



Ford Administration
1620 E. Elza, Hazel Park, MI 48030 | 248-658-5200 | F: 248-544-5223
www.hazelparkschools.org

Agenda

Regular Meeting

Ford Administration Building

1620 E Elza Avenue

Hazel Park, MI 48030

March 14, 2022

7:00 PM

LOCATION AND FORMAT: The meeting will be held at the Ford Administration Building, 1620 E Elza Hazel Park, Michigan. It will be live-streamed on YouTube. Members of the public wishing to speak during the public comment portion of the meeting may do so in-person or by emailing Board President, Laura Adkins, prior to the meeting at laura.adkins@hazelparkschools.org.

CALL TO ORDER

ROLL CALL

PLEDGE OF ALLEGIANCE

APPROVAL OF THE AGENDA (ACTION ITEM)

PUBLIC COMMENT

The Board of Education recognizes the value of public comment on education items and the importance of allowing members of the public to express themselves on District matters.

During this portion of public comment, each statement made by a participant shall be limited to three (3) minutes and participants must identify themselves by name and address.

CONSENT AGENDA (Action Items)

The Board of Education shall use a consent agenda to keep routine matters within a reasonable time frame. A member of the Board may request any item to be removed from the consent agenda and defer it for more discussion and specific action.

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B. Monthly Financial Reports 16

C. Conference Requests

D. Personnel Recommendations 27

NEW BUSINESS

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SUPERINTENDENT REPORT

A. Certificate of Appreciation for Edison	657
B. Academies for Machinery & Fire Update	

REQUESTS FOR FUTURE AGENDA ITEMS

CALENDAR DATES

PUBLIC COMMENT

During this portion of public comment, each statement made by a participant shall be limited to one (1) minute and participants must identify themselves by name and address.

BOARD MEMBER AND ADMINISTRATION COMMENTS

ADJOURNMENT

Any person with a disability who needs accommodation for participation in this meeting should contact the Superintendent's office at (248) 658-5220 at least five (5) days in advance of the meeting to request assistance.

All Official minutes of school board meetings are stored and available for inspection in the Ford Administration office at the above address.

This notice is given in compliance with Act No. 267 of the Public Acts Michigan, 1976



SCHOOL DISTRICT OF THE
CITY OF HAZEL PARK
COUNTY OF OAKLAND AND STATE OF MICHIGAN
REGULAR MEETING
February 14, 2022 7:00 PM

CALL TO ORDER

The Regular Meeting of the Hazel Park Board of Education was held at the Ford School Administration Office on February 14, 2022 and was called to order by President Adkins at 7:00 p.m.

ROLL CALL

Members Present: Adkins, Baldwin, Fortress, Hinton, Rice,
Members Absent: Noth, Schlak
Others Present: Kruppe, Zirnis, Dillard, Dulmage, Miller, Pleiness, Postell, Wilkins

PLEDGE OF ALLEGIANCE

APPROVAL OF THE AGENDA (ACTION ITEM)

Moved by Melissa Baldwin, supported by Dawn Rice, that the Board of Education approve the agenda as written.

Discussion - None

Roll Call Vote

Yeas Baldwin, Fortress, Hinton, Rice, Adkins

Nays:

Motion carried.

PUBLIC COMMENT - None

SPECIAL ORDER OF BUSINESS

A. Promise Zone Update (Informational)

Mr. Brandon Gleaton updated the Board of Education on Hazel Park High School, College Spring, Advantage Alternative & the Promise Zone Dinner.

B. STEAM Update (Informational Item)

Dr. Stephanie Dulmage, Director of 21st Century Learning, updated the Board of Education and community stakeholders on the STEAM curriculum, STEAM Clubs and FIRST Robotics clubs throughout the district.

C. LEO Update (Informational Item)

Dr. Stephanie Dulmage, Director of 21st Century Learning, updated the Board of Education on LEO processes explaining how immeasurable this has been for our district. Foundational coaching has been very impactful and shared resources help all instructional coaches across the district.

CONSENT AGENDA (Action Items)

- A. Approval of Minutes
 - 1) Board Meetings
 - 2) Committee Meetings
- B. Monthly Financial Reports
- C. Personnel Recommendations
- D. Conference Requests

Moved by Melissa Baldwin, supported by Dawn Rice, that the Board of Education approve the consent agenda, as presented.

Roll Call Vote

Yeas Baldwin, Fortress, Hinton, Rice, Adkins

Nays:

Motion carried.

NEW BUSINESS

- A. MME Assessment Testing (Action Item)

Motion made by Dawn Rice, supported by Melissa Baldwin, that the Board of Education approve the recommendation to waive the 12th-grade MME testing requirement for the 2021-2022 school year.

Roll Call Vote

Yeas Rice, Baldwin, Fortress, Hinton, Adkins

Nays:

Motion carried.

- B. IDEA Funding (Action Item)

Motion made by Dawn Rice, supported by Melissa Baldwin, that the Board of Education approve the resolution to ask for full funding from the federal government for our students with disabilities.

Roll Call Vote

Yeas Rice, Baldwin, Fortress, Hinton, Adkins

Nays:

Motion carried.

- C. IDEA Washington DC Trip (Action Item)

Motion made by Dawn Rice, supported by Melissa Baldwin, that the Board of Education approve the trip to Washington DC and the resolution to ask for full funding from the federal government for our students with disabilities.

Roll Call Vote

Yeas Rice, Baldwin, Fortress, Hinton, Adkins

Nays:

Motion carried.

- D. Webb Behavior Paraprofessional (Action Item)

Motion made by Dawn Rice, supported by Melissa Baldwin, that the Board of Education approve the addition of one Webb behavioral paraprofessional for the 2021-2022 school year.

Roll Call Vote

Yeas Rice, Baldwin, Fortress, Hinton, Adkins

Nays:

Motion carried.

E. 1:1 Paraprofessional (Action Item)

Motion made by Dawn Rice, supported by Melissa Baldwin, that the Board of Education approve the addition of one one-to-one paraprofessional for the 2021-2022 school year.

Roll Call Vote

Yeas Rice, Baldwin, Fortress, Hinton, Adkins

Nays:

Motion carried.

F. AED Replacement (Action Item)

Motion made by Dawn Rice, supported by Melissa Baldwin, that the Board of Education approve the spending of \$10,388 for AED Replacements.

Roll Call Vote

Yeas Rice, Baldwin, Fortress, Hinton, Adkins

Nays:

Motion carried.

G. Testing Tables for High School (Action Item)

Motion made by Dawn Rice, supported by Melissa Baldwin, that the Board of Education approve spending of \$14,750 for testing tables.

Roll Call Vote

Yeas Rice, Baldwin, Fortress, Hinton, Adkins

Nays:

Motion carried.

H. Helmets for Junior High (Action Item)

Motion made by Dawn Rice, supported by Melissa Baldwin, that the Board of Education approve the spending of \$7,977.07 for football helmets.

Roll Call Vote

Yeas Rice, Baldwin, Fortress, Hinton, Adkins

Nays:

Motion carried.

I. High School Weight Room Equipment (Action Item)

Motion made by Dawn Rice, supported by Melissa Baldwin, that the Board of Education approve the spending of \$5,641.96 for weight room equipment.

Roll Call Vote

Yeas Rice, Baldwin, Fortress, Hinton, Adkins

Nays:

Motion carried.

J. Junior High Uniforms (Action Item)

Motion made by Dawn Rice, supported by Melissa Baldwin, that the Board of Education approve the spending of \$2,793 For athletic uniforms.

Roll Call Vote

Yeas Baldwin, Fortress, Hinton, Rice, Adkins

Nays:

Motion carried.

K. Band Uniforms (Action Item)

Motion made by Melissa Baldwin, supported by Dawn Rice, that the Board of Education approve the spending of \$20,000 For band uniforms.

Roll Call Vote

Yeas Baldwin, Rice, Fortress, Hinton, Adkins

Nays:

Motion carried.

L. One Paraprofessional & One MTSS Teacher for Hoover Pilot Program (Action Item)

Motion made by Melissa Baldwin, supported by Dawn Rice, that the Board of Education approve a 1.0 MTSS Teacher and 0.5 Paraprofessional for Hoover for the remainder of the 2021-2022 school year.

Motion amended by Melissa Baldwin, supported by Dawn Rice, that the Board of Education approve a 0.5 MTSS teacher and a 1.0 Paraprofessional for Hoover for the remainder of the 2021-2022 school year.

Roll Call Vote

Yeas Baldwin, Rice, Fortress, Hinton, Adkins

Nays:

Motion carried.

M. National Superintendent Roundtable (Action Item)

Motion made by Dawn Rice, supported by Melissa Baldwin, that the Board of Education approve the membership for Dr. Kruppe at a cost of \$1700.00 to the National Superintendents Roundtable (NSR).

Roll Call Vote

Yeas Baldwin, Fortress, Hinton, Rice, Adkins

Nays:

Motion carried.

N. Superintendent Administrative Assistant for HR Support (Action Item)

Motion made by Dawn Rice, supported by Melissa Baldwin, that the Board of Education approve the Superintendent Administrative Assistant for HR Support position, as presented.

Roll Call Vote

Yeas Baldwin, Rice, Adkins

Nays: Fortress, Hinton

Motion failed.

O. Three-year plans (Informational Item)

Superintendent, Dr. Amy Kruppe shared the projections for the three year plans as requested by the Board of Education. Finance to be presented at a later time.

P. 2022 MASB Board of Directors Election (Action Item)

Motion made by Melissa Baldwin, supported by Dawn Rice, that the Board of Education approve a candidate for the 2022 MASB Board of Directors, as presented.

Roll Call Vote

Yeas Baldwin, Fortress, Hinton, Rice, Adkins

Nays:

Motion carried.

SUPERINTENDENT REPORT

A. 1st Semester Attendance Presentation (Informational Item)

B. Attendance Report (Informational Item)

Dr. Amy Kruppe, Superintendent updated the Board of Education on District attendance and explained the difficulty in projection this year with so many students being out for 10 days with COVID.

C. Notes of Appreciation (Informational Item)

1) Memorial contribution for Janet Boughton

Mrs. Issacson made a monetary donation in the name of Janet Boughton.

2) Mezzanine Dedication

Dr. Amy Kruppe, Superintendent read highlights from the thank you letter Mr. Robert Morrill had sent about the Mezzanine Dedication in his honor.

D. School Mask Mandate (Informational Item)

Dr. Amy Kruppe, Superintendent, discussed that it is still recommended for those in schools to continue to wear the mask. She continued to ask the Board of Education what their thoughts were. Heidi Fortress states we have always followed the recommended guidelines and we should continue to do so. She believes we could leave it up to the parent if they choose to have their child wear a mask. Laura Adkins agreed that we have always followed recommended guidelines and she was okay to continue this moving forward. Dr. Amy Kruppe will make the announcement after we come back from break, stating the barriers, Covid cleaners and other procedures we have will remain in place.

CLOSED SESSION

A. Motion to recess into closed session (h) Attorney/Client privilege to consider material exempt from discussion or disclosure by state or federal statute; which is exempt from disclosure pursuant to Section 8(h) of the Open Meeting Act.

Motion made by Dawn Rice, supported by Melissa Baldwin that the Board of Education recess into closed session (h) Attorney/Client privilege to consider material exempt from discussion or disclosure by state or federal statute; which is exempt from disclosure pursuant to Section 8(h) of the Open Meeting Act.

Roll Call Vote:

Yeas: Rice, Baldwin, Fortress, Hinton, Adkins

Nays:

Motion carried.

REQUESTS FOR FUTURE AGENDA ITEMS

CALENDAR DATES

PUBLIC COMMENT

BOARD MEMBER AND ADMINISTRATION COMMENTS

Beverly Hinton, Secretary Thank you for the \$2000 Make A Wish foundation donation in our name. I love purchasing new uniforms! Happy Valentine's Day everyone!

Heidi Fortress, Treasurer Happy Valentine's Day! Loved the 3 notes, a great idea and very cute! Hope the teachers enjoyed it too! Have a good night and Happy Valentine's Day!

Melissa Baldwin, Vice President The Recreation Department is hiring a Zamboni driver! Plante Moran had the second finance meeting that I attended, had speaker, Kurt Bechler, he was great! Thank you to the anonymous donor as well, for the donation to Make A Wish. Boys & Girls Basketball are doing great. I have had the chance to watch several games and I see they keep improving! UO All Stars night tomorrow, Thank you to Mr. Gleaton for the Promise Zone update. The Senior All Night Party is still taking donations. Thank you Board for approving my conference request, I am looking forward to it!

Dawn Rice, Trustee Thank you for the presents, I love presents! Good Night Everyone!

Dr. Amy Kruppe, Superintendent Thank you for a great meeting.

Laura Adkins, President The Promise Zone baskets, I know we have a lot of craft people on the board so I wondered if someone wanted to make the baskets. Melissa and I will be attending the OCSBA Meeting on March 16th, there is still time if others want to join us! Next week is winter break, I hope everyone can get some rest and relax during that time. Thank you and good night.

ADJOURNMENT

Moved and supported that the meeting be adjourned at 9:48 pm.
Unanimous Approval.

Respectfully Submitted,

Beverly Hinton, Secretary
Hazel Park Board of Education



SCHOOL DISTRICT OF THE
CITY OF HAZEL PARK
COUNTY OF OAKLAND AND STATE OF MICHIGAN
SPECIAL MEETING
February 28, 2022 6:30 PM

CALL TO ORDER

The Special Meeting of the Hazel Park Board of Education was held at the Ford School Administration Office on February 28, 2022 and was called to order by President Adkins at 6:32 p.m.

ROLL CALL

Members Present: Adkins, Baldwin, Fortress, Hinton, Rice, Schlak

Members Absent: Noth

Others Present: Kruppe, Zirnis, Dulmage, Postell, Wilkins

PLEDGE OF ALLEGIANCE

APPROVAL OF THE AGENDA (ACTION ITEM)

Moved by Kristy Schlak, supported by Melissa Baldwin, that the Board of Education approve the agenda as written.

Discussion - None

Roll Call Vote

Yeas Schlak, Baldwin, Fortress, Hinton, Rice, Adkins

Nays:

Motion carried.

PUBLIC COMMENT - None

CONSENT AGENDA (Action Items)

A. Approval of Minutes

1) Board Meetings

2) Committee Meetings

B. Monthly Financial Reports

C. Personnel Recommendations

D. Conference Requests

Moved by Kristy Schlak, supported by Melissa Baldwin, that the Board of Education approve the consent agenda, as presented.

Roll Call Vote

Yeas Baldwin, Fortress, Hinton, Rice, Adkins

Nays:

Motion carried.

NEW BUSINESS

A. Pool RFP (Action Item)

Motion made by Schlak, supported by Baldwin, that the Board of Education approve the spending of \$1,246,560 for the Natatorium Renovation, as presented.

Discussion

Mr. Zirnis, Assistant Superintendent of Business and Operations, presented information on the pool project to the board. The estimated completion date will be September 30th.

Heidi Fortress would like the project to be completed by August for the girls swim team to be able to utilize the pool.

Dawn Rice voiced some concerns for getting materials in a timely manner due to the current state of shortages in the industry.

Roll Call Vote

Yeas Schlak, Baldwin, Rice, Fortress, Hinton, Adkins

Nays:

Motion carried.

B. eRate (Action Item)

Motion made by Schlak, supported by Baldwin, that the Board of Education approves the recommendation from the Technology Department for the eRate project.

Roll Call Vote

Yeas Schlak, Baldwin, Rice, Fortress, Hinton, Adkins

Nays:

Motion carried.

C. Grading (Informational Item)

The High School Admin team presented a new pilot program to make the grading policy more equitable for our students.

D. Jardon Update (Informational Item)

Mr Jason Zirnis presented information regarding the new Jardon project and how the space would be utilized.

E. Superintendent Evaluation Check In: written (Informational Item)

Dr. Amy Kruppe presented the board with a letter of check in for items that have been completed to date. She also asked the preference of the board in deliverance of these materials. The decision was split as Dr. Kruppe agreed to provide versions of this report moving forward.

F. Protocols (Informational Item)

The Board reviewed protocols and requested a few changes.

PUBLIC COMMENT

Sue Hemple
1203 E Hayes
Hazel Park, MI 48030

Glad to see the board moving forward with the pool. I agree it needs to be done sooner. I also agree with Kristy regarding liking social media posts.

BOARD MEMBER AND ADMINISTRATION COMMENTS

Beverly Hinton, Secretary

Heidi Fortress, Treasurer See you Monday!

Dr. Amy Kruppe, Superintendent It's always important to be careful sharing opinions on social media. We need to continue focusing on the positives in our district. I was notified Bobby McDermott has been ill, he has done many positive things for our district and we need to rally around him.
Some discussion took place regarding possible ideas to honor him.

Melissa Baldwin, Vice President

Laura Adkins, President Melissa has many things going on! She has completed some training this week and she is learning a lot of information! The Promise Zone dinner is next week. Enjoyed the presentation from the High School about the grading pilot. Excited to have the pool moving forward. Next week is the Promise Zone dinner. I hope everyone has a good night!

Dawn Rice, Trustee Good Night Everyone!

ADJOURNMENT

Moved and supported that the meeting be adjourned at 9:50 pm.
Unanimous Approval.

Respectfully Submitted,

Beverly Hinton, Secretary
Hazel Park Board of Education



Ford Administration
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Finance Committee Meeting

March 7, 2022

5:15PM

Ford Administration Building

Board Members Present:	Heidi Fortress, Beverly Hinton
Board Members Absent:	Laura Adkins
Administrators Present:	Dr. Amy Kruppe, Jason Zirnis, Matthew Miller
Audience:	Sue Hemple

Meeting start time - 5:15pm

- A. **Budget** - The budget was presented with an excess of \$460k. The District believes that this amount is conservative and most likely ends in a position greater than this amount. The three year forecast shows the District losing fund balance in the near future. COVID funding is about \$9m and that will soon dry up after the 2023-24 year. The District is using about \$2m a year and stretching out the funding until this time. The District indicated that MTSS teachers cost \$2m a year and that is a large part of the COVID spending.
- B. **Human Resources** - The District has received several resumes to review. Board requested to be on the committee to review the Director as this would be the third director in as many years. Currently the Superintendent is doing Human Resources.
- C. **IT Intern** - The District is requesting another hiring of an IT intern. This person would support IT during this time of need. The motion will go before the board for approval. Will need to be given out by March 1.
- D. **Check Register Review** - Any and all questions were reviewed and answered.

Meeting end time - 6:15pm

Minutes submitted by Matthew Miller





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Buildings & Grounds Committee Meeting

March 7, 2022

6:30 PM

Board Members Present: Melissa Baldwin, Heidi Fortress and Kristy Schlak
Board Members Absent: None
Administrators Present: Dr. Amy Kruppe, Jason Zirnis, Matt Miller
Audience: Chuck Hemple

Meeting start time - 6:20 pm

Public Comment: Mr. Hemple - Commented on the installation of the optional ADA lift in the Natatorium RFP and its impact on the pool and deck.

- A. **Sinking Fund Cash Flow** -A brief overview was provided of the anticipated revenue and expenses with the current projects being scheduled through next summer. The Fund is in a positive position right now but will begin to feel some strain with the Natatorium and locker room renovations, bathrooms and camera RFP currently planned. Further updates will be provided to monitor the funds available.
- B. **Pool Update** - We are moving forward with contract award, meetings with the contractors have been scheduled for this week to ensure the timelines and working arrangements between the two contractors can be met to complete all the work.
- C. **Natatorium Locker Room** - The RFP has been completed and the font section is with the attorneys for review. It is slated to be released on March 15, 2022 with bids due March 31, 2022.
- D. **High School Floor** - The abatement is complete and the contractors are now scheduled for the hallway flooring and repair of the main gym floor. It is anticipated that the lead time for the hallway floor material is 4-6 weeks and the project will be done at the start of summer. The gym floor repair is a little more involved and we are formulating a timeline to reduce the impact on classes and extracurricular activities.
- E. **MSP Grant Application** - The grant was opened at the start of the month and closes March 24, 2022. The guidelines for the award is \$250,000 per District with no building receiving \$50,000. Recommendation from administration will be to replace interior doors and hardware across the District as provided by the funding.

Meeting end time - 6:50





HAZEL PARK
SCHOOLS

Minutes submitted by Jason Zirnig, Assistant Superintendent of Business and Operations



Ford Administration
1620 E. Elza, Hazel Park, MI 48030 | 248-658-5200 | F: 248-544-5223
www.hazelparkschools.org

**Personnel Committee Meeting
March 10, 2022
5:00 PM**

Board Members Present: Kristy Schlak
Board Members Absent: None
Administrators Present: Jason Zirniss
Audience: None

Meeting start time - 5:08 pm

Public Comment: None

- A. **Technology** - Reviewed the salary rate for the technology temporary help to replace an individual on leave. Current rate is \$12.00 and hours and administration is recommending \$14.00 to retain quality personnel.
- B. **Administrative Assistant** - Administration is recommending a full time Administrative Assistant to aid with processing paperwork in the Human Resources Office. Other duties would include; fingerprinting, file audits, file reviews, and other areas as outlined by the job description reviewed. Recommended pay rate based on experience would be \$45,000 to \$55,000.
- C. **Human Resource Update** - Numerous items of concerns were noted in the review of files and employee onboarding. It was identified that personnel were assigned the wrong rate of pay, files were incomplete prior to starting and there was a lack of follow-up through the onboarding process. We are assessing the issues and making the necessary corrections. The Administrative Assistant noted above would be integral to making sure the information is collected and flowing to the necessary departments to ensure accuracy and completeness.
- D. **Staffing Update** - We are waiting on several schools to complete the building schedules for the fall before we assess the impact on staffing. A review will be taking place shortly when all the necessary information is received to make an accurate assessment of staffing needs based on course selection.
- E. **Administrative Pay Rates** - In review of the pay rates for several Central Office staff it was noted that there was a discrepancy between the rates the District is compensating several employees well below their counterparts. We will bring forth a recommendation to the Board at the time of contract renewal to make the necessary equity changes.
- F. **Personnel Leave Request** - A teacher has asked (as outlined by the HPEA contract) to take 10 personal days for a wedding overseas. Administrative recommendation is to allow the personal days, committee agreed

Meeting end time - 5:25 pm

Minutes submitted by Jason Zirniss, Assistant Superintendent of Business and Operations





Ford Administration
Matthew Miller, Business Office Manager
1620 E. Elza, Hazel Park, MI 48030 | 248-658-5213 | F: 248-544-5443
www.hazelparkschools.org

TO: The School District of the City of Hazel Park
Board of Education

FROM: Jason Zirniss
Assistant Superintendent, Business & Operations

RE: Treasurer's Report February, 2022

DATE: March 9, 2022

Attached is the check register (including current period voids), a listing of ACH debits, wire transfers, and P-Card purchases made during the period

GENERAL FUND (11)		1,101,130.04	
	<i>Total - General Fund</i>	<u>\$ 1,101,130.04</u>	
CENTER PROGRAM (22)		15,737.08	
COMMUNITY SERVICE (23)		0.00	
FOOD SERVICE FUND (25)		139,202.93	
COMMON DEBT (31-39)		500.00	
CAPITAL PROJECTS (41-49)		54,538.25	
	<i>Total - Special Revenue Funds</i>	<u>\$ 209,978.26</u>	
INTERNAL ACCOUNT FUNDS (29)		3,217.05	
	<i>Total - Other Funds</i>	<u>\$ 3,217.05</u>	
TOTAL CHECK DISBURSEMENTS		<u><u>\$ 1,314,325.35</u></u>	\$ 1,314,325.35
ACH DEBITS			1,659,818.11
PAYROLL			1,295,770.53
OUTGOING WIRE TRANSFERS			2,355,758.56
P-CARD PURCHASES			155,041.73
			<u>5,466,388.93</u>
TOTAL DISBURSEMENTS IN PERIOD			<u><u>\$ 6,780,714.28</u></u>

I certify that the disbursements listed on the attached check registers and listing of ACH debits, wire transfers, and P-Card purchases were payments made for obligations of The School District of the City of Hazel Park and that all materials or services listed on the invoices have been received or performed.

Jason Zirniss
Assistant Superintendent, Business & Operations

Monthly Summary of EFT's from HP Bank Accounts

Feb-22

<u>Date</u>	<u>Amount</u>	<u>Bank Acct Taken From</u>	<u>Reason</u>
2/2/2022	\$333.85	Gen Funds	Latchkey Fees
2/9/2022	\$10,000.00	Gen Funds	Arbiterpay for Refs
2/11/2022	\$5,254.33	Gen Funds	Health Equity Payment February 11th Payroll
2/25/2022	\$3,821.00	Gen Funds	Health Equity Payment February 11th Payroll
2/10/2022	\$10,129.98	Gen Funds	EduStaff Payment
2/24/2022	\$13,127.71	Gen Funds	EduStaff Payment
2/15/2022	\$23,356.01	Gen Funds	Penserv Payment February 11th Payroll
2/28/2022	\$22,775.63	Gen Funds	Penserv Payment February 25th Payroll
2/11/2022	\$32,295.78	Tax W/H	Payroll State Tax Withholding February 11th
2/17/2022	\$14.92	Tax W/H	Sales Tax
2/25/2022	\$32,522.76	Tax W/H	Payroll State Tax Withholding February 25th
2/11/2022	\$214,345.07	Tax W/H	Payroll Federal Tax Withholding February 11th
2/25/2022	\$218,017.12	Tax W/H	Payroll Federal Tax Withholding February 25th
2/10/2022	\$361,413.63	Ret W/H	Payroll Retirement Withholding January 28th
2/24/2022	\$330,131.38	Ret W/H	Payroll Retirement Withholding February 11th
2/18/2022	\$5,190.70	UIA	Unemployment Payment
2/18/2022	\$331,988.89	UAAL	Payroll UAAL Payment February
2/1/2022	\$29,459.79	DTE	February DTE Payments
2/8/2022	\$15,639.56	Consumers	February Consumers Payments
	<u>\$1,659,818.11</u>	Total ACH Debits	

<u>Date</u>	<u>Amount</u>	<u>Payroll</u>
2/11/2022	\$637,456.40	General Payroll on February 11th
2/25/2022	\$658,314.13	General Payroll on February 25th
	<u>\$1,295,770.53</u>	Total Payroll

<u>Date</u>	<u>Amount</u>	<u>Wires</u>
2/23/2022	\$2,355,758.56	MVCA Wire State Aid
	<u>\$2,355,758.56</u>	Total Wires

<u>Date</u>	<u>Amount</u>	<u>P-Card Purchases</u>
2/23/2022	\$155,041.73	General P-Card charges Huntington Bank
	<u>\$155,041.73</u>	Total P-Card Purchases

Hazel Park Schools
Budget to Actual by St Revenue and St Function

As of 02/28/2022

St Revenue/Function	Description		Original Budget	1st Amended Budget	Encumbrance	Actual	Balance	Percent
Type: 4 Revenue								
St Revenue: 100	Revenue from Local Sources	Total:	5,565,278.40	5,301,863.00	0.00	3,637,361.61	1,664,501.39	68.61%
St Revenue: 300	Rev from State Sources	Total:	27,440,953.46	28,260,564.00	0.00	14,027,920.91	14,232,643.09	49.64%
St Revenue: 400	Rev from Federal Sources	Total:	5,323,130.00	7,055,186.00	0.00	5,171,263.77	1,883,922.23	73.30%
St Revenue: 500	Incoming Transfer/Oth Transact	Total:	2,380,209.40	2,929,867.00	0.00	1,235,894.45	1,693,972.55	42.18%
St Revenue: 600	Fund Modifications	Total:	1,569,040.36	1,619,040.00	0.00	0.00	1,619,040.00	0.00%
Type: 4	RevenueTotal:		42,278,611.62	45,166,520.00	0.00	24,072,440.74	21,094,079.26	53.30%
Type: 5 Expense								
St. Function:110	Basic Programs	Total:	19,059,579.88	20,268,503.00	131,150.58	10,613,209.33	9,524,143.09	52.36%
St. Function:120	Added Needs	Total:	8,221,581.26	7,822,408.00	5,240.21	4,576,510.93	3,240,656.86	58.51%
St. Function:210	Support Services-Pupil	Total:	2,449,653.37	2,526,515.00	5,050.80	1,642,934.80	878,529.40	65.03%
St. Function:220	Support Services-Instr Staff	Total:	1,610,429.25	2,221,870.00	898.32	1,455,937.07	765,034.61	65.53%
St. Function:230	Support Services-General Admin	Total:	646,988.52	648,807.00	4,150.00	480,727.51	163,929.49	74.09%
St. Function:240	Support Services-School Admin	Total:	2,081,369.84	2,059,557.00	580.28	1,255,193.76	803,782.96	60.94%
St. Function:250	Support Services-Business	Total:	757,166.28	688,081.00	1,262.25	483,941.58	202,877.17	70.33%
St. Function:260	Operations and Maintenance	Total:	4,471,426.19	5,286,186.00	115,969.36	3,088,119.81	2,082,096.83	58.42%
St. Function:270	Pupil Transportation Services	Total:	317,126.07	201,941.00	27,901.50	201,545.07	-27,505.57	99.80%
St. Function:280	Support Services-Central	Total:	1,325,197.03	1,446,099.00	758.09	957,797.20	487,543.71	66.23%
St. Function:290	Support Services-Other	Total:	580,337.23	479,649.00	21,393.78	291,002.81	167,252.41	60.67%
St. Function:330	Community Activities	Total:	15,912.00	10,400.00	0.00	1,947.79	8,452.21	18.73%
St. Function:390	Other Community Services	Total:	57,846.47	251,514.00	0.00	69,069.19	182,444.81	27.46%
St. Function:440	Pymts to Other Govnmt	Total:	209,706.64	266,665.00	0.00	266,665.00	0.00	100.00%
St. Function:510	Debt Services - Long Term Only	Total:	33,000.00	33,000.00	0.00	33,000.00	0.00	100.00%
St. Function:600	Transfers Out	Total:	292,088.00	292,088.00	0.00	26,043.75	266,044.25	8.92%
Type: 5	ExpenseTotal:		42,129,408.03	44,503,283.00	314,355.17	25,443,645.60	16,685,762.43	57.17%
Grand Total:			149,203.59	663,237.00		-1,371,204.86	4,408,316.83	

Hazel Park Schools
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Check Date	Check#	PE ID	Vendor Name	PO#	Amount
Fund: 110					
02/10/2022	EH 0000227	100550	AMAZON CAPITAL SERVICES INC		339.17
02/10/2022	EH 0000228	100860	BALDWIN, MELISSA	P2200005	40.00
02/10/2022	EH 0000230	100861	FORTRESS, HEIDI	P2200286	40.00
02/10/2022	EH 0000231	100056	HINTON, BEVERLY	P2200007	40.00
02/10/2022	EH 0000232	100044	HP PROMISE ZONE	P2200012	40.00
02/10/2022	EH 0000233	100745	KSS ENTERPRISES		1,736.95
02/10/2022	EH 0000234	100021	PEARSON CLINICAL ASSESSMENT	P2200270	2,038.69
02/10/2022	EH 0000235	100489	PEARSON EDUCATION	P2200271	420.62
02/10/2022	EH 0000236	100125	SCHLAK, KRISTY	P2200017	40.00
02/10/2022	EH 0000237	100397	SCHOOL SPECIALTY	P2200163	41.44
02/10/2022	EH 0000238	100357	STAPLES BUSINESS ADVANTGE	P2200260	11.34
02/10/2022	EH 0000239	100977	THE CYPRESS INITIATIVE	P2200179	1,285.20
02/11/2022	HP 00500757	100458	ACE TRANSPORTATION	P2200174	216.00
02/11/2022	HP 00500758	100412	AVENTRIC TECHNOLOGIES		477.00
02/11/2022	HP 00500759	100512	CHAPT 13 TRUSTEE-TAMMY L TERRY		420.00
02/11/2022	HP 00500760	100011	CHAPTER 13 TRUSTEE		332.00
02/11/2022	HP 00500761	100322	CITY HAZEL PARK WATER		3,079.98
02/11/2022	HP 00500762	100111	CLARK, DENNIS		120.00
02/11/2022	HP 00500763	100139	COLLEGE ENTRANCE EXAMINATION BOARD		67.50
02/11/2022	HP 00500764	100888	CONSTELLATION		21,997.73
02/11/2022	HP 00500765	100459	CONVERGENT TECH PARTNERS		475.00
02/11/2022	HP 00500766	100953	DAVID BADER P67307		166.86
02/11/2022	HP 00500767	100446	FAR THERAPEUTIC & PERFORMING ARTS	P2200059	136.02
02/11/2022	HP 00500769	100404	HASTINGS AUTO PARTS	P2200024	89.93
02/11/2022	HP 00500771	100839	K 12 MANAGEMENT DBA FuelEd		4,712.40
02/11/2022	HP 00500772	100411	LOWES COMPANIES	P2200042	94.60
02/11/2022	HP 00500773	100413	MCGRAW HILL BOOK CO		463.01
02/11/2022	HP 00500774	100327	MICHIGAN EDUCATION SPECIAL		528,625.81
02/11/2022	HP 00500775	100276	MICHIGAN SPORTS ASSIGNERS INC		240.00
02/11/2022	HP 00500776	100387	MISDU		912.65

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Check Date	Check#	PE ID	Vendor Name	PO#	Amount
02/11/2022	HP 00500777	100332	NBC TRUCK EQUIPMENT	P2200033	897.38
02/11/2022	HP 00500778	101012	RIVERSIDE INSIGHTS		660.00
02/11/2022	HP 00500779	100609	RUSKIN, DAVID		1,127.58
02/11/2022	HP 00500780	100226	SOCIAL THINKING-SOCIAL THINKING	P2200184	179.31
02/11/2022	HP 00500782	100615	WARREN WOODS TOWER HIGH SCHOOL		250.00
02/11/2022	HP 00500783	100345	WESTERN PSYCHOLOGICAL SERVICES	P2200274	58.30
02/14/2022	HP 00500784	100458	ACE TRANSPORTATION	P2200174	1,818.50
02/14/2022	HP 00500785	101018	HAZEL PARK DANCE TEAM		481.00
02/15/2022	HP 00500786	101019	SCHLECHTY CENTER		1,871.00
02/24/2022	EH 00000240	100045	A & I ENTERPRISES		170,440.20
02/24/2022	EH 00000241	100550	AMAZON CAPITAL SERVICES INC	P2200283	826.30
02/24/2022	EH 00000242	100495	C G NEWSPAPERS		9,740.80
02/24/2022	EH 00000243	100292	INVEST CENTERS LLC		223,414.18
02/24/2022	EH 00000244	100745	KSS ENTERPRISES		4,005.95
02/24/2022	EH 00000245	100520	PEDIATRIC HEALTH CONSULTANTS INC		8,915.10
02/24/2022	EH 00000247	100357	STAPLES BUSINESS ADVANTGE	P2200269	133.53
02/24/2022	HP 00500787	100350	ASCENSION MICHIGAN EMPLOYER SOLUTIONS		108.00
02/24/2022	HP 00500788	100544	ASCENSION MICHIGAN EMPLOYER SOLUTIONS		132.00
02/24/2022	HP 00500789	100584	ASCENSION MICHIGAN EMPLOYER SOLUTIONS		38.00
02/24/2022	HP 00500790	100278	ATHLETICO LTD	P2200021	8,850.00
02/24/2022	HP 00500791	100735	BURKES SPORT HAVEN		877.22
02/24/2022	HP 00500792	100512	CHAPT 13 TRUSTEE-TAMMY L TERRY		420.00
02/24/2022	HP 00500793	100111	CLARK, DENNIS		240.00
02/24/2022	HP 00500794	100888	CONSTELLATION		22,045.40
02/24/2022	HP 00500795	100479	CRISIS PREVENTION INSTITUTE		200.00
02/24/2022	HP 00500796	100953	DAVID BADER P67307		166.86
02/24/2022	HP 00500797	100031	DEAF COMMUNITY ADVOCACY NETWORK		693.36
02/24/2022	HP 00500799	100640	FIBER LINK INC		316.25
02/24/2022	HP 00500800	101024	FLAT ROCK LANES		296.40
02/24/2022	HP 00500801	101021	HEALTHED TALKS		300.00
02/24/2022	HP 00500802	101022	HEARTLAND BUSINESS SYSTEMS LLC.		1,497.00

Hazel Park Schools
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02/24/2022	HP 00500803	100488	HOME DEPOT CREDIT SERVICES	P2200038	54.73
02/24/2022	HP 00500804	100079	INTEGRITY TESTING & SAFETY ADM		221.00
02/24/2022	HP 00500806	101023	LANGUAGE LINE SERVICES INC..		462.00
02/24/2022	HP 00500807	100511	M L SCHOENHERR CONST INC		4,970.00
02/24/2022	HP 00500808	101020	MASSP		250.00
02/24/2022	HP 00500809	100413	MCGRAW HILL BOOK CO	P2200255	4,792.55
02/24/2022	HP 00500810	100730	METRO ATHLETIC OFFICIALS ASSOC		190.00
02/24/2022	HP 00500811	100589	MILLENNIUM BUSINESS SYSTEMS	P2200010	2,518.48
02/24/2022	HP 00500812	100387	MISDU		912.65
02/24/2022	HP 00500813	101015	MYFTARI, SUZANA		852.60
02/24/2022	HP 00500814	100380	OAKLAND SCHOOLS		37,710.77
02/24/2022	HP 00500815	100000	OFFICE DEPOT	P2200285	663.48
02/24/2022	HP 00500816	100995	PETER PUGGER MFG INC	P2200216	918.75
02/24/2022	HP 00500817	100337	PETERSON GLASS CO		538.25
02/24/2022	HP 00500819	101003	PHOENIX MACHINERY MOVERS INC.		5,300.00
02/24/2022	HP 00500820	100585	PITNEY BOWES		92.03
02/24/2022	HP 00500821	100060	PLANTE MORAN PLLC		3,800.00
02/24/2022	HP 00500822	100468	PROGRESSIVE PLUMBING SUPPLY	P2200090	290.30
02/24/2022	HP 00500824	100690	RIDDELL ALL AMERICAN		4,194.25
02/24/2022	HP 00500826	100609	RUSKIN, DAVID		1,127.58
02/24/2022	HP 00500828	100740	SPECTRUM WIRELESS USA INC		45.00
02/24/2022	HP 00500830	100977	THE CYPRESS INITIATIVE		1,285.20
02/24/2022	HP 00500832	100345	WESTERN PSYCHOLOGICAL SERVICES	P2200278	240.90
			Fund 110	Total:	1,101,130.04
Fund: 220					
02/10/2022	EH 00000227	100550	AMAZON CAPITAL SERVICES INC		823.47
02/11/2022	HP 00500767	100446	FAR THERAPEUTIC & PERFORMING ARTS	P2200059	2,635.24
02/11/2022	HP 00500781	100515	STAFF CONNECTIONS LLC		4,143.00
02/24/2022	EH 00000241	100550	AMAZON CAPITAL SERVICES INC		173.78
02/24/2022	EH 00000246	100397	SCHOOL SPECIALTY	P2200265	714.65
02/24/2022	HP 00500798	100446	FAR THERAPEUTIC & PERFORMING ARTS	P2200059	887.66

Hazel Park Schools
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Check Date	Check#	PE ID	Vendor Name	PO#	Amount
02/24/2022	HP 00500811	100589	MILLENNIUM BUSINESS SYSTEMS	P2200010	579.81
02/24/2022	HP 00500818	100543	PETTY CASH		283.52
02/24/2022	HP 00500829	100515	STAFF CONNECTIONS LLC		4,436.00
02/24/2022	HP 00500831	100020	UNDERWOOD DISTRIBUTING COMPANY	P2200287	1,059.95
				Fund 220 Total:	15,737.08
Fund: 250					
02/10/2022	EH 00000229	100118	CHARTWELLS DINING SERVICES		138,818.03
02/24/2022	HP 00500811	100589	MILLENNIUM BUSINESS SYSTEMS	P2200010	108.40
02/24/2022	HP 00500825	100954	RITEWAY SERVICE INC		276.50
				Fund 250 Total:	139,202.93
Fund: 290					
02/11/2022	HP 00500768	100681	GREYSTONE GARDENS INC		1,296.65
02/24/2022	HP 00500791	100735	BURKES SPORT HAVEN		393.40
02/24/2022	HP 00500823	100338	QUICK MADE SIGNS & TROPHY SALE		1,327.00
02/24/2022	HP 00500827	100856	SHOWCASE AMERICA UNLIMITED		200.00
				Fund 290 Total:	3,217.05
Fund: 310					
02/11/2022	HP 00500770	100695	HUNTINGTON NATIONAL BANK		500.00
				Fund 310 Total:	500.00
Fund: 420					
02/24/2022	EH 00000248	100867	TRAFERA LLC	P2200143	16,074.00
02/24/2022	HP 00500805	100948	KINGSCOTT ASSOCIATES INC		38,464.25
				Fund 420 Total:	54,538.25
Grand Total:					1,314,325.35

End of Report

Huntington Bank
Commercial Card Summary (P-Card)
For Month Ending - February 2022

<u>Date of Trans</u>	<u>Card Holder</u>	<u>Vendor</u>	<u>Amount</u>
02/28/2022	MEGAN PAPASIAN-BROADWELL	ADOBE PRODUCTS	10.59
02/28/2022	TAMMY SCHOLZ	AMAZON.COM*1I50K6K70	36.95
02/28/2022	STEPHANIE DULMAGE	KOHL'S #1066	262.98
02/27/2022	GINA BREW	SULLIVANS FLEET SERVIC	524.21
02/27/2022	GINA BREW	SULLIVANS FLEET SERVIC	4,440.53
02/27/2022	GREG RICHARDSON	TLF*BLUMZ BY JR DESIGN	41.94
02/27/2022	AMY KRUPPE	MDE EDUCATOR LICENSE	135.00
02/27/2022	LINDA YATES	REI*GREENWOODHEINEMANN	517.00
02/27/2022	LINDA YATES	EMU WEB PURCHASE	299.73
02/27/2022	AMY KRUPPE	MDE EDUCATOR LICENSE	90.00
02/25/2022	CHRISTINE LUPTAK	DOWNRIVER REFRIGERATIO	325.49
02/25/2022	CHRISTINE LUPTAK	APOC SALES INC.	2,607.40
02/25/2022	GREG RICHARDSON	TONYS ACE HDWE	44.60
02/25/2022	AMY KRUPPE	MDE EDUCATOR LICENSE	45.00
02/24/2022	BRADLEY WILKINS	MICRO CENTER #055-RETA	19.99
02/24/2022	CHRISTINE LUPTAK	AIRGAS USA, LLC	161.45
02/24/2022	CHRISTINE LUPTAK	MCNAUGHTON MCKAY ELECT	1,479.22
02/24/2022	CHRISTINE LUPTAK	MICHIGAN MAINTENANCE S	1,089.32
02/24/2022	GREG RICHARDSON	TONYS ACE HDWE	51.26
02/23/2022	TAMMY SCHOLZ	AMAZON.COM*TK7UD8KR3 A	56.15
02/23/2022	GREG RICHARDSON	TONYS ACE HDWE	17.09
02/23/2022	CHRISTINE LUPTAK	VIGILANTE SECURITY INC	125.00
02/23/2022	BRADLEY WILKINS	SQ *LION TECHNOLOGIES	280.00
02/23/2022	CHRISTINE LUPTAK	VIGILANTE SECURITY INC	90.00
02/23/2022	CHRISTINE LUPTAK	OTIS ELEVATOR	2,720.97
02/23/2022	CHRISTINE LUPTAK	JOHNSON CONTROLS FIRE	1,216.48
02/23/2022	CHRISTINE LUPTAK	FERRELLGAS L P	1,283.19
02/23/2022	CHRISTINE LUPTAK	SONITROL GREAT LAKES M	225.00
02/23/2022	CORRI NASTASI	SCHOLASTIC, INC.	181.79
02/22/2022	AMY KRUPPE	DELTA	238.20
02/22/2022	ACCOUNTS PAYABLE	A AND G CENTRAL MUSIC	95.00
02/20/2022	ROCHELLE TASSIE	AMZN MKTP US*1B6UL6S80	169.98
02/20/2022	GINA BREW	SHELL OIL 12666749002	50.00
02/20/2022	DEBRA DIMAS	OTC BRANDS INC	174.50
02/20/2022	TAMMY SCHOLZ	AMZN MKTP US*191EZ3TZ3	99.99
02/20/2022	TAMMY SCHOLZ	AMAZON.COM*1I5GU5FG1 A	24.64
02/18/2022	MICHELLE KRAUSE	CREATIVE ARTS STUDIO -	98.58
02/18/2022	TAMMY SCHOLZ	AMZN MKTP US*ZY70V98C3	236.72
02/18/2022	TAMMY SCHOLZ	AMZN MKTP US*1B8Q10UT1	5.99
02/18/2022	MICHELLE KRAUSE	WESTBORN MARKET BERKLE	81.96
02/18/2022	JAMIE BUCZKO	THE ATS STORE LLC RP	77.96
02/18/2022	GREG RICHARDSON	TONYS ACE HDWE	7.59
02/17/2022	ACCOUNTS PAYABLE	DTE ENERGY	25,383.37
02/17/2022	SHEILA OKANE	MDE EDUCATOR LICENSE	100.00
02/17/2022	DEBRA DIMAS	TST* NEW YORK BAGEL -	106.00
02/17/2022	KARLA GRAESSLEY	GFS STORE #0950	438.02
02/17/2022	GREG RICHARDSON	TONYS ACE HDWE	8.10
02/17/2022	BRADLEY WILKINS	APPLE.COM/US	316.94
02/17/2022	BRADLEY WILKINS	CFLOW BLISS PLAN	1,920.00
02/17/2022	MICHELLE KRAUSE	MEIJER # 268	65.43
02/17/2022	JASON ZIRNIS	AMZN MKTP US*1B0OH92T1	236.24
02/16/2022	MATTHEW MILLER	CORRIGAN MOVING SYSTEM	210.00
02/16/2022	THOMAS OESTRIKE	PHYSICAL EDUCATION EQU	1,385.46
02/16/2022	SHEILA OKANE	OAKLAND SCHOOLS-RC INT	44.00
02/16/2022	CHRISTINE LUPTAK	ECOLAB INC	310.00

02/16/2022	LINDA YATES	KROGER #602	50.00
02/16/2022	KARLA GRAESSLEY	JIMMY JOHNS - 2213	2,930.62
02/16/2022	ACCOUNTS PAYABLE	PROCARE SOFTWARE	323.50
02/16/2022	JAMIE BUCZKO	MASB	900.00
02/16/2022	GREG RICHARDSON	TONYS ACE HDWE	29.42
02/16/2022	SHEILA OKANE	CARSON DELLOSA EDUCATI	52.95
02/15/2022	SHEILA OKANE	LIBIB.COM	11.00
02/15/2022	DEBRA DIMAS	AMZN MKTP US*C32KA4KI3	211.00
02/15/2022	CHRISTINE LUPTAK	REPUBLIC SERVICES TRAS	3,303.54
02/15/2022	ACCOUNTS PAYABLE	REPUBLIC SERVICES TRAS	343.28
02/15/2022	DEBRA DIMAS	AMZN MKTP US*TU24W4BP3	113.96
02/15/2022	TAMMY SCHOLZ	SUBWAY 14707	60.00
02/15/2022	ACCOUNTS PAYABLE	TMOBILE*AUTO PAY	421.72
02/15/2022	CORRI NASTASI	TST* NEW YORK BAGEL -	100.00
02/15/2022	GREG RICHARDSON	TONYS ACE HDWE	9.49
02/15/2022	AMY KRUPPE	MDE EDUCATOR LICENSE	90.00
02/15/2022	TAMMY SCHOLZ	CVS/PHARMACY #08103	25.00
02/15/2022	DEBRA DIMAS	AMAZON.COM*WW8TM8UY3 A	72.35
02/14/2022	DEBRA DIMAS	AMZN MKTP US*176VH33Z3	165.14
02/14/2022	JAMIE BUCZKO	OAKLAND SCHOOLS-RC INT	105.00
02/14/2022	CORRI NASTASI	AMAZON.COM*8Q21U0PD3	64.64
02/13/2022	GINA BREW	TONYS ACE HDWE	12.52
02/13/2022	GINA BREW	TONYS ACE HDWE	41.88
02/13/2022	THOMAS OESTRIKE	HOLLYWOOD HOTEL	854.00
02/13/2022	THOMAS OESTRIKE	CPR SAVES LIVES	275.00
02/13/2022	BRADLEY WILKINS	APPLE.COM/US	104.94
02/13/2022	LINDA YATES	BARNES & NOBLE #2923	373.40
02/13/2022	BRADLEY WILKINS	APPLE.COM/US	104.94
02/13/2022	BRADLEY WILKINS	APPLE.COM/US	104.94
02/13/2022	BRADLEY WILKINS	APPLE.COM/US	104.94
02/13/2022	LINDA YATES	KNIGHTS INN	205.00
02/13/2022	CORRI NASTASI	KROGER #737	42.44
02/11/2022	DEBRA DIMAS	TST* NEW YORK BAGEL -	12.00
02/11/2022	CHRISTINE LUPTAK	ECOLAB INC	853.00
02/11/2022	LINDA YATES	CENGAGE LEARNING, INC	3,356.75
02/11/2022	ACCOUNTS PAYABLE	CONSUMERS ENERGY CO	109.86
02/11/2022	AMY KRUPPE	MDE EDUCATOR LICENSE	45.00
02/11/2022	GREG RICHARDSON	TONYS ACE HDWE	13.28
02/11/2022	MEGAN PAPASIAN-BROADWELL	AMZN MKTP US*JC5LT6ZB3	179.98
02/11/2022	MEGAN PAPASIAN-BROADWELL	AMZN MKTP US*P67XW8Y13	33.91
02/11/2022	MEGAN PAPASIAN-BROADWELL	GFS STORE #0950	47.56
02/11/2022	ACCOUNTS PAYABLE	CONSUMERS ENERGY CO	170.88
02/10/2022	THOMAS OESTRIKE	FATHEAD, LLC	98.54
02/10/2022	ROCHELLE TASSIE	AMZN MKTP US*S61D14E33	27.98
02/10/2022	GREG RICHARDSON	TONYS ACE HDWE	31.11
02/10/2022	MEGAN PAPASIAN-BROADWELL	SAMSCLUB #6659	40.62
02/10/2022	THOMAS OESTRIKE	CPR SAVES LIVES	299.00
02/10/2022	TAMMY SCHOLZ	AMZN MKTP US*T20I96OA3	45.90
02/10/2022	JAMIE BUCZKO	THE ATS STORE LLC RP	29.06
02/10/2022	JAMIE BUCZKO	A 1 FINGERPRINT	70.00
02/10/2022	AMY KRUPPE	CORE INC	187.05
02/10/2022	AMY KRUPPE	CORE INC	168.00
02/10/2022	DEBRA DIMAS	TST* NEW YORK BAGEL -	94.00
02/09/2022	CHRISTINE LUPTAK	ORKIN LLC 002	123.00
02/09/2022	CHRISTINE LUPTAK	DOWNRIVER REFRIGERATIO	16.78
02/09/2022	CHRISTINE LUPTAK	A1 SERVICE AND PARTS	168.75
02/09/2022	CHRISTINE LUPTAK	COCHRANE SUPPLY AND EN	271.66
02/09/2022	CHRISTINE LUPTAK	SQ *MECHANICAL SYSTEM	31,553.55
02/09/2022	CHRISTINE LUPTAK	BIGD LOCK & KEY	22.00
02/09/2022	LINDA YATES	KROGER #447	50.00
02/09/2022	ACCOUNTS PAYABLE	CONSUMERS ENERGY CO	1,094.11

02/09/2022	JAMIE BUCZKO	STAPLS734969408000001	142.75
02/09/2022	GREG RICHARDSON	TRI-COUNTY BUILDERS HA	(4.86)
02/09/2022	MEGAN PAPASIAN-BROADWELL	MEIJER # 222	266.02
02/09/2022	AMY KRUPPE	CCI*HOTEL RES	815.37
02/09/2022	TAMMY SCHOLZ	SAMSClub #6662	61.14
02/09/2022	ACCOUNTS PAYABLE	CONSUMERS ENERGY CO	125.01
02/08/2022	GINA BREW	SULLIVANS FLEET SERVIC	2,113.28
02/08/2022	CORRI NASTASI	TST* NEW YORK BAGEL -	100.00
02/08/2022	GREG RICHARDSON	TONYS ACE HDWE	56.99
02/07/2022	BRADLEY WILKINS	COURSRA912JCJZ2MXTRY9	39.00
02/07/2022	ROCHELLE TASSIE	AMZN MKTP US*XJ8TP6UD3	18.99
02/06/2022	CORRI NASTASI	AMZN MKTP US*GL6A79DD3	18.99
02/06/2022	CHARLES PLEINESS	MI ASSOC SCH ADM	250.00
02/06/2022	GINA BREW	OAKLAND SCHOOLS-RC INT	90.00
02/06/2022	MICHELLE KRAUSE	THE HENRY FORD	115.00
02/06/2022	ACCOUNTS PAYABLE	CONSUMERS ENERGY CO	1,186.17
02/06/2022	GREG RICHARDSON	ANGELO S WHOLESALE-124	63.78
02/06/2022	BRADLEY WILKINS	JUMPCLOUD INC	152.00
02/06/2022	ACCOUNTS PAYABLE	CONSUMERS ENERGY CO	1,493.89
02/04/2022	ACCOUNTS PAYABLE	CONSUMERS ENERGY CO	1,461.40
02/04/2022	GINA BREW	SULLIVANS FLEET SERVIC	1,275.84
02/04/2022	ACCOUNTS PAYABLE	CONSUMERS ENERGY CO	26.91
02/04/2022	ACCOUNTS PAYABLE	CONSUMERS ENERGY CO	1,200.82
02/04/2022	JAMIE BUCZKO	EMU WEB PURCHASE	250.00
02/04/2022	ACCOUNTS PAYABLE	CONSUMERS ENERGY CO	2,851.23
02/04/2022	CORRI NASTASI	MEIJER # 177	8.76
02/04/2022	ACCOUNTS PAYABLE	CONSUMERS ENERGY CO	21.16
02/04/2022	ACCOUNTS PAYABLE	CONSUMERS ENERGY CO	1,455.98
02/03/2022	CORRI NASTASI	SAMSClub #6664	100.34
02/03/2022	CORRI NASTASI	KROGER #737	19.96
02/03/2022	CORRI NASTASI	SAMSClub #6664	91.63
02/03/2022	CORRI NASTASI	SAMSClub #6664	33.52
02/03/2022	CORRI NASTASI	SAMS CLUB #6664	23.04
02/03/2022	CORRI NASTASI	AMAZON.COM*I24KQ7GG3	7.17
02/03/2022	MEGAN PAPASIAN-BROADWELL	AMZN MKTP US*AY62M6283	239.24
02/03/2022	STEPHANIE DULMAGE	VEXROBOTICS	72.46
02/03/2022	ACCOUNTS PAYABLE	DTE ENERGY	1,163.10
02/03/2022	ACCOUNTS PAYABLE	DTE ENERGY	100.22
02/03/2022	CORRI NASTASI	SAMS CLUB #6664	15.36
02/02/2022	MEGAN PAPASIAN-BROADWELL	AMZN MKTP US*4Y5B687E3	164.99
02/02/2022	MEGAN PAPASIAN-BROADWELL	AMZN MKTP US*G64L94QE3	649.06
02/02/2022	LINDA YATES	EMU WEB PURCHASE	51.50
02/02/2022	CORRI NASTASI	AMAZON.COM*OX9X432P3	45.96
02/02/2022	THOMAS OESTRIKE	PEPSIBEVERAGECO	488.23
02/02/2022	GINA BREW	UNITY SCHOOL BUS PARTS	844.60
02/02/2022	JASON ZIRNIS	A 1 FINGERPRINT	70.00
02/02/2022	JAMIE BUCZKO	A 1 FINGERPRINT	70.00
02/02/2022	GREG RICHARDSON	TONYS ACE HDWE	6.99
02/02/2022	GREG RICHARDSON	TONYS ACE HDWE	58.95
02/02/2022	GREG RICHARDSON	CORRECT CAR CARE	424.90
02/02/2022	MICHELLE KRAUSE	SCHOLASTIC, INC.	103.72
02/02/2022	CORRI NASTASI	TST* NEW YORK BAGEL -	100.00
02/01/2022	CHRISTINE LUPTAK	VIGILANTE SECURITY INC	1,089.00
02/01/2022	ACCOUNTS PAYABLE	IN *NAVIGATE360, LLC	7,925.00
02/01/2022	ACCOUNTS PAYABLE	A AND G CENTRAL MUSIC	7.65
02/01/2022	CORRI NASTASI	AMZN MKTP US*996DC5T83	43.99
02/01/2022	LINDA YATES	KROGER #447	50.00
02/01/2022	GREG RICHARDSON	MOTOR CITY FASTENER LL	8.24
02/01/2022	MEGAN PAPASIAN-BROADWELL	AMZN MKTP US*ZI4F61CQ3	115.00
02/01/2022	TAMMY SCHOLZ	AMZN MKTP US*QS27W7AF3	44.96
02/01/2022	TAMMY SCHOLZ	AMZN MKTP US*WP8V26HL3	54.97

02/01/2022

CORRI NASTASI

AMZN MKTP US*XC0OP0HB3

95.81

131,118.12



Ford Administration
1620 E. Elza, Hazel Park, MI 48030 | 248-658-5200 | F: 248-544-5223
www.hazelparkschools.org

To: Hazel Park Board of Education
From: Dr. Amy Kruppe, Superintendent
Subject: Personnel Recommendations Report
Date: March 14, 2022

Please see the personnel actions as indicated on the *Hazel Park Board of Education Personnel Recommendations* report for the March 14, 2022 Board of Education regular meeting. The packet also includes supporting documentation.

Goal Statement - Resources

The Hazel Park School District will maximize its resources to assure high quality education by fostering financial stability, preserving and utilizing quality facilities, and integrating state-of-the-art technology.

Recommendation

That the Board of Education approve the Personnel Recommendations as presented.

**APPROVED AND RECOMMENDED FOR
BOARD ACTION**

Amy Y. Kruppe, Ed.D.
Superintendent





Ford Administration
1620 E. Elza, Hazel Park, MI 48030 | 248-658-5200 | F: 248-544-5223
www.hazelparkschools.org

To: Hazel Park Board of Education
From: Amy Kruppe, Ed.D., Superintendent
Jason Zirnig, Assistant Superintendent of Business and Operations
Subject: School Safety Grant Submission
Date: March 14, 2022

We are fortunate to be able to apply again for the school safety grant. This year's grant allows up to \$250,000 for the district. We have divided this grant among the buildings as we did last time.

After careful consideration we decided to ask for door replacement. The replacement of doors and hardware will allow a secure and safe environment for our students. The doors will be steel and have a longer rating system than the current doors. They will additionally have smaller windows for safety as well as shatterproof glass. We additionally will have door handles that lock from the inside as well as a deadbolt that locks from the inside but with keys someone could open from the outside. We know given the Oxford tragedy that the doors were a major safety and security piece. We believe that our door bid is the correct next step.

The doors will be around \$3000 a piece for the doors, doors molding and safety latches. We will request as many doors as possible in each building. Some doors may not need replacing, however a new handle and latch for around \$750 will be installed.

Funding Source: School Safety Grant

Resources: The Hazel Park School District will maximize its resources to assure high quality education by fostering financial stability, preserving and utilizing quality facilities, and integrating state-of-the-art technology.

Recommendation

That the Board of Education approve the submission of the school safety grant toward doors and locks.

**APPROVED AND RECOMMENDED FOR
BOARD ACTION**

Amy Y. Kruppe, Ed.D.
Superintendent





Ford Administration
1620 E. Elza, Hazel Park, MI 48030 | 248-658-5200 | F: 248-544-5223
www.hazelparkschools.org

To: Hazel Park Board of Education
From: Dr. Amy Kruppe, Superintendent
Subject: IT Intern
Date: 3/8/2022

We are seeking approval to add a 1.0 FTE position as an support to our IT Department to assist with the technology needs for our buildings for the remainder of the 21/22 school year. The primary purpose of this position is to assist with the maintenance and upkeep of our current technology needs throughout the district. We currently have an employee in the technology department who continues to need to be home to support their family. The addition of this position will fill the gaps so the other staff member is able to take their leave. The pay for this position is \$14 an hour.

Funding Sources: General Fund

Resources: The Hazel Park School District will maximize its resources to assure high quality education by fostering financial stability, preserving and utilizing quality facilities, and integrating state-of-the-art technology.

Recommendation

That the Board of Education approves the hiring of one Intern for the Technology Department for the remainder of the 21/22 school year.

**APPROVED AND RECOMMENDED FOR
BOARD ACTION**

Amy Y. Kruppe, Ed.D.
Superintendent





Ford Administration
1620 E. Elza, Hazel Park, MI 48030 | 248-658-5200 | F: 248-544-5223
www.hazelparkschools.org

To: Hazel Park Board of Education
From: Jason Zirnis, Assistant Superintendent of Business and Operations
Subject: Budget Amendment #2
Date: March 9, 2022

We are proposing the following amendment for the General Fund Budget for 2021/22.

	Amendment #2 2021/22
Revenues	\$ 46,224,109
Expenses	45,764,144
Surplus	459,965
Opening Fund Balance	3,492,060
Closing Fund Balance	\$ 3,952,025

The amendment has taken into account all currently known factors that are impacting the District. This includes the following;

1. Current current staffing and benefit structure
2. Local, State and Federal revenue sources
3. Estimated indirect and transfers to and from other funds
4. Review of the costs associated with services, supplies and materials.

We have seen a slight reduction of the surplus from Amendment #1 in November but anticipate that unspent appropriations will produce a final year end surplus around \$750,000

Recommendation
That the Board of Education approve the Final Budgets for fiscal year 2020/21 and the Original Budgets for fiscal year 2021/22

**APPROVED AND RECOMMENDED FOR
BOARD ACTION**

30 Amy Y. Kruppe, Ed. D.
Superintendent



Ford Administration
1620 E. Elza, Hazel Park, MI 48030 | 248-658-5200 | F: 248-544-5223
www.hazelparkschools.org

To: Hazel Park Board of Education
From: Dr. Amy Kruppe, Superintendent
Subject: Superintendent Administrative Assistant for HR Support
Date: March 8, 2022

We respectfully request to add an additional Administrative Assistant to the Superintendent for the purpose of supporting the Superintendent in the important work in human resources. This position will be responsible for setting up appointments, maintaining files, workman compensation maintenance, the REP and other administrative duties as requested by the superintendent to support the positive relationship between staff and central office.

Supporting HR for the last several weeks has made it clear that our office will thrive with the appropriate administrative assistant organizing and supporting the hiring process.

This position will be full time and posted immediately if approved by the Board of Education . The pay will be \$50,000-\$55,000 plus benefits.

Goal Statement - Resource: The Hazel Park School District will maximize its resources to assure high quality education by fostering financial stability, preserving and utilizing quality facilities, and integrating state-of-the-art technology.

Recommendation
That the Board of Education approve the Superintendent Administrative Assistant for HR Support position, as presented.

**APPROVED AND RECOMMENDED FOR
BOARD DISCUSSION AND ACTION**

Amy Y. Kruppe, Ed.D.
Superintendent





Ford Administration
1620 E. Elza, Hazel Park, MI 48030 | 248-658-5200 | F: 248-544-5223
www.hazelparkschools.org

Hazel Park Administrative Assistant of the Superintendent for Human Resources Job Description

Job Title: Administrative Assistant of the Superintendent for Human Resources

Location: Hazel Park, Michigan

Position: Full-time

Please submit resume to Dr. Amy Kruppe – amy.kruppe@hazelparkschools.org

Description: The Administrative Assistant of the Superintendent for Human Resources is a full time position, who is responsible for supporting duties associated with the Human Resources department, as well as other tasks as directed by the Superintendent.

Administrative Assistant of the Superintendent for Human Resources will be responsible for setting appointments, posting jobs, follow up procedures for all new hires, creating and maintaining files, workman's compensation claims, maintenance of the REP, maintaining records for LARA, and maintaining records for all third-party vendors for substitutes, and communication from the HR department to staff, and supporting all compliance procedures.

Qualifications:

Knowledge, Skills and Abilities

- Ability to describe problems and work orally or in writing to supervisor, as needed
- Ability to establish and maintain cooperative working relationships with others contacted in the course of work
- Ability to carry out instructions furnished in written or oral form
- Ability to add, subtract, multiply and divide and perform arithmetic computations
- Ability to understand, apply and use personal computers and software applications (e.g., Word, Excel, Google doc's PowerPoint)
- Ability to problem-solve job-related issues
- Ability to work with a diverse group of individuals
- Ability to process paperwork accurately according to standardized procedures
- Ability to maintain confidentiality of information regarding students, employees and others, financial information, collective bargaining information, etc.
- Organizational, scheduling and time management skills
- Knowledge of office management procedures
- Knowledge of state and federal laws relating to public education and public information

Duties: Responsibilities include, but are not limited to:

- Support the human resources department by screening applicants' documents.
- Provides orientation for new employees by providing information packets, reviewing company policies, gathering withholding and other payroll information, explaining benefit programs, and obtaining signatures for documents, and setting up required training.
- Maintains human resources records for employees by recording the hiring, transfer, termination, change in job classifications, and merit increase dates as well as tracking vacation, sick, and personal time.
- Supports the administration of employee benefit programs for medical insurance by advising employees of eligibility, providing application information, helping with form completion, verifying submission, and notifying employees of approvals.
- Support the preparation of paperwork for HR policies and procedures.
- Support the employees' requests and provide relevant information



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- Collaborate with the manager to post job ads and process incoming resumes.
- Prepare reports and presentations for internal communications
- Provide orientations for new employees by sharing onboarding packages and explaining company policies.
- Documents and tracks human resources actions by completing forms, reports, logs, and records.
- Sets up and schedules complicated meetings for interviewees, hiring managers, employees, and department heads.
- Accomplishes human resources department and organization mission by completing related results as needed.

Note: The above description is illustrative of tasks and responsibilities. It is not meant to be all inclusive of every task or responsibility.



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www.hazelparkschools.org

To: Hazel Park Board of Education
From: Jason Zirnig, Assistant Superintendent of Business and Operations
Subject: Pool Locker Room Renovations RFP
Date: March 10, 2022

We are bringing to the Board the RFP for Pool Locker Room Renovations that will encompass replacing the Boys and Girls Change Rooms and Showers with an updated set for each. Also the Coaches rooms will be combined into one creating space for a family change room for future family events. Please see the attached RFP prepared by Kingscott PLLC.

The RFP is currently being reviewed by our attorney's to ensure all conditions are in place. It is our expectation that we will have the RFP reviewed with any necessary changes and issued the week of March 15th. This will allow for the mandatory 2 week posting, bid opening, review of contractors and award recommendation for the April 4, 2022 Special Board Meeting or the April 18, 2022 Regular Board Meeting.

Funding Source: Sinking Fund

Resources: The Hazel Park School District will maximize its resources to assure high quality education by fostering financial stability, preserving and utilizing quality facilities, and integrating state-of-the-art technology.

Recommendation

That the Board of Education approves the RFP for the pool renovations to be charged to the sinking fund.

**APPROVED AND RECOMMENDED FOR
BOARD ACTION**

Amy Y. Kruppe, Ed.D.
Superintendent



CONDITIONS OF THE CONTRACT AND SPECIFICATIONS

FOR

**HAZEL PARK SCHOOLS
HIGH SCHOOL
LOCKER ROOM REMODELING**

ISSUED FOR BIDS: MARCH 15, 2022

A/E #4500-04

OWNER

HAZEL PARK SCHOOLS
1620 E. ELZA
HAZEL PARK, MICHIGAN 48030
(248) 658-5217

ARCHITECTS/ENGINEERS

KINGSCOTT ASSOCIATES, INC
259 EAST MICHIGAN AVENUE, SUITE 308
KALAMAZOO, MICHIGAN 49007
(269) 381-4880

Kingscott Associates, Inc.
Architects/Engineers
Kalamazoo, Michigan

Locker Room Remodeling
Hazel Park High School
Hazel Park, Michigan

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Kingscott Associates, Inc.
Architects/Engineers
Kalamazoo, Michigan

Locker Room Remodeling
Hazel Park High School
Hazel Park, Michigan

NOTICE TO BIDDERS

Sealed Bids for the **Hazel Park Schools, High School Locker Room Remodeling Project** will be received by Hazel Park Schools, at the District Business Office, 1620 E. Elza, Hazel Park, Michigan 48030 on **March 31, 2022 until 2:00 p.m.**, local time. Bids received after that time will be returned unopened.

Bid will be opened publicly and read aloud at the District Administration Building, 1620 E. Elza, Hazel Park, Michigan 48030

Bids shall be executed on the Bid Form provided. Each proposal must be accompanied by a satisfactory certified check, money order, or bid bond payable to Hazel Park Public Schools for not less than five (5%) percent of the amount of the bid and delivered in a sealed envelope bearing the bidder's name, address, and project identification.

All bids submitted shall be from a prime bidder only and shall include all subcontractor costs for scopes identified in the contract documents.

Owner is exempt from Michigan use and sales tax. Contractors **are not** exempt from Michigan use and sales tax. This project **does not** require prevailing wages.

Successful bidder(s) will be awarded by AIA A101-2017, Standard Form of Agreement Between Owner and Contractor, issued by the Owner following action by Hazel Park Public Schools at a meeting of the Board of Education on April 18, 2022.

Bidding and Contract Documents will be available from Kingscott Associates, Inc. on **Tuesday, March 15, 2022** on the Kingscott ShareFile site. For access to the Kingscott ShareFile site, please contact Lisa Dailey ldailey@kingscott.com. No printed sets of contract documents will be issued; however, the electronic files may be reproduced for bidding purposes by the bidder and at the bidder's expense.

The Owner reserves the right to accept or reject any or all bids, to waive any irregularities in bidding and to refrain from accepting or rejecting any bids for a period of thirty (30) days after the bid opening.

Pre-Bid Meeting: March 24, 2022 at 2:00 p.m. For all contractors interested in submitting a bid, a meeting will begin at the Main Entrance of Hazel Park High School – 23400 Hughes Ave., Hazel Park, MI 48030.

The project scope of work includes the following:

1. Demolition of interior masonry walls, tile flooring and gypsum board ceilings including lighting, plumbing fixtures, and piping.
2. Installation of new masonry walls, tile flooring and gypsum board ceilings.
3. Installation of new plumbing fixtures and piping.
4. Installation of new lighting and limited power outlets.

Kingscott Associates, Inc.
Architects/Engineers
Kalamazoo, Michigan

Locker Room Remodeling
Hazel Park High School
Hazel Park, Michigan

INSTRUCTIONS TO BIDDERS

DEFINITIONS: Bidding Documents include the Advertisement or Invitation for Bids, or Notice to Bidders, Instructions to Bidders, Bid/Proposal Forms and Supplements (if any), Sample Forms and the Proposed Contract Documents, including General Conditions of the Contract for Construction, Supplementary Conditions, Specifications, Drawings and any Addenda issued prior to receipt of bids.

All definitions set forth in the General Conditions of the Contract for Construction or in any other Contract Documents are applicable to the Bidding Documents.

Addenda are written or graphic instruments issued by the Architects/Engineers prior to execution of a Contract which modify or interpret the Bidding Documents by additions, clarifications, or corrections.

A Bid is a complete and properly signed proposal to do the Work or designated portion thereof for the sums stipulated therein submitted in accordance with and supported by such data as required by the Bidding Documents.

A Bidder is a person or entity who submits a Bid for the Work or specified portion thereof as described in the Proposed Contract Documents.

A Sub-bidder is a person or entity who submits a bid to a Bidder for materials, equipment or labor for a portion of the Work.

BIDDER'S REPRESENTATIONS: Each Bidder by submitting a Bid represents that the Bidder has; read and understands the Bidding Documents and the Bid is made in accordance therewith; read and understands the Bidding Documents to the extent that such documentation relates to the Work for which the Bids is submitted, and to other portions of the Project (if any) that may be bid concurrently or are presently under construction; visited the site, become familiar with local conditions under which the Work is to be performed and correlated personal observations with requirements of the proposed Contract Documents; based the Bid upon materials, systems, and equipment described in the Bidding Documents without exception, unless so noted as may be provided on the Bid Form.

BIDDING DOCUMENTS: Bidding Documents may be obtained from the issuing office as stated in the Advertisement, Invitation, or Notice to Bidders. All plans and specifications shall remain the property of the Architects/Engineers.

Complete sets of the Bidding Documents shall be used in preparing Bids. Neither the Owner nor the Architect/Engineer assumes any responsibility for errors or misinterpretations resulting from the use of incomplete sets of Bidding Documents.

In making electronic copies of the Bidding Documents available, the Owner and the Architect/Engineers do so only for the purpose of obtaining Bids on the Work and do not confer a license or grant permission for any other use of the Bidding Documents.

INTERPRETATION OF BIDDING DOCUMENTS: Bidders shall carefully study and compare the Bidding Documents with each other, and with other work being bid concurrently or presently

under construction to the extent that it is related to the Work for which the Bid is submitted. Bidders shall promptly notify the Architect of any ambiguity, inconsistency or errors that they may discover upon examination of the Bidding Documents or of the site and local conditions.

Bidders or Subbidders requiring clarification or interpretation of the Bidding Documents shall make such written request to the Architects/Engineers at least three (3) days prior to the date of receipt of bids. Any required interpretation, correction or change of the Bidding Documents will be made by addendum and will be issued by electronic transmission or posting to a File Transfer Protocol (FTP) site. Interpretations, corrections or changes made in any other manner are not binding and Bidders shall not rely upon such.

SUBSTITUTIONS: The materials, products and equipment described in the Bidding Documents establish a standard of required function, dimension, appearance and quality to be met by any proposed substitution. No substitution will be considered prior to receipt of Bids unless written request for approval has been received by the Architect at least three (3) days prior to the date for receipt of Bids. Such requests shall include the name of the material or equipment for which it is to be substituted and a complete description of the proposed substitution including drawings, performance and test data, and other information necessary for an evaluation. A statement setting forth changes in other materials, equipment or other portions of the Work including changes in the work of other contracts that incorporation of the proposed substitution would require shall be included. The burden of proof of the merit of the proposed substitution is upon the proposer. The Architect decision of approval or disapproval of a proposed substitution shall be final.

If the Architect approves a proposed substitution prior to receipt of Bids, such approval will be set forth in an Addendum and will be issued by electronic transmission or posting to a File Transfer Protocol (FTP) site. Bidders shall not rely upon approvals made in any other manner. No substitutions will be considered after the Contract award unless specifically provided in the Contract Documents.

ADDENDA: Addenda will be and will be issued by electronic transmission or posting to a File Transfer Protocol (FTP) site to all who are known by the Architect to have received access to the Bidding Documents. Copies also will be made available for inspection wherever Bidding Documents are on file for that purpose. Each Bidder shall ascertain prior to submitting a bid that the Bidder has received all Addenda issued, and the Bidder shall acknowledge their receipt in the allotted space on the proposal form.

It shall be understood and agreed that the requirements contained in all Bidding Documents shall apply to all addenda items and the general character of the work called for in the Addenda shall be the same as originally required for similar work (unless otherwise noted) and that all incidental work necessitated shall be included, even though not specified herein.

BIDS - FORM AND STYLE: Bids shall be submitted in duplicate on forms provided by the Architects, with all applicable blanks filled in by typewriter or manually by ink. Where so indicated by the makeup of the Bid Form, sums shall be expressed in both words and figures. In case of discrepancy between the two, the written amount shall govern. Any interlineation, alteration or erasure must be initialed by the signer of the Bid.

Each Bid shall include the legal name and address of the Bidder and a statement whether the Bidder is a sole proprietor, partnership, corporation or any other Legal Entity. Each copy shall be signed by a person legally authorized to bind the Bidder to a Contract. Bids submitted by a corporation shall have the corporation seal affixed. Bids submitted by an agent shall be accompanied by a current power of attorney certifying the agent's authority to bind the Bidder.

BID SECURITY: Each Bid shall be accompanied by a bid security in the form of a certified check, money order or bid bond in the amount of not less than five (5%) percent of the maximum total bid price. The bid security shall be made payable to the Owner and as such pledges that the Bidder will enter into a Contract with the owner in accordance with the terms stated in the Bid and the requirements of the Bidding Documents. Should the Bidder refuse to enter into such contract within ten (10) days after notice of said Contract having been awarded, then the bid security shall be forfeited to the Owner as liquidated damages, not as penalty.

Bid Security shall be written in the form of AIA Document A-310, Bid Bond or equivalent. The attorney-in-fact who executes the bond in behalf of the surety shall affix to the bond a certified and current copy of the power of attorney.

The Owner shall have the right to retain the bid security of Bidders until either (1), the contract has been executed and the required bonds have been furnished or (2), the specified time has elapsed so the Bids may be withdrawn, or (3), all Bids have been rejected.

SUBMISSION OF BIDS: All Bids and any other documents required to be submitted with the Bid, shall be enclosed in a sealed opaque envelope. The envelope shall be addressed to the Owner and shall be identified with the Bidders name and address, the Project name, and the designated portion of the Work for which the Bid is submitted. If the Bid is sent by mail, the sealed envelope shall be enclosed in a separate mailing envelope with a notation "BID ENCLOSED" on the face thereof.

Bids shall be deposited at the designated location prior to the time and date indicated in the Advertisement, Invitation to Bid or Notice to Bidders or any extension thereof made by Addendum. Bids received after the time and date set for receipt of Bids will be returned unopened.

Bidders shall assume full responsibility for timely delivery to the location designated for receipt of Bids. Oral, telephonic or telegraphic bids are invalid and will not receive consideration.

BID MODIFICATION OR WITHDRAWAL: The Bidders so agrees in submitting a Bid that it may not be modified, withdrawn or canceled during the stipulated time period following the time and date designated for receipt of Bids. Modification or withdrawal of an early submitted Bid may be made only by notice to the party receiving Bids at the place and prior to the time designated for receipt. Such notice shall be in writing over the signature of the Bidder or by telegram. If by telegram, written confirmation over the signature of the Bidder must have been mailed and postmarked on or before the date and time set for receipt of Bids. Modified or withdrawn Bids may be resubmitted up to the time designated for receipt of Bids, provided that they comply fully with all Bidding Documents.

CONSIDERATION OF BIDS: The Owner shall have the right to reject any and all Bids. A bid may be rejected if not accompanied by a required bid security, or by other data required by the Bidding Documents or which is in any way incomplete or irregular.

The Owner shall have the right to waive informalities or irregularities in a Bid received, and to accept the Bid which, in the Owner's judgment, is in the Owner's best interests.

The Owner shall have the right to accept Alternates in any order or combination, unless otherwise specifically provided in the Bidding Documents, and to determine the low Bidder on the basis of the sum of the Base Bid and Alternates accepted.

SUBMISSION OF POST BID INFORMATION: Bidders to whom award of a Contract is under consideration shall, upon request of the Architect, promptly submit statements setting forth

previous experience, references, physical plant and equipment possessed, description of organization, financial resources and such other evidence as may testify to the ability to carry out contracts. This requirement may be met by submitting AIA Document A-305, Contractor's Qualification Statement.

Unless waived by the Architect, the Bidder shall as soon as practicable after notification of selection for the award of a Contract, submit the following information to the Architect:

A designation of the Work to be performed by the Bidders own forces.

The proprietary names and the suppliers of principal items or systems materials and equipment proposed for the Work.

A list of names of the Subcontractors or other persons or organizations (including those who are furnished materials or equipment fabricated to a special design) proposed for the principal portions of the Work.

The Bidder will be required to establish to the satisfaction of the Architect and the Owner the reliability and responsibility of the proposed Subcontractors to furnish and perform the Work described in the sections of the specifications pertaining to such proposed Subcontractors respective trades.

Prior to the award of the Contract, the Architect will notify the Bidder in writing if after due investigation, the Owner or Architect has reasonable objection to any person or organization, on such list. If the Owner or Architect has a reasonable objection to any person or organization, the Bidder may, at the Bidders option, (1) withdraw the Bid or (2) submit an acceptable substitute person or organization with an adjustment in the Bid to cover the difference in cost occasioned by such substitution. The Owner may, at his discretion, accept the adjusted Bid or may disqualify the Bidder. In the event of either withdrawal or disqualification under this paragraph, bid security will not be forfeited.

Subcontractors and other persons and organizations proposed by the Bidder and accepted by the Owner and the Architect must be used on the Work for which they were proposed and accepted and shall not be changed except with the written approval of the Owner and Architect.

PERFORMANCE BOND AND PAYMENT BOND: The successful Bidder shall furnish a Performance Bond in an amount of not less than one hundred (100%) percent of the contract sum as a security for the faithful performance of this contract and also a Payment Bond in an amount of not less than one hundred (100%) percent of the sum of contract as security for the payment of all persons performing labor on the project under the contract and/or furnishing materials in connection with the contract. Bidders shall include the premiums for bonds in their proposals, however **the premium for performance and payment bonds shall be included in the base bid amount.**

The Bidder shall deliver the required bonds to the Owner not later than the date of execution of the contract, or if the Work is commenced prior thereto in response to a letter of intent, the Bidder shall, prior to commencement of the Work and if required by the Owner, submit evidence satisfactory to the Owner that such bonds will be issued.

The Bidder shall require the attorney in fact who executed the required bonds on behalf of the surety to affix thereto a certified and current copy of the power of attorney indicating the monetary limit of such power. Bonds shall be written in the form of AIA Document A-312,

Performance Bond and Payment Bond or equivalent. Bonds shall be dated on or after the date of the Contract.

INSURANCE: Successful Bidders will be required to furnish evidence of insurance of the kind and in the amounts as required by the General Conditions of the Contract for Construction and Supplementary General Conditions.

PAYMENTS RETAINED: Owner shall make payments on account upon issuance of Certificates of Payment by the Architect for labor and material incorporated in the work and for materials suitably stored at the site up to ninety (90%) percent of the value thereof.

When the cumulative total of payment retained is equal to ten (10%) percent of the contract sum, subsequent payments will be made in the full amount for labor and material incorporated in the work and for materials suitably stored at the site, if, in the judgment of the Architect and the Owner, the work is progressing satisfactorily. This amount shall be retained until final acceptance of the work.

FINAL PAYMENT: Final payment, including retained percentage, shall become due when the contractor submits satisfactory evidence to the Architect that:

All payrolls, bills for materials, equipment and other indebtedness connected with the work for which the Owner of his property might in any way be responsible have been paid or otherwise satisfied.

Consent of surety in writing to final payment.

Data establishing payment or satisfaction of all obligations, such as receipts, releases and waivers of liens from each supplier and subcontractor covering each item of work.

SPECIFICATIONS/AUTOMATED TECHNICAL SECTIONS: Portions of the specifications may have been derived from an automated master specification production system and may include minor deviations from traditional writing forms. Such deviations must be recognized as a normal result of this production technique and no other meaning will be implied or permitted.

The editing and printing methods utilized by the automated procedures can produce some irregularities in grammatical structure such as form, structure, spelling and punctuation. Most are of common practice. Should any Bidder be in doubt as to the intended meaning, he shall so notify the Architect who in turn shall clarify the question by means of addenda to all Bidders.

MICHIGAN OCCUPATIONAL SAFETY AND HEALTH ACT (MIOSHA): The contractor is to note the MIOSHA - (ACT 154 of the Public Acts of 1974) amendments that include requirements for the communication of information regarding safe handling of hazardous chemicals present in Michigan workplaces known as "Michigan's Right to Know Law". The Contractor and all subcontractors shall comply with all required provisions that may relate to any materials that contain hazardous chemicals.

VOLUNTARY ALTERNATES: When reference is made in the specifications to one or more trade names or to the names of one or more manufacturers, such references are made to designate and identify the material or equipment to be furnished. The Bidder may, at his option, in addition to the Base Bid on the specified items, provide Voluntary Alternate proposals for optional materials and/or methods that the Bidder proposes to use, together with the difference in cost from that basically specified. The Owner reserves the right to accept or reject such options.

Submission of Voluntary Alternate proposals does not require prior approval of the Architect. However, where a proposed Voluntary Alternate requires changes or modifications, in assembly, detail or form of any other construction, for accommodation, it shall be the responsibility of the Bidder to reconcile and include all costs necessary for incorporation of such into the work. Voluntary Alternates if accepted, will be incorporated into the executed contract.

ALTERNATES: Where, by make up of the Proposal Form provision is made for an "Alternate" the Bidder shall state the amount that will be added or deducted from the Base Bid if the Owner decides to accept a change in the scope of work or in products, materials, equipment, systems or installation methods that is described in the Contract Documents.

Included as part of each Alternate shall be all miscellaneous devices, appurtenances and similar items incidental to or required for a complete installation whether or not specifically mentioned as part of the Alternate.

TIME OF COMPLETION: Work shall be substantially complete no later than **October 15, 2022**. Final completion shall be achieved no later than **October 30, 2022**.

EXAMINATION OF SITE, EXISTING BUILDINGS AND CONTRACT DOCUMENTS: Before submitting a proposal, each Bidder shall carefully examine the Contract Documents, visit the site of the Work, fully inform himself as to all existing conditions and limitations and shall include in the proposal a sum to cover the cost of all items included in the work. No additional compensation for the omission of any work, materials, and/or labor required to complete the work in accordance with the contract will be granted due to the bidder's failure to conform to these requirements.

Pre-Bid Meeting: March 24, 2022 at 2:00 p.m. For all contractors interested in submitting a bid, a meeting will begin at the Main Entrance of Hazel Park High School – 23400 Hughes Ave., Hazel Park, MI 48030.

Questions regarding the bid or contract documents shall be directed to:

Martin Smith, msmith@kingscott.com
Kingscott Associates, Inc.
259 East Michigan, Suite 308
Kalamazoo, Michigan 49007-6403
(269) 381-4880

END OF SECTION

Kingscott Associates, Inc.
Architects/Engineers
Kalamazoo, Michigan

Locker Room Remodeling
Hazel Park High School
Hazel Park, Michigan

BID FORM

Owner:
Hazel Park Schools
Hazel Park, Michigan

The undersigned, having carefully examined the Notice to Bidders, Instruction to Bidders, the premise and conditions affecting this work, together with drawings and specifications for the **Hazel Park HS Locker Room Remodeling, Hazel Park Schools, Hazel Park, Michigan** and other documents related thereto, does hereby propose to furnish labor, materials, services and equipment necessary to complete all work, called for by and in accordance with the drawings and specifications for same, dated **March 14, 2022** including addenda numbered

_____.

TIME OF COMPLETION

The undersigned agrees to start work upon receipt of the Contract and shall achieve Final Completion by **October 30, 2022**. Construction is to happen beginning **May 9, 2022** with substantial completion on or before **October 15, 2022**. (Note: Contract will be issued after the **April 18th**, 2022 School Board Meeting)

BID SECURITY

Enclosed herewith find (Certified Check), (Cashier's Check), (Bid Bond), in the amount of \$ _____ being 5% percent of the maximum bid herein, made payable to **Hazel Park Schools**. The proceeds of which are to remain the property of the **Hazel Park Schools**, if bidder does not, within ten (10) days after notice of acceptance of bid, enter into a written contract.

EXCEPTIONS AND/OR SUBSTITUTIONS

We have submitted our proposal(s) complete as specified and in accordance with the Construction Documents WITH/WITHOUT (circle one) exceptions or substitutions. (Explain the exceptions or substitutions below).

**BASE BID TOTAL for Hazel Park HS Locker Room Remodeling, Hazel Park Schools,
Hazel Park, Michigan**

ACCEPTANCE:

The undersigned agree(s) to accept a contract for the work covered by this proposal, in accordance with the contract and bidding documents.

The Owner reserves the right to accept or reject any and all proposals or parts of the same.

BIDDER STATUS:

(Check One)

_____ Individual _____ Partnership _____ Corporation

Submitted By:

Company _____

Address _____

Telephone/Fax _____

Email _____

Signature/Date _____

Print Name/Title _____

SCHEDULE

The proposed schedule may be a deciding factor in the selection of the successful bidder. Please indicate the proposed schedule as follows:

Proposed Material Delivery Date: _____

Proposed Installation Start Date: _____

Proposed Completion Date: _____

END OF SECTION

Kingscott Associates, Inc.
Architects/Engineers
Kalamazoo, Michigan

Locker Room Remodeling
Hazel Park High School
Hazel Park, Michigan

AFFIDAVIT OF BIDDER #1

The undersigned, the owner or authorized officer of _____
(the "Bidder"), pursuant to the familial disclosure requirement provided in advertisement for
construction bids and Instructions to Bidders, hereby represent and warrant, except as provided
below, that no familial relationships exist between the owner(s) or any employee of
and any other member of the Board of Education or Administration of **Hazel Park Schools**, or
the Superintendent of **Hazel Park Schools**.

List any Familial Relationships:

BIDDER: _____

By: _____

Its: _____

STATE OF MICHIGAN)
)ss
COUNTY OF _____)

This instrument was acknowledged before me on the _____ day of _____, in the year
_____, by _____.

_____, Notary Public
_____ County, Michigan

My Commission Expires: _____

Acting in the County of: _____

Kingscott Associates, Inc.
Architects/Engineers
Kalamazoo, Michigan

Locker Room Remodeling
Hazel Park High School
Hazel Park, Michigan

AFFIDAVIT OF BIDDER #2

The undersigned, the owner or authorized officer of _____
(the "Bidder"), hereby certify that they are not an Iran-linked business nor on the U.S.
Government Services Administration's Excluded Parties List.

BIDDER: _____

By: _____

Its: _____

STATE OF MICHIGAN)
)ss
COUNTY OF _____)

This instrument was acknowledged before me on the _____ day of _____, in the year
_____, by _____.

_____, Notary Public
_____, County, Michigan

My Commission Expires: _____

Acting in the County of: _____

Kingscott Associates, Inc.
Architects/Engineers
Kalamazoo, Michigan

Locker Room Remodeling
Hazel Park High School
Hazel Park, Michigan

GENERAL CONDITIONS

GENERAL CONDITIONS A-201:

The General Conditions shall be the "General Conditions of the Contract for Construction ", AIA Document A-201, 2017 edition, issued by the American Institute of Architects, 1735 New York Avenue, N.W., Washington D.C. 20006.

The General Conditions are on file at the following location:

Architect:

Kingscott Associates Inc.
259 E. Michigan Ave. Suite 308
Kalamazoo, MI 49007

Kingscott Associates, Inc.
Architects/Engineers
Kalamazoo, Michigan

Locker Room Remodeling
Hazel Park High School
Hazel Park, Michigan

SUPPLEMENTARY GENERAL CONDITIONS
OF THE
CONTRACT FOR CONSTRUCTION

SPECIAL NOTE:

These supplementary General Conditions consist of amendments and/or additions which shall take precedence over and modify specific articles and/or paragraphs of the "General Conditions of the Contract" A-201, 2017 Edition, and shall be used in conjunction with them as part of the contract documents. Any and/or all articles and/or paragraphs of the "General Conditions of the Contract" not specifically amended in this section shall apply in their entirety.

AMENDMENTS AND ADDITIONS:

The following items relate to the General Conditions by specific article and/or paragraph number being amended or added to. These items, as amendments, shall have precedence over only such portions and said articles and/or paragraphs of the General Conditions which are specifically modified thereby.

MODIFICATIONS OF THE GENERAL CONDITIONS

ARTICLE 1 GENERAL PROVISIONS Paragraph 1.2 Correlation and Intent of the Contract Documents, add the following subparagraph:

1.2.4. In case of an inconsistency between Drawings and Specifications or within either Document not clarified by addendum, the better quality or greater quantity of Work shall be provided in accordance with the Architect's interpretation.

ARTICLE 3 CONTRACTOR Paragraph 3.2. "Review of Contract Documents and Field Conditions by Contractor":

DELETE PARAGRAPH 3.2.2 AND REPLACE WITH THE FOLLOWING:

3.2.2 The Contractor shall carefully study and compare the Contract Documents with each other and with information furnished by the Owner pursuant to Section 2.2.3 and shall at once report to the Architect errors, inconsistencies or omissions discovered. The Contractor shall not be liable to the Owner, or Architect for damage resulting from errors, inconsistencies or omissions in the Contract Documents unless the Contractor recognized such error, inconsistency or omission and knowingly failed to report it to the Architect. If the Contractor performs any construction activity knowing it involves a recognized error, inconsistency or omission in the Contract Documents without such notice to the Architect, the Contractor shall assume appropriate responsibility for such performance and shall bear an appropriate amount of the attributable costs for correction. Prior to submitting its bid, the Contractor shall have studied and compared the Contract Documents and shall have reported to the Architect any error, inconsistency or omission in the Contract Documents. It will be presumed that the Contractor's bid and the Contract Sum include the cost of correcting any such error, inconsistency or omission, which could have been discovered by the exercise of reasonable diligence. Unless the Contractor establishes that such

error, inconsistency or omission could not have been discovered by the exercise of reasonable diligence, the contractor will make such corrections without additional compensation so that the Work is fully functional.

ARTICLE 3 CONTRACTOR Paragraph 3.4. "Labor and Materials" add the following to subparagraph 3.4.3:

Contractor shall enforce regulations regarding the use of tobacco products on school property.

ARTICLE 3 CONTRACTOR Paragraph 3.4 Labor and Materials, add the following subparagraph.

3.4.4 The Contractor shall take precautions to ensure that he or his subcontractors utilize no asbestos containing building materials (ACBM, as defined in section 763.83 of 40 CFR Part 763 amended). Upon completion of the work, and before final payment, the contractor shall submit a signed statement that "to the best of his or her knowledge no asbestos containing building materials (ACBM) was used as a building material in construction of the project."

ARTICLE 11 INSURANCE AND BONDS Paragraph 11.1 Contractor's Liability Insurance, add the following subparagraphs:

11.5 The Contractor shall purchase and maintain insurance for the following with minimum coverage as indicated and naming **Hazel Park Schools and Kingscott Associates, Inc.**

COMPENSATION

Employer's Liability, Occupational Disease and Workmen's Compensation	\$500,000 minimum and as required by the laws of the State of Michigan
---	--

PUBLIC LIABILITY AND PROPERTY DAMAGE

Comprehensive General Liability Form Required	
Bodily Injury and Death	\$1,000,000 each occurrence \$2,000,000 aggregate
Property Damage	\$1,000,000 each occurrence \$2,000,000 aggregate

AUTOMOBILE LIABILITY

Comprehensive Automobile Liability Form Required	
Bodily Injury and Death	\$1,000,000 each person \$2,000,000 each occurrence
Property Damage	\$2,000,000 each occurrence

ADDITIONAL CONDITIONS

ADD ARTICLES 16 AND 17 AS FOLLOWS:

ARTICLE 16:

Pursuant to Michigan House Bill No. 5376, which amends Public Act 451 of 1976, each contractor/subcontractor shall provide the following:

“All bids shall be accompanied by a sworn statement disclosing any familial relationship that exists between the owner(s) or any employee of the bidder and any member of the Board of Education of the School District or the Superintendent of the School District. The Board of Education shall not accept a bid that does not include a sworn and notarized relationship disclosure statement.”

ARTICLE 17

Pursuant to the Iran Economic Sanctions Act 517 of 2012,

(1) Beginning April 1, 2013, an Iran linked business is not eligible to submit a bid on a request for proposal with a public entity.

(2) Beginning April 1, 2013, a public entity shall require a person that submits a bid on a request for proposal with the public entity to certify that it is not an Iran linked business.

The contractor shall submit with their bid a sworn statement certifying the above.

END OF SECTION

Request for Information

RFI:

To:

Company:

Subject:

Reference:

Date:

Project Name:

Response By:

Request:

Requested By:

Company:

Response:

Response By:

Date:

SECTION 013300
ARCHITECT'S SUBMITTAL PROCEDURES

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section includes administrative and procedural requirements for submitting RFI's, Shop Drawings, Product Data, Samples, and other submittals.

1.2 DEFINITIONS

- A. Action Submittals: Written and graphic information that requires Architect's responsive action.
- B. Informational Submittals: Written information that does not require Architect's responsive action. Submittals may be rejected for not complying with requirements.

1.3 SUBMITTAL PROCEDURES

- A. General: Electronic copies of CAD Drawings of the Contract Documents will be provided by Architect for Contractor's use in preparing submittals. See 1.4 below.
- B. All submittals must be in electronic form. Paper copies are not acceptable unless specifically listed. The architect will review, stamp and return an electronic document for the contractor's use. Copies of the reviewed shop drawings shall be provided by the contractor for distribution as required by the Construction Manager.
- C. Each submittal item shall be submitted in its entirety as one complete package including all information required to fully review the item. Material sample, data, warranty and maintenance information, and drawings shall come as one package. Submittals missing required components and / or without product selections identified will be rejected without review.
- D. Compliance Certificate: Refer to the attached Compliance Certificate. Compliance Certificates are to be used by contractors to indicate the products/devices intended for use in this project without the need and time for product data submittals. Contractors shall use Compliance Certificates whenever possible to expedite the work and limit paper work. Items listed on the form must be approved products listed in the specifications. No substitutions allowed. Select one (1) source for each category, sign this sheet, and submit as the contractor's commitment to use products required by the contract documents. No further product data submittals are required for this section. Physical sample, color samples, or layout shop drawings must be submitted where required by the specification. Refer to the attached specification list for sections that are subject to this certificate. **NOTE: Not all specification sections listed below will apply to the project listed above. There might not be specification sections included that are in the**

project listed above, in that case coordinate with architect at post bid interview for submittal requirements.

- E. Coordination: Coordinate preparation and processing of submittals with performance of construction activities.
 - 1. Coordinate each submittal with fabrication, purchasing, testing, delivery, other submittals, and related activities that require sequential activity.
 - 2. Coordinate transmittal of different types of submittals for related parts of the Work so processing will not be delayed because of need to review submittals concurrently for coordination.
 - a. Architect reserves the right to withhold action on a submittal requiring coordination with other submittals until related submittals are received.
- F. Submittals Schedule: Comply with requirements in Division 1 Section "Construction Progress Documentation" for list of submittals and time requirements for scheduled performance of related construction activities.
- G. Processing Time: Allow enough time for submittal review, including time for resubmittals, as follows. Time for review shall commence on Architect's receipt of submittal. No extension of the Contract Time will be authorized because of failure to transmit submittals enough in advance of the Work to permit processing, including resubmittals.
 - 1. RFI's, request for information: Allow 5 working days for initial response for each RFI. Allow additional time if coordination with subsequent RFI is required, or when additional information is need for the response.
 - 2. Shop drawings, sample, and product data:
 - a. Initial Review: Allow 15 days for initial review of each submittal. Allow additional time if coordination with subsequent submittals is required. Architect will advise Contractor when a submittal being processed must be delayed for coordination.
 - b. Intermediate Review: If intermediate submittal is necessary, process it in same manner as initial submittal.
 - c. Resubmittal Review: Allow 15 days for review of each resubmittal.
 - d. Sequential Review: where sequential review of submittals by Architect's consultants, Owner, or other parties is indicated, allow 21 days for initial review of each submittal.
 - e. Submissions that are large or of multiple submissions or requires detailed or lengthy review by the Architect or his consultant may require additional time.
 - f. Submissions for products or material that require a long lead time for delivery shall be noted as such and marked "Top Priority" so the architect may expedite the process. The architect will expedite reviews when the contractor legitimately can't submit within a reasonable time due to construction schedule. Failure to submit in a timely manner or to allow sufficient time for initial review and resubmittal reviews may result in project delays, additional service charges by the architect, or other penalties for the contractor.

- H. Identification: Place a permanent label or title block on each submittal for identification.
1. Indicate name of firm or entity that prepared each submittal on label or title block.
 2. Provide a space approximately 6 by 8 inches on label or beside title block to record Contractor's review and approval markings and action taken by Architect.
 3. Include the following information on label for processing and recording action taken:
 - a. Project name.
 - b. Date.
 - c. Name and address of Architect.
 - d. Name and address of Contractor.
 - e. Name and address of subcontractor.
 - f. Name and address of supplier.
 - g. Name of manufacturer.
 - h. Submittal number or other unique identifier, including revision identifier.
 - 1) Submittal number shall use Specification Section number followed by a decimal point and then a sequential number (e.g., 06100.01). Resubmittals shall include an alphabetic suffix after another decimal point (e.g., 06100.01.A).
 - i. Number and title of appropriate Specification Section.
 - j. Drawing number and detail references, as appropriate.
 - k. Location(s) where product is to be installed, as appropriate.
 - l. Other necessary identification.
- I. Deviations: Highlight, encircle, or otherwise specifically identify deviations from the Contract Documents on submittals.
- J. Additional Copies: Unless additional copies are required for final submittal, and unless Architect observes noncompliance with provisions in the Contract Documents, initial submittal may serve as final submittal.
1. Additional copies submitted for maintenance manuals will not be marked with action taken and will be returned.
- K. Transmittal: Package each submittal individually and appropriately for transmittal and handling. Transmit each submittal using a transmittal form including electronic submittals. Architect will discard submittals received from sources other than the Construction Manager. Architect will return any submittal with a transmittal, which doesn't fully list, and properly identify the enclosed items.
- L. Resubmittals: Make resubmittals in same form and number of copies as initial submittal.
1. Note date and content of previous submittal.
 2. Note date and content of revision in label or title block and clearly indicate extent of revision.
 3. Resubmit submittals until they are marked " Review or reviewed with comments."
- M. Distribution: Furnish copies of reviewed submittals to the Construction Manager, manufacturers, subcontractors, suppliers, fabricators, installers, authorities having jurisdiction, and others as necessary for performance of construction activities. Show distribution on transmittal forms.

1.4 CONTRACTOR'S USE OF ARCHITECT'S CAD FILES

- A. General: At Contractor's written request, copies of Architect's CAD files will be provided to the Contractor for Contractor's use in connection with Project, subject to the following conditions:
 - 1. The Architect will provide, electronic data files, compatible with AutoCAD for contractor's convenience and use in the preparation of shop drawings. **Refer to Terms and Conditions at the end of this specification.** Requests for electronic data shall be in written form through the architect. Prior to the release of electronic files, the Architect will require a signed waiver of release. Contractors should allow a minimum of 1-week for this process.

PART 2 - RFI'S – REQUEST FOR INFORMATION

- 1. All RFI's shall be submitted to the Architect in electronic form. PDF's and Word files are acceptable.
- 2. PDF RFI forms shall include an editable text area for response, date, and signature.
- 3. RFI's shall be distributed by e-mail. E-mail title shall be specific to job name, and RFI number. This is mandatory for proper tracking.
- 4. Faxed and Hand written RFI's are not acceptable and will be rejected.

PART 3 - PRODUCTS

3.1 ACTION SUBMITTALS

- A. General: Prepare and submit Action Submittals required by individual Specification Sections.
 - 1. Submittal Types:
 - a. Shop Drawing
 - b. Product Data
 - c. Sample
 - d. Other
- B. Kingscott Review Stamp Statement: "Reviewed only for the limited purpose of checking for conformance with the design concept expressed in the Contract Documents. Dimensions, quantities, accuracy, assembly methods, installation methods, coordination with other trades and field verification are the responsibility of the contractor."
 - 1. The following Actions will be taken:
 - a. Reviewed with no exceptions
 - b. Reviewed with Exceptions
 - c. Revise and resubmit
 - d. Rejected
- C. Product Data: Collect information into a single submittal for each element of construction and type of product or equipment.

1. Use the Material Compliance form when permitted and whenever possible to save time and paper work.
 2. If information must be specially prepared for submittal because standard data are not suitable for use, submit as Shop Drawings, not as Product Data.
 3. Mark each copy of each submittal to show which products and options are applicable. Unmarked submittals will be rejected. Failure to mark appropriate products will result in rejection of the submittal.
 4. Include the following information, as applicable:
 - a. Manufacturer's written recommendations.
 - b. Manufacturer's product specifications.
 - c. Manufacturer's installation instructions.
 - d. Manufacturer's catalog cuts.
 - e. Wiring diagrams showing factory-installed wiring.
 - f. Printed performance curves.
 - g. Operational range diagrams.
 - h. Compliance with specified referenced standards.
 - i. Testing by recognized testing agency.
 5. Number of Copies: Submit one electronic copy of Product Data, unless otherwise indicated. Architect will return one electronic copy. See the Construction Manager's submittal requirements for final record and distribution copy requirements.
- D. Shop Drawings: Prepare Project-specific information, drawn accurately to scale. Do not base Shop Drawings on reproductions of the Contract Documents or standard printed data, unless submittal of Architect's CAD Drawings is otherwise permitted.
1. Preparation: Fully illustrate requirements in the Contract Documents. Include the following information, as applicable:
 - a. Dimensions.
 - b. Identification of products.
 - c. Fabrication and installation drawings.
 - d. Roughing-in and setting diagrams.
 - e. Wiring diagrams showing field-installed wiring, including power, signal, and control wiring.
 - f. Shop work manufacturing instructions.
 - g. Templates and patterns.
 - h. Schedules.
 - i. Notation of coordination requirements.
 - j. Notation of dimensions established by field measurement.
 - k. Relationship to adjoining construction clearly indicated.
 - l. Seal and signature of professional engineer if specified.
 - m. Wiring Diagrams: Differentiate between manufacturer-installed and field-installed wiring.
 2. Sheet Size: Except for templates, patterns, and similar full-size drawings, submit Shop Drawings on sheets at least 8-1/2 by 11 inches but no larger than 30 by 40 inches.
 3. Number of Copies: Submit one opaque (bond) copy, and one electronic copy of each submittal. Architect will return one electronic copy for printing and distribution.

- E. Samples: **Submit Physical Samples** for review of kind, color, pattern, and texture for a check of these characteristics with other elements and for a comparison of these characteristics between submittal and actual component as delivered and installed.
1. Transmit Samples that contain multiple, related components such as accessories together in one submittal package.
 2. Identification: Attach label on unexposed side of Samples that includes the following:
 - a. Generic description of Sample.
 - b. Product name and name of manufacturer.
 - c. Sample source.
 - d. Number and title of appropriate Specification Section.
 3. Disposition: Maintain sets of approved Samples at Project site, available for quality-control comparisons throughout the course of construction activity. Sample sets may be used to determine final acceptance of construction associated with each set.
 4. Samples for Initial Selection: Submit manufacturer's color charts consisting of units or sections of units showing the full range of colors, textures, and patterns available. **Scanned color charts, samples, etc. will be REJECTED. Send physical samples, color charts, etc. as described in each specification section.**
 - a. Number of Samples: Submit one full set of available choices where color, pattern, texture, or similar characteristics are required to be selected from manufacturer's product line. Architect will return submittal with options selected.
 5. Samples for Verification: Submit full-size units or Samples of size indicated, prepared from same material to be used for the Work, cured and finished in manner specified, and physically identical with material or product proposed for use, and that show full range of color and texture variations expected. Samples include, but are not limited to, the following: partial sections of manufactured or fabricated components; small cuts or containers of materials; complete units of repetitively used materials; swatches showing color, texture, and pattern; color range sets; and components used for independent testing and inspection. **Scanned color charts, samples, etc., will be REJECTED. Send physical samples, color charts, etc. as described in each specification section.**
 - a. Number of Samples: Submit three sets of Samples. Architect will retain one Sample set; remainder will be returned. Mark up and retain one returned Sample set as a Project Record Sample.

3.2 DELEGATED DESIGN

- A. Performance and Design Criteria: Where professional design services or certifications by a design professional are specifically required of Contractor by the Contract Documents, provide products and systems complying with specific performance and design criteria indicated.
 1. If criteria indicated are not sufficient to perform services or certification required, submit a written request for additional information to Architect.
- B. Delegated-Design Submittal: In addition to Shop Drawings, Product Data, and other required submittals, submit four copies of a statement, signed and sealed by the responsible design professional, for each product and system specifically assigned to Contractor to be designed or certified by a design professional.

1. Indicate that products and systems comply with performance and design criteria in the Contract Documents. Include list of codes, loads, and other factors used in performing these services.

PART 4 - EXECUTION

4.1 CONTRACTOR'S REVIEW

- A. Review each submittal and check for coordination with other Work of the Contract and for compliance with the Contract Documents. Note corrections and field dimensions prior to submission for review. It is the contractor's responsibility to review and identify major discrepancy with the contract documents, and significant missing information. Documents with discrepancies and substantially missing information shall be returned for revisions prior to submission to the Construction Manager.
- B. Mark with approval stamp before submitting to the Construction Manager.
- C. Approval Stamp: Stamp each submittal with a uniform, approval stamp. Include Project name and location, submittal number, Specification Section title and number, name of reviewer, date of Contractor's approval, and statement certifying that submittal has been reviewed, checked, and approved for compliance with the Contract Documents.

4.2 CONSTRUCTION MANAGER'S REVIEW

- A. Review each submittal and check for coordination with other Work of the Contract and for compliance with the Contract Documents. Note corrections and field dimensions prior to submission for review. It is the Construction Manager's responsibility to review and identify major discrepancy with the contract documents, and significant missing information. Documents with discrepancies and substantially missing information shall be returned for revisions prior to submission to the Architect.
- B. Mark with approval stamp before submitting to Architect.
- C. Approval Stamp: Stamp each submittal with a uniform, approval stamp. Include Project name and location, submittal number, Specification Section title and number, name of reviewer, date of approval, and statement certifying that submittal has been reviewed, checked, and approved for compliance with the Contract Documents.

4.3 ARCHITECT'S ACTION

- A. General: Architect will not review submittals that do not bear Contractor's and Construction Managers approval stamp, and have not been fully reviewed and will return them without action.
- B. Action Submittals: Architect will review each submittal, make marks to indicate corrections or modifications required, and return it. Architect will stamp each submittal with an action stamp and will mark stamp appropriately to indicate action taken, as follows:
 1. Reviewed with no exceptions.
 2. Reviewed with exceptions.
 3. Revise and resubmit.
 4. Rejected.

- C. Partial submittals are not acceptable, will be considered non-responsive, and will be returned without review.
- D. Incomplete submittals with substantial missing information, will be considered non-responsive, and will be returned without review.
- E. Non-complaint submittals, will be considered non-responsive, and will be returned without review.
- F. Submittals not required by the Contract Documents will not be reviewed and will be discarded.

SUBMITTALS REQUESTED BY SPECIFICATION SECTION						
<i>This is a general guide, but may vary by project.</i>						
Given the age of digital submittal, product information and images, and multiple files can be compiled into one complete product data page. When this complete product data sheet is submitted, it becomes an acceptable option to help limit physical samples and paper.						
SECTION NO.	SECTION TITLE	PRODUCT DATA	SAMPLE	SHOP DRAWINGS	MATERIAL COMPLIANCE	TESTING
033000	CAST-IN-PLACE CONCRETE	X		X		X
042000	UNIT MASONRY/BRICK	X	X (BRICK)			
047200	CAST STONE	X	X			
051200	STRUCTURAL STEEL FRAMING			X		
052100	STEEL JOIST			X		
053100	STEEL DECKING				X	
054000	COLD-FORMED METAL FRAMING			X		
055000	METAL FABRICATIONS			X		
055113	METAL PAN STAIRS			X		
055213	PIPE AND TUBE			X		
061000	ROUGH CARPENTRY				X	
061053	MISCELLANEOUS ROUGH CARPENTRY				X	
061063	EXTERIOR ROUGH CARPENTRY				X	
061600	SHEATHING				X	
061753	SHOP-FABRICATED WOOD TRUSSES			X		
062013	EXTERIOR FINISH CARPENTRY		X		X	
062023	INTERIOR FINISH CARPENTRY		X		X	
071326	SELF-ADHERING SHEET	X			X	
072100	THERMAL INSULATION	X			X	
072119	FOAMED-IN-PLACE INSULATION	X			X	
072500	WEATHER BARRIERS	X			X	
072600	VAPOR RETARDERS	X			X	
073113	ASPHALT SHINGLES		X			

SECTION. NO.	SECTION TITLE	PRODUCT DATA	SAMPLE	SHOP DRAWINGS	MATERIAL COMPLIANCE	TESTING
074113.16	STANDING-SEAM METAL ROOF PANELS		X			
074213.13	FORMED METAL WALL PANELS		X	X		
074213.19	INSULATED METAL WALL PANELS		X	X		
075323	ETHYLENE-PROPYLENE-DIENE-MONOMER (EPDM) ROOFING			X		
075423	THERMOPLASTIC POLYOLEFIN (TPO) ROOFING			X		
076200	SHEET METAL FLASHING AND TRIM		X			
077100	ROOF SPECIALTIES	X			X	
077129	MANUFACTURED ROOF EXPANSION JOINTS	X			X	
077200	ROOF ACCESSORIES	X			X	
078413	PENETRATION FIRESTOPPING				X	
078443	JOINT FIRESTOPPING				X	
079200	JOINT SEALANTS	X	X			
079219	ACOUSTICAL JOINT SEALANTS	X	X			
081213	HOLLOW METAL DOORS AND FRAMES			X		
081416	FLUSH WOOD DOORS		X	X		
083113	ACCESS DOORS AND FRAMES				X	
083313	COILING COUNTER DOORS			X		
083323	OVERHEAD COILING DOORS			X		
083513	FOLDING DOORS			X		
083613	SECTIONAL DOORS			X		

SECTION. NO.	SECTION TITLE	PRODUCT DATA	SAMPLE	SHOP DRAWINGS	MATERIAL COMPLIANCE	TESTING
084113	ALUMINUM-FRAMED ENTRANCES AND STOREFRONTS		X	X		
084413	GLAZED ALUMINUM CURTAIN WALLS		X	X		
084523	FIBERGLASS-SANDWICH-PANEL ASSEMBLIES	X			X	
085113	ALUMINUM WINDOWS		X	X		
087100	DOOR HARDWARE			X		
088000	GLAZING	X			X	
088300	MIRRORS				X	
089119	FIXED LOUVERS		X	X		
092116.23	GYPSTUM BOARD SHAFT WALL ASSEMBLIES				X	
092216	NON-STRUCTURAL METAL FRAMING				X	
092900	GYPSTUM BOARD				X	
093013	CERAMIC TILE	X			X	
095113	ACOUSTICAL PANEL CEILING				X	
096513	RESILIENT BASE & ACCESSORIES				X	
096516	RESILIENT SHEET VINYL	X				
096519	RESILIENT TILE FLOORING	X				
096566	RESILIENT ATHLETIC FLOORING	X				
096813	TILE CARPET	X				
096816	SHEET CARPET	X				
097200	WALL COVERINGS	X				
098433	SOUND ABSORBING WALL UNITS	X				
098436	SOUND ABSORBING CEILING UNITS	X				
099113	EXTERIOR PAINTING		X			
099123	INTERIOR PAINTING		X			
099600	HIGH PERFORMANCE COATINGS		X			

SECTION. NO.	SECTION TITLE	PRODUCT DATA	SAMPLE	SHOP DRAWINGS	MATERIAL COMPLIANCE	TESTING
101100	VISUAL DISPLAY BOARDS			X	X	
101200	DISPLAY CASES			X	X	
101423	PANEL SIGNAGE		X	X		
102113	TOILET COMPARTMENTS	X		X		
102116	SHOWER AND DRESSING COMPARTMENTS	X		X		
102123	CUBICAL CURTAINS AND TRACK	X			X	
102800	TOILET, BATH, AND LAUNDRY ACCESSORIES (CONTRACTOR TO VERIFY QUANTITIES)				X	
104413	FIRE PROTECTION CABINETS				X	
104416	FIRE EXTINGUISHERS				X	
105113	METAL LOCKERS		X	X		
105613	METAL SHELVING				X	
105626	MOBILE STORAGE SHELVING			X	X	
113100	RESIDENTIAL APPLIANCES				X	
115123	LIBRARY STACK SYSTEMS		X	X		
115213	PROJECTION SCREENS				X	
115313	LABORATORY FUME HOODS		X	X		
116143	STAGE CURTAINS		X	X		
116623	GYMNASIUM EQUIPMENT		X	X		
126600	TELESCOPING STANDS		X	X		
122113	HORIZONTAL BLINDS	X				
122413	VERTICLE BLINDS	X				
122413	ROLLER SHADES (OPERABLE SHOP DRAWINGS)	X		X	X	

SECTION. NO.	SECTION TITLE	PRODUCT DATA	SAMPLE	SHOP DRAWINGS	MATERIAL COMPLIANCE	TESTING
123__	CASEWORK AND COUNTERTOPS		X	X		
124816	ENTRANCE FLOOR GRILLS	X				

Material Compliance Form

Name of Building:

Owner:

Bid Package #:

A/E #:

Cc:

Material Compliance Submittal Section:

This document is to be used by this contractor to indicate the products/devices intended for use in this project without the need for product data submittals. Items listed are approved products in the specifications. No substitutions allowed. Select one (1) source for each category, sign this sheet, and submit as the contractor's commitment to use products required by the contract documents. **No further product data submittals are required for this section. However, physical sample, color samples, or layout shop drawings must be submitted where required by the specification.**

As contractor for work specified under the section named above, I agree to use only the products/devices listed below that were listed in the specification section.

Contractor:

Date:

Print Name: **Filled out by Contractor**

Title:

Signature: _____

Notary:

County:

Date Commission Expires:

Print Name:

Signature: _____

Filled out by Contractor and Notary used from Contractor

Reviewed By: Construction Manager, Inc.

Date:

Print Name: **Filled out by Construction Manager**

Signature: _____

Reviewed By: Kingscott Associates, Inc.

Date:

Print Name: **Filled out by Architect**

Signature: _____

List the manufacturer's name and model number(s) for each item being submitted in this division. Provide all relevant information not covered by the model number to show full compliance with each requirement of the specification. This will include but is not limited to color, finish, size, thickness and all other selectable option. Note: Use location for each listed item when several different products in this division are used in specific locations.

Specification Section:

Manufacturer's Name:

Model Number:

096519
096519

Shaw Commercial
Shaw Commercial

Uncommon Ground 6 #0188V (LVT-1)
Skyline #02560 (LVT-2)

095113
095113
095113
095113

Armstrong
Armstrong
Armstrong
Armstrong

#1713 (CP-1)
#3101 (CP-2)
Armstrong Prelude XL (ME-1 grid)
Armstrong Axiom Classic Trim (ME-2 grid and trim)



Material Compliance Form

Name of Building:

Owner:

Bid Package #:

A/E #:

Cc:

Material Compliance Submittal Section:

This document is to be used by this contractor to indicate the products/devices intended for use in this project without the need for product data submittals. Items listed are approved products in the specifications. No substitutions allowed. Select one (1) source for each category, sign this sheet, and submit as the contractor’s commitment to use products required by the contract documents. **No further product data submittals are required for this section. However, physical sample, color samples, or layout shop drawings must be submitted where required by the specification.**

As contractor for work specified under the section named above, I agree to use only the products/devices listed below that were listed in the specification section.

Contractor:

Date:

Print Name:

Title:

Signature: _____

Notary:

County:

Date Commission Expires:

Print Name:

Signature: _____

Reviewed By: Construction Manager, Inc.

Date:

Print Name:

Signature: _____

Reviewed By: Kingscott Associates, Inc.

Date:

Print Name:

Signature: _____

List the manufacturer’s name and model number(s) below for each item being submitted in this division. Provide all relevant information not covered by the model number to show full compliance with each requirement of the specification. This will include but is not limited to color, finish, size, thickness and all other selectable option. Note: Use location for each listed item when several different products in this division are used in specific locations.

Specification Section:

Manufacturer’s Name:

Model Number:

Electronic Media Authorization

Signed waiver required prior to release

Project Name: _____ KAI Project# _____

Name : _____ Company: _____

Address: _____

City, State, Zip: _____

Phone: _____ Email: _____

Autocad file version: _____

Signature: _____ Date: _____

By signing, you are agreeing to the Terms and Conditions on the following page

Documents Requested:	KAI DWG #	Issued Date on DWG
_____	_____	_____
_____	_____	_____
_____	_____	_____

Approved by: _____ Date: _____

Return Form to:
Project Architect
Kingscott Associates
msmith@kingscott.com

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SECTION 024119
SELECTIVE DEMOLITION

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Demolition and removal of selected portions of building or structure.

1.2 DEFINITIONS

- A. Remove: Detach items from existing construction and dispose of them off-site unless indicated to be salvaged or reinstalled.
- B. Remove and Reinstall: Detach items from existing construction, in a manner to prevent damage, prepare for reuse, and reinstall where indicated.
- C. Existing to Remain: Leave existing items that are not to be removed and that are not otherwise indicated to be salvaged or reinstalled.
- D. Dismantle: To remove by disassembling or detaching an item from a surface, using gentle methods and equipment to prevent damage to the item and surfaces; disposing of items unless indicated to be salvaged or reinstalled.

1.3 MATERIALS OWNERSHIP

- A. Unless otherwise indicated, demolition waste becomes property of Contractor.
- B. Historic items, relics, antiques, and similar objects including, but not limited to, cornerstones and their contents, commemorative plaques and tablets, and other items of interest or value to Owner that may be uncovered during demolition remain the property of Owner.
 1. Carefully salvage in a manner to prevent damage and promptly return to Owner.

1.4 PREINSTALLATION MEETINGS

- A. Predemolition Conference: Conduct conference at Project site .
 1. Inspect and discuss condition of construction to be selectively demolished.
 2. Review structural load limitations of existing structure.
 3. Review and finalize selective demolition schedule and verify availability of materials, demolition personnel, equipment, and facilities needed to make progress and avoid delays.

4. Review requirements of work performed by other trades that rely on substrates exposed by selective demolition operations.
5. Review areas where existing construction is to remain and requires protection.

1.5 INFORMATIONAL SUBMITTALS

- A. Predemolition Photographs or Video: Show existing conditions of adjoining construction, including finish surfaces, that might be misconstrued as damage caused by salvage and demolition operations.

1.6 CLOSEOUT SUBMITTALS

- A. Inventory: Submit a list of items that have been removed and salvaged.

1.7 FIELD CONDITIONS

- A. Owner will occupy portions of building immediately adjacent to selective demolition area. Conduct selective demolition so Owner's operations will not be disrupted.
- B. Conditions existing at time of inspection for bidding purpose will be maintained by Owner as far as practical.
- C. Notify Architect of discrepancies between existing conditions and Drawings before proceeding with selective demolition.
- D. Hazardous Materials: Present in buildings and structures to be selectively demolished. A report on the presence of hazardous materials is on file for review and use. Examine report to become aware of locations where hazardous materials are present.
 1. Do not disturb hazardous materials or items suspected of containing hazardous materials except under procedures specified elsewhere in the Contract Documents.
 2. Owner will provide material safety data sheets for suspected hazardous materials that are known to be present in buildings and structures to be selectively demolished because of building operations or processes performed there.
- E. Storage or sale of removed items or materials on-site is not permitted.
- F. Utility Service: Maintain existing utilities indicated to remain in service and protect them against damage during selective demolition operations.
 1. Maintain fire-protection facilities in service during selective demolition operations.

1.8 COORDINATION

- A. Arrange selective demolition schedule so as not to interfere with Owner's operations.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Regulatory Requirements: Comply with governing EPA notification regulations before beginning selective demolition. Comply with hauling and disposal regulations of authorities having jurisdiction.
- B. Standards: Comply with ANSI/ASSP A10.6 and NFPA 241.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify that utilities have been disconnected and capped before starting selective demolition operations.
- B. Review Project Record Documents of existing construction or other existing condition and hazardous material information provided by Owner. Owner does not guarantee that existing conditions are same as those indicated in Project Record Documents.
- C. Verify that hazardous materials have been remediated before proceeding with building demolition operations.
- D. Survey of Existing Conditions: Record existing conditions by use of preconstruction photographs or video .
 - 1. Inventory and record the condition of items to be removed and salvaged.
 - 2. Before selective demolition or removal of existing building elements that will be reproduced or duplicated in final Work, make permanent record of measurements, materials, and construction details required to make exact reproduction.

3.2 PREPARATION

- A. Refrigerant: Before starting demolition, remove refrigerant from mechanical equipment according to 40 CFR 82 and regulations of authorities having jurisdiction.

3.3 UTILITY SERVICES AND MECHANICAL/ELECTRICAL SYSTEMS

- A. Existing Services/Systems to Be Removed, Relocated, or Abandoned: Locate, identify, disconnect, and seal or cap off utility services and mechanical/electrical systems serving areas to be selectively demolished.
 - 1. Owner will arrange to shut off indicated services/systems when requested by Contractor.
 - 2. If services/systems are required to be removed, relocated, or abandoned, provide temporary services/systems that bypass area of selective demolition and that maintain continuity of services/systems to other parts of building.

3. Disconnect, demolish, and remove fire-suppression systems, plumbing, and HVAC systems, equipment, and components indicated on Drawings to be removed.
 - a. Piping to Be Removed: Remove portion of piping indicated to be removed and cap or plug remaining piping with same or compatible piping material.
 - b. Equipment to Be Removed: Disconnect and cap services and remove equipment.
 - c. Equipment to Be Removed and Salvaged: Disconnect and cap services and remove equipment and deliver to Owner.
 - d. Ducts to Be Removed: Remove portion of ducts indicated to be removed and plug remaining ducts with same or compatible ductwork material.

3.4 PROTECTION

- A. Temporary Protection: Provide temporary barricades and other protection required to prevent injury to people and damage to adjacent buildings and facilities to remain.
 1. Provide protection to ensure safe passage of people around selective demolition area and to and from occupied portions of building.
 2. Provide temporary weather protection, during interval between selective demolition of existing construction on exterior surfaces and new construction, to prevent water leakage and damage to structure and interior areas.
 3. Protect walls, ceilings, floors, and other existing finish work that are to remain or that are exposed during selective demolition operations.
 4. Cover and protect furniture, furnishings, and equipment that have not been removed.
- B. Temporary Shoring: Design, provide, and maintain shoring, bracing, and structural supports as required to preserve stability and prevent movement, settlement, or collapse of construction and finishes to remain, and to prevent unexpected or uncontrolled movement or collapse of construction being demolished.
 1. Strengthen or add new supports when required during progress of selective demolition.
- C. Remove temporary barricades and protections where hazards no longer exist.

3.5 SELECTIVE DEMOLITION, GENERAL

- A. General: Demolish and remove existing construction only to the extent required by new construction and as indicated. Use methods required to complete the Work within limitations of governing regulations and as follows:
 1. Proceed with selective demolition systematically, from higher to lower level. Complete selective demolition operations above each floor or tier before disturbing supporting members on the next lower level.
 2. Neatly cut openings and holes plumb, square, and true to dimensions required. Use cutting methods least likely to damage construction to remain or adjoining construction. Use hand tools or small power tools designed for sawing or grinding, not hammering and chopping. Temporarily cover openings to remain.
 3. Cut or drill from the exposed or finished side into concealed surfaces to avoid marring existing finished surfaces.

4. Do not use cutting torches until work area is cleared of flammable materials. At concealed spaces, such as duct and pipe interiors, verify condition and contents of hidden space before starting flame-cutting operations. Maintain portable fire-suppression devices during flame-cutting operations.
5. Maintain fire watch during and for at least 2 hours after flame-cutting operations.
6. Maintain adequate ventilation when using cutting torches.
7. Remove decayed, vermin-infested, or otherwise dangerous or unsuitable materials and promptly dispose of off-site.
8. Remove structural framing members and lower to ground by method suitable to avoid free fall and to prevent ground impact or dust generation.
9. Locate selective demolition equipment and remove debris and materials so as not to impose excessive loads on supporting walls, floors, or framing.
10. Dispose of demolished items and materials promptly.

B. Removed and Salvaged Items:

1. Transport items to Owner's storage area designated by Owner .
2. Protect items from damage during transport and storage.

3.6 SELECTIVE DEMOLITION PROCEDURES FOR SPECIFIC MATERIALS

- A. Concrete: Demolish in sections. Cut concrete full depth at junctures with construction to remain and at regular intervals using power-driven saw, and then remove concrete between saw cuts.
- B. Masonry: Demolish in small sections. Cut masonry at junctures with construction to remain, using power-driven saw, and then remove masonry between saw cuts.
- C. Resilient Floor Coverings: Remove floor coverings and adhesive according to recommendations in RFCI's "Recommended Work Practices for the Removal of Resilient Floor Coverings." Do not use methods requiring solvent-based adhesive strippers.

3.7 DISPOSAL OF DEMOLISHED MATERIALS

- A. Remove demolition waste materials from Project site
 1. Do not allow demolished materials to accumulate on-site.
 2. Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.
 3. Remove debris from elevated portions of building by chute, hoist, or other device that will convey debris to grade level in a controlled descent.

3.8 CLEANING

- A. Clean adjacent structures and improvements of dust, dirt, and debris caused by selective demolition operations. Return adjacent areas to condition existing before selective demolition operations began.

END OF SECTION 024119

SECTION 033000
CAST-IN-PLACE CONCRETE

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Cast-in-place concrete for patching and repair..

PART 2 - PRODUCTS

2.1 CONCRETE, GENERAL

- A. ACI Publications: Comply with ACI 301 unless modified by requirements in the Contract Documents.

2.2 CONCRETE MIXTURES

- A. Normal-weight concrete.

1. Exposure Class: ACI 318 .
2. Minimum Compressive Strength: 3500 psi at 28 days.
3. Minimum Cementitious Materials Content: .
4. Slump Limit: 5 inches, plus or minus 1 inch.

2.3 CONCRETE MIXING

- A. Project-Site Mixing: Measure, batch, and mix concrete materials and concrete in accordance with ASTM C94/C94M.

PART 3 - EXECUTION

3.1 INSTALLATION OF EMBEDDED ITEMS

- A. Place and secure anchorage devices and other embedded items required for adjoining Work that is attached to or supported by cast-in-place concrete.

3.2 JOINTS

- A. Construct joints true to line, with faces perpendicular to surface plane of concrete.

3.3 CONCRETE PLACEMENT

- A. Before placing concrete, verify that installation of formwork, reinforcement, embedded items, and vapor retarder is complete and that required inspections are completed.
 - 1. Immediately prior to concrete placement, inspect vapor retarder for damage and deficient installation, and repair defective areas.
 - 2. Provide continuous inspection of vapor retarder during concrete placement and make necessary repairs to damaged areas as Work progresses.
- B. Deposit and consolidate concrete for floors and slabs in a continuous operation, within limits of construction joints, until placement of a panel or section is complete.

3.4 FINISHING FLOORS AND SLABS

- A. Comply with ACI 302.1R recommendations for screeding, restraightening, and finishing operations for concrete surfaces. Do not wet concrete surfaces.

3.5 INSTALLATION OF MISCELLANEOUS CONCRETE ITEMS

- A. Filling In:
 - 1. Fill in holes and openings left in concrete structures after Work of other trades is in place unless otherwise indicated.
 - 2. Mix, place, and cure concrete, as specified, to blend with in-place construction.
 - 3. Provide other miscellaneous concrete filling indicated or required to complete the Work.

3.6 TOLERANCES

- A. Conform to ACI 117.

END OF SECTION 033000

SECTION 042000
UNIT MASONRY

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Concrete masonry units.
2. Lintels.
3. Mortar and grout materials.
4. Reinforcement.
5. Ties and anchors.
6. Accessories.
7. Mortar and grout mixes.

B. Products Installed but not Furnished under This Section:

1. Steel lintels in unit masonry.

1.2 PREINSTALLATION MEETINGS

- A. Preinstallation Conference: Conduct conference at Project site.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product.

PART 2 - PRODUCTS

2.1 UNIT MASONRY, GENERAL

- A. Masonry Standard: Comply with TMS 602, except as modified by requirements in the Contract Documents.
- B. Defective Units: Referenced masonry unit standards may allow a certain percentage of units to contain chips, cracks, or other defects exceeding limits stated. Do not use units where such defects are exposed in the completed Work.

2.2 CONCRETE MASONRY UNITS

- A. Shapes: Provide shapes indicated and as follows, with exposed surfaces matching exposed faces of adjacent units unless otherwise indicated.
 - 1. Provide special shapes for lintels, corners, jambs, sashes, movement joints, headers, bonding, and other special conditions.
 - 2. Provide **bullnose units** for outside corners unless otherwise indicated.
- B. CMUs: ASTM C90, lightweight or medium weight.
 - 1. Unit Compressive Strength: Provide units with minimum average net-area compressive strength of 2150 psi .
 - 2. Size (Width): Manufactured to dimensions 3/8 inch less than nominal dimensions.

2.3 LINTELS

- A. Masonry Lintels: Prefabricated or built-in-place masonry lintels made from bond beam CMUs matching adjacent CMUs in color, texture, and density classification, with reinforcing bars placed as indicated and filled with coarse grout. Cure precast lintels before handling and installing. Temporarily support built-in-place lintels until cured.

2.4 MORTAR AND GROUT MATERIALS

- A. Portland Cement: ASTM C150/C150M, Type I or II, except Type III may be used for cold-weather construction. Provide natural color or white cement as required to produce mortar color indicated.
 - 1. Alkali content will not be more than 0.1 percent when tested in accordance with ASTM C114.
- B. Hydrated Lime: ASTM C207, Type S.
- C. Portland Cement-Lime Mix: Packaged blend of portland cement and hydrated lime containing no other ingredients.
- D. Masonry Cement: ASTM C91/C91M.
- E. Mortar Cement: ASTM C1329/C1329M.
- F. Aggregate for Mortar: ASTM C144.
 - 1. For mortar that is exposed to view, use washed aggregate consisting of natural sand or crushed stone.
 - 2. For joints less than 1/4 inch thick, use aggregate graded with 100 percent passing the No. 16 sieve.
- G. Aggregate for Grout: ASTM C404.
- H. Water: Potable.

2.5 REINFORCEMENT

- A. Uncoated-Steel Reinforcing Bars: ASTM A615/A615M or ASTM A996/A996M, Grade 60.
- B. Reinforcing Bar Positioners: Wire units designed to fit into mortar bed joints spanning masonry unit cells and to hold reinforcing bars in center of cells. Units are formed from 0.148-inch steel wire, hot-dip galvanized after fabrication. Provide units designed for number of bars indicated.
- C. Masonry-Joint Reinforcement, General: ASTM A951/A951M.
 - 1. Interior Walls: Mill- galvanized carbon steel.
 - 2. Wire Size for Side Rods: 0.148-inch diameter.
 - 3. Wire Size for Cross Rods: 0.148-inch diameter.
 - 4. Spacing of Cross Rods, Tabs, and Cross Ties: Not more than 16 inches o.c.
 - 5. Provide in lengths of not less than 10 ft. , with prefabricated corner and tee units.
- D. Masonry-Joint Reinforcement for Single-Wythe Masonry: Ladder or truss type with single pair of side rods.

2.6 ACCESSORIES

- A. Compressible Filler: Premolded filler strips complying with ASTM D1056, Grade 2A1; compressible up to 35 percent; of width and thickness indicated; formulated from neoprene urethane or PVC.
- B. Bond-Breaker Strips: Asphalt-saturated felt complying with ASTM D226/D226M, Type I (No. 15 asphalt felt).

2.7 MORTAR AND GROUT MIXES

- A. General: Do not use admixtures, including pigments, air-entraining agents, accelerators, retarders, water-repellent agents, antifreeze compounds, or other admixtures unless otherwise indicated.
 - 1. Do not use calcium chloride in mortar or grout.
 - 2. Use portland cement-lime masonry cement or mortar cement mortar unless otherwise indicated.
 - 3. For reinforced masonry, use portland cement-lime masonry cement or mortar cement mortar.
- B. Preblended, Dry Mortar Mix: Furnish dry mortar ingredients in form of a preblended mix. Measure quantities by weight to ensure accurate proportions, and thoroughly blend ingredients before delivering to Project site.
- C. Mortar for Unit Masonry: Comply with ASTM C270, Proportion Specification. Provide the following types of mortar for applications stated unless another type is indicated.
 - 1. For interior nonload-bearing partitions, Type O may be used instead of Type N.
- D. Grout for Unit Masonry: Comply with ASTM C476.

1. Use grout of type indicated or, if not otherwise indicated, of type (fine or coarse) that will comply with TMS 602 for dimensions of grout spaces and pour height.
2. Proportion grout in accordance with ASTM C476, Table 1 or paragraph 4.2.1.2 for specified 28-day compressive strength indicated, but not less than 2000 psi.
3. Provide grout with a slump of 8 to 11 inches as measured in accordance with ASTM C143/C143M.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.
 1. Verify that reinforcing dowels are properly placed.
 2. Verify that substrates are free of substances that impair mortar bond.
- B. Before installation, examine rough-in and built-in construction for piping systems to verify actual locations of piping connections.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION, GENERAL

- A. Leave openings for equipment to be installed before completing masonry. After installing equipment, complete masonry to match construction immediately adjacent to opening.
- B. Use full-size units without cutting if possible. If cutting is required to provide a continuous pattern or to fit adjoining construction, cut units with motor-driven saws; provide clean, sharp, unchipped edges. Allow units to dry before laying unless wetting of units is specified. Install cut units with cut surfaces and, where possible, cut edges concealed.
- C. Select and arrange units for exposed unit masonry to produce a uniform blend of colors and textures. Mix units from several pallets or cubes as they are placed.
- D. Matching Existing Masonry: Match coursing, bonding, color, and texture of existing masonry.
- E. **Tooth-in** where adjoining existing masonry unless noted otherwise.

3.3 TOLERANCES

- A. Dimensions and Locations of Elements:
 1. For dimensions in cross section or elevation, do not vary by more than plus 1/2 inch or minus 1/4 inch.
 2. For location of elements in plan, do not vary from that indicated by more than plus or minus 1/2 inch.

3. For location of elements in elevation, do not vary from that indicated by more than plus or minus 1/4 inch in a story height or 1/2 inch total.

B. Lines and Levels:

1. For bed joints and top surfaces of bearing walls, do not vary from level by more than 1/4 inch in 10 ft., or 1/2-inch maximum.
2. For conspicuous horizontal lines, such as lintels, sills, parapets, and reveals, do not vary from level by more than 1/8 inch in 10 ft., 1/4 inch in 20 ft., or 1/2-inch maximum.
3. For vertical lines and surfaces, do not vary from plumb by more than 1/4 inch in 10 ft., 3/8 inch in 20 ft., or 1/2-inch maximum.
4. For conspicuous vertical lines, such as external corners, door jambs, reveals, and expansion and control joints, do not vary from plumb by more than 1/8 inch in 10 ft., 1/4 inch in 20 ft., or 1/2-inch maximum.
5. For lines and surfaces, do not vary from straight by more than 1/4 inch in 10 ft., 3/8 inch in 20 ft., or 1/2-inch maximum.
6. For vertical alignment of exposed head joints, do not vary from plumb by more than 1/4 inch in 10 ft., or 1/2-inch maximum.
7. For faces of adjacent exposed masonry units, do not vary from flush alignment by more than 1/16 inch except due to warpage of masonry units within tolerances specified for warpage of units.

C. Joints:

1. For bed joints, do not vary from thickness indicated by more than plus or minus 1/8 inch, with a maximum thickness limited to 1/2 inch.
2. For exposed bed joints, do not vary from bed-joint thickness of adjacent courses by more than 1/8 inch.
3. For head and collar joints, do not vary from thickness indicated by more than plus 3/8 inch or minus 1/4 inch.
4. For exposed head joints, do not vary from thickness indicated by more than plus or minus 1/8 inch. Do not vary from adjacent bed-joint and head-joint thicknesses by more than 1/8 inch .
5. For exposed bed joints and head joints of stacked bond, do not vary from a straight line by more than 1/16 inch from one masonry unit to the next.

3.4 LAYING MASONRY WALLS

- A. Lay out walls in advance for accurate spacing of surface bond patterns with uniform joint thicknesses and for accurate location of openings, movement-type joints, returns, and offsets. Avoid using less-than-half-size units, particularly at corners, jambs, and, where possible, at other locations.
- B. Bond Pattern for Exposed Masonry: Unless otherwise indicated, lay exposed masonry in running bond ; do not use units with less-than-nominal 4-inch horizontal face dimensions at corners or jambs.
- C. Lay concealed masonry with all units in a wythe in running bond or bonded by lapping not less than 4 inches. Bond and interlock each course of each wythe at corners. Do not use units with less-than-nominal 4-inch horizontal face dimensions at corners or jambs.

- D. Stopping and Resuming Work: Stop work by stepping back units in each course from those in course below; do not tooth. When resuming work, clean masonry surfaces that are to receive mortar, remove loose masonry units and mortar, and wet brick if required before laying fresh masonry.
- E. Built-in Work: As construction progresses, build in items specified in this and other Sections. Fill in solidly with masonry around built-in items.
- F. Where built-in items are to be embedded in cores of hollow masonry units, place a layer of metal lath, wire mesh, or plastic mesh in the joint below, and rod mortar or grout into core.
- G. Fill cores in hollow CMUs with grout 24 inches under bearing plates, beams, lintels, posts, and similar items unless otherwise indicated.
- H. Build nonload-bearing interior partitions full height of story to underside of solid floor or roof structure above unless otherwise indicated.
 - 1. Install compressible filler in joint between top of partition and underside of structure above.
 - 2. Fasten partition top anchors to structure above and build into top of partition. Grout cells of CMUs solidly around plastic tubes of anchors, and push tubes down into grout to provide 1/2-inch clearance between end of anchor rod and end of tube. Space anchors 48 inches o.c. unless otherwise indicated.
 - 3. Wedge nonload-bearing partitions against structure above with small pieces of tile, slate, or metal. Fill joint with mortar after dead-load deflection of structure above approaches final position.

3.5 MORTAR BEDDING AND JOINTING

- A. Lay CMUs as follows:
 - 1. Bed face shells in mortar and make head joints of depth equal to bed joints.
 - 2. Bed webs in mortar in all courses of piers, columns, and pilasters.
 - 3. Bed webs in mortar in grouted masonry, including starting course on footings.
 - 4. Fully bed entire units, including areas under cells, at starting course on footings where cells are not grouted.
 - 5. Fully bed units and fill cells with mortar at anchors and ties as needed to fully embed anchors and ties in mortar.
- B. Lay solid masonry units and hollow brick with completely filled bed and head joints; butter ends with sufficient mortar to fill head joints and shove into place. Do not deeply furrow bed joints or slush head joints.
- C. Tool exposed joints slightly concave when thumbprint hard, using a jointer larger than joint thickness unless otherwise indicated.
 - 1. For glazed masonry units, use a nonmetallic jointer 3/4 inch or more in width.
- D. Cut joints flush for masonry walls to receive plaster or other direct-applied finishes (other than paint) unless otherwise indicated.

- E. Cut joints flush where indicated to receive cavity wall insulation unless otherwise indicated.

3.6 MASONRY-JOINT REINFORCEMENT

- A. General: Install entire length of longitudinal side rods in mortar with a minimum cover of 5/8 inch on exterior side of walls, 1/2 inch elsewhere. Lap reinforcement a minimum of 6 inches.
 - 1. Space reinforcement not more than 16 inches o.c.
 - 2. Space reinforcement not more than 8 inches o.c. in foundation walls and parapet walls.
 - 3. Provide reinforcement not more than 8 inches above and below wall openings and extending 12 inches beyond openings.
- B. Interrupt joint reinforcement at control and expansion joints unless otherwise indicated.
- C. Provide continuity at wall intersections by using prefabricated T-shaped units.
- D. Provide continuity at corners by using prefabricated L-shaped units.
- E. Cut and bend reinforcing units as directed by manufacturer for continuity at corners, returns, offsets, column fireproofing, pipe enclosures, and other special conditions.

3.7 LINTELS

- A. Install steel lintels where indicated.
- B. Provide masonry lintels where indicated and where openings of more than 12 inches for brick-size units and 24 inches for block-size units are indicated without structural steel or other supporting lintels.
- C. Provide minimum bearing of 8 inches at each jamb unless otherwise indicated.

3.8 REPAIRING, POINTING, AND CLEANING

- A. Remove and replace masonry units that are loose, chipped, broken, stained, or otherwise damaged or that do not match adjoining units. Install new units to match adjoining units; install in fresh mortar, pointed to eliminate evidence of replacement.
- B. Pointing: During the tooling of joints, enlarge voids and holes, except weep holes, and completely fill with mortar. Point up joints, including corners, openings, and adjacent construction, to provide a neat, uniform appearance. Prepare joints for sealant application, where indicated.
- C. In-Progress Cleaning: Clean unit masonry as work progresses by dry brushing to remove mortar fins and smears before tooling joints.
- D. Final Cleaning: After mortar is thoroughly set and cured, clean exposed masonry as follows:
 - 1. Remove large mortar particles by hand with wooden paddles and nonmetallic scrape hoes or chisels.

2. Test cleaning methods on sample wall panel; leave one-half of panel uncleaned for comparison purposes. Obtain Architect's approval of sample cleaning before proceeding with cleaning of masonry.
3. Protect adjacent stone and nonmasonry surfaces from contact with cleaner by covering them with liquid strippable masking agent or polyethylene film and waterproof masking tape.
4. Wet wall surfaces with water before applying cleaners; remove cleaners promptly by rinsing surfaces thoroughly with clear water.
5. Clean brick by bucket-and-brush hand-cleaning method described in BIA Technical Notes 20.
6. Clean concrete masonry by applicable cleaning methods indicated in NCMA TEK 8-4A.
7. Clean masonry with a proprietary acidic masonry cleaner applied according to manufacturer's written instructions.

3.9 MASONRY WASTE DISPOSAL

- A. Salvageable Materials: Unless otherwise indicated, excess masonry materials are Contractor's property. At completion of unit masonry work, remove from Project site.
- B. Waste Disposal as Fill Material: Dispose of clean masonry waste, including excess or soil-contaminated sand, waste mortar, and broken masonry units, by crushing and mixing with fill material as fill is placed.
 1. Crush masonry waste to less than 4 inches in each dimension.
 2. Mix masonry waste with at least two parts of specified fill material for each part of masonry waste. Fill material is specified in Section 312000 "Earth Moving."
 3. Do not dispose of masonry waste as fill within 18 inches of finished grade.
- C. Masonry Waste Recycling: Return broken CMUs not used as fill to manufacturer for recycling.
- D. Excess Masonry Waste: Remove excess clean masonry waste that cannot be used as fill, as described above or recycled, and other masonry waste, and legally dispose of off Owner's property.

END OF SECTION 042000

SECTION 051200
STRUCTURAL STEEL FRAMING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section. If differing requirements are identified elsewhere (in these specifications or on drawings or separate instructions), the more stringent requirement shall be met.

1.2 SUMMARY

- A. Section Includes:
 - 1. Structural steel.
 - 2. Loose steel lintels.

1.3 DEFINITIONS

- A. Structural Steel: Elements of the structural frame indicated on Drawings and as described in ANSI/AISC 303.

1.4 PREINSTALLATION MEETINGS

- A. Preinstallation Conference: Conduct conference at Project site.

1.5 ACTION SUBMITTALS

- A. Product Data:
 - 1. Structural-steel materials.
 - 2. Shop primer.
 - 3. Galvanized-steel primer.
 - 4. Galvanized repair paint.
- B. Shop Drawings: Show fabrication of structural-steel components.

1.6 QUALITY ASSURANCE

- A. Fabricator Qualifications: A qualified fabricator that participates in the AISC Quality Certification Program and is designated an AISC-Certified Plant, Category BU is accredited by the IAS Fabricator Inspection Program for Structural Steel (Acceptance Criteria 172), or a fabricator that can provide documentation that their process meets or exceeds AISC standards.
- B. Installer Qualifications: A qualified installer who participates in the AISC Quality Certification Program and is designated an AISC-Certified Erector, Category CSE, or that can provide documentation through references that they have done this type of work for more than 5 years.
- C. Welding Qualifications: Qualify procedures and personnel in accordance with AWS D1.1/D1.1M.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Comply with applicable provisions of the following specifications and documents, refer to the local building code to determine the applicable version:
 - 1. ANSI/AISC 303.
 - 2. ANSI/AISC 360.
 - 3. RCSC's "Specification for Structural Joints Using High-Strength Bolts."

2.2 STRUCTURAL-STEEL MATERIALS

- A. W-Shapes: ASTM A992/A992M or ASTM A572/A572M, Grade 50.
- B. Plate and Bar: ASTM A36/A36M.
- C. Galvanize all steel.

1.1 LOOSE STEEL LINTELS

- A. Fabricate loose steel lintels from steel angles and shapes of size indicated for openings and recesses in masonry walls and partitions at locations indicated. Fabricate in single lengths for each opening unless otherwise indicated. Weld adjoining members together to form a single unit where indicated.
- B. Size loose lintels to provide bearing length at each side of openings equal to 1/12 of clear span, but not less than 8 inches unless otherwise indicated.

- C. Galvanize and prime loose steel lintels

2.3 PRIMER

- A. Galvanized-Steel Primer: MPI#26.
 - 1. Etching Cleaner: MPI#25, for galvanized steel.
 - 2. Galvanizing Repair Paint: MPI#18, MPI#19, or SSPC-Paint 20.

2.4 FABRICATION

- A. Structural Steel: Fabricate and assemble in shop to greatest extent possible. Fabricate in accordance with ANSI/AISC 303 and to ANSI/AISC 360.

2.5 SHOP CONNECTIONS

- A. Weld Connections: Comply with AWS D1.1/D1.1M for tolerances, appearances, welding procedure specifications, weld quality, and methods used in correcting welding work.

2.6 GALVANIZING

- A. Hot-Dip Galvanized Finish: Apply zinc coating by the hot-dip process to structural steel in accordance with ASTM A123/A123M.
 - 1. Fill vent and drain holes that are exposed in the finished Work unless they function as weep holes, by plugging with zinc solder and filing off smooth.

2.7 SHOP PRIMING

- A. Shop prime steel surfaces indicated to be painted.
- B. Surface Preparation of Galvanized Steel: Prepare galvanized-steel surfaces for shop priming by thoroughly cleaning steel of grease, dirt, oil, flux, and other foreign matter, and treating with etching cleaner or in accordance with SSPC-SP 16.
- C. Priming: Immediately after surface preparation, apply primer in accordance with manufacturer's written instructions and at rate recommended by SSPC to provide a minimum dry film thickness of 1.5 mils. Use priming methods that result in full coverage of joints, corners, edges, and exposed surfaces.

2.8 SOURCE QUALITY CONTROL

- A. If one of the two conditions below is followed then source quality control need not be required provided approved by building official:

1. The fabricator is AISC certified and provides documentation they are approved to perform such work without special inspection, and at the completion of fabrication the approved fabricator shall submit a certificate of compliance to the building official stating that the work was performed in accordance with the approved construction documents.
2. The fabrication process does not require any welding, thermal cutting, heating operations of any kind. In such cases the fabricator shall submit a detailed procedure for material control that demonstrates the fabricator's ability to maintain suitable records and procedures such that, at any time during the fabrication process, the material specification, grade and mill test reports for the main stress-carrying elements are capable of being determined.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify, with certified steel erector present, elevations of concrete- and masonry-bearing surfaces and locations of anchor rods, bearing plates, and other embedments for compliance with requirements.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 ERECTION

- A. Set structural steel accurately in locations and to elevations indicated and in accordance with ANSI/AISC 303 and ANSI/AISC 360.
- B. Maintain erection tolerances of structural steel within ANSI/AISC 303.

END OF SECTION 051200

SECTION 079200
JOINT SEALANTS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Silicone joint sealants.
2. Mildew-resistant joint sealants.
3. Latex joint sealants.

1.2 ACTION SUBMITTALS

A. Product Data:

1. Joint-sealants.
2. Joint sealant backing materials.

- B. Samples for Initial Selection: Manufacturer's standard color charts consisting of strips of cured sealants showing the full range of colors available for each product exposed to view.

1.3 FIELD CONDITIONS

A. Do not proceed with installation of joint sealants under the following conditions:

1. When ambient and substrate temperature conditions are outside limits permitted by joint-sealant manufacturer or are below 40 deg F.
2. When joint substrates are wet.
3. Where joint widths are less than those allowed by joint-sealant manufacturer for applications indicated.
4. Where contaminants capable of interfering with adhesion have not yet been removed from joint substrates.

PART 2 - PRODUCTS

2.1 JOINT SEALANTS, GENERAL

- A. Compatibility: Provide joint sealants, backings, and other related materials that are compatible with one another and with joint substrates under conditions of service and application, as demonstrated by joint-sealant manufacturer, based on testing and field experience.

- B. Colors of Exposed Joint Sealants: As selected by Architect from manufacturer's full range.

2.2 SILICONE JOINT SEALANTS

- A. Silicone, S, NS, 50, T, NT: Single-component, nonsag, plus 50 percent and minus 50 percent movement capability, traffic- and nontraffic-use, neutral-curing silicone joint sealant; ASTM C920, Type S, Grade NS, Class 50, Uses T and NT.
 - 1. Manufacturers: Subject to compliance with requirements, provide products by the following:
 - a. Pecora Corporation.
 - b. The Dow Chemical Company.
 - c. Tremco Incorporated.

2.3 MILDEW-RESISTANT JOINT SEALANTS

- A. Mildew-Resistant Joint Sealants: Formulated for prolonged exposure to humidity with fungicide to prevent mold and mildew growth.
- B. Silicone, Mildew Resistant, Acid Curing, S, NS, 25, NT: Mildew-resistant, single-component, nonsag, plus 25 percent and minus 25 percent movement capability, nontraffic-use, acid-curing silicone joint sealant; ASTM C920, Type S, Grade NS, Class 25, Use NT.
 - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Pecora Corporation.
 - b. The Dow Chemical Company.
 - c. Tremco Incorporated.

2.4 LATEX JOINT SEALANTS

- A. Acrylic Latex: Acrylic latex or siliconized acrylic latex, ASTM C834, Type OP, Grade NF.
 - 1. Manufacturers: Subject to compliance with requirements, provide products by the following:
 - a. Pecora Corporation.
 - b. The Dow Chemical Company.
 - c. Tremco Incorporated.

2.5 JOINT-SEALANT BACKING

- A. Sealant Backing Material, General: Nonstaining; compatible with joint substrates, sealants, primers, and other joint fillers; and approved for applications indicated by sealant manufacturer based on field experience and laboratory testing.
- B. Cylindrical Sealant Backings: ASTM C1330, Type C (closed-cell material with a surface skin) , and of size and density to control sealant depth and otherwise contribute to producing optimum sealant performance.

2.6 MISCELLANEOUS MATERIALS

- A. Primer: Material recommended by joint-sealant manufacturer where required for adhesion of sealant to joint substrates indicated, as determined from preconstruction joint-sealant-substrate tests and field tests.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine joints indicated to receive joint sealants, with Installer present, for compliance with requirements for joint configuration, installation tolerances, and other conditions affecting performance of the Work.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Surface Cleaning of Joints: Clean out joints immediately before installing joint sealants to comply with joint-sealant manufacturer's written instructions and the following requirements:
 - 1. Remove all foreign material from joint substrates that could interfere with adhesion of joint sealant, including dust, paints (except for permanent, protective coatings tested and approved for sealant adhesion and compatibility by sealant manufacturer), old joint sealants, oil, grease, waterproofing, water repellents, water, surface dirt, and frost.
 - 2. Clean porous joint substrate surfaces by brushing, grinding, mechanical abrading, or a combination of these methods to produce a clean, sound substrate capable of developing optimum bond with joint sealants. Remove loose particles remaining after cleaning operations above by vacuuming or blowing out joints with oil-free compressed air. Porous joint substrates include the following:
 - a. Concrete.
 - b. Masonry.
 - c. Unglazed surfaces of ceramic tile.
 - 3. Remove laitance and form-release agents from concrete.
 - 4. Clean nonporous joint substrate surfaces with chemical cleaners or other means that do not stain, harm substrates, or leave residues capable of interfering with adhesion of joint sealants. Nonporous joint substrates include the following:
 - a. Metal.
 - b. Glass.
 - c. Porcelain enamel.
 - d. Glazed surfaces of ceramic tile.
- B. Joint Priming: Prime joint substrates where recommended by joint-sealant manufacturer or as indicated by preconstruction joint-sealant-substrate tests or prior experience. Apply primer to comply with joint-sealant manufacturer's written instructions. Confine primers to areas of joint-sealant bond; do not allow spillage or migration onto adjoining surfaces.

- C. Masking Tape: Use masking tape where required to prevent contact of sealant or primer with adjoining surfaces that otherwise would be permanently stained or damaged by such contact or by cleaning methods required to remove sealant smears. Remove tape immediately after tooling without disturbing joint seal.

3.3 INSTALLATION OF JOINT SEALANTS

- A. General: Comply with joint-sealant manufacturer's written installation instructions for products and applications indicated, unless more stringent requirements apply.
- B. Sealant Installation Standard: Comply with recommendations in ASTM C1193 for use of joint sealants as applicable to materials, applications, and conditions indicated.
- C. Install sealant backings of type indicated to support sealants during application and at position required to produce cross-sectional shapes and depths of installed sealants relative to joint widths that allow optimum sealant movement capability.
 - 1. Do not leave gaps between ends of sealant backings.
 - 2. Do not stretch, twist, puncture, or tear sealant backings.
 - 3. Remove absorbent sealant backings that have become wet before sealant application, and replace them with dry materials.
- D. Install bond-breaker tape behind sealants where sealant backings are not used between sealants and backs of joints.
- E. Install sealants using proven techniques that comply with the following and at the same time backings are installed:
 - 1. Place sealants so they directly contact and fully wet joint substrates.
 - 2. Completely fill recesses in each joint configuration.
 - 3. Produce uniform, cross-sectional shapes and depths relative to joint widths that allow optimum sealant movement capability.
- F. Tooling of Nonsag Sealants: Immediately after sealant application and before skinning or curing begins, tool sealants according to requirements specified in subparagraphs below to form smooth, uniform beads of configuration indicated; to eliminate air pockets; and to ensure contact and adhesion of sealant with sides of joint.
 - 1. Remove excess sealant from surfaces adjacent to joints.
 - 2. Use tooling agents that are approved in writing by sealant manufacturer and that do not discolor sealants or adjacent surfaces.
 - 3. Provide concave joint profile in accordance with Figure 8A in ASTM C1193 unless otherwise indicated.
 - 4. Provide flush joint profile at in accordance with Figure 8B in ASTM C1193.
 - 5. Provide recessed joint configuration of recess depth and at in accordance with Figure 8C in ASTM C1193.
 - a. Use masking tape to protect surfaces adjacent to recessed tooled joints.

3.4 CLEANING

- A. Clean off excess sealant or sealant smears adjacent to joints as the Work progresses by methods and with cleaning materials approved in writing by manufacturers of joint sealants and of products in which joints occur.

3.5 PROTECTION

- A. Protect joint sealants during and after curing period from contact with contaminating substances and from damage resulting from construction operations or other causes so sealants are without deterioration or damage at time of Substantial Completion. If, despite such protection, damage or deterioration occurs, cut out, remove, and repair damaged or deteriorated joint sealants immediately so installations with repaired areas are indistinguishable from original work.

3.6 JOINT-SEALANT SCHEDULE

- A. Interior joints in horizontal traffic surfaces:
 - 1. Joint Locations:
 - a. Control and expansion joints in tile flooring.
 - b. Other joints as indicated on Drawings.
 - 2. Joint Sealant: Urethane, S, P, 25, T, NT .
 - 3. Joint-Sealant Color: As selected by Architect from manufacturer's full range of colors .

- B. Mildew-resistant interior joints in vertical surfaces and horizontal nontraffic surfaces:
 - 1. Joint Locations:
 - a. Joints between plumbing fixtures and adjoining walls, floors, and counters.
 - b. Tile control and expansion joints where indicated.
 - c. Other joints as indicated on Drawings.
 - 2. Joint Sealant: Silicone, mildew resistant, acid curing, S, NS, 25, NT .
 - 3. Joint-Sealant Color: As selected by Architect from manufacturer's full range of colors .

END OF SECTION 079200

SECTION 081116
ALUMINUM FLUSH DOORS AND FRAMES

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Aluminum Flush Doors.
- B. Aluminum Door Frames

1.02 RELATED SECTIONS

- A. Section 04 20 00: Masonry (Frame Installation)
- B. Section 07 90 00: Joint Sealers
- C. Section 08 71 00: Door Hardware

1.03 REFERENCES

- A. ASTM B 209 - Aluminum and Aluminum-Alloy Sheet and Plate.
- B. ASTM B 221 - Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes.
- C. ASTM B 308 - Aluminum-Alloy 6061-T6 Standard Structural Profiles.
- D. ASTM E 283 - Determining the Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen.
- E. ASTM E 330 - Structural Performance of Exterior Windows, Doors, Skylights and Curtain Walls by Uniform Static Air Pressure Difference.
- F. ASTM E 331 - Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls by Uniform Static Air Pressure Difference.
- G. ASTM E 1886 – Standard Test Method for Performance of Exterior Windows, Curtain Walls, Protective Systems Impacted by Missile(s) and Exposed to Cyclic Pressure Differentials.
- H. ASTM E 1996 – Standard Specification for Performance of Exterior Windows, Curtain Walls, Doors and Impact Protective Systems Impacted by Windborne Debris in Hurricanes.

1.05 SUBMITTALS

- B. Product Data: Include manufacturer's product information, including material, elemental construction, fabrication, and finishes.
- C. Shop Drawings: Include shop drawings relating to dimensions, fabrication, finish and installation.
 - 1. Drawings should include the following:
 - a. Dimensions
 - b. Elevations with necessary detail keys
 - c. Entry system reinforcements (if applicable)

d. Fabrication and Finish

1.06 QUALITY ASSURANCE

- A. Manufacturer's Qualifications:
 - 1. Manufacturing process with contemporary inspection using neoteric checklist for optimum field performance.
 - 2. Manufacturing same product specified for over 25 years.

1.07 DELIVERY, STORAGE, HANDLING

- A. Packing: Finished products shall be packaged securely with appropriate labeling for protection and product identification visible on packaging.
- B. Shipping and Handling: Deliver materials to site in original condition and packaging without any damage to packaging or materials.
- C. Unloading: Individually packaged products to be unloaded by hand truck or 2-person team lift (or more if needed) to avoid unnecessary damage.
- D. Storage and Protection:
 - 1. Store items indoors away from excessive amounts of moisture.
 - 2. Protect entry doors against damage from outdoor hazards and during the entire installation

1.08 WARRANTY

- A. Warrant doors and frames to be free from defects and premature degradation of finish and door structure.
- B. Warranty period will be ten years from the date of manufacture.

PART 2 PRODUCTS

2.01 MANUFACTURER

- A. Cross Aluminum Products Inc.,
Address: 1770 Mayflower Rd., Niles, Michigan 49120.
Phone: (800) 806-3667 or (269) 697-8340
Fax: (269) 697-8348
Web: www.crossaluminum.com
Email: door@crossaluminum.com

2.02 ALUMINUM FLUSH DOORS

- A. Product: FL-400 Series with required aluminum frames.
- B. Door Opening Size: [refer to drawings]
- C. Door Assembly:
 - 1. Door Stile: To be aluminum alloy 6063; temper to be T5 with a minimum 1/8" wall thickness.
 - 2. Stile Thickness: To be 1 3/4" thick tubular extrusion.

3. Door Joinery: Joinery shall be 3/8" diameter zinc plated tie rods bolted through interlocking stiles. Minimum of 3 tie rods per door (where applicable).
 4. Top of Door: To receive added 1/8" reinforcement closer plate adhered to interior wall for door closer hardware.
 5. Top/Bottom of Door: To receive 1/8" thick cap for further seal and to trim the top and bottom of door.
- D. Pattern: Smooth

2.03 MATERIALS & ACCESSORIES

- A. Aluminum:
1. ASTM B 221, alloy and temper to be 6063 T-5 or similar alloy and temper recommended by manufacturer for optimum finish results and consistency.
- B. Internal Reinforcement
1. ASTM B 308, for structural aluminum.
- C. Fasteners
1. Material: Aluminum, 18-8 Stainless Steel, or other non-corrosive materials compatible with items being screw applied.
 2. Exposed:
 - a. Type: Fasteners exposed will be Philips flathead fasteners unless provided by other supplier.
 - b. Finish: Fasteners to match appropriate finish on standard doors and frames.
 3. Concealed: To be standard according to manufacturer's standards.

2.04 HARDWARE

- A. Hardware Preparation: To be fabricated at factory according to hardware templates provided.
- B. Hardware Installation: To factory install all applicable and supplied hardware to doors and frames.
- C. Hardware Reinforcement: To provide necessary reinforcement for proper longevity and hardware function; ASTM B 209 and/or ASTM 308.

2.05 FABRICATION

- A. Processes:
1. Job Preparation:
 - a. Preliminary Analysis: Job drawings to indicate door types, sizes, vision lite configuration(s), and finishes.
 - b. Fulfill Custom Requirements: Follow through on any specific deviations from standard requirements.
 2. Assembly:
 - a. Product Operation: Measure, cut, and fabricate required materials for designated job.
 - b. Product Refinement: Smooth rough cut edges.
 - c. Arrangement: Place prepared structural fasteners inside door to conceal from view.

- d. Reinforcement Preparation: To apply necessary structural and hardware reinforcement in beneficial areas of doors and frames where needed.
- 3. Fitting:
 - a. Placement: Product materials to fit accurately in appropriate locations.
 - b. Alignment: Doors to be in proper alignment with intended elevations.
- B. Tolerances: Doors and/or frame elevations will not deviate from last revised and approved drawings.

2.06 FRAMING SYSTEMS

- A. Framing Members: Manufacturer's standard aluminum extruded profiles with required thickness for load support.
 - 1. Vertical Jamb Sizes: 2"x 4 1/2"
 - 2. Header Sizes: 2" x 4 1/2"
- B. Clips and Reinforcements: Manufacturer's standard high strength aluminum: ASTM B 221 and/or ASTM B 308.
- C. Fasteners and Accessories: Manufacturer's standard non-bleeding and non-corrosive material congruent to adjacent material.
 - 1. Exposed Fasteners: To be stainless steel Philips flathead screws with appropriate finish: ASME B 18.6.4
 - 2. Concealed Fasteners: To be manufacturer's standard.
- D. Assembly:
 - 1. Framing members are separate aluminum pieces cut to length and mechanically fastened from either spline or clip systems.
 - 2. Joinery to be hairline.
 - 3. Sommer and Maca Dymonic or Dow Corning® 795 Sealants applied on applicable areas.
 - 4. Framing elevations to be identified according to final approved drawings.
- E. Anchoring:
 - 1. Appropriate anchoring fasteners to be secured no more than 18" apart on entire frame opening.
 - 2. Frame headers to receive no less than 2 anchoring fasteners.
 - 3. Add extra fasteners where hardware and hinge may require more.
- F. Doorstop:
 - 1. To be #CDM-32.
 - a. Wall Thickness: To be 3/16" thick for receiving applicable hardware.
 - b. Profile Height: To be no less than 5/8" high.
 - 2. Snap-in: Fits standard manufacturer's door jamb profiles.
- G. Hardware Preparation:
 - 1. Intramural Work: Hardware preparation according to hardware suppliers' templates.
 - 2. Field Work: Refer to manufacturers' installation instructions.
- H. Side lites and Transoms:
 - 1. Factory-assembled to largest allowable shipping size.
 - 2. Identified in concealed locations according to final approved elevation numbers.

2.07 GLAZING

- A. Reference section Glazing accessories (08 85 00)
- B. Door Glass Stops:
 - 1. Profile: 1/8" thick interlocking flush fit screw-applied extruded aluminum-stops with color matching door finish and removable from interior. Exterior glass stops to be non-removable.

2.08 LOUVERS

- A. Style: Extruded Aluminum, mitered corners secured with reinforcing clips, inverted-Y design.
- B. Dimension: Refer to drawings
- C. Finish: Clear
- D. Installation: Louvers to be factory installed and removable from interior only.

2.09 FINISHES

- A. Standard Anodic Finishes:
 - 1. Clear 204 R1: Architectural Class 11, AA-M12C22A31, 0.4 mils.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Examine conditions for compliance with requirements for installation tolerances and other conditions affecting proper installation.

3.02 INSTALLATION

- A. Comply with manufacturer's instructions.
- B. Do not install damaged components.
- C. Install doors plumb, level, and square, with no warp or rack in frame.
- D. Hang doors with the following required clearances:
 - 1. Lock Stiles: 0.125"
 - 2. Between Meeting Stiles: 0.187"- 0.250"
 - 3. At Top Rails: 0.125"
 - 4. Between Bottom Rail and Threshold: 0.125" - 0.187"
- E. Fit joints to produce hairline joints free of burrs and distortion.
- F. Rigidly secure non movement joints.
- G. Install recommended anchors with separators to prevent metal corrosion and electrolytic deterioration.
- H. Seal joints watertight, unless otherwise indicated.
- I. Glazers to provide necessary glazing shims for proper glass installation on vision lites and side lites. Reference section Glazing Accessories (08 85 00).

3.03 ADJUSTING

- A. Fine-tune doors and hinges to operate properly without bind or sag.
- B. Adjust pressure settings on closers.
 - 1. For doors accessible to people with disabilities, adjust closers to provide a 3-second closer sweep period for doors to move from a 70-degree open position to 3 inches from the latch measured to the leading door edge.

3.04 CLEANING

- A. Immediately clean doors after installation.
- B. Avoid any harsh cleaners not specified on manufacturer's cleaning and care guide.

3.05 PROTECTION

- A. Follow Manufacturer's guide to cleaning and care for proper treatment on entrances for optimum longevity, function, and performance.

END OF SECTION

SECTION 083113
ACCESS DOORS AND FRAMES

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Access doors and frames.

1.2 ACTION SUBMITTALS

- A. Product Data: For each type of product.

PART 2 - PRODUCTS

2.1 ACCESS DOORS AND FRAMES

A. Recessed Access Doors with Concealed Flanges:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. ACUDOR Products, Inc.
 - b. Babcock-Davis.
 - c. J. L. Industries, Inc.; Activar Construction Products Group, Inc.
 - d. Milcor; Hart & Cooley, Inc.
2. Description: Door face recessed 5/8 inch for gypsum board infill; with concealed flange for gypsum board installation and concealed hinge.
3. Locations: Ceiling .
4. Door Size: See drawings .
5. Metallic-Coated Steel Sheet for Door: Nominal 0.064 inch , 16 gage , factory finished.
6. Latch and Lock: Cam latch, key operated .

2.2 MATERIALS

- A. Steel Plates, Shapes, and Bars: ASTM A36/A36M.
- B. Steel Sheet: Uncoated or electrolytic zinc coated, ASTM A879/A879M, with cold-rolled steel sheet substrate complying with ASTM A1008/A1008M, Commercial Steel (CS), exposed.
- C. Metallic-Coated Steel Sheet: ASTM A653/A653M, Commercial Steel (CS), Type B; with minimum G60 or A60 metallic coating.

- D. Stainless Steel Plate, Sheet, and Strip: ASTM A240/A240M or ASTM A666, Type 304 . Remove tool and die marks and stretch lines, or blend into finish.
- E. Stainless Steel Flat Bars: ASTM A666, Type 304 . Remove tool and die marks and stretch lines, or blend into finish.
- F. Aluminum Extrusions: ASTM B221, Alloy 6063.
- G. Aluminum Sheet: ASTM B209, alloy and temper recommended by aluminum producer and finisher for type of use and finish indicated.
- H. Frame Anchors: Same material as door face.
- I. Inserts, Bolts, and Anchor Fasteners: Hot-dip galvanized steel according to ASTM A153/A153M or ASTM F2329.

2.3 FABRICATION

- A. General: Provide access door and frame assemblies manufactured as integral units ready for installation.
- B. Metal Surfaces: For metal surfaces exposed to view in the completed Work, provide materials with smooth, flat surfaces without blemishes. Do not use materials with exposed pitting, seam marks, roller marks, rolled trade names, or roughness.
- C. Doors and Frames: Grind exposed welds smooth and flush with adjacent surfaces. Furnish mounting holes, attachment devices and fasteners of type required to secure access doors to types of supports indicated.
 - 1. For concealed flanges with drywall bead, provide edge trim for gypsum panels securely attached to perimeter of frames.
 - 2. For concealed flanges with plaster bead for full-bed plaster applications, provide zinc-coated expanded-metal lath and exposed casing bead welded to perimeter of frames.
- D. Recessed Access Doors: Form face of panel to provide recess for application of applied finish. Reinforce panel as required to prevent buckling. Provide access sleeves for each latch operator and install in holes cut through finish.
 - 1. For recessed doors with plaster infill, provide self-furring expanded-metal lath attached to door panel.
- E. Latch and Lock Hardware:
 - 1. Quantity: Furnish number of latches and locks required to hold doors tightly closed.
 - 2. Keys: Furnish two keys per lock and key all locks alike.
- F. Aluminum: After fabrication, apply manufacturer's standard protective coating on aluminum that will come in contact with concrete.

2.4 FINISHES

- A. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.
- B. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.
- C. Painted Finishes: Comply with coating manufacturer's written instructions for cleaning, conversion coating, and applying and baking finish.
 - 1. Factory Primed: Apply manufacturer's standard, lead- and chromate-free, universal primer immediately after surface preparation and pretreatment.
 - 2. Factory Finished: Apply manufacturer's standard baked-enamel or powder-coat finish immediately after cleaning and pretreating, with minimum dry-film thickness of 1 mil for topcoat.
 - a. Color: As selected by Architect from full range of industry colors .

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

- A. Comply with manufacturer's written instructions for installing access doors and frames.

3.3 ADJUSTING

- A. Adjust doors and hardware, after installation, for proper operation.

END OF SECTION 083113

SECTION 087100
DOOR HARDWARE

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes commercial door hardware for the following:
1. Swinging doors.
- B. Door hardware includes, but is not necessarily limited to, the following:
1. Mechanical door hardware.
- C. Related Sections:
1. Division 08 Section "Aluminum Flush Doors".
- D. Codes and References: Comply with the version year adopted by the Authority Having Jurisdiction.
1. ANSI A117.1 - Accessible and Usable Buildings and Facilities.
 2. ICC/IBC - International Building Code.
 3. NFPA 70 - National Electrical Code.
 4. NFPA 80 - Fire Doors and Windows.
 5. NFPA 101 - Life Safety Code.
 6. NFPA 105 - Installation of Smoke Door Assemblies.
 7. State Building Codes, Local Amendments.
- E. Standards: All hardware specified herein shall comply with the following industry standards as applicable. Any undated reference to a standard shall be interpreted as referring to the latest edition of that standard:
1. ANSI/BHMA Certified Product Standards - A156 Series.
 2. UL10C - Positive Pressure Fire Tests of Door Assemblies.
 3. ANSI/UL 294 - Access Control System Units.
 4. UL 305 - Panic Hardware.

5. ANSI/UL 437- Key Locks.

1.3 SUBMITTALS

- A. Product Data: Manufacturer's product data sheets including installation details, material descriptions, dimensions of individual components and profiles, operational descriptions and finishes.
- B. Door Hardware Schedule: Prepared by or under the supervision of supplier, detailing fabrication and assembly of door hardware, as well as procedures and diagrams. Coordinate the final Door Hardware Schedule with doors, frames, and related work to ensure proper size, thickness, hand, function, and finish of door hardware.

1.4 QUALITY ASSURANCE

- A. Manufacturers Qualifications: Engage qualified manufacturers with a minimum 5 years of documented experience in producing hardware and equipment similar to that indicated for this Project and that have a proven record of successful in-service performance.
- B. Certified Products: Where specified, products must maintain a current listing in the Builders Hardware Manufacturers Association (BHMA) Certified Products Directory (CPD).
- C. Installer Qualifications: A minimum 3 years documented experience installing both standard and electrified door hardware similar in material, design, and extent to that indicated for this Project and whose work has resulted in construction with a record of successful in-service performance.
- D. Source Limitations: Obtain each type and variety of door hardware specified in this section from a single source unless otherwise indicated.
- E. Each unit to bear third party permanent label demonstrating compliance with the referenced standards.
- F. At completion of installation, provide written documentation that components were applied to manufacturer's instructions and recommendations and according to approved schedule.

1.5 COORDINATION

- A. Templates: Obtain and distribute to the parties involved templates for doors, frames, and other work specified to be factory prepared for installing standard and electrified hardware. Check Shop Drawings of other work to confirm that adequate provisions are made for locating and installing hardware to comply with indicated requirements.
- B. Door and Frame Preparation: Doors and corresponding frames are to be prepared, reinforced and pre-wired (if applicable) to receive the installation of the specified electrified, monitoring, signaling and access control system hardware without additional in-field modifications.

1.6 WARRANTY

- A. Warranty Period: Written warranty, executed by manufacturer(s), agreeing to repair or replace components of standard and electrified door hardware that fails in materials or workmanship within specified warranty period after final acceptance by the Owner. Failures include, but are not limited to, the following:
 - 1. Structural failures including excessive deflection, cracking, or breakage.
 - 2. Faulty operation of the hardware.
 - 3. Deterioration of metals, metal finishes, and other materials beyond normal weathering.
 - 4. Electrical component defects and failures within the systems operation.
- B. Standard Warranty Period: One year from date of Substantial Completion, unless otherwise indicated.
- C. Special Warranty Periods:
 - 1. Ten years for mortise locks and latches.
 - 2. Twenty five years for manual overhead door closer bodies.

1.7 MAINTENANCE SERVICE

- A. Maintenance Tools and Instructions: Furnish a complete set of specialized tools and maintenance instructions as needed for Owner's continued adjustment, maintenance, and removal and replacement of door hardware.

PART 2 - PRODUCTS

2.1 SCHEDULED DOOR HARDWARE

- A. General: Provide door hardware for each door to comply with requirements in Door Hardware Sets and each referenced section that products are to be supplied under.
- B. Designations: Requirements for quantity, item, size, finish or color, grade, function, and other distinctive qualities of each type of door hardware are indicated in the Door Hardware Sets at the end of Part 3. Products are identified by using door hardware designations, as follows:
 - 1. Named Manufacturer's Products: Product designation and manufacturer are listed for each door hardware type required for the purpose of establishing requirements. Manufacturers' names are abbreviated in the Door Hardware Schedule.
- C. Substitutions: Requests for substitution and product approval for inclusive mechanical and electromechanical door hardware in compliance with the specifications must be submitted in writing and in accordance with the procedures and time frames outlined in Division 01, Substitution Procedures. Approval of requests is at the discretion of the architect, owner, and their designated consultants.

2.2 HANGING DEVICES

- A. Continuous Geared Hinges: ANSI/BHMA A156.26 Grade 1-600 certified continuous geared hinge. with minimum 0.120-inch thick extruded 6060 T6 aluminum alloy hinge leaves and a minimum overall width of 4 inches. Hinges are non-handed, reversible and fabricated to template screw locations. Factory trim hinges to suit door height and prepare for electrical cut-outs.
 - 1. Manufacturers:
 - a. Ives (IV).
 - b. Pemko (PE).

2.3 DOOR OPERATING TRIM

- A. Door Push Plates and Pulls: ANSI/BHMA A156.6 certified door pushes and pulls of type and design specified in the Hardware Sets. Coordinate and provide proper width and height as required where conflicting hardware dictates.
 - 1. Push/Pull Plates: Minimum .050 inchthick, size as indicated in hardware sets, with beveled edges, secured with exposed screws unless otherwise indicated.
 - 2. Door Pull and Push Bar Design: Size, shape, and material as indicated in the hardware sets. Minimum clearance of 2 1/2-inches from face of door unless otherwise indicated.
 - 3. Offset Pull Design: Size, shape, and material as indicated in the hardware sets. Minimum clearance of 2 1/2-inches from face of door and offset of 90 degrees unless otherwise indicated.
 - 4. Fasteners: Provide manufacturer's designated fastener type as indicated in Hardware Sets.
 - 5. Manufacturers:
 - a. Ives (IV).
 - b. Rockwood (RO).

2.4 CYLINDERS AND KEYING

- A. Construction Keying: Provide plastic disposable construction cores.
- B. Key Registration List (Bitting List):
 - 1. Furnish a list of opening numbers with locking devices, showing cylinder types and quantities required when cylinders or cores are to be owner furnished.

2.5 MECHANICAL LOCKS AND LATCHING DEVICES

- A. Mortise Locksets, Grade 1 (Heavy Duty): ANSI/BHMA A156.13, Series 1000, Operational Grade 1 Certified Products Directory (CPD) listed. Locksets are to be manufactured with a

corrosion resistant steel case and be field-reversible for handing without disassembly of the lock body.

1. Where specified, provide status indicators with highly reflective color and wording for “locked/unlocked” or “vacant/occupied” with custom wording options if required. Indicator to be located above the cylinder with the inside thumb-turn not blocking the visibility of the indicator status. Indicator window size to be a minimum of 2.1” x 0.6” with a curved design allowing a 180 degree viewing angle with protective covering to prevent tampering.
2. Manufacturers:
 - a. Corbin Russwin Hardware (RU) - ML2000 Series.
 - b. Sargent Manufacturing (SA) - 8200 Series.
 - c. Schlage (SC) - L9000 Series.

2.6 AUXILIARY LOCKS

- A. Mortise Deadlocks, Small Case: ANSI/BHMA A156.36, Grade 1, small case mortise type deadlocks constructed of heavy gauge wrought corrosion resistant steel. Steel or stainless steel bolts with a 1" throw and hardened steel roller pins. Deadlocks to be products of the same source manufacturer and keyway as other specified locksets.
 1. Manufacturers:
 - a. Corbin Russwin Hardware (RU) - DL4000 Series.
 - b. Sargent Manufacturing (SA) - 4870 Series.
 - c. Schlage (SC) - L460 Series.

2.7 LOCK AND LATCH STRIKES

- A. Strikes: Provide manufacturer's standard strike with strike box for each latch or lock bolt, with curved lip extended to protect frame, finished to match door hardware set, unless otherwise indicated, and as follows:
 1. Flat-Lip Strikes: For locks with three-piece antifriction latchbolts, as recommended by manufacturer.
 2. Extra-Long-Lip Strikes: For locks used on frames with applied wood casing trim.
 3. Aluminum-Frame Strike Box: Provide manufacturer's special strike box fabricated for aluminum framing.
 4. Double-lipped strikes: For locks at double acting doors. Furnish with retractable stop for rescue hardware applications.
- B. Standards: Comply with the following:
 1. Strikes for Mortise Locks and Latches: BHMA A156.13.
 2. Strikes for Bored Locks and Latches: BHMA A156.2.
 3. Strikes for Auxiliary Deadlocks: BHMA A156.36.

4. Dustproof Strikes: BHMA A156.16.

2.8 DOOR CLOSERS

A. All door closers specified herein shall meet or exceed the following criteria:

1. General: Door closers to be from one manufacturer, matching in design and style, with the same type door preparations and templates regardless of application or spring size. Closers to be non-handed with full sized covers.
2. Standards: Closers to comply with UL-10C for Positive Pressure Fire Test and be U.L. listed for use of fire rated doors.
3. Size of Units: Comply with manufacturer's written recommendations for sizing of door closers depending on size of door, exposure to weather, and anticipated frequency of use. Where closers are indicated for doors required to be accessible to the Americans with Disabilities Act, provide units complying with ANSI ICC/A117.1.
4. Closer Arms: Provide heavy duty, forged steel closer arms unless otherwise indicated in Hardware Sets.
5. Closers shall not be installed on exterior or corridor side of doors; where possible install closers on door for optimum aesthetics.
6. Closer Accessories: Provide door closer accessories including custom templates, special mounting brackets, spacers and drop plates as required for proper installation. Provide through-bolt and security type fasteners as specified in the hardware sets.

B. Door Closers, Surface Mounted (Heavy Duty): ANSI/BHMA A156.4, Grade 1 Certified Products Directory (CPD) listed surface mounted, heavy duty door closers with complete spring power adjustment, sizes 1 thru 6; and fully operational adjustable according to door size, frequency of use, and opening force. Closers to be rack and pinion type, one piece cast iron or aluminum alloy body construction, with adjustable backcheck and separate non-critical valves for closing sweep and latch speed control. Provide non-handed units standard.

1. Manufacturers:
 - a. Norton (NO) – 7500 ST Series.
 - b. LCN Closers (LC) – 4010T Series.
 - c. Corbin Russwin (RU) – DC8230 Series.

2.9 ARCHITECTURAL TRIM

A. Door Protective Trim

1. General: Door protective trim units to be of type and design as specified below or in the Hardware Sets.

2. Size: Fabricate protection plates (kick, armor, or mop) not more than 2" less than door width (LDW) on stop side of single doors and 1" LDW on stop side of pairs of doors, and not more than 1" less than door width on pull side. Coordinate and provide proper width and height as required where conflicting hardware dictates. Height to be as specified in the Hardware Sets.
3. Where plates are applied to fire rated doors with the top of the plate more than 16" above the bottom of the door, provide plates complying with NFPA 80. Consult manufacturer's catalog and template book for specific requirements for size and applications.
4. Protection Plates: ANSI/BHMA A156.6 certified protection plates (kick, armor, or mop), fabricated from the following:
 - a. Stainless Steel: 300 grade, 050-inch thick.
5. Options and fasteners: Provide manufacturer's designated fastener type as specified in the Hardware Sets. Provide countersunk screw holes.
6. Manufacturers:
 - a. Ives (IV).
 - b. Rockwood (RO).

2.10 DOOR STOPS AND HOLDERS

- A. General: Door stops and holders to be of type and design as specified below or in the Hardware Sets.
- B. Door Stops and Bumpers: ANSI/BHMA A156.16, Grade 1 certified door stops and wall bumpers. Provide wall bumpers, either convex or concave types with anchorage as indicated, unless floor or other types of door stops are specified in Hardware Sets. Do not mount floor stops where they will impede traffic. Where floor or wall bumpers are not appropriate, provide overhead type stops and holders.
 1. Manufacturers:
 - a. Ives (IV).
 - b. Rockwood (RO).

2.11 FABRICATION

- A. Fasteners: Provide door hardware manufactured to comply with published templates generally prepared for machine, wood, and sheet metal screws. Provide screws according to manufacturers recognized installation standards for application intended.

2.12 FINISHES

- A. Standard: Designations used in the Hardware Sets and elsewhere indicate hardware finishes complying with ANSI/BHMA A156.18, including coordination with traditional U.S. finishes indicated by certain manufacturers for their products.
- B. Provide quality of finish, including thickness of plating or coating (if any), composition, hardness, and other qualities complying with manufacturer's standards, but in no case less than specified by referenced standards for the applicable units of hardware
- C. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine scheduled openings, with Installer present, for compliance with requirements for installation tolerances, labeled fire door assembly construction, wall and floor construction, and other conditions affecting performance.
- B. Notify architect of any discrepancies or conflicts between the door schedule, door types, drawings and scheduled hardware. Proceed only after such discrepancies or conflicts have been resolved in writing.

3.2 INSTALLATION

- A. Install each item of mechanical and electromechanical hardware and access control equipment to comply with manufacturer's written instructions and according to specifications.
 - 1. Installers are to be trained and certified by the manufacturer on the proper installation and adjustment of fire, life safety, and security products including: hanging devices; locking devices; closing devices; and seals.
- B. Mounting Heights: Mount door hardware units at heights indicated in following applicable publications, unless specifically indicated or required to comply with governing regulations:
 - 1. Standard Steel Doors and Frames: DHI's "Recommended Locations for Architectural Hardware for Standard Steel Doors and Frames."
 - 2. DHI TDH-007-20: Installation Guide for Doors and Hardware.
 - 3. Where indicated to comply with accessibility requirements, comply with ANSI A117.1 "Accessibility Guidelines for Buildings and Facilities."
 - 4. Provide blocking in drywall partitions where wall stops or other wall mounted hardware is located.

3.3 ADJUSTING

- A. Initial Adjustment: Adjust and check each operating item of door hardware and each door to ensure proper operation or function of every unit. Replace units that cannot be adjusted to operate as intended. Adjust door control devices to compensate for final operation of heating and ventilating equipment and to comply with referenced accessibility requirements.

3.4 CLEANING AND PROTECTION

- A. Protect all hardware stored on construction site in a covered and dry place. Protect exposed hardware installed on doors during the construction phase. Install any and all hardware at the latest possible time frame.
- B. Clean adjacent surfaces soiled by door hardware installation.
- C. Clean operating items as necessary to restore proper finish. Provide final protection and maintain conditions that ensure door hardware is without damage or deterioration at time of owner occupancy.

3.5 DEMONSTRATION

- A. Instruct Owner's maintenance personnel to adjust, operate, and maintain mechanical and electromechanical door hardware.

3.6 DOOR HARDWARE SETS

- A. The hardware sets represent the design intent and direction of the owner and architect. They are a guideline only and should not be considered a detailed hardware schedule. Discrepancies, conflicting hardware and missing items should be brought to the attention of the architect with corrections made prior to the bidding process. Omitted items not included in a hardware set should be scheduled with the appropriate additional hardware required for proper application and functionality.
 - 1. Quantities listed are for each pair of doors, or for each single door.
 - 2. The supplier is responsible for handling and sizing all products.
 - 3. Where multiple options for a piece of hardware are given in a single line item, the supplier shall provide the appropriate application for the opening.
 - 4. At existing openings with new hardware the supplier shall field inspect existing conditions prior to the submittal stage to verify the specified hardware will work as required. Provide alternate solutions and proposals as needed.

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B. Manufacturer's Abbreviations:

1. PE - Pemko
2. RU - Corbin Russwin
3. BE - dormakaba Best
4. NO - Norton
5. RO - Rockwood

Hardware Sets

Set: 1.0

Doors: 105B

1 Continuous Gear Hinge	CFM-SLF-HD1		PE
1 Classroom Lock	ML2055 PSA CT7SD	630	RU
1 Cylinder Core	SFIC – Best Standard Core	26D	BE
1 Surface Closer	ST-180 7500	689	RU
1 Wall Stop	406	US32D	RO

Notes:

Provide uncombined cores for Big D Lock and Key to pin.

Set: 2.0

Doors: 104, 107B, 112

1 Continuous Gear Hinge	CFM-SLF-HD1		PE
1 Classroom Deadbolt	DL4117 CT7SD M34	626	RU
1 Cylinder Core	SFIC – Best Standard Core	26D	BE
1 Pull Plate	BF 107 x 70C (4 x 16)	US32D-316	RO
1 Push Plate	73C (4 x 16)	US32D-316	RO
1 Surface Closer	ST 7500 (Pull Side)	689	RU
1 Wall Stop	406	US32D	RO

Notes:

Provide uncombined cores for Big D Lock and Key to pin.

Set: 3.0

Doors: 106, 108

1 Continuous Gear Hinge	CFM-SLF-HD1		PE
1 Privacy Lock	ML2060 PSA M34 V21	630	RU
1 Surface Closer	ST 7500 (Pull Side)	689	RU
1 Wall Stop	406	US32D	RO

END OF SECTION 087100

SECTION 092900
GYPSUM BOARD

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Interior gypsum board.

1.2 ACTION SUBMITTALS

- A. Product data.

PART 2 - PRODUCTS

2.1 GYPSUM BOARD, GENERAL

- A. Size: Provide maximum lengths and widths available that will minimize joints in each area and that correspond with support system indicated.

2.2 INTERIOR GYPSUM BOARD

- A. Mold-Resistant Gypsum Board: ASTM C1396/C1396M. With moisture- and mold-resistant core and paper surfaces.
 - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. American Gypsum.
 - b. Georgia-Pacific Gypsum LLC.
 - c. USG Corporation.
 - 2. Core: 5/8 inch , Type X.
 - 3. Long Edges: Tapered.
 - 4. Mold Resistance: ASTM D3273, score of 10 as rated according to ASTM D3274.

2.3 TRIM ACCESSORIES

- A. Interior Trim: ASTM C1047.

1. Material: Galvanized or aluminum-coated steel sheet, rolled zinc, plastic, or paper-faced galvanized-steel sheet .
2. Shapes:
 - a. LC-Bead: J-shaped; exposed long flange receives joint compound.
 - b. Expansion (control) joint.

2.4 JOINT TREATMENT MATERIALS

- A. General: Comply with ASTM C475/C475M.
- B. Joint Tape:
 1. Interior Gypsum Board: Paper.
- C. Joint Compound for Interior Gypsum Board: For each coat, use formulation that is compatible with other compounds applied on previous or for successive coats.
 1. Prefilling: At open joints , rounded or beveled panel edges, and damaged surface areas, use setting-type taping compound.
 2. Embedding and First Coat: For embedding tape and first coat on joints, fasteners, and trim flanges, use setting-type taping drying-type, all-purpose compound.
 - a. Use setting-type compound for installing paper-faced metal trim accessories.
 3. Fill Coat: For second coat, use setting-type, sandable topping drying-type, all-purpose compound.
 4. Finish Coat: For third coat, use setting-type, sandable topping drying-type, all-purpose compound.

2.5 AUXILIARY MATERIALS

- A. Provide auxiliary materials that comply with referenced installation standards and manufacturer's written instructions.
- B. Laminating Adhesive: Adhesive or joint compound recommended for directly adhering gypsum panels to continuous substrate.
- C. Steel Drill Screws: ASTM C1002 unless otherwise indicated.
 1. Use screws complying with ASTM C954 for fastening panels to steel members from 0.033 to 0.112 inch thick.
 2. For fastening cementitious backer units, use screws of type and size recommended by panel manufacturer.

PART 3 - EXECUTION

3.1 INSTALLATION OF PANELS

- A. Examine panels before installation. Reject panels that are wet, moisture damaged, and mold damaged.

- B. Comply with ASTM C840.
- C. Isolate perimeter of gypsum board applied to non-load-bearing partitions at structural abutments. Provide 1/4- to 1/2-inch-wide spaces at these locations and trim edges with edge trim where edges of panels are exposed. Seal joints between edges and abutting structural surfaces with acoustical sealant.
- D. For trim with back flanges intended for fasteners, attach to framing with same fasteners used for panels. Otherwise, attach trim according to manufacturer's written instructions.

3.2 FINISHING OF GYPSUM BOARD

- A. Prefill open joints , rounded or beveled edges, and damaged surface areas.
- B. Apply joint tape over gypsum board joints, except for trim products specifically indicated as not intended to receive tape.
- C. Gypsum Board Finish Levels: Finish panels to levels indicated below and according to ASTM C840:
 - 1. Level 4: At panel surfaces that will be exposed to view unless otherwise indicated .
 - a. Primer and its application to surfaces are specified in Section 099123 "Interior Painting."

3.3 PROTECTION

- A. Protect installed products from damage from weather, condensation, direct sunlight, construction, and other causes during remainder of the construction period.
- B. Remove and replace panels that are wet, moisture damaged, and mold damaged.

END OF SECTION 092900

SECTION 093013
CERAMIC TILING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Ceramic mosaic tile.
2. Glazed wall tile.

B. Related Requirements:

1. Section 079200 "Joint Sealants" for sealing of expansion, contraction, control, and isolation joints in tile surfaces.

1.2 DEFINITIONS

A. General: Definitions in the ANSI A108 series of tile installation standards and in ANSI A137.1 apply to Work of this Section unless otherwise specified.

B. Face Size: Actual tile size, excluding spacer lugs.

C. Module Size: Actual tile size plus joint width indicated.

1.3 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at Project site .

1. Review requirements in ANSI A108.01 for substrates and for preparation by other trades.

1.4 ACTION SUBMITTALS

A. Product Data: For each type of product.

1.5 INFORMATIONAL SUBMITTALS

A. Qualification Data: For Installer.

1.6 MAINTENANCE MATERIAL SUBMITTALS

- A. Furnish extra materials that match and are from same production runs as products installed and that are packaged with protective covering for storage and identified with labels describing contents.
 - 1. Tile and Trim Units: Furnish quantity of full-size units equal to 3 percent of amount installed for each type, composition, color, pattern, and size indicated.
 - 2. Grout: Furnish quantity of grout equal to 3 percent of amount installed for each type, composition, and color indicated.

1.7 QUALITY ASSURANCE

- A. Installer Qualifications:
 - 1. Installer is a Five-Star member of the National Tile Contractors Association or a Trowel of Excellence member of the Tile Contractors' Association of America.
 - 2. Installer employs at least one installer for Project that has completed the Advanced Certification for Tile Installers (ACT) certification for installation of gauged porcelain tile/gauged porcelain tile panels and slabs and large format tile.

1.8 DELIVERY, STORAGE, AND HANDLING

- A. Deliver and store packaged materials in original containers with seals unbroken and labels intact until time of use. Comply with requirements in ANSI A137.1 for labeling tile packages.
- B. Store tile and cementitious materials on elevated platforms, under cover, and in a dry location.
- C. Store aggregates where grading and other required characteristics can be maintained and contamination can be avoided.
- D. Store liquid materials in unopened containers and protected from freezing.

1.9 FIELD CONDITIONS

- A. Environmental Limitations: Do not install tile until construction in spaces is complete and ambient temperature and humidity conditions are maintained at the levels indicated in referenced standards and manufacturer's written instructions.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Source Limitations for Tile: Obtain tile of each type and color or finish from single source or producer.

1. Obtain tile of each type and color or finish from same production run and of consistent quality in appearance and physical properties for each contiguous area.
- B. Source Limitations for Setting and Grouting Materials: Obtain ingredients of a uniform quality for each mortar, adhesive, and grout component from single manufacturer and each aggregate from single source or producer.
1. Obtain setting and grouting materials from single manufacturer.
- C. Source Limitations for Other Products: Obtain each of the following products specified in this Section from a single manufacturer:
1. Waterproof membrane.
 2. Crack isolation membrane.

2.2 PRODUCTS, GENERAL

- A. ANSI Ceramic Tile Standard: Provide tile that complies with ANSI A137.1 for types, compositions, and other characteristics indicated.
1. Provide tile complying with Standard grade requirements unless otherwise indicated.
- B. ANSI Standards for Tile Installation Materials: Provide materials complying with ANSI A108.02, ANSI standards referenced in other Part 2 articles, ANSI standards referenced by TCNA installation methods specified in tile installation schedules, and other requirements specified.
- C. Factory Blending: For tile exhibiting color variations within ranges, blend tile in factory and package so tile units taken from one package show same range in colors as those taken from other packages and match approved Samples.
- D. Mounting: For factory-mounted tile, provide back- or edge-mounted tile assemblies as standard with manufacturer unless otherwise indicated.

2.3 TILE PRODUCTS

- A. Factory-Mounted Mosaic Ceramic Tile Type CTF-1: Unglazed.
1. Manufacturers: Subject to compliance with requirements, undefined:
 - a. American Olean; a division of Dal-Tile Corporation.
 - b. Daltile
 2. Composition: Porcelain .
 3. Certification: Porcelain tile certified by the Porcelain Tile Certification Agency.
 4. Module Size: 2X2 .
 5. Thickness: 1/4 inch.
 6. Face: **Plain** with cushion edges.
 7. Surface: Smooth, without abrasive admixture.
 8. Dynamic Coefficient of Friction: Not less than 0.42.
 9. Finish: Matte, unglazed.

10. Tile Color and Pattern: As indicated by manufacturer's designations. Match Architect's sample.
 - a. Preset manufacturer's mosaic: Random/confetti pattern.
 - 1) Basis of design: Daltile, Keystones Mosaics
 - 2) Color 1: URBAN PUTTY SPECKLE #D201
 - a) Use this color 50% in blend
 - 3) Color 2: MOTTLED MEDIUM BROWN #D050
 - a) Use this color 35% in blend
 - 4) Color 3: ELEMENTAL TAN #D166
 - a) Use this color 15% in blend
11. Grout Color: As indicated by manufacturer's designations.
 - a. TEC Accucolor EFX #440, Light Buff Chamois #945
12. Mosaic built up cove base: (CTF-1B) Coordinated with sizes and coursing of adjoining flat tile where applicable and matching characteristics of adjoining flat tile. Provide shapes as follows, selected from manufacturer's standard shapes:
 - a. Basis of design: American Olean, Unglazed Colorbody Mosaics, built up cove base #MB5A (when ceramic tile wall above), Mottled Medium Brown #050
 - b. Basis of design: American Olean, Unglazed Colorbody Mosaics, built up cove base #MB5B (when no ceramic tile wall above), Mottled Medium Brown #050
 - c. Overall height 6 inches nominal.
 - d. External Corners for Thinset Mortar Installations required to match CTF-1B.
 - e. Internal Corners: Field-buttet using CTF-1B

B. Glazed Wall Tile Type CTW-1A, CTW-1B:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Daltile.
2. Module Size: 4 by 8 inches.
3. Face Size Variation: Rectified.
4. Thickness: 5/16 inch.
5. Face: Pattern of design indicated, with manufacturer's standard edges.
6. Finish: Bright, opaque glaze.
7. Tile Color and Pattern: .
 - a. Basis of design: CTW-1A Daltile, Natural Hues, Almond #QH02
 - b. Basis of design: CTW-1B Daltile, Natural Hues, Burgundy #QH47
8. Grout Color: As indicated by manufacturer's designations.
 - a. TEC Power Grout #550, Antique White #940

2.4 SETTING MATERIALS

- A. Medium-Bed, Modified Dry-Set Mortar: Comply with requirements in ANSI A118.4. Provide product that is approved by manufacturer for application thickness of 5/8" maximum (floor).
 1. Manufacturers: Subject to compliance with requirements, provide products by the following:
 - a. H.B. Fuller Construction Products Inc. / TEC.
 - 1) 3-N1 #517/518
 2. Provide prepackaged, dry-mortar mix containing dry, redispersible, vinyl acetate or acrylic additive to which only water must be added at Project site.

3. Provide prepackaged, dry-mortar mix combined with acrylic resin or styrene-butadiene-rubber liquid-latex additive at Project site.

B. Improved Modified Dry-Set Mortar (Thinset): ANSI A118.4 (walls).

1. Manufacturers: Subject to compliance with requirements, provide products by the following:
 - a. H.B. Fuller Construction Products Inc. / TEC.
 - 1) Hydraflex
2. Provide prepackaged, dry-mortar mix containing dry, redispersible, vinyl acetate or acrylic additive to which only water must be added at Project site.
3. Provide prepackaged, dry-mortar mix combined with acrylic resin or styrene-butadiene-rubber liquid-latex additive at Project site.
4. For wall applications, provide mortar that complies with requirements for nonsagging mortar in addition to the other requirements in ANSI A118.15.

2.5 GROUT MATERIALS

A. High-Performance Tile Grout: ANSI A118.7 (wall).

1. Manufacturers: Subject to compliance with requirements, provide products by the following:
 - a. H.B. Fuller Construction Products Inc. / TEC.
 - 1) Power Grout #550, Antique White #940
2. Polymer Type:
 - a. Ethylene vinyl acetate or acrylic additive, in dry, redispersible form, prepackaged with other dry ingredients.
 - b. Acrylic resin or styrene-butadiene rubber in liquid-latex form for addition to prepackaged dry-grout mix.

B. Water-Cleanable Epoxy Grout: ANSI A118.3, with a VOC content of 65 g/L or less (floor).

1. Manufacturers: Subject to compliance with requirements, provide products by the following:
 - a. H.B. Fuller Construction Products Inc. / TEC.
 - 1) Accucolor EFX #440, Light Buff Chamis #945
2. Provide product capable of withstanding continuous and intermittent exposure to temperatures of up to 140 and 212 deg F, respectively, and certified by manufacturer for intended use.

C. Grout for PregROUTed Tile Sheets: Same product used in factory to pregROUT tile sheets.

2.6 MISCELLANEOUS MATERIALS

- A. Tile Cleaner: A neutral cleaner capable of removing soil and residue without harming tile and grout surfaces, specifically approved for materials and installations indicated by tile and grout manufacturers.

2.7 Aluminum thresholds: Schluter RENO-RAMP 2" WIDE REDUCER, ALUMINUM SATIN ANNODIZED, HEIGHT AS REQUIRED FOR MATERIAL

2.8 Aluminum trim for exposed tile edges: Schluter JOLLY #AE

2.9 MIXING MORTARS AND GROUT

- A. Mix mortars and grouts to comply with referenced standards and mortar and grout manufacturers' written instructions.
- B. Add materials, water, and additives in accurate proportions.
- C. Obtain and use type of mixing equipment, mixer speeds, mixing containers, mixing time, and other procedures to produce mortars and grouts of uniform quality with optimum performance characteristics for installations indicated.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions where tile will be installed, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.
 - 1. Verify that substrates for setting tile are firm; dry; clean; free of coatings that are incompatible with tile-setting materials, including curing compounds and other substances that contain soap, wax, oil, or silicone; and comply with flatness tolerances required by ANSI A108.01 for installations indicated.
 - 2. Verify that concrete substrates for tile floors installed with adhesives medium bed mortar comply with surface finish requirements in ANSI A108.01 for installations indicated.
 - a. COORDINATE WITH TCNA
 - b. Verify that surfaces that received a steel trowel finish have been mechanically scarified.
 - c. Verify that protrusions, bumps, and ridges have been removed by sanding or grinding.
 - 3. Verify that installation of grounds, anchors, recessed frames, electrical and mechanical units of work, and similar items located in or behind tile has been completed.
 - 4. Verify that joints and cracks in tile substrates are coordinated with tile joint locations; if not coordinated, adjust joint locations in consultation with Architect.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Fill cracks, holes, and depressions in concrete substrates for tile floors installed with adhesives or thinset mortar with trowelable leveling and patching compound specifically recommended by tile-setting material manufacturer.

- B. Where indicated, prepare substrates to receive waterproof membrane by applying a reinforced mortar bed that complies with ANSI A108.1A and is sloped 1/4 inch per foot toward drains.
- C. Blending: For tile exhibiting color variations, verify that tile has been factory blended and packaged so tile units taken from one package show same range of colors as those taken from other packages and match approved Samples. If not factory blended, either return to manufacturer or blend tiles at Project site before installing.

3.3 INSTALLATION OF CERAMIC TILE

- A. Comply with TCNA's "Handbook for Ceramic, Glass, and Stone Tile Installation" for TCNA installation methods specified in tile installation schedules. Comply with parts of the ANSI A108 series "Specifications for Installation of Ceramic Tile" that are referenced in TCNA installation methods, specified in tile installation schedules, and apply to types of setting and grouting materials used.
 - 1. For the following installations, follow procedures in the ANSI A108 series of tile installation standards for providing 95 percent mortar coverage:
 - a. Tile floors in wet areas.
 - B. Extend tile work into recesses and under or behind equipment and fixtures to form complete covering without interruptions unless otherwise indicated. Terminate work neatly at obstructions, edges, and corners without disrupting pattern or joint alignments.
 - C. Accurately form intersections and returns. Perform cutting and drilling of tile without marring visible surfaces. Carefully grind cut edges of tile abutting trim, finish, or built-in items for straight aligned joints. Fit tile closely to electrical outlets, piping, fixtures, and other penetrations so plates, collars, or covers overlap tile.
 - D. Provide manufacturer's standard trim shapes where necessary to eliminate exposed tile edges.
 - E. Where accent tile differs in thickness from field tile, vary setting-bed thickness so that tiles are flush.
 - 1. Back Buttering is acceptable for this condition.
 - F. Jointing Pattern: Lay tile in grid pattern unless otherwise indicated. Lay out tile work and center tile fields in both directions in each space or on each wall area. Lay out tile work to minimize the use of pieces that are less than half of a tile. Provide uniform joint widths unless otherwise indicated.
 - 1. For tile mounted in sheets, make joints between tile sheets same width as joints within tile sheets so joints between sheets are not apparent in finished work.
 - 2. Where adjoining tiles on floor, base, walls, or trim are specified or indicated to be same size, align joints.
 - 3. Where tiles are specified or indicated to be whole integer multiples of adjoining tiles on floor, base, walls, or trim, align joints unless otherwise indicated.
 - G. Joint Widths: Unless otherwise indicated, install tile with the following joint widths:

1. Ceramic Mosaic Tile: 1/16 inch .
 2. Glazed Wall Tile: 1/16 inch .
- H. Expansion Joints: Provide expansion joints and other sealant-filled joints, including control, contraction, and isolation joints, where indicated. Form joints during installation of setting materials, mortar beds, and tile. Do not saw-cut joints after installing tiles.
1. Where joints occur in concrete substrates, locate joints in tile surfaces directly above them.
- I. Metal Edge Strips: Install where exposed edge of tile flooring meets other flooring that finishes flush with or below top of tile and no threshold is indicated, or exposed unfinished edge of tile.

3.4 ADJUSTING AND CLEANING

- A. Remove and replace tile that is damaged or that does not match adjoining tile. Provide new matching units, installed as specified and in a manner to eliminate evidence of replacement.
- B. Cleaning: On completion of placement and grouting, clean all ceramic tile surfaces so they are free of foreign matter.
1. Remove grout residue from tile as soon as possible.
 2. Clean grout smears and haze from tile according to tile and grout manufacturer's written instructions but no sooner than 10 days after installation. Use only cleaners recommended by tile and grout manufacturers and only after determining that cleaners are safe to use by testing on samples of tile and other surfaces to be cleaned. Protect metal surfaces and plumbing fixtures from effects of cleaning. Flush surfaces with clean water before and after cleaning.

3.5 PROTECTION

- A. Protect installed tile work with kraft paper or other heavy covering during construction period to prevent staining, damage, and wear. If recommended by tile manufacturer, apply coat of neutral protective cleaner to completed tile walls and floors.
- B. Prohibit foot and wheel traffic from tiled floors for at least seven days after grouting is completed.
- C. Before final inspection, remove protective coverings and rinse neutral protective cleaner from tile surfaces.

3.6 INTERIOR CERAMIC TILE INSTALLATION SCHEDULE

- A. Interior Floor Installations, Concrete Subfloor:
1. TCNA F125-Full CTF-1, CTF-1B: Thinset mortar on crack isolation membrane.
 - a. Ceramic Tile Type: Mosaic .
 - b. Thinset Mortar: Medium-bed, modified dry-set Improved modified dry-setmortar.
 - c. Grout: Water-cleanable epoxy grout.

B. Interior Wall Installations, Masonry or Concrete:

1. TCNA W202 CTW-1A, CTW-1B: Thinset mortar.
 - a. Ceramic Tile Type: Glazed .
 - b. Thinset Mortar: Improved modified dry-set mortar.
 - c. Grout: High-performance sanded grout.

END OF SECTION 093013

SECTION 099600
HIGH-PERFORMANCE COATINGS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes surface preparation and the application of high-performance coating systems on the following substrates:
 - 1. Interior Substrates:
 - a. Concrete masonry units (CMUs).
 - b. Gypsum board.

1.3 DEFINITIONS

- A. MPI Gloss Level 3: according to ASTM D 523
- B. MPI Gloss Level 4: according to ASTM D 523
- C. MPI Gloss Level 5: 35 to 70 units at 60 degrees, according to ASTM D 523.

1.4 ACTION SUBMITTALS

- A. Product Data: For each type of product. Include preparation requirements and application instructions.
 - 1. Include printout of current "MPI Approved Products List" for each product category specified, with the proposed product highlighted.
 - 2. Indicate VOC content.
- B. Samples for Verification: For each type of coating system and each color and gloss of topcoat indicated.
 - 1. Submit Samples on rigid backing, 8 inches square.
 - 2. Apply coats on Samples in steps to show each coat required for system.
 - 3. Tint intermediate coat noticeably lighter with difference, than top finish coat.
 - 4. Label each coat of each Sample.

5. Label each Sample for location and application area.
- C. Product List: Cross-reference to coating system and locations of application areas. Use same designations indicated on Drawings and in schedules. Include color designations.

1.5 MAINTENANCE MATERIAL SUBMITTALS

- A. Furnish extra materials , from the same product run, that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
1. Coatings: 5 percent, but not less than 1 gal. of each material and color applied.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Store materials not in use in tightly covered containers in well-ventilated areas with ambient temperatures continuously maintained at not less than 45 deg F.
1. Maintain containers in clean condition, free of foreign materials and residue.
 2. Remove rags and waste from storage areas daily.

1.7 FIELD CONDITIONS

- A. Apply coatings only when temperature of surfaces to be coated and ambient air temperatures are between 50 and 95 deg F.
- B. Do not apply coatings when relative humidity exceeds 85 percent; at temperatures less than 5 deg F above the dew point; or to damp or wet surfaces.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
1. Benjamin Moore & Co.
 2. Devoe Coatings; Akzo Nobel.
 3. PPG Paints.
 4. Sherwin-Williams Company (The).
- B. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to products listed in the Exterior High-Performance Coating Schedule or Interior High-Performance Coating Schedule for the coating category indicated.

2.2 HIGH-PERFORMANCE COATINGS, GENERAL

- A. MPI Standards: Products shall comply with MPI standards indicated and shall be listed in its "MPI Approved Products Lists."
- B. Material Compatibility:
 - 1. Materials for use within each paint system shall be compatible with one another and substrates indicated, under conditions of service and application as demonstrated by manufacturer, based on testing and field experience.
 - 2. For each coat in a paint system, products shall be recommended in writing by topcoat manufacturers for use in paint system and on substrate indicated.
 - 3. Products shall be of same manufacturer for each coat in a coating system.
- C. Colors: As indicated in color schedule .

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates and conditions, with Applicator present, for compliance with requirements for maximum moisture content and other conditions affecting performance of the Work.
- B. Gypsum Board Substrates: Verify that finishing compound is sanded smooth.
- C. Verify suitability of substrates, including surface conditions and compatibility, with existing finishes and primers.
- D. Proceed with coating application only after unsatisfactory conditions have been corrected.
 - 1. Application of coating indicates acceptance of surfaces and conditions.

3.2 PREPARATION

- A. Comply with manufacturer's written instructions and recommendations in "MPI Architectural Painting Specification Manual" applicable to substrates and coating systems indicated.
- B. Remove hardware, covers, plates, and similar items already in place that are removable and are not to be painted. If removal is impractical or impossible because of size or weight of item, provide surface-applied protection before surface preparation and painting.
 - 1. After completing painting operations, use workers skilled in the trades involved to reinstall items that were removed. Remove surface-applied protection if any.
- C. Clean substrates of substances that could impair bond of coatings, including dust, dirt, oil, grease, and incompatible paints and encapsulants.
 - 1. Remove incompatible primers and reprime substrate with compatible primers or apply tie coat as required to produce coating systems indicated.

- D. Masonry Substrates: Remove efflorescence and chalk. Do not coat surfaces if moisture content, alkalinity of surfaces, or alkalinity of mortar joints exceeds that permitted in manufacturer's written instructions.
 - 1. Clean surfaces with pressurized water. Use pressure range of 100 to 600 psi at 6 to 12 inches.

3.3 APPLICATION

- A. Apply high-performance coatings according to manufacturer's written instructions and recommendations in "MPI Architectural Painting Specification Manual."
 - 1. Use applicators and techniques suited for coating and substrate indicated.
 - 2. Coat surfaces behind movable equipment and furniture same as similar exposed surfaces. Before final installation, coat surfaces behind permanently fixed equipment or furniture with prime coat only.
 - 3. Coat backsides of access panels, removable or hinged covers, and similar hinged items to match exposed surfaces.
 - 4. Do not apply coatings over labels of independent testing agencies or equipment name, identification, performance rating, or nomenclature plates.
- B. Tint each undercoat a lighter shade to facilitate identification of each coat if multiple coats of the same material are to be applied. Tint undercoats to match color of finish coat, but provide sufficient difference in shade of undercoats to distinguish each separate coat.
- C. If undercoats or other conditions show through final coat, apply additional coats until cured film has a uniform coating finish, color, and appearance.
- D. Apply coatings to produce surface films without cloudiness, spotting, holidays, laps, brush marks, runs, sags, ropiness, or other surface imperfections. Produce sharp glass lines and color breaks.

3.4 CLEANING AND PROTECTION

- A. At end of each workday, remove rubbish, empty cans, rags, and other discarded materials from Project site.
- B. After completing coating application, clean spattered surfaces. Remove spattered coatings by washing, scraping, or other methods. Do not scratch or damage adjacent finished surfaces.
- C. Protect work of other trades against damage from coating operation. Correct damage to work of other trades by cleaning, repairing, replacing, and recoating, as approved by Architect, and leave in an undamaged condition.
- D. At completion of construction activities of other trades, touch up and restore damaged or defaced coated surfaces.

3.5 INTERIOR HIGH-PERFORMANCE COATING SCHEDULE

A. CMU Substrates:

1. Epoxy-Modified Latex System **MPI INT 4.2K**:
 - a. Block Filler: Block filler, latex, interior/exterior , **MPI #4**.
 - b. Intermediate Coat: Epoxy-modified latex, interior, matching topcoat.
 - c. Topcoat: Epoxy-modified latex, gloss MPI Gloss Level 4 **MPI #153**

B. Gypsum Board Plaster Substrates:

1. Epoxy, High-Build System **MPI INT 9.2L**:
 - a. Prime Coat: Primer sealer, latex, interior **MPI #50**.
 - b. Topcoat: Water Borne Light Industrial Coating (MPI Gloss Level 3) **MPI #151**.

3.6 INTERIOR PAINT COLOR SCHEDULE

A. Interior Paint **P-1**: Where this paint color designation is indicated; provide the following:

1. Manufacturer: Equal to Sherwin-Williams
2. Color: To match SW7531 Canvas Tan

B. Interior Paint **P-2**: Where this paint color designation is indicated; provide the following:

1. Manufacturer: Equal to Sherwin-Williams
2. Color: To match district standard "ceiling white"

C. Interior Paint **P-3**: Where this paint color designation is indicated; provide the following:

1. Manufacturer: Equal to Sherwin-Williams
2. Color: To be selected by Architect

END OF SECTION 099600

SECTION 102113.13
METAL TOILET COMPARTMENTS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Metal toilet compartments.

B. Related Requirements:

1. Section 102800 "Toilet, Bath, and Laundry Accessories" for accessories mounted on toilet compartments.

1.2 ACTION SUBMITTALS

A. Product data.

B. Shop Drawings: Plans, elevations, sections, and attachment details.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Regulatory Requirements: Comply with applicable provisions in ICC A117.1 for toilet compartments designated as accessible.

2.2 METAL TOILET COMPARTMENTS

A. Manufacturers: Subject to compliance with requirements, provide products by the following:

1. General Partitions Mfg. Corp. 40 Series Powder Coated Steel.

B. Toilet-Enclosure Style: Overhead braced.

- C. Door, Panel, and Pilaster Construction: Seamless, metal facing sheets pressure laminated to core material; with continuous, interlocking molding strip or lapped-and-formed edge closures; corners secured by welding or clips and exposed welds ground smooth. Exposed surfaces shall be free of pitting, seam marks, roller marks, stains, discolorations, telegraphing of core material, or other imperfections.

1. Core Material: Manufacturer's standard sound-deadening honeycomb of resin-impregnated kraft paper in thickness required to provide finished thickness of 1 inch for doors and panels and 1-1/4 inches for pilasters.
 2. Grab-Bar Reinforcement: Provide concealed internal reinforcement for grab bars mounted on units of size and material adequate for panel to withstand specified structural performance requirements.
 3. Tapping Reinforcement: Provide concealed reinforcement for tapping (threading) at locations where machine screws are used for attaching items to units.
- D. Facing Sheets and Closures: hot-dip galvanized-steel sheet with nominal base-metal (uncoated) thicknesses as follows:
1. Pilasters, Braced at Both Ends: Manufacturer's standard thickness, but not less than 0.036 inch.
 2. Pilasters, Unbraced at One End: Manufacturer's standard thickness, but not less than 0.048 inch.
 3. Panels: 0.036 inch.
 4. Doors: Manufacturer's standard thickness, but not less than 0.030 inch.
- E. Pilaster Shoes: Formed from stainless steel sheet, not less than 0.031-inch nominal thickness and 3 inches high, finished to match hardware.
- F. Pilaster Sleeves (Caps): Formed from stainless steel sheet, not less than 0.031-inch nominal thickness and 3 inches high, finished to match hardware.
- G. Brackets (Fittings):
1. Full-Height (Continuous) Type: Manufacturer's standard design; stainless steel .
- H. Steel Sheet Finish: Immediately after cleaning and pretreating, apply manufacturer's standard baked-on finish, including thermosetting, electrostatically applied, and powder coatings. Apply one color in each room.
1. Color: Burgundy SO-715.

2.3 HARDWARE AND ACCESSORIES

- A. Door Hardware and Accessories: Manufacturer's operating hardware and accessories.
1. Hinges:
 - a. Manufacturer's standard hinge.
 2. Latch and Keeper: Manufacturer's surface-mounted latch unit designed for emergency access and with combination rubber-faced door strike and keeper. Provide units that comply with regulatory requirements for accessibility at toilet enclosures designated as accessible.
 - a. Material: Manufacturer's standard.
 3. Coat Hook: Manufacturer's combination hook and rubber-tipped bumper, sized to prevent inswinging door from hitting compartment-mounted accessories.
 - a. Material: Manufacturer's standard.
 4. Door Bumper: Manufacturer's rubber-tipped bumper at outswinging doors.

- a. Material: Manufacturer's standard.
- 5. Door Pull: Manufacturer's unit at outswinging doors that complies with regulatory requirements for accessibility. Provide units on both sides of doors at toilet enclosures designated as accessible.
 - a. Material: Manufacturer's standard.
- B. Overhead Bracing: Manufacturer's standard continuous, extruded-aluminum head rail with antigrip profile and in manufacturer's standard finish.
- C. Anchorages and Fasteners: Manufacturer's standard exposed fasteners of stainless steel, finished to match items they are securing, with theft-resistant-type heads. Provide sex-type bolts for through-bolt applications. For concealed anchors, use stainless steel, hot-dip galvanized steel, or other rust-resistant, protective-coated steel compatible with related materials.

2.4 MATERIALS

- A. Aluminum Castings: ASTM B26/B26M.
- B. Aluminum Extrusions: ASTM B221.
- C. Stainless Steel Sheet: ASTM A240/A240M or ASTM A666, Type 304, stretcher-leveled standard of flatness.
- D. Stainless Steel Castings: ASTM A743/A743M.
- E. Zamac: ASTM B86, commercial zinc-alloy die castings, chrome plated.

2.5 FABRICATION

- A. Fabricate toilet compartment components to sizes indicated. Coordinate requirements and provide cutouts for through-partition toilet accessories, and solid blocking within panel where required for attachment of toilet accessories.
- B. Overhead-Braced Units: Manufacturer's standard corrosion-resistant supports, leveling mechanism, and anchors at pilasters and walls to suit floor and wall conditions. Provide shoes at pilasters to conceal supports and leveling mechanism.
- C. Door Size and Swings: Unless otherwise indicated, provide 24-inch-wide, inswinging doors for standard toilet enclosures and 36-inch-wide, outswinging doors with a minimum 32-inch-wide, clear opening for toilet enclosures designated as accessible.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. General: Comply with manufacturer's written installation instructions. Install units rigid, straight, level, and plumb. Secure units in position indicated with manufacturer's recommended anchoring devices.

1. Maximum Clearances:
 - a. Pilasters and Panels or Screens: 1/2 inch.
 - b. Panels or Screens and Walls: 1 inch.
 2. Full-Height (Continuous) Brackets: Secure panels or screens to walls and to pilasters with full-height brackets.
 - a. Locate bracket fasteners so holes for wall anchors occur in masonry or tile joints.
 - b. Align brackets at pilasters with brackets at walls.
- B. Overhead-Braced Units: Secure pilasters to floor and level, plumb, and tighten. Set pilasters with anchors penetrating not less than 1-3/4 inches into structural floor unless otherwise indicated in manufacturer's written instructions. Secure continuous head rail to each pilaster with no fewer than two fasteners. Hang doors to align tops of doors with tops of panels, and adjust so tops of doors are parallel with overhead brace when doors are in closed position.

3.2 ADJUSTING

- A. Hardware Adjustment: Adjust and lubricate hardware in accordance with hardware manufacturer's written instructions for proper operation. Set hinges on inswinging doors to hold doors open approximately 30 degrees from closed position when unlatched. Set hinges on outswinging doors to return doors to fully closed position.

END OF SECTION 102113.13

SECTION 102116.13
METAL SHOWER AND DRESSING COMPARTMENTS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Painted-steel compartments.

B. Related Requirements:

1. Section 102800 "Toilet, Bath, and Laundry Accessories" for grab bars, purse shelves, and similar accessories.

1.2 ACTION SUBMITTALS

A. Product Data: For each type of product.

1. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes.

B. Shop Drawings: For shower and dressing compartments.

1. Include plans, elevations, sections, and attachment details.
2. Show locations of cutouts for compartment-mounted accessories.
3. Show locations of reinforcements for compartment-mounted grab bars and locations of blocking for surface-mounted toilet accessories.
4. Show overhead support or bracing locations.

1.3 FIELD CONDITIONS

- A. Field Measurements: Verify actual locations of fixtures, drains, walls, columns, ceilings, and other construction contiguous with shower and dressing compartments by field measurements before fabrication.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Accessibility Standard: Comply with applicable provisions in ICC A117.1 for shower and dressing compartments designated as accessible.

2.2 PAINTED-STEEL COMPARTMENTS

- A. Manufacturers: Subject to compliance with requirements, provide products by the following:
 - 1. General Partitions Mfg. Corp.
- B. Configuration: Shower compartment .
- C. Enclosure Style: Overhead braced .
- D. Panel and Pilaster Construction: Seamless steel facing sheets, pressure laminated to core material, with continuous, interlocking molding strip or lapped-and-formed edge closures and with corners secured by welding or clips and exposed welds ground smooth. Exposed surfaces shall be free of pitting, seam marks, roller marks, stains, discolorations, telegraphing of core material, or other imperfections.
 - 1. Core Material: Manufacturer's standard, sound-deadening honeycomb of resin-impregnated kraft paper in thickness required to provide finished thickness of 1 inch for panels and 1-1/4 inches for pilasters.
 - 2. Grab-Bar and Seat Reinforcement: Concealed internal reinforcement for grab bars and seats mounted on compartments of size and material adequate for panel to withstand required grab-bar or seat loading without deformation of panel.
 - 3. Tapping Reinforcement: Concealed reinforcement for tapping (threading) at locations where machine screws are used for attaching items to compartments.
- E. Facing Sheets and Edge Closures: Hot-dip galvanized-steel sheet with nominal base-metal (uncoated) thicknesses as follows:
 - 1. Pilasters, Braced at Both Ends: Manufacturer's standard thickness, but not less than 0.036 inch.
 - 2. Panels: 0.036 inch.
 - 3. Doors: Manufacturer's standard thickness, but not less than 0.030 inch.
- F. Pilaster Shoes: Formed from stainless steel sheet, not less than 0.031-inch nominal thickness and 3 inches high, finished to match hardware.
- G. Pilaster Sleeves (Caps): Formed from stainless steel sheet, not less than 0.031-inch nominal thickness and 3 inches high, finished to match hardware.
- H. Brackets (Fittings):
 - 1. Full-Height (Continuous) Type: Manufacturer's standard design; clear-anodized aluminum

- I. Steel-Sheet Finish: Immediately after cleaning and pretreating, apply manufacturer's standard baked-on finish, including thermosetting, electrostatically applied, and powder coatings. Comply with coating manufacturer's written instructions for applying and baking. Apply one color in each room.

- 1. Color: Burgandy SO-715.

2.3 MATERIALS

- A. Aluminum Castings: ASTM B26/B26M.
- B. Aluminum Extrusions: ASTM B221.
- C. Steel Sheet: ASTM A653/A653M, either hot-dip galvanized or galvanized; mill phosphatized and selected for smoothness.
- D. Stainless Steel Sheet: ASTM A240/A240M or ASTM A666, Type 304, stretcher-leveled standard of flatness.
- E. Stainless Steel Castings: ASTM A743/A743M.

2.4 ACCESSORIES

- A. Overhead Bracing: Manufacturer's standard, continuous, extruded-aluminum headrail or cap with antigrip profile; in manufacturer's standard finish.
- B. Headrail with Hooks: Manufacturer's standard, continuous, extruded-aluminum headrail or cap with curtain hooks running in concealed track; with antigrip profile; in manufacturer's standard finish.
- C. Curtain: Flame-resistant, manufacturer's standard fabric that is stain resistant, self-sanitizing, antistatic, antimicrobial, and launderable to a temperature of not less than 90 deg F .
 - 1. Flame Resistance: Passes NFPA 701 tests when tested by a testing and inspecting agency acceptable to authorities having jurisdiction.
 - 2. Labeling: Identify fabrics with appropriate markings of applicable testing and inspecting agency.
 - 3. Curtain Grommets: Two-piece, rolled-edge, rustproof, nickel-plated brass; spaced not more than 6 inches o.c.; machined into top hem.
 - 4. Width: Minimum 6 inches wider than opening.
 - 5. Length: Where curtain extends to a floor surface, size so that bottom hem clears finished floor by not more than 1 inch and not less than 1/2 inch above floor surface. Where curtains extend to a shower-receptor curb, size so that bottom hem hangs above curb line and clears curb line by not more than 1/2 inch.
 - 6. Color and Pattern: As selected by Architect from manufacturer's full range .
- D. Anchorages and Fasteners: Manufacturer's standard, exposed fasteners of stainless steel, chrome-plated steel, or solid brass, finished to match the items they are securing; with theft-resistant-type heads. Provide sex-type bolts for through-bolt applications. Use countersunk, flush-type bolt

heads or otherwise make fasteners inconspicuous if exposed on opposite side of panel from hardware or accessory item. For concealed anchors, use stainless steel, hot-dip galvanized steel, or other rust-resistant, protective-coated steel.

2.5 FABRICATION

- A. Overhead-Braced Compartments: Manufacturer's standard, corrosion-resistant supports, leveling method, and anchors at pilasters and walls to suit floor and wall conditions. Provide shoes at pilasters to conceal supports and leveling method.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. General: Comply with manufacturer's written installation instructions. Install compartments rigid, straight, level, and plumb. Secure compartments in position with manufacturer's recommended anchoring devices.
 - 1. Clearances for Dressing Compartments: Maximum 1/2 inch between pilasters and panels; 1 inch between panels and walls.
 - 2. Full-Height (Continuous) Brackets for Dressing Compartments: Secure panels to walls and to pilasters with full-height brackets.
 - a. Locate bracket fasteners so holes for wall anchors occur in masonry or tile joints.
 - b. Align brackets at pilasters with brackets at walls.
- B. Overhead-Braced Compartments: Secure pilasters to floor, and level, plumb, and tighten. Set pilasters with anchors penetrating not less than 1-3/4 inches into structural floor unless otherwise indicated in manufacturer's written instructions. Secure continuous headrail to each pilaster with no fewer than two fasteners.
- C. Curtains: Install curtains to specified length, and verify that they hang vertically without stress points or diagonal folds.

3.2 ADJUSTING

- A. Curtain Adjustment: After hanging curtains, test and adjust each track or rod to produce unencumbered, smooth operation. Steam and dress down curtains as required to produce crease- and wrinkle-free installation. Remove and replace curtains that are stained or soiled or that have stress points or diagonal folds.
- B. Hardware Adjustment: Adjust and lubricate hardware according to hardware manufacturer's written instructions for proper operation. Set hinges on inswinging doors to hold doors open approximately 30 degrees from closed position when unlatched. Set hinges on outswinging doors to return doors to fully closed position.

END OF SECTION 102116.13

SECTION 102800
TOILET, BATH, AND LAUNDRY ACCESSORIES

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Locker room toilet accessories.

B. Related Requirements:

1.2 COORDINATION

- A. Coordinate accessory locations with other work to prevent interference with clearances required for access by people with disabilities, and for proper installation, adjustment, operation, cleaning, and servicing of accessories.

- B. Deliver inserts and anchoring devices set into concrete or masonry as required to prevent delaying the Work.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product.

1. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes.
2. Include anchoring and mounting requirements, including requirements for cutouts in other work and substrate preparation.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Structural Performance: Design accessories and fasteners to comply with the following requirements:

1. Grab Bars: Installed units are able to resist 250 lbf concentrated load applied in any direction and at any point.

2.2 PUBLIC-USE WASHROOM ACCESSORIES

- A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
1. American Specialties, Inc.
 2. Bobrick Washroom Equipment, Inc.
 3. Bradley Corporation.
- B. Grab Bar: **TA-1, TA-2, TA-3**
1. Basis-of-Design Product: Bobrick #B-6806
 2. Mounting: Flanges with concealed fasteners.
 3. Material: Stainless steel, 0.05 inch thick.
 - a. Finish: Smooth, No. 4, satin finish on ends and slip-resistant texture in grip area.
 4. Outside Diameter: 1-1/2 inches.
 5. Configuration and Length: straight grab bar for barrier free toilet.
- C. Grab Bar: **TA-4**
1. Basis-of-Design Product: Bobrick #B-6861
- D. Toilet Tissue Dispenser: **TA-5**
1. Furnished by Owner, installed by contractor.
- E. Sanitary Napkin Disposal Unit: **TA-6**
1. Basis-of-Design Product: Bobrick #B-254
 1. Mounting: Surface mounted.
 2. Door or Cover: Self-closing, disposal-opening cover.
 3. Receptacle: Removable.
 4. Material and Finish: Stainless steel, No. 4 finish (satin)
- F. Soap Dispenser: **TA-7**
1. Furnished by Owner. Installed by Contractor.
- G. Not Used: **TA-8**
- H. Warm Air Hand Dryer: **TA-9**
1. Basis-of-Design Product: World Dryer Smart Dri-Series.
 2. Description: High-speed, warm-air hand dryer for rapid hand drying.
 4. Mounting: Surface mounted.
 2. Operation: Electronic-sensor activated with operation time of 10 to 20 seconds.
 3. Cover Material and Finish: Stainless steel, No. 4 finish (satin).
 4. Electrical Requirements: 115 V, 13 A, 1500W

I. Mirror: **TA-10, TA-11**

1. Basis-of-Design Product: Bobrick #B-165
2. Frame: Stainless-steel channel.
 - a. Corners: Welded and ground smooth.
3. Hangers: Produce rigid, tamper- and theft-resistant installation, using method indicated below.
 - a. Wall bracket of galvanized steel equipped with concealed locking devices requiring a special tool to remove.
Size: Refer to toilet accessory schedule.

J. Robe Hook: **TA-12**

1. Basis-of-Design Product:

K. ADA Shower Seat: **TA-13**

1. Basis-of-Design: Bradley #9569

2.3 MATERIALS

- A. Stainless Steel: ASTM A240/A240M or ASTM A666, Type 304, 0.031-inch-minimum nominal thickness unless otherwise indicated.
- B. Brass: ASTM B19, flat products; ASTM B16/B16M, rods, shapes, forgings, and flat products with finished edges; or ASTM B30, castings.
- C. Steel Sheet: ASTM A1008/A1008M, Designation CS (cold rolled, commercial steel), 0.036-inch-minimum nominal thickness.
- D. Galvanized-Steel Sheet: ASTM A653/A653M, with G60 hot-dip zinc coating.
- E. Galvanized-Steel Mounting Devices: ASTM A153/A153M, hot-dip galvanized after fabrication.
- F. Fasteners: Screws, bolts, and other devices of same material as accessory unit, unless otherwise recommended by manufacturer or specified in this Section, and tamper and theft resistant where exposed, and of stainless or galvanized steel where concealed.
- G. Chrome Plating: ASTM B456, Service Condition Number SC 2 (moderate service).
- H. Mirrors: ASTM C1503, Mirror Glazing Quality, clear-glass mirrors, nominal 6.0 mm thick.

2.4 FABRICATION

- A. General: Fabricate units with tight seams and joints, and exposed edges rolled. Hang doors and access panels with full-length, continuous hinges. Equip units for concealed anchorage and with corrosion-resistant backing plates.

- B. Keys: Provide universal keys for internal access to accessories for servicing and resupplying. Provide minimum of **six** keys to Owner's representative.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install accessories in accordance with manufacturers' written instructions, using fasteners appropriate to substrate indicated and recommended by unit manufacturer. Install units level, plumb, and firmly anchored in locations and at heights indicated.
 - 1. Remove temporary labels and protective coatings.
- B. Grab Bars: Install to comply with specified structural-performance requirements.
- C. Shower Seats: Install to comply with specified structural-performance requirements.

3.2 ADJUSTING AND CLEANING

- A. Adjust accessories for unencumbered, smooth operation. Replace damaged or defective items.
- B. Clean and polish exposed surfaces in accordance with manufacturer's written instructions.

END OF SECTION 102800

SECTION 105113
METAL LOCKERS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:
 - 1. All welded, athletic metal lockers to match existing.
 - 2. Locker benches.

1.3 SUBMITTALS

- A. Product Data: For each type of product indicated. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for each type of metal locker and bench.
- B. Shop Drawings: For metal lockers. Include plans, elevations, sections, details, and attachments to other work.
 - 1. Show locker trim and accessories.
 - 2. Include locker identification system and numbering sequence.
- C. Maintenance Data: For adjusting, repairing, and replacing locker doors and latching mechanisms to include in maintenance manuals.
- D. Warranty: Sample of special warranty.

1.4 QUALITY ASSURANCE

- A. Installer Qualifications: Manufacturer's authorized representative who is trained and approved for installation of units required for this Project.
- B. Source Limitations: Obtain metal lockers, locker benches, and accessories from single source from single manufacturer.
- C. Regulatory Requirements: Where metal lockers and benches are indicated to comply with accessibility requirements, comply with the U.S. Architectural & Transportation Barriers

Compliance Board's "Americans with Disabilities Act (ADA) and Architectural Barriers Act (ABA) Accessibility Guidelines for Buildings and Facilities" and ICC/ANSI A117.1.

- D. Preinstallation Conference: Conduct conference at Project site.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Do not deliver metal lockers until spaces to receive them are clean, dry, and ready for their installation.
- B. Deliver master and control keys and combination control charts to Owner by registered mail or overnight package service.

1.6 PROJECT CONDITIONS

- A. Field Measurements: Verify actual dimensions of recessed openings by field measurements before fabrication.

1.7 COORDINATION

- A. Coordinate sizes and locations of concrete and steel bases for metal lockers.
- B. Coordinate sizes and locations of framing, blocking, furring, reinforcements, and other related units of work specified in other Sections to ensure that metal lockers can be supported and installed as indicated.

1.8 WARRANTY

- A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components of metal lockers that fail in materials or workmanship, excluding finish, within specified warranty period.
 - 1. Failures include, but are not limited to, the following:
 - a. Structural failures.
 - b. Faulty operation of latches and other door hardware.
 - 2. Damage from deliberate destruction and vandalism is excluded.
 - 3. Warranty Period for All-Welded Metal Lockers: 10 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Cold-Rolled Steel Sheet: ASTM A 1008/A 1008M, Commercial Steel (CS), Type B, suitable for exposed applications.
- B. Metallic-Coated Steel Sheet: ASTM A 653/A 653M, Commercial Steel (CS), Type B; with A60 zinc-iron, alloy (galvannealed) coating designation.
- C. Expanded Metal: ASTM F 1267, Type II (flattened), Class I, 3/4-inch steel mesh, with at least 70 percent open area.
- D. Stainless-Steel Sheet: ASTM A 666, Type 304.
- E. Extruded Aluminum: ASTM B 221, alloy and temper recommended by aluminum producer and manufacturer for type of use and finish indicated.
- F. Steel Tube: ASTM A 500, cold rolled.
- G. Fasteners: Zinc- or nickel-plated steel, slotless-type, exposed bolt heads; with self-locking nuts or lock washers for nuts on moving parts.
- H. Anchors: Material, type, and size required for secure anchorage to each substrate.
 - 1. Provide nonferrous-metal or hot-dip galvanized anchors and inserts on inside face of exterior walls, and elsewhere as indicated, for corrosion resistance.
 - 2. Provide toothed-steel or lead expansion sleeves for drilled-in-place anchors.
- S. Finish: Baked enamel or powder coat.
 - 2. Color(s): Match existing

2.3 ATHLETIC METAL LOCKERS

- A. Products: Basis of Design Product: Republic All Welded Ventilated Athletic Lockers. Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
 - 1. Art Metal Products; Lockers.
 - 2. DeBourgh Mfg. Co.; Worley Lockers.
 - 3. List Industries Inc.; Lockers.
 - 4. Lyon Workspace Products, LLC; Lockers.
 - 5. Republic Storage Systems Company; Lockers.
- B. Locker Arrangement: Double tier.
 - 1. Double Tier 12" w x 15" d x 36" h (72" OAH) Padlock hasp, sloped top, vented diamond perforated fronts and stainless-steel bottoms. padlock hasp. On concrete base see drawings for details

- C. Material: Metallic-coated steel sheet.
- D. Unperforated Sides: Fabricated from 0.060-inch nominal-thickness steel sheet.
- E. Frames: Channel formed; fabricated from 0.060-inch nominal-thickness steel sheet or 0.097-inch nominal-thickness steel angles; lapped and factory welded at corners; with top and bottom main frames factory welded into vertical main frames. Form continuous, integral door strike full height on vertical main frames.
 - 1. Cross Frames for Double-Tier Lockers: Channel formed and fabricated from same material as main frames; welded to vertical main frames
- F. Reinforced Bottoms: Structural channels, formed from 0.075-inch nominal-thickness steel sheet; welded to front and rear of side-panel frames.
- G. Perforated Doors: One piece; fabricated from 0.075-inch nominal-thickness steel sheet with manufacturer's standard diamond perforations; formed into channel shape with double bend at vertical edges and with right-angle single bend at horizontal edges and latch point (bottom) and right-angle single bend at remaining edges for box lockers.
 - 1. Reinforcement: Manufacturer's standard reinforcing angles, channels, or stiffeners for doors more than 15 inches wide; welded to inner face of doors.
- H. Hinges: Manufacturer's standard, steel continuous or knuckle type.
- I. Recessed Door Handle and Latch: Stainless-steel cup with integral door pull, recessed so locking device does not protrude beyond face of door; pry and vandal resistant.
 - 1. Multipoint Latching: Finger-lift latch control designed for use with built-in combination locks, built-in cylinder locks, or padlocks; positive automatic latching and prelocking.
 - a. Latch Hooks: Equip doors 48 inches and higher with three latch hooks and doors less than 48 inches high with two latch hooks; fabricated from 0.120-inch nominal-thickness steel sheet; welded to full-height door strikes; with resilient silencer on each latch hook.
 - b. Latching Mechanism: Manufacturer's standard, rattle-free latching mechanism and moving components isolated to prevent metal-to-metal contact and incorporating a prelocking device that allows locker door to be locked while door is open and then closed without unlocking or damaging lock or latching mechanism.
- J. Combination Padlocks: Provide by owner.
- K. Equipment: Equip each metal locker with identification plate and the following unless otherwise indicated:
 - 1. Single-Tier Units: Shelf, one double-prong ceiling hook, and two single-prong wall hooks.
 - 2. Double- and triple-tier units in first two subparagraphs below do not typically contain shelves.

- L. Accessories:
 - 1. Continuous Sloping Tops: Fabricated from 16 gauge nominal-thickness steel sheet, with a pitch of approximately 20 degrees. Provide bulkhead stiffeners at maximum 12" o.c.
 - a. Closures: Vertical-end type.
 - 2. Filler Panels: Fabricated from 16 gauge nominal-thickness steel sheet.
 - 3. Boxed End Panels: Fabricated from 0.060-inch nominal-thickness steel sheet.
- M. Finish: Baked enamel or powder coat.
 - 1. Color(s): Match existing.

2.5 LOCKER BENCHES - TYPICAL

- A. Products: Basis of Design Product: Lyons Workspace Model #5810 Hardwood Top bench with (2) anodized aluminum pedestals. Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
 - 1. Art Metal Products; Lockers.
 - 2. DeBourgh Mfg. Co.; Worley Lockers.
 - 3. List Industries Inc.; Lockers.
 - 4. Lyon Workspace Products, LLC; Lockers.
 - 5. Republic Storage Systems Company; Lockers.
- B. Provide bench units with overall assembly height of 17-1/8 inches. Provide pedestals count to support length as required.
 - 1. TAG:
 - a. BCH-5 = 60" WX 10"D
 - b. BCH-6= 72" W X 10" D
 - c. BCH-7= 84" W X 10" D
 - d. BCH-8 = 96" W X 10" D
 - e. BCH-9 =108"W X 10" D
- C. Bench Tops: Manufacturer's standard one-piece units, with rounded corners and edges.
 - 1. Size: Minimum 9-1/2 inches wide by 2" inches thick.
 - 2. Hardwood with manufacturer's standard finish.
- D. Floor Anchored Pedestals: Manufacturer's standard supports, with predrilled fastener holes for attaching bench top, complete with fasteners, and as follows:
 - 1. Aluminum: 1/8 inch thick by 3 inch wide channel or 1/4 inch thick by 3 inch wide bar stock, shaped into inverted-T form; with nonskid pads at bottom.
- E. Materials:
 - 1. Stainless Steel: ASTM A 666, Type 304.

2. Extruded Aluminum: ASTM B 221 (ASTM B 221M), alloy and temper recommended by aluminum producer and manufacturer for type of use and finish indicated.

2.6 LOCKER BENCHES – ADA / FLOOR MOUNTED

- A. Products: Basis of Design Product: Robinson Steel Co. #ADAWMB-SS Stainless Steel Wall Mounted Bench. Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
 1. Robinson Steel Co; (800-275-6702)
 2. Art Metal Products; Lockers.
 3. DeBourgh Mfg. Co.; Worley Lockers.
 4. List Industries Inc.; Lockers.
 5. Lyon Workspace Products, LLC; Lockers.
 6. Republic Storage Systems Company; Lockers.
- B. Bench Size:
 1. Tag : BCH- ADA 48” x 20 d x 17-1/8” h
- C. Materials:
 1. Stainless Steel: ASTM A 666, Type 304.
- D. Installation: PEDESTAL MOUNTED TO FLOORS

2.7 FABRICATION

- A. Fabricate metal lockers square, rigid, and without warp and with metal faces flat and free of dents or distortion. Make exposed metal edges safe to touch and free of sharp edges and burrs.
 1. Form body panels, doors, shelves, and accessories from one-piece steel sheet unless otherwise indicated.
 2. Provide fasteners, filler plates, supports, clips, and closures as required for complete installation.
- B. Fabricate each metal locker with an individual door and frame; individual top, bottom, and back; and common intermediate uprights separating compartments. Factory weld frame members of each metal locker together to form a rigid, one-piece assembly.
- C. All-Welded Construction: Factory preassemble metal lockers by welding all joints, seams, and connections; with no bolts, nuts, screws, or rivets used in assembly of main locker groups. Factory weld main locker groups into one-piece structures. Grind exposed welds flush.
- D. Accessible Lockers: Fabricate as follows:
 1. Locate bottom shelf no lower than 15 inches above the floor.
 2. Where hooks, coat rods, or additional shelves are provided, locate no higher than 48 inches above the floor.

- E. Hooks: Manufacturer's standard ball-pointed type, aluminum or steel; zinc plated.
- F. Identification Plates: Manufacturer's standard, etched, embossed, or stamped aluminum plates, with numbers and letters at least 3/8 inch high.
- G. Continuous Sloping Tops: Fabricated in lengths as long as practical, without visible fasteners at splice locations; finished to match lockers.
 - 1. Sloping-top corner fillers, mitered.
- H. Filler Panels: Fabricated in an unequal leg angle shape; finished to match lockers. Provide slip-joint filler angle formed to receive filler panel.
- I. Boxed End Panels: Fabricated with 1-inch- wide edge dimension and designed for concealing fasteners and holes at exposed ends of nonrecessed metal lockers; finished to match lockers.
 - 1. Provide one-piece panels for double-row (back-to-back) locker ends.
- J. Finished End Panels: Designed for concealing unused penetrations and fasteners, except for perimeter fasteners, at exposed ends of nonrecessed metal lockers; finished to match lockers.
 - 1. Provide one-piece panels for double-row (back-to-back) locker ends.

2.8 STEEL SHEET FINISHES

- A. Baked-Enamel Finish: Immediately after cleaning, pretreating, and phosphatizing, apply manufacturer's standard thermosetting baked-enamel finish. Comply with paint manufacturer's written instructions for application, baking, and minimum dry film thickness.
- B. Powder-Coat Finish: Immediately after cleaning and pretreating, electrostatically apply manufacturer's standard, baked-polymer, thermosetting powder finish. Comply with resin manufacturer's written instructions for application, baking, and minimum dry film thickness.

PART 3 - EXECUTION

3.5 EXAMINATION

- A. Examine walls, floors, and support bases, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.
- B. Prepare written report, endorsed by Installer, listing conditions detrimental to performance of the Work.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.6 INSTALLATION

- A. General: Install level, plumb, and true; shim as required, using concealed shims.

1. Anchor locker runs at ends and at intervals recommended by manufacturer, but not more than 36 inches o.c. Using concealed fasteners, install anchors through backup reinforcing plates, channels, or blocking as required to prevent metal distortion.
 2. Anchor single rows of metal lockers to walls near top and bottom of lockers.
 3. Anchor back-to-back metal lockers to floor.
 4. Shim required for clearance at exposed structural columns.
- B. All-Welded Metal Lockers: Connect groups together with standard fasteners, with no exposed fasteners on face frames.
- C. Equipment and Accessories: Fit exposed connections of trim, fillers, and closures accurately together to form tight, hairline joints, with concealed fasteners and splice plates.
1. Attach hooks with at least two fasteners.
 2. Attach door locks on doors using security-type fasteners.
 3. Identification Plates: Identify metal lockers with identification indicated on Drawings.
 - a. Attach plates to each locker door, near top, centered, with at least two aluminum rivets.
 - b. Attach plates to upper shelf of each open-front metal locker, centered, with a least two aluminum rivets.
 4. Attach filler panels with concealed fasteners. Locate filler panels where indicated on Drawings.
 5. Attach sloping-top units to metal lockers, with closures at exposed ends.
 6. Attach boxed end panels with concealed fasteners to conceal exposed ends of nonrecessed metal lockers.
 7. Attach finished end panels with fasteners only at perimeter to conceal exposed ends of nonrecessed metal lockers.
- D. Fixed Locker Benches: Provide no fewer than two pedestals for each bench, uniformly spaced not more than 72 inches apart. Securely fasten tops of pedestals to undersides of bench tops, and anchor bases to floor.

3.7 ADJUSTING, CLEANING, AND PROTECTION

- A. Clean, lubricate, and adjust hardware. Adjust doors and latches to operate easily without binding. Verify that integral locking devices operate properly.
- B. Protect metal lockers from damage, abuse, dust, dirt, stain, or paint. Do not permit use during construction.
- C. Touch up marred finishes, or replace metal lockers that cannot be restored to factory-finished appearance. Use only materials and procedures recommended or furnished by locker manufacturer.

END OF SECTION 105113

SECTION 22 0005
BASIC PLUMBING REQUIREMENTS

PART 1 GENERAL

1.1 RELATED DOCUMENTS

- A. This section applies to all sections of Division 22.
- B. Drawings and general provisions of the contract, including Division 00 and Division 01 specification sections, apply to work of this section.
- C. Provide all items, articles, materials, operations or methods listed, mentioned or scheduled on drawings and/or herein, including all labor, materials, equipment and incidentals necessary and required for their completion.
- D. The items in this section are supplementary to the requirements set forth in other portions of the specifications as indicated under item "A" above.

1.2 APPLICATION

- A. This section applies to all plumbing work. The contractors involved shall check all sections of the specifications in addition to the particular section covering their specific trade. Each distinct section of the specifications aimed for one trade may have detailed information with regards to other trades, therefore, it is imperative that all sections be reviewed to get a complete picture of all other trades' functions and work required.
- B. The plumbing contractor is responsible for the installation and operation of the plumbing systems.
- C. The plumbing contractor is responsible for receiving, unloading and placement of all of the owner provided equipment.

1.3 INSPECTION OF SITE

- A. Visit the site, examine and verify the conditions under which the work must be conducted before submitting proposal.
- B. The submitting of a proposal implies that the contractor has visited the site and understands the conditions under which the work must be conducted.

1.4 ALTERNATES AND SUBSTITUTIONS

- A. Refer to Division 01 - General Requirements for procedures.

1.5 DRAWINGS

- A. The drawings are diagrammatic and show general location and arrangement of all the equipment and piping.

- B. Do not scale drawings for measurements.
- C. Field verifications of actual existing conditions are required by the contractor since actual locations, distances, and levels will be governed by actual field conditions. All measurements shall be verified at the site.
- D. If during field verification, the contractor identifies that there may require substantial changes from the original plans, the contractor shall notify the architect for agreement on necessary adjustment before the installation is started.
- E. Should any discrepancies between the contract documents and specifications occur, the greater quality or quantity of work shall be performed. This shall also pertain to any discrepancies in the contract documents between trades. This work must be submitted in writing to the engineer and architect prior to final bid for approval. No extras will be allowed after that time.
- F. Drawings and specifications are intended to cover the completed installation of systems to function as described. The omission of the expressed reference to any item of labor and material necessary to comply with practice codes, ordinances, etc., shall not relieve the contractor from providing such additional labor and material at no cost to Owner.
- G. The contract drawings serve as working drawings for the general layout of the various services. However, layout of equipment accessories, specialties, piping not necessarily indicate every required valve, fitting, transition, provide all systems, etc. As part of the total work required and the cost to be included in this base bid.
- H. Deviations from the drawings, with the exception of minor changes in routing and other such incidental changes that do not affect the functioning or serviceability of the systems, shall not be made without the written approval of the Architect.

1.6 CODES, PERMITS AND FEES

- A. Unless otherwise indicated, all required permits, licenses, inspections, approvals and fees for plumbing work shall be secured and paid for by the contractor. All work shall conform to all applicable codes, rules and regulations. Applicable publications listed in all sections of Division 22 shall be the latest issue, unless otherwise noted.
- B. Rules of local utility companies and municipalities shall be complied with. Check with the utility company and/or municipality supplying service to the installation and determine all devices including, but not limited to: meters, regulators, valves which will be required and include the cost of all such items in the proposal.
- C. All work shall be executed in accordance with the rules and regulations set forth in local and state codes. Prepare any detailed drawings or diagrams which may be required by the governing authorities. Where the drawings and/or specifications indicate materials or construction in excess of code requirements, the drawings and/or specifications shall govern.

1.7 SUBSTITUTION

- A. Refer to Division 01 - General Requirements for procedures.
- B. All items that the contractor proposes to use in the work that are not specifically named in the contract documents must be submitted for review as a proposed substitution.
- C. The contractor shall provide, in a written format, that the proposed substitution is of equal quality and performance.

1.8 WARRANTY AND GUARANTEE

- A. Contractor shall guarantee all work installed by him or his subcontractors to be free from defect in material and workmanship for a period of one year from date of final acceptance of the work, unless a longer period is stipulated under specific headings. Contractor shall repair or replace at no additional cost to the owner, any material or equipment developing defects and shall also make good any damage caused by such defects or the correction of defects. Repairs or replacements shall bear additional guarantee, as originally called for, dated from the final acceptance of the repair or replacement. This requirement shall be binding even though it will exceed product guarantees normally furnished by some manufacturers. Contractor shall submit his own and each equipment manufacturers written certificates, warranting that each item of equipment furnished complies with all requirements of the drawings and specifications. Note that guarantee shall run from date of final acceptance of the work, not from date of installation of a device or piece of equipment.

1.9 SUBMITTALS

- A. Refer to Division 01 - General Requirements for procedures.
- B. Contractor shall provide submittals where items are referred to by symbolic designation on the drawings. All submittals shall bear the same designation (plumbing piping, plumbing fixtures, etc.).
- C. Engineer WILL NOT REVIEW:
 - 1. Submittals not specified.
 - 2. Submittals not reviewed by Contractor; including Contractor stamp with signature comments.
 - 3. Submittals made after work is delivered to site and/or installed.
 - 4. Submittal resubmissions unless resubmission is required by Architect/Engineer.
- D. Installation of any item that requires submittal approval by the engineer shall be installed at the contractors risk. The contractor, at his cost, shall remove all work installed prior to approval of the submittal.
- E. The engineer will not be responsible for errors in quantities, or dimensions required to fit the job condition, details of fabrication to insure proper assembly at the job, or for errors resulting

from errors in submittals.

- F. For underground piping, record dimensions and invert elevations of all piping, including all offsets, fittings, cathodic protection and accessories. Locate dimensions from benchmarks that will be preserved after construction is complete.

1.10 RECORD DRAWINGS

- A. Refer to Division 01 - General Requirements for procedures. All literature shall be furnished in accordance with requirements listed in Division 01.
- B. Contractor shall provide the following record drawings as part of the Project closeout document process:
 - 1. Contract Documents, specifications and submittals, indicating "As-Built" conditions and actual products selected for use.
 - 2. Product and Maintenance manuals for all equipment listed within this specification manual and in Contract Documents. Provide with parts lists as applicable.

1.11 QUALITY ASSURANCE

- A. Other referenced standards:
 - 1. Comply with referenced standards, guidelines, data sheets from various associations, including NFPA, ANSI, ASTM, ASME, ASHRAE.

PART 2 PRODUCTS

2.1 SLEEVES AND ESCUTCHEONS

- A. Provide sleeves wherever pipes pass through exterior wall and floors. Sleeves shall be schedule 40 steel pipe cut to length. Sleeves shall terminate flush with walls, partitions and ceilings in finished areas. All sleeves through floor shall extend 2" above floor. Provide cast brass nickel-plated escutcheons with positive catches on each visible sleeve penetration. Sleeves are to be sealed at each installation with a 3M approved sealant. The space between the inside of the sleeve and the outside of the pipe or conduit within the sleeve shall be sealed at each installation with a 3M approved sealant.

2.2 DIELECTRIC UNIONS

- A. Dielectric unions shall be used to connect dissimilar metals (such as steel and copper) to prevent electrolytic action.

2.3 BUILDING ATTACHMENTS FOR PLUMBING WORK SUPPORTS

- A. General Requirements:

1. Provide building attachments required for supporting plumbing work, suitably selected and installed for the loads applied with a minimum additional safety factor of 3.
2. Where specified attachments are not suitable for conditions, submit to Engineer for approval, proposal for alternate building attachments.
3. Approved Manufacturers: Grinnell, or equivalent products by Michigan Hanger and B-Line.
4. Provide supplemental trapeze supports where necessary. Design trapeze to support all trades. Coordinate loads, and supports with all trades. Size trapeze for maximum deflection of 1/64 of the span.

B. Attachments to Structural Steel:

1. Support plumbing work from building structural steel where possible and approved. No welding or bolting to structural steel is permitted unless authorized by Architect. C-clamps are not permitted.
 - a. Center beam clamp - for loads over 120 lb.: Malleable center hung Grinnell Fig. 228.
 - b. Side beam clamp with retaining clips - for loads up to 120 lb.

C. Cast in Place Concrete Inserts:

1. Provide inserts selected for applied load of present load plus 100% for future, and coordinated with concrete work. Except as detailed on drawings, inserts shall be Unistrut or Grinnell. Plan, lay out and coordinate setting of inserts prior to concrete pour. Use Grinnell Fig. 285 lightweight concrete insert for loads up to 400# or Grinnell Fig. 281 Wedge Type concrete insert for loads up to 1200#

D. Drilled Insert Anchors:

1. Where plumbing work cannot be supported from structural steel, or cast in place concrete inserts, provide drilled concrete insert anchors. Submit for approval, project specific installation drawings for all loads over 100 lbs. Install inserts in web of beam if possible and approved. Insert depth shall not exceed two thirds the thickness of the concrete. Where existing concrete appears to be deteriorating, or where applied load at insert exceeds 1000 lbs., conduct test of concrete to determine derated capacity of insert. Anchors may be adhesive or expansion type up to 1000 lbs., and shall be adhesive type for loads over 1000 lbs.
2. Manufacturers: Hilti

PART 3 EXECUTION

3.1 GENERAL

- A. Demolition of plumbing equipment shall include all existing piping, valves, controls, supports and equipment where such items are not required for reuse. Plumbing equipment not specified for reuse shall be removed by the Plumbing contractor from the site.
- B. Existing piping: when encountered during the course of work, protect, brace and support existing piping where required for proper execution of the work.
- C. Interruption of existing active piping: when the course of work makes shut-down of services unavoidable, the plumbing contractor shall schedule the shut-down at such time as approved by the owners representative, which will cause least interference with established operating routine.
- D. Arrange work accordingly, providing such fittings as duct transitions traps, valves and accessories necessary to complete all construction in an orderly fashion.
- E. Install all equipment in strict accordance all directions and recommendations furnished by the manufacturer.

3.2 ACCESSIBILITY

- A. Do not locate traps, controls, unions, pull boxes, etc. in any system at a location that will be inaccessible after construction is completed. Maintain accessibility for all components in mechanical, electrical, and plumbing systems.

3.3 ACCESS PANELS:

- A. Refer to Division 08 - Openings; Provide access doors in locations as required by applicable codes and as indicated below. Coordinate locations with architectural trades.
- B. Furnish access panels to access valves, traps, control valves or devices, dampers, damper motors, etc. Access panels shall be sized as necessary for ample access, or as indicated on drawings, but no smaller than 12" x 12" where devices are within easy reach of operator, and at least 24"x24" when operator must pass through opening in order to reach the devices. Architectural Trades shall install access panels coordinated with Mechanical Trades.
- C. Access panels in fire rated walls or ceiling must be U.L. labeled for intended use. Unless otherwise indicated on plans, access doors shall be hinged flush type steel framed panel, 14 gauge minimum for frame, and with anchor straps. Only narrow border shall be exposed. Hinges shall be concealed type. Locking device shall be flush type and screw driver operated. Metal surfaces shall be prime coated with rust-inhibitive paint. Panels shall be compatible with architectural adjacent materials.
 - 1. Manufacturer: Milcor, Bilco.

3.4 CUTTING, PATCHING AND DAMAGE TO OTHER WORK

- A. Refer to Division 01 - General Requirements and .

- B. The contractor, under whose jurisdiction the work may fall, shall provide labor, material, and tools required to cut, repair, protect, cap, or relocate existing pipes, conduits, or utilities interfering with or uncovered during work, per regulations of the authorities having jurisdiction.
- C. All cutting required shall be done by the contractor whose work is involved, without extra cost to the owner. All patching and restoration including the furnishing and installation of access panels in ceiling, walls; etc. Within the building lines shall be done by the respective, responsible contractor. No cutting of structural steel, concrete, or wood shall be done without prior approval and explicit directions of the architect patched by the respective, responsible contractor.

3.5 EXCAVATION AND BACKFILLING

- A. Provide all excavation, trenching, tunneling, removal of materials, de-watering and backfilling required for the proper laying of pipes and plumbing work. Coordinate the work with other excavating and backfilling in same area.

3.6 ROUGH-IN FOR CONNECTION TO EQUIPMENT

- A. It shall be the responsibility of each contractor to study the architectural, structural, electrical, and mechanical drawings, conferring with the various trades involved and checking with the supplier of equipment in order to properly rough-in for all equipment.

3.7 MATERIAL AND EQUIPMENT

- A. All material and equipment shall be new and of the best quality used for the purpose in good commercial practice, and shall be the standard product of reputable manufacturers. The material and equipment must meet approval of state and local codes in the area it is being used. Roof decks shall not be used to support piping, conduit, equipment, devices, etc.

3.8 SEAL PENETRATIONS

- A. Seal the space around pipes in sleeves and around duct openings through walls, floors and ceilings. Provide adequate clearance to allow for proper sealing.

3.9 FIRESTOPPING

- A. Refer to Division 07 - Thermal and Moisture Protection for more information.
- B. Provide UL classified firestopping system for plumbing penetrations through rated walls and floors to maintain the fire rating.

3.10 CLEANING

- A. Refer to Division 01 - General Requirements; all plumbing equipment and components shall be cleaned as frequently as necessary through the construction process and again prior to project completion.

3.11 DELIVERY, STORAGE AND PROTECTION OF EQUIPMENT AND MATERIALS

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Architects/Engineers
Kalamazoo, Michigan

Locker Room Remodeling
Hazel Park High School
Hazel Park, Michigan

- A. Refer to Division 01 - General Requirements; all equipment and materials shall be delivered, stored and secured per manufacturer's recommendations.
- B. On-site storage shall be coordinated with Construction Manager/General Contractor and be performed in a manner as to avoid damage, deterioration and loss.

END OF SECTION

SECTION 22 0505
SELECTIVE DEMOLITION FOR PLUMBING

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Demolition and extension of existing plumbing work.

1.2 RELATED REQUIREMENTS

- A. Division 01 - General Requirements: Project administrative and procedural requirements.
- B. Division 02 - Existing Conditions: Demolition, cleaning and disposal requirements, cutting and patching requirements, repairs.

1.3 SUMMARY

- A. The work covered under this section consists of the furnishing of all necessary labor, supervision, materials, equipment, and services to completely execute the system of minor electrical demolition as described in this specification.
- B. The demolition documents plans and specification have been prepared from existing non-as built documents and cursory non-invasive field investigation.
- C. It is the contractors obligation to become familiar with the extent of demolition and the existing condition before submitting their bid.
- D. During demolition if the contractor discovers unforeseen significant non-code compliance conditions of the existing installation they shall notify the Architect and Engineer immediately in writing.
- E. The contractor shall become familiar with the drawings and scope of work of other trades as the work scope of those trades relates to mechanical equipment and connection requirements.
- F. During demolition the contractor shall record on site as-builts all plumbing sanitary, waste and domestic hot, cold and hot water recirculation capped branches for reuse in renovated project space.

PART 2 EXECUTION

2.1 EXAMINATION

- A. Verify that piping to be demolished serve only equipment and facilities within the demolition areas.
- B. Demolition drawings are based on casual field observation and existing record documents.
- C. Report discrepancies to Owner before disturbing existing installation.

- D. Beginning of demolition means installer accepts existing conditions.

2.2 PREPARATION

- A. Identify locations for capping plumbing piping before any demolition work commences.
- B. Confirm isolation valve locations for domestic water piping. Repair leaking isolation valves or replace inoperable valves before commencing piping demolition.

2.3 **DEMOLITION AND EXTENSION OF EXISTING PLUMBING WORK**

- A. Remove, relocate, and extend existing plumbing piping to accommodate new construction.
- B. Remove domestic water piping back to isolation valve.
- C. Remove sanitary and waste piping to branch connection fitting to negate any dead ends.

2.4 CLEANING AND REPAIR

- A. Clean and repair existing materials and equipment that remain or that are to be reused.

END OF SECTION

SECTION 22 0553
IDENTIFICATION FOR PLUMBING PIPING AND EQUIPMENT

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Tags.
- B. Pipe markers.

1.2 RELATED REQUIREMENTS

- A. Division 01 - General Requirements
- B. Division 09 - Finishes: Identification painting.

1.3 REFERENCE STANDARDS

- A. ASME A13.1 - Scheme for the Identification of Piping Systems 2020.

1.4 SUBMITTALS

- A. Contractor shall provide submittals for equipment listed herein. Refer to Division 01 - General Requirements for submittal procedures.
- B. Chart and Schedule: Submit valve chart and schedule, including valve tag number, location, function, and valve manufacturer's name and model number.

PART 2 PRODUCTS

2.1 IDENTIFICATION APPLICATIONS

- A. Piping: Pipe markers.

2.2 MANUFACTURERS

- A. Brady Corp.
- B. Champion-America, Inc.
- C. Seton Identification Products.

2.3 TAGS

- A. Manufacturers:
 - 1. Brady Corporation: www.bradycorp.com.
 - 2. Brimar Industries, Inc.: www.pipemarker.com.

3. Kolbi Pipe Marker Co.: www.kolbipipemarkers.com.

4. Seton Identification Products: www.seton.com.

B. Metal Tags: Brass with stamped letters; tag size minimum 1-1/2 inch diameter with smooth edges.

C. Valve Tag Chart: Typewritten letter size list in anodized aluminum frame.

2.4 PIPE MARKERS

A. Manufacturers:

1. Brady Corporation: www.bradycorp.com.

2. Brimar Industries, Inc.: www.pipemarker.com.

3. Kolbi Pipe Marker Co.: www.kolbipipemarkers.com.

4. Seton Identification Products: www.seton.com.

B. Comply with ASME A13.1.

C. Plastic Pipe Markers: Factory fabricated, flexible, semi-rigid plastic, preformed to fit around pipe or pipe covering; minimum information indicating flow direction arrow and identification of fluid being conveyed.

PART 3 EXECUTION

3.1 PREPARATION

A. Degrease and clean surfaces to receive adhesive for identification materials.

3.2 INSTALLATION

A. Install tags with corrosion resistant chain.

B. Install plastic pipe markers complete around pipe in accordance with manufacturer's instructions.

C. Install underground plastic pipe markers 6 to 8 inches below finished grade, directly above buried pipe.

D. Identify piping, concealed or exposed, with plastic pipe markers. Use tags on piping 3/4 inch diameter and smaller. Identify service, flow direction, and pressure. Install in clear view and align with axis of piping. Locate identification not to exceed 20 feet on straight runs including risers and drops, adjacent to each valve and Tee, at each side of penetration of structure or enclosure, and at each obstruction.

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Architects/Engineers
Kalamazoo, Michigan

Locker Room Remodeling
Hazel Park High School
Hazel Park, Michigan

3.3 SCHEDULES

- A. Identify all plumbing equipment and piping with tags and markers.

END OF SECTION 22 0553

SECTION 22 0719
PLUMBING PIPING INSULATION

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Piping insulation.
- B. Lavatory Trim Covers
- C. Jackets and accessories.

1.2 RELATED REQUIREMENTS

- A. Division 01 - General Requirements: Project administrative and procedural requirements.
- B. Division 02 - Existing Conditions: Demolition, cleaning and disposal requirements, cutting and patching requirements, and repairs.
- C. Division 07 - Thermal and Moisture Protection: Firestopping requirements.
- D. Section 22 1005 - Plumbing Piping: Placement of hangers and hanger inserts.

1.3 REFERENCE STANDARDS

- A. ASTM B209 - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate 2014.
- B. ASTM C177 - Standard Test Method for Steady-State Heat Flux Measurements and Thermal Transmission Properties by Means of the Guarded-Hot-Plate Apparatus 2019.
- C. ASTM C195 - Standard Specification for Mineral Fiber Thermal Insulating Cement 2007 (Reapproved 2019).
- D. ASTM C534/C534M - Standard Specification for Preformed Flexible Elastomeric Cellular Thermal Insulation in Sheet and Tubular Form 2020a.
- E. ASTM C547 - Standard Specification for Mineral Fiber Pipe Insulation 2019.
- F. ASTM C795 - Standard Specification for Thermal Insulation for Use in Contact with Austenitic Stainless Steel 2008 (Reapproved 2018).
- G. ASTM D1056 - Standard Specification for Flexible Cellular Materials—Sponge or Expanded Rubber 2020.
- H. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials 2021a.

- I. ASTM E96/E96M - Standard Test Methods for Gravimetric Determination of Water Vapor Transmission Rate of Materials 2021.
- J. UL 723 - Standard for Test for Surface Burning Characteristics of Building Materials Current Edition, Including All Revisions.

1.4 SUBMITTALS

- A. Contractor shall provide submittals for equipment listed herein. Refer to Division 01 - General Requirements for submittal procedures.
- B. Product Data: Provide product description, thermal characteristics, list of materials and thickness for each service, and locations.

1.5 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing the Products specified in this section with not less than three years of documented experience.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Accept materials on site, labeled with manufacturer's identification, product density, and thickness.

1.7 FIELD CONDITIONS

- A. Maintain ambient conditions required by manufacturers of each product.
- B. Maintain temperature before, during, and after installation for minimum of 24 hours.

PART 2 PRODUCTS

2.1 REGULATORY REQUIREMENTS

- A. Surface Burning Characteristics: Flame spread index/Smoke developed index of 25/50, maximum, when tested in accordance with ASTM E84, UL 723, ASTM E84, or UL 723.

2.2 LAVATORY TRIM COVERS

- A. Provide trim covers for all ADA compliant fixtures including but not limited to lavatories.
- B. Provide fully molded closed cell vinyl insulation with nylon fasteners to completely cover all exposed supply and waste piping, angle stops and ADA compliant offset trap assemblies for all barrier free lavatories and sinks. Insulation shall be white, nominal 3/16 inch thickness with minimum K value of 1.17, shall comply with Fire Marshal requirements for flame spread and shall satisfy ADA Article 4.19.4 and ANSI A117.1.
- C. Approved manufacturers:
 - 1. Truebro Inc. Lav Guard 2, Model #102 with #105 trap offset

2.3 GLASS FIBER

A. Manufacturers:

1. Johns Manville Corporation: www.jm.com.
2. Knauf Insulation: www.knaufusa.com.
3. Owens Corning Corporation; Fiberglas Pipe Insulation ASJ: www.ocbuildingspec.com.

B. Insulation: ASTM C547 and ASTM C795; rigid molded, noncombustible.

1. 'K' Value: ASTM C177, 0.24 at 75 degrees F.
2. Maximum Service Temperature: 850 degrees F.
3. Maximum Moisture Absorption: 0.2 percent by volume.
4. Density: 3.5 lb/cu. ft

C. Vapor Barrier Jacket:

1. White kraft paper with glass fiber yarn, bonded to aluminized film; moisture vapor transmission when tested in accordance with ASTM E 96 of 0.02 perm-inches.

D. Tie Wire:

1. 0.048 inch stainless steel with twisted ends on maximum 12 inch centers.

E. Vapor Barrier Lap Adhesive: Compatible with insulation.

1. Vapor Barrier Lap Adhesive shall be compatible with the insulation and as recommended by the insulation manufacturer.

F. Insulating Cement/Mastic: ASTM C195; hydraulic setting on mineral wool.

G. Fibrous Glass Fabric:

1. Cloth: Untreated; 9 oz/sq yd weight.
2. Blanket: 1.0 lb/cu ft density.
3. Weave: 5 by 5.

H. Indoor Vapor Barrier Finish:

1. Vinyl emulsion type acrylic, compatible with insulation, white color.

2.4 JACKETS

A. PVC Plastic.

1. Manufacturers:
 - a. Johns Manville Corporation: www.jm.com.
 - b. Protto
 - c. Ceelco
2. Jacket: One piece molded type fitting covers and sheet material, off-white color.
 - a. Minimum Service Temperature: 0 degrees F.
 - b. Maximum Service Temperature: 150 degrees F.
 - c. Moisture Vapor Permeability: 0.002 perm inch, maximum, when tested in accordance with ASTM E96/E96M.
 - d. Thickness: 10 mil.
 - e. Connections: Brush on welding adhesive.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify that piping has been tested before applying insulation materials.
- B. Verify that surfaces are clean and dry, with foreign material removed.

3.2 INSTALLATION

- A. Install in accordance with manufacturer's instructions.
- B. Install in accordance with North American Insulation Manufacturers Association (NAIMA) National Insulation Standards.
- C. Exposed Piping: Locate insulation and cover seams in least visible locations.
- D. Glass fiber insulated pipes conveying fluids below ambient temperature:
 1. Provide vapor barrier jackets, factory-applied or field-applied. Secure with self-sealing longitudinal laps and butt strips with pressure sensitive adhesive. Secure with outward clinch expanding staples and vapor barrier mastic.
 2. Insulate fittings, joints, and valves with molded insulation of like material and thickness as adjacent pipe. Finish with glass cloth and vapor barrier adhesive or PVC fitting covers.
- E. Glass fiber insulated pipes conveying fluids above ambient temperature:

1. Provide standard jackets, with vapor barrier, factory-applied or field-applied. Secure with self-sealing longitudinal laps and butt strips with pressure sensitive adhesive. Secure with outward clinch expanding staples.
2. Insulate fittings, joints, and valves with insulation of like material and thickness as adjoining pipe. Finish with glass cloth and adhesive or PVC fitting covers.

F. Inserts and Shields:

1. Application: Piping 1-1/2 inches diameter or larger.
2. Shields: Galvanized steel between pipe hangers or pipe hanger rolls and inserts.
3. Insert Location: Between support shield and piping and under the finish jacket.
4. Insert Configuration: Minimum 6 inches long, of same thickness and contour as adjoining insulation; may be factory fabricated.
5. Insert Material: Hydrous calcium silicate insulation or other heavy density insulating material suitable for the planned temperature range.

- G. Continue insulation through walls, sleeves, pipe hangers, and other pipe penetrations. Finish at supports, protrusions, and interruptions.

3.3 SCHEDULES

A. Plumbing Systems:

1. Domestic Hot Water Supply and Return
 - a. Glass Fiber Insulation:
 - 1) Pipe Size Range: 1/2-1 1/4 inch.
 - 2) Thickness: 1 inch.
 - b. Glass Fiber Insulation:
 - 1) Pipe Size Range: 1 1/2-8 inch.
 - 2) Thickness: 1 1/2 inch.
2. Domestic Potable Cold Water:
 - a. Glass Fiber Insulation:
 - 1) Pipe Size Range: up to 3 inch.
 - (a) Thickness: 1 inch.

END OF SECTION 22 0719

SECTION 22 1005
PLUMBING PIPING

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Pipe, pipe fittings, specialties, and connections for piping systems.
 - 1. Sanitary sewer.
 - 2. Domestic water.
 - 3. Pipe hangers and supports.
 - 4. Valves.
 - 5. Balancing valves.

1.2 RELATED REQUIREMENTS

- A. Division 01 - General Requirements: Project administrative and procedural requirements.
- B. Division 02 - Existing Conditions: Demolition, cleaning and disposal requirements, cutting and patching requirements, and repairs.
- C. Section 07 8400 - Firestopping.
- D. Section 22 0719 - Plumbing Piping Insulation.

1.3 REFERENCE STANDARDS

- A. ASME B16.18 - Cast Copper Alloy Solder Joint Pressure Fittings 2018.
- B. ASME B16.22 - Wrought Copper and Copper Alloy Solder-Joint Pressure Fittings 2018.
- C. ASME B31.9 - Building Services Piping 2020.
- D. ASME BPVC-IX - Boiler and Pressure Vessel Code, Section IX - Qualification Standard for Welding, Brazing, and Fusing Procedures; Welders; Brazers; and Welding, Brazing, and Fusing Operators 2021.
- E. ASTM B32 - Standard Specification for Solder Metal 2020.
- F. ASTM B88 - Standard Specification for Seamless Copper Water Tube 2020.
- G. ASTM B88M - Standard Specification for Seamless Copper Water Tube (Metric) 2020.
- H. ASTM B813 - Standard Specification for Liquid and Paste Fluxes for Soldering of Copper and Copper Alloy Tube 2016.

- I. ASTM B828 - Standard Practice for Making Capillary Joints by Soldering of Copper and Copper Alloy Tube and Fittings 2016.
- J. AWWA C651 - Disinfecting Water Mains 2014, with Addendum (2020).
- K. CISPI 301 - Standard Specification for Hubless Cast Iron Soil Pipe and Fittings for Sanitary and Storm Drain, Waste, and Vent Piping Applications 2018.
- L. CISPI 310 - Specification for Coupling for Use in Connection with Hubless Cast Iron Soil Pipe and Fittings for Sanitary and Storm Drain, Waste, and Vent Piping Applications 2018.
- M. MSS SP-58 - Pipe Hangers and Supports - Materials, Design, Manufacture, Selection, Application, and Installation 2018, with Amendment (2019).
- N. MSS SP-110 - Ball Valves Threaded, Socket-Welding, Solder Joint, Grooved and Flared Ends 2010, with Errata .
- O. NSF 61 - Drinking Water System Components - Health Effects 2020.
- P. NSF 372 - Drinking Water System Components - Lead Content 2020.

1.4 SUBMITTALS

- A. Contractor shall provide submittals for equipment listed herein. Refer to Division 01 - General Requirements for submittal procedures.
- B. Product Data: Provide data on pipe materials, pipe fittings, valves, and accessories. Provide manufacturers catalog information. Indicate valve data and ratings.
- C. Project Record Documents: Record actual locations of valves.

1.5 QUALITY ASSURANCE

- A. Perform Work in accordance with State of Michigan standards.
- B. Welding Materials and Procedures: Conform to ASME BPVC-IX and applicable state labor regulations.
- C. Welder Qualifications: Certified in accordance with ASME BPVC-IX.

1.6 REGULATORY REQUIREMENTS

- A. Perform Work in accordance with State of Michigan plumbing code.
- B. Conform to applicable code for installation of backflow prevention devices.
- C. Provide certificate of compliance from authority having jurisdiction indicating approval of installation of backflow prevention devices.

1.7 FIELD CONDITIONS

- A. Do not install underground piping when bedding is wet or frozen.

PART 2 PRODUCTS

2.1 GENERAL REQUIREMENTS

- A. Potable Water Supply Systems: Provide piping, pipe fittings, and solder and flux (if used), that comply with NSF 61 and NSF 372 for maximum lead content; label pipe and fittings.

2.2 SANITARY SEWER AND VENT PIPING, ABOVE GRADE

- A. Cast Iron Pipe: CISPI 301 (latest edition), hubless, service weight.
 - 1. Fittings: Cast iron.
 - 2. Joints: CISPI 310 (latest edition) bearing the markings of NSF International, neoprene gaskets and stainless steel clamp-and-shield assemblies.

2.3 DOMESTIC WATER PIPING, ABOVE GRADE

- A. Copper Tube: ASTM B88 (ASTM B88M), Type L (B), Drawn (H).
 - 1. Fittings: ASME B16.18, cast copper alloy or ASME B16.22, wrought copper and bronze.
 - 2. Joints: ASTM B32, alloy Sn95 solder.

2.4 PIPE HANGERS AND SUPPORTS

- A. Provide hangers and supports that comply with MSS SP-58.
 - 1. If type of hanger or support for a particular situation is not indicated, select appropriate type using MSS SP-58 recommendations.
 - 2. Overhead Supports: Individual steel rod hangers attached to structure or to trapeze hangers.
 - 3. Trapeze Hangers: Welded steel channel frames attached to structure.
 - 4. Vertical Pipe Support: Steel riser clamp.
- B. Plumbing Piping - Drain, Waste, and Vent:
 - 1. Hangers for Pipe Sizes 1/2 Inch to 1-1/2 Inches: Malleable iron, adjustable swivel, split ring.
 - 2. Hangers for Pipe Sizes 2 Inches and Over: Carbon steel, adjustable, clevis.
 - 3. Multiple or Trapeze Hangers: Steel channels with welded spacers and hanger rods.
 - 4. Wall Support for Pipe Sizes to 3 Inches: Cast iron hook.

5. Wall Support for Pipe Sizes 4 Inches and Over: Welded steel bracket and wrought steel clamp.
6. Vertical Support: Steel riser clamp.
7. Floor Support: Cast iron adjustable pipe saddle, lock nut, nipple, floor flange, and concrete pier or steel support.
8. Copper Pipe Support: Carbon steel ring, adjustable, copper plated.

C. Plumbing Piping - Water:

1. Conform to ASME B31.9.
2. Hangers for Pipe Sizes 1/2 Inch to 1-1/2 Inches: Malleable iron, adjustable swivel, split ring.
3. Hangers for Cold Pipe Sizes 2 Inches and Over: Carbon steel, adjustable, clevis.
4. Hangers for Hot Pipe Sizes 2 Inches to 4 Inches: Carbon steel, adjustable, clevis.
5. Multiple or Trapeze Hangers: Steel channels with welded supports or spacers and hanger rods.
6. Wall Support for Pipe Sizes to 3 Inches: Cast iron hook.
7. Vertical Support: Steel riser clamp.
8. Floor Support for Cold Pipe: Cast iron adjustable pipe saddle, lock nut, nipple, floor flange, and concrete pier or steel support.
9. Floor Support for Hot Pipe Sizes to 4 Inches: Cast iron adjustable pipe saddle, locknut, nipple, floor flange, and concrete pier or steel support.
10. Copper Pipe Support: Carbon steel ring, adjustable, copper plated.

2.5 BALL VALVES

A. Manufacturers:

1. Apollo Valves: www.apollovalves.com
2. Tyco Flow Control: www.tycoflowcontrol.com.
3. Conbraco Industries, Inc: www.apollovalves.com.
4. Nibco, Inc: www.nibco.com.
5. Milwaukee Valve Company: www.milwaukeevalve.com.

- B. Construction, 4 Inches and Smaller: MSS SP-110, Class 150, 600 psi CWP, dezincification resistant, lead free bronze body, 304 stainless steel or chrome plated brass ball, full port, teflon seats and stuffing box ring, blow-out proof stem, lever handle with balancing stops, solder or threaded ends.

2.6 BALANCING VALVES

- A. Manufacturers:
 - 1. Anvil International; [_____]: www.anvilintl.com/#sle.
 - 2. ITT Bell & Gossett; [_____]: www.bellgossett.com/#sle.
 - 3. Griswold Controls; [_____]: www.griswoldcontrols.com/#sle.
- B. Construction: Class 125, brass or bronze body with union on inlet and outlet, temperature and pressure test plug on inlet and outlet, blowdown/backflush drain.
- C. Calibration: Control flow within five percent of selected rating, over operating pressure range of 10 times minimum pressure required for control, maximum minimum pressure 3.5 psi.

PART 3 EXECUTION

3.1 PREPARATION

- A. Ream pipe and tube ends. Remove burrs. Bevel plain end ferrous pipe.
- B. Remove scale and dirt, on inside and outside, before assembly.
- C. Prepare piping connections to equipment with flanges or unions.

3.2 INSTALLATION

- A. Install in accordance with manufacturer's instructions. Cast iron soil pipe installed in accordance to CISPI's Handbook.
- B. Provide non-conducting dielectric connections wherever jointing dissimilar metals.
- C. Route piping in orderly manner and maintain gradient. Route parallel and perpendicular to walls.
- D. Install piping to maintain headroom, conserve space, and not interfere with use of space.
- E. Group piping whenever practical at common elevations.
- F. Provide clearance in hangers and from structure and other equipment for installation of insulation and access to valves and fittings.
- G. Provide access where valves and fittings are not exposed.

- H. Where pipe support members are welded to structural building framing, scrape, brush clean, and apply one coat of zinc rich primer to welding.
- I. Copper Pipe and Tube: Make soldered joints in accordance with ASTM B828, using specified solder, and flux meeting ASTM B813; in potable water systems use flux also complying with NSF 61 and NSF 372.
- J. Sleeve pipes passing through partitions, walls and floors.
- K. Inserts:
 - 1. Provide inserts for suspending hangers from reinforced concrete slabs and sides of reinforced concrete beams.
 - 2. Where concrete slabs form finished ceiling, locate inserts flush with slab surface.
- L. Pipe Hangers and Supports:
 - 1. Install in accordance with ASME B31.9.
 - 2. Support horizontal piping as indicated.
 - 3. Install hangers to provide minimum 1/2 inch space between finished covering and adjacent work.
 - 4. Place hangers within 12 inches of each horizontal elbow.
 - 5. Use hangers with 1-1/2 inch minimum vertical adjustment. Design hangers for pipe movement without disengagement of supported pipe.
 - 6. Support vertical piping at every floor. Support riser piping independently of connected horizontal piping.
 - 7. Where several pipes can be installed in parallel and at same elevation, provide multiple or trapeze hangers.
 - 8. Provide copper plated hangers and supports for copper piping.
 - 9. Prime coat exposed steel hangers and supports. Hangers and supports located in crawl spaces, pipe shafts, and suspended ceiling spaces are not considered exposed.
 - 10. Support cast iron drainage piping at every joint.

3.3 APPLICATION

- A. Install unions downstream of valves and at equipment or apparatus connections.
- B. Install brass male adapters each side of valves in copper piped system. Solder adapters to pipe.
- C. Install ball valves for shut-off and to isolate equipment, part of systems, or vertical risers.

3.4 TOLERANCES

- A. Drainage Piping: Establish invert elevations within 1/2 inch vertically of location indicated and slope to drain at minimum of 1/8 inch per foot slope.
- B. Water Piping: Slope at minimum of 1/32 inch per foot and arrange to drain at low points.

3.5 DISINFECTION OF DOMESTIC WATER PIPING SYSTEM

- A. Disinfect water distribution system in accordance with Section 33 0110.58.
- B. Prior to starting work, verify system is complete, flushed and clean.
- C. Ensure acidity (pH) of water to be treated is between 7.4 and 7.6 by adding alkali (caustic soda or soda ash) or acid (hydrochloric).
- D. Inject disinfectant, free chlorine in liquid, powder, tablet or gas form, throughout system to obtain 50 to 80 mg/L residual.
- E. Bleed water from outlets to ensure distribution and test for disinfectant residual at minimum 15 percent of outlets.
- F. Maintain disinfectant in system for 24 hours.
- G. If final disinfectant residual tests less than 25 mg/L, repeat treatment.
- H. Flush disinfectant from system until residual equal to that of incoming water or 1.0 mg/L.
- I. Take samples no sooner than 24 hours after flushing, from 10 percent of outlets and from water entry, and analyze in accordance with AWWA C651.

3.6 SCHEDULES

- A. Pipe Hanger Spacing:
 - 1. Metal Piping:
 - a. Pipe Size: 1/2 inches to 1-1/4 inches:
 - 1) Maximum Hanger Spacing: 6.5 ft.
 - 2) Hanger Rod Diameter: 3/8 inches.
 - b. Pipe Size: 1-1/2 inches to 2 inches:
 - 1) Maximum Hanger Spacing: 10 ft.
 - 2) Hanger Rod Diameter: 3/8 inch.
 - c. Pipe Size: 2-1/2 inches to 3 inches:

Kingscott Associates, Inc.
Architects/Engineers
Kalamazoo, Michigan

Locker Room Remodeling
Hazel Park High School
Hazel Park, Michigan

- 1) Maximum Hanger Spacing: 10 ft.
 - 2) Hanger Rod Diameter: 1/2 inch.
- d. Pipe Size: 4 inches to 6 inches:
- 1) Maximum Hanger Spacing: 10 ft.
 - 2) Hanger Rod Diameter: 5/8 inch.

END OF SECTION 22 1005

SECTION 22 1006
PLUMBING PIPING SPECIALTIES

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Floor drains.
- B. Cleanouts.
- C. Water hammer arrestors.
- D. Mixing valves.

1.2 RELATED REQUIREMENTS

- A. Section 22 1005 - Plumbing Piping.
- B. Section 22 4000 - Plumbing Fixtures.

1.3 REFERENCE STANDARDS

- A. ASME A112.6.3 - Floor and Trench Drains 2019.
- B. ASSE 1019 - Performance Requirements for Wall Hydrant with Backflow Protection and Freeze Resistance 2011 (Reaffirmed 2016).
- C. NSF 61 - Drinking Water System Components - Health Effects 2020.
- D. NSF 372 - Drinking Water System Components - Lead Content 2020.
- E. PDI-WH 201 - Water Hammer Arresters 2017.

1.4 SUBMITTALS

- A. Contractor shall provide submittals for equipment listed herein. Refer to Division 01 - General Requirements for submittal procedures.
- B. Product Data: Provide component sizes, rough-in requirements, service sizes, and finishes.
- C. Shop Drawings: Indicate dimensions, weights, and placement of openings and holes.

PART 2 PRODUCTS

2.1 GENERAL REQUIREMENTS

- A. Specialties in Potable Water Supply Systems: Provide products that comply with NSF 61 and NSF 372 for maximum lead content.

2.2 DRAINS

A. Manufacturers:

1. Mifab Manufacturing Inc.: www.mifab.com
2. Josam Company: www.josam.com.
3. Jay R. Smith Manufacturing Company.
4. Zurn Industries, LLC: www.zurn.com.

B. Floor Drain (FD-1):

1. ASME A112.21.1M; lacquered cast iron body with bottom outlet, combination invertible membrane clamp and adjustable collar with adjustable Type "S" polished nickel-bronze strainer.
2. Zurn Industries Model #Z-415S.

2.3 CLEANOUTS (CO)

A. Manufacturers:

1. Mifab Manufacturing Inc.: www.mifab.com
2. Jay R. Smith Manufacturing Company: www.jrsmith.com
3. Josam Company: www.josam.com
4. Zurn Industries, Inc.: www.zurn.com

B. Cleanouts at Interior Finished Floor Areas:

1. Adjustable floor cleanout, Lacquered cast iron body with agas and watertight ABS tapered thread plug, and reversible clamping collar,round scoriated secured top (finish: polished nickel bronze) adjustable to floor finish. Coordinate floor finishes with architect prior to order.
2. Zurn Industries, Inc.: ; Model Z-1400

C. Cleanouts at Interior Finished Wall Areas :

1. Lacquered cast iron body, gas and water tight ABS tapered thread plug, and round stainless steel access cover with vandal proof securing top.
2. Zurn Industries, Inc.: Wall; Model Z-1441 or Z-1446

D. Cleanouts at Interior Unfinished Accessible Areas : Calked or threaded type. Provide bolted stack cleanouts on vertical rainwater leaders.

2.4 WATER HAMMER ARRESTORS

A. Manufacturers:

1. Mifab Manufacturing Inc.: www.mifab.com
2. Jay R. Smith Manufacturing Company: www.jrsmith.com.
3. Watts Regulator Company, a part of Watts Water Technologies:
www.wattsregulator.com.
4. Zurn Industries, LLC: www.zurn.com.

B. Water Hammer Arrestors:

1. Stainless steel construction, bellows type sized in accordance with PDI-WH 201, precharged suitable for operation in temperature range 34 to 250 degrees F and maximum 150 psi working pressure.

2.5 MIXING VALVES

A. Thermostatic Mixing Valves:

1. Refer to Plumbing Fixture Schedule for individual ASSE 1070 thermostatic mixing valve.

PART 3 EXECUTION

3.1 INSTALLATION

- A. Install in accordance with manufacturer's instructions.
- B. Extend cleanouts to finished floor or wall surface. Lubricate threaded cleanout plugs with mixture of graphite and linseed oil. Ensure clearance at cleanout for rodding of drainage system.
- C. Install floor cleanouts at elevation to accommodate finished floor.
- D. Install water hammer arrestors complete with accessible isolation valve on hot and cold water supply piping to lavatories, and flush valve fixtures.[_____]

END OF SECTION 22 1006

SECTION 22 4000
PLUMBING FIXTURES

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Water closets
- B. Urinals
- C. Lavatories
- D. Showers.

1.2 RELATED REQUIREMENTS

- A. Division 01 - General Requirements: Project administrative and procedural requirements.
- B. Division 02 - Existing Conditions: Demolition, cleaning and disposal requirements, cutting and patching requirements, and repairs.
- C. Division 07 - Thermal and Moisture Protection: Sealing joints between fixtures, walls and floors.
- D. Section 22 1005 - Plumbing Piping.
- E. Section 22 1006 - Plumbing Piping Specialties.

1.3 REFERENCE STANDARDS

- A. ASME A112.18.1 - Plumbing Supply Fittings 2018, with Errata.
- B. ASME A112.19.2 - Ceramic Plumbing Fixtures 2018, with Errata.
- C. ASME A112.19.5 - Flush Valves and Spuds for Water Closets, Urinals, and Tanks 2017.
- D. NSF 61 - Drinking Water System Components - Health Effects 2020.
- E. NSF 372 - Drinking Water System Components - Lead Content 2020.

1.4 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Contractor shall provide submittals for equipment listed herein. Refer to Division 01 - General Requirements for submittal procedures.
- C. Product Data: Provide catalog illustrations of fixtures, sizes, rough-in dimensions, utility sizes, trim, and finishes.

- D. Maintenance Data: Include fixture trim exploded view and replacement parts lists.
- E. Warranty: Submit manufacturer warranty and ensure forms have been completed in Owner's name and registered with manufacturer.

1.5 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing the type of products specified in this section, with minimum three years of documented experience.

1.6 REGULATORY REQUIREMENTS

- A. Products Requiring Electrical Connection: Listed and classified by Underwriters Laboratories Inc., as suitable for the purpose specified and indicated.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Accept fixtures on site in factory packaging. Inspect for damage.
- B. Protect installed fixtures from damage by securing areas and by leaving factory packaging in place to protect fixtures and prevent use.

PART 2 PRODUCTS

2.1 GENERAL

- A. Potable Water Systems: Provide plumbing fittings and faucets that comply with NSF 61 and NSF 372 for maximum lead content; label pipe and fittings.

2.2 REGULATORY REQUIREMENTS

- A. Comply with applicable codes for installation of plumbing systems.
- B. Perform work in accordance with local health department regulations.

2.3 **FLOOR MOUNTED FLUSH VALVE WATER CLOSETS (WC-1) REFER TO PLUMBING FIXTURE SCHEDULE ON DRAWINGS.**

- A. Bowl:
 - 1. Manufacturers:
 - a. American Standard Inc.
 - b. Kohler.
 - c. Zurn.
 - 2. ASME A112.19.2; floor mounted, siphon jet vitreous china closet bowl, with elongated rim, 1-1/2 inch top spud, china bolt caps.

B. Flush Valve Manufacturers:

1. Delta Tech
2. Sloan Valve Company
3. Zurn Industries, Inc..

C. Battery Powered Sensor Operated Flush Valve:

1. ASSE 1037, ANSI/ASME A112.19.6 and Military Specification V-29193. Chrome plated closet flushometer for either left or right hand supply, installation conforms to ADA requirements. Exposed, synthetic rubber diaphragm with dual filtered fixed bypass; battery powered infrared sensor with range adjustment; chrome plated metal cover with tempered glass window; indicator light and courtesy over-ride flush button; dual filtered by-pass; maximum 1.6 gallon flush volume; solid handle cap; 1" I.P.S. screwdriver angle stop; free spinning vandal resistant stop cap; vacuum breaker; spud coupling and flange for 1-1/2" top spud valve body.

D. Seat:

1. Manufacturers:
 - a. Bemis. 1055SSC
 - b. Centoco.
 - c. Olsonite; Model 1055SSC.
 - d. Substitutions: See Section 01600 - Product Requirements.
2. Solid white plastic, elongated open front, extended back, self-sustaining hinge, SS posts, pintles, washers and nuts without cover.

2.4 WALL HUNG URINALS (UR-1) REFER TO PLUMBING FIXTURE SCHEDULE ON DRAWINGS.

A. Wall Hung Urinal Manufacturers:

1. American Standard Inc.
2. Kohler.
3. Zurn.

B. Urinal:

1. ASME A112.19.2; vitreous china, wall hung washout flushing rim urinal with shields, integral trap, removable stainless steel strainer, top spud, steel supporting hanger.

C. Battery Powered Sensor Operated Flush Valve:

1. ASSE 1037, ANSI/ASME A112.19.6 and Military Specification V-29193. Chrome plated closet flushometer for either left or right hand supply, installation conforms to ADA requirements. Exposed, synthetic rubber diaphragm with dual filtered fixed bypass; battery powered infrared sensor with range adjustment; plastic cover assembly with integral window; indicator light and courtesy over-ride flush button; dual filtered bypass; maximum 1.0 gallon flush volume; solid handle cap; 3/4" I.P.S. screwdriver angle stop; free spinning vandal resistant stop cap; vacuum breaker; spud coupling and flange for 3/4" top spud valve body.
2. ASME A112.18.1M; exposed chrome plated, porous felt type for 1/2 inch supply with oscillating handle, screwdriver stop and vacuum breaker.

D. Carriers:

1. Manufacturers:
 - a. Watts Drainage.
 - b. Zurn.
2. ASME A112.6.1M; Wall urinal support system with top and bottom plates. Complete with Dura Coated tubular rectangular steel uprights with welded feet, adjustable support plates, and mounting lugs for floor and wall attachment, threaded fixture studs for fixture hanger.

2.5 LAVATORIES (LAV-1) REFER TO PLUMBING FIXTURE SCHEDULE ON DRAWINGS.

A. Manufacturers:

1. American Standard.
2. Kohler.
3. Zurn.

B. Vitreous China Wall Hung Basin:

1. ASME A112.19.2M; vitreous china wall hung lavatory 20.5 x 18.25 inch minimum, rectangular basin with splash lip and front overflow.

C. Supply Faucet Manufacturers:

1. American Standard Inc.
2. Delta.
3. Chicago Faucet.

4. Zurn.

D. Accessories:

1. Chrome plated 17 gage brass P-trap with clean-out plug and arm with escutcheon.
2. Offset waste with perforated open strainer.
3. Screwdriver stops.
4. Rigid supplies.
5. Carrier:
 - a. Manufacturers:
 - 1) Watts Drainage.
 - 2) Zurn Industries, Inc..
 - b. ASME A112.6.1M; cast iron and steel frame with tubular legs, floor supports, lugs for floor and wall attachment, concealed arm supports, bearing plate and studs.

2.6 SHOWERS (SH-1) REFER TO PLUMBING FIXTURE SCHEDULE ON DRAWINGS.

A. Trim:

1. ASME A112.18.1M; ADA compliant, concealed shower supply with pressure balanced mixing valve, integral service stops, vandal resistant metal lever handle.

B. Shower Valve:

1. Comply with ASME A112.18.1.

C. Shower Head:

1. ASME A112.18.1; chrome plated vandal-proof institutional head with integral wall bracket, built-in 2.5 gpm flow control.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify that walls and floor finishes are prepared and ready for installation of fixtures.

3.2 PREPARATION

- A. Rough-in fixture piping connections in accordance with minimum sizes indicated in Plumbing Fixture Schedule on drawings for particular fixtures.

3.3 INSTALLATION

- A. Install in accordance with manufacturer's instructions.
- B. Install each fixture with trap, easily removable for servicing and cleaning.
- C. Provide chrome plated rigid or flexible supplies to fixtures with loose key stops, reducers, and escutcheons.
- D. Install components level and plumb.
- E. Install and secure fixtures in place with wall supports and bolts.
- F. Solidly attach water closets to floor with lag screws. Lead flashing is not intended hold fixture in place.

3.4 ADJUSTING

- A. Adjust stops or valves for intended water flow rate to fixtures without splashing, noise, or overflow.

3.5 CLEANING

- A. Clean plumbing fixtures and equipment.

3.6 PROTECTION

- A. Protect installed products from damage due to subsequent construction operations.
- B. Repair or replace damaged products before Date of Substantial Completion.

END OF SECTION 22 4000

SECTION 23 0005
BASIC HVAC REQUIREMENTS

PART 1 GENERAL

1.1 RELATED DOCUMENTS

- A. This section applies to all sections of Division 23.
- B. Drawings and general provisions of the contract, including Division 00 and Division 01 specification sections, apply to work of this section.
- C. Provide all items, articles, materials, operations or methods listed, mentioned or scheduled on drawings and/or herein, including all labor, materials, equipment and incidentals necessary and required for their completion.
- D. The items in this section are supplementary to the requirements set forth in other portions of the specifications as indicated under item "A" above.

1.2 APPLICATION

- A. This section applies to all mechanical work. The contractors involved shall check all sections of the specifications in addition to the particular section covering their specific trade. Each distinct section of the specifications aimed for one trade may have detailed information with regards to other trades, therefore, it is imperative that all sections be reviewed to get a complete picture of all other trades' functions and work required.
- B. The mechanical contractor is responsible for the installation and operation of the hvac systems and temperature control systems.
- C. The mechanical contractor is responsible for receiving, unloading and placement of all of the owner provided equipment.

1.3 INSPECTION OF SITE

- A. Visit the site, examine and verify the conditions under which the work must be conducted before submitting proposal.
- B. The submitting of a proposal implies that the contractor has visited the site and understands the conditions under which the work must be conducted.

1.4 ALTERNATES AND SUBSTITUTIONS

- A. Refer to Division 01 - General Requirements for procedures.

1.5 DRAWINGS

- A. The drawings show the location and general arrangement of all equipment, piping and related items. They shall be followed as closely as elements of the construction will permit.

- B. Deviations from the drawings, with the exception of minor changes in routing and other such incidental changes that do not affect the functioning or serviceability of the systems, shall not be made without the written approval of the Architect.
- C. Do not scale drawings for measurements.
- D. Field verifications of actual existing conditions are required by the contractor since actual locations, distances, and levels will be governed by actual field conditions. All measurements shall be verified at the site.
- E. If during field verification, the contractor identifies that there may require substantial changes from the original plans, the contractor shall notify the architect for agreement on necessary adjustment before the installation is started
- F. Should any discrepancies between the contract documents and specifications occur, the greater quality or quantity of work shall be performed. This shall also pertain to any discrepancies in the contract documents between trades. This work must be submitted in writing to the engineer and architect prior to final bid for approval. No extras will be allowed after that time.
- G. Drawings and specifications are intended to cover the completed installation of systems to function as described. The omission of the expressed reference to any item of labor and material necessary to comply with practice codes, ordinances, etc., shall not relieve the contractor from providing such additional labor and material at no cost to Owner.

1.6 **CODES, PERMITS AND FEES**

- A. Unless otherwise indicated, all required permits, licenses, inspections, approvals and fees for mechanical work shall be secured and paid for by the contractor. All work shall conform to all applicable codes, rules and regulations. Applicable publications listed in all sections of Division 23 shall be the latest issue, unless otherwise noted.
- B. All work shall be executed in accordance with the rules and regulations set forth in local and state codes. Prepare any detailed drawings or diagrams which may be required by the governing authorities. Where the drawings and/or specifications indicate materials or construction in excess of code requirements, the drawings and/or specifications shall govern.

1.7 **SUBSTITUTION**

- A. Refer to Division 01 - General Requirements for procedures.
- B. All items that the contractor proposes to use in the work that are not specifically named in the contract documents must be submitted for review as a proposed substitution.
- C. The contractor shall provide, in a written format, that the proposed substitution is of equal quality and performance.

1.8 **WARRANTY AND GUARANTEE**

- A. Contractor shall guarantee all work installed by themselves or their subcontractors to be free from defect in material and workmanship for a period of one year from date of final acceptance of the work, unless a longer period is stipulated under specific headings. Contractor shall repair or replace at no additional cost to the owner, any material or equipment developing defects and shall also make good any damage caused by such defects or the correction of defects. Repairs or replacements shall bear additional guarantee, as originally called for, dated from the final acceptance of the repair or replacement. This requirement shall be binding even though it will exceed product guarantees normally furnished by some manufacturers. Contractor shall submit his own and each equipment manufacturers written certificates, warranting that each item of equipment furnished complies with all requirements of the drawings and specifications. Note that guarantee shall run from date of final acceptance of the work, not from date of installation of a device or piece of equipment.

1.9 SUBMITTALS

- A. Refer to Division 01 - General Requirements for procedures.
- B. Contractor shall provide submittals where items are referred to by symbolic designation on the drawings. All submittals shall bear the same designation (hvac equipment, piping equipment, etc.). Refer to other sections of the mechanical specifications for additional requirements.
- C. Engineer WILL NOT REVIEW:
 - 1. Submittals not specified.
 - 2. Submittals not reviewed by Contractor, including Contractor stamp with signature comments.
 - 3. Submittals made after work is delivered to site and/or installed.
 - 4. Submittal resubmissions unless resubmission is required by Architect/Engineer.
- D. Installation of any item that requires submittal approval by the engineer shall be installed at the contractors risk. The contractor, at his cost, shall remove all work installed prior to approval of the submittal.
- E. The engineer will not be responsible for errors in quantities, or dimensions required to fit the job condition, details of fabrication to insure proper assembly at the job, or for errors resulting from mistakes in submittals.

PART 2 PRODUCTS

2.1 SLEEVES AND ESCUTCHEONS

- A. Provide sleeves wherever pipes pass through exterior wall, and floors. Sleeves shall be schedule 40 steel pipe cut to length. Sleeves shall terminate flush with walls, partitions and ceilings in finished areas. All sleeves through floor shall extend 2" above floor. Provide cast brass nickel-plated escutcheons with positive catches on each visible sleeve penetration. Sleeves are to be

sealed at each installation with a 3M approved sealant. The space between the inside of the sleeve and the outside of the pipe or conduit within the sleeve shall be sealed at each installation with a 3M approved sealant.

2.2 DIELECTRIC UNIONS

- A. Dielectric unions shall be used to connect dissimilar metals (such as steel and copper) to prevent electrolytic action.

2.3 BUILDING ATTACHMENTS FOR MECHANICAL WORK SUPPORTS

A. General Requirements:

1. Provide building attachments required for supporting mechanical work, suitably selected and installed for the loads applied with a minimum additional safety factor of 3.
2. Where specified attachments are not suitable for conditions, submit to Engineer for approval, proposal for alternate building attachments.
3. Approved Manufacturers: Grinnell, or equivalent products by Michigan Hanger and B-Line.
4. Provide supplemental trapeze supports where necessary. Design trapeze to support all trades. Coordinate loads, and supports with all trades. Size trapeze for maximum deflection of 1/64 of the span.

B. Attachments to Structural Steel:

1. Support mechanical work from building structural steel where possible and approved. No welding or bolting to structural steel is permitted unless authorized by Architect. C-clamps are not permitted.
 - a. Center beam clamp - for loads over 120 lb.: Malleable center hung Grinnell Fig. 228.
 - b. Side beam clamp with retaining clips - for loads up to 120 lb.

C. Cast in Place Concrete Inserts:

1. Provide inserts selected for applied load of present load plus 100% for future, and coordinated with concrete work. Except as detailed on drawings, inserts shall be Unistrut or Grinnell. Plan, lay out and coordinate setting of inserts prior to concrete pour. Use Grinnell Fig. 285 lightweight concrete insert for loads up to 400# or Grinnell Fig. 281 Wedge Type concrete insert for loads up to 1200#

D. Drilled Insert Anchors:

1. Where mechanical work cannot be supported from structural steel, or cast in place concrete inserts, provide drilled concrete insert anchors. Submit for approval, project

specific installation drawings for all loads over 100 lbs. Install inserts in web of beam if possible and approved. Insert depth shall not exceed two thirds the thickness of the concrete. Where existing concrete appears to be deteriorating, or where applied load at insert exceeds 1000 lbs., conduct test of concrete to determine derated capacity of insert. Anchors may be adhesive or expansion type up to 1000 lbs., and shall be adhesive type for loads over 1000 lbs.

2. Manufacturers: Hilti

PART 3 EXECUTION

3.1 GENERAL

- A. Demolition of mechanical equipment shall include all existing piping, valves, controls, supports and equipment where such items are not required for reuse. Mechanical equipment not specified for reuse shall be removed by the mechanical contractor from the site.
- B. Existing piping and ductwork: when encountered during the course of work, protect, brace and support existing piping and ductwork where required for proper execution of the work.
- C. Interruption of existing active piping and ductwork: when the course of work makes shut-down of services unavoidable, the mechanical contractor shall schedule the shut-down at such time as approved by the owners representative, which will cause least interference with established operating routine.
- D. Install all equipment in strict accordance all directions and recommendations furnished by the manufacturer.

3.2 ACCESSIBILITY

- A. Do not locate traps, controls, unions, pull boxes, etc. in any system at a location that will be inaccessible after construction is completed. Maintain accessibility for all components in mechanical, electrical, and plumbing systems.

3.3 ACCESS DOORS AND PANELS

- A. Refer to Division 08 - Openings; Provide access doors in locations as required by applicable codes and as indicated below. Coordinate locations with architectural trades.
- B. Furnish access panels to access valves, traps, control valves or devices, dampers, damper motors, etc. Access panels shall be sized as necessary for ample access, or as indicated on drawings, but no smaller than 12" x 12" where devices are within easy reach of operator, and at least 24"x24" when operator must pass through opening in order to reach the devices. Architectural Trades shall install access panels coordinated with Mechanical Trades.
- C. Access panels in fire rated walls or ceiling must be U.L. labeled for intended use. Unless otherwise indicated on plans, access doors shall be hinged flush type steel framed panel, 14 gauge minimum for frame, and with anchor straps. Only narrow border shall be exposed.

Hinges shall be concealed type. Locking device shall be flush type and screw driver operated. Metal surfaces shall be prime coated with rust-inhibitive paint. Panels shall be compatible with architectural adjacent materials Manufacturer: Milcor, Bilco.

3.4 CUTTING AND PATCHING

- A. Refer to Division 01 - General Requirements and Division 02 - Existing Conditions.
- B. All cutting required shall be done by the contractor whose work is involved, without extra cost the owner. All patching and restoration including the furnishing and installation of access panels in ceiling, walls, etc. within the building lines shall be done by the respective, responsible contractor. No cutting of structural steel, concrete, or wood shall be done without prior approval and explicit directions of the architect patched by the respective, responsible contractor.
- C. The contractor, under whose jurisdiction the work may fall, shall provide labor, material, and tools required to cut, repair, protect, cap, or relocate existing pipes, conduits, or utilities interfering with or uncovered during work, per regulations of the authorities having jurisdiction.

3.5 MATERIAL AND EQUIPMENT

- A. All material and equipment shall be new and of the best quality used for the purpose in good commercial practice, and shall be the standard product of reputable manufacturers. The material and equipment must meet approval of state and local codes in the area it is being used. Roof decks shall not be used to support piping, conduit, equipment, devices, etc.

3.6 SEAL PENETRATIONS

- A. Seal the space around pipes in sleeves and around duct openings through walls, floors and ceilings. Provide adequate clearance to allow for proper sealing.

3.7 FIRESTOPPING

- A. Refer to Division 07 - Thermal and Moisture Protection for more information.
- B. Provide UL classified firestopping system for mechanical penetrations through rated walls and floors to maintain the fire rating.

3.8 DELIVERY, STORAGE AND HANDLING OF EQUIPMENT AND MATERIALS

- A. Refer to Division 01 - General Requirements; All equipment and materials shall be delivered, stored and secured per manufacturer's recommendations.
- B. On-site storage shall be coordinated with Construction Manager and be performed in a manner as to avoid damage, deterioration and loss.
- C. Provide temporary end caps and closures on piping and fittings. Maintain in place until installation.

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Hazel Park, Michigan

- D. Protect piping systems from entry of foreign materials by temporary covers, completing sections of the work, and isolating parts of completed system.
- E. Protect dampers, grilles, louvers from damage to operating linkages and blades.

3.9 CLEANING

- A. Refer to Division 01 - General Requirements; all mechanical equipment and components shall be cleaned as frequently as necessary through the construction process and again prior to project completion.

END OF SECTION

SECTION 23 0505
SELECTIVE DEMOLITION FOR HVAC

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Demolition and extension of existing mechanical work.

1.2 RELATED REQUIREMENTS

- A. Division 01 - General Requirements: Project administrative and procedural requirements.
- B. Division 02 - Existing Conditions: Demolition, cleaning and disposal requirements, cutting and patching requirements, repairs.

1.3 SUMMARY

- A. The work covered under this section consists of the furnishing of all necessary labor, supervision, materials, equipment, and services to completely execute the system of minor electrical demolition as described in this specification.
- B. The demolition documents plans and specification have been prepared from existing non-as built documents and cursory non-invasive field investigation.
- C. It is the contractors obligation to become familiar with the extent of demolition and the existing condition before submitting their bid.
- D. During demolition if the contractor discovers unforeseen significant non-code compliance conditions of the existing installation they shall notify the Architect and Engineer immediately in writing.
- E. The contractor shall become familiar with the drawings and scope of work of other trades as the work scope of those trades relates to mechanical equipment and connection requirements.
- F. During demolition the contractor shall record on site as-builts all hydronic system piping capped branches, capped supply air, return air and exhaust ducts for reuse in renovated project space.

PART 2 PRODUCTS

2.1 MATERIALS

- A. Materials and equipment for patching and extending work: As specified in individual sections.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify that piping and ductwork to be demolished serve only equipment and facilities within the demolition areas.
- B. Demolition drawings are based on casual field observation and existing record documents.
- C. Report discrepancies to Owner before disturbing existing installation.
- D. Beginning of demolition means installer accepts existing conditions.

3.2 PREPARATION

- A. Identify locations for capping piping and ductwork before any demolition work commences.
- B. Confirm isolation valve locations for hydronic piping. Repair leaking isolation valves or replace inoperable valves before commencing piping demolition.
- C. Cap and seal air-tight supply, return and exhaust air ductwork at shaft walls before commencing sheet metal demolition

3.3 DEMOLITION AND EXTENSION OF EXISTING MECHANICAL WORK

- A. Remove all supply, return and exhaust air ductwork as indicated on plans.

END OF SECTION

SECTION 23 0593
TESTING, ADJUSTING, AND BALANCING FOR HVAC

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Testing, adjustment, and balancing of air systems.

1.2 RELATED REQUIREMENTS

- A. Division 01 - General Requirements: Project administrative and procedural requirements.
- B. Section 23 0005 - Basic HVAC Requirements.

1.3 REFERENCE STANDARDS

- A. AABC (NSTSB) - AABC National Standards for Total System Balance, 7th Edition 2016.
- B. ASHRAE Std 111 - Measurement, Testing, Adjusting, and Balancing of Building HVAC Systems 2008, with Errata (2019).
- C. NEBB (TAB) - Procedural Standards for Testing Adjusting and Balancing of Environmental Systems 2015, with Errata (2017).
- D. SMACNA (TAB) - HVAC Systems Testing, Adjusting and Balancing 2002.

1.4 SUBMITTALS

- A. Contractor shall provide submittals for equipment listed herein. Refer to Division 01 - General Requirements for submittal procedures.
- B. TAB Plan: Submit a written plan indicating the testing, adjusting, and balancing standard to be followed and the specific approach for each system and component.

1. Include at least the following in the plan:

- a. List of all air flow, water flow, sound level, system capacity and efficiency measurements to be performed and a description of specific test procedures, parameters, formulas to be used.
- b. Copy of field checkout sheets and logs to be used, listing each piece of equipment to be tested, adjusted and balanced with the data cells to be gathered for each.
- c. Discussion of what notations and markings will be made on the duct and piping drawings during the process.
- d. Final test report forms to be used.
- e. Details of how TOTAL flow will be determined; for example:

- 1) Air: Sum of terminal flows via control system calibrated readings or via hood readings of all terminals, supply (SA) and return air (RA) pitot traverse, SA or RA flow stations.
 - f. Specific procedures that will ensure that air side are operating at the lowest possible pressures and methods to verify this.
 - g. Exhaust fan balancing and capacity verifications, including any required room pressure differentials.
 - h. Procedures for formal deficiency reports, including scope, frequency and distribution.
- C. Final Report: Indicate deficiencies in systems that would prevent proper testing, adjusting, and balancing of systems and equipment to achieve specified performance.
1. Revise TAB plan to reflect actual procedures and submit as part of final report.
 2. Submit draft copies of report for review prior to final acceptance of Project. Provide final copies for Strategic Energy Solutions, Inc. and for inclusion in operating and maintenance manuals.
 3. Include actual instrument list, with manufacturer name, serial number, and date of calibration.
 4. Form of Test Reports: Where the TAB standard being followed recommends a report format use that; otherwise, follow ASHRAE Std 111.
 5. Units of Measure: Report data in both I-P (inch-pound) and SI (metric) units.
 6. Include the following on the title page of each report:
 - a. Name of Testing, Adjusting, and Balancing Agency.
 - b. Address of Testing, Adjusting, and Balancing Agency.
 - c. Telephone number of Testing, Adjusting, and Balancing Agency.
 - d. Project name.
 - e. Project location.
 - f. Report date.
- D. Project Record Documents: Record actual locations of flow measuring stations and balancing valves and rough setting.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

3.1 GENERAL REQUIREMENTS

- A. Perform total system balance in accordance with one of the following:
 - 1. AABC (NSTSB), AABC National Standards for Total System Balance.
 - 2. ASHRAE Std 111, Practices for Measurement, Testing, Adjusting and Balancing of Building Heating, Ventilation, Air-Conditioning, and Refrigeration Systems.
 - 3. NEBB Procedural Standards for Testing Adjusting Balancing of Environmental Systems.
 - 4. SMACNA (TAB).
- B. Begin work after completion of systems to be tested, adjusted, or balanced and complete work prior to Substantial Completion of the project.
- C. Where HVAC systems and/or components interface with life safety systems, including fire and smoke detection, alarm, and control, coordinate scheduling and testing and inspection procedures with the authorities having jurisdiction.
- D. TAB Agency Qualifications:
 - 1. Company specializing in the testing, adjusting, and balancing of systems specified in this section.
 - 2. Certified by one of the following:
 - a. AABC, Associated Air Balance Council: www.aabc.com/#sle; upon completion submit AABC National Performance Guaranty.
 - b. NEBB, National Environmental Balancing Bureau: www.nebb.org/#sle.
 - c. TABB, The Testing, Adjusting, and Balancing Bureau of National Energy Management Institute: www.tabbcertified.org/#sle.
- E. TAB Supervisor and Technician Qualifications: Certified by same organization as TAB agency.

3.2 EXAMINATION

- A. Verify that systems are complete and operable before commencing work. Ensure the following conditions:
 - 1. Systems are started and operating in a safe and normal condition.
 - 2. Temperature control systems are installed complete and operable.
 - 3. Proper thermal overload protection is in place for electrical equipment.
 - 4. Duct systems are clean of debris.

5. Fans are rotating correctly.
6. Fire and volume dampers are in place and open.
7. Access doors are closed and duct end caps are in place.
8. Air outlets are installed and connected.
9. Duct system leakage is minimized.

B. Beginning of work means acceptance of existing conditions.

3.3 ADJUSTMENT TOLERANCES

- A. Air Handling Systems: Adjust to within plus or minus 5 percent of design for supply systems and plus or minus 10 percent of design for return and exhaust systems.
- B. Air Outlets and Inlets: Adjust total to within plus 10 percent and minus 5 percent of design to space. Adjust outlets and inlets in space to within plus or minus 10 percent of design.

3.4 RECORDING AND ADJUSTING

- A. Ensure recorded data represents actual measured or observed conditions.
- B. Permanently mark settings of valves, dampers, and other adjustment devices allowing settings to be restored. Set and lock memory stops.
- C. Mark on drawings the locations where traverse and other critical measurements were taken and cross reference the location in the final report.
- D. After adjustment, take measurements to verify balance has not been disrupted or that such disruption has been rectified.
- E. Leave systems in proper working order, replacing belt guards, closing access doors, closing doors to electrical switch boxes, and restoring thermostats to specified settings.

3.5 AIR SYSTEM PROCEDURE

- A. Adjust air handling and distribution systems to provide required or design supply, return, and exhaust air quantities at site altitude.
- B. Make air quantity measurements in ducts by Pitot tube traverse of entire cross sectional area of duct.
- C. Measure air quantities at air inlets and outlets.
- D. Adjust distribution system to obtain uniform space temperatures free from objectionable drafts and noise.

- E. Use volume control devices to regulate air quantities only to extend that adjustments do not create objectionable air motion or sound levels. Effect volume control by duct internal devices such as dampers and splitters.
- F. Vary total system air quantities by adjustment of fan speeds. Provide drive changes required. Vary branch air quantities by damper regulation.
- G. Provide system schematic with required and actual air quantities recorded at each outlet or inlet.
- H. Measure static air pressure conditions on air supply units, including filter and coil pressure drops, and total pressure across the fan. Make allowances for 50 percent loading of filters.
- I. Adjust outside air automatic dampers, outside air, return air, and exhaust dampers for design conditions.
- J. Measure temperature conditions across outside air, return air, and exhaust dampers to check leakage.

3.6 SCOPE

- A. Test, adjust, and balance the following:
 - 1. Fans.
 - 2. Air Inlets and Outlets.

3.7 MINIMUM DATA TO BE REPORTED

- A. Electric Motors:
 - 1. Manufacturer.
 - 2. Model/Frame.
 - 3. HP/BHP.
 - 4. Phase, voltage, amperage; nameplate, actual, no load.
 - 5. RPM.
 - 6. Service factor.
 - 7. Starter size, rating, heater elements.
 - 8. Sheave Make/Size/Bore.
- B. Exhaust Fans:
 - 1. Location.
 - 2. Manufacturer.

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3. Model number.
4. Serial number.
5. Air flow, specified and actual.
6. Total static pressure (total external), specified and actual.
7. Inlet pressure.
8. Discharge pressure.
9. Sheave Make/Size/Bore.
10. Number of Belts/Make/Size.
11. Fan RPM.

END OF SECTION

SECTION 23 0713
DUCT INSULATION

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Duct insulation.
- B. Duct liner.

1.2 RELATED REQUIREMENTS

- A. Division 01 - General Requirements: Project procedural and administrative requirements.
- B. Division 07 - Thermal and Moisture Protection: Firestopping.
- C. Section 23 0005 - Basic HVAC Requirements.
- D. Section 23 3100 - HVAC Ducts and Casings: Glass fiber ducts.

1.3 REFERENCE STANDARDS

- A. ASTM C553 - Standard Specification for Mineral Fiber Blanket Thermal Insulation for Commercial and Industrial Applications 2013 (Reapproved 2019).
- B. ASTM C612 - Standard Specification for Mineral Fiber Block and Board Thermal Insulation 2014 (Reapproved 2019).
- C. ASTM C916 - Standard Specification for Adhesives for Duct Thermal Insulation 2020.
- D. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials 2021a.
- E. SMACNA (DCS) - HVAC Duct Construction Standards Metal and Flexible 2020.
- F. UL 723 - Standard for Test for Surface Burning Characteristics of Building Materials Current Edition, Including All Revisions.

1.4 SUBMITTALS

- A. Contractor shall provide submittals for equipment listed herein. Refer to Division 01 - General Requirements for submittal procedures.
- B. Product Data: Provide product description, thermal characteristics, list of materials and thickness for each service, and locations.
- C. Manufacturer's Instructions: Indicate installation procedures necessary to ensure acceptable workmanship and that installation standards will be achieved.

1.5 QUALITY ASSURANCE

- A. Applicator Qualifications: Company specializing in performing the type of work specified in this section and approved by manufacturer.

PART 2 PRODUCTS

2.1 REGULATORY REQUIREMENTS

- A. Surface Burning Characteristics: Flame spread index/Smoke developed index of 25/50, maximum, when tested in accordance with ASTM E84, UL 723, ASTM E84, or UL 723.

2.2 GLASS FIBER, FLEXIBLE WRAP

- A. Manufacturer:

1. Knauf Insulation: www.knaufusa.com.
2. Johns Manville: www.jm.com.
3. Owens Corning Corporation: www.ocbuildingspec.com.
4. CertainTeed Corporation: www.certainteed.com/#sle.

- B. Insulation: ASTM C553; flexible, noncombustible blanket.

1. 'K' value: 0.31 at 75 degrees F, when tested in accordance with ASTM C518.
2. Maximum Service Temperature: 1200 degrees F.
3. Maximum Water Vapor Absorption: 5.0 percent by weight.

- C. Insulation shall be 1.5 lb/cu. ft. density. Refer to Schedule below for thickness.

- D. Vapor Barrier Jacket:

1. Kraft paper with glass fiber yarn and bonded to aluminized film.
2. Secure with pressure sensitive tape.

- E. Vapor Barrier Tape:

1. Kraft paper reinforced with glass fiber yarn and bonded to aluminized film, with pressure sensitive rubber based adhesive.

- F. Tie Wire: Annealed steel, 16 gage, 0.0508 inch diameter.

2.3 GLASS FIBER, RIGID (EXTERIOR BOARD DUCT INSULATION)

- A. Manufacturer:

1. Knauf Insulation: www.knaufusa.com.
2. Johns Manville: www.jm.com.

3. Owens Corning Corporation: www.ocbuildingspec.com/#sle.
4. CertainTeed Corporation: www.certainteed.com.

B. Insulation: ASTM C612; rigid, noncombustible blanket.

1. 'K' Value: 0.24 at 75 degrees F, when tested in accordance with ASTM C518.
2. Maximum Service Temperature: 450 degrees F.
3. Maximum Water Vapor Absorption: 5.0 percent.

C. Vapor Barrier Jacket:

1. Kraft paper with glass fiber yarn and bonded to aluminized film.
2. Moisture Vapor Permeability: 0.029 ng/Pa s m (0.02 perm inch), when tested in accordance with ASTM E96/E96M.
3. Secure with two coats of vapor barrier mastic and glass tape.

D. Vapor Barrier Tape:

1. Kraft paper reinforced with glass fiber yarn and bonded to aluminized film, with pressure sensitive rubber based adhesive. The use of duct tape is prohibited.

2.4 DUCT LINER

A. Manufacturers:

1. Knauf Insulation: www.knaufusa.com.
2. Johns Manville: www.jm.com.
3. Owens Corning Corporation: www.ocbuildingspec.com.
4. CertainTeed Corporation: www.certainteed.com/#sle.

B. Insulation: ASTM C 1071; flexible, noncombustible blanket with poly vinyl acetate polymer impregnated surface and edge coat.

1. Apparent Thermal Conductivity: Maximum of 0.31 at 75 degrees F.
2. Service Temperature: Up to 250 degrees F.
3. Rated Velocity on Coated Air Side for Air Erosion: 5,000 fpm, minimum.
4. Maximum Velocity on Coated Air Side: 5,000 fpm.
5. Minimum Noise Reduction Coefficients:
6. 1 inch Thickness: 0.45.

- C. Adhesive: Waterproof, fire-retardant type, ASTM C916.
- D. Liner Fasteners: Galvanized steel, self-adhesive pad with integral head.
 - 1. Density: 1.5 lb/cu ft
 - 2. Liner shall meet Anti-Bacterial Requirements of ASTM C 1071, ASTM G 21 and ASTM G 22
 - 3. Liner shall be cleanable in accordance with NAIMA "Duct Cleaning Guide."

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify that ducts have been pressure and leak tested before applying insulation materials.
- B. Verify that surfaces are clean, foreign material removed, and dry.

3.2 INSTALLATION

- A. Install in accordance with manufacturer's instructions.
- B. Install in accordance with NAIMA National Insulation Standards.
- C. Insulated ducts conveying air below ambient temperature:
 - 1. Provide insulation with vapor barrier jackets.
 - 2. Finish with tape and vapor barrier jacket.
 - 3. Continue insulation through walls penetrtrions and at hanger connections.
 - 4. Insulate entire system including fittings, joints, flanges, fire dampers, flexible connections, and expansion joints.
- D. Exterior Applications: Provide insulation with vapor barrier jacket. Cover with with calked aluminum jacket with seams located on bottom side of horizontal duct section.
- E. External Duct Insulation Application:
 - 1. Secure insulation with vapor barrier with wires and seal jacket joints with vapor barrier adhesive or tape to match jacket.
 - 2. Secure insulation without vapor barrier with staples, tape, or wires.
 - 3. Install without sag on underside of duct. Use adhesive or mechanical fasteners where necessary to prevent sagging. Lift duct off trapeze hangers and insert spacers.
 - 4. Seal vapor barrier penetrations by mechanical fasteners with vapor barrier adhesive.

5. Stop and point insulation around access doors and damper operators to allow operation without disturbing wrapping.

F. Duct and Plenum Liner Application:

1. Adhere insulation with adhesive for 90 percent coverage.
2. Secure insulation with mechanical liner fasteners. Refer to SMACNA (DCS) for spacing.
3. Seal and smooth joints. Seal and coat transverse joints.
4. Seal liner surface penetrations with adhesive.
5. Duct dimensions indicated are net inside dimensions required for air flow. Increase duct size to allow for insulation thickness.
6. Provide nosing on all exposed fiberglass edges.

3.3 SCHEDULES

A. Exhaust Ducts Within 10 ft of Exterior Openings:

1. Flexible Glass Fiber Duct Insulation: 1-1/2 inches thick.

B. Return Air Ductwork (located in plenum/conditioned space):

1. Duct Liner: 1 inches thick (first ten feet only) from unit.

C. Supply Ductwork (located in plenum or unconditioned spaces):

1. Flexible Glass Fiber Duct Insulation: 1-1/2 inches thick.

END OF SECTION

SECTION 23 3100
HVAC DUCTS AND CASINGS

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Single-wall rectangular ducts and fittings.
- B. Single-wall round ducts and fittings.
- C. Sheet metal materials.
- D. Sealants and gaskets.
- E. Hangers and supports.

1.2 RELATED REQUIREMENTS

- A. Division 07 - Thermal and Moisture Protection: Firestopping.
- B. Section 23 0005 - Basic HVAC Requirements.
- C. Section 23 0593 - Testing, Adjusting, and Balancing for HVAC.
- D. Section 23 3300 - Air Duct Accessories.
- E. Section 23 3700 - Air Outlets and Inlets.

1.3 REFERENCE STANDARDS

- A. ASTM A36/A36M - Standard Specification for Carbon Structural Steel 2019.
- B. ASTM A276/A276M - Standard Specification for Stainless Steel Bars and Shapes 2017.
- C. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process 2020.
- D. ASTM A1011/A1011M - Standard Specification for Steel, Sheet and Strip, Hot-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, and Ultra-High Strength 2018a.
- E. ASTM B209 - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate 2014.
- F. NFPA 90A - Standard for the Installation of Air-Conditioning and Ventilating Systems 2021.
- G. NFPA 96 - Standard for Ventilation Control and Fire Protection of Commercial Cooking Operations 2021.
- H. SMACNA (DCS) - HVAC Duct Construction Standards Metal and Flexible 2020.

- I. UL 181 - Standard for Factory-Made Air Ducts and Air Connectors current edition, including all revisions.

1.4 PERFORMANCE REQUIREMENTS

- A. Delegated Duct Design: Duct construction, including sheet metal thicknesses, seam and joint construction, reinforcements, and hangers and supports, shall comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible" and performance requirements and design criteria indicated in "Duct Schedule" Article.
- B. Structural Performance: Duct hangers and supports shall withstand the effects of gravity loads and stresses within limits and under conditions described in SMACNA's "HVAC Duct Construction Standards - Metal and Flexible" and ASCE/SEI 7.
- C. Airstream Surfaces: Surfaces in contact with the airstream shall comply with requirements in ASHRAE 62.1.

1.5 SUBMITTALS

- A. Contractor shall provide submittals for equipment listed herein. Refer to Division 01 - General Requirements for submittal procedures.
- B. Product Data: Provide data for duct materials, duct connections, and factory fabricated fittings.

1.6 REGULATORY REQUIREMENTS

- A. Construct ductwork to SMACNA (DCS) - HVAC Duct Construction Standards - Metal and Flexible; Sheet Metal and Air Conditioning Contractors' National Association; 1995, Second Edition with Addendum No. 1.

PART 2 PRODUCTS

2.1 SINGLE-WALL RECTANGULAR DUCT AND FITTING ASSEMBLIES

- A. Regulatory Requirements: Construct ductwork to NFPA 90A standards.
- B. General Fabrication Requirements: Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible" based on indicated static-pressure class unless otherwise indicated.
- C. Transverse Joints: Select joint types and fabricate according to SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Figure 2-1, "Rectangular Duct/Transverse Joints," for static-pressure class, applicable sealing requirements, materials involved, duct-support intervals, and other provisions in SMACNA's "HVAC Duct Construction Standards - Metal and Flexible."
- D. Longitudinal Seams: Select seam types and fabricate according to SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Figure 2-2, "Rectangular Duct/Longitudinal Seams," for static-pressure class, applicable sealing requirements, materials involved, duct-

support intervals, and other provisions in SMACNA's "HVAC Duct Construction Standards - Metal and Flexible."

- E. Elbows, Transitions, Offsets, Branch Connections, and Other Duct Construction: Select types and fabricate according to SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Chapter 4, "Fittings and Other Construction," for static-pressure class, applicable sealing requirements, materials involved, duct-support intervals, and other provisions in SMACNA's "HVAC Duct Construction Standards - Metal and Flexible."

2.2 SINGLE-WALL ROUND DUCT AND FITTING ASSEMBLIES

- A. General Fabrication Requirements: Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Chapter 3, "Round, Oval, and Flexible Duct," based on indicated static-pressure class unless otherwise indicated.
 - 1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - a. McGill AirFlow LLC.
 - b. Spiral Manufacturing Co., Inc.
- B. Transverse Joints: Select joint types and fabricate according to SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Figure 3-1, "Round Duct Transverse Joints," for static-pressure class, applicable sealing requirements, materials involved, duct-support intervals, and other provisions in SMACNA's "HVAC Duct Construction Standards - Metal and Flexible."
 - 1. Transverse Joints in Ducts Larger Than 60 Inches in Diameter: Flanged.
- C. Longitudinal Seams: Select seam types and fabricate according to SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Figure 3-2, "Round Duct Longitudinal Seams," for static-pressure class, applicable sealing requirements, materials involved, duct-support intervals, and other provisions in SMACNA's "HVAC Duct Construction Standards - Metal and Flexible."
 - 1. Fabricate round ducts larger than 90 inches in diameter with butt-welded longitudinal seams.
- D. Tees and Laterals: Select types and fabricate according to SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Figure 3-5, "90 Degree Tees and Laterals," and Figure 3-6, "Conical Tees," for static-pressure class, applicable sealing requirements, materials involved, duct-support intervals, and other provisions in SMACNA's "HVAC Duct Construction Standards - Metal and Flexible."

2.3 MATERIALS

- A. Galvanized Steel for Ducts: Hot-dipped galvanized steel sheet, ASTM A653/A653M FS Type B, with G60/Z180 coating.
- B. General Material Requirements: Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible" for acceptable materials, material thicknesses, and duct construction methods unless otherwise indicated. Sheet metal materials shall be free of pitting, seam marks, roller marks, stains, discolorations, and other imperfections.
- C. Galvanized Sheet Steel: Comply with ASTM A 653/A 653M.
 - 1. Galvanized Coating Designation: G90.
 - 2. Finishes for Surfaces Exposed to View: Mill phosphatized.
- D. Tie Rods: Galvanized steel, 1/4-inch minimum diameter for lengths 36 inches or less; 3/8-inch minimum diameter for lengths longer than 36 inches.

2.4 SEALANTS AND GASKETS

- A. General Sealant and Gasket Requirements: Surface-burning characteristics for sealants and gaskets shall be a maximum flame-spread index of 25 and a maximum smoke-developed index of 50 when tested according to UL 723; certified by an NRTL.
- B. Two-Part Tape Sealing System:
 - 1. Tape: Woven cotton fiber impregnated with mineral gypsum and modified acrylic/silicone activator to react exothermically with tape to form hard, durable, airtight seal.
 - 2. Tape Width: 3 inches.
 - 3. Sealant: Modified styrene acrylic.
 - 4. Water resistant.
 - 5. Mold and mildew resistant.
 - 6. Maximum Static-Pressure Class: 10-inch wg, positive and negative.
 - 7. Service: Indoor and outdoor.
 - 8. Service Temperature: Minus 40 to plus 200 deg F.
 - 9. Substrate: Compatible with galvanized sheet steel (both PVC coated and bare), stainless steel, or aluminum.
 - 10. For indoor applications, sealant shall have a VOC content of 250 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).

11. Sealant shall comply with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."

C. Water-Based Joint and Seam Sealant:

1. Application Method: Brush on.
2. Solids Content: Minimum 65 percent.
3. Shore A Hardness: Minimum 20.
4. Water resistant.
5. Mold and mildew resistant.
6. VOC: Maximum 75 g/L (less water).
7. Maximum Static-Pressure Class: 10-inch wg, positive and negative.
8. Service: Indoor or outdoor.
9. Substrate: Compatible with galvanized sheet steel (both PVC coated and bare), stainless steel, or aluminum sheets.

D. Flanged Joint Sealant: Comply with ASTM C 920.

1. General: Single-component, acid-curing, silicone, elastomeric.
2. Type: S.
3. Grade: NS.
4. Class: 25.
5. Use: O.
6. For indoor applications, sealant shall have a VOC content of 250 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
7. Sealant shall comply with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."

E. Flange Gaskets: Butyl rubber, neoprene, or EPDM polymer with polyisobutylene plasticizer.

F. Round Duct Joint O-Ring Seals:

1. Seal shall provide maximum leakage class of 3 cfm/100 sq. ft. at 1-inch wg and shall be rated for

2.5 HANGERS AND SUPPORTS

- A. Hanger Rods for Noncorrosive Environments: Cadmium-plated steel rods and nuts.
- B. Hanger Rods for Corrosive Environments: Electrogalvanized, all-thread rods or galvanized rods with threads painted with zinc-chromate primer after installation.
- C. Strap and Rod Sizes: Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Table 5-1, "Rectangular Duct Hangers Minimum Size," and Table 5-2, "Minimum Hanger Sizes for Round Duct."
- D. Steel Cables for Galvanized-Steel Ducts: Galvanized steel complying with ASTM A 603.
- E. Steel Cables for Stainless-Steel Ducts: Stainless steel complying with ASTM A 492.
- F. Steel Cable End Connections: Cadmium-plated steel assemblies with brackets, swivel, and bolts designed for duct hanger service; with an automatic-locking and clamping device.
- G. Duct Attachments: Sheet metal screws, blind rivets, or self-tapping metal screws; compatible with duct materials.
- H. Trapeze and Riser Supports:
 - 1. Supports for Galvanized-Steel Ducts: Galvanized-steel shapes and plates.
 - 2. Supports for Stainless-Steel Ducts: Stainless-steel shapes and plates.
 - 3. Supports for Aluminum Ducts: Aluminum or galvanized steel coated with zinc chromate.

2.6 DUCTWORK FABRICATION

- A. Provide duct material, gages, reinforcing, and sealing for operating pressures indicated.
- B. Construct T's, bends, and elbows with radius of not less than 1-1/2 times width of duct on centerline. Where not possible and where rectangular elbows must be used, provide air foil turning vanes of perforated metal with glass fiber insulation.
- C. T's, bends, and elbows: Construct according to SMACNA (DCS).
- D. Increase duct sizes gradually, not exceeding 15 degrees divergence wherever possible; maximum 30 degrees divergence upstream of equipment and 45 degrees convergence downstream.
- E. Provide standard 45 degree lateral wye takeoffs unless otherwise indicated where 90 degree conical tee connections may be used.

2.7 MANUFACTURED DUCTWORK AND FITTINGS

- A. Manufacture in accordance with SMACNA HVAC Duct Construction Standards - Metal and Flexible, and as indicated. Provide duct material, gages, reinforcing, and sealing for operating

pressures indicated.

- B. Round Ducts: Round lockseam duct with galvanized steel outer wall.
 - 1. Manufacture in accordance with SMACNA (DCS).
- C. Flexible Ducts: Black polymer film supported by helically wound spring steel wire.
 - 1. UL labeled.
 - 2. Insulation: Fiberglass insulation with polyethylene vapor barrier film.
 - 3. Pressure Rating: 4 inches WG positive and 0.5 inches WG negative.
 - 4. Maximum Velocity: 4000 fpm.
 - 5. Temperature Range: Minus 20 degrees F to 175 degrees F.

PART 3 EXECUTION

3.1 INSTALLATION

- A. Install in accordance with manufacturer's instructions.
- B. Drawing plans, schematics, and diagrams indicate general location and arrangement of duct system. Indicated duct locations, configurations, and arrangements were used to size ducts and calculate friction loss for air-handling equipment sizing and for other design considerations. Install duct systems as indicated unless deviations to layout are approved on Shop Drawings and Coordination Drawings.
- C. Install, support and seal ducts according to SMACNA's "HVAC Duct Construction Standards - Metal and Flexible" unless otherwise indicated.
- D. Install ducts with fewest possible joints.
- E. Install factory- or shop-fabricated fittings for changes in direction, size, and shape and for branch connections.
- F. Unless otherwise indicated, install ducts vertically and horizontally, and parallel and perpendicular to building lines.
- G. Install ducts with a clearance of 1 inch, plus allowance for insulation thickness.
- H. Protect duct interiors from moisture, construction debris and dust, and other foreign materials. Comply with SMACNA's "IAQ Guidelines for Occupied Buildings Under Construction," Appendix G, "Duct Cleanliness for New Construction Guidelines."
- I. During construction provide temporary closures of metal or taped polyethylene on open ductwork to prevent construction dust from entering ductwork system.

- J. Duct sizes indicated are inside clear dimensions. For lined ducts, maintain sizes inside lining.
- K. Use double nuts and lock washers on threaded rod supports.
- L. Connect diffusers to low pressure ducts directly or with 5 feet maximum length of flexible duct held in place with strap or clamp.

3.2 HANGER AND SUPPORT INSTALLATION

- A. Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Chapter 5, "Hangers and Supports."
- B. Building Attachments: Concrete inserts, powder-actuated fasteners, or structural-steel fasteners appropriate for construction materials to which hangers are being attached.
 - 1. Where practical, install concrete inserts before placing concrete.
 - 2. Install powder-actuated concrete fasteners after concrete is placed and completely cured.
 - 3. Use powder-actuated concrete fasteners for standard-weight aggregate concretes or for slabs more than 4 inches thick.
 - 4. Do not use powder-actuated concrete fasteners for lightweight-aggregate concretes or for slabs less than 4 inches thick.
 - 5. Do not use powder-actuated concrete fasteners for seismic restraints.
- C. Hanger Spacing: Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Table 5-1, "Rectangular Duct Hangers Minimum Size," and Table 5-2, "Minimum Hanger Sizes for Round Duct," for maximum hanger spacing; install hangers and supports within 24 inches of each elbow and within 48 inches of each branch intersection.
- D. Install upper attachments to structures. Select and size upper attachments with pull-out, tension, and shear capacities appropriate for supported loads and building materials where used.

3.3 DUCT SEALING

- A. Seal ducts for duct static-pressure, seal classes, and leakage classes specified in "Duct Schedule" Article according to SMACNA's "HVAC Duct Construction Standards - Metal and Flexible."

3.4 CLEANING

- A. Clean duct systems with high power vacuum machines. Protect equipment that could be harmed by excessive dirt with filters, or bypass during cleaning. Provide adequate access into ductwork for cleaning purposes.

END OF SECTION 23 3100

SECTION 23 3300
AIR DUCT ACCESSORIES

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Backdraft dampers - metal.
- B. Flexible duct connections.
- C. Volume control dampers.

1.2 RELATED REQUIREMENTS

- A. Division 01 - General Requirements: Project procedural and administrative requirements.
- B. Division 07 - Thermal and Moisture Protection: Firestopping.
- C. Section 23 0005 - Basic HVAC Requirements.
- D. Section 23 3100 - HVAC Ducts and Casings.

1.3 REFERENCE STANDARDS

- A. NFPA 90A - Standard for the Installation of Air-Conditioning and Ventilating Systems 2021.
- B. SMACNA (DCS) - HVAC Duct Construction Standards Metal and Flexible 2020.

1.4 SUBMITTALS

- A. Contractor shall provide submittals for equipment listed herein. Refer to Division 01 - General Requirements for submittal procedures.

PART 2 PRODUCTS

2.1 BACKDRAFT DAMPERS - METAL

2.2 BACKDRAFT DAMPERS

- A. Manufacturers:
 - 1. Greenheck Inc: www.greenheck.com.
 - 2. Ruskin Company: www.ruskin.com.
- B. Gravity Backdraft Dampers, Size 18 by 18 inches or Smaller, Furnished with Air Moving Equipment: Air moving equipment manufacturer's standard construction.

2.3 BACKDRAFT DAMPERS - FABRIC

- A. Fabric Backdraft Dampers: Factory-fabricated.

1. Blades: Neoprene coated fabric material.
2. Birdscreen: 1/2 inch nominal mesh of galvanized steel or aluminum.
3. Maximum Velocity: 1000 fpm (5 mps) face velocity.

2.4 FLEXIBLE DUCT CONNECTIONS

- A. Fabricate in accordance with SMACNA (DCS) and as indicated.
- B. Flexible Duct Connections: Fabric crimped into metal edging strip.

2.5 VOLUME CONTROL DAMPERS

- A. Manufacturers:
 1. Louvers & Dampers, Inc: www.louvers-dampers.com.
 2. Price Industries Inc: www.priceindustries.com.
 3. Ruskin Company: www.ruskin.com.
- B. Fabricate in accordance with SMACNA (DCS) and as indicated.
- C. Single Blade Dampers:
 1. Blade: 24 gage, 0.0239 inch, minimum.
- D. Multi-Blade Damper: Fabricate of opposed blade pattern with maximum blade sizes 8 by 72 inch. Assemble center and edge crimped blades in prime coated or galvanized channel frame with suitable hardware.
 1. Blade: 18 gage, 0.0478 inch, minimum.
- E. End Bearings: Except in round ducts 12 inches and smaller, provide end bearings. On multiple blade dampers, provide oil-impregnated nylon, thermoplastic elastomer, or sintered bronze bearings.
- F. Quadrants:
 1. Provide locking, indicating quadrant regulators on single and multi-blade dampers.
 2. On insulated ducts mount quadrant regulators on stand-off mounting brackets, bases, or adapters.
 3. Where rod lengths exceed 30 inches provide regulator at both ends.

PART 3 EXECUTION

3.1 INSTALLATION

- A. Install accessories in accordance with manufacturer's instructions, NFPA 90A, and follow SMACNA (DCS). Refer to Section 23 3100 for duct construction and pressure class.
- B. Provide backdraft dampers on exhaust fans or exhaust ducts nearest to outside and where indicated.
- C. Provide duct test holes where indicated and required for testing and balancing purposes.
- D. Provide balancing dampers at points on supply, return, and exhaust systems where branches are taken from larger ducts as required for air balancing. Install minimum 2 duct widths from duct take-off.
- E. Provide balancing dampers on duct take-off to diffusers, grilles, and registers, regardless of whether dampers are specified as part of the diffuser, grille, or register assembly.

END OF SECTION 23 3300

SECTION 23 3423
HVAC POWER VENTILATORS

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Roof exhausters.

1.2 SUBMITTALS

- A. Product Data: Provide data on fans and accessories including fan curves with specified operating point clearly plotted, power, RPM, sound power levels at rated capacity, and electrical characteristics and connection requirements.

1.3 FIELD CONDITIONS

- A. Permanent ventilators may not be used for ventilation during construction.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Greenheck: www.greenheck.com.
- B. Loren Cook Company: www.lorencook.com.
- C. PennBarry: www.pennbarry.com.

2.2 POWER VENTILATORS - GENERAL

- A. Electrical Components: Listed and classified by Underwriters Laboratories Inc. as suitable for the purpose specified and indicated.

2.3 ROOF EXHAUSTERS

- A. Fan Unit: V-belt or direct driven as indicated, with spun aluminum housing; resilient mounted motor; 1/2 inch mesh, 0.62 inch thick aluminum wire birdscreen; square base to suit roof curb with continuous curb gaskets.
- B. Roof Curb: 12 inch high self-flashing of galvanized steel with continuously welded seams, built-in cant strips.
- C. Disconnect Switch: Factory wired, non-fusible, in housing for thermal overload protected motor and wall mounted multiple speed switch.
- D. Backdraft Damper: Gravity actuated, aluminum multiple blade construction, felt edged with offset hinge pin, nylon bearings, blades linked, and line voltage motor drive, power open, spring return.

Kingscott Associates, Inc.
Architects/Engineers
Kalamazoo, Michigan

Locker Room Remodeling
Hazel Park High School
Hazel Park, Michigan

PART 3 EXECUTION

3.1 INSTALLATION

- A. Install in accordance with manufacturer's instructions.
- B. Extend ducts to roof exhausters into roof curb. Counterflash duct to roof opening.
- C. Provide sheaves required for final air balance.
- D. Install backdraft dampers on inlet to roof and wall exhausters.
- E. Provide backdraft dampers on outlet from cabinet and ceiling exhauster fans and as indicated.

END OF SECTION 23 3423

SECTION 23 3700
AIR OUTLETS AND INLETS

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Diffusers:
- B. Rectangular ceiling diffusers.
- C. Registers/grilles.

1.2 RELATED REQUIREMENTS

- A. Division 01 - General Requirements: Project procedural and administrative requirements.
- B. Division 09 - Finishes: Painting of ducts visible behind outlets and inlets.

1.3 REFERENCE STANDARDS

- A. ASHRAE Std 70 - Method of Testing the Performance of Air Outlets and Inlets 2006 (Reaffirmed 2021).

1.4 SUBMITTALS

- A. Contractor shall provide submittals for equipment listed herein. Refer to Division 01 - General Requirements for submittal procedures.
- B. Product Data: Provide data for equipment required for this project. Review outlets and inlets as to size, finish, and type of mounting prior to submission. Submit schedule of outlets and inlets showing type, size, location, application, and noise level.

1.5 QUALITY ASSURANCE

- A. Test and rate air outlet and inlet performance in accordance with ASHRAE Std 70.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Krueger: www.krueger-hvac.com.
- B. Price Industries: www.price-hvac.com.
- C. Titus: www.titus-hvac.com.

2.2 RECTANGULAR CEILING DIFFUSERS

- A. Type: Provide minimum security diffuser with lattice face to discharge air in four way pattern.

- B. Connections: Round.
- C. Frame: Provide surface mount and inverted T-bar type.
- D. Fabrication: Steel with baked enamel finish.
- E. Accessories: Provide radial opposed blade volume control damper; gaskets for surface mounted diffusers with damper adjustable from diffuser face.
- F. Provide tamper resistant hardware.

2.3 CEILING EXHAUST REGISTERS

- A. Type: Streamlined blades, 3/4 inch minimum depth, 3/4 inch maximum spacing, with blades set at 45 degrees, vertical face.
- B. Frame: 1-1/4 inch margin with countersunk screw mounting.
- C. Fabrication: Steel with 20 gage, 0.0359 inch minimum frames and 22 gage, 0.0299 inch minimum blades, steel and aluminum with 20 gage, 0.0359 inch minimum frame, or aluminum extrusions, with factory baked enamel finish.
- D. Damper: Integral, gang-operated, opposed blade type with removable key operator, operable from face where not individually connected to exhaust fans.

PART 3 EXECUTION

3.1 INSTALLATION

- A. Install in accordance with manufacturer's instructions.
- B. Check location of outlets and inlets and make necessary adjustments in position to conform with architectural features, symmetry, and lighting arrangement.
- C. Install diffusers to ductwork with air tight connection.
- D. Provide balancing dampers on duct take-off to diffusers, and grilles and registers, despite whether dampers are specified as part of the diffuser, or grille and register assembly.
- E. Paint ductwork visible behind air outlets and inlets matte black. Refer to Section 09 9123.

END OF SECTION 23 3700

SECTION 26 0005
BASIC ELECTRICAL REQUIREMENTS

PART 1 GENERAL

1.1 RELATED DOCUMENTS

- A. This section applies to all sections of Division 26 and Division 28.
- B. Drawings and general provisions of the contract, including Division 00 and Division 01 specification sections, apply to work of this section.
- C. Provide all items, articles, materials, operations or methods listed, mentioned or scheduled on drawings and/or herein, including all labor, materials, equipment and incidentals necessary and required for their completion.
- D. The items in this section are supplementary to the requirements set forth in other portions of the specifications as indicated under Item "A" above.

1.2 DRAWINGS

- A. The drawings show the location and general arrangement of equipment, electrical systems and related items. They shall be followed as closely as elements of the construction will permit.
- B. Examine the drawings of other trades and verify the conditions governing the work on the job site. Arrange work accordingly, providing such fittings, conduit, junction boxes and accessories as may be required to meet such conditions.
- C. Deviations from the drawings, with the exception of minor changes in routing and other such incidental changes that do not affect the functioning or serviceability of the systems, shall not be made without the written approval of the Architect/Engineer.
- D. The architectural and structural drawings take precedence in all matters pertaining to the building structure, mechanical drawings in all matters pertaining to mechanical trades and electrical drawings in all matters pertaining to electrical trades. Where there are conflicts or differences between the drawings for the various trades, report such conflicts or differences to the Architect/Engineer for resolution.

1.3 INSPECTION OF SITE

- A. Visit the site, examine and verify the conditions under which the work must be conducted before submitting proposal.
- B. The submitting of a proposal implies that the contractor has visited the site and understands the conditions under which the work must be conducted.

1.4 TEMPORARY FACILITIES

- A. Provide and remove upon completion of the project, in accordance with the general conditions, a complete temporary electrical and telephone service during construction.

1.5 ALTERNATES

- A. Refer to Division 01 - General Requirements for procedures.

1.6 GUARANTEE

- A. Contractor guarantees that the installation is free from defects and agrees to replace or repair, any part of this installation which becomes defective within a period of one year following final acceptance, unless noted otherwise, provided that such failure is due to defects in the equipment, material or installation or to follow the specifications and drawings. File with the Owner any and all guarantees from the equipment manufacturers.

1.7 CODES, PERMITS AND FEES

- A. Unless otherwise indicated, all required permits, licenses, inspections, approvals and fees for electrical work shall be secured and paid for by the contractor. All work shall conform to all applicable codes, rules and regulations. Applicable publications listed in all sections of Division 26 shall be the latest issue, unless otherwise noted.
- B. Rules of local utility companies shall be complied with. Check with the utility company supplying service to the installation and determine all devices including, but not limited to, all current and potential transformers, meter boxes, C.T. cabinets and meters which will be required and include the cost of all such items in proposal.
- C. All work shall be executed in accordance with the rules and regulations set forth in local and state codes. Prepare any detailed drawings or diagrams which may be required by the governing authorities. Where the drawings and/or specifications indicate materials or construction in excess of code requirements, the drawings and/or specifications shall govern.

1.8 STANDARDS OF MATERIAL AND WORKMANSHIP:

- A. All materials shall be new, unless noted otherwise. The electrical and physical properties of all materials, and the design, performance characteristics, and methods of construction of all items of equipment, shall be in accordance with the latest issue of the various, applicable standard specifications of the following recognized authorities:
 - 1. A.N.S.I. - American National Standards Institute
 - 2. A.S.T.M. - American Society for Testing Materials
 - 3. I.C.E.A. - Insulated Cable Engineers Association
 - 4. I.E.E.E. - Institute of Electrical and Electronics Engineers
 - 5. N.E.C. - National Electrical Code (NFPA 70)

6. N.E.C.A. - National Electrical Contractors Association
7. N.E.M.A. - National Electrical Manufacturer's Association
8. N.F.P.A. - National Fire Protection Association
9. U.L. - Underwriters Laboratories, Inc.

B. Perform all work in a first class and workmanlike manner, in accordance with the latest accepted standards and practices for the Trades involved.

C. All equipment of the same or similar systems shall be by the same manufacturer.

1.9 RECORD DRAWINGS

A. Refer to Division 01 - General Requirements for procedures. All literature shall be furnished in accordance with requirements listed in Division 01.

B. Contractor shall provide the following record drawings as part of the Project closeout document process:

1. Contract Documents, specifications and submittals, indicating "As-Built" conditions and actual products selected for use.
2. Product and Maintenance manuals for all equipment listed within this specification manual and in Contract Documents. Provide with parts lists as applicable.

1.10 SUBMITTALS

A. Refer to Division 01 - General Requirements for procedures.

B. Contractor shall provide submittals where items are referred to by symbolic designation on the drawings. All submittals shall bear the same designation (light fixtures, wiring devices, etc.). Refer to other sections of the electrical specifications for additional requirements.

1. Wiring Devices
2. Lighting Fixtures
3. Fire Alarm System

C. Engineer WILL NOT REVIEW:

1. Submittals not specified.
2. Submittals which do not indicate optional equipment being provided.
3. Submittals not reviewed by Contractor; including Contractor stamp with signature comments.

4. Submittals made after work is delivered to site and/or installed.
5. Submittal resubmissions unless resubmission is required by Architect/Engineer.

1.11 MANUFACTURERS LISTED

- A. The listing of specific manufacturers does not imply acceptance of their products that do not meet the specified ratings, features and functions. Manufacturers listed are not relieved from meeting these specifications in their entirety.
- B. Products in compliance with the specification and manufactured by others not named will be considered only if pre-approved by the Engineer five (5) days prior to bid date.

1.12 USE OF EQUIPMENT

- A. The use of any equipment, or any part thereof for purposes other than testing even with the Owner's consent, shall not be construed to be an acceptance of the work on the part of the Owner, nor be construed to obligate the Owner in any way to accept improper work or defective materials.
- B. Do not use Owner's light fixtures for temporary lighting except as allowed and directed by the Owner.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

3.1 INSTALLATION OF EQUIPMENT

- A. Install all equipment in strict accordance with all directions and recommendations furnished by the manufacturer. Where such directions are in conflict with the drawings and specifications, report such conflicts to the Architect/Engineer for resolution.
- B. Equipment location shall be as close as practical to locations shown on the drawings.
- C. Working clearances shall not be less than specified in NFPA 70 (National Electric Code).

3.2 COORDINATION

- A. Install work to avoid interference with work of other trades including, but not limited to, architectural and mechanical trades. Remove and relocate any work that causes an interference at Contractor's expense. Disputes regarding the cause of an interference will be resolved by the Construction Manager or Architect/Engineer.

3.3 CUTTING, PATCHING AND DAMAGE TO OTHER WORK

- A. Refer to Division 01 - General Requirements and Division 02 - Existing Conditions.

- B. All cutting, patching and repair work shall be performed by the contractor through approved, qualified subcontractors. Contractor shall include full cost of same in bid.

3.4 EQUIPMENT FOUNDATION AND SUPPORTS

- A. Shall be as required or as shown on plans or specified.
- B. Provide concrete house keeping bases 4" above finished floor, with leveling channels, where noted, for floor-mounted equipment. Coordinate requirements with Division 03 - Concrete.
- C. For equipment suspended from ceilings or walls, furnish and install all inserts, rods, structural steel frames, brackets and platforms required.

3.5 EQUIPMENT CONNECTIONS

- A. Make connections to equipment, motors, lighting fixtures, and other items included in the work in accordance with the approved shop drawings and rough-in measurements furnished by the manufacturers of the particular equipment furnished. All additional connections not shown on the drawings, but called out by the equipment manufacturer's shop drawings shall be provided.

3.6 ACCESS DOORS AND PANELS

- A. Refer to Division 08 - Openings; Provide access doors in locations as required per N.E.C. Coordinate locations with architectural trades.

3.7 CLEANING

- A. Refer to Division 01 - General Requirements; All equipment shall be cleaned as frequently as necessary through the construction process and again prior to project completion.
- B. Final cleanup shall include, but not be limited to, washing of fixture lenses or louvers, switchboards, substations, motor control centers, panels, etc. Fixture reflectors and lenses or louvers shall be left with no water marks or cleaning streaks.

3.8 DELIVERY, STORAGE AND PROTECTION OF EQUIPMENT AND MATERIALS

- A. Refer to Division 01 - General Requirements; All equipment and materials shall be delivered, stored and secured per manufacturer's recommendations.
- B. On-site storage shall be coordinated with Construction Manager and be performed in a manner as to avoid damage, deterioration and loss.

3.9 DRAWINGS AND MEASUREMENTS

- A. Electrical drawings are not intended to be scaled for rough-in measurements nor to serve as submittals. Field measurements necessary for ordering materials and fitting the installation to the building construction and arrangement shall be taken by the Contractor.

END OF SECTION

SECTION 26 0505
SELECTIVE DEMOLITION FOR ELECTRICAL

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Demolition and extension of existing electrical work.

1.2 RELATED REQUIREMENTS

- A. Division 01 - General Requirements: Project administrative and procedural requirements.
- B. Division 02 - Existing Conditions: Demolition, cleaning and disposal requirements, cutting and patching requirements, repairs.
- C. Section 26 0005 - Basic Electrical Requirements.

1.3 SUMMARY

- A. The work covered under this section consists of the furnishing of all necessary labor, supervision, materials, equipment, and services to completely execute the system of minor electrical demolition as described in this specification.
- B. The demolition documents plans and specification have been prepared from existing non-as built documents and cursory non-invasive field investigation.
- C. It is the contractors obligation to become familiar with the extent of demolition and the existing condition before submitting their bid.
- D. During demolition if the contractor discovers unforeseen significant non-code compliance conditions of the existing installation they shall notify the Architect and Engineer immediately in writing.
- E. During demolition the contractor shall record on the as-builts all demolished circuits numbers that can be used for new circuiting.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify that abandoned wiring and equipment serve only abandoned facilities.
- B. Demolition drawings are based on casual field observation and existing record documents.
- C. Report discrepancies to Owner before disturbing existing installation.
- D. Beginning of demolition means installer accepts existing conditions.

3.2 PREPARATION

- A. Disconnect electrical systems in walls, floors, and ceilings to be removed.
- B. Coordinate utility service outages with utility company.
- C. Provide temporary wiring and connections to maintain existing systems in service during construction. When work must be performed on energized equipment or circuits, use personnel experienced in such operations.

3.3 DEMOLITION AND EXTENSION OF EXISTING ELECTRICAL WORK

- A. Perform work for removal and disposal of equipment and materials containing toxic substances regulated under the Federal Toxic Substances Control Act (TSCA) in accordance with applicable federal, state, and local regulations. Applicable equipment and materials include, but are not limited to:
 - 1. PCB-containing electrical equipment, including transformers, capacitors, and switches.
 - 2. PCB- and DEHP-containing lighting ballasts.
 - 3. Mercury-containing lamps and tubes, including fluorescent lamps, high intensity discharge (HID), arc lamps, ultra-violet, high pressure sodium, mercury vapor, ignitron tubes, neon, and incandescent.
- B. Remove, relocate, and extend existing installations to accommodate new construction.
- C. Remove abandoned wiring to source of supply.
- D. Remove exposed abandoned conduit, including abandoned conduit above accessible ceiling finishes. Cut conduit flush with walls and floors, and patch surfaces.
- E. Disconnect abandoned outlets and remove devices. Remove abandoned outlets if conduit servicing them is abandoned and removed. Provide blank cover for abandoned outlets that are not removed.
- F. Disconnect and remove abandoned luminaires indicated as being demolished on drawings.. Remove brackets, stems, hangers, and other accessories.
- G. Repair adjacent construction and finishes damaged during demolition and extension work.
- H. Maintain access to existing electrical installations that remain active. Modify installation or provide access panel as appropriate.
- I. Extend existing installations using materials and methods compatible with existing electrical installations, or as specified.

3.4 CLEANING AND REPAIR

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Architects/Engineers
Kalamazoo, Michigan

Locker Room Remodeling
Hazel Park High School
Hazel Park, Michigan

- A. Refer to Division 01 - General Requirements.
- B. Clean and repair existing materials and equipment that remain or that are to be reused.
- C. Panelboards: Clean exposed surfaces and check tightness of electrical connections. Replace damaged circuit breakers and provide closure plates for vacant positions. Provide typed circuit directory showing revised circuiting arrangement.

END OF SECTION

SECTION 26 0519
LOW-VOLTAGE ELECTRICAL POWER CONDUCTORS AND CABLES

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Single conductor building wire.
- B. Metal-clad cable.
- C. Wiring connectors.
- D. Electrical tape.
- E. Wire pulling lubricant.
- F. Cable ties.

1.2 RELATED REQUIREMENTS

- A. Division 01 - General Requirements: Project administrative and procedural requirements.
- B. Division 02 - Existing Conditions: Demolition, cleaning and disposal requirements, cutting and patching requirements, and repairs.
- C. Section 26 0005 - Basic Electrical Requirements.
- D. Section 26 0505 - Selective Demolition for Electrical: Disconnection, removal, and/or extension of existing electrical conductors and cables.
- E. Section 26 0526 - Grounding and Bonding for Electrical Systems: Additional requirements for grounding conductors and grounding connectors.
- F. Section 28 4600 - Fire Detection and Alarm: Fire alarm system conductors and cables.

1.3 REFERENCE STANDARDS

- A. ASTM B3 - Standard Specification for Soft or Annealed Copper Wire 2013 (Reapproved 2018).
- B. ASTM B8 - Standard Specification for Concentric-Lay-Stranded Copper Conductors, Hard, Medium-Hard, or Soft 2011 (Reapproved 2017).
- C. ASTM B33 - Standard Specification for Tin-Coated Soft or Annealed Copper Wire for Electrical Purposes 2010, with Editorial Revision (2020).
- D. ASTM B787/B787M - Standard Specification for 19 Wire Combination Unilay-Stranded Copper Conductors for Subsequent Insulation 2004 (Reapproved 2020).

- E. ASTM D3005 - Standard Specification for Low-Temperature Resistant Vinyl Chloride Plastic Pressure-Sensitive Electrical Insulating Tape 2017.
 - F. NECA 1 - Standard for Good Workmanship in Electrical Construction 2015.
 - G. NECA 120 - Standard For Installing Armored Cable (Type AC) And Metal-Clad Cable (Type MC) 2018.
 - H. NEMA WC 70 - Power Cables Rated 2000 Volts or Less for the Distribution of Electrical Energy 2021.
 - I. NETA ATS - Acceptance Testing Specifications for Electrical Power Equipment and Systems 2017.
 - J. NFPA 70 - National Electrical Code Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
 - K. UL 44 - Thermoset-Insulated Wires and Cables Current Edition, Including All Revisions.
 - L. UL 83 - Thermoplastic-Insulated Wires and Cables Current Edition, Including All Revisions.
 - M. UL 486A-486B - Wire Connectors Current Edition, Including All Revisions.
 - N. UL 486C - Splicing Wire Connectors Current Edition, Including All Revisions.
 - O. UL 486D - Sealed Wire Connector Systems Current Edition, Including All Revisions.
 - P. UL 510 - Polyvinyl Chloride, Polyethylene, and Rubber Insulating Tape Current Edition, Including All Revisions.
 - Q. UL 1569 - Metal-Clad Cables Current Edition, Including All Revisions.
- 1.4 ADMINISTRATIVE REQUIREMENTS
- A. Coordination:
 - 1. Coordinate sizes of raceways, boxes, and equipment enclosures installed under other sections with the actual conductors to be installed, including adjustments for conductor sizes increased for voltage drop.
 - 2. Coordinate the installation of direct burial cable with other trades to avoid conflicts with piping or other potential conflicts.
 - 3. Coordinate with electrical equipment installed under other sections to provide terminations suitable for use with the conductors to be installed.
 - 4. Notify Strategic Energy Solutions, Inc. of any conflicts with or deviations from the contract documents. Obtain direction before proceeding with work.

1.5 SUBMITTALS

- A. Contractor shall provide submittals for equipment listed herein. Refer to Division 01 for submittal procedures.

1.6 QUALITY ASSURANCE

- A. Conform to requirements of NFPA 70.
- B. Maintain at the project site a copy of each referenced document that prescribes execution requirements.
- C. Product Listing Organization Qualifications: An organization recognized by OSHA as a Nationally Recognized Testing Laboratory (NRTL) and acceptable to authorities having jurisdiction.

1.7 FIELD CONDITIONS

- A. Do not install or otherwise handle thermoplastic-insulated conductors at temperatures lower than 14 degrees F, unless otherwise permitted by manufacturer's instructions. When installation below this temperature is unavoidable, notify Strategic Energy Solutions, Inc. and obtain direction before proceeding with work.

PART 2 PRODUCTS

2.1 CONDUCTOR AND CABLE APPLICATIONS

- A. Do not use conductors and cables for applications other than as permitted by NFPA 70 and product listing.
- B. Provide single conductor building wire installed in suitable raceway unless otherwise indicated, permitted, or required.
- C. Nonmetallic-sheathed cable is not permitted.
- D. Underground feeder and branch-circuit cable is not permitted.
- E. Service entrance cable is not permitted.
- F. Armored cable is not permitted.
- G. Metal-clad cable is permitted only as follows:
 - 1. Where not otherwise restricted, may be used:
 - a. Where concealed above accessible ceilings for final connections from junction boxes to luminaires.

- 1) Maximum Length: 6 feet.

2.2 CONDUCTOR AND CABLE GENERAL REQUIREMENTS

- A. Provide products that comply with requirements of NFPA 70.
- B. Provide products listed, classified, and labeled as suitable for the purpose intended.
- C. Unless specifically indicated to be excluded, provide all required conduit, boxes, wiring, connectors, etc. as required for a complete operating system.
- D. Comply with NEMA WC 70.
- E. Thermoplastic-Insulated Conductors and Cables: Listed and labeled as complying with UL 83.
- F. Thermoset-Insulated Conductors and Cables: Listed and labeled as complying with UL 44.
- G. Conductor Material:
 - 1. Provide copper conductors only. Aluminum conductors are not acceptable for this project. Conductor sizes indicated are based on copper.
 - 2. Copper Conductors: Soft drawn annealed, 98 percent conductivity, uncoated copper conductors complying with ASTM B3, ASTM B8, or ASTM B787/B787M unless otherwise indicated.
 - 3. Tinned Copper Conductors: Comply with ASTM B33.
- H. Minimum Conductor Size:
 - 1. Branch Circuits: 12 AWG.
 - a. Exceptions:
 - 1) 20 A, 120 V circuits longer than 75 feet: 10 AWG, for voltage drop.
 - 2) 20 A, 120 V circuits longer than 150 feet: 8 AWG, for voltage drop.
 - 3) 20 A, 277 V circuits longer than 150 feet: 10 AWG, for voltage drop.
- I. Where conductor size is not indicated, size to comply with NFPA 70 but not less than applicable minimum size requirements specified.
- J. Conductor Color Coding:
 - 1. Color code conductors as indicated unless otherwise required by the authority having jurisdiction. Maintain consistent color coding throughout project.
 - 2. Color Coding Method: Integrally colored insulation.

2.3 SINGLE CONDUCTOR BUILDING WIRE

- A. Manufacturers:
 - 1. Copper Building Wire:
 - a. Cerro Wire LLC: www.cerrowire.com/#sle.
 - b. Encore Wire Corporation: www.encorewire.com/#sle.
 - c. Southwire Company: www.southwire.com/#sle.
- B. Description: Single conductor insulated wire.
- C. Conductor Stranding:
 - 1. Feeders and Branch Circuits: Stranded.
- D. Insulation Voltage Rating: 600 V.
- E. Insulation:
 - 1. Copper Building Wire: Type THHN/THWN or THHN/THWN-2, except as indicated below.

2.4 METAL-CLAD CABLE

- A. Manufacturers:
 - 1. AFC Cable Systems Inc: www.afcweb.com/#sle.
 - 2. Encore Wire Corporation: www.encorewire.com/#sle.
 - 3. Southwire Company: www.southwire.com/#sle.
- B. Description: NFPA 70, Type MC cable listed and labeled as complying with UL 1569, and listed for use in classified firestop systems to be used.
- C. Conductor Stranding:
 - 1. Size 10 AWG and Smaller: Stranded.
 - 2. Size 8 AWG and Larger: Stranded.
- D. Insulation Voltage Rating: 600 V.
- E. Insulation: Type THHN, THHN/THWN, or THHN/THWN-2.
- F. Provide oversized neutral conductors where indicated or required.
- G. Grounding: Full-size integral equipment grounding conductor.

- H. Armor: Steel, interlocked tape.

2.5 WIRING CONNECTORS

- A. Description: Wiring connectors appropriate for the application, suitable for use with the conductors to be connected, and listed as complying with UL 486A-486B or UL 486C as applicable.
- B. Connectors for Grounding and Bonding: Comply with Section 26 0526.
- C. Wiring Connectors for Splices and Taps:
 - 1. Copper Conductors Size 8 AWG and Smaller: Use twist-on insulated spring connectors.
 - 2. Copper Conductors Size 6 AWG and Larger: Use mechanical connectors or compression connectors.
- D. Wiring Connectors for Terminations:
 - 1. Provide terminal lugs for connecting conductors to equipment furnished with terminations designed for terminal lugs.
 - 2. Provide compression adapters for connecting conductors to equipment furnished with mechanical lugs when only compression connectors are specified.
 - 3. Where over-sized conductors are larger than the equipment terminations can accommodate, provide connectors suitable for reducing to appropriate size, but not less than required for the rating of the overcurrent protective device.
 - 4. Copper Conductors Size 8 AWG and Larger: Use mechanical connectors or compression connectors where connectors are required.
- E. Twist-on Insulated Spring Connectors: Rated 600 V, 221 degrees F for standard applications and 302 degrees F for high temperature applications; pre-filled with sealant and listed as complying with UL 486D for damp and wet locations.
- F. Mechanical Connectors: Provide bolted type or set-screw type.
- G. Compression Connectors: Provide circumferential type or hex type crimp configuration.

2.6 WIRING ACCESSORIES

- A. Electrical Tape:
 - 1. Vinyl Insulating Electrical Tape: Complying with ASTM D3005 and listed as complying with UL 510; minimum thickness of 7 mil; resistant to abrasion, corrosion, and sunlight; conformable for application down to 0 degrees F and suitable for continuous temperature environment up to 221 degrees F.

- B. Wire Pulling Lubricant: Listed; suitable for use with the conductors or cables to be installed and suitable for use at the installation temperature.
- C. Cable Ties: Material and tensile strength rating suitable for application.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify that interior of building has been protected from weather.
- B. Verify that work likely to damage wire and cable has been completed.
- C. Verify that raceways, boxes, and equipment enclosures are installed and are properly sized to accommodate conductors and cables in accordance with NFPA 70.
- D. Verify that field measurements are as indicated.
- E. Verify that conditions are satisfactory for installation prior to starting work.

3.2 PREPARATION

- A. Clean raceways thoroughly to remove foreign materials before installing conductors and cables.

3.3 INSTALLATION

- A. Circuiting Requirements:
 - 1. Unless dimensioned, circuit routing indicated is diagrammatic.
 - 2. When circuit destination is indicated without specific routing, determine exact routing required.
 - 3. Arrange circuiting to minimize splices.
 - 4. Include circuit lengths required to install connected devices within 10 ft of location indicated.
 - 5. Maintain separation of wiring for emergency systems in accordance with NFPA 70.
 - 6. Circuiting Adjustments: Unless otherwise indicated, when branch circuits are indicated as separate, combining them together in a single raceway is permitted, under the following conditions:
 - a. Provide no more than six current-carrying conductors in a single raceway. Dedicated neutral conductors are considered current-carrying conductors.
 - b. Increase size of conductors as required to account for ampacity derating.

- c. Size raceways, boxes, etc. to accommodate conductors.
7. Common Neutrals: Unless otherwise indicated, sharing of neutral/grounded conductors among up to three single phase branch circuits of different phases installed in the same raceway is permitted where not otherwise prohibited, except for the following:
 - a. Branch circuits fed from ground fault circuit interrupter (GFCI) circuit breakers.
 - b. Branch circuits fed from feed-through protection of GFI receptacles.
 - c. Branch circuits with dimming controls.
 - d. Branch circuits with isolated grounding conductor.
- B. Install products in accordance with manufacturer's instructions.
- C. Perform work in accordance with NECA 1 (general workmanship).
- D. Install metal-clad cable (Type MC) in accordance with NECA 120.
- E. Installation in Raceway:
 1. Tape ends of conductors and cables to prevent infiltration of moisture and other contaminants.
 2. Pull all conductors and cables together into raceway at same time.
 3. Do not damage conductors and cables or exceed manufacturer's recommended maximum pulling tension and sidewall pressure.
 4. Use suitable wire pulling lubricant where necessary, except when lubricant is not recommended by the manufacturer.
- F. Paralleled Conductors: Install conductors of the same length and terminate in the same manner.
- G. Secure and support conductors and cables in accordance with NFPA 70 using suitable supports and methods approved by the authority having jurisdiction. Provide independent support from building structure. Do not provide support from raceways, piping, ductwork, or other systems.
 1. Installation Above Suspended Ceilings: Do not provide support from ceiling support system. Do not provide support from ceiling grid or allow conductors and cables to lay on ceiling tiles.
 2. Installation in Vertical Raceways: Provide supports where vertical rise exceeds permissible limits as indicated in NFPA 70.
- H. Terminate cables using suitable fittings.
 1. Metal-Clad Cable (Type MC):

- a. Use listed fittings.
 - b. Cut cable armor only using specialized tools to prevent damaging conductors or insulation. Do not use hacksaw or wire cutters to cut armor.
- I. Install conductors with a minimum of 12 inches of slack at each outlet.
 - J. Where conductors are installed in enclosures for future termination by others, provide a minimum of 5 feet of slack.
 - K. Neatly train and bundle conductors inside boxes, wireways, panelboards and other equipment enclosures.
 - L. Group or otherwise identify neutral/grounded conductors with associated ungrounded conductors inside enclosures in accordance with NFPA 70.
 - M. Make wiring connections using specified wiring connectors.
 1. Make splices and taps only in accessible boxes. Do not pull splices into raceways or make splices in conduit bodies or wiring gutters.
 2. Remove appropriate amount of conductor insulation for making connections without cutting, nicking or damaging conductors.
 3. Do not remove conductor strands to facilitate insertion into connector.
 4. Clean contact surfaces on conductors and connectors to suitable remove corrosion, oxides, and other contaminates. Do not use wire brush on plated connector surfaces.
 5. Mechanical Connectors: Secure connections according to manufacturer's recommended torque settings.
 6. Compression Connectors: Secure connections using manufacturer's recommended tools and dies.
 - N. Insulate splices and taps that are made with uninsulated connectors using methods suitable for the application, with insulation and mechanical strength at least equivalent to unspliced conductors.
 - O. Insulate ends of spare conductors using vinyl insulating electrical tape.
 - P. Install firestopping to preserve fire resistance rating of partitions and other elements, using materials and methods specified by Division 07 .
 - Q. Unless specifically indicated to be excluded, provide final connections to all equipment and devices, including those furnished by others, as required for a complete operating system.

3.4 FIELD QUALITY CONTROL

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Architects/Engineers
Kalamazoo, Michigan

Locker Room Remodeling
Hazel Park High School
Hazel Park, Michigan

- A. Inspect and test in accordance with NETA ATS, except Section 4.
- B. Perform inspections and tests listed in NETA ATS, Section 7.3.2. The insulation resistance test is required for all conductors. The resistance test for parallel conductors listed as optional is not required.
- C. Correct deficiencies and replace damaged or defective conductors and cables.

END OF SECTION

SECTION 26 0526
GROUNDING AND BONDING FOR ELECTRICAL SYSTEMS

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Grounding and bonding requirements.
- B. Conductors for grounding and bonding.
- C. Connectors for grounding and bonding.

1.2 RELATED REQUIREMENTS

- A. Division 01 - General Requirements: Project administrative and procedural requirements.
- B. Division 02 - Existing Conditions: Demolition, cleaning and disposal requirements, cutting and patching requirements, repairs.
- C. Section 26 0005 - Basic Electrical Requirements.
- D. Section 26 0519 - Low-Voltage Electrical Power Conductors and Cables: Additional requirements for conductors for grounding and bonding, including conductor color coding.
- E. Section 26 0553 - Identification for Electrical Systems: Identification products and requirements.
- F. Section 26 5600 - Exterior Lighting: Additional grounding and bonding requirements for pole-mounted luminaires.
- G. Division 31 - Earthwork: Excavating, trenching and fill.

1.3 REFERENCE STANDARDS

- A. NECA 1 - Standard for Good Workmanship in Electrical Construction 2015.
- B. NETA ATS - Acceptance Testing Specifications for Electrical Power Equipment and Systems 2017.
- C. NFPA 70 - National Electrical Code Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
- D. UL 467 - Grounding and Bonding Equipment Current Edition, Including All Revisions.

1.4 ADMINISTRATIVE REQUIREMENTS

- A. Coordination:
 - 1. Verify exact locations of underground metal water service pipe entrances to building.

2. Notify Strategic Energy Solutions, Inc. of any conflicts with or deviations from the contract documents. Obtain direction before proceeding with work.

1.5 QUALITY ASSURANCE

- A. Conform to requirements of NFPA 70.

PART 2 PRODUCTS

2.1 GROUNDING AND BONDING REQUIREMENTS

- A. Existing Work: Where existing grounding and bonding system components are indicated to be reused, they may be reused only where they are free from corrosion, integrity and continuity are verified, and where acceptable to the authority having jurisdiction.
- B. Do not use products for applications other than as permitted by NFPA 70 and product listing.
- C. Unless specifically indicated to be excluded, provide all required components, conductors, connectors, conduit, boxes, fittings, supports, accessories, etc. as necessary for a complete grounding and bonding system.
- D. Where conductor size is not indicated, size to comply with NFPA 70 but not less than applicable minimum size requirements specified.
- E. Bonding and Equipment Grounding:
 1. Provide bonding for equipment grounding conductors, equipment ground busses, metallic equipment enclosures, metallic raceways and boxes, device grounding terminals, and other normally non-current-carrying conductive materials enclosing electrical conductors/equipment or likely to become energized as indicated and in accordance with NFPA 70.
 2. Provide insulated equipment grounding conductor in each feeder and branch circuit raceway. Do not use raceways as sole equipment grounding conductor.
 3. Where circuit conductor sizes are increased for voltage drop, increase size of equipment grounding conductor proportionally in accordance with NFPA 70.
 4. Unless otherwise indicated, connect wiring device grounding terminal to branch circuit equipment grounding conductor and to outlet box with bonding jumper.
 5. Terminate branch circuit equipment grounding conductors on solidly bonded equipment ground bus only. Do not terminate on neutral (grounded) or isolated/insulated ground bus.
 6. Provide bonding jumper across expansion or expansion/deflection fittings provided to accommodate conduit movement.
- F. Pole-Mounted Luminaires: Also comply with Section 26 5600.

2.2 GROUNDING AND BONDING COMPONENTS

A. General Requirements:

1. Provide products listed, classified, and labeled as suitable for the purpose intended.
2. Provide products listed and labeled as complying with UL 467 where applicable.

B. Conductors for Grounding and Bonding, in Addition to Requirements of Section 26 0526:

1. Use insulated copper conductors unless otherwise indicated.
 - a. Exceptions:
 - 1) Use bare copper conductors where installed underground in direct contact with earth.
 - 2) Use bare copper conductors where directly encased in concrete (not in raceway).

C. Connectors for Grounding and Bonding:

1. Description: Connectors appropriate for the application and suitable for the conductors and items to be connected; listed and labeled as complying with UL 467.
2. Unless otherwise indicated, use exothermic welded connections for underground, concealed and other inaccessible connections.
3. Unless otherwise indicated, use mechanical connectors, compression connectors, or exothermic welded connections for accessible connections.
4. Manufacturers - Mechanical and Compression Connectors:
 - a. Advanced Lightning Technology (ALT): www.altfab.com.
 - b. Burndy LLC: www.burndy.com.
 - c. Thomas & Betts Corporation: www.tnb.com.
5. Manufacturers - Exothermic Welded Connections:
 - a. Burndy LLC: www.burndy.com.
 - b. Cadweld, a brand of Erico International Corporation: www.erico.com.
 - c. ThermOweld, a brand of Continental Industries, Inc: www.thermoweld.com.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify that work likely to damage grounding and bonding system components has been completed.
- B. Verify that field measurements are as indicated.
- C. Verify that conditions are satisfactory for installation prior to starting work.

3.2 INSTALLATION

- A. Install products in accordance with manufacturer's instructions.
- B. Perform work in accordance with NECA 1 (general workmanship).
- C. Make grounding and bonding connections using specified connectors.
 - 1. Remove appropriate amount of conductor insulation for making connections without cutting, nicking or damaging conductors. Do not remove conductor strands to facilitate insertion into connector.
 - 2. Remove nonconductive paint, enamel, or similar coating at threads, contact points, and contact surfaces.
 - 3. Exothermic Welds: Make connections using molds and weld material suitable for the items to be connected in accordance with manufacturer's recommendations.
 - 4. Mechanical Connectors: Secure connections according to manufacturer's recommended torque settings.
 - 5. Compression Connectors: Secure connections using manufacturer's recommended tools and dies.
- D. Identify grounding and bonding system components in accordance with Section 26 0553.

3.3 FIELD QUALITY CONTROL

- A. Inspect and test in accordance with NETA ATS except Section 4.
- B. Perform inspections and tests listed in NETA ATS, Section 7.13.
- C. Perform ground electrode resistance tests under normally dry conditions. Precipitation within the previous 48 hours does not constitute normally dry conditions.
- D. Investigate and correct deficiencies where measured ground resistances do not comply with specified requirements.

END OF SECTION

SECTION 26 0529
HANGERS AND SUPPORTS FOR ELECTRICAL SYSTEMS

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Support and attachment requirements and components for equipment, conduit, cable, boxes, and other electrical work.

1.2 RELATED REQUIREMENTS

- A. Division 01 - General Requirements: Project administrative and procedural requirements.
- B. Division 02 - Existing Conditions: Demolition, cleaning and disposal requirements, and cutting and patching requirements.
- C. Division 03 - Concrete: Concrete equipment pads.
- D. Section 26 0005 - Basic Electrical Requirements.
- E. Section 26 0533.13 - Conduit for Electrical Systems: Additional support and attachment requirements for conduits.
- F. Section 26 0533.16 - Boxes for Electrical Systems: Additional support and attachment requirements for boxes.
- G. Section 26 5100 - Interior Lighting: Additional support and attachment requirements for interior luminaires.
- H. Section 26 5600 - Exterior Lighting: Additional support and attachment requirements for exterior luminaires.

1.3 REFERENCE STANDARDS

- A. ASTM A123/A123M - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products 2017.
- B. ASTM A153/A153M - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware 2016a.
- C. MFMA-4 - Metal Framing Standards Publication 2004.
- D. NECA 1 - Standard for Good Workmanship in Electrical Construction 2015.
- E. NFPA 70 - National Electrical Code Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
- F. UL 5B - Strut-Type Channel Raceways and Fittings Current Edition, Including All Revisions.

1.4 ADMINISTRATIVE REQUIREMENTS

A. Coordination:

1. Coordinate sizes and arrangement of supports and bases with the actual equipment and components to be installed.
2. Coordinate the work with other trades to provide additional framing and materials required for installation.
3. Coordinate compatibility of support and attachment components with mounting surfaces at the installed locations.
4. Coordinate the arrangement of supports with ductwork, piping, equipment and other potential conflicts installed under other sections or by others.
5. Notify Strategic Energy Solutions, Inc. of any conflicts with or deviations from the contract documents. Obtain direction before proceeding with work.

B. Sequencing:

1. Do not install products on or provide attachment to concrete surfaces until concrete has fully cured in accordance with Division 03.

1.5 SUMMARY

- A. The work covered under this section consists of the furnishing of all necessary labor, supervision, materials, equipment, and services to completely execute the system of conduit hangers and supports as described in this specification.
- B. Rated Strength: Adequate in tension, shear, and pullout force to resist maximum loads calculated or imposed for this project, with a minimum structural safety factor of five times the applied force.

1.6 QUALITY ASSURANCE

- A. Comply with NFPA 70.
- B. Comply with applicable building code.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Receive, inspect, handle, and store products in accordance with manufacturer's instructions.
- B. Conduit hangers and supports shall have the manufacturer's name and part number stamped on the part for identification.
- C. Manufacturer: Company specializing in manufacturing products specified in this section with a minimum of five years documented experience in the industry, and certified ISO 9000.

1.8 COORDINATION

- A. Coordinate size and location of concrete bases. Cast anchor-bolt inserts into bases. Concrete, reinforcement, and formwork requirements are specified in Division 03.
- B. Coordinate installation of roof curbs, equipment supports, and roof penetrations.

PART 2 PRODUCTS

2.1 SUPPORT AND ATTACHMENT COMPONENTS

A. General Requirements:

- 1. Provide all required hangers, supports, anchors, fasteners, fittings, accessories, and hardware as necessary for the complete installation of electrical work.
- 2. Provide products listed, classified, and labeled as suitable for the purpose intended, where applicable.
- 3. Where support and attachment component types and sizes are not indicated, select in accordance with manufacturer's application criteria as required for the load to be supported. Include consideration for vibration, equipment operation, and shock loads where applicable.
- 4. Do not use products for applications other than as permitted by NFPA 70 and product listing.
- 5. Steel Components: Use corrosion resistant materials suitable for the environment where installed.
 - a. Zinc-Plated Steel: Electroplated in accordance with ASTM B633.
 - b. Galvanized Steel: Hot-dip galvanized after fabrication in accordance with ASTM A123/A123M or ASTM A153/A153M.

B. Conduit and Cable Supports: Straps, clamps, etc. suitable for the conduit or cable to be supported.

- 1. Conduit Straps: One-hole or two-hole type; steel or malleable iron.
- 2. Conduit Clamps: Bolted type unless otherwise indicated.
- 3. Manufacturers:
 - a. Cooper Crouse-Hinds, a division of Eaton Corporation: www.cooperindustries.com/#sle.
 - b. Erico International Corporation: www.erico.com/#sle.
 - c. O-Z/Gedney, a brand of Emerson Electric Co: www.emerson.com/#sle.

- d. Thomas & Betts Corporation: www.tnb.com/#sle.
- C. Outlet Box Supports: Hangers, brackets, etc. suitable for the boxes to be supported.
1. Manufacturers:
 - a. Cooper Crouse-Hinds, a division of Eaton Corporation: www.cooperindustries.com/#sle.
 - b. Erico International Corporation: www.erico.com/#sle.
 - c. O-Z/Gedney, a brand of Emerson Electric Co: www.emerson.com/#sle.
 - d. Thomas & Betts Corporation: www.tnb.com/#sle.
- D. Metal Channel (Strut) Framing Systems: Factory-fabricated continuous-slot metal channel (strut) and associated fittings, accessories, and hardware required for field-assembly of supports.
1. Comply with MFMA-4.
 2. Channel (Strut) Used as Raceway (only where specifically indicated): Listed and labeled as complying with UL 5B.
 3. Manufacturers:
 - a. Cooper B-Line, a division of Eaton Corporation: www.cooperindustries.com/#sle.
 - b. Thomas & Betts Corporation: www.tnb.com/#sle.
 - c. Unistrut, a brand of Atkore International Inc: www.unistrut.com/#sle.
 - d. Source Limitations: Furnish channels (struts) and associated fittings, accessories, and hardware produced by a single manufacturer.
- E. Hanger Rods: Threaded zinc-plated steel unless otherwise indicated.
1. Minimum Size, Unless Otherwise Indicated or Required:
 - a. Equipment Supports: 1/2 inch diameter.
 - b. Single Conduit up to 1 inch (27 mm) trade size: 1/4 inch diameter.
- F. Anchors and Fasteners:
1. Unless otherwise indicated and where not otherwise restricted, use the anchor and fastener types indicated for the specified applications.
 2. Manufacturers - Powder-Actuated Fastening Systems:
 - a. Hilti, Inc: www.us.hilti.com/#sle.

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- b. ITW Ramset, a division of Illinois Tool Works, Inc: www.ramset.com/#sle.
 - c. Powers Fasteners, Inc: www.powers.com/#sle.
 - d. Simpson Strong-Tie Company Inc: www.strongtie.com/#sle.
- G. Hangers, Supports, Anchors, and Fasteners - General: Protective zinc coating either Electro-Plated (ASTM B633 SCI or SC3), Pre-Galvanized (ASTM a525 coating designation G90) or Hot-Dip Galvanized after fabrication (ASTM A123). The minimum thickness of zinc coating shall be 0.2 mill (5 micrometers)..
- H. Provide materials of size and type adequate to carry the loads of equipment and conduit, including weight of wire in conduit.
1. Product: Pre-galvanized strut.
 2. Product: Hilti DX Series
- I. Conduit Hangers:
1. Shall have a vertical load limit of 100 lbs, and a horizontal load limit of 25 lbs..
 2. Shall be available with either a plain hole for 1/4" bolt or a 1/4-20 thread impression.
 3. Shall be available for 3/8" through 2" EMT, rigid, and aluminum conduit.
 4. Shall be available pre-assembled with manufacturer's specialty fasteners for connection to building structures like beam, flange, drop wire/rod, wood structure, concrete and acoustical tee grid.
- J. Wire Rope Hangers:
1. Wire rope hanger assemblies shall be made of galvanized steel.
 2. Hanger shall meet the fire rating requirements for DIN 4102-2 for 30 minutes at 30 percent of rated load.
 3. Rope hangers shall have a minimum safety factor of 5:1.
 4. Rope hangers are not permitted to support conduits.
 5. Rope hangers are permitted to hang light fixtures, were applicable.
 6. Hangers shall be fully adjustable.
 7. Manufacturer of wire rope hangers shall be:
 - a. ERICO, INC., Speed Link series.

PART 3 EXECUTION

3.1 INSTALLATION

- A. Provide independent support from building structure. Do not provide support from piping, ductwork, or other systems.
- B. Unless specifically indicated or approved by Strategic Energy Solutions, Inc., do not provide support from suspended ceiling support system or ceiling grid.
- C. Unless specifically indicated or approved by Strategic Energy Solutions, Inc., do not provide support from roof deck.
- D. Do not penetrate or otherwise notch or cut structural members without approval of Structural Engineer.
- E. Equipment Support and Attachment:
 - 1. Use metal fabricated supports or supports assembled from metal channel (strut) to support equipment as required.
 - 2. Use metal channel (strut) secured to studs to support equipment surface-mounted on hollow stud walls when wall strength is not sufficient to resist pull-out.
 - 3. Use metal channel (strut) to support surface-mounted equipment in wet or damp locations to provide space between equipment and mounting surface.
 - 4. Securely fasten floor-mounted equipment. Do not install equipment such that it relies on its own weight for support.
- F. Secure fasteners according to manufacturer's recommended torque settings.
- G. Remove temporary supports.

3.2 FIELD QUALITY CONTROL

- A. Inspect support and attachment components for damage and defects.
- B. Repair cuts and abrasions in galvanized finishes using zinc-rich paint recommended by manufacturer. Replace components that exhibit signs of corrosion.
- C. Correct deficiencies and replace damaged or defective support and attachment components.
- D. Mounting and Anchorage of surface-mounted equipment and components: Anchor and fasten electrical items and their supports to building structural elements by the following methods unless otherwise indicated by code:
 - 1. To wood: Fasten with lag screws or through bolts.
 - 2. To new concrete: Bolt to concrete inserts

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3. To Masonry: Approved toggle-type bolts on hollow masonry units and expansion anchor fasteners on solid masonry units.
4. Instead of expansion anchors, powder-actuated driven threaded studs provided with lock washers and nuts may be used in existing standard-weight concrete 4-inches thick or greater. Do not use for anchorage to lightweight-aggregate concrete or for slabs less than 4 inches thick.
5. To Steel: Beam clamps (MSS type 19,21,23,25,or 27) complying with MSS SP-69.
6. To light steel: Sheet metal screws.

END OF SECTION

SECTION 26 0533.13
CONDUIT FOR ELECTRICAL SYSTEMS

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Galvanized steel rigid metal conduit (RMC).
- B. Electrical metallic tubing (EMT).
- C. Conduit fittings.
- D. Accessories.
- E. Conduit, fittings and conduit bodies.

1.2 RELATED REQUIREMENTS

- A. Division 01 - General Requirements: Project administrative and procedural requirements.
- B. Division 02 - Existing Conditions: Demolition, cleaning and disposal requirements, cutting and patching requirements, and repairs.
- C. Division 07 - Thermal and Moisture Protection: Firestopping.
- D. Section 26 0005 - Basic Electrical Requirements.
- E. Section 26 0519 - Low-Voltage Electrical Power Conductors and Cables.
- F. Section 26 0526 - Grounding and Bonding for Electrical Systems.
- G. Section 26 0529 - Hangers and Supports for Electrical Systems.
- H. Section 26 0533.16 - Boxes for Electrical Systems.

1.3 REFERENCE STANDARDS

- A. ANSI C80.1 - American National Standard for Electrical Rigid Steel Conduit (ERSC) 2020.
- B. ANSI C80.3 - American National Standard for Electrical Metallic Tubing -- Steel (EMT-S) 2020.
- C. NECA 1 - Standard for Good Workmanship in Electrical Construction 2015.
- D. NECA 101 - Standard for Installing Steel Conduits (Rigid, IMC, EMT) 2013.
- E. NECA 111 - Standard for Installing Nonmetallic Raceways (RNC, ENT, LFNC) 2017.
- F. NEMA FB 1 - Fittings, Cast Metal Boxes, and Conduit Bodies for Conduit, Electrical Metallic Tubing, and Cable 2014.

- G. NFPA 70 - National Electrical Code Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
- H. UL 6 - Electrical Rigid Metal Conduit-Steel Current Edition, Including All Revisions.
- I. UL 514B - Conduit, Tubing, and Cable Fittings Current Edition, Including All Revisions.
- J. UL 797 - Electrical Metallic Tubing-Steel Current Edition, Including All Revisions.

1.4 ADMINISTRATIVE REQUIREMENTS

A. Coordination:

- 1. Coordinate minimum sizes of conduits with the actual conductors to be installed, including adjustments for conductor sizes increased for voltage drop.
- 2. Coordinate the arrangement of conduits with structural members, ductwork, piping, equipment and other potential conflicts installed under other sections or by others.
- 3. Verify exact conduit termination locations required for boxes, enclosures, and equipment installed under other sections or by others.
- 4. Coordinate the work with other trades to provide roof penetrations that preserve the integrity of the roofing system and do not void the roof warranty.
- 5. Notify Strategic Energy Solutions, Inc. of any conflicts with or deviations from Contract Documents. Obtain direction before proceeding with work.

B. Sequencing:

- 1. Do not begin installation of conductors and cables until installation of conduit is complete between outlet, junction and splicing points.

1.5 QUALITY ASSURANCE

- A. Conform to requirements of NFPA 70.
- B. Products: Listed and classified by Underwriters Laboratories Inc. as suitable for purpose specified and shown.

PART 2 PRODUCTS

2.1 CONDUIT APPLICATIONS

- A. Do not use conduit and associated fittings for applications other than as permitted by NFPA 70 and product listing.
- B. Unless otherwise indicated and where not otherwise restricted, use the conduit types indicated for the specified applications. Where more than one listed application applies, comply with the most restrictive requirements. Where conduit type for a particular application is not specified,

use galvanized steel rigid metal conduit.

- C. Concealed Within Masonry Walls: Use galvanized steel rigid metal conduit or electrical metallic tubing (EMT).
- D. Concealed Within Hollow Stud Walls: Use galvanized steel rigid metal conduit or electrical metallic tubing (EMT).
- E. Concealed Above Accessible Ceilings: Use galvanized steel rigid metal conduit or electrical metallic tubing (EMT).
- F. Interior, Damp or Wet Locations: Use galvanized steel rigid metal conduit.
- G. Exposed, Interior, Not Subject to Physical Damage: Use galvanized steel rigid metal conduit, intermediate metal conduit (IMC), or electrical metallic tubing (EMT).
- H. Exposed, Interior, Subject to Physical Damage: Use galvanized steel rigid metal conduit.
 - 1. Locations subject to physical damage include, but are not limited to:
 - a. Where exposed below 8 feet, except within electrical and communication rooms or closets.
- I. Connections to Luminaires Above Accessible Ceilings: Use flexible metal conduit.
 - 1. Maximum Length: 6 feet.
- J. Connections to Vibrating Equipment:
 - 1. Dry Locations: Use flexible metal conduit.
 - 2. Damp, Wet, or Corrosive Locations: Use liquidtight flexible metal conduit.
 - 3. Maximum Length: 6 feet unless otherwise indicated.
 - 4. Vibrating equipment includes, but is not limited to:
 - a. Transformers.
 - b. Motors.

2.2 CONDUIT REQUIREMENTS

- A. Existing Work: Where existing conduits are indicated to be reused, they may be reused only where they comply with specified requirements, are free from corrosion, and integrity is verified by pulling a mandrel through them.
- B. Provide all conduit, fittings, supports, and accessories required for a complete raceway system.
- C. Provide products listed, classified, and labeled as suitable for the purpose intended.

D. Minimum Conduit Size, Unless Otherwise Indicated:

1. Branch Circuits: 3/4 inch (21 mm) trade size.
2. Flexible Connections to Luminaires: 1/2 inch (16 mm) trade size.
3. Underground, Interior: 1 inch (27 mm) trade size.
4. Underground, Exterior: 1 inch (27 mm) trade size.

E. Where conduit size is not indicated, size to comply with NFPA 70 but not less than applicable minimum size requirements specified.

2.3 GALVANIZED STEEL RIGID METAL CONDUIT (RMC)

A. Manufacturers:

1. Allied Tube & Conduit: www.alliedeg.com/#sle.
2. Republic Conduit: www.republic-conduit.com/#sle.
3. Wheatland Tube, a Division of Zekelman Industries: www.wheatland.com/#sle.

B. Description: NFPA 70, Type RMC galvanized steel rigid metal conduit complying with ANSI C80.1 and listed and labeled as complying with UL 6.

C. Fittings:

1. Non-Hazardous Locations: Use fittings complying with NEMA FB 1 and listed and labeled as complying with UL 514B.
2. Material: Use steel or malleable iron.
3. Connectors and Couplings: Use threaded type fittings only. Threadless set screw and compression (gland) type fittings are not permitted.

2.4 FLEXIBLE METAL CONDUIT (FMC)

A. Manufacturers:

1. AFC Cable Systems, Inc: www.afcweb.com.
2. Electri-Flex Company: www.electriflex.com.
3. International Metal Hose: www.metalhose.com.

B. Description: NFPA 70, Type FMC standard wall steel flexible metal conduit listed and labeled as complying with UL 1, and listed for use in classified firestop systems to be used.

C. Fittings:

1. Description: Fittings complying with NEMA FB 1 and listed and labeled as complying with UL 514B.

2. Material: Use steel or malleable iron.

D. Description: Interlocked steel construction.

E. Fittings: NEMA FB 1.

2.5 ELECTRICAL METALLIC TUBING (EMT)

A. Manufacturers:

1. Allied Tube & Conduit: www.alliedeg.com.

2. Beck Manufacturing, Inc: www.beckmfg.com.

3. Wheatland Tube Company: www.wheatland.com.

B. Description: NFPA 70, Type EMT steel electrical metallic tubing complying with ANSI C80.3 and listed and labeled as complying with UL 797.

C. Fittings:

1. Manufacturers:

a. Bridgeport Fittings Inc: www.bptfittings.com/#sle.

b. O-Z/Gedney, a brand of Emerson Electric Co: www.emerson.com/#sle.

c. Thomas & Betts Corporation: www.tnb.com/#sle.

2. Description: Fittings complying with NEMA FB 1 and listed and labeled as complying with UL 514B.

3. Material: Use steel or malleable iron.

4. Connectors and Couplings: Use compression (gland) or set-screw type.

a. Do not use indenter type connectors and couplings.

D. Description: ANSI C80.3; galvanized tubing.

E. Fittings and Conduit Bodies: NEMA FB 1; steel or malleable iron compression type.

2.6 ACCESSORIES

A. Conduit Joint Compound: Corrosion-resistant, electrically conductive; suitable for use with the conduit to be installed.

B. Pull Strings: Use nylon cord with average breaking strength of not less than 200 pound-force.

- C. Sealing Compound for Sealing Fittings: Listed for use with the particular fittings to be installed.
- D. Modular Seals for Conduit Penetrations: Rated for minimum of 40 psig; Suitable for the conduits to be installed.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify that field measurements are as indicated.
- B. Verify that mounting surfaces are ready to receive conduits.
- C. Verify that conditions are satisfactory for installation prior to starting work.
- D. Verify routing and termination locations of conduit prior to rough-in.
- E. Conduit routing is shown on drawings in approximate locations unless dimensioned. Route as required to complete wiring system.

3.2 INSTALLATION

- A. Install products in accordance with manufacturer's instructions.
- B. Perform work in accordance with NECA 1 (general workmanship).
- C. Install galvanized steel rigid metal conduit (RMC) in accordance with NECA 101.
- D. Conduit Routing:
 - 1. Unless dimensioned, conduit routing indicated is diagrammatic.
 - 2. When conduit destination is indicated without specific routing, determine exact routing required.
 - 3. Conceal all conduits unless specifically indicated to be exposed.
 - 4. Conduits in the following areas may be exposed, unless otherwise indicated:
 - a. Electrical rooms.
 - b. Mechanical equipment rooms.
 - c. Within joists in areas with no ceiling.
 - 5. Unless otherwise approved, do not route conduits exposed:
 - a. Across floors.
 - b. Across roofs.

- c. Across top of parapet walls.
- d. Across building exterior surfaces.
6. Conduits installed underground or embedded in concrete may be routed in the shortest possible manner unless otherwise indicated. Route all other conduits parallel or perpendicular to building structure and surfaces, following surface contours where practical.
7. Arrange conduit to maintain adequate headroom, clearances, and access.
8. Arrange conduit to provide no more than the equivalent of four 90 degree bends between pull points.
9. Arrange conduit to prevent moisture traps. Provide drain fittings at low points and at sealing fittings where moisture may collect.
10. Group parallel conduits in the same area together on a common rack.

E. Conduit Support:

1. Secure and support conduits in accordance with NFPA 70 and Section 26 0529 using suitable supports and methods approved by the authority having jurisdiction.
2. Provide independent support from building structure. Do not provide support from piping, ductwork, or other systems.
3. Installation Above Suspended Ceilings: Do not provide support from ceiling support system. Do not provide support from ceiling grid or allow conduits to lay on ceiling tiles.
4. Use conduit strap to support single surface-mounted conduit.
 - a. Use clamp back spacer with conduit strap for damp and wet locations to provide space between conduit and mounting surface.
5. Use metal channel (strut) with accessory conduit clamps to support multiple parallel surface-mounted conduits.
6. Use conduit clamp to support single conduit from beam clamp or threaded rod.
7. Use trapeze hangers assembled from threaded rods and metal channel (strut) with accessory conduit clamps to support multiple parallel suspended conduits.
8. Use of wire for support of conduits is not permitted.

F. Connections and Terminations:

1. Use approved zinc-rich paint or conduit joint compound on field-cut threads of galvanized steel conduits prior to making connections.

2. Where two threaded conduits must be joined and neither can be rotated, use three-piece couplings or split couplings. Do not use running threads.
3. Use suitable adapters where required to transition from one type of conduit to another.
4. Terminate threaded conduits in boxes and enclosures using threaded hubs or double lock nuts for dry locations and raintight hubs for wet locations.
5. Provide insulating bushings or insulated throats at all conduit terminations to protect conductors.
6. Secure joints and connections to provide maximum mechanical strength and electrical continuity.

G. Penetrations:

1. Do not penetrate or otherwise notch or cut structural members, including footings and grade beams, without approval of Structural Engineer.
2. Make penetrations perpendicular to surfaces unless otherwise indicated.
3. Provide sleeves for penetrations as indicated or as required to facilitate installation. Set sleeves flush with exposed surfaces unless otherwise indicated or required.
4. Conceal bends for conduit risers emerging above ground.
5. Seal interior of conduits entering the building from underground at first accessible point to prevent entry of moisture and gases.
6. Where conduits penetrate waterproof membrane, seal as required to maintain integrity of membrane.
7. Make penetrations for roof-mounted equipment within associated equipment openings and curbs where possible to minimize roofing system penetrations. Where penetrations are necessary, seal as indicated or as required to preserve integrity of roofing system and maintain roof warranty. Include proposed locations of penetrations and methods for sealing with submittals.
8. Install firestopping to preserve fire resistance rating of partitions and other elements, using materials and methods specified in Division 07.

H. Conduit Movement Provisions: Where conduits are subject to movement, provide expansion and expansion/deflection fittings to prevent damage to enclosed conductors or connected equipment. This includes, but is not limited to:

1. Where conduits cross structural joints intended for expansion, contraction, or deflection.
2. Where calculated in accordance with NFPA 70 for rigid polyvinyl chloride (PVC) conduit installed above ground to compensate for thermal expansion and contraction.

3. Where conduits are subject to earth movement by settlement or frost.

I. Condensation Prevention: Where conduits cross barriers between areas of potential substantial temperature differential, provide sealing fitting or approved sealing compound at an accessible point near the penetration to prevent condensation. This includes, but is not limited to:

1. Where conduits pass from outdoors into conditioned interior spaces.

2. Where conduits pass from unconditioned interior spaces into conditioned interior spaces.

J. Provide pull string in all empty conduits and in conduits where conductors and cables are to be installed by others. Leave minimum slack of 12 inches at each end.

K. Provide grounding and bonding in accordance with Section 26 0526.

L. Identify conduits in accordance with Section 26 0553.

3.3 CLEANING

A. Clean interior of conduits to remove moisture and foreign matter.

3.4 PROTECTION

A. Immediately after installation of conduit, use suitable manufactured plugs to provide protection from entry of moisture and foreign material and do not remove until ready for installation of conductors.

END OF SECTION

SECTION 26 0533.16
BOXES FOR ELECTRICAL SYSTEMS

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Outlet and device boxes up to 100 cubic inches, including those used as junction and pull boxes.
- B. Cabinets and enclosures, including junction and pull boxes larger than 100 cubic inches.

1.2 RELATED REQUIREMENTS

- A. Section 26 0005 - Basic Electrical Requirements.
- B. Section 26 0529 - Hangers and Supports for Electrical Systems.
- C. Section 26 0533.13 - Conduit for Electrical Systems:
- D. Section 26 2726 - Wiring Devices

1.3 REFERENCE STANDARDS

- A. NECA 1 - Standard for Good Workmanship in Electrical Construction 2015.
- B. NECA 130 - Standard for Installing and Maintaining Wiring Devices 2016.
- C. NEMA FB 1 - Fittings, Cast Metal Boxes, and Conduit Bodies for Conduit, Electrical Metallic Tubing, and Cable 2014.
- D. NEMA OS 1 - Sheet-Steel Outlet Boxes, Device Boxes, Covers, and Box Supports 2013 (Reaffirmed 2020).
- E. NEMA 250 - Enclosures for Electrical Equipment (1000 Volts Maximum) 2020.
- F. NFPA 70 - National Electrical Code Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
- G. UL 50 - Enclosures for Electrical Equipment, Non-Environmental Considerations Current Edition, Including All Revisions.
- H. UL 50E - Enclosures for Electrical Equipment, Environmental Considerations Current Edition, Including All Revisions.
- I. UL 514A - Metallic Outlet Boxes Current Edition, Including All Revisions.

1.4 ADMINISTRATIVE REQUIREMENTS

- A. Coordination:

1. Coordinate the work with other trades to avoid placement of ductwork, piping, equipment, or other potential obstructions within the dedicated equipment spaces and working clearances for electrical equipment required by NFPA 70.
2. Coordinate arrangement of electrical equipment with the dimensions and clearance requirements of the actual equipment to be installed.
3. Coordinate minimum sizes of boxes with the actual installed arrangement of conductors, clamps, support fittings, and devices, calculated according to NFPA 70.
4. Coordinate minimum sizes of pull boxes with the actual installed arrangement of connected conduits, calculated according to NFPA 70.
5. Coordinate the placement of boxes with millwork, furniture, devices, equipment, etc. installed under other sections or by others.
6. Coordinate the work with other trades to preserve insulation integrity.
7. Coordinate the work with other trades to provide walls suitable for installation of flush-mounted boxes where indicated.
8. Notify Strategic Energy Solutions, Inc. of any conflicts with or deviations from the contract documents. Obtain direction before proceeding with work.

1.5 QUALITY ASSURANCE

- A. Conform to requirements of NFPA 70.

PART 2 PRODUCTS

2.1 BOXES

- A. General Requirements:

1. Do not use boxes and associated accessories for applications other than as permitted by NFPA 70 and product listing.
2. Provide all boxes, fittings, supports, and accessories required for a complete raceway system and to accommodate devices and equipment to be installed.
3. Provide products listed, classified, and labeled as suitable for the purpose intended.
4. Where box size is not indicated, size to comply with NFPA 70 but not less than applicable minimum size requirements specified.
5. Provide grounding terminals within boxes where equipment grounding conductors terminate.

- B. Outlet and Device Boxes Up to 100 cubic inches, Including Those Used as Junction and Pull Boxes:
1. Use sheet-steel boxes for dry locations unless otherwise indicated or required.
 2. Use cast iron boxes or cast aluminum boxes for damp or wet locations unless otherwise indicated or required; furnish with compatible weatherproof gasketed covers.
 3. Use suitable concrete type boxes where flush-mounted in concrete.
 4. Use suitable masonry type boxes where flush-mounted in masonry walls.
 5. Use raised covers suitable for the type of wall construction and device configuration where required.
 6. Use shallow boxes where required by the type of wall construction.
 7. Do not use "through-wall" boxes designed for access from both sides of wall.
 8. Sheet-Steel Boxes: Comply with NEMA OS 1, and list and label as complying with UL 514A.
 9. Cast Metal Boxes: Comply with NEMA FB 1, and list and label as complying with UL 514A; furnish with threaded hubs.
 10. Boxes for Supporting Luminaires and Ceiling Fans: Listed as suitable for the type and weight of load to be supported; furnished with fixture stud to accommodate mounting of luminaire where required.
 11. Boxes for Ganged Devices: Use multigang boxes of single-piece construction. Do not use field-connected gangable boxes unless specifically indicated or permitted.
 12. Wall Plates: Comply with Section 26 2726.
 13. Manufacturers:
 - a. Cooper Crouse-Hinds, a division of Eaton Corporation:
www.cooperindustries.com/#sle.
 - b. Hubbell Incorporated; Bell Products: www.hubbell-rtb.com.
 - c. Hubbell Incorporated; RACO Products: www.hubbell-rtb.com.
 - d. Thomas & Betts Corporation: www.tnb.com/#sle.
- C. Cabinets and Enclosures, Including Junction and Pull Boxes Larger Than 100 cubic inches:
1. Comply with NEMA 250, and list and label as complying with UL 50 and UL 50E, or UL 508A.

2. NEMA 250 Environment Type, Unless Otherwise Indicated:
3. Junction and Pull Boxes Larger Than 100 cubic inches:
 - a. Provide screw-cover or hinged-cover enclosures unless otherwise indicated.
- D. Manufacturers:
 1. The Wiremold Company: www.wiremold.com.
 2. Thomas & Betts Corporation: www.tnb.com.
 3. Hubbell Raco: www.hubbell.com/raco/en.
- E. Minimum size for communications, fire alarm, sound system and security system rough-ins shall be 4" square, 3-1/2" deep unless otherwise noted.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify that field measurements are as indicated.
- B. Verify that mounting surfaces are ready to receive boxes.
- C. Verify that conditions are satisfactory for installation prior to starting work.

3.2 INSTALLATION

- A. Install products in accordance with manufacturer's instructions.
- B. Install boxes in accordance with NECA 1 (general workmanship) and, where applicable, NECA 130, including mounting heights specified in those standards where mounting heights are not indicated.
- C. Arrange equipment to provide minimum clearances in accordance with manufacturer's instructions and NFPA 70.
- D. Provide separate boxes for emergency power and normal power systems.
- E. Unless otherwise indicated, provide separate boxes for line voltage and low voltage systems.
- F. Flush-mount boxes in finished areas unless specifically indicated to be surface-mounted.
- G. Unless otherwise indicated, boxes may be surface-mounted where exposed conduits are indicated or permitted.
- H. Box Locations:
 1. Locate boxes to be accessible. Provide access panels in accordance with Division 08 as required where approved by the Architect.

2. Unless dimensioned, box locations indicated are approximate.
 3. Locate boxes so that wall plates do not span different building finishes.
 4. Locate boxes so that wall plates do not cross masonry joints.
 5. Unless otherwise indicated, where multiple outlet boxes are installed at the same location at different mounting heights, install along a common vertical center line.
 6. Fire Resistance Rated Walls: Install flush-mounted boxes such that the required fire resistance will not be reduced.
 - a. Do not install flush-mounted boxes on opposite sides of walls back-to-back; provide minimum 24 inches separation where wall is constructed with individual noncommunicating stud cavities or protect both boxes with listed putty pads.
 7. Locate junction and pull boxes as indicated, as required to facilitate installation of conductors, and to limit conduit length and/or number of bends between pulling points in accordance with Section 26 0533.13.
- I. Box Supports:
1. Secure and support boxes in accordance with NFPA 70 and Section 26 0529 using suitable supports and methods approved by the authority having jurisdiction.
 2. Provide independent support from building structure except for cast metal boxes (other than boxes used for fixture support) supported by threaded conduit connections in accordance with NFPA 70. Do not provide support from piping, ductwork, or other systems.
 3. Installation Above Suspended Ceilings: Do not provide support from ceiling grid or ceiling support system.
- J. Install boxes plumb and level.
- K. Install boxes as required to preserve insulation integrity.
- L. Install permanent barrier between ganged wiring devices when voltage between adjacent devices exceeds 300 V.
- M. Install firestopping to preserve fire resistance rating of partitions and other elements, using materials and methods specified in Division 07.
- N. Close unused box openings.
- O. Install blank wall plates on junction boxes and on outlet boxes with no devices or equipment installed or designated for future use.
- P. Provide grounding and bonding in accordance with Section 26 0526.

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Architects/Engineers
Kalamazoo, Michigan

Locker Room Remodeling
Hazel Park High School
Hazel Park, Michigan

3.3 PROTECTION

- A. Immediately after installation, protect boxes from entry of moisture and foreign material until ready for installation of conductors.

END OF SECTION

SECTION 26 0935
DISTRIBUTED DIGITAL LIGHTING CONTROL SYSTEM

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Distributed Digital Lighting Control System
- B. Digital Load Controllers (Room and Fixture Controllers)
- C. Digital Wall or Ceiling Mounted Occupancy Sensor
- D. Digital Wall Switch Occupancy Sensors
- E. Digital Wall Switches

1.2 **RELATED REQUIREMENTS**

- A. Division 01 - General Requirements: Project administrative and procedural requirements.
- B. Section 26 0005 - Basic Electrical Requirements.
- C. Section 26 0529 - Hangers and Supports for Electrical Systems.
- D. Section 26 0533.13 - Conduit for Electrical Systems.
- E. Section 26 0533.16 - Boxes for Electrical Systems.
- F. Section 26 0553 - Identification for Electrical Systems: Identification products and requirements.
- G. Section 26 0573 - Power System Studies.
- H. Section 26 2726 - Wiring Devices: wall switches and wall dimmers.
- I. Section 26 2813 - Fuses.
- J. Section 26 3323 - Central Battery Equipment and Inverters.
- K. Section 26 5100 - Interior Lighting.
- L. Section 26 5600 - Exterior Lighting.

1.3 **REFERENCE STANDARDS**

- A. FCC Article 15, Section J, Class A.
- B. NECA 1 - Standard for Good Workmanship in Electrical Construction; 2010.
- C. NEMA WD 7 - Occupancy Motion Sensors Standard; Current Edition.

- D. NETA ATS - Acceptance Testing Specifications for Electrical Power Equipment and Systems; 2013.
- E. NFPA 70 - National Electrical Code; Most recent edition adopted by Authority Having Jurisdiction, including all applicable Amendments and Supplements.
- F. UL 508 - Standard for Industrial Control Equipment; Current Edition, including all Revisions.
- G. UL 916 - Standard for Energy Management Equipment; Current Edition, including all Revisions.
- H. UL 924 - Standard for Emergency Lighting and Power Equipment
- I. UL 2043 - Standard for Fire Test for Heat and Visible Smoke Release for Discrete Products Installed in Air-Handling Spaces.

1.4 DESIGN / PERFORMANCE REQUIREMENTS

- A. Digital lighting control system shall accommodate the square-footage coverage requirements for each area controlled, utilizing room controllers, digital occupancy sensors, switches, daylighting sensors and accessories that suit the required lighting and electrical system parameters.
- B. System shall comply with FCC emission standards specified in part 15, sub-part J for commercial and residential application.

1.5 ADMINISTRATIVE REQUIREMENTS

- A. Contractor shall provide submittals for equipment listed herein. Refer to Division 01 - General Requirements for submittal procedures.
- B. Product Data: Manufacturer's data sheets on each product to be used, including:
 - 1. Catalog sheets and specifications.
 - 2. Ratings, configurations, standard wiring diagrams, dimensions, colors, service condition requirements, and installed features.
 - 3. Storage and handling requirements and recommendations.
 - 4. Installation instructions.
- C. Shop Drawings: Wiring diagrams a for the various components of the System specified including:
 - 1. Composite wiring and/or schematic diagram of each control circuit as proposed to be installed.
 - 2. Show location of all devices, including at minimum sensors, load controllers, and switches/dimmers for each area on reflected ceiling plans.

3. Provide room/area details including products and sequence of operation for each room or area. Illustrate typical acceptable room/area connection topologies.
4. Network riser diagram including floor and building level details. Include network cable specification. Illustrate points of connection to integrated systems. Coordinate integration with mechanical and/or other trades.

D. Manufacturer's Certificates: Certify products meet or exceed specified requirements.

E. Closeout Submittals:

1. Project Record Documents: Record actual installed locations and settings for lighting control devices.
2. Operation and Maintenance Manual:
 - a. Include approved Shop Drawings and Product Data.
 - b. Include Sequence of Operation, identifying operation for each room or space.
 - c. Include manufacturer's maintenance information.
 - d. Operation and Maintenance Data: Include detailed information on device programming and setup.
 - e. Include startup and test reports.

1.6 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing of centralized and distributed lighting control systems with a minimum of 10 years documented experience.
- B. Installer Qualifications: Company certified by the manufacturer and specializing in installation of networked lighting control products with minimum three years documented experience.
- C. System Components: Demonstrate that individual components have undergone quality control and testing prior to shipping.

1.7 PRE-INSTALLATION MEETINGS

- A. Convene minimum two weeks prior to commencing Work of this section. Meeting to be attended by Contractor, Architect, system installer, factory authorized manufacturer's representative, and representative of all trades related to the system installation.
- B. Review installation procedures and coordination required with related Work and the following:
 1. Confirm the location and mounting of all devices, with special attention to placement of switches, dimmers, and any sensors.
 2. Review the specifications for low voltage control wiring and termination.

3. Discuss the functionality and configuration of all products, including sequences of operation, per design requirements.
 4. Discuss requirements for integration with other trades
- C. Inspect and make notes of job conditions prior to installation:
1. Record minutes of the conference and provide copies to all parties present.
 2. Identify all outstanding issues in writing designating the responsible party for follow-up action and the timetable for completion.
 3. Installation shall not begin until all outstanding issues are resolved to the satisfaction of the Architect.

1.8 PROJECT CONDITIONS

- A. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's absolute limits.
- B. Do not install equipment until following conditions can be maintained in spaces to receive equipment:
 1. Ambient temperature: 32 to 104 degrees F (0 to 40 degrees C).
 2. Relative humidity: Maximum 90 percent, non-condensing.

1.9 WARRANTY

- A. Manufacturer shall provide a 5 year limited warranty on products within this installation, except where otherwise noted, and consisting of a one for one device replacement.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Acceptable Manufacturers:
 1. Lutron
 2. Wattstopper (Legrand)
 3. Eaton Greengate
 4. nLight (Acuity Brands)
 5. Crestron
 6. Leviton

7. Osram
8. Engineer pre-approved equal.

2.2 DISTRIBUTED DIGITAL LIGHTING CONTROL SYSTEM

- A. System General: Provide digital lighting control system complete with all necessary enclosures, wiring, and system components to ensure a complete and properly functioning system as indicated on the Drawings and specified herein. If a conflict is identified, between the Drawing, this specification, contact the Engineer for clarification prior to proceeding.
1. Space Control Requirements: Provide occupancy/vacancy sensors with Manual- or Partial-ON functionality as indicated in all spaces except toilet rooms, storerooms, library stacks, or other applications where hands-free operation is desirable and Automatic-ON occupancy sensors are more appropriate. Provide Manual-ON occupancy/vacancy sensors for any enclosed office, conference room, meeting room, open plan system and training room. For spaces with multiple occupants, or where line-of-sight may be obscured, provide ceiling- or corner-mounted sensors and Manual-ON switches.
 2. Daylit Areas: Provide daylight-responsive automatic control in all spaces (conditioned or unconditioned) where daylight contribution is available as defined by relevant local building energy code:
 - a. All luminaires within code-defined daylight zones shall be controlled separately from luminaires outside of daylit zones.
 - b. Daytime setpoints for total ambient illumination (combined daylight and electric light) levels that initiate dimming shall be programmed in compliance with relevant local building energy codes.
 - c. Multiple-level switched daylight harvesting controls may be utilized for areas marked on drawings.
 - d. Provide smooth and continuous daylight dimming for areas marked on drawings. Daylighting control system may be designed to turn off electric lighting when daylight is at or above required lighting levels, only if system functions to turn lamps back on at dimmed level, rather than turning full-on prior to dimming.
 3. Conference, meeting, training, auditoriums, and multipurpose rooms shall have controls that allow for independent control of each local control zone. Rooms larger than 300 square feet shall instead have at least four preset lighting scenes unless otherwise specified. Occupancy / vacancy sensors shall be provided to turn off all lighting in the space. Spaces with up to four moveable walls shall include controls that can be reconfigured when the room is partitioned.
- B. Equipment Required: Lighting Control and Automation system as defined under this section covers the following equipment.

1. Digital Lighting Management (DLM) local network: Free topology, plug-in wiring system for power and data to room devices.
 2. Digital Fixture Controllers: Self-configuring, digitally addressable one relay fixture-integrated controllers for on/off/0-10V dimming control.
 3. Digital Occupancy Sensors: Self-configuring, digitally addressable, calibrated occupancy sensors with LCD display and two-way active infrared (IR) communications.
 4. Digital Switches: Self-configuring, digitally addressable pushbutton on/off, dimming, and scene switches with two-way active infrared (IR) communications.
 5. Digital Daylighting Sensors: Single-zone closed loop, multi-zone open loop and single-zone dual-loop daylighting sensors with two-way active infrared (IR) communications for daylight harvesting using switching, bi-level, tri-level or dimming control.
- C. Local Network: Digital lighting control local network is a free topology lighting control physical connection and communication protocol designed to control a small area of a building.
1. Features of the digital lighting control local network include:
 - a. Automatic configuration and binding of occupancy sensors, switches and lighting loads to the most energy-efficient sequence of operation based upon the device attached.
 - b. Simple replacement of any device in the local digital lighting control network with a standard off the shelf unit without requiring significant commissioning, configuration or setup.
 - c. Ability to change the automatic configuration, including binding and load parameters without tools, using only the buttons on the digital devices in the local network.
 - d. Two-way infrared communications for control by handheld remotes, and configuration by a handheld tool including adjusting load parameters, sensor configuration and binding, within a line of sight of up to 30 feet from a sensor, wall switch or IR receiver.
 2. Digital room devices connect to the local network using pre-terminated low voltage cables with RJ-45 connectors, which provide both data and power to room devices. Systems that utilize RJ-45 patch cords but do not provide serial communication data from individual end devices are not acceptable.
 3. If manufacturer's pre-terminated low voltage cables are not used for the installation each cable must be individually tested and observed by authorized service representative following installation.

2.3 DIGITAL LOAD CONTROLLERS (ROOM AND FIXTURE CONTROLLERS)

- A. Digital Load Controllers: Digital controllers for lighting zones, fixtures and/or plug loads automatically bind room loads to the connected control devices in the space without commissioning or the use of any tools. Provide controllers to match the room lighting and plug load control requirements. Controllers are simple to install, and do not have dip switches/potentiometers, or require special configuration for standard applications. Control units include the following features
1. Automatic room configuration to the most energy-efficient sequence of operation based upon the devices in the room.
 2. Simple replacement using the default automatic configuration capabilities, a room controller may be replaced with an off-the-shelf device.
 3. Multiple room controllers connected together in a local network must automatically arbitrate with each other, without requiring any configuration or setup, so that individual load numbers are assigned starting with load 1 to a maximum of 64, assigned based on each controller's device ID's from highest to lowest.
 4. Device Status LEDs to indicate:
 - a. Data transmission
 - b. Device has power
 - c. Status for each load
 - d. Configuration status
 5. Quick installation features including:
 - a. Standard junction box mounting
 - b. Quick low voltage connections using standard RJ-45 patch cable
 6. Based on individual configuration, each load shall be capable of the following behavior on power up following the loss of normal power:
 - a. Turn on to 100 percent
 - b. Turn off
 - c. Turn on to last level
 7. Each load be configurable to operate in the following sequences based on occupancy:
 - a. Auto-on/Auto-off (Follow on and off)
 - b. Manual-on/Auto-off (Follow off only)

8. Polarity of each load output shall be reversible, via digital configuration, so that on is off and off is on.
9. BACnet object information shall be available for the following objects:
 - a. Load status
 - b. Schedule state, normal or after-hours
 - c. Demand Response enable and disable
 - d. Room occupancy status
 - e. Total room lighting and plug loads watts
 - f. Electrical current
 - g. Total watts per controller
 - h. Total room watts/sq ft.
 - i. Force on/off all loads
10. UL 2043 plenum rated
11. Manual override and LED indication for each load
12. Zero cross circuitry for each load
13. All digital parameter data programmed into an individual room controller or plug load controller shall be retained in non-volatile FLASH memory within the controller itself. Memory shall have an expected life of no less than 10 years.
14. Dimming Room Controllers shall share the following features:
 - a. Each load shall have an independently configurable preset on level for Normal Hours and After Hours events to allow different dimmed levels to be established at the start of both Normal Hours and After Hours events.
 - b. Fade rates for dimming loads shall be specific to bound switch buttons, and the load shall maintain a default value for any bound buttons that do not specify a unique value.
 - c. The following dimming attributes may be changed or selected using a wireless configuration tool:
 - 1) Establish preset level for each load from 0-100 percent
 - 2) Set high and low trim for each load

- 3) Initiate lamp burn in for each load of either 0, 12 or 100 hours
 - d. Override button for each load provides the following functions:
 - 1) Press and release for on/off control
 - 2) Press and hold for dimming control
 - e. Each dimming output channel shall have an independently configurable minimum and maximum calibration trim level to set the dimming range to match the true dynamic range of the connected ballast or driver. LED level indicators on bound dimming switches shall utilize this new maximum and minimum trim.
 - f. Each dimming output channel shall have an independently configurable minimum and maximum trim level to set the dynamic range of the output within the new 0-100 percent dimming range defined by the minimum and maximum calibration trim.
 - g. Calibration and trim levels must be set per output channel. Devices that set calibration or trim levels per controller (as opposed to per load) are not acceptable.
 - h. All configuration shall be digital. Devices that set calibration or trim levels per output channel via trim pots or dip-switches are not acceptable.
- B. Fixture Controllers shall include
1. A form factor and product ratings to allow various OEM fixture manufacturers to mount the device inside the ballast/driver cavity of standard-sized fluorescent or LED general lighting fixtures.
 2. One 3A 120/277V rated mechanically held relay.
 3. Programmable behavior on power up following the loss of normal power:
 - a. Turn on to 100 percent
 - b. Turn off
 - c. Turn on to last level
 4. Requirement for 7 mA of 24VDC operating power from the digital lighting control local network.
 5. Fixture Controller does not require a connection to a neutral conductor to operate, and unlike other types of Load Controllers it does not contribute power to the digital lighting control local network to drive accessory devices.
 6. Power to drive the fixture controller electronics can come from any room controller

7. 0-10V dimming capability via a single 0-10 volt analog output from the device for control of compatible ballasts and LED drivers. The 0-10 volt output shall automatically open upon loss of power to the Fixture Controller.
8. Connect to a single or dual RJ-45 adaptor with 24 inch leads. Single adaptor mounts in a 1/2 inch KO and dual adaptor in a 2.2 by 1.32 inch rectangular hole for connection to the digital lighting control local network.
9. Adaptor leads are insulated for use in a fixture cavity, and the lead length allows the OEM fixture manufacturer flexibility to position the Fixture Controller and the RJ45 jack in the best locations on each fixture.
10. A complete set of dimming features described above in the paragraph detailing On/Off/Dimming Enhanced Room Controllers.

2.4 DIGITAL WALL OR CEILING MOUNTED OCCUPANCY SENSOR

- A. Digital Occupancy Sensors shall provide graphic LCD display for digital calibration and electronic documentation. Features include the following:
 1. Digital calibration and pushbutton configuration for the following variables:
 - a. Sensitivity, 0-100 percent in 10 percent increments
 - b. Time delay, 1-30 minutes in 1 minute increments
 - c. Test mode, Five second time delay
 - d. Detection technology, PIR, Ultrasonic or Dual Technology activation and/or re-activation.
 - e. Walk-through mode
 2. Load parameters including Auto/Manual-ON, blink warning, and daylight enable/disable when photosensors are included in the digital lighting control local network.
 3. Programmable control functionality including:
 - a. Each sensor may be programmed to control specific loads within a local network.
 - b. Sensor shall be capable of activating one of 16 user-definable lighting scenes.
 - c. Adjustable retrigger time period for manual-on loads. Load will retrigger (turn on) automatically within a configurable period of time (default 10 seconds) after turning off.
 - d. On dual technology sensors, independently configurable trigger modes are available for both Normal (NH) and After Hours (AH) time periods. The retrigger mode can be programmed to use the following technologies:

- e. Ultrasonic and Passive Infrared
 - f. Ultrasonic or Passive Infrared
 - g. Ultrasonic only
 - h. Passive Infrared only
 - i. Independently configurable sensitivity settings for passive infrared and ultrasonic technologies (on dual technology sensors) for both Normal (NH) and After Hour (AH) time periods.
4. One or two RJ-45 port(s) for connection to digital lighting control local network.
 5. Two-way infrared (IR) transceiver to allow remote programming through handheld commissioning tool and control by remote personal controls.
 6. Device Status LEDs, which may be disabled for selected applications, including:
 - a. PIR detection
 - b. Ultrasonic detection
 - c. Configuration mode
 - d. Load binding
 7. Assignment of occupancy sensor to a specific load within the room without wiring or special tools.
 8. Manual override of controlled loads.
 9. All digital parameter data programmed into an individual occupancy sensor shall be retained in non-volatile FLASH memory within the sensor itself. Memory shall have an expected life of no less than 10 years.
- B. BACnet object information shall be available for the following objects:
1. Detection state
 2. Occupancy sensor time delay
 3. Occupancy sensor sensitivity, PIR and Ultrasonic
- C. Units shall not have any dip switches or potentiometers for field settings
- D. Multiple occupancy sensors may be installed in a room by simply connecting them to the free topology digital lighting control local network. No additional configuration will be required.

2.5 DIGITAL WALL SWITCH OCCUPANCY SENSORS

- A. Digital Occupancy Sensors shall provide scrolling LCD display for digital calibration and electronic documentation. Features include the following:
1. Digital calibration and pushbutton configuration for the following variables:
 - a. Sensitivity: 0-100 percent in 10 percent increments
 - b. Time delay: 1-30 minutes in 1 minute increments
 - c. Test mode: Five second time delay
 - d. Detection technology: PIR, Dual Technology activation and/or re-activation.
 - e. Walk-through mode
 - f. Load parameters including Auto/Manual-ON, blink warning, and daylight enable/disable when photosensors are included in the digital lighting control local network.
 2. Programmable control functionality including:
 - a. Each sensor may be programmed to control specific loads within a local network.
 - b. Sensor shall be capable of activating one of 16 user-definable lighting scenes.
 - c. Adjustable retrigger time period for manual-on loads. Load will retrigger (turn on) automatically during the configurable period of time (default 10 seconds) after turning off.
 - d. On dual technology sensors, independently configurable trigger modes are available for both Normal (NH) and After Hours (AH) time periods. The retrigger mode can be programmed to use the following technologies:
 - 1) Ultrasonic and Passive Infrared
 - 2) Ultrasonic or Passive Infrared
 - 3) Ultrasonic only
 - 4) Passive Infrared only
 3. Independently configurable sensitivity settings for passive infrared and ultrasonic technologies (on dual technology sensors) for both Normal (NH) and After Hour (AH) time periods.
 4. Two RJ-45 ports for connection to digital lighting control local network.
 5. Two-way infrared (IR) transceiver to allow remote programming through handheld configuration tool and control by remote personal controls.

6. Device Status LEDs including
 - a. PIR detection
 - b. Ultrasonic detection
 - c. Configuration mode
 - d. Load binding
 7. Assignment of any occupancy sensor to a specific load within the room without wiring or special tools.
 8. Assignment of local buttons to specific loads within the room without wiring or special tools
 9. Manual override of controlled loads
 10. All digital parameter data programmed into an individual wall switch sensor shall be retained in non-volatile FLASH memory within the wall switch sensor itself. Memory shall have an expected life of no less than 10 years.
- B. BACnet object information shall be available for the following objects:
1. Detection state
 2. Occupancy sensor time delay
 3. Occupancy sensor sensitivity, PIR and Ultrasonic
 4. Button state
 5. Switch lock control
 6. Switch lock status
- C. Units shall not have any dip switches or potentiometers for field settings.
- D. Multiple occupancy sensors may be installed in a room by simply connecting them to the free topology digital lighting control local network. No additional configuration will be required.
- E. Two-button wall switch occupancy sensors, when connected to a single relay dimming room or fixture controller, shall operate in the following sequence as a factory default:
1. Left button
 - a. Press and release - Turn load on
 - b. Press and hold - Raise dimming load
 2. Right button

- a. Press and release - Turn load off
- b. Press and hold - Lower dimming load

F. Low voltage momentary pushbuttons shall include the following features:

- 1. Load/Scene Status LED on each switch button with the following characteristics:
 - a. Bi-level LED
 - b. Dim locator level indicates power to switch
 - c. Bright status level indicates that load or scene is active
- 2. The following button attributes may be changed or selected using a wireless configuration tool:
 - a. Load and Scene button function may be reconfigured for individual buttons (from Load to Scene, and vice versa).
 - b. Individual button function may be configured to Toggle, On only or Off only.
 - c. Individual scenes may be locked to prevent unauthorized change.
 - d. Fade Up and Fade Down times for individual scenes may be adjusted from 0 seconds to 18 hours.
 - e. Ramp rate may be adjusted for each dimmer switch.
 - f. Switch buttons may be bound to any load on any load controller or relay panel and are not load type dependent; each button may be bound to multiple loads.

2.6 DIGITAL WALL SWITCHES

- A. Low voltage momentary pushbutton switches in 1, 2, 3, 4, 5 and 6 button configuration. Wall switches shall include the following features:
 - 1. Two-way infrared (IR) transceiver for use with personal and configuration remote controls.
 - 2. Removable buttons for field replacement with engraved buttons and/or alternate color buttons. Button replacement may be completed without removing the switch from the wall.
 - 3. Configuration LED on each switch that blinks to indicate data transmission.
 - 4. Load/Scene Status LED on each switch button with the following characteristics:
 - a. Bi-level LED

- b. Dim locator level indicates power to switch
 - c. Bright status level indicates that load or scene is active
 - d. Dimming switches shall include seven bi-level LEDs to indicate load levels using 14 steps.
5. Programmable control functionality including:
- a. Button priority may be configured to any BACnet priority level, from 1-16, corresponding to networked operation allowing local actions to utilize life safety priority
 - b. Scene patterns may be saved to any button other than dimming rockers. Once set, buttons may be digitally locked to prevent overwriting of the preset levels.
6. All digital parameter data programmed into an individual wall switch shall be retained in non-volatile FLASH memory within the wall switch itself. Memory shall have an expected life of no less than 10 years.
- B. BACnet object information shall be available for the following objects:
1. Button state
 2. Switch lock control
 3. Switch lock status
- C. Two RJ-45 ports for connection to digital lighting control local network.
- D. Multiple digital wall switches may be installed in a room by simply connecting them to the free topology digital lighting control local network. No additional configuration shall be required to achieve multi-way switching.
- E. Load and Scene button function may be reconfigured for individual buttons from Load to Scene, and vice versa.
1. Individual button function may be configured to Toggle, On only or Off only.
 2. Individual scenes may be locked to prevent unauthorized change.
 3. Fade Up and Fade Down times for individual scenes may be adjusted from 0 seconds to 18 hours.
 4. Ramp rate may be adjusted for each dimmer switch.
 5. Switch buttons may be bound to any load on any load controller or relay panel and are not load type dependent; each button may be bound to multiple loads.

PART 3 EXECUTION

3.1 **EXAMINATION**

- A. Do not begin installation until measurements have been verified and work areas have been properly prepared.
- B. If preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.
- C. Verify that required pre-installation meeting specified in Part 1 of this specification has been completed, recorded meeting minutes have been distributed and all outstanding issues noted have been resolved prior to the start of installation.

3.2 **INSTALLATION**

- A. Install system in accordance with the approved system shop drawings and manufacturer's instructions.
- B. All wiring associated with the specified controls system shall be installed within conduit or conduits unless otherwise indicated on the Drawings. Refer to 26 0533.13 - Conduit for Electrical Systems for requirements.
- C. Install all room/area devices using manufacturer's factory-tested low voltage cable with pre-terminated RJ-45 connectors.
 - 1. If pre-terminated cable is not used for room/area wiring, each field-terminated cable shall be tested following installation and testing results submitted to the Manufacturer's Representative for approval prior to proceeding with the Work.
 - 2. If fixtures have internal digital lighting control Control Modules, ensure that they are also connected with low voltage cable.
 - 3. Install all room to room network devices using manufacturer-supplied network wire or wireless devices. Network wire substitution is not permitted and may result in loss of product warranty.
 - 4. Low voltage wiring topology must comply with manufacturer's specifications.
 - 5. Route network wiring as indicated on the Drawings as closely as possible. Document final wiring location, routing and topology on as built drawings.
- D. All line voltage connections shall be tagged to indicate circuit and switched legs.
- E. Test all devices to ensure proper communication.
- F. Calibrate all sensor time delays and sensitivity to guarantee proper detection of occupants and energy savings. Adjust time delay so that controlled area remains lighted while occupied.
- G. Provide written or computer-generated documentation on the configuration of the system including room by room description including:

1. Sensor parameters, time delays, sensitivities, and daylighting setpoints.
 2. Sequence of operation, (e.g. manual ON, Auto OFF. etc.)
 3. Load Parameters (e.g. blink warning, etc.)
- H. Post start-up tuning - Adjust sensor time delays and sensitivities to meet the Owner's requirements 30 days from beneficial occupancy. Provide a detailed report to the Architect / Owner of post start-up activity.
- I. Tighten all panel Class I conductors from both circuit breaker and to loads to torque ratings as marked on enclosure UL label.
- J. All Class II cabling shall enter enclosures from within low-voltage wiring areas and shall remain within those areas. No Class I conductors shall enter a low-voltage area.
- K. Run separate neutrals for any phase dimmed branch load circuit. Different types of dimming loads shall have separate neutral.
- L. Verify all non-panel-based lighting loads to be free from short circuits prior to connection to room controllers.
- M. Remote Access for Network Systems: If "REMOTE ACCESS AND ENHANCED WARRANTY FOR NETWORKED SYSTEMS" is specified in Part 1 of this specification, ensure Segment Manager enclosure is installed in a location with good to excellent cellular phone coverage based on building orientation and geographic location, and mount magnetic antenna for the modem. For cases where alternate mounting locations are not available and a stronger cellular signal is needed, the manufacturer shall offer additional antenna options to improve signal quality. Verify final mounting location with Engineer and Owner prior to proceeding with the Work.

3.3 FIELD QUALITY CONTROL

- A. Manufacturer's Field Service: Engage a factory-authorized service representative to inspect components, assemblies, and equipment installations, including connections, and to assist in testing. Notify Engineer and Manufacturer in writing a minimum of 3 weeks prior to system start-up and testing.
- B. Tests and Inspections: Manufacturer's service representative shall perform the following inspections and prepare reports.
1. Verify Class I and II wiring connections are terminated properly by validating system performance.
 2. Set IP addresses and other network settings of system front end hardware per facilities IT instructions.
 3. Verify / complete task programming for all switches, dimmers, time clocks, and sensors.

4. Verify that the control of each space complies with the Sequence of Operation.
 5. Correct any system issues and re-test.
- C. Provide a report in table format with drawings, or using a software file that can be opened in the manufacturer's system software including each room or space that has lighting control installed. Indicate the following:
1. Date of test or inspection.
 2. Loads per space, or Fixture Address identification.
 3. Quantity and Type of each device installed
 4. Reports providing each device's settings.

3.4 DEMONSTRATION AND TRAINING

- A. Before Substantial Completion, arrange and provide a one-day Owner instruction period to designated Owner personnel. Set-up, starting of the lighting control system and Owner instruction includes:
1. Confirmation of entire system operation and communication to each device.
 2. Confirmation of operation of individual relays, switches, and sensors.
 3. Confirmation of system Programming, photocell settings, override settings, etc.
 4. Provide training to cover installation, programming, operation, and troubleshooting of the lighting control system.

3.5 PRODUCT SUPPORT AND SERVICE

- A. Factory telephone support shall be available at no cost to the Owner following acceptance. Factory assistance shall consist of assistance in solving application issues pertaining to the control equipment.

END OF SECTION

SECTION 26 2726
WIRING DEVICES

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Wall switches.
- B. Receptacles.
- C. Wall plates.

1.2 RELATED REQUIREMENTS

- A. Division 01 - General Requirements: Project administrative and procedural requirements.
- B. Division 02 - Existing Conditions: Demolition, cleaning and disposal requirements, cutting and patching requirements, and repairs.
- C. Section 26 0005 - Basic Electrical Requirements.
- D. Section 26 0519 - Low-Voltage Electrical Power Conductors and Cables: Manufactured wiring systems for use with access floor boxes with compatible pre-wired connectors.
- E. Section 26 0526 - Grounding and Bonding for Electrical Systems.
- F. Section 26 0533.16 - Boxes for Electrical Systems.
- G. Section 26 0935 - Distributed Digital Lighting Controls: Lighting controls, to match accessory receptacles and wall plates specified in this section.

1.3 REFERENCE STANDARDS

- A. FS W-C-596 - Connector, Electrical, Power, General Specification for 2017h.
- B. FS W-S-896 - Switches, Toggle (Toggle and Lock), Flush-mounted (General Specification) 2014g, with Amendment (2017).
- C. NECA 1 - Standard for Good Workmanship in Electrical Construction 2015.
- D. NECA 130 - Standard for Installing and Maintaining Wiring Devices 2016.
- E. NEMA WD 1 - General Color Requirements for Wiring Devices 1999 (Reaffirmed 2020).
- F. NEMA WD 6 - Wiring Devices - Dimensional Specifications 2016.
- G. NFPA 70 - National Electrical Code Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
- H. UL 20 - General-Use Snap Switches Current Edition, Including All Revisions.

- I. UL 498 - Attachment Plugs and Receptacles Current Edition, Including All Revisions.
- J. UL 514D - Cover Plates for Flush-Mounted Wiring Devices Current Edition, Including All Revisions.
- K. UL 943 - Ground-Fault Circuit-Interruption Current Edition, Including All Revisions.

1.4 ADMINISTRATIVE REQUIREMENTS

- A. Coordination:
 - 1. Coordinate the placement of outlet boxes with millwork, furniture, equipment, etc. installed under other sections or by others.
 - 2. Coordinate wiring device ratings and configurations with the electrical requirements of actual equipment to be installed.
 - 3. Coordinate the placement of outlet boxes for wall switches with actual installed door swings.
 - 4. Coordinate the installation and preparation of uneven surfaces, such as split face block, to provide suitable surface for installation of wiring devices.
 - 5. Notify Strategic Energy Solutions, Inc. of any conflicts or deviations from the contract documents to obtain direction prior to proceeding with work.

1.5 SUBMITTALS

- A. Contractor shall provide submittals for equipment listed herein. Refer to Division 01 for submittal procedures.
- B. Product Data: Provide manufacturer's catalog information showing dimensions, colors, and configurations.

1.6 QUALITY ASSURANCE

- A. Conform to requirements of NFPA 70.
- B. Products: Listed, classified, and labeled as suitable for the purpose intended.

PART 2 PRODUCTS

2.1 WIRING DEVICE APPLICATIONS

- A. Provide wiring devices suitable for intended use and with ratings adequate for load served.
- B. For single receptacles installed on an individual branch circuit, provide receptacle with ampere rating not less than that of the branch circuit.

- C. Provide weather resistant GFCI receptacles with specified weatherproof covers for receptacles installed outdoors, or in damp or wet locations.
- D. Provide tamper resistant receptacles for receptacles in areas listed below.
 - 1. All 15 and 20-ampere 125 and 250-volt nonlocking type receptacles in the areas listed below shall be listed tamper-resistant receptacles, unless otherwise excluded in NEC.
 - a. Business offices, corridors, waiting rooms and the like in clinics, medical and dental offices and outpatient facilities.
- E. Provide GFCI protection for receptacles installed within 6 feet of sinks.
- F. Provide GFCI protection for receptacles installed in kitchens.
- G. Provide GFCI protection for receptacles serving electric drinking fountains.
 - 1. Outlet shall be readily accessible.

2.2 WIRING DEVICE FINISHES

- A. Provide wiring device finishes as described below unless otherwise indicated.
- B. Wiring Devices, Unless Otherwise Indicated: Black with galvanized steel wall plate.
- C. Wiring Devices Installed in Finished Spaces: Black with galvanized steel wall plate.

2.3 ALL WIRING DEVICES

- A. Provide products listed and classified by Underwriters Laboratories Inc. as suitable for the purpose specified and indicated.

2.4 WALL SWITCHES

- A. Manufacturers:
 - 1. Hubbell Incorporated: www.hubbell.com.
 - 2. Leviton Manufacturing Company, Inc: www.leviton.com/#sle.
 - 3. Pass & Seymour, a brand of Legrand North America, Inc: www.legrand.us/#sle.
- B. Wall Switches - General Requirements: AC only, quiet operating, general-use snap switches with silver alloy contacts, complying with NEMA WD 1 and NEMA WD 6, and listed as complying with UL 20 and where applicable FS W-S-896; types as indicated on the drawings.
 - 1. Wiring Provisions: Terminal screws for side wiring and screw actuated binding clamp for back wiring with separate ground terminal screw.
- C. Wall Switches: Heavy Duty, AC only general-use snap switch, complying with NEMA WD 6 and WD 1.

1. Body and Handle: Ivory plastic with toggle handle.
2. Ratings:
 - a. Voltage: 120 - 277 volts, AC.
 - b. Current: 20 amperes.

2.5 RECEPTACLES

A. Manufacturers:

1. Hubbell Incorporated: www.hubbell.com.
2. Leviton Manufacturing Company, Inc: www.leviton.com/#sle.
3. Lutron Electronics Company, Inc; Designer Style: www.lutron.com.
4. Pass & Seymour, a brand of Legrand North America, Inc: www.legrand.us/#sle.
5. Source Limitations: Where wall controls are furnished as part of lighting control system, provide accessory matching receptacles and wallplates by the same manufacturer in locations indicated.

B. Receptacles - General Requirements: Self-grounding, complying with NEMA WD 1 and NEMA WD 6, and listed as complying with UL 498 and where applicable FS W-C-596; types as indicated on the drawings.

1. Wiring Provisions: Terminal screws for side wiring or screw actuated binding clamp for back wiring with separate ground terminal screw.
2. NEMA configurations specified are according to NEMA WD 6.

C. Convenience Receptacles:

1. Standard Convenience Receptacles: Industrial specification grade, 20A, 125V, NEMA 5-20R; single or duplex as indicated on the drawings.

D. GFCI Receptacles:

1. GFCI Receptacles - General Requirements: Self-testing, with feed-through protection and light to indicate ground fault tripped condition and loss of protection; listed as complying with UL 943, class A.
2. Standard GFCI Receptacles: Industrial specification grade, duplex, 20A, 125V, NEMA 5-20R.

2.6 WALL PLATES

A. Manufacturers:

1. Hubbell Incorporated: www.hubbell-wiring.com/#sle.
 2. Leviton Manufacturing Company, Inc: www.leviton.com/#sle.
 3. Lutron Electronics Company, Inc: www.lutron.com.
 4. Pass & Seymour, a brand of Legrand North America, Inc: www.legrand.us/#sle.
- B. Wall Plates: Comply with UL 514D.
1. Configuration: One piece cover as required for quantity and types of corresponding wiring devices.
 2. Size: Standard.
 3. Screws: Metal with slotted heads finished to match wall plate finish.
- C. Stainless Steel Wall Plates: Brushed satin finish, Type 302 stainless steel.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify that field measurements are as indicated.
- B. Verify that outlet boxes are installed in proper locations and at proper mounting heights and are properly sized to accommodate devices and conductors in accordance with NFPA 70.
- C. Verify that wall openings are neatly cut and will be completely covered by wall plates.
- D. Verify that final surface finishes are complete, including painting.
- E. Verify that branch circuit wiring installation is completed, tested, and ready for connection to wiring devices.
- F. Verify that conditions are satisfactory for installation prior to starting work.

3.2 PREPARATION

- A. Provide extension rings to bring outlet boxes flush with finished surface.
- B. Clean dirt, debris, plaster, and other foreign materials from outlet boxes.

3.3 INSTALLATION

- A. Perform work in accordance with NECA 1 (general workmanship) and, where applicable, NECA 130, including mounting heights specified in those standards unless otherwise indicated.
- B. Coordinate locations of outlet boxes provided under Section 26 0533.16 as required for installation of wiring devices provided under this section.

1. Mounting Heights: Unless otherwise indicated, as follows:
 - a. Wall Switches: 48 inches above finished floor.
 - b. Wall Dimmers: 48 inches above finished floor.
 - c. Receptacles: 18 inches above finished floor or 6 inches above counter.
 2. Where multiple receptacles, wall switches, wall dimmers, or low voltage devices are installed at the same location and at the same mounting height, gang devices together under a common wall plate.
 3. Locate wall switches on strike side of door with edge of wall plate 3 inches from edge of door frame. Where locations are indicated otherwise, notify Strategic Energy Solutions, Inc. to obtain direction prior to proceeding with work.
- C. Install wiring devices in accordance with manufacturer's instructions.
- D. Install permanent barrier between ganged wiring devices when voltage between adjacent devices exceeds 300 V.
- E. Where required, connect wiring devices using pigtails not less than 6 inches long. Do not connect more than one conductor to wiring device terminals.
- F. Connect wiring devices by wrapping conductor clockwise 3/4 turn around screw terminal and tightening to proper torque specified by the manufacturer. Where present, do not use push-in pressure terminals that do not rely on screw-actuated binding.
- G. Unless otherwise indicated, connect wiring device grounding terminal to branch circuit equipment grounding conductor and to outlet box with bonding jumper.
- H. Provide GFCI receptacles with integral GFCI protection at each location indicated. Do not use feed-through wiring to protect downstream devices.
- I. Install wiring devices plumb and level with mounting yoke held rigidly in place.
- J. Install wall switches with OFF position down.
- K. Install vertically mounted receptacles with grounding pole on top and horizontally mounted receptacles with grounding pole on left.
- L. Install wall plates to fit completely flush to wall with no gaps and rough opening completely covered without strain on wall plate. Repair or reinstall improperly installed outlet boxes or improperly sized rough openings. Do not use oversized wall plates in lieu of meeting this requirement.
- M. Install blank wall plates on junction boxes and on outlet boxes with no wiring devices installed or designated for future use.
- N. Identify wiring devices in accordance with Section 26 0553.

3.4 FIELD QUALITY CONTROL

- A. Inspect each wiring device for damage and defects.
- B. Operate each wall switch and wall dimmer with circuit energized to verify proper operation.
- C. Test each receptacle to verify operation and proper polarity.
- D. Test each GFCI receptacle for proper tripping operation according to manufacturer's instructions.
- E. Correct wiring deficiencies and replace damaged or defective wiring devices.

3.5 CLEANING

- A. Clean exposed surfaces to remove dirt, paint, or other foreign material and restore to match original factory finish.

END OF SECTION

SECTION 26 5100
INTERIOR LIGHTING

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Interior luminaires.
- B. Ballasts and drivers.
- C. LED emergency power supply units.
- D. Luminaire accessories.

1.2 RELATED REQUIREMENTS

- A. Division 01 - General Requirements: Project administrative and procedural requirements.
- B. Division 02 - Existing Conditions: Demolition, cleaning and disposal requirements, cutting and patching requirements, repairs.
- C. Section 26 0005 - Basic Electrical Requirements.
- D. Section 26 0533.16 - Boxes for Electrical Systems.
- E. Section 26 0553 - Identification for Electrical Systems: Identification products and requirements.
- F. Section 26 0935 - Distributed Digital Lighting Control System: Devices for automatic control of lighting, including occupancy sensors, daylighting controls, networked control stations and motion sensors.
- G. Section 26 2726 - Wiring Devices: Manual wall switches and wall dimmers.

1.3 REFERENCE STANDARDS

- A. ANSI C78.379 - Electric Lamps - Classification of the Beam Patterns of Reflector Lamps 2006 (Reaffirmed 2015).
- B. IEC 60529 - Degrees of Protection Provided by Enclosures (IP Code) 2013 (Corrigendum 2019).
- C. IES LM-79 - Approved Method: Optical and Electrical Measurements of Solid-State Lighting Products 2019.
- D. IES LM-80 - Approved Method: Measuring Luminous Flux and Color Maintenance of LED Packages, Arrays, and Modules 2019.
- E. NECA 1 - Standard for Good Workmanship in Electrical Construction 2015.

- F. NECA/IESNA 500 - Standard for Installing Indoor Lighting Systems 2006.
- G. NEMA 410 - Performance Testing for Lighting Controls and Switching Devices 2020.
- H. NEMA LE 4 - Recessed Luminaires, Ceiling Compatibility 2012 (Reaffirmed 2018).
- I. NFPA 70 - National Electrical Code Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
- J. NFPA 101 - Life Safety Code Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
- K. UL 924 - Emergency Lighting and Power Equipment Current Edition, Including All Revisions.
- L. UL 1598 - Luminaires Current Edition, Including All Revisions.
- M. UL 8750 - Light Emitting Diode (LED) Equipment for Use in Lighting Products Current Edition, Including All Revisions.

1.4 ADMINISTRATIVE REQUIREMENTS

- A. Coordination:
 - 1. Coordinate the installation of luminaires with mounting surfaces installed under other sections or by others. Coordinate the work with placement of supports, anchors, etc. required for mounting. Coordinate compatibility of luminaires and associated trims with mounting surfaces at installed locations.
 - 2. Coordinate the placement of luminaires with structural members, ductwork, piping, equipment, diffusers, fire suppression system components, and other potential conflicts installed under other sections or by others.
 - 3. Coordinate the placement of exit signs with furniture, equipment, signage or other potential obstructions to visibility installed under other sections or by others.
 - 4. Notify Strategic Energy Solutions, Inc. of any conflicts or deviations from the contract documents to obtain direction prior to proceeding with work.

1.5 SUBMITTALS

- A. Contractor shall provide submittals for equipment listed herein. Refer to Division 01 for submittal procedures.
- B. Product Data: Provide manufacturer's standard catalog pages and data sheets including detailed information on luminaire construction, dimensions, ratings, finishes, mounting requirements, listings, service conditions, photometric performance, installed accessories, and ceiling compatibility; include model number nomenclature clearly marked with all proposed features.
 - 1. LED Luminaires:

- a. Include estimated useful life, calculated based on IES LM-80 test data.

C. Manufacturer's Installation Instructions: Indicate application conditions and limitations of use stipulated by product testing agency. Include instructions for storage, handling, protection, examination, preparation, and installation of product.

D. Ballast product specification sheet from manufacturer.

1.6 QUALITY ASSURANCE

A. Conform to requirements of NFPA 70 and NFPA 101.

1.7 COORDINATION

A. Coordinate layout and installation of lighting fixtures and suspension system with other construction that penetrates ceilings or is supported by them, including HVAC equipment, fire-suppression system, and partition assemblies.

PART 2 PRODUCTS

2.1 LUMINAIRE TYPES

A. Furnish products as indicated in luminaire schedule included on the drawings.

2.2 LUMINAIRES

A. Provide products that comply with requirements of NFPA 70 and NFPA 101.

B. Provide products that are listed and labeled as complying with UL 1598, where applicable.

C. Provide products listed, classified, and labeled as suitable for the purpose intended.

D. Unless otherwise indicated, provide complete luminaires including lamp(s), light engines, drivers and all sockets, ballasts, reflectors, lenses, housings and other components required to position, energize and protect the lamp/light engine and distribute the light.

E. Unless specifically indicated to be excluded, provide all required conduit, boxes, wiring, connectors, hardware, supports, trims, accessories, etc. as necessary for a complete operating system.

F. Provide products suitable to withstand normal handling, installation, and service without any damage, distortion, corrosion, fading, discoloring, etc.

G. Recessed Luminaires:

1. Ceiling Compatibility: Comply with NEMA LE 4.

2. Luminaires Recessed in Insulated Ceilings: Listed and labeled as IC-rated, suitable for direct contact with insulation and combustible materials.

H. LED Luminaires:

1. Components: UL 8750 recognized or listed as applicable.
2. Tested in accordance with IES LM-79 and IES LM-80.
3. LED Estimated Useful Life: Minimum of 50,000 hours at 70 percent lumen maintenance, calculated based on IES LM-80 test data.

I. Luminaires Mounted in Continuous Rows: Provide quantity of units required for length indicated, with all accessories required for joining and aligning.

2.3 EMERGENCY LIGHTING UNITS

A. Description: Emergency lighting units complying with NFPA 101 and all applicable state and local codes, and listed and labeled as complying with UL 924.

B. Operation: Upon interruption of normal power source or brownout condition exceeding 20 percent voltage drop from nominal, solid-state control automatically switches connected lamps to integral battery power for minimum of 90 minutes of rated emergency illumination, and automatically recharges battery upon restoration of normal power source.

C. Battery:

1. Sealed maintenance-free nickel cadmium unless otherwise indicated.
2. Size battery to supply all connected lamps, including emergency remote heads where indicated.

D. Diagnostics: Provide power status indicator light and accessible integral test switch to manually activate emergency operation.

E. Provide low-voltage disconnect to prevent battery damage from deep discharge.

2.4 BALLASTS AND DRIVERS

A. Ballasts/Drivers - General Requirements:

1. Provide ballasts containing no polychlorinated biphenyls (PCBs).
2. Minimum Efficiency/Efficacy: Provide ballasts complying with all current applicable federal and state ballast efficiency/efficacy standards.
3. Electronic Ballasts/Drivers: Inrush currents not exceeding peak currents specified in NEMA 410.

B. Dimmable LED Drivers:

1. Dimming Range: Continuous dimming from 100 percent to 10 percent relative light output unless dimming capability to lower level is indicated, without flicker.

2. Control Compatibility: Fully compatible with the dimming controls to be installed.

C. Dimmable LED Drivers: Comply with Section 26 0935 - Distributed Digital Lighting Control System

2.5 LED EMERGENCY POWER SUPPLY UNITS

A. Manufacturers:

1. Iota Engineering, LLC: www.iotaengineering.com/#sle.

2. Lithonia Lighting: www.lithonia.com/#sle.

3. Philips Emergency Lighting/Bodine: www.bodine.com/#sle.

4. Manufacturer Limitations: Where possible, for each type of luminaire provide LED emergency power supply units produced by a single manufacturer.

B. Description: Self-contained LED emergency power supply units suitable for use with indicated luminaires, complying with NFPA 101 and all applicable state and local codes, and listed and labeled as complying with UL 924.

C. Operation: Upon interruption of normal power source, solid-state control automatically switches connected lamp(s) to the emergency power supply for minimum of 90 minutes of rated emergency illumination, and automatically recharges battery upon restoration of normal power source.

D. Battery: Sealed maintenance-free high-temperature nickel cadmium unless otherwise indicated.

E. Diagnostics: Provide accessible and visible multi-chromatic combination test switch/indicator light to display charge, test, and diagnostic status and to manually activate emergency operation.

F. Self-Diagnostics: Provide units that self-monitor functionality and automatically perform testing required by NFPA 101 where indicated; provide indicator light(s) to report test and diagnostic status and field selectable audible alert.

2.6 ACCESSORIES

A. Stems for Suspended Luminaires: Steel tubing, minimum 1/2" size, factory finished to match luminaire or field-painted as directed.

B. Threaded Rods for Suspended Luminaires: Zinc-plated steel, minimum 1/4" size, field-painted as directed.

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify that outlet boxes are installed in proper locations and at proper mounting heights and are properly sized to accommodate conductors in accordance with NFPA 70.

- B. Verify that suitable support frames are installed where required.
- C. Verify that branch circuit wiring installation is completed, tested, and ready for connection to luminaires.
- D. Verify that conditions are satisfactory for installation prior to starting work.

3.2 INSTALLATION

- A. Coordinate locations of outlet boxes provided under Section 26 0533.16 as required for installation of luminaires provided under this section.
- B. All wiring associated with the specified controls system shall be installed within conduit or conduits unless otherwise indicated on the Drawings. Refer to 26 0533.13 - Conduit for Electrical Systems for requirements.
- C. Install products in accordance with manufacturer's instructions.
- D. Install luminaires securely, in a neat and workmanlike manner, as specified in NECA 500 (commercial lighting) and NECA 502 (industrial lighting).
- E. Install luminaires plumb and square and aligned with building lines and with adjacent luminaires.
- F. Suspended Ceiling Mounted Luminaires:
 - 1. Do not use ceiling tiles to bear weight of luminaires.
 - 2. Do not use ceiling support system to bear weight of luminaires unless ceiling support system is certified as suitable to do so.
 - 3. Secure pendant-mounted luminaires to building structure.
 - 4. Secure lay-in luminaires to ceiling support channels using listed safety clips at four corners.
 - 5. See appropriate Division 09 section where suspended grid ceiling is specified for additional requirements.
- G. Recessed Luminaires:
 - 1. Install trims tight to mounting surface with no visible light leakage.
 - 2. Non-IC Rated Luminaires: Maintain required separation from insulation and combustible materials according to listing.
 - 3. Luminaires Recessed in Fire-Rated Ceilings: Install using accessories and firestopping materials to meet regulatory requirements for fire rating.
- H. Emergency Lighting Units:

1. Unless otherwise indicated, connect unit to unswitched power from same circuit feeding normal lighting in same room or area. Bypass local switches, contactors, or other lighting controls.

I. LED Emergency Power Supply Units:

1. For field-installed units, install inside luminaire unless otherwise indicated. Where installation inside luminaire is not possible, install on top of luminaire.

J. Identify luminaires connected to emergency power system in accordance with Section 26 0553.

3.3 FIELD QUALITY CONTROL

- A. Inspect each product for damage and defects.
- B. Operate each luminaire after installation and connection to verify proper operation.
- C. Test LED emergency power supply units and emergency lighting units to verify proper operation upon loss of normal power supply.

END OF SECTION

SECTION 28 4600
FIRE DETECTION AND ALARM

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Fire alarm system design and installation, including all components, wiring, and conduit.
- B. Circuits from protected premises to supervising station, including conduit.
- C. Replacement and removal of existing fire alarm system components, wiring, and conduit indicated.
- D. Maintenance of fire alarm system under contract for specified warranty period.

1.2 RELATED REQUIREMENTS

- A. Division 01 - General Requirements: Project administrative and procedural requirements.
- B. Division 02 - Existing Conditions: Demolition, cleaning and disposal requirements, cutting and patching requirements, repairs.
- C. Section 26 0005 - Basic Electrical Requirements.
- D. Section 26 0505 - Selective Demolition for Electrical.
- E. Section 26 0533.13 - Conduit for Electrical Systems.
- F. Section 26 0533.16 - Boxes for Electrical Systems.

1.3 REFERENCE STANDARDS

- A. ADA Standards - Americans with Disabilities Act (ADA) Standards for Accessible Design 2010.
- B. NFPA 70 - National Electrical Code Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
- C. NFPA 72 - National Fire Alarm and Signaling Code Most Recent Edition Cited by Referring Code or Reference Standard.
- D. NFPA 101 - Life Safety Code Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
- E. UL 268 - Standard for Smoke Detectors for Fire Alarm Systems Current Edition, Including All Revisions.

1.4 SUBMITTALS

- A. Contractor shall provide submittals for equipment listed herein. Refer to Division 01 for submittal procedures.
- B. Evidence of designer qualifications.
- C. Design Documents: Submit all information required for plan review and permitting by authorities having jurisdiction, including but not limited to floor plans, riser diagrams, and description of operation:
 - 1. Copy (if any) of list of data required by authority having jurisdiction.
 - 2. NFPA 72 "Record of Completion", filled out to the extent known at the time.
 - 3. Clear and concise description of operation, with input/output matrix similar to that shown in NFPA 72 Appendix A-7-5-2.2(9), and complete listing of software required.
 - 4. System zone boundaries and interfaces to fire safety systems.
 - 5. Location of all components, circuits, and raceways; mark components with identifiers used in control unit programming.
 - 6. Circuit layouts; number, size, and type of raceways and conductors; conduit fill calculations; spare capacity calculations; notification appliance circuit voltage drop calculations.
 - 7. List of all devices on each signaling line circuit, with spare capacity indicated.
 - 8. Manufacturer's detailed data sheet for each component, including wiring diagrams, installation instructions, and circuit length limitations.
 - 9. Description of power supplies; if secondary power is by battery include calculations demonstrating adequate battery power.
 - 10. Certification by either the manufacturer of the control unit or by the manufacturer of each other component that the components are compatible with the control unit.
 - 11. Certification by the manufacturer of the control unit that the system design complies with the contract documents.
 - 12. Certification by Contractor that the system design complies with the contract documents.
- D. Evidence of installer qualifications.
- E. Evidence of instructor qualifications; training lesson plan outline.
- F. Evidence of maintenance contractor qualifications, if different from installer.
- G. Inspection and Test Reports:
 - 1. Submit inspection and test plan prior to closeout demonstration.

2. Submit documentation of satisfactory inspections and tests.
 3. Submit NFPA 72 "Inspection and Test Form," filled out.
- H. Operating and Maintenance Data: Revise and resubmit until acceptable; have one set available during closeout demonstration:
1. Complete set of specified design documents, as approved by authority having jurisdiction.
 2. Additional printed set of project record documents and closeout documents, bound or filed in same manuals.
 3. Contact information for firm that will be providing contract maintenance and trouble call-back service.
 4. List of recommended spare parts, tools, and instruments for testing.
 5. Replacement parts list with current prices, and source of supply.
 6. Detailed troubleshooting guide and large scale input/output matrix.
 7. Preventive maintenance, inspection, and testing schedule complying with NFPA 72; provide printed copy and computer format acceptable to Owner.
 8. Detailed but easy to read explanation of procedures to be taken by non-technical administrative personnel in the event of system trouble, when routine testing is being conducted, for fire drills, and when entering into contracts for remodeling.
- I. Project Record Documents: Have one set available during closeout demonstration:
1. Complete set of floor plans showing actual installed locations of components, conduit, and zones.
 2. "As installed" wiring and schematic diagrams, with final terminal identifications.
 3. "As programmed" operating sequences, including control events by device, updated input/output chart, and voice messages by event.
- J. Closeout Documents:
1. Certification by manufacturer that the system has been installed in compliance with manufacturer's installation requirements, is complete, and is in satisfactory operating condition.
 2. NFPA 72 "Record of Completion", filled out completely and signed by installer and authorized representative of authority having jurisdiction.
 3. Maintenance contract.

1.5 QUALITY ASSURANCE

- A. Designer Qualifications: NICET Level III or IV (3 or 4) certified fire alarm technician or registered fire protection engineer, employed by fire alarm control panel manufacturer, Contractor, or installer, with experience designing fire alarm systems in the jurisdictional area of the authorities having jurisdiction.
- B. Installer Qualifications: Firm with minimum 3 years documented experience installing fire alarm systems of the specified type and providing contract maintenance service as a regular part of their business.
 - 1. Authorized representative of control unit manufacturer; submit manufacturer's certification that installer is authorized; include name and title of manufacturer's representative making certification.
 - 2. Installer Personnel: At least 2 years of experience installing fire alarm systems.
 - 3. Supervisor: NICET level III or IV (3 or 4) certified fire alarm technician; furnish name and address.
- C. Maintenance Contractor Qualifications: Same entity as installer or different entity with specified qualifications.
- D. Instructor Qualifications: Experienced in technical instruction, understanding fire alarm theory, and able to provide the required training; trained by fire alarm control unit manufacturer.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Fire Alarm Control Units and Accessories - Basis of Design: National Time and Signal - Existing System.
- B. Initiating Devices and Notification Appliances:
 - 1. National Time & Signal: www.natsco.net
 - 2. Same manufacturer as control units.
 - 3. Provide initiating devices and notification appliances made by the same manufacturer, where possible.

2.2 FIRE ALARM SYSTEM

- A. Fire Alarm System: Provide modifications and extensions to the existing automatic fire detection and alarm system:
 - 1. Provide all components necessary, regardless of whether shown in the contract documents or not.

2. Protected Premises: Renovated area indicated on plans.
3. Comply with the following; where requirements conflict, order of precedence of requirements is as listed:
 - a. ADA Standards.
 - b. The requirements of the State Fire Marshal.
 - c. The requirements of the local authority having jurisdiction .
 - d. Applicable local codes.
 - e. The contract documents (drawings and specifications).
 - f. NFPA 72; where the word "should" is used consider that provision mandatory; where conflicts between requirements require deviation from NFPA 72, identify deviations clearly on design documents.
4. Evacuation Alarm: Multiple smoke zones; allow for evacuation notification of any individual zone or combination of zones, in addition to general evacuation of entire premises.
5. General Evacuation Zones: Each smoke zone is considered a general evacuation zone unless otherwise indicated, with alarm notification in all zones on the same floor, on the floor above, and the floor below.

2.3 COMPONENTS

A. General:

1. Provide flush mounted units where installed in finish areas; in unfinished areas, surface mounted unit are acceptable.
2. Provide legible, permanent labels for each control device, using identification used in operation and maintenance data.

B. Notification Appliances:

C. Circuit Conductors: Copper or optical fiber; provide 200 feet extra; color code and label.

D. Locks and Keys: Deliver keys to Owner.

E. Instruction Charts: Printed instruction chart for operators, showing steps to be taken when a signal is received (normal, alarm, supervisory, and trouble); easily readable from normal operator's station.

1. Frame: Stainless steel or aluminum with polycarbonate or glass cover.
2. Provide one for each control unit where operations are to be performed.

3. Obtain approval of Owner prior to mounting; mount in location acceptable to Owner.
4. Provide extra copy with operation and maintenance data submittal.

PART 3 EXECUTION

3.1 INSTALLATION

- A. Install in accordance with applicable codes, NFPA 72, NFPA 70, and the contract documents.
- B. Conceal all wiring, conduit, boxes, and supports where installed in finished areas.
- C. Obtain Owner's approval of locations of devices, before installation.
- D. Install instruction cards and labels.

3.2 INSPECTION AND TESTING FOR COMPLETION

- A. Notify Owner 7 days prior to beginning completion inspections and tests.
- B. Notify authorities having jurisdiction and comply with their requirements for scheduling inspections and tests and for observation by their personnel.
- C. Provide the services of the installer's supervisor or person with equivalent qualifications to supervise inspection and testing, correction, and adjustments.
- D. Prepare for testing by ensuring that all work is complete and correct; perform preliminary tests as required.
- E. Provide all tools, software, and supplies required to accomplish inspection and testing.
- F. Perform inspection and testing in accordance with NFPA 72 and requirements of local authorities; document each inspection and test.
- G. Correct defective work, adjust for proper operation, and retest until entire system complies with contract documents.
- H. Diagnostic Period: After successful completion of inspections and tests, Operate system in normal mode for at least 14 days without any system or equipment malfunctions.
 1. Record all system operations and malfunctions.
 2. If a malfunction occurs, start diagnostic period over after correction of malfunction.
 3. Owner will provide attendant operator personnel during diagnostic period; schedule training to allow Owner personnel to perform normal duties.
 4. At end of successful diagnostic period, fill out and submit NFPA 72 "Inspection and Testing Form."

3.3 CLOSEOUT

- A. Closeout Demonstration: Demonstrate proper operation of all functions to Owner.
 - 1. Be prepared to conduct any of the required tests.
 - 2. Have at least one copy of operation and maintenance data, preliminary copy of project record drawings, input/output matrix, and operator instruction chart(s) available during demonstration.
 - 3. Have authorized technical representative of control unit manufacturer present during demonstration.
 - 4. Demonstration may be combined with inspection and testing required by authority having jurisdiction; notify authority having jurisdiction in time to schedule demonstration.
 - 5. Repeat demonstration until successful.

3.4 MAINTENANCE

- A. Provide to Owner, at no extra cost, a written maintenance contract for entire manufacturer's warranty period, to include the work described below.
- B. Perform routine inspection, testing, and preventive maintenance required by NFPA 72, including:
 - 1. Maintenance of fire safety interface and supervisory devices connected to fire alarm system.
 - 2. Repairs required, unless due to improper use, accidents, or negligence beyond the control of the maintenance contractor.
 - 3. Record keeping required by NFPA 72 and authorities having jurisdiction.
- C. Provide trouble call-back service upon notification by Owner:
 - 1. Provide on-site response within 2 hours of notification.
 - 2. Include allowance for call-back service during normal working hours at no extra cost to Owner.
 - 3. Owner will pay for call-back service outside of normal working hours on an hourly basis, based on actual time spent at site and not including travel time; include hourly rate and definition of normal working hours in maintenance contract.
- D. Provide a complete description of preventive maintenance, systematic examination, adjustment, cleaning, inspection, and testing, with a detailed schedule.

Kingscott Associates, Inc.
Architects/Engineers
Kalamazoo, Michigan

Locker Room Remodeling
Hazel Park High School
Hazel Park, Michigan

- E. Maintain a log at each fire alarm control unit, listing the date and time of each inspection and call-back visit, the condition of the system, nature of the trouble, correction performed, and parts replaced. Submit duplicate of each log entry to Owner's representative upon completion of site visit.
- F. Comply with Owner's requirements for access to facility and security.

END OF SECTION



HAZEL PARK HS LOCKER ROOM REMODEL

Hazel Park Schools
1620 East Elza
Hazel Park, MI 48030

305

HAZEL PARK HS LOCKER ROOM REMODEL

Hazel Park Schools

1620 East Elza
Hazel Park, MI 48030



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DIRECTORY

OWNER:

HAZEL PARK SCHOOLS
STREET ADDRESS
HAZEL PARK, MICHIGAN

ARCHITECT & CIVIL ENGINEER:

KINGSCOTT ASSOCIATES INC.
259 E MICHIGAN AVE, SUITE 308
KALAMAZOO, MI 49007
TEL: (800) 632-7815

MEP ENGINEER:

SES ENGINEERING
4000 WEST 11 MILE ROAD
BERKLEY, MI 48012
(248) 399-1900

LOCATION MAP



SHEET INDEX:

NO.	NAME	NO.	NAME	NO.	NAME
GENERAL					
G01	TITLE SHEET				
ARCHITECTURAL					
A11	FIRST FLOOR PLAN, DEMOLITION PLAN, AND EQUIPMENT PLAN				
A21	REFLECTED CEILING PLAN, DOOR SCHEDULE, DETAILS				
A31	COLOR PLAN, INTERIOR ELEVATIONS				
MECHANICAL					
M00	MECHANICAL GENERAL INFORMATION				
M04.1	MECHANICAL DEMOLITION PLAN				
M41	MECHANICAL NEW WORK PLAN				
M50	MECHANICAL SCHEDULES				
ELECTRICAL					
E00	ELECTRICAL GENERAL INFORMATION				
ED41	ELECTRICAL DEMOLITION PLAN				
E41	ELECTRICAL NEW WORK PLAN				
E50	ELECTRICAL SCHEDULES				

ISSUANCES DATE

JOB NO. 4500.04

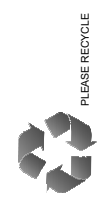
SHEET TITLE
TITLE SHEET

SHEET NO.

G0.1

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FINAL OWNER REVIEW 03/11/22



HAZEL PARK HS LOCKER ROOM REMODEL

Hazel Park Schools

1620 East Elza
Hazel Park, MI 48030



ISSUANCES DATE

ISSUANCES	DATE

ARCHITECTURAL GENERAL NOTES

- ALL NEW CMU PARTITIONS SHALL HAVE A 5 1/2" x 1/4" FIRST COURSE TO MATCH EXISTING CMU COURSES.
- REFER TO COLOR PLAN FOR FLOOR FINISH PATTERNS AND COLORS.
- CONTRACTOR SHALL COORDINATE LOCATIONS OF FLOOR DRAINS, CLEAN OUTS, ETC. WITH APPROPRIATE TRADES.
- MASONRY CONTRACTOR TO INSTALL LOOSE LITELS FOR MISCELLANEOUS OPENINGS NOT INDICATED ON DRAWINGS BUT REQUIRED FOR MECHANICAL, ELECTRICAL, FOOD SERVICE EQUIPMENT OR OTHER ITEMS THAT PASS THROUGH A WALL. STEEL LITELS SHALL BE SUPPLIED BY THE STEEL CONTRACTOR.
- REFER TO PARTITION TYPES SHOWN ON REFLECTED CEILING PLANS AND PARTITION TYPE SHEET.
- DIMENSIONS SHOWN ARE TO FACE OF CMU WALL.
- FIELD SEAL ALL PENETRATIONS THROUGH WALLS & VOIDS AT STRUCTURAL MEMBERS.
- ALL EXPOSED CMU CORNERS SHALL BE BULLNOSE CORNERS, U.N.O.
- NEW OPENINGS IN EXISTING MASONRY WALLS SHALL BE TOOTHED IN TO MATCH EXISTING COURSES AND MASONRY SIZES, U.N.O.

DEMOLITION PLAN GENERAL NOTES

- CONTRACTORS SHALL COORDINATE WITH ALL DRAWINGS AND SPECIFICATIONS FOR AREAS THAT WILL REQUIRE DEMOLITION THAT ARE NOT INDICATED ON DEMOLITION PLAN.
- THE DEMOLITION PLAN GENERALLY INDICATES AREAS OF EXISTING REMOVALS AND MAY NOT INDICATE ALL DEMOLITION. CONTRACTOR SHALL PERFORM ALL DEMOLITION WHICH IS NECESSARY FOR THE PROPER EXECUTION OF THE WORK.
- CONTRACTOR IS RESPONSIBLE TO FILL, PATCH AND/OR REPAIR EXISTING WALL, FLOORS AND CEILINGS TO MATCH EXISTING WHERE DEMOLITION OCCURS OTHER THAN AS DESCRIBED IN THESE DOCUMENTS.
- PATCH AND REPAIR REMAINING ADJACENT SURFACES AT AREAS OF REMOVAL AND/OR ALTERATION TO MATCH EXISTING. PROVIDE A SOUND AND PROPER SUBSTRATE FOR NEW FINISH. COORDINATE WITH COLOR PLANS. WHERE A NEW FINISH IS NOT INDICATED, MATCH EXISTING ADJACENT FINISHES.
- ALL DEMOLITION IS TO BE DONE WITH REASONABLE CARE AS TO MINIMIZE DAMAGE TO EXISTING REMAINING SURFACES. CONTRACTOR IS RESPONSIBLE TO PROPERLY DISPOSE OF ALL DEMOLISHED ITEMS NOT INDICATED TO BE RELOCATED OR TURNED OVER TO OWNER.
- CLEAN AND PREPARE ALL EXISTING SURFACES WHICH ARE TO BE PAINTED/PATCHED. PREPARATION TO INCLUDE MINOR PATCHING.

DEMOLITION PLAN KEYNOTES

- FLOORS**
 - REMOVE CERAMIC FLOOR TILE. PREPARE SLAB FOR NEW CERAMIC TILE.
 - REMOVE CERAMIC FLOOR TILE AND MORTAR BED DOWN TO SLAB. PREPARE SLAB FOR NEW CERAMIC TILE.
- WALLS**
 - REMOVE AND DISPOSE OF MASONRY WALL CONSTRUCTION AND ALL RELATED BRACING / SUPPORTS. PREP REMAINING SURFACES TO RECEIVE NEW FINISHES AND/OR CONSTRUCTION.
 - NOT USED.
 - CUT OPENINGS INTO WALL AND REMOVE AS REQUIRED FOR THE PROPER INSTALLATION OF A NEW DOOR, WINDOW ASSEMBLY OR MECHANICAL EQUIPMENT/LOUVER. COORDINATE WITH FLOOR PLANS AND DOOR/WINDOW MANUFACTURERS REQUIREMENTS.
- CEILING**
 - REMOVE AND DISPOSE OF HARD CEILING, FURRING, ANCHORS, SUPPORTS AND ATTACHMENTS AS REQUIRED FOR NEW CONSTRUCTION MECHANICAL OR ELECTRICAL WORK. COORDINATE ALL NECESSARY ELECTRICAL AND MECHANICAL REMOVAL AND REPLACEMENT WITH ELECTRICAL AND MECHANICAL CONTRACTORS.
- DOORS**
 - REMOVE AND DISPOSE OF DOOR AND FRAME, AND ALL RELATED ANCHORS AND SUPPORTS. SAWCUT ALL FRAME ANCHORS - PRYING ANCHORS FROM SUBSTRATES IS UNACCEPTABLE. SALVAGE HARDWARE & RETURN TO OWNER.
- NOT USED**
- TOILETS / PLUMBING**
 - REMOVE / DISPOSE OF PLUMBING FIXTURE - REFER TO PLUMBING DEMOLITION PLANS. PREP REMAINING SURFACES TO RECEIVE NEW CONSTRUCTION AND/OR FINISHES.
 - REMOVE ACCESSORIES INCLUDING HAND DRYERS, PAPER TOWEL DISPENSERS, TOILET PAPER DISPENSERS, SOAP DISPENSERS AND ALL RELATED ANCHORS, SUPPORTS, HARDWARE AND ADHESIVES. RETURN TO OWNER.

EQUIPMENT PLAN GENERAL NOTES

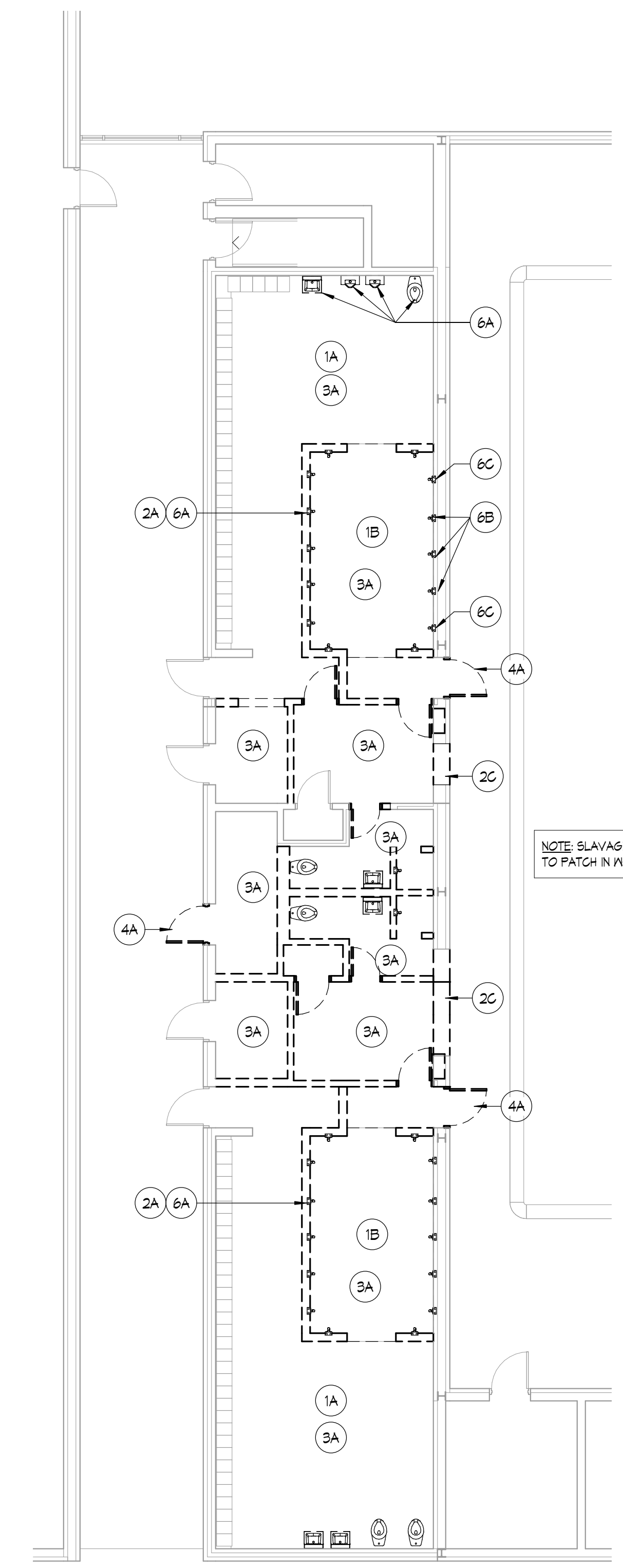
- ALL VISUAL DISPLAY BOARD INSTALLATION LOCATIONS ARE TO BE FIELD VERIFIED PRIOR TO INSTALLATION.
- REFER TO SPECIFICATIONS FOR VISUAL DISPLAY BOARD FINISHES AND COLOR DESIGNATIONS.
- SEE SHEET 60.3 FOR SIGNAGE MOUNTING HEIGHTS. PROVIDE BACK PANELS AT ALL SIGNAGE MOUNTED ON GLASS.
- REFER TO TECHNOLOGY DRAWINGS BY OTHERS TO COORDINATE VDB'S. INFORM ARCHITECT OF CONFLICTS.

EQUIPMENT PLAN KEYNOTES

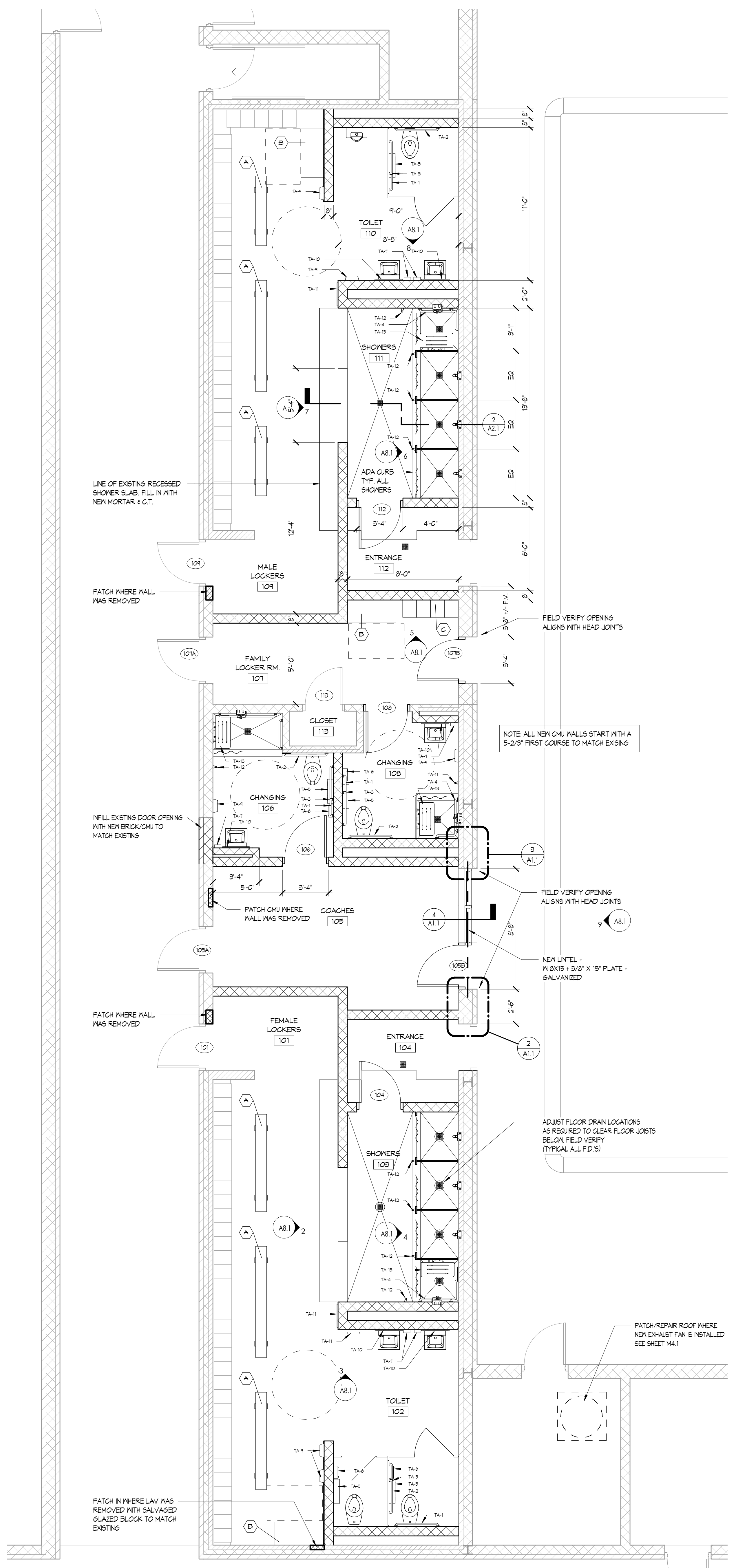
- LOCKER BENCH - REFER TO SPECIFICATION SECTION 105113.
- ADA LOCKER BENCH - REFER TO SPECIFICATION SECTION 105113.
- METAL LOCKERS - REFER TO SPECIFICATION SECTION 105113.

TOILET ACCESSORIES	
MARK	DESCRIPTION
TA-1	GRAB BAR - 42"
TA-2	GRAB BAR - 36"
TA-3	GRAB BAR - 18" VERTICAL
TA-4	GRAB BAR - 18" X 30" TWO-WALL
TA-5	TOILET TISSUE DISPENSER
TA-6	SANITARY NAPKIN DISPOSAL UNIT
TA-7	LIQUID SOAP DISPENSER
TA-8	PAPER TOWEL DISPENSER
TA-9	WARM AIR HAND DRYER
TA-10	2'-0" X 3'-0" MIRROR
TA-11	1'-0" X 2'-0" MIRROR
TA-12	ROBE HOOK
TA-13	ADA SHOWER SEAT - TRANSFER

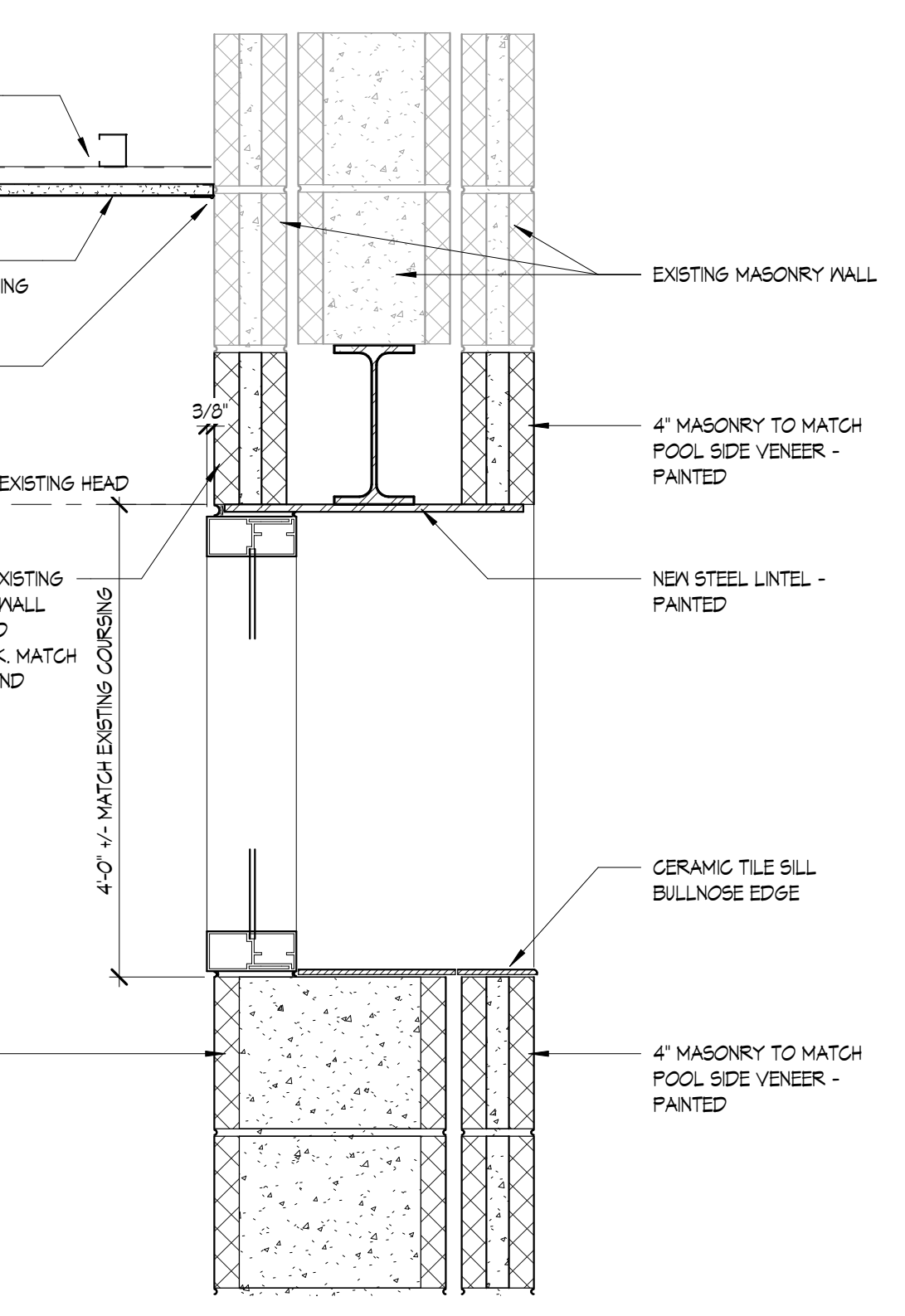
- NOTES:
- REFER TO SPECIFICATION SECTION 102300.
 - REFER TO SHEET 60.1 FOR TYPICAL MOUNTING HEIGHTS.



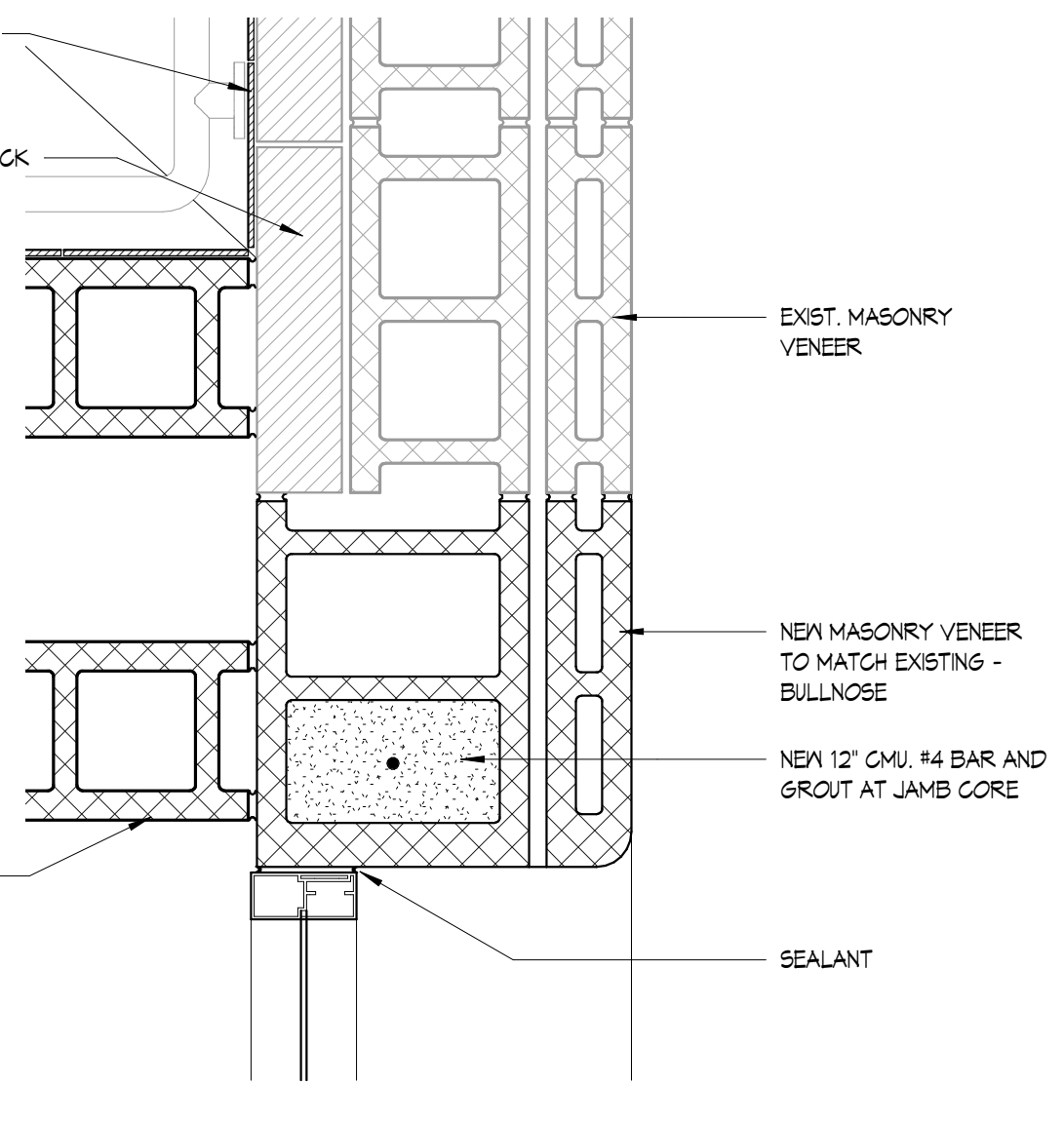
5 FIRST FLOOR DEMOLITION PLAN - LOCKER ROOMS
1/8" = 1'-0"



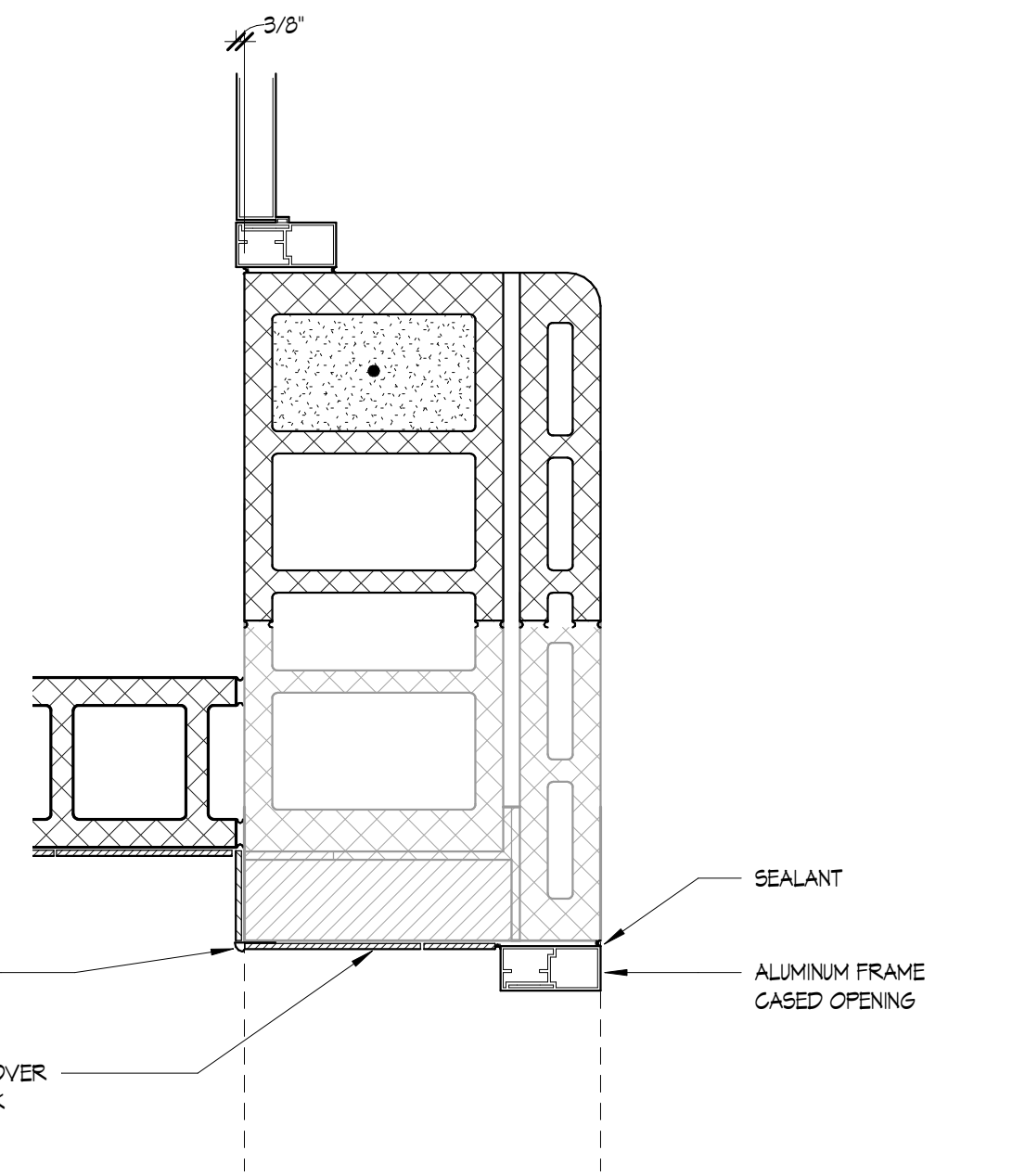
1 LOCKER ROOMS PLAN
1/4" = 1'-0"



4 NEW LINTEL DETAIL
1 1/2" = 1'-0" REFER TO 1/A.1



3 JAMB DETAIL D
1 1/2" = 1'-0" REFER TO 1/A.1



2 DOOR JAMB 105B, 107B SIM
1 1/2" = 1'-0" REFER TO 1/A.1

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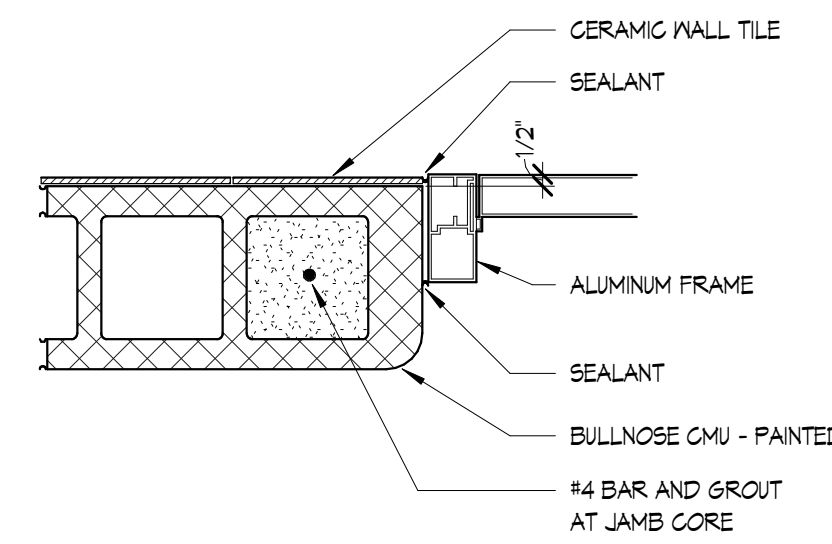
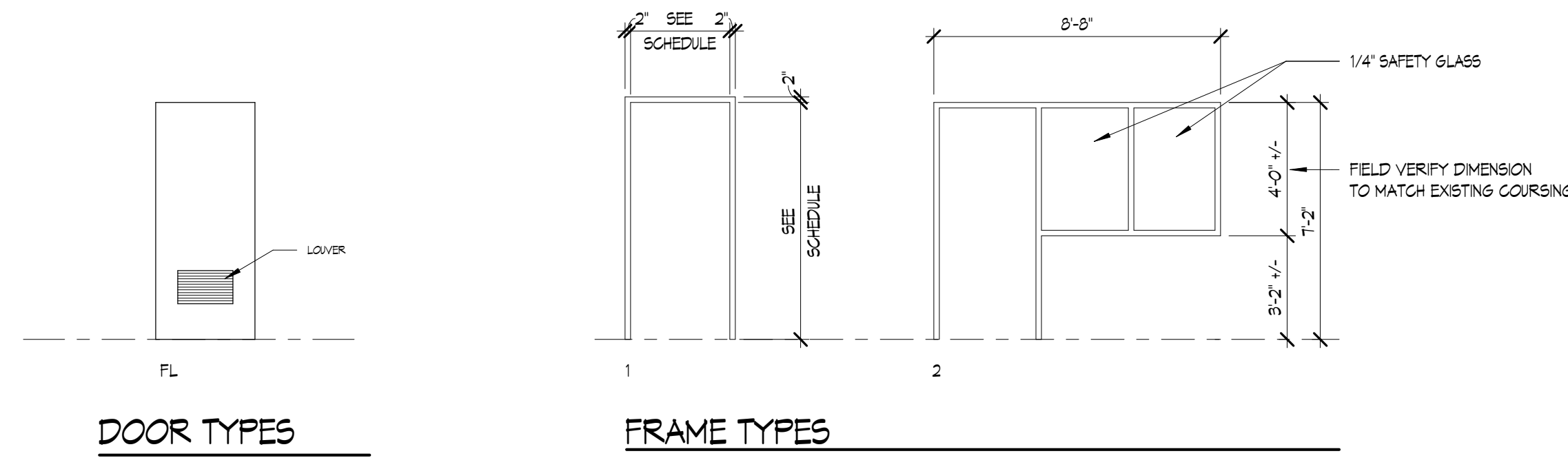
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SHEET TITLE
FIRST FLOOR PLAN, DEMOLITION PLAN, AND EQUIPMENT PLAN
SHEET NO.



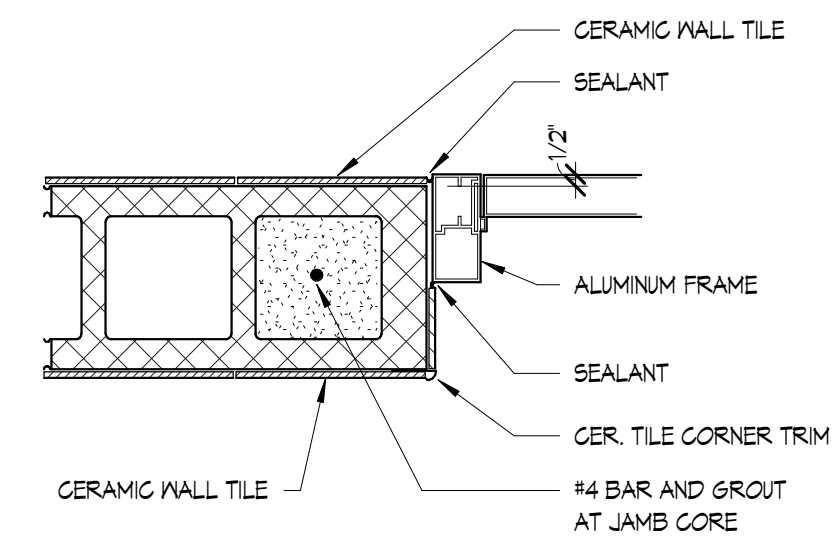
OWNER PROGRESS REVIEW 02/17/2022



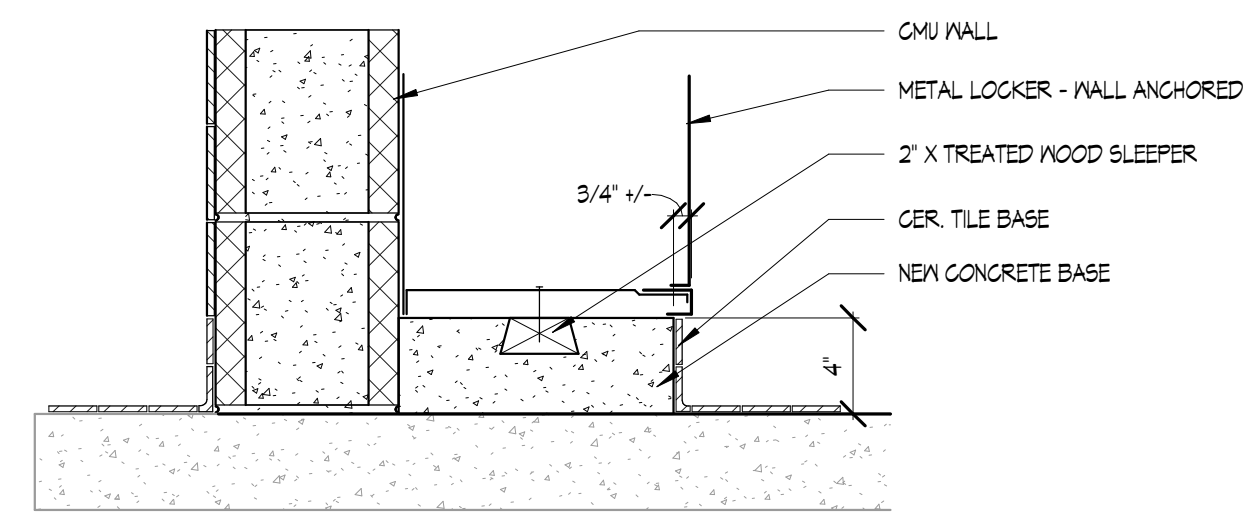
DOOR NUMBER	DOOR SCHEDULE										FIRE RATING	HARDWARE SET	REMARKS	
	DOOR		FRAME											
	WIDTH	HEIGHT	DOOR TYPE	DOOR MATERIAL	DOOR GLASS	FRAME TYPE	FRAME MATERIAL	FRAME GLASS	HEAD	JAMB				JAMB
101	3'-0"	7'-0"	EXST	FL	AL	1	AL			5/A2.1	5/A2.1		2	
104A	3'-0"	7'-0"	EXST	FL	AL									
105B	3'-0"	7'-0"	FL	AL		2	AL	1/4 SAF					1	
106	3'-0"	7'-0"	FL	AL		1	AL			4/A2.1	4/A2.1		3	
107A	3'-0"	7'-0"	EXST	FL	AL									
107B	3'-0"	7'-0"	FL	AL										
108	3'-0"	7'-0"	FL	AL									3	
104	3'-0"	7'-0"	EXST	FL	AL									
112	3'-0"	7'-0"	FL	AL		1	AL			5/A2.1	5/A2.1		2	
113	2'-8"	7'-0"	EXST	FL	AL									



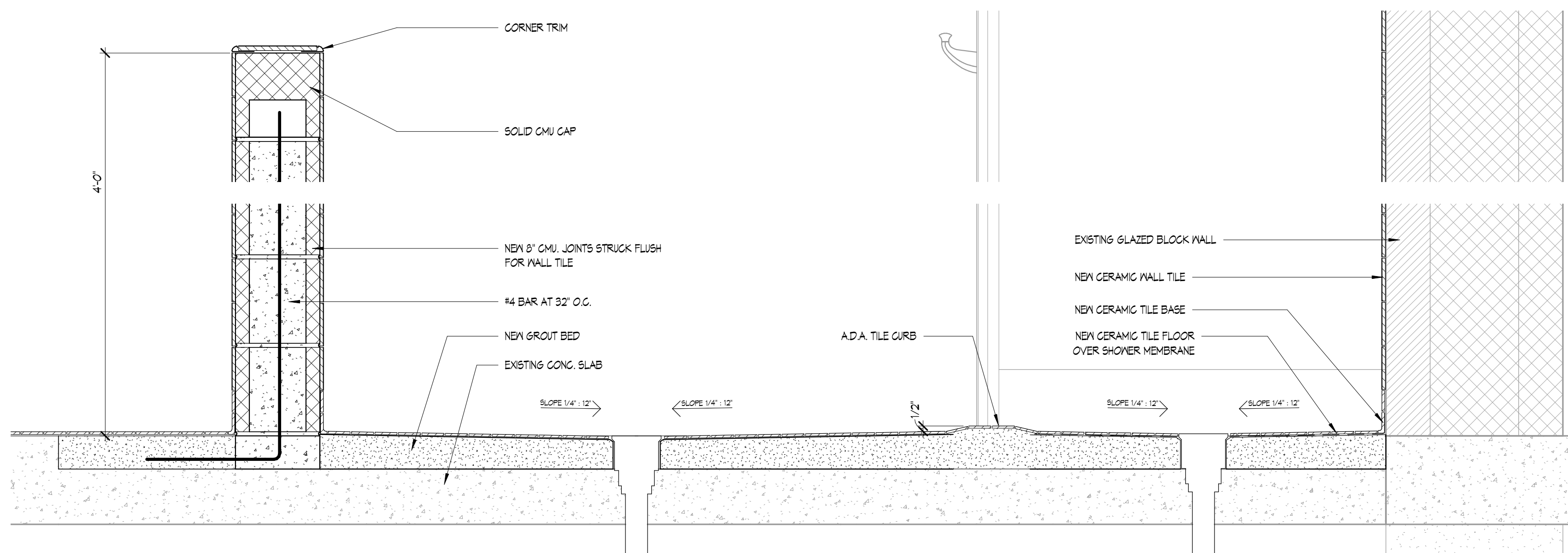
4 DOOR JAMB 106
1 1/2" = 1'-0"



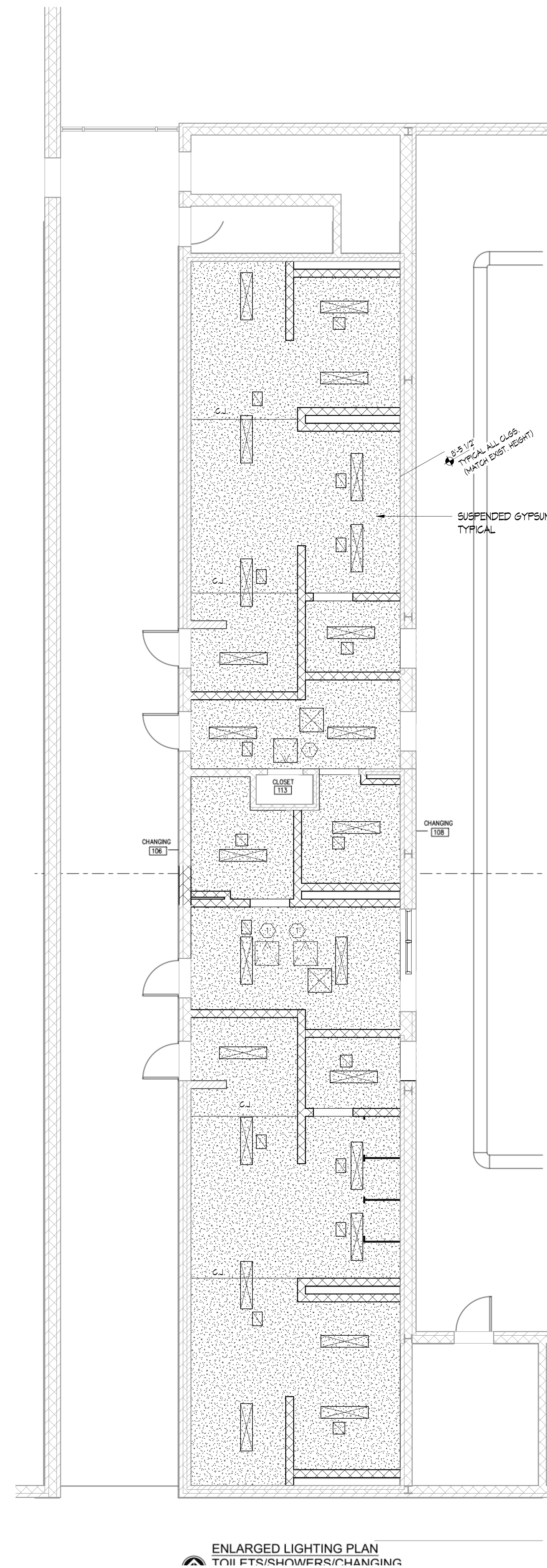
5 DOOR JAMB 104, 112
1 1/2" = 1'-0"



3 LOCKER BASE DETAIL
1 1/2" = 1'-0" REFER TO 5 / A3.1



2 PONY WALL / SHOWER DETAIL
1 1/2" = 1'-0" REFER TO 1 / A1.1



1 LOCKER ROOM REFLECTED CEILING PLAN
3/16" = 1'-0"

REFLECTED CEILING PLAN GENERAL NOTES

- COORDINATE LOCATION OF ACCESS PANELS WITH OTHER TRADES—PROVIDE ADDITIONAL ACCESS PANELS FOR PLUMBING VALVES BEYOND WHAT IS SHOWN AS REQUIRED.
- SEE COLOR LAYOUT PLANS A0.1 FOR CEILING PAINT COLORS.

REFLECTED CEILING PLAN KEYNOTES

- CEILING ACCESS PANEL - 24" X 24"

HAZEL PARK HS LOCKER ROOM REMODEL

Hazel Park Schools

1620 East Elza
Hazel Park, MI 48030



ISSUANCES	DATE

JOB NO. 4500.04
SHEET TITLE
REFLECTED CEILING PLAN, DOOR SCHEDULE, DETAILS

SHEET NO.
A2.1
KINGSCOTT ASSOCIATES INC. KALAMAZOO, MICHIGAN

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HAZEL PARK HS LOCKER ROOM REMODEL

Hazel Park Schools

1620 East Elza
Hazel Park, MI 48030



ISSUANCES DATE

ISSUANCES	DATE

JOB NO. 4500.04

SHEET TITLE
COLOR PLAN, INTERIOR ELEVATIONS

SHEET NO.

A8.1

KINGSKOTT ASSOCIATES INC. KALAMAZOO, MICHIGAN

COLOR LAYOUT PLAN GENERAL NOTES

- UNLESS NOTED OTHERWISE, PAINT NEW BULKHEADS, GYP CEILING, AND EXPOSED CEILING'S P-2.
- SEE INTERIOR ELEVATIONS FOR ADDITIONAL INTERIOR FINISH DETAILS.
- CERAMIC TILE CONTROL JOINTS TBD.
- FLOORING TRANSITIONS TO OCCUR IN LINE WITH THE CENTERLINE OF THE DOOR LEAF.
- REFER TO 1/A1.1 FOR LOCATIONS REQUIRING PATCHING/REPAIR OF WALL MATERIAL FROM DEMOLITION. SALVAGE EXISTING MATERIAL FROM DEMOLITION TO INFILL WHERE REQUIRED.
- METAL TRIM AT ALL EXPOSED EDGES OF WALL TILE.
- PAINT ALL EXISTING CMU P-1 AT ALL AREAS OF WORK.
- SEE EQUIPMENT PLANS FOR ADDITIONAL DETAILS.

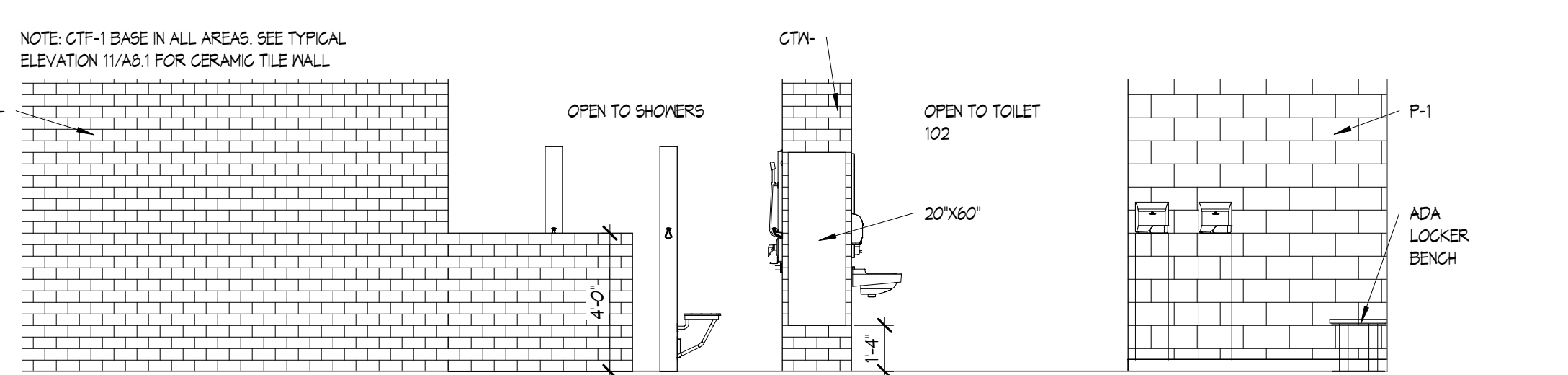
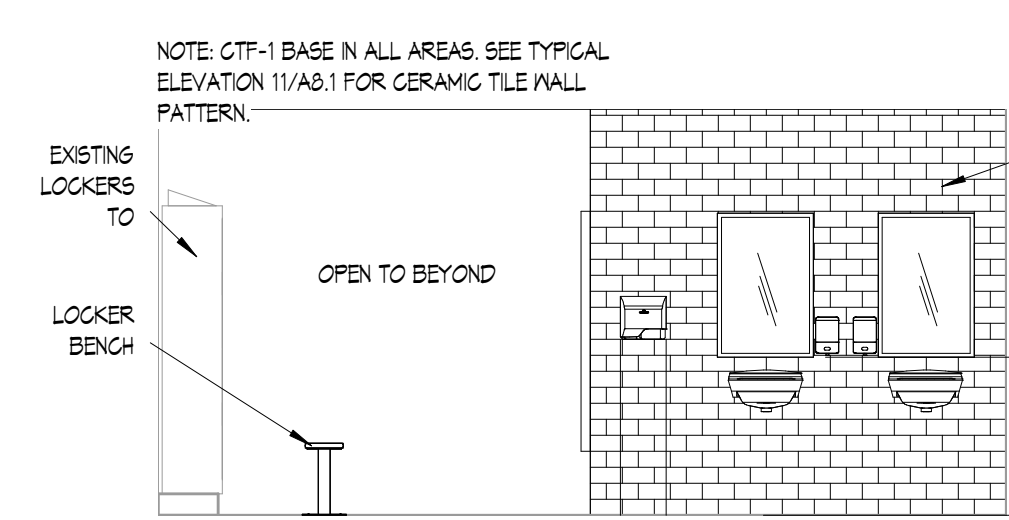
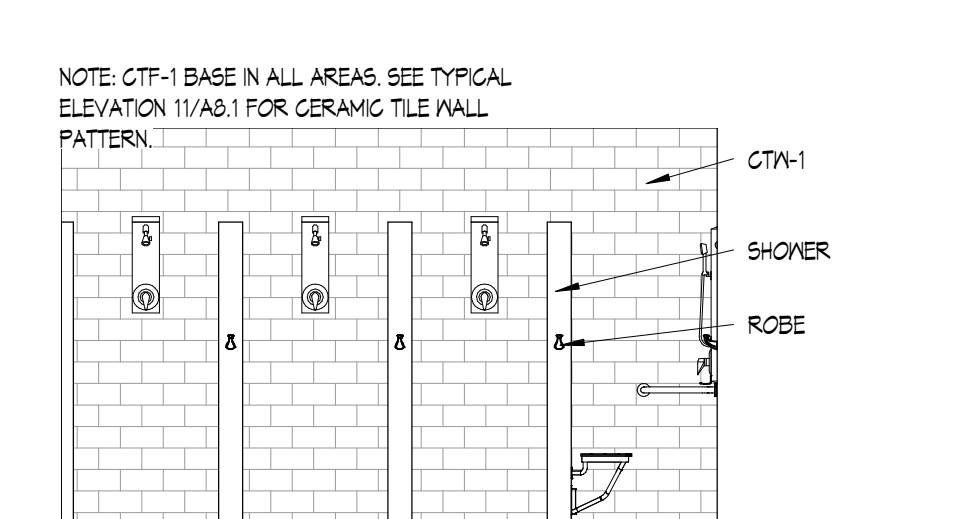
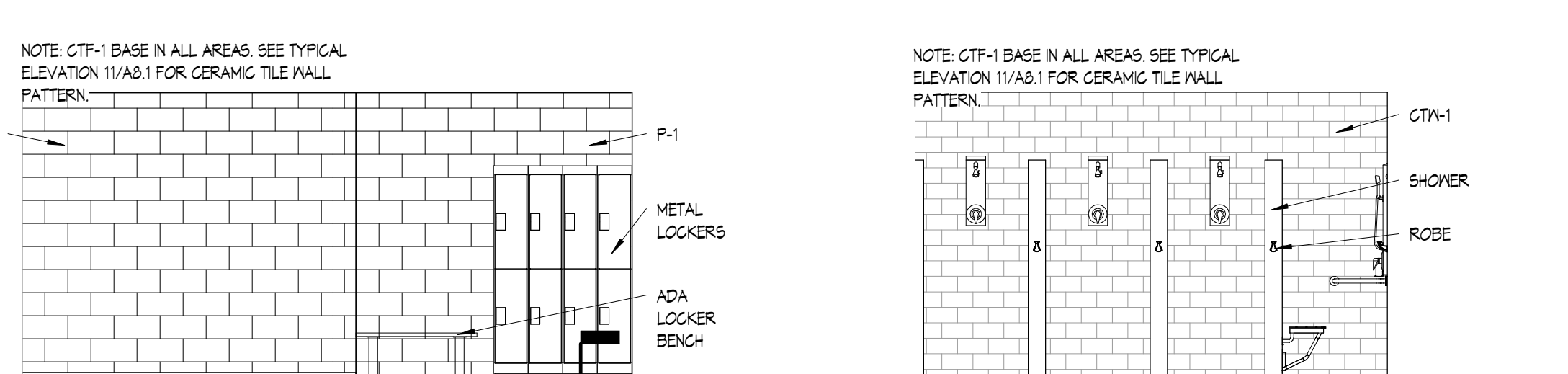
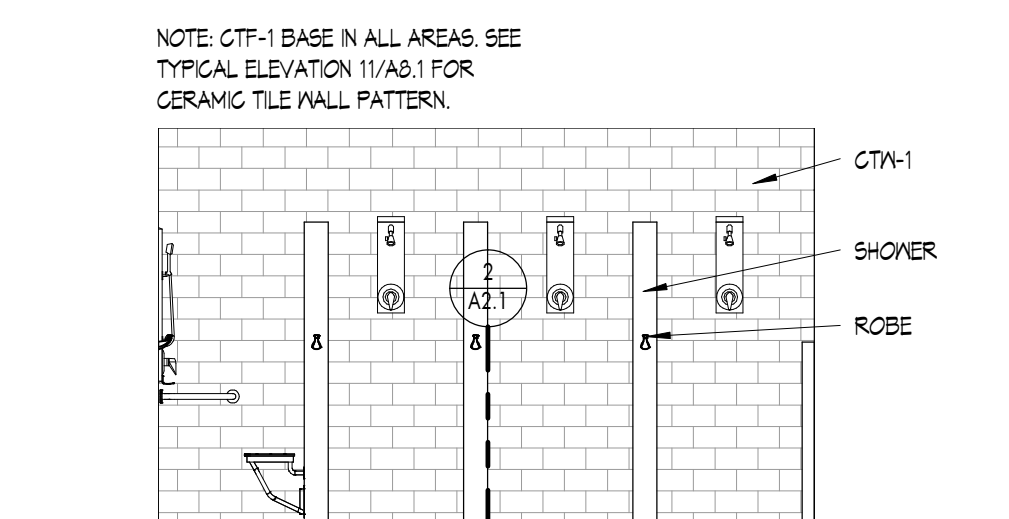
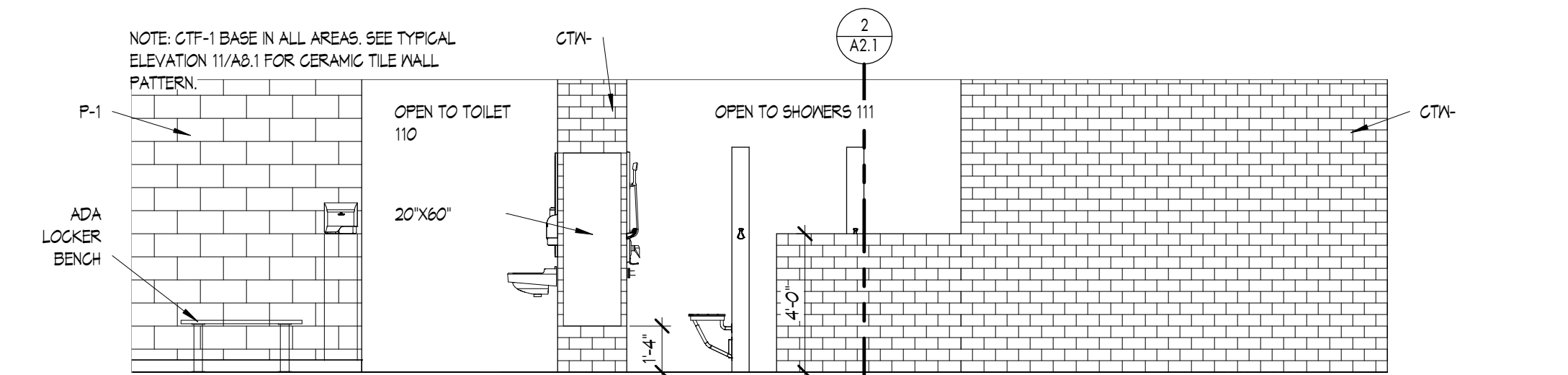
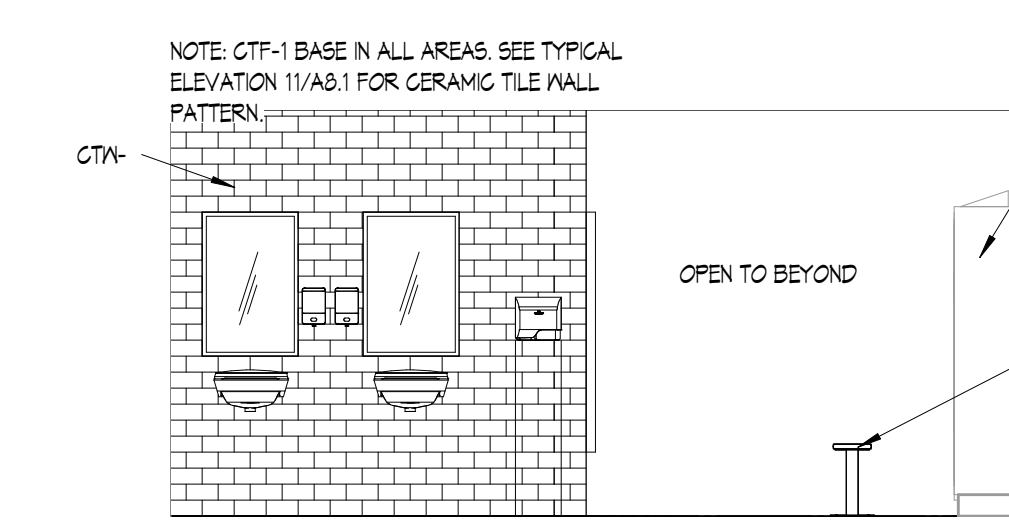
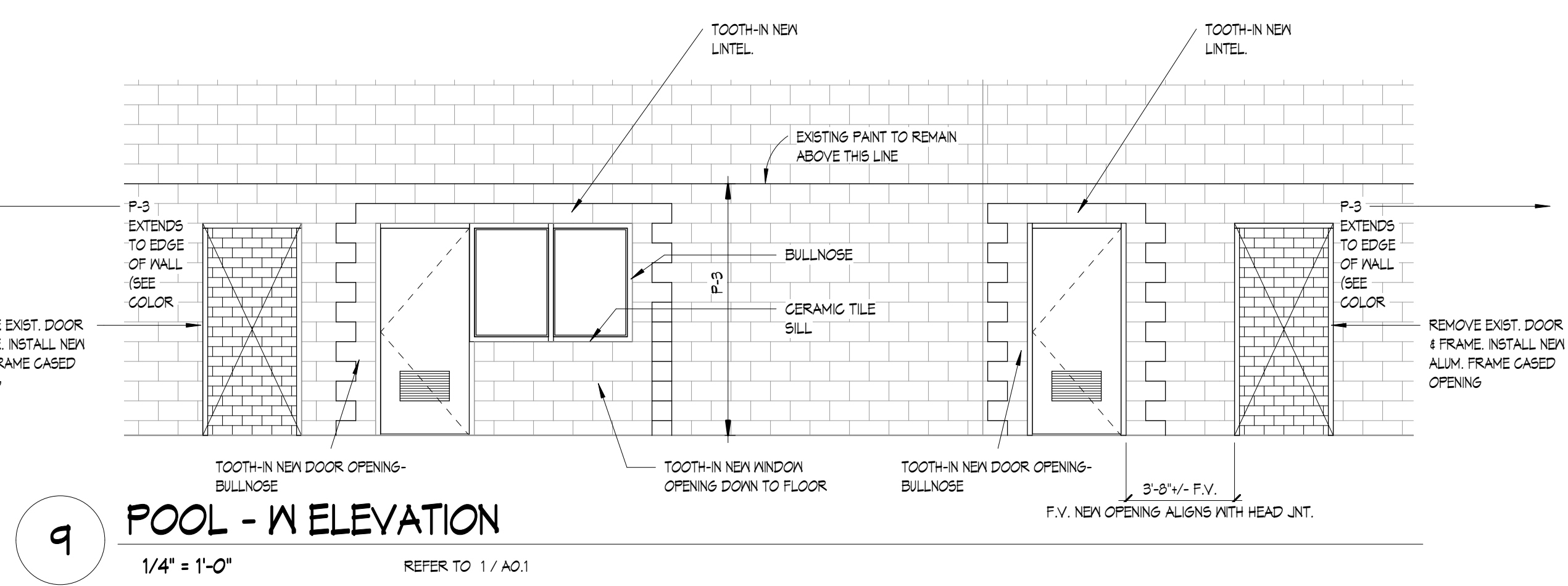
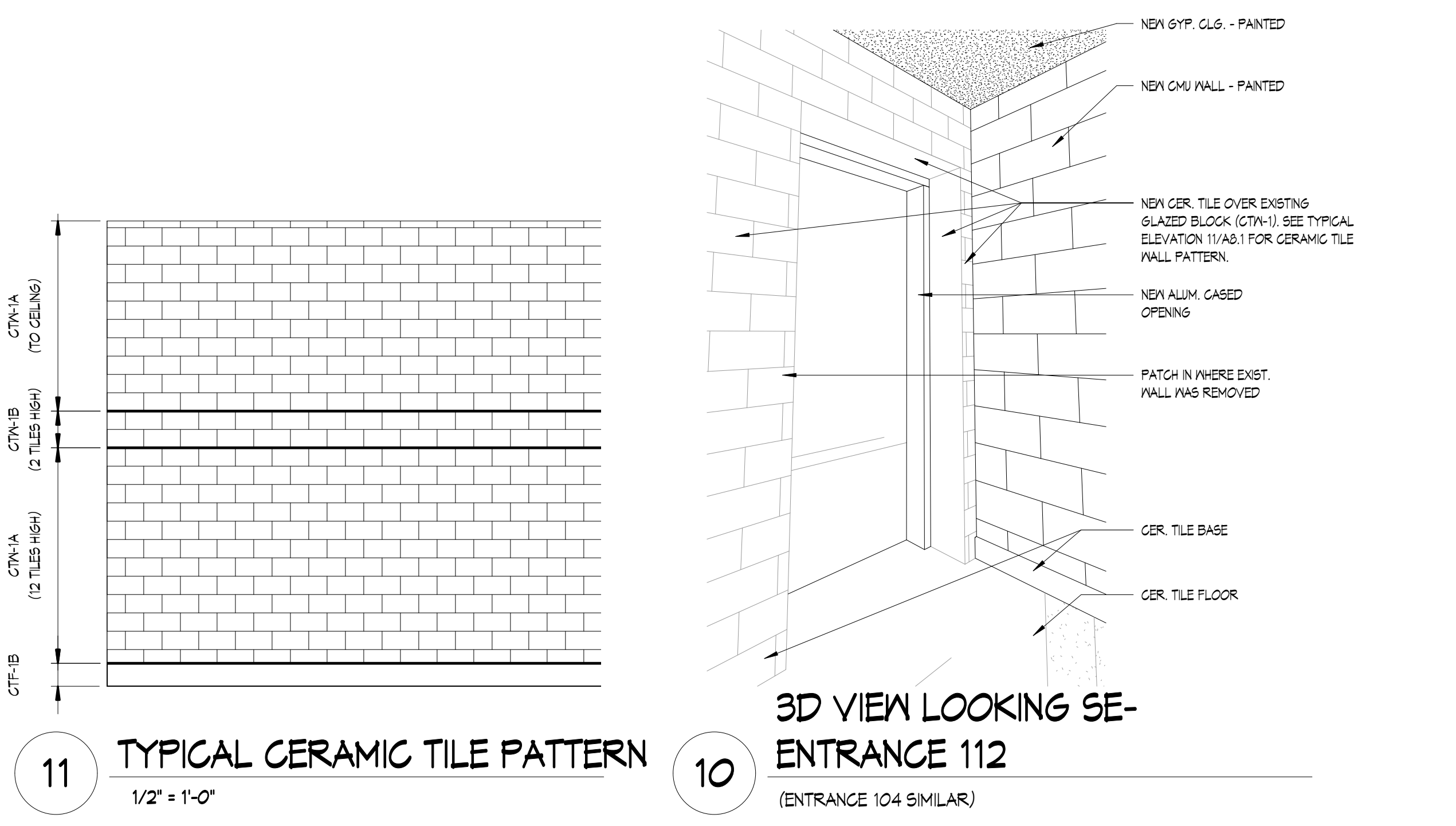
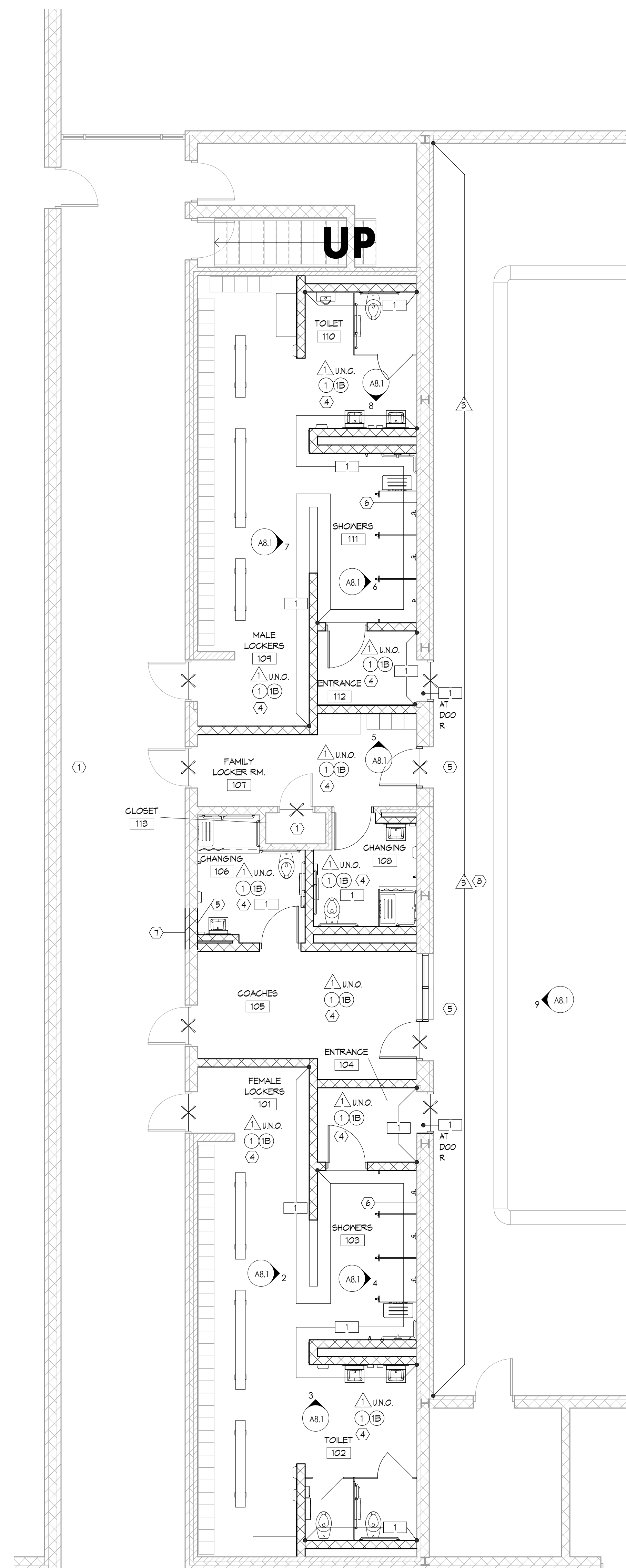
COLOR SYMBOL LEGEND

- PAINT, SEE SPEC 09123 & 09800
- SEALED CONCRETE
- CERAMIC TILE FLOOR
- CERAMIC TILE BASE
- CERAMIC TILE WALL - FULL HT.
- CONTROL JOINT
- PRODUCT EXTENTS
- WORK POINT
- FLOORING TRANSITION
- WIDTH OF MATERIAL

- BFST BARRIER FREE STONE THRESHOLD
- CPT-# CARPET TILE, REFER TO SPECIFICATION
- LVT-# LUXURY VINYL TILE
- MT BARRIER FREE METAL TRANSITION EQUAL TO SCHLUTER / RAMP
- POL. CONC. POLISHED CONCRETE (NOTE GRIND LEVEL)
- RB-# RUBBER BASE
- REF-# RESINOUS EPOXY FLOORS
- RSTA-# RUBBER STAR ACCESSORIES - SEE SPECIFICATION
- SC SEALED CONCRETE FLOOR (SC)
- RT RESILIENT TRANSITION, REFER TO SPECIFICATION
- RAF-# RESILIENT ATHLETIC FLOORING
- WAR-# WOOD ATHLETIC FLOORING

COLOR LAYOUT PLAN KEYNOTES

- EXISTING FINISHES TO REMAIN, U.N.O.
- NOT USED.
- NOT USED.
- EXISTING STRUCTURAL GLAZED BLOCK WALLS TO REMAIN, U.N.O. PATCH/PAINT EXISTING WALLS AS REQUIRED TO MATCH EXISTING FINISHES.
- AT NEW CONSTRUCTION, PATCH EXISTING WALLS AS REQUIRED TO MATCH EXISTING FINISHES. SALVAGE EXISTING WALL MATERIAL FROM DEMOLITION TO INFILL WHERE REQUIRED.
- CTM-1 OVER EXISTING WALL FINISH. COORDINATE PATCHING OF EXISTING WALL WITH SHEET A1.1.
- INFILL OPENING WITH BRICK TO COORDINATE WITH EXISTING BRICK.



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OWNER PROGRESS REVIEW 02/17/2022



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Phone 248.399.1900 Fax 248.399.1901
www.sesnet.com

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SES Project #21 0588 09

HAZEL PARK HS LOCKER ROOM REMODEL

23400 Hughes Ave.

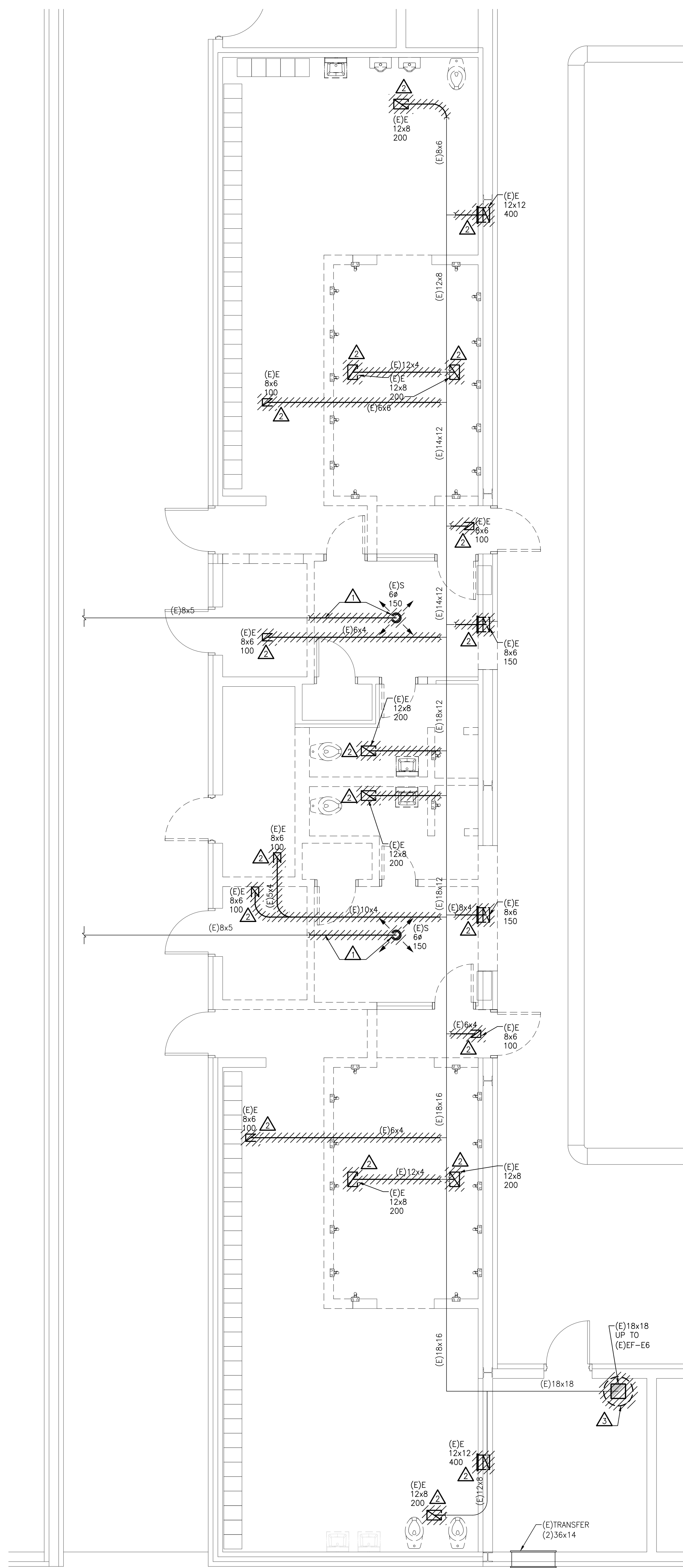
Hazel Park, Michigan 48030

MECHANICAL DEMOLITION NOTES

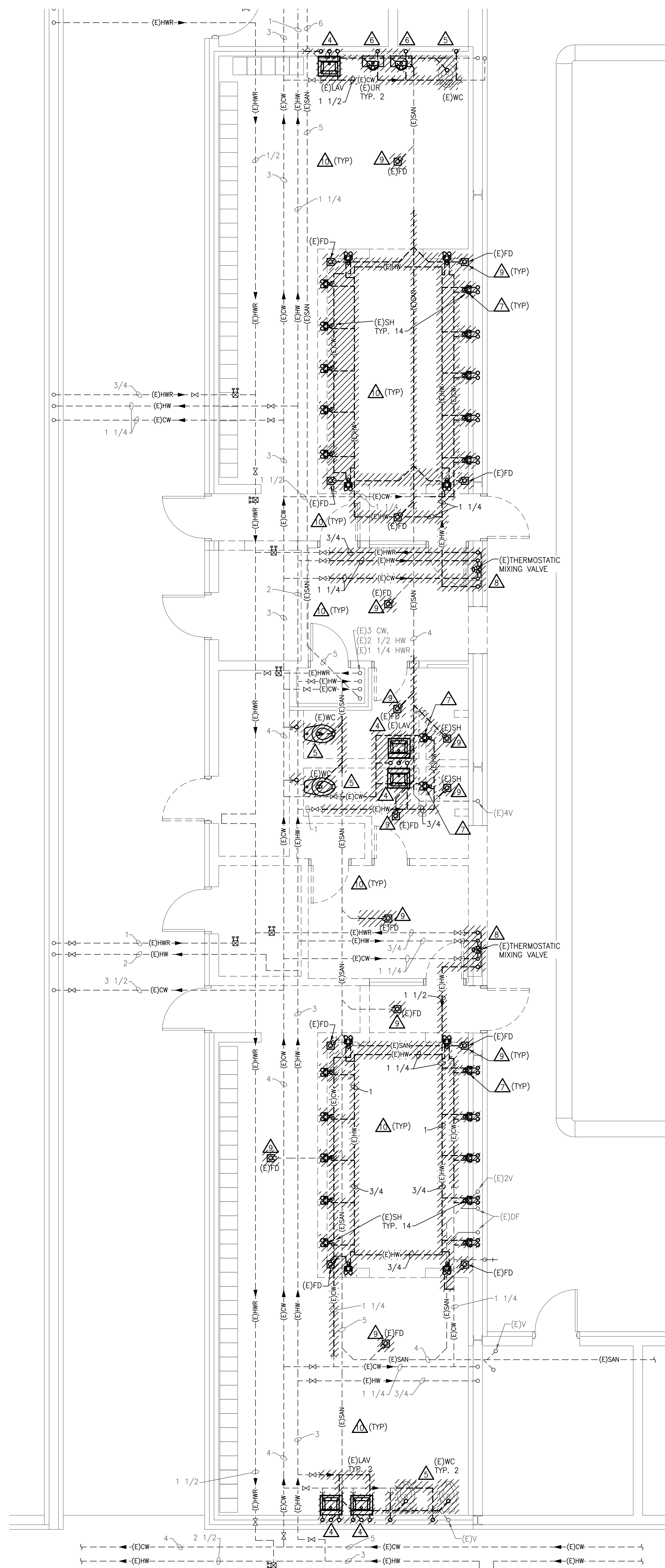
- THESE DRAWINGS ARE DIAGRAMMATIC AND INDICATE THE GENERAL EXTENT OF WORK TO BE PERFORMED. THE EXACT EXTENT OF DEMOLITION SHALL BE AS REQUIRED BY THE NEW WORK.
- PRIOR TO COMMENCEMENT OF WORK, CONTRACTOR SHALL VISIT THE SITE AND BECOME FAMILIAR WITH EXISTING SITE CONDITIONS, SYSTEMS, AND UTILITIES. NOTIFY ARCHITECT OF ANY INTERFERENCES OR DISCREPANCIES.
- VERIFY DEPTH, SIZE, LOCATIONS AND CONDITION OF EXISTING UTILITIES IN THE FIELD, INCLUDING POINTS OF CONNECTION PRIOR TO STARTING ANY WORK.
- ANY INTERRUPTIONS OF EXISTING SERVICES AND/OR EQUIPMENT SHALL BE PERFORMED AT A TIME APPROVED IN ADVANCE BY THE OWNER'S REPRESENTATIVE SO AS NOT TO INTERFERE WITH THE PRESENT BUILDING'S OPERATION.
- ALL ITEMS ON DEMOLITION PLAN SHALL BE CONSIDERED EXISTING UNLESS OTHERWISE NOTED. ALL WORK INDICATED ON PLANS HAS BEEN LOCATED PER EXISTING DRAWINGS AND/OR FIELD OBSERVATION AND REQUIRES FIELD VERIFICATION.
- ALL ITEMS INDICATED WITH CROSS-HATCHING SHALL BE REMOVED COMPLETE, WITH ALL RELATED ITEMS INCLUDING HANGERS, SUPPORTS, INSULATION, CONTROLS, ETC. CAP ALL OPEN ENDED PIPES AND DUCTS.
- ALL EXISTING WORK TO REMAIN SHALL BE PROTECTED FROM DAMAGE, WHERE DUCT OR PIPE INSULATION HAS BEEN DAMAGED DURING DEMOLITION, THE CONTRACTOR SHALL REPAIR INSULATION AS REQUIRED TO MATCH EXISTING.
- THE OWNER SHALL HAVE FIRST RIGHT OF REFUSAL ON ALL EQUIPMENT BEING REMOVED. ALL ITEMS REMOVED SHALL BE LEGALLY DISPOSED OF. GENERAL CONTRACTOR SHALL BE RESPONSIBLE FOR ALL EXISTING RELOCATED AND OWNER PROVIDED EQUIPMENT.

DEMOLITION KEYED NOTES

- REMOVE EXISTING SUPPLY DIFFUSER AND PORTION OF EXISTING BRANCH SUPPLY DUCT. PREPARE EXISTING SUPPLY DUCT FOR NEW CONNECTION.
- REMOVE EXISTING EXHAUST GRILLE COMPLETE WITH EXISTING BRANCH EXHAUST DUCT. CAP EXISTING BRANCH EXHAUST DUCT AT THE MAIN EXHAUST DUCT AS INDICATED.
- REMOVE EXISTING EXHAUST FAN ON THE ROOF COMPLETE WITH ROOF CURB (FIELD VERIFY). PREPARE EXISTING EXHAUST DUCTWORK FOR NEW CONNECTIONS AND FOR NEW GRAVITY BACKDRAFT DAMPER.
- REMOVE EXISTING LAVATORY COMPLETE, INCLUDING ALL MOUNTING HARDWARE, ACCESSORIES, AND STOP VALVES. REMOVE EXISTING PLUMBING PIPING IN TUNNEL BELOW, AS INDICATED TO THE POINTS OF NEW CONNECTION. DISCONNECT FROM EXISTING VENT PIPING ABOVE CEILING. PREPARE ALL PLUMBING PIPING IN TUNNEL BELOW AND VENT PIPING ABOVE CEILING FOR NEW CONNECTIONS.
- REMOVE EXISTING WATER CLOSET COMPLETE, INCLUDING ALL ACCESSORIES AND STOP VALVES. REMOVE EXISTING PLUMBING PIPING IN TUNNEL BELOW, AS INDICATED TO THE POINTS OF NEW CONNECTION. DISCONNECT FROM EXISTING VENT PIPING ABOVE CEILING. PREPARE ALL PLUMBING PIPING IN TUNNEL BELOW AND VENT PIPING ABOVE CEILING FOR NEW CONNECTIONS.
- REMOVE EXISTING FLOOR MOUNTED URINAL COMPLETE, INCLUDING ASSOCIATED TRAP, TRIM PIECES AND ACCESSORIES. REMOVE EXISTING PLUMBING PIPING IN TUNNEL BELOW, AS INDICATED TO THE POINTS OF NEW CONNECTION. DISCONNECT FROM EXISTING VENT PIPING ABOVE CEILING. PREPARE ALL PLUMBING PIPING IN TUNNEL BELOW AND VENT PIPING ABOVE CEILING FOR NEW CONNECTIONS.
- REMOVE EXISTING SHOWER COMPLETE, INCLUDING ALL ACCESSORIES AND STOP VALVES. REMOVE EXISTING PLUMBING PIPING INSIDE THE EXISTING WALL AND IN TUNNEL BELOW COMPLETE, AS INDICATED TO THE POINTS OF NEW CONNECTION. DISCONNECT FROM EXISTING VENT PIPING ABOVE CEILING. PREPARE ALL PLUMBING PIPING IN TUNNEL BELOW AND VENT PIPING ABOVE CEILING FOR NEW CONNECTIONS.
- REMOVE EXISTING SHOWER THERMOSTATIC MIXING VALVE COMPLETE WITH ALL PLUMBING PIPING DOWN IN TUNNEL BELOW AND CAP PLUMBING PIPING AS INDICATED.
- REMOVE EXISTING FLOOR DRAIN COMPLETE. REMOVE EXISTING SANITARY PIPING IN TUNNEL BELOW, AS INDICATED TO THE POINT OF NEW CONNECTION.
- PLUMBING PIPING (EXISTING AND DEMO) SHOWN WITH DASHED LINES, INDICATES PIPING LOCATED IN TUNNEL BELOW THE FLOOR.



ENLARGED MECHANICAL DEMOLITION PLAN - LOCKER ROOMS
SCALE: 1/4" = 1'-0"



ENLARGED PLUMBING DEMOLITION PLAN - LOCKER ROOMS
SCALE: 1/4" = 1'-0"

REVISIONS/REVIEW	DATE
CONSTRUCTION DOCUMENTS	03.14.22

JOB NO. **2130-18B**

SHEET TITLE

ENLARGED MECHANICAL DEMOLITION PLANS

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MD4.1



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HAZEL PARK HS LOCKER ROOM REMODEL

23400 Hughes Ave.

Hazel Park, Michigan 48030

REVISIONS/REVIEW	DATE
CONSTRUCTION DOCUMENTS	03.14.22

JOB NO. **2130-188**

SHEET TITLE
ENLARGED MECHANICAL NEW WORK PLANS

SHEET NO.

M4.1

PLUMBING GENERAL NOTES

- THESE DRAWINGS ARE DIAGRAMMATIC AND INDICATE THE GENERAL EXTENT OF THE WORK. PROVIDE PLUMBING SYSTEMS COMPLETE AND PER APPLICABLE CODES INCLUDING REQUIRED COMPONENTS, OFFSETS REQUIRED TO AVOID THE STRUCTURE, ETC.
- REFER TO ARCHITECTURAL PLANS FOR EXACT LOCATION AND MOUNTING HEIGHT OF ALL PLUMBING FIXTURES, BOTH STANDARD AND BARRIER FREE. REFER TO PLUMBING FIXTURE SCHEDULE FOR FIXTURE TYPES, BRANCH CONNECTION SIZES AND ADDITIONAL REQUIREMENTS.
- CONTRACTOR SHALL BE RESPONSIBLE FOR COMPLIANCE WITH THE STATE AND LOCAL COUNTY DEPARTMENT OF HEALTH CROSS CONTAMINATION CODE REQUIREMENTS.
- VERIFY DEPTH, SIZE, LOCATION AND CONDITION OF ALL UTILITIES IN THE FIELD, INCLUDING POINTS OF CONNECTION, PRIOR TO STARTING ANY WORK. NOTIFY THE ARCHITECT/ENGINEER OF ANY INTERFERENCES OR DISCREPANCIES.
- CONTRACTOR SHALL COORDINATE THE INSTALLATION OF PLUMBING AND PIPING WORK WITH THE WORK OF ALL OTHER TRADES, EXISTING SITE CONDITIONS, AND EQUIPMENT MANUFACTURER RECOMMENDATIONS. VERIFY ALL CLEARANCES PRIOR TO THE FABRICATION OF ANY NEW WORK.
- PIPING SHALL BE ROUTED AS HIGH AS POSSIBLE AND SHALL MAINTAIN REQUIRED CLEARANCES OVER, AROUND AND IN FRONT OF ALL ELECTRICAL EQUIPMENT, PANELS, TRANSFORMERS, ETC. PIPING SHALL NOT INTERFERE WITH, OR BE INSTALLED IN A LOCATION THAT RESTRICTS ACCESS OR CLEARANCE TO ELECTRICAL OR MECHANICAL DEVICES. PROVIDE REQUIRED ACCESS AND CLEARANCE AROUND ALL EQUIPMENT PER MANUFACTURER'S RECOMMENDATIONS.
- CONTRACTOR SHALL PROVIDE SUPPLEMENTARY STEEL AS REQUIRED FOR THE PROPER SUPPORT OF ALL MECHANICAL SYSTEMS.
- PROVIDE BRANCH LINE ISOLATION VALVES ON DOMESTIC PIPING TO EACH GROUP OF FIXTURES AND TOILET ROOMS.
- PLUMBING VENT PIPING THRU THE ROOF SHALL BE LOCATED 10'-0" FROM ANY FRESH AIR INTAKE LOCATION AND A MINIMUM OF 18" CLEAR FROM THE INSIDE FACE OF PARAPET.
- PROVIDE CODE REQUIRED CLEARANCE/ACCESS DOORS FOR VALVES/CLEANOUTS LOCATED IN WALLS OR ABOVE HARD CEILINGS. COORDINATE LOCATIONS WITH ARCHITECT. PROVIDE CLEANOUTS AT THE BASE OF ALL STACKS.
- RUN ALL SANITARY AND STORM PIPING 2 1/2" OR LESS AT 1/4" PER FOOT AND 3" AND LARGER PIPING AT 1/8" PER FOOT MINIMUM UNLESS OTHERWISE NOTED. MINIMUM UNDERGROUND PIPE SIZE SHALL BE 3".
- PROVIDE "UNLIME" TRAP SEAL PROTECTION OR TRAP PRIMER ON ALL FLOOR DRAINS AND TRAPS SUBJECT TO EVAPORATION.
- THE CEILING SPACE IS USED AS A RETURN AIR PLENUM. NO PLASTIC MATERIALS INCLUDING PVC PIPING, CONDUIT, WIRING, ETC. SHALL BE USED. ALL MATERIAL IN THE CEILING SPACE IS TO BE PLENUM RATED.

KEYED NOTES

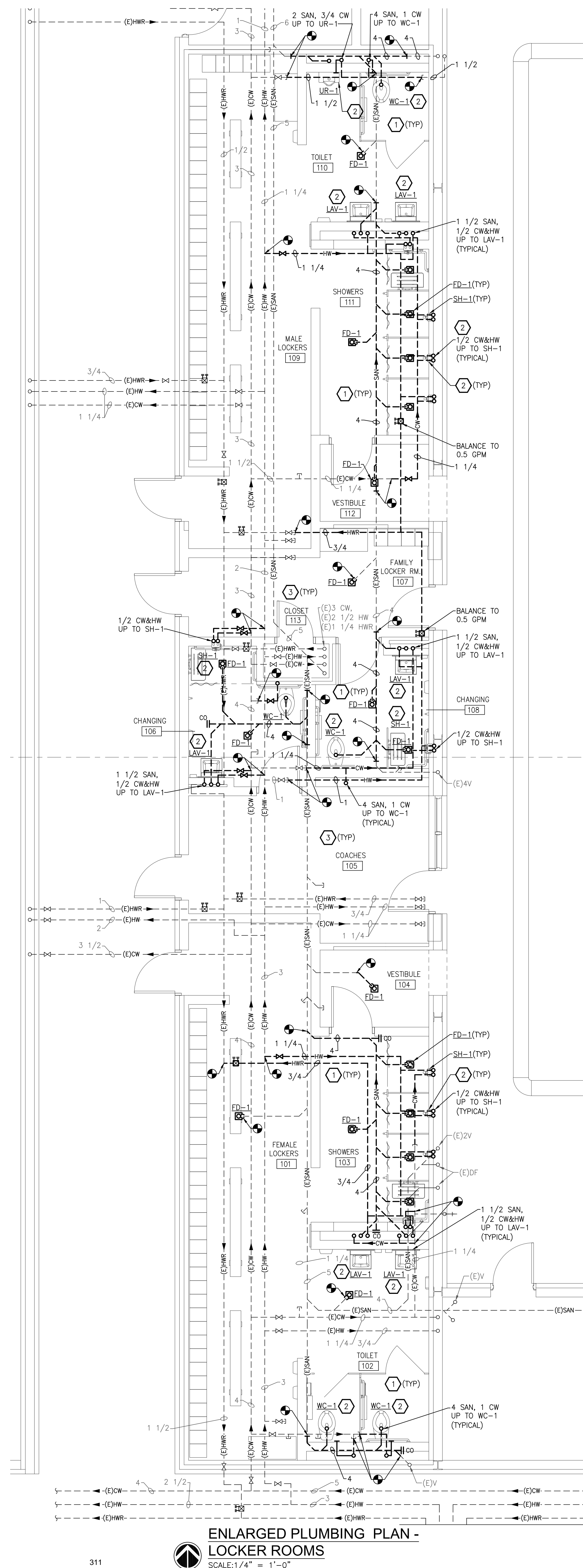
- ALL EXISTING AND NEW PLUMBING PIPING, SANITARY, COLD WATER, HOT WATER, HOT WATER RETURN, INDICATED AS DASHED LINES, REPRESENT PIPING THAT IS LOCATED BELOW THE FLOOR IN THE EXISTING TUNNEL.
- CONNECT NEW PLUMBING SERVICES (SANITARY, COLD WATER, HOT WATER) TO NEW PLUMBING FIXTURES FROM EXISTING PLUMBING SERVICES LOCATED IN THE TUNNEL BELOW, AS INDICATED. CONNECT NEW VENT PIPING FROM EACH NEW FIXTURE TO EXISTING VENT PIPING FROM THE REMOVED FIXTURES ABOVE. CEILING, EXTEND EXISTING VENT PIPING TO ALL NEW PLUMBING FIXTURES AS REQUIRED.
- REFER TO ARCHITECTURAL PLANS FOR GENERAL LOCATION OF CEILING ACCESS PANELS. COORDINATE EXACT LOCATIONS IN FIELD. PROVIDE ADDITIONAL CEILING ACCESS PANELS AS REQUIRED, FOR ACCESS TO SHUT-OFF VALVES ON THE PLUMBING PIPING LOCATED IN THE CEILING, SERVICING THE FLOOR ABOVE. LOCATION AND QUANTITIES OF ADDITIONAL CEILING ACCESS PANELS TO BE DETERMINED IN FIELD AFTER DEMOLITION OF EXISTING CEILINGS AND BEFORE INSTALLATION OF THE NEW CEILINGS.

HVAC GENERAL NOTES

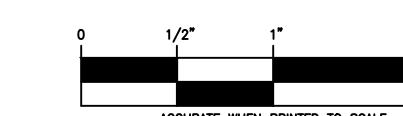
- THESE DRAWINGS ARE DIAGRAMMATIC AND INDICATE THE GENERAL EXTENT OF THE WORK. PROVIDE HVAC SYSTEMS COMPLETE PER SPECIFICATION, SMACNA STANDARDS, AND PER APPLICABLE CODES INCLUDING ALL NECESSARY OFFSETS, FITTINGS, SPECIAL RADIUS OR MITERED ELBOWS WHICH ARE REQUIRED DUE TO SPACE CONSTRAINTS OR STRUCTURAL CONDITIONS OR OTHER CONDITIONS.
- CONTRACTOR SHALL COORDINATE THEIR WORK WITH THE WORK OF ALL OTHER TRADES. ALL DUCTWORK IS TO BE ROUTED AS HIGH AS POSSIBLE. PROVIDE ACCESS AROUND ALL NEW EQUIPMENT PER MANUFACTURER'S RECOMMENDATIONS. VERIFY ALL CLEARANCES PRIOR TO THE FABRICATION OF ANY WORK.
- DUCTWORK/PIPING SHALL BE ROUTED AS HIGH AS POSSIBLE AND SHALL NOT BE LOCATED OVER ELECTRICAL EQUIPMENT/PANELS. PROVIDE REQUIRED CLEARANCE IN FRONT OF ELECTRICAL EQUIPMENT. DUCTWORK/PIPING SHALL NOT INTERFERE WITH ELECTRICAL EQUIPMENT CLEARANCE.
- DUCTWORK/PIPING SHALL NOT BE INSTALLED IN A LOCATION THAT RESTRICTS THE ACCESS TO MECHANICAL DEVICES REQUIRING ACCESS.
- THE CONTRACTOR SHALL PROVIDE ALL MISCELLANEOUS SUPPORTING STEEL, ETC. FOR THE PROPER INSTALLATION OF ALL MECHANICAL SYSTEMS.
- COORDINATE FLOOR, WALL, ROOF PENETRATIONS, LOUVER SIZES, PAD LOCATIONS ETC. WITH ARCHITECTURAL TRADES. SEAL ALL PIPING AND DUCT PENETRATIONS.
- THE CONTRACTOR SHALL REFER TO ARCHITECTURAL REFLECTED CEILING PLANS FOR EXACT LOCATION OF GRILLES, REGISTERS, AND DIFFUSERS.
- COORDINATE AND PROVIDE ACCESS DOORS IN HARD CEILING AREAS FOR ACCESS TO BALANCING DAMPERS, ETC. REFER TO ARCHITECTURAL DRAWINGS FOR CEILING TYPES.
- BRANCH DUCTWORK TO GRILLES, REGISTERS AND DIFFUSERS SHALL BE THE SAME SIZE AS THE GRILLE, REGISTER OR DIFFUSER NECK SIZE WHERE NO DUCT SIZE IS INDICATED ON PLAN.
- MAXIMUM LENGTH OF FLEXIBLE DUCT SHALL BE 5'-0".
- FOR EQUIPMENT VALVING, COMPONENT, AND PIPING ARRANGEMENT, REFER TO PIPING DIAGRAMS AND DETAILS.
- PAINT ALL VISIBLE INTERIOR SURFACES OF EXHAUST/RETURN GRILLES, REGISTERS AND VISIBLE ASSOCIATED DUCTWORK FLAT BLACK.
- THE CEILING SPACE IS USED AS A RETURN AIR PLENUM. NO PLASTIC MATERIALS INCLUDING PVC PIPING, CONDUIT, WIRING, ETC. SHALL BE USED. ALL MATERIAL IN THE CEILING SPACE IS TO BE PLENUM RATED.
- PROVIDE CODE REQUIRED CLEARANCE/ACCESS DOORS FOR DAMPERS, VALVES, AND CLEANOUTS LOCATED IN WALLS OR ABOVE HARD CEILINGS. COORDINATE LOCATIONS WITH ARCHITECT. REFER TO ARCHITECTURAL PLANS FOR CEILING TYPES.
- CONNECTION TO EQUIPMENT SHALL BE VERIFIED WITH MANUFACTURER'S CERTIFIED DRAWINGS. TRANSITIONS TO ALL EQUIPMENT SHALL BE VERIFIED AND PROVIDED FOR EQUIPMENT FURNISHED.

KEYED NOTES

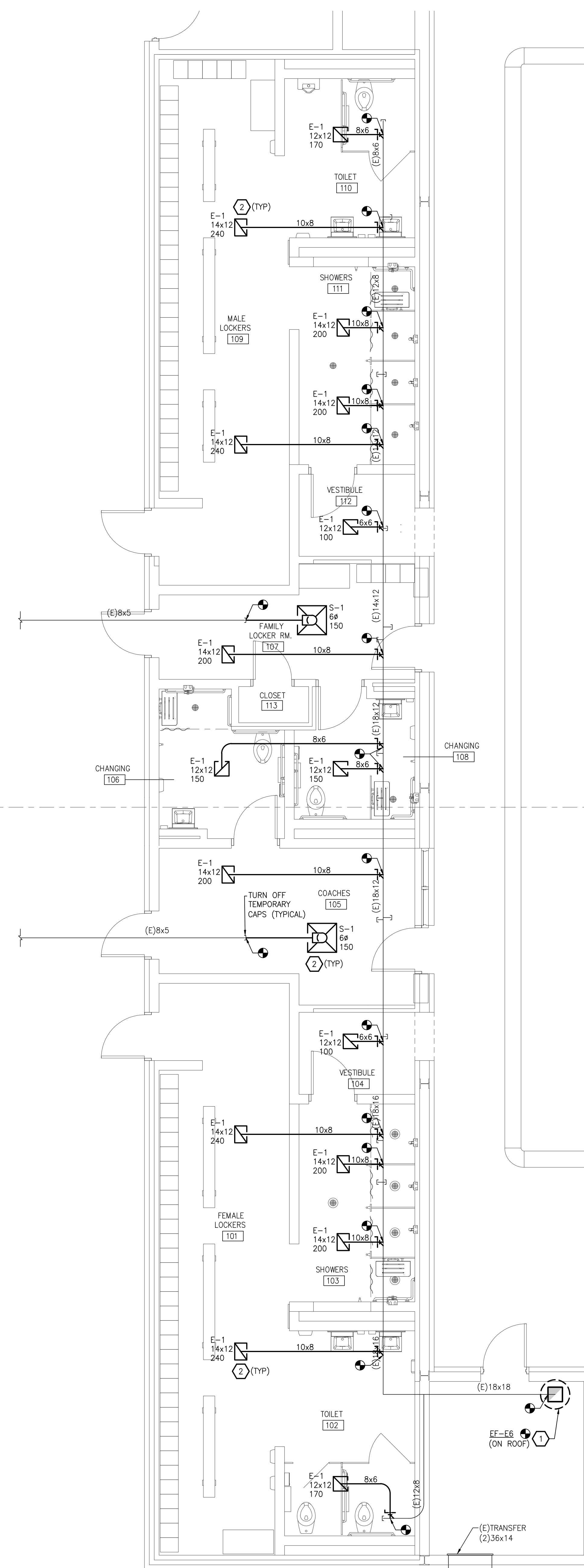
- NEW EXHAUST FAN AND NEW ROOF CURB. INSTALL IN LOCATION OF THE REMOVED EXHAUST FAN. PATCH, REPAIR AND SEAL WATER-TIGHT EXISTING ROOF AS REQUIRED. CONNECT TO EXISTING EXHAUST DUCT. PROVIDE REQUIRED OFFSETS AND DUCT TRANSITIONS. PROVIDE NEW GRAVITY BACKDRAFT DAMPER. RECONNECT TO EXISTING CONTROLS. REFER TO EXHAUST FAN SCHEDULE FOR ADDITIONAL NOTES.
- NEW SUPPLY DIFFUSER AND EXHAUST GRILLE. CONNECT NEW BRANCH DUCTWORK TO EXISTING SUPPLY/EXHAUST DUCTS. BALANCE ALL SUPPLY AND EXHAUST DIFFUSERS/GRILLES TO INDICATED CFM'S BEFORE INSTALLATION OF THE NEW CEILINGS.



ENLARGED PLUMBING PLAN -
LOCKER ROOMS
SCALE: 1/4" = 1'-0"



ENLARGED HVAC PLAN -
LOCKER ROOMS
SCALE: 1/4" = 1'-0"





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HAZEL PARK HS LOCKER ROOM REMODEL

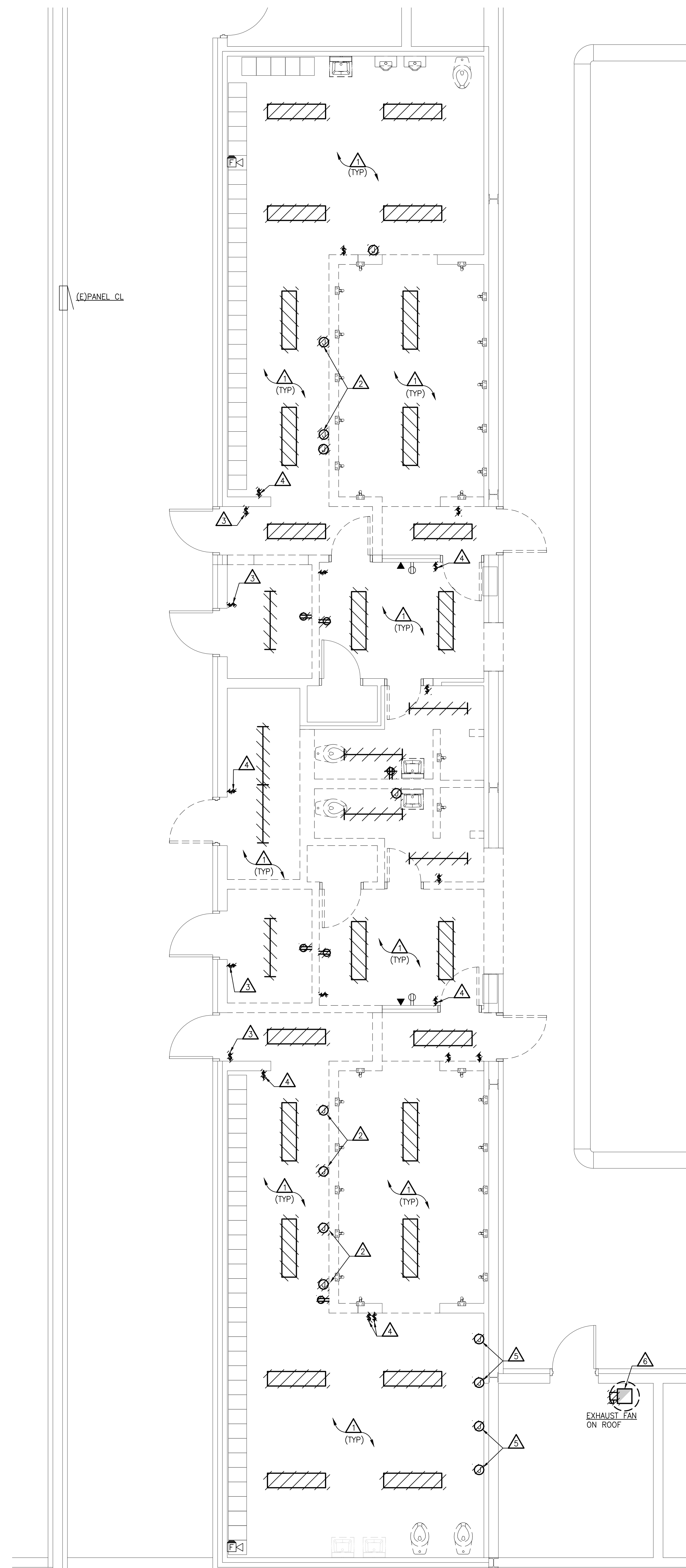
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ELECTRICAL DEMOLITION NOTES

1. VISIT THE SITE PRIOR TO SUBMISSION OF BID TO EXAMINE THE EXISTING CONDITIONS AND THE EXTENT OF DEMOLITION WORK.
2. EXAMINE THE DRAWINGS OF OTHER TRADES, BE FAMILIAR WITH THE DEMOLITION REQUIRED BY OTHER TRADES.
3. PERFORM ALL INCIDENTAL ELECTRICAL DEMOLITION AND/OR RELOCATION OF DEVICES AND EQUIPMENT REQUIRED TO FACILITATE THE DEMOLITION WORK OF OTHER TRADES.
4. COORDINATE WITH NEW WORK PLANS, ONE LINE, AND RISER DIAGRAMS FOR EXTENT OF DEMOLITION WORK.
5. COORDINATE ANY SHUTDOWN OF EXISTING SERVICES AND EQUIPMENT REMAINING IN USE WITH OWNERS' REPRESENTATIVE. WHERE EXISTING BUILDING SERVICE IS REQUIRED TO BE SHUT DOWN, INCLUDE ALL ASSOCIATED OVERTIME COST TO PERFORM THIS WORK DURING EVENING AND WEEKENDS. INCLUDE ALL COSTS FOR PROVIDING TEMPORARY POWER.
6. REMOVE ALL CONDUIT AND WIRE BACK TO NEAREST UPSTREAM DEVICE REMAINING IN SERVICE.
7. WHERE DEMOLITION WORK AFFECTS ELECTRICAL SERVICE TO DOWNSTREAM DEVICES TO REMAIN; EXTEND CONDUIT AND WIRE AS REQUIRED TO MAINTAIN ELECTRICAL SERVICE.
8. PROVIDE BLANK COVER PLATES WHERE SWITCHES AND DEVICES ARE REMOVED AND WALL REMAINS INTACT. MARK ALL UNUSED CIRCUIT BREAKERS AS "SPARE".
9. CONTRACTOR TO TAG ALL CIRCUITS AT BOTH ENDS AFFECTED BY THIS SCOPE OF WORK.
10. CONTRACTOR SHALL PROVIDE UPDATED, TYPED-IN DIRECTORIES FOR ALL PANELS AFFECTED BY THIS SCOPE OF WORK.
11. CONTRACTOR SHALL VERIFY ALL UNDERGROUND AND IN-SLAB UTILITIES LOCATIONS PRIOR TO SAW CUTTING OR PENETRATING ANY FLOOR SLABS. CONTRACTOR SHALL REPAIR ALL UTILITIES DAMAGED BY SAW CUTTING.

DEMOLITION KEYED NOTES

1. DISCONNECT AND REMOVE EXISTING LIGHT FIXTURE COMPLETE. MAINTAIN EXISTING ROOM LIGHTING CIRCUITS FOR CONNECTION TO NEW FIXTURES. SEE NEW WORK PLANS FOR FURTHER INFORMATION.
2. DISCONNECT AND REMOVE EXISTING HAND/HAIR DRYERS INCLUDING CONDUIT AND BOXES BACK TO ABOVE CEILING. MAINTAIN CIRCUITS FOR CONNECTION TO NEW HAND/HAIR DRYERS. SEE NEW WORK PLANS FOR FURTHER INFORMATION.
3. MAINTAIN EXISTING LIGHT SWITCH LOCATION FOR USE IN NEW WORK. SEE NEW WORK PLANS FOR FURTHER INFORMATION.
4. REMOVE EXISTING WIRE AND ABANDON IN PLACE EXISTING LIGHT SWITCH LOCATION IN EXISTING BLOCK WALL TO REMAIN. PROVIDE COVER PLATE AS REQUIRED.
5. DISCONNECT AND REMOVE EXISTING HAND/HAIR DRYERS, CONDUIT AND BACKBOXES IN EXISTING TO REMAIN BLOCK WALL ARE TO BE ABANDONED IN PLACE. PROVIDE COVER PLATES AS REQUIRED.
6. DISCONNECT AND MAKE SAFE EXISTING EXHAUST FAN FOR MECHANICAL DEMOLITION. DEMOLISH EXISTING EXHAUST FAN POWER CONNECTION COMPLETE BACK TO SOURCE. PATCH, REPAIR AND SEAL WATERTIGHT EXISTING CONDUIT PENETRATIONS TO ROOF AS REQUIRED DURING CONSTRUCTION.



ENLARGED ELECTRICAL DEMOLITION PLAN - LOCKER ROOMS
SCALE: 1/4" = 1'-0"

REVISIONS/REVIEW	DATE
CONSTRUCTION DOCUMENTS	03.14.22

JOB NO. **2130-188**

SHEET TITLE

ENLARGED ELECTRICAL DEMOLITION PLANS

SHEET NO.

ED4.1

Drawing: 5/10 1/25/22 09:25:00 hazel park hs locker room renovation assessment/CAD/Elec/21 0588 09_ED4.1.dwg
Date: 03/14/22 10:14:41
Author: JY



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REVISIONS/REVIEW	DATE
CONSTRUCTION DOCUMENTS	03.14.22

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SHEET TITLE

ENLARGED ELECTRICAL NEW WORK PLANS

SHEET NO.

E4.1

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LIGHTING GENERAL NOTES

- REFER TO ARCHITECTURAL REFLECTED CEILING PLAN FOR EXACT LOCATION OF ALL LIGHTING FIXTURES UNLESS OTHERWISE NOTED.
- EXIT LIGHTS AND EMERGENCY BATTERY UNITS SHALL BE UNCONTROLLED AND TIED AHEAD OF LOCAL AREA LIGHTING SWITCH, UNLESS CIRCUITED OTHERWISE.
- WHERE MORE THAN ONE LIGHT SWITCH IS INDICATED TO BE INSTALLED AT THE SAME LOCATION, THEY SHALL BE GROUPED UNDER ONE COMMON FACEPLATE.
- ALL POWER PACKS TO BE LOCATED DIRECTLY ABOVE SWITCH.
- LIGHT FIXTURES ARE LOOPED TOGETHER TO INDICATE CONTROL ZONE GROUPS. CONNECTED FIXTURES ARE TO BE CONTROLLED TOGETHER. CIRCUITS MAY BE SHARED AMONG SEPARATE CONTROL ZONE GROUPS. MULTIPLE ZONES ZONES MAY BE COMBINED IN SOFTWARE TO FORM SCENES. SEE LIGHTING CONTROL MATRIX: SCENE SCHEDULE (IF PROVIDED), AND PANEL SCHEDULES FOR ADDITIONAL INFORMATION.
- ALL CONDUITS SHALL BE ROUTED CONCEALED UNLESS NOTED OTHERWISE.

KEYED NOTES

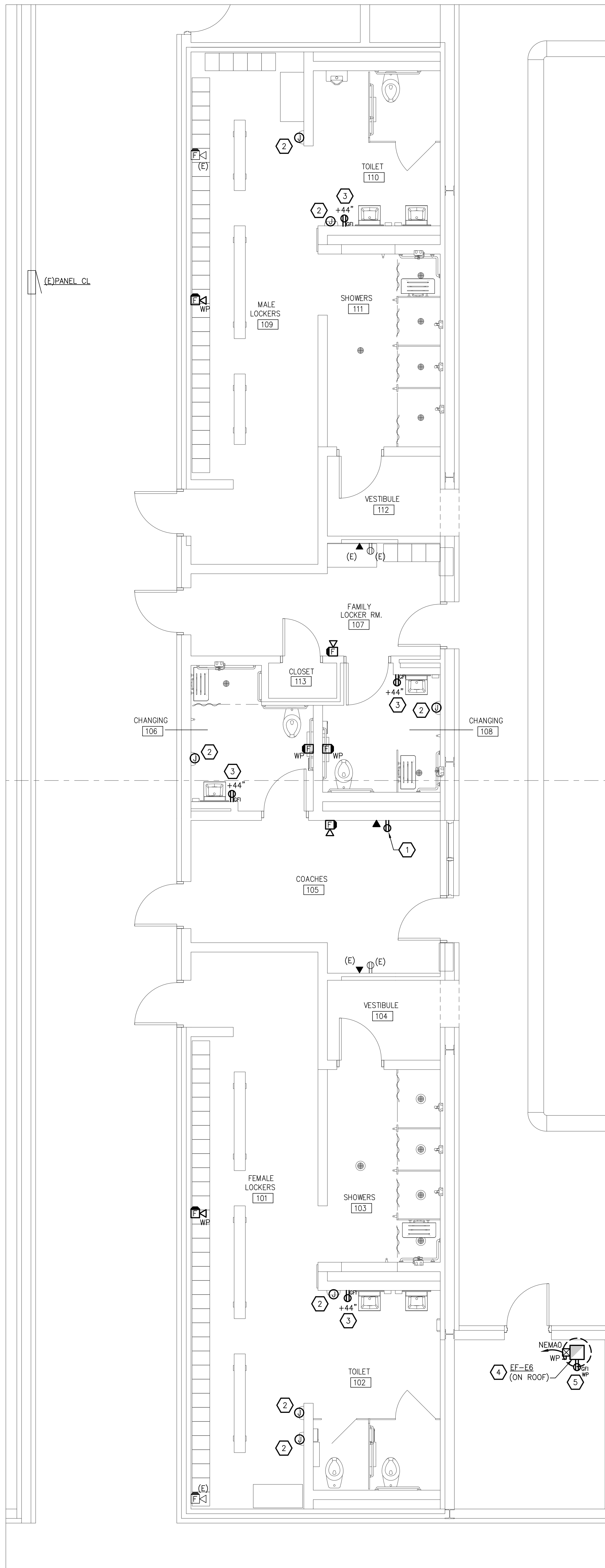
- CONNECT ROOM LIGHTING TO EXISTING LIGHTING CIRCUIT MAINTAINED DURING DEMOLITION. SEE DEMO PLANS FOR FURTHER INFORMATION.
- REUSE EXISTING LIGHT SWITCH LOCATION MADE EMPTY DURING DEMOLITION. SEE DEMO PLANS FOR FURTHER INFORMATION.

POWER GENERAL NOTES

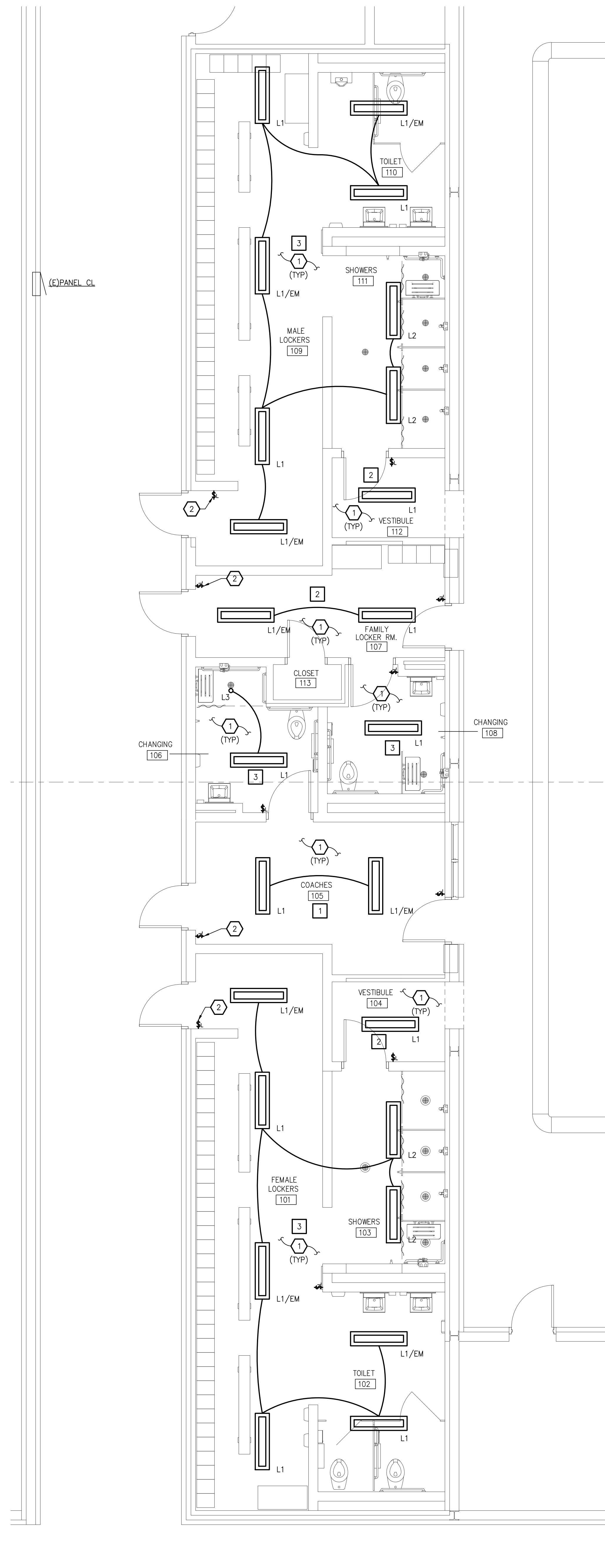
- ALL RECEPTACLES ON EXTERIOR, IN KITCHEN, IN CONCESSION, IN LABORATORY, AND WITHIN 6'-0" OF SINK OR OTHER WATER SUPPLY SHALL BE READILY ACCESSIBLE GFCI TYPE RECEPTACLE.
- REFER TO ARCHITECTURAL FLOOR PLANS AND ELEVATIONS TO VERIFY LOCATION OF DEVICES.
- ALL CONDUITS SERVING 120 VOLTS OR GREATER SHALL INCLUDE A GROUND WIRE.
- ALL CONDUITS SHALL BE ROUTED CONCEALED UNLESS NOTED OTHERWISE.
- ALL 120 VOLT CIRCUITS SHALL UTILIZE A SEPARATE NEUTRAL.
- RECEPTACLES INSTALLED IN ELEVATOR HOISTWAY(S), ELEVATOR MACHINE ROOM(S), CONTROL ROOM(S)/SPACE(S) SHALL BE GROUND FAULT CIRCUIT INTERRUPTER TYPE (GFCI) WITH THE EXCEPTION OF A DEDICATED SINGLE PHASE RECEPTACLE SUPPLYING AN ELEVATOR PIT SUMP PUMP SHALL NOT BE A GFCI TYPE RECEPTACLE.
- ALL BRANCH CIRCUITS THAT SUPPLY 125-V SINGLE PHASE, 15 AND 20 AMP OUTLETS TO BE INSTALLED IN DWELLING UNIT FAMILY ROOMS, DINING ROOMS, LIVING ROOMS, PARLORS, LIBRARIES, RECREATION ROOMS, CLOSETS, HALLWAYS OR SIMILAR ROOMS OR AREAS SHALL BE PROTECTED BY A LISTED ARC-FAULT CIRCUIT INTERRUPTER; COMBINATION-TYPE, INSTALLED TO PROVIDE PROTECTION OF THE BRANCH CIRCUIT.

KEYED NOTES

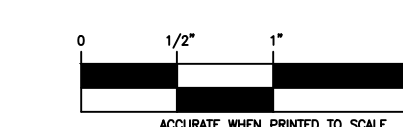
- EXTEND EXISTING ROOM RECEPTACLE CIRCUIT TO NEW DEVICE.
- PROVIDE NEW HAND/HAIR DRYER. CONNECT TO EXISTING HAND/HAIR DRYER CIRCUITS MAINTAINED DURING DEMOLITION.
- EXTEND EXISTING RECEPTACLE CIRCUIT TO NEW RECEPTACLE.
- PROVIDE A NEW WEATHERPROOF H-O-A STARTER AT NEW EXHAUST FAN. DISCONNECT FURNISHED AND INSTALLED BY EQUIPMENT MANUFACTURER. COORDINATE STARTER SIZE WITH MANUFACTURER INSTALLATION INSTRUCTIONS AND FINAL LOCATION WITH MECHANICAL TRADES. EC TO PROVIDE NEW TIMECLOCK FOR CONTROLS. EXHAUST FAN SHALL RUN CONTINUOUS DURING BUILDING OCCUPANCY. COORDINATE LOCATION OF TIME CLOCK IN FIELD WITH OWNER'S REPRESENTATIVE AND MECHANICAL TRADES.
- ELECTRICAL CONTRACTOR TO INSPECT ROOF FOR EXISTING MAINTENANCE RECEPTACLE. PROVIDE A NEW GFI RECEPTACLE IN A WEATHERPROOF ENCLOSURE IF NONE ARE WITHIN 25' OF THE NEW EXHAUST. CIRCUIT TO PANEL CL IN FIRST AVAILABLE CIRCUIT AS REQUIRED.



ENLARGED POWER PLAN - LOCKER ROOMS
SCALE: 1/4" = 1'-0"



ENLARGED LIGHTING PLAN - LOCKER ROOMS
SCALE: 1/4" = 1'-0"



LUMINAIRE SCHEDULE											
TYPE	DESCRIPTION	MANUFACTURER	MODEL NUMBER	LIGHT ENGINE	WATTAGE	VOLTAGE	REMARKS	MANUFACTURER #2	MODEL NUMBER #2	MANUFACTURER #3	
L1	1 1/2' SURFACE MOUNTED VOLUMETRIC FIXTURE	LITHONIA	ST14-40L-MVOLT-EZ1-1P835	3500K CCT, 4000LM, 80 CRI	35	MVOLT		FAILSAFE	HV518-4-1D4-2-STD-35-UNV-D-ED1D-1	COLUMBIA	
L2	4' LINEAR LED WRAP W/ET LOCATION	LITHONIA	FEM 148-4000LM LPPFL W/D MVOLT GZ10 35K 80 CRI	3500K CCT, 4000LM, 80 CRI	35	MVOLT		FAILSAFE	HV73-1D5-4-W-UNV-1835-CD1	COLUMBIA	
L3	4" RECESSED LED OPEN DOWNLIGHT	LITHONIA	LDN4 3S/10 L04AR LD MVOLT GZ1 SF	3500K CCT, 1000LM, 80 CRI	11	MVOLT	GYP BOARD CEILINGS	HALO	HC410-D01D-HM4-12-835-41-MD-C	PRESCOLITE	
X1	WHITE THERMOPLASTIC EXIT SIGN WITH INTEGRAL BATTERY	LITHONIA	LQM-R-MVOLT-EL-N	LED	3	MVOLT		ISOLITE	RL-EM-R-U-WH-MTEB	COMPASS	
EM	PROVIDE EMERGENCY BATTERY BALLAST OR DRIVER, EITHER INTEGRAL OR REMOTE AS REQUIRED, TO PROVIDE 90 MINUTES OF EMERGENCY EGRESS ILLUMINATION UPON LOSS OF NORMAL POWER TO FIXTURE. 1400 LUMEN MINIMUM FOR LINEAR LED PRODUCTS, 700 LUMENS MINIMUM FOR MODULAR LED PRODUCTS (E.G. DOWNLIGHTS) AND 3000 LUMENS MINIMUM FOR LED HIGH BAY OR HIGH LUMEN PRODUCTS. UNITS SHALL MEET OR EXCEED CURRENT NEC AND UL STANDARDS FOR EMERGENCY LIGHTING AND SHALL BE UL LISTED FOR INSTALLATION INSIDE, ON TOP OF, AND/OR REMOTE FROM THE FIXTURE, AS REQUIRED.						NOTE:	WHERE MULTIPLE MANUFACTURERS AND CATALOG NUMBERS ARE LISTED ALL ARE ACCEPTABLE. WHERE ONLY ONE MANUFACTURER AND CATALOG NUMBER IS LISTED IT SHALL BE THE ONLY ACCEPTABLE OPTION WITHOUT PRIOR ENGINEER REVIEW AND APPROVAL. ALL POTENTIAL SUBSTITUTIONS MUST BE PROVIDED TO THE ENGINEER 2 WEEKS PRIOR TO BIDS FOR REVIEW AND MUST BE ACCOMPANIED BY COMPLETE PHOTOMETRIC REPORTS AND ANY OTHER SUPPORTING MATERIALS REQUESTED BY THE ENGINEER. ANY POTENTIAL SUBSTITUTIONS NOT MEETING THESE CRITERIA SHALL NOT BE CONSIDERED OR ACCEPTED.			

LIGHTING CONTROLS MATRIX													
TAG NUMBER	SPACE TYPE	PARAMETERS										SEQUENCE OF OPERATIONS	
		MANUAL ON/OFF SWITCH	DIMMING SWITCH	OVERRIDE SWITCH	MULTI-ZONE CONTROL	KEY SWITCH	OCCUPANCY SENSOR	PHOTOCONTROL DIMMING	PHOTOCONTROL ON/OFF	COLOR TUNING	RGB/RGBW		BAGNET INTEGRATION
1	PRIVATE OFFICE	X	X										MANUAL ON/AUTOMATIC OFF WITHIN 20 MIN OF OCCUPANTS LEAVING SPACE (VACANCY MODE). CONTINUOUS DIMMING.
2	CORRIDOR			X	X			X	X				LOCAL CONTROL SWITCH WITH ON/OFF FUNCTION. AUTOMATIC ON TO FULL VIA OCCUPANCY SENSOR. AUTOMATIC FULL OFF VIA OCCUPANCY SENSOR (VACANCY MODE) WITHIN 20 MIN OF OCCUPANTS LEAVING SPACE.
3	RESTROOM/LOCKER ROOM	X									X		LOCAL CONTROL SWITCH WITH ON/OFF FUNCTION. AUTOMATIC ON TO FULL VIA OCCUPANCY SENSOR. AUTOMATIC FULL OFF VIA OCCUPANCY SENSOR (VACANCY MODE) WITHIN 20 MIN OF OCCUPANTS LEAVING SPACE.

Panel Designation: CL (DEMOLITION)												Main: 200A BREAKER			P-P Voltage: 208		
Panel Location: POOL LOCKER HALLWAY												Bussing: 225A			P-N Voltage: 120		
Fed From: STANDARD												Ground Bus: STANDARD			Phase: 3		
Feeder Size:												Mounting: SURFACE			Wire: 4		
												Neutral: 100%			Min SC Interrupting Rating: XXX		
Remarks	Light Load	Recept Load	Cont Load	nonC Load	OC Prof	OC A	OC B	OC C	OC	nonC Load	Cont Load	Recept Load	Light Load	Remarks			
DRYER					20	1	X	2	20					TUNNEL LIGHTING			
						3	X	4	20					RECEPT TUNNEL			
						5	X	4	20					RECEPT TUNNEL			
RECEPT FIRST AID					20	7	X	8	20					RECEPT LOCKER			
RECEPT COACH TOILET					20	9	X	10	20					RECEPT GYM			
RECEPT COACH					20	11	X	12	20					RECEPT 176			
					20	13	X	14	20					RECEPT BOYS LOCKER, POOL SCOREBOARD			
WASHER					40	15	X	16	20					RECEPT HALL			
						17	X	18	20					RECEPT HALL			
RECEPT LAUNDRY					20	19	X	20	20					RECEPT GYM			
RECEPT COACH					20	21	X	22	20					RECEPT GYM			
RECEPT CORRIDOR					20	23	X	24	20					RECEPT GYM			
BACK STOP					20	25	X	26	20					SCORE BOARD			
BACK STOP					20	27	X	28	20					HAIR DRYER			
HAIR DRYER					20	29	X	30	20					HAIR DRYER			
HAIR DRYER					20	31	X	32	20					HAIR DRYER			
BLANK					20	33	X	34	20					HAIR DRYER			
BLANK					20	35	X	36	20					HAIR DRYER			
BLANK					20	37	X	38	20					BLANK			
HAIR DRYER					20	39	X	40	20					BLANK			
HAIR DRYER					20	41	X	42	20					BLANK			

Panel Designation: CL (NEW WORK)												Main: 200A BREAKER			P-P Voltage: 208		
Panel Location: POOL LOCKER HALLWAY												Bussing: 225A			P-N Voltage: 120		
Fed From: STANDARD												Ground Bus: STANDARD			Phase: 3		
Feeder Size:												Mounting: SURFACE			Wire: 4		
												Neutral: 100%			Min SC Interrupting Rating: XXX		
Remarks	Light Load	Recept Load	Cont Load	nonC Load	OC Prof	OC A	OC B	OC C	OC	nonC Load	Cont Load	Recept Load	Light Load	Remarks			
(E)DRYER					20	1	X	2	20					(E)TUNNEL LIGHTING			
						3	X	4	20					(E)RECEPT TUNNEL			
						5	X	4	20					(E)RECEPT TUNNEL			
(E)RECEPT FIRST AID					20	7	X	8	20					(E)RECEPT LOCKER			
(E)RECEPT COACH TOILET					20	9	X	10	20					(E)RECEPT GYM			
(E)RECEPT COACH					20	11	X	12	20					(E)RECEPT 176			
					20	13	X	14	20					(E)RECEPT BOYS LOCKER, POOL SCOREBOARD			
(E)WASHER					40	15	X	16	20					(E)RECEPT HALL			
						17	X	18	20					(E)RECEPT HALL			
(E)RECEPT LAUNDRY					20	19	X	20	20					(E)RECEPT GYM			
(E)RECEPT COACH					20	21	X	22	20					(E)RECEPT GYM			
(E)RECEPT CORRIDOR					20	23	X	24	20					(E)RECEPT GYM			
(E)BACK STOP					20	25	X	26	20					(E)SCORE BOARD			
(E)BACK STOP					20	27	X	28	20					(E)HAIR DRYER			
(E)HAIR DRYER					20	29	X	30	20					(E)HAIR DRYER			
(E)HAIR DRYER					20	31	X	32	20					(E)HAIR DRYER			
NEW EF-6					15	33	X	34	20					(E)HAIR DRYER			
						35	X	36	20					(E)HAIR DRYER			
						37	X	38	20					BLANK			
(E)HAIR DRYER					20	39	X	40	20					BLANK			
(E)HAIR DRYER					20	41	X	42	20					BLANK			

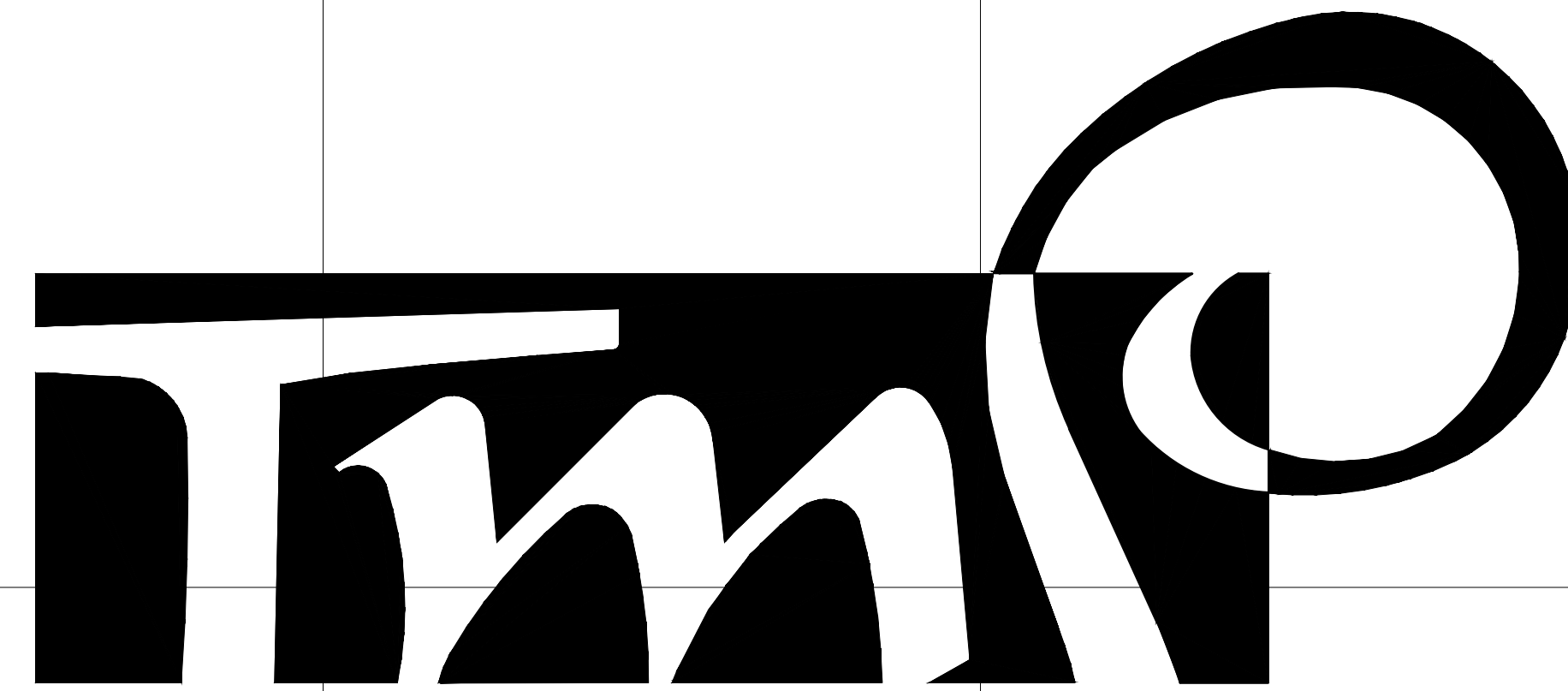
PANEL SCHEDULE NOTE:
BOLD NEW WORK BREAKERS ARE SHOWN BOLD
STRIKE-THROUGH EXISTING BREAKERS TO BE REMOVED ARE SHOWN AS BOLD AND STRIKE-THROUGH.

PANEL CL LOAD SUMMARY

DEVICE DEMOULISHED	NO. OF DEVICES	DEVICES	TOTAL WATTS
2-LAMP FLUORESCENT	24	64	1536
1-LAMP FLUORESCENT	8	32	256
RECEPTACLES	8	180	1440
HAND DRYERS	10	1500	15000
TOTAL WATTS REMOVED			18232

DEVICE ADDED	NO. OF DEVICES	DEVICES	TOTAL WATTS
L1 AND L2 LED FIXTURES	24	35	840
L3	1	1	11
RECEPTACLES	6	180	1080
HAND DRYERS	7	1500	10500
EF-6	1	4323.192	4323
TOTAL WATTS ADDED			16754

TOTAL REMOVED WATTS	18232
TOTAL ADDED WATTS	-16754
TOTAL REMAINING AVAILABLE WATTS	1478



ARCHITECTURE

T M P ARCHITECTURE I N C
 1191 WEST SQUARE LAKE ROAD · BLOOMFIELD HILLS · MICHIGAN · 48302
 PH · 248.338.4561 FX · 248.338.0223 EM · INFO @TMP-ARCHITECTURE.COM

HAZEL PARK HIGH SCHOOL MAIN OFFICE TOILET ROOM UPGRADE

HAZEL PARK, MI 48030
 PROJECT NUMBER 20011B
 OWNER REVIEW

BUILDING:
 EXISTING BUILDING AREA: 197,540 SQ. FT.
 EXISTING ALTERED AREA: 170 SQ. FT.

CONSULTANTS:
MECHANICAL ENGINEER
STRATEGIC ENERGY SOLUTIONS
CONSULTING ENGINEERS
 4000 WEST 11 MILE ROAD
 BERKLEY, MICHIGAN 48072
 PHONE: (248) 399-1900

ELECTRICAL ENGINEER
STRATEGIC ENERGY SOLUTIONS
CONSULTING ENGINEERS
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 BERKLEY, MICHIGAN 48072
 PHONE: (248) 399-1900

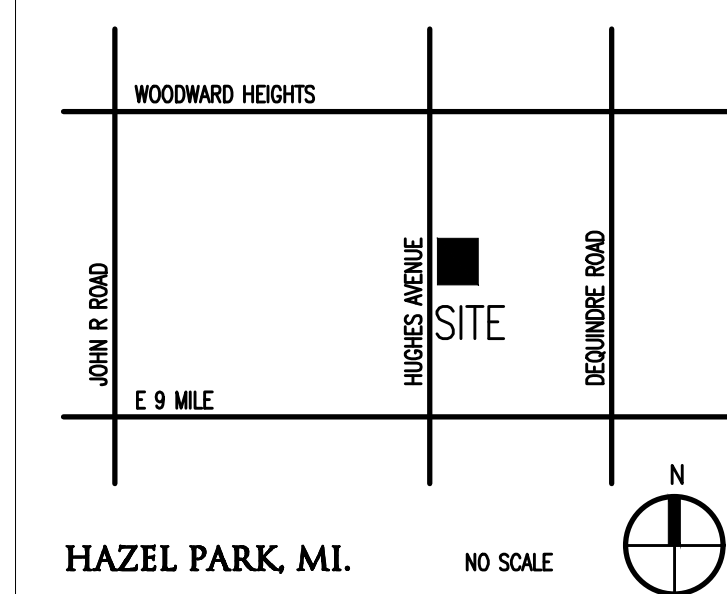
LIST OF DRAWINGS
GENERAL INFORMATION
 TS.1 COVER SHEET
 TG.1 GENERAL INFORMATION

ARCHITECTURAL
 AC.1.1 FIRST LEVEL COMPOSITE FLOOR PLAN
 A1.1 DEMOLITION PLAN, FLOOR PLAN, REFLECTED CEILING PLAN,
 FINISH PLAN, DOOR AND FRAME SCHEDULE AND DETAILS

MECHANICAL
 M0.0 MECHANICAL GENERAL INFORMATION
 M4.1 ENLARGED MECHANICAL DEMOLITION AND NEW
 WORK PLANS
 M5.1 MECHANICAL SCHEDULES AND DETAILS

ELECTRICAL
 E0.0 ELECTRICAL GENERAL INFORMATION
 E4.1 ENLARGED ELECTRICAL DEMOLITION AND NEW
 WORK PLANS

PROJECT DATA:
LOCATION MAP



CODE:
GOVERNING CODES:
 - 2016 SCHOOL FIRE SAFETY RULES
 (2012 Life Safety Code, plus amendments)
 - 2015 MICHIGAN BUILDING CODE
 - 2015 MICHIGAN REHABILITATION CODE FOR EXISTING BUILDINGS
 - 2018 MICHIGAN PLUMBING CODE
 - 2015 MICHIGAN MECHANICAL CODE
 - 2015 MICHIGAN UNIFORM ENERGY CODE
 (ANSI/ASHRAE/IES Standard 90.1-2013)
 - 2017 MICHIGAN ELECTRICAL RULES (2017 NEC, plus Part B Rules)
 - 2010 MICHIGAN ELEVATOR RULES
 (ASME A17.1-2010, ASME A18.1-2011)
 - MICHIGAN BARRIER FREE CODE
 (Michigan Building Code 2015 and ICC A117.1-2009)
 - 2013 MICHIGAN BOILER CODE RULES
 (ASME Boiler and Pressure Vessel Code, 2010 edition,
 plus 2011a addenda)
 (National Board Inspection Code [NBIC], 2011 edition)

PROJECT ADDRESS: 23400 HUGHES AVE
 HAZEL PARK, MI 48030
OWNER ADDRESS: 1620 E ELZA AVE
 HAZEL PARK, MI 48030

CONSTRUCTION CLASSIFICATION:
 BCC = 110
 BFS = 11(000)
USE GROUP CLASSIFICATION:
 (E) EDUCATION

02/18/2022 OWNER REVIEW
DATE ISSUED FOR:

LICENSEE'S STATEMENT:
 This Document has been prepared under the supervision of the Architect, as the person in Responsible Charge with the firm of TMP ARCHITECTURE, INC. An original embossed or rubber stamp seal and original signature of the Architect is required and shall be affixed to any copy of this Document submitted to a governmental agency for approval or record. This is in conformance with the State of Michigan's PA 299, Article 20 and the General Rules of the Board of Architects.
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PROJECT TITLE
**HPHS Main Office
 Toilet Room Upgrade**
PROJECT NO.
20011B
DRAWING NO.
TS.1

ABBREVIATIONS

Table with 2 columns: Abbreviation and Full Name. Includes items like A.B.V. ABOVE FINISH FLOOR, A.C. AC, A.C. INSUL. ACOUSTIC INSULATION, etc.

Table with 2 columns: Abbreviation and Full Name. Includes items like D.M.P.R. DAMPER, D.L. DEAD LEAD, D.S. DEEP, etc.

Table with 2 columns: Abbreviation and Full Name. Includes items like H.H. HANDICAPPED, H.B. HARDBOARD, H.W. HARDWARE, etc.

Table with 2 columns: Abbreviation and Full Name. Includes items like O.B.S. OBSOLETE, O.C. OFF-CENTER, O.P. OPERATOR, etc.

Table with 2 columns: Abbreviation and Full Name. Includes items like S.T.B. SWITCH, S.W. SWITCH, S.W.S. SWITCH, etc.

Table with 2 columns: Abbreviation and Full Name. Includes items like B.B. BACK-TO-BACK, B.F. BACK-FIN REVENTER, B.D.D. BACK DRIFT DAMPER, etc.

Table with 2 columns: Abbreviation and Full Name. Includes items like E.A. EACH, E.W. EACH WAY, E.I.F.S. EXTERIOR INSULATION FINISH SYSTEM, etc.

Table with 2 columns: Abbreviation and Full Name. Includes items like I.D. IDENTIFICATION, I.N.C. INCLINATED, I.N.C.H. INCHES, etc.

Table with 2 columns: Abbreviation and Full Name. Includes items like J.C. JANITOR CLOSET, J.B. JOINT, J.B. JOINT, etc.

Table with 2 columns: Abbreviation and Full Name. Includes items like U.C. UNDERCUT, U.G. UNDERGRINDER'S LABORATORY, U.L. ULTIMATE, etc.

Table with 2 columns: Abbreviation and Full Name. Includes items like C.B. CABINET, C.U.H. CARPET UNIT HEATER, C.A.P. CARPET, etc.

Table with 2 columns: Abbreviation and Full Name. Includes items like L.L. LABEL, L.B. LABORATORY, L.A.B. LAMINATE, etc.

Table with 2 columns: Abbreviation and Full Name. Includes items like R.B.T. RABBIT, R.W. RAIN WATER CONDUCTOR, R.R. RAILROAD, etc.

Table with 2 columns: Abbreviation and Full Name. Includes items like W.M.S. WAINSCOT, W.C.B. WALL CABINET, W.C. WALL, etc.

Table with 2 columns: Abbreviation and Full Name. Includes items like X.M. MARBLE, X.M.F. MANUFACTURER, X.M. MARBLE, etc.

Table with 2 columns: Abbreviation and Full Name. Includes items like G.A. GAUGE, G. GALLON, G.P.M. GALLONS PER HOUR, etc.

Table with 2 columns: Abbreviation and Full Name. Includes items like M.M. MACHINE, M.B. MACHINE BOLT, M.C. MACHINE, etc.

Table with 2 columns: Abbreviation and Full Name. Includes items like S.S. SANITARY, S.N.D. SANITARY NAPKIN DISPENSER, S.C.H. SCHEDULE, etc.

Table with 2 columns: Abbreviation and Full Name. Includes items like Y.D. YARD, Y.P. YIELD POINT, Y.S. YIELD STRENGTH, etc.

Table with 2 columns: Abbreviation and Full Name. Includes items like N.N. NATURAL, N.S. NEAR SIDE, N.E. NEUTRAL, etc.

Table with 2 columns: Abbreviation and Full Name. Includes items like Z.C. ZINC, Z.C. ZINC, Z.C. ZINC, etc.

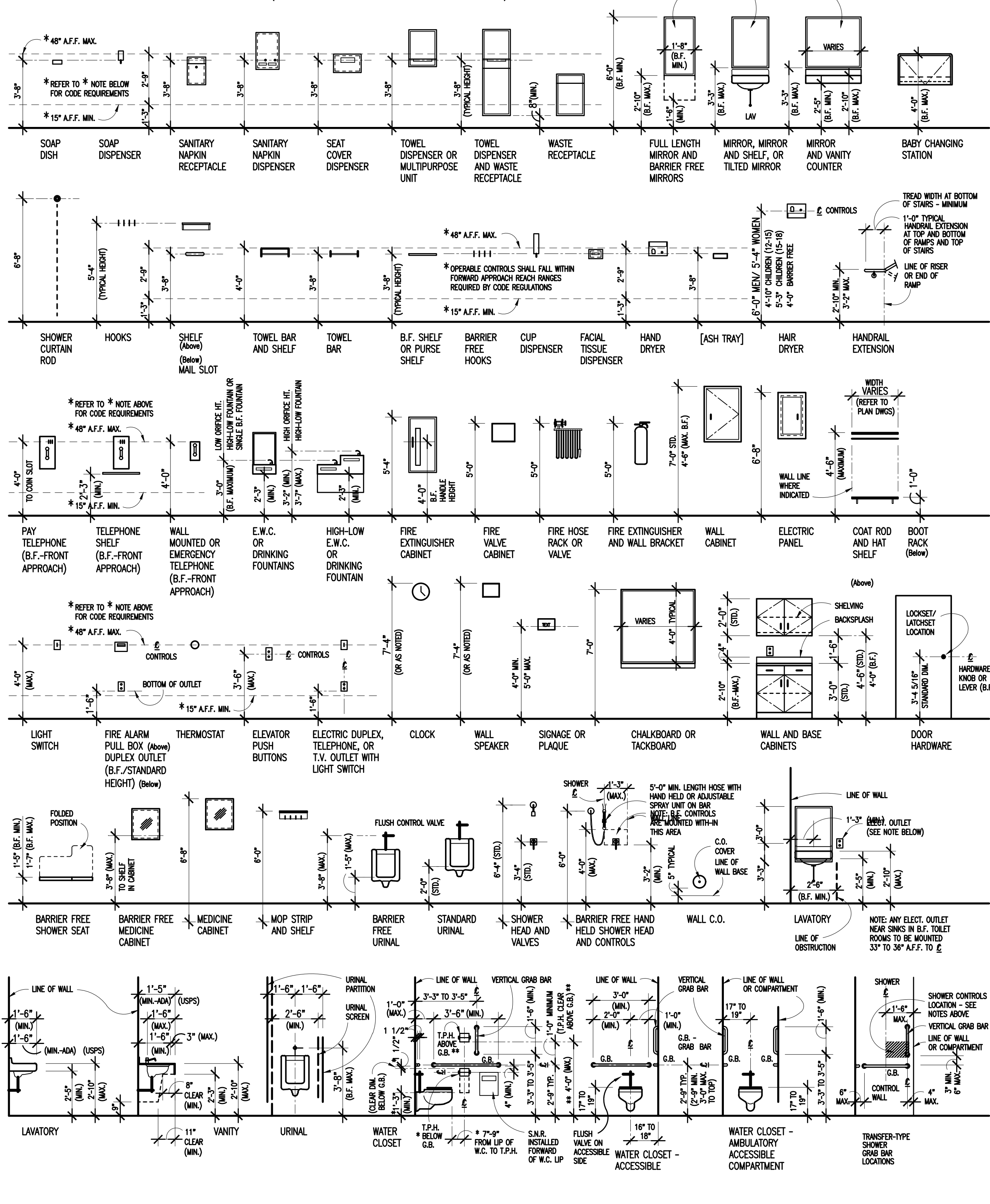
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Table with 2 columns: Abbreviation and Full Name. Includes items like S.S. SANITARY, S.N.D. SANITARY NAPKIN DISPENSER, S.C.H. SCHEDULE, etc.

TYPICAL MOUNTING HEIGHTS

MISCELLANEOUS ACCESSORIES, TOILET ACCESSORIES AND FIXTURES

NOTE: MOUNTING HEIGHTS SHOWN ARE PROPOSED FOR ALL ACCESSORIES AND FIXTURES REQUIRED UNLESS OTHERWISE NOTED OR DIMENSIONED ON DRAWINGS FOR SPECIFIC CONDITIONS (B.F. - DENOTES ACCESSIBLE BARRIER FREE REQUIREMENTS)

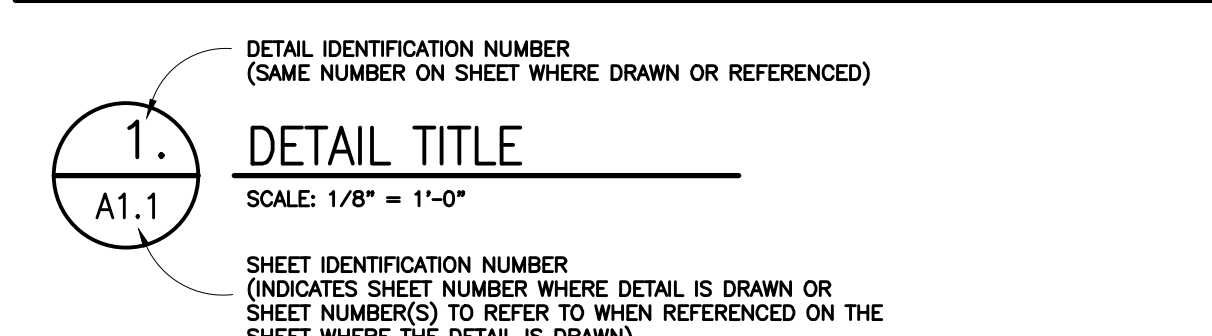


MATERIAL DESIGNATIONS

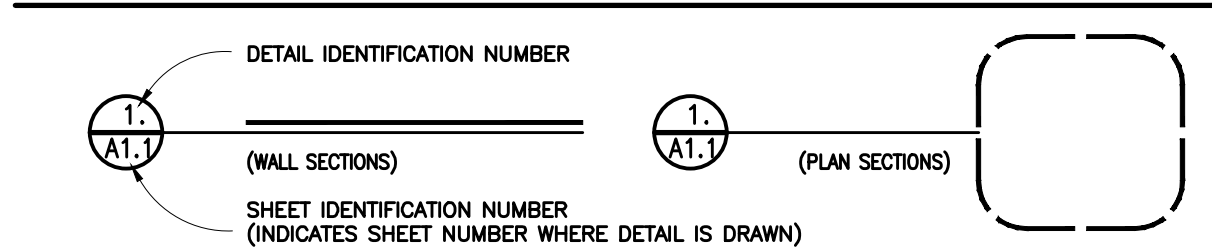
Table with 4 columns: Elevation, Section, Material, and Elevation/Section. Lists materials like Brick, Concrete Masonry Units, Prefabricated Concrete Masonry Units, etc. with corresponding symbols and notes.

REFERENCE SYMBOLS

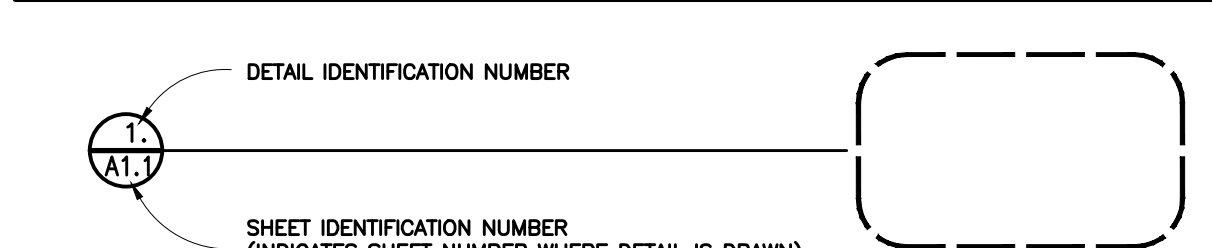
DETAIL IDENTIFICATION



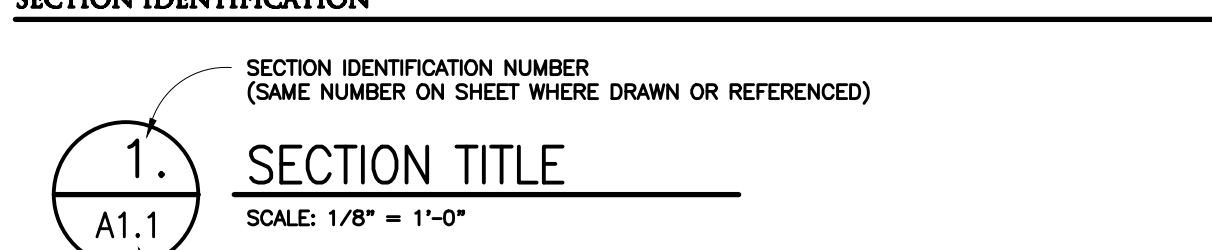
DETAIL LOCATION INDICATION



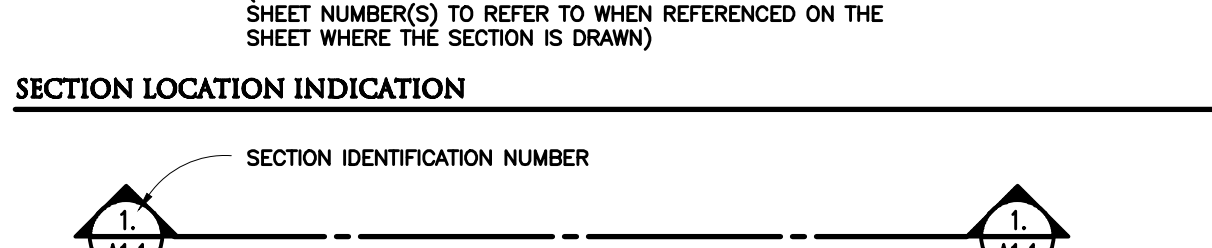
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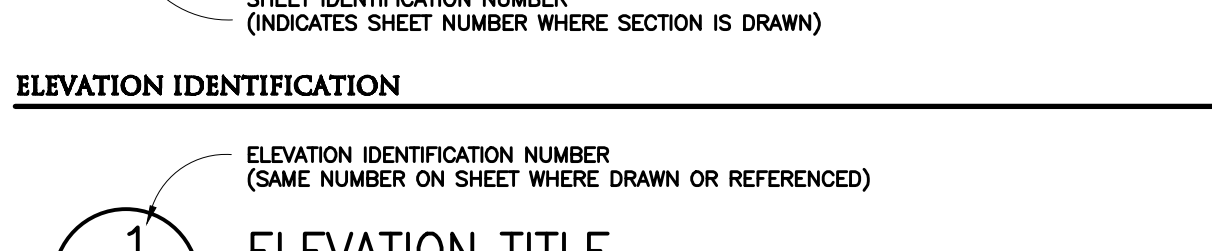
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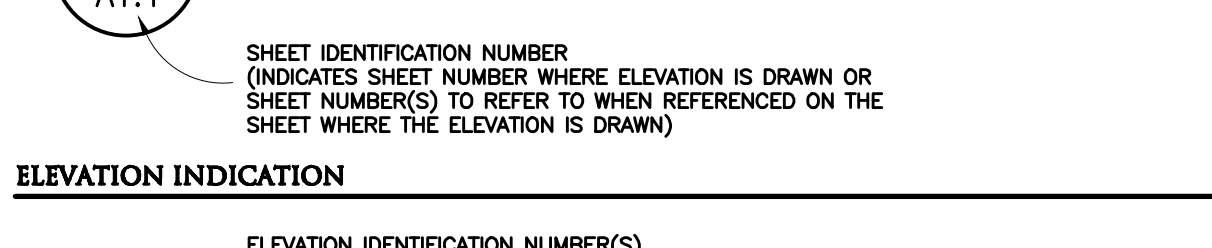
ELEVATION IDENTIFICATION



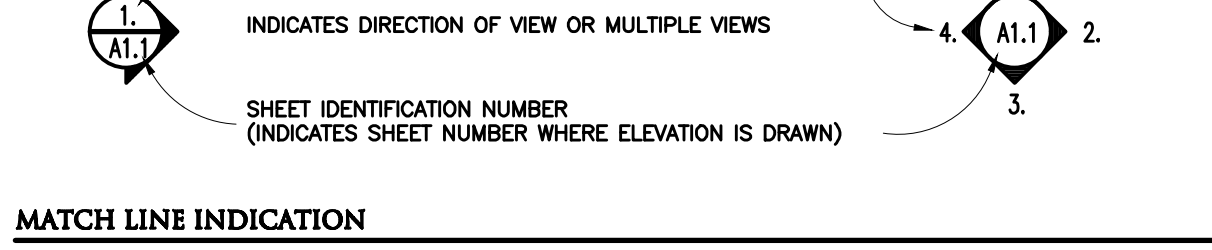
ELEVATION INDICATION



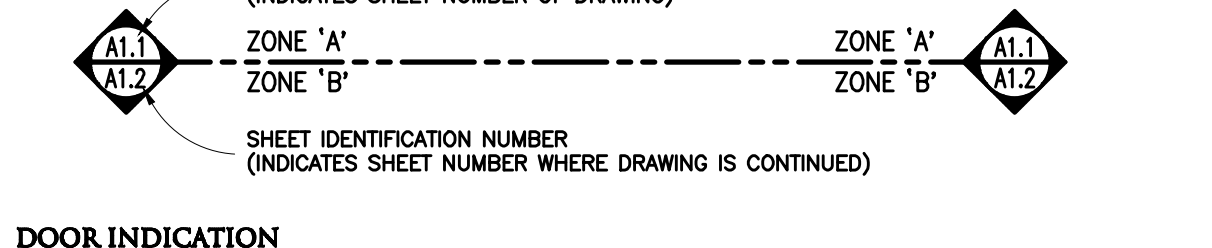
MATCH LINE INDICATION



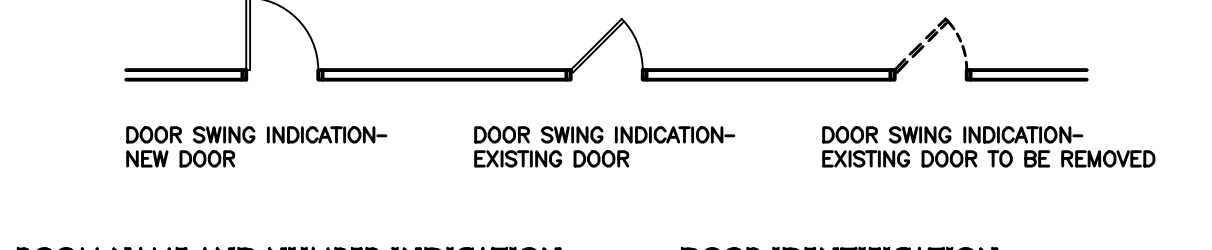
DOOR INDICATION



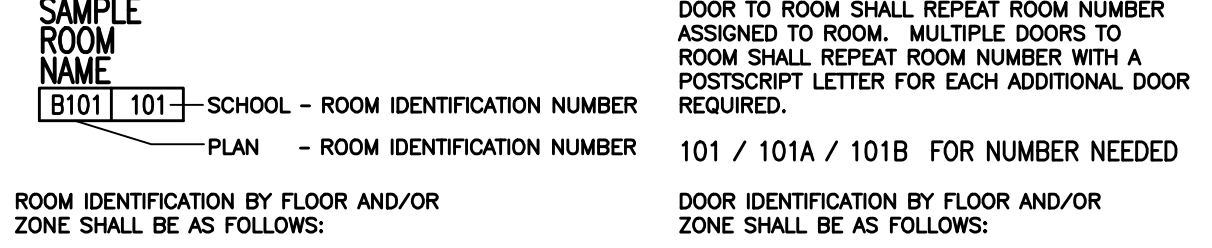
ROOM NAME AND NUMBER INDICATION



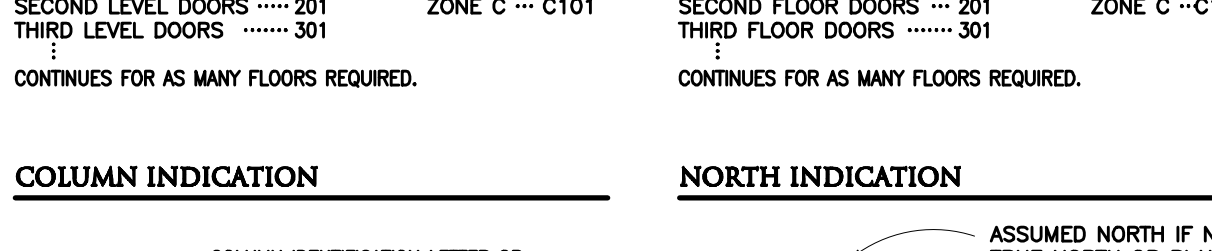
DOOR IDENTIFICATION



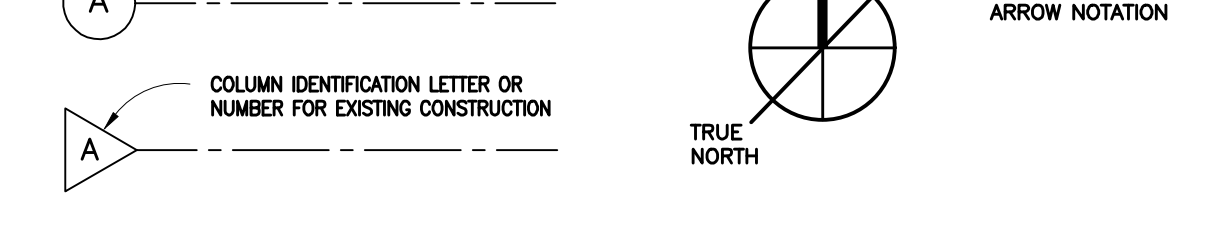
COLUMN INDICATION



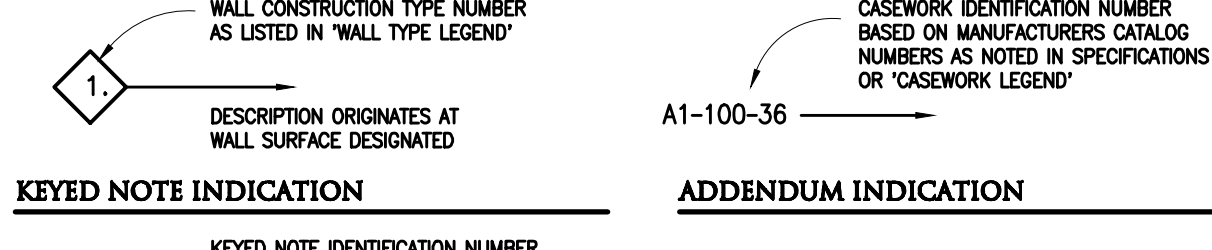
WALL TYPE NOTATION



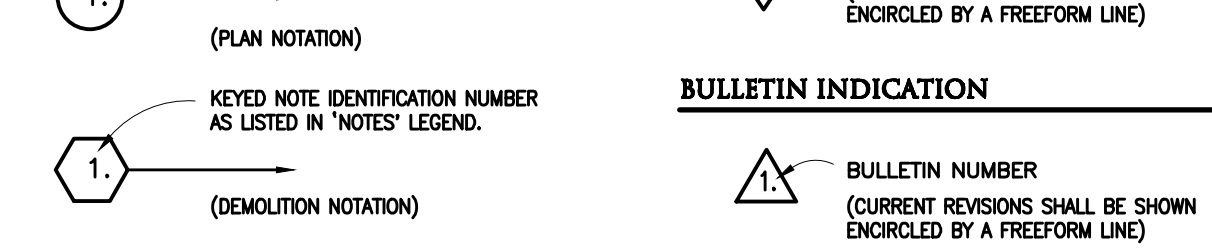
KEYED NOTE INDICATION



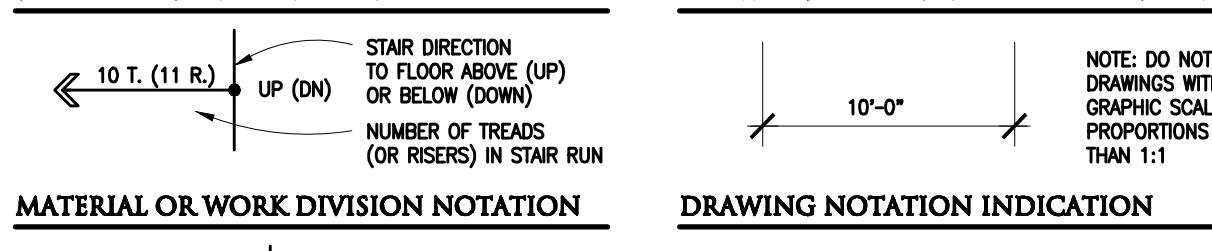
STAIR DIRECTION NOTATION



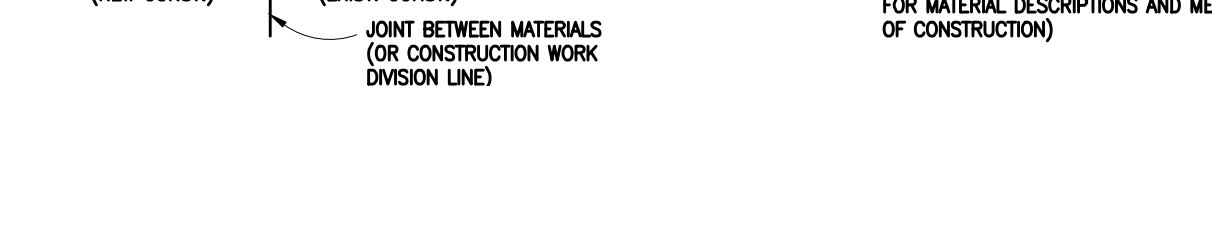
MATERIAL OR WORK DIVISION NOTATION



WALL TYPE NOTATION



KEYED NOTE INDICATION



Project information section including: TMF ARCHITECTURE logo, address (191 WEST SQUARE LAKE ROAD), registration seal, consultant name (TMF ARCHITECTURE INC.), project title (Hazel Park High School Main Office Toilet Room Upgrade), drawing title (General Information), issue dates, and project number (20011B).

MECHANICAL ABBREVIATIONS	
ABBREV.	DESCRIPTION
AAV	AUTOMATIC AIR VENT / AIR ADMITTANCE VALVE
AD	ACCESS DOOR
AE	AIR EXTRACTOR
AFF	ABOVE FINISHED FLOOR
APD	AIR PRESSURE DROP
ASR	AUTOMATIC SPRINKLER RISER
BFP	BACKFLOW PREVENTER
BHP	BRAKE HORSEPOWER
BOD	BOTTOM OF DUCT
BTU	BRITISH THERMAL UNIT
BTUH	BRITISH THERMAL UNITS PER HOUR
BWV	BACKWATER VALVE
CAP	CAPACITY
CAV	CONSTANT AIR VOLUME
CFH	CUBIC FEET PER HOUR
CFM	CUBIC FEET PER MINUTE
CIRC	CIRCULATING
CLG	COOLING
CO	CLEAN OUT
CONT	CONTINUATION OR CONTINUED
CONV	CONNECTOR
CUH	CABINET UNIT HEATER
CV	CONTROL VALVE
DB	DRY BULB TEMPERATURE
DEG	DEGREES
DDC	DIRECT DIGITAL CONTROL
DN	DOWN
DTC	DRAIN TILE CONNECTION
DWH	DOMESTIC WATER HEATER
(E)	EXISTING
EA/EXH	EXHAUST AIR
EAT	ENTERING AIR TEMPERATURE
EDB	ENTERING DRY BULB TEMPERATURE
EF	EXHAUST FAN
EJ	EXPANSION JOINT
EL	ELEVATION
ELECT	ELECTRICAL
EMS	ENERGY MANAGEMENT SYSTEM
ESP	EXTERNAL STATIC PRESSURE
EWB	ENTERING WET BULB TEMPERATURE
EWV	ELECTRIC WATER COOLER
°F	DEGREES FAHRENHEIT
FA	FACE AREA (COIL) / FREE AREA (LOUVER)
FC	FLEXIBLE CONNECTION
FD	FLOOR DRAIN
FDC	FIRE DEPARTMENT CONNECTION
FH	FIRE HYDRANT
FHC	FIRE HOSE CABINET
FHR	FIRE HOSE RACK
FHV	FIRE HOSE VALVE
FLA	FULL LOAD AMPS
FLR	FLOOR
FPM	FEET PER MINUTE
FFD	FUNNEL FLOOR DRAIN
FFE	FINISHED FLOOR ELEVATION
FS	FLOOR SINK
FT	FEET
FURN	FURNISHED
FV	FACE VELOCITY
FVC	FIRE VALVE CABINET
GAL	GALLON
GPH	GALLONS PER HOUR
GPM	GALLONS PER MINUTE
HB	HOSE BIBB
HO	HUB OUTLET
HP	HORSEPOWER

MECHANICAL ABBREVIATIONS	
ABBREV.	DESCRIPTION
HR	HOUR
HTG	HEATING
HYD	HYDRANT
HZ	HERTZ
ID	INSIDE DIAMETER
IE	INVERT ELEVATION
IN	INCHES
INST	INSTALLED
INV	INVERT
ISP	INTERNAL STATIC PRESSURE
IW	INDIRECT WASTE
KW	KILOWATT
LAT	LEAVING AIR TEMPERATURE
LAV	LAVATORY
LBS/HR	POUNDS PER HOUR
LDB	LEAVING DRY BULB TEMPERATURE
LRA	LOCKED ROTOR AMPS
LWB	LEAVING WET BULB TEMPERATURE
MAV	MANUAL AIR VENT
MAX	MAXIMUM
MBH	1000 BRITISH THERMAL UNITS PER HOUR
MCA	MINIMUM CIRCUIT AMPACITY
MECH	MECHANICAL
MFR	MANUFACTURER
MH	MANHOLE
MIN	MINIMUM
MISC	MISCELLANEOUS
MOD	MOTOR OPERATED DAMPER (AUTOMATIC)
MOP	MAXIMUM OVER-CURRENT PROTECTION
N.C.	NOISE CRITERIA
NIC	NOT IN CONTRACT
NC	NORMALLY CLOSED
NO	NORMALLY OPEN
NOM	NOMINAL
OA	OUTSIDE AIR
OBD	OPPOSED BLADE DAMPER
OC	ON CENTER / CENTER TO CENTER
OD	OUTSIDE DIAMETER
OED	OPEN ENDED DUCT
ORS	OVERFLOW ROOF SUMP
OS&Y	OUTSIDE SCREW AND YOKE
(O)	OVERHEAD
PD	PRESSURE DROP (FEET OF WATER)
PRV	PRESSURE REDUCING VALVE
PSIA	POUNDS PER SQUARE INCH - ABSOLUTE
PSIG	POUNDS PER SQUARE INCH - GAUGE
PT	PRESSURE / TEMPERATURE PORT
RA	RETURN AIR
RH	RELATIVE HUMIDITY
REQD	REQUIRED
RELA	RELIEF AIR
RPM	REVOLUTIONS PER MINUTE
RPZ	REDUCED PRESSURE ZONE
RS	ROOF SUMP
SA	SUPPLY AIR
SH	SHOWER
SP	STATIC PRESSURE
Sqft / SF	SQUARE FOOT/SQUARE FEET
SS	SERVICE SINK
TC	TEMPERATURE CONTROL
T & P	TEMPERATURE AND PRESSURE
TSP	TOTAL STATIC PRESSURE
TYP	TYPICAL
UG	UNDERGROUND
UH	UNIT HEATER
UL	UNDERWRITERS LABORATORY
UNO	UNLESS NOTED OTHERWISE

MECHANICAL ABBREVIATIONS	
ABBREV.	DESCRIPTION
UR	URINAL
VD	VOLUME DAMPER (MANUALLY ADJUSTABLE)
VTR	VENT THRU ROOF
W	WASTE
W&V	WASTE AND VENT
WB	WET BULB TEMPERATURE
WC	WATER CLOSET
WG	WATER GAUGE
WH	WALL HYDRANT

MECHANICAL PIPING SYMBOLS	
ABBREV.	DESCRIPTION
	PIPE ELBOW UP
	PIPE ELBOW DOWN
	PIPE TEE DOWN
	DIRECTION OF FLOW
	UNION
	STRAINER
	CONCENTRIC REDUCER
	ECCENTRIC REDUCER
	EXPANSION JOINT
	FLEXIBLE CONNECTION
	PIPE ANCHOR
	PIPE GUIDE
	PIPE CAP OR PLUG
	ISOLATION VALVE
	CIRCULATING PUMP
	GLOBE VALVE
	BALL VALVE
	BUTTERFLY VALVE
	ANGLE VALVE
	CHECK VALVE (SWING)
	CHECK VALVE (SPRING)
	PLUG VALVE
	NEEDLE VALVE
	OUTSIDE SCREW AND YOKE VALVE (OS&Y)
	PRESSURE REGULATING VALVE
	SOLENOID VALVE
	CONTROL VALVE (2-WAY / 3-WAY)
	CENTRIFUGAL FAN
	AUTOMATIC GAS SHUT-OFF VALVE
	TRAP (PLAN VIEW)
	FLOOR DRAIN / FUNNEL FLOOR DRAIN (PLAN VIEW)
	FLOOR DRAIN / FUNNEL FLOOR DRAIN (ELEVATION)
	ROOF SUMP
	CLEAN OUT (IN FLOOR)
	CLEAN OUT (IN LINE)
	CLEAN OUT (WALL)
	BACKFLOW PREVENTER
	WATER METER ASSEMBLY
	HOSE BIBB, WALL HYDRANT
	DIRECTION OF PIPE PITCH
	SPRINKLER HEAD (UPRIGHT)
	SPRINKLER HEAD (SIDEWALL)
	FLOW SWITCH
	SIAMESE CONNECTION (YARD)
	SIAMESE CONNECTION (WALL MOUNTED)
	FIRE HYDRANT
	FLOW MEASURING DEVICE
	BALANCING VALVE
	COMBINATION FLOW MEASURING AND BALANCING DEVICE
	AUTOMATIC AIR VALVE
	MANUAL AIR VALVE

MECHANICAL SYMBOLS	
ABBREV.	DESCRIPTION
	RECTANGULAR TAKE-OFF (SINGLE LINE)
	RECTANGULAR TAKE-OFF (DOUBLE LINE)
	ROUND TAKE-OFF (SINGLE LINE)
	ROUND TAKE-OFF (DOUBLE LINE)
	SPIN-IN FITTING (WITH VOLUME DAMPER)
	ELBOW (WITH TURNING VANES)
	RADIUS RECTANGULAR ELBOW
	RADIUS ROUND ELBOW
	RECTANGULAR ELBOW UP
	ROUND ELBOW UP
	RECTANGULAR ELBOW DOWN
	ROUND ELBOW DOWN
	CONCENTRIC TRANSITION (DOUBLE LINE)
	CONCENTRIC TRANSITION (SINGLE LINE)
	ECCENTRIC TRANSITION (DOUBLE LINE)
	ECCENTRIC TRANSITION (SINGLE LINE)
	INCLUDED RISE IN DIRECTION OF AIR FLOW (DOUBLE LINE)
	INCLUDED RISE IN DIRECTION OF AIR FLOW (SINGLE LINE)
	INCLUDED DROP IN DIRECTION OF AIR FLOW (DOUBLE LINE)
	INCLUDED DROP IN DIRECTION OF AIR FLOW (SINGLE LINE)
	FLEXIBLE CONNECTION
	FLEXIBLE DUCT CONNECTION TO SUPPLY DIFFUSER
	SUPPLY DIFFUSER
	LINEAR SLOT DIFFUSER
	RETURN OR EXHAUST GRILLE
	TRANSFER GRILLE
	CROSS SECTION OF SUPPLY AIR DUCT
	CROSS SECTION OF EXHAUST OR RETURN AIR DUCT
	EXISTING FIRE DAMPER (HORIZONTAL)
	NEW FIRE DAMPER (HORIZONTAL)
	EXISTING FIRE DAMPER (VERTICAL)
	NEW FIRE DAMPER (VERTICAL)
	EXISTING SMOKE DAMPER
	NEW SMOKE DAMPER
	EXISTING COMBINATION FIRE/SMOKE DAMPER (VERTICAL)
	NEW COMBINATION FIRE/SMOKE DAMPER (VERTICAL)
	NEW VOLUME DAMPER (MANUALLY ADJUSTABLE)
	MOTORIZED DAMPER
	SMOKE DETECTOR
	CO2 SENSOR
	THERMOSTAT OR TEMPERATURE SENSOR
	HUMIDISTAT OR HUMIDITY SENSOR
	RETURN OR EXHAUST / SUPPLY AIR FLOW

PIPING LEGEND	
ABBREV.	DESCRIPTION
CA	COMPRESSED AIR PIPING
CD	CONDENSATE DRAIN PIPING
DT	DRAIN TILE
F	FIRE PROTECTION PIPING
FOR	FUEL OIL RETURN PIPING
FOS	FUEL OIL SUPPLY PIPING
G	NATURAL GAS PIPING
BCW	BOOSTED-DOMESTIC COLD WATER PIPING
BHW	BOOSTED-DOMESTIC HOT WATER PIPING
CW	DOMESTIC COLD WATER PIPING
NPCW	NON POTABLE COLD WATER PIPING
TW	TEMPERED WATER PIPING
HW	DOMESTIC HOT WATER PIPING
HW(140°F)	DOMESTIC 140°F HOT WATER PIPING
HWR	DOMESTIC HOT WATER RETURN PIPING
SAN	SANITARY WASTE PIPING
PSAN	PUMPED SANITARY PIPING
V	VENT PIPING
ST	STORM SEWER PIPING
PST	PUMPED STORM PIPING
RC	RAIN CONDUCTOR PIPING
ORC	OVERFLOW RAIN CONDUCTOR PIPING
CHWR	CHILLED WATER RETURN PIPING
CHWS	CHILLED WATER SUPPLY PIPING
CWR	CONDENSER WATER RETURN PIPING
CWS	CONDENSER WATER SUPPLY PIPING
HWR	HEATING HOT WATER RETURN PIPING
HWS	HEATING HOT WATER SUPPLY PIPING
HPLR	HEAT PUMP LOOP RETURN PIPING
HPLS	HEAT PUMP LOOP SUPPLY PIPING
RL	REFRIGERANT LIQUID PIPING
RS	REFRIGERANT SUCTION PIPING
HGB	HOT GAS BY-PASS PIPING
GHR	GEO HEAT EXCHANGE RETURN
GHS	GEO HEAT EXCHANGE SUPPLY
STM	STEAM PIPING
HPS	HIGH PRESSURE STEAM PIPING
LPS	LOW PRESSURE STEAM PIPING
CR	STEAM CONDENSATE RETURN PIPING
PCR	PUMPED STEAM CONDENSATE RETURN PIPING
LPC	LOW PRESSURE CONDENSATE PIPING
HPC	HIGH PRESSURE CONDENSATE PIPING
MA	MEDICAL AIR PIPING
N	NITROGEN GAS PIPING
O2	OXYGEN GAS PIPING
VAC	VACUUM PIPING

APPLICABLE CODES AND REGULATIONS	
YEAR	CODE
2015	MICHIGAN BUILDING CODE
2015	MICHIGAN REHABILITATION CODE FOR EXISTING BUILDINGS
2015	MICHIGAN PLUMBING CODE
2015	MICHIGAN MECHANICAL CODE
2015	MICHIGAN UNIFORM ENERGY CODE
2012	NFPA 101 WITH BFS AMENDMENTS
2009	ICC/ANSI ACCESSIBLE AND USABLE BUILDING & FACILITIES
-	AMERICANS WITH DISABILITIES ACT ACCESSIBILITIES GUIDELINE (ADA-AG)

DRAWING INDEX	
SHT NO.	DESCRIPTION
MO.0	Mechanical General Information
M4.1	Enlarged Mechanical Demolition and New Work Plans
M5.1	Mechanical Schedules and Details

DRAWING NOTATION	
SYMBOL	DESCRIPTION
	NEW WORK KEY NOTE NO. 1
	DEMOLITION KEY NOTE NO. 1
	EQUIPMENT DESIGNATION, (E: EXHAUST FAN NO. 1)
	AIR TERMINAL TAG: S = SUPPLY, R = RETURN, E = EXHAUST IE: DIFFUSER TYPE = S-1 NECK SIZE = 10"x10" CFM = 100 (TYPICAL FOR 2)
	EXISTING DEVICES OR EQUIPMENT
	NEW OR MODIFIED DEVICES OR EQUIPMENT
	EXISTING SYSTEM COMPONENT TO BE REMOVED
	POINT OF NEW CONNECTION
	SECTION NO. 4 SHEET M5.2 ON WHICH SECTION IS DRAWN
	SECTION NO. 6 SCALE: 1/4" = 1' - 0" SHEET M5.2 ON WHICH SECTION IS CUT (ENLARGED PARTIAL PLAN SIMILAR)



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SES Project #21 0351 01

PROJECT TITLE
Hazel Park High School Main Office Toilet Room Upgrade

Hazel Park Schools
Hazel Park, Michigan

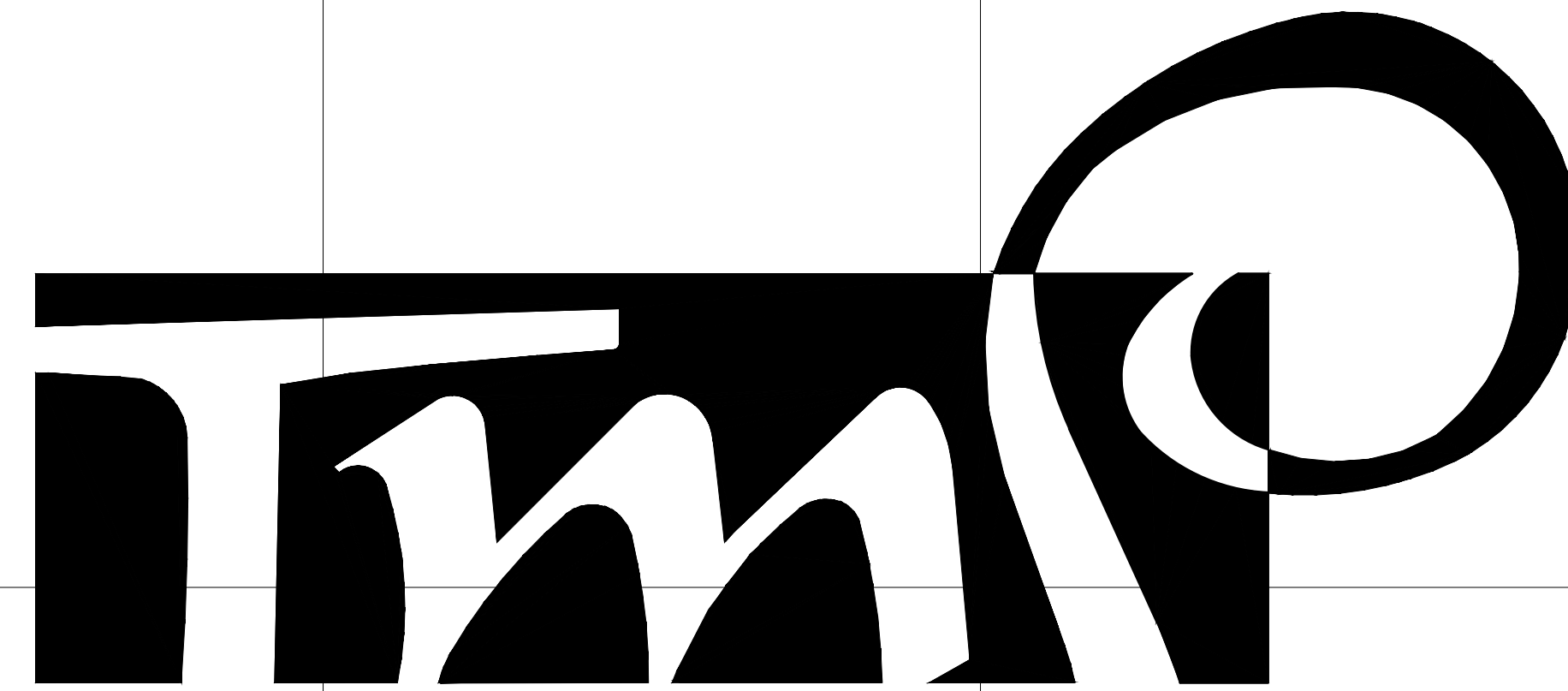
DRAWING TITLE
Mechanical General Information

ISSUE DATES

02-18-2022 OWNER REVIEW
DATE: ISSUED FOR:

DRAWN GK
CHECKED NCS
APPROVED NCS

PROJECT NO.
20011B
DRAWING NO.
MO.0



ARCHITECTURE

T M P ARCHITECTURE I N C
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HAZEL PARK HIGH SCHOOL CAFETERIA DOORS

HAZEL PARK, MI 48030 PROJECT NUMBER 19126B OWNER REVIEW

BUILDING:
EXISTING BUILDING AREA: 197,540 SQ. FT.
EXISTING ALTERED AREA: 150 SQ. FT.

CONSULTANTS:
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STRATEGIC ENERGY SOLUTIONS
CONSULTING ENGINEERS
4000 WEST 11 MILE ROAD
BERKLEY, MICHIGAN 48072
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ELECTRICAL ENGINEER
STRATEGIC ENERGY SOLUTIONS
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LIST OF DRAWINGS

GENERAL INFORMATION
TS.1 COVER SHEET
TG.1 GENERAL INFORMATION

ARCHITECTURAL

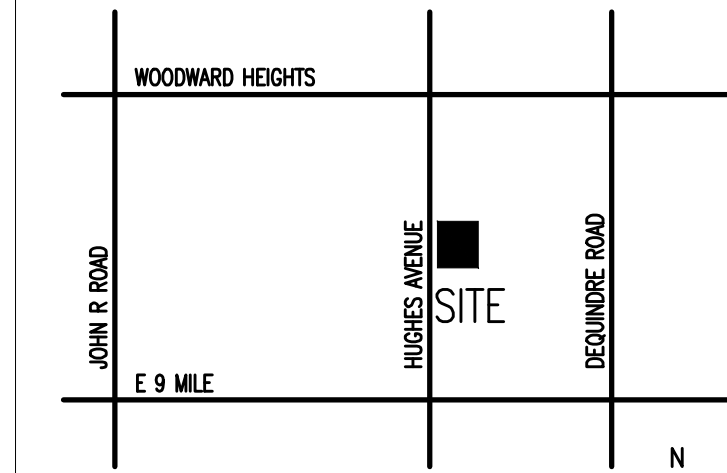
AC1.1 FIRST LEVEL COMPOSITE FLOOR PLAN
A1.1 DEMOLITION PLAN, FLOOR PLAN, REFLECTED CEILING
PLAN, FINISH PLAN, INTERIOR ELEVATIONS, DOOR AND
FRAME SCHEDULE AND DETAILS

ELECTRICAL

ED.0 ELECTRICAL GENERAL INFORMATION
E4.1 ENLARGED ELECTRICAL DEMOLITION AND NEW WORK PLANS

PROJECT DATA:

LOCATION MAP



HAZEL PARK, MI.

CODE:
GOVERNING CODES:
- 2016 SCHOOL FIRE SAFETY RULES
(2012 Life Safety Code, plus amendments)
- 2015 MICHIGAN BUILDING CODE
- 2015 MICHIGAN REHABILITATION CODE FOR EXISTING BUILDINGS
- 2018 MICHIGAN PLUMBING CODE
- 2015 MICHIGAN MECHANICAL CODE
- 2015 MICHIGAN UNIFORM ENERGY CODE
(ANSI/ASHRAE/IES Standard 90.1-2013)
- 2017 MICHIGAN ELECTRICAL RULES (2017 NEC, plus Part B Rules)
- 2010 MICHIGAN ELEVATOR RULES
(ASME A17.1-2010, ASME A18.1-2011)
- MICHIGAN BARRIER FREE CODE
(Michigan Building Code 2015 and ICC A117.1-2009)
- 2013 MICHIGAN BOILER CODE RULES
(ASME Boiler and Pressure Vessel Code, 2010 edition,
plus 2011a addenda)
(National Board Inspection Code [NBIC], 2011 edition)

PROJECT ADDRESS: 23400 HUGHES AVE
HAZEL PARK, MI 48030
OWNER ADDRESS: 1620 E ELZA AVE
HAZEL PARK, MI 48030

CONSTRUCTION CLASSIFICATION:
BCC = 100
BFS = 10(00)
USE GROUP CLASSIFICATION:
(E) EDUCATION

02/18/2022 OWNER REVIEW
DATE ISSUED FOR:

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PROJECT TITLE
Hazel Park High School Cafeteria Doors
PROJECT NO.
19126B
DRAWING NO.
TS.1



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PROJECT TITLE
Hazel Park High School Cafeteria Doors

**Hazel Park Schools
Hazel Park, Michigan**

DRAWING TITLE
First Level Composite Floor Plan

ISSUE DATES

02/18/2022 OWNER REVIEW

DATE: ISSUED FOR:

DRAWN KYC

CHECKED KYC

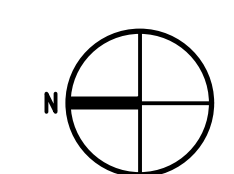
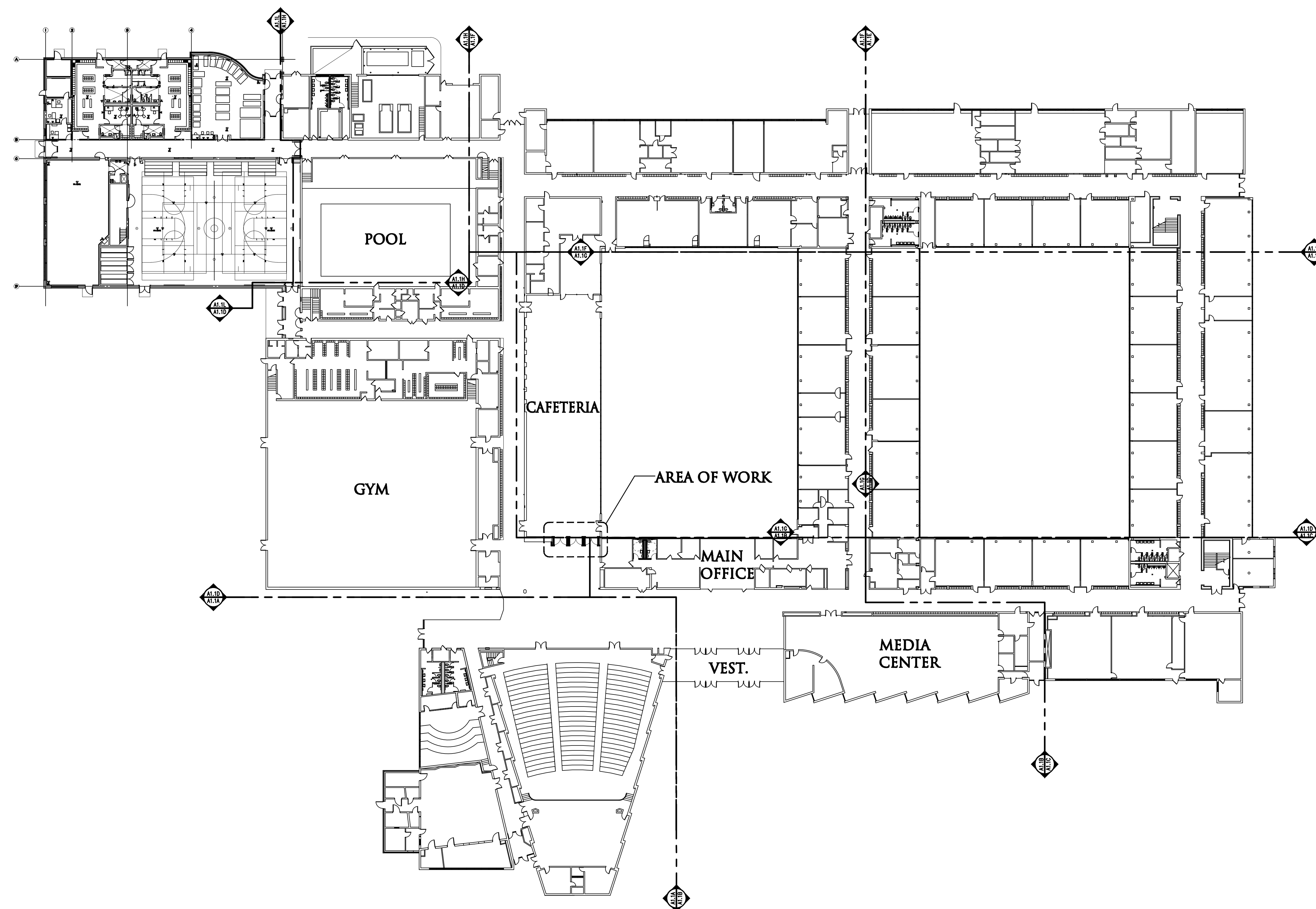
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PROJECT NO.

19126B

DRAWING NO.

AC.1



FIRST LEVEL COMPOSITE FLOOR PLAN

SCALE: N.T.S. = 1/4" = 1'-0"



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PROJECT TITLE
Hazel Park High School Cafeteria Doors

**Hazel Park Schools
Hazel Park, Michigan**

DRAWING TITLE
Electrical General Information

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02-18-2022	OWNER REVIEW
DATE:	ISSUED FOR:
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CHECKED	JMC
APPROVED	SET

PROJECT NO.
19126B
DRAWING NO.
E0.0

COPPER FEEDER SCHEDULE											
FEEDER (AMPS)	COND. SIZE	2 WIRE WITH GROUND		FEEDER (AMPS)	COND. SIZE	3 WIRE WITH GROUND		FEEDER (AMPS)	COND. SIZE	4 WIRE WITH GROUND	
155	12	2#12, 1#12 GND IN 3/4"		15	12	3#12, 1#12 GND IN 3/4"		15N	12	4#12, 1#12 GND IN 3/4"	
205	12	2#12, 1#12 GND IN 3/4"		20	12	3#12, 1#12 GND IN 3/4"		20N	12	4#12, 1#12 GND IN 3/4"	
255	10	2#10, 1#10 GND IN 3/4"		25	10	3#10, 1#10 GND IN 3/4"		25N	10	4#10, 1#10 GND IN 3/4"	
305	10	2#10, 1#10 GND IN 3/4"		30	10	3#10, 1#10 GND IN 3/4"		30N	10	4#10, 1#10 GND IN 3/4"	
355	8	2#8, 1#10 GND IN 3/4"		35	8	3#8, 1#10 GND IN 3/4"		35N	8	4#8, 1#10 GND IN 3/4"	
405	8	2#8, 1#10 GND IN 3/4"		40	8	3#8, 1#10 GND IN 3/4"		40N	8	4#8, 1#10 GND IN 3/4"	
455	6	2#6, 1#10 GND IN 3/4"		45	6	3#6, 1#10 GND IN 3/4"		45N	6	4#6, 1#10 GND IN 1"	
505	6	2#6, 1#10 GND IN 3/4"		50	6	3#6, 1#10 GND IN 3/4"		50N	6	4#6, 1#10 GND IN 1"	
605	4	2#4, 1#10 GND IN 1"		60	4	3#4, 1#10 GND IN 1"		60N	4	4#4, 1#10 GND IN 1 1/4"	
705	4	2#4, 1#8 GND IN 1"		70	4	3#4, 1#8 GND IN 1"		70N	4	4#4, 1#8 GND IN 1 1/4"	
805	3	2#3, 1#8 GND IN 1"		80	3	3#3, 1#8 GND IN 1"		80N	3	4#3, 1#8 GND IN 1 1/4"	
905	2	2#2, 1#8 GND IN 1"		90	2	3#2, 1#8 GND IN 1 1/4"		90N	2	4#2, 1#8 GND IN 1 1/2"	
1005	1	2#1, 1#8 GND IN 1 1/4"		100	1	3#1, 1#8 GND IN 1 1/4"		100N	1	4#1, 1#8 GND IN 1 1/2"	
				110	2	3#2, 1#6 IN 1 1/4"		110N	2	4#2, 1#6 GND IN 1 1/4"	
				125	1	3#1, 1#6 GND IN 1 1/4"		125N	1	4#1, 1#6 GND IN 1 1/2"	
				150	1/0	3#1/0, 1#6 GND IN 1 1/2"		150N	1/0	4#1/0, 1#6 GND IN 2"	
				175	2/0	3#2/0, 1#6 GND IN 1 1/2"		175N	2/0	4#2/0, 1#6 GND IN 2"	
				200	3/0	3#3/0, 1#6 GND IN 2"		200N	3/0	4#3/0, 1#6 GND IN 2"	
				225	4/0	3#4/0, 1#4 GND IN 2"		225N	4/0	4#4/0, 1#4 GND IN 2 1/2"	
				250	250	3-250 KCMIL, 1#4 GND IN 2"		250N	250	4-250 KCMIL, 1#4 GND IN 2 1/2"	
				300	350	3-350 KCMIL, 1#4 GND IN 2"		300N	350	4-350 KCMIL, 1#4 GND IN 3"	
				350	500	3-500 KCMIL, 1#3 GND IN 3"		350N	500	4-500 KCMIL, 1#3 GND IN 3 1/2"	
				400	600	3-600 KCMIL, 1#3 GND IN 3 1/2"		400N	600	4-600 KCMIL, 1#3 GND IN 4"	
				450	2-4/0	(2) 3#4/0, 1#2 GND IN 2"		450N	2-4/0	(2) 4#4/0, 1#2 GND IN 2 1/2"	
				500	2-250	(2) 3-250 KCMIL, 1#2 GND IN 2 1/2"		500N	2-250	(2) 4-250 KCMIL, 1#1 GND IN 3"	
				600	2-350	(2) 3-350 KCMIL, 1#1 GND IN 2 1/2"		600N	2-350	(2) 4-350 KCMIL, 1#1 GND IN 3"	
				700	2-500	(2) 3-500 KCMIL, 1#1/0 GND IN 3"		700N	2-500	(2) 4-500 KCMIL, 1#1/0 GND IN 3 1/2"	
				800	2-600	(2) 3-600 KCMIL, 1#1/0 GND IN 3 1/2"		800N	2-600	(2) 4-600 KCMIL, 1#1/0 GND IN 4"	
				1000	3-500	(3) 3-500 KCMIL, 1#2/0 GND IN 3"		1000N	3-500	(3) 4-500 KCMIL, 1#2/0 GND IN 3 1/2"	
				1200	3-600	(3) 3-600 KCMIL, 1#3/0 GND IN 4"		1200N	3-600	(3) 4-600 KCMIL, 1#3/0 GND IN 4"	
				1600	4-600	(4) 3-600 KCMIL, 1#4/0 GND IN 4"		1600N	4-600	(4) 4-600 KCMIL, 1#4/0 GND IN 4"	
				2000	5-600	(5) 3-600 KCMIL, 1-250 KCMIL GND IN 4"		2000N	5-600	(5) 4-600 KCMIL, 1-250 KCMIL GND IN 4"	
				2500	7-500	(7) 3-500 KCMIL, 1-350 KCMIL GND IN 3 1/2"		2500N	7-500	(7) 4-500 KCMIL, 1-350 KCMIL GND IN 3 1/2"	
				3000	8-500	(8) 3-500 KCMIL, 1-400 KCMIL GND IN 3 1/2"		3000N	8-500	(8) 4-500 KCMIL, 1-400 KCMIL GND IN 3 1/2"	
				4000	10-600	(10) 3-600 KCMIL, 1-500 KCMIL GND IN 4"		4000N	10-600	(10) 4-600 KCMIL, 1-500 KCMIL GND IN 4"	
				5000	12-600	(12) 3-600 KCMIL, 1-700 KCMIL GND IN 4"		5000N	12-600	(12) 4-600 KCMIL, 1-700 KCMIL GND IN 4"	
				6000	15-600	(15) 3-600 KCMIL, 1-500 KCMIL GND IN 4"		6000N	15-600	(15) 4-600 KCMIL, 1-800 KCMIL GND IN 4"	

NOTES:
1. AMPACITIES FOR FEEDER SIZES ARE BASED ON N.E.C. CODE 110-14. (TERMINATION PROVISIONS FOR EQUIPMENT RATED 100A OR LESS ARE RATED FOR USE WITH CONDUCTORS RATED 60C. TERMINATION PROVISIONS FOR EQUIPMENT RATED GREATER THAN 100A ARE RATED FOR USE WITH CONDUCTORS RATED 75C.)
2. CONDUIT FILL IS BASED ON 40% FILL USING SINGLE CONDUCTOR BUILDING WIRE OF INSULATION TYPES THHN, THWN, THWN-2, XHH, XHHW, AND XHHW-2 IN RMC. FOR OTHER RACEWAY TYPES REFER TO APPROPRIATE N.E.C. APPENDIX C TABLES.
3. EQUIPMENT GROUND SIZING BASED ON N.E.C. TABLE 250.122.

LIGHTING CONTROLS LEGEND	
SYMBOL	DESCRIPTION
⚡	SINGLE POLE SWITCH
⚡	THREE WAY SWITCH
⚡	FOUR WAY SWITCH
⚡	LIGHT CONTROL LOCATION
⚡	GENERATOR TRANSFER DEVICE

TAG NUMBER	SPACE TYPE	PARAMETERS								SEQUENCE OF OPERATIONS		
		MANUAL ON/OFF	DIMMING SWITCH	OVERRIDE SWITCH	MULTI-ZONE CONTROL	KEY SWITCH	TIME-DELAY	PHOTO CONTROL DIMMING	EXTERIOR PHOTOCELL		COLOR TUNING	RGB/RGBW
1	CONFERENCE, MEETING, MULTI-PURPOSE ROOM	X	X					X				MANUAL ON/AUTOMATIC OFF WITHIN 20 MIN OF OCCUPANTS LEAVING SPACE (VACANCY MODE). CONTINUOUS DIMMING.
2	RESTROOM			X				X				LOCAL CONTROL SWITCH WITH ON/OFF FUNCTION. AUTOMATIC ON TO FULL VIA OCCUPANCY SENSOR. AUTOMATIC FULL OFF VIA OCCUPANCY SENSOR (VACANCY MODE) WITHIN 20 MIN OF OCCUPANTS LEAVING SPACE.

LUMINAIRE SCHEDULE											
TYPE	DESCRIPTION	MANUFACTURER	MODEL NUMBER	LIGHT ENGINE	WATTAGE	VOLTAGE	REMARKS	MANUFACTURER #2	MODEL NUMBER #2	MANUFACTURER #3	MODEL NUMBER #3
L1	1'x4' SURFACE MOUNTED VOLUMETRIC FIXTURE	LITHONIA	SLT4-20L-MVOLT-EZ1-1P835	LED	31.3	MVOLT					
L2	RECESSED 6" LED DOWNLIGHT	LITHONIA	LDN6-SSL-30-LOG-ARR-LS5-MVOLT	LED	34	MVOLT	EXISTING OPENING IS 8" PATCH CEILING AS REQUIRED FOR SMALLER OPENING				
L3	1'x4' RECESSED FLANGE VOLUMETRIC FIXTURE	LITHONIA	BLT4-40L-ADS-MVOLT-1P835-DGA	LED	33.1	MVOLT	VERIFY WITH EXISTING DR/WALL OPENING SIZE				
EM	PROVIDE EMERGENCY BATTERY BALLAST OR DRIVER, EITHER INTEGRAL OR REMOTE AS REQUIRED, TO PROVIDE 90 MINUTES OF EMERGENCY EGRESS ILLUMINATION UPON LOSS OF NORMAL POWER TO FIXTURE. 1400 LUMEN MINIMUM FOR LINEAR LED PRODUCTS, 700 LUMENS MINIMUM FOR MODULAR LED PRODUCTS (E.G. DOWNLIGHTS) AND 3000 LUMENS MINIMUM FOR LED HIGH BAY OR HIGH LUMEN PRODUCTS. UNITS SHALL MEET OR EXCEED CURRENT NEC AND UL STANDARDS FOR EMERGENCY LIGHTING AND SHALL BE UL LISTED FOR INSTALLATION INSIDE, ON TOP OF, AND/OR REMOTE FROM THE FIXTURE, AS REQUIRED.						WHERE MULTIPLE MANUFACTURERS' AND CATALOG NUMBERS ARE LISTED ALL ARE ACCEPTABLE. WHERE ONLY ONE MANUFACTURER AND CATALOG NUMBER IS LISTED IT SHALL BE THE ONLY ACCEPTABLE OPTION WITHOUT PRIOR ENGINEER REVIEW AND APPROVAL. ALL POTENTIAL SUBSTITUTIONS MUST BE PROVIDED TO THE ENGINEER 2 WEEKS PRIOR TO BIDS FOR REVIEW AND MUST BE ACCOMPANIED BY COMPLETE PHOTOMETRIC REPORTS AND ANY OTHER SUPPORTING MATERIALS REQUESTED BY THE ENGINEER. ANY POTENTIAL SUBSTITUTIONS NOT MEETING THESE CRITERIA SHALL NOT BE CONSIDERED OR ACCEPTED.				

POWER SYMBOL LIST	
SYMBOL	DESCRIPTION
○	CONDUIT DOWN
○	CONDUIT UP
□	DISCONNECT SWITCH - NON FUSED
□	DISCONNECT SWITCH - FUSED
□	DISCONNECT SWITCH - COMB. MOTOR STARTER
□	ELECTRICAL PANEL
⊕	GROUNDING ROD
⊕	GROUND
⊕	GROUNDING BAR
⊕	JUNCTION BOX
M	METER
○	MOTOR - SINGLE PHASE
○	MOTOR - THREE PHASE
Sw	MOTOR RATED SWITCH
⊕	POWER RECEPTACLE - SIMPLEX TYPE
⊕	POWER RECEPTACLE - DUPLEX TYPE
⊕	POWER RECEPTACLE - DUPLEX 6" ABOVE COUNTER
⊕	POWER RECEPTACLE - USB/DUPLEX COMBO. DEVICE
⊕	POWER RECEPTACLE - QUADRUPLUX TYPE
⊕	POWER RECEPTACLE - RECESSED FLOOR TYPE
⊕	POWER RECEPTACLE - SPECIALTY TYPE
TC	TIME CLOCK
T	TRANSFORMER

NOTES:
1. ALL DEVICE RATINGS/SIZES SHALL BE COORDINATED WITH PLANS AND SCHEDULES.

TECHNOLOGY SYMBOL LIST	
SYMBOL	DESCRIPTION
◻	CAMERA
◻	CARD READER
◻	TECHNOLOGY OUTLET - 6" ABOVE COUNTER
◻	TECHNOLOGY OUTLET - FLOOR
◻	TECHNOLOGY OUTLET - WALL
◻	MAGNETIC DOOR HOLDER
◻	PUSH BUTTON
◻	SPEAKER
◻	WALL CLOCK - SINGLE FACE
◻	WALL CLOCK - DOUBLE FACE
◻	WALL CLOCK AND SPEAKER UNIT
◻	WIRELESS ACCESS POINT

NOTES:
1. ELECTRICAL CONTRACTOR SHALL BE RESPONSIBLE FOR BOX AND CONDUIT FOR ALL DEVICES INDICATED.
2. LOW VOLTAGE CONTRACTOR SHALL PROVIDE EXACT SPECIFICATIONS AND LOCATIONS OF ALL DEVICES.

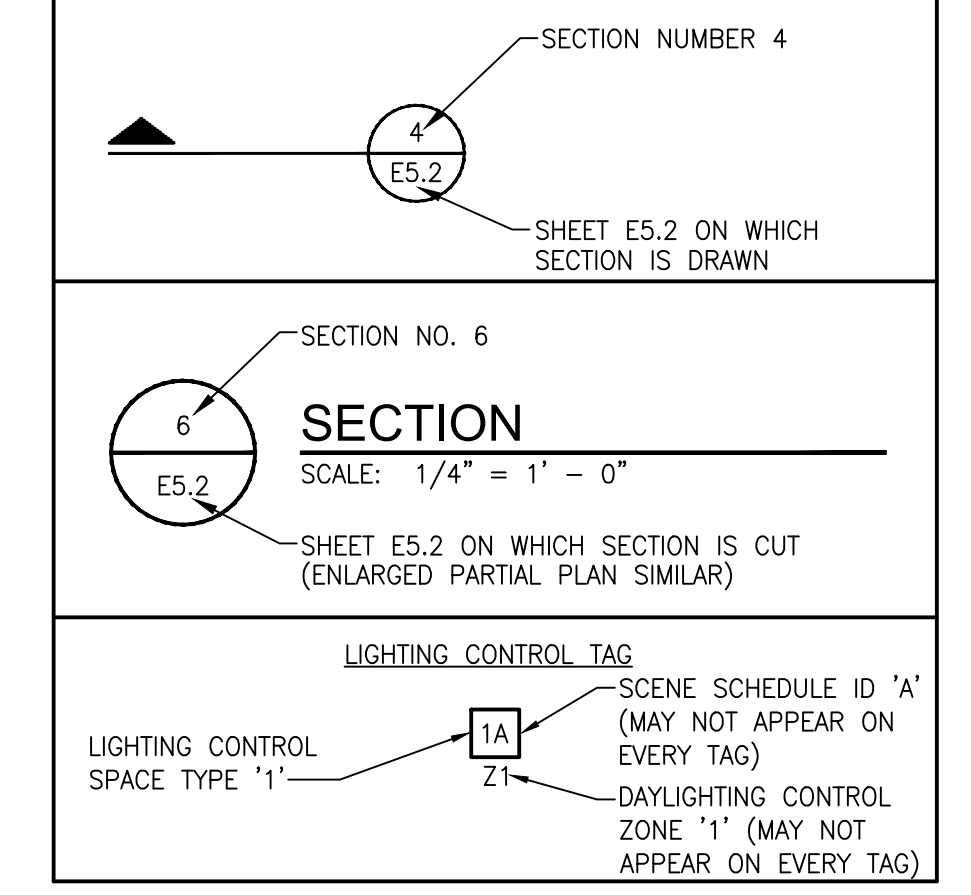
FIRE ALARM SYMBOL LIST	
SYMBOL	DESCRIPTION
◻	AUDIBLE DEVICE/WALL MOUNTED
◻	VISUAL DEVICE/WALL MOUNTED
◻	COMBO AUDIBLE/VISUAL DEVICE/WALL MOUNTED
◻	AUDIBLE DEVICE/CEILING MOUNTED
◻	VISUAL DEVICE/CEILING MOUNTED
◻	COMBO AUDIBLE/VISUAL DEVICE/CEILING MOUNTED
◻	CO ALARM/SMOKE DETECTOR
◻	SMOKE DETECTOR
◻	CO ALARM
◻	DUCT MOUNTED SMOKE DETECTOR
◻	HEAT DETECTOR
◻	FIRE DEPARTMENT COMMUNICATION OUTLET
◻	EXISTING COMBINATION FIRE/SMOKE DAMPER (HORIZONTAL)
◻	NEW COMBINATION FIRE/SMOKE DAMPER (HORIZONTAL)
◻	EXISTING COMBINATION FIRE/SMOKE DAMPER (VERTICAL)
◻	NEW COMBINATION FIRE/SMOKE DAMPER (VERTICAL)
F	MANUAL PULL STATION
FS	FLOW SWITCH
TS	TAMPER SWITCH
FAA	FIRE ALARM ANNUCIATOR PANEL
FACP	FIRE ALARM CONTROL PANEL
I/O	INPUT/OUTPUT CONTROL MODULE

NOTES:
1. DRAWINGS INDICATE DESIGN INTENT ONLY. FINAL LOCATIONS AND DEVICE SPECIFICATIONS SHALL BE PROVIDED BY FIRE ALARM MANUFACTURER. REFER TO PROJECT SPECIFICATIONS FOR APPROVED MANUFACTURERS.

ELECTRICAL ABBREVIATIONS	
ABBREV.	DESCRIPTION
AFF	ABOVE FINISHED FLOOR
A	AMPERE
AF	AMPERE FUSE/AMPERE FRAME
AWG	AMERICAN WIRE GAUGE
AT	AMPERE TRIP
ATS	AUTOMATIC TRANSFER SWITCH
AIC	AVAILABLE INTERRUPTING CURRENT (AMPS)
C	CONDUIT OR CEILING MOUNTED
CB	CIRCUIT BREAKER
CU	COPPER
CT	CURRENT TRANSFORMER
DIA	DIAMETER
DISC	DISCONNECT
EMT	ELECTRICAL METALLIC TUBING
EW	ELECTRIC WATER COOLER
EPO	EMERGENCY POWER OFF
(E)	EXISTING ELECTRICAL EQUIPMENT OR WORK
FA	FIRE ALARM
FACP	FIRE ALARM CONTROL PANEL
FLA	FULL LOAD AMPS
F	FUSE
G/GRD	GROUND
GFCI/GFI	GROUND FAULT CIRCUIT INTERRUPTER
HOA	HAND-OFF-AUTO
HP	HORSEPOWER
IG	ISOLATED GROUND
KV	KILOVOLT
KVA	KILOVOLT AMPERE
KW	KILOWATT
KWH	KILOWATT HOUR
LP	LIGHTING PANEL
MCB	MAIN CIRCUIT BREAKER
MDP	MAIN DISTRIBUTION PANEL
MLO	MAIN LUG ONLY
MAX	MAXIMUM
MIN	MINIMUM
NEC	NATIONAL ELECTRICAL CODE
NEMA	NATIONAL ELECTRICAL MANUFACTURERS ASSOC.
N/NEU	NEUTRAL
NF	NON-FUSIBLE
NC	NORMALLY CLOSED
NO	NORMALLY OPEN
NIC	NOT IN CONTRACT
PH. OR #	PHASE
P	POLE
PF	POWER FACTOR
PVC	POLYVINYL CHLORIDE (PLASTIC)
(R)	RELOCATED EXISTING ELECTRICAL EQUIPMENT
(RR)	REMOVE AND REINSTALL
RMC	RIGID METALLIC CONDUIT
RP	RECEPTACLE PANEL
TBB	TELEPHONE BACKBOARD
TYP.	TYPICAL
UC	UNDER COUNTER
UL	UNDERWRITERS LABORATORIES
UPS	UNINTERRUPTIBLE POWER SUPPLY
USB	UNIVERSAL SERIAL BUS
V	VOLT
VA	VOLT AMPERE
W	WATT
WG	WIRE GUARD
WP	WEATHERPROOF
XFMR	TRANSFORMER

DRAWING INDEX	
SHT NO.	DESCRIPTION
E0.0	Electrical General Information
E4.1	Enlarged Electrical Demolition and New Work Plans

DRAWING NOTATION	
SYMBOL	DESCRIPTION
L1	LIGHTING FIXTURE TAG
①	CONSTRUCTION KEY NOTE NUMBER 1
①	DEMOLITION KEY NOTE NUMBER 1
20	COPPER FEEDER SIZE TAG (REFER TO FEEDER SCHEDULE)
20	ALUMINUM FEEDER SIZE TAG (REFER TO FEEDER SCHEDULE)
EQUIPMENT	EQUIPMENT TAG
—	EXISTING DEVICES OR EQUIPMENT
—	NEW OR MODIFIED DEVICES OR EQUIPMENT
-----	NEW OR MODIFIED UNDERGROUND WIRING
	EXISTING SYSTEM COMPONENT TO BE REMOVED
⊕	POINT OF NEW CONNECTION



APPLICABLE CODES AND REGULATIONS	
YEAR	CODE
2015	MICHIGAN BUILDING CODE
2015	MICHIGAN ENERGY CODE
2015	MICHIGAN RESIDENTIAL CODE
2015	MICHIGAN REHABILITATION CODE
2017	MICHIGAN ELECTRICAL CODE RULES, PART B
2017	NATIONAL ELECTRICAL CODE (NFPA 70)
2013	NFPA 20
2013	NFPA 72
2013	NFPA 101
2013	NFPA 110
2009	ICC A117.1 ACCESSIBLE AND USABLE BUILDINGS & FACILITIES
1985	DETROIT ELEVATOR CODE

SECTION 00 0101 - PROJECT MANUAL

PROJECT:

HAZEL PARK HIGH SCHOOL CAFETERIA DOORS (19126B)
HAZEL PARK HIGH SCHOOL MAIN OFFICE TOILET ROOM
UPGRADE (20011B)

OWNER:

HAZEL PARK SCHOOLS
1620 EAST ELZA
HAZEL PARK, MICHIGAN 48030

TMP PROJECT NO. 19126B & 20011B

DATE: FEBRUARY 18, 2022

ISSUED FOR: OWNER REVIEW

ARCHITECT

TMP ARCHITECTURE, INC
1191 West Square Lake Road
Bloomfield Hills, Michigan 48302-0374

PH 248-338-4561
FX 248-338-0223
Email info@tmp-achitecture.com

MECHANICAL & ELECTRICAL CONSULTANT

STRATEGIC ENERGY SOLUTIONS

4000 West 11 Mile Road

Berkley, Michigan 48072

PH (248) 399-1900

Email hello@sesnet.com

END OF SECTION

TABLE OF CONTENTS

PROCUREMENT AND CONTRACTING REQUIREMENTS GROUP

DIVISION 00 – PROCUREMENT AND CONTRACTING REQUIREMENTS

Section	Title	Issued
00 0101	Title Page	OR
00 0110	Table of Contents	OR
00 0115	List of Drawings	OR
00 1113	Advertisement for Bids	OR
00 2113	Instructions to Bidders	OR
00 4100	Bid Form	OR
00 4110	Familial Disclosure Form	OR
00 4120	Iran Economic Sanctions Act Compliance Form	OR
00 7200	General Conditions	OR
00 7300	Supplementary Conditions (AIA A201 2017)	OR
00 8200	Availability of Electronic Files	OR
00 8200.01	Electronic Files Release Form	OR

SPECIFICATIONS GROUP

GENERAL REQUIREMENTS SUBGROUP

DIVISION 01 - GENERAL REQUIREMENTS

Section	Title	Issued
01 0005	Related Requirements	OR
01 2000	Price and Payment Procedures	OR
01 2500	Substitution Procedures	OR
01 2500.01	TMP Substitution Request Form	OR
01 3000	Administrative Requirements	OR
01 4000	Quality Requirements	OR
01 4100	Regulatory Requirements	OR
01 4216	Definitions	OR
01 4219	Reference Standards	OR
01 5000	Temporary Facilities and Controls	OR
01 6000	Product Requirements	OR
01 7000	Execution and Closeout Requirements	OR
01 7329	Cutting and Patching	OR

FACILITY CONSTRUCTION SUBGROUP

DIVISION 02 – EXISTING CONDITIONS

Section	Title	Issued
02 4100	Demolition	OR

DIVISION 03 - CONCRETE

Not Used

DIVISION 04 - MASONRY

Section	Title	Issued
04 2000	Unit Masonry	OR

DIVISION 05 - METALS

Not Used

DIVISION 06 – WOOD, PLASTICS, AND COMPOSITES

Section	Title	Issued
06 4023	Interior Architectural Woodwork	OR

DIVISION 07 - THERMAL AND MOISTURE PROTECTION

Section	Title	Issued
07 8400	Firestopping	OR
07 9200	Joint Sealants	OR

DIVISION 08 - OPENINGS

Section	Title	Issued
08 1113	Hollow Metal Doors and Frames	OR
08 1416	Flush Wood Doors	OR
08 3100	Access Doors and Panels	OR
08 3483	Fire-rated Framed Glazing Assemblies	OR
08 7100	Door Hardware	OR
08 8000	Glazing	OR

DIVISION 09 - FINISHES

Section	Title	Issued
09 2216	Non-Structural Metal Framing	OR
09 2900	Gypsum Board	OR
09 3000	Hard Tiling	OR
09 9100	Painting	OR
09 9600	High-Performance Coatings	OR

DIVISION 10 - SPECIALTIES

Section	Title	Issued
10 1400	Signage	OR
10 2113.17	Phenolic Toilet Compartments	OR
10 2800	Toilet, Bath, and Laundry Accessories	OR

DIVISION 11 THRU DIVISION 14

Not Used

FACILITY SERVICES SUBGROUP

DIVISION 20 THRU DIVISION 21

Not Used

DIVISION 22 - PLUMBING

Section	Title	Issued
22 0005	Basic Plumbing Requirements	OR
22 0505	Selective Demolition for Plumbing	OR
22 0553	Identification for Plumbing Piping and Equipment	OR
22 0719	Plumbing Piping Insulation	OR
22 1005	Plumbing Piping	OR
22 1006	Plumbing Piping Specialties	OR
22 4000	Plumbing Fixtures	OR

DIVISION 23 – HEATING VENTILATING AND AIR CONDITIONING (HVAC)

Section	Title	Issued
23 0005	Basic HVAC Requirements	OR
23 0505	Selective Demolition for HVAC	OR
23 0593	Testing, Adjusting, and Balancing for HVAC	OR
23 3100	HVAC Ducts and Casings	OR
23 3300	Air Duct Accessories	OR

23 3700 Air Outlets and Inlets OR

DIVISION 25 – INTEGRATED AUTOMATION

Not Used

DIVISION 26 – ELECTRICAL

Section	Title	Issued
26 0005	Basic Electrical Requirements	OR
26 0505	Selective Demolition for Electrical	OR
26 0519	Low-Voltage Electrical Power Conductors and Cables	OR
26 0526	Grounding and Bonding for Electrical Systems	OR
26 0529	Hangers and Supports for Electrical Systems	OR
26 0533.13	Conduit for Electrical Systems	OR
26 0533.16	Boxes for Electrical Systems	OR
26 0935	Distributed Digital Lighting Control System	OR
26 2726	Wiring Devices	OR
26 5100	Interior Lighting	OR

DIVISION 27 – COMMUNICATIONS

Not Used

DIVISION 28 – ELECTRONIC SAFETY AND SECURITY

Section	Title	Issued
28 4600	Fire Detection and Alarm	OR

SITE AND INFRASTRUCTURE SUBGROUP

DIVISION 31 THRU DIVISION 33

Not Used

END OF SECTION

SECTION 00 0115 - LIST OF DRAWINGS

LIST OF DRAWINGS

1.01 GENERAL

- A. Drawings: Drawings consist of the Contract Drawings including drawings listed on the TITLE SHEET page of the separately bound drawing set titled HAZEL PARK HIGH SCHOOL CAFETERIA DOORS (19126B) and HAZEL PARK HIGH SCHOOL MAIN OFFICE TOILET ROOM UPGRADE (20011B), dated February 18, 2022 and any subsequent Addenda and Contract modifications which may occur.

END OF SECTION

SECTION 00 1113 - ADVERTISEMENT FOR BIDS

GENERAL

DATE: February 18, 2022

PROJECT: 19126B - Cafeteria Fire Doors
20011B - Main Office Toileet Room Upgrades

OWNER: Hazel Park Schools
1620 East Elza
Hazel Park, Michigan 48030

ARCHITECT: TMP Architecture, Inc.
1191 West Square Lake Road
Bloomfield Hills, Michigan 48302

BIDS RECEIVED

Bid Proposals will be received until the following date and local time:

DATE: March 4, 2022
TIME: 10:30am

Sealed Bids will be received at the following location:

LOCATION: BOARD OF EDUCATION
Hazel Park Schools
1620 East Elza
Hazel Park, Michigan 48030

Attn: Jason Zirniss, Assistant Superintendent of Business and Operations

At which time and place Bids will be publicly opened and read aloud.

A bid tabulation summary will be made available within one working day of the bid opening.

DOCUMENT AVAILABILITY

Bid Documents will be available for examination and distribution on or after February 18, 2022.

Bid Documents will be made available by electronic transfer from the office of the Architect, TMP ARCHITECTURE, INC., 1191 West Square Lake Road, Bloomfield Hills, Michigan 48302
Bid Documents may be examined at the following locations:

The Offices of the Architect: TMP Architecture, Inc., 1191 West Square Lake Road, Bloomfield Hills, Michigan 48302

Construction Association of Michigan, 43636 Woodward Ave., Bloomfield Hills, Michigan 48302, (248) 972-1000.

PRE-BID CONFERENCE

A pre-bid conference is scheduled for [] at [] local time. All interested Bidders are required to attend. Bids will not be accepted from Bidders who do not attend the pre-bid conference. Bidders shall meet at the following location:

[]
[]
[]

BID PROPOSALS

Bid Proposals shall be on forms furnished within the Project Manual.
Each Bidder shall agree not to withdraw a Bid Proposal for a period of thirty (30) calendar days after date for receipt of bids.
Familial Disclosure Statement: A sworn and notarized statement in compliance with Michigan Compiled Laws, MCL.380.1267, disclosing any familial relationship existing between the Bidder, or any employee of the Bidder, and any member of the Board of Education of the School District or the Superintendent of the School District, must accompany each Bid Proposal.
The Iran Economic Sanctions Act: A sworn and notarized statement in compliance with Michigan Public Act No. 517 of 2012 must accompany each Bid Proposal.
The Owner will not accept a bid that does not include all of these forms and statements.
The successful Bidder shall provide a Performance Bond and a Labor and Material Payment Bond, each in the amount of one hundred percent (100%) of the contract amount. The cost of such bonds shall be included in the Bid Proposal.
The Owner reserves the right to reject any or all Bid Proposals, either in whole or in part, and to waive any informalities and irregularities in the Bid Proposals and in the bidding.

END OF SECTION

SECTION 00 2113 - INSTRUCTIONS TO BIDDERS**SUMMARY****1.01 DOCUMENT INCLUDES**

- A. Invitation
 - 1. Bid Submission
 - 2. Intent
 - 3. Work Identified in Contract Documents
 - 4. Contract Time
- B. Bid Documents and Contract Documents
 - 1. Definitions
 - 2. Contract Documents Identification
 - 3. Availability
 - 4. Examination
 - 5. Inquiries/Addenda
 - 6. Product/Assembly/System Substitutions
- C. Site Assessment
 - 1. Site Examination
 - 2. Prebid Conference
- D. Bid Submission
 - 1. Submission Procedure
 - 2. Bid Ineligibility
- E. Bid Enclosures/Requirements
 - 1. Security Deposit
 - 2. Performance Assurance
 - 3. Insurance
 - 4. Bid Form Requirements
 - 5. Familial Disclosure Statement
 - 6. Iran Economic Sanctions Act
 - 7. Taxes
 - 8. Permits and Fees
 - 9. Fees for Changes in the Work
 - 10. Bid Form Signature
 - 11. Additional Bid Information
- F. Offer Acceptance/Rejection
 - 1. Duration of Offer
 - 2. Acceptance of Offer
 - 3. Execution of Agreement

1.02 RELATED DOCUMENTS

- A. Document 00 1113 - Advertisement for Bids.
- B. Document 00 4100 - Bid Form.
- C. Document 00 7300 - Supplementary Conditions:

INVITATION**2.01 BID SUBMISSION**

- A. Refer to Section 00 1113 - Advertisement for Bids for bid submission date, time, and location.

2.02 INTENT

- A. The intent of this Bid request is to obtain an offer to perform work to complete a project located at Hazel Park High School for a Stipulated Sum contract, in accordance with the Contract Documents.

2.03 WORK IDENTIFIED IN THE CONTRACT DOCUMENTS

- A. Work of this proposed Contract comprises building construction, site development, renovation, and demolition, including general construction, structural, mechanical, and electrical Work.

2.04 CONTRACT TIME

- A. Complete the work on or before the Completion Date stated in 00 4100 - Bid Form.

BID DOCUMENTS AND CONTRACT DOCUMENTS**3.01 DEFINITIONS**

- A. Bid Documents: Consists of the Contract Documents supplemented with Invitation to Bid, Instructions to Bidders, Bid Form, and Appendixes in the Project Manual.
- B. Contract Documents: Consists of the Drawings, Owner-Contractor Agreement, General Conditions of the Contract for Construction, Supplementary Conditions, Specifications within the Project Manual, Appendixes within the Project Manual, and Addenda issued prior to execution of the Contract
- C. Bid, Offer, or Bidding: Act of submitting an offer under seal.
- D. Bid Amount: Monetary sum identified by the Bidder in the Bid Form.
- E. Base Bid: Monetary amount stated in the Bid Form for which the Bidder offers to perform the work as described in the Bidding Documents as the base, to which work may be added to or deleted from, by the amounts stated in the Alternates or Unit Pricing.
- F. Alternate: Monetary amount stated in the Bid Form to be added to or deducted from the amount of the Base Bid if the Alternate is accepted.
- G. Unit Price: Monetary amount stated in the Bid Form as a price per unit of measurement for materials, equipment, services, or a portion of the work as described in the Bidding Documents to which the the Base Bid will be adjusted according to the amount of units used.
- H. Accepted Bidder: Bidder to whom the Owner proposes to award the Contract.
- I. Bid Closing (submission date and time): Date and time after which bids are no longer accepted.

3.02 CONTRACT DOCUMENTS IDENTIFICATION

- A. The Contract Documents are identified as Project Number 19126B and 20011B, as prepared by Architect who is located at 1191 West Square Lake Road, Bloomfield Hills, Michigan, 48302, and with contents as identified in the Project Manual.

3.03 AVAILABILITY

- A. Refer to Section 00 1113 - Advertisement for Bids for availability of Bid Documents.
- B. Bid Documents are made available only for the purpose of obtaining offers for this project. Their use does not grant a license for other purposes.

3.04 EXAMINATION

- A. Upon receipt of Bid Documents verify that documents are complete. Notify Architect should the documents be incomplete.
- B. Immediately notify Architect upon finding discrepancies or omissions in the Bid Documents.

3.05 INQUIRIES/ADDENDA

- A. Direct questions to Kyra Copeland, TMP Architecture, Inc., , email; kcopeland@tmp-architecture.com. .
- B. Addenda may be issued during the bidding period. All Addenda become part of the Contract Documents. Include resultant costs in the Bid Amount.
- C. Verbal answers are not binding on any party.
- D. Clarifications requested by bidders must be in writing not less than 7 days before date set for receipt of bids. The reply will be in the form of an Addendum, a copy of which will be forwarded to known recipients and bidders.

3.06 PRODUCT/ASSEMBLY/SYSTEM SUBSTITUTIONS

- A. General Requirements for Substitution Requests:
- B. Substitution Request Form:
- C. Review and Acceptance of Request:

- D. Submit substitution requests by completing the form in Section 01 2500.01 - TMP Substitution Request Form. Use only this form; other forms of submission are unacceptable. See Section 01 2500 - Substitution Procedures for additional information and instructions.
- E. See Section 01 2500 - Substitution Procedures for additional requirements.

SITE ASSESSMENT

4.01 SITE EXAMINATION

- A. Examine the project site before submitting a bid.
- B. Refer to Section 000 1113 - Advertisement for Bids for Pre-Bid Conference date, time, and location.

4.02 PREBID CONFERENCE

- A. Refer to Section 00 1113 - Advertisement for Bids for Pre-Bid Conference date, time, and location.
- B. Representatives of Architect will be in attendance.
- C. Summarized minutes of this meeting will be circulated to all known bidders. These minutes will form part of the Contract Documents.
- D. Information relevant to the Bid Documents will be recorded in an Addendum, issued to all known bidders.

BID SUBMISSION

5.01 SUBMISSION PROCEDURE

- A. In submitting a bid the Bidder is stating the following:
 - 1. Bidder has read and understands the Bidding Documents, including the Drawings, and Specifications.
 - 2. Bid is made in compliance with the Bidding Documents.
 - 3. Bidder understands existing conditions and limitations under which the Work is to be performed, including the overall construction timeframe and completion date, and includes in the Bid a sum(s) to cover the costs necessary to perform the Work as set forth in the Bidding Documents.
- B. Bidders shall be solely responsible for the delivery of their bids in the manner and time prescribed.
- C. Submit two copies of the executed offer on the Bid Forms provided, signed and sealed with the required security deposit in a closed opaque envelope, clearly identified with bidder's name, project name and Owner's name on the outside.
- D. Improperly completed information, irregularities in security deposit, may be cause not to open the Bid Form envelope and declare the bid invalid or informal.
- E. Bids submitted by telephone, fax or email will not be accepted.
- F. Modifications to a submitted bid will be permitted if received in writing prior to bid closing and if endorsed by the same party or parties who signed and sealed the offer. A change shall be worded as not to reveal the amount of the original Bid.
- G. Bids may be voluntarily withdrawn at anytime before the bid closing if endorsed by the same party or parties who signed and sealed the offer. Withdrawals may be done in person or by written request. Withdrawn Bids may be resubmitted at anytime before the bid closing.
- H. Bids received after the submission date and time will not be considered and will not be opened.
- I. A bid tabulation summary of submitted bids will be made available to all bidders following bid opening. Refer to Section 00 1113 - Advertisement for Bids.

5.02 BID INELIGIBILITY

- A. Bids that are unsigned, improperly signed or sealed, conditional, illegible, obscure, contain arithmetical errors, erasures, alterations, or irregularities of any kind, may at the discretion of the Owner, be declared unacceptable.

- B. Failure to provide security deposit, bonding or insurance requirements may, at the discretion of Owner, invalidate the bid.
- C. Failure to provide a sworn and notarized Familial Disclosure Statement will invalidate the bid.
- D. Failure to provide a sworn and notarized Iran Economic Sanctions Act Statement will invalidate the bid.

BID ENCLOSURES/REQUIREMENTS

6.01 BID SECURITY DEPOSIT

- A. Bids shall be accompanied by a security deposit as follows:
 - 1. Bid Bond or certified check of a sum no less than 5 percent of the Bid Amount.
- B. Endorse the Bid Bond in the name of the Owner as obligee, signed and sealed by the principal (Contractor) and surety.
- C. Endorse the certified check in the name of the Owner.
- D. The security deposits will be returned to Bidders after Accepted Bidder executes the Contract Agreement, delivers to Owner required Performance Bond and Labor and Material Payment Bond, and provides specified Certificate of Insurance.
- E. The security deposit of the Accepted Bidder shall be retained as liquidated damages by the Owner if the Accepted Bidder fails to execute the Contract Agreement, fails to furnish Performance Bond and Labor and Material Payment Bond, or fails to provide Certificate of Insurance as specified, within 10 days after notification of the award of Contract.
- F. Include the cost of bid security in the Bid Amount.
- G. If no contract is awarded, all security deposits will be returned.
- H. If period in which bids cannot be withdrawn passes, all security deposits will be returned.

6.02 PERFORMANCE ASSURANCE

- A. Accepted Bidder: Provide a Performance Bond and a Labor and Material Payment Bond each in the amount of one hundred percent (100%) of the contract amount.
- B. Include the cost of the Performance Bond and the Labor and Material Payment Bond in the Bid Amount.

6.03 INSURANCE

- A. Provide an executed "Undertaking of Insurance" on a standard form provided by the insurance company stating their intention to provide insurance to the Accepted Bidder in accordance with the insurance requirements of the Contract Documents.

6.04 BID FORM REQUIREMENTS

- A. Complete all requested information in the Bid Form electronically or by hand in ink.
- B. Amounts shall be expressed in both words and figures. In case of a discrepancy the amount stated in words shall govern.
- C. All Alternates must be bid. If no change in the Base Bid is required, enter "No Change to Base Bid" for the respective Alternate.
- D. All Unit Pricing must be bid.

6.05 FAMILIAL DISCLOSURE STATEMENT

- A. Each Bid shall be accompanied by the Familial Disclosure Statement in compliance Michigan Compiled Laws, MCL.380.1267. The Bid proposal must be accompanied by a sworn and notarized statement disclosing Familial Relationship that exists between the Bidder or any employee of the Bidder and any member of the Board of Education of the School District or the Superintendent of the School District. The School District will not consider a Bid Proposal that does not include this sworn and notarized Disclosure Statement.

6.06 IRAN ECONOMIC SANCTIONS ACT

- A. Each Bidder shall be in compliance with Michigan Public Act No. 517 of 2012. The Bid proposal must be accompanied by a sworn and notarized statement that certifies, represents, and warrants that the Bidder (including its officers, directors and employees) is not an "Iran

Linked Business” within the meaning of the Iran Economic Sanctions Act, Michigan Public Act No. 517 of 2012, and that in the event Bidder is awarded a Contract, the Bidder will not become an “Iran Linked Business” at any time during the course of performing under the Contract.

6.07 TAXES

- A. All Bids shall include all applicable taxes, including social security unemployment, and sales or use taxes, and any other taxes specifically levied on the work or on wages by local, city, state, or federal government, except real property taxes on the site. Bids shall also include all premiums, assessments, and other like payments, charges, and costs incidental to the work covered by the Bidding Documents.

6.08 FEES FOR CHANGES IN THE WORK

- A. Include the fees for overhead and profit on own Work and Work by subcontractors, identified in Document 00 7300 - Supplementary Conditions .

6.09 PERMITS AND FEES

- A. All Bids shall include costs of all applicable permits and fees.

6.10 BID FORM SIGNATURE

- A. The Bid Form shall be signed by the Bidder, as follows:
 - 1. Bid form shall be signed personally by the Bidder and by a partner or by a duly authorized officer for the corporation their normal signatures. Insert the capacity in which the signing officer acts, under each signature. Affix seal.

OFFER ACCEPTANCE/REJECTION

7.01 DURATION OF OFFER

- A. Bids shall remain open to acceptance for a period of 30 calendar days after the bid closing date.

7.02 ACCEPTANCE OF OFFER

- A. Owner reserves the right to reject any or all Bid Proposals, either in whole or in part, and to waive any informalities and irregularities in the Bid Proposals and in the bidding.
- B. Owner reserves the right to accept Alternates in any order or combination in order to determine the low bidder.
- C. Owner reserves the right to negotiate with any Bidder without rebidding the project in whole or in part.
- D. Owner reserves the right to award the Contract to whomever it may select.
- E. After acceptance by Owner, Architect on behalf of Owner, will issue to the successful bidder, a written notice of award.

7.03 EXECUTION OF AGREEMENT

- A. Accepted Bidder will be required to execute Standard Form of Agreement between Owner and Contractor, AIA Document A101-2017 in conjunction with General Conditions of the Contract for Construction, AIA Document A201-2017.
- B. The Accepted Bidder to whom the Contract is awarded shall, within 10 calendar days after notice of award and receipt of Agreement forms from the Owner, sign and deliver required copies to the Owner.
- C. Accepted Bidder shall deliver specified Certificates of Insurance to the Owner within 10 calendar days after notification of the award of Contract.
 - 1. Work shall not commence before receipt of the certificates.
- D. Accepted Bidder shall deliver Performance Bond and a Labor and Material Payment Bond to the Owner within 10 calendar days after notification of the award of Contract.
 - 1. Work shall not commence before receipt of the bonds.

END OF SECTION

SECTION 00 4100 – BID FORM

OWNER: Hazel Park Schools
1620 East Elza
Hazel Park, Michigan 48030

PROJECT: 19126B – Cafeteria Doors
20011B – HS Main Office Toilet Room Upgrade

ARCHITECT: TMP Architecture, Inc.
1191 West Square Lake Road
Bloomfield Hills, Michigan, 48302-0374
248-338-4561

BIDDER:

NAME: _____

ADDRESS: _____

PHONE: _____

EMAIL: _____

BID

The undersigned, having examined the Project Site and Bidding Documents, including the Advertisement for Bids, Invitation to Bid, Instruction to Bidders, and related Contract Documents prepared by TMP Architecture, Inc. for the above mentioned project, hereby offers to enter into a Contract to perform the Work of this Project in accordance with the Contract Documents as modified, augmented, or supplemented by Addenda for the sums herein provided.

BASE BID

19126B – Cafeteria Doors

Lump sum bid for all work indicated in the Contract Documents excluding alternates, if any.

_____ Dollars (\$_____)

For the above sum and all subsequent sums in this bid form, the sum shall be shown in both words and figures. Amount in words shall govern if there is a discrepancy.

20011B – HS Main Office Toilet Room Upgrade

Lump sum bid for all work indicated in the Contract Documents excluding alternates, if any.

_____ Dollars (\$_____)

For the above sum and all subsequent sums in this bid form, the sum shall be shown in both words and figures. Amount in words shall govern if there is a discrepancy.

ADDENDA

The undersigned acknowledges the receipt of the following addenda:

Addendum No. _____ Dated: _____	Addendum No. _____ Dated: _____
Addendum No. _____ Dated: _____	Addendum No. _____ Dated: _____

ALTERNATES

Alternate 1:

Lump sum bid for all work indicated in the Contract Documents excluding alternates, if any.

_____ Dollars (\$ _____)

For the above sum and all subsequent sums in this bid form, the sum shall be shown in both words and figures. Amount in words shall govern if there is a discrepancy.

Alternate 2:

Lump sum bid for all work indicated in the Contract Documents excluding alternates, if any.

_____ Dollars (\$ _____)

For the above sum and all subsequent sums in this bid form, the sum shall be shown in both words and figures. Amount in words shall govern if there is a discrepancy.

CHANGES TO THE WORK

Changes in the Work authorized by a contract modification involving additions to or deductions from the Contract Sum shall be performed or omitted at a cost calculated by using the net cost plus a combined overhead and profit sum based on a percentage fee schedule in accordance with General Conditions and Supplemental Conditions as follows:

For the Contractor, for Work performed by the Contractor's own forces, 15 percent of the cost.

For the Contractor, for Work performed by the Contractor's Subcontractor, 7-1/2 percent of the amount due the Subcontractor.

For the Subcontractor or Sub-subcontractor, for Work performed by that Subcontractor's or Sub-subcontractor's own forces, 15 percent of the cost.

For the Subcontractor, for Work performed by the Subcontractor's Sub-subcontractors, 7-1/2 percent of the amount due the Sub-subcontractor.

Percentages shall include all charges for supervision, overhead, and profit. Undersigned agrees to bind all subcontractors to this method of calculation.

SUBCONTRACTORS

Listing of the following subcontractors and sums, which are included in the Base Bid, is mandatory. Omission may result in rejection of the Bid.

Mechanical Subcontractor:	_____	Dollar Amount:	_____
Electrical Subcontractor:	_____	Dollar Amount:	_____

TAXES, PERMITS, AND FEES

Base Bid shall include all applicable Federal, State and local taxes.

Base Bid shall include all applicable permits and fees.

TIME OF COMPLETION

The undersigned agrees to substantially complete the Project by August 01, 2022.

The undersigned agrees not to commence work before June 3, 2022.

WITHDRAWAL OF BIDS

The undersigned agrees that this Bid shall not be withdrawn for a period of 30 calendar days after date set for receipt of Bids.

BID SECURITY

Accompanying this Bid is a ____ Bid Bond ____ Certified Check. (Bidder to indicate security provided)

Security shall be made payable to Hillsdale Community Schools in the amount of five percent (5%) of Base Bid, which shall be retained by the Owner as liquidated damages, if the undersigned, after being awarded the contract, fails to execute the Contract Agreement, fails to furnish required Bonds, or fails to provide Certificates of Insurance within 10 calendar days after notification of the award of Contract.

SIGNATURE AND LEGAL STATUS

Signed and sealed this _____ day of _____, 20_____.

Individual, Partnership, Corporation

State of Incorporation

Authorized Signature of Bidder

Affix Corporate Seal

By _____
Print or Type Name of Bidder

Title

Business Address

Business Address

Bidder to submit original and two copies of this form.

END OF SECTION

SECTION 00 4110 – FAMILIAL DISCLOSURE FORM

As required by Michigan Compiled Laws, MCL.380.1267, all bids shall be accompanied by a sworn and notarized statement disclosing any familial relationship that exists between the Bidder or any employee of the Bidder and any member of the Hazel Park Schools Board of Education or the superintendent of the school district. The Board of Education shall not accept a bid that does not include this sworn and notarized disclosure statement.

The undersigned, the owner or authorized officer of _____ (the "Bidder"), pursuant to the familial disclosure requirement provided in the Hazel Park Schools advertisement for construction bids, hereby represent and warrant, except as provided below, that no familial relationships exist between the owner(s) or any employee of the company and any member of the Hazel Park Schools Board of Education or the Superintendent of Schools.

Disclosed Familial Relationships:

Attach additional pages if necessary

By:

Individual, Partnership, Corporation

Authorized Signature of Bidder

Print or Type Name of Bidder

Title

Acknowledged and sworn before me:

This _____ day of _____, 20____, in and for the

County of _____, Michigan.

Print or Type Name of Notary Public

Signature of Notary

My Commission expires _____

END OF SECTION

SECTION 00 4120 – IRAN ECONOMIC SANCTIONS ACT COMPLIANCE FORM

The undersigned, the owner or authorized officer of the below named company (the "Bidder"), pursuant to the compliance certification requirement stated in the Hazel Park School (the "School District") Advertisement for Bids, hereby certifies, represents and warrants that the Bidder (including its officers, directors and employees) is not an "Iran Linked Business" within the meaning of the Iran Economic Sanctions Act, Michigan Public Act No. 517 of 2012 (the "Act"), and that in the event Bidder is awarded a Contract as a result of the aforementioned Advertisement for Bids, the Bidder will not become an "Iran Linked Business" at any time during the course of performing any services under the Contract.

The Bidder further acknowledges that any person who is found to have submitted a false certification is responsible for a civil penalty of not more than \$250,000 or 2 times the amount of the Contract or proposed Contract for which the false certification was made, whichever is greater, the cost of the School District's investigation, and reasonable attorney fees, in addition to the fine. Moreover, any person who submitted a false certification shall be ineligible to bid on an Advertisement for Bids for three (3) years from the date that it is determined that the person has submitted the false certification.

By:

Individual, Partnership, Corporation

Authorized Signature of Bidder

Print or Type Name of Bidder

Title

Acknowledged and sworn before me:

This _____ day of _____, 20_____, in and for the

County of _____, Michigan.

Print or Type Name of Notary Public

Signature of Notary

My Commission expires _____

END OF SECTION

SECTION 00 7200 - GENERAL CONDITIONS

FORM OF GENERAL CONDITIONS

**1.01 THE GENERAL CONDITIONS APPLICABLE TO THIS CONTRACT ARE ATTACHED
FOLLOWING THIS PAGE.**

A. AIA DOCUMENT A201 - 2017

SUPPLEMENTARY CONDITIONS

**2.01 REFER TO DOCUMENT 00 7300 - SUPPLEMENTARY CONDITIONS FOR AMENDMENTS TO
THESE GENERAL CONDITIONS.**

END OF SECTION

SECTION 00 7300 - SUPPLEMENTARY CONDITIONS**PART 1 GENERAL****1.01 SUMMARY**

- A. These Supplementary Conditions amend and supplement the General Conditions, AIA Document A201 - 2017 General Conditions of the Contract for Construction, and other provisions of the Contract Documents as indicated below. Provisions that are not so amended or supplemented remain in full force and effect.
- B. The terms used in these Supplementary Conditions that are defined in the General Conditions have the meanings assigned to them in the General Conditions.

1.02 MODIFICATIONS TO GENERAL CONDITIONS**A. ARTICLE 1 – GENERAL PROVISIONS**

- 1. Modifications to Paragraph 1.2 Correlation and Intent of the Contract Documents:
 - a. Add subparagraph 1.2.1.1 as follows:

The Drawings are intended to show the general arrangement, design and extent of the work and are partly diagrammatic. They are not intended to be scaled for roughing-in measurements or to serve as shop drawings.
 - b. Add subparagraph 1.2.1.2 as follows:

In the case of an inconsistency between Drawings and Specifications or within either Document not clarified by addendum, the better quality or greater quantity of Work shall be provided in accordance with the Architect's interpretation.
- 2. Delete Paragraph 1.7 Digital Data Use and Transmission.
- 3. Delete Paragraph 1.8 Building Information Models and Reliance.

B. ARTICLE 2 – OWNER

- 1. Modification to Paragraph 2.1 General:
 - a. Delete Paragraph 2.1.2.
- 2. Modification to Paragraph 2.2 Evidence of the Owner's Financial Arrangements:
 - a. Delete Paragraph 2.2.1.
- 3. Modifications to Paragraph 2.3 Information and Services Required of the Owner:
 - a. Revise subparagraph 2.3.4 to read as follows:

The Owner shall furnish surveys describing physical characteristics, legal limitations, and utility locations for the site of the Project. The Contractor shall be entitled to rely on the general accuracy of the information furnished by the Owner but shall exercise proper precautions relating to the safe performance of the Work.
 - b. Revise subparagraph 2.3.6 to read as follows:

Unless otherwise provided in the Contract Documents, the Owner shall furnish to the Contractor an electronic copy of the Contract Documents in the form of pdf files for the purposes of making reproductions pursuant to Section 1.5.2.

C. ARTICLE 3 – CONTRACTOR

- 1. Modifications to Paragraph 3.2 Review of Contract Documents and Field Conditions by Contractor:
 - a. Add subparagraph 3.2.1.1 as follows:

The Contractor shall not be allowed any extra compensation or time by reason of any matter, or thing, concerning which he or she might have fully informed himself or herself, because of his or her failure to have so informed himself or herself prior to executing the Contract.
 - b. Add subparagraph 3.2.2.1 as follows:

The Drawings do not guarantee the exact location of existing work, including but not limited to, piping, sewers, wiring, ducts, walls, structural members and the like shown on the Drawings. The Contractor shall verify the location and accuracy of all existing construction as it relates to the Work before proceeding with the Work.
 - c. Add subparagraph 3.2.2.2 as follows:

The Contract Documents contemplate a finished Work of such quality and design as is described therein and as reasonably inferable from them. The Contractor agrees that the Contract Sum for the Work includes sufficient monetary amounts to make his or her work complete and operable, fitting with the work of other Contractors and the Owner, and in compliance with good practice. He or she agrees that minor discrepancies or omissions, the failure to show repeated details, or the repetition on any drawings of the figures or notes given on another drawing shall not be the cause for additional charges or claims.

2. Modifications to Paragraph 3.3 Supervision and Contraction Procedures:
 - a. Add subparagraph 3.3.4 as follows:
The Contractor shall organize meetings for the purpose of coordinating and expediting the work. The Architect shall be notified of these meetings, and when directed by the Architect, the Contractor shall hold additional meetings as required.
 - b. Add subparagraph 3.3.4.1 as follows:
The Contractor shall invite all affected Subcontractors and any other person or entity it deems appropriate.
 - c. Add subparagraph 3.3.4.2 as follows:
The Contractor shall conduct the meeting and keep minutes of all discussions and decisions. The Contractor shall be responsible for distribution of the minutes in writing to all parties in attendance.
3. Modifications to Paragraph 3.4 Labor and Materials:
 - a. Add subparagraph 3.4.2.1 as follows:
After the Contract has been executed, the Owner and the Architect will consider a formal request for the substitution of products in place of those specified only under the conditions set forth in the General Requirements (Division 01 of the Project Manual). By making requests for substitutions, the Contractor:
 - b. Add subparagraph 3.4.2.1.1 as follows:
represents that it has personally investigated the proposed substitute product and determined that it is equal or superior in all respects to that specified;
 - c. Add subparagraph 3.4.2.1.2 as follows:
represents that it will provide the same warranty for the substitution as it would have provided for the product specified;
 - d. Add subparagraph 3.4.2.1.3 as follows:
certifies that the cost data presented is complete and includes all related costs for the substituted product and for the Work that must be changed as a result of the substitution, except for the Architect's redesign costs, and waives all claims for additional costs related to the substitution that subsequently become apparent; and
 - e. Add subparagraph 3.4.2.1.4 as follows:
shall coordinate the installation of the accepted substitute, making such changes as may be required for the Work to be complete in all respects.
 - f. Add subparagraph 3.4.2.2 as follows:
The Owner shall be entitled to reimbursement from the Contractor for amounts paid to the Architect for reviewing the Contractor's proposed substitutions and making agreed-upon changes in the Drawings and Specifications resulting from such substitutions.
 - g. Add subparagraph 3.4.3.1 as follows:
All workers on site shall dress in a neat manner. Clothing depicting foul language or crude behavior will not be tolerated.
 - h. Add subparagraph 3.4.3.2 as follows:
Foul language or crude behavior will not be tolerated.
 - i. Add subparagraph 3.4.3.3 as follows:
Possession, sale, or consumption of alcoholic beverages on the Owner's property is prohibited.
 - j. Add subparagraph 3.4.3.4 as follows:

The unlawful manufacture, distribution, dispensation, possession, or use of drugs and narcotics on the Owner's property is prohibited and may result in criminal prosecution.

4. Modification to Paragraph 3.6 Taxes:
 - a. Add subparagraph 3.6.1 as follows:
Work of this Contract is exempt from State and Local Sales and Use Taxes and Federal Excise Taxes on material used in construction and becoming a permanent part of the work. The Owner's General Sales Tax Exemption Certification Number will be provided to the Contractor.
 5. Modifications to Paragraph 3.7 Permits, Fees, Notices and Compliance with Laws:
 - a. Add subparagraph 3.7.1.1 as follows:
A General Building Permit, Mechanical Permit and Electrical Permit from the State of Michigan, Department of Licensing and Regulatory Affairs, Bureau of Construction Codes (BCC) are required.
 - b. Add subparagraph 3.7.1.1.1 as follows:
The Contractor shall pay all permit fees.
 - c. Add subparagraph 3.7.1.2 as follows:
The State of Michigan, Department of Licensing and Regulatory Affairs, Bureau of Construction Codes will conduct a plan review.
 - d. Add subparagraph 3.7.1.2.1 as follows:
The Architect will submit Drawings and Specifications, and pay plan review fees.
 - e. Add subparagraph 3.7.1.3 as follows:
The State of Michigan, Department of Licensing and Regulatory Affairs, Bureau of Fire Services will conduct a plan review and inspect the Work for fire safety.
 - f. Add subparagraph 3.7.1.3.1 as follows:
The Architect will submit Drawings and Specifications, and pay plan review fees.
 6. Modifications to Paragraph 3.9 Superintendent:
 - a. Add subparagraph 3.9.1.1 as follows:
The superintendent shall be satisfactory to the Owner and shall not be changed except with the consent of the Owner; unless the Superintendent ceases to be in the Contractor's employ.
 - b. Add subparagraph 3.9.1.1.1 as follows:
The Contractor shall provide the Owner and Architect with a formal written notice of any change in the superintendent.
 - c. Add subparagraph 3.9.1.1.2 as follows:
Any new superintendent must be satisfactory to the Owner.
- D. ARTICLE 7 - CHANGES IN THE WORK
1. Modifications to Paragraph 7.1 General:
 - a. Add subparagraph 7.1.1.1 as follows:
A Work Changes Proposal Request, also known as a Bulletin, shall be used to obtain price quotations required in the negotiation of Change Orders.
 - b. Add subparagraph 7.1.1.1.1 as follows:
In order to facilitate checking of quotations for extras or credits, all proposals, except those so minor that their propriety can be seen by inspection, shall be accompanied by a complete itemization of costs including labor, materials and Subcontracts. Labor and materials shall be itemized in the manner prescribed above. Where major cost items are Subcontracts, they shall be itemized also. In no case will a change involving over \$1,000 be approved without such itemization.
 - c. Add subparagraph 7.1.1.2 as follows:
A Construction Change Directive shall also be known as a Field Order.
 - d. Add subparagraph 7.1.1.3 as follows:
A minor change in the Work shall also be known as an Architect's Supplemental Instructions.
 - e. Add subparagraph 7.1.4 as follows:

The combined overhead and profit included in the total cost to the Owner for Changes in the Work shall be based on the following schedule:

- f. Add subparagraph 7.1.4.1 as follows:
For the Contractor, for Work performed by the Contractor's own forces, 15 percent of the cost.
 - g. Add subparagraph 7.1.4.2 as follows:
For the Contractor, for Work performed by the Contractor's Subcontractor, 7-1/2 percent of the amount due the Subcontractor.
 - h. Add subparagraph 7.1.4.3 as follows:
For each Subcontractor or Sub-subcontractor, for Work performed by that Subcontractor's or Sub-subcontractor's own forces, 15 percent of the cost.
 - i. Add subparagraph 7.1.4.4 as follows:
For each Subcontractor, for Work performed by the Subcontractor's Sub-subcontractors, 7-1/2 percent of the amount due the Sub-subcontractor.
 - j. Add subparagraph 7.1.5 as follows:
Cost to which overhead and profit is to be applied shall be determined in accordance with Subparagraph 7.3.4
- E. ARTICLE 8 – TIME
- 1. Modification to Paragraph 8.1 Definitions:
 - a. Revise subparagraph 8.1.4 as follows:
The term "day" as used in the Contract Documents shall mean working day, excluding weekends and legal holidays.
- F. ARTICLE 9 – PAYMENT AND COMPLETION
- 1. Modifications to Paragraph 9.3 Applications for Payment:
 - a. Add subparagraph 9.3.1.1 as follows:
The form of Application for Payment shall be a notarized AIA Document G702-1992, Application and Certification for Payment, supported by AIA Document G703-1992, Continuation Sheet.
 - b. Add subparagraph 9.3.1.2 as follows:
Retainage shall be 10 percent. Until Substantial Completion, the Owner shall pay 90 percent of the amount due the Contractor on account of progress payments.
 - c. Add subparagraph 9.3.1.3 as follows:
After Substantial Completion, if the manner of completion of the Work and its progress are and remain satisfactory and in the absence of other good and sufficient reasons, retainage shall be reduced to 5 percent until Final Completion and Final Payment.
 - 2. Modification to Paragraph 9.8 Substantial Completion:
 - a. Add subparagraph 9.8.3.1 as follows:
The Architect will perform no more than two (2) inspections to determine whether the Work or designated portion thereof has attained Substantial Completion in accordance with the Contract Documents. The Owner is entitled to reimbursement from the Contractor for amount paid to the Architect for additional inspections.
 - 3. Modification to Paragraph 9.10 Final Completion and Final Payment:
 - a. Add subparagraph 9.10.1.1 as follows:
The Architect will perform no more than two (2) inspections to determine whether the Work or designated portion thereof has attained Final Completion in accordance with the Contract Documents. The Owner is entitled to reimbursement from the Contractor for amount paid to the Architect for additional inspections.
- G. ARTICLE 10 – PROTECTION OF PERSONS AND PROPERTY
- 1. Modifications to Paragraph 10.2 Safety of Persons and Property:
 - a. Add subparagraph 10.2.4.1 as follows:

When use or storage of explosives, or other hazardous materials, substances or equipment, or unusual methods are necessary for the execution of the Work, the Contractor shall give the Owner at least 5 days advance notice.

- b. Add subparagraph 10.2.4.2 as follows:
If the Contract Documents require the Contractor to handle materials or substances that under certain circumstances may be designated as hazardous, the contractor shall handle such materials in an appropriate manner.

H. ARTICLE 11 – INSURANCE AND BONDS

1. Modifications to Paragraph 11.1 Contractor’s Insurance and Bonds:

- a. Add subparagraph 11.1.1.1 as follows:
 - 1) Minimum Insurance Requirements:
- b. Add subparagraph 11.1.1.1.1 as follows:
Worker’s Compensation and Employers’ Liability Insurance: All such insurance shall meet statutory limits mandated by State and Federal Laws. In addition, Employee’s Liability Limits shall not be less than:

Each Accident	\$1,000,000
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- c. Add subparagraph 11.1.1.1.2 as follows:
Comprehensive or Commercial General Liability and Property Damage including coverage for Premises-Operations, Independent Contractors’ Protective, Products-Completed Operations, Contractual Liability, Personal Injury, and Broad Form Property Damage (including coverage for Explosion, Collapse, and Underground Hazards) shall be as follows:

Each Occurrence	\$1,000,000
General Aggregate	\$5,000,000
Personal and Advertising Injury	\$1,000,000
Products-Completed Operations Aggregate	\$1,000,000

Include coverage for X (explosion), C (collapse) and U (underground hazards).

Contractual Liability insurance shall include coverage sufficient to meet the obligations in AIA Document A201-2017 under Section 3.18.

Products-Completed Operations insurance shall be maintained for a minimum period of at least two (2) years after date of Final Payment.

- d. Add subparagraph 11.1.1.1.3 as follows:
Comprehensive Automobile Liability insurance covering all liability for owned, non-owned, or rented vehicles and equipment, including bodily injury and property damage, arising out of vehicle operations used in connection with the Work, shall be in amounts not less than:

Each Occurrence/Accident	\$1,000,000
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- e. Add subparagraph 11.1.1.1.4 as follows:
Umbrella Excess Policies:
Per occurrence and aggregate insurance limits may be achieved under a single policy or by a combination of underlying and excess or umbrella policies.

- f. Add subparagraph 11.1.1.1.5 as follows:
 - 1) Materials which the Owner has paid for but which are still in transit or not yet permanently attached to the Work or stored on-site, shall be fully insured by the Contractor at the Contractor’s expense until the materials are located on-site or permanently attached to the Work.

- g. Add subparagraph 11.1.2.1 as follows:

The Contractor shall furnish a Performance Bond and a Labor and Material Payment Bond covering faithful performance of the Contract and payment of obligations arising thereunder. Bonds may obtained through the Contractor's usual source and the cost thereof shall be included in the Contract Sum. The amount of the bonds shall be equal to 100 percent of the Contract Sum.

- h. Add subparagraph 11.1.2.2 as follows:
The Contractor shall require the attorney-in-fact who executes the required bonds on behalf of the surety to affix thereto a certified and current copy of the power of attorney.

I. ARTICLE 13 – MISCELLANEOUS PROVISIONS

- 1. Add Paragraph 13.6 as follows:
Prevailing Wage Law: The Contractor and all subcontractors shall comply with Act 166 of the Michigan Public Acts of 1965 as amended, for work performed on this Project.
- 2. Add subparagraph 13.6.1 as follows:
 - a. The Contractor shall be financially responsible for the payment of prevailing wages and fringe benefits by all subcontractors contracted by him or her for work on the Project
- 3. Add Paragraph 13.7 as follows:
 - a. Contractor shall comply with Michigan Public Act No. 517 of 2012, The Iran Economic Sanctions Act.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED

END OF SECTION

SECTION 00 8200 - AVAILABILITY OF ELECTRONIC FILES**AVAILABILITY OF ELECTRONIC FILES****1.01 POLICY**

- A. As a service to Contractor, subcontractors, vendors, material suppliers and others needing electronic copies of Drawings, the Architect will provide CAD files electronically in accordance with the following policy:
1. By acceptance it is understood and agreed that the data and medium being supplied is to be used only for the project referenced.
 2. It is further understood and agreed that the undersigned will hold TMP Architecture, Inc. and its Consultants harmless and indemnify TMP Architecture, Inc. and its Consultants from all claims, liabilities, losses, and so forth, including attorney's fees arising out of the use or misuse of the transferred files.
 3. It is understood and agreed that the files transmitted are prepared from CAD files current at the time of preparation. All files are AutoCAD version 2014 dwg files.
 4. This information does not waive the need to verify and review current field conditions and the status of Addenda and/or Bulletin documentation.
 5. As a record of information to be transmitted, TMP Architecture, Inc. will prepare a duplicate electronic back-up for its record.
 6. Compensation Fee for providing this material will be as follows:
 - a. Base Fee of \$250 for 1 to 3 Drawings.
 - b. Base Fee of \$500 for 4 to 10 Drawings.
 - c. For each additional Drawing after 10, the fee is \$40 per Drawing.
 - 1) Example: 11 Drawings = \$540.
 7. A signed copy of the Release Form and Fee must be provided before files will be released.

1.02 REQUEST PROCEDURE

- A. To receive Drawing CAD files the Release Form must be completed in full and submitted to the Construction Manager to be forwarded to the Project Manager at TMP Architecture, Inc.
1. A signed copy of the Release Form must be submitted.
 - a. Faxed or emailed copies will be accepted.
 2. Upon remittance of the signed Release Form and Fee, allow five working days for processing.
 3. Transmission of Drawings will be provided electronically after the receipt of Fee.

1.03 RELEASE FORM

- A. Release Form is located immediately after this Section. Refer to Section 00 8200.01 Electronic Files Release Form.

END OF SECTION

SECTION 00 8200.01 - TMP ELECTRONIC FILE RELEASE FORM

RE: AUTHORIZATION FORM FOR CAD FILE TRANSFERS

PROJECT NAME: _____
TMP PROJECT NO. : _____ **BID PACK NO.** _____

DEAR SIR/MADAM:

- A. Per your request, TMP Architecture, Inc. will electronically transmit requested CAD files upon receipt of an original signed copy of this form which states the conditions of agreement and the receipt of the required compensation fee.
- B. By acceptance it is understood and agreed that the data and medium being supplied is to be used only for the project referenced.
- C. It is further understood and agreed that the undersigned will hold TMP Architecture, Inc. and its Consultants harmless and indemnify TMP Architecture, Inc. and its Consultants from all claims, liabilities, losses, and so forth, including attorney's fees arising out of the use or misuse of the transferred files.
- D. It is understood and agreed that the items transmitted are prepared from CAD files current at the time of preparation. All files are [AutoCAD version 2014 dwg files].
- E. This information does not waive the need to verify and review current field conditions and the status of Addenda and/or Bulletin documentation.
- F. As a record of information to be transmitted, TMP Architecture, Inc. will prepare a duplicate electronic back-up for its record.
- G. Compensation for providing this material will be as follows:
 - 1. Base Fee of [\$250] for 1 to 3 Drawings.
 - 2. Base Fee of [\$500] for 4 to 10 Drawings.
- H. For each additional Drawing after 10 the fee is [\$40] per Drawing.
- I. Example: [11 drawings = \$540].
- J. Payment must be provided along with a signed copy of this form before files will be released. Please remit to [Construction Manager] to be forwarded to the Project Manager at TMP Architecture, Inc. and allow five working days for processing.

FEE: \$ _____

REQUESTED DRAWINGS: _____

FIRM REQUESTING FILES:

Company: _____
Address: _____
Signed: _____ Date: _____
Printed Name / Title: _____
Email: _____

TO BE COMPLETED BY TMP ARCHITECTURE, INC.

Released(signed by): _____ TMP Architecture, Inc.
Printed Name/Title: _____ Date: _____

END OF SECTION

SECTION 01 0005 - RELATED REQUIREMENTS

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Related requirements.

1.02 DIVISION 00 AND DIVISION 01

- A. Unless otherwise noted, all provisions of sections and documents in Division 00 and Division 01, including, but not limited to, General Conditions and Supplementary Conditions, relate and apply to all sections and documents within Project Manual; including, but not limited to, sections and documents in Division 00 through Division 48.

1.03 DRAWINGS

- A. Unless otherwise noted, Drawings relate and apply to all specification sections and documents within Project Manual; including, but not limited to, sections and documents in Division 00 through Division 48.

PART 2 PRODUCTS -- NOT USED

PART 3 EXECUTION -- NOT USED

END OF SECTION

SECTION 01 2000 - PRICE AND PAYMENT PROCEDURES**PART 1 GENERAL****1.01 SECTION INCLUDES**

- A. Procedures for preparation and submittal of applications for progress payments.
- B. Documentation of changes in Contract Sum and Contract Time.
- C. Procedures for preparation and submittal of application for final payment.

1.02 RELATED REQUIREMENTS

- A. Section 01 2100 - Allowances: Payment procedures relating to allowances.
- B. Section 01 2200 - Unit Prices: Payment and modification procedures relating to unit prices.

1.03 SCHEDULE OF VALUES

- A. Use Schedule of Values Form: AIA G703, edition stipulated in the Agreement.
- B. Electronic media printout including equivalent information will be considered in lieu of standard form specified; submit draft to Architect for approval.
- C. Forms filled out by hand will not be accepted.
- D. Revise schedule to list approved Change Orders, with each Application For Payment.

1.04 APPLICATIONS FOR PROGRESS PAYMENTS

- A. Payment Period: Submit at intervals stipulated in the Agreement.
- B. Use Form AIA G702 and Form AIA G703, edition stipulated in the Agreement.
- C. Electronic media printout including equivalent information will be considered in lieu of standard form specified; submit sample to Architect for approval.
- D. Forms filled out by hand will not be accepted.
- E. Execute certification by signature of authorized officer.
- F. Use data from approved Schedule of Values. Provide dollar value in each column for each line item for portion of work performed and for stored products.
- G. List each authorized Change Order as a separate line item, listing Change Order number and dollar amount as for an original item of work.
- H. Submit one electronic and three hard-copies of each Application for Payment.
- I. When Architect requires substantiating information, submit data justifying dollar amounts in question. Provide one copy of data with cover letter for each copy of submittal. Show application number and date, and line item by number and description.

1.05 MODIFICATION PROCEDURES

- A. Refer to General Conditions and 00 7300 Supplementary Conditions .

1.06 APPLICATION FOR FINAL PAYMENT

- A. Prepare Application for Final Payment as specified for progress payments, identifying total adjusted Contract Sum, previous payments, and sum remaining due.
- B. Application for Final Payment will not be considered until the following have been accomplished:
 - 1. All closeout procedures specified in Section 01 7000.

PART 2 PRODUCTS - NOT USED**PART 3 EXECUTION - NOT USED****END OF SECTION**

SECTION 01 2500 - SUBSTITUTION PROCEDURES**PART 1 GENERAL****1.01 SECTION INCLUDES**

- A. Procedural requirements for proposed substitutions.

1.02 RELATED REQUIREMENTS

- A. Section 01 2500.01 - TMP Substitution Request Form.

1.03 DEFINITIONS

- A. Substitutions: Changes from Contract Documents requirements proposed by Contractor to materials, products, assemblies, and equipment.
 - 1. Substitutions for Cause: Proposed due to changed Project circumstances beyond Contractor's control.
 - 2. Substitutions for Convenience: Proposed due to possibility of offering substantial advantage to the Project.

PART 2 PRODUCTS - NOT USED**PART 3 EXECUTION****3.01 GENERAL REQUIREMENTS**

- A. A Substitution Request for products, assemblies, materials, and equipment constitutes a representation that the submitter:
 - 1. Has investigated proposed product and determined that it meets or exceeds the quality level of the specified product, equipment, assembly, or system.
 - 2. Agrees to provide the same warranty for the substitution as for the specified product.
 - 3. Agrees to provide same or equivalent maintenance service and source of replacement parts, as applicable.
 - 4. Agrees to coordinate installation and make changes to other work that may be required for the work to be complete, with no additional cost to Owner.
 - 5. Waives claims for additional costs or time extension that may subsequently become apparent.
- B. Document each request with complete data substantiating compliance of proposed substitution with Contract Documents. Burden of proof is on proposer.
 - 1. Note explicitly any non-compliant characteristics.
- C. Content: Include information necessary for tracking the status of each Substitution Request, and information necessary to provide an actionable response.
 - 1. Forms included in the Project Manual are adequate for this purpose, and must be used.
- D. Limit each request to a single proposed substitution item.
 - 1. Submit an electronic document, combining the request form with supporting data into single document.

3.02 SUBSTITUTION PROCEDURES DURING PROCUREMENT

- A. Substitution Request Form: TMP Substitution Request Form must be completed and provided at the beginning of each substitution request.
 - 1. Refer to Section 01 2500.01 - TMP Substitution Request Form.
 - 2. Submittals without a completed TMP Substitution Request Form will not be acknowledged, reviewed, or returned. Use only this form; other forms of submission are unacceptable.
- B. Instructions to Bidders specifies time restrictions for submitting requests for substitutions during the bidding period.

3.03 SUBSTITUTION PROCEDURES DURING CONSTRUCTION

- A. Substitution Request Form: TMP Substitution Request Form must be completed and provided at the beginning of each substitution request.
 - 1. Refer to Section 01 2500.01 - TMP Substitution Request Form.
 - 2. Submittals without a completed TMP Substitution Request Form will not be acknowledged, reviewed, or returned. Use only this form; other forms of submission are unacceptable.

- B. Submit request for Substitution for Cause immediately upon discovery of need for substitution, but not later than 14 days prior to time required for review and approval by Architect, in order to stay on approved project schedule.
- C. Submit request for Substitution for Convenience immediately upon discovery of its potential advantage to the project, but not later than 14 days prior to time required for review and approval by Architect, in order to stay on approved project schedule.
 - 1. In addition to meeting general documentation requirements, document how the requested substitution benefits the Owner through cost savings, time savings, greater energy conservation, or in other specific ways.
 - 2. Document means of coordinating of substitution item with other portions of the work, including work by affected subcontractors.
 - 3. Bear the costs engendered by proposed substitution of:
 - a. Owner's compensation to the Architect for any required redesign, time spent processing and evaluating the request.
 - b. Other unanticipated project considerations.
- D. Substitutions will not be considered under one or more of the following circumstances:
 - 1. When they are indicated or implied on shop drawing or product data submittals, without having received prior approval.
 - 2. Without a separate written request.

3.04 RESOLUTION

- A. Architect may request additional information and documentation prior to rendering a decision. Provide this data in an expeditious manner.
- B. Architect will notify Contractor in writing of decision to accept or reject request.
 - 1. During construction, Architect's decision following review of proposed substitution will be noted on the submitted form.
 - 2. During bidding, Architect will approve substitution requests by issuing an Addendum. Substitutions not approved by addendum are rejected.

3.05 ACCEPTANCE

- A. Accepted substitutions change the work of the Project. They will be documented and incorporated into work of the project by Change Order, Construction Change Directive, Architectural Supplementary Instructions, or similar instruments provided for in the Conditions of the Contract.

3.06 CLOSEOUT ACTIVITIES

- A. See Section 01 7800 - Closeout Submittals, for closeout submittals.

END OF SECTION

SECTION 01 2500.01 - TMP SUBSTITUTION REQUEST FORM

SUBSTITUTION REQUEST NUMBER: _____ **DATE SUBMITTED:** _____
TMP PROJECT NUMBER _____ **PROJECT NAME:** _____

SPECIFIED ITEM

SPECIFICATION TITLE: _____
SPECIFICATION SECTION _____ **SPECIFICATION ARTICLE/PARAGRAPH:** _____
SPECIFIED PRODUCT / DESCRIPTION: _____
SPECIFIED MANUFACTURER: _____
SPECIFIED PRODUCT / MODEL: _____
REASON SPECIFIED ITEM CANNOT BE PROVIDED: _____

PROPOSED SUBSTITUTION

DESCRIPTION OF PROPOSED SUBSTITUTION: _____

PROPOSED MANUFACTURER: _____
ADDRESS: _____
WEBSITE: _____
PRODUCT / MODEL: _____
YEARS PRODUCT/MODEL HAS BEEN MANUFACTURED: _____
DIFFERENCES BETWEEN PROPOSED SUBSTITUTION AND SPECIFIED ITEM: _____

WILL PROPOSED SUBSTITUTION AFFECT OTHER PARTS OF WORK? **NO** **YES**
IF YES, EXPLAIN HOW: _____

HOW WILL SUBSTITUTION BENEFIT THE OWNER: **COST SAVINGS** **TIME SAVINGS** **OTHER**
PROVIDE SPECIFIC DETAILS: _____

THE FOLLOWING INFORMATION IS REQUIRED; CHECK TO INDICATE INFORMATION IS ATTACHED. (REQUEST WILL BE REJECTED WITHOUT REQUIRED DATA)

32.01

- A. List of references where proposed product has been installed; include address, owner, architect, and date installed.
- B. Product data sheets.
- C. Applicable certificates and test reports.

- D. Comparative Data: Provide point-by-point, side-by-side comparison of specified product and proposed substitution addressing essential attributes specified.

INDICATE WHICH OF THE FOLLOWING VOLUNTARY INFORMATION IS ATTACHED, IF ANY:

- DRAWINGS.
- SAMPLES.
- OTHER ITEMS: _____

SIGNATURE

THE UNDERSIGNED CERTIFIES:

The proposed substitution meets or exceeds the quality level of the specified product, equipment, assembly, or system.
 To provide the same warranty for the substitution as for the specified product.
 Agrees to provide same or equivalent maintenance service and source of replacement parts, as applicable.
 Agrees to coordinate installation and make changes to other work that may be required for the work to be complete, with no additional cost to Owner.
 The proposed substitution will have no adverse effects on other work.
 The proposed substitution will not affect project schedule.
 Waives claims for additional costs or time extension that may subsequently become apparent.

CONTRACTOR / COMPANY: _____
SIGNED BY: _____ **PRINTED NAME:** _____
TITLE: _____
ADDRESS: _____
EMAIL: _____ **PHONE:** _____

ARCHITECT'S RESPONSE

- A. During bidding, Architect will approve substitution requests by issuing an Addendum. Substitutions not approved by addendum are rejected.
- B. During construction, Architect will notify Contractor in writing (see below) of decision to accept or reject request, and incorporate the substitution into the project by Change Order, Construction Change Directive, Architectural Supplementary Instructions, or similar instruments as provided for in the Conditions of the Contract.

- SUBSTITUTION APPROVED - PROVIDE SUBMITTALS PER SECTION 01 3000 AND RESPECTIVE SECTION FOR WHICH SUBSTITUTION WAS MADE.**
- SUBSTITUTION REJECTED - PROVIDE SPECIFIED MATERIALS.**

SIGNED BY: _____ **PRINTED NAME:** _____
ARCHITECT'S COMMENTS: _____

END OF SECTION

SECTION 01 3000 - ADMINISTRATIVE REQUIREMENTS**PART 1 GENERAL****1.01 SECTION INCLUDES**

- A. Submittals for review, information, and project closeout.
- B. Number of copies of submittals.
- C. Requests for Interpretation (RFI) procedures.
- D. Submittal procedures.

1.02 RELATED REQUIREMENTS

- A. Section 01 3000.01 - TMP Submittal and Sample Transmittal Form.

1.03 REFERENCE STANDARDS

- A. AIA G716 - Request for Information 2004.
- B. CSI/CSC Form 13.2A - Request for Information Current Edition.

PART 2 PRODUCTS - NOT USED**PART 3 EXECUTION****3.01 REQUESTS FOR INTERPRETATION (RFI)**

- A. Definition: A request seeking one of the following:
 - 1. An interpretation, amplification, or clarification of some requirement of Contract Documents arising from inability to determine from them the exact material, process, or system to be installed; or when the elements of construction are required to occupy the same space (interference); or when an item of work is described differently at more than one place in Contract Documents.
 - 2. A resolution to an issue which has arisen due to field conditions and affects design intent.
- B. Preparation: Prepare an RFI immediately upon discovery of a need for interpretation of Contract Documents. Failure to submit a RFI in a timely manner is not a legitimate cause for claiming additional costs or delays in execution of the work.
 - 1. Prepare a separate RFI for each specific item.
 - a. Review, coordinate, and comment on requests originating with subcontractors and/or materials suppliers.
 - b. Do not forward requests which solely require internal coordination between subcontractors.
 - 2. Prepare in a format and with content acceptable to Architect. Use one of the following:
 - a. Use AIA G716 - Request for Information .
 - b. Use CSI/CSC Form 13.2A - Request for Interpretation.
 - c. Other format acceptable to Architect.
 - 3. Combine RFI and its attachments into a single electronic file. PDF format is preferred.
- C. Reason for the RFI: Prior to initiation of an RFI, carefully study all Contract Documents to confirm that information sufficient for their interpretation is definitely not included.
 - 1. Include in each request Contractor's signature attesting to good faith effort to determine from Contract Documents information requiring interpretation.
 - 2. Improper RFIs: Requests not prepared in conformance to requirements of this section, and/or missing key information required to render an actionable response. They will be returned without a response and may include an explanatory notation.
 - 3. Frivolous RFIs: Requests regarding information that is clearly indicated on, or reasonably inferable from, the Contract Documents, with no additional input required to clarify the question. They will be returned without a response and may include an explanatory notation.
 - a. The Owner reserves the right to assess the Contractor for the costs (on time-and-materials basis) incurred by the Architect, and any of its consultants, due to processing of such RFIs.
- D. Content: Include identifiers necessary for tracking the status of each RFI, and information necessary to provide an actionable response.

1. Official Project name and number, and any additional required identifiers established in Contract Documents.
 2. Discrete and consecutive RFI number, and descriptive subject/title.
 3. Issue date, and requested reply date.
 4. Reference to particular Contract Document(s) requiring additional information/interpretation. Identify pertinent drawing and detail number and/or specification section number, title, and paragraph(s).
 5. Annotations: Field dimensions and/or description of conditions which have engendered the request.
 6. Contractor's suggested resolution: A written and/or a graphic solution, to scale, is required in cases where clarification of coordination issues is involved, for example; routing, clearances, and/or specific locations of work shown diagrammatically in Contract Documents. If applicable, state the likely impact of the suggested resolution on Contract Time or the Contract Sum.
- E. Attachments: Include sketches, coordination drawings, descriptions, photos, submittals, and other information necessary to substantiate the reason for the request.
- F. RFI Log: Prepare and maintain a tabular log of RFIs for the duration of the project.
1. Indicate current status of every RFI. Update log promptly and on a regular basis.
 2. Note dates of when each request is made, and when a response is received.
 3. Identify and include improper or frivolous RFIs.
- G. Review Time: Architect will respond and return RFIs to Contractor within seven calendar days of receipt. For the purpose of establishing the start of the mandated response period, RFIs received after 3:00 PM will be considered as having been received on the following regular working day.
1. Response period may be shortened or lengthened for specific items, subject to mutual agreement, and recorded in a timely manner in progress meeting minutes.
- H. Responses: Content of answered RFIs will not constitute in any manner a directive or authorization to perform extra work or delay the project. If in Contractor's belief it is likely to lead to a change to Contract Sum or Contract Time, promptly issue a notice to this effect, and follow up with an appropriate Change Order request to Owner.
1. Response may include a request for additional information, in which case the original RFI will be deemed as having been answered, and an amended one is to be issued forthwith. Identify the amended RFI with an R suffix to the original number.
 2. Do not extend applicability of a response to specific item to encompass other similar conditions, unless specifically so noted in the response.
 3. Upon receipt of a response, promptly review and distribute it to all affected parties, and update the RFI Log.
 4. Notify Architect within seven calendar days if an additional or corrected response is required by submitting an amended version of the original RFI, identified as specified above.

3.02 SUBMITTAL SCHEDULE

- A. Submit to Architect for review a schedule for submittals in tabular format.
1. Submit at the same time as the preliminary schedule.
 2. Coordinate with Contractor's construction schedule and schedule of values.
 3. Format schedule to allow tracking of status of submittals throughout duration of construction.
 4. Arrange information to include scheduled date for initial submittal, specification number and title, description of item of work covered, and role and name of subcontractor.
 5. Account for time required for preparation, review, manufacturing, fabrication and delivery when establishing submittal delivery and review deadline dates.
 - a. For assemblies, equipment, systems comprised of multiple components and/or requiring detailed coordination with other work, allow for additional time to make corrections or revisions to initial submittals, and time for their review.

3.03 SUBMITTALS FOR REVIEW

- A. When the following are specified in individual sections, submit them for review:
 - 1. Product data.
 - 2. Shop drawings.
 - 3. Samples for selection.
 - 4. Samples for verification.
- B. Submit to Architect for review for the limited purpose of checking for compliance with information given and the design concept expressed in Contract Documents.
- C. Samples will be reviewed for aesthetic, color, or finish selection.
- D. After review, provide copies and distribute in accordance with SUBMITTAL PROCEDURES article below and for record documents purposes described in Section 01 7800 - Closeout Submittals.

3.04 SUBMITTALS FOR INFORMATION

- A. When the following are specified in individual sections, submit them for information:
 - 1. Design data.
 - 2. Certificates.
 - 3. Test reports.
 - 4. Inspection reports.
 - 5. Manufacturer's instructions.
 - 6. Manufacturer's field reports.
 - 7. Other types indicated.
- B. Submit for Architect's knowledge as contract administrator or for Owner.

3.05 SUBMITTALS FOR PROJECT CLOSEOUT

- A. Submit Correction Punch List for Substantial Completion.
- B. Submit Final Correction Punch List for Substantial Completion.
- C. When the following are specified in individual sections, submit them at project closeout in compliance with requirements of Section 01 7800 - Closeout Submittals:
 - 1. Project record documents.
 - 2. Operation and maintenance data.
 - 3. Warranties.
 - 4. Other types as indicated.
- D. Submit for Owner's benefit during and after project completion.

3.06 NUMBER OF COPIES OF SUBMITTALS

- A. Electronic Documents: Submit one electronic copy.
- B. Samples: Submit the number specified in individual specification sections, but not less than 3; one (minimum) of which will be retained by Architect.
 - 1. After review, produce duplicates.
 - 2. Retained samples will not be returned to Contractor unless specifically so stated.

3.07 SUBMITTAL PROCEDURES

- A. Transmittal Form: TMP Submittal and Sample Transmittal Form must be completed and provided at the beginning of each submittal.
 - 1. Refer to Section 01 3000.01 - TMP Submittal and Sample Transmittal Form.
 - 2. Submittals without a completed TMP Submittal and Sample Transmittal Form will not be acknowledged, reviewed, or returned.
- B. Submittals shall be submitted in electronic form.
 - 1. Exceptions: Physical samples.
 - a. Physical Samples must be accompanied by an electronic copy and a hard/physical copy of the completed TMP Submittal and Sample Transmittal Form.
- C. Electronic Submittals: Comply with the following:
 - 1. Submittal process shall be through a data management system (i.e. Submittal Exchange) or other approved method agreed to by the Architect and Owner.
 - 2. File Format: Portable Document Format (PDF).

3. File Naming: File naming shall be in the following format:
 - a. Specification section number, followed by a hyphen, and a consecutive number indicating sequential submittals for that section; followed by a general description of the submittal contents.
 - 1) Examples:
 - (a) Section 07 9200; first submittal:
 - (1) 07 9200-01 Joint Sealants
 - (b) Section 07 9200; second submittal:
 - (1) 07 9200-02 Joint Sealant Color
 - b. Resubmittals. For revised resubmittals use original number and a sequential combination numerical and alphabetical suffix; hyphen followed by "R" and a two-digit consecutive number indicating sequential resubmittals for that particular submittal.
 - 1) Examples:
 - (a) Section 07 9200; resubmittal of first submittal of section:
 - (1) 07 9200-01-R01 Joint Sealants.
 - (b) Section 07 9200; second resubmittal of first submittal of section:
 - (1) 07 9200-01-R02 Joint Sealants
 - (c) Section 07 9200; first resubmittal of second submittal of section:
 - (1) 07 9200-02-R01 Joint Sealant Color
 4. Each Submittal shall be one file, complete with all attachments.
 - a. Multi-file submittal will not be acknowledged, reviewed, or returned.

D. General Requirements:

 1. Use a single transmittal for related items.
 - a. Each transmittal shall be for one specification section only; do not submit items for multiple sections under the same transmittal.
 - 1) Multi-section submittals will be acknowledged and returned; stamped "X - Not Approved - Resubmit".
 2. Submit separate packages of submittals for review and submittals for information, when included in the same specification section.
 3. Apply Contractor's stamp, signed or initialed certifying that review, approval, verification of products required, field dimensions, adjacent construction work, and coordination of information is in accordance with the requirements of the work and Contract Documents.
 - a. Submittals from sources other than the Contractor, or without Contractor's stamp will not be acknowledged, reviewed, or returned.
 4. Deliver each submittal on date noted in submittal schedule, unless an earlier date has been agreed to by all affected parties, and is of the benefit to the project.
 5. Schedule submittals to expedite the Project, and coordinate submission of related items.
 - a. For each submittal for review, allow 14 calendar days excluding delivery time to and from the Contractor.
 - b. For sequential reviews involving Architect's consultants, Owner, or another affected party, allow an additional 7 calendar days.
 6. Identify variations from Contract Documents and product or system limitations that may be detrimental to successful performance of the completed work.
 7. When revised for resubmission, identify all changes made since previous submission.
 8. Distribute reviewed submittals. Instruct parties to promptly report inability to comply with requirements.
 9. Incomplete submittals will not be reviewed, unless they are partial submittals for distinct portion(s) of the work, and have received prior approval for their use.
 10. Submittals not requested will be recognized and returned; stamped "NA - No Action Taken - Not Reviewed"

E. Product Data Procedures:

 1. Submit only information required by individual specification sections.
 2. Collect required information into a single submittal.
 3. Submit concurrently with related shop drawing submittal.
 4. Do not submit (Material) Safety Data Sheets for materials or products unless specifically called for in individual sections.

- F. Shop Drawing Procedures:
 1. Prepare accurate, drawn-to-scale, original shop drawing documentation by interpreting Contract Documents and coordinating related work.
 2. Do not reproduce Contract Documents to create shop drawings.
 3. Generic, non-project-specific information submitted as shop drawings do not meet the requirements for shop drawings.
 4. Non-complying submittals will be acknowledged and returned; stamped "X - Not Approved - Resubmit".
- G. Samples Procedures:
 1. Transmit related items together as single package.
 2. Identify each item to allow review for applicability in relation to shop drawings showing installation locations.
 3. Submit actual physical samples.
 4. Electronic submittals will not be accepted unless prior approval is received from the Architect. Electronic samples without prior approval will be acknowledged and returned; stamped "X - Not Approved - Resubmit."

3.08 SUBMITTAL REVIEW

- A. General: Submittals that do not conform to the requirements of this section will not be acknowledged, reviewed, or returned.
- B. Submittals for Review: Architect will review each submittal, and approve, or take other appropriate action.
- C. Submittals for Information: Architect will acknowledge and may review. See below for actions to be taken.
- D. Architect's actions will be reflected by marking each returned submittal using virtual stamp on electronic submittals.
 1. Where more than one action has been indicated, each shall apply to that portion of the submittal for which the action is indicated.
- E. Architect's review shall not indicate approval of dimensions, quantities or fabrication processes unless specific notations are made by the Architect regarding same.
- F. Architect's and consultants' actions on items submitted for review:
 1. Authorizing purchasing, fabrication, delivery, and installation:
 - a. "Reviewed - No Exceptions Taken", "Approved", or language with same legal meaning.
 - b. "Reviewed with Corrections Noted", "Approved as Noted, Resubmission not required", or language with same legal meaning.
 - 1) At Contractor's option, submit corrected item, with review notations acknowledged and incorporated.
 - c. "Approved as Noted, Resubmit for Record", or language with same legal meaning.
 - 1) Resubmit corrected item, with review notations acknowledged and incorporated. Resubmit separately, or as part of project record documents.
 2. Not Authorizing fabrication, delivery, and installation:
 - a. "Not Approved - Resubmit", "Revise and Resubmit", or language with the same legal meaning.
 - 1) Resubmit revised item, with review notations acknowledged and incorporated.
- G. Architect's and consultants' actions on items submitted for information:
 1. Items for which no action was taken:
 - a. "No Action Taken - Not Reviewed" or "Received" - to notify the Contractor that the submittal has been received for record only.

END OF SECTION

SECTION 01 4000 - QUALITY REQUIREMENTS**PART 1 GENERAL****1.01 SECTION INCLUDES**

- A. Submittals.
- B. Quality assurance.
- C. References and standards.
- D. Testing and inspection agencies and services.
- E. Contractor's design-related professional design services.
- F. Control of installation.
- G. Mock-ups.
- H. Tolerances.
- I. Manufacturers' field services.
- J. Defect Assessment.

1.02 REFERENCE STANDARDS

- A. ASTM E329 - Standard Specification for Agencies Engaged in Construction Inspection, Testing, or Special Inspection 2021.
- B. ASTM E543 - Standard Specification for Agencies Performing Nondestructive Testing 2021.
- C. ASTM E699 - Standard Specification for Agencies Involved in Testing, Quality Assurance, and Evaluating of Manufactured Building Components 2016.

1.03 DEFINITIONS

- A. Contractor's Professional Design Services: Design of some aspect or portion of the project by party other than the design professional of record. Provide these services as part of the Contract for Construction.
 - 1. Design Services Types Required:
 - a. Design-Related: Design services explicitly required to be performed by another design professional due to highly-technical and/or specialized nature of a portion of the project. Services primarily involve engineering analysis, calculations, and design, and are not intended to alter the aesthetic aspects of the design.
 - B. Design Data: Design-related, signed and sealed drawings, calculations, specifications, certifications, shop drawings and other submittals provided by Contractor, and prepared directly by, or under direct supervision of, appropriately licensed design professional.

1.04 CONTRACTOR'S DESIGN-RELATED PROFESSIONAL DESIGN SERVICES

- A. Coordination: Contractor's professional design services are subject to requirements of project's Conditions for Construction Contract.
- B. Base design on performance and/or design criteria indicated in individual specification sections.

1.05 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Design Data: Submit for Architect's knowledge as contract administrator for the limited purpose of assessing compliance with information given and the design concept expressed in the Contract Documents, or for Owner's information.
 - 1. Include a statement or certification attesting that design data complies with criteria indicated, such as building codes, loads, functional, and similar engineering requirements.
 - 2. Include signature and seal of design professional responsible for allocated design services on calculations and drawings.
- C. Test Reports: After each test/inspection, promptly submit 1 copies of report to Architect and to Contractor.
 - 1. Include:
 - a. Date issued.
 - b. Project title and number.

- c. Name of inspector.
- d. Date and time of sampling or inspection.
- e. Identification of product and specifications section.
- f. Location in the Project.
- g. Type of test/inspection.
- h. Date of test/inspection.
- i. Results of test/inspection.
- j. Compliance with Contract Documents.
- k. When requested by Architect, provide interpretation of results.
- 2. Test report submittals are for Architect's knowledge as contract administrator for the limited purpose of assessing compliance with information given and the design concept expressed in the Contract Documents, or for Owner's information.
- D. Certificates: When specified in individual specification sections, submit certification by the manufacturer and Contractor or installation/application subcontractor to Architect, in quantities specified for Product Data.
 - 1. Indicate material or product complies with or exceeds specified requirements. Submit supporting reference data, affidavits, and certifications as appropriate.
 - 2. Certificates may be recent or previous test results on material or product, but must be acceptable to Architect.
- E. Manufacturer's Instructions: When specified in individual specification sections, submit printed instructions for delivery, storage, assembly, installation, start-up, adjusting, and finishing, for the Owner's information. Indicate special procedures, perimeter conditions requiring special attention, and special environmental criteria required for application or installation.
- F. Manufacturer's Field Reports: Submit reports for Architect's benefit as contract administrator or for Owner.
 - 1. Submit for information for the limited purpose of assessing compliance with information given and the design concept expressed in the Contract Documents.

1.06 QUALITY ASSURANCE

- A. Testing Agency Qualifications:
 - 1. Prior to start of Work, submit agency name, address, and telephone number, and names of full time specialist and responsible officer.
- B. Designer Qualifications: Where professional engineering design services and design data submittals are specifically required of Contractor by Contract Documents, provide services of a Professional Engineer experienced in design of this type of work and licensed in the State in which the Project is located.

1.07 REFERENCES AND STANDARDS

- A. Obtain copies of standards where required by product specification sections.
- B. Maintain copy at project site during submittals, planning, and progress of the specific work, until Substantial Completion.

1.08 TESTING AND INSPECTION AGENCIES AND SERVICES

- A. As indicated in individual specification sections, Owner or Contractor shall employ and pay for services of an independent testing agency to perform other specified testing.
- B. Employment of agency in no way relieves Contractor of obligation to perform Work in accordance with requirements of Contract Documents.
- C. Contractor Employed Agency:
 - 1. Testing agency: Comply with requirements of ASTM E329, ASTM E543, and ASTM E699.
 - 2. Inspection agency: Comply with requirements of ASTM E329.
 - 3. Laboratory Staff: Maintain a full time specialist on staff to review services.

PART 2 PRODUCTS - NOT USED**PART 3 EXECUTION****3.01 CONTROL OF INSTALLATION**

- A. Monitor quality control over suppliers, manufacturers, products, services, site conditions, and workmanship, to produce work of specified quality.
- B. Comply with manufacturers' instructions, including each step in sequence.
- C. Should manufacturers' instructions conflict with Contract Documents, request clarification from Architect before proceeding.
- D. Comply with specified standards as minimum quality for the work except where more stringent tolerances, codes, or specified requirements indicate higher standards or more precise workmanship.
- E. Have work performed by persons qualified to produce required and specified quality.
- F. Verify that field measurements are as indicated on shop drawings or as instructed by the manufacturer.
- G. Secure products in place with positive anchorage devices designed and sized to withstand stresses, vibration, physical distortion, and disfigurement.

3.02 MOCK-UPS

- A. Before installing portions of the Work where mock-ups are required, construct mock-ups in location and size indicated for each form of construction and finish required to comply with the following requirements, using materials indicated for the completed Work. The purpose of mock-up is to demonstrate the proposed range of aesthetic effects and workmanship.
- B. Accepted mock-ups establish the standard of quality the Architect will use to judge the Work.
- C. Integrated Exterior Mock-ups: Construct integrated exterior mock-up as indicated on drawings. Coordinate installation of exterior envelope materials and products as required in individual Specification Sections. Provide adequate supporting structure for mock-up materials as necessary.
- D. Notify Architect 5 working days in advance of dates and times when mock-ups will be constructed.
- E. Provide supervisory personnel who will oversee mock-up construction. Provide workers that will be employed during the construction at Project.
- F. Tests shall be performed under provisions identified in this section and identified in the respective product specification sections.
- G. Assemble and erect specified items with specified attachment and anchorage devices, flashings, seals, and finishes.
- H. Obtain Architect's approval of mock-ups before starting work, fabrication, or construction.
 - 1. Make corrections as necessary until Architect's approval is issued.
- I. Where mock-up has been accepted by Architect and is specified in product specification sections to be removed, protect mock-up throughout construction, remove mock-up and clear area when directed to do so by Architect.

3.03 TOLERANCES

- A. Monitor fabrication and installation tolerance control of products to produce acceptable Work. Do not permit tolerances to accumulate.
- B. Comply with manufacturers' tolerances. Should manufacturers' tolerances conflict with Contract Documents, request clarification from Architect before proceeding.
- C. Adjust products to appropriate dimensions; position before securing products in place.

3.04 TESTING AND INSPECTION

- A. See individual specification sections for testing and inspection required.
- B. Testing Agency Duties:

1. Provide qualified personnel at site. Cooperate with Architect and Contractor in performance of services.
 2. Perform specified sampling and testing of products in accordance with specified standards.
 3. Ascertain compliance of materials and mixes with requirements of Contract Documents.
 4. Promptly notify Architect and Contractor of observed irregularities or non-compliance of Work or products.
 5. Perform additional tests and inspections required by Architect.
 6. Submit reports of all tests/inspections specified.
- C. Limits on Testing/Inspection Agency Authority:
1. Agency may not release, revoke, alter, or enlarge on requirements of Contract Documents.
 2. Agency may not approve or accept any portion of the Work.
 3. Agency may not assume any duties of Contractor.
 4. Agency has no authority to stop the Work.
- D. Contractor Responsibilities:
1. Deliver to agency at designated location, adequate samples of materials proposed to be used that require testing, along with proposed mix designs.
 2. Cooperate with laboratory personnel, and provide access to the Work.
 3. Provide incidental labor and facilities:
 - a. To provide access to Work to be tested/inspected.
 - b. To obtain and handle samples at the site or at source of Products to be tested/inspected.
 - c. To facilitate tests/inspections.
 - d. To provide storage and curing of test samples.
 4. Notify Architect and laboratory 48 hours prior to expected time for operations requiring testing/inspection services.
 5. Employ services of an independent qualified testing laboratory and pay for additional samples, tests, and inspections required by Contractor beyond specified requirements.
 6. Arrange with Owner's agency and pay for additional samples, tests, and inspections required by Contractor beyond specified requirements.
- E. Re-testing required because of non-compliance with specified requirements shall be performed by the same agency on instructions by Architect.
- F. Re-testing required because of non-compliance with specified requirements shall be paid for by Contractor.

3.05 MANUFACTURERS' FIELD SERVICES

- A. When specified in individual specification sections, require material or product suppliers or manufacturers to provide qualified staff personnel to observe site conditions, conditions of surfaces and installation, quality of workmanship, start-up of equipment, test, adjust, and balance equipment as applicable, and to initiate instructions when necessary.
- B. Report observations and site decisions or instructions given to applicators or installers that are supplemental or contrary to manufacturers' written instructions.

3.06 DEFECT ASSESSMENT

- A. Replace Work or portions of the Work not complying with specified requirements.
- B. If, in the opinion of Architect, it is not practical to remove and replace the work, Architect will direct an appropriate remedy or adjust payment.

END OF SECTION

SECTION 01 4100 - REGULATORY REQUIREMENTS**PART 1 GENERAL****1.01 SUMMARY OF REFERENCE STANDARDS**

- A. Regulatory requirements applicable to this project are the following:
1. Barrier Free Code: Comply with the following:
 - a. Michigan Building Code; 2015.
 - b. ICC A117.1 - Accessible and Usable Buildings and Facilities; 2009.
 2. School Fire Safety Rules: Michigan School Fire Safety Rules; 2016.
 - a. Includes NFPA 101-2012 - Life Safety Code; 2012, plus amendments.
 3. Building Code: Michigan Building Code; 2015.
 4. Plumbing Code: Michigan Plumbing Code; 2015.
 5. Mechanical Code: Michigan Mechanical Code; 2015.
 6. Electrical Code: NFPA 70 - National Electric Code; 2017.
 - a. Includes 2017 Michigan Construction Code - Part 8 Electrical Code Rules.
 7. Elevator Code: Comply with the following:
 - a. ASME A17.1 - Safety Code for Elevators and Escalators; 2010.
 - b. ASME A18.1- Safety Standard for Platform Lifts and Stairway Chairlifts; 2011.
 - c. Michigan Elevator Safety Board General Rules.
 8. Boiler Code: Michigan Boiler Code.
 - a. Includes the following:
 - 1) ASME Boiler and Pressure Vessel Codes; 2010, plus 2011 addenda.
 - 2) National Board Inspection Code; 2011.
 - 3) PA 407 Skilled Trades Regulation Act; 2016.
 9. Energy Code: Michigan Energy Code; 2015.
 - a. Includes ASHRAE Std 90.1 I-P-2013- Energy Standard for Buildings Except Low-Rise Residential Buildings; 2013.
 10. Existing Building Code: Michigan Rehabilitation Code; 2015.
- B. Where specification sections reference more current standards or codes, comply with the more restrictive requirements unless notified in writing by Architect.

PART 2 PRODUCTS - NOT USED**PART 3 EXECUTION - NOT USED****END OF SECTION**

SECTION 01 4216 - DEFINITIONS

PART 1 GENERAL

1.01 SUMMARY

- A. This section supplements the definitions contained in the General Conditions.
- B. Other definitions are included in individual specification sections.

1.02 DEFINITIONS

- A. Furnish: To supply, deliver, unload, and inspect for damage.
- B. Install: To unpack, assemble, erect, apply, place, finish, cure, protect, clean, start up, and make ready for use.
- C. Product: Material, machinery, components, equipment, fixtures, and systems forming the work result. Not materials or equipment used for preparation, fabrication, conveying, or erection and not incorporated into the work result. Products may be new, never before used, or re-used materials or equipment.
- D. Project Manual: The book-sized volume that includes the procurement requirements (if any), the contracting requirements, and the specifications.
- E. Provide: To furnish and install.
- F. Supply: Same as Furnish.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED

END OF SECTION

SECTION 01 4219 - REFERENCE STANDARDS

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Requirements relating to referenced standards.

1.02 QUALITY ASSURANCE

- A. For products or workmanship specified by reference to a document or documents not included in the Project Manual, also referred to as reference standards, comply with requirements of the standard, except when more rigid requirements are specified or are required by applicable codes.
- B. Comply with the reference standard of date of issue specified in this section, except where a specific date is established by applicable code.
- C. Should specified reference standards conflict with Contract Documents, request clarification from the Architect before proceeding.
- D. Neither the contractual relationships, duties, or responsibilities of the parties in Contract nor those of the Architect shall be altered by Contract Documents by mention or inference otherwise in any reference document.

PART 2 PRODUCTS -- NOT USED

PART 3 EXECUTION -- NOT USED

END OF SECTION

SECTION 01 5000 - TEMPORARY FACILITIES AND CONTROLS**PART 1 GENERAL****1.01 SECTION INCLUDES**

- A. Temporary utilities.
- B. Temporary telecommunications services.
- C. Temporary sanitary facilities.
- D. Security requirements.
- E. Vehicular access and parking.
- F. Waste removal facilities and services.
- G. Project identification sign.
- H. Field offices.

1.02 REFERENCE STANDARDS

- A. 29 CFR 1926 - Safety and Health Regulations for Construction Current Edition.
- B. ASTM E90 - Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements 2009 (Reapproved 2016).

1.03 TEMPORARY UTILITIES

- A. Owner will provide the following:
 - 1. Electrical power, consisting of connection to existing facilities.
 - a. Provide adequate distribution equipment, wiring, and outlets to provide single phase branch circuits for power and lighting.
 - b. Do not disrupt Owner's need for continuous service.
 - c. Exercise measures to conserve energy.
 - 2. Water supply, consisting of connection to existing facilities.
 - a. Extend branch piping with outlets located so water is available by hoses with threaded connections. Prevent piping from freezing.
 - b. Exercise measures to conserve water.
 - 3. Permanent building lighting may be utilized during construction.
- B. Provide and pay for all lighting, heating and cooling, and ventilation required for construction purposes.
 - 1. Lighting: Provide and maintain LED, compact fluorescent, or high-intensity discharge as suitable for the application for construction operations in accordance with requirements of 29 CFR 1926 and authorities having jurisdiction.
 - 2. Heating: Maintain minimum ambient temperature of 50 degrees F in areas where construction is in progress, unless indicated otherwise in specifications.
 - a. Existing facilities may be used, at no cost to Contractor, if Work is located in existing building.
 - 3. Cooling: Maintain maximum ambient temperature of 80 degrees F in areas where construction is in progress, unless indicated otherwise in specifications.
 - a. Existing facilities may be used, at no cost to Contractor, if Work is located in existing building.
- C. New permanent facilities may be used.

1.04 TELECOMMUNICATIONS SERVICES

- A. Provide, maintain, and pay for telecommunications services to field office at time of project mobilization.
- B. Telecommunications services shall include:
 - 1. Windows-based personal computer dedicated to project telecommunications, with necessary software and laser printer.
 - 2. Internet Connections: Minimum of one; DSL modem or faster.
 - a. Owner will provide internet connections if Work is located in existing facilities that have an existing internet connection.
 - 3. Provide superintendent with cellular telephone.

1.05 TEMPORARY SANITARY FACILITIES

- A. Provide and maintain required facilities and enclosures. Provide at time of project mobilization.
 - 1. Use of existing facilities is permitted if Work is located in existing facility.
- B. Maintain daily in clean and sanitary condition.
- C. At end of construction, return facilities to same or better condition as originally found.

1.06 EXTERIOR ENCLOSURES

- A. Provide temporary insulated weather tight closure of exterior openings to accommodate acceptable working conditions and protection for Products, to allow for temporary heating and maintenance of required ambient temperatures identified in individual specification sections, and to prevent entry of unauthorized persons. Provide access doors with self-closing hardware and locks.

1.07 INTERIOR ENCLOSURES

- 1. STC rating of 45 in accordance with ASTM E90.

1.08 SECURITY

- A. Provide security and facilities to protect Work, existing facilities, and Owner's operations from unauthorized entry, vandalism, or theft.

1.09 VEHICULAR ACCESS AND PARKING

- A. Coordinate access and haul routes with governing authorities and Owner.
- B. Provide and maintain access to fire hydrants, free of obstructions.
- C. Provide means of removing mud from vehicle wheels before entering streets.
- D. Provide temporary parking areas to accommodate construction personnel. When site space is not adequate, provide additional off-site parking.
 - 1. Use of designated areas of existing parking facilities by construction personnel is permitted.
- E. Designate 2 parking spaces for Owner and Architect use.
- F. Maintain existing paved areas used for construction; promptly repair breaks, potholes, low areas, standing water, and other deficiencies, to maintain paving and drainage in original, or specified, condition.

1.10 WASTE REMOVAL

- A. Provide waste removal facilities and services as required to maintain the site in clean and orderly condition.
- B. Provide containers with lids. Remove trash from site weekly.
- C. If materials to be recycled or re-used on the project must be stored on-site, provide suitable non-combustible containers; locate containers holding flammable material outside the structure unless otherwise approved by the authorities having jurisdiction.
- D. Open free-fall chutes are not permitted. Terminate closed chutes into appropriate containers with lids.

1.11 PROJECT IDENTIFICATION

- A. Provide project identification sign of design and construction as indicated by Architect.
 - 1. One painted sign, 48 sq ft area, bottom 6 feet above ground.
 - a. Structure and Framing: New, wood, structurally adequate.
 - b. Sign Surfaces: Exterior grade plywood with medium density overlay, minimum 3/4 inch thick.
 - c. Rough Hardware: Galvanized.
 - 2. Graphic Design, Colors, Style of Lettering: Designated by Architect.
 - a. Content:
 - 1) Project title, logo and name of Owner as indicated on Contract Documents.
 - 2) Names and logos of Architect and Consultants.
 - 3) Name and logo of Contractor.
- B. Erect on site at location indicated by Owner.

- C. No other signs are allowed without Owner permission except those required by law.

1.12 FIELD OFFICES

- A. Office: Weathertight, with lighting, electrical outlets, heating, cooling equipment, and equipped with sturdy furniture and drawing display table. Remove at completion of Work.
 - 1. Use of space in existing facilities may be permitted if Work is located in existing facility and Owner agrees.
- B. Provide space for Project meetings, with table and chairs to accommodate 6 persons.
- C. Locate offices a minimum distance of 30 feet from existing and new structures.
- D. Provide weekly janitorial services for offices.

1.13 REMOVAL OF UTILITIES, FACILITIES, AND CONTROLS

- A. Remove temporary utilities, equipment, facilities, materials, prior to Date of Substantial Completion inspection.
- B. Clean and repair damage caused by installation or use of temporary work.
- C. Restore new permanent facilities used during construction to specified condition.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED

END OF SECTION

SECTION 01 6000 - PRODUCT REQUIREMENTS**PART 1 GENERAL****1.01 SECTION INCLUDES**

- A. Re-use of existing products.
- B. Transportation, handling, storage and protection.
- C. Product option requirements.
- D. Substitution limitations.
- E. Procedures for Owner-supplied products.
- F. Maintenance materials, including extra materials, spare parts, tools, and software.

1.02 SUBMITTALS

- A. Product Data Submittals: Submit manufacturer's standard published data. Mark each copy to identify applicable products, models, options, and other data. Supplement manufacturers' standard data to provide information specific to this Project.
- B. Shop Drawing Submittals: Prepared specifically for this Project; indicate utility and electrical characteristics, utility connection requirements, and location of utility outlets for service for functional equipment and appliances.
- C. Sample Submittals: Illustrate functional and aesthetic characteristics of the product, with integral parts and attachment devices. Coordinate sample submittals for interfacing work.
 - 1. For selection from standard finishes, submit samples of the full range of the manufacturer's standard colors, textures, and patterns.

PART 2 PRODUCTS**2.01 EXISTING PRODUCTS**

- A. Do not use materials and equipment removed from existing premises unless specifically required or permitted by Contract Documents.
- B. Unforeseen historic items encountered remain the property of the Owner; notify Owner promptly upon discovery; protect, remove, handle, and store as directed by Owner.
- C. Existing materials and equipment indicated to be removed, but not to be re-used, relocated, reinstalled, delivered to the Owner, or otherwise indicated as to remain the property of the Owner, become the property of the Contractor; remove from site.
- D. Specific Products to be Reused: The reuse of certain materials and equipment already existing on the project site is required.
 - 1. Refer to Drawings and Section 02 4100 - Demolition.

2.02 NEW PRODUCTS

- A. Provide new products unless specifically required or permitted by Contract Documents.

2.03 PRODUCT OPTIONS

- A. Products Specified by Reference Standards or by Description Only: Use any product meeting those standards or description.
- B. Products Specified by Naming One or More Manufacturers: Use a product of one of the manufacturers named and meeting specifications, no options or substitutions allowed.
- C. Products Specified by Naming One or More Manufacturers with a Provision for Substitutions: Submit a request for substitution for any manufacturer not named.
- D. Available Products: Products specified by naming one or more Manufacturers as an Available Product indicates that these Manufacturers' products may be provided but other comparable products and Manufacturers not named may also be provided without submitting a request for substitution.

2.04 MAINTENANCE MATERIALS

- A. Furnish extra materials, spare parts, tools, and software of types and in quantities specified in individual specification sections.
- B. Deliver and place in location as directed; obtain receipt prior to final payment.

PART 3 EXECUTION**3.01 SUBSTITUTION LIMITATIONS**

- A. See Section 01 2500 - Substitution Procedures.

3.02 OWNER-SUPPLIED PRODUCTS

- A. Owner's Responsibilities:
 - 1. Arrange for and deliver Owner reviewed shop drawings, product data, and samples, to Contractor.
 - 2. Arrange and pay for product delivery to site.
 - 3. On delivery, inspect products jointly with Contractor.
 - 4. Submit claims for transportation damage and replace damaged, defective, or deficient items.
 - 5. Arrange for manufacturers' warranties, inspections, and service.
- B. Contractor's Responsibilities:
 - 1. Review Owner reviewed shop drawings, product data, and samples.
 - 2. Receive and unload products at site; inspect for completeness or damage jointly with Owner.
 - 3. Handle, store, install and finish products.
 - 4. Repair or replace items damaged after receipt.

3.03 TRANSPORTATION AND HANDLING

- A. Package products for shipment in manner to prevent damage; for equipment, package to avoid loss of factory calibration.
- B. If special precautions are required, attach instructions prominently and legibly on outside of packaging.
- C. Coordinate schedule of product delivery to designated prepared areas in order to minimize site storage time and potential damage to stored materials.
- D. Transport and handle products in accordance with manufacturer's instructions.
- E. Promptly inspect shipments to ensure that products comply with requirements, quantities are correct, and products are undamaged.
- F. Provide equipment and personnel to handle products by methods to prevent soiling, disfigurement, or damage, and to minimize handling.
- G. Arrange for the return of packing materials, such as wood pallets, where economically feasible.

3.04 STORAGE AND PROTECTION

- A. Designate receiving/storage areas for incoming products so that they are delivered according to installation schedule and placed convenient to work area in order to minimize waste due to excessive materials handling and misapplication.
- B. Store and protect products in accordance with manufacturers' instructions.
- C. Store with seals and labels intact and legible.
- D. Store sensitive products in weathertight, climate-controlled enclosures in an environment favorable to product.
- E. For exterior storage of fabricated products, place on sloped supports above ground.
- F. Provide off-site storage and protection when site does not permit on-site storage or protection.
- G. Protect products from damage or deterioration due to construction operations, weather, precipitation, humidity, temperature, sunlight and ultraviolet light, dirt, dust, and other contaminants.
- H. Comply with manufacturer's warranty conditions, if any.
- I. Do not store products directly on the ground.
- J. Cover products subject to deterioration with impervious sheet covering. Provide ventilation to prevent condensation and degradation of products.
- K. Store loose granular materials on solid flat surfaces in a well-drained area. Prevent mixing with foreign matter.

- L. Prevent contact with material that may cause corrosion, discoloration, or staining.
- M. Provide equipment and personnel to store products by methods to prevent soiling, disfigurement, or damage.
- N. Arrange storage of products to permit access for inspection. Periodically inspect to verify products are undamaged and are maintained in acceptable condition.

END OF SECTION

SECTION 01 7000 - EXECUTION AND CLOSEOUT REQUIREMENTS**PART 1 GENERAL****1.01 SECTION INCLUDES**

- A. Examination, preparation, and general installation procedures.
- B. Requirements for alterations work, including selective demolition.
- C. Pre-installation meetings.
- D. Cutting and patching.
- E. Surveying for laying out the work.
- F. Cleaning and protection.
- G. Starting of systems and equipment.
- H. Demonstration and instruction of Owner personnel.
- I. Closeout procedures, including Contractor's Correction Punch List, except payment procedures.
- J. General requirements for maintenance service.

1.02 REFERENCE STANDARDS

- A. NFPA 241 - Standard for Safeguarding Construction, Alteration, and Demolition Operations 2022.

1.03 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Cutting and Patching: Submit written request in advance of cutting or alteration that affects:
 - 1. Structural integrity of any element of Project.
 - 2. Integrity of weather exposed or moisture resistant element.
 - 3. Efficiency, maintenance, or safety of any operational element.
 - 4. Visual qualities of sight exposed elements.
 - 5. Work of Owner or separate Contractor.
 - 6. Include in request:
 - a. Identification of Project.
 - b. Location and description of affected work.
 - c. Necessity for cutting or alteration.
 - d. Description of proposed work and products to be used.
 - e. Effect on work of Owner or separate Contractor.
- C. Project Record Documents: Accurately record actual locations of capped and active utilities.
- D. Warranties: For each affected material under warranty, submit written verification, signed by manufacturer of existing materials, stating that the Owner's full warranty will remain in effect after cutting and patching operations have been completed

1.04 QUALIFICATIONS

- A. For surveying work, employ a land surveyor registered in the State in which the Project is located and acceptable to Architect. Submit evidence of surveyor's Errors and Omissions insurance coverage in the form of an Insurance Certificate. Employ only individual(s) trained and experienced in collecting and recording accurate data relevant to ongoing construction activities,

1.05 PROJECT CONDITIONS

- A. Use of explosives is not permitted.
- B. Grade site to drain. Maintain excavations free of water. Provide, operate, and maintain pumping equipment.
- C. Protect site from puddling or running water. Provide water barriers as required to protect site from soil erosion.
- D. Perform dewatering activities, as required, for the duration of the project.
- E. Ventilate enclosed areas to assist cure of materials, to dissipate humidity, and to prevent accumulation of dust, fumes, vapors, or gases.

- F. Dust Control: Execute work by methods to minimize raising dust from construction operations. Provide positive means to prevent air-borne dust from dispersing into atmosphere and over adjacent property.
 - 1. Provide dust-proof enclosures to prevent entry of dust generated outdoors.
 - 2. Provide dust-proof barriers between construction areas and areas continuing to be occupied by Owner.
- G. Erosion and Sediment Control: Plan and execute work by methods to control surface drainage from cuts and fills, from borrow and waste disposal areas. Prevent erosion and sedimentation.
 - 1. Periodically inspect earthwork to detect evidence of erosion and sedimentation; promptly apply corrective measures.
- H. Noise Control: Provide methods, means, and facilities to minimize noise produced by construction operations.
 - 1. Outdoors: Limit conduct of especially noisy exterior work to the hours of 8 am to 5 pm.
 - 2. Indoors: Limit conduct of especially noisy interior work to the hours of 6 pm to 7 am.
- I. Pest and Rodent Control: Provide methods, means, and facilities to prevent pests and insects from damaging the work.
- J. Pollution Control: Provide methods, means, and facilities to prevent contamination of soil, water, and atmosphere from discharge of noxious, toxic substances, and pollutants produced by construction operations. Comply with federal, state, and local regulations.

1.06 COORDINATION

- A. Coordinate scheduling, submittals, and work of the various sections of the Project Manual to ensure efficient and orderly sequence of installation of interdependent construction elements, with provisions for accommodating items installed later.
- B. Notify affected utility companies and comply with their requirements.
- C. Verify that utility requirements and characteristics of new operating equipment are compatible with building utilities. Coordinate work of various sections having interdependent responsibilities for installing, connecting to, and placing in service, such equipment.
- D. Coordinate space requirements, supports, and installation of mechanical and electrical work that are indicated diagrammatically on drawings. Follow routing indicated for pipes, ducts, and conduit, as closely as practicable; place runs parallel with lines of building. Utilize spaces efficiently to maximize accessibility for other installations, for maintenance, and for repairs.
- E. In finished areas except as otherwise indicated, conceal pipes, ducts, and wiring within the construction. Coordinate locations of fixtures and outlets with finish elements.
- F. Coordinate completion and clean-up of work of separate sections.
- G. After Owner occupancy of premises, coordinate access to site for correction of defective work and work not in accordance with Contract Documents, to minimize disruption of Owner's activities.

1.07 WARRANTIES

- A. Existing Warranties: Remove, replace, patch, and repair materials and surfaces cut or damaged during cutting and patching operations, by methods and with materials so as not to void existing warranties.

PART 2 PRODUCTS

2.01 PATCHING MATERIALS

- A. New Materials: As specified in product sections; match existing products and work for patching and extending work.
- B. Type and Quality of Existing Products: Determine by inspecting and testing products where necessary, referring to existing work as a standard.
- C. Product Substitution: For any proposed change in materials, submit request for substitution described in Section 01 6000 - Product Requirements.

PART 3 EXECUTION**3.01 EXAMINATION**

- A. Verify that existing site conditions and substrate surfaces are acceptable for subsequent work. Start of work means acceptance of existing conditions.
- B. Verify that existing substrate is capable of structural support or attachment of new work being applied or attached.
- C. Examine and verify specific conditions described in individual specification sections.
- D. Take field measurements before confirming product orders or beginning fabrication, to minimize waste due to over-ordering or misfabrication.
- E. Verify that utility services are available, of the correct characteristics, and in the correct locations.
- F. Prior to Cutting: Examine existing conditions prior to commencing work, including elements subject to damage or movement during cutting and patching. After uncovering existing work, assess conditions affecting performance of work. Beginning of cutting or patching means acceptance of existing conditions.

3.02 PREPARATION

- A. Clean substrate surfaces prior to applying next material or substance.
- B. Seal cracks or openings of substrate prior to applying next material or substance.
- C. Apply manufacturer required or recommended substrate primer, sealer, or conditioner prior to applying any new material or substance in contact or bond.

3.03 PREINSTALLATION MEETINGS

- A. When required in individual specification sections, convene a preinstallation meeting at the site prior to commencing work of the section.
- B. Require attendance of parties directly affecting, or affected by, work of the specific section.
- C. Notify Architect 5 calendar days in advance of meeting date.
- D. Prepare agenda and preside at meeting:
 - 1. Review conditions of examination, preparation and installation procedures.
 - 2. Review coordination with related work.
- E. Record minutes and distribute copies within two days after meeting to participants, with 1 copies to Architect, Owner, participants, and those affected by decisions made.

3.04 LAYING OUT THE WORK

- A. Verify locations of survey control points prior to starting work.
- B. Promptly notify Architect of any discrepancies discovered.
- C. Contractor shall locate and protect survey control and reference points.
- D. Protect survey control points prior to starting site work; preserve permanent reference points during construction.
- E. Promptly report to Architect the loss or destruction of any reference point or relocation required because of changes in grades or other reasons.
- F. Replace dislocated survey control points based on original survey control. Make no changes without prior written notice to Architect.
- G. Utilize recognized engineering survey practices.
- H. Establish elevations, lines and levels. Locate and lay out by instrumentation and similar appropriate means:
 - 1. Site improvements including pavements; stakes for grading, fill and topsoil placement; utility locations, slopes, and invert elevations.
 - 2. Grid or axis for structures.
 - 3. Building foundation, column locations, ground floor elevations.
 - 4. Controlling lines and levels required for mechanical and electrical trades.
- I. Periodically verify layouts by same means.

- J. Maintain a complete and accurate log of control and survey work as it progresses.

3.05 GENERAL INSTALLATION REQUIREMENTS

- A. In addition to compliance with regulatory requirements, conduct construction operations in compliance with NFPA 241, including applicable recommendations in Appendix A.
- B. Install products as specified in individual sections, in accordance with manufacturer's instructions and recommendations, and so as to avoid waste due to necessity for replacement.
- C. Make vertical elements plumb and horizontal elements level, unless otherwise indicated.
- D. Install equipment and fittings plumb and level, neatly aligned with adjacent vertical and horizontal lines, unless otherwise indicated.
- E. Make consistent texture on surfaces, with seamless transitions, unless otherwise indicated.
- F. Make neat transitions between different surfaces, maintaining texture and appearance.

3.06 ALTERATIONS

- A. Drawings showing existing construction and utilities are based on casual field observation only.
 - 1. Verify that construction and utility arrangements are as indicated.
 - 2. Report discrepancies to Architect before disturbing existing installation.
 - 3. Beginning of alterations work constitutes acceptance of existing conditions.
- B. Keep areas in which alterations are being conducted separated from other areas that are still occupied.
 - 1. Provide, erect, and maintain temporary dustproof partitions.
- C. Maintain weatherproof exterior building enclosure except for interruptions required for replacement or modifications; take care to prevent water and humidity damage.
 - 1. Where openings in exterior enclosure exist, provide construction to make exterior enclosure weatherproof.
 - 2. Insulate existing ducts or pipes that are exposed to outdoor ambient temperatures by alterations work.
- D. Remove existing work as indicated and as required to accomplish new work.
 - 1. Remove items indicated on drawings.
 - 2. Relocate items indicated on drawings.
 - 3. Where new surface finishes are to be applied to existing work, perform removals, patch, and prepare existing surfaces as required to receive new finish; remove existing finish if necessary for successful application of new finish.
 - 4. Where new surface finishes are not specified or indicated, patch holes and damaged surfaces to match adjacent finished surfaces as closely as possible.
- E. Services (Including but not limited to HVAC, Plumbing, Fire Protection, Electrical, and Telecommunications): Remove, relocate, and extend existing systems to accommodate new construction.
 - 1. Maintain existing active systems that are to remain in operation; maintain access to equipment and operational components; if necessary, modify installation to allow access or provide access panel.
 - 2. Where existing systems or equipment are not active and Contract Documents require reactivation, put back into operational condition; repair supply, distribution, and equipment as required.
 - 3. Where existing active systems serve occupied facilities but are to be replaced with new services, maintain existing systems in service until new systems are complete and ready for service.
 - a. Disable existing systems only to make switchovers and connections; minimize duration of outages.
 - b. Provide temporary connections as required to maintain existing systems in service.
 - 4. Verify that abandoned services serve only abandoned facilities.
 - 5. Remove abandoned pipe, ducts, conduits, and equipment, including those above accessible ceilings; remove back to source of supply where possible, otherwise cap stub and tag with identification; patch holes left by removal using materials specified for new construction.

- F. Protect existing work to remain.
 - 1. Prevent movement of structure; provide shoring and bracing if necessary.
 - 2. Perform cutting to accomplish removals neatly and as specified for cutting new work.
 - 3. Repair adjacent construction and finishes damaged during removal work.
- G. Adapt existing work to fit new work: Make as neat and smooth transition as possible.
 - 1. Where removal of partitions or walls results in adjacent spaces becoming one, rework floors, walls, and ceilings to a smooth plane without breaks, steps, or bulkheads.
- H. Patching: Where the existing surface is not indicated to be refinished, patch to match the surface finish that existed prior to cutting. Where the surface is indicated to be refinished, patch so that the substrate is ready for the new finish.
- I. Refinish existing surfaces as indicated:
 - 1. Where rooms or spaces are indicated to be refinished, refinish all visible existing surfaces to remain to the specified condition for each material, with a neat transition to adjacent finishes.
 - 2. If mechanical or electrical work is exposed accidentally during the work, re-cover and refinish to match.
- J. Clean existing systems and equipment.
- K. Remove demolition debris and abandoned items from alterations areas and dispose of off-site; do not burn or bury.
- L. Do not begin new construction in alterations areas before demolition is complete.
- M. Comply with all other applicable requirements of this section.

3.07 CUTTING AND PATCHING

- A. Whenever possible, execute the work by methods that avoid cutting or patching.
- B. See Alterations article above for additional requirements.
- C. Perform whatever cutting and patching is necessary to:
 - 1. Complete the work.
 - 2. Fit products together to integrate with other work.
 - 3. Provide openings for penetration of mechanical, electrical, and other services.
 - 4. Match work that has been cut to adjacent work.
 - 5. Repair areas adjacent to cuts to required condition.
 - 6. Repair new work damaged by subsequent work.
 - 7. Remove samples of installed work for testing when requested.
 - 8. Remove and replace defective and non-complying work.
- D. Execute work by methods that avoid damage to other work and that will provide appropriate surfaces to receive patching and finishing. In existing work, minimize damage and restore to original condition.
- E. Employ skilled and experienced installer to perform cutting for weather exposed and moisture resistant elements, and sight exposed surfaces.
- F. Cut rigid materials using masonry saw or core drill. Pneumatic tools not allowed without prior approval.
- G. Restore work with new products in accordance with requirements of Contract Documents.
- H. Fit work air tight to pipes, sleeves, ducts, conduit, and other penetrations through surfaces.
- I. At penetrations of fire rated walls, partitions, ceiling, or floor construction, completely seal voids with fire rated material in accordance with Section 07 8400, to full thickness of the penetrated element.
- J. Patching:
 - 1. Finish patched surfaces to match finish that existed prior to patching. On continuous surfaces, refinish to nearest intersection or natural break. For an assembly, refinish entire unit.
 - a. This includes painted surfaces.
 - b. Where the surface is indicated to be refinished, patch so that the substrate is ready for the new finish.

2. Match color, texture, and appearance.
3. Repair patched surfaces that are damaged, lifted, discolored, or showing other imperfections due to patching work. If defects are due to condition of substrate, repair substrate prior to repairing finish.

3.08 PROGRESS CLEANING

- A. Maintain areas free of waste materials, debris, and rubbish. Maintain site in a clean and orderly condition.
- B. Remove debris and rubbish from pipe chases, plenums, attics, crawl spaces, and other closed or remote spaces, prior to enclosing the space.
- C. Broom and vacuum clean interior areas prior to start of surface finishing, and continue cleaning to eliminate dust.
- D. Collect and remove waste materials, debris, and trash/rubbish from site periodically and dispose off-site; do not burn or bury.

3.09 PROTECTION OF INSTALLED WORK

- A. Protect installed work from damage by construction operations.
- B. Provide special protection where specified in individual specification sections.
- C. Provide temporary and removable protection for installed products. Control activity in immediate work area to prevent damage.
- D. Provide protective coverings at walls, projections, jambs, sills, and soffits of openings.
- E. Protect finished floors, stairs, and other surfaces from traffic, dirt, wear, damage, or movement of heavy objects, by protecting with durable sheet materials.
- F. Prohibit traffic or storage upon waterproofed or roofed surfaces. If traffic or activity is necessary, obtain recommendations for protection from waterproofing or roofing material manufacturer.
- G. Remove protective coverings when no longer needed; reuse or recycle coverings if possible.

3.10 SYSTEM STARTUP

- A. Coordinate schedule for start-up of various equipment and systems.
- B. Notify Architect and Owner 7 calendar days prior to start-up of each item.
- C. Verify that each piece of equipment or system has been checked for proper lubrication, drive rotation, belt tension, control sequence, and for conditions that may cause damage.
- D. Verify tests, meter readings, and specified electrical characteristics agree with those required by the equipment or system manufacturer.
- E. Verify that wiring and support components for equipment are complete and tested.
- F. Execute start-up under supervision of applicable Contractor personnel and manufacturer's representative in accordance with manufacturers' instructions.
- G. When specified in individual specification Sections, require manufacturer to provide authorized representative to be present at site to inspect, check, and approve equipment or system installation prior to start-up, and to supervise placing equipment or system in operation.
- H. Submit a written report that equipment or system has been properly installed and is functioning correctly.

3.11 DEMONSTRATION AND INSTRUCTION

- A. Demonstrate operation and maintenance of products to Owner's personnel two weeks prior to date of Substantial Completion.
- B. Demonstrate start-up, operation, control, adjustment, trouble-shooting, servicing, maintenance, and shutdown of each item of equipment at agreed time, at equipment location.
- C. For equipment or systems requiring seasonal operation, perform demonstration for other season within six months.
- D. Provide a qualified person who is knowledgeable about the Project to perform demonstration and instruction of Owner's personnel.

- E. Utilize operation and maintenance manuals as basis for instruction. Review contents of manual with Owner's personnel in detail to explain all aspects of operation and maintenance.
- F. Prepare and insert additional data in operations and maintenance manuals when need for additional data becomes apparent during instruction.

3.12 ADJUSTING

- A. Adjust operating products and equipment to ensure smooth and unhindered operation.

3.13 FINAL CLEANING

- A. Use cleaning materials that are nonhazardous.
- B. Clean interior and exterior glass, surfaces exposed to view; remove temporary labels, stains and foreign substances, polish transparent and glossy surfaces, vacuum carpeted and soft surfaces.
- C. Remove all labels that are not permanent. Do not paint or otherwise cover fire test labels or nameplates on mechanical and electrical equipment.
- D. Clean equipment and fixtures to a sanitary condition with cleaning materials appropriate to the surface and material being cleaned.
- E. Clean filters of operating equipment.
- F. Clean debris from roofs, gutters, downspouts, scuppers, overflow drains, area drains, and drainage systems.
- G. Clean site; sweep paved areas, rake clean landscaped surfaces.
- H. Remove waste, surplus materials, trash/rubbish, and construction facilities from the site; dispose of in legal manner; do not burn or bury.

3.14 CLOSEOUT PROCEDURES

- A. Make submittals that are required by governing or other authorities.
- B. Accompany Contractor on preliminary inspection to determine items to be listed for completion or correction in the Contractor's Correction Punch List for Contractor's Notice of Substantial Completion.
- C. Notify Architect when work is considered ready for Architect's Substantial Completion inspection.
- D. Submit written certification containing Contractor's Correction Punch List, that Contract Documents have been reviewed, work has been inspected, and that work is complete in accordance with Contract Documents and ready for Architect's Substantial Completion inspection.
- E. Conduct Substantial Completion inspection and create Final Correction Punch List containing Architect's and Contractor's comprehensive list of items identified to be completed or corrected and submit to Architect.
- F. Correct items of work listed in Final Correction Punch List and comply with requirements for access to Owner-occupied areas.
- G. Notify Architect when work is considered finally complete and ready for Architect's Substantial Completion final inspection.
- H. Complete items of work determined by Architect listed in executed Certificate of Substantial Completion.

3.15 MAINTENANCE

- A. Provide service and maintenance of components indicated in specification sections.
- B. Maintenance Period: As indicated in specification sections or, if not indicated, not less than one year from the Date of Substantial Completion or the length of the specified warranty, whichever is longer.
- C. Examine system components at a frequency consistent with reliable operation. Clean, adjust, and lubricate as required.

- D. Include systematic examination, adjustment, and lubrication of components. Repair or replace parts whenever required. Use parts produced by the manufacturer of the original component.
- E. Maintenance service shall not be assigned or transferred to any agent or subcontractor without prior written consent of the Owner.

END OF SECTION

SECTION 01 7329 - CUTTING AND PATCHING

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Cutting and patching.

1.02 REFERENCE STANDARDS

- A. NFPA 241 - Standard for Safeguarding Construction, Alteration, and Demolition Operations; 2013.

1.03 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Cutting and Patching: Submit written request in advance of cutting or alteration that affects:
 - 1. Structural integrity of any element of Project.
 - 2. Integrity of weather exposed or moisture resistant element.
 - 3. Efficiency, maintenance, or safety of any operational element.
 - 4. Visual qualities of sight exposed elements.
 - 5. Work of Owner or separate Contractor.
 - 6. Include in request:
 - a. Location and description of affected work.
 - b. Necessity for cutting or alteration.
 - c. Description of proposed work and products to be used.
 - d. Effect on work of Owner or separate Contractor.
- C. Warranties: For each affected material under warranty, submit written verification, signed by manufacturer of existing materials, stating that the Owner's full warranty will remain in effect after cutting and patching operations have been completed.

1.04 WARRANTIES

- A. Existing Warranties: Remove, replace, patch, and repair materials and surfaces cut or damaged during cutting and patching operations, by methods and with materials so as not to void existing warranties.
 - 1. Materials that are still under warranty include, but are not limited to, the following:
 - a. .
 - b. .
 - c. .

PART 2 PRODUCTS

2.01 PATCHING MATERIALS

- A. New Materials: As specified in product sections; match existing products and work for patching and extending work.
- B. Type and Quality of Existing Products: Determine by inspecting and testing products where necessary, referring to existing work as a standard.
- C. Product Substitution: For any proposed change in materials, submit request for substitution described in Section 01 6000 - Product Requirements.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Prior to Cutting: Examine existing conditions prior to commencing work, including elements subject to damage or movement during cutting and patching. After uncovering existing work, assess conditions affecting performance of work. Beginning of cutting or patching means acceptance of existing conditions.
- B. Prior to Patching: Before patching, verify compatibility and suitability of substrates, including compatibility with existing finishes or primers. Beginning of patching means acceptance of existing conditions.

3.02 PREPARATION

- A. Clean substrate surfaces prior to applying next material or substance.

- B. Seal cracks or openings of substrate prior to applying next material or substance.
- C. Apply manufacturer required or recommended substrate primer, sealer, or conditioner prior to applying any new material or substance in contact or bond.
- D. Protect existing work to remain.
 - 1. Prevent movement of structure; provide shoring and bracing if necessary.
 - 2. Perform cutting to accomplish removals neatly and as specified for cutting new work.
- E. Existing Services: Where existing services are required to be removed, relocated, or abandoned, bypass such services before cutting to avoid interruption of services to occupied areas.

3.03 CUTTING AND PATCHING

- A. Whenever possible, execute the work by methods that avoid cutting or patching.
- B. Perform whatever cutting and patching is necessary to:
 - 1. Complete the work.
 - 2. Fit products together to integrate with other work.
 - 3. Provide openings for penetration of mechanical, electrical, and other services.
 - 4. Match work that has been cut to adjacent work.
 - 5. Repair areas adjacent to cuts to required condition.
 - 6. Repair new work damaged by subsequent work.
 - 7. Remove samples of installed work for testing when requested.
 - 8. Remove and replace defective and non-conforming work.
- C. Execute work by methods that avoid damage to other work and that will provide appropriate surfaces to receive patching and finishing. In existing work, minimize damage and restore to original condition.
- D. Employ skilled and experienced installer to perform cutting for weather exposed and moisture resistant elements, and sight exposed surfaces.
- E. Cutting:
 - 1. In general, use hand or small power tools designed for sawing and grinding, not hammering and chopping. Cut holes and slots as small as possible, neatly to size required, and with minimum disturbance of adjacent surfaces.
 - 2. Cut rigid materials using masonry saw or core drill. Pneumatic tools not allowed without prior approval.
 - 3. Mechanical and Electrical Services: Cut off pipe or conduit in walls or partitions to be removed. Cap, valve, or plug and seal remaining portion of pipe or conduit to prevent entrance of moisture or other foreign matter after cutting.
- F. Restore work with new products in accordance with requirements of Contract Documents.
- G. Fit work air tight to pipes, sleeves, ducts, conduit, and other penetrations through surfaces.
- H. At penetrations of fire rated walls, partitions, ceiling, or floor construction, completely seal voids with fire rated material in accordance with Section 07 8400 - Firestopping, to full thickness of the penetrated element.
- I. Patching:
 - 1. Repair adjacent construction and finishes damaged during removal work and cutting work.
 - 2. Finish patched surfaces to match finish that existed prior to patching. On continuous surfaces, refinish to nearest intersection or natural break. For an assembly, refinish entire unit.
 - a. This includes painted surfaces.
 - b. Where the surface is indicated to be refinished, patch so that the substrate is ready for the new finish.
 - 3. Match color, texture, and appearance.
 - 4. Repair patched surfaces that are damaged, lifted, discolored, or showing other imperfections due to patching work. If defects are due to condition of substrate, repair substrate prior to repairing finish.

END OF SECTION

SECTION 02 4100 - DEMOLITION**PART 1 GENERAL****1.01 SECTION INCLUDES**

- A. Selective demolition of built site elements.
- B. Selective demolition of building elements for alteration purposes.
- C. Abandonment and removal of existing utilities and utility structures.
- D. Salvaged items.
- E. Removed and reinstalled items.

1.02 RELATED REQUIREMENTS

- A. Section 04 2000 - Unit Masonry: Salvaging existing brick.

1.03 REFERENCE STANDARDS

- A. NFPA 241 - Standard for Safeguarding Construction, Alteration, and Demolition Operations 2022.
- B. RFCI (RWP) - Recommended Work Practices for Removal of Resilient Floor Coverings 2011.

1.04 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Project Record Documents: Accurately record actual locations of capped and active utilities and subsurface construction.

1.05 QUALITY ASSURANCE

- A. Demolition Firm Qualifications: Company specializing in the type of work required.
 - 1. Minimum of 5 years of documented experience.

PART 2 PRODUCTS - NOT USED**2.01 MATERIALS**

- A. Fill Material: As specified in Division 31.

PART 3 EXECUTION**3.01 SCOPE**

- A. Remove portions of existing building as indicated on Drawings including, but not limited to, the following:
 - 1. Remove all paving and curbs as indicated on drawings.
 - 2. Remove indicated foundation walls and footings completely.
 - 3. Remove concrete slabs on grade as indicated on drawings.
 - 4. Remove manholes and manhole covers, curb inlets and catch basins.
 - 5. Remove other items indicated, for salvage and relocation.
 - 6. Unless otherwise indicated, fill excavations, open pits, and holes in ground areas generated as result of removals, using specified fill; compact fill as specified in Division 31.

3.02 GENERAL PROCEDURES AND PROJECT CONDITIONS

- A. Comply with other requirements specified in Section 01 7000.
- B. Comply with applicable codes and regulations for demolition operations and safety of adjacent structures and the public.
 - 1. Obtain required permits.
 - 2. Comply with applicable requirements of NFPA 241.
 - 3. Prior to start of demolition operations, perform an engineering survey of building condition to determine whether removing any element might result in structural deficiency or unplanned collapse of any portion of structure or adjacent structures.
 - 4. Use of explosives is not permitted.
 - 5. Take precautions to prevent catastrophic or uncontrolled collapse of structures to be removed; do not allow worker or public access within range of potential collapse of unstable structures.
 - 6. Provide, erect, and maintain temporary barriers and security devices.

7. Conduct operations to minimize effects on and interference with adjacent structures and occupants.
 8. Do not close or obstruct roadways or sidewalks without permit.
 9. Conduct operations to minimize obstruction of public and private entrances and exits; do not obstruct required exits at any time; protect persons using entrances and exits from removal operations.
 10. Obtain written permission from owners of adjacent properties when demolition equipment will traverse, infringe upon or limit access to their property.
- C. Do not begin removal until receipt of notification to proceed from Owner.
 - D. Do not begin removal until built elements to be salvaged or relocated have been removed.
 - E. Protect existing structures and other elements that are not to be removed.
 1. Provide bracing and shoring.
 2. Prevent movement or settlement of adjacent structures.
 3. Stop work immediately if adjacent structures appear to be in danger.
 - F. Minimize production of dust due to demolition operations; do not use water if that will result in ice, flooding, sedimentation of public waterways or storm sewers, or other pollution.
 - G. If hazardous materials are discovered during removal operations, stop work and notify Architect and Owner; hazardous materials include regulated asbestos containing materials, lead, PCB's, and mercury.
 - H. Partial Removal of Paving and Curbs: Neatly saw cut at right angle to surface.

3.03 SELECTIVE DEMOLITION PROCEDURES FOR SPECIFIC MATERIALS

- A. Concrete: Demolish in sections. Cut concrete full depth at junctures with construction to remain and at regular intervals using power-driven saw, and then remove concrete between saw cuts.
 1. Where concrete cannot be cut full depth, cut concrete to a depth of at least 3/4 inch. Dislodge concrete from reinforcement at perimeter of areas being demolished, cut reinforcement, and then remove remainder of concrete. Neatly trim openings to dimensions indicated.
- B. Masonry: Demolish in small sections. Cut masonry at junctures with construction to remain, using power-driven saw, and then remove masonry between saw cuts.
 1. Refer to Section 04 2000 - Unit Masonry for salvaging brick.
- C. Concrete Slabs-on-Grade: Saw-cut perimeter of area to be demolished, and then break up and remove.
- D. Resilient Floor Coverings: Remove floor coverings and adhesive according to recommendations in RFCI (RWP). Do not use methods requiring solvent-based adhesive strippers.
- E. Carpet: Remove carpet and adhesive according to industry standard and below. Do not use methods requiring solvent-based adhesive strippers.
 1. Remove carpet in manageable sections and dispose.
 2. Using a floor scraper, scrape residual of carpet and adhesive from concrete.
 3. Sand the floor by mechanical means starting with a heavy grit to remove the bulk of the left adhesive and then a finer grit (approx 300) for the finish sand to allow new finish to be applied.

3.04 EXISTING UTILITIES

- A. Coordinate work with utility companies; notify before starting work and comply with their requirements; obtain required permits.
- B. Protect existing utilities to remain from damage.
- C. Do not disrupt public utilities without permit from authority having jurisdiction.
- D. Do not close, shut off, or disrupt existing life safety systems that are in use without at least 7 days prior written notification to Owner.
- E. Do not close, shut off, or disrupt existing utility branches or take-offs that are in use without at least 3 days prior written notification to Owner.

- F. Locate and mark utilities to remain; mark using highly visible tags or flags, with identification of utility type; protect from damage due to subsequent construction, using substantial barricades if necessary.
- G. Remove exposed piping, valves, meters, equipment, supports, and foundations of disconnected and abandoned utilities.
- H. Prepare building demolition areas by disconnecting and capping utilities outside the demolition zone; identify and mark utilities to be subsequently reconnected, in same manner as other utilities to remain.

3.05 SELECTIVE DEMOLITION FOR ALTERATIONS

- A. Drawings showing existing construction and utilities are based on casual field observation and existing record documents only.
 - 1. Verify that construction and utility arrangements are as indicated.
 - 2. Report discrepancies to Architect before disturbing existing installation.
 - 3. Beginning of demolition work constitutes acceptance of existing conditions that would be apparent upon examination prior to starting demolition.
- B. Separate areas in which demolition is being conducted from other areas that are still occupied.
 - 1. Provide, erect, and maintain temporary dustproof partitions of construction as specified and/or indicated on Drawings .
- C. Maintain weatherproof exterior building enclosure except for interruptions required for replacement or modifications; take care to prevent water and humidity damage.
- D. Remove existing work as indicated and as required to accomplish new work.
 - 1. Remove items indicated on Drawings.
- E. Services (Including but not limited to HVAC, Plumbing, Fire Protection, Electrical, and Telecommunications): Remove existing systems and equipment as indicated.
 - 1. Maintain existing active systems that are to remain in operation; maintain access to equipment and operational components.
 - 2. Where existing active systems serve occupied facilities but are to be replaced with new services, maintain existing systems in service until new systems are complete and ready for service.
 - 3. Verify that abandoned services serve only abandoned facilities before removal.
 - 4. Remove abandoned pipe, ducts, conduits, and equipment, including those above accessible ceilings; remove back to source of supply where possible, otherwise cap stub and tag with identification.
- F. Protect existing work to remain.
 - 1. Prevent movement of structure; provide shoring and bracing if necessary.
 - 2. Perform cutting to accomplish removals neatly and as specified for cutting new work.
 - 3. Repair adjacent construction and finishes damaged during removal work.
 - 4. Patch as specified for patching new work.

3.06 SALVAGED ITEMS

- A. Clean salvaged items.
- B. Pack or crate items after cleaning. Identify contents of containers.
- C. Store items in a secure area until delivery to Owner.
- D. Transport items to Owner's storage area on-site.
- E. Protect items from damage during transport and storage.

3.07 REMOVED AND REINSTALLED ITEMS

- A. Clean and repair items to functional condition adequate for intended reuse.
- B. Pack or crate items after cleaning and repairing. Identify contents of containers.
- C. Protect items from damage during transport and storage.
- D. Reinstall items in locations indicated. Comply with installation requirements for new materials and equipment. Provide connections, supports, and miscellaneous materials necessary to make item functional for use indicated.

3.08 EXISTING ITEMS TO REMAIN

- A. Protect construction indicated to remain against damage and soiling during selective demolition. When permitted by Architect, items may be removed to a suitable, protected storage location during selective demolition and cleaned and reinstalled in their original locations after selective demolition operations are complete

3.09 DEBRIS AND WASTE REMOVAL

- A. Remove debris, junk, and trash from site.
- B. Leave site in clean condition, ready for subsequent work.
- C. Clean up spillage and wind-blown debris from public and private lands.

END OF SECTION

SECTION 04 2000 - UNIT MASONRY**PART 1 GENERAL****1.01 SECTION INCLUDES**

- A. Concrete block.
- B. Clay facing brick.
- C. Reinforcement and anchorage.
- D. Flashings.
- E. Cavity wall insulation.
- F. Lintels.
- G. Accessories.
- H. Products installed under this section:
 - 1. Precast architectural concrete units set in masonry; furnished by Section 03 4500 - Precast Architectural Concrete.
 - 2. Cast stone units set in masonry; furnished by Section 04 7200 - Cast Stone Masonry.
 - 3. Loose steel lintels in unit masonry; furnished by Section 05 5000 - Metal Fabrications.
 - 4. Manufactured reglets embedded in unit masonry; furnished by Section 07 6200 - Sheet Metal Flashing and Trim.
- I. Products furnished under this section:
 - 1. Dovetail anchor slots for connecting masonry to cast-in-place concrete; installed by Section 03 3000 - Cast-in-Place Concrete.
 - 2. Structural steel anchor sections for connecting masonry to structural steel; installed by Section 05 1200 - Structural Steel Framing.

1.02 REFERENCE STANDARDS

- A. ACI 315 - Guide to Presenting Reinforcing Steel Design Details; 2018.
- B. ASTM D1056 - Standard Specification for Flexible Cellular Materials—Sponge or Expanded Rubber 2020.
- C. ASTM D2000 - Standard Classification System for Rubber Products in Automotive Applications 2018.
- D. NFPA 285 - Standard Fire Test Method for Evaluation of Fire Propagation Characteristics of Exterior Wall Assemblies Containing Combustible Components 2019.
- E. ASTM A153/A153M - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware 2016a.
- F. ASTM A240/A240M - Standard Specification for Chromium and Chromium-Nickel Stainless Steel Plate, Sheet, and Strip for Pressure Vessels and for General Applications 2020a.
- G. ASTM A615/A615M - Standard Specification for Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement 2020.
- H. ASTM A641/A641M - Standard Specification for Zinc-Coated (Galvanized) Carbon Steel Wire 2019.
- I. ASTM A1064/A1064M - Standard Specification for Carbon-Steel Wire and Welded Wire Reinforcement, Plain and Deformed, for Concrete 2018a.
- J. ASTM C90 - Standard Specification for Loadbearing Concrete Masonry Units 2021.
- K. ASTM C91/C91M - Standard Specification for Masonry Cement 2018.
- L. ASTM C144 - Standard Specification for Aggregate for Masonry Mortar 2018.
- M. ASTM C216 - Standard Specification for Facing Brick (Solid Masonry Units Made From Clay or Shale) 2021.
- N. ASTM C270 - Standard Specification for Mortar for Unit Masonry 2019a.
- O. ASTM C404 - Standard Specification for Aggregates for Masonry Grout 2018.
- P. ASTM C476 - Standard Specification for Grout for Masonry 2020.
- Q. ASTM C979/C979M - Standard Specification for Pigments for Integrally Colored Concrete 2016.

- R. ASTM C1072 - Standard Test Methods for Measurement of Masonry Flexural Bond Strength 2019.
- S. ASTM C1314 - Standard Test Method for Compressive Strength of Masonry Prisms 2021.
- T. ASTM C 1329 - Standard Specification for Mortar Cement - 2016.
- U. ASTM C1714/C1714M - Standard Specification for Preblended Dry Mortar Mix for Unit Masonry 2019a.
- V. ASTM D226/D226M - Standard Specification for Asphalt-Saturated Organic Felt Used in Roofing and Waterproofing 2017.
- W. ASTM E514/E514M - Standard Test Method for Water Penetration and Leakage Through Masonry 2020.
- X. BIA Technical Notes No. 7 - Water Penetration Resistance – Design and Detailing 2017.
- Y. BIA Technical Notes No. 13 - Ceramic Glazed Brick Exterior Walls 2017.
- Z. TMS 402/602 - Building Code Requirements and Specification for Masonry Structures 2016.

1.03 ADMINISTRATIVE REQUIREMENTS

- A. Product Coordination and Limitations: Provide products that when combined with materials and components of other sections, form exterior wall assemblies as detailed on Drawings, that comply with NFPA 285 testing and acceptance criteria.

1.04 SUBMITTALS

- A. Product Data: Provide data for the following:
 - 1. Masonry Units:
 - a. Include data on material properties.
 - b. Masonry units used in structural masonry, include data and calculations establishing average net-area compressive strength of units.
 - 2. Brick units:
 - a. For exposed brick, include test report for efflorescence according to ASTM C 67.
 - b. Include size-variation data verifying that the actual range of sizes falls within specified tolerances.
 - 3. Cementitious materials. Include name of manufacturer, brand name and type.
 - 4. Mortar admixtures.
 - 5. Preblended, dry mortar mixes. Include description of type and proportion of ingredients.
 - 6. Grout mixes. Include description of type and proportion of ingredients.
 - 7. Sound Isolating anchors.
 - 8. Anchors, ties, weep/cavity vent, preformed control-joint gaskets, cavity drainage material, and metal accessories.
- B. Shop Drawings: Indicate pertinent dimensions, materials, anchorage, size and type of fasteners, and accessories for masonry.
 - 1. Masonry Units: Indicate sizes, profiles, coursing, and locations of special units.
 - 2. Reinforcing: Indicate bending, lap lengths, and placement of unit masonry reinforcing bars.
 - a. Comply with ACI 315.
 - 3. Flashings: Provide details of embedded flashings including end dams, corners, drips, weeps.
- C. Mix Designs: For each type of mortar and grout. Include description of type and proportions of ingredients.
 - 1. Include test reports for mortar mixes required to comply with property specification. Test according to ASTM C 109/C 109M for compressive strength, ASTM C 1506 for water retention, and ASTM C91/C 91M for air content.
 - 2. Include test reports, according to ASTM C 1019, for grout mixes required to comply with compressive strength requirements.
- D. Samples: Submit 3 samples of standard block, decorative block, facing brick, ceramic glazed facing brick, and ceramic glazed structural clay facing tile units to illustrate color, texture, and extremes of color range.

- E. Manufacturer's Certificate: Certify that water repellent admixture manufacturer has certified masonry unit manufacturer as an approved user of water repellent admixture in the manufacture of concrete block.
- F. Test Reports:
 - 1. Concrete masonry manufacturer's test reports for units with integral water repellent admixture.
 - 2. Masonry Veneer Anchors: At wall cavities greater than 4-1/2 inches, provide masonry veneer anchor manufacturer's test reports indicating compliance with TMS 402/602 for lateral load requirements; wall cavity depth includes airspace and cavity wall insulation thickness.
- G. NFPA 285 Documentation: For each product, submit documentation listing compatible materials and components that when used together in wall assemblies as detailed on Drawings, comply with NFPA 285 testing and acceptance criteria.
- H. Manufacturer's Qualification Statement.
- I. Installer's Qualification Statement.
- J. Cold-Weather and Hot-Weather Procedures: Detail description of methods, material, and equipment to be used to comply with requirements.

1.05 QUALITY ASSURANCE

- A. Comply with provisions of TMS 402/602, except where exceeded by requirements of Contract Documents.
- B. Fire Rated Assemblies: Comply with applicable codes and UL Assembly Numbers indicated.
- C. Manufacturer Qualifications: Company specializing in manufacturing the type of products specified in this section with minimum 5 years of documented experience.
- D. Installer Qualifications: Company specializing in performing work of the type specified and with at least 5 years of documented experience.

1.06 MOCK-UPS

- A. Build mockups to verify selections made under Sample submittals, to demonstrate aesthetic effects, and to set quality standards for material and execution.
- B. Construct a masonry wall as a mock-up panel sized 8 feet long by 6 feet high; include mortar, accessories, structural backup, wall openings, flashings (with lap joint, corner, and end dam), through-wall flashing (omit masonry above half of flashings, wall insulation, and sealant-filled joint at least 16 inches long in exterior wall in mock-up).
- C. Include lower corner of window opening at upper corner of exterior wall mockup. Make opening approximately 12 inches wide by 16 inches high.
- D. Locate where directed.
- E. Where masonry is to match existing, erect mockups adjacent and parallel to existing surface.
- F. Clean one-half of exposed faces of mockups with masonry cleaner as indicated.
- G. Approval of mockups is for color, texture, and blending of masonry units; relationship of mortar and sealant colors to masonry unit colors; tooling of joints; and aesthetic qualities of workmanship.
 - 1. Approval of mockups is also for other materials and construction qualities specifically approved by Architect in writing.
 - 2. Approval of mockups does not constitute approval of deviations from Contract Documents contained in the mock-ups unless Architect specifically approves such deviations in writing.

1.07 DELIVERY, STORAGE, AND HANDLING

- A. Deliver, handle, and store masonry units by means that will prevent mechanical damage and contamination by other materials.
- B. Store masonry units on elevated platforms in a dry location. If units are not stored in a enclosed location, cover tops and sides of stacks with waterproof sheeting, securely tied. If

- units become wet, do not install until they are dry.
- C. Store cementitious materials on elevated platforms, under cover, and in a dry location. Do not use cementitious materials that have become damp.
 - D. Deliver preblended, dry mortar mix in moisture-resistant containers. Store preblended, dry mortar mix in delivery containers on elevated platforms in a dry location or in covered weatherproof dispensing silos.
 - E. Store masonry accessories, including metal items, to prevent corrosion and accumulation of dirt and oil.
 - F. Handle and store ceramic glazed masonry units in protective cartons or trays. Do not remove from protective packaging until ready for installation.

1.08 FIELD CONDITIONS

- A. Protection of Masonry: During construction, cover tops of walls, protections, and sills with waterproof sheeting at end of each days's work. Cover partially completed masonry when construction is not in progress.
 - 1. Extend cover a minimum of 24 inches (600 mm) down both sides of walls, and hold cover securely in place.
 - 2. Where one wythe of multiwythe masonry walls is completed in advance of other wythes, secure cover a minimum of 24 inches (600 mm) down face next to unconstructed wythe, and hold cover in place.
- B. Do not apply uniform floor or roof loads for at least 12 hours and concentrated loads for at least three days after building masonry walls or columns.
- C. Stain Prevention: Prevent grout, mortar, and soil from staining the face of masonry to be left exposed or painted. Immediately remove grout, mortar, and soil that come in contact with such masonry.
 - 1. Protect base of walls from rain-splashed mud and from mortar splatter by spreading coverings on ground and over wall surface.
 - 2. Protect sills, ledges, and projections from mortar droppings.
 - 3. Protect surfaces of window and door frames, as well as similar products with painted and integral finishes, from mortar droppings.
 - 4. Turn scaffold boards near the wall on edge at the end of each day to prevent rain from splashing mortar and dirt onto completed masonry.
- D. Cold-Weather Requirements: Do not use frozen materials or materials mixed or coated with ice or frost. Do not build on frozen substrates. Remove and replace unit masonry damaged by frost or by freezing conditions. Comply with cold-weather construction requirements contained in **TMS 602/ACI 530.1/ASCE 6**.
 - 1. Cold-Weather Cleaning: Use liquid cleaning methods only when air temperature is 40 deg F (4 deg C) and higher and will remain so until masonry has dried, but not less than seven days after completing cleaning.
- E. Hot-Weather Requirements: Comply with hot-weather construction requirements contained in **TMS 602/ACI 530.1/ASCE 6**.

PART 2 PRODUCTS

2.01 UNIT MASONRY, GENERAL

- A. Masonry Standard: Comply with TMS 602/ACI 530.1/ASCE 6, except as modified by requirements in the Contract Documents.
- B. Defective Units: Referenced masonry unit standards may allow a certain percentage of units to contain chips, cracks, or other defects exceeding limits stated. Do not use units where such defects are exposed in the completed Work and will be within 20 feet (6 m) vertically and horizontally of a walking surface.
- C. Fire-Resistance Ratings: Comply with requirements for fire-resistance-rated assembly designs indicated.

1. Where fire-resistance-rated construction is indicated, units shall be listed and labeled by a qualified testing agency acceptable to authorities having jurisdiction.

2.02 CONCRETE MASONRY UNITS (CMU)

- A. Concrete Block: Comply with referenced standards and as follows:
 1. Size: Standard units with nominal face dimensions of 16 by 8 inches and nominal depths as indicated on drawings for specific locations.
 2. Special Shapes: Provide non-standard blocks configured for corners, lintels, headers, control joint edges, and other detailed conditions.
 3. Exposed Outside Block Corners: Provide bullnose, radiused, corners unless otherwise indicated on Drawings.
 - a. Field-ground radiused corners are not permitted.
 - b. Stop bullnose at bulkhead/soffits.
 - c. Provide square corners at door frame even with block and bullnose where door frame is set back from corner.
 4. Load-Bearing and Non-Loadbearing Units: ASTM C90, normal weight.
 - a. Standard Units:
 - 1) Exposed Faces: Manufacturer's standard color and texture as approved by Architect per ASTM C90.
 - 2) Manufacturers:
 - (a) Best Block Company: www.bestblock.net.
 - (b) Consumers Concrete Corp.: www.consumersconcrete.com.
 - (c) Echelon by Oldcastle: www.echelonmasonry.com.
 - (d) Fendt Builder's Supply, Inc.: www.fendtproducts.com.
 - (e) Grand Blanc Cement Products: www.grandblancementproducts.com.
 - (f) Michigan Certified Products, Inc.: www.micertconcrete.com.
 - (g) National Block Company: www.nationalblock.com.
 - (h) Substitutions: See Section 01 6000 - Product Requirements.
 - b. Decorative Units:
 - 1) Ground-face:
 - (a) Color: [_____].
 - (b) Factory-Applied Sealer: Not Allowed.
 - (1) Refer to Section 09 9100 - Painting for field applied sealer.
 - (c) Manufacturers:
 - (1) Grand Blanc Cement Products: www.grandblancementproducts.com.
 - (2) Substitutions: Not permitted.
 - 2) Split-face:
 - (a) Color: [_____].
 - (b) Factory-Applied Sealer: Not Allowed.
 - (1) Refer to Section 09 9100 - Painting for field applied sealer.
 - (c) Manufacturers:
 - (1) Grand Blanc Cement Products: www.grandblancementproducts.com.
 - (2) Substitutions: Not permitted.
 - 3) Scored: Vertical single score.
 - (a) Color: Manufacturer's standard color and texture.
 - (b) Manufacturers:
 - (1) Best Block Company: www.bestblock.net.
 - (2) Consumers Concrete Corp.: www.consumersconcrete.com.
 - (3) Echelon by Oldcastle: www.echelonmasonry.com.
 - (4) Fendt Builder's Supply, Inc.: www.fendtproducts.com.
 - (5) Grand Blanc Cement Products: www.grandblancementproducts.com.
 - (6) Michigan Certified Products, Inc.: www.micertconcrete.com.
 - (7) National Block Company: www.nationalblock.com.
 - (8) Substitutions: See Section 01 6000 - Product Requirements.
 - 4) Ribbed: Vertically ribbed and split.
 - (a) Color: Manufacturer's standard color and texture.
 - (b) Manufacturers:

- (1) Consumers Concrete Corp.: www.consumersconcrete.com.
 - (2) Echelon by Oldcastle: www.echelonmasonry.com.
 - (3) Fendt Builder's Supply, Inc.: www.fendtproducts.com.
 - (4) Grand Blanc Cement Products: www.grandblancementproducts.com.
 - (5) Michigan Certified Products, Inc.: www.micertconcrete.com.
 - (6) National Block Company: www.nationalblock.com.
 - (7) Substitutions: See Section 01 6000 - Product Requirements.
5. Units with Integral Water Repellent: Concrete block units as specified in this section with polymeric liquid admixture added to concrete masonry units at the time of manufacture.
- a. Locations: Provide at exposed exterior concrete block and elsewhere as indicated.
 - b. Performance of Units with Integral Water Repellent:
 - 1) Water Permeance: When tested per ASTM E514/E514M and for a minimum of 72 hours.
 - (a) No water visible on back of wall above flashing at the end of 24 hours.
 - (b) No flow of water from flashing equal to or greater than 0.032 gallons per hour at the end of 24 hours.
 - (c) No more than 25 percent of wall area above flashing visibly damp at end of test.
 - 2) Flexural Bond Strength: ASTM C1072; minimum 10 percent increase.
 - 3) Compressive Strength: ASTM C1314; maximum 5 percent decrease.
 - c. Limitations:
 - 1) Use only in combination with mortar containing integral water repellent admixture.
 - 2) Source Limitations: Use water repellent admixtures for masonry units and mortar from a single manufacturer.
 - d. Products:
 - 1) BASF Corp.; MasterPel 240: www.master-builders-solutions.basf.us.
 - 2) Euclid Chemical Company (The); an RPM company; Eucon Blocktite Admixture: www.euclidchemical.com.
 - 3) GCP Applied Technologies Inc.; Dry-Block Block Admixture: www.gcpat.com.
 - 4) Substitutions: See Section 01 6000 - Product Requirements.

2.03 BRICK UNITS

- A. General: Provide shapes indicated and as follows, with exposed surfaces matching finish and color of exposed faces of adjacent units:
 1. For ends of sills and caps and for similar applications that would otherwise expose unfinished brick surfaces, provide units without cores or frogs and with exposed surfaces finished.
 2. Provide special shapes for applications where stretcher units cannot accommodate special conditions, including those at corners, movement joints, bond beams, sashes, and lintels.
 3. Provide special shapes for applications requiring brick of size, form, color, and texture on exposed surfaces that cannot be produced by sawing.
 4. Provide special shapes for applications where shapes produced by sawing would result in sawed surfaces being exposed to view.
- B. Manufacturers: Provide products from the manufacturer listed for each brick type.
 1. Substitutions: Not permitted.
- C. Facing Brick:
 1. Special shapes: Provide molded units as required by conditions indicated, unless standard units can be sawn to produce equivalent effect.
 2. Type A: Field Brick.
 - a. Manufacturer: Belden Brick Company: www.beldinbrick.com.
 - 1) Substitutions: Not permitted.
 - b. ASTM C216, Type FBS, Grade SW.
 - c. Size (Actual): 3-5/8 inches wide by 2-1/4 inches high by 7-5/8 inches long (Modular).
 - d. Color/Blend: [_____].

- e. Texture: Velour.
- 3. Type B: Accent Brick.
 - a. Manufacturer: Glen-Gery Corp.: www.glengery.com.
 - 1) Substitutions: Not permitted.
 - b. ASTM C216, Type FBS, Grade SW.
 - c. Size (Nominal): 3-5/8 inches wide by 3-5/8 inches high by 11-5/8 inches long (Utility).
 - d. Color/Blend: [_____].
 - e. Texture: Wire-cut.
- 4. Type C: Accent Brick.
 - a. Manufacturer: Endicott Clay Products Company: www.endicott.com.
 - 1) Substitutions: Not permitted.
 - b. ASTM C216, Type FBS, Grade SW.
 - c. Size (Actual): 3-5/8 inches wide by 2-1/4 inches high by 7-5/8 inches long (Modular).
 - d. Color/Blend: [_____].
 - e. Texture: Matt.

2.04 MORTAR AND GROUT MATERIALS

- A. Masonry Cement: ASTM C91/C91M.
- B. Mortar Cement: ASTM C1329.
- C. Mortar Aggregate: ASTM C144.
- D. Grout Aggregate: ASTM C404.
- E. Pigments for Colored Mortar: Pure, concentrated mineral pigments specifically intended for mixing into mortar and complying with ASTM C979/C979M.
 - 1. Color(s): As selected by Architect from manufacturer's full range.
 - 2. Manufacturers:
 - a. Davis Colors: www.daviscolors.com.
 - b. Lambert Corporation: www.lambertusa.com.
 - c. Solomon Colors: www.solomoncolors.com/sle.
 - d. Substitutions: See Section 01 6000 - Product Requirements.
- F. Water: Clean and potable.
- G. Integral Water Repellent Admixture for Mortar: Polymeric liquid admixture added to mortar at the time of manufacture.
 - 1. Locations: Provide at exposed exterior concrete block and elsewhere as indicated.
 - 2. Limitations:
 - a. Use only in combination with masonry units manufactured with integral water repellent admixture.
 - b. Source Limitations: Use water repellent admixtures for masonry units and mortar from a single manufacturer.
 - 3. Meet or exceed performance specified for water repellent admixture used in masonry units.
 - 4. Products:
 - a. BASF Corp.; MasterPel 210MA: www.master-builders-solutions.basf.us.
 - b. Euclid Chemical Company (The); an RPM company; Blocktite Mortar Admixture: www.euclidchemical.com.
 - c. GCP Applied Technologies Inc.; Dry-Block Mortar Admixture: www.gcpat.com.
 - d. Substitutions: See Section 01 6000 - Product Requirements.
- H. Packaged Dry Material for Mortar for Unit Masonry:
 - 1. At Contractor's option, prepackaged dry material for mortar may be used subject to compliance with mortar requirements of this section including, but not limited to, the following:
 - a. Mortar Types: As indicated.
 - b. Color(s): As selected by Architect from manufacturer's full range.
 - c. Use only water repellent admixture for mortar from the same manufacturer as water repellent admixture in masonry units.

2. Portlant Cement Based: Premixed Portland cement, hydrated lime, and sand; complying with ASTM C1714/C1714M and capable of producing mortar of the specified strength in accordance with ASTM C270 with the addition of water only.
 - a. Manufacturers:
 - 1) Amerimix, an Oldcastle brand; www.amerimix.com.
 - 2) The QUIKRETE Companies; www.quikcrete.com.
 - 3) SPEC MIX, Inc.; www.specmix.com.
 - 4) Substitutions: See Section 01 6000 - Product Requirements.
3. Masonry Cement Based: Premixed masonry cement and mason's sand; complying with ASTM C1714/C1714M and capable of producing mortar of the specified strength in accordance with ASTM C270 with the addition of water only.
 - a. Manufacturers:
 - 1) Amerimix, an Oldcastle brand; www.amerimix.com.
 - 2) The QUIKRETE Companies; www.quikcrete.com.
 - 3) SPEC MIX, Inc.; www.specmix.com.
 - 4) Substitutions: See Section 01 6000 - Product Requirements.
- I. Packaged Dry Material for Grout for Masonry: Premixed cementitious materials and dried aggregates; capable of producing grout of the specified strength in accordance with ASTM C476 with the addition of water only.
 1. At Contractor's option, prepackaged dry material for grout may be used subject to compliance with grout requirements of this section.
 2. Manufacturers:
 - a. Amerimix, an Oldcastle brand; www.amerimix.com.
 - b. The QUIKRETE Companies; www.quikcrete.com.
 - c. SPEC MIX, Inc.; www.specmix.com.
 - d. Substitutions: See Section 01 6000 - Product Requirements.

2.05 REINFORCEMENT AND ANCHORAGE

- A. Manufacturers:
 1. Basis-of-Design Product: The design for each item specified is based on the product named. Provide either the named product or a comparable product by one of the following:
 - a. Fero Corp.; www.ferocorp.com.
 - b. Heckmann Building Products; www.heckmannbuildingprods.com.
 - c. Hohmann & Barnard, Inc.; www.h-b.com.
 - d. Wire-Bond; www.wirebond.com.
 - e. Substitutions: See Section 01 6000 - Product Requirements.
- B. Reinforcing Steel: ASTM A615/A615M, Grade 60 (60,000 psi), deformed billet bars; galvanized.
- C. Reinforcing Bar Positioners: 0.156 inch, ASTM A1064/A1064M steel wire, hot dip galvanized after fabrication to 16 CFR 1201 Class B.
 1. Basis-of-Design Product: Hohmann & Barnard, Inc.; www.h-b.com: RB and RB-Twin Rebar Positioners.
- D. Reinforcing Bar Lap Joint Ties: ASTM A1064/A1064M steel wire, mill galvanized to 16 CFR 1201 Class 3.
 1. Basis-of-Design Product: Hohmann & Barnard, Inc.; www.h-b.com: Spyra-Lox Rebar Lap-Joint Tie.
- E. Single Wythe Joint Reinforcement: Truss or ladder type; ASTM A1064/A1064M steel wire, hot dip galvanized after fabrication to 16 CFR 1201 Class B; 0.1483 inch side rods with 0.1483 inch cross rods; width as required to provide not more than 1 inch and not less than 1/2 inch of mortar coverage on each exposure.
 1. Basis-of-Design Product: Hohmann & Barnard, Inc.; www.h-b.com: 120 Truss-Mesh or 220 Ladder-Mesh.

- F. Adjustable Multiple Wythe Joint Reinforcement: Truss or ladder type with adjustable ties or tabs spaced at 16 in on center ASTM A1064/A1064M steel wire, hot dip galvanized after fabrication to ASTM A153/153M, Class B; 0.1483 inch side rods with 0.1483 inch cross rods and adjustable components of 0.1875 inch wire; width of components as required to provide not more than 1 inch and not less than 1/2 inch of mortar coverage from each masonry face.
 - 1. Basis-of-Design Product: Hohmann & Barnard, Inc.; www.h-b.com: 170 Truss LOX-ALL Adjustable Eye Wire or 270 Ladder LOX-ALL Adjustable Eye Wire with 2X-HOOK.
- G. Rigid Anchors: Fabricate from steel bars 1-1/2 inches wide by 1/4 inch thick by 24 inches long, with ends turned up 2 inches; hot dip galvanized to ASTM A153/A153M Class B.
 - 1. Basis-of-Design Product: Hohmann & Barnard, Inc.; www.h-b.com: 344 Rigid Partition Anchor.
- H. Partition Top Anchors: 0.1875 inch thick metal plate with a 3/8 inch diameter metal rod 6 inches long welded to plate and with closed-end plastic tube fitted over rod that allows rod to move in and out of tube; hot dip galvanized to ASTM A153/A153M Class B.
 - 1. Basis-of-Design Product: Hohmann & Barnard, Inc.; www.h-b.com: PTA-420-HS and PTA Tubes.
- I. Dovetail Anchor Slots for Connecting to Concrete: 2-piece anchors that permit differential movement between masonry and concrete frame, sized to provide not more than 1 inch and not less than 1/2 inch of mortar coverage from masonry face.
 - 1. Concrete frame: Dovetail anchors of bent steel, nominal 1 inch width by 1 inch deep by 0.03 in thick, with trapezoidal wire ties 0.1875 inch thick, hot dip galvanized to ASTM A 153/A 153M, Class B.
 - a. Basis-of-Design Product: Hohmann & Barnard, Inc.; www.h-b.com: 305 Dovetail Slot with 315 Flexible Dovetail Brick Ties.
- J. Adjustable Anchors for Connecting to Structural Steel Framing: 2-piece anchors that permit differential movement between masonry and steel frame, sized to provide not more than 1 inch and not less than 1/2 inch of mortar coverage from masonry face.
 - 1. Crimped wire anchors for welding to frame, 0.25 inch thick, with trapezoidal wire ties 0.1875 inch thick, hot dip galvanized to ASTM A 153/A 153M, Class B.
 - 2. Basis-of-Design Product: Hohmann & Barnard, Inc.; www.h-b.com: 359/359FP anchors with 301W or VBT ties.
- K. Adjustable Masonry Veneer Anchors: 2-piece anchors that permit differential movement between masonry veneer and structural backup, hot dip galvanized to ASTM A 153/A 153M, Class B.
 - 1. For cold-formed metal framing and sheathing back-up.
 - 2. Anchor plates: Not less than 0.075 inch thick, designed for fastening to structural backup through sheathing by two fasteners.
 - 3. Wire ties: Rectangular shape, 0.1875 inch thick.
 - 4. Vertical adjustment: Not less than 2 inches.
 - 5. Basis-of-Design Product: Hohmann & Barnard, Inc.; www.h-b.com: HB-213 anchors with 2X-HOOK.
- L. Sound Isolating Anchors.
 - 1. Provide as indicated on the Drawings.
 - a. Basis of Design Product: Provide PSB-M isolators as manufactured by Kinetics. Texture Wire cut or as follows:
 - 1) Mason Industries AB-716.

2.06 FLASHINGS

- A. Flexible Fabric Flashing - Self-Adhering: Self-adhering stainless steel/polymer fabric flashing. ASTM A240/A240M; 2 mil type 304 stainless steel sheet bonded on one side to one sheet of polymer fabric. Flashing shall be self-adhering using a pressure-sensitive adhesive.
 - 1. Type 304 stainless steel.
 - a. Thickness: 2 mils, minimum.

2. Basis-of-Design Product: Provide York Manufacturing, Inc.; York 304: www.yorkmfg.com, or one of the following products:
 - a. Hohmann & Barnard, Inc.; Mighty-Flash SA: www.h-b.com.
 - b. Wire-Bond; Bond-N-Flash SA: www.wirebond.com.
 - c. Substitutions: See Section 01 6000 - Product Requirements.
- B. Factory-Fabricated Inside and Outside Flashing Corners and End Dams: Stainless steel.
 1. Manufacturer shall be the same as flexible fabric flashing manufacturer.
- C. Factory-Fabricated Drip Plates including Inside and Outside Corners: Stainless steel.
 1. Pre-formed smooth drip plates with hemmed edges.
 2. Manufacturer shall be the same as stainless steel/polymer fabric flashing manufacturer.
- D. Flashing Sealant/Adhesives: Silicone, polyurethane, or silyl-terminated polyether/polyurethane or other type required or recommended by flashing manufacturer; type capable of adhering to type of flashing used.
 1. Manufacturer shall be the same as flexible fabric flashing manufacturer.

2.07 CAVITY WALL INSULATION

- A. Refer to Section 07 2119 Foamed-In-Place Insulation.

2.08 ACCESSORIES

- A. Preformed Control Joints: Rubber material. Provide with corner and tee accessories, fused joints. ASTM D2000, 2AA-805.
 1. Manufacturers:
 - a. Hohmann & Barnard, Inc: www.h-b.com/sle.
 - b. WIRE-BOND: www.wirebond.com/#sle.
 - c. Substitutions: See Section 01 6000 - Product Requirements.
- B. Compressible Joint Filler: Closed cell neoprene; oversized 50 percent to joint width; self expanding; in maximum lengths available. ASTM D1056, Grade 2A1.
 1. Manufacturers:
 - a. Hohmann & Barnard, Inc: www.h-b.com/sle.
 - b. WIRE-BOND: www.wirebond.com/#sle.
 - c. Substitutions: See Section 01 6000 - Product Requirements.
- C. Cavity Mortar Control/Drainage Material: Semi-rigid polyethylene or polyester mesh panels, sized to thickness of wall cavity, and designed to prevent mortar droppings from clogging weeps and cavity vents and allow proper cavity drainage.
 1. Mortar Diverter: Semi-rigid mesh designed for installation at flashing locations.
 - a. Full depth of cavity and 10 inches high, with dovetail-shaped notches 7 inches deep that prevent clogging with mortar droppings.
 - b. Basis-of-Design Product: Provide Hohmann & Barnard, Inc.; www.h-b.com; Mortar Trap or a comparable product by one of the following:
 - 1) Advanced Building Products Inc.; www.advancedbuildingproducts.com.
 - 2) Heckmann Building Products; www.heckmannbuildingprods.com.
 - 3) Mortar Net Solutions; www.mortarnet.com.
 - 4) Wire-Bond; www.wirebond.com.
 - 5) Substitutions: See Section 01 6000 - Product Requirements.
- D. Building Paper: ASTM D226/D226M, Type I ("No.15") asphalt felt.
- E. Termination Bars: Stainless steel, 1/8 inch thick by 1-1/2 inch high with 3/8 inch sealant flange at top; compatible with flashing membrane and adhesives.
 1. Manufacturers:
 - a. Advanced Building Products Inc.; www.advancedbuildingproducts.com
 - b. Heckmann Building Products; www.heckmannbuildingprods.com.
 - c. Hohmann & Barnard, Inc.; www.h-b.com.
 - d. Wire-Bond; www.wirebond.com.
 - e. York Manufacturing, Inc.; www.yorkmfg.com
 - f. Substitutions: See Section 01 6000 - Product Requirements.
- F. Weep Inserts and Cavity Vents:

1. Type: Plastic cellular/honeycomb design.
 2. Color(s): As selected by Architect from manufacturer's full range.
 3. Basis-of-Design Product: Provide Hohmann & Barnard, Inc.; www.h-b.com; QV Quadro-Vent or a comparable product by one of the following:
 - a. Advanced Building Products Inc.; www.advancedbuildingproducts.com.
 - b. Heckmann Building Products; www.heckmannbuildingprods.com.
 - c. Mortar Net Solutions; www.mortarnet.com.
 - d. Wire-Bond; www.wirebond.com.
 - e. Substitutions: See Section 01 6000 - Product Requirements.
- G. Mortar and Grout Screen: 1/4 inch square, polypropylene monofilament screening for preventing grout flow; width sized to match masonry widths.
1. Basis-of-Design Product: Provide Hohmann & Barnard, Inc.; www.h-b.com; MGS or a comparable product by one of the following:
 - a. Heckmann Building Products; www.heckmannbuildingprods.com.
 - b. Wire-Bond; www.wirebond.com.
 - c. Substitutions: See Section 01 6000 - Product Requirements.
- H. Masonry Cleaners:
1. Proprietary Acidic Cleaner: Manufacturer's standard-strength cleaner designed for removing mortar/grout stains, efflorescence, and other new construction stains from new masonry without discoloring or damaging masonry surfaces. Use product expressly approved for intended use by cleaner manufacturer and manufacturer of masonry units being cleaned.
 - a. Basis-of-Design Products: Provide PROSOCO, Inc.; www.prosoco.com: Sure Klean 600 or Sure Klean Vana Trol or a comparable product by one of the following:
 - 1) Diedrich Technologies, Inc.; www.diedrichtechnologies.com.
 - 2) Substitutions: See Section 01 6000 - Product Requirements.

2.09 LINTELS

- A. Masonry Lintels: Masonry lintels made from bond beam CMUs matching adjacent CMUs in color, texture, and weight classification; reinforcing bars as indicated, and filled with grout.
- B. Loose Steel Lintels: Refer to Section 05 5000 - Metal Fabrications.

2.10 MORTAR AND GROUT MIXING

- A. Mortar for Unit Masonry: ASTM C270, using the Proportion Specification.
 1. Masonry below grade and in contact with earth: Type M.
 2. Exterior, loadbearing masonry: Type S.
 3. Exterior, non-loadbearing masonry: Type N.
 4. Interior, loadbearing masonry: Type N.
 5. Interior, non-loadbearing masonry: Type N.
 6. Precast concrete units: Same Type as wall masonry in which unit is set.
 7. Limestone units: Same Type as wall masonry in which unit is set.
 8. Pointing Mortar: Type N.
- B. Colored Mortar: Proportion selected pigments and other ingredients to match Architect's sample, without exceeding manufacturer's recommended pigment-to-cement ratio.
- C. Grout: ASTM C476; consistency required to fill completely volumes indicated for grouting; fine grout for spaces with smallest horizontal dimension of 2 inches or less; coarse grout for spaces with smallest horizontal dimension greater than 2 inches.
 1. Grout Strength: 3000 psi at 28 days, unless otherwise indicated.
- D. Admixtures: Add to mixture at manufacturer's recommended rate and in accordance with manufacturer's instructions; mix uniformly.
- E. Mixing: Use mechanical batch mixer and comply with referenced standards.

PART 3 EXECUTION

3.01 SALVAGING BRICK

- A. General: Comply with Section 02 4100 - Demolition.
- B. Where indicated, remove and salvage existing brick.

1. Carefully remove brick by hand. Cut out full units from joint to joint.
 - a. If required, use a motor-driven saw designed to cut masonry with clean, sharp, unchipped edges.
 2. Salvage as many whole, undamaged bricks as needed for new construction.
 3. Salvage damaged brick that may be cut and used where cut units are required.
 4. Take care not to chip, crack or otherwise damage surrounding masonry.
- C. Remove mortar, loose particles and soil from salvaged brick by cleaning with hand chisels, brushes and water. Store brick for reuse.
- D. Clean remaining masonry at edges of removal areas by removing mortar, dust, and loose debris in preparation for new construction.
- E. Support and protect remaining masonry that surrounds removal area. Maintain flashing, reinforcement, lintels, and adjoining construction in an undamaged condition.

3.02 EXAMINATION

- A. Verify that field conditions are acceptable and are ready to receive masonry.
- B. Verify that foundations are within tolerances specified.
- C. Verify that related items provided under other sections are properly sized and located.
- D. Verify that built-in items are in proper location, and ready for roughing into masonry work.
- E. Verify that reinforcing dowels are properly placed.

3.03 PREPARATION

- A. Direct and coordinate placement of metal anchors supplied for installation under other sections.

3.04 INSTALLATION, GENERAL

- A. Thickness: Build cavity and composite walls and other masonry construction to full thickness shown. Build single-wythe walls to actual widths of masonry units, using units of widths indicated.
- B. Build chases and recesses to accommodate items specified in this and other Sections.
- C. Leave openings for equipment to be installed before completing masonry. After installing equipment, complete masonry to match construction immediately adjacent to opening.
- D. Use full-size units without cutting if possible. If cutting is required to provide a continuous pattern or to fit adjoining construction, cut units with motor-driven saws; provide clean, sharp, unchipped edges. Allow units to dry before laying unless wetting of units is specified. Install cut units with cut surfaces and, where possible, cut edges concealed.
- E. Select and arrange units for exposed unit masonry to produce a uniform blend of colors and textures. Mix units from several pallets or cubes as they are placed.
- F. Matching Existing Masonry: Match coursing, bonding, color, and texture of existing masonry.

3.05 COURSING

- A. Establish lines, levels, and coursing indicated. Protect from displacement.
- B. Maintain masonry courses to uniform dimension. Form vertical and horizontal joints of uniform thickness.
- C. Existing Masonry: Match coursing and bonding of existing masonry unless otherwise indicated.
- D. Concrete Masonry Units: Unless otherwise indicated:
 1. Bond: Running.
 2. Coursing: One unit and one mortar joint to equal 8 inches.
 3. Mortar Joints: Concave.
 4. Mortar Joint Thickness: 3/8 inch.
- E. Brick Units: Unless otherwise indicated:
 1. Bond: Running.
 2. Coursing: Three units and three mortar joints to equal 8 inches.
 3. Mortar Joints: Concave.
 4. Mortar Joint Thickness: 3/8 inch.

3.06 PLACING AND BONDING

- A. Lay hollow masonry units with face shell bedding on head and bed joints.
- B. Buttering corners of joints or excessive furrowing of mortar joints is not permitted.
- C. Remove excess mortar and mortar smears as work progresses.
- D. Remove excess mortar with water repellent admixture promptly. Do not use acids, sandblasting or high pressure cleaning methods.
- E. Interlock intersections and external corners.
- F. Tooth-in new masonry work with existing, unless otherwise indicated on Drawings.
- G. Tooth-in cutting and patching masonry work unless otherwise indicated on Drawings.
- H. Do not shift or tap masonry units after mortar has achieved initial set. Where adjustment must be made, remove mortar and replace.
- I. Perform job site cutting of masonry units with proper tools to provide straight, clean, unchipped edges. Prevent broken masonry unit corners or edges.
- J. Cut mortar joints flush where wall tile is scheduled or resilient base is scheduled.
- K. Isolate top joint of masonry partitions from horizontal structural framing members and slabs or decks with compressible joint filler.
- L. Isolate cast stone units and precast architectural concrete units from clay masonry with building paper or similar method of providing a continuous bond break/slip plane.
- M. Set cast-stone trim units in full bed of mortar with full vertical joints. Fill dowel, anchor, and similar holes.
 - 1. Clean soiled surfaces with fiber brush and soap powder and rinse thoroughly with clear water.
 - 2. Allow cleaned surfaces to dry before setting.
 - 3. Wet joint surfaces thoroughly before applying mortar.
 - 4. Rake out mortar joints for pointing with sealant.

3.07 WEEPS INSERTS/CAVITY VENTS

- A. Install weep inserts in veneer and cavity walls at 24 inches on center horizontally above through-wall flashing, above shelf angles and lintels, and at bottom of walls.
- B. Install cavity vents in veneer and cavity walls at 24 inches on center horizontally below shelf angles and lintels and near top of walls.

3.08 CAVITY MORTAR CONTROL

- A. Do not permit mortar to drop or accumulate into cavity air space or to plug weep/cavity vents.
- B. Provide not less than 2 inches of airspace between back of masonry veneer and face of insulation.
 - 1. Keep airspace clean of mortar droppings and other materials during construction. Bevel beds away from airspace, to minimize mortar protrusions into airspace. Do not attempt to trowel or remove mortar fins protruding into airspace.
- C. For cavity walls, build inner wythe ahead of outer wythe to accommodate accessories.
- D. Install cavity mortar diverter at base of cavity and at other flashing locations as recommended by manufacturer to prevent mortar droppings from blocking weep/cavity vents.

3.09 HORIZONTAL JOINT REINFORCEMENT AND ANCHORAGE - SINGLE WYTHE MASONRY AND CAVITY WALL MASONRY

- A. Unless otherwise indicated on drawings or specified under specific wall type, install horizontal joint reinforcement 16 inches on center.
- B. Place masonry joint reinforcement in first and second horizontal joints above and below openings. Extend minimum 16 inches each side of opening.
- C. Place continuous joint reinforcement in first and second joint below top of walls.
- D. Lap joint reinforcement ends minimum 6 inches.
- E. Masonry to Structural Steel and Concrete:

1. Provide an open space not less than 1/2 inch wide between masonry and structural steel or concrete unless otherwise indicated. Keep open space free of mortar and other rigid materials.
 2. Fasten anchors to structural framing and embed in masonry joints as masonry is laid. Unless otherwise indicated on drawings or closer spacing is indicated under specific wall type, space anchors at maximum of 24 inches horizontally and 24 inches vertically.
- F. Embed ties and anchors in mortar joint and extend into masonry unit a minimum of 1-1/2 inches with at least 5/8 inch mortar cover to the outside face of the anchor.

3.10 MASONRY VENEER REINFORCEMENT AND ANCHORAGE

- A. Masonry Back-Up: Embed anchors to bond veneer at maximum 16 inches on center vertically and 16 inches on center horizontally. Place additional anchors at perimeter of openings and ends of panels, so maximum spacing of anchors is 8 inches on center.
- B. Stud Back-Up: Secure veneer anchors to stud framed back-up and embed into masonry veneer at maximum 16 inches on center vertically and 16 inches on center horizontally. Place additional anchors at perimeter of openings and ends of panels, so maximum spacing of anchors is 8 inches on center.
- C. Embed ties and anchors in mortar joint and extend into masonry veneer unit a minimum of 1-1/2 inches with at least 5/8 inch mortar cover to the outside face of the anchor.

3.11 MASONRY FLASHINGS

- A. General:
1. Install masonry flashings according to manufacturer's instructions and as indicated on the Drawings.
 2. Remove or cover protrusions or sharp edges that could puncture flashings.
 3. Lap end joints of flashings at least 6 inches, minimum, and seal watertight with flashing sealant/adhesive.
 4. Whether or not specifically indicated, install masonry flashing to divert water to exterior at all locations where downward flow of water will be interrupted.
 - a. Extend flashings full width at such interruptions and at least 6 inches, minimum, into adjacent masonry or turn up at least 8 inches, minimum, to form watertight pan at non-masonry construction.
 5. Terminate flashing up 8 inches minimum on vertical surface of backing:
 - a. Install vertical leg of flashing over fluid-applied or self-adhered air/vapor barriers over backing or per manufacturer's direction, unless otherwise indicated.
 - b. Anchor vertical leg of flashing into backing with a termination bar and sealant.
 6. Install flashing in accordance with manufacturer's instructions and BIA Technical Notes No. 7, unless more stringent requirements are specified in this section.
- B. Flexible Fabric Flashing:
1. Use factory-fabricated drip plates, corners and end dams.
 2. Extend flexible fabric flashing to within 1/4 inch of exterior face of masonry overlapping metal drip plate.
 3. Extend flexible fabric flashing full width of cavity space and turn up inner masonry wythe or sheathing at least 14 inches.
 4. Secure flexible fabric flashing to wall with continuous termination bar and apply sealant across top of termination bar.

3.12 LINTELS

- A. Install loose steel lintels over openings.
- B. Install reinforced unit masonry lintels over openings where steel lintels are not scheduled.
1. Unless otherwise indicated, reinforce as follows:
 - a. Openings to 48 inches: Place two, No. 4 reinforcing bars 1 inch from bottom web.
 - b. Openings from 48 inches to 80 inches: Place two, No. 5 reinforcing bars 1 inch from bottom web.
 - c. Openings over 80 inches: Reinforce openings as detailed.
 2. Do not splice reinforcing bars.

3. Support and secure reinforcing bars from displacement. Maintain position within 1/2 inch of dimensioned position.
 4. Place and consolidate grout fill without displacing reinforcing.
 5. Allow masonry lintels to attain specified strength before removing temporary supports.
- C. Where the Drawings do not indicate otherwise, provide reinforced unit masonry lintels at all openings and penetrations wider than 12 inches in brick and 24 inches in CMU.
- D. Maintain minimum 8 inch bearing on each side of opening unless otherwise indicated.

3.13 BOND BEAMS

- A. Bond Beams: At bond beams or other locations for horizontally reinforced masonry, provide special masonry units or saw to accommodate reinforcement.
- B. Reinforce bond beams with 2, No. 5 bars, 1 inch from bottom web unless otherwise indicated.
- C. Lap reinforcing bar splices minimum 24 bar diameters, unless otherwise indicated.
- D. Place and consolidate grout fill without displacing reinforcing.

3.14 VERTICAL MASONRY REINFORCEMENT

- A. Reinforcement: Size and place vertical masonry reinforcement to comply with TMS 402/602 requirements and as indicated on Drawings.
- B. Place and consolidate grout fill without displacing reinforcing.

3.15 GROUTING

- A. Reinforced Hollow Unit Masonry: Keep vertical cores to be grouted clear of mortar, including bed area of first course.
- B. Perform grouting by means of high-lift technique, except in locations that mandate use of low-lift grouting technique.
1. Do not use high-lift grouting where size of cavities mandates use of fine grout.
- C. Low-Lift Grouting:
1. Limit height of pours to 12 inches.
 2. Limit height of masonry to 16 inches above each pour.
 3. Pour grout only after vertical reinforcing is in place; place horizontal reinforcing as grout is poured. Prevent displacement of bars as grout is poured.
 4. Place grout for each pour continuously and consolidate immediately; do not interrupt pours for more than 1-1/2 hours.
- D. High-Lift Grouting:
1. Verify that horizontal and vertical reinforcement is in proper position and adequately secured before beginning pours.
 2. Clean out masonry cells and other cavities to be grouted by high pressure water spray or compressed air. Remove debris, allow to dry, and inspect before sealing cleanout openings.
 3. Hollow Masonry: Limit lifts to maximum 4 feet and pours to maximum height of 24 feet.
 4. Place grout for spanning elements in single, continuous pour.

3.16 GROUTED COMPONENTS

- A. Support and secure reinforcing bars from displacement. Maintain position within 1/2 inch of dimensioned position.
- B. Place and consolidate grout fill without displacing reinforcing.
- C. At bearing locations, fill masonry cores with grout for a minimum 12 inches either side of opening.

3.17 CONTROL AND EXPANSION JOINTS

- A. Do not continue horizontal joint reinforcement through control or expansion joints.
- B. Install preformed control joint device in continuous lengths. Seal butt and corner joints in accordance with manufacturer's instructions.
1. Refer to Section 07 9200 - Joint Sealants for sealant installation.

3.18 BUILT-IN WORK

- A. As work progresses, install built-in metal door frames, glazed frames, anchor bolts, plates, and reglets and other items to be built into the work and furnished under other sections.
- B. Install built-in items plumb, level, and true to line.
- C. Bed anchors of metal door and glazed frames in adjacent mortar joints. Fill frame voids solid with grout.
 - 1. Fill adjacent masonry cores with grout minimum 12 inches from framed openings.

3.19 TOLERANCES

- A. Dimensions and Locations of Elements:
 - 1. Location of elements in plan; do not vary from that indicated on Drawings by more than:
 - a. Plus or minus 1/2 inch.
 - 2. Dimensions in cross section; do not vary from that indicated on Drawings by more than:
 - a. Minus 1/4 inch.
 - b. Plus 1/2 inch.
- B. Maximum Variation from Alignment of Columns and Pilasters: 1/4 inch.
- C. Maximum Variation From Unit to Adjacent Unit: 1/16 inch.
- D. Maximum Variation from Plane of Wall: 1/4 inch in 10 ft and 1/2 inch in 20 ft or more.
- E. Maximum Variation from Plumb: 1/4 inch per story non-cumulative; 1/2 inch in two stories or more.
- F. Maximum Variation from Level Coursing: 1/8 inch in 3 ft and 1/4 inch in 10 ft; 1/2 inch in 30 ft.
- G. Maximum Variation from Cross Sectional Thickness of Walls: 1/4 inch.
- H. Lines and Levels:
 - 1. Maximum variation from level:
 - a. Includes, but is not limited to, the following:
 - 1) Lintels.
 - 2) Sills.
 - 3) Parapets.
 - 4) Reveals.
 - 5) Other conspicuous lines.
 - b. Do not vary from level by more than:
 - 1) 1/4 inch in 20 feet.
 - 2) 1/2 in in 40 feet or more.
 - 2. Maximum variation from plumb:
 - a. Includes, but is not limited to, the following:
 - 1) External corners.
 - 2) Control and expansion joints.
 - 3) Reveals.
 - 4) Other conspicuous lines.
 - b. Do not vary from plumb by more than:
 - 1) 1/4 inch in 20 feet.
 - 2) 1/2 in in 40 feet or more.
- I. Mortar Joint Thickness: Do not vary thickness indicated by more than plus or minus 1/8 inch.

3.20 FIELD QUALITY CONTROL

- A. An independent testing agency will perform field quality control tests, as specified in Section 01 4000 - Quality Requirements.

3.21 CLEANING

- A. Protect surrounding elements and finishes from damage due to cleaning procedures.
- B. Appearance Standard: Cleaned surfaces are to have a uniform appearance as viewed from 10 feet away, subject to Architect's approval.
- C. Remove excess mortar and mortar droppings.
- D. Clean soiled surfaces with cleaning solution.

- E. Apply masonry cleaners to masonry surfaces according to manufacturer's written instructions; use brush or spray application.
 - 1. Periodically during rinsing, test pH of rinse water running off of cleaned area to determine that chemical cleaner is completely removed.
 - a. Repeat rinsing until tested pH of water runoff is between 6.7 and 7.5.
- F. Ground-Face CMU: Refer to Section 09 9100 - Painting for field applied sealer.

END OF SECTION

SECTION 06 4023 - INTERIOR ARCHITECTURAL WOODWORK**PART 1 GENERAL****1.01 SECTION INCLUDES**

- A. Miscellaneous items including:
 - 1. Window stools
 - 2. Other items as indicated on Drawings.

1.02 REFERENCE STANDARDS

- A. AWI/AWMAC/WI (AWS) - Architectural Woodwork Standards, 2nd Edition 2014, with Errata (2016).
- B. AWPA U1 - Use Category System: User Specification for Treated Wood 2021.
- C. BHMA A156.9 - Cabinet Hardware 2020.
- D. ISFA 2-01 - Classification and Standards for Solid Surfacing Material 2013.
- E. MIA (DSDM) - Dimensional Stone Design Manual, Version VIII 2016.
- F. NEMA LD 3 - High-Pressure Decorative Laminates 2005.
- G. UL (DIR) - Online Certifications Directory Current Edition.

1.03 ADMINISTRATIVE REQUIREMENTS

- A. Preinstallation Meeting: Convene a preinstallation meeting not less than one week before starting work of this section; require attendance by all affected installers.

1.04 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide data for the following:
 - 1. Anchors and fasteners.
 - 2. Adhesives.
- C. Samples: Three samples of each of the following:
 - 1. Solid Surfacing: 4 by 4 inches, for each type, color, pattern, and finish.

1.05 QUALITY ASSURANCE

- A. Fabricator Qualifications: Company specializing in fabricating the products specified in this section with minimum five years of documented experience.
- B. Single Source Responsibility: Provide and install interior architectural woodwork from single fabricator.

1.06 DELIVERY, STORAGE, AND HANDLING

- A. Comply with AWI/AWMAC/WI (AWS).
- B. Do not deliver interior architectural woodwork until painting and similar finish operations that might damage woodwork have been completed in installation areas.
- C. Store woodwork in installation areas or in areas with the same environmental conditions; temperature and humidity conditions in storage areas shall be at the same levels planned for occupancy.
- D. Protect units from moisture damage.

1.07 FIELD CONDITIONS

- A. During and after installation of architectural woodwork, maintain temperature and humidity conditions in building spaces at same levels planned for occupancy.

PART 2 PRODUCTS**2.01 SOLID SURFACING**

- A. Solid Surfacing Sheet and Plastic Resin Castings: Complying with ISFA 2-01 and NEMA LD 3; acrylic or polyester resin, mineral filler, and pigments; homogenous and non-porous; no surface coating; color and pattern consistent throughout thickness.
 - 1. Manufacturers:
 - a. E. I. du Pont de Nemours and Company (Dupont); Corian: www.corian.com.
 - b. Substitutions: See Section 01 6000 - Product Requirements Not permitted.
 - 2. Colors, Patterns, and Finishes:

- a. SS-1 Corian Solid Surface, Pearl Gray.

2.02 ACCESSORIES

- A. Support Framing, Grounds, and Concealed Blocking: Refer to Section 06 1000 - Rough Carpentry.
- B. Stain and Finishing Materials: In compliance with AWI/AWMAC/WI (AWS), unless noted otherwise.
- C. Adhesives: Type recommended by fabricator to suit application.
 - 1. Do not use adhesives that contain urea formaldehyde.
 - 2. VOC Limits for Installation Adhesives and Glues: Use installation adhesives that comply with the following limits for VOC content when calculated according to 40 CFR 59, Subpart D (EPA Method 24):
 - a. Wood Glues: 30 g/L.
 - b. Contact Adhesive: 250 g/L.
- D. Fasteners: Size and type to suit application.
- E. Bolts, Nuts, Washers, Lags, Pins, and Screws: Of size and type to suit application; galvanized or chrome-plated finish in concealed locations and stainless steel or chrome-plated finish in exposed locations.
- F. Concealed Joint Fasteners: Threaded steel.

2.03 FABRICATION

- A. General:
 - 1. Fabricate woodwork to dimensions, profiles, and details indicated.
 - 2. Complete fabrication, including assembly, finishing, and hardware application, to maximum extent possible before shipment to Project site. Disassemble components only as necessary for shipment and installation.
 - 3. Provide cutouts for plumbing fixtures, inserts, appliances, outlet boxes, and fixtures and fittings. Verify locations of cutouts from on-site dimensions. Seal cut edges.
 - a. Locate openings accurately and use templates to produce accurately sized and shaped openings.
 - 4. Fitting: When necessary to cut and fit on site, provide materials with ample allowance for cutting. Provide matching trim for scribing and site cutting.
 - 5. Fire Retardant Wood Materials:
 - a. Provide UL (DIR) listed and approved identification on fire retardant treated material.
 - b. Deliver fire retardant treated materials cut to required sizes. Minimize field cutting.

2.04 MISCELLANEOUS ITEMS

- A. Quality Standard: Premium Grade, in accordance with AWI/AWMAC/WI (AWS), unless noted otherwise.
- B. Solid Surface Window Stools: Solid surfacing sheet or plastic resin casting over continuous substrate.
 - 1. Flat Sheet Thickness: 1/2 inch, minimum.
 - 2. Exposed Edge Treatment: Built up to minimum 1-1/4 inch thick; square edge.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify adequacy of backing and support framing.
- B. Verify location and sizes of utility rough-in associated with work of this section.

3.02 PREPARATION

- A. Coordinate sizes and locations of framing, blocking, furring, reinforcements, and other related units of Work specified in other Sections to ensure that architectural woodwork can be supported and installed as indicated.
- B. Condition all interior architectural woodwork to temperature and humidity conditions in installation areas for not less than 72 hours prior to installation.
 - 1. Temperature and humidity conditions shall be same levels planned for occupancy.

3.03 INSTALLATION - GENERAL

- A. Install work in accordance with AWI/AWMAC/WI (AWS) requirements for grade indicated.
- B. Install architectural woodwork level, plumb, true in line, and without distortion.
 - 1. Shim as required with concealed shims.
 - 2. Install level and plumb to a tolerance of 1/8 inch in 96 inches
- C. Scribe and cut architectural woodwork to fit adjoining work, refinish cut surfaces, and repair damaged finish at cuts.

3.04 ADJUSTING

- A. Adjust installed work.
- B. Adjust moving or operating parts to function smoothly and correctly.

3.05 REPAIRING AND CLEANING

- A. Repair damaged and defective architectural woodwork, where possible, to eliminate functional and visual defects. Where not possible to repair, replace architectural woodwork.
- B. Clean all architectural woodwork, including, but not limited to, casework, counters, shelves, hardware, fittings, and fixtures.

END OF SECTION

SECTION 07 8400 - FIRESTOPPING**PART 1 GENERAL****1.01 SECTION INCLUDES**

- A. Firestopping systems.
 - 1. Firestopping of joints and penetrations in fire resistance rated and smoke resistant assemblies, whether indicated on drawings or not, and other openings indicated.

1.02 REFERENCE STANDARDS

- A. ASTM E814 - Standard Test Method for Fire Tests of Penetration Firestop Systems 2013a (Reapproved 2017).
- B. ASTM E1966 - Standard Test Method for Fire-Resistive Joint Systems 2015 (Reapproved 2019).
- C. ASTM E2174 - Standard Practice for On-Site Inspection of Installed Firestop Systems 2020a.
- D. ASTM E2393 - Standard Practice for On-Site Inspection of Installed Fire Resistive Joint Systems and Perimeter Fire Barriers 2020a.
- E. ASTM E2307 - Standard Test Method for Determining Fire Resistance of Perimeter Fire Barriers Using Intermediate-Scale, Multi-story Test Apparatus 2020.
- F. ASTM E2837 - Standard Test Method for Determining the Fire Resistance of Continuity Head-of-Wall Joint Systems Installed Between Rated Wall Assemblies and Nonrated Horizontal Assemblies 2013 (Reapproved 2017).
- G. UL 2079 - Standard for Tests for Fire Resistance of Building Joint Systems Current Edition, Including All Revisions.
- H. UL (FRD) - Fire Resistance Directory Current Edition.

1.03 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements for submittal procedures.
- B. Schedule of Firestopping: List each type of penetration, each type of joint, fire rating of the penetrated assembly, firestopping test or design number, and illustration of each firestopping system.
- C. Product Data: Provide data on product characteristics, performance ratings, and limitations.
- D. Installer's qualification statement.

1.04 QUALITY ASSURANCE

- A. Fire Testing: Provide firestopping assemblies of designs that provide the scheduled fire ratings when tested in accordance with methods indicated.
 - 1. Listing in UL (FRD) will be considered as constituting an acceptable test report.
- B. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum 5 years documented experience.
- C. Installer Qualifications: Company specializing in performing the work of this section and:
 - 1. Verification of minimum 5 years documented experience installing work of this type.

1.05 MOCK-UP

- A. Install one firestopping assembly representative of each fire rating design required on project.
 - 1. Where one design may be used for different penetrating items or in different wall or floor constructions, install one assembly for each different combination.
 - 2. Where firestopping is intended to fill a linear opening, install minimum of 1 linear ft.
- B. If accepted, mock-up will represent minimum standard for this work.
- C. If accepted, mock-up may remain as part of this work. Remove and replace mock-ups not accepted.

1.06 FIELD CONDITIONS

- A. Comply with firestopping manufacturer's recommendations for temperature and conditions during and after installation; maintain minimum temperature before, during, and for three days after installation of materials.

- B. Provide ventilation in areas where solvent-cured materials are being installed.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Firestopping Manufacturers:
1. 3M Fire Protection Systems; www.3m.com.
 2. A/D Fire Protection Systems; www.adfire.com.
 3. Hilti Firestop; www.hilti.com.
 4. RectorSeal Firestop; www.rectorseal.com.
 5. Specified Technologies, Inc. (STI); www.stifirestop.com.
 6. Tremco Fire Protection Systems; www.tremcofirestop.com.
 7. Substitutions: See Section 01 6000 - Product Requirements.

2.02 MATERIALS

- A. Firestopping Materials: Any materials complying with firestopping assembly design requirements including, but not limited to, the following:
1. Cast-in-Place Firestop Devices: Factory-assembled devices for use in cast-in-place concrete floors and consisting of an outer sleeve lined with an intumescent strip, a flange attached to one end of the sleeve for fastening to concrete formwork, and a neoprene gasket.
 2. Latex Sealants: Single-component latex formulations that do not re-emulsify after cure during exposure to moisture.
 3. Firestop Devices: Factory-assembled collars formed from galvanized steel and lined with intumescent material sized to fit specific diameter of penetrant.
 4. Intumescent Composite Sheets: Rigid panels consisting of aluminum-foil-faced intumescent elastomeric sheet bonded to galvanized-steel sheet.
 5. Intumescent Putties: Nonhardening, water-resistant, intumescent putties containing no solvents or inorganic fibers.
 6. Intumescent Wrap Strips: Single-component intumescent elastomeric sheets with aluminum foil on one side.
 7. Mortars: Prepackaged dry mixes consisting of a blend of inorganic binders, hydraulic cement, fillers and lightweight aggregate formulated for mixing with water at Project site to form a nonshrinking, homogeneous mortar.
 8. Pillows/Bags: Reusable heat-expanding pillows/bags consisting of glass-fiber cloth cases filled with a combination of mineral-fiber, water-insoluble expansion agents, and fire-retardant additives. Where exposed, cover openings with steel-reinforcing wire mesh to protect pillows/bags from being easily removed.
 9. Silicone Foams: Multicomponent, silicone-based liquid elastomers that, when mixed, expand and cure in place to produce a flexible, nonshrinking foam.
 10. Silicone Sealants: Single-component, silicone-based, neutral-curing elastomeric sealants
- B. Accessory Materials: For each firestopping assembly, provide all primers, forming/damming/backing materials, collars, sleeves, and related materials for a complete installation.

2.03 FIRESTOPPING ASSEMBLY REQUIREMENTS

- A. General:
1. Provide firestopping assemblies indicated, or, if not indicated, as required to comply with fire ratings indicated.
 2. Fire Ratings: As indicated on Drawings.
 3. Joint Firestopping:
 - a. Nominal Widths: As indicated on Drawings.
 - b. Movement Capabilities: Class 1, 50 percent compression or extension, unless otherwise indicated or required.
- B. Penetration Firestopping Systems: Systems that resist spread of fire, passage of smoke and other gases, and maintain original fire-resistance rating of construction penetrated. Penetration firestopping systems shall be compatible with one another, with the substrates forming openings, and with penetrating items if any.

1. Through Penetration Firestopping: Use system that has been tested according to ASTM E814 to have fire resistance F Rating equal to required fire rating of penetrated assembly.
 - a. Temperature Rise: Provide systems that have been tested to show T Rating as indicated or required.
 - b. Air Leakage: Provide systems that have been tested to show L Rating as indicated, at Smoke Barriers, and elsewhere as indicated or required.
 - c. Watertightness: Provide systems that have been tested to show W Rating as indicated or required.
- C. Joint Firestopping Systems: Systems that resist spread of fire, passage of smoke and other gases, and maintain original fire-resistance rating of assemblies in or between which joint firestopping systems are installed. Joint firestopping systems shall accommodate building movements without impairing their ability to resist the passage of fire and hot gases.
 1. Perimeter Fire Containment Firestopping: Use system that has been tested according to ASTM E2307 to have fire resistance F Rating equal to required fire rating of floor assembly.
 - a. Movement: Provide systems that have been tested to show movement capability as indicated or required.
 - b. Temperature Rise: Provide systems that have been tested to show T Rating as indicated or required.
 - c. Air Leakage: Provide systems that have been tested to show L Rating as indicated or required..
 - d. Where floor assembly is not required to have a fire rating, provide systems that have been tested to show L Rating as indicated or required..
 2. Head-of-Wall Joint System Firestopping at Joints Between Fire-Rated Wall Assemblies and Non-Rated Horizontal Assemblies: Use system that has been tested according to ASTM E2837 to have fire resistance F Rating equal to required fire rating of floor or wall, whichever is greater.
 - a. Movement: Provide systems that have been tested to show movement capability as indicated or required.
 3. Floor-to-Floor, Wall-to-Wall, and Wall-to-Floor Joints, Except Perimeter, Where Both Are Fire-Rated: Use system that has been tested according to ASTM E1966 or UL 2079 to have fire resistance F Rating equal to required fire rating of the assembly in which the joint occurs.
 - a. Movement: Provide systems that have been tested to show movement capability as indicated or required.
 - b. Air Leakage: Provide systems that have been tested to show L Rating as indicated or required.
 - c. Watertightness: Provide systems that have been tested to show W Rating as indicated or required.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify openings are ready to receive the work of this section.

3.02 PREPARATION

- A. Clean substrate surfaces of dirt, dust, grease, oil, loose material, or other materials that could adversely affect bond of firestopping material.
- B. Remove incompatible materials that could adversely affect bond.

3.03 INSTALLATION

- A. Install materials in manner described in fire test report and in accordance with manufacturer's instructions, completely closing openings.
- B. Do not cover installed firestopping until inspected by Owner's Independent Testing Agency.
- C. Do not cover installed firestopping until inspected by authorities having jurisdiction.

3.04 IDENTIFICATION

- A. General: Install labeling required by code.

- B. Wall Identification:
 - 1. Permanently label walls containing penetration firestopping systems with the words "FIRE /SMOKE BARRIER - PROTECT ALL OPENINGS."
 - a. Use lettering not less than 3 inches high and with minimum 0.375-inch strokes.
 - 2. Locate in accessible concealed floor, floor-ceiling, or attic space at 15 feet from end of wall and at intervals not exceeding 30 feet.
- C. Penetration Identification:
 - 1. Identify each penetration firestopping system with legible metal or plastic labels.
 - 2. Attach labels permanently to surfaces adjacent to and within 6 inches of penetration firestopping system edge so labels are visible to anyone seeking to remove penetrating items or firestopping systems.
 - 3. Use mechanical fasteners or self-adhering-type labels with adhesives capable of permanently bonding labels to surfaces on which labels are placed.
 - 4. Include the following information on labels:
 - a. The words "Warning - Penetration Firestopping - Do Not Disturb. Notify Building Management of Any Damage."
 - b. Manufacturer's name.
 - c. Installer's name, address, and phone number.
 - d. Designation of applicable testing and inspecting agency.
 - e. Date of installation.

3.05 FIELD QUALITY CONTROL

- A. Independent Testing Agency: Inspection agency employed and paid by Owner, may examine penetration firestopping in accordance with ASTM E2174, and ASTM E2393.
- B. Repair or replace penetration firestopping and joints at locations where inspection results indicate firestopping or joints do not meet specified requirements.

3.06 CLEANING

- A. Clean adjacent surfaces of firestopping materials.

3.07 PROTECTION

- A. Protect adjacent surfaces from damage by material installation.

END OF SECTION

SECTION 07 9200 - JOINT SEALANTS**PART 1 GENERAL****1.01 SECTION INCLUDES**

- A. Nonsag gunnable joint sealants.
- B. Self-leveling pourable joint sealants.
- C. Joint backings and accessories.

1.02 RELATED REQUIREMENTS

- A. Section 07 8400 - Firestopping: Firestopping sealants.
- B. Section 07 9100 - Preformed Joint Seals: Precompressed foam, gaskets, and strip seals.
- C. Section 08 8000 - Glazing: Glazing sealants and accessories.
- D. Section 09 2116 - Gypsum Board Assemblies: Sealing acoustical and sound-rated walls and ceilings.

1.03 REFERENCE STANDARDS

- A. ASTM C661 - Standard Test Method for Indentation Hardness of Elastomeric-Type Sealants by Means of a Durometer 2015 (Reapproved 2022).
- B. ASTM C794 - Standard Test Method for Adhesion-In-Peel of Elastomeric Joint Sealants 2018.
- C. ASTM C834 - Standard Specification for Latex Sealants 2017.
- D. ASTM C920 - Standard Specification for Elastomeric Joint Sealants 2018.
- E. ASTM C1087 - Standard Test Method for Determining Compatibility of Liquid-Applied Sealants with Accessories Used in Structural Glazing Systems 2016.
- F. ASTM C1193 - Standard Guide for Use of Joint Sealants 2016.
- G. ASTM C1248 - Standard Test Method for Staining of Porous Substrate by Joint Sealants 2018.
- H. ASTM C1330 - Standard Specification for Cylindrical Sealant Backing for Use with Cold Liquid-Applied Sealants 2018.
- I. ASTM C1521 - Standard Practice for Evaluating Adhesion of Installed Weatherproofing Sealant Joints 2019 (Reapproved 2020).
- J. ASTM D2240 - Standard Test Method for Rubber Property--Durometer Hardness 2015 (Reapproved 2021).

1.04 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Product Data for Sealants: Submit manufacturer's technical data sheets for each product to be used, that includes the following.
 - 1. Physical characteristics, including movement capability, VOC content, hardness, cure time, and color availability.
 - 2. List of backing materials approved for use with the specific product.
 - 3. Substrates that product is known to satisfactorily adhere to and with which it is compatible.
 - 4. Substrates the product should not be used on.
 - 5. Substrates for which use of primer is required.
 - 6. Sample product warranty.
- C. Product Data for Accessory Products: Submit manufacturer's technical data sheet for each product to be used, including physical characteristics, installation instructions, and recommended tools.
- D. Color Cards for Selection: Where custom colors are not specified, submit manufacturer's color cards showing standard colors available for selection.
- E. Samples for Verification: For each sealant color, submit at least three physical samples for color verification.
 - 1. Provide 1/2 inch wide joint sealant samples formed between two 4 inch long strips of material matching appearance of exposed surfaces adjacent to joint sealants.
- F. Preconstruction Laboratory Test Reports: Submit at least four weeks prior to start of installation.

- G. Field Quality Control Plan: Submit at least two weeks prior to start of installation.
- H. Field Quality Control Log: Submit filled out log for each length or instance of sealant installed, within 10 days after completion of inspections/tests; include bagged test samples and photographic records, if any.

1.05 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum 5 years documented experience.
- B. Installer Qualifications: Company specializing in performing the work of this section and with at least 5 years of documented experience.
- C. Preconstruction Laboratory Testing: Arrange for sealant manufacturer(s) to test each combination of sealant, substrate, backing, and accessories.
 - 1. Adhesion Testing: In accordance with ASTM C794.
 - 2. Compatibility Testing: In accordance with ASTM C1087.
 - 3. Stain Testing: In accordance with ASTM C1248; required only for stone substrates.
 - 4. Allow sufficient time for testing to avoid delaying the work.
 - 5. Deliver to manufacturer sufficient samples for testing.
 - 6. Report manufacturer's recommended corrective measures, if any, including primers or techniques not indicated in product data submittals.
 - 7. Testing is not required if sealant manufacturer provides data showing previous testing, not older than 24 months, that shows satisfactory adhesion, lack of staining, and compatibility.
- D. Owner may employ an independent testing agency to perform the field quality control inspection and testing as referenced in PART 3 of this section and as follows, to prepare and submit the field quality control plan and log, and to provide recommendations of remedies in the case of failure.
 - 1. Contractor shall cooperate with testing agency and repair failures discovered.
 - 2. Otherwise, if Owner does not employ an independent testing agency, Contractor shall perform its own field quality control measures including the following:
 - a. Field Quality Control Plan and Log.
 - b. Field Adhesion Test Procedures.
- E. Field Quality Control Plan:
 - 1. Visual inspection of entire length of sealant joints.
 - 2. Non-destructive field adhesion testing of sealant joints, except interior acrylic latex sealants.
 - a. For each different sealant and substrate combination, allow for one test every 12 inches in the first 10 linear feet of joint and one test every 120 inches thereafter.
 - b. If any failures occur in the first 10 linear feet, continue testing at 48 inch intervals at no extra cost to Owner.
- F. Field Adhesion Test Procedures:
 - 1. Allow sealants to fully cure as recommended by manufacturer before testing.
 - 2. Have a copy of the test method document available during tests.
 - 3. Record the type of failure that occurred, other information required by test method, and the information required on the Field Quality Control Log.
 - 4. If any combination of sealant type and substrate does not show evidence of minimum adhesion or shows cohesion failure before minimum adhesion, report results to Architect.
 - 5. Non-Destructive Field Adhesion Test: Test for adhesion in accordance with ASTM C1521, using Nondestructive Spot Method.
 - a. Record results on Field Quality Control Log.
 - b. Repair failed portions of joints.

1.06 WARRANTY

- A. See Section 01 7800 - Closeout Submittals, for additional warranty requirements.
- B. Correct defective work within a five year period after Date of Substantial Completion.
- C. Warranty: Include coverage for installed sealants and accessories that fail to achieve watertight seal, exhibit loss of adhesion or cohesion, or do not cure.

PART 2 PRODUCTS**2.01 JOINT SEALANT APPLICATIONS**

- A. Scope:
1. Exterior Joints: Seal open joints, whether or not the joint is indicated on drawings, unless specifically indicated not to be sealed. Exterior joints to be sealed include, but are not limited to, the following items.
 - a. Wall expansion and control joints.
 - b. Joints between door, window, and other frames and adjacent construction.
 - c. Joints between different exposed materials.
 - d. Openings below ledge angles in masonry.
 - e. Other joints as indicated.
 2. Interior Joints: Do not seal interior joints unless specifically indicated to be sealed. Interior joints to be sealed include, but are not limited to, the following items.
 - a. Joints between door, window, and other frames and adjacent construction.
 - b. Other joints as indicated.
 3. Do not seal the following types of joints.
 - a. Intentional weepholes in masonry.
 - b. Joints indicated to be treated with manufactured expansion joint cover or some other type of sealing device.
 - c. Joints where sealant is specified to be provided by manufacturer of product to be sealed.
 - d. Joints where installation of sealant is specified in another section.
 - e. Joints between suspended panel ceilings/grid and walls.
- B. Exterior Joints: Use non-sag non-staining silicone sealant, unless otherwise indicated.
1. Control and Expansion Joints in Concrete Paving: Self-leveling silicone traffic-grade sealant.
- C. Interior Joints: Use non-sag acrylic emulsion latex sealant, unless otherwise indicated.
1. Interior Sides of Aluminum Framing in Exterior Walls: Use non-sag non-staining silicone sealant, unless otherwise indicated.
 - a. Includes, but is not limited to, curtain walls, storefronts, and metal-framed skylights.
 2. Control Joints in Interior Concrete Slabs: Self-leveling silicone "traffic grade" sealant.
 3. Column Isolation Joints in Interior Concrete Slabs: Self-leveling silicone "traffic grade" sealant.
 4. Floor Joints in Wet Areas: Self-leveling silicone "traffic grade" sealant; not for continuous liquid immersion
 5. Joints between Fixtures in Wet Areas and Floors, Walls, and Ceilings: Mildew-resistant silicone sealant; clear, unless otherwise indicated.
 6. Joints between countertops and walls: Mildew-resistant silicone sealant; clear, unless otherwise indicated.
- D. Interior Wet Areas: Includes, but is not limited to, toilet rooms, showering areas, locker rooms, kitchens, and food service areas; fixtures in wet areas include plumbing fixtures, food service equipment, countertops, cabinets, and other similar items.

2.02 NONSAG JOINT SEALANTS

- A. Non-Staining Silicone Sealant: ASTM C920, Grade NS, Type S, Uses NT, A, G, M and O; not expected to withstand continuous water immersion or traffic.
1. Movement Capability: Plus and minus 50 percent, minimum.
 2. Non-Staining To Porous Stone: Non-staining to light-colored natural stone when tested in accordance with ASTM C1248.
 3. Dirt Pick-Up: Reduced dirt pick-up compared to other silicone sealants.
 4. Hardness Range: Comply with one of the following:
 - a. 15 to 35, Shore A, when tested in accordance with ASTM C661.
 - b. 25 to 35, Shore A, when tested in accordance with ASTM D2240.
 5. Color: Custom color(s) to match Architect's sample(s).
 6. Cure Type: Single-component, neutral moisture curing.

7. Service Temperature Range: Minus 40 to 250 degrees F.
8. Products:
 - a. Momentive Performance Materials, Inc./GE; SCS9000 SilPruf NB: www.siliconeforbuilding.com.
 - b. Pecora Corporation; 890NST: www.pecora.com.
 - c. Sika Corporation; Sikasil WS-295 FPS: www.usa.sika.com.
 - d. Tremco, Inc.; Spectrem 3: www.tremcosealants.com.
 - e. Dow Chemical Company; DOWSIL 790 Silicone Building Sealant: consumer.dow.com/en-us/industry/ind-building-construction.html/#sle.
 - f. Substitutions: See Section 01 6000 - Product Requirements.
- B. Traffic Grade Silicone Sealant: ASTM C920, Grade NS, Type S, Uses T, M, and O; not expected to withstand continuous water immersion.
 1. Movement Capability: Plus 100 percent, minus 50 percent, minimum
 2. Hardness Range: Comply with one of the following:
 - a. 5 to 15, Shore A, when tested in accordance with ASTM C661.
 - b. 85, Shore 00, when tested in accordance with ASTM C661.
 3. Color: To be selected by Architect from manufacturer's full range.
 4. Cure Type: Single-component, neutral moisture curing.
 5. Service Temperature Range: Minus 40 to 250 degrees F.
 6. Products:
 - a. Dow Corning; NS Parking Structure Sealant: www.dowcorning.com.
 - b. Pecora Corporation; 311NS: www.pecora.com.
 - c. Sika Corporation; Sikasil - 728 NS: www.usa.sika.com.
 - d. Tremco, Inc.; Spectrem 800: www.tremcosealants.com.
 - e. Substitutions: See Section 01 6000 - Product Requirements.
- C. Mildew-Resistant Silicone Sealant: ASTM C920, Grade NS, Type S, Uses NT, A, G, and O; mildew resistant; not expected to withstand continuous water immersion or traffic.
 1. Movement Capability: Plus and minus 25 percent, minimum.
 2. Hardness Range: Comply with one of the following:
 - a. 15 to 35, Shore A, when tested in accordance with ASTM C661.
 - b. 25 to 35, Shore A, when tested in accordance with ASTM D2240.
 3. Color: Clear.
 4. Cure Type: Single-component, acetoxo or neutral moisture curing .
 5. Service Temperature Range: Minus 40 to 300 degrees F.
 6. Products:
 - a. Dow Corning; 786 Sealant M: www.dowcorning.com.
 - b. Momentive Performance Materials, Inc./GE; SCS1700 Sanitary: www.siliconeforbuilding.com.
 - c. Pecora Corporation; 898NST: www.pecora.com.
 - d. Sika Corporation; Sikasil - GP: www.usa.sika.com.
 - e. Tremco, Inc.; Tremsil 200 with fungicide: www.tremcosealants.com.
 - f. Substitutions: See Section 01 6000 - Product Requirements.
- D. Acrylic Emulsion Latex: Water-based; ASTM C834, single component, non-staining, non-bleeding, non-sagging; not intended for exterior use. Siliconized.
 1. Color: To be selected by Architect from manufacturer's full range.
 2. Grade: ASTM C834; Grade Minus 18 Degrees C (0 Degrees F).
 3. Products:
 - a. Franklin International Inc; Titebond Painter's Plus Caulk: www.titebond.com.
 - b. Pecora Corporation; AC-20 +Silicone: www.pecora.com.
 - c. Sherwin Williams; 950A Siliconized Acrylic Latex Caulk: www.sherwin-williams.com.
 - d. Tremco, Inc.; Tremflex 834: www.tremcosealants.com.
 - e. Substitutions: See Section 01 6000 - Product Requirements.

2.03 SELF-LEVELING SEALANTS

- A. Self-Leveling Silicone Sealant: ASTM C920, Type S, Grade P, Uses T, M and O; single-component, explicitly approved by manufacturer for traffic exposure when recessed below

traffic surface; not expected to withstand continuous water immersion.

1. Movement Capability: Plus 100 percent, minus 50 percent, minimum.
2. Hardness Range: Comply with one of the following:
 - a. 5 to 20, Shore A, when tested in accordance with ASTM C661.
 - b. 40 to 85, Shore 00, when tested in accordance with ASTM D2240.
3. Color: To be selected by Architect from manufacturer's full range.
4. Cure Type: Single-component, neutral moisture curing.
5. Service Temperature Range: Minus 50 to 300 degrees F.
6. Products:
 - a. Dow Corning; SL Parking Structure Sealant: www.siliconeforbuilding.com.
 - b. Pecora Corporation; 310SL: www.pecora.com.
 - c. Sika Corporation; Sikasil-728 SL: www.usa.sika.com.
 - d. Tremco, Inc.; Spectrem 900SL: www.tremcosealants.com.
 - e. Substitutions: See Section 01 6000 - Product Requirements.

2.04 ACCESSORIES

- A. Backer Rod: Cylindrical cellular foam rod with surface that sealant will not adhere to, compatible with specific sealant used, and recommended by backing and sealant manufacturers for specific application.
 1. Type for Joints Not Subject to Pedestrian or Vehicular Traffic: ASTM C1330; Type B - Bi-Cellular Polyethylene.
 2. Type for Joints Subject to Pedestrian or Vehicular Traffic: ASTM C1330; Type B - Bi-Cellular Polyethylene.
 3. Bi-Cellular: 25 to 33 percent larger in diameter than joint width.
- B. Backing Tape: Self-adhesive polyethylene tape with surface that sealant will not adhere to and recommended by tape and sealant manufacturers for specific application.
- C. Masking Tape: Self-adhesive, nonabsorbent, non-staining, removable without adhesive residue, and compatible with surfaces adjacent to joints and sealants.
- D. Primers: Type recommended by sealant manufacturer to suit application; non-staining.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that joints are ready to receive work.
- B. Verify that backing materials are compatible with sealants.
- C. Verify that backer rods are of the correct size.

3.02 PREPARATION

- A. Remove loose materials and foreign matter that could impair adhesion of sealant.
- B. Clean joints, and prime as necessary, in accordance with manufacturer's instructions.
- C. Perform preparation in accordance with manufacturer's instructions and ASTM C1193.
- D. Mask elements and surfaces adjacent to joints from damage and disfigurement due to sealant work; be aware that sealant drips and smears may not be completely removable.
- E. Concrete Floor Joints That Will Be Exposed in Completed Work: Test joint filler in inconspicuous area to verify that it does not stain or discolor slab.

3.03 INSTALLATION

- A. Perform work in accordance with sealant manufacturer's requirements for preparation of surfaces and material installation instructions.
- B. Perform installation in accordance with ASTM C1193.
- C. Measure joint dimensions and size joint backers to achieve width-to-depth ratio, neck dimension, and surface bond area as recommended by manufacturer.
- D. Install bond breaker backing tape where backer rod cannot be used.
- E. Install sealant free of air pockets, foreign embedded matter, ridges, and sags, and without getting sealant on adjacent surfaces.

- F. Do not install sealant when ambient temperature is outside manufacturer's recommended temperature range, or will be outside that range during the entire curing period, unless manufacturer's approval is obtained and instructions are followed.
- G. Nonsag Sealants: Tool surface concave, unless otherwise indicated; remove masking tape immediately after tooling sealant surface.
- H. Concrete Floor Joint Filler: After full cure, shave joint filler flush with top of concrete slab.
- I. Installation of Two-Stage Joints at Precast Architectural Concrete Units:
 - 1. Joint system consists of two back-to-back sealant joints at each precast architectural concrete unit joint with a weep at the bottom of the unit joint per Precast/Prestressed Concrete Institute (PCI) recommendations and as follows:
 - a. Inner (Secondary) Seal: Inner secondary backer rod and sealant joint is installed a minimum of 2 to 2-1/2 inches beyond the exposed face of the precast architectural concrete panels within the panel joint itself.
 - b. Exterior (Primary) Seal: Following the installation of the secondary joint, the outer primary backer rod and sealant joint is installed at the face of the precast architectural concrete panels with a weep at the bottom of the joint. Leave open continuous air space between the primary backer rod and inner secondary seal.
 - c. Install 3/8 inch minimum weep openings in the exterior seal to allow water penetrating the exterior seal and contained by the inner seal to exit the cavity between joint seals.
 - 1) Do not install weeps below finish grades.
 - d. Near the junction of horizontal and vertical joints, the inner seal must turn out to the plane of the exterior seal at regular intervals to force water out of the joint.

3.04 FIELD QUALITY CONTROL

- A. Owner may employ an independent testing agency to perform field quality control inspection and testing as specified in PART 1 under QUALITY ASSURANCE article.
- B. Non-Destructive Adhesion Testing: If there are any failures in first 100 linear feet, notify Architect immediately.
- C. Remove and replace failed portions of sealants using same materials and procedures as indicated for original installation.

END OF SECTION

SECTION 08 1113 - HOLLOW METAL DOORS AND FRAMES**PART 1 GENERAL****1.01 SECTION INCLUDES**

- A. Non-fire-rated hollow metal doors and frames.
- B. Hollow metal frames for wood doors.
 - 1. Including fire-rated frames
- C. Fire-rated hollow metal doors and frames.
- D. Hollow metal borrowed lites glazing frames.

1.02 ABBREVIATIONS AND ACRONYMS

- A. ANSI: American National Standards Institute.
- B. BHMA - Builders Hardware Manufacturers Association.
- C. NFPA: National Fire Protection Association.
- D. SDI: Steel Door Institute.
- E. UL: Underwriters Laboratories.

1.03 REFERENCE STANDARDS

- A. ADA Standards - Americans with Disabilities Act (ADA) Standards for Accessible Design 2010.
- B. ANSI A250.8 - SDI-100 Recommended Specifications for Standard Steel Doors and Frames. 2003.
- C. ANSI/SDI A250.4 - Test Procedure and Acceptance Criteria for Physical Endurance for Steel Doors, Frames and Frame Anchors 2018.
- D. ANSI/SDI A250.8 - Specifications for Standard Steel Doors and Frames (SDI-100) 2017.
- E. ANSI/SDI A250.10 - Test Procedure and Acceptance Criteria for Prime Painted Steel Surfaces for Steel Doors and Frames 2020.
- F. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process 2020.
- G. ASTM A1008/A1008M - Standard Specification for Steel, Sheet, Cold-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, Required Hardness, Solution Hardened, and Bake Hardenable 2021a.
- H. ASTM A1011/A1011M - Standard Specification for Steel, Sheet and Strip, Hot-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, and Ultra-High Strength 2018a.
- I. ASTM C143/C143M - Standard Test Method for Slump of Hydraulic-Cement Concrete 2020.
- J. ASTM C476 - Standard Specification for Grout for Masonry 2020.
- K. ASTM C665 - Standard Specification for Mineral-Fiber Blanket Thermal Insulation for Light Frame Construction and Manufactured Housing 2017.
- L. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials 2021a.
- M. BHMA A156.115 - Hardware Preparation In Steel Doors And Steel Frames 2016.
- N. ICC A117.1 - Accessible and Usable Buildings and Facilities 2017.
- O. ITS (DIR) - Directory of Listed Products current edition.
- P. NAAMM HMMA 861 - Guide Specifications for Commercial Hollow Metal Doors and Frames 2014.
- Q. NFPA 80 - Standard for Fire Doors and Other Opening Protectives 2022.
- R. NFPA 105 - Standard for Smoke Door Assemblies and Other Opening Protectives 2022.
- S. NFPA 252 - Standard Methods of Fire Tests of Door Assemblies 2022.
- T. SDI 117 - Manufacturing Tolerances for Standard Steel Doors and Frames 2013.
- U. UL (DIR) - Online Certifications Directory Current Edition.
- V. UL 10C - Standard for Positive Pressure Fire Tests of Door Assemblies Current Edition, Including All Revisions.

- W. UL 1784 - Standard for Air Leakage Tests of Door Assemblies Current Edition, Including All Revisions.

1.04 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements for submittal procedures.
- B. Product Data: Materials and details of design and construction, hardware locations, reinforcement type and locations, anchorage and fastening methods, and finishes.
- C. Shop Drawings: Details of each opening, showing elevations, glazing, frame profiles, and any indicated finish requirements.
1. Include details of electrical raceway and preparation for electrified hardware, access control systems, and security systems.
- D. Manufacturer's Qualification Statement.
- E. Installer's Qualification Statement.

1.05 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section, with not less than 5 years documented experience.
- B. Installer Qualifications: Company specializing in performing work of the type specified and with at least 5 years of documented experience.

1.06 DELIVERY, STORAGE, AND HANDLING

- A. Comply with ANSI A250.8 (SDI-100) in accordance with specified requirements.
- B. Protect with resilient packaging; avoid humidity build-up under coverings; prevent corrosion and adverse effects on factory applied painted finish.

1.07 WARRANTY

- A. See Section 01 7800 - Closeout Submittals, for additional warranty requirements.
- B. Provide manufacturer warranty for doors and frames to be free from material or workmanship defects and within commercial tolerances within a 1 year period after Date of Substantial Completion.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Hollow Metal Doors and Frames:
1. Ceco Door, an Assa Abloy Group company; []: www.assaabloydss.com/#sle.
 2. Curries, an Assa Abloy Group company: www.curries.com.
 3. De La Fontaine: www.delafontaine.com.
 4. Mesker/Mesker Openings Group, a Dormakaba Group company: www.meskeropeningsgroup.com.
 5. Pioneer Industries, an Assa Abloy Group company: www.pioneerindustries.com.
 6. Republic Doors, an Allegion brand: www.republicdoor.com.
 7. Steelcraft, an Allegion brand: www.allegion.com.
 8. Substitutions: See Section 01 6000 - Product Requirements.

2.02 PERFORMANCE REQUIREMENTS

- A. Requirements for Hollow Metal Doors and Frames:
1. Steel Sheet: Comply with one or more of the following requirements; galvanized steel complying with ASTM A653/A653M, cold-rolled steel complying with ASTM A1008/A1008M, or hot-rolled pickled and oiled (HRPO) steel complying with ASTM A1011/A1011M, commercial steel (CS) Type B, for each.
 2. Accessibility: Comply with ICC A117.1 and ADA Standards.
 3. Exterior Door Top Closures: Flush end closure channel, with top and door faces aligned.
 4. Door Edge Profile: Beveled, both sides.
 5. Typical Door Face Sheets: Flush.
 6. Glazed Lights: Non-removable stops on non-secure side; sizes and configurations as indicated on drawings. Style: Manufacturer's standard.
 7. Hardware Preparations, Selections and Locations: Comply with BHMA A156.115 and ANSI A250.8 (SDI-100) in accordance with specified requirements and as follows:

- a. Minimum Hardware reinforcing thicknesses:
 - 1) Mortise Butt Hinges: 0.123 inches (10 gage),
 - 2) Pivot Hinges: 0.167 inches (7 gage)
 - 3) Continuous Hinges: 0.067 inches (14 gage).
 - 4) Exit Devices: 0.067 inches (14 gage)
 - 5) Mortise Locksets and Deadbolts: 0.067 inches (14 gage).
 - 6) Bored Locksets and Deadbolts: 0.067 inches (14 gage).
 - 7) Flush and Surface Bolts: 0.067 inches (14 gage).
 - 8) Closers and Hold Open Arms: 0.067 inches (14 gage).
 - 9) Pull Plates and Push/Pull Bars: 0.067 inches (14 gage).
 - 10) Protection Plates and Push Plates: No reinforcing required.
- 8. Zinc Coating: Where indicated, provide metal components zinc-coated (galvanized) and/or zinc-iron alloy-coated (galvannealed) by the hot-dip process in accordance with ASTM A653/A653M.
 - a. Minimum A60/ZF180 (galvannealed) coating unless otherwise indicated.
- B. Hollow Metal In-Fill Panels: Same construction, performance, and finish as doors.
- C. Combined Requirements: If a particular door and frame unit is indicated to comply with more than one type of requirement, comply with the specified requirements for each type; for instance, an exterior door that is also indicated as being sound-rated must comply with the requirements specified for exterior doors and for sound-rated doors; where two requirements conflict, comply with the most stringent.

2.03 HOLLOW METAL DOORS

- A. Door Finish: Factory primed and field finished.
- B. Interior Doors, Non-Fire Rated:
 - 1. Based on SDI Standards: ANSI/SDI A250.8 (SDI-100).
 - a. Level 2 - Heavy-duty.
 - b. Physical Performance Level C, 250,000 cycles; in accordance with ANSI/SDI A250.4.
 - c. Model 2 - Seamless.
 - d. Door Face Metal Thickness: 20 gauge, 0.032 inch, minimum.
 - 2. Door Core Material: Manufacturers standard core material/construction and in compliance with requirements.
- C. Fire-Rated Doors:
 - 1. Based on SDI Standards: ANSI/SDI A250.8 (SDI-100).
 - a. Level 2 - Heavy-duty.
 - b. Physical Performance Level C, 250,000 cycles; in accordance with ANSI/SDI A250.4.
 - c. Model 2 - Seamless.
 - d. Door Face Metal Thickness: 20 gauge, 0.032 inch, minimum.
 - 2. Fire Rating: As indicated on drawings, tested in accordance with UL 10C and NFPA 252 ("positive pressure fire tests").
 - 3. Temperature-Rise Rating (TRR) Across Door Thickness: 450 degrees F.
 - a. Provide where indicated on Drawings and at vertical exit enclosures and exit passageways.
 - 4. Provide units listed and labeled by UL (DIR) or ITS (DIR).
 - a. Attach fire rating label to each fire rated unit.
 - 5. Smoke and Draft Control Doors: Install in accordance with NFPA 80 and NFPA 105, with fire-resistance-rated wall construction rated the same or greater than the fire-rated doors, and the following;
 - a. Maximum Air Leakage: 3.0 cfm/sq ft of door opening at 0.10 inch w.g. pressure, when tested in accordance with UL 1784 at both ambient and elevated temperatures.
 - b. Gasketing: Refer to Section 08 7100.
 - c. Label: Include the "S" label on fire-rating label of door.
 - 6. Door Core Material: Manufacturers standard core material/construction in compliance with requirements.
 - 7. For Exterior Fire-Rated Doors provide the following:

- a. Zinc Coating: A60/ZF180 galvanized coating; ASTM A653/A653M.
- b. Core Material: Mineral board.
- c. Weatherstripping: Refer to Section 08 7100.

2.04 HOLLOW METAL FRAMES

- A. Hollow metal frames based on SDI Standards: ANSI A250.8 (SDI-100).
 1. Joints between faces of abutting frame members shall appear seamless; joints shall be securely welded, filled, and finished smooth without visible seams.
- B. Frame Finish: Factory primed and field finished.
- C. Interior Door Frames, Non-Fire Rated: Full profile/continuously welded type.
 1. Frame Metal Thickness: 16 gage, 0.053 inch, minimum.
 2. Includes frames for wood doors.
- D. Door Frames, Fire-Rated: Full profile/continuously welded type.
 1. Fire Rating: Same as door, labeled.
 2. Frame Metal Thickness: 16 gage, 0.053 inch, minimum.
 3. Includes frames for wood doors.
 4. For Exterior Fire-Rated Doors provide the following:
 - a. Galvanizing: Components hot-dipped zinc-iron alloy-coated (galvanized) in accordance with ASTM A653/A653M, with A60/ZF180 coating.
- E. Borrowed Light Frames: Full profile/continuously welded type.
 1. Frame Metal Thickness: 16 gage, 0.053 inch, minimum.
 2. Face dimensions to match door frames.
- F. Mullions for Pairs of Doors: Where indicated provide fixed mullions with profile similar to jambs.
 1. Refer to Section 08 7100 - Door Hardware for removable mullions.
- G. Transom Bars: Fixed, of profile same as jamb and head.
- H. Provide mortar guard boxes for hardware cut-outs in frames to be installed in masonry or to be grouted.
- I. Frames in Masonry Walls: Size to suit masonry coursing with head member 4 inches high to fill opening without cutting masonry units.
- J. Frames Wider than 48 inches: Reinforce with steel channel fitted tightly into frame head, flush with top.
- K. Frame Anchors:
 1. Provide anchors of minimum size and type required by applicable door and frame standard, and suitable for performance level indicated.
 2. Floor Anchors: Base anchors welded to bottom of frames, designed to attach frame to floor.
 3. Masonry Anchors: Masonry anchors shall be T-strap type, corrugated or perforated.
 4. Stud Anchors: Z-type, welded to back of frames.
 5. In-Place Concrete or Masonry Wall Anchors: Minimum 3/8 inch diameter bolts with expansion shields or inserts, with manufacturer's standard spacer.
 - a. For existing walls or new openings cut into existing walls

2.05 FINISHES

- A. Primer: Rust-inhibiting, complying with ANSI/SDI A250.10, door manufacturer's standard.
- B. Corrosion Resistant Back-Coating: Automotive undercoating, asphalt emulsion, or other high-build, water-resistant, resilient coating.

2.06 ACCESSORIES

- A. Louvers: Roll formed steel with overlapping frame; finish same as door components; factory-installed.
 1. In Fire-Rated Doors: UL (DIR) or ITS (DIR) listed fusible link louver, same rating as door.
 2. Style: Sightproof inverted V or Y blades.
 3. Louver Free Area: 50 percent.
 4. Fasteners: Concealed fasteners.
- B. Glazing: As specified in Section 08 8000.

- C. Removable Stops: Formed sheet steel, mitered or butted corners; prepared for countersink style tamper proof screws.
 - 1. At Contractor's option, instead of glass stops provided by door manufacturer, provide fire rated glass manufacturer's standard vision lite kits for installing fire-rated glass in doors.
 - a. Refer to Section 08 8000 - Glazing.
- D. Astragals for Double Doors: Specified in Section 08 7100.
- E. Grout for Frames: Mortar grout complying with ASTM C476 with maximum slump of 4 inches as measured in accordance with ASTM C143/C143M for hand troweling in place; plaster grout and thinner pumpable grout are prohibited.
 - 1. Comply with requirements of Section 04 2000 - Unit Masonry.
- F. Silencers: Resilient rubber, fitted into drilled hole; provide three on strike side of single door, three on center mullion of pairs, and two on head of pairs without center mullions.
- G. Filler: Two-component, non-shrinking resin, autobody filler.
 - 1. Available Products:
 - a. 3M/Bondo; Professional Gold Body Filler: www.bondo.com.
- H. Mineral Fiber Insulation: Flexible preformed batt or blanket, complying with ASTM C665; friction fit; unfaced flame spread and smoke developed indexes of 0 (zero) when tested in accordance with ASTM E84.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify existing conditions before starting work.
- B. Verify that opening sizes and tolerances are acceptable.
- C. Verify that finished walls are in plane to ensure proper door alignment.

3.02 PREPARATION

- A. Back-Coating of Non-Rated Frames: Field-apply corrosion resistant back-coatings to frames that are to be grouted solid.
 - 1. Do not back-coat fire-rated frames.

3.03 INSTALLATION

- A. Install doors and frames in accordance with manufacturer's instructions and related requirements of specified door and frame standards or custom guidelines indicated.
- B. Install fire rated units in accordance with NFPA 80.
- C. Install smoke control units in accordance with NFPA 105.
- D. Set frames accurately in position, aligned, plumb, and square.
- E. Fill head and jamb members with mineral fiber insulation prior to installation.
 - 1. Exception: Do not fill frames that are to be grouted solid.
- F. Grout frames solid in masonry and concrete construction, using hand trowel methods; brace frames so that pressure of grout before setting will not deform frames.
 - 1. Install silencers prior to grouting frames.
 - 2. Do not grout fire-rated frames; instead fill head and jamb members with mineral fiber insulation.
- G. Frame Anchors:
 - 1. Coordinate frame anchor placement with wall construction.
 - 2. Minimum number of anchors:
 - a. Provide 3 jamb anchors per jamb up to 90 inches in height; evenly spaced.
 - b. Provide 4 jamb anchors per jamb from 90 to 144 inches in height; evenly spaced.
 - c. Provide 1 additional anchor per jamb for each 24 inches or fraction thereof more than 144 inches in height.
 - d. Provide 1 floor anchor at the bottom of each jamb or mullion; where a floor anchor is not possible provide one additional jamb anchor.
 - 3. In-Place Concrete or Masonry Wall Anchor: Secure frames in place with postinstalled expansion anchors. Countersink anchors, and fill and make smooth, flush, and invisible on

exposed faces.

- H. Install doors plumb with uniform clearance at jambs and head; doors shall open and close without binding
- I. Install glass in accordance with Section 08 8000 - Glazing.
- J. Install door hardware as specified in Section 08 7100.
- K. Coordinate installation of electrical connections to electrical hardware items.

3.04 TOLERANCES

- A. Clearances Between Door and Frame: Comply with related requirements of specified frame standards or custom guidelines indicated in accordance with SDI 117.
- B. Maximum Diagonal Distortion: 1/16 inch measured with straight edge, corner to corner.

3.05 ADJUSTING

- A. Adjust for smooth and balanced door movement.

END OF SECTION

SECTION 08 1416 - FLUSH WOOD DOORS**PART 1 GENERAL****1.01 SECTION INCLUDES**

- A. Flush wood doors; flush configuration; fire-rated, non-rated, and acoustical.

1.02 REFERENCE STANDARDS

- A. HPVA HP-1 - American National Standard for Hardwood and Decorative Plywood 2016.
- B. NFPA 105 - Standard for Smoke Door Assemblies and Other Opening Protectives 2022.

1.03 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements for submittal procedures.
- B. Product Data: Indicate door core materials and construction; veneer species, type and characteristics.
- C. Shop Drawings: Show doors and frames, elevations, sizes, types, swings, undercuts, beveling, blocking for hardware, factory machining, factory finishing, cutouts for glazing and other details.
 - 1. Provide information as required by AWI/AWMAC/WI (AWS).
 - 2. Include details of electrical raceway and preparation for electrified hardware, access control systems, and security systems
- D. Samples: Submit three samples of door veneer, 8 by 10 inch in size illustrating wood grain, stain color, and sheen.
 - 1. Transparent finish Samples shall illustrate typical range of wood color and grain.
- E. Manufacturer's Qualification Statement.
- F. Installer's Qualification Statement.
- G. Warranty, executed in Owner's name.

1.04 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section, with not less than 5 years of documented experience.
- B. Installer Qualifications: Company specializing in performing work of the type specified in this section, with not less than 5 years of documented experience.

1.05 DELIVERY, STORAGE, AND HANDLING

- A. Package, deliver and store doors in accordance with specified quality standard.
- B. Accept doors on site in manufacturer's packaging, and inspect for damage.
- C. Protect doors with resilient packaging. Do not store in damp or wet areas; or in areas where sunlight might bleach veneer. Seal top and bottom edges if stored more than one week. Break seal on site to permit ventilation.

1.06 WARRANTY

- A. See Section 01 7800 - Closeout Submittals for additional warranty requirements.
- B. Interior Doors: Provide manufacturer's warranty for the life of the installation.
- C. Include coverage for delamination of veneer, warping beyond specified installation tolerances, defective materials, and telegraphing core construction.

PART 2 PRODUCTS**2.01 MANUFACTURERS**

- A. Wood Veneer Faced Doors:
 - 1. Masonite Architectural; Cendura Standard Wood Veneer Doors: www.architectural.masonite.com/#sle.
 - 2. Mohawk Doors, Masonite Architectural: <https://architectural.masonite.com>.
 - 3. Oshkosh Door Company: www.oshkoshdoor.com.
 - 4. VT Industries, Inc: www.vtindustries.com.
 - 5. Substitutions: See Section 01 6000 - Product Requirements.

2.02 DOORS

- A. Interior Doors: 1-3/4 inches thick unless otherwise indicated; flush construction.

1. Provide solid core doors at each location.
2. Wood veneer facing with factory transparent finish.

2.03 DOOR CORES

- A. Non-Rated Solid Core and 20 Minute Rated Doors: Type particleboard core (PC), plies and faces as indicated.

2.04 DOOR FACINGS

- A. Veneer Facing for Transparent Finish:
 1. Species and Cut:
 - a. Species: Select White Maple.
 - b. Cut: Plain sliced (flat cut).
 - c. Grade: HPVA Grade A.
 2. Veneer Matching:
 - a. Matching Within Door Faces: Center balance match.
 3. Vertical Edges: Same species as face veneer.
 4. Transoms: Continuous match to doors.
- B. Facing Adhesive: Type II - water resistant.

2.05 DOOR CONSTRUCTION

- A. Fabricate doors in accordance with door quality standard specified.
- B. Cores Constructed with stiles and rails:
 1. Provide solid blocks at lock edge and top of door for closer for hardware reinforcement.
 2. Provide solid blocking for other throughbolted hardware.
- C. Factory machine doors for hardware other than surface-mounted hardware, in accordance with hardware requirements and dimensions.
- D. Factory fit doors for frame opening dimensions identified on shop drawings, with edge clearances in accordance with specified quality standard.
- E. Provide edge clearances in accordance with the quality standard specified.

2.06 ACCESSORIES

- A. Hollow Metal Door Frames: As specified in Section 08 1113 - Hollow Metal Doors and Frames.
- B. Door Hardware: See Section 08 7100.

PART 3 EXECUTION**3.01 EXAMINATION**

- A. Verify existing conditions before starting work.
- B. Verify that opening sizes and tolerances are acceptable.
- C. Do not install doors in frame openings that are not plumb or are out-of-tolerance for size or alignment.

3.02 INSTALLATION

- A. Install doors in accordance with manufacturer's instructions and specified quality standard.
 1. Install smoke and draft control doors in accordance with NFPA 105 requirements.
- B. Use machine tools to cut or drill for hardware.
- C. Coordinate installation of doors with installation of frames and hardware.
- D. Install door hardware as specified in Section 08 7100 - Door Hardware.
- E. Coordinate installation of electrical connections to electrical hardware items.

3.03 TOLERANCES

- A. Comply with specified quality standard for fit and clearance tolerances.
- B. Comply with specified quality standard for telegraphing, warp, and squareness.

3.04 ADJUSTING

- A. Adjust doors for smooth and balanced door movement.
- B. Adjust closers for full closure.

END OF SECTION

SECTION 08 3100 - ACCESS DOORS AND PANELS**PART 1 GENERAL****1.01 SECTION INCLUDES**

- A. Wall- and ceiling-mounted access units.

1.02 DEFINITIONS

- A. Wet Areas: Includes the following:
 - 1. Exterior locations.
 - 2. Showers.
 - 3. Other areas as indicated.
- B. Non-Wet Areas: Areas that are not indicated or listed as wet areas including, but not limited to, the following:
 - 1. Kitchens.
 - 2. Locker rooms.
 - 3. Toilet rooms.
 - 4. Janitor closets.

1.03 REFERENCE STANDARDS

- A. ASTM A1008/A1008M - Standard Specification for Steel, Sheet, Cold-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, Required Hardness, Solution Hardened, and Bake Hardenable 2021a.
- B. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process 2020.
- C. ITS (DIR) - Directory of Listed Products current edition.
- D. UL (FRD) - Fire Resistance Directory Current Edition.

1.04 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements for submittal procedures.
- B. Product Data: Provide sizes, types, finishes, hardware, scheduled locations, and details of adjoining work.
- C. Shop Drawings: Indicate exact position of each access door and/or panel unit.
- D. Project Record Documents: Record actual locations of each access unit.

1.05 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum 5 years documented experience.
- B. Installer Qualifications: Company specializing in performing work of the type specified and with at least 5 years documented experience.

PART 2 PRODUCTS**2.01 MATERIALS**

- A. Steel: Sheet complying with the following:
 - 1. All areas except wet areas: ASTM A1008/A1008M.
 - 2. Wet areas: ASTM A653/A653M Grade 33; A40 galvannealed.

2.02 WALL- AND CEILING-MOUNTED ACCESS UNITS

- A. Manufacturers:
 - 1. Acudor; www.acudor.com.
 - 2. Babcock-Davis; www.babcockdavis.com.
 - 3. JL Industries/Activar Construction Products Group, Inc; www.activarcpg.com/jl-industries.
 - 4. Karp Associates, Inc; www.karpinc.com.
 - 5. Larsen's Manufacturing Company; www.larsenmfg.com.
 - 6. Milcor / Hart & Cooley Inc; www.milcorinc.com.
 - 7. MIFAB, Inc.; www.mifab.com.
 - 8. Nystrom; www.nystrom.com.
 - 9. Substitutions: See Section 01 6000 - Product Requirements.
- B. General:

1. Factory fabricate doors and frames.
 2. Fully assemble units with corner joints welded, filled and ground flush; square and without rack or warp.
 3. Coordinate requirements with type of installation assembly being used for each unit.
- C. Flush Access Doors with Exposed Flanges:
1. Locations: Masonry.
 2. Material: Steel.
 3. Style: Exposed frame with door surface flush with frame surface.
 - a. Masonry Mounting Criteria: Provide masonry anchor straps.
 4. Door Style: Single thickness with rolled or turned in edges.
 5. Doors: 14 gage, 0.0747 inch, minimum thickness.
 6. Frames: 16 gage, 0.0598 inch, minimum thickness.
 7. Steel Finish: Primed; manufacturer's standard rust-inhibitive powder coat.
 8. Door/Panel Size: As indicated on the drawings.
 9. Hardware:
 - a. Hinges: Concealed, constant force closure spring type.
 - b. Handle: No handle.
 - c. Latch/Lock: Screw driver slot for quarter turn cam latch.
 - d. Number of Locks/Latches Required: As recommended by manufacturer for size of unit.
- D. Flush Access Doors with Concealed Flanges:
1. Locations: Gypsum board.
 2. Material: Steel.
 3. Style: Concealed flange for drywall.
 - a. Gypsum Board Mounting Criteria: Use drywall bead type frame.
 4. Door Style: Single thickness with rolled or turned in edges.
 5. Doors: 14 gage, 0.0747 inch, minimum thickness
 6. Frames: 16 gage, 0.0598 inch, minimum thickness.
 7. Steel Finish: Primed; manufacturer's standard rust-inhibitive powder coat.
 8. Door/Panel Size: As indicated on the drawings.
 9. Hardware:
 - a. Hinges: Concealed, constant force closure spring type.
 - b. Handle: No handle.
 - c. Latch/Lock: Screw driver slot for quarter turn cam latch.
 - d. Number of Locks/Latches Required: As recommended by manufacturer for size of unit.
- E. Fire-Rated, Flush, Uninsulated, Access Doors with Exposed Flanges:
1. Locations: Masonry.
 2. Material: Steel.
 3. Style: Exposed frame with door surface flush with frame surface.
 - a. Masonry Mounting Criteria: Provide masonry anchor straps.
 4. Door Style: Single thickness with rolled or turned in edges.
 5. Doors: 16 gage, 0.0598 inch, minimum thickness
 6. Frames: 16 gage, 0.0598 inch, minimum thickness.
 7. Fire-Rating: Fire rating as required by applicable code for fire-rated assembly that access doors are being installed.
 - a. Provide products listed by ITS (DIR) or UL (FRD) as suitable for purpose indicated.
 8. Steel Finish: Primed; manufacturer's standard rust-inhibitive powder coat.
 9. Door/Panel Size: As indicated on the drawings.
 10. Hardware: Automatic closing, self-latching, with interior latch release.
 - a. Hinges: Exposed, continuous piano hinge.
 - b. Handle: No handle.
 - c. Latch/Lock: Cylinder lock-operated cam latch, two keys for each unit.
 - d. Number of Locks/Latches Required: As recommended by manufacturer for size of unit.

- e. Inside Latch Release: Mechanism that allows door/panel to be opened from inside.
- F. Fire-Rated, Flush, Uninsulated, Access Doors with Concealed Flanges:
 - 1. Locations: Gypsum board.
 - 2. Material: Steel.
 - 3. Style: Concealed flange for drywall.
 - a. Gypsum Board Mounting Criteria: Use drywall bead type frame.
 - 4. Door Style: Single thickness with rolled or turned in edges.
 - 5. Doors: 16 gage, 0.0598 inch, minimum thickness
 - 6. Frames: 16 gage, 0.0598 inch, minimum thickness.
 - 7. Fire-Rating: Fire rating as required by applicable code for fire-rated assembly that access doors are being installed.
 - a. Provide products listed by ITS (DIR) or UL (FRD) as suitable for purpose indicated.
 - 8. Steel Finish: Primed; manufacturer's standard rust-inhibitive powder coat.
 - 9. Door/Panel Size: As indicated on the drawings.
 - 10. Hardware: Automatic closing, self-latching, with interior latch release.
 - a. Hinges: Exposed continuous piano hinge.
 - b. Handle: No handle.
 - c. Latch/Lock: Cylinder lock-operated cam latch, two keys for each unit.
 - d. Number of Locks/Latches Required: As recommended by manufacturer for size of unit.
 - e. Inside Latch Release: Mechanism that allows door/panel to be opened from inside.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that rough openings are correctly sized and located.
- B. Begin installation only after substrates have been properly prepared, and if the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

3.02 PREPARATION

- A. Clean surfaces thoroughly prior to proceeding with this work.
- B. Prepare surfaces using methods recommended by manufacturer for applicable substrates in accordance with project conditions.

3.03 INSTALLATION

- A. Install units in accordance with manufacturer's instructions.
- B. Install frames plumb and level in openings, and secure units rigidly in place.
- C. Position units to provide convenient access to concealed equipment when necessary.

3.04 ADJUSTING

- A. Adjust doors and hardware, after installation, for proper operation.

END OF SECTION

SECTION 08 3483 - FIRE-RATED FRAMED GLAZING ASSEMBLIES**PART 1 GENERAL****1.01 SECTION INCLUDES**

- A. Interior fire-rated framed glazing assemblies.

1.02 RELATED REQUIREMENTS

- A. Section 07 2500 - Weather Barriers: Sealing framing to water-resistive barrier installed on adjacent construction.
- B. Section 08 8000 - Glazing: Fire-resistance-rated glazing.

1.03 REFERENCE STANDARDS

- A. AAMA CW-10 - Care and Handling of Architectural Aluminum from Shop to Site 2015.
- B. AAMA 2605 - Voluntary Specification, Performance Requirements and Test Procedures for Superior Performing Organic Coatings on Aluminum Extrusions and Panels (with Coil Coating Appendix) 2020.
- C. ASTM A1008/A1008M - Standard Specification for Steel, Sheet, Cold-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, Required Hardness, Solution Hardened, and Bake Hardenable 2021a.
- D. ASTM A1011/A1011M - Standard Specification for Steel, Sheet and Strip, Hot-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, and Ultra-High Strength 2018a.
- E. ASTM A36/A36M - Standard Specification for Carbon Structural Steel 2019.
- F. ASTM A123/A123M - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products 2017.
- G. ASTM B209/B209M - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate 2021.
- H. ASTM A501/A501M - Standard Specification for Hot-Formed Welded and Seamless Carbon Steel Structural Tubing 2021.
- I. ASTM C665 - Standard Specification for Mineral-Fiber Blanket Thermal Insulation for Light Frame Construction and Manufactured Housing 2017.
- J. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials 2021a.
- K. ASTM E119 - Standard Test Methods for Fire Tests of Building Construction and Materials 2020.
- L. ITS (DIR) - Directory of Listed Products current edition.
- M. NFPA 80 - Standard for Fire Doors and Other Opening Protectives 2022.
- N. UL (DIR) - Online Certifications Directory Current Edition.
- O. UL 263 - Standard for Fire Tests of Building Construction and Materials Current Edition, Including All Revisions.

1.04 ADMINISTRATIVE REQUIREMENTS

- A. Preinstallation Meeting: Conduct a preinstallation meeting one week before starting work of this section; require attendance by each affected installer.

1.05 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements for submittal procedures.
- B. Product Data: Provide evidence of compliance with fire performance criteria and manufacturer's published product data on framing components, glazing, anchorage and fasteners, and doors, if any.
- C. Shop Drawings: Indicate system dimensions, framed opening requirements and tolerances, affected related work, expansion and contraction joint location and details, and field welding required.
 - 1. Details of conduits and preparations for power, signal, and control systems.

- D. Samples: Submit samples as follows illustrating each exposed metal finish of project-specific applications.
 - 1. Submit three samples for each finish specified, not less than 6 inches square or 6 inches long for linear components.
- E. Hardware Schedule: Complete itemization of each item of hardware to be provided for each door, cross-referenced to door identification numbers in Contract Documents.
- F. Manufacturer's Qualification Statement.
- G. Installer's Qualification Statement.
- H. Warranty Documentation: Submit manufacturer warranty and ensure forms have been completed in Owner's name and registered with manufacturer.

1.06 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section with at least 5 years documented experience.
- B. Installer Qualifications: Company specializing in performing work of the type specified and with at least 5 years documented experience and approved by manufacturer.

1.07 MOCK-UPS

- A. See Section 01 4000 - Quality Requirements for additional requirements.
- B. Provide mock-up that includes components of the types specified, and assemble to illustrate complete assembly, including attachments, anchors, and perimeter sealant.
- C. Locate on-site where directed. Mock-up may remain as part of the Work.

1.08 DELIVERY, STORAGE, AND HANDLING

- A. Handle products of this section in accordance with AAMA CW-10.

1.09 WARRANTY

- A. See Section 01 7800 - Closeout Submittals for additional warranty requirements.
- B. Provide five year manufacturer's warranty for defects in workmanship and materials.
- C. Finish Warranty: Provide manufacturer's warranty covering failure of factory-applied finish and agreeing to repair or replace panels that show evidence of finish degradation, including significant fading, chalking, cracking, or peeling within specified warranty period of 20 years from Date of Substantial Completion

PART 2 PRODUCTS

2.01 INTERIOR FIRE-RATED FRAMED GLAZING ASSEMBLIES

- A. Basis of Design: SAFTIFIRST, a division of O'Keeffe's Inc.; GPX Architectural Series including GPX Architectural Series Fire Resistive Doors www.safti.com.
- B. Other acceptable products:
 - 1. Alufam North America; Fire-Rated Aluminum Vision Wall and Window System with Fire-Rated Aluminum Doors: www.alufam-usa.com.
 - 2. Technical Glass Products (TGP); Fireframes Aluminum Series including Fireframes Heat Barrier Doors: www.fireglass.com.
 - 3. Substitutions: Refer to Section 01 6000 - Product Requirements.
- C. Interior Fire-Resistive Framed Glazing Assemblies: Fire-resistive, temperature rise, framing system, including doors.
 - 1. Frame Profile:
 - a. Face Width: 2-1/2 inches, maximum.
 - b. Frame Depth: 4-1/2 inches, maximum.
 - 2. Door Stile Face Width: 3 to 5 inch nominal face width.
 - 3. Glazing Stops: Flush.
- D. Glazing: Comply with requirements of Section 08 8000 - Glazing.
 - 1. Refer to Fire Rated Glass, Fire-Resistance-Rated Glazing.
- E. Fabrication:
 - 1. Provide one of the following:

- a. Formed steel structural members with aluminum cladding with non-combustible thermally-resistive material as required for fire rating.
- b. Extruded aluminum framing, thermally broken, filled with cement composite material.
2. Fabrication: Joints and corners flush, hairline, and weatherproof, accurately fitted and secured; prepared to receive anchors; fasteners and attachments concealed from view; reinforced as required for imposed loads.
- F. Fire Performance: Provide fire-resistance-rated units; tested as an assembly including glazing in compliance with ASTM E119 or UL 263 and requirements of local authorities having jurisdiction.
 1. Fire-Rating: As indicated.
 2. Acceptable evidence of compliance includes listing by UL (DIR), ITS (DIR), or testing agency acceptable to authorities having jurisdiction.

2.02 MATERIALS

- A. Sheet Aluminum: ASTM B209/B209M.
- B. Structural Steel Sections: ASTM A36/A36M; galvanized in accordance with requirements of ASTM A123/A123M.
- C. Tube steel; ASTM A501/A501M.
- D. Cold-Rolled Sheet and Strip: ASTM A1008/A1008M.
- E. Hot-Rolled Sheet and Strip: ASTM A1011/A1011M.
- F. Fasteners: Galvanized steel.
 1. Type recommended by manufacturer; concealed
- G. Glazing Accessories:
 1. Provide glazing gaskets, glazing sealants, glazing tapes, setting blocks, spacers, edge blocks, and other glazing accessories that are compatible with fire rated glazing and each other, and that are approved for use with protective framed glazing assembly by testing agencies that listed and labeled protective framed glazing assembly.
- H. Mineral Fiber Insulation: Flexible preformed batt or blanket, complying with ASTM C665; friction fit; unfaced flame spread and smoke developed indexes of 0 (zero) when tested in accordance with ASTM E84.
- I. Sealants: Refer to Section 07 9200 - Joint Sealants.
- J. Firestopping Materials: Refer to Section 07 8400 - Firestopping.

2.03 DOOR HARDWARE

- A. Factory prepare doors and framing for field mounting of hardware.
 1. Door Hardware: Comply with Section 08 7100 - Door Hardware and the following:
 - a. Provide door hardware approved for use with protective framed glazing assembly that maintains and does not compromise the fire rating.

2.04 FINISHES

- A. Finishing: Apply factory finish to surfaces that will be exposed in completed assemblies.
 1. Touch-up surfaces cut during fabrication so that no natural metal surfaces are visible in completed assemblies, including joint edges.
- B. Superior Performing Organic Coatings: AAMA 2605 multiple coat, thermally cured polyvinylidene fluoride system.
- C. Color: Two or three-coat custom color to match Architect's sample.
- D. Touch-Up Materials: As recommended by coating manufacturer for field application.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify dimensions, tolerances, and method of attachment with other work.
- B. Verify that wall openings and adjoining water-resistive barrier materials are ready to receive work of this section; see Section 07 2500 for additional information.
- C. Verify that anchorage devices have been properly installed and located.

3.02 INSTALLATION

- A. Install wall system in accordance with limitations of fire rating and with manufacturer's instructions.
- B. Install framed glazing assemblies in accordance with NFPA 80 and requirements of local authorities having jurisdiction.
- C. Attach to structure to permit sufficient adjustment to accommodate construction tolerances and other irregularities.
- D. Provide alignment attachments and shims to permanently fasten system to building structure.
- E. Align assembly plumb and level, free of warp or twist. Maintain assembly dimensional tolerances, aligning with adjacent work.
- F. Firmly pack mineral fiber fire stop insulation or appropriately rated intumescent sealant around frame perimeter and rough opening as recommended by protective framed glazing assembly manufacturer.
- G. Door Hardware:
 - 1. Install door hardware using templates provided.
 - a. See Section 08 7100 for hardware installation requirements.
 - 2. Coordinate installation of electrical connections to electrical hardware items.
- H. Touch-up minor damage to factory applied finish; replace components that cannot be satisfactorily repaired.

3.03 TOLERANCES

- A. Maximum Variation from Plumb: 1/16 inch every 3 feet non-cumulative or 1/2 inch per 100 ft, whichever is less.
- B. Maximum Misalignment of Two Adjoining Members Abutting in Plane: 1/32 inch.
- C. Sealant Space Between Mullions and Adjacent Construction: Maximum of 3/4 inch and minimum of 1/4 inch.

3.04 FIELD QUALITY CONTROL

- A. Provide services of manufacturer's field representative to observe installation and submit report.
- B. Replace components that have failed field testing and retest until performance is satisfactory.

3.05 ADJUSTING

- A. Adjust doors for smooth operation.

3.06 CLEANING

- A. Remove protective material from pre-finished surfaces.
- B. Wash down surfaces with a solution of mild detergent in warm water, applied with soft, clean wiping cloths. Take care to remove dirt from corners. Wipe surfaces clean.

3.07 PROTECTION

- A. Protect installed products from damage until Date of Substantial Completion.

END OF SECTION

SECTION 08 7100 - DOOR HARDWARE**PART 1 - GENERAL****1.1 RELATED DOCUMENTS**

- A. **Drawings and general provisions** of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes items of finish hardware that are required for swing, sliding, and folding doors, except hardware specified in the same sections as the doors and door frames on which it is installed.
- B. Related work specified in other sections:
1. Furnishing and installing of Finish Hardware for the following items:
 - a. Division 06 Section "Interior Architectural Woodwork" for casework.
 - b. Division 26 for electrical general requirements.
 2. Electrical trades are responsible for roughing in, providing power and control wiring, and connecting finish hardware requiring electrical connections.
- C. Related Sections include the following:
1. Division 26 Sections for connections to electrical power system and for low-voltage wiring work.

1.3 QUALITY ASSURANCE

- A. Single Source Responsibility:
1. Obtain each category of hardware (hinges, latch and locksets, exit devices, closers, etc.) from a single manufacturer.
- B. Supplier Qualifications:
1. An established finish hardware supplier who is a factory authorized distributor for all products required, and has display samples, inventory, and qualified personnel trained and experienced in preparing Hardware Schedules, issuing templates, and ordering, furnishing, and servicing finish hardware for architecturally designed projects.
 2. Supplier or supplier's representative shall meet with Owner to determine keying requirements.

C. Preinstallation Seminar:

1. Before the installation of finish hardware begins, the Contractor/Construction Manager shall request that a hardware installation seminar for the installation of Schlage AD400 series wireless locks, LCN closers and Von Duprin exit devices be conducted by the manufacturer's representative of these products. Seminar to be held at job site and attended by all installers of hardware. Examples: Aluminum doors and carpentry installers. Seminar will address proper coordination and installation of exit devices, door closers, and weatherstripping, as detailed in the finish hardware schedule for this project, with the use of installation manuals, hardware schedule, templates, physical product samples, and exit device installation videos.

1.4 SUBMITTALS

A. Hardware Schedules:

1. Submit proper number of Hardware Schedules to allow the Architect to retain two copies for his use, plus the number of copies required by the Contractor/Construction Manager for his distribution and use; but, do not submit more than six copies. Include the following:

- a. Door index, listing all doors by Architect's number, with Schedule page number where Hardware is itemized.
- b. Complete preface sheet, in the same order as the Specification, listing product categories only and manufacturers' names of items being furnished, as follows:

<u>CATEGORY</u>	<u>SPECIFIED</u>	<u>SCHEDULED</u>
Hinges	Manufacturer A	Manufacturer B
Locksets	Manufacturer X	Manufacturer X
Kick Plates	Open	Manufacturer Z

- c. Hardware locations: Refer to paragraph 3.1.B, Templates and Hardware Locations.
- d. Opening Description: Single or pair, number, room locations, hand, active leaf, degree of swing, size, material, frame material, and UL Listed.
- e. Hardware Description: Quantity, category, product number, and finish.
- f. Headings that refer to the specified Hardware Set Numbers.
- g. To facilitate checking, follow scheduling sequence specified in Hardware Sets and as outlined in Sequence and Format for the Hardware Schedule published by DHI.
- h. Product data of each hardware item, and shop drawings where required, for special conditions and specialty hardware.
- i. "Vertical" scheduling format only. "Horizontal" schedules will be returned "Not Approved".
- j. Typed copy.
- k. Double spacing of lines containing product details.
- l. 8-1/2 x 11 inch sheets.
- m. Consecutively numbered pages.
- n. U.S. Standard finish symbols or BHMA finish symbols.

2. Do NOT submit hardware catalog cuts.

1.5 PRODUCT DELIVERY, STORAGE, AND HANDLING

- A. Label each item of hardware with the appropriate door number and Hardware Schedule heading number, and deliver to the installer so designated by the Contractor/Construction Manager.

PART 2 - PRODUCTS**2.1 MATERIALS**

- A. General:
1. Requirements for function, size, and other distinctive qualities for finish hardware are specified in the "Hardware Sets" at the end of this Section.
- B. Hinges:
1. Full Mortise Butt Type: Numbers specified in sets are Ives.
 - a. Equal products from any B.H.M.A. member will also be acceptable.
 2. Continuous: Furnish door height less one inch. Numbers specified in sets are Ives.
 - a. Ives
 - b. McKinney
 - c. Pemko
 - d. Select Products
- C. Mortise Locksets and Latchsets:
1. Function designations are Schlage L9000 with 07N lever trim.
- D. Closers:
1. Do not furnish surface closers with through-bolts. Furnish wood and machine screws only.
 2. Review the door frame and plan details to determine the proper length of arm and the degree of swing. State the degree of door swing in the Hardware Schedule. Provide accessories such as drop and adapter plates, panel adapters, thick-hub shoes, blade stop spacers, and shoe supports as required to install door closers correctly.
 3. Products listed in sets are LCN 4011/4111 series.
 - a. Sargent 281
- E. Kick Plates:
1. Furnish 10 x 0.050 inches x door width less 2 inches at single doors, and less one inch at pairs.
 - a. Where glass or louvers prevent this height, supply with height equal to height of bottom rail less two inches.

- b. When specified to be installed above surface mounted automatic door bottoms, deduct height of door bottoms.
 - c. Drill and countersink screw holes for oval head undercut screws. Pan head screws are not acceptable.
- F. Overhead Holders and Stops:
- 1. Type, function, fasteners, and quantities of fasteners must be the same as Glynn-Johnson specified. Size: Per manufacturer's sizing chart.
 - a. Equal products from any B.H.M.A. member will also be acceptable.
- G. Wall Stops:
- 1. Furnish with pictorial installation instructions illustrating downward slope of diagonal side.
 - 2. Numbers listed in sets are Ives model WS33.
 - a. Equal products from any B.H.M.A. member will also be acceptable.
- H. Cylinders and Keying: All hardware components capable of being locked shall be provided with a cylinder housing as listed below. Cylinder housings shall be mortise or rim type as required by function of locking device. Provide cams or tail pieces as required.
- 1. Furnish SFIC cylinder housings with construction cores as required by the Construction Manager. Furnish final cores factory keyed per the owner's instructions to the existing Best Access SFIC system. Furnish two keys per cylinder.
 - 2. Supply cylinders with interchangeable construction cores for use during the construction period.
 - 3. Furnish construction master keys as required by Contractor/Construction Manager.
- I. Miscellaneous:
- 1. Furnish items not categorized in the above descriptions but specified by manufacturers' names in the Hardware Sets.
- J. Fasteners:
- 1. Furnish fasteners of the proper type, size, quantity, and finish.
 - a. Use machine screws and lead anchors for attaching hardware to concrete or masonry.
 - b. Use wall grip inserts at hollow wall construction.
 - c. Install exit devices with fasteners supplied by the exit device manufacturer.
 - d. Attach closers with wood or machine screws.

K. Finishes:

1. Furnish finish for each item as indicated in sets.

L. Quantities

1. Furnish one hinge for each 30 inches of door height or fraction thereof.
2. Furnish one additional intermediate pivot for doors over 90 inches.
3. Furnish hinges, continuous hinges, electric hinges, pivot sets, electric pivots, roller latches, exit devices, push and pull hardware, closers, overhead holders and stops, kick plates, armor plates, door edgings, bumpers, stops, seals, automatic bottoms, bottom sweeps, stop strips, weatherstripping, and thresholds for both leaves of pairs and batteries unless specified otherwise.

PART 3 – EXECUTION**3.1 EXISTING DOOR AND FRAME INSPECTION****A. General:**

1. This supplier will inspect all existing doors and frames for compatibility with the new doors and hardware being furnished. Custom strikes will need to fit the existing frame prep, and work with the new locks and latches furnished.

3.2 INSTALLATION**A. General:**

1. Install hardware according to manufacturers' printed instructions and to template dimensions.
2. Refer to Cylinders and Keying in Part 2 of this Section regarding replacement of construction cores with final cores.

B. Templates and Hardware Locations:

1. Furnish hardware made to template. Supply required templates and hardware locations to the door and frame manufacturers.
2. Dimensions are from finish floor to centerline of items.

C. Inspecting, Adjusting, and Demonstrating:

1. Provide the services of a hardware supplier's or manufacturer's representative to inspect and adjust each item of hardware to ensure proper installation and operation of every unit.
2. Replace units that cannot be adjusted to operate freely and smoothly or as intended for the application made.
3. Instruct the Owner's personnel in adjustment and maintenance of the hardware.

3.3 HARDWARE SETS:

HW SET: 01

3	EA	HINGE	5BB1 4.5 X 4.5	652	IVE
1	EA	PRIVACY W/ INDICATOR	L9040 06A L583-363 X L283-722	626	SCH
1	EA	WALL STOP	WS33	626	IVE

HW SET: 02

1	SET	HINGES	BY PACKAGED DOOR MFR.		
2	EA	FIRE EXIT HARDWARE	BY PACKAGED DOOR MFR.		
2	EA	LOCKING EXIT LEVER	BY PACKAGED DOOR MFR.		
2	EA	CYLINDER	MORTISE	626	BES
2	EA	DOOR CLOSER	BY PACKAGED DOOR MFR.		
1	SET	SMOKE SEAL	BY PACKAGED DOOR MFR.		
2	EA	WALL MAGNETS	BY PACKAGED DOOR MFR.		
1	EA	FIRE ALARM PANEL POWER	BY FIRE ALARM CONTRACTOR		

OPERATION: THE MAGNETIC HOLD-OPEN DEVICES ARE POWERED BY THE FIRE ALARM PANEL RELAY, AND WILL CUT POWER, PERMITTING THE DOORS TO AUTOMATICALLY CLOSE UPON ACTIVATION OF THE FIRE ALARM SYSTEM.

END OF SECTION

SECTION 08 8000 - GLAZING**PART 1 GENERAL****1.01 SECTION INCLUDES**

- A. Fire rated glazing.
- B. Glazing compounds.

1.02 REFERENCE STANDARDS

- A. 16 CFR 1201 - Safety Standard for Architectural Glazing Materials Current Edition.
- B. ANSI Z97.1 - American National Standard for Safety Glazing Materials Used in Buildings - Safety Performance Specifications and Methods of Test 2015 (Reaffirmed 2020).
- C. ASTM C864 - Standard Specification for Dense Elastomeric Compression Seal Gaskets, Setting Blocks, and Spacers 2005 (Reapproved 2019).
- D. ASTM C1193 - Standard Guide for Use of Joint Sealants 2016.
- E. GANA (GM) - GANA Glazing Manual 2008.
- F. GANA (SM) - GANA Sealant Manual 2008.
- G. GANA (LGRM) - Laminated Glazing Reference Manual 2009.
- H. ICC (IBC) - International Building Code Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
- I. IGMA TB-3001 - Guidelines for Sloped Glazing 2001.
- J. IGMA TM-3000 - North American Glazing Guidelines for Sealed Insulating Glass Units for Commercial & Residential Use 1990 (2016).
- K. NFPA 251 - Standard Methods of Tests of Fire Resistance of Building Construction and Materials - 2006.

1.03 ADMINISTRATIVE REQUIREMENTS

- A. Preinstallation Meeting: Convene a preinstallation meeting one week before starting work of this section; require attendance by each of the affected installers.

1.04 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements for submittal procedures.
- B. Product Data on Glazing. Provide structural, physical and environmental characteristics, size limitations, special handling and installation requirements.
- C. Product Data on Glazing Compounds and Accessories: Provide chemical, functional, and environmental characteristics, limitations, special application requirements, and identify available colors.
- D. Samples: Submit three samples 12 by 12 inch in size for each glass type.
 - 1. Non-insulated types may be 4 by 4 inches in size.
- E. Certificate: Certify that products of this section meet or exceed specified requirements.
- F. Warranty Documentation: Submit manufacturer warranty and ensure that forms have been completed in Owner's name and registered with manufacturer.

1.05 QUALITY ASSURANCE

- A. Perform Work in accordance with GANA (GM), GANA (SM), GANA (LGRM), IGMA TM-3000, and IGMA TB-3001 for glazing installation methods.
- B. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum 5 years of documented experience.
- C. Installer Qualifications: Company specializing in performing work of the type specified and with at least 5 years documented experience.

1.06 FIELD CONDITIONS

- A. Do not install glazing when ambient temperature is less than 40 degrees F.
- B. Maintain minimum ambient temperature before, during and 24 hours after installation of glazing compounds.

1.07 WARRANTY

- A. See Section 01 7800 - Closeout Submittals for additional warranty requirements.
- B. Insulating Glass Units: Provide a ten (10) year manufacturer warranty to include coverage for seal failure, interpane dusting or misting, including providing products to replace failed units.
- C. Laminated Glass: Provide a ten (10) year manufacturer warranty to include coverage for delamination, including providing products to replace failed units.
- D. Coated Glass: Provide a ten (10) year manufacturer warranty to include coverage for peeling, cracking, and other indications of deterioration in coating, including providing products to replace failed units.

PART 2 PRODUCTS**2.01 MANUFACTURERS**

- A. Fire Rated Glass Manufacturers:
 - 1. SAFTIFIRST, a division of O'Keeffe's Inc.; www.safti.com.
 - 2. Schott Corporation: www.us.schott.com
 - 3. Technical Glass Products (TGP); www.fireglass.com.
 - 4. Vetrotech Saint-Gobain North America; www.vetrotech.com.
 - 5. Substitutions: Refer to Section 01 6000 - Product Requirements.

2.02 PERFORMANCE REQUIREMENTS

- A. Probability of Breakage: Design glass for a probability of breakage not greater than 0.008 (8 lites per 1000) for glass not more than 15 degrees from vertical.
- B. Differential Shading: Design glass to resist thermal stresses induced by differential shading within individual glass lites.
- C. Safety Glazing:
 - 1. Complies with ANSI Z97.1 and 16 CFR 1201; test requirements for Class A/Category II.
 - 2. Markings for Safety Rated Glazing: Provide permanent markings on safety-rated glazing in compliance with applicable safety glazing standards, ICC (IBC), local building code, and authorities having jurisdiction.
- D. Glass Thickness: Indicated glass thicknesses are minimums. Provide glass that complies with performance requirements and load designs, and is not less than the thickness indicated.
- E. Glass Strength:
 - 1. Where annealed float glass is indicated, provide annealed float glass, heat-strengthened float glass, or fully tempered float glass as needed to comply with performance requirements.
 - 2. Where heat-strengthened float glass is indicated, provide heat-strengthened float glass or fully tempered float glass as needed to comply with performance requirements.
- F. Glass Distortion Tolerances:
 - 1. Roller Wave: Maximum 0.003 (0.076 mm) from peak to valley within the main body of the sheet and maximum 0.008 (0.2 mm) within 10.5 inches of a leading or trailing edge.
 - 2. Localized Warp: Maximum 0.03 inch (0.8 mm) over any 12 inch (305 mm) span, but limited to 0.31 inch (8 mm).

2.03 FIRE RATED GLASS

- A. Fire-Resistance-Rated Glazing: Type, thickness, and configuration of glazing that contains flame, smoke, and blocks radiant heat, as required to achieve indicated fire-rating period.
 - 1. Glass Type: Multi-laminate annealed glass with intumescent fire retardant interlayers.
 - 2. Meet safety glazing requirements indicated in performance requirements.
 - 3. Meet fire door assembly criteria for "D", and "H" labels as indicated in the performance requirements.
 - 4. Meet fire window assembly criteria for "W" and "OH" labels as indicated in the performance requirements.
 - 5. Meet temperature rise criteria for "T" label as indicated in the performance requirements.
 - 6. Glazing Method: As required for fire rating.
 - 7. Fire-Rating: 60 minutes.

8. Products: Provide one of the following products or a comparable product from one of the other manufacturers specified for fire rated glass.
 - a. SAFTIFIRST, a division of O'Keeffe's Inc; SuperLite II-XL : www.safti.com/sle.
 - b. Technical Glass Products; Pilkington Pyrostop : www.fireglass.com.
 - c. Vetrotech Saint-Gobain North America; Contraflam : www.vetrotechusa.com

2.04 ACCESSORIES

- A. Setting Blocks: EPDM or neoprene, with 80 to 90 Shore A durometer hardness; ASTM C864 Option II. Length of 0.1 inch for each square foot of glazing or minimum 4 inch by width of glazing rabbet space minus 1/16 inch by height to suit glazing method and pane weight and area.
- B. Spacer Shims: EPDM or neoprene, 50 to 60 Shore A durometer hardness; ASTM C864 Option II. Minimum 3 inch long by one half the height of the glazing stop by thickness to suit application, self adhesive on one face.
- C. Glazing Tape, Back Bedding Mastic Type: Preformed, butyl-based, 100 percent solids compound; 5 to 30 cured Shore A durometer hardness; coiled on release paper; black color.
 1. Width: As required for application.
 2. Thickness: As required for application.
- D. Glazing Gaskets and Splines: Resilient EPDM or polyvinyl chloride extruded shape to suit glazing channel retaining slot; ASTM C864 Option II; color black.
- E. Glazing Clips: Manufacturer's standard type.

2.05 VISION LITE KITS FOR FIRE RATED DOOR GLAZING

- A. At Contractor's option, instead of glass stops provided by door manufacturers, provide fire rated glass manufacturer's standard vision lite kits for installing fire-rated glass in doors.
 1. Moldings: Minimum 20 gage, 0.036 inch, thick steel.
 2. Profile: Manufacturer's standard profiles.
 3. Door Lite Sizes: As indicated on Drawings.
 4. Fire Ratings: As indicated on Drawings.
 5. Finish: Manufacturer's standard primer.
 6. Basis-of-Design Product: Provide SAFTIFIRST, a division of O'Keeffe's Inc.; Vision Kits: www.safti.com, or a comparable product from any of the manufacturers specified for fire-rated glass.

PART 3 EXECUTION

3.01 VERIFICATION OF CONDITIONS

- A. Verify that openings for glazing are correctly sized and within tolerances, including those for size, squareness, and offsets at corners.
- B. Verify that surfaces of glazing channels or recesses are clean, free of obstructions that may impede moisture movement, weeps are clear, and support framing is ready to receive glazing system.
- C. Proceed with glazing system installation only after unsatisfactory conditions have been corrected.

3.02 PREPARATION

- A. Clean contact surfaces with appropriate solvent and wipe dry within maximum of 24 hours before glazing. Remove coatings that are not tightly bonded to substrates.
- B. Seal porous glazing channels or recesses with substrate compatible primer or sealer.
- C. Prime surfaces scheduled to receive sealant where required for proper sealant adhesion.

3.03 INSTALLATION, GENERAL

- A. Install glazing in compliance with written instructions of glass, gaskets, and other glazing material manufacturers, unless more stringent requirements are indicated, including those in glazing referenced standards.
- B. Use one or more of the specified glazing methods as recommended by GANA, glass manufacturer, and installer, and as required to comply with performance requirements.

- C. Install glazing sealants in accordance with ASTM C1193, GANA (SM), and manufacturer's instructions.
- D. Do not exceed edge pressures around perimeter of glass lites as stipulated by glass manufacturer.
- E. Set glass lites of system with uniform pattern, draw, bow, and similar characteristics.
- F. Set glass lites in proper orientation so that coatings face exterior or interior as indicated.
- G. Prevent glass from contact with any contaminating substances that may be the result of construction operations such as, and not limited to the following; weld splatter, fire-safing, plastering, mortar droppings, etc.

3.04 INSTALLATION - DRY GLAZING METHOD (GASKET GLAZING)

- A. Application - Exterior and/or Interior Glazed: Set glazing infills from either the exterior or the interior of the building.
- B. Place setting blocks at 1/4 points with edge block no more than 6 inch from corners.
- C. Rest glazing on setting blocks and push against fixed stop with sufficient pressure on gasket to attain full contact.
- D. Install removable stops without displacing glazing gasket; exert pressure for full continuous contact.

3.05 INSTALLATION - DRY GLAZING METHOD (TAPE AND GASKET SPLINE GLAZING)

- A. Application - Exterior Glazed: Set glazing infills from the exterior of the building.
- B. Cut glazing tape or spline to length; install on glazing pane. Seal corners by butting tape and sealing junctions with butyl sealant.
- C. Place setting blocks at 1/4 points with edge block no more than 6 inch from corners.
- D. Rest glazing on setting blocks and push against fixed stop with sufficient pressure to attain full contact.
- E. Install removable stops without displacing glazing spline. Exert pressure for full continuous contact.
- F. Carefully trim protruding tape with knife.

3.06 INSTALLATION - DRY GLAZING METHOD (TAPE AND TAPE)

- A. Application - Interior Glazed: Set glazing infills from the interior of the building.
- B. Cut glazing tape to length and set against permanent stops, projecting 1/16 inch above sight line.
- C. Place setting blocks at 1/4 points with edge block no more than 6 inch from corners.
- D. Rest glazing on setting blocks and push against tape for full contact at perimeter of pane or unit.
- E. Place glazing tape on free perimeter of glazing in same manner described above.
- F. Install removable stop without displacement of tape. Exert pressure on tape for full continuous contact.
- G. Carefully trim protruding tape with knife.

3.07 INSTALLATION - FIRE-RATED GLAZING UNITS

- A. Install fire-rated glazing in compliance with written instructions of fire-rated glazing manufacturer as required to maintain specified fire rating.
 - 1. Use glazing method and materials as indicated by the fire rated glazing manufacturer as required to maintain specified fire-rating.

3.08 CLEANING

- A. Remove excess glazing materials from finish surfaces immediately after application using solvents or cleaners recommended by manufacturers.
- B. Remove nonpermanent labels immediately after glazing installation is complete.
- C. Clean glass and adjacent surfaces after sealants are fully cured.

- D. Clean glass on both exposed surfaces not more than 4 days prior to Date of Substantial Completion in accordance with glass manufacturer's written recommendations.

3.09 PROTECTION

- A. Remove and replace glass that is damaged during construction period prior to Date of Substantial Completion.

3.10 GLASS SCHEDULE

- A. FRGL-4b: 60 minute fire-resistance-rated glazing.
 - 1. Multi-laminate tempered glass with intumescent fire retardant interlayers.
 - 2. Thickness: 1-1/2 inches.
 - 3. Fire Rating: 60 minutes, ASTM E119

END OF SECTION

SECTION 09 2216 - NON-STRUCTURAL METAL FRAMING**PART 1 GENERAL****1.01 SECTION INCLUDES**

- A. Metal non-load-bearing interior partition, ceiling, and soffit framing.
- B. Suspension systems for interior ceilings and soffits.
- C. Framing accessories.

1.02 REFERENCE STANDARDS

- A. ASTM A641/A641M - Standard Specification for Zinc-Coated (Galvanized) Carbon Steel Wire 2019.
- B. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process 2020.
- C. ASTM B633 - Standard Specification for Electrodeposited Coatings of Zinc on Iron and Steel 2019.
- D. ASTM C645 - Standard Specification for Nonstructural Steel Framing Members 2018.
- E. ASTM C754 - Standard Specification for Installation of Steel Framing Members to Receive Screw-Attached Gypsum Panel Products 2020.
- F. ASTM C840 - Standard Specification for Application and Finishing of Gypsum Board 2020.
- G. ASTM C955 - Standard Specification for Cold-Formed Steel Structural Framing Members 2018, with Editorial Revision.
- H. ASTM D3575 - Standard Test Methods for Flexible Cellular Materials Made From Olefin Polymers.
- I. ASTM E119 - Standard Test Methods for Fire Tests of Building Construction and Materials 2020.
- J. ASTM E90 - Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements 2009 (Reapproved 2016).
- K. ASTM E413 - Classification for Rating Sound Insulation 2016.
- L. ASTM F1941/F1941M - Standard Specification for Electrodeposited Coatings on Mechanical Fasteners, Inch and Metric 2016.
- M. ASTM F593 - Standard Specification for Stainless Steel Bolts, Hex Cap Screws, and Studs 2017.
- N. ASTM F594 - Standard Specification for Stainless Steel Nuts 2009 (Reapproved 2020).
- O. GA-216 - Application and Finishing of Gypsum Panel Products 2016, with Errata.
- P. GA-600 - Fire Resistance Design Manual Sound Control 2021.
- Q. ICC-ES AC193 - Acceptance Criteria for Mechanical Anchors in Concrete Elements 2015.
- R. ICC-ES AC308 - Acceptance Criteria for Post-Installed Adhesive Anchors in Concrete Elements 2016.
- S. UL (FRD) - Fire Resistance Directory Current Edition.

1.03 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements for submittal procedures.
- B. Shop Drawings:
 - 1. Indicate component details, stud layout, framed openings, anchorage to structure, acoustic details, type and location of fasteners, accessories, and items of other related work.
 - 2. Describe method for securing studs to tracks, splicing, and for blocking and reinforcement of framing connections.
- C. Product Data: Provide data describing framing member materials and finish, product criteria, load charts, and limitations.
- D. Product Data: Provide manufacturer's data on partition head to structure connectors, showing compliance with requirements.

- E. Manufacturer's Qualification Statement.
- F. Installer's Qualification Statement.

1.04 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in performing work of type specified and with at least five years of documented experience.
- B. Installer Qualifications: Company specializing in performing the work of this section with minimum five years documented experience and approved by manufacturer.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Metal Framing, Connectors, and Accessories:
 - 1. ClarkDietrich Building Systems: www.clarkdietrich.com.
 - 2. Jaimes Industries Inc.: www.jaimesind.com.
 - 3. MarinoWARE: www.marinoware.com.
 - 4. MBA Building Supplies, Inc.: www.mbastuds.com.
 - 5. State Building Products; www.statebp.com.
 - 6. The Steel Network, Inc: www.SteelNetwork.com.
 - 7. Telling Industries; www.buildstrong.com.
 - 8. Substitutions: See Section 01 6000 - Product Requirements.

2.02 PERFORMANCE REQUIREMENTS

- A. Provide completed assemblies complying with ASTM C840 and GA-216.
- B. Fire-Rated Assemblies: For fire-resistance-rated assemblies that incorporate non-load-bearing steel framing, provide materials and construction identical to those tested in assembly indicated, according to ASTM E119 and as follows:
 - 1. Provide construction equivalent to one of the following:
 - a. UL Assembly Numbers: Provide construction equivalent to that listed for the particular assembly in the current UL (FRD).
 - b. Gypsum Association File Numbers: Provide construction complying with requirements of GA-600 for the particular assembly.
- C. STC-Rated Assemblies: For STC-rated assemblies, provide materials and construction identical to those tested in assembly indicated on Drawings, calculated in accordance with ASTM E413, based on tests conducted in accordance with ASTM E90.
- D. Horizontal Deflection: For wall assemblies, limit maximum deflection of wall framing to L/240 at 5 psf .
 - 1. Exception: Limit deflection of walls to receive hard tile surfaces to L/360 at 5 psf.
- E. Protective Coatings: Equivalent (EQ) coatings are not acceptable; products shall be hot-dip galvanized as indicated.
- F. Embossed (equivalent thickness) steel framing products are not acceptable; products shall be in steel thicknesses indicated.

2.03 FRAMING MATERIALS

- A. Non-Loadbearing Framing System Components: ASTM C645; galvanized sheet steel, of size and properties necessary to comply with ASTM C754 for the spacing indicated.
 - 1. Protective Coating: ASTM A653/A653M, G60, hot-dip galvanized.
 - 2. Minimum Metal Thickness: 0.0329 inch (20 gage).
 - 3. Framing Depths: As indicated.
 - 4. Profiles:
 - a. Studs: C shaped with flat or formed webs.
 - b. Runners: U shaped, sized to match studs.
 - 1) Where indicated or required, provide slip-type head joints using slotted deflection track.
 - c. Ceiling Channels: C shaped.
 - d. Furring: Hat-shaped sections, minimum depth of 7/8 inch.

- B. Slotted Deflection Track: Provide galvanized sheet steel track with slotted holes in flanges for mechanical anchorage of studs that accommodate deflection; provide screws and anti-friction bushings. Slotted connections prevent stud rotation without use of lateral bracing and maintains structural performance of partition.
1. Provide at partition heads to structure connections.
 2. Shall prevent cracking of finishes applied to interior partition framing resulting from deflection of structure above
 3. Structural Performance: Maintain lateral load resistance and vertical movement capacity required by applicable code, when evaluated in accordance with AISI S100-12.
 4. Comply with ASTM C645 and ASTM C754.
 5. Protective Coating: ASTM A653/A653M, G60, hot-dip galvanized.
 6. Minimum Metal Thickness: Same material thickness as studs.
 7. Track Depth: Matching studs.
 8. Provide components UL-listed for use in UL-listed fire-resistance-rated head of partition joint systems indicated on drawings.
 - a. At Contractor's option, provide the following:
 - 1) Slotted Deflection and Firestop Track: Similar to standard slotted deflection track specified, but includes intumescent strip factory-applied to track flanges or web that expands when exposed to heat or flames to provide a perimeter joint seal.
 - (a) Products:
 - (1) ClarkDietrich Building Systems; BlazeFrame Firestop Deflection Track: www.clarkdietrich.com.
 - (2) MarinoWARE; FAS Track 1000: www.marinoware.com.
 - (3) Substitutions: See Section 01 6000 - Product Requirements.
- C. Preformed Top Track Firestop Seal: Pre-formed firestop device field-applied to head of top track that expands when exposed to heat or flames to provide a perimeter joint seal.
1. At Contractor's option provide preformed top track firestop seals instead of traditional perimeter joint seals.
 2. Provide components UL-listed for use in UL-listed fire-resistance-rated head of partition joint systems indicated on drawings.
 3. Products:
 - a. Hilti, Inc; Top Track Seal CFS TTS: www.us.hilti.com.
 - b. Substitutions: See Section 01 6000 - Product Requirements.
- D. Resilient Furring Channels: Galvanized sheet steel, single leg, asymmetrical channel, 1/2 inch deep with a 1-1/4 inch screw flange; complying with ASTM C645.
1. Exception: At ceilings provide double leg, symmetrical channels.
 2. Protective Coating: ASTM A653/A653M, G40, hot-dip galvanized.
 3. Minimum Metal Thickness: 0.0179 inch (25 gage).
- E. Z-shaped Furring: Galvanized sheet steel z-shaped furring, 2 inches deep, unless otherwise indicated; complying with ASTM C645.
1. Protective Coating: ASTM A653/A653M, G60, hot-dip galvanized.
 2. Minimum Metal Thickness: 0.0312 inch (20 gage).

2.04 FRAMING ACCESSORIES

- A. Bridging and Bracing Members: Of same material as studs; thickness to suit purpose; complying with applicable requirements of ASTM C754.
1. Steel, 0.0538-inch (1.37mm) minimum base-metal thickness, with a minimum 1/2-inch (13mm) wide flanges.
 - a. Basis-of-Design Product: Subject to compliance with requirements, provide ClarkDietrich Systems Spazzer 9200 Bridge and Spacing Bar, or equivalent.
- B. Backing Plates: 0.064 inch thick (16 gage), galvanized.
- C. Wood Blocking: Refer to Section 06 1000 - Rough Carpentry.
- D. Anchorage Devices: Powder actuated or Drilled expansion bolts.
- E. Acoustic Sealant: As specified in Section 09 2900 - Gypsum Board.

- F. Isolation Strip: Foam gasket, ASTM D3575, closed-cell vinyl foam strips, 1/8 inch thick, in width to suit steel stud size.
 - 1. Manufacturer:
 - a. Williams; Everlastic EVA 200; www.williamsproducts.net.
 - b. Substitutions: See Section 01 6000 - Product Requirements.

2.05 SUSPENSION SYSTEMS

- A. Carrying Channels: ASTM C955; cold-rolled galvanized steel sheet U-channel.
 - 1. Protective Coating: ASTM A653/A653M, G60, hot-dip galvanized.
 - 2. Minimum Metal Thickness: 0.064 inch (16 gage).
 - 3. Depth: 2 inches unless otherwise indicated.
- B. Furring Channels:
 - 1. Hat-Shaped, Rigid Furring Channels: As specified in "Framing Materials" above.
 - 2. Resilient Furring Channels: As specified in "Framing Materials" above.
- C. Tie Wire: ASTM A641/A641M, Class 1 zinc coating, soft temper, 0.062-inch (16 gage) diameter or double strand of 0.048-inch (18 gage) diameter wire.
- D. Wire Hangers: ASTM A641/A641M, Class 1 zinc coating, soft temper, 0.16 inch (8 gage) diameter.
- E. Hanger Attachments to Concrete:
 - 1. Expansion Anchors: Fastener systems with evaluations based on ICC-ES AC193.
 - 2. Adhesive Anchors: Fastener systems with evaluations based on ICC-ES AC308.
 - 3. Material for Interior Locations: Carbon-steel components zinc-plated to comply with ASTM B633 or ASTM F1941/F1941M, Class Fe/Zn 5, unless otherwise indicated.
 - 4. Material for Exterior Locations and Interior Wet/Humid Locations: Alloy Group 1 (A1) stainless-steel bolts, ASTM F593, and nuts, ASTM F594.
- F. Grid Suspension System for Gypsum Board Ceilings: ASTM C645, direct-hung system composed of main beams and cross-furring members that interlock.
 - 1. At Contractor's option provide grid suspension system instead of traditional carrying and furring channels.
 - 2. Not permitted for multi-layer gypsum board systems.
 - 3. Manufacturers:
 - a. Armstrong World Industries, Inc.; Drywall Grid Suspension System: www.armstrongceilings.com.
 - b. CertainTeed/Saint-Gobain; Quicksan Locking Drywall Grid System: www.certainteed.com.
 - c. Rockfon, Part of the Rockwool Group; Chicago Metallic Drywall Grid: www.rockfon.com.
 - d. USG Corporation: Drywall Suspension System: www.usg.com
 - e. Substitutions: See Section 01 6000 - Product Requirements

2.06 FABRICATION

- A. Fabricate assemblies of framed sections to sizes and profiles required.
- B. Fit, reinforce, and brace framing members to suit design requirements.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify existing conditions before starting work.

3.02 INSTALLATION OF STUD FRAMING

- A. Comply with requirements of ASTM C754.
- B. Install framing, shaft wall framing, suspension systems, and related accessories and components in accordance with manufacturer's instructions.
- C. Extend partition framing to structure where indicated and to 4 inches above ceiling in other locations unless otherwise indicated.
- D. Partitions Terminating at Ceiling: Attach ceiling runner securely to ceiling framing in accordance with details.

- E. Partitions Terminating at Structure: Attach extended leg top runner to structure, maintain clearance between top of studs and structure, and brace both flanges of studs as indicated.
- F. Partitions Terminating at Structure: Attach top runner to structure, maintain clearance between top of studs and structure, and connect studs to track using specified mechanical devices in accordance with manufacturer's instructions; verify free movement of top of stud connections; do not leave studs unattached to track.
- G. Align and secure top and bottom runners at 24 inches on center.
- H. Fire-Resistance-Rated Partitions: Install framing, including shaft wall framing, to comply with fire-resistance-rated assembly indicated.
- I. Sound-Rated Partitions: Install framing to comply with sound-rated assembly indicated.
 - 1. At partitions indicated with an acoustic rating:
 - a. Provide components and install as required to produce STC ratings indicated, based on published tests by manufacturer conducted in accordance with ASTM E90 with STC rating calculated in accordance with ASTM E413.
 - b. Place two beads of acoustic sealant between runners and substrate, studs and adjacent construction.
- J. Fit runners under and above openings; secure intermediate studs to same spacing as wall studs.
- K. Install studs vertically at 16 inches on center, unless otherwise indicated.
 - 1. Install studs so flanges within framing system point in same direction
- L. Align stud web openings horizontally.
- M. Secure studs to tracks using fastener method. Do not weld.
- N. Stud splicing is not permissible.
- O. Fabricate corners using a minimum of three studs.
- P. Install double studs at wall openings, door and window jambs, not more than 2 inches from each side of openings.
- Q. Brace stud framing system rigid.
- R. Coordinate installation of bucks, anchors, and blocking with electrical, mechanical, and other work to be placed within or behind stud framing.
- S. Blocking/Backing: Use metal backing plate, wood blocking, or supplementary framing secured to studs. Provide blocking/backing for support of equipment services, plumbing fixtures, toilet partitions, wall cabinets, toilet accessories, hardware, and similar construction.
- T. Furring: Install at spacing and locations shown on drawings. Lap splices a minimum of 6 inches.
- U. Do not bridge building control and expansion joints. Frame both sides of joints independently.
 - 1. Install Horizontal stiffeners in stud system, spaced (vertical distance) not more than 4'-6" o.c.
- V. General requirements and locations of control joints in metal-framed gypsum board construction:
 - 1. General: Comply with requirements of ASTM C840, and as noted below:
 - a. Control joints shall be constructed with manufactured control joint trim, or field fabricated from materials as specified.
 - b. Control joints will be installed where a partition, wall, or ceiling traverses and construction joint (expansion, or building control element) in the base building structure.
 - c. Control joints will be installed where a wall or partition extends in an uninterrupted straight plane exceeding 30 linear feet. Door and/or window frames that extend full height of partitions will be considered equivalent to control joint construction.
 - d. Control joints in interior ceilings, bulkheads, fasciae and soffits will be installed so that linear dimensions between control joints do not exceed 30 linear feet and total area between control joints does not exceed 900 square feet. Control joints will be

- installed to isolate wings of "L", "U: and "T" shaped ceiling and soffit areas.
- e. A control joint will be installed where ceiling, bulkhead, fascia and soffit framing members change direction.
 - f. Provide appropriate backing material, fire-safing insulation, and sealant for control joints installed in acoustical or fire-rated construction, as required to maintain fire-rating and/or acoustical separation.
- W. Where studs are installed directly against exterior masonry walls, install isolation strip between studs and exterior wall.

3.03 CEILING AND SOFFIT FRAMING

- A. Comply with requirements of ASTM C754.
- B. Install furring after work above ceiling or soffit is complete. Coordinate the location of hangers with other work.
- C. Install furring independent of walls, columns, and above-ceiling work.
- D. Securely anchor hangers to structural members or embed in structural slab. Space hangers as required to limit deflection to criteria indicated.
 - 1. Space hangers at maximum 48 inches on center.
 - 2. Do not attach hangers to the following:
 - a. Metal deck or rolled-in hanger tabs of composite metal deck.
 - b. Permanent metal forms.
 - c. Ducts, pipes, or conduit.
 - 3. Install hangers plumb and free from contact with insulation or other objects within ceiling plenum that are not part of supporting structural or suspension system.
 - 4. Splay hangers only where required to miss obstructions and offset resulting horizontal forces by bracing, countersplaying, or other equally effective means.
 - 5. Where width of ducts and other construction within ceiling plenum produces hanger spacings that interfere with locations of hangers required to support suspension system members, install supplemental suspension members and hangers in the form of trapezes or equivalent devices.
 - a. Size supplemental suspension members and hangers to support ceiling loads within performance requirements.
- E. Space main carrying channels at maximum 48 inch on center, and not more than 6 inches from wall surfaces. Lap splices securely.
- F. Securely fix carrying channels to hangers to prevent turning or twisting and to transmit full load to hangers.
- G. Place furring channels perpendicular to carrying channels, not more than 2 inches from perimeter walls, and rigidly secure. Lap splices securely.
 - 1. Space furring channels at maximum 24 inches on center.
- H. Laterally brace suspension system.
- I. Grid Suspension Systems:
 - 1. Attach perimeter wall angle where grid suspension systems meet vertical surfaces.
 - 2. Mechanically join main beam and cross-furring members to each other and butt-cut to fit into wall track.

3.04 TOLERANCES

- A. Maximum Variation From True Position: 1/8 inch in 10 feet.
- B. Maximum Variation From Plumb: 1/8 inch in 10 feet.
- C. Maximum variation From Level: 1/8 inch in 10 feet.

END OF SECTION

SECTION 09 2900 - GYPSUM BOARD**PART 1 GENERAL****1.01 SECTION INCLUDES**

- A. Gypsum wallboard.
- B. Tile backing board.
- C. Finishing materials.
- D. Trim accessories.
- E. Acoustic insulation.

1.02 REFERENCE STANDARDS

- A. ANSI A108.11 - American National Standard Specifications for Interior Installation of Cementitious Backer Units 2018.
- B. ANSI A118.9 - American National Standard Specifications for Test Methods and Specifications for Cementitious Backer Units 1999 (Reaffirmed 2016).
- C. ASTM C475/C475M - Standard Specification for Joint Compound and Joint Tape for Finishing Gypsum Board 2017.
- D. ASTM C665 - Standard Specification for Mineral-Fiber Blanket Thermal Insulation for Light Frame Construction and Manufactured Housing 2017.
- E. ASTM C834 - Standard Specification for Latex Sealants 2017.
- F. ASTM C840 - Standard Specification for Application and Finishing of Gypsum Board 2020.
- G. ASTM C919 - Standard Practice for Use of Sealants in Acoustical Applications 2019.
- H. ASTM C954 - Standard Specification for Steel Drill Screws for the Application of Gypsum Panel Products or Metal Plaster Bases to Steel Studs From 0.033 in. (0.84 mm) to 0.112 in. (2.84 mm) in Thickness 2018.
- I. ASTM C1002 - Standard Specification for Steel Self-Piercing Tapping Screws for Application of Gypsum Panel Products or Metal Plaster Bases to Wood Studs or Steel Studs 2020.
- J. ASTM C1047 - Standard Specification for Accessories for Gypsum Wallboard and Gypsum Veneer Base 2019.
- K. ASTM C1325 - Standard Specification for Fiber-Mat Reinforced Cementitious Backer Units 2021.
- L. ASTM C1396/C1396M - Standard Specification for Gypsum Board 2017.
- M. ASTM C1629/C1629M - Standard Classification for Abuse-Resistant Nondecorated Interior Gypsum Panel Products and Fiber-Reinforced Cement Panels 2019.
- N. ASTM D3273 - Standard Test Method for Resistance to Growth of Mold on the Surface of Interior Coatings in an Environmental Chamber 2016.
- O. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials 2021a.
- P. ASTM E119 - Standard Test Methods for Fire Tests of Building Construction and Materials 2020.
- Q. GA-216 - Application and Finishing of Gypsum Panel Products 2016, with Errata.
- R. GA-226 - Application of Gypsum Board to Form Curved Surfaces 2008.
- S. GA-600 - Fire Resistance Design Manual Sound Control 2021.
- T. UL (FRD) - Fire Resistance Directory Current Edition.

1.03 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Shop Drawings: Indicate special details associated with fireproofing and acoustic seals.
 - 1. Include locations of control joints. Coordination drawings for proposed control joint locations may be annotated copies of Construction Documents architectural floor plans, reflected ceiling plans, and interior elevations. Submit prior to commencement of framing installation. Coordinate with requirements specified in Section 09 2216.

- C. Product Data: Provide data on gypsum wallboard, shaft wall liner panels, tile backing panels, finishing materials, trim accessories, acoustical accessories, and fasteners and adhesives.
- D. Samples:
 - 1. Submit three samples of each board type, 4 inches square in size.
 - 2. Submit three samples of each type of special trim, 4 inches in length.
- E. Manufacturer's Qualification Statement.
- F. Installer's Qualification Statement.

1.04 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in performing work of type specified and with at least 5 years of documented experience.
- B. Installer Qualifications: Company specializing in performing the work of this section with minimum 5 years documented experience.

1.05 FIELD CONDITIONS

- A. Ambient Condition (Environmental Limitations): Comply with ASTM C840 and GA-216 requirements or gypsum board manufacturer's written instructions, whichever are more stringent

PART 2 PRODUCTS

2.01 PERFORMANCE REQUIREMENTS

- A. Provide completed assemblies complying with ASTM C840 and GA-216.
- B. Fire-Rated Assemblies: For fire-resistance-rated assemblies that incorporate gypsum board, provide materials and construction identical to those tested in assembly indicated, according to ASTM E119 and as follows:
 - 1. Provide construction equivalent to one of the following:
 - a. UL Assembly Numbers: Provide construction equivalent to that listed for the particular assembly in the current UL (FRD).
 - b. Gypsum Association File Numbers: Provide construction complying with requirements of GA-600 for the particular assembly.
- C. Horizontal Deflection: For wall assemblies, limit maximum deflection of wall framing to L/240 at 5 psf .
 - 1. Exception: Limit deflection of walls to receive hard tile surfaces to L/360 at 5 psf.

2.02 GYPSUM WALLBOARD

- A. Gypsum Wallboard - Type X: Paper-faced gypsum panels with fire-resistant core; ASTM C1396/C1396M.
 - 1. Thickness: 5/8 inch.
 - 2. Long Edges: Tapered with paper face wrapping edge.
 - 3. Short Edges: Square cut.
 - 4. Sized to minimize joints.
 - 5. Type: Fire resistance rated Type X, UL or WH listed.
 - 6. Products:
 - a. CertainTeed Corp.; Type X Gypsum Board: www.certainteed.com.
 - b. Continental Building Products; Firecheck Type X: www.continental-bp.com.
 - c. Georgia-Pacific Gypsum; ToughRock Fireguard X: www.gp.com.
 - d. National Gypsum Company; Gold Bond Brand Fire-Shield Gypsum Board: www.nationalgypsum.com.
 - e. USG Corporation; Sheetrock Brand Firecode X Panels: www.usg.com.
 - f. Substitutions: See Section 01 6000 - Product Requirements.
- B. Impact Resistant Gypsum Wallboard: Heavy paper-faced, mold and moisture resistant, gypsum panel with fire-resistant core; ASTM C1396/C1396M.
 - 1. Thickness: 5/8 inch.
 - 2. Long Edges: Tapered with paper face wrapping edge.
 - 3. Short Edges: Square cut.
 - 4. Sized to minimize joints.

5. Type: Fire resistance rated Type X, UL or WH listed.
6. Mold Resistance: Score of 10, when tested in accordance with ASTM D3273.
7. Surface Abrasion: Level 2, minimum, when tested in accordance with ASTM C1629/C1629M.
8. Indentation: Level 1, minimum, when tested in accordance with ASTM C1629/C1629M.
9. Soft Body Impact: Level 3, minimum, when tested in accordance with ASTM C1629/C1629M.
10. Hard Body Impact: Level 3, minimum, when tested in accordance with ASTM C1629/C1629M.
11. Products:
 - a. CertainTeed Corp.; Extreme Impact Resistant Gypsum Board: www.certainteed.com.
 - b. Continental Building Products; Protecta HIR 300 Type X with Mold Defense: www.continental-bp.com.
 - c. National Gypsum Company; Gold Bond Brand Hi-Impact XP Gypsum Board: www.nationalgypsum.com.
 - d. USG Corporation; Sheetrock Brand Mold Tough VHI Firecode X Panels: www.usg.com.
 - e. Substitutions: See Section 01 6000 - Product Requirements.

2.03 TILE BACKING BOARDS

- A. Cementitious Backer Board: Non-gypsum-based; aggregated Portland cement panels with glass fiber mesh embedded in front and back surfaces complying with ANSI A118.9 or ASTM C1325.
 1. Thickness: 5/8 inch.
 2. Flame Spread/Smoke Developed: 0/0 per ASTM E84.
 3. Mold Resistance: Score of 10, when tested in accordance with ASTM D3273.
 4. Locations: Wet areas and elsewhere as indicated on Drawings; including, but not limited to, the following:
 - a. Toilet Rooms
 5. Products:
 - a. National Gypsum Company; PermaBase Brand Cement Board: www.nationalgypsum.com.
 - b. USG Corporation; Durock Brand Cement Board: www.usg.com.
 - c. Substitutions: See Section 01 6000 - Product Requirements.

2.04 FINISHING MATERIALS

- A. Joint Materials: ASTM C475/C475M and as recommended by gypsum board manufacturer for project conditions.
 1. Paper Tape: 2 inch wide, creased paper tape for joints and corners.
 - a. Exception: At tile backing board provide the following:
 - 1) Fiberglass Tape: 2 inch, coated glass fiber tape for joints and corners.
 - b. Manufacturers: Provide products from one of the specified gypsum wallboard manufacturers.
 2. Joint Compound: Drying and setting types, vinyl-based, ready-mixed or field-mixed.
 - a. Each coat shall be compatible with previously applied coats.
 - b. Manufacturers: Provide products from one of the specified gypsum wallboard manufacturers.

2.05 TRIM ACCESSORIES

- A. Trim Accessories: ASTM C1047, galvanized steel or rolled zinc, unless noted otherwise.
 1. Types: As detailed or required for finished appearance. Including, but not limited to, the following:
 - a. Corner beads.
 - b. Control joints.
 - c. LC or L bead at exposed edges.
 2. Products:
 - a. ClarkDietrich Building Systems: www.clarkdietrich.com.
 - b. Marino\WARE: www.marinoware.com.

- c. Telling Industries; www.buildstrong.com.
- d. Phillips Manufacturing Co: www.phillipsmfg.com.
- e. USG Corporation: www.usg.com.
- f. Substitutions: See Section 01 6000 - Product Requirements.

2.06 ACOUSTICAL ACCESSORIES

- A. Acoustic Insulation: Provide one of the following types:
 - 1. Mineral Fiber/Rock Wool Batts: ASTM C665; preformed mineral fiber, friction fit type, unfaced.
 - a. Thickness: 3 inches, unless otherwise indicated.
 - b. Density: 2.5 pcf.
 - c. Flame Spread/Smoke Developed: 0/0 per ASTM E84.
 - d. Products:
 - 1) JohnsManville; Mineral Wool Sound Attenuation Fire Batts (SAFB): www.jm.com.
 - 2) Owens Corning; Thermafiber SAFB (Sound Attenuation Fire Batts): www.owenscorning.com.
 - 3) Rockwool; Safe'n'Sound: www.rockwool.com.
 - 4) Substitutions: See Section 01 6000 - Product Requirements.
 - 2. Fiberglass Batts: ASTM C665; preformed glass fiber, friction fit type, unfaced.
 - a. Thickness: 3-1/2 inches, unless otherwise indicated.
 - b. Products:
 - 1) CertainTeed Corporation/Saint-Gobain; NoiseReducer Sound Attenuation Batts: www.certainteed.com.
 - 2) Johns Manville; Formaldehyde-Free Fiberglass Insulation: www.jm.com.
 - 3) Knauf Insulation; EcoBatt Insulation with ECOSE Technology: www.knaufinsulation.com.
 - 4) Owens Corning Corporation; EcoTouch Sound Attenuation Batts: www.owenscorning.com.
 - 5) Substitutions: See Section 01 6000 - Product Requirements.
- B. Acoustical Sealant: Nonsag, paintable, nonstaining latex sealant complying with ASTM C834. Reduces airborne sound transmission through perimeter joints and openings in wall assemblies.
 - 1. Products:
 - a. Franklin International Inc; Titebond GreenChoice Professional Acoustical Smoke & Sound Sealant: www.titebond.com.
 - b. PPG Architectural Coatings; Liquid Nails AS-825 Acoustical Sound Sealant: www.liquidnails.com.
 - c. Pecora Corporation; AC-20 FTR: www.pecora.com.
 - d. Pecora Corporation; AIS-919: www.pecora.com.
 - e. United States Gypsum Co.; USG Sheetrock Brand Firecode Smoke-Sound Sealant: www.usg.com.
 - f. United States Gypsum Co.; USG Sheetrock Brand Acoustical Sealant: www.usg.com.
 - g. Substitutions: See Section 01 6000 - Product Requirements.

2.07 FASTENERS AND ADHESIVES

- A. Screws for Fastening of Gypsum Panel Products to Cold-Formed Steel Studs Less than 0.033 inch in Thickness and Wood Members: ASTM C1002; self-piercing tapping screws, corrosion resistant.
- B. Screws for Fastening of Gypsum Panel Products to Steel Members from 0.033 to 0.112 inch in Thickness: ASTM C954; steel drill screws, corrosion resistant.
- C. Screws for Fastening of Cementitious Backer Board Products to Steel Studs: Use screws of type and size recommended by panel manufacturer
- D. Anchorage to Other Substrates: Tie wire, nails, screws, and other metal supports, of type and size to suit application; to rigidly secure materials in place.

PART 3 EXECUTION**3.01 EXAMINATION**

- A. Verify that project conditions are appropriate for work of this section to commence.
- B. Control Joint Layout: Prior to commencement of framing and gypsum board installation, submit coordination drawings indicating proposed control joint locations in metal-framed gypsum board-sheathed partitions, walls, ceilings, bulkheads, fasciae, and soffits, for review and acceptance of Architect. Coordinate with requirements of Section 09 2216.

3.02 GENERAL INSTALLATION

- A. Comply with ASTM C840, GA-216, and manufacturer's instructions.

3.03 ACOUSTIC ACCESSORIES INSTALLATION

- A. General: Apply acoustic accessories at all STC-Rated Assemblies and elsewhere as indicated on Drawings.
 - 1. Apply acoustic sealant at all smoke-tight assemblies.
 - 2. Fire-Rated Construction: Install acoustic accessories in strict compliance with requirements of assembly listing.
- B. Acoustic Insulation: Place tightly within spaces, around cut openings, behind and around electrical and mechanical items within partitions, and tight to items passing through partitions.
- C. Acoustic Sealant: Install in accordance with manufacturer's instructions.
 - 1. Comply with ASTM C919.
 - 2. Place continuous bead at perimeter of each layer of gypsum board.
 - 3. Seal around all penetrations by conduit, pipe, ducts, rough-in boxes, and similar items, except where firestopping is provided.

3.04 BOARD INSTALLATION

- A. Install to minimize butt end joints, especially in highly visible locations.
 - 1. Use screws for attachment of gypsum board.
 - 2. Use screws for attachment of cementitious backing board.
- B. Single-Layer Non-Rated: Install gypsum board parallel to framing, with long edges occurring over framing.
 - 1. Stagger joints on opposite sides of partitions.
- C. Multi-Layer Non-Rated: Install first layer of gypsum board parallel to framing with long edges occurring over framing. Place second layer parallel to framing with long edges occurring over framing, and joints offset from joints of first layer.
 - 1. Offset face-layer joints at least one stud or furring member from base-layer joints.
 - 2. Stagger joints on opposite sides of partitions.
 - 3. Install additional layers beyond double layers similarly; maintain offset and staggered joints between layers.
 - 4. Apply laminating adhesive between layers of gypsum board for bonding of layers in addition to fasteners.
- D. Fire-Rated Construction: Install gypsum board in strict compliance with requirements of assembly listing.
- E. Cementitious Backing Board: Install in accordance with ANSI A108.11 and manufacturer's instructions.
- F. Curved Surfaces: Apply gypsum board to curved substrates in accordance with GA-226.

3.05 INSTALLATION OF TRIM AND ACCESSORIES

- A. Control Joints: Place control joints consistent with lines of building spaces and as follows:
 - 1. Not more than 30 feet apart on walls and ceilings, unless otherwise indicated.
 - 2. Submit control joint locations to Architect for approval prior to installation.
- B. Corner Beads: Install at external corners, using longest practical lengths.
- C. Edge Trim (LC or L Beads): Install at locations where gypsum board abuts dissimilar materials and as indicated, using longest practical lengths.

3.06 JOINT TREATMENT

- A. Paper Faced Gypsum Board: Use paper joint tape, embed with drying or setting type joint compound and finish with drying type joint compound.
- B. Tile Backing Panels: Use fiberglass joint tape, embed and finish with tile setting material.
 - 1. Refer to Section 09 3000 - Hard Tiling for tile setting materials.
- C. Glass Mat Faced Gypsum Board other than Tile Backing Panels: Use fiberglass joint tape, embed and finish with setting type joint compound.
- D. Finish gypsum board in accordance with levels defined in ASTM C840, as follows:
 - 1. Level 4: Walls and ceilings to receive paint finish or wall coverings, unless otherwise indicated.
 - 2. Level 2: In utility areas, behind cabinetry, and in similar locations that shall not be painted or finished, and at tile backing board to receive tile finish.
 - 3. Level 1: Wall areas above finished ceilings, whether or not accessible in the completed construction.
 - a. Exception: Fire-Rated Construction shall comply with requirements of assembly listing.
- E. Tape, fill, and sand exposed joints, edges, and corners to produce smooth surface ready to receive finishes.
 - 1. Feather coats of joint compound so that camber is maximum 1/32 inch.
 - 2. Taping, filling and sanding is not required at base layers of multi-layer applications.

3.07 TOLERANCES

- A. Maximum Variation of Finished Gypsum Board Surface from True Flatness: 1/8 inch in 10 feet in any direction.

END OF SECTION

SECTION 09 3000 - HARD TILING**PART 1 GENERAL****1.01 SECTION INCLUDES**

- A. Hard tile.
- B. Hard tile trim units.
- C. Solid surfacing thresholds.
- D. Tile setting materials, grout, sealants, and accessories.
- E. Metal trim.
- F. Waterproofing and crack isolation membranes.

1.02 REFERENCE STANDARDS

- A. ANSI A108.1a - American National Standard Specifications for Installation of Ceramic Tile in the Wet-Set Method, with Portland Cement Mortar 2017.
- B. ANSI A108.1b - American National Standard Specifications for Installation of Ceramic Tile on a Cured Portland Cement Mortar Setting Bed with Dry-Set or Latex-Portland Cement Mortar 2017.
- C. ANSI A108.1c - Contractor's Option: Installation of Ceramic Tile in the Wet-Set Method with Portland Cement Mortar or Installation of Ceramic Tile on a Cured Portland Cement Mortar Setting Bed with Dry-Set or Latex-Portland Cement Mortar 1999 (Reaffirmed 2021).
- D. ANSI A108.4 - American National Standard Specifications for Installation of Ceramic Tile with Organic Adhesives or Water Cleanable Tile-Setting Epoxy Adhesive 2019.
- E. ANSI A108.5 - American National Standard Specifications for Installation of Ceramic Tile with Dry-Set Portland Cement Mortar or Latex-Portland Cement Mortar 2020.
- F. ANSI A108.6 - American National Standard Specifications for Installation of Ceramic Tile with Chemical Resistant, Water Cleanable Tile-Setting and -Grouting Epoxy 1999 (Reaffirmed 2019).
- G. ANSI A108.8 - American National Standard Specifications for Installation of Ceramic Tile with Chemical Resistant Furan Resin Mortar and Grout 1999 (Reaffirmed 2019).
- H. ANSI A108.9 - American National Standard Specifications for Installation of Ceramic Tile with Modified Epoxy Emulsion Mortar/Grout 1999 (Reaffirmed 2019).
- I. ANSI A108.10 - American National Standard Specifications for Installation of Grout in Tilework 2017.
- J. ANSI A108.12 - American National Standard for Installation of Ceramic Tile with EGP (Exterior Glue Plywood) Latex-Portland Cement Mortar 1999 (Reaffirmed 2019).
- K. ANSI A108.13 - American National Standard for Installation of Load Bearing, Bonded, Waterproof Membranes for Thin-Set Ceramic Tile and Dimension Stone 2005 (Reaffirmed 2021).
- L. ANSI A118.3 - American National Standard Specifications for Chemical Resistant, Water Cleanable Tile-Setting and -Grouting Epoxy and Water Cleanable Tile-Setting Epoxy Adhesive 2013 (Revised).
- M. ANSI A118.4 - American National Standard Specifications for Modified Dry-Set Cement Mortar 2012 (Revised).
- N. ANSI A118.7 - American National Standard Specifications for High Performance Cement Grouts for Tile Installation 2010 (Reaffirmed 2016).
- O. ANSI A118.10 - American National Standard Specifications for Load Bearing, Bonded, Waterproof Membranes For Thin-Set Ceramic Tile And Dimension Stone Installation 2014.
- P. ANSI A118.11 - American National Standard Specifications for EGP (Exterior Glue Plywood) Latex-Portland Cement Mortar 1999 (Reaffirmed 2010).
- Q. ANSI A118.12 - American National Standard Specifications for Crack Isolation Membranes for Thin-Set Ceramic Tile and Dimension Stone Installation 2014.

- R. ANSI A137.1 - American National Standard Specifications for Ceramic Tile 2021.
- S. ISFA 2-01 - Classification and Standards for Solid Surfacing Material 2013.
- T. NEMA LD 3 - High-Pressure Decorative Laminates 2005.
- U. TCNA (HB) - Handbook for Ceramic, Glass, and Stone Tile Installation 2019.

1.03 ADMINISTRATIVE REQUIREMENTS

- A. Preinstallation Meeting: Convene a preinstallation meeting one week before starting work of this section; require attendance by affected installers.

1.04 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide manufacturers' data sheets on tile, mortar, grout, and accessories. Include instructions for using grouts and adhesives.
- C. Shop Drawings: Indicate tile layout, patterns, color arrangement, perimeter conditions, junctions with dissimilar materials, control and expansion joints, thresholds, ceramic accessories, and setting details.
- D. Samples:
 - 1. Full-size units of each type of tile and each color and finish.
 - 2. Full-size units of each type of trim, threshold and accessory for each color and finish.
 - a. Trim and Threshold Samples: 4 inches long, minimum.
- E. Maintenance Data: Include recommended cleaning methods, cleaning materials, and stain removal methods.
- F. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
 - 1. See Section 01 6000 - Product Requirements, for additional provisions.
 - 2. Extra Tile: 2 percent of each size, color, and surface finish combination, but not less than one box of each type.

1.05 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing the types of products specified in this section, with minimum five years of documented experience.
- B. Installer Qualifications: Company specializing in performing tile installation, with minimum of five years of documented experience.
- C. Provide setting materials, grouts, and waterproofing and crack isolation membrane materials from one manufacturer.

1.06 MOCK-UP

- A. See Section 01 4000 - Quality Requirements, for general requirements for mock-up.
- B. Construct mockups to demonstrate aesthetics and quality of materials and execution.
 - 1. Build mock-up of each type of floor tile and installation method.
 - 2. Build mock-up of each type of wall tile and installation method.
 - 3. Build mock-up of any other specific locations as requested by the Architect.
 - 4. Mockup sizes shall be sized as appropriate to demonstrate complete tile pattern layout; 16 square feet, minimum.
 - 5. Approved mock-ups may remain as part of the Work.

1.07 DELIVERY, STORAGE, AND HANDLING

- A. Delivery: Deliver materials to project site in manufacturer's original, unopened containers with labels intact. Inspect materials and notify manufacturer of any discrepancies.
- B. Storage: Store materials as directed by manufacturer's written instructions.

1.08 FIELD CONDITIONS

- A. Maintain ambient and substrate temperature above 50 degrees F and below 100 degrees F during installation and curing of setting materials.

PART 2 PRODUCTS

2.01 PERFORMANCE REQUIREMENTS

- A. Floor Tile: Floor tile shall comply with the following:

1. Dynamic Coefficient of Friction (DCOF): 0.42 or greater when tested in accordance with DCOF AcuTest per ANSI A137.1.

2.02 HARD TILE

- A. CT-1 Porcelain Tile: ANSI A137.1 standard grade.
 1. Locations: Walls.
 2. Size: 12 by 24 inch, nominal.
 3. Thickness: 3/8 inch, nominal.
 4. Surface Finish: Unpolished with Cross-Sheen
 5. Color(s): Clock Tower AV323
 6. Trim Units: Stainless steel trim units at all corners and top edges of tile, where applicable. [_____]
 7. Joint Size: 1/8 inch.
 8. Base: Cove Base to match field tile
 9. Products:
 - a. Crossville, Gotham; Porcelain Stone: www.crossvilleinc.com.
 - b. Substitutions: Not permitted.
 - c. Distributor: Virginia Tile, Kathleen Black, (248) 467-4362, kathleen.black@virginiatile.com.
- B. CT2 Wall Tile: ANSI A137.1 standard grade.
 1. Locations: Wall Accent Band.
 2. Size: 4 inch by 8 inch inch, nominal.
 3. Thickness: 5/16 inch, nominal.
 4. Surface Finish: Glazed.
 5. Color(s): Burgundy QH47.
 6. Joint Size: 1/8 inch.
 7. Products:
 - a. Daltil; Natural Hues: www.daltil.com.
 - b. Substitutions: Not permitted.
 - c. Manufacturer's Rep: Megan Erickson, (734) 740-3078, megan.erickson@daltil.com
- C. CT3 Wall Tile: ANSI A137.1 standard grade.
 1. Size: 4 by 8 inch, nominal.
 2. Thickness: 5/16 inch, nominal.
 3. Surface Finish: Glazed.
 4. Color(s): .
 - a. CT-3A Mist QH15.
 - b. CT-3B Burgundy QH47.
 5. Trim Units: Matching bullnose shapes in sizes coordinated with field tile.
 6. Joint Size: 1/8 inch.
 7. Products:
 - a. Daltil; Natural Hues: www.daltil.com.
 - b. Substitutions: Not permitted.
 - c. Manufacturer's Rep: Megan Erickson, (734) 740-3078, megan.erickson@daltil.com
- D. CT4 Floor Tile: ANSI A137.1 standard grade.
 1. Size: 12 by 12 inch, nominal.
 2. Thickness: 3/8 inch, nominal.
 3. Surface Finish: Unpolished.
 4. Color(s): .
 - a. CT-4A Ashgrey P405.
 - b. CT-4B Nero P406.
 5. Trim Units: Matching cove base shapes in sizes coordinated with field tile.
 6. Joint Size: 1/8 inch.
 7. Base: Cove Base S36C9 - Ashgrey Color.
 8. Products:
 - a. Daltil; Unity: www.daltil.com.
 - b. Substitutions: Not permitted.

- c. Manufacturer's Rep: Megan Erickson, (734) 740-3078, megan.erickson@daltile.com

2.03 TILE TRIM UNITS

- A. Trim Units: For tile with coordinating trim units, provide bullnoses, cove bases, and other shapes as required for a complete installation.
1. Shapes: As selected by Architect from manufacturer's standard shapes; coordinate with adjacent flat tile sizes and jointing.
 2. Sizes: As selected by Architect from manufacturer's standard sizes; coordinate with adjacent flat tile sizes and jointing.
 3. Manufacturers: Same as adjacent flat tile, unless otherwise indicated.

2.04 THRESHOLDS

- A. Thresholds - General:
1. Beveled Edges:
 - a. Maximum Height: 1/2 inch.
 - b. Bevel Slope: 1:2 slope.
 - c. Align lower bevel edge with adjacent floor finish.
 - d. Finish bevels to match threshold face.
 - B. THR-1 Solid Surfacing Thresholds: Plastic resin casting complying with ISFA 2-01 and NEMA LD 3; acrylic or polyester resin, mineral filler or unfilled, and pigments; homogenous, non-porous; no surface coating; color and pattern consistent throughout thickness.
 1. Size: 4 inches wide by full width of opening; 1/2 inch thick; beveled long edge, both sides.
 2. Finish on Exposed Surfaces: Matte, gloss rating of 5 to 20.
 3. Products:
 - a. E. I. DuPont De Nemours and Co.; Corian Solid Surface: www.corian.com.
 - b. Substitutions: Not permitted
 4. Color: Carbon Concrete
 - C. Applications:
 1. At doorways where tile terminates.

2.05 SETTING MATERIALS

- A. Latex-Portland Cement Thin-Set Mortar Bond Coat: ANSI A118.4 and ANSI A118.11
1. Products:
 - a. Bostik, Inc; Bostik PM: www.bostik.com.
 - b. Custom Building Products; VersaBond Flex Professional Thin-Set Mortar: www.custombuildingproducts.com.
 - c. LATICRETE International, Inc; 253 Gold: www.laticrete.com.
 - d. MAPEI Corp.; Porcelain Tile Mortar: www.mapei.com.
 - e. Substitutions: See Section 01 6000 - Product Requirements.
 - B. Large Format Tile Latex-Portland Cement Medium-Bed Mortar Bond Coat: ANSI A118.4 and ANSI A118.11.
 1. Products:
 - a. Bostik, Inc; Big Tile & Stone: www.bostik.com.
 - b. Custom Building Products; Natural Stone & Large Tile Premium Mortar: www.custombuildingproducts.com.
 - c. LATICRETE International, Inc; 4-XLT: www.laticrete.com.
 - d. MAPEI Corp.; Large Tile & Stone Mortar: www.mapei.com.
 - e. TEC, H.B. Fuller Construction Products Inc; Ultimate Large Tile Mortar or Ultraflex LFT: www.tecspecialty.com.
 - f. Substitutions: See Section 01 6000 - Product Requirements.

2.06 GROUTS

- A. High Performance Grout: ANSI A118.7 polymer modified cement grout or other high performance formulation.
1. Color(s): As selected by Architect from manufacturer's full line, unless otherwise indicated.
 2. Products:
 - a. Bostik, Inc; Hydroment Vivid: www.bostik.com.

- b. Custom Building Products; Prism Ultimate Performance Grout: www.custombuildingproducts.com.
 - c. LATICRETE International, Inc; PERMACOLOR Select Grout: www.laticrete.com.
 - d. MAPEI Corp.; Ultracolor Plus FA: www.mapei.com.
 - e. TEC, an H.B. Fuller Construction Products Inc; Power Grout: www.tecspecialty.com/#sle.
 - f. Substitutions: See Section 01 6000 - Product Requirements.
- B. Epoxy Grout: ANSI A118.3 chemical resistant and water-cleanable epoxy grout.
- 1. Color(s): As selected by Architect from manufacturer's full line, unless otherwise indicated.
 - 2. Products:
 - a. Bostik, Inc; EzPoxy EzClean: www.bostik.com.
 - b. Custom Building Products; CEG-Lite 100% Solids Commercial Epoxy Grout: www.custombuildingproducts.com.
 - c. H.B. Fuller Construction Products, Inc; TEC AccuColor EFX Epoxy Special Effects Grout: www.tecspecialty.com/#sle.
 - d. LATICRETE International, Inc; SPECTRALOCK Pro Premium or SPECTRALOCK Premium: www.laticrete.com.
 - e. MAPEI Corp.; Kerapoxy or Kerapoxy CQ: www.mapei.com
 - f. Substitutions: See Section 01 6000 - Product Requirements.
 - 1) Substitutions will only be accepted for manufacturers for epoxy grout. Product substitutions for other than epoxy grouts will not be accepted.

2.07 METAL TRIM

- A. Metal Trim: Provide metal profiles in heights to match tile and setting-bed thicknesses, designed specifically for hard tile applications.
- 1. Profiles:
 - a. Angle or L-shaped.
 - b. Other shapes as indicated on Drawings.
 - 2. Material: Satin Anodized Aluminum.
 - 3. Applications and Locations:
 - a. Open edges of wall tile.
 - b. Open edges of floor tile.
 - c. Outside wall corners.
 - d. Transitions between hard tile and other floor finishes.
 - e. Tile perimeters not against a wall or other solid vertical surface.
 - f. Other areas as indicated on Drawings.
 - 4. Manufacturers:
 - a. Schluter-Systems: www.schluter.com.
 - b. Substitutions: See Section 01 6000 - Product Requirements.

2.08 WATERPROOFING AND CRACK ISOLATION MEMBRANE

- A. Waterproofing and Crack Isolation Membrane: Elastomeric liquid applied membrane complying with ANSI A118.10 and ANSI A118.12.
- 1. Applications: Use at the following locations:
 - a. All floor and traffic areas.
 - b. Other areas as indicated.
 - 2. Thickness: As recommended by membrane manufacturer.
 - 3. Crack Resistance: No failure at 1/8 inch gap, minimum.
 - 4. Membrane system may or may not include fabric reinforcing.
 - 5. Products:
 - a. Without Fabric Reinforcing:
 - 1) Custom Building Products; RedGard: www.custombuildingproducts.com.
 - 2) LATICRETE International, Inc; Hydro Ban: www.laticrete.com.
 - 3) MAPEI Corp.; Mapelastic AquaDefense: www.mapei.com.
 - 4) Substitutions: See Section 01 6000 - Product Requirements.
 - b. With Fabric Reinforcing:

- 1) Bostik, Inc; GoldPlus: www.bostik.com.
- 2) Custom Building Products; 9240 Waterproofing and Anti-Fracture Membrane: www.custombuildingproducts.com.
- 3) LATICRETE International, Inc; Hydro Barrier: www.laticrete.com.
- 4) MAPEI Corp.; Mapelastic AquaDefense: www.mapei.com.
- 5) TEC, H.B. Fuller Construction Products Inc; HydraFlex: www.tecspecialty.com.
- 6) Substitutions: See Section 01 6000 - Product Requirements.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that subfloor surfaces are smooth and flat within the tolerances specified for that type of work and are ready to receive tile.
 1. Verify that sub-floor surfaces are dust-free and free of substances that could impair bonding of setting materials to sub-floor surfaces.
 2. Verify that substrates comply with tolerances of TCNA (HB).
- B. Verify that wall surfaces are smooth and flat within the tolerances specified for that type of work, are dust-free, and are ready to receive tile.
 1. Verify that substrates comply with tolerances of TCNA (HB).

3.02 PREPARATION

- A. Protect surrounding work from damage.
- B. Vacuum clean surfaces and damp clean.
- C. Follow manufacturer's written instructions, in strict accordance, for surface preparation of existing hard tile floors and walls at all toilet rooms prior to application of any installation materials associated with CT3 and CT4
- D. Follow manufacturer's written instructions, in strict accordance, for surface preparation of existing SGFT walls prior to application of any installation materials associated with CT3.

3.03 INSTALLATION - GENERAL

- A. Install tile and thresholds and grout in accordance with applicable requirements of ANSI A108.1a through ANSI A108.13, manufacturer's instructions, and TCNA (HB) recommendations.
- B. Install waterproofing and crack isolation membrane according to manufacturer's instructions and TCNA (HB) recommendations.
 1. Applications: Use at the following locations:
 - a. All floor and traffic areas.
 - b. Other areas as indicated.
- C. Bond Coats:
 1. Use latex-portland cement thin-set mortar, unless otherwise indicated.
 - a. Exceptions:
 - 1) For tiles that have at least one side greater than 15 inches long, use large format tile latex-portland cement medium-bed mortar.
 - b. Bond Coat Color: White or gray.
 - 1) Exception: White at glass tiles.
- D. Grout:
 1. Use high performance grout at CT1 & CT2
 - a. CT1 & CT2 - TEC; Silverado 949
 2. Use epoxy grout at CT3 & CT4
 - a. CT3 - TEC; Standard White 931
 - b. CT4 - TEC; Slate Gray 934
- E. Install tile prior to installation of equipment, cabinets, and other recessed and surface mounted items.
- F. Completely cover substrates with tile, including those which will be under and behind surface mounted items in finished construction.
- G. Lay tile from center lines outward unless otherwise indicated.

- H. Lay tile to pattern indicated. Do not interrupt tile pattern through openings.
- I. Cut and fit tile to penetrations through tile, leaving sealant joint space. Form corners and bases neatly.
- J. Place tile joints uniform in width, subject to variance in tolerance allowed in tile size. Make grout joints without voids, cracks, excess mortar or excess grout, or too little grout.
- K. Form internal angles square and external angles square, with metal trim, or bullnose trim pieces as indicated.
- L. Install accessories rigidly in place in accordance with manufacturer's instructions..
- M. Install metal trim in accordance with manufacturer's instructions.
- N. Install thresholds where indicated.
- O. Sound tile after setting. Replace hollow sounding units.
- P. Keep control and expansion joints free of mortar, grout, and adhesive.
- Q. Prior to grouting, allow installation to completely cure; minimum of 48 hours.
- R. Grout tile joints unless otherwise indicated.
- S. Joint Sealant:
 - 1. Use joint sealant at the following locations instead of grout.
 - a. Tile changes in plane.
 - b. Tile-to-tile control joints .
 - c. Junctions of tile and dissimilar materials
 - d. And elsewhere as required by TCNA (HB), EJ171 movement joint guidelines.
 - 2. Install joint sealant with bond breaker tape or backer rod as appropriate to prevent three-sided bonding.
- T. Grout Sealers:
 - 1. Seal the following:
 - a. High performance grout joints only as recommended by grout manufacturer.

3.04 INSTALLATION - FLOORS - THIN-SET METHODS

- A. Over concrete substrates, install in accordance with TCNA (HB) Method F122 or F122A, as appropriate to substrate conditions.
 - 1. Provide waterproofing and crack isolation membrane.

3.05 INSTALLATION - WALL TILE

- A. Over cementitious backer units on studs, install in accordance with TCNA (HB) Method W244C.
 - 1. Provide waterproofing and crack isolation membrane in wet areas and elsewhere as indicated.
- B. Over coated glass mat backer board on studs, install in accordance with TCNA (HB) Method W245.
 - 1. Provide waterproofing and crack isolation membrane where indicated.
- C. Over concrete and masonry install in accordance with TCNA (HB) Method W202I.
 - 1. Provide waterproofing and crack isolation membrane in wet areas and elsewhere as indicated.

3.06 CLEANING

- A. Clean tile and grout surfaces.

3.07 PROTECTION

- A. Do not permit traffic over finished floor surface for 4 days after installation.

END OF SECTION

SECTION 09 9100 - PAINTING**PART 1 GENERAL****1.01 SUMMARY**

- A. Interior painting.

1.02 RELATED REQUIREMENTS

- A. Section 09 9600 - High-Performance Coatings: Epoxy paints.

1.03 DEFINITIONS

- A. Conform to ASTM D16 for interpretation of terms used in this section
- B. DFT: Dry film thickness, measured in mils.
- C. WFT : Wet film thickness, measured in mils.

1.04 REFERENCE STANDARDS

- A. 40 CFR 59, Subpart D - National Volatile Organic Compound Emission Standards for Architectural Coatings; U.S. Environmental Protection Agency; current edition.
- B. ASTM D16 - Standard Terminology for Paint, Related Coatings, Materials, and Applications; 2016.
- C. ASTM D1653 - Standard Test Methods for Water Vapor Transmission of Organic Coating Films; 2013.
- D. ASTM D4258 - Standard Practice for Surface Cleaning Concrete for Coating; 2005 (Reapproved 2012).
- E. ASTM D4442 - Standard Test Methods for Direct Moisture Content Measurement of Wood and Wood-Based Materials; 2016.
- F. ASTM D523 - Standard Test Method for Specular Gloss; 2014.
- G. ASTM E96/E96M - Standard Test Methods of Water Vapor Transmission of Materials - 2016
- H. CAL (CDPH SM) - Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions From Indoor Sources Using Environmental Chambers; California Department of Public Health; v1.1, 2010.
- I. CARB (SCM) - Suggested Control Measure for Architectural Coatings; California Air Resources Board; 2007.
- J. SCAQMD 1113 - South Coast Air Quality Management District Rule No.1113; current edition.
- K. SSPC-SP 1 - Solvent Cleaning; 2015.
- L. SSPC-SP 2 - Hand Tool Cleaning; 1982 (Ed. 2004).
- M. SSPC-SP 6 - Commercial Blast Cleaning; 2007.

1.05 SUBMITTALS

- A. Refer to Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide product data for each paint product. Include complete list of products to be used, with the following information for each:
 - 1. Manufacturer's name, product name and/or catalog number, and general product category.
 - a. Example of general product categories:
 - 1) Interior finish coat - latex, eggshell.
 - 2) Exterior primer for ferrous metal.
 - 2. For each paint system and substrate, indicate which paint products are to be used.
 - a. Examples:
 - 1) Interior latex eggshell system for gypsum board:
 - (a) Primer: Name of specific product provided.
 - (b) Finish Coats: Name of specific product provided.
 - 2) Exterior latex semigloss system for ferrous metals.
 - (a) Primer: Name of specific product provided.
 - (b) Finish Coats: Name of specific product provided.
 - 3. Use same designations indicated on Drawings and Schedules.

- C. Samples: Submit 3 paper "draw down" samples, 8-1/2 by 11 inches in size, illustrating each color and sheen specified.
 - 1. Paint color submittals will not be considered until color submittals for major materials not to be painted, such as masonry and storefront finishes, have been approved.
- D. Manufacturer's Qualification Statement.
- E. Installer's Qualification Statement.
- F. Maintenance Data: Submit data including finish schedule showing where each product/color/finish was used, product technical data sheets, material safety data sheets (MSDS), care and cleaning instructions, and color samples of each color and finish used.
- G. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
 - 1. See Section 01 6000 - Product Requirements, for additional provisions.
 - 2. Extra Paint and Finish Materials: 1 gallon of each color, sheen, and type; from the same product run.
 - 3. Label each container with color, sheen, and type in addition to the manufacturer's label.
- H. Field Quality Control Reports.

1.06 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing the products specified, with minimum 5 years documented experience.
- B. Applicator Qualifications: Company specializing in performing the type of work specified with minimum 5 years documented experience.

1.07 MOCK-UPS

- A. See Section 01 4000 - Quality Requirements, for general requirements for mock-up.
- B. Mock-ups shall demonstrate aesthetic effects and set quality standards for materials and execution.
 - 1. Approval of mockups does not constitute approval of deviations from the Contract Documents unless Architect specifically approves such deviations in writing.
- C. Provide a mock-up for each paint system, substrate, color and sheen as follows:
 - 1. Vertical and Horizontal Surfaces: Provide mockup samples of at least 100 sq. ft.
 - 2. Doors and Frames: Provide mock-up samples of one complete door and frame.
 - 3. Railings and Other Lineal Materials: Provide mock-up samples of at least 8 lineal feet.
 - 4. Include mock-up for each dryfall paint system and color.
- D. Locate where directed by Architect.
- E. Mock-ups may remain as part of work.

1.08 DELIVERY, STORAGE, AND HANDLING

- A. Deliver products to site in sealed and labeled containers; inspect to verify acceptability.
- B. Container Label: Include manufacturer's name, type of paint, brand name, lot number, brand code, coverage, surface preparation, drying time, cleanup requirements, color designation, and instructions for mixing and reducing.
- C. Paint Materials: Store at minimum ambient temperature of 45 degrees F and a maximum of 90 degrees F, in ventilated area, and as required by manufacturer's instructions.

1.09 FIELD CONDITIONS

- A. Do not apply materials when surface and ambient temperatures are outside temperature ranges required by paint product manufacturer.
- B. Follow manufacturer's recommended procedures for producing best results, including testing of substrates, moisture in substrates, and humidity and temperature limitations.
- C. Do not apply exterior coatings during rain or snow, or when relative humidity is outside humidity ranges required by paint product manufacturer.
- D. Do not apply interior coatings when relative humidity exceeds 85 percent; at temperatures less than 5 degrees F above the dew point; or to damp or wet surfaces.

- E. Minimum Application Temperatures for Paints: 50 degrees F unless otherwise required by manufacturer's instructions.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Provide paint and coating products from same manufacturer, unless otherwise specified.
 - 1. Exceptions shall be permitted, provided approval of Architect is obtained using specified procedures for substitutions.
- B. Paint Manufacturers.
 - 1. Benjamin Moore: Benjamin Moore & Co.: www.benjaminmoore.com.
 - 2. PPG: PPG Industries, Inc., Architectural Coatings: www.ppgpaints.com.
 - 3. Sherwin-Williams: The Sherwin-Williams Company: www.sherwin-williams.com.
 - 4. Substitutions: See Section 01 6000 - Product Requirements.
- C. Concrete Stain Manufacturers:
 - 1. Benjamin Moore: Benjamin Moore & Co.: www.benjaminmoore.com.
 - 2. H&C: H&C Products Group/Sherwin-Williams: www.hcconcrete.com.
 - 3. PPG: PPG Industries, Inc., Architectural Coatings: www.ppgpaints.com.
 - 4. Substitutions: See Section 01 6000 - Product Requirements.

2.02 PAINTS AND FINISHES - GENERAL

- A. Exclusions:
 - 1. This section excludes epoxy paints and other high performance coatings for the following:
 - a. Interior non-traffic surfaces (epoxy paints).
 - 2. Refer to Section 09 9600 - High-Performance Coatings.
- B. Paints and Finishes: Ready mixed, unless required to be a field-catalyzed paint.
 - 1. Provide paints and finishes of a soft paste consistency, capable of being readily and uniformly dispersed to a homogeneous coating, with good flow and brushing properties, and capable of drying or curing free of streaks or sags.
 - 2. Provide materials that are compatible with one another and the substrates indicated under conditions of service and application, as demonstrated by manufacturer based on testing and field experience.
 - 3. For opaque finishes, tint each coat including primer coat and intermediate coats, one-half shade lighter than succeeding coat, with final finish coat as base color.
 - 4. Supply each paint material in quantity required to complete entire project's work from a single production run.
 - 5. Do not reduce, thin, or dilute paint or finishes or add materials unless such procedure is specifically described in manufacturer's product instructions.
- C. Volatile Organic Compound (VOC) Content and Emissions:
 - 1. Volatile Organic Compound (VOC) Content:
 - 2. Determination of VOC Content: Testing and calculation in accordance with 40 CFR 59, Subpart D (EPA Method 24), exclusive of colorants added to a tint base and water added at project site; or other method acceptable to authorities having jurisdiction.
- D. Sheen/Gloss Criteria.
 - 1. Product names are not acceptable as gloss level identification.
 - 2. Determine gloss value of paint finish by testing paint samples according to ASTM D523, using 60 degree geometry. Sheen/Gloss levels shall be defined as follows:
 - a. Gloss Level 1: Flat/Matte, value between 0 and 5 units.
 - b. Gloss Level 2: Velvet, value between 5 and 10 units.
 - c. Gloss Level 3: Eggshell, value between 10 and 20 units.
 - d. Gloss Level 4: Satin, value between 20 and 35 units.
 - e. Gloss Level 5: Semigloss, value between 35 and 70 units.
 - f. Gloss Level 6: Gloss, value between 70 and 85 units.
 - g. Gloss Level 7: High Gloss, value more than 85 units.
 - 3. Provide the sheens specified; where sheen is not specified, sheen will be selected later by Architect from the manufacturer's full line.
- E. Colors: To match Architect's samples unless indicated otherwise on Drawings.

1. Provide tinted deep tone primers at deep tone colors, and as recommended by paint manufacturer.

2.03 INTERIOR PAINTS

A. General:

1. For the following locations, provide the paint sheen indicated, unless otherwise indicated on Drawings:
 - a. Ceilings, Soffits and Ceiling Drops: Flat sheen.
 - b. Gypsum Board, except at Ceilings: Eggshell sheen.
 - c. Masonry: Semigloss sheen.
 - d. Metals: Semigloss sheen

B. Interior Paint Systems - Latex.

1. Primers: For all sheens unless otherwise indicated.
 - a. Primer for concrete masonry units; one coat.
 - 1) Benjamin Moore; Super Spec Masonry Interior/Exterior Hi-Build Block Filler, 206; DFT 9.0 mils.
 - 2) PPG; Speedhide Interior/Exterior Masonry Hi Fill Latex Block Filler, 6-15; DFT 7.0 mils.
 - 3) Sherwin Williams; PrepRite Interior/Exterior Latex Block Filler, B25W25; DFT 8.0 mils.
 - b. Primer for ferrous metal and galvanized steel; one coat.
 - 1) Benjamin Moore; Super Spec HP Acrylic Metal Primer, P04; DFT 2.0 mils.
 - 2) PPG; Pitt-Tech Plus Int./Ext. DTM Industrial Primer, 90-912 Series; DFT 3.0 mils.
 - 3) Sherwin Williams; Pro Industrial Pro-Cryl Universal Primer, B66W310 Series; DFT 3.0 mils.
 - c. Primer for gypsum board; one coat.
 - 1) Benjamin Moore; Fresh Start Natura Zero VOC Primer, 511; DFT 1.2 mils.
 - 2) PPG; Pure Performance Interior Latex Primer - 9-900; DFT 1.4 mils.
 - 3) Sherwin Williams; ProMar 200 Zero VOC Interior Latex Primer, B28W02600; DFT 1.0 mils.
 - d. Primer for previously painted surfaces; one coat.
 - 1) Benjamin Moore; Fresh Start High-Hiding All Purpose Primer, 046; DFT 1.4 mils.
 - 2) PPG; Seal Grip Interior/Exterior Acrylic Universal Primer/Sealer, 17-921 Series; DFT 1.6 mils.
 - 3) Sherwin Williams; PrepRite ProBlock Interior/Exterior Latex Primer/Sealer, B51-600 Series; DFT 1.4 mils.
 - e. Primer for insulated piping and insulated ductwork; one coat.
 - 1) Benjamin Moore; Fresh Start High-Hiding All Purpose Primer, 046; DFT 1.4 mils.
 - 2) PPG; Seal Grip Interior/Exterior Acrylic Universal Primer/Sealer, 17-921 Series; DFT 1.6 mils.
 - 3) Sherwin Williams; PrepRite ProBlock Interior/Exterior Latex Primer/Sealer, B51-600 Series; DFT 1.4 mils.
2. Semigloss Sheen:
 - a. Finish coats for all surfaces except metals; two coats.
 - 1) Benjamin Moore; Ultra Spec 500 Interior Semi-gloss Finish, N539; DFT 1.8 mils.
 - 2) PPG; Speedhide Zero Interior Zero-VOC Latex Semi-Gloss, 6-4500 Series; DFT 1.3 mils.
 - 3) Sherwin Williams; ProMar 200 Zero VOC Interior Latex Semi-Gloss, B31-2600 Series; DFT 1.6 mils.
 - b. Finish coats for ferrous metal and galvanized steel; two coats.
 - 1) Benjamin Moore; Ultra Spec HP DTM Acrylic Semi-Gloss, WH29; DFT 2.3 mils.
 - 2) PPG; Pitt-Tech Plus Int./Ext. Semi-Gloss DTM Industrial Enamel, 90-1210 Series; DFT 2.0 mils.
 - 3) Sherwin Williams; Pro Industrial DTM Acrylic Semi-Gloss, B66W01150 Series; DFT 2.5 mils.

3. Eggshell Sheen:
 - a. Finish coats for all surfaces; two coats.
 - 1) Benjamin Moore; Ultra Spec 500 Interior Eggshell Finish, N538; DFT 1.8 mils.
 - 2) PPG; Speedhide Zero Interior Zero-VOC Latex Eggshell, 6-4300 Series; DFT 1.5 mils.
 - 3) Sherwin Williams; ProMar 200 Zero VOC Interior Latex Eg-Shel, B20-2600 Series; DFT 1.7 mils.
 - b. Finish coats for ferrous metal and galvanized steel; two coats.
 - 1) Benjamin Moore; Ultra Spec 500 Interior Eggshell Finish, N538; DFT 1.8 mils.
 - 2) PPG; Speedhide Zero Interior Zero-VOC Latex Eggshell, 6-4300 Series; DFT 1.5 mils.
 - 3) Sherwin Williams; ProMar 200 Zero VOC Interior Latex Eg-Shel, B20-2600 Series; DFT 1.7 mils.
4. Flat Sheen:
 - a. Finish coats for all surfaces; two coats.
 - 1) Benjamin Moore; Ultra Spec 500 Interior Flat Finish, N536; DFT 1.8 mils.
 - 2) PPG; Speedhide Zero Interior Zero-VOC Latex Flat, 6-4100 Series; DFT 1.4 mils.
 - 3) Sherwin Williams; ProMar 200 Zero VOC Interior Latex Flat, B30-2600 Series; DFT 1.6 mils.
 - b. Finish coats for ferrous metal and galvanized steel; two coats.
 - 1) Benjamin Moore; Ultra Spec 500 Interior Flat Finish, N536; DFT 1.8 mils.
 - 2) PPG; Speedhide Zero Interior Zero-VOC Latex Flat, 6-4100 Series; DFT 1.4 mils.
 - 3) Sherwin Williams; ProMar 200 Zero VOC Interior Latex Flat, B30-2600 Series; DFT 1.6 mils.

2.04 MASONRY SEALER

- A. General:
 1. Provide sealer at ground-face decorative concrete masonry units, unless otherwise indicated.
- B. Masonry Sealer Systems:
 1. For Ground-face Decorative Concrete Masonry Units:
 - a. Penetrating, water-repellent, non-film forming, non-yellowing, sealer; two coats.
 - 1) United Coatings/GAF; CanyonTone Stain.
 - (a) Sealer/Stain Color: Clear/non-tinted.

2.05 ACCESSORY MATERIALS

- A. Accessory Materials: Provide sealers, cleaning agents, cleaning cloths, sanding materials, and clean-up materials as required for final completion of painted surfaces.
- B. Patching Material: Latex filler.
- C. Fastener Head Cover Material: Latex filler.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Do not begin application of paints and finishes until substrates have been properly prepared.
- B. Verify that surfaces are ready to receive work as instructed by product manufacturer.
- C. Examine surfaces scheduled to be finished prior to commencement of work. Report any condition that may potentially affect proper application.
- D. Test shop-applied primer for compatibility with subsequent cover materials; report incompatible primer conditions and submit recommended changes for Architect's approval.
 1. Do not proceed with remedial action or change without receiving written authorization from Architect.
- E. Measure moisture content of surfaces using electronic moisture meter. Do not apply finishes unless moisture content of surfaces are below following maximums:
 1. Exterior Materials:

- a. Masonry, Concrete, and Concrete Masonry Units: 12 percent.
2. Interior Materials:
 - a. Gypsum Wallboard: 12 percent.
 - b. Masonry, Concrete, and Concrete Masonry Units: 12 percent.
3. Report unacceptable conditions and submit recommended remedial action for Architect's approval.
 - a. Do not proceed with remedial action or change without receiving written authorization from Architect.

3.02 PREPARATION

- A. General:
 1. Clean surfaces thoroughly and correct defects prior to application.
 2. Prepare surfaces using the methods recommended by the top coat manufacturer for achieving the best result for the substrate under the project conditions.
 3. Remove or repair existing paints or finishes that exhibit surface defects.
 4. Remove or mask surface appurtenances, including electrical plates, hardware, light fixture trim, escutcheons, and fittings, prior to preparing surfaces for finishing.
 - a. After work is completed, reinstall removed items.
 5. Seal surfaces that might cause bleed through or staining of topcoat.
 6. Remove mildew from impervious surfaces by scrubbing with solution of tri-sodium phosphate and bleach. Rinse with clean water and allow surface to dry.
- B. Masonry:
 1. Remove efflorescence and chalk. Do not coat surfaces if moisture content or alkalinity of surfaces or if alkalinity of mortar joints exceed that permitted in manufacturer's written instructions. Allow to dry.
- C. Gypsum Board:
 1. Interior:
 - a. Fill minor defects with filler compound; make smooth and flush with adjacent surfaces.
 - b. Spot prime defects after repair.
- D. Ferrous Metal - Non-galvanized:
 1. Solvent clean according to SSPC-SP 1.
 2. Shop-Primed Surfaces: Sand and scrape to remove loose primer and rust. Feather edges to make touch-up patches inconspicuous. Clean surfaces with solvent. Prime bare steel surfaces.
 - a. Re-prime entire shop-primed item.
 3. Remove rust, loose mill scale, and other foreign substances using methods recommended in writing by paint manufacturer and blast cleaning according to SSPC-SP 6 "Commercial Blast Cleaning." Protect from corrosion until coated.
- E. Galvanized Surfaces:
 1. Remove surface contamination and oils and wash with solvent according to SSPC-SP 1.
 2. Remove loose paint and other debris according to SSPC-SP 2.
- F. Metal Doors to be Painted:
 1. Prime metal door top and bottom edge surfaces.
- G. Previously Painted Existing Surfaces:
 1. Remove all loose paint, dust, dirt, mold, mildew, oil, grease, rust, loose mill scale, mortar, and any other surface contamination.
 2. Scrape all loose, blistered, peeling, scratched or otherwise imperfect paint down to bare substrate and sand adjacent tightly adhering paint to feather edge.
 - a. Tightly adhered existing paint may remain.
 3. Spot prime all bare areas with appropriate primer before re-priming entire surface.

3.03 APPLICATION - PAINT PRODUCTS

- A. Apply products in accordance with manufacturer's written instructions.
- B. Provide smooth, opaque coatings of uniform finish, color, appearance, and coverage without brush marks, runs, sags, laps, ropiness, holidays, spotting, cloudiness, or other surface

- imperfections.
- C. Terminate paint in neat lines.
 - D. Apply paint products to properly prepared surfaces.
 - 1. Do not apply coatings over dirt, rust, scale, grease, moisture, or other conditions detrimental to application of coatings
 - E. Primers:
 - 1. Apply first coat of primer to surfaces as soon as practical after preparation and before subsequent surface deterioration.
 - 2. Re-prime shop-primed surfaces.
 - F. Do not apply succeeding coats until previous coat has cured as recommended by manufacturer.
 - 1. Sand between coats as recommended by manufacturer; before applying next coat vacuum clean surfaces of loose particles and use tack cloth to remove any remaining dust and particles just prior to applying next coat.
 - G. Provide completed work matching approved samples for color, sheen, texture, coverage and quality of work.
 - 1. Remove, refinish, or repaint work not complying with requirements.
 - H. Where adjacent sealant is to be painted, do not apply finish coats until sealant is applied.
 - I. Use applicators and methods best suited for substrate and type of material being applied and according to manufacturer's instructions.
 - 1. Brush Application: Use brushes best suited for type of material applied; use brush of appropriate size for surface or item being painted; produce results free of visible brush marks.
 - 2. Roller Application: Use rollers of fiber type and nap length as recommended by manufacturer for material and texture required.
 - 3. Spray Application: Use airless spray equipment with orifice size as recommended by manufacturer for material and texture required.
 - J. Number of Coats: Each paint system specifies a number of coats. This is the minimum number required.
 - 1. If undercoats, stains, or other imperfections are visible after final coat of paint, apply additional coats until paint is of uniform finish, color, and appearance without defects or imperfections.
 - K. Minimum Coating Thickness: Provide dry film thickness for each coat as indicated, but not less than that recommended by the coating manufacturer.
 - 1. Number of coats and film thicknesses required are same regardless of application method.
 - 2. Ensure edges, corners, crevices, welds, and exposed fasteners receive dry film thickness equivalent to that of flat surfaces.

3.04 SURFACES TO BE PAINTED

- A. General: Paint all exposed surfaces except where indicated not to be painted or to remain natural.
 - 1. The term "exposed" includes areas visible through permanent and built-in fixtures when they are in place.
 - 2. If surface, material, or item is not specifically mentioned, paint in same manner, color, and sheen as similar surfaces, materials, or items, regardless of whether indicated or not.
 - 3. Paint surfaces that are cut and patched to permit installation of electrical services, piping, and ductwork.
- B. Equipment and Furniture:
 - 1. Paint surfaces behind movable equipment and furniture the same as similar exposed surfaces.
 - 2. Paint surfaces to be concealed behind permanently installed fixtures, equipment, and furnishings, using primer only, prior to installation of permanent item.

- C. Registers and Grilles: Paint interior surfaces of ducts, for a minimum of 18 inches or beyond sight line, whichever is greater, with a flat black (non-reflecting) paint.
- D. Access Panels: Paint back sides of access panels and removable or hinged covers to match exposed surfaces.
- E. Doors:
 - 1. Exterior Doors: Finish doors on tops, bottoms, and all four edges the same as exterior faces.
 - 2. Interior Doors: Finish doors on tops, bottoms, and all four edges the same as face of non-secured side.
- F. Panelboards for Service Panels, Telephone and Other Electrical Equipment:
 - 1. Paint both sides and all edges of plywood before installation.
 - a. Color and Sheen: Gray, semi-gloss, unless otherwise indicated.
- G. Mechanical and Electrical:
 - 1. This Section includes painting of all mechanical, fire protection, and electrical items.
 - a. Do not paint sprinkler heads and polished fire protection components.
 - b. Do not paint insulated pipe, duct work or equipment before insulation is applied.
 - 2. Piping, Insulated Piping, Pipe Hangers, and Supports:
 - a. In finished/public areas, paint exposed piping the same color and sheen as surface it is mounted on unless otherwise indicated.
 - b. In utility areas, paint exposed piping according to piping color coding scheme; otherwise paint the same color and sheen as surface it is mounted on unless otherwise indicated.
 - c. Paint all exposed pipe hangers and supports the same color and sheen as surface it is mounted on unless otherwise indicated.
 - 1) Any portion of hangers and supports encompassing the actual pipe shall be painted to match the pipe color and sheen.
 - 3. Ductwork, Insulated Ducts, and Supports:
 - a. In finished/public areas, paint exposed ductwork and supports the same color and sheen as surface it is mounted on unless otherwise indicated.
 - b. In utility areas, paint exposed ductwork according to color coding scheme; otherwise paint the same color and sheen as surface it is mounted on unless otherwise indicated.
 - c. Paint all exposed hangers and supports the same color and sheen as surface it is mounted on unless otherwise indicated.
 - 1) Any portion of hangers and supports encompassing the actual ductwork shall be painted to match the ductwork color and sheen.
 - 4. Electrical Conduit, Fittings and Junction Boxes:
 - a. In finished/public areas, paint exposed conduit, fittings and junction boxes same color and sheen as surface it is mounted on unless otherwise indicated.
 - b. In utility areas, paint exposed conduit, fittings and junction boxes according to color coding scheme; otherwise paint the same color and sheen as surface it is mounted on unless otherwise indicated.
 - 5. Mechanical and Electrical Equipment:
 - a. Exterior Equipment: Paint all equipment exposed to the weather.
 - 1) Do not paint factory-finished equipment unless otherwise indicated.
 - b. Paint shop-primed mechanical and electrical equipment same color and sheen as surface it is mounted on unless otherwise indicated.
 - c. Remove unfinished louvers, grilles, covers, and access panels on mechanical and electrical components and paint separately.
 - d. Paint interior surfaces of convector and baseboard heating cabinets to match face panels.

3.05 SURFACES NOT TO BE PAINTED

- A. Do not paint or finish the following unless otherwise indicated:
 - 1. Factory-finished items; factory-primed items are not considered factory-finished.
 - 2. Items indicated to receive other finish.

3. Items indicated to remain naturally finished.
4. Fire rating labels.
5. Equipment serial number and capacity labels.
6. Operating parts of equipment.
7. All low voltage cabeling.
8. Aluminum components.
9. Polished and brushed stainless steel items.
10. Metal flashings.
11. Brick.
12. Cast-in-place concrete.
13. Floors.
14. Surfaces concealed by suspended ceilings.
15. Concealed piping, ductwork, and conduit.
16. Surfaces within pipe and duct spaces.
17. Acoustical materials.

3.06 IDENTIFICATION AND COLOR CODING

A. Partition Identification.

1. Permanently label each partition required to have protected openings, such as fire walls, fire barriers, fire partitions, smoke barriers, and smoke partitions.
 - a. Labeling:
 - 1) Labeling may be either painted stencils or premanufactured self-adhesive stickers.
 - 2) Lettering not less than 3 inches in height, minimum 3/8 inch stroke width, in contrasting color. Suggested wording as follows:
 - (a) "2 HOUR FIRE BARRIER - PROTECT ALL OPENINGS" or similar.
 - 3) Colors and exact wording of labels shall comply with local code(s).
 - b. Locations:
 - 1) Where possible, locate labels in accessible concealed floor, floor-ceiling, and attic spaces.
 - 2) Locate labels within 15 feet of the ends of each wall and intervals not to exceed 30 feet measured horizontally along the wall. Minimum of one label per run of wall.
 - (a) Locate 6 inches above accessible ceiling or 6 inches below ceiling/roof in exposed construction unless otherwise required by local code(s).
 - 3) Where multiple construction types occur in single run of wall:
 - (a) At accessible ceilings, paint 2 inch wide vertical line full height above ceiling to note changes in wall construction, label area between the line as indicated.
 - (b) At exposed construction, paint 2 inch wide vertical line 2 inches beyond top and bottom of lettering and label area between the line as indicated.

B. Mechanical and Electrical Identification and Color Coding :

1. Refer to Divisions 21, 22, 23, and 26 for color coding scheme and identification of mechanical and electrical services; if no identification is provided, paint as follows:
 - a. Color Coding Scheme and Identification:
 - 1) Piping: None; paint to match surface on which it is mounted.
 - 2) Ductwork: None; paint to match surface on which it is mounted.
 - 3) Conduit: None; paint to match surface on which it is mounted.

3.07 FIELD QUALITY CONTROL

A. Owner may provide field inspection.

B. All painted surfaces shall be inspected as follows:

1. Paint shall be rejected for the following:
 - a. Lacking minimum dry film thicknesses.
 - 1) Inspector may test for proper dry film thickness using methods as recommended by the inspector.
 - b. Poor coverage at rivet heads, plate edges, lap joints, crevices, pockets, and corners.

- c. Damage from touching, or disturbing paint in any other manner, before sufficiently dry.
 - d. Damage from application to moist surfaces or damage caused by inadequate protection from the weather.
 - e. Damage or contamination of paint from blown contaminants including but not limited to dust.
2. Paint shall be rejected if any of the following are evident under natural lighting for exterior surfaces and final lighting source, including daylighting, for interior surfaces:
 - a. Visible defects are evident on vertical surfaces when viewed at normal viewing angles from a distance of not less than 48 inches.
 - b. Visible defects are evident on horizontal surfaces when viewed at normal viewing angles from a distance of not less than 48 inches.
 - c. Visible defects are evident on ceiling, soffit and other overhead surfaces when viewed at normal viewing angles from a distance of not less than 48 inches.
- C. Visible defects are defined as follows:
1. Brush and roller marks, streaks, laps, runs, sags, drips, heavy stippling, hiding or shadowing by inefficient application methods, skipped or missed areas, and foreign materials in paint coatings.
 2. When the final coat on any surface exhibits a lack of uniformity of color, sheen, texture, and hiding across full surface area.
- D. Paint rejected by the inspection shall be repaired or replaced at the expense of the Contractor.
1. Small affected areas shall be touched up.
 2. Large affected areas shall be repainted.
 3. Small and large areas shall be as defined by the Architect.
 4. Areas without sufficient dry film thickness shall be repainted.
 5. Paint runs and sags shall be removed by scraper or sanding and repainted.

3.08 CLEANING

- A. At end of each workday, remove empty cans, rags, and other discarded paint materials from site.
1. Collect waste material which may constitute fire hazard, place in closed metal containers, and remove daily from site.

3.09 PROTECTION

- A. Protect other work, whether being painted or not, against damage from painting activities.
1. Correct damage by cleaning, repairing, replacing as approved by Architect
- B. Protect finishes until completion of project.
- C. Touch-up damaged finishes after Substantial Completion.

END OF SECTION

SECTION 09 9600 - HIGH-PERFORMANCE COATINGS**PART 1 GENERAL****1.01 SECTION INCLUDES**

- A. Interior epoxy paints - non-traffic surfaces.
- B. High performance coatings for structural steel, steel joists, and metal decking, including exposed steel lintels.

1.02 DEFINITIONS

- A. Conform to ASTM D16 for interpretation of terms used in this section
- B. DFT: Dry film thickness, measured in mils.
- C. WFT : Wet film thickness, measured in mils.

1.03 REFERENCE STANDARDS

- A. 40 CFR 59, Subpart D - National Volatile Organic Compound Emission Standards for Architectural Coatings; U.S. Environmental Protection Agency; current edition.
- B. ASTM D16 - Standard Terminology for Paint, Related Coatings, Materials, and Applications; 2016.
- C. ASTM D1653 - Standard Test Methods for Water Vapor Transmission of Organic Coating Films; 2013.
- D. ASTM D4258 - Standard Practice for Surface Cleaning Concrete for Coating; 2005 (Reapproved 2012).
- E. ASTM D4442 - Standard Test Methods fASTM D3359 or Direct Moisture Content Measurement of Wood and Wood-Based Materials; 2016.
- F. ASTM D523 - Standard Test Method for Specular Gloss; 2014.
- G. ASTM D3359 - Standard Test Methods For Rating Adhesion By Tape Test; current edition.
- H. ASTM E96/E96M - Standard Test Methods of Water Vapor Transmission of Materials - 2016
- I. CAL (CDPH SM) - Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions From Indoor Sources Using Environmental Chambers; California Department of Public Health; v1.1, 2010.
- J. CARB (SCM) - Suggested Control Measure for Architectural Coatings; California Air Resources Board; 2007.
- K. SCAQMD 1113 - South Coast Air Quality Management District Rule No.1113; current edition.
- L. SSPC-SP 1 - Solvent Cleaning; 2015.
- M. SSPC-SP 2 - Hand Tool Cleaning; 1982 (Ed. 2004).
- N. SSPC-SP 6 - Commercial Blast Cleaning; 2007.

1.04 SUBMITTALS

- A. Refer to Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide product data for each coating product. Include complete list of products to be used, with the following information for each:
 - 1. Manufacturer's name, product name and/or catalog number, and general product category.
 - a. Example of general product categories:
 - 1) Two component, waterbased, acrylic epoxy - Gloss Sheen.
 - 2) Interior primer for concrete masonry units.
 - 2. For each high-performance coating system and substrate, indicate which products are to be used.
 - a. Examples:
 - 1) Interior Waterborne Acrylic Epoxy Paint for Concrete Masonry Units:
 - (a) Primer: Name of specific product provided.
 - (b) Finish Coats: Name of specific product provided.
 - 2) Interior High Performance Coating For Structural Steel.
 - (a) Primer: Name of specific product provided.

- (b) Intermediate Coat: Name of specific product provided.
- (c) Top Coat: Name of specific product provided.
- b. Use same designations indicated on Drawings and Schedules.
- C. Samples: Submit 3 samples, 8-1/2 by 11 inches in size, illustrating each color and sheen specified.
 - 1. High-performance coating color submittals will not be considered until color submittals for major materials not to be painted, such as masonry and storefront finishes, have been approved.
- D. Manufacturer's Qualification Statement.
- E. Installer's Qualification Statement.
- F. Maintenance Data: Submit data including finish schedule showing where each product/color/finish was used, product technical data sheets, material safety data sheets (MSDS), care and cleaning instructions, and color samples of each color and finish used.
- G. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
 - 1. See Section 01 6000 - Product Requirements, for additional provisions.
 - 2. Extra Materials: 1 gallon of each color, sheen, and type; from the same product run.
 - 3. Label each container with color, type, and finish in addition to the manufacturer's label.
- H. Field Quality Control Reports.

1.05 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing the products specified, with minimum 5 years documented experience.
- B. Applicator Qualifications: Company specializing in performing the type of work specified with minimum 5 years documented experience.

1.06 ADHESION TEST

- A. Adhesion Test to be performed per ASTM D3359 Method A (5mils or less) or B (over 5mils)
- B. Test to be completed after primer has been installed but before finish coats.

1.07 MOCK-UPS

- A. See Section 01 4000 - Quality Requirements, for general requirements for mock-up.
- B. Mock-ups shall demonstrate aesthetic effects and set quality standards for materials and execution.
 - 1. Approval of mockups does not constitute approval of deviations from the Contract Documents unless Architect specifically approves such deviations in writing.
- C. Provide a mock-up for each high-performance coating system, substrate, color and sheen as follows:
 - 1. Vertical and Horizontal Surfaces: Provide mockup samples of at least 100 sq. ft.
 - 2. Doors and Frames: Provide mock-up samples of one complete door and frame.
 - 3. Railings and Other Lineal Materials: Provide mock-up samples of at least 8 lineal feet.
- D. Locate where directed by Architect.
- E. Mock-ups may remain as part of work.

1.08 DELIVERY, STORAGE, AND HANDLING

- A. Deliver products to site in sealed and labeled containers; inspect to verify acceptability.
- B. Container Label: Include manufacturer's name, type of coating, brand name, lot number, brand code, coverage, surface preparation, drying time, cleanup requirements, color designation, and instructions for mixing and reducing.
- C. Coating Materials: Store at minimum ambient temperature of 45 degrees F and a maximum of 90 degrees F, in ventilated area, and as required by manufacturer's instructions.

1.09 FIELD CONDITIONS

- A. Follow manufacturer's recommended procedures for producing best results, including testing of substrates, moisture in substrates, and humidity and temperature limitations.

- B. Do not apply exterior coatings during rain or snow, or when relative humidity is outside the humidity ranges required by the coating product manufacturer.
- C. Do not install materials when temperature is below 55 degrees F or above 90 degrees F.
- D. Maintain this temperature range, 24 hours before, during, and 72 hours after installation of coating.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Provide high-performance coating products from same manufacturer, unless otherwise specified. For each high performance coating system, provide one of the indicated products for each coating within the system.
 - 1. Exceptions shall be permitted, provided approval of Architect is obtained using specified procedures for substitutions.
- B. High Performance Coating Manufacturers.
 - 1. Benjamin Moore: Benjamin Moore & Co.: www.benjaminmoore.com.
 - 2. PPG: PPG Industries, Inc., Architectural Coatings: www.ppgpaints.com.
 - 3. Sherwin-Williams: The Sherwin-Williams Company: www.sherwin-williams.com.
 - 4. Tnemec: Tnemec Company Inc.: www.tnemec.com.
 - 5. Substitutions: See Section 01 6000 - Product Requirements.

2.02 HIGH-PERFORMANCE COATINGS - GENERAL

- A. Provide epoxy paints and high performance coatings where indicated on Drawings; otherwise provide paints as specified in Section 09 9100 - Painting.
- B. Provide materials that are compatible with one another and the substrates indicated under conditions of service and application, as demonstrated by manufacturer based on testing and field experience.
- C. Supply each coating material in quantity required to complete entire project's work from a single production run.
- D. Do not reduce, thin, or dilute coatings or finishes or add materials unless such procedure is specifically described in manufacturer's product instructions.
- E. Volatile Organic Compound (VOC) Content and Emissions:
 - 1. Volatile Organic Compound (VOC) Content:
 - a. Provide paints and finishes that comply with the most stringent requirements specified in the following:
 - 1) 40 CFR 59, Subpart D--National Volatile Organic Compound Emission Standards for Architectural Coatings.
 - 2) Architectural coatings VOC limits of State in which the project is located.
 - 2. Determination of VOC Content: Testing and calculation in accordance with 40 CFR 59, Subpart D (EPA Method 24), exclusive of colorants added to a tint base and water added at project site; or other method acceptable to authorities having jurisdiction.
 - F. Sheen/Gloss Criteria.
 - 1. Product names are not acceptable as gloss level identification.
 - 2. Determine gloss value of paint finish by testing paint samples according to ASTM D523, using 60 degree geometry. Sheen/Gloss levels shall be defined as follows:
 - a. Gloss Level 1: Flat/Matte, value between 0 and 5 units.
 - b. Gloss Level 2: Velvet, value between 5 and 10 units.
 - c. Gloss Level 3: Eggshell, value between 10 and 20 units.
 - d. Gloss Level 4: Satin, value between 20 and 35 units.
 - e. Gloss Level 5: Semigloss, value between 35 and 70 units.
 - f. Gloss Level 6: Gloss, value between 70 and 85 units.
 - g. Gloss Level 7: High Gloss, value more than 85 units.
 - 3. Provide the sheens specified; where sheen is not specified, sheen will be selected later by Architect from the manufacturer's full line.
 - G. Colors: To match Architect's samples unless indicated otherwise on Drawings

2.03 INTERIOR EPOXY PAINTS - NON-TRAFFIC SURFACES

- A. General:
1. Excludes the following:
 - a. Structural steel, steel joists, and metal decking.
 - b. Exposed exterior steel lintels.
- B. Waterborne Acrylic Epoxy Paint - Non-Traffic Systems.
1. Primers: For all sheens unless otherwise indicated.
 - a. Primer for concrete; one coat.
 - 1) Benjamin Moore:
 - (a) Semigloss and Eggshell Sheens: INSL-X Aqua Lock Plus 100 pct Acrylic Primer Sealer, AQ-0XXX; DFT 1.6 mils.
 - 2) PPG; Perma-Crete Interior/Exterior Alkali Resistant Primer, 4-603; DFT 1.5 mils.
 - 3) Sherwin Williams; Loxon Concrete and Masonry Prime/Sealer Interior/Exterior Latex, A24W8300 Series; DFT 2.5 mils.
 - b. Primer for concrete masonry units; one coat.
 - 1) Benjamin Moore; Super Spec Masonry Interior/Exterior Hi-Build Block Filler, 206; DFT 9.0 mils.
 - 2) PPG; Speedhide Interior/Exterior Masonry Hi Fill Latex Block Filler, 6-15; DFT 7.0 mils.
 - 3) Sherwin Williams:
 - (a) Semigloss and Eggshell Sheens: Loxon Block Surfacers A24W00200; DFT 2.5 mils.
 - c. Primer for ferrous metal and galvanized steel; one coat.
 - 1) Benjamin Moore; Corotech Acrylic Metal Primer, V110; DFT 2.0 mils.
 - 2) PPG; Pitt-Tech Int./Ext. DTM Industrial Primer, 90-712 Series; DFT 3.0 mils.
 - 3) Sherwin Williams; Pro Industrial Pro-Cryl Universal Primer, B66W310 Series; DFT 3.0 mils.
 - d. Primer for gypsum board; one coat.
 - 1) Benjamin Moore; Fresh Start Natura Zero VOC Primer, 511; DFT 1.2 mils.
 - 2) PPG; Pure Performance Interior Latex Primer - 9-900; DFT 1.4 mils.
 - 3) Sherwin Williams; ProMar 200 Zero VOC Interior Latex Primer, B28W02600; DFT 1.0 mils.
 - e. Primer for previously painted surfaces; one coat.
 - 1) Benjamin Moore; Fresh Start High-Hiding All Purpose Primer, 046; DFT 1.4 mils.
 - 2) PPG; Seal Grip Interior/Exterior Acrylic Universal Primer/Sealer, 17-921 Series; DFT 1.6 mils.
 - 3) Sherwin Williams; PrepRite ProBlock Interior/Exterior Latex Primer/Sealer, B51-600 Series; DFT 1.4 mils.
 - f. Primer for insulated piping and insulated ductwork; one coat.
 - 1) Benjamin Moore; Fresh Start High-Hiding All Purpose Primer, 046; DFT 1.4 mils.
 - 2) PPG; Seal Grip Interior/Exterior Acrylic Universal Primer/Sealer, 17-921 Series; DFT 1.6 mils.
 - 3) Sherwin Williams; PrepRite ProBlock Interior/Exterior Latex Primer/Sealer, B51-600 Series; DFT 1.4 mils.
 2. Semigloss Sheen: One component, pre-catalyzed, waterbased, acrylic epoxy.
 - a. Finish coats for all surfaces; two coats.
 - 1) Benjamin Moore; Corotech Pre-Catalyzed Waterborne Epoxy Semi-Gloss, V341; DFT 1.5 mils
 - 2) PPG; Pitt-Glaze WB1 Interior Semi-Gloss Pre-Catalyzed Water-Borne Acrylic Epoxy, 16-510 Series; DFT 2.0 mils.
 - 3) Sherwin Williams; Pro Industrial Pre-Catalyzed Waterbased Epoxy, K46-150 Series, Semi-Gloss; DFT 1.5 mils.

2.04 INTERIOR EPOXY PAINTS - TRAFFIC SURFACES (FLOORS)

- A. Heavy Duty, Polyamine, Epoxy Paint - Traffic Systems.
1. Locations:

- a. As indicated.
- 2. Gloss Sheen: Two component, polyamine, epoxy.
 - a. Primer for concrete, including previously painted surfaces; one coat.
 - 1) Benjamin Moore; Corotech 100 pct Solids Epoxy Pre-Primer, V155; DFT 2.0 mils.
 - 2) PPG; HPC High Gloss Epoxy 95-501 Series; DFT 3.0 mils.
 - 3) Sherwin Williams; Pro Industrial High Performance Epoxy, B67-W00200 Series, Gloss; DFT 4.0 mils.
 - 4) Tnemec; Epoxoprime Series 201; DFT 9.0 mils.
 - b. Finish coats; two coats.
 - 1) Benjamin Moore; Corotech Polyamide Epoxy Coating, Gloss, V400; DFT 4.5 mils.
 - 2) PPG; HPC High Gloss Epoxy 95-501 Series; DFT 3.0 mils.
 - 3) Sherwin Williams; Pro Industrial High Performance Epoxy, B67 Series; DFT 6.0 mils.
 - 4) Tnemec; Power-Tread Series 237; DFT 12.0 mils.

2.05 HIGH PERFORMANCE COATINGS FOR STRUCTURAL STEEL, METAL DECKING, AND STEEL JOISTS

- A. General:
 - 1. Includes interior and exterior high performance coatings for the following:
 - a. Structural steel, steel joists, and metal decking.
 - b. Exposed exterior steel lintels.
- B. Steel Coating Systems.
 - 1. Primer; one coat.
 - a. Zinc-rich primer.
 - 1) Locations:
 - (a) Exterior locations.
 - (b) Natatorium/pool environments.
 - (c) Wet areas.
 - (d) Galvanized steel.
 - (e) Other areas as indicated.
 - 2) Primer:
 - (a) Benjamin Moore; Corotech Organic Zinc Rich Primer, V170; DFT 2.0 mils.
 - (b) PPG; Aquapon 97-670 Series; DFT 4.0 mils.
 - (c) Sherwin Williams; Protective and Marine Coatings Zinc Clad IV (85) Organic Zinc Rich Coating; DFT 4.0 mils.
 - (d) Tnemec; Tneme-Zinc Series 90-97; DFT 3.0 mils.
 - b. Epoxy primer.
 - 1) Locations:
 - (a) Where zinc-rich primer is not required.
 - 2) Primer:
 - (a) Benjamin Moore; Corotech Polyamide Epoxy Primer V150; DFT 2.5 mils.
 - (b) PPG; PMC Amercoat 278 High Solids, Zinc Phosphate Epoxy Primer and Buildcoat; DFT 5.0 mils.
 - (c) Sherwin Williams; Protective and Marine Coatings Macropoxy 5000 Penetrating Epoxy Primer/Sealer, B58 Series; DFT 1.5 mils.
 - (d) Tnemec; Hi-Build Epoxoline Series 66; DFT 4.0 mils.
 - c. Primer at previously painted surfaces:
 - 1) Benjamin Moore; Corotech Polyamide Epoxy Primer V150; DFT 2.5 mils.
 - 2) PPG; PMC Amercoat 278 High Solids, Zinc Phosphate Epoxy Primer and Buildcoat; DFT 5.0 mils.
 - 3) Sherwin Williams; Protective and Marine Coatings Macropoxy 5000 Penetrating Epoxy Primer/Sealer, B58 Series; DFT 1.5 mils.
 - 4) Tnemec; Hi-Build Epoxoline Series 66; DFT 4.0 mils.
 - 2. Intermediate Coat; one coat, polyamide epoxy.

- a. Benjamin Moore; Corotech Surface Tolerant Epoxy Mastic Coating, V160; DFT 6.0 mils.
 - b. PPG; Pittguard 97-145 Series; DFT6.0 mils.
 - c. Sherwin Williams; Protective and Marine Coatings Macropoxy 646 Fast Cure Epoxy; DFT 7.5 mils.
 - d. Tnemec; F.C. Typoxy Series 27; DFT 5.0 mils.
3. Top Coat; one coat, semi-gloss sheen, aliphatic acrylic polyurethane.
- a. Benjamin Moore; Corotech Aliphatic Acrylic Urethane Semi-Gloss, V510; DFT 2.5 mils.
 - b. PPG; Pitthane 95-8800 Series; DFT4.0 mils.
 - c. Sherwin Williams; Protective and Marine Coatings Acrolon 218 HS Acrylic Polyurethane, Semi-gloss; DFT 5.0 mils.
 - d. Tnemec; Endura-Shield Series 73; DFT 4.0 mils.

2.06 HIGH PERFORMANCE COATINGS IN NATATORIUMS

- A. Structural steel, steel joists, and metal decking, including exposed steel lintels:
- 1. Refer to "High Performance Coatings For Structural Steel, Metal Decking, and Steel Joists" Article above.
- B. Concrete Masonry Units and Concrete:
- 1. Primer:
 - a. Primer for concrete masonry units; one coat.
 - 1) Benjamin Moore; Corotech, Waterborne Epoxy Block Filler, V163; DFT 10.0 mils.
 - 2) PPG; Cementitious Waterproofing Block Filler, 95-217; DFT 12.5 mils.
 - 3) Sherwin Williams: Protective and Marine Coatings, Kem Cati-Coat HS Epoxy Filler/Sealer, B42 Series; DFT 15.0 mils.
 - 4) Tnemec; Envriofill Series 130; Coverage rate 70 sq. ft. per gallon.
 - b. Primer for concrete; one coat.
 - 1) Benjamin Moore: Corotech 100 pct Solids Epoxy Pre-Primer V155; DFT 2.5 mils.
 - 2) PPG; HPC High Gloss Epoxy 95-501 Series; DFT 4.0 mils.
 - 3) Sherwin Williams; Pro Industrial High Performance Epoxy, B67 Series; DFT 6.0 mils.
 - 4) Tnemec; Surfacing Epoxy, Series 215; DFT 3.0 mils.
 - c. Primer for previously painted surfaces; one coat.
 - 1) Benjamin Moore: Corotech 100 pct Solids Epoxy Pre-Primer V155; DFT 2.5 mils.
 - 2) PPG; HPC High Gloss Epoxy 95-501 Series; DFT 4.0 mils.
 - 3) Sherwin Williams; Pro Industrial High Performance Epoxy, B67 Series; DFT 6.0 mils.
 - 4) Tnemec; Surfacing Epoxy, Series 215; DFT 3.0 mils.
 - 2. Intermediate Coat; one coat.
 - a. Benjamin Moore; Corotech Surface Tolerant Epoxy Mastic Coating, V160; DFT 6.0 mils.
 - b. PPG; Aquapon 97-130 Series; DFT5.0 mils.
 - c. Sherwin Williams; Protective and Marine Coatings Macropoxy 646 Fast Cure Epoxy; DFT 7.5 mils.
 - d. Tnemec; Hi-Build Epoxoline II Series L69; DFT 5.0 mils.
 - 3. Top Coat; one coat.
 - a. Benjamin Moore; Corotech Aliphatic Acrylic Urethane Semi-Gloss, V510; DFT 2.5 mils.
 - b. PPG; Pitthane 95-8800 Series; DFT4.0 mils.
 - c. Sherwin Williams; Protective and Marine Coatings Acrolon 218 HS Acrylic Polyurethane, Semi-gloss; DFT 5.0 mils.
 - d. Tnemec; Enviro-Glaze Series 297; DFT 3.0 mils.
- C. Miscellaneous Non-Structural, Ferrous Metal and Galvanized Steel:

1. Primers:
 - a. Zinc-rich primer.
 - 1) Locations:
 - (a) Galvanized steel.
 - (b) Other areas as indicated.
 - 2) Primer:
 - (a) Benjamin Moore; Corotech Organic Zinc Rich Primer, V170; DFT 2.0 mils.
 - (b) PPG; Aquapon 97-670 Series; DFT 4.0 mils.
 - (c) Sherwin Williams; Protective and Marine Coatings Zinc Clad IV (85) Organic Zinc Rich Coating; DFT 4.0 mils.
 - (d) Tnemec; Tneme-Zinc Series 90-97; DFT 3.0 mils.
 - b. Epoxy Primer; one coat.
 - 1) Locations:
 - (a) Where zinc-rich primer is not required.
 - 2) Primer:
 - (a) Benjamin Moore: Corotech Polyamide Epoxy Primer V150; DFT 2.5 mils.
 - (b) PPG; PMC Amercoat 278 High Solids, Zinc Phosphate Epoxy Primer and Buildcoat; DFT 5.0 mils.
 - (c) Sherwin Williams; Protective and Marine Coatings Macropoxy 5000 Penetrating Epoxy Primer/Sealer, B58 Series; DFT 1.5 mils.
 - (d) Tnemec; Hi-Build Epoxoline Series 66; DFT 4.0 mils..
 - c. Primer for previously painted surfaces: one coat.
 - 1) Benjamin Moore: Corotech Polyamide Epoxy Primer V150; DFT 2.5 mils.
 - 2) PPG; PMC Amercoat 278 High Solids, Zinc Phosphate Epoxy Primer and Buildcoat; DFT 5.0 mils.
 - 3) Sherwin Williams; Protective and Marine Coatings Macropoxy 5000 Penetrating Epoxy Primer/Sealer, B58 Series; DFT 1.5 mils.
 - 4) Tnemec; Hi-Build Epoxoline Series 66; DFT 4.0 mils..
2. Intermediate Coat; one coat.
 - a. Benjamin Moore; Corotech Surface Tolerant Epoxy Mastic Coating, V160; DFT 6.0 mils.
 - b. PPG; Aquapon 97-130 Series; DFT 5.0 mils.
 - c. Sherwin Williams; Protective and Marine Coatings Macropoxy 646 Fast Cure Epoxy; DFT 7.5 mils.
 - d. Tnemec; F.C. Typoxy Series 27; DFT 5.0 mils.
3. Top Coat; one coat.
 - a. Benjamin Moore; Corotech Aliphatic Acrylic Urethane Semi-Gloss, V510; DFT 2.5 mils.
 - b. PPG; Pitthane 95-8800 Series; DFT 4.0 mils.
 - c. Sherwin Williams; Protective and Marine Coatings Acrolon 218 HS Acrylic Polyurethane, Semi-gloss; DFT 5.0 mils.
 - d. Tnemec; Endura-Shield Series 73; DFT 4.0 mils..

2.07 ACCESSORY MATERIALS

- A. Accessory Materials: Provide sealers, cleaning agents, cleaning cloths, sanding materials, and clean-up materials as required for final completion of high-performance coated surfaces.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Do not begin application of high performance coatings until substrates have been properly prepared.
- B. Verify that surfaces are ready to receive work as instructed by product manufacturer.
- C. Examine surfaces scheduled to be finished prior to commencement of work. Report any condition that may potentially affect proper application.
- D. Test shop-applied primer for compatibility with subsequent cover materials; report incompatible primer conditions and submit recommended changes for Architect's approval.

1. Do not proceed with remedial action or change without receiving written authorization from Architect.
- E. Measure moisture content of surfaces using electronic moisture meter. Do not apply finishes unless moisture content of surfaces are below following maximums:
 1. Interior Materials:
 - a. Gypsum Wallboard: 12 percent.
 - b. Masonry, Concrete, and Concrete Masonry Units: 12 percent.
 2. Report unacceptable conditions and submit recommended remedial action for Architect's approval.
 - a. Do not proceed with remedial action or change without receiving written authorization from Architect.

3.02 PREPARATION

- A. General:
 1. Clean surfaces thoroughly and correct defects prior to application.
 2. Prepare surfaces using the methods recommended by the top coat manufacturer for achieving the best result for the substrate under the project conditions.
 3. Remove or repair existing paints or finishes that exhibit surface defects.
 4. Remove or mask surface appurtenances, including electrical plates, hardware, light fixture trim, escutcheons, and fittings, prior to preparing surfaces for finishing.
 - a. After work is completed, reinstall removed items.
 5. Seal surfaces that might cause bleed through or staining of topcoat.
 6. Remove mildew from impervious surfaces by scrubbing with solution of tri-sodium phosphate and bleach. Rinse with clean water and allow surface to dry.
 7. Adhesion Test to be performed per ASTM D3359 Method A (5mils or less) or B (over 5mils) of primer. Adhesion test to be performed on primer.
- B. Concrete - Non-Traffic Surfaces:
 1. Remove release agents, curing compounds, efflorescence, and chalk. Do not coat surfaces if moisture content or alkalinity of surfaces to be coated exceeds that permitted in manufacturer's written instructions.
 2. Clean concrete according to ASTM D4258. Allow to dry.
- C. Masonry:
 1. Remove efflorescence and chalk. Do not coat surfaces if moisture content or alkalinity of surfaces or if alkalinity of mortar joints exceed that permitted in manufacturer's written instructions. Allow to dry.
- D. Gypsum Board:
 1. Interior:
 - a. Fill minor defects with filler compound; make smooth and flush with adjacent surfaces.
 - b. Spot prime defects after repair.
- E. Ferrous Metal - Non-galvanized:
 1. Solvent clean according to SSPC-SP 1.
 2. Shop-Primed Surfaces: Sand and scrape to remove loose primer and rust. Feather edges to make touch-up patches inconspicuous. Clean surfaces with solvent. Prime bare steel surfaces.
 - a. Re-prime entire shop-primed item.
 3. Remove rust, loose mill scale, and other foreign substances using using methods recommended in writing by paint manufacturer and blast cleaning according to SSPC-SP 6 "Commercial Blast Cleaning." Protect from corrosion until coated.
- F. Galvanized Surfaces:
 1. Remove surface contamination and oils and wash with solvent according to SSPC-SP 1.
 2. Remove loose paint and other debris according to SSPC-SP 2.
- G. Previously Painted Existing Surfaces:
 1. Remove all loose paint, dust, dirt, mold, mildew, oil, grease, rust, loose mill scale, mortar, and any other surface contamination.

2. Scrape all loose, blistered, peeling, scratched or otherwise imperfect paint down to bare substrate and sand adjacent tightly adhering paint to feather edge.
 - a. Tightly adhered existing paint may remain unless primer manufacturer recommends removal.
3. Test for proper primer adhesion, as defined by the primer manufacturer, prior to proceeding with application of high performance coatings.
 - a. Notify Architect of improper adhesion results; do not proceed with work until additional instructions are received from Architect.
4. Spot prime all bare areas with appropriate primer before re-priming entire surface.

3.03 APPLICATION - HIGH PERFORMANCE COATINGS

- A. Apply products in accordance with manufacturer's written instructions.
- B. Provide smooth, opaque coatings of uniform finish, color, appearance, and coverage without brush marks, runs, sags, laps, ropiness, holidays, spotting, cloudiness, or other surface imperfections.
- C. Terminate high performance coatings in neat lines.
- D. Apply high performance coatings to properly prepared surfaces.
 1. Do not apply coatings over dirt, rust, scale, grease, moisture, or other conditions detrimental to application of coatings
- E. Primers:
 1. Apply first coat of primer to surfaces as soon as practical after preparation and before subsequent surface deterioration.
 2. Re-prime shop-primed surfaces.
- F. Do not apply succeeding coats until previous coat has cured as recommended by manufacturer.
- G. Provide completed work matching approved samples for color, sheen, texture, coverage and quality of work.
 1. Remove, refinish, or reapply work not complying with requirements.
- H. Where adjacent sealant is to be painted, do not apply finish coats until sealant is applied.
- I. Use applicators and methods best suited for substrate and type of material being applied and according to manufacturer's instructions.
 1. Brush Application: Use brushes best suited for type of material applied; use brush of appropriate size for surface or item being painted; produce results free of visible brush marks.
 2. Roller Application: Use rollers of fiber type and nap length as recommended by manufacturer for material and texture required.
 3. Spray Application: Use airless spray equipment with orifice size as recommended by manufacturer for material and texture required.
- J. Number of Coats: Each high performance coatings system specifies a number of coats. This is the minimum number required.
 1. If undercoats, stains, or other imperfections are visible after final coat of high performance coatings is applied, apply additional coats until high performance coating is of uniform finish, color, and appearance without defects or imperfections.
- K. Minimum Coating Thickness: Provide dry film thickness for each coat as indicated, but not less than that recommended by the coating manufacturer.
 1. Number of coats and film thicknesses required are same regardless of application method.
 2. Ensure edges, corners, crevices, welds, and exposed fasteners receive dry film thickness equivalent to that of flat surfaces.

3.04 SURFACES TO BE PAINTED

- A. Refer to Section 09 9100 - Painting.

3.05 SURFACES NOT TO BE PAINTED

- A. Refer to Section 09 9100 - Painting.

3.06 IDENTIFICATION AND COLOR CODING

- A. Refer to Section 09 9100 - Painting.

3.07 FIELD QUALITY CONTROL

- A. Owner may provide field inspection.
- B. Adhesion Test to be performed per ASTM D3359 Method A (5mils or less) or B (over 5mils)
- C. All high performance coatings shall be inspected as follows:
1. Coatings shall be rejected for the following:
 - a. Lacking minimum dry film thicknesses.
 - 1) Inspector may test for proper dry film thickness using methods as recommended by the inspector.
 - b. Poor coverage at rivet heads, plate edges, lap joints, crevices, pockets, and corners.
 - c. Damage from touching, or disturbing paint in any other manner, before sufficiently dry.
 - d. Damage from application to moist surfaces or damage caused by inadequate protection from the weather.
 - e. Damage or contamination of paint from blown contaminants including but not limited to dust.
 2. Coatings shall be rejected if any of the following are evident under natural lighting for exterior surfaces and final lighting source, including daylighting, for interior surfaces:
 - a. Visible defects are evident on vertical surfaces when viewed at normal viewing angles from a distance of not less than 48 inches.
 - b. Visible defects are evident on horizontal surfaces when viewed at normal viewing angles from a distance of not less than 48 inches.
 - c. Visible defects are evident on ceiling, soffit and other overhead surfaces when viewed at normal viewing angles from a distance of not less than 48 inches.
- D. Visible defects are defined as follows:
1. Brush and roller marks, streaks, laps, runs, sags, drips, heavy stippling, hiding or shadowing by inefficient application methods, skipped or missed areas, and foreign materials in paint coatings.
 2. When the final coat on any surface exhibits a lack of uniformity of color, sheen, texture, and hiding across full surface area.
- E. Coatings rejected by the inspection shall be repaired or replaced at the expense of the Contractor.
1. Small affected areas shall be touched up.
 2. Large affected areas shall be repainted.
 3. Small and large areas shall be as defined by the Architect.
 4. Areas without sufficient dry film thickness shall be repainted.
 5. Paint runs and sags shall be removed by scraper or sanding and repainted.

3.08 CLEANING

- A. At end of each workday, remove empty cans, rags, and other discarded paint materials from site.
1. Collect waste material which may constitute fire hazard, place in closed metal containers, and remove daily from site.

3.09 PROTECTION

- A. Protect other work, whether being painted or not, against damage from high performance painting activities.
1. Correct damage by cleaning, repairing, replacing as approved by Architect
- B. Protect finishes until completion of project.
- C. Touch-up damaged finishes after Substantial Completion.

END OF SECTION

SECTION 10 1400 - SIGNAGE**PART 1 GENERAL****1.01 SECTION INCLUDES**

- A. Room and door signs.
- B. Dimensional characters.
- C. Plaques.

1.02 REFERENCE STANDARDS

- A. ADA Standards - Americans with Disabilities Act (ADA) Standards for Accessible Design 2010.
- B. ASTM B209 - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate 2014.
- C. ICC A117.1 - Accessible and Usable Buildings and Facilities 2017.

1.03 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide manufacturer's data on each type of sign.
- C. Shop Drawings: For each sign type, provide dimensioned elevation including letter sizes and locations, graphics, colors and finishes, mounting methods, mounting heights, and material descriptions.
- D. Signage Schedule: Provide information sufficient to completely define each sign for fabrication, including room number, room name, other text to be applied, sign and letter sizes, fonts, and colors.
 - 1. When room numbers to appear on signs differ from those on drawings, include the drawing room number on schedule.
 - 2. When content of signs is indicated to be determined later, request such information from Owner through Architect at least 2 months prior to start of fabrication; upon request, submit preliminary schedule.
 - 3. Submit for approval by Owner through Architect prior to fabrication.
- E. Samples:
 - 1. Room and Door Signs: Submit 3 samples of each type of sign construction, of size similar to that required for project, illustrating sign style, font, colors, and method of attachment.
 - 2. Dimensional Characters: Submit 3 samples, full size, of each dimensional character style, font, color, and method of attachment.
 - a. For specified sizes 12 inches and under, provide samples matching specified size.
 - b. For specified sizes over 12 inches, provide 12 inch high samples unless actual specified size requested by Architect.
 - 3. Plaques: Provide samples upon Architect's request.
- F. Verification Samples: Submit samples showing colors specified.
 - 1. Where colors are not specified, submit two sets of color selection charts or chips.
- G. Maintenance Data: Include data on regular cleaning.

1.04 QUALITY ASSURANCE

- A. Installer Qualifications: Company experienced in installing the products specified in this section with minimum 5 years documented experience.

1.05 DELIVERY, STORAGE, AND HANDLING

- A. Package signs as required to prevent damage before installation.
- B. Store tape adhesive at normal room temperature.

1.06 FIELD CONDITIONS

- A. Do not install tape adhesive when ambient temperature is lower than recommended by manufacturer.
- B. Maintain this minimum temperature during and after installation of signs.

PART 2 PRODUCTS**2.01 MANUFACTURERS**

- A. Room and Door Signs:
 - 1. ASI Signage Innovation: www.asisignage.com.

2. Inpro Corporation: www.inprocorp.com.
 3. Foresight Supersign: www.foresightsupersign.net.
 4. The Supersine Company: www.supersine.com.
 5. Summit Advertising, Inc...
 6. Substitutions: See Section 01 6000 - Product Requirements.
- B. Dimensional characters:
1. A.R.K. Ramos: www.arkramos.com.
 2. Gemini Inc.: www.geminisignproducts.com.
 3. Substitutions: See Section 01 6000 - Product Requirements.
- C. Plaques:
1. A.R.K. Ramos: www.arkramos.com.
 2. Gemini Inc.: www.geminisignproducts.com.
 3. Substitutions: See Section 01 6000 - Product Requirements.

2.02 ROOM AND DOOR SIGNS

- A. Sign Type: Flat signs with die-raised panel media as specified. Tactile characters and Braille shall be integral to sign face; separate adhesively-fixed characters are not permitted. Frameless.
1. Accessibility Compliance: Signs are required to comply with ADA Standards and ICC A117.1 and applicable building codes, unless otherwise indicated; in the event of conflicting requirements, comply with the most comprehensive and specific requirements.
 2. Provide "tactile" signage, with letters raised minimum 1/32 inch and Grade II braille.
- B. Materials:
1. Sign Material: Face material shall be 1/16" thickness transparent non-glare, optically corrected, acrylic sheet with reverse screen printed colored border and stripe, leaving center see-through areas for inserts..
 2. Backing Plate: None, unless otherwise indicated.
- C. Sign Properties:
1. Sign Sizes and Shapes: As indicated.
 2. Character and Graphic Layouts: As indicated.
 3. Character Styles (Fonts): As indicated.
 4. Character Sizes: As indicated.
 5. Pictograms and Graphics: As indicated.
- D. Colors and Finish:
1. First questionBackground Colors: As indicated.
 2. Character Colors: As indicated.
 3. Pictograms and Graphics Colors: As indicated.
- E. drop down Miscellaneous:
1. Changeable Message Inserts: Manufacturer's standard "window" section for replaceable text inserts; provide where indicated.
 - a. Window shall have a transparent cover to protect changeable messages.
 - b. Windows shall accommodate printed paper and engraved inserts.
 - c. Unless otherwise indicated, window opening shall have corner radiuses of 1/4 inch.
- F. Mounting:
1. Walls Tape adhesive.
 2. Glass: Tape adhesive with matching plate of same material as sign, on opposite side of glass to conceal mounting materials.
 3. Bracket-Mounted 2-Sided Signs - Walls and Ceilings: Aluminum wall bracket, powder coated, color selected from manufacturer's standard colors, attached with screws in predrilled mounting holes.
- G. Locations - General:
1. Provide a sign for every doorway, whether it has a door or not, not including corridors, lobbies, and similar open areas.
- H. Sign Layots - General: Unless otherwise indicated provide the following:

1. Classrooms and Offices: Identify with room numbers to be determined later, not the numbers indicated on drawings; in addition, provide changeable message inserts. Include braille.
2. Conference and Meeting Rooms: Identify with room numbers to be determined later, not the numbers indicated on drawings. Include braille.
3. Storage and Janitor's Closet Rooms: Identify with room names and numbers to be determined later, not those indicated on drawings. Include braille.
4. Mechanical, Electrical, and Other Service Rooms: Identify with room names and numbers to be determined later, not those indicated on drawings. Include braille.
5. Rest Rooms: Identify with pictograms, the names "MEN" or "BOYS" and "WOMEN" or "GIRLS", and braille.
6. Stairways: Identify with pictograms and the name "STAIR", and braille.
7. Elevators: Identify with pictograms and the name "ELEVATOR", and braille.
 - a. Emergency Text and Pictograms: Comply with requirements of authorities having jurisdiction indicating that in case of fire, elevators are out of service and stairway exits should be used instead.

2.03 PLAQUES

A. Metal Plaques:

1. Metal: Aluminum casting.
2. Plaque Properties:
 - a. Size: As indicated
 - b. Border Style: Equal to A.R.K. Ramos; Style 513.
 - c. Background Texture: Equal to A.R.K. Ramos; Pebble.
 - d. Character and Graphic Layouts: As indicated.
 - e. Character Styles (Fonts): As indicated.
 - f. Character Sizes: As indicated.
 - g. Pictograms and Graphics: As indicated.
3. Finish:
 - a. Raised Characters and Graphics: Equal to A.R.K. Ramos; Satin Bronze.
 - b. Background: Equal to A.R.K. Ramos; Dark Oxidized.
4. Mounting: Concealed non-corrosive studs for masonry walls.

2.04 DIMENSIONAL CHARACTERS

A. Metal Characters:

1. Cast Characters: Form individual characters by casting.
 - a. Fabricate characters with smooth surfaces and precisely formed profiles, lines, and edges; without pits and other imperfections. Cast lugs into back of characters and tap for threaded mounting studs.
 - b. Material:
 - 1) Aluminum: In alloy and temper as recommended by dimensional character manufacturer.
 - c. Character Styles (Fonts): As indicated.
 - d. Character Sizes: As indicated.
 - e. Finish: Clear anodized.
 - f. Mounting: Manufacturer's standard non-corrosive concealed studs (pin mounting). Provide fasteners as applicable for substrates indicated.
 - 1) Projected Mounting: Mount dimensional characters 1 inch off substrate; from face of substrate to back of dimensional character.
 - 2) At exterior locations, provide stainless steel fasteners and hardware.
2. Cut Characters: Cut characters from solid plate of thickness and metal indicated.
 - a. Precisely cut characters with smooth square edges.
 - b. Characters shall be flat and free of warps, distortions or other surface imperfections.
 - c. Material:
 - 1) Aluminum Plate: ASTM B209 in alloy and temper as recommended by dimensional character manufacturer.
 - (a) Thickness: 3/8 inch.

- d. Character Styles (Fonts): As indicated.
- e. Character Sizes: As indicated.
- f. Finish: Clear anodized.
- g. Mounting: Manufacturer's standard non-corrosive concealed studs (pin mounting). Provide fasteners as applicable for substrates indicated.
 - 1) Projected Mounting: Mount dimensional characters 1 inch off the substrate; from face of substrate to back of dimensional character.
 - 2) At exterior locations, provide stainless steel fasteners and hardware.
- 3. Fabricated Characters: Cut characters from metal sheet and thickness indicated.
 - a. Precisely form characters with welded returns; welds shall be ground smooth and continuous.
 - b. Characters shall be flat with sharp defined corners; free of warps, distortions or other surface imperfections.
 - c. Material:
 - 1) Aluminum Sheet: ASTM B209 in alloy and temper as recommended by dimensional character manufacturer.
 - (a) Character Face Thickness: 0.09 inch, minimum.
 - (b) Character Return Thickness: 0.063 inch, minimum.
 - d. Character Styles (Fonts): As indicated.
 - e. Character Sizes: As indicated.
 - f. Character Return/Depths: As indicated.
 - g. Finish: Clear anodized.
 - h. Mounting: Manufacturer's standard non-corrosive concealed studs (pin mounting). Provide fasteners as applicable for substrates indicated.
 - 1) Projected Mounting: Mount dimensional characters 1 inch off the substrate; from face of substrate to back of dimensional character.
 - 2) At exterior locations, provide stainless steel fasteners and hardware.

2.05 ACCESSORIES

- A. Tape Adhesive: Double sided tape, permanent adhesive.
 - 1. Acrylic, foam carrier, pressure-sensitive tapes with release liner for permanent bonding.
 - a. Products:
 - 1) 3M; VHB Tapes: www.3M.com.
 - (a) Provide specific VHB tape as recommended by tape manufacturer for applicable substrates.
 - 2) Substitutions: See Section 01 6000 - Product Requirements.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that substrate surfaces are ready to receive work.

3.02 INSTALLATION

- A. General:
 - 1. Install in accordance with manufacturer's instructions.
 - 2. Install neatly, with horizontal edges level.
- B. Room and Door Signs:
 - 1. Mounting Locations: Unless otherwise indicated, mount signs as follows:
 - a. Locate signs and mount at heights indicated on drawings and in accordance with ADA Standards and ICC A117.1.
- C. Dimensional Characters:
 - 1. Mount dimensional characters at heights and locations indicated; with characters equally spaced unless otherwise indicated.
- D. Plaques:
 - 1. Mount plaques at heights and locations indicated.

3.03 CLEANING AND PROTECTION

- A. Clean signage as recommended by signage manufacturer.

B. Protect from damage until Date of Substantial Completion; repair or replace damaged items.
END OF SECTION

SECTION 10 2113.17 - PHENOLIC TOILET COMPARTMENTS**PART 1 GENERAL****1.01 SECTION INCLUDES**

- A. Phenolic toilet compartments.
- B. Urinal screens.

1.02 REFERENCE STANDARDS

- A. ADA Standards - Americans with Disabilities Act (ADA) Standards for Accessible Design 2010.
- B. ASTM A666 - Standard Specification for Annealed or Cold-Worked Austenitic Stainless Steel Sheet, Strip, Plate, and Flat Bar 2015.
- C. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials 2021a.
- D. ICC A117.1 - Accessible and Usable Buildings and Facilities 2017.

1.03 ADMINISTRATIVE REQUIREMENTS

- A. Coordination:
 - 1. Coordinate the work with placement of support framing and anchors in walls and ceilings.
 - 2. Coordinate the work with floor drain locations.

1.04 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide data on panel construction, hardware, and accessories.
- C. Shop Drawings: Indicate partition plan, elevation views, dimensions, details of wall and floor supports, door swings.
 - 1. Indicate reinforcement locations for partition-mounted grab bars and surface-mounted toilet accessories.
 - 2. Show floor drain locations.
- D. Samples:
 - 1. Submit 3 samples of partition panels, 6 by 6 inch in size illustrating panel finish, color, and sheen.
 - 2. Submit 3 sample sets of hardware and accessories indicating material and finish; each set to include door latch, hinge, and panel bracket.
- E. Selection Samples: Where colors and finishes are not specified, submit 3 sets of color and finish selection charts or chips.
- F. Test Reports: Show compliance to specified surface burning characteristics requirements.
- G. Maintenance Data: Include data on regular cleaning.
- H. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
 - 1. See Section 01 6000 - Product Requirements, for additional provisions.
 - 2. Door Hinges: Quantity equal to 2 percent of total installed, but not less than 4; including fasteners.
 - 3. Door Latch, Strike, and Keeper: Quantity equal to 2 percent of total installed, but not less than 4; including fasteners.
 - 4. Door Bumper: Quantity equal to 2 percent of total installed, but not less than 4; including fasteners.
 - 5. Door Pull: Quantity equal to 2 percent of total installed, but not less than 2; including fasteners.
 - 6. Fasteners: Quantity equal to 2 percent of each fastener type and size installed, but not less than 10 fasteners of each type and size.

1.05 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum 5 years of documented experience.
- B. Installer Qualifications: Company experienced in installing the products specified in this section with minimum 5 years documented experience.

1.06 DELIVERY, STORAGE, AND HANDLING

- A. Package partition panels and material as required to prevent damage before installation.

1.07 WARRANTY

- A. See Section 01 7800 - Closeout Submittals, for additional warranty requirements.
- B. Provide 10 year warranty against defects in workmanship and materials, including delamination, breakage, and corrosion.

PART 2 PRODUCTS**2.01 MANUFACTURERS**

- A. Phenolic Toilet Compartments:
 1. Accurate Partitions Corp., an ASI Group company: www.accuratepartitions.com.
 2. All American Metal Corp - AAMCO: www.allamericanmetal.com.
 3. Bobrick Washroom Equipment, Inc.: www.products.bobrick.com.
 4. Bradley Corporation: www.bradleycorp.com.
 5. Flush Metal Partitions, LLC: www.flushmetal.com.
 6. General Partitions Mfg. Corp: www.generalpartitions.com.
 7. Global Partitions Corp., an ASI Group company: www.globalpartitions.com.
 8. Knickerbocker Partition Corp.: www.knickerbockerpartition.com.
 9. Substitutions: Section 01 6000 - Product Requirements.

2.02 PHENOLIC TOILET COMPARTMENTS

- A. Toilet Compartments: Factory fabricated doors, pilasters, and divider panels made of solid phenolic core panels with integral melamine finish, floor-mounted headrail-braced.
 1. Accessibility: Comply with ICC A117.1 and ADA Standards.
 2. Surface Burning Characteristics:
 - a. Class B per ASTM E84; flame spread 75, maximum, and smoke developed 450, maximum.
 3. Color: Two standard colors as selected by Architect.
- B. Doors:
 1. Thickness: 3/4 inch.
 2. Width: 24 inch, unless otherwise indicated.
 3. Width for Handicapped Use: 36 inch, out-swinging, unless otherwise indicated.
 4. Height: 58 inch.
- C. Panels:
 1. Thickness: 1/2 inch.
 2. Height: 58 inch.
 3. Widths: As indicated.
- D. Pilasters:
 1. Thickness: 3/4 inch.
 2. Width: As required to fit space; minimum 3 inch.
- E. Urinal Screens: Wall mounted with continuous panel brackets.
 1. Construction: Same as panels.
 2. Width: 24 inches, unless otherwise indicated.
 3. Height: 42 inches, unless otherwise indicated.

2.03 ACCESSORIES

- A. Pilaster Shoes: Formed ASTM A666 Type 304 stainless steel with No. 4 finish, 3 inch high, concealing floor fastenings.
 1. Provide adjustment for floor variations with screw jack through steel saddles integral with pilaster.
- B. Head Rails: Hollow stainless steel, 1 inch by 1-1/2 inch size, with anti-grip profile and cast socket wall brackets.
- C. Wall, Pilaster, and Urinal Screen Brackets: Satin stainless steel; continuous type.
- D. Attachments, Screws, and Bolts: Stainless steel, tamper proof type.
 1. For attaching panels and pilasters to brackets: Through-bolts and nuts; tamper proof.

- E. Hardware: Satin stainless steel; heavy-duty type.
 - 1. Pivot hinges, gravity type, adjustable for door close positioning; two per door.
 - 2. Door Latch: Slide type with exterior emergency access feature.
 - 3. Door strike and keeper with rubber bumper; mounted on pilaster in alignment with door latch.
 - 4. Coat hook with rubber bumper; one per compartment, mounted on door.
 - 5. Provide door pull for outswinging doors.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify existing conditions before starting work.
- B. Verify correct spacing of and between plumbing fixtures.
- C. Verify correct location of built-in framing, anchorage, and bracing.

3.02 INSTALLATION

- A. Install partitions secure, rigid, plumb, and level in accordance with manufacturer's instructions.
- B. Maintain 3/8 inch to 1/2 inch space between wall and panels and between wall and end pilasters.
- C. Align tops of doors and panels.
- D. Attach panel brackets securely to walls using anchor devices.
- E. Wall fasteners shall be located at masonry and tile joints; do not penetrate masonry or tile faces.
- F. Align wall brackets and pilaster brackets.
- G. Attach panels and pilasters to brackets. Locate head rail joints at pilaster center lines.
- H. Field touch-up of scratches or damaged finish will not be permitted. Replace damaged or scratched materials with new materials.

3.03 TOLERANCES

- A. Maximum Variation From True Position: 1/4 inch.
- B. Maximum Variation From Plumb: 1/8 inch.

3.04 ADJUSTING

- A. Adjust and align hardware to uniform clearance at vertical edge of doors, not exceeding 3/16 inch.
- B. Adjust hinges to position doors in partial opening position when unlatched. Return outswinging doors to closed position.
- C. Adjust adjacent components for consistency of line or plane.

END OF SECTION

SECTION 10 2800 - TOILET, BATH, AND LAUNDRY ACCESSORIES**PART 1 GENERAL****1.01 SECTION INCLUDES**

- A. Commercial toilet, shower, and bath accessories.
- B. Commercial shower and bath accessories.
- C. Electric hand dryers.
- D. Electric hair dryers.
- E. Diaper changing stations.
- F. Utility room accessories.

1.02 REFERENCE STANDARDS

- A. ADA Standards - Americans with Disabilities Act (ADA) Standards for Accessible Design 2010.
- B. ASTM A269/A269M - Standard Specification for Seamless and Welded Austenitic Stainless Steel Tubing for General Service 2015a (Reapproved 2019).
- C. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process 2020.
- D. ASTM A666 - Standard Specification for Annealed or Cold-Worked Austenitic Stainless Steel Sheet, Strip, Plate, and Flat Bar 2015.
- E. ASTM B86 - Standard Specification for Zinc and Zinc-Aluminum (ZA) Alloy Foundry and Die Castings 2018, with Editorial Revision (2021).
- F. ASTM C1036 - Standard Specification for Flat Glass 2021.
- G. ASTM C1503 - Standard Specification for Silvered Flat Glass Mirror 2018.
- H. ASTM F2285 - Standard Consumer Safety Performance Specification for Diaper Changing Tables for Commercial Use 2004, with Editorial Revision (2016).

1.03 ADMINISTRATIVE REQUIREMENTS

- A. Coordinate the work with the placement of internal wall reinforcement and reinforcement of toilet partitions to receive anchor attachments.

1.04 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Product Data: Submit data on accessories describing size, finish, details of function, and attachment methods.
- C. Samples: When requested by Architect.
 - 1. Submit 3 sample for each color and finish, 2 by 2 inch in size.
- D. Selection Samples: Where colors and finishes are not specified, submit 3 sets of color and finish selection charts or chips.
- E. Operation and Maintenance Data: Include operating procedures and recommended cleaning methods.
- F. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
 - 1. See Section 01 6000 - Product Requirements, for additional provisions.
 - 2. Hand Dryer Filters: For units with filters, provide quantity equal to 2 filters per unit installed. .

1.05 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum 5 years of documented experience.
- B. Installer Qualifications: Company experienced in installing the products specified in this section with minimum 5 years documented experience.

1.06 DELIVERY, STORAGE, AND HANDLING

- A. Package toilet, bath, and laundry accessories as required to prevent damage before installation.

1.07 WARRANTY

- A. See Section 01 7800 - Closeout Submittals, for additional warranty requirements.
- B. Mirrors: Provide 15 year warranty against silver spoilage.
- C. Electric Hand Dryers: Provide 5 year warranty against defects in workmanship and materials.

PART 2 PRODUCTS**2.01 MANUFACTURERS**

- A. Basis-of-Design:
 - 1. Commercial Toilet, Shower, and Bath Accessories, including Utility Room Accessories: Provide product indicated or a comparable product by one of the following:
 - a. American Specialties, Inc, (ASI): www.americanspecialties.com.
 - b. Bobrick Washroom Equipment, Inc.: www.bobrick.com.
 - c. Bradley Corporation: www.bradleycorp.com.
 - d. Substitutions: Section 01 6000 - Product Requirements.
 - 2. Electric Hand Dryers: Provide product indicated or a comparable product by one of the following:
 - a. American Specialties, Inc, (ASI): www.americanspecialties.com.
 - b. Bobrick Washroom Equipment, Inc.: www.bobrick.com.
 - c. Bradley Corporation: www.bradleycorp.com.
 - d. Excel Dryer Inc.: www.exceldryer.com.
 - e. World Dryer Corp.: www.worlddryer.com.
 - f. Substitutions: Section 01 6000 - Product Requirements.
 - 3. Diaper Changing Stations: Provide product indicated or a comparable product by one of the following:
 - a. American Specialties, Inc, (ASI): www.americanspecialties.com.
 - b. Bobrick Washroom Equipment, Inc.: www.bobrick.com.
 - c. Bradley Corporation: www.bradleycorp.com.
 - d. World Dryer Corp.: www.worlddryer.com.
 - e. Substitutions: Section 01 6000 - Product Requirements.

2.02 MATERIALS

- A. Accessories - General: Shop assembled, free of dents and scratches and packaged complete with anchors and fittings, steel anchor plates, adapters, and anchor components for installation.
- B. Keys: Provide 2 keys for each accessory to Owner; master key lockable accessories.
- C. Stainless Steel Sheet: ASTM A666, Type 304.
- D. Stainless Steel Tubing: ASTM A269/A269M, Grade TP304 or TP316.
- E. Galvanized Sheet Steel: Hot-dipped galvanized steel sheet, ASTM A653/A653M, with G90/Z275 coating.
- F. Zinc Alloy: Die cast, ASTM B86.
- G. Mirror Glass: Annealed float glass, ASTM C1036 Type I, Class 1, Quality Q2, with silvering, protective and physical characteristics complying with ASTM C1503.
- H. Fasteners, Screws, and Bolts: Hot dip galvanized; tamper-proof; security type.
- I. Expansion Shields: Fiber, lead, or rubber as recommended by accessory manufacturer for component and substrate.

2.03 FINISHES

- A. Stainless Steel: Satin finish, unless otherwise noted.

2.04 COMMERCIAL TOILET ACCESSORIES

- A. Toilet Paper Dispenser - Bracket Type: Double roll, surface mounted bracket type, stainless steel, eccentric-shaped plastic spindle for 1/2 revolution delivery designed to prevent theft of tissue roll.
 - 1. Basis-of-Design Product: Bobrick Washroom Equipment, Inc.; B-2740.

- B. Toilet Paper Dispenser - Roll-in-Reserve Type: Roll-in-reserve type, designed to allow automatic activation of reserve roll when needed, or manual activation by pressing release bar, surface-mounted, stainless steel unit with pivot hinge, tumbler lock.
 - 1. Basis-of-Design Product: Bobrick Washroom Equipment, Inc.; B-2888.
- C. Toilet Paper Dispenser - Jumbo Type: Double jumbo roll type, surface mounted, stainless steel unit with viewing slot, hinged cover, and tumbler lock. Sliding access panel exposes one roll at a time.
 - 1. Basis-of-Design Product: Bobrick Washroom Equipment, Inc.; B-2892.
- D. Paper Towel Dispenser - Folded Paper Type: Folded paper type, stainless steel, surface-mounted, with viewing slots on sides as refill indicator and tumbler lock.
 - 1. Capacity: 400 C-fold or 500 multifold minimum.
 - 2. Basis-of-Design Product: Bobrick Washroom Equipment, Inc.; B-262.
- E. Waste Receptacle: Wall-mounted, stainless steel, removable container, continuously welded bottom pan and seamless exposed flanges.
 - 1. Minimum capacity: 12 gallons.
 - 2. Basis-of-Design Product: Bobrick Washroom Equipment, Inc.; B-3644
- F. Combination Towel Dispenser/Waste Receptacle - Recessed Type: Recessed flush with wall, stainless steel; seamless wall flanges, continuous piano hinges.
 - 1. Towel dispenser capacity: 300 C-fold or 400 multifold.
 - 2. Waste receptacle capacity: 2 gallons.
 - 3. Basis-of-Design Product: Bobrick Washroom Equipment, Inc.; B-369.
- G. Combination Towel Dispenser/Waste Receptacle - Semi-Recessed Type: Semi-recessed with projecting waste receptacle, stainless steel; seamless wall flanges, continuous piano hinges, and tumbler lock.
 - 1. Towel dispenser capacity: 600 C-fold or 800 multifold.
 - 2. Waste receptacle capacity: 12 gallons.
 - 3. Basis-of-Design Product: Bobrick Washroom Equipment, Inc.; B-3944.
- H. Soap Dispenser - Deck-Mounted: Liquid soap dispenser, deck-mounted on countertop, with polyethylene container concealed below deck; piston and 4 inch spout of stainless steel with bright polished finish; chrome-plated deck escutcheon.
 - 1. Minimum Capacity: 30 ounces.
 - 2. Basis-of-Design Product: Bobrick Washroom Equipment, Inc.; B-822.
- I. Soap Dispenser - Wall-Mounted: Liquid soap dispenser, wall-mounted, surface, with stainless steel cover and vertical stainless steel tank and working parts; push type soap valve, check valve, and window gauge refill indicator, tumbler lock.
 - 1. Minimum Capacity: 40 ounces.
 - 2. Basis-of-Design Product: Bobrick Washroom Equipment, Inc.; B-2111.
- J. Mirrors: Stainless steel framed, 1/4 inch thick annealed float glass; ASTM C1036.
 - 1. Annealed Float Glass: Silvering, protective and physical characteristics in compliance with ASTM C1503.
 - 2. Size: As indicated on drawings.
 - 3. Frame: Angle shapes, with mitered and welded and ground corners, and tamperproof hanging system; satin finish.
 - 4. Backing: Full-mirror sized, minimum 0.03 inch galvanized steel sheet and nonabsorptive filler material.
 - 5. Basis-of-Design Product: Bobrick Washroom Equipment, Inc.; B-290.
- K. Seat Cover Dispenser - Surface-Mounted: Stainless steel, surface-mounted, reloading by concealed opening at base.
 - 1. Minimum capacity: 250 seat covers.
 - 2. Basis-of-Design Product: Bobrick Washroom Equipment, Inc.; B-221.
- L. Grab Bars: Stainless steel, smooth surface.
 - 1. Standard Duty Grab Bars:

- a. Push/Pull Point Load: 250 pound-force, minimum.
- b. Dimensions: 1-1/2 inch outside diameter, minimum 0.05 inch wall thickness, concealed flange mounting, 1-1/2 inch clearance between wall and inside of grab bar.
- c. Finish: Satin.
- d. Length and Configuration: As indicated on drawings.
- e. Basis-of-Design Product: Bobrick Washroom Equipment, Inc.; B-6806 Series.
- M. Fixed Shelf: Wall-mounted; 0.05 inch thick satin-finished stainless steel shelf with welded mounting brackets and hemmed edges.
 - 1. Shelf Depth: 5 inches.
 - 2. Shelf Length: 24 inches, unless otherwise indicated.
 - 3. Basis-of-Design Product: Bobrick Washroom Equipment, Inc.; B-295.
- N. Purse Shelf: Fold-down, with spring-loaded hinge designed to automatically return shelf to vertical position when not in use; 0.05 inch thick satin-finished stainless steel, with rolled or hemmed edge at shelf front.
 - 1. Basis-of-Design Product: Bobrick Washroom Equipment, Inc.; B-287.
- O. Combination Sanitary Napkin/Tampon Dispenser: Stainless steel, surface-mounted.
 - 1. Door: Seamless 0.05 inch door with returned edges and tumbler lock.
 - 2. Cabinet: Fully welded, 0.03 inch thick sheet.
 - 3. Operation: No charge; no coin slots.
 - 4. Identify dispensers slots without using brand names.
 - 5. Minimum capacity: 20 napkins and 30 tampons.
 - 6. Basis-of-Design Product: Bobrick Washroom Equipment, Inc.; B-2706C.
- P. Sanitary Napkin Disposal Unit: Stainless steel, surface-mounted, self-closing door, removable receptacle.
 - 1. Basis-of-Design Product: Bobrick Washroom Equipment, Inc.; B-270.

2.05 COMMERCIAL SHOWER AND BATH ACCESSORIES

- A. Shower Curtain Rod: Stainless steel tube, 1-1/4 inch outside diameter, 0.05 inch wall thickness, satin-finished, with 2-1/2 inch outside diameter, minimum 0.04 inch thick satin-finished stainless steel flanges, for concealed mounting.
 - 1. Length: As indicated on Drawings.
 - 2. Basis-of-Design Product: Bobrick Washroom Equipment, Inc.; B-6047.
- B. Shower Curtain and Hooks:
 - 1. Material: Opaque vinyl, 0.008 inch thick, matte finish, with antibacterial treatment, flameproof and stain-resistant.
 - 2. Size: As indicated on Drawings, hemmed edges.
 - 3. Grommets: HDPE grommets; pierced through top hem on 6 inch centers.
 - 4. Color: White.
 - 5. Shower Curtain Hooks: Stainless steel spring wire designed for snap closure.
 - 6. Basis-of-Design Product: Bobrick Washroom Equipment, Inc.; B-204 Series.
- C. Folding Shower Seat: Wall-mounted surface; welded tubular seat frame, structural support members, hinges, and mechanical fasteners of Type 304 stainless steel, L-shaped reversible seat.
 - 1. Seat: Phenolic or polymeric composite one-piece seat or seat slats, of white color.
 - 2. Size: ADA Standards compliant.
 - 3. Load: Supports 350 pounds, minimum.
 - 4. Basis-of-Design Product: Bobrick Washroom Equipment, Inc.; B-5181.
- D. Soap Dish - Recessed: Heavy duty, seamless stainless steel, recess mounted, without grab bar, satin finish; with mechanical fastening suitable for substrate.
 - 1. Basis-of-Design Product: Bobrick Washroom Equipment, Inc.; B-4380.
- E. Soap Dish - Surface-Mounted: Normal duty, seamless stainless steel, surface-mounted with drain holes, without grab bar, satin finish; with concealed mechanical fastening suitable for substrate and backplate.

1. Basis-of-Design Product: Bobrick Washroom Equipment, Inc.; B-6807.
- F. Robe Hook - Single: Stainless steel, single-prong, rectangular-shaped bracket and backplate for concealed attachment, satin finish.
 1. Basis-of-Design Product: Bobrick Washroom Equipment, Inc.; B-76717.
- G. Robe Hook - Double: Stainless steel, double-prong, rectangular-shaped bracket and backplate for concealed attachment, satin finish.
 1. Basis-of-Design Product: Bobrick Washroom Equipment, Inc.; B-76727.
- H. Robe Hook - Vandal-Resistant: Heavy-duty stainless steel; single-prong hook that releases at 40 pound load; rectangular-shaped base with sloped edges; satin finish; tamper-resistant exposed fasteners.
 1. Basis-of-Design Product: Bobrick Washroom Equipment, Inc.; B-983.

2.06 ELECTRIC HAND DRYERS

- A. Electric Hand Dryers: Traditional fan-in-case type, with downward fixed nozzle.
 1. Operation: Automatic, sensor-operated on and off.
 2. Mounting: Surface mounted.
 - a. Maximum Projection From Wall: 4 inches.
 3. Cover: Stainless steel with brushed finish.
 - a. Tamper-resistant screw attachment of cover to mounting plate.
 - b. Screened or shielded air intake.
 - c. Screen or shield to prevent access to motor/heater.
 4. Air Flow: 60 CFM, minimum.
 5. Air Velocity: 12,500 linear feet per minute, maximum.
 6. Noise: 75dB, maximum, 72 inches from unit; with hands under nozzle.
 7. Total Wattage: 1200 W, maximum.
 8. Runtime: 60 to 90 seconds, maximum.
 9. Supply Voltage: 240 V, single phase, 60 Hz, nominal, unless otherwise indicated.
 10. Warranty: 10 years.
 11. Basis-of-Design Product: World Dryer Corp.; SLIMdri. Provide the basis-of-design product or one of the following:
 - a. American Specialties, Inc, (ASI) ; Model 0185: www.americanspecialties.com.
 - b. Bobrick Washroom Equipment, Inc.; B-7188: www.bobrick.com.
 - c. Bradley Corporation ; Model 2902: www.bradleycorp.com.
 - d. Substitutions: Section 01 6000 - Product Requirements.
- B. Electric Hand Dryers: High Speed, high performance hand dryer, with downward fixed nozzle.
 1. Operation: Automatic, sensor-operated on and off.
 2. Mounting: Surface mounted.
 - a. Maximum Projection From Wall: 4 inches.
 3. Cover: Stainless steel with brushed finish.
 - a. Tamper-resistant screw attachment of cover to mounting plate.
 - b. Screened or shielded air intake.
 - c. Screen or shield to prevent access to motor/heater.
 4. Air Flow: 60 CFM, minimum.
 5. Air Velocity: 16,000 linear feet per minute, minimum, at full power.
 6. Fan/Heater Control: Field adjustable fan speed and heater on/off selection.
 7. Noise: 75dB, maximum, 72 inches from unit; with hands under nozzle.
 8. Total Wattage: 1000 W, maximum.
 9. Runtime: Field adjustable, from approximately 10 seconds to approximately 35 seconds.
 10. Supply Voltage: 240 V, single phase, 60 Hz, nominal, unless otherwise indicated.
 11. Warranty: 5 years.
 12. Basis-of-Design Product: World Dryer Corp.; SLIM-DRIP Provide the basis-of-design product or one of the following:
 - a. American Specialties, Inc, (ASI) ; Model 0199: www.americanspecialties.com.
 - b. Bobrick Washroom Equipment, Inc.; B-7125: www.bobrick.com.
 - c. Bradley Corporation ; Model 2923: www.bradleycorp.com.

- d. Excel Dryer Inc.; ThinAir: www.exceldryer.com.
- e. Substitutions: Section 01 6000 - Product Requirements

2.07 ELECTRIC HAIR DRYERS

- A. Electric Hair Dryers: Traditional fan-in-case type, with downward fixed nozzle.
 - 1. Operation: Automatic, sensor-operated on and off.
 - 2. Mounting: Semi-recessed.
 - a. Maximum Projection From Wall: 4 inches.
 - 3. Cover: Stainless steel with brushed finish.
 - a. Tamper-resistant screw attachment of cover to mounting plate.
 - b. Screened or shielded air intake.
 - c. Screen or shield to prevent access to motor/heater.
 - 4. Air Flow: 200 CFM, minimum.
 - 5. Air Velocity: 7,000 linear feet per minute, maximum.
 - 6. Total Wattage: 2300 W, maximum.
 - 7. Runtime: 60 to 90 seconds, maximum.
 - 8. Basis-of-Design Product: World Dryer Corp.; World Airstyle Model B.
 - a. Substitutions: Section 01 6000 - Product Requirements.

2.08 DIAPER CHANGING STATIONS

- A. Diaper Changing Station: Wall-mounted, horizontal, folding diaper changing station for use in commercial toilet facilities, meeting or exceeding ASTM F2285.
 - 1. Material: Polyethylene.
 - 2. Mounting: Surface.
 - 3. Color: Standard color as selected by Architect.
 - 4. Minimum Rated Load: 300 pounds.
 - 5. Include an integral bed liner dispenser; 50 liner capacity.
 - 6. Basis-of-Design Product: Bobrick Washroom Equipment, Inc.; KB200

2.09 UTILITY ROOM ACCESSORIES

- A. Combination Utility Shelf/Mop and Broom Holder: 0.05 inch thick stainless steel, Type 304, with 1/2 inch returned edges, 0.06 inch steel wall brackets.
 - 1. Drying rod: Stainless steel, 1/4 inch diameter.
 - 2. Hooks: Three, 0.06 inch stainless steel rag hooks at shelf front.
 - 3. Mop/broom holders: Four spring-loaded rubber cam holders at shelf front.
 - 4. Length: 36 inches.
 - 5. Basis-of-Design Product: Bobrick Washroom Equipment, Inc.; B-224.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify existing conditions before starting work.
- B. Verify exact location of accessories for installation.
- C. For electrically-operated accessories, verify that electrical power connections are ready and in the correct locations.

3.02 INSTALLATION

- A. Install accessories in accordance with manufacturers' instructions in locations indicated on drawings.
- B. Install plumb and level, securely and rigidly anchored to substrate.
- C. Mounting Heights: As indicated and as required by accessibility regulations.
- D. Where possible, locate wall fasteners at masonry and tile joints; do not penetrate masonry or tile faces.

3.03 PROTECTION

- A. Protect installed accessories from damage due to subsequent construction operations.

END OF SECTION

SECTION 22 0005 - BASIC PLUMBING REQUIREMENTS**PART 1 GENERAL****1.01 RELATED DOCUMENTS**

- A. This section applies to all sections of Division 22.
- B. Drawings and general provisions of the contract, including Division 00 and Division 01 specification sections, apply to work of this section.
- C. Provide all items, articles, materials, operations or methods listed, mentioned or scheduled on drawings and/or herein, including all labor, materials, equipment and incidentals necessary and required for their completion.
- D. The items in this section are supplementary to the requirements set forth in other portions of the specifications as indicated under item "A" above.

1.02 APPLICATION

- A. This section applies to all plumbing work. The contractors involved shall check all sections of the specifications in addition to the particular section covering their specific trade. Each distinct section of the specifications aimed for one trade may have detailed information with regards to other trades, therefore, it is imperative that all sections be reviewed to get a complete picture of all other trades' functions and work required.
- B. The plumbing contractor is responsible for the installation and operation of the plumbing systems.
- C. The plumbing contractor is responsible for receiving, unloading and placement of all of the owner provided equipment.

1.03 INSPECTION OF SITE

- A. Visit the site, examine and verify the conditions under which the work must be conducted before submitting proposal.
- B. The submitting of a proposal implies that the contractor has visited the site and understands the conditions under which the work must be conducted.

1.04 ALTERNATES AND SUBSTITUTIONS

- A. Refer to Division 01 - General Requirements for procedures.

1.05 DRAWINGS

- A. The drawings are diagrammatic and show general location and arrangement of all the equipment and piping.
- B. Do not scale drawings for measurements.
- C. Field verifications of actual existing conditions are required by the contractor since actual locations, distances, and levels will be governed by actual field conditions. All measurements shall be verified at the site.
- D. If during field verification, the contractor identifies that there may require substantial changes from the original plans, the contractor shall notify the architect for agreement on necessary adjustment before the installation is started.
- E. Should any discrepancies between the contract documents and specifications occur, the greater quality or quantity of work shall be performed. This shall also pertain to any discrepancies in the contract documents between trades. This work must be submitted in writing to the engineer and architect prior to final bid for approval. No extras will be allowed after that time.

- F. Drawings and specifications are intended to cover the completed installation of systems to function as described. The omission of the expressed reference to any item of labor and material necessary to comply with practice codes, ordinances, etc., shall not relieve the contractor from providing such additional labor and material at no cost to Owner.
- G. The contract drawings serve as working drawings for the general layout of the various services. However, layout of equipment accessories, specialties, piping not necessarily indicate every required valve, fitting, transition, provide all systems, etc. As part of the total work required and the cost to be included in this base bid.
- H. Deviations from the drawings, with the exception of minor changes in routing and other such incidental changes that do not affect the functioning or serviceability of the systems, shall not be made without the written approval of the Architect.

1.06 CODES, PERMITS AND FEES

- A. Unless otherwise indicated, all required permits, licenses, inspections, approvals and fees for plumbing work shall be secured and paid for by the contractor. All work shall conform to all applicable codes, rules and regulations. Applicable publications listed in all sections of Division 22 shall be the latest issue, unless otherwise noted.
- B. Rules of local utility companies and municipalities shall be complied with. Check with the utility company and/or municipality supplying service to the installation and determine all devices including, but not limited to: meters, regulators, valves which will be required and include the cost of all such items in the proposal.
- C. All work shall be executed in accordance with the rules and regulations set forth in local and state codes. Prepare any detailed drawings or diagrams which may be required by the governing authorities. Where the drawings and/or specifications indicate materials or construction in excess of code requirements, the drawings and/or specifications shall govern.

1.07 SUBSTITUTION

- A. Refer to Division 01 - General Requirements for procedures.
- B. All items that the contractor proposes to use in the work that are not specifically named in the contract documents must be submitted for review as a proposed substitution.
- C. The contractor shall provide, in a written format, that the proposed substitution is of equal quality and performance.

1.08 WARRANTY AND GUARANTEE

- A. Contractor shall guarantee all work installed by him or his subcontractors to be free from defect in material and workmanship for a period of one year from date of final acceptance of the work, unless a longer period is stipulated under specific headings. Contractor shall repair or replace at no additional cost to the owner, any material or equipment developing defects and shall also make good any damage caused by such defects or the correction of defects. Repairs or replacements shall bear additional guarantee, as originally called for, dated from the final acceptance of the repair or replacement. This requirement shall be binding even though it will exceed product guarantees normally furnished by some manufacturers. Contractor shall submit his own and each equipment manufacturers written certificates, warranting that each item of equipment furnished complies with all requirements of the drawings and specifications. Note that guarantee shall run from date of final acceptance of the work, not from date of installation of a device or piece of equipment.

1.09 SUBMITTALS

- A. Refer to Division 01 - General Requirements for procedures.
- B. Contractor shall provide submittals where items are referred to by symbolic designation on the drawings. All submittals shall bear the same designation (plumbing piping, plumbing fixtures, etc.).

- C. Engineer WILL NOT REVIEW:
 - 1. Submittals not specified.
 - 2. Submittals not reviewed by Contractor; including Contractor stamp with signature comments.
 - 3. Submittals made after work is delivered to site and/or installed.
 - 4. Submittal resubmissions unless resubmission is required by Architect/Engineer.
- D. Installation of any item that requires submittal approval by the engineer shall be installed at the contractors risk. The contractor, at his cost, shall remove all work installed prior to approval of the submittal.
- E. The engineer will not be responsible for errors in quantities, or dimensions required to fit the job condition, details of fabrication to insure proper assembly at the job, or for errors resulting from errors in submittals.
- F. For underground piping, record dimensions and invert elevations of all piping, including all offsets, fittings, cathodic protection and accessories. Locate dimensions from benchmarks that will be preserved after construction is complete.

1.10 RECORD DRAWINGS

- A. Refer to Division 01 - General Requirements for procedures. All literature shall be furnished in accordance with requirements listed in Division 01.
- B. Contractor shall provide the following record drawings as part of the Project closeout document process:
 - 1. Contract Documents, specifications and submittals, indicating "As-Built" conditions and actual products selected for use.
 - 2. Product and Maintenance manuals for all equipment listed within this specification manual and in Contract Documents. Provide with parts lists as applicable.

1.11 QUALITY ASSURANCE

- A. Other referenced standards:
 - 1. Comply with referenced standards, guidelines, data sheets from various associations, including NFPA, ANSI, ASTM, ASME, ASHRAE.

PART 2 PRODUCTS

2.01 SLEEVES AND ESCUTCHEONS

- A. Provide sleeves wherever pipes pass through exterior wall and floors. Sleeves shall be schedule 40 steel pipe cut to length. Sleeves shall terminate flush with walls, partitions and ceilings in finished areas. All sleeves through floor shall extend 2" above floor. Provide cast brass nickel-plated escutcheons with positive catches on each visible sleeve penetration. Slevs are to be sealed at each installation with a 3M approved sealant. The space between the inside of the sleeve and the outside of the pipe or conduit with in the sleeve shall be sealed at each installation with a 3M approved sealant.

2.02 DIELECTRIC UNIONS

- A. Dielectric unions shall be used to connect dissimilar metals (such as steel and copper) to prevent electrolytic action.

2.03 BUILDING ATTACHMENTS FOR PLUMBING WORK SUPPORTS

- A. General Requirements:
 - 1. Provide building attachments required for supporting plumbing work, suitably selected and installed for the loads applied with a minimum additional safety factor of 3.
 - 2. Where specified attachments are not suitable for conditions, submit to Engineer for approval, proposal for alternate building attachments.
 - 3. Approved Manufacturers: Grinnell, or equivalent products by Michigan Hanger and B-Line.

4. Provide supplemental trapeze supports where necessary. Design trapeze to support all trades. Coordinate loads, and supports with all trades. Size trapeze for maximum deflection of 1/64 of the span.
- B. Attachments to Structural Steel:
 1. Support plumbing work from building structural steel where possible and approved. No welding or bolting to structural steel is permitted unless authorized by Architect. C-clamps are not permitted.
 - a. Center beam clamp - for loads over 120 lb.: Malleable center hung Grinnell Fig. 228.
 - b. Side beam clamp with retaining clips - for loads up to 120 lb.
- C. Cast in Place Concrete Inserts:
 1. Provide inserts selected for applied load of present load plus 100% for future, and coordinated with concrete work. Except as detailed on drawings, inserts shall be Unistrut or Grinnell. Plan, lay out and coordinate setting of inserts prior to concrete pour. Use Grinnell Fig. 285 lightweight concrete insert for loads up to 400# or Grinnell Fig. 281 Wedge Type concrete insert for loads up to 1200#
- D. Drilled Insert Anchors:
 1. Where plumbing work cannot be supported from structural steel, or cast in place concrete inserts, provide drilled concrete insert anchors. Submit for approval, project specific installation drawings for all loads over 100 lbs. Install inserts in web of beam if possible and approved. Insert depth shall not exceed two thirds the thickness of the concrete. Where existing concrete appears to be deteriorating, or where applied load at insert exceeds 1000 lbs., conduct test of concrete to determine derated capacity of insert. Anchors may be adhesive or expansion type up to 1000 lbs., and shall be adhesive type for loads over 1000 lbs.
 2. Manufacturers: Hilti

PART 3 EXECUTION

3.01 GENERAL

- A. Demolition of plumbing equipment shall include all existing piping, valves, controls, supports and equipment where such items are not required for reuse. Plumbing equipment not specified for reuse shall be removed by the Plumbing contractor from the site.
- B. Existing piping: when encountered during the course of work, protect, brace and support existing piping where required for proper execution of the work.
- C. Interruption of existing active piping: when the course of work makes shut-down of services unavoidable, the plumbing contractor shall schedule the shut-down at such time as approved by the owners representative, which will cause least interference with established operating routine.
- D. Arrange work accordingly, providing such fittings as duct transitions traps, valves and accessories necessary to complete all construction in an orderly fashion.
- E. Install all equipment in strict accordance all directions and recommendations furnished by the manufacturer.

3.02 ACCESSIBILITY

- A. Do not locate traps, controls, unions, pull boxes, etc. in any system at a location that will be inaccessible after construction is completed. Maintain accessibility for all components in mechanical, electrical, and plumbing systems.

3.03 ACCESS PANELS:

- A. Refer to Division 08 - Openings; Provide access doors in locations as required by applicable codes and as indicated below. Coordinate locations with architectural trades.

- B. Furnish access panels to access valves, traps, control valves or devices, dampers, damper motors, etc. Access panels shall be sized as necessary for ample access, or as indicated on drawings, but no smaller than 12" x 12" where devices are within easy reach of operator, and at least 24"x24" when operator must pass through opening in order to reach the devices. Architectural Trades shall install access panels coordinated with Mechanical Trades.
- C. Access panels in fire rated walls or ceiling must be U.L. labeled for intended use. Unless otherwise indicated on plans, access doors shall be hinged flush type steel framed panel, 14 gauge minimum for frame, and with anchor straps. Only narrow border shall be exposed. Hinges shall be concealed type. Locking device shall be flush type and screw driver operated. Metal surfaces shall be prime coated with rust-inhibitive paint. Panels shall be compatible with architectural adjacent materials.
 - 1. Manufacturer: Milcor, Bilco.

3.04 CUTTING, PATCHING AND DAMAGE TO OTHER WORK

- A. Refer to Division 01 - General Requirements and .
- B. The contractor, under whose jurisdiction the work may fall, shall provide labor, material, and tools required to cut, repair, protect, cap, or relocate existing pipes, conduits, or utilities interfering with or uncovered during work, per regulations of the authorities having jurisdiction.
- C. All cutting required shall be done by the contractor whose work is involved, without extra cost the owner. All patching and restoration including the furnishing and installation of access panels in ceiling, walls; etc. Within the building lines shall be done by the respective, responsible contractor. No cutting of structural steel, concrete, or wood shall be done without prior approval and explicit directions of the architect patched by the respective, responsible contractor.

3.05 EXCAVATION AND BACKFILLING

- A. Provide all excavation, trenching, tunneling, removal of materials, de-watering and backfilling required for the proper laying of pipes and plumbing work. Coordinate the work with other excavating and backfilling in same area.

3.06 ROUGH-IN FOR CONNECTION TO EQUIPMENT

- A. It shall be the responsibility of each contractor to study the architectural, structural, electrical, and mechanical drawings, conferring with the various trades involved and checking with the supplier of equipment in order to properly rough-in for all equipment.

3.07 MATERIAL AND EQUIPMENT

- A. All material and equipment shall be new and of the best quality used for the purpose in good commercial practice, and shall be the standard product of reputable manufacturers. The material and equipment must meet approval of state and local codes in the area it is being used. Roof decks shall not be used to support piping, conduit, equipment, devices, etc.

3.08 SEAL PENETRATIONS

- A. Seal the space around pipes in sleeves and around duct openings through walls, floors and ceilings. Provide adequate clearance to allow for proper sealing.

3.09 FIRESTOPPING

- A. Refer to Division 07 - Thermal and Moisture Protection for more information.
- B. Provide UL classified firestopping system for plumbing penetrations through rated walls and floors to maintain the fire rating.

3.10 CLEANING

- A. Refer to Division 01 - General Requirements; all plumbing equipment and components shall be cleaned as frequently as necessary through the construction process and again prior to project completion.

3.11 DELIVERY, STORAGE AND PROTECTION OF EQUIPMENT AND MATERIALS

- A. Refer to Division 01 - General Requirements; all equipment and materials shall be delivered, stored and secured per manufacturer's recommendations.
- B. On-site storage shall be coordinated with Construction Manager/General Contractor and be performed in a manner as to avoid damage, deterioration and loss.

END OF SECTION

SECTION 22 0505 - SELECTIVE DEMOLITION FOR PLUMBING**PART 1 GENERAL****1.01 SECTION INCLUDES**

- A. Demolition and extension of existing plumbing work.

1.02 RELATED REQUIREMENTS

- A. Division 01 - General Requirements: Project administrative and procedural requirements.
- B. Division 02 - Existing Conditions: Demolition, cleaning and disposal requirements, cutting and patching requirements, repairs.

1.03 SUMMARY

- A. The work covered under this section consists of the furnishing of all necessary labor, supervision, materials, equipment, and services to completely execute the system of minor electrical demolition as described in this specification.
- B. The demolition documents plans and specification have been prepared from existing non-as built documents and cursory non-invasive field investigation.
- C. It is the contractors obligation to become familiar with the extent of demolition and the existing condition before submitting their bid.
- D. During demolition if the contractor discovers unforeseen significant non-code compliance conditions of the existing installation they shall notify the Architect and Engineer immediately in writing.
- E. The contractor shall become familiar with the drawings and scope of work of other trades as the work scope of those trades relates to mechanical equipment and connection requirements.
- F. During demolition the contractor shall record on site as-builts all plumbing sanitary, waste and domestic hot, cold and hot water recirculation capped branches for reuse in renovated project space.

PART 2 EXECUTION**2.01 EXAMINATION**

- A. Verify that piping to be demolished serve only equipment and facilities within the demolition areas.
- B. Demolition drawings are based on casual field observation and existing record documents.
- C. Report discrepancies to Owner before disturbing existing installation.
- D. Beginning of demolition means installer accepts existing conditions.

2.02 PREPARATION

- A. Identify locations for capping plumbing piping before any demolition work commences.
- B. Confirm isolation valve locations for domestic water piping. Repair leaking isolation valves or replace inoperable valves before commencing piping demolition.

2.03 DEMOLITION AND EXTENSION OF EXISTING PLUMBING WORK

- A. Remove, relocate, and extend existing plumbing piping to accommodate new construction.
- B. Remove domestic water piping back to isolation valve.
- C. Remove sanitary and waste piping to branch connection fitting to negate any dead ends.

2.04 CLEANING AND REPAIR

- A. Clean and repair existing materials and equipment that remain or that are to be reused.

END OF SECTION

SECTION 22 0553 - IDENTIFICATION FOR PLUMBING PIPING AND EQUIPMENT**PART 1 GENERAL****1.01 SECTION INCLUDES**

- A. Tags.
- B. Pipe markers.

1.02 RELATED REQUIREMENTS

- A. Division 01 - General Requirements
- B. Division 09 - Finishes: Identification painting.

1.03 REFERENCE STANDARDS

- A. ASME A13.1 - Scheme for the Identification of Piping Systems 2020.

1.04 SUBMITTALS

- A. Contractor shall provide submittals for equipment listed herein. Refer to Division 01 - General Requirements for submittal procedures.
- B. Chart and Schedule: Submit valve chart and schedule, including valve tag number, location, function, and valve manufacturer's name and model number.

PART 2 PRODUCTS**2.01 IDENTIFICATION APPLICATIONS**

- A. Piping: Pipe markers.

2.02 MANUFACTURERS

- A. Brady Corp.
- B. Champion-America, Inc.
- C. Seton Identification Products.

2.03 TAGS

- A. Manufacturers:
 - 1. Brady Corporation: www.bradycorp.com.
 - 2. Brimar Industries, Inc.: www.pipemarker.com.
 - 3. Kolbi Pipe Marker Co.: www.kolbipipemarkers.com.
 - 4. Seton Identification Products: www.seton.com.
- B. Metal Tags: Brass with stamped letters; tag size minimum 1-1/2 inch diameter with smooth edges.
- C. Valve Tag Chart: Typewritten letter size list in anodized aluminum frame.

2.04 PIPE MARKERS

- A. Manufacturers:
 - 1. Brady Corporation: www.bradycorp.com.
 - 2. Brimar Industries, Inc.: www.pipemarker.com.
 - 3. Kolbi Pipe Marker Co.: www.kolbipipemarkers.com.
 - 4. Seton Identification Products: www.seton.com.
- B. Comply with ASME A13.1.
- C. Plastic Pipe Markers: Factory fabricated, flexible, semi-rigid plastic, preformed to fit around pipe or pipe covering; minimum information indicating flow direction arrow and identification of fluid being conveyed.

PART 3 EXECUTION**3.01 PREPARATION**

- A. Degrease and clean surfaces to receive adhesive for identification materials.

3.02 INSTALLATION

- A. Install tags with corrosion resistant chain.
- B. Install plastic pipe markers complete around pipe in accordance with manufacturer's instructions.
- C. Install underground plastic pipe markers 6 to 8 inches below finished grade, directly above buried pipe.
- D. Identify piping, concealed or exposed, with plastic pipe markers. Use tags on piping 3/4 inch diameter and smaller. Identify service, flow direction, and pressure. Install in clear view and align with axis of piping. Locate identification not to exceed 20 feet on straight runs including risers and drops, adjacent to each valve and Tee, at each side of penetration of structure or enclosure, and at each obstruction.

3.03 SCHEDULES

- A. Identify all plumbing equipment and piping with tags and markers.

END OF SECTION

SECTION 22 0719 - PLUMBING PIPING INSULATION**PART 1 GENERAL****1.01 SECTION INCLUDES**

- A. Piping insulation.
- B. Lavatory Trim Covers
- C. Jackets and accessories.

1.02 RELATED REQUIREMENTS

- A. Division 01 - General Requirements: Project administrative and procedural requirements.
- B. Division 02 - Existing Conditions: Demolition, cleaning and disposal requirements, cutting and patching requirements, and repairs.
- C. Division 07 - Thermal and Moisture Protection: Firestopping requirements.
- D. Section 22 1005 - Plumbing Piping: Placement of hangers and hanger inserts.

1.03 REFERENCE STANDARDS

- A. ASTM B209 - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate 2014.
- B. ASTM C177 - Standard Test Method for Steady-State Heat Flux Measurements and Thermal Transmission Properties by Means of the Guarded-Hot-Plate Apparatus 2019.
- C. ASTM C195 - Standard Specification for Mineral Fiber Thermal Insulating Cement 2007 (Reapproved 2019).
- D. ASTM C534/C534M - Standard Specification for Preformed Flexible Elastomeric Cellular Thermal Insulation in Sheet and Tubular Form 2020a.
- E. ASTM C547 - Standard Specification for Mineral Fiber Pipe Insulation 2019.
- F. ASTM C795 - Standard Specification for Thermal Insulation for Use in Contact with Austenitic Stainless Steel 2008 (Reapproved 2018).
- G. ASTM D1056 - Standard Specification for Flexible Cellular Materials—Sponge or Expanded Rubber 2020.
- H. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials 2021a.
- I. ASTM E96/E96M - Standard Test Methods for Gravimetric Determination of Water Vapor Transmission Rate of Materials 2021.
- J. UL 723 - Standard for Test for Surface Burning Characteristics of Building Materials Current Edition, Including All Revisions.

1.04 SUBMITTALS

- A. Contractor shall provide submittals for equipment listed herein. Refer to Division 01 - General Requirements for submittal procedures.
- B. Product Data: Provide product description, thermal characteristics, list of materials and thickness for each service, and locations.

1.05 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing the Products specified in this section with not less than three years of documented experience.

1.06 DELIVERY, STORAGE, AND HANDLING

- A. Accept materials on site, labeled with manufacturer's identification, product density, and thickness.

1.07 FIELD CONDITIONS

- A. Maintain ambient conditions required by manufacturers of each product.
- B. Maintain temperature before, during, and after installation for minimum of 24 hours.

PART 2 PRODUCTS**2.01 REGULATORY REQUIREMENTS**

- A. Surface Burning Characteristics: Flame spread index/Smoke developed index of 25/50, maximum, when tested in accordance with ASTM E84, UL 723, ASTM E84, or UL 723.

2.02 LAVATORY TRIM COVERS

- A. Provide trim covers for all ADA compliant fixtures including but not limited to lavatories.
- B. Provide fully molded closed cell vinyl insulation with nylon fasteners to completely cover all exposed supply and waste piping, angle stops and ADA compliant offset trap assemblies for all barrier free lavatories and sinks. Insulation shall be white, nominal 3/16 inch thickness with minimum K value of 1.17, shall comply with Fire Marshal requirements for flame spread and shall satisfy ADA Article 4.19.4 and ANSI A117.1.
- C. Approved manufacturers:
 - 1. Truebro Inc. Lav Guard 2, Model #102 with #105 trap offset

2.03 GLASS FIBER

- A. Manufacturers:
 - 1. Johns Manville Corporation: www.jm.com.
 - 2. Knauf Insulation: www.knaufusa.com.
 - 3. Owens Corning Corporation; Fiberglas Pipe Insulation ASJ: www.ocbuildingspec.com.
- B. Insulation: ASTM C547 and ASTM C795; rigid molded, noncombustible.
 - 1. 'K' Value: ASTM C177, 0.24 at 75 degrees F.
 - 2. Maximum Service Temperature: 850 degrees F.
 - 3. Maximum Moisture Absorption: 0.2 percent by volume.
 - 4. Density: 3.5 lb/cu. ft
- C. Vapor Barrier Jacket:
 - 1. White kraft paper with glass fiber yarn, bonded to aluminized film; moisture vapor transmission when tested in accordance with ASTM E 96 of 0.02 perm-inches.
- D. Tie Wire:
 - 1. 0.048 inch stainless steel with twisted ends on maximum 12 inch centers.
- E. Vapor Barrier Lap Adhesive: Compatible with insulation.
 - 1. Vapor Barrier Lap Adhesive shall be compatible with the insulation and as recommended by the insulation manufacturer.
- F. Insulating Cement/Mastic: ASTM C195; hydraulic setting on mineral wool.
- G. Fibrous Glass Fabric:
 - 1. Cloth: Untreated; 9 oz/sq yd weight.
 - 2. Blanket: 1.0 lb/cu ft density.
 - 3. Weave: 5 by 5.
- H. Indoor Vapor Barrier Finish:
 - 1. Vinyl emulsion type acrylic, compatible with insulation, white color.

2.04 JACKETS

- A. PVC Plastic.
 - 1. Manufacturers:
 - a. Johns Manville Corporation: www.jm.com.
 - b. Protto

- c. Ceelco
- 2. Jacket: One piece molded type fitting covers and sheet material, off-white color.
 - a. Minimum Service Temperature: 0 degrees F.
 - b. Maximum Service Temperature: 150 degrees F.
 - c. Moisture Vapor Permeability: 0.002 perm inch, maximum, when tested in accordance with ASTM E96/E96M.
 - d. Thickness: 10 mil.
 - e. Connections: Brush on welding adhesive.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that piping has been tested before applying insulation materials.
- B. Verify that surfaces are clean and dry, with foreign material removed.

3.02 INSTALLATION

- A. Install in accordance with manufacturer's instructions.
- B. Install in accordance with North American Insulation Manufacturers Association (NAIMA) National Insulation Standards.
- C. Exposed Piping: Locate insulation and cover seams in least visible locations.
- D. Glass fiber insulated pipes conveying fluids below ambient temperature:
 - 1. Provide vapor barrier jackets, factory-applied or field-applied. Secure with self-sealing longitudinal laps and butt strips with pressure sensitive adhesive. Secure with outward clinch expanding staples and vapor barrier mastic.
 - 2. Insulate fittings, joints, and valves with molded insulation of like material and thickness as adjacent pipe. Finish with glass cloth and vapor barrier adhesive or PVC fitting covers.
- E. Glass fiber insulated pipes conveying fluids above ambient temperature:
 - 1. Provide standard jackets, with vapor barrier, factory-applied or field-applied. Secure with self-sealing longitudinal laps and butt strips with pressure sensitive adhesive. Secure with outward clinch expanding staples.
 - 2. Insulate fittings, joints, and valves with insulation of like material and thickness as adjoining pipe. Finish with glass cloth and adhesive or PVC fitting covers.
- F. Inserts and Shields:
 - 1. Application: Piping 1-1/2 inches diameter or larger.
 - 2. Shields: Galvanized steel between pipe hangers or pipe hanger rolls and inserts.
 - 3. Insert Location: Between support shield and piping and under the finish jacket.
 - 4. Insert Configuration: Minimum 6 inches long, of same thickness and contour as adjoining insulation; may be factory fabricated.
 - 5. Insert Material: Hydrous calcium silicate insulation or other heavy density insulating material suitable for the planned temperature range.
- G. Continue insulation through walls, sleeves, pipe hangers, and other pipe penetrations. Finish at supports, protrusions, and interruptions.

3.03 SCHEDULES

- A. Plumbing Systems:
 - 1. Domestic Hot Water Supply and Return
 - a. Glass Fiber Insulation:
 - 1) Pipe Size Range: 1/2-1 1/4 inch.
 - 2) Thickness: 1 inch.
 - b. Glass Fiber Insulation:
 - 1) Pipe Size Range: 1 1/2-8 inch.
 - 2) Thickness: 1 1/2 inch.

- 2. Domestic Potable Cold Water:
 - a. Glass Fiber Insulation:
 - 1) Pipe Size Range: up to 3 inch.
 - (a) Thickness: 1 inch.

END OF SECTION

SECTION 22 1005 - PLUMBING PIPING**PART 1 GENERAL****1.01 SECTION INCLUDES**

- A. Pipe, pipe fittings, specialties, and connections for piping systems.
 - 1. Sanitary sewer.
 - 2. Domestic water.
 - 3. Pipe hangers and supports.
 - 4. Valves.

1.02 RELATED REQUIREMENTS

- A. Division 01 - General Requirements: Project administrative and procedural requirements.
- B. Division 02 - Existing Conditions: Demolition, cleaning and disposal requirements, cutting and patching requirements, and repairs.
- C. Section 07 8400 - Firestopping.
- D. Section 22 0719 - Plumbing Piping Insulation.

1.03 REFERENCE STANDARDS

- A. ASME B16.18 - Cast Copper Alloy Solder Joint Pressure Fittings 2018.
- B. ASME B16.22 - Wrought Copper and Copper Alloy Solder-Joint Pressure Fittings 2018.
- C. ASME B31.9 - Building Services Piping 2020.
- D. ASME BPVC-IX - Boiler and Pressure Vessel Code, Section IX - Qualification Standard for Welding, Brazing, and Fusing Procedures; Welders; Brazers; and Welding, Brazing, and Fusing Operators 2021.
- E. ASTM B32 - Standard Specification for Solder Metal 2020.
- F. ASTM B88 - Standard Specification for Seamless Copper Water Tube 2020.
- G. ASTM B88M - Standard Specification for Seamless Copper Water Tube (Metric) 2020.
- H. ASTM B813 - Standard Specification for Liquid and Paste Fluxes for Soldering of Copper and Copper Alloy Tube 2016.
- I. ASTM B828 - Standard Practice for Making Capillary Joints by Soldering of Copper and Copper Alloy Tube and Fittings 2016.
- J. ASTM D2564 - Standard Specification for Solvent Cements for Poly(Vinyl Chloride) (PVC) Plastic Piping Systems 2020.
- K. ASTM D2665 - Standard Specification for Poly(Vinyl Chloride) (PVC) Plastic Drain, Waste, and Vent Pipe and Fittings 2020.
- L. ASTM D2855 - Standard Practice for the Two-Step (Primer and Solvent Cement) Method of Joining Poly (Vinyl Chloride) (PVC) or Chlorinated Poly (Vinyl Chloride) (CPVC) Pipe and Piping Components with Tapered Sockets 2020.
- M. ASTM D3034 - Standard Specification for Type PSM Poly(Vinyl Chloride) (PVC) Sewer Pipe and Fittings 2016.
- N. AWWA C651 - Disinfecting Water Mains 2014, with Addendum (2020).
- O. CISPI 301 - Standard Specification for Hubless Cast Iron Soil Pipe and Fittings for Sanitary and Storm Drain, Waste, and Vent Piping Applications 2018.
- P. CISPI 310 - Specification for Coupling for Use in Connection with Hubless Cast Iron Soil Pipe and Fittings for Sanitary and Storm Drain, Waste, and Vent Piping Applications 2018.
- Q. MSS SP-58 - Pipe Hangers and Supports - Materials, Design, Manufacture, Selection, Application, and Installation 2018, with Amendment (2019).

- R. MSS SP-110 - Ball Valves Threaded, Socket-Welding, Solder Joint, Grooved and Flared Ends 2010, with Errata .
- S. NSF 61 - Drinking Water System Components - Health Effects 2020.
- T. NSF 372 - Drinking Water System Components - Lead Content 2020.

1.04 SUBMITTALS

- A. Contractor shall provide submittals for equipment listed herein. Refer to Division 01 - General Requirements for submittal procedures.
- B. Product Data: Provide data on pipe materials, pipe fittings, valves, and accessories. Provide manufacturers catalog information. Indicate valve data and ratings.
- C. Project Record Documents: Record actual locations of valves.

1.05 QUALITY ASSURANCE

- A. Perform Work in accordance with State of Michigan standards.
- B. Welding Materials and Procedures: Conform to ASME BPVC-IX and applicable state labor regulations.
- C. Welder Qualifications: Certified in accordance with ASME BPVC-IX.

1.06 REGULATORY REQUIREMENTS

- A. Perform Work in accordance with State of Michigan plumbing code.
- B. Conform to applicable code for installation of backflow prevention devices.
- C. Provide certificate of compliance from authority having jurisdiction indicating approval of installation of backflow prevention devices.

1.07 FIELD CONDITIONS

- A. Do not install underground piping when bedding is wet or frozen.

PART 2 PRODUCTS

2.01 GENERAL REQUIREMENTS

- A. Potable Water Supply Systems: Provide piping, pipe fittings, and solder and flux (if used), that comply with NSF 61 and NSF 372 for maximum lead content; label pipe and fittings.

2.02 SANITARY SEWER PIPING, BURIED WITHIN 5 FEET OF BUILDING

- A. Cast Iron Pipe: CISPI 301 (latest edition), hubless.
 - 1. Fittings: Cast iron.
 - 2. Joints: CISPI 310 (latest edition) bearing the markings of NSF International, neoprene gasket and stainless steel clamp and shield assemblies.
- B. PVC Pipe: ASTM D2665 or ASTM D3034.
 - 1. Fittings: PVC.
 - 2. Joints: Solvent welded, with ASTM D2564 solvent cement.

2.03 SANITARY SEWER AND VENT PIPING, ABOVE GRADE

- A. Cast Iron Pipe: CISPI 301 (latest edition), hubless, service weight.
 - 1. Fittings: Cast iron.
 - 2. Joints: CISPI 310 (latest edition) bearing the markings of NSF International, neoprene gaskets and stainless steel clamp-and-shield assemblies.

2.04 DOMESTIC WATER PIPING, ABOVE GRADE

- A. Copper Tube: ASTM B88 (ASTM B88M), Type L (B), Drawn (H).
 - 1. Fittings: ASME B16.18, cast copper alloy or ASME B16.22, wrought copper and bronze.
 - 2. Joints: ASTM B32, alloy Sn95 solder.

2.05 PIPE HANGERS AND SUPPORTS

- A. Provide hangers and supports that comply with MSS SP-58.
 - 1. If type of hanger or support for a particular situation is not indicated, select appropriate type using MSS SP-58 recommendations.
 - 2. Overhead Supports: Individual steel rod hangers attached to structure or to trapeze hangers.
 - 3. Trapeze Hangers: Welded steel channel frames attached to structure.
 - 4. Vertical Pipe Support: Steel riser clamp.
- B. Plumbing Piping - Drain, Waste, and Vent:
 - 1. Hangers for Pipe Sizes 1/2 Inch to 1-1/2 Inches: Malleable iron, adjustable swivel, split ring.
 - 2. Hangers for Pipe Sizes 2 Inches and Over: Carbon steel, adjustable, clevis.
 - 3. Multiple or Trapeze Hangers: Steel channels with welded spacers and hanger rods.
 - 4. Wall Support for Pipe Sizes to 3 Inches: Cast iron hook.
 - 5. Wall Support for Pipe Sizes 4 Inches and Over: Welded steel bracket and wrought steel clamp.
 - 6. Vertical Support: Steel riser clamp.
 - 7. Floor Support: Cast iron adjustable pipe saddle, lock nut, nipple, floor flange, and concrete pier or steel support.
 - 8. Copper Pipe Support: Carbon steel ring, adjustable, copper plated.
- C. Plumbing Piping - Water:
 - 1. Conform to ASME B31.9.
 - 2. Hangers for Pipe Sizes 1/2 Inch to 1-1/2 Inches: Malleable iron, adjustable swivel, split ring.
 - 3. Hangers for Cold Pipe Sizes 2 Inches and Over: Carbon steel, adjustable, clevis.
 - 4. Hangers for Hot Pipe Sizes 2 Inches to 4 Inches: Carbon steel, adjustable, clevis.
 - 5. Multiple or Trapeze Hangers: Steel channels with welded supports or spacers and hanger rods.
 - 6. Wall Support for Pipe Sizes to 3 Inches: Cast iron hook.
 - 7. Vertical Support: Steel riser clamp.
 - 8. Floor Support for Cold Pipe: Cast iron adjustable pipe saddle, lock nut, nipple, floor flange, and concrete pier or steel support.
 - 9. Floor Support for Hot Pipe Sizes to 4 Inches: Cast iron adjustable pipe saddle, locknut, nipple, floor flange, and concrete pier or steel support.
 - 10. Copper Pipe Support: Carbon steel ring, adjustable, copper plated.

2.06 BALL VALVES

- A. Manufacturers:
 - 1. Apollo Valves: www.apollovalves.com
 - 2. Tyco Flow Control: www.tycoflowcontrol.com.
 - 3. Conbraco Industries, Inc: www.apollovalves.com.
 - 4. Nibco, Inc: www.nibco.com.
 - 5. Milwaukee Valve Company: www.milwaukeevalve.com.
- B. Construction, 4 Inches and Smaller: MSS SP-110, Class 150, 600 psi CWP, dezincification resistant, lead free bronze body, 304 stainless steel or chrome plated brass ball, full port, teflon seats and stuffing box ring, blow-out proof stem, lever handle with balancing stops, solder or threaded ends.

PART 3 EXECUTION

3.01 PREPARATION

- A. Ream pipe and tube ends. Remove burrs. Bevel plain end ferrous pipe.

- B. Remove scale and dirt, on inside and outside, before assembly.
- C. Prepare piping connections to equipment with flanges or unions.

3.02 INSTALLATION

- A. Install in accordance with manufacturer's instructions. Cast iron soil pipe installed in accordance to CISPI's Handbook.
- B. Provide non-conducting dielectric connections wherever jointing dissimilar metals.
- C. Route piping in orderly manner and maintain gradient. Route parallel and perpendicular to walls.
- D. Install piping to maintain headroom, conserve space, and not interfere with use of space.
- E. Group piping whenever practical at common elevations.
- F. Provide clearance in hangers and from structure and other equipment for installation of insulation and access to valves and fittings.
- G. Provide access where valves and fittings are not exposed.
- H. Where pipe support members are welded to structural building framing, scrape, brush clean, and apply one coat of zinc rich primer to welding.
- I. Copper Pipe and Tube: Make soldered joints in accordance with ASTM B828, using specified solder, and flux meeting ASTM B813; in potable water systems use flux also complying with NSF 61 and NSF 372.
- J. PVC Pipe: Underground installation in compliance to ASTM D-2321. Make solvent-welded joints in accordance with ASTM D2855.
- K. Sleeve pipes passing through partitions, walls and floors.
- L. Inserts:
 - 1. Provide inserts for suspending hangers from reinforced concrete slabs and sides of reinforced concrete beams.
 - 2. Where concrete slabs form finished ceiling, locate inserts flush with slab surface.
- M. Pipe Hangers and Supports:
 - 1. Install in accordance with ASME B31.9.
 - 2. Support horizontal piping as indicated.
 - 3. Install hangers to provide minimum 1/2 inch space between finished covering and adjacent work.
 - 4. Place hangers within 12 inches of each horizontal elbow.
 - 5. Use hangers with 1-1/2 inch minimum vertical adjustment. Design hangers for pipe movement without disengagement of supported pipe.
 - 6. Support vertical piping at every floor. Support riser piping independently of connected horizontal piping.
 - 7. Where several pipes can be installed in parallel and at same elevation, provide multiple or trapeze hangers.
 - 8. Provide copper plated hangers and supports for copper piping.
 - 9. Prime coat exposed steel hangers and supports. Hangers and supports located in crawl spaces, pipe shafts, and suspended ceiling spaces are not considered exposed.
 - 10. Support cast iron drainage piping at every joint.

3.03 APPLICATION

- A. Install unions downstream of valves and at equipment or apparatus connections.
- B. Install brass male adapters each side of valves in copper piped system. Solder adapters to pipe.
- C. Install ball valves for shut-off and to isolate equipment, part of systems, or vertical risers.

3.04 TOLERANCES

- A. Drainage Piping: Establish invert elevations within 1/2 inch vertically of location indicated and slope to drain at minimum of 1/8 inch per foot slope.
- B. Water Piping: Slope at minimum of 1/32 inch per foot and arrange to drain at low points.

3.05 DISINFECTION OF DOMESTIC WATER PIPING SYSTEM

- A. Disinfect water distribution system in accordance with Section 33 0110.58.
- B. Prior to starting work, verify system is complete, flushed and clean.
- C. Ensure acidity (pH) of water to be treated is between 7.4 and 7.6 by adding alkali (caustic soda or soda ash) or acid (hydrochloric).
- D. Inject disinfectant, free chlorine in liquid, powder, tablet or gas form, throughout system to obtain 50 to 80 mg/L residual.
- E. Bleed water from outlets to ensure distribution and test for disinfectant residual at minimum 15 percent of outlets.
- F. Maintain disinfectant in system for 24 hours.
- G. If final disinfectant residual tests less than 25 mg/L, repeat treatment.
- H. Flush disinfectant from system until residual equal to that of incoming water or 1.0 mg/L.
- I. Take samples no sooner than 24 hours after flushing, from 10 percent of outlets and from water entry, and analyze in accordance with AWWA C651.

3.06 SCHEDULES

- A. Pipe Hanger Spacing:
 - 1. Metal Piping:
 - a. Pipe Size: 1/2 inches to 1-1/4 inches:
 - 1) Maximum Hanger Spacing: 6.5 ft.
 - 2) Hanger Rod Diameter: 3/8 inches.
 - b. Pipe Size: 1-1/2 inches to 2 inches:
 - 1) Maximum Hanger Spacing: 10 ft.
 - 2) Hanger Rod Diameter: 3/8 inch.
 - c. Pipe Size: 2-1/2 inches to 3 inches:
 - 1) Maximum Hanger Spacing: 10 ft.
 - 2. Plastic Piping:
 - a. All Sizes:
 - 1) Maximum Hanger Spacing: 6 ft.
 - 2) Hanger Rod Diameter: 3/8 inch.

END OF SECTION

SECTION 22 1006 - PLUMBING PIPING SPECIALTIES**PART 1 GENERAL****1.01 SECTION INCLUDES**

- A. Floor drains.
- B. Cleanouts.
- C. Water hammer arrestors.
- D. Mixing valves.

1.02 RELATED REQUIREMENTS

- A. Section 22 1005 - Plumbing Piping.
- B. Section 22 4000 - Plumbing Fixtures.

1.03 REFERENCE STANDARDS

- A. ASME A112.6.3 - Floor and Trench Drains 2019.
- B. ASSE 1019 - Performance Requirements for Wall Hydrant with Backflow Protection and Freeze Resistance 2011 (Reaffirmed 2016).
- C. NSF 61 - Drinking Water System Components - Health Effects 2020.
- D. NSF 372 - Drinking Water System Components - Lead Content 2020.
- E. PDI-WH 201 - Water Hammer Arresters 2017.

1.04 SUBMITTALS

- A. Contractor shall provide submittals for equipment listed herein. Refer to Division 01 - General Requirements for submittal procedures.
- B. Product Data: Provide component sizes, rough-in requirements, service sizes, and finishes.
- C. Shop Drawings: Indicate dimensions, weights, and placement of openings and holes.

PART 2 PRODUCTS**2.01 GENERAL REQUIREMENTS**

- A. Specialties in Potable Water Supply Systems: Provide products that comply with NSF 61 and NSF 372 for maximum lead content.

2.02 DRAINS

- A. Manufacturers:
 - 1. Mifab Manufacturing Inc.: www.mifab.com
 - 2. Josam Company: www.josam.com
 - 3. Jay R. Smith Manufacturing Company.
 - 4. Zurn Industries, LLC: www.zurn.com
- B. Floor Drain (FD-1):
 - 1. ASME A112.21.1M; lacquered cast iron body with bottom outlet, combination invertible membrane clamp and adjustable collar with adjustable Type "S" polished nickel-bronze strainer.
 - 2. Zurn Industries Model #Z-415S.

2.03 CLEANOUTS (CO)

- A. Manufacturers:
 - 1. Mifab Manufacturing Inc.: www.mifab.com
 - 2. Jay R. Smith Manufacturing Company: www.jrsmith.com
 - 3. Josam Company: www.josam.com
 - 4. Zurn Industries, Inc.: www.zurn.com

- B. Cleanouts at Interior Finished Floor Areas:
 - 1. Adjustable floor cleanout, Lacquered cast iron body with agas and watertight ABS tapered thread plug, and reversible clamping collar,round scoriated secured top (finish: polished nickel bronze) adjustable to floor finish. Coordinate floor finishes with architect prior to order.
 - 2. Zurn Industries, Inc.: ; Model Z-1400
- C. Cleanouts at Interior Finished Wall Areas :
 - 1. Lacquered cast iron body, gas and water tight ABS tapered thread plug, and round stainless steel access cover with vandal proof securing top.
 - 2. Zurn Industries, Inc.: Wall; Model Z-1441 or Z-1446
- D. Cleanouts at Interior Unfinished Accessible Areas : Calked or threaded type. Provide bolted stack cleanouts on vertical rainwater leaders.

2.04 WATER HAMMER ARRESTORS

- A. Manufacturers:
 - 1. Mifab Manufacturing Inc.: www.mifab.com
 - 2. Jay R. Smith Manufacturing Company: www.jrsmith.com.
 - 3. Watts Regulator Company, a part of Watts Water Technologies: www.wattsregulator.com.
 - 4. Zurn Industries, LLC: www.zurn.com.
- B. Water Hammer Arrestors:
 - 1. Stainless steel construction, bellows type sized in accordance with PDI-WH 201, precharged suitable for operation in temperature range 34 to 250 degrees F and maximum 150 psi working pressure.

2.05 MIXING VALVES

- A. Thermostatic Mixing Valves:
 - 1. Refer to Plumbing Fixture Schedule for individual ASSE 1070 thermostatic mixing valve.

PART 3 EXECUTION

3.01 INSTALLATION

- A. Install in accordance with manufacturer's instructions.
- B. Extend cleanouts to finished floor or wall surface. Lubricate threaded cleanout plugs with mixture of graphite and linseed oil. Ensure clearance at cleanout for rodding of drainage system.
- C. Install floor cleanouts at elevation to accommodate finished floor.
- D. Install water hammer arrestors complete with accessible isolation valve on hot and cold water supply piping to lavatories, and flush valve fixtures.

END OF SECTION

SECTION 22 4000 - PLUMBING FIXTURES**PART 1 GENERAL****1.01 SECTION INCLUDES**

- A. Water closets
- B. Lavatories

1.02 RELATED REQUIREMENTS

- A. Division 01 - General Requirements: Project administrative and procedural requirements.
- B. Division 02 - Existing Conditions: Demolition, cleaning and disposal requirements, cutting and patching requirements, and repairs.
- C. Division 07 - Thermal and Moisture Protection: Sealing joints between fixtures, walls and floors.
- D. Section 22 1005 - Plumbing Piping.
- E. Section 22 1006 - Plumbing Piping Specialties.

1.03 REFERENCE STANDARDS

- A. ASME A112.18.1 - Plumbing Supply Fittings 2018, with Errata.
- B. ASME A112.19.2 - Ceramic Plumbing Fixtures 2018, with Errata.
- C. ASME A112.19.5 - Flush Valves and Spuds for Water Closets, Urinals, and Tanks 2017.
- D. NSF 61 - Drinking Water System Components - Health Effects 2020.
- E. NSF 372 - Drinking Water System Components - Lead Content 2020.

1.04 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Contractor shall provide submittals for equipment listed herein. Refer to Division 01 - General Requirements for submittal procedures.
- C. Product Data: Provide catalog illustrations of fixtures, sizes, rough-in dimensions, utility sizes, trim, and finishes.
- D. Maintenance Data: Include fixture trim exploded view and replacement parts lists.
- E. Warranty: Submit manufacturer warranty and ensure forms have been completed in Owner's name and registered with manufacturer.

1.05 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing the type of products specified in this section, with minimum three years of documented experience.

1.06 REGULATORY REQUIREMENTS

- A. Products Requiring Electrical Connection: Listed and classified by Underwriters Laboratories Inc., as suitable for the purpose specified and indicated.

1.07 DELIVERY, STORAGE, AND HANDLING

- A. Accept fixtures on site in factory packaging. Inspect for damage.
- B. Protect installed fixtures from damage by securing areas and by leaving factory packaging in place to protect fixtures and prevent use.

PART 2 PRODUCTS**2.01 GENERAL**

- A. Potable Water Systems: Provide plumbing fittings and faucets that comply with NSF 61 and NSF 372 for maximum lead content; label pipe and fittings.

2.02 REGULATORY REQUIREMENTS

- A. Comply with applicable codes for installation of plumbing systems.
- B. Perform work in accordance with local health department regulations.

2.03 FLOOR MOUNTED FLUSH VALVE WATER CLOSETS (WC-1) REFER TO PLUMBING FIXTURE SCHEDULE ON DRAWINGS.

- A. Bowl:
 - 1. Manufacturers:
 - a. American Standard Inc.
 - b. Kohler.
 - c. Zurn.
 - 2. ASME A112.19.2; floor mounted, siphon jet vitreous china closet bowl, with elongated rim, 1-1/2 inch top spud, china bolt caps.
- B. Flush Valve Manufacturers:
 - 1. Delta Tech
 - 2. Sloan Valve Company
 - 3. Zurn Industries, Inc..
- C. Exposed Flush Valve:
- D. Battery Powered Sensor Operated Flush Valve:
 - 1. ASSE 1037, ANSI/ASME A112.19.6 and Military Specification V-29193. Chrome plated closet flushometer for either left or right hand supply, installation conforms to ADA requirements. Exposed, synthetic rubber diaphragm with dual filtered fixed bypass; battery powered infrared sensor with range adjustment; chrome plated metal cover with tempered glass window; indicator light and courtesy over-ride flush button; dual filtered bypass; maximum 1.6 gallon flush volume; solid handle cap; 1" I.P.S. screwdriver angle stop; free spinning vandal resistant stop cap; vacuum breaker; spud coupling and flange for 1-1/2" top spud valve body.
- E. Seat:
 - 1. Manufacturers:
 - a. Bemis. 1055SSC
 - b. Centoco.
 - c. Olsonite; Model 1055SSC.
 - d. Substitutions: See Section 01600 - Product Requirements.
 - 2. Solid white plastic, elongated open front, extended back, self-sustaining hinge, SS posts, pintles, washers and nuts without cover.

2.04 LAVATORIES (LAV-1) REFER TO PLUMBING FIXTURE SCHEDULE ON DRAWINGS.

- A. Manufacturers:
 - 1. American Standard.
 - 2. Kohler.
 - 3. Zurn.
- B. Vitreous China Wall Hung Basin:
 - 1. ASME A112.19.2M; vitreous china wall hung lavatory 20.5 x 18.25 inch minimum, rectangular basin with splash lip and front overflow.
- C. Supply Faucet Manufacturers:
 - 1. American Standard Inc.
 - 2. Delta.
 - 3. Chicago Faucet.
 - 4. Zurn.
- D. Accessories:

1. Chrome plated 17 gage brass P-trap with clean-out plug and arm with escutcheon.
2. Offset waste with perforated open strainer.
3. Screwdriver stops.
4. Rigid supplies.
5. Carrier:
 - a. Manufacturers:
 - 1) Watts Drainage.
 - 2) Zurn Industries, Inc..
 - b. ASME A112.6.1M; cast iron and steel frame with tubular legs, floor supports, lugs for floor and wall attachment, concealed arm supports, bearing plate and studs.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that walls and floor finishes are prepared and ready for installation of fixtures.

3.02 PREPARATION

- A. Rough-in fixture piping connections in accordance with minimum sizes indicated in Plumbing Fixture Schedule on drawings for particular fixtures.

3.03 INSTALLATION

- A. Install in accordance with manufacturer's instructions.
- B. Install each fixture with trap, easily removable for servicing and cleaning.
- C. Provide chrome plated rigid or flexible supplies to fixtures with loose key stops, reducers, and escutcheons.
- D. Install components level and plumb.
- E. Install and secure fixtures in place with wall supports and bolts.
- F. Solidly attach water closets to floor with lag screws. Lead flashing is not intended hold fixture in place.

3.04 ADJUSTING

- A. Adjust stops or valves for intended water flow rate to fixtures without splashing, noise, or overflow.

3.05 CLEANING

- A. Clean plumbing fixtures and equipment.

3.06 PROTECTION

- A. Protect installed products from damage due to subsequent construction operations.
- B. Repair or replace damaged products before Date of Substantial Completion.

END OF SECTION

SECTION 23 0005 - BASIC HVAC REQUIREMENTS**PART 1 GENERAL****1.01 RELATED DOCUMENTS**

- A. This section applies to all sections of Division 23.
- B. Drawings and general provisions of the contract, including Division 00 and Division 01 specification sections, apply to work of this section.
- C. Provide all items, articles, materials, operations or methods listed, mentioned or scheduled on drawings and/or herein, including all labor, materials, equipment and incidentals necessary and required for their completion.
- D. The items in this section are supplementary to the requirements set forth in other portions of the specifications as indicated under item "A" above.

1.02 APPLICATION

- A. This section applies to all mechanical work. The contractors involved shall check all sections of the specifications in addition to the particular section covering their specific trade. Each distinct section of the specifications aimed for one trade may have detailed information with regards to other trades, therefore, it is imperative that all sections be reviewed to get a complete picture of all other trades' functions and work required.
- B. The mechanical contractor is responsible for the installation and operation of the hvac systems and temperature control systems.
- C. The mechanical contractor is responsible for receiving, unloading and placement of all of the owner provided equipment.

1.03 INSPECTION OF SITE

- A. Visit the site, examine and verify the conditions under which the work must be conducted before submitting proposal.
- B. The submitting of a proposal implies that the contractor has visited the site and understands the conditions under which the work must be conducted.

1.04 ALTERNATES AND SUBSTITUTIONS

- A. Refer to Division 01 - General Requirements for procedures.

1.05 DRAWINGS

- A. The drawings show the location and general arrangement of all equipment, piping and related items. They shall be followed as closely as elements of the construction will permit.
- B. Deviations from the drawings, with the exception of minor changes in routing and other such incidental changes that do not affect the functioning or serviceability of the systems, shall not be made without the written approval of the Architect.
- C. Do not scale drawings for measurements.
- D. Field verifications of actual existing conditions are required by the contractor since actual locations, distances, and levels will be governed by actual field conditions. All measurements shall be verified at the site.
- E. If during field verification, the contractor identifies that there may require substantial changes from the original plans, the contractor shall notify the architect for agreement on necessary adjustment before the installation is started
- F. Should any discrepancies between the contract documents and specifications occur, the greater quality or quantity of work shall be performed. This shall also pertain to any discrepancies in the contract documents between trades. This work must be submitted in writing to the engineer and architect prior to final bid for approval. No extras will be allowed after that time.

- G. Drawings and specifications are intended to cover the completed installation of systems to function as described. The omission of the expressed reference to any item of labor and material necessary to comply with practice codes, ordinances, etc., shall not relieve the contractor from providing such additional labor and material at no cost to Owner.

1.06 CODES, PERMITS AND FEES

- A. Unless otherwise indicated, all required permits, licenses, inspections, approvals and fees for mechanical work shall be secured and paid for by the contractor. All work shall conform to all applicable codes, rules and regulations. Applicable publications listed in all sections of Division 23 shall be the latest issue, unless otherwise noted.
- B. All work shall be executed in accordance with the rules and regulations set forth in local and state codes. Prepare any detailed drawings or diagrams which may be required by the governing authorities. Where the drawings and/or specifications indicate materials or construction in excess of code requirements, the drawings and/or specifications shall govern.

1.07 SUBSTITUTION

- A. Refer to Division 01 - General Requirements for procedures.
- B. All items that the contractor proposes to use in the work that are not specifically named in the contract documents must be submitted for review as a proposed substitution.
- C. The contractor shall provide, in a written format, that the proposed substitution is of equal quality and performance.

1.08 WARRANTY AND GUARANTEE

- A. Contractor shall guarantee all work installed by themselves or their subcontractors to be free from defect in material and workmanship for a period of one year from date of final acceptance of the work, unless a longer period is stipulated under specific headings. Contractor shall repair or replace at no additional cost to the owner, any material or equipment developing defects and shall also make good any damage caused by such defects or the correction of defects. Repairs or replacements shall bear additional guarantee, as originally called for, dated from the final acceptance of the repair or replacement. This requirement shall be binding even though it will exceed product guarantees normally furnished by some manufacturers. Contractor shall submit his own and each equipment manufacturers written certificates, warranting that each item of equipment furnished complies with all requirements of the drawings and specifications. Note that guarantee shall run from date of final acceptance of the work, not from date of installation of a device or piece of equipment.

1.09 SUBMITTALS

- A. Refer to Division 01 - General Requirements for procedures.
- B. Contractor shall provide submittals where items are referred to by symbolic designation on the drawings. All submittals shall bear the same designation (hvac equipment, piping equipment, etc.). Refer to other sections of the mechanical specifications for additional requirements.
- C. Engineer WILL NOT REVIEW:
 - 1. Submittals not specified.
 - 2. Submittals not reviewed by Contractor, including Contractor stamp with signature comments.
 - 3. Submittals made after work is delivered to site and/or installed.
 - 4. Submittal resubmissions unless resubmission is required by Architect/Engineer.
- D. Installation of any item that requires submittal approval by the engineer shall be installed at the contractors risk. The contractor, at his cost, shall remove all work installed prior to approval of the submittal.

- E. The engineer will not be responsible for errors in quantities, or dimensions required to fit the job condition, details of fabrication to insure proper assembly at the job, or for errors resulting from mistakes in submittals.

PART 2 PRODUCTS

2.01 SLEEVES AND ESCUTCHEONS

- A. Provide sleeves wherever pipes pass through exterior wall, and floors. Sleeves shall be schedule 40 steel pipe cut to length. Sleeves shall terminate flush with walls, partitions and ceilings in finished areas. All sleeves through floor shall extend 2" above floor. Provide cast brass nickel-plated escutcheons with positive catches on each visible sleeve penetration. Sleeves are to be sealed at each installation with a 3M approved sealant. The space between the inside of the sleeve and the outside of the pipe or conduit within the sleeve shall be sealed at each installation with a 3M approved sealant.

2.02 DIELECTRIC UNIONS

- A. Dielectric unions shall be used to connect dissimilar metals (such as steel and copper) to prevent electrolytic action.

2.03 BUILDING ATTACHMENTS FOR MECHANICAL WORK SUPPORTS

- A. General Requirements:
1. Provide building attachments required for supporting mechanical work, suitably selected and installed for the loads applied with a minimum additional safety factor of 3.
 2. Where specified attachments are not suitable for conditions, submit to Engineer for approval, proposal for alternate building attachments.
 3. Approved Manufacturers: Grinnell, or equivalent products by Michigan Hanger and B-Line.
 4. Provide supplemental trapeze supports where necessary. Design trapeze to support all trades. Coordinate loads, and supports with all trades. Size trapeze for maximum deflection of 1/64 of the span.
- B. Attachments to Structural Steel:
1. Support mechanical work from building structural steel where possible and approved. No welding or bolting to structural steel is permitted unless authorized by Architect. C-clamps are not permitted.
 - a. Center beam clamp - for loads over 120 lb.: Malleable center hung Grinnell Fig. 228.
 - b. Side beam clamp with retaining clips - for loads up to 120 lb.
- C. Cast in Place Concrete Inserts:
1. Provide inserts selected for applied load of present load plus 100% for future, and coordinated with concrete work. Except as detailed on drawings, inserts shall be Unistrut or Grinnell. Plan, lay out and coordinate setting of inserts prior to concrete pour. Use Grinnell Fig. 285 lightweight concrete insert for loads up to 400# or Grinnell Fig. 281 Wedge Type concrete insert for loads up to 1200#
- D. Drilled Insert Anchors:
1. Where mechanical work cannot be supported from structural steel, or cast in place concrete inserts, provide drilled concrete insert anchors. Submit for approval, project specific installation drawings for all loads over 100 lbs. Install inserts in web of beam if possible and approved. Insert depth shall not exceed two thirds the thickness of the concrete. Where existing concrete appears to be deteriorating, or where applied load at insert exceeds 1000 lbs., conduct test of concrete to determine derated capacity of insert. Anchors may be adhesive or expansion type up to 1000 lbs., and shall be adhesive type for loads over 1000 lbs.
 2. Manufacturers: Hilti

PART 3 EXECUTION**3.01 GENERAL**

- A. Demolition of mechanical equipment shall include all existing piping, valves, controls, supports and equipment where such items are not required for reuse. Mechanical equipment not specified for reuse shall be removed by the mechanical contractor from the site.
- B. Existing piping and ductwork: when encountered during the course of work, protect, brace and support existing piping and ductwork where required for proper execution of the work.
- C. Interruption of existing active piping and ductwork: when the course of work makes shut-down of services unavoidable, the mechanical contractor shall schedule the shut-down at such time as approved by the owners representative, which will cause least interference with established operating routine.
- D. Install all equipment in strict accordance all directions and recommendations furnished by the manufacturer.

3.02 ACCESSIBILITY

- A. Do not locate traps, controls, unions, pull boxes, etc. in any system at a location that will be inaccessible after construction is completed. Maintain accessibility for all components in mechanical, electrical, and plumbing systems.

3.03 ACCESS DOORS AND PANELS

- A. Refer to Division 08 - Openings; Provide access doors in locations as required by applicable codes and as indicated below. Coordinate locations with architectural trades.
- B. Furnish access panels to access valves, traps, control valves or devices, dampers, damper motors, etc. Access panels shall be sized as necessary for ample access, or as indicated on drawings, but no smaller than 12" x 12" where devices are within easy reach of operator, and at least 24"x24" when operator must pass through opening in order to reach the devices. Architectural Trades shall install access panels coordinated with Mechanical Trades.
- C. Access panels in fire rated walls or ceiling must be U.L. labeled for intended use. Unless otherwise indicated on plans, access doors shall be hinged flush type steel framed panel, 14 gauge minimum for frame, and with anchor straps. Only narrow border shall be exposed. Hinges shall be concealed type. Locking device shall be flush type and screw driver operated. Metal surfaces shall be prime coated with rust-inhibitive paint. Panels shall be compatible with architectural adjacent materials Manufacturer: Milcor, Bilco.

3.04 CUTTING AND PATCHING

- A. Refer to Division 01 - General Requirements and Division 02 - Existing Conditions.
- B. All cutting required shall be done by the contractor whose work is involved, without extra cost the owner. All patching and restoration including the furnishing and installation of access panels in ceiling, walls, etc. within the building lines shall be done by the respective, responsible contractor. No cutting of structural steel, concrete, or wood shall be done without prior approval and explicit directions of the architect patched by the respective, responsible contractor.
- C. The contractor, under whose jurisdiction the work may fall, shall provide labor, material, and tools required to cut, repair, protect, cap, or relocate existing pipes, conduits, or utilities interfering with or uncovered during work, per regulations of the authorities having jurisdiction.

3.05 MATERIAL AND EQUIPMENT

- A. All material and equipment shall be new and of the best quality used for the purpose in good commercial practice, and shall be the standard product of reputable manufacturers. The material and equipment must meet approval of state and local codes in the area it is being used. Roof decks shall not be used to support piping, conduit, equipment, devices, etc.

3.06 SEAL PENETRATIONS

- A. Seal the space around pipes in sleeves and around duct openings through walls, floors and ceilings. Provide adequate clearance to allow for proper sealing.

3.07 FIRESTOPPING

- A. Refer to Division 07 - Thermal and Moisture Protection for more information.
- B. Provide UL classified firestopping system for mechanical penetrations through rated walls and floors to maintain the fire rating.

3.08 DELIVERY, STORAGE AND HANDLING OF EQUIPMENT AND MATERIALS

- A. Refer to Division 01 - General Requirements; All equipment and materials shall be delivered, stored and secured per manufacturer's recommendations.
- B. On-site storage shall be coordinated with Construction Manager and be performed in a manner as to avoid damage, deterioration and loss.
- C. Provide temporary end caps and closures on piping and fittings. Maintain in place until installation.
- D. Protect piping systems from entry of foreign materials by temporary covers, completing sections of the work, and isolating parts of completed system.
- E. Protect dampers, grilles, louvers from damage to operating linkages and blades.

3.09 CLEANING

- A. Refer to Division 01 - General Requirements; all mechanical equipment and components shall be cleaned as frequently as necessary through the construction process and again prior to project completion.

END OF SECTION

SECTION 23 0505 - SELECTIVE DEMOLITION FOR HVAC**PART 1 GENERAL****1.01 SECTION INCLUDES**

- A. Demolition and extension of existing mechanical work.

1.02 RELATED REQUIREMENTS

- A. Division 01 - General Requirements: Project administrative and procedural requirements.
- B. Division 02 - Existing Conditions: Demolition, cleaning and disposal requirements, cutting and patching requirements, repairs.

1.03 SUMMARY

- A. The work covered under this section consists of the furnishing of all necessary labor, supervision, materials, equipment, and services to completely execute the system of minor electrical demolition as described in this specification.
- B. The demolition documents plans and specification have been prepared from existing non-as built documents and cursory non-invasive field investigation.
- C. It is the contractors obligation to become familiar with the extent of demolition and the existing condition before submitting their bid.
- D. During demolition if the contractor discovers unforeseen significant non-code compliance conditions of the existing installation they shall notify the Architect and Engineer immediately in writing.
- E. The contractor shall become familiar with the drawings and scope of work of other trades as the work scope of those trades relates to mechanical equipment and connection requirements.
- F. During demolition the contractor shall record on site as-builts all hydronic system piping capped branches, capped supply air, return air and exhaust ducts for reuse in renovated project space.

PART 2 PRODUCTS**2.01 MATERIALS**

- A. Materials and equipment for patching and extending work: As specified in individual sections.

PART 3 EXECUTION**3.01 EXAMINATION**

- A. Verify that piping and ductwork to be demolished serve only equipment and facilities within the demolition areas.
- B. Demolition drawings are based on casual field observation and existing record documents.
- C. Report discrepancies to Owner before disturbing existing installation.
- D. Beginning of demolition means installer accepts existing conditions.

3.02 PREPARATION

- A. Identify locations for capping piping and ductwork before any demolition work commences.
- B. Confirm isolation valve locations for hydronic piping. Repair leaking isolation valves or replace inoperable valves before commencing piping demolition.
- C. Cap and seal air-tight supply, return and exhaust air ductwork at shaft walls before commencing sheet metal demolition

3.03 DEMOLITION AND EXTENSION OF EXISTING MECHANICAL WORK

- A. Remove all supply, return and exhaust air ductwork as indicated on plans.

END OF SECTION

SECTION 23 0593 - TESTING, ADJUSTING, AND BALANCING FOR HVAC**PART 1 GENERAL****1.01 SECTION INCLUDES**

- A. Testing, adjustment, and balancing of air systems.

1.02 RELATED REQUIREMENTS

- A. Division 01 - General Requirements: Project administrative and procedural requirements.
- B. Section 23 0005 - Basic HVAC Requirements.

1.03 REFERENCE STANDARDS

- A. AABC (NSTSB) - AABC National Standards for Total System Balance, 7th Edition 2016.
- B. ASHRAE Std 111 - Measurement, Testing, Adjusting, and Balancing of Building HVAC Systems 2008, with Errata (2019).
- C. NEBB (TAB) - Procedural Standards for Testing Adjusting and Balancing of Environmental Systems 2015, with Errata (2017).
- D. SMACNA (TAB) - HVAC Systems Testing, Adjusting and Balancing 2002.

1.04 SUBMITTALS

- A. Contractor shall provide submittals for equipment listed herein. Refer to Division 01 - General Requirements for submittal procedures.
- B. TAB Plan: Submit a written plan indicating the testing, adjusting, and balancing standard to be followed and the specific approach for each system and component.
 - 1. Include at least the following in the plan:
 - a. List of all air flow, water flow, sound level, system capacity and efficiency measurements to be performed and a description of specific test procedures, parameters, formulas to be used.
 - b. Copy of field checkout sheets and logs to be used, listing each piece of equipment to be tested, adjusted and balanced with the data cells to be gathered for each.
 - c. Discussion of what notations and markings will be made on the duct and piping drawings during the process.
 - d. Final test report forms to be used.
 - e. Details of how TOTAL flow will be determined; for example:
 - 1) Air: Sum of terminal flows via control system calibrated readings or via hood readings of all terminals, supply (SA) and return air (RA) pitot traverse, SA or RA flow stations.
 - f. Specific procedures that will ensure that air side are operating at the lowest possible pressures and methods to verify this.
 - g. Exhaust fan balancing and capacity verifications, including any required room pressure differentials.
 - h. Procedures for formal deficiency reports, including scope, frequency and distribution.
- C. Final Report: Indicate deficiencies in systems that would prevent proper testing, adjusting, and balancing of systems and equipment to achieve specified performance.
 - 1. Revise TAB plan to reflect actual procedures and submit as part of final report.
 - 2. Submit draft copies of report for review prior to final acceptance of Project. Provide final copies for Strategic Energy Solutions, Inc. and for inclusion in operating and maintenance manuals.
 - 3. Include actual instrument list, with manufacturer name, serial number, and date of calibration.
 - 4. Form of Test Reports: Where the TAB standard being followed recommends a report format use that; otherwise, follow ASHRAE Std 111.

5. Units of Measure: Report data in both I-P (inch-pound) and SI (metric) units.
 6. Include the following on the title page of each report:
 - a. Name of Testing, Adjusting, and Balancing Agency.
 - b. Address of Testing, Adjusting, and Balancing Agency.
 - c. Telephone number of Testing, Adjusting, and Balancing Agency.
 - d. Project name.
 - e. Project location.
 - f. Report date.
- D. Project Record Documents: Record actual locations of flow measuring stations and balancing valves and rough setting.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

3.01 GENERAL REQUIREMENTS

- A. Perform total system balance in accordance with one of the following:
 1. AABC (NSTSB), AABC National Standards for Total System Balance.
 2. ASHRAE Std 111, Practices for Measurement, Testing, Adjusting and Balancing of Building Heating, Ventilation, Air-Conditioning, and Refrigeration Systems.
 3. NEBB Procedural Standards for Testing Adjusting Balancing of Environmental Systems.
 4. SMACNA (TAB).
- B. Begin work after completion of systems to be tested, adjusted, or balanced and complete work prior to Substantial Completion of the project.
- C. Where HVAC systems and/or components interface with life safety systems, including fire and smoke detection, alarm, and control, coordinate scheduling and testing and inspection procedures with the authorities having jurisdiction.
- D. TAB Agency Qualifications:
 1. Company specializing in the testing, adjusting, and balancing of systems specified in this section.
 2. Certified by one of the following:
 - a. AABC, Associated Air Balance Council: www.aabc.com/#sle; upon completion submit AABC National Performance Guaranty.
 - b. NEBB, National Environmental Balancing Bureau: www.nebb.org/#sle.
 - c. TABB, The Testing, Adjusting, and Balancing Bureau of National Energy Management Institute: www.tabbcertified.org/#sle.
- E. TAB Supervisor and Technician Qualifications: Certified by same organization as TAB agency.

3.02 EXAMINATION

- A. Verify that systems are complete and operable before commencing work. Ensure the following conditions:
 1. Systems are started and operating in a safe and normal condition.
 2. Temperature control systems are installed complete and operable.
 3. Proper thermal overload protection is in place for electrical equipment.
 4. Duct systems are clean of debris.
 5. Fans are rotating correctly.
 6. Fire and volume dampers are in place and open.
 7. Access doors are closed and duct end caps are in place.
 8. Air outlets are installed and connected.
 9. Duct system leakage is minimized.
- B. Beginning of work means acceptance of existing conditions.

3.03 ADJUSTMENT TOLERANCES

- A. Air Handling Systems: Adjust to within plus or minus 5 percent of design for supply systems and plus or minus 10 percent of design for return and exhaust systems.
- B. Air Outlets and Inlets: Adjust total to within plus 10 percent and minus 5 percent of design to space. Adjust outlets and inlets in space to within plus or minus 10 percent of design.

3.04 RECORDING AND ADJUSTING

- A. Ensure recorded data represents actual measured or observed conditions.
- B. Permanently mark settings of valves, dampers, and other adjustment devices allowing settings to be restored. Set and lock memory stops.
- C. Mark on drawings the locations where traverse and other critical measurements were taken and cross reference the location in the final report.
- D. After adjustment, take measurements to verify balance has not been disrupted or that such disruption has been rectified.
- E. Leave systems in proper working order, replacing belt guards, closing access doors, closing doors to electrical switch boxes, and restoring thermostats to specified settings.

3.05 AIR SYSTEM PROCEDURE

- A. Adjust air handling and distribution systems to provide required or design supply, return, and exhaust air quantities at site altitude.
- B. Make air quantity measurements in ducts by Pitot tube traverse of entire cross sectional area of duct.
- C. Measure air quantities at air inlets and outlets.
- D. Adjust distribution system to obtain uniform space temperatures free from objectionable drafts and noise.
- E. Use volume control devices to regulate air quantities only to extend that adjustments do not create objectionable air motion or sound levels. Effect volume control by duct internal devices such as dampers and splitters.
- F. Vary total system air quantities by adjustment of fan speeds. Provide drive changes required. Vary branch air quantities by damper regulation.
- G. Provide system schematic with required and actual air quantities recorded at each outlet or inlet.
- H. Measure static air pressure conditions on air supply units, including filter and coil pressure drops, and total pressure across the fan. Make allowances for 50 percent loading of filters.
- I. Adjust outside air automatic dampers, outside air, return air, and exhaust dampers for design conditions.
- J. Measure temperature conditions across outside air, return air, and exhaust dampers to check leakage.

3.06 SCOPE

- A. Test, adjust, and balance the following:
 - 1. Fans.
 - 2. Air Inlets and Outlets.

END OF SECTION

SECTION 23 3100 - HVAC DUCTS AND CASINGS**PART 1 GENERAL****1.01 SECTION INCLUDES**

- A. Single-wall rectangular ducts and fittings.
- B. Single-wall round ducts and fittings.
- C. Sheet metal materials.
- D. Sealants and gaskets.
- E. Hangers and supports.

1.02 RELATED REQUIREMENTS

- A. Division 07 - Thermal and Moisture Protection: Firestopping.
- B. Section 23 0005 - Basic HVAC Requirements.
- C. Section 23 0593 - Testing, Adjusting, and Balancing for HVAC.
- D. Section 23 3300 - Air Duct Accessories.
- E. Section 23 3700 - Air Outlets and Inlets.

1.03 REFERENCE STANDARDS

- A. ASTM A36/A36M - Standard Specification for Carbon Structural Steel 2019.
- B. ASTM A276/A276M - Standard Specification for Stainless Steel Bars and Shapes 2017.
- C. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process 2020.
- D. ASTM A1011/A1011M - Standard Specification for Steel, Sheet and Strip, Hot-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, and Ultra-High Strength 2018a.
- E. ASTM B209 - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate 2014.
- F. NFPA 90A - Standard for the Installation of Air-Conditioning and Ventilating Systems 2021.
- G. NFPA 96 - Standard for Ventilation Control and Fire Protection of Commercial Cooking Operations 2021.
- H. SMACNA (DCS) - HVAC Duct Construction Standards Metal and Flexible 2020.
- I. UL 181 - Standard for Factory-Made Air Ducts and Air Connectors current edition, including all revisions.

1.04 PERFORMANCE REQUIREMENTS

- A. Delegated Duct Design: Duct construction, including sheet metal thicknesses, seam and joint construction, reinforcements, and hangers and supports, shall comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible" and performance requirements and design criteria indicated in "Duct Schedule" Article.
- B. Structural Performance: Duct hangers and supports shall withstand the effects of gravity loads and stresses within limits and under conditions described in SMACNA's "HVAC Duct Construction Standards - Metal and Flexible" and ASCE/SEI 7.
- C. Airstream Surfaces: Surfaces in contact with the airstream shall comply with requirements in ASHRAE 62.1.

1.05 SUBMITTALS

- A. Contractor shall provide submittals for equipment listed herein. Refer to Division 01 - General Requirements for submittal procedures.
- B. Product Data: Provide data for duct materials, duct connections, and factory fabricated fittings.

1.06 REGULATORY REQUIREMENTS

- A. Construct ductwork to SMACNA (DCS) - HVAC Duct Construction Standards - Metal and Flexible; Sheet Metal and Air Conditioning Contractors' National Association; 1995, Second Edition with Addendum No. 1.

PART 2 PRODUCTS**2.01 SINGLE-WALL RECTANGULAR DUCT AND FITTING ASSEMBLIES**

- A. Regulatory Requirements: Construct ductwork to NFPA 90A standards.
- B. General Fabrication Requirements: Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible" based on indicated static-pressure class unless otherwise indicated.
- C. Transverse Joints: Select joint types and fabricate according to SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Figure 2-1, "Rectangular Duct/Transverse Joints," for static-pressure class, applicable sealing requirements, materials involved, duct-support intervals, and other provisions in SMACNA's "HVAC Duct Construction Standards - Metal and Flexible."
- D. Longitudinal Seams: Select seam types and fabricate according to SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Figure 2-2, "Rectangular Duct/Longitudinal Seams," for static-pressure class, applicable sealing requirements, materials involved, duct-support intervals, and other provisions in SMACNA's "HVAC Duct Construction Standards - Metal and Flexible."
- E. Elbows, Transitions, Offsets, Branch Connections, and Other Duct Construction: Select types and fabricate according to SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Chapter 4, "Fittings and Other Construction," for static-pressure class, applicable sealing requirements, materials involved, duct-support intervals, and other provisions in SMACNA's "HVAC Duct Construction Standards - Metal and Flexible."

2.02 SINGLE-WALL ROUND DUCT AND FITTING ASSEMBLIES

- A. General Fabrication Requirements: Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Chapter 3, "Round, Oval, and Flexible Duct," based on indicated static-pressure class unless otherwise indicated.
 - 1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - a. McGill AirFlow LLC.
 - b. Spiral Manufacturing Co., Inc.
- B. Transverse Joints: Select joint types and fabricate according to SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Figure 3-1, "Round Duct Transverse Joints," for static-pressure class, applicable sealing requirements, materials involved, duct-support intervals, and other provisions in SMACNA's "HVAC Duct Construction Standards - Metal and Flexible."
 - 1. Transverse Joints in Ducts Larger Than 60 Inches in Diameter: Flanged.
- C. Longitudinal Seams: Select seam types and fabricate according to SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Figure 3-2, "Round Duct Longitudinal Seams," for static-pressure class, applicable sealing requirements, materials involved, duct-support intervals, and other provisions in SMACNA's "HVAC Duct Construction Standards - Metal and Flexible."
 - 1. Fabricate round ducts larger than 90 inches in diameter with butt-welded longitudinal seams.

- D. Tees and Laterals: Select types and fabricate according to SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Figure 3-5, "90 Degree Tees and Laterals," and Figure 3-6, "Conical Tees," for static-pressure class, applicable sealing requirements, materials involved, duct-support intervals, and other provisions in SMACNA's "HVAC Duct Construction Standards - Metal and Flexible."

2.03 MATERIALS

- A. Galvanized Steel for Ducts: Hot-dipped galvanized steel sheet, ASTM A653/A653M FS Type B, with G60/Z180 coating.
- B. General Material Requirements: Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible" for acceptable materials, material thicknesses, and duct construction methods unless otherwise indicated. Sheet metal materials shall be free of pitting, seam marks, roller marks, stains, discolorations, and other imperfections.
- C. Galvanized Sheet Steel: Comply with ASTM A 653/A 653M.
1. Galvanized Coating Designation: G90.
 2. Finishes for Surfaces Exposed to View: Mill phosphatized.
- D. Tie Rods: Galvanized steel, 1/4-inch minimum diameter for lengths 36 inches or less; 3/8-inch minimum diameter for lengths longer than 36 inches.

2.04 SEALANTS AND GASKETS

- A. General Sealant and Gasket Requirements: Surface-burning characteristics for sealants and gaskets shall be a maximum flame-spread index of 25 and a maximum smoke-developed index of 50 when tested according to UL 723; certified by an NRTL.
- B. Two-Part Tape Sealing System:
1. Tape: Woven cotton fiber impregnated with mineral gypsum and modified acrylic/silicone activator to react exothermically with tape to form hard, durable, airtight seal.
 2. Tape Width: 3 inches.
 3. Sealant: Modified styrene acrylic.
 4. Water resistant.
 5. Mold and mildew resistant.
 6. Maximum Static-Pressure Class: 10-inch wg, positive and negative.
 7. Service: Indoor and outdoor.
 8. Service Temperature: Minus 40 to plus 200 deg F.
 9. Substrate: Compatible with galvanized sheet steel (both PVC coated and bare), stainless steel, or aluminum.
 10. For indoor applications, sealant shall have a VOC content of 250 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
 11. Sealant shall comply with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."
- C. Water-Based Joint and Seam Sealant:
1. Application Method: Brush on.
 2. Solids Content: Minimum 65 percent.
 3. Shore A Hardness: Minimum 20.
 4. Water resistant.
 5. Mold and mildew resistant.
 6. VOC: Maximum 75 g/L (less water).
 7. Maximum Static-Pressure Class: 10-inch wg, positive and negative.
 8. Service: Indoor or outdoor.
 9. Substrate: Compatible with galvanized sheet steel (both PVC coated and bare), stainless steel, or aluminum sheets.

- D. Flanged Joint Sealant: Comply with ASTM C 920.
 - 1. General: Single-component, acid-curing, silicone, elastomeric.
 - 2. Type: S.
 - 3. Grade: NS.
 - 4. Class: 25.
 - 5. Use: O.
 - 6. For indoor applications, sealant shall have a VOC content of 250 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
 - 7. Sealant shall comply with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."
- E. Flange Gaskets: Butyl rubber, neoprene, or EPDM polymer with polyisobutylene plasticizer.
- F. Round Duct Joint O-Ring Seals:
 - 1. Seal shall provide maximum leakage class of 3 cfm/100 sq. ft. at 1-inch wgand shall be rated for

2.05 HANGERS AND SUPPORTS

- A. Hanger Rods for Noncorrosive Environments: Cadmium-plated steel rods and nuts.
- B. Hanger Rods for Corrosive Environments: Electrogalvanized, all-thread rods or galvanized rods with threads painted with zinc-chromate primer after installation.
- C. Strap and Rod Sizes: Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible, "Table 5-1, "Rectangular Duct Hangers Minimum Size," and Table 5-2, "Minimum Hanger Sizes for Round Duct."
- D. Steel Cables for Galvanized-Steel Ducts: Galvanized steel complying with ASTM A 603.
- E. Steel Cables for Stainless-Steel Ducts: Stainless steel complying with ASTM A 492.
- F. Steel Cable End Connections: Cadmium-plated steel assemblies with brackets, swivel, and bolts designed for duct hanger service; with an automatic-locking and clamping device.
- G. Duct Attachments: Sheet metal screws, blind rivets, or self-tapping metal screws; compatible with duct materials.
- H. Trapeze and Riser Supports:
 - 1. Supports for Galvanized-Steel Ducts: Galvanized-steel shapes and plates.
 - 2. Supports for Stainless-Steel Ducts: Stainless-steel shapes and plates.
 - 3. Supports for Aluminum Ducts: Aluminum or galvanized steel coated with zinc chromate.

2.06 DUCTWORK FABRICATION

- A. Provide duct material, gages, reinforcing, and sealing for operating pressures indicated.
- B. Construct T's, bends, and elbows with radius of not less than 1-1/2 times width of duct on centerline. Where not possible and where rectangular elbows must be used, provide air foil turning vanes of perforated metal with glass fiber insulation.
- C. T's, bends, and elbows: Construct according to SMACNA (DCS).
- D. Increase duct sizes gradually, not exceeding 15 degrees divergence wherever possible; maximum 30 degrees divergence upstream of equipment and 45 degrees convergence downstream.
- E. Provide standard 45 degree lateral wye takeoffs unless otherwise indicated where 90 degree conical tee connections may be used.

2.07 MANUFACTURED DUCTWORK AND FITTINGS

- A. Manufacture in accordance with SMACNA HVAC Duct Construction Standards - Metal and Flexible, and as indicated. Provide duct material, gages, reinforcing, and sealing for operating pressures indicated.

- B. Round Ducts: Round lockseam duct with galvanized steel outer wall.
 - 1. Manufacture in accordance with SMACNA (DCS).
- C. Flexible Ducts: Black polymer film supported by helically wound spring steel wire.
 - 1. UL labeled.
 - 2. Insulation: Fiberglass insulation with polyethylene vapor barrier film.
 - 3. Pressure Rating: 4 inches WG positive and 0.5 inches WG negative.
 - 4. Maximum Velocity: 4000 fpm.
 - 5. Temperature Range: Minus 20 degrees F to 175 degrees F.

PART 3 EXECUTION

3.01 INSTALLATION

- A. Install in accordance with manufacturer's instructions.
- B. Drawing plans, schematics, and diagrams indicate general location and arrangement of duct system. Indicated duct locations, configurations, and arrangements were used to size ducts and calculate friction loss for air-handling equipment sizing and for other design considerations. Install duct systems as indicated unless deviations to layout are approved on Shop Drawings and Coordination Drawings.
- C. Install, support and seal ducts according to SMACNA's "HVAC Duct Construction Standards - Metal and Flexible" unless otherwise indicated.
- D. Install ducts with fewest possible joints.
- E. Install factory- or shop-fabricated fittings for changes in direction, size, and shape and for branch connections.
- F. During construction provide temporary closures of metal or taped polyethylene on open ductwork to prevent construction dust from entering ductwork system.
- G. Duct sizes indicated are inside clear dimensions. For lined ducts, maintain sizes inside lining.
- H. Use double nuts and lock washers on threaded rod supports.
- I. Connect diffusers to low pressure ducts directly or with 5 feet maximum length of flexible duct held in place with strap or clamp.

3.02 HANGER AND SUPPORT INSTALLATION

- A. Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Chapter 5, "Hangers and Supports."
- B. Building Attachments: Concrete inserts, powder-actuated fasteners, or structural-steel fasteners appropriate for construction materials to which hangers are being attached.
 - 1. Where practical, install concrete inserts before placing concrete.
 - 2. Install powder-actuated concrete fasteners after concrete is placed and completely cured.
 - 3. Use powder-actuated concrete fasteners for standard-weight aggregate concretes or for slabs more than 4 inches thick.
 - 4. Do not use powder-actuated concrete fasteners for lightweight-aggregate concretes or for slabs less than 4 inches thick.
 - 5. Do not use powder-actuated concrete fasteners for seismic restraints.
- C. Hanger Spacing: Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Table 5-1, "Rectangular Duct Hangers Minimum Size," and Table 5-2, "Minimum Hanger Sizes for Round Duct," for maximum hanger spacing; install hangers and supports within 24 inches of each elbow and within 48 inches of each branch intersection.
- D. Install upper attachments to structures. Select and size upper attachments with pull-out, tension, and shear capacities appropriate for supported loads and building materials where used.

3.03 DUCT SEALING

- A. Seal ducts for duct static-pressure, seal classes, and leakage classes specified in "Duct Schedule" Article according to SMACNA's "HVAC Duct Construction Standards - Metal and Flexible."

3.04 CLEANING

- A. Clean duct systems with high power vacuum machines. Protect equipment that could be harmed by excessive dirt with filters, or bypass during cleaning. Provide adequate access into ductwork for cleaning purposes.

END OF SECTION

SECTION 23 3300 - AIR DUCT ACCESSORIES**PART 1 GENERAL****1.01 SECTION INCLUDES**

- A. Flexible duct connections.
- B. Volume control dampers.

1.02 RELATED REQUIREMENTS

- A. Division 01 - General Requirements: Project procedural and administrative requirements.
- B. Division 07 - Thermal and Moisture Protection: Firestopping.
- C. Section 23 0005 - Basic HVAC Requirements.
- D. Section 23 3100 - HVAC Ducts and Casings.

1.03 REFERENCE STANDARDS

- A. NFPA 90A - Standard for the Installation of Air-Conditioning and Ventilating Systems 2021.
- B. SMACNA (DCS) - HVAC Duct Construction Standards Metal and Flexible 2020.

1.04 SUBMITTALS

- A. Contractor shall provide submittals for equipment listed herein. Refer to Division 01 - General Requirements for submittal procedures.

PART 2 PRODUCTS**2.01 FLEXIBLE DUCT CONNECTIONS**

- A. Fabricate in accordance with SMACNA (DCS) and as indicated.
- B. Flexible Duct Connections: Fabric crimped into metal edging strip.

2.02 VOLUME CONTROL DAMPERS

- A. Manufacturers:
 - 1. Louvers & Dampers, Inc: www.louvers-dampers.com.
 - 2. Price Industries Inc: www.priceindustries.com.
 - 3. Ruskin Company: www.ruskin.com.
- B. Fabricate in accordance with SMACNA (DCS) and as indicated.
- C. Single Blade Dampers:
 - 1. Blade: 24 gage, 0.0239 inch, minimum.
- D. Multi-Blade Damper: Fabricate of opposed blade pattern with maximum blade sizes 8 by 72 inch. Assemble center and edge crimped blades in prime coated or galvanized channel frame with suitable hardware.
 - 1. Blade: 18 gage, 0.0478 inch, minimum.
- E. End Bearings: Except in round ducts 12 inches and smaller, provide end bearings. On multiple blade dampers, provide oil-impregnated nylon, thermoplastic elastomer, or sintered bronze bearings.
- F. Quadrants:
 - 1. Provide locking, indicating quadrant regulators on single and multi-blade dampers.
 - 2. On insulated ducts mount quadrant regulators on stand-off mounting brackets, bases, or adapters.
 - 3. Where rod lengths exceed 30 inches provide regulator at both ends.

PART 3 EXECUTION**3.01 INSTALLATION**

- A. Install accessories in accordance with manufacturer's instructions, NFPA 90A, and follow SMACNA (DCS). Refer to Section 23 3100 for duct construction and pressure class.
- B. Provide balancing dampers at points on supply, return, and exhaust systems where branches are taken from larger ducts as required for air balancing. Install minimum 2 duct widths from duct take-off.
- C. Provide balancing dampers on duct take-off to diffusers, grilles, and registers, regardless of whether dampers are specified as part of the diffuser, grille, or register assembly.

END OF SECTION

SECTION 23 3700 - AIR OUTLETS AND INLETS**PART 1 GENERAL****1.01 SECTION INCLUDES**

- A. Registers/grilles.

1.02 RELATED REQUIREMENTS

- A. Division 01 - General Requirements: Project procedural and administrative requirements.
- B. Division 09 - Finishes: Painting of ducts visible behind outlets and inlets.

1.03 REFERENCE STANDARDS

- A. ASHRAE Std 70 - Method of Testing the Performance of Air Outlets and Inlets 2006 (Reaffirmed 2021).

1.04 SUBMITTALS

- A. Contractor shall provide submittals for equipment listed herein. Refer to Division 01 - General Requirements for submittal procedures.
- B. Product Data: Provide data for equipment required for this project. Review outlets and inlets as to size, finish, and type of mounting prior to submission. Submit schedule of outlets and inlets showing type, size, location, application, and noise level.

1.05 QUALITY ASSURANCE

- A. Test and rate air outlet and inlet performance in accordance with ASHRAE Std 70.

PART 2 PRODUCTS**2.01 MANUFACTURERS**

- A. Krueger: www.krueger-hvac.com.
- B. Price Industries: www.price-hvac.com.
- C. Titus: www.titus-hvac.com.

2.02 CEILING EXHAUST REGISTERS

- A. Type: Streamlined blades, 3/4 inch minimum depth, 3/4 inch maximum spacing, with blades set at 45 degrees, vertical face.
- B. Frame: 1-1/4 inch margin with countersunk screw mounting.
- C. Fabrication: Steel with 20 gage, 0.0359 inch minimum frames and 22 gage, 0.0299 inch minimum blades, steel and aluminum with 20 gage, 0.0359 inch minimum frame, or aluminum extrusions, with factory baked enamel finish.
- D. Damper: Integral, gang-operated, opposed blade type with removable key operator, operable from face where not individually connected to exhaust fans.

PART 3 EXECUTION**3.01 INSTALLATION**

- A. Install in accordance with manufacturer's instructions.
- B. Check location of outlets and inlets and make necessary adjustments in position to conform with architectural features, symmetry, and lighting arrangement.
- C. Install diffusers to ductwork with air tight connection.
- D. Provide balancing dampers on duct take-off to diffusers, and grilles and registers, despite whether dampers are specified as part of the diffuser, or grille and register assembly.
- E. Paint ductwork visible behind air outlets and inlets matte black. Refer to Section 09 9123.

END OF SECTION

SECTION 26 0005 - BASIC ELECTRICAL REQUIREMENTS**PART 1 GENERAL****1.01 RELATED DOCUMENTS**

- A. This section applies to all sections of Division 26 and Division 28.
- B. Drawings and general provisions of the contract, including Division 00 and Division 01 specification sections, apply to work of this section.
- C. Provide all items, articles, materials, operations or methods listed, mentioned or scheduled on drawings and/or herein, including all labor, materials, equipment and incidentals necessary and required for their completion.
- D. The items in this section are supplementary to the requirements set forth in other portions of the specifications as indicated under Item "A" above.

1.02 DRAWINGS

- A. The drawings show the location and general arrangement of equipment, electrical systems and related items. They shall be followed as closely as elements of the construction will permit.
- B. Examine the drawings of other trades and verify the conditions governing the work on the job site. Arrange work accordingly, providing such fittings, conduit, junction boxes and accessories as may be required to meet such conditions.
- C. Deviations from the drawings, with the exception of minor changes in routing and other such incidental changes that do not affect the functioning or serviceability of the systems, shall not be made without the written approval of the Architect/Engineer.
- D. The architectural and structural drawings take precedence in all matters pertaining to the building structure, mechanical drawings in all matters pertaining to mechanical trades and electrical drawings in all matters pertaining to electrical trades. Where there are conflicts or differences between the drawings for the various trades, report such conflicts or differences to the Architect/Engineer for resolution.

1.03 INSPECTION OF SITE

- A. Visit the site, examine and verify the conditions under which the work must be conducted before submitting proposal.
- B. The submitting of a proposal implies that the contractor has visited the site and understands the conditions under which the work must be conducted.

1.04 TEMPORARY FACILITIES

- A. Provide and remove upon completion of the project, in accordance with the general conditions, a complete temporary electrical and telephone service during construction.

1.05 ALTERNATES

- A. Refer to Division 01 - General Requirements for procedures.

1.06 GUARANTEE

- A. Contractor guarantees that the installation is free from defects and agrees to replace or repair, any part of this installation which becomes defective within a period of one year following final acceptance, unless noted otherwise, provided that such failure is due to defects in the equipment, material or installation or to follow the specifications and drawings. File with the Owner any and all guarantees from the equipment manufacturers.

1.07 CODES, PERMITS AND FEES

- A. Unless otherwise indicated, all required permits, licenses, inspections, approvals and fees for electrical work shall be secured and paid for by the contractor. All work shall conform to all applicable codes, rules and regulations. Applicable publications listed in all sections of Division 26 shall be the latest issue, unless otherwise noted.

- B. Rules of local utility companies shall be complied with. Check with the utility company supplying service to the installation and determine all devices including, but not limited to, all current and potential transformers, meter boxes, C.T. cabinets and meters which will be required and include the cost of all such items in proposal.
- C. All work shall be executed in accordance with the rules and regulations set forth in local and state codes. Prepare any detailed drawings or diagrams which may be required by the governing authorities. Where the drawings and/or specifications indicate materials or construction in excess of code requirements, the drawings and/or specifications shall govern.

1.08 STANDARDS OF MATERIAL AND WORKMANSHIP:

- A. All materials shall be new, unless noted otherwise. The electrical and physical properties of all materials, and the design, performance characteristics, and methods of construction of all items of equipment, shall be in accordance with the latest issue of the various, applicable standard specifications of the following recognized authorities:
 - 1. A.N.S.I. - American National Standards Institute
 - 2. A.S.T.M. - American Society for Testing Materials
 - 3. I.C.E.A. - Insulated Cable Engineers Association
 - 4. I.E.E.E. - Institute of Electrical and Electronics Engineers
 - 5. N.E.C. - National Electrical Code (NFPA 70)
 - 6. N.E.C.A. - National Electrical Contractors Association
 - 7. N.E.M.A. - National Electrical Manufacturer's Association
 - 8. N.F.P.A. - National Fire Protection Association
 - 9. U.L. - Underwriters Laboratories, Inc.
- B. Perform all work in a first class and workmanlike manner, in accordance with the latest accepted standards and practices for the Trades involved.
- C. All equipment of the same or similar systems shall be by the same manufacturer.

1.09 RECORD DRAWINGS

- A. Refer to Division 01 - General Requirements for procedures. All literature shall be furnished in accordance with requirements listed in Division 01.
- B. Contractor shall provide the following record drawings as part of the Project closeout document process:
 - 1. Contract Documents, specifications and submittals, indicating "As-Built" conditions and actual products selected for use.
 - 2. Product and Maintenance manuals for all equipment listed within this specification manual and in Contract Documents. Provide with parts lists as applicable.

1.10 SUBMITTALS

- A. Refer to Division 01 - General Requirements for procedures.
- B. Contractor shall provide submittals where items are referred to by symbolic designation on the drawings. All submittals shall bear the same designation (light fixtures, wiring devices, etc.). Refer to other sections of the electrical specifications for additional requirements.
 - 1. Wiring Devices
 - 2. Lighting Fixtures
 - 3. Fire Alarm System
- C. Engineer WILL NOT REVIEW:
 - 1. Submittals not specified.
 - 2. Submittals which do not indicate optional equipment being provided.
 - 3. Submittals not reviewed by Contractor; including Contractor stamp with signature comments.
 - 4. Submittals made after work is delivered to site and/or installed.
 - 5. Submittal resubmissions unless resubmission is required by Architect/Engineer.

1.11 MANUFACTURERS LISTED

- A. The listing of specific manufacturers does not imply acceptance of their products that do not meet the specified ratings, features and functions. Manufacturers listed are not relieved from meeting these specifications in their entirety.
- B. Products in compliance with the specification and manufactured by others not named will be considered only if pre-approved by the Engineer five (5) days prior to bid date.

1.12 USE OF EQUIPMENT

- A. The use of any equipment, or any part thereof for purposes other than testing even with the Owner's consent, shall not be construed to be an acceptance of the work on the part of the Owner, nor be construed to obligate the Owner in any way to accept improper work or defective materials.
- B. Do not use Owner's light fixtures for temporary lighting except as allowed and directed by the Owner.

PART 2 PRODUCTS - NOT USED**PART 3 EXECUTION****3.01 INSTALLATION OF EQUIPMENT**

- A. Install all equipment in strict accordance with all directions and recommendations furnished by the manufacturer. Where such directions are in conflict with the drawings and specifications, report such conflicts to the Architect/Engineer for resolution.
- B. Equipment location shall be as close as practical to locations shown on the drawings.
- C. Working clearances shall not be less than specified in NFPA 70 (National Electric Code).

3.02 COORDINATION

- A. Install work to avoid interference with work of other trades including, but not limited to, architectural and mechanical trades. Remove and relocate any work that causes an interference at Contractor's expense. Disputes regarding the cause of an interference will be resolved by the Construction Manager or Architect/Engineer.

3.03 CUTTING, PATCHING AND DAMAGE TO OTHER WORK

- A. Refer to Division 01 - General Requirements and Division 02 - Existing Conditions.
- B. All cutting, patching and repair work shall be performed by the contractor through approved, qualified subcontractors. Contractor shall include full cost of same in bid.

3.04 EQUIPMENT FOUNDATION AND SUPPORTS

- A. Shall be as required or as shown on plans or specified.
- B. Provide concrete house keeping bases 4" above finished floor, with leveling channels, where noted, for floor-mounted equipment. Coordinate requirements with Division 03 - Concrete.
- C. For equipment suspended from ceilings or walls, furnish and install all inserts, rods, structural steel frames, brackets and platforms required.

3.05 EQUIPMENT CONNECTIONS

- A. Make connections to equipment, motors, lighting fixtures, and other items included in the work in accordance with the approved shop drawings and rough-in measurements furnished by the manufacturers of the particular equipment furnished. All additional connections not shown on the drawings, but called out by the equipment manufacturer's shop drawings shall be provided.

3.06 ACCESS DOORS AND PANELS

- A. Refer to Division 08 - Openings; Provide access doors in locations as required per N.E.C. Coordinate locations with architectural trades.

3.07 CLEANING

- A. Refer to Division 01 - General Requirements; All equipment shall be cleaned as frequently as necessary through the construction process and again prior to project completion.
- B. Final cleanup shall include, but not be limited to, washing of fixture lenses or louvers, switchboards, substations, motor control centers, panels, etc. Fixture reflectors and lenses or louvers shall be left with no water marks or cleaning streaks.

3.08 DELIVERY, STORAGE AND PROTECTION OF EQUIPMENT AND MATERIALS

- A. Refer to Division 01 - General Requirements; All equipment and materials shall be delivered, stored and secured per manufacturer's recommendations.
- B. On-site storage shall be coordinated with Construction Manager and be performed in a manner as to avoid damage, deterioration and loss.

3.09 DRAWINGS AND MEASUREMENTS

- A. Electrical drawings are not intended to be scaled for rough-in measurements nor to serve as submittals. Field measurements necessary for ordering materials and fitting the installation to the building construction and arrangement shall be taken by the Contractor.

END OF SECTION

SECTION 26 0505 - SELECTIVE DEMOLITION FOR ELECTRICAL**PART 1 GENERAL****1.01 SECTION INCLUDES**

- A. Demolition and extension of existing electrical work.

1.02 RELATED REQUIREMENTS

- A. Division 01 - General Requirements: Project administrative and procedural requirements.
- B. Division 02 - Existing Conditions: Demolition, cleaning and disposal requirements, cutting and patching requirements, repairs.
- C. Section 26 0005 - Basic Electrical Requirements.

1.03 SUMMARY

- A. The work covered under this section consists of the furnishing of all necessary labor, supervision, materials, equipment, and services to completely execute the system of minor electrical demolition as described in this specification.
- B. The demolition documents plans and specification have been prepared from existing non-as built documents and cursory non-invasive field investigation.
- C. It is the contractors obligation to become familiar with the extent of demolition and the existing condition before submitting their bid.
- D. During demolition if the contractor discovers unforeseen significant non-code compliance conditions of the existing installation they shall notify the Architect and Engineer immediately in writing.
- E. During demolition the contractor shall record on the as-builts all demolished circuits numbers that can be used for new circuiting.

PART 2 PRODUCTS - NOT USED**PART 3 EXECUTION****3.01 EXAMINATION**

- A. Verify that abandoned wiring and equipment serve only abandoned facilities.
- B. Demolition drawings are based on casual field observation and existing record documents.
- C. Report discrepancies to Owner before disturbing existing installation.
- D. Beginning of demolition means installer accepts existing conditions.

3.02 PREPARATION

- A. Disconnect electrical systems in walls, floors, and ceilings to be removed.
- B. Coordinate utility service outages with utility company.
- C. Provide temporary wiring and connections to maintain existing systems in service during construction. When work must be performed on energized equipment or circuits, use personnel experienced in such operations.

3.03 DEMOLITION AND EXTENSION OF EXISTING ELECTRICAL WORK

- A. Perform work for removal and disposal of equipment and materials containing toxic substances regulated under the Federal Toxic Substances Control Act (TSCA) in accordance with applicable federal, state, and local regulations. Applicable equipment and materials include, but are not limited to:
 - 1. PCB-containing electrical equipment, including transformers, capacitors, and switches.
 - 2. PCB- and DEHP-containing lighting ballasts.

3. Mercury-containing lamps and tubes, including fluorescent lamps, high intensity discharge (HID), arc lamps, ultra-violet, high pressure sodium, mercury vapor, ignitron tubes, neon, and incandescent.
 - B. Remove, relocate, and extend existing installations to accommodate new construction.
 - C. Remove abandoned wiring to source of supply.
 - D. Remove exposed abandoned conduit, including abandoned conduit above accessible ceiling finishes. Cut conduit flush with walls and floors, and patch surfaces.
 - E. Disconnect abandoned outlets and remove devices. Remove abandoned outlets if conduit servicing them is abandoned and removed. Provide blank cover for abandoned outlets that are not removed.
 - F. Disconnect and remove abandoned luminaires indicated as being demolished on drawings.. Remove brackets, stems, hangers, and other accessories.
 - G. Repair adjacent construction and finishes damaged during demolition and extension work.
 - H. Maintain access to existing electrical installations that remain active. Modify installation or provide access panel as appropriate.
 - I. Extend existing installations using materials and methods compatible with existing electrical installations, or as specified.

3.04 CLEANING AND REPAIR

- A. Refer to Division 01 - General Requirements.
- B. Clean and repair existing materials and equipment that remain or that are to be reused.
- C. Panelboards: Clean exposed surfaces and check tightness of electrical connections. Replace damaged circuit breakers and provide closure plates for vacant positions. Provide typed circuit directory showing revised circuiting arrangement.

END OF SECTION

SECTION 26 0519 - LOW-VOLTAGE ELECTRICAL POWER CONDUCTORS AND CABLES**PART 1 GENERAL****1.01 SECTION INCLUDES**

- A. Single conductor building wire.
- B. Metal-clad cable.
- C. Wiring connectors.
- D. Electrical tape.
- E. Wire pulling lubricant.
- F. Cable ties.

1.02 RELATED REQUIREMENTS

- A. Division 01 - General Requirements: Project administrative and procedural requirements.
- B. Division 02 - Existing Conditions: Demolition, cleaning and disposal requirements, cutting and patching requirements, and repairs.
- C. Section 26 0005 - Basic Electrical Requirements.
- D. Section 26 0505 - Selective Demolition for Electrical: Disconnection, removal, and/or extension of existing electrical conductors and cables.
- E. Section 26 0526 - Grounding and Bonding for Electrical Systems: Additional requirements for grounding conductors and grounding connectors.
- F. Section 28 4600 - Fire Detection and Alarm: Fire alarm system conductors and cables.

1.03 REFERENCE STANDARDS

- A. ASTM B3 - Standard Specification for Soft or Annealed Copper Wire 2013 (Reapproved 2018).
- B. ASTM B8 - Standard Specification for Concentric-Lay-Stranded Copper Conductors, Hard, Medium-Hard, or Soft 2011 (Reapproved 2017).
- C. ASTM B33 - Standard Specification for Tin-Coated Soft or Annealed Copper Wire for Electrical Purposes 2010, with Editorial Revision (2020).
- D. ASTM B787/B787M - Standard Specification for 19 Wire Combination Unilay-Stranded Copper Conductors for Subsequent Insulation 2004 (Reapproved 2020).
- E. ASTM D3005 - Standard Specification for Low-Temperature Resistant Vinyl Chloride Plastic Pressure-Sensitive Electrical Insulating Tape 2017.
- F. NECA 1 - Standard for Good Workmanship in Electrical Construction 2015.
- G. NECA 120 - Standard For Installing Armored Cable (Type AC) And Metal-Clad Cable (Type MC) 2018.
- H. NEMA WC 70 - Power Cables Rated 2000 Volts or Less for the Distribution of Electrical Energy 2021.
- I. NETA ATS - Acceptance Testing Specifications for Electrical Power Equipment and Systems 2017.
- J. NFPA 70 - National Electrical Code Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
- K. UL 44 - Thermoset-Insulated Wires and Cables Current Edition, Including All Revisions.
- L. UL 83 - Thermoplastic-Insulated Wires and Cables Current Edition, Including All Revisions.
- M. UL 486A-486B - Wire Connectors Current Edition, Including All Revisions.
- N. UL 486C - Splicing Wire Connectors Current Edition, Including All Revisions.

- O. UL 486D - Sealed Wire Connector Systems Current Edition, Including All Revisions.
- P. UL 510 - Polyvinyl Chloride, Polyethylene, and Rubber Insulating Tape Current Edition, Including All Revisions.
- Q. UL 1569 - Metal-Clad Cables Current Edition, Including All Revisions.

1.04 ADMINISTRATIVE REQUIREMENTS

- A. Coordination:
 - 1. Coordinate sizes of raceways, boxes, and equipment enclosures installed under other sections with the actual conductors to be installed, including adjustments for conductor sizes increased for voltage drop.
 - 2. Coordinate the installation of direct burial cable with other trades to avoid conflicts with piping or other potential conflicts.
 - 3. Coordinate with electrical equipment installed under other sections to provide terminations suitable for use with the conductors to be installed.
 - 4. Notify Strategic Energy Solutions, Inc. of any conflicts with or deviations from the contract documents. Obtain direction before proceeding with work.

1.05 SUBMITTALS

- A. Contractor shall provide submittals for equipment listed herein. Refer to Division 01 for submittal procedures.

1.06 QUALITY ASSURANCE

- A. Conform to requirements of NFPA 70.
- B. Maintain at the project site a copy of each referenced document that prescribes execution requirements.
- C. Product Listing Organization Qualifications: An organization recognized by OSHA as a Nationally Recognized Testing Laboratory (NRTL) and acceptable to authorities having jurisdiction.

1.07 FIELD CONDITIONS

- A. Do not install or otherwise handle thermoplastic-insulated conductors at temperatures lower than 14 degrees F, unless otherwise permitted by manufacturer's instructions. When installation below this temperature is unavoidable, notify Strategic Energy Solutions, Inc. and obtain direction before proceeding with work.

PART 2 PRODUCTS

2.01 CONDUCTOR AND CABLE APPLICATIONS

- A. Do not use conductors and cables for applications other than as permitted by NFPA 70 and product listing.
- B. Provide single conductor building wire installed in suitable raceway unless otherwise indicated, permitted, or required.
- C. Nonmetallic-sheathed cable is not permitted.
- D. Underground feeder and branch-circuit cable is not permitted.
- E. Service entrance cable is not permitted.
- F. Armored cable is not permitted.
- G. Metal-clad cable is permitted only as follows:
 - 1. Where not otherwise restricted, may be used:
 - a. Where concealed above accessible ceilings for final connections from junction boxes to luminaires.
 - 1) Maximum Length: 6 feet.

2.02 CONDUCTOR AND CABLE GENERAL REQUIREMENTS

- A. Provide products that comply with requirements of NFPA 70.
- B. Provide products listed, classified, and labeled as suitable for the purpose intended.
- C. Unless specifically indicated to be excluded, provide all required conduit, boxes, wiring, connectors, etc. as required for a complete operating system.
- D. Comply with NEMA WC 70.
- E. Thermoplastic-Insulated Conductors and Cables: Listed and labeled as complying with UL 83.
- F. Thermoset-Insulated Conductors and Cables: Listed and labeled as complying with UL 44.
- G. Conductor Material:
 - 1. Provide copper conductors only. Aluminum conductors are not acceptable for this project. Conductor sizes indicated are based on copper.
 - 2. Copper Conductors: Soft drawn annealed, 98 percent conductivity, uncoated copper conductors complying with ASTM B3, ASTM B8, or ASTM B787/B787M unless otherwise indicated.
 - 3. Tinned Copper Conductors: Comply with ASTM B33.
- H. Minimum Conductor Size:
 - 1. Branch Circuits: 12 AWG.
 - a. Exceptions:
 - 1) 20 A, 120 V circuits longer than 75 feet: 10 AWG, for voltage drop.
 - 2) 20 A, 120 V circuits longer than 150 feet: 8 AWG, for voltage drop.
 - 3) 20 A, 277 V circuits longer than 150 feet: 10 AWG, for voltage drop.
- I. Where conductor size is not indicated, size to comply with NFPA 70 but not less than applicable minimum size requirements specified.
- J. Conductor Color Coding:
 - 1. Color code conductors as indicated unless otherwise required by the authority having jurisdiction. Maintain consistent color coding throughout project.
 - 2. Color Coding Method: Integrally colored insulation.

2.03 SINGLE CONDUCTOR BUILDING WIRE

- A. Manufacturers:
 - 1. Copper Building Wire:
 - a. Cerro Wire LLC: www.cerrowire.com/#sle.
 - b. Encore Wire Corporation: www.encorewire.com/#sle.
 - c. Southwire Company: www.southwire.com/#sle.
- B. Description: Single conductor insulated wire.
- C. Conductor Stranding:
 - 1. Feeders and Branch Circuits: Stranded.
- D. Insulation Voltage Rating: 600 V.
- E. Insulation:
 - 1. Copper Building Wire: Type THHN/THWN or THHN/THWN-2, except as indicated below.

2.04 METAL-CLAD CABLE

- A. Manufacturers:
 - 1. AFC Cable Systems Inc: www.afcweb.com/#sle.
 - 2. Encore Wire Corporation: www.encorewire.com/#sle.
 - 3. Southwire Company: www.southwire.com/#sle.

- B. Description: NFPA 70, Type MC cable listed and labeled as complying with UL 1569, and listed for use in classified firestop systems to be used.
- C. Conductor Stranding:
 - 1. Size 10 AWG and Smaller: Stranded.
 - 2. Size 8 AWG and Larger: Stranded.
- D. Insulation Voltage Rating: 600 V.
- E. Insulation: Type THHN, THHN/THWN, or THHN/THWN-2.
- F. Provide oversized neutral conductors where indicated or required.
- G. Grounding: Full-size integral equipment grounding conductor.
- H. Armor: Steel, interlocked tape.

2.05 WIRING CONNECTORS

- A. Description: Wiring connectors appropriate for the application, suitable for use with the conductors to be connected, and listed as complying with UL 486A-486B or UL 486C as applicable.
- B. Connectors for Grounding and Bonding: Comply with Section 26 0526.
- C. Wiring Connectors for Splices and Taps:
 - 1. Copper Conductors Size 8 AWG and Smaller: Use twist-on insulated spring connectors.
 - 2. Copper Conductors Size 6 AWG and Larger: Use mechanical connectors or compression connectors.
- D. Wiring Connectors for Terminations:
 - 1. Provide terminal lugs for connecting conductors to equipment furnished with terminations designed for terminal lugs.
 - 2. Provide compression adapters for connecting conductors to equipment furnished with mechanical lugs when only compression connectors are specified.
 - 3. Where over-sized conductors are larger than the equipment terminations can accommodate, provide connectors suitable for reducing to appropriate size, but not less than required for the rating of the overcurrent protective device.
 - 4. Copper Conductors Size 8 AWG and Larger: Use mechanical connectors or compression connectors where connectors are required.
- E. Twist-on Insulated Spring Connectors: Rated 600 V, 221 degrees F for standard applications and 302 degrees F for high temperature applications; pre-filled with sealant and listed as complying with UL 486D for damp and wet locations.
- F. Mechanical Connectors: Provide bolted type or set-screw type.
- G. Compression Connectors: Provide circumferential type or hex type crimp configuration.

2.06 WIRING ACCESSORIES

- A. Electrical Tape:
 - 1. Vinyl Insulating Electrical Tape: Complying with ASTM D3005 and listed as complying with UL 510; minimum thickness of 7 mil; resistant to abrasion, corrosion, and sunlight; conformable for application down to 0 degrees F and suitable for continuous temperature environment up to 221 degrees F.
- B. Wire Pulling Lubricant: Listed; suitable for use with the conductors or cables to be installed and suitable for use at the installation temperature.
- C. Cable Ties: Material and tensile strength rating suitable for application.

PART 3 EXECUTION**3.01 EXAMINATION**

- A. Verify that interior of building has been protected from weather.
- B. Verify that work likely to damage wire and cable has been completed.
- C. Verify that raceways, boxes, and equipment enclosures are installed and are properly sized to accommodate conductors and cables in accordance with NFPA 70.
- D. Verify that field measurements are as indicated.
- E. Verify that conditions are satisfactory for installation prior to starting work.

3.02 PREPARATION

- A. Clean raceways thoroughly to remove foreign materials before installing conductors and cables.

3.03 INSTALLATION

- A. Circuiting Requirements:
 - 1. Unless dimensioned, circuit routing indicated is diagrammatic.
 - 2. When circuit destination is indicated without specific routing, determine exact routing required.
 - 3. Arrange circuiting to minimize splices.
 - 4. Include circuit lengths required to install connected devices within 10 ft of location indicated.
 - 5. Maintain separation of wiring for emergency systems in accordance with NFPA 70.
 - 6. Circuiting Adjustments: Unless otherwise indicated, when branch circuits are indicated as separate, combining them together in a single raceway is permitted, under the following conditions:
 - a. Provide no more than six current-carrying conductors in a single raceway. Dedicated neutral conductors are considered current-carrying conductors.
 - b. Increase size of conductors as required to account for ampacity derating.
 - c. Size raceways, boxes, etc. to accommodate conductors.
 - 7. Common Neutrals: Unless otherwise indicated, sharing of neutral/grounded conductors among up to three single phase branch circuits of different phases installed in the same raceway is permitted where not otherwise prohibited, except for the following:
 - a. Branch circuits fed from ground fault circuit interrupter (GFCI) circuit breakers.
 - b. Branch circuits fed from feed-through protection of GFI receptacles.
 - c. Branch circuits with dimming controls.
 - d. Branch circuits with isolated grounding conductor.
- B. Install products in accordance with manufacturer's instructions.
- C. Perform work in accordance with NECA 1 (general workmanship).
- D. Install metal-clad cable (Type MC) in accordance with NECA 120.
- E. Installation in Raceway:
 - 1. Tape ends of conductors and cables to prevent infiltration of moisture and other contaminants.
 - 2. Pull all conductors and cables together into raceway at same time.
 - 3. Do not damage conductors and cables or exceed manufacturer's recommended maximum pulling tension and sidewall pressure.
 - 4. Use suitable wire pulling lubricant where necessary, except when lubricant is not recommended by the manufacturer.

- F. Paralleled Conductors: Install conductors of the same length and terminate in the same manner.
- G. Secure and support conductors and cables in accordance with NFPA 70 using suitable supports and methods approved by the authority having jurisdiction. Provide independent support from building structure. Do not provide support from raceways, piping, ductwork, or other systems.
 - 1. Installation Above Suspended Ceilings: Do not provide support from ceiling support system. Do not provide support from ceiling grid or allow conductors and cables to lay on ceiling tiles.
 - 2. Installation in Vertical Raceways: Provide supports where vertical rise exceeds permissible limits as indicated in NFPA 70.
- H. Terminate cables using suitable fittings.
 - 1. Metal-Clad Cable (Type MC):
 - a. Use listed fittings.
 - b. Cut cable armor only using specialized tools to prevent damaging conductors or insulation. Do not use hacksaw or wire cutters to cut armor.
- I. Install conductors with a minimum of 12 inches of slack at each outlet.
- J. Where conductors are installed in enclosures for future termination by others, provide a minimum of 5 feet of slack.
- K. Neatly train and bundle conductors inside boxes, wireways, panelboards and other equipment enclosures.
- L. Group or otherwise identify neutral/grounded conductors with associated ungrounded conductors inside enclosures in accordance with NFPA 70.
- M. Make wiring connections using specified wiring connectors.
 - 1. Make splices and taps only in accessible boxes. Do not pull splices into raceways or make splices in conduit bodies or wiring gutters.
 - 2. Remove appropriate amount of conductor insulation for making connections without cutting, nicking or damaging conductors.
 - 3. Do not remove conductor strands to facilitate insertion into connector.
 - 4. Clean contact surfaces on conductors and connectors to suitable remove corrosion, oxides, and other contaminates. Do not use wire brush on plated connector surfaces.
 - 5. Mechanical Connectors: Secure connections according to manufacturer's recommended torque settings.
 - 6. Compression Connectors: Secure connections using manufacturer's recommended tools and dies.
- N. Insulate splices and taps that are made with uninsulated connectors using methods suitable for the application, with insulation and mechanical strength at least equivalent to unspliced conductors.
- O. Insulate ends of spare conductors using vinyl insulating electrical tape.
- P. Install firestopping to preserve fire resistance rating of partitions and other elements, using materials and methods specified by Division 07 .
- Q. Unless specifically indicated to be excluded, provide final connections to all equipment and devices, including those furnished by others, as required for a complete operating system.

3.04 FIELD QUALITY CONTROL

- A. Inspect and test in accordance with NETA ATS, except Section 4.

- B. Perform inspections and tests listed in NETA ATS, Section 7.3.2. The insulation resistance test is required for all conductors. The resistance test for parallel conductors listed as optional is not required.
- C. Correct deficiencies and replace damaged or defective conductors and cables.

END OF SECTION

SECTION 26 0526 - GROUNDING AND BONDING FOR ELECTRICAL SYSTEMS**PART 1 GENERAL****1.01 SECTION INCLUDES**

- A. Grounding and bonding requirements.
- B. Conductors for grounding and bonding.
- C. Connectors for grounding and bonding.

1.02 RELATED REQUIREMENTS

- A. Division 01 - General Requirements: Project administrative and procedural requirements.
- B. Division 02 - Existing Conditions: Demolition, cleaning and disposal requirements, cutting and patching requirements, repairs.
- C. Section 26 0005 - Basic Electrical Requirements.
- D. Section 26 0519 - Low-Voltage Electrical Power Conductors and Cables: Additional requirements for conductors for grounding and bonding, including conductor color coding.
- E. Section 26 0553 - Identification for Electrical Systems: Identification products and requirements.
- F. Section 26 5600 - Exterior Lighting: Additional grounding and bonding requirements for pole-mounted luminaires.
- G. Division 31 - Earthwork: Excavating, trenching and fill.

1.03 REFERENCE STANDARDS

- A. NECA 1 - Standard for Good Workmanship in Electrical Construction 2015.
- B. NETA ATS - Acceptance Testing Specifications for Electrical Power Equipment and Systems 2017.
- C. NFPA 70 - National Electrical Code Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
- D. UL 467 - Grounding and Bonding Equipment Current Edition, Including All Revisions.

1.04 ADMINISTRATIVE REQUIREMENTS

- A. Coordination:
 - 1. Verify exact locations of underground metal water service pipe entrances to building.
 - 2. Notify Strategic Energy Solutions, Inc. of any conflicts with or deviations from the contract documents. Obtain direction before proceeding with work.

1.05 QUALITY ASSURANCE

- A. Conform to requirements of NFPA 70.

PART 2 PRODUCTS**2.01 GROUNDING AND BONDING REQUIREMENTS**

- A. Existing Work: Where existing grounding and bonding system components are indicated to be reused, they may be reused only where they are free from corrosion, integrity and continuity are verified, and where acceptable to the authority having jurisdiction.
- B. Do not use products for applications other than as permitted by NFPA 70 and product listing.
- C. Unless specifically indicated to be excluded, provide all required components, conductors, connectors, conduit, boxes, fittings, supports, accessories, etc. as necessary for a complete grounding and bonding system.
- D. Where conductor size is not indicated, size to comply with NFPA 70 but not less than applicable minimum size requirements specified.

- E. Bonding and Equipment Grounding:
1. Provide bonding for equipment grounding conductors, equipment ground busses, metallic equipment enclosures, metallic raceways and boxes, device grounding terminals, and other normally non-current-carrying conductive materials enclosing electrical conductors/equipment or likely to become energized as indicated and in accordance with NFPA 70.
 2. Provide insulated equipment grounding conductor in each feeder and branch circuit raceway. Do not use raceways as sole equipment grounding conductor.
 3. Where circuit conductor sizes are increased for voltage drop, increase size of equipment grounding conductor proportionally in accordance with NFPA 70.
 4. Unless otherwise indicated, connect wiring device grounding terminal to branch circuit equipment grounding conductor and to outlet box with bonding jumper.
 5. Terminate branch circuit equipment grounding conductors on solidly bonded equipment ground bus only. Do not terminate on neutral (grounded) or isolated/insulated ground bus.
 6. Provide bonding jumper across expansion or expansion/deflection fittings provided to accommodate conduit movement.
- F. Pole-Mounted Luminaires: Also comply with Section 26 5600.

2.02 GROUNDING AND BONDING COMPONENTS

- A. General Requirements:
1. Provide products listed, classified, and labeled as suitable for the purpose intended.
 2. Provide products listed and labeled as complying with UL 467 where applicable.
- B. Conductors for Grounding and Bonding, in Addition to Requirements of Section 26 0526:
1. Use insulated copper conductors unless otherwise indicated.
 - a. Exceptions:
 - 1) Use bare copper conductors where installed underground in direct contact with earth.
 - 2) Use bare copper conductors where directly encased in concrete (not in raceway).
- C. Connectors for Grounding and Bonding:
1. Description: Connectors appropriate for the application and suitable for the conductors and items to be connected; listed and labeled as complying with UL 467.
 2. Unless otherwise indicated, use exothermic welded connections for underground, concealed and other inaccessible connections.
 3. Unless otherwise indicated, use mechanical connectors, compression connectors, or exothermic welded connections for accessible connections.
 4. Manufacturers - Mechanical and Compression Connectors:
 - a. Advanced Lightning Technology (ALT): www.altfab.com.
 - b. Burndy LLC: www.burndy.com.
 - c. Thomas & Betts Corporation: www.tnb.com.
 5. Manufacturers - Exothermic Welded Connections:
 - a. Burndy LLC: www.burndy.com.
 - b. Cadweld, a brand of Erico International Corporation: www.erico.com.
 - c. ThermOweld, a brand of Continental Industries, Inc: www.thermoweld.com.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that work likely to damage grounding and bonding system components has been completed.
- B. Verify that field measurements are as indicated.
- C. Verify that conditions are satisfactory for installation prior to starting work.

3.02 INSTALLATION

- A. Install products in accordance with manufacturer's instructions.
- B. Perform work in accordance with NECA 1 (general workmanship).
- C. Make grounding and bonding connections using specified connectors.
 - 1. Remove appropriate amount of conductor insulation for making connections without cutting, nicking or damaging conductors. Do not remove conductor strands to facilitate insertion into connector.
 - 2. Remove nonconductive paint, enamel, or similar coating at threads, contact points, and contact surfaces.
 - 3. Exothermic Welds: Make connections using molds and weld material suitable for the items to be connected in accordance with manufacturer's recommendations.
 - 4. Mechanical Connectors: Secure connections according to manufacturer's recommended torque settings.
 - 5. Compression Connectors: Secure connections using manufacturer's recommended tools and dies.
- D. Identify grounding and bonding system components in accordance with Section 26 0553.

3.03 FIELD QUALITY CONTROL

- A. Inspect and test in accordance with NETA ATS except Section 4.
- B. Perform inspections and tests listed in NETA ATS, Section 7.13.
- C. Perform ground electrode resistance tests under normally dry conditions. Precipitation within the previous 48 hours does not constitute normally dry conditions.
- D. Investigate and correct deficiencies where measured ground resistances do not comply with specified requirements.

END OF SECTION

SECTION 26 0529 - HANGERS AND SUPPORTS FOR ELECTRICAL SYSTEMS**PART 1 GENERAL****1.01 SECTION INCLUDES**

- A. Support and attachment requirements and components for equipment, conduit, cable, boxes, and other electrical work.

1.02 RELATED REQUIREMENTS

- A. Division 01 - General Requirements: Project administrative and procedural requirements.
- B. Division 02 - Existing Conditions: Demolition, cleaning and disposal requirements, and cutting and patching requirements.
- C. Division 03 - Concrete: Concrete equipment pads.
- D. Section 26 0005 - Basic Electrical Requirements.
- E. Section 26 0533.13 - Conduit for Electrical Systems: Additional support and attachment requirements for conduits.
- F. Section 26 0533.16 - Boxes for Electrical Systems: Additional support and attachment requirements for boxes.
- G. Section 26 5100 - Interior Lighting: Additional support and attachment requirements for interior luminaires.
- H. Section 26 5600 - Exterior Lighting: Additional support and attachment requirements for exterior luminaires.

1.03 REFERENCE STANDARDS

- A. ASTM A123/A123M - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products 2017.
- B. ASTM A153/A153M - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware 2016a.
- C. MFMA-4 - Metal Framing Standards Publication 2004.
- D. NECA 1 - Standard for Good Workmanship in Electrical Construction 2015.
- E. NFPA 70 - National Electrical Code Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
- F. UL 5B - Strut-Type Channel Raceways and Fittings Current Edition, Including All Revisions.

1.04 ADMINISTRATIVE REQUIREMENTS

- A. Coordination:
 - 1. Coordinate sizes and arrangement of supports and bases with the actual equipment and components to be installed.
 - 2. Coordinate the work with other trades to provide additional framing and materials required for installation.
 - 3. Coordinate compatibility of support and attachment components with mounting surfaces at the installed locations.
 - 4. Coordinate the arrangement of supports with ductwork, piping, equipment and other potential conflicts installed under other sections or by others.
 - 5. Notify Strategic Energy Solutions, Inc. of any conflicts with or deviations from the contract documents. Obtain direction before proceeding with work.
- B. Sequencing:
 - 1. Do not install products on or provide attachment to concrete surfaces until concrete has fully cured in accordance with Division 03.

1.05 SUMMARY

- A. The work covered under this section consists of the furnishing of all necessary labor, supervision, materials, equipment, and services to completely execute the system of conduit hangers and supports as described in this specification.
- B. Rated Strength: Adequate in tension, shear, and pullout force to resist maximum loads calculated or imposed for this project, with a minimum structural safety factor of five times the applied force.

1.06 QUALITY ASSURANCE

- A. Comply with NFPA 70.
- B. Comply with applicable building code.

1.07 DELIVERY, STORAGE, AND HANDLING

- A. Receive, inspect, handle, and store products in accordance with manufacturer's instructions.
- B. Conduit hangers and supports shall have the manufacturer's name and part number stamped on the part for identification.
- C. Manufacturer: Company specializing in manufacturing products specified in this section with a minimum of five years documented experience in the industry, and certified ISO 9000.

1.08 COORDINATION

- A. Coordinate size and location of concrete bases. Cast anchor-bolt inserts into bases. Concrete, reinforcement, and formwork requirements are specified in Division 03.
- B. Coordinate installation of roof curbs, equipment supports, and roof penetrations.

PART 2 PRODUCTS**2.01 SUPPORT AND ATTACHMENT COMPONENTS**

- A. General Requirements:
 - 1. Provide all required hangers, supports, anchors, fasteners, fittings, accessories, and hardware as necessary for the complete installation of electrical work.
 - 2. Provide products listed, classified, and labeled as suitable for the purpose intended, where applicable.
 - 3. Where support and attachment component types and sizes are not indicated, select in accordance with manufacturer's application criteria as required for the load to be supported. Include consideration for vibration, equipment operation, and shock loads where applicable.
 - 4. Do not use products for applications other than as permitted by NFPA 70 and product listing.
 - 5. Steel Components: Use corrosion resistant materials suitable for the environment where installed.
 - a. Zinc-Plated Steel: Electroplated in accordance with ASTM B633.
 - b. Galvanized Steel: Hot-dip galvanized after fabrication in accordance with ASTM A123/A123M or ASTM A153/A153M.
- B. Conduit and Cable Supports: Straps, clamps, etc. suitable for the conduit or cable to be supported.
 - 1. Conduit Straps: One-hole or two-hole type; steel or malleable iron.
 - 2. Conduit Clamps: Bolted type unless otherwise indicated.
 - 3. Manufacturers:
 - a. Cooper Crouse-Hinds, a division of Eaton Corporation: www.cooperindustries.com/#sle.
 - b. Erico International Corporation: www.erico.com/#sle.
 - c. O-Z/Gedney, a brand of Emerson Electric Co: www.emerson.com/#sle.

- d. Thomas & Betts Corporation: www.tnb.com/#sle.
- C. Outlet Box Supports: Hangers, brackets, etc. suitable for the boxes to be supported.
 - 1. Manufacturers:
 - a. Cooper Crouse-Hinds, a division of Eaton Corporation: www.cooperindustries.com/#sle.
 - b. Erico International Corporation: www.erico.com/#sle.
 - c. O-Z/Gedney, a brand of Emerson Electric Co: www.emerson.com/#sle.
 - d. Thomas & Betts Corporation: www.tnb.com/#sle.
- D. Metal Channel (Strut) Framing Systems: Factory-fabricated continuous-slot metal channel (strut) and associated fittings, accessories, and hardware required for field-assembly of supports.
 - 1. Comply with MFMA-4.
 - 2. Channel (Strut) Used as Raceway (only where specifically indicated): Listed and labeled as complying with UL 5B.
 - 3. Manufacturers:
 - a. Cooper B-Line, a division of Eaton Corporation: www.cooperindustries.com/#sle.
 - b. Thomas & Betts Corporation: www.tnb.com/#sle.
 - c. Unistrut, a brand of Atkore International Inc: www.unistrut.com/#sle.
 - d. Source Limitations: Furnish channels (struts) and associated fittings, accessories, and hardware produced by a single manufacturer.
- E. Hanger Rods: Threaded zinc-plated steel unless otherwise indicated.
 - 1. Minimum Size, Unless Otherwise Indicated or Required:
 - a. Equipment Supports: 1/2 inch diameter.
 - b. Single Conduit up to 1 inch (27 mm) trade size: 1/4 inch diameter.
- F. Anchors and Fasteners:
 - 1. Unless otherwise indicated and where not otherwise restricted, use the anchor and fastener types indicated for the specified applications.
 - 2. Manufacturers - Powder-Actuated Fastening Systems:
 - a. Hilti, Inc: www.us.hilti.com/#sle.
 - b. ITW Ramset, a division of Illinois Tool Works, Inc: www.ramset.com/#sle.
 - c. Powers Fasteners, Inc: www.powers.com/#sle.
 - d. Simpson Strong-Tie Company Inc: www.strongtie.com/#sle.
- G. Hangers, Supports, Anchors, and Fasteners - General: Protective zinc coating either Electro-Plated (ASTM B633 SCI or SC3), Pre-Galvanized (ASTM a525 coating designation G90) or Hot-Dip Galvanized after fabrication (ASTM A123). The minimum thickness of zinc coating shall be 0.2 mill (5 micrometers)..
- H. Provide materials of size and type adequate to carry the loads of equipment and conduit, including weight of wire in conduit.
 - 1. Product: Pre-galvanized strut.
 - 2. Product: Hilti DX Series
- I. Conduit Hangers:
 - 1. Shall have a vertical load limit of 100 lbs, and a horizontal load limit of 25 lbs..
 - 2. Shall be available with either a plain hole for 1/4" bolt or a 1/4-20 thread impression.
 - 3. Shall be available for 3/8" through 2" EMT, rigid, and aluminum conduit.
 - 4. Shall be available pre-assembled with manufacturer's specialty fasteners for connection to building structures like beam, flange, drop wire/rod, wood structure, concrete and acoustical tee grid.
- J. Wire Rope Hangers:
 - 1. Wire rope hanger assemblies shall be made of galvanized steel.

2. Hanger shall meet the fire rating requirements for DIN 4102-2 for 30 minutes at 30 percent of rated load.
3. Rope hangers shall have a minimum safety factor of 5:1.
4. Rope hangers are not permitted to support conduits.
5. Rope hangers are permitted to hang light fixtures, where applicable.
6. Hangers shall be fully adjustable.
7. Manufacturer of wire rope hangers shall be:
 - a. ERICO, INC., Speed Link series.

PART 3 EXECUTION

3.01 INSTALLATION

- A. Provide independent support from building structure. Do not provide support from piping, ductwork, or other systems.
- B. Unless specifically indicated or approved by Strategic Energy Solutions, Inc., do not provide support from suspended ceiling support system or ceiling grid.
- C. Unless specifically indicated or approved by Strategic Energy Solutions, Inc., do not provide support from roof deck.
- D. Do not penetrate or otherwise notch or cut structural members without approval of Structural Engineer.
- E. Equipment Support and Attachment:
 1. Use metal fabricated supports or supports assembled from metal channel (strut) to support equipment as required.
 2. Use metal channel (strut) secured to studs to support equipment surface-mounted on hollow stud walls when wall strength is not sufficient to resist pull-out.
 3. Use metal channel (strut) to support surface-mounted equipment in wet or damp locations to provide space between equipment and mounting surface.
 4. Securely fasten floor-mounted equipment. Do not install equipment such that it relies on its own weight for support.
- F. Secure fasteners according to manufacturer's recommended torque settings.
- G. Remove temporary supports.

3.02 FIELD QUALITY CONTROL

- A. Inspect support and attachment components for damage and defects.
- B. Repair cuts and abrasions in galvanized finishes using zinc-rich paint recommended by manufacturer. Replace components that exhibit signs of corrosion.
- C. Correct deficiencies and replace damaged or defective support and attachment components.
- D. Mounting and Anchorage of surface-mounted equipment and components: Anchor and fasten electrical items and their supports to building structural elements by the following methods unless otherwise indicated by code:
 1. To wood: Fasten with lag screws or through bolts.
 2. To new concrete: Bolt to concrete inserts
 3. To Masonry: Approved toggle-type bolts on hollow masonry units and expansion anchor fasteners on solid masonry units.
 4. Instead of expansion anchors, powder-actuated driven threaded studs provided with lock washers and nuts may be used in existing standard-weight concrete 4-inches thick or greater. Do not use for anchorage to lightweight-aggregate concrete or for slabs less than 4 inches thick.
 5. To Steel: Beam clamps (MSS type 19,21,23,25,or 27) complying with MSS SP-69.
 6. To light steel: Sheet metal screws.

END OF SECTION

SECTION 26 0533.13 - CONDUIT FOR ELECTRICAL SYSTEMS**PART 1 GENERAL****1.01 SECTION INCLUDES**

- A. Galvanized steel rigid metal conduit (RMC).
- B. Electrical metallic tubing (EMT).
- C. Conduit fittings.
- D. Accessories.
- E. Conduit, fittings and conduit bodies.

1.02 RELATED REQUIREMENTS

- A. Division 01 - General Requirements: Project administrative and procedural requirements.
- B. Division 02 - Existing Conditions: Demolition, cleaning and disposal requirements, cutting and patching requirements, and repairs.
- C. Division 07 - Thermal and Moisture Protection: Firestopping.
- D. Section 26 0005 - Basic Electrical Requirements.
- E. Section 26 0519 - Low-Voltage Electrical Power Conductors and Cables.
- F. Section 26 0526 - Grounding and Bonding for Electrical Systems.
- G. Section 26 0529 - Hangers and Supports for Electrical Systems.
- H. Section 26 0533.16 - Boxes for Electrical Systems.

1.03 REFERENCE STANDARDS

- A. ANSI C80.1 - American National Standard for Electrical Rigid Steel Conduit (ERSC) 2020.
- B. ANSI C80.3 - American National Standard for Electrical Metallic Tubing -- Steel (EMT-S) 2020.
- C. NECA 1 - Standard for Good Workmanship in Electrical Construction 2015.
- D. NECA 101 - Standard for Installing Steel Conduits (Rigid, IMC, EMT) 2013.
- E. NECA 111 - Standard for Installing Nonmetallic Raceways (RNC, ENT, LFNC) 2017.
- F. NEMA FB 1 - Fittings, Cast Metal Boxes, and Conduit Bodies for Conduit, Electrical Metallic Tubing, and Cable 2014.
- G. NFPA 70 - National Electrical Code Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
- H. UL 6 - Electrical Rigid Metal Conduit-Steel Current Edition, Including All Revisions.
- I. UL 514B - Conduit, Tubing, and Cable Fittings Current Edition, Including All Revisions.
- J. UL 797 - Electrical Metallic Tubing-Steel Current Edition, Including All Revisions.

1.04 ADMINISTRATIVE REQUIREMENTS

- A. Coordination:
 - 1. Coordinate minimum sizes of conduits with the actual conductors to be installed, including adjustments for conductor sizes increased for voltage drop.
 - 2. Coordinate the arrangement of conduits with structural members, ductwork, piping, equipment and other potential conflicts installed under other sections or by others.
 - 3. Verify exact conduit termination locations required for boxes, enclosures, and equipment installed under other sections or by others.
 - 4. Coordinate the work with other trades to provide roof penetrations that preserve the integrity of the roofing system and do not void the roof warranty.
 - 5. Notify Strategic Energy Solutions, Inc. of any conflicts with or deviations from Contract Documents. Obtain direction before proceeding with work.

- B. Sequencing:
 - 1. Do not begin installation of conductors and cables until installation of conduit is complete between outlet, junction and splicing points.

1.05 QUALITY ASSURANCE

- A. Conform to requirements of NFPA 70.
- B. Products: Listed and classified by Underwriters Laboratories Inc. as suitable for purpose specified and shown.

PART 2 PRODUCTS

2.01 CONDUIT APPLICATIONS

- A. Do not use conduit and associated fittings for applications other than as permitted by NFPA 70 and product listing.
- B. Unless otherwise indicated and where not otherwise restricted, use the conduit types indicated for the specified applications. Where more than one listed application applies, comply with the most restrictive requirements. Where conduit type for a particular application is not specified, use galvanized steel rigid metal conduit.
- C. Concealed Within Masonry Walls: Use galvanized steel rigid metal conduit or electrical metallic tubing (EMT).
- D. Concealed Within Hollow Stud Walls: Use galvanized steel rigid metal conduit or electrical metallic tubing (EMT).
- E. Concealed Above Accessible Ceilings: Use galvanized steel rigid metal conduit or electrical metallic tubing (EMT).
- F. Interior, Damp or Wet Locations: Use galvanized steel rigid metal conduit.
- G. Exposed, Interior, Not Subject to Physical Damage: Use galvanized steel rigid metal conduit, intermediate metal conduit (IMC), or electrical metallic tubing (EMT).
- H. Exposed, Interior, Subject to Physical Damage: Use galvanized steel rigid metal conduit.
 - 1. Locations subject to physical damage include, but are not limited to:
 - a. Where exposed below 8 feet, except within electrical and communication rooms or closets.
- I. Connections to Luminaires Above Accessible Ceilings: Use flexible metal conduit.
 - 1. Maximum Length: 6 feet.
- J. Connections to Vibrating Equipment:
 - 1. Dry Locations: Use flexible metal conduit.
 - 2. Damp, Wet, or Corrosive Locations: Use liquidtight flexible metal conduit.
 - 3. Maximum Length: 6 feet unless otherwise indicated.
 - 4. Vibrating equipment includes, but is not limited to:
 - a. Transformers.
 - b. Motors.

2.02 CONDUIT REQUIREMENTS

- A. Existing Work: Where existing conduits are indicated to be reused, they may be reused only where they comply with specified requirements, are free from corrosion, and integrity is verified by pulling a mandrel through them.
- B. Provide all conduit, fittings, supports, and accessories required for a complete raceway system.
- C. Provide products listed, classified, and labeled as suitable for the purpose intended.
- D. Minimum Conduit Size, Unless Otherwise Indicated:
 - 1. Branch Circuits: 3/4 inch (21 mm) trade size.
 - 2. Flexible Connections to Luminaires: 1/2 inch (16 mm) trade size.

3. Underground, Interior: 1 inch (27 mm) trade size.
 4. Underground, Exterior: 1 inch (27 mm) trade size.
- E. Where conduit size is not indicated, size to comply with NFPA 70 but not less than applicable minimum size requirements specified.

2.03 GALVANIZED STEEL RIGID METAL CONDUIT (RMC)

- A. Manufacturers:
1. Allied Tube & Conduit: www.alliedeg.com/#sle.
 2. Republic Conduit: www.republic-conduit.com/#sle.
 3. Wheatland Tube, a Division of Zekelman Industries: www.wheatland.com/#sle.
- B. Description: NFPA 70, Type RMC galvanized steel rigid metal conduit complying with ANSI C80.1 and listed and labeled as complying with UL 6.
- C. Fittings:
1. Non-Hazardous Locations: Use fittings complying with NEMA FB 1 and listed and labeled as complying with UL 514B.
 2. Material: Use steel or malleable iron.
 3. Connectors and Couplings: Use threaded type fittings only. Threadless set screw and compression (gland) type fittings are not permitted.

2.04 FLEXIBLE METAL CONDUIT (FMC)

- A. Manufacturers:
1. AFC Cable Systems, Inc: www.afcweb.com.
 2. Electri-Flex Company: www.electriflex.com.
 3. International Metal Hose: www.metalhose.com.
- B. Description: NFPA 70, Type FMC standard wall steel flexible metal conduit listed and labeled as complying with UL 1, and listed for use in classified firestop systems to be used.
- C. Fittings:
1. Description: Fittings complying with NEMA FB 1 and listed and labeled as complying with UL 514B.
 2. Material: Use steel or malleable iron.
- D. Description: Interlocked steel construction.
- E. Fittings: NEMA FB 1.

2.05 ELECTRICAL METALLIC TUBING (EMT)

- A. Manufacturers:
1. Allied Tube & Conduit: www.alliedeg.com.
 2. Beck Manufacturing, Inc: www.beckmfg.com.
 3. Wheatland Tube Company: www.wheatland.com.
- B. Description: NFPA 70, Type EMT steel electrical metallic tubing complying with ANSI C80.3 and listed and labeled as complying with UL 797.
- C. Fittings:
1. Manufacturers:
 - a. Bridgeport Fittings Inc: www.bptfittings.com/#sle.
 - b. O-Z/Gedney, a brand of Emerson Electric Co: www.emerson.com/#sle.
 - c. Thomas & Betts Corporation: www.tnb.com/#sle.
 2. Description: Fittings complying with NEMA FB 1 and listed and labeled as complying with UL 514B.
 3. Material: Use steel or malleable iron.
 4. Connectors and Couplings: Use compression (gland) or set-screw type.
 - a. Do not use indenter type connectors and couplings.

- D. Description: ANSI C80.3; galvanized tubing.
- E. Fittings and Conduit Bodies: NEMA FB 1; steel or malleable iron compression type.

2.06 ACCESSORIES

- A. Conduit Joint Compound: Corrosion-resistant, electrically conductive; suitable for use with the conduit to be installed.
- B. Pull Strings: Use nylon cord with average breaking strength of not less than 200 pound-force.
- C. Sealing Compound for Sealing Fittings: Listed for use with the particular fittings to be installed.
- D. Modular Seals for Conduit Penetrations: Rated for minimum of 40 psig; Suitable for the conduits to be installed.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that field measurements are as indicated.
- B. Verify that mounting surfaces are ready to receive conduits.
- C. Verify that conditions are satisfactory for installation prior to starting work.
- D. Verify routing and termination locations of conduit prior to rough-in.
- E. Conduit routing is shown on drawings in approximate locations unless dimensioned. Route as required to complete wiring system.

3.02 INSTALLATION

- A. Install products in accordance with manufacturer's instructions.
- B. Perform work in accordance with NECA 1 (general workmanship).
- C. Install galvanized steel rigid metal conduit (RMC) in accordance with NECA 101.
- D. Conduit Routing:
 - 1. Unless dimensioned, conduit routing indicated is diagrammatic.
 - 2. When conduit destination is indicated without specific routing, determine exact routing required.
 - 3. Conceal all conduits unless specifically indicated to be exposed.
 - 4. Conduits in the following areas may be exposed, unless otherwise indicated:
 - a. Electrical rooms.
 - b. Mechanical equipment rooms.
 - c. Within joists in areas with no ceiling.
 - 5. Unless otherwise approved, do not route conduits exposed:
 - a. Across floors.
 - b. Across roofs.
 - c. Across top of parapet walls.
 - d. Across building exterior surfaces.
 - 6. Conduits installed underground or embedded in concrete may be routed in the shortest possible manner unless otherwise indicated. Route all other conduits parallel or perpendicular to building structure and surfaces, following surface contours where practical.
 - 7. Arrange conduit to maintain adequate headroom, clearances, and access.
 - 8. Arrange conduit to provide no more than the equivalent of four 90 degree bends between pull points.
 - 9. Arrange conduit to prevent moisture traps. Provide drain fittings at low points and at sealing fittings where moisture may collect.
 - 10. Group parallel conduits in the same area together on a common rack.
- E. Conduit Support:

1. Secure and support conduits in accordance with NFPA 70 and Section 26 0529 using suitable supports and methods approved by the authority having jurisdiction.
 2. Provide independent support from building structure. Do not provide support from piping, ductwork, or other systems.
 3. Installation Above Suspended Ceilings: Do not provide support from ceiling support system. Do not provide support from ceiling grid or allow conduits to lay on ceiling tiles.
 4. Use conduit strap to support single surface-mounted conduit.
 - a. Use clamp back spacer with conduit strap for damp and wet locations to provide space between conduit and mounting surface.
 5. Use metal channel (strut) with accessory conduit clamps to support multiple parallel surface-mounted conduits.
 6. Use conduit clamp to support single conduit from beam clamp or threaded rod.
 7. Use trapeze hangers assembled from threaded rods and metal channel (strut) with accessory conduit clamps to support multiple parallel suspended conduits.
 8. Use of wire for support of conduits is not permitted.
- F. Connections and Terminations:
1. Use approved zinc-rich paint or conduit joint compound on field-cut threads of galvanized steel conduits prior to making connections.
 2. Where two threaded conduits must be joined and neither can be rotated, use three-piece couplings or split couplings. Do not use running threads.
 3. Use suitable adapters where required to transition from one type of conduit to another.
 4. Terminate threaded conduits in boxes and enclosures using threaded hubs or double lock nuts for dry locations and raintight hubs for wet locations.
 5. Provide insulating bushings or insulated throats at all conduit terminations to protect conductors.
 6. Secure joints and connections to provide maximum mechanical strength and electrical continuity.
- G. Penetrations:
1. Do not penetrate or otherwise notch or cut structural members, including footings and grade beams, without approval of Structural Engineer.
 2. Make penetrations perpendicular to surfaces unless otherwise indicated.
 3. Provide sleeves for penetrations as indicated or as required to facilitate installation. Set sleeves flush with exposed surfaces unless otherwise indicated or required.
 4. Conceal bends for conduit risers emerging above ground.
 5. Seal interior of conduits entering the building from underground at first accessible point to prevent entry of moisture and gases.
 6. Where conduits penetrate waterproof membrane, seal as required to maintain integrity of membrane.
 7. Make penetrations for roof-mounted equipment within associated equipment openings and curbs where possible to minimize roofing system penetrations. Where penetrations are necessary, seal as indicated or as required to preserve integrity of roofing system and maintain roof warranty. Include proposed locations of penetrations and methods for sealing with submittals.
 8. Install firestopping to preserve fire resistance rating of partitions and other elements, using materials and methods specified in Division 07.
- H. Conduit Movement Provisions: Where conduits are subject to movement, provide expansion and expansion/deflection fittings to prevent damage to enclosed conductors or connected equipment. This includes, but is not limited to:
1. Where conduits cross structural joints intended for expansion, contraction, or deflection.
 2. Where calculated in accordance with NFPA 70 for rigid polyvinyl chloride (PVC) conduit installed above ground to compensate for thermal expansion and contraction.
 3. Where conduits are subject to earth movement by settlement or frost.

- I. Condensation Prevention: Where conduits cross barriers between areas of potential substantial temperature differential, provide sealing fitting or approved sealing compound at an accessible point near the penetration to prevent condensation. This includes, but is not limited to:
 - 1. Where conduits pass from outdoors into conditioned interior spaces.
 - 2. Where conduits pass from unconditioned interior spaces into conditioned interior spaces.
- J. Provide pull string in all empty conduits and in conduits where conductors and cables are to be installed by others. Leave minimum slack of 12 inches at each end.
- K. Provide grounding and bonding in accordance with Section 26 0526.
- L. Identify conduits in accordance with Section 26 0553.

3.03 CLEANING

- A. Clean interior of conduits to remove moisture and foreign matter.

3.04 PROTECTION

- A. Immediately after installation of conduit, use suitable manufactured plugs to provide protection from entry of moisture and foreign material and do not remove until ready for installation of conductors.

END OF SECTION

SECTION 26 0533.16 - BOXES FOR ELECTRICAL SYSTEMS**PART 1 GENERAL****1.01 SECTION INCLUDES**

- A. Outlet and device boxes up to 100 cubic inches, including those used as junction and pull boxes.
- B. Cabinets and enclosures, including junction and pull boxes larger than 100 cubic inches.

1.02 RELATED REQUIREMENTS

- A. Section 26 0005 - Basic Electrical Requirements.
- B. Section 26 0529 - Hangers and Supports for Electrical Systems.
- C. Section 26 0533.13 - Conduit for Electrical Systems:
- D. Section 26 2726 - Wiring Devices

1.03 REFERENCE STANDARDS

- A. NECA 1 - Standard for Good Workmanship in Electrical Construction 2015.
- B. NECA 130 - Standard for Installing and Maintaining Wiring Devices 2016.
- C. NEMA FB 1 - Fittings, Cast Metal Boxes, and Conduit Bodies for Conduit, Electrical Metallic Tubing, and Cable 2014.
- D. NEMA OS 1 - Sheet-Steel Outlet Boxes, Device Boxes, Covers, and Box Supports 2013 (Reaffirmed 2020).
- E. NEMA 250 - Enclosures for Electrical Equipment (1000 Volts Maximum) 2020.
- F. NFPA 70 - National Electrical Code Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
- G. UL 50 - Enclosures for Electrical Equipment, Non-Environmental Considerations Current Edition, Including All Revisions.
- H. UL 50E - Enclosures for Electrical Equipment, Environmental Considerations Current Edition, Including All Revisions.
- I. UL 514A - Metallic Outlet Boxes Current Edition, Including All Revisions.

1.04 ADMINISTRATIVE REQUIREMENTS

- A. Coordination:
 - 1. Coordinate the work with other trades to avoid placement of ductwork, piping, equipment, or other potential obstructions within the dedicated equipment spaces and working clearances for electrical equipment required by NFPA 70.
 - 2. Coordinate arrangement of electrical equipment with the dimensions and clearance requirements of the actual equipment to be installed.
 - 3. Coordinate minimum sizes of boxes with the actual installed arrangement of conductors, clamps, support fittings, and devices, calculated according to NFPA 70.
 - 4. Coordinate minimum sizes of pull boxes with the actual installed arrangement of connected conduits, calculated according to NFPA 70.
 - 5. Coordinate the placement of boxes with millwork, furniture, devices, equipment, etc. installed under other sections or by others.
 - 6. Coordinate the work with other trades to preserve insulation integrity.
 - 7. Coordinate the work with other trades to provide walls suitable for installation of flush-mounted boxes where indicated.
 - 8. Notify Strategic Energy Solutions, Inc. of any conflicts with or deviations from the contract documents. Obtain direction before proceeding with work.

1.05 QUALITY ASSURANCE

- A. Conform to requirements of NFPA 70.

PART 2 PRODUCTS

2.01 BOXES

- A. General Requirements:
1. Do not use boxes and associated accessories for applications other than as permitted by NFPA 70 and product listing.
 2. Provide all boxes, fittings, supports, and accessories required for a complete raceway system and to accommodate devices and equipment to be installed.
 3. Provide products listed, classified, and labeled as suitable for the purpose intended.
 4. Where box size is not indicated, size to comply with NFPA 70 but not less than applicable minimum size requirements specified.
 5. Provide grounding terminals within boxes where equipment grounding conductors terminate.
- B. Outlet and Device Boxes Up to 100 cubic inches, Including Those Used as Junction and Pull Boxes:
1. Use sheet-steel boxes for dry locations unless otherwise indicated or required.
 2. Use cast iron boxes or cast aluminum boxes for damp or wet locations unless otherwise indicated or required; furnish with compatible weatherproof gasketed covers.
 3. Use suitable concrete type boxes where flush-mounted in concrete.
 4. Use suitable masonry type boxes where flush-mounted in masonry walls.
 5. Use raised covers suitable for the type of wall construction and device configuration where required.
 6. Use shallow boxes where required by the type of wall construction.
 7. Do not use "through-wall" boxes designed for access from both sides of wall.
 8. Sheet-Steel Boxes: Comply with NEMA OS 1, and list and label as complying with UL 514A.
 9. Cast Metal Boxes: Comply with NEMA FB 1, and list and label as complying with UL 514A; furnish with threaded hubs.
 10. Boxes for Supporting Luminaires and Ceiling Fans: Listed as suitable for the type and weight of load to be supported; furnished with fixture stud to accommodate mounting of luminaire where required.
 11. Boxes for Ganged Devices: Use multigang boxes of single-piece construction. Do not use field-connected gangable boxes unless specifically indicated or permitted.
 12. Wall Plates: Comply with Section 26 2726.
 13. Manufacturers:
 - a. Cooper Crouse-Hinds, a division of Eaton Corporation: www.cooperindustries.com/#sle.
 - b. Hubbell Incorporated; Bell Products: www.hubbell-rtb.com.
 - c. Hubbell Incorporated; RACO Products: www.hubbell-rtb.com.
 - d. Thomas & Betts Corporation: www.tnb.com/#sle.
- C. Cabinets and Enclosures, Including Junction and Pull Boxes Larger Than 100 cubic inches:
1. Comply with NEMA 250, and list and label as complying with UL 50 and UL 50E, or UL 508A.
 2. NEMA 250 Environment Type, Unless Otherwise Indicated:
 3. Junction and Pull Boxes Larger Than 100 cubic inches:
 - a. Provide screw-cover or hinged-cover enclosures unless otherwise indicated.
- D. Manufacturers:
1. The Wiremold Company: www.wiremold.com.
 2. Thomas & Betts Corporation: www.tnb.com.

3. Hubbell Raco: www.hubbell.com/raco/en.
- E. Minimum size for communications, fire alarm, sound system and security system rough-ins shall be 4" square, 3-1/2" deep unless otherwise noted.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that field measurements are as indicated.
- B. Verify that mounting surfaces are ready to receive boxes.
- C. Verify that conditions are satisfactory for installation prior to starting work.

3.02 INSTALLATION

- A. Install products in accordance with manufacturer's instructions.
- B. Install boxes in accordance with NECA 1 (general workmanship) and, where applicable, NECA 130, including mounting heights specified in those standards where mounting heights are not indicated.
- C. Arrange equipment to provide minimum clearances in accordance with manufacturer's instructions and NFPA 70.
- D. Provide separate boxes for emergency power and normal power systems.
- E. Unless otherwise indicated, provide separate boxes for line voltage and low voltage systems.
- F. Flush-mount boxes in finished areas unless specifically indicated to be surface-mounted.
- G. Unless otherwise indicated, boxes may be surface-mounted where exposed conduits are indicated or permitted.
- H. Box Locations:
 1. Locate boxes to be accessible. Provide access panels in accordance with Division 08 as required where approved by the Architect.
 2. Unless dimensioned, box locations indicated are approximate.
 3. Locate boxes so that wall plates do not span different building finishes.
 4. Locate boxes so that wall plates do not cross masonry joints.
 5. Unless otherwise indicated, where multiple outlet boxes are installed at the same location at different mounting heights, install along a common vertical center line.
 6. Fire Resistance Rated Walls: Install flush-mounted boxes such that the required fire resistance will not be reduced.
 - a. Do not install flush-mounted boxes on opposite sides of walls back-to-back; provide minimum 24 inches separation where wall is constructed with individual noncommunicating stud cavities or protect both boxes with listed putty pads.
 7. Locate junction and pull boxes as indicated, as required to facilitate installation of conductors, and to limit conduit length and/or number of bends between pulling points in accordance with Section 26 0533.13.
- I. Box Supports:
 1. Secure and support boxes in accordance with NFPA 70 and Section 26 0529 using suitable supports and methods approved by the authority having jurisdiction.
 2. Provide independent support from building structure except for cast metal boxes (other than boxes used for fixture support) supported by threaded conduit connections in accordance with NFPA 70. Do not provide support from piping, ductwork, or other systems.
 3. Installation Above Suspended Ceilings: Do not provide support from ceiling grid or ceiling support system.
- J. Install boxes plumb and level.
- K. Install boxes as required to preserve insulation integrity.

- L. Install permanent barrier between ganged wiring devices when voltage between adjacent devices exceeds 300 V.
- M. Install firestopping to preserve fire resistance rating of partitions and other elements, using materials and methods specified in Division 07.
- N. Close unused box openings.
- O. Install blank wall plates on junction boxes and on outlet boxes with no devices or equipment installed or designated for future use.
- P. Provide grounding and bonding in accordance with Section 26 0526.

3.03 PROTECTION

- A. Immediately after installation, protect boxes from entry of moisture and foreign material until ready for installation of conductors.

END OF SECTION

SECTION 26 0935 - DISTRIBUTED DIGITAL LIGHTING CONTROL SYSTEM**PART 1 GENERAL****1.01 SECTION INCLUDES**

- A. Distributed Digital Lighting Control System
- B. Digital Load Controllers (Room and Fixture Controllers)
- C. Digital Wall or Ceiling Mounted Occupancy Sensor
- D. Digital Wall Switch Occupancy Sensors
- E. Digital Wall Switches

1.02 RELATED REQUIREMENTS

- A. Division 01 - General Requirements: Project administrative and procedural requirements.
- B. Section 26 0005 - Basic Electrical Requirements.
- C. Section 26 0529 - Hangers and Supports for Electrical Systems.
- D. Section 26 0533.13 - Conduit for Electrical Systems.
- E. Section 26 0533.16 - Boxes for Electrical Systems.
- F. Section 26 0553 - Identification for Electrical Systems: Identification products and requirements.
- G. Section 26 0573 - Power System Studies.
- H. Section 26 2726 - Wiring Devices: wall switches and wall dimmers.
- I. Section 26 2813 - Fuses.
- J. Section 26 3323 - Central Battery Equipment and Inverters.
- K. Section 26 5100 - Interior Lighting.
- L. Section 26 5600 - Exterior Lighting.

1.03 REFERENCE STANDARDS

- A. FCC Article 15, Section J, Class A.
- B. NECA 1 - Standard for Good Workmanship in Electrical Construction; 2010.
- C. NEMA WD 7 - Occupancy Motion Sensors Standard; Current Edition.
- D. NETA ATS - Acceptance Testing Specifications for Electrical Power Equipment and Systems; 2013.
- E. NFPA 70 - National Electrical Code; Most recent edition adopted by Authority Having Jurisdiction, including all applicable Amendments and Supplements.
- F. UL 508 - Standard for Industrial Control Equipment; Current Edition, including all Revisions.
- G. UL 916 - Standard for Energy Management Equipment; Current Edition, including all Revisions.
- H. UL 924 - Standard for Emergency Lighting and Power Equipment
- I. UL 2043 - Standard for Fire Test for Heat and Visible Smoke Release for Discrete Products Installed in Air-Handling Spaces.

1.04 DESIGN / PERFORMANCE REQUIREMENTS

- A. Digital lighting control system shall accommodate the square-footage coverage requirements for each area controlled, utilizing room controllers, digital occupancy sensors, switches, daylighting sensors and accessories that suit the required lighting and electrical system parameters.
- B. System shall comply with FCC emission standards specified in part 15, sub-part J for commercial and residential application.

1.05 ADMINISTRATIVE REQUIREMENTS

- A. Contractor shall provide submittals for equipment listed herein. Refer to Division 01 - General Requirements for submittal procedures.
- B. Product Data: Manufacturer's data sheets on each product to be used, including:
 - 1. Catalog sheets and specifications.
 - 2. Ratings, configurations, standard wiring diagrams, dimensions, colors, service condition requirements, and installed features.
 - 3. Storage and handling requirements and recommendations.
 - 4. Installation instructions.
- C. Shop Drawings: Wiring diagrams a for the various components of the System specified including:
 - 1. Composite wiring and/or schematic diagram of each control circuit as proposed to be installed.
 - 2. Show location of all devices, including at minimum sensors, load controllers, and switches/dimmers for each area on reflected ceiling plans.
 - 3. Provide room/area details including products and sequence of operation for each room or area. Illustrate typical acceptable room/area connection topologies.
 - 4. Network riser diagram including floor and building level details. Include network cable specification. Illustrate points of connection to integrated systems. Coordinate integration with mechanical and/or other trades.
- D. Manufacturer's Certificates: Certify products meet or exceed specified requirements.
- E. Closeout Submittals:
 - 1. Project Record Documents: Record actual installed locations and settings for lighting control devices.
 - 2. Operation and Maintenance Manual:
 - a. Include approved Shop Drawings and Product Data.
 - b. Include Sequence of Operation, identifying operation for each room or space.
 - c. Include manufacturer's maintenance information.
 - d. Operation and Maintenance Data: Include detailed information on device programming and setup.
 - e. Include startup and test reports.

1.06 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing of centralized and distributed lighting control systems with a minimum of 10 years documented experience.
- B. Installer Qualifications: Company certified by the manufacturer and specializing in installation of networked lighting control products with minimum three years documented experience.
- C. System Components: Demonstrate that individual components have undergone quality control and testing prior to shipping.

1.07 PRE-INSTALLATION MEETINGS

- A. Convene minimum two weeks prior to commencing Work of this section. Meeting to be attended by Contractor, Architect, system installer, factory authorized manufacturer's representative, and representative of all trades related to the system installation.
- B. Review installation procedures and coordination required with related Work and the following:
 - 1. Confirm the location and mounting of all devices, with special attention to placement of switches, dimmers, and any sensors.
 - 2. Review the specifications for low voltage control wiring and termination.
 - 3. Discuss the functionality and configuration of all products, including sequences of operation, per design requirements.
 - 4. Discuss requirements for integration with other trades

- C. Inspect and make notes of job conditions prior to installation:
 - 1. Record minutes of the conference and provide copies to all parties present.
 - 2. Identify all outstanding issues in writing designating the responsible party for follow-up action and the timetable for completion.
 - 3. Installation shall not begin until all outstanding issues are resolved to the satisfaction of the Architect.

1.08 PROJECT CONDITIONS

- A. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's absolute limits.
- B. Do not install equipment until following conditions can be maintained in spaces to receive equipment:
 - 1. Ambient temperature: 32 to 104 degrees F (0 to 40 degrees C).
 - 2. Relative humidity: Maximum 90 percent, non-condensing.

1.09 WARRANTY

- A. Manufacturer shall provide a 5 year limited warranty on products within this installation, except where otherwise noted, and consisting of a one for one device replacement.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Acceptable Manufacturers:
 - 1. Lutron
 - 2. Wattstopper (Legrand)
 - 3. Eaton Greengate
 - 4. nLight (Acuity Brands)
 - 5. Crestron
 - 6. Leviton
 - 7. Osram
 - 8. Engineer pre-approved equal.

2.02 DISTRIBUTED DIGITAL LIGHTING CONTROL SYSTEM

- A. System General: Provide digital lighting control system complete with all necessary enclosures, wiring, and system components to ensure a complete and properly functioning system as indicated on the Drawings and specified herein. If a conflict is identified, between the Drawing, this specification, contact the Engineer for clarification prior to proceeding.
 - 1. Space Control Requirements: Provide occupancy/vacancy sensors with Manual- or Partial-ON functionality as indicated in all spaces except toilet rooms, storerooms, library stacks, or other applications where hands-free operation is desirable and Automatic-ON occupancy sensors are more appropriate. Provide Manual-ON occupancy/vacancy sensors for any enclosed office, conference room, meeting room, open plan system and training room. For spaces with multiple occupants, or where line-of-sight may be obscured, provide ceiling- or corner-mounted sensors and Manual-ON switches.
 - 2. Daylit Areas: Provide daylight-responsive automatic control in all spaces (conditioned or unconditioned) where daylight contribution is available as defined by relevant local building energy code:
 - a. All luminaires within code-defined daylight zones shall be controlled separately from luminaires outside of daylight zones.
 - b. Daytime setpoints for total ambient illumination (combined daylight and electric light) levels that initiate dimming shall be programmed in compliance with relevant local building energy codes.

- c. Multiple-level switched daylight harvesting controls may be utilized for areas marked on drawings.
 - d. Provide smooth and continuous daylight dimming for areas marked on drawings. Daylighting control system may be designed to turn off electric lighting when daylight is at or above required lighting levels, only if system functions to turn lamps back on at dimmed level, rather than turning full-on prior to dimming.
 3. Conference, meeting, training, auditoriums, and multipurpose rooms shall have controls that allow for independent control of each local control zone. Rooms larger than 300 square feet shall instead have at least four preset lighting scenes unless otherwise specified. Occupancy / vacancy sensors shall be provided to turn off all lighting in the space. Spaces with up to four moveable walls shall include controls that can be reconfigured when the room is partitioned.
 - B. Equipment Required: Lighting Control and Automation system as defined under this section covers the following equipment.
 1. Digital Lighting Management (DLM) local network: Free topology, plug-in wiring system for power and data to room devices.
 2. Digital Fixture Controllers: Self-configuring, digitally addressable one relay fixture-integrated controllers for on/off/0-10V dimming control.
 3. Digital Occupancy Sensors: Self-configuring, digitally addressable, calibrated occupancy sensors with LCD display and two-way active infrared (IR) communications.
 4. Digital Switches: Self-configuring, digitally addressable pushbutton on/off, dimming, and scene switches with two-way active infrared (IR) communications.
 5. Digital Daylighting Sensors: Single-zone closed loop, multi-zone open loop and single-zone dual-loop daylighting sensors with two-way active infrared (IR) communications for daylight harvesting using switching, bi-level, tri-level or dimming control.
 - C. Local Network: Digital lighting control local network is a free topology lighting control physical connection and communication protocol designed to control a small area of a building.
 1. Features of the digital lighting control local network include:
 - a. Automatic configuration and binding of occupancy sensors, switches and lighting loads to the most energy-efficient sequence of operation based upon the device attached.
 - b. Simple replacement of any device in the local digital lighting control network with a standard off the shelf unit without requiring significant commissioning, configuration or setup.
 - c. Ability to change the automatic configuration, including binding and load parameters without tools, using only the buttons on the digital devices in the local network.
 - d. Two-way infrared communications for control by handheld remotes, and configuration by a handheld tool including adjusting load parameters, sensor configuration and binding, within a line of sight of up to 30 feet from a sensor, wall switch or IR receiver.
 2. Digital room devices connect to the local network using pre-terminated low voltage cables with RJ-45 connectors, which provide both data and power to room devices. Systems that utilize RJ-45 patch cords but do not provide serial communication data from individual end devices are not acceptable.
 3. If manufacturer's pre-terminated low voltage cables are not used for the installation each cable must be individually tested and observed by authorized service representative following installation.

2.03 DIGITAL LOAD CONTROLLERS (ROOM AND FIXTURE CONTROLLERS)

- A. Digital Load Controllers: Digital controllers for lighting zones, fixtures and/or plug loads automatically bind room loads to the connected control devices in the space without commissioning or the use of any tools. Provide controllers to match the room lighting and plug load control requirements. Controllers are simple to install, and do not have dip switches/potentiometers, or require special configuration for standard applications. Control units include the following features
1. Automatic room configuration to the most energy-efficient sequence of operation based upon the devices in the room.
 2. Simple replacement using the default automatic configuration capabilities, a room controller may be replaced with an off-the-shelf device.
 3. Multiple room controllers connected together in a local network must automatically arbitrate with each other, without requiring any configuration or setup, so that individual load numbers are assigned starting with load 1 to a maximum of 64, assigned based on each controller's device ID's from highest to lowest.
 4. Device Status LEDs to indicate:
 - a. Data transmission
 - b. Device has power
 - c. Status for each load
 - d. Configuration status
 5. Quick installation features including:
 - a. Standard junction box mounting
 - b. Quick low voltage connections using standard RJ-45 patch cable
 6. Based on individual configuration, each load shall be capable of the following behavior on power up following the loss of normal power:
 - a. Turn on to 100 percent
 - b. Turn off
 - c. Turn on to last level
 7. Each load be configurable to operate in the following sequences based on occupancy:
 - a. Auto-on/Auto-off (Follow on and off)
 - b. Manual-on/Auto-off (Follow off only)
 8. Polarity of each load output shall be reversible, via digital configuration, so that on is off and off is on.
 9. BACnet object information shall be available for the following objects:
 - a. Load status
 - b. Schedule state, normal or after-hours
 - c. Demand Response enable and disable
 - d. Room occupancy status
 - e. Total room lighting and plug loads watts
 - f. Electrical current
 - g. Total watts per controller
 - h. Total room watts/sq ft.
 - i. Force on/off all loads
 10. UL 2043 plenum rated
 11. Manual override and LED indication for each load
 12. Zero cross circuitry for each load
 13. All digital parameter data programmed into an individual room controller or plug load controller shall be retained in non-volatile FLASH memory within the controller itself. Memory shall have an expected life of no less than 10 years.
 14. Dimming Room Controllers shall share the following features:

- a. Each load shall have an independently configurable preset on level for Normal Hours and After Hours events to allow different dimmed levels to be established at the start of both Normal Hours and After Hours events.
 - b. Fade rates for dimming loads shall be specific to bound switch buttons, and the load shall maintain a default value for any bound buttons that do not specify a unique value.
 - c. The following dimming attributes may be changed or selected using a wireless configuration tool:
 - 1) Establish preset level for each load from 0-100 percent
 - 2) Set high and low trim for each load
 - 3) Initiate lamp burn in for each load of either 0, 12 or 100 hours
 - d. Override button for each load provides the following functions:
 - 1) Press and release for on/off control
 - 2) Press and hold for dimming control
 - e. Each dimming output channel shall have an independently configurable minimum and maximum calibration trim level to set the dimming range to match the true dynamic range of the connected ballast or driver. LED level indicators on bound dimming switches shall utilize this new maximum and minimum trim.
 - f. Each dimming output channel shall have an independently configurable minimum and maximum trim level to set the dynamic range of the output within the new 0-100 percent dimming range defined by the minimum and maximum calibration trim.
 - g. Calibration and trim levels must be set per output channel. Devices that set calibration or trim levels per controller (as opposed to per load) are not acceptable.
 - h. All configuration shall be digital. Devices that set calibration or trim levels per output channel via trim pots or dip-switches are not acceptable.
- B. Fixture Controllers shall include
1. A form factor and product ratings to allow various OEM fixture manufacturers to mount the device inside the ballast/driver cavity of standard-sized fluorescent or LED general lighting fixtures.
 2. One 3A 120/277V rated mechanically held relay.
 3. Programmable behavior on power up following the loss of normal power:
 - a. Turn on to 100 percent
 - b. Turn off
 - c. Turn on to last level
 4. Requirement for 7 mA of 24VDC operating power from the digital lighting control local network.
 5. Fixture Controller does not require a connection to a neutral conductor to operate, and unlike other types of Load Controllers it does not contribute power to the digital lighting control local network to drive accessory devices.
 6. Power to drive the fixture controller electronics can come from any room controller
 7. 0-10V dimming capability via a single 0-10 volt analog output from the device for control of compatible ballasts and LED drivers. The 0-10 volt output shall automatically open upon loss of power to the Fixture Controller.
 8. Connect to a single or dual RJ-45 adaptor with 24 inch leads. Single adaptor mounts in a 1/2 inch KO and dual adaptor in a 2.2 by 1.32 inch rectangular hole for connection to the digital lighting control local network.
 9. Adaptor leads are insulated for use in a fixture cavity, and the lead length allows the OEM fixture manufacturer flexibility to position the Fixture Controller and the RJ45 jack in the best locations on each fixture.
 10. A complete set of dimming features described above in the paragraph detailing On/Off/Dimming Enhanced Room Controllers.

2.04 DIGITAL WALL OR CEILING MOUNTED OCCUPANCY SENSOR

- A. Digital Occupancy Sensors shall provide graphic LCD display for digital calibration and electronic documentation. Features include the following:
1. Digital calibration and pushbutton configuration for the following variables:
 - a. Sensitivity, 0-100 percent in 10 percent increments
 - b. Time delay, 1-30 minutes in 1 minute increments
 - c. Test mode, Five second time delay
 - d. Detection technology, PIR, Ultrasonic or Dual Technology activation and/or re-activation.
 - e. Walk-through mode
 2. Load parameters including Auto/Manual-ON, blink warning, and daylight enable/disable when photosensors are included in the digital lighting control local network.
 3. Programmable control functionality including:
 - a. Each sensor may be programmed to control specific loads within a local network.
 - b. Sensor shall be capable of activating one of 16 user-definable lighting scenes.
 - c. Adjustable retrigger time period for manual-on loads. Load will retrigger (turn on) automatically within a configurable period of time (default 10 seconds) after turning off.
 - d. On dual technology sensors, independently configurable trigger modes are available for both Normal (NH) and After Hours (AH) time periods. The retrigger mode can be programmed to use the following technologies:
 - e. Ultrasonic and Passive Infrared
 - f. Ultrasonic or Passive Infrared
 - g. Ultrasonic only
 - h. Passive Infrared only
 - i. Independently configurable sensitivity settings for passive infrared and ultrasonic technologies (on dual technology sensors) for both Normal (NH) and After Hour (AH) time periods.
 4. One or two RJ-45 port(s) for connection to digital lighting control local network.
 5. Two-way infrared (IR) transceiver to allow remote programming through handheld commissioning tool and control by remote personal controls.
 6. Device Status LEDs, which may be disabled for selected applications, including:
 - a. PIR detection
 - b. Ultrasonic detection
 - c. Configuration mode
 - d. Load binding
 7. Assignment of occupancy sensor to a specific load within the room without wiring or special tools.
 8. Manual override of controlled loads.
 9. All digital parameter data programmed into an individual occupancy sensor shall be retained in non-volatile FLASH memory within the sensor itself. Memory shall have an expected life of no less than 10 years.
- B. BACnet object information shall be available for the following objects:
1. Detection state
 2. Occupancy sensor time delay
 3. Occupancy sensor sensitivity, PIR and Ultrasonic
- C. Units shall not have any dip switches or potentiometers for field settings
- D. Multiple occupancy sensors may be installed in a room by simply connecting them to the free topology digital lighting control local network. No additional configuration will be required.

2.05 DIGITAL WALL SWITCH OCCUPANCY SENSORS

- A. Digital Occupancy Sensors shall provide scrolling LCD display for digital calibration and electronic documentation. Features include the following:
1. Digital calibration and pushbutton configuration for the following variables:
 - a. Sensitivity: 0-100 percent in 10 percent increments
 - b. Time delay: 1-30 minutes in 1 minute increments
 - c. Test mode: Five second time delay
 - d. Detection technology: PIR, Dual Technology activation and/or re-activation.
 - e. Walk-through mode
 - f. Load parameters including Auto/Manual-ON, blink warning, and daylight enable/disable when photosensors are included in the digital lighting control local network.
 2. Programmable control functionality including:
 - a. Each sensor may be programmed to control specific loads within a local network.
 - b. Sensor shall be capable of activating one of 16 user-definable lighting scenes.
 - c. Adjustable retrigger time period for manual-on loads. Load will retrigger (turn on) automatically during the configurable period of time (default 10 seconds) after turning off.
 - d. On dual technology sensors, independently configurable trigger modes are available for both Normal (NH) and After Hours (AH) time periods. The retrigger mode can be programmed to use the following technologies:
 - 1) Ultrasonic and Passive Infrared
 - 2) Ultrasonic or Passive Infrared
 - 3) Ultrasonic only
 - 4) Passive Infrared only
 3. Independently configurable sensitivity settings for passive infrared and ultrasonic technologies (on dual technology sensors) for both Normal (NH) and After Hour (AH) time periods.
 4. Two RJ-45 ports for connection to digital lighting control local network.
 5. Two-way infrared (IR) transceiver to allow remote programming through handheld configuration tool and control by remote personal controls.
 6. Device Status LEDs including
 - a. PIR detection
 - b. Ultrasonic detection
 - c. Configuration mode
 - d. Load binding
 7. Assignment of any occupancy sensor to a specific load within the room without wiring or special tools.
 8. Assignment of local buttons to specific loads within the room without wiring or special tools
 9. Manual override of controlled loads
 10. All digital parameter data programmed into an individual wall switch sensor shall be retained in non-volatile FLASH memory within the wall switch sensor itself. Memory shall have an expected life of no less than 10 years.
- B. BACnet object information shall be available for the following objects:
1. Detection state
 2. Occupancy sensor time delay
 3. Occupancy sensor sensitivity, PIR and Ultrasonic
 4. Button state
 5. Switch lock control
 6. Switch lock status
- C. Units shall not have any dip switches or potentiometers for field settings.

- D. Multiple occupancy sensors may be installed in a room by simply connecting them to the free topology digital lighting control local network. No additional configuration will be required.
- E. Two-button wall switch occupancy sensors, when connected to a single relay dimming room or fixture controller, shall operate in the following sequence as a factory default:
 - 1. Left button
 - a. Press and release - Turn load on
 - b. Press and hold - Raise dimming load
 - 2. Right button
 - a. Press and release - Turn load off
 - b. Press and hold - Lower dimming load
- F. Low voltage momentary pushbuttons shall include the following features:
 - 1. Load/Scene Status LED on each switch button with the following characteristics:
 - a. Bi-level LED
 - b. Dim locator level indicates power to switch
 - c. Bright status level indicates that load or scene is active
 - 2. The following button attributes may be changed or selected using a wireless configuration tool:
 - a. Load and Scene button function may be reconfigured for individual buttons (from Load to Scene, and vice versa).
 - b. Individual button function may be configured to Toggle, On only or Off only.
 - c. Individual scenes may be locked to prevent unauthorized change.
 - d. Fade Up and Fade Down times for individual scenes may be adjusted from 0 seconds to 18 hours.
 - e. Ramp rate may be adjusted for each dimmer switch.
 - f. Switch buttons may be bound to any load on any load controller or relay panel and are not load type dependent; each button may be bound to multiple loads.

2.06 DIGITAL WALL SWITCHES

- A. Low voltage momentary pushbutton switches in 1, 2, 3, 4, 5 and 6 button configuration. Wall switches shall include the following features:
 - 1. Two-way infrared (IR) transceiver for use with personal and configuration remote controls.
 - 2. Removable buttons for field replacement with engraved buttons and/or alternate color buttons. Button replacement may be completed without removing the switch from the wall.
 - 3. Configuration LED on each switch that blinks to indicate data transmission.
 - 4. Load/Scene Status LED on each switch button with the following characteristics:
 - a. Bi-level LED
 - b. Dim locator level indicates power to switch
 - c. Bright status level indicates that load or scene is active
 - d. Dimming switches shall include seven bi-level LEDs to indicate load levels using 14 steps.
 - 5. Programmable control functionality including:
 - a. Button priority may be configured to any BACnet priority level, from 1-16, corresponding to networked operation allowing local actions to utilize life safety priority
 - b. Scene patterns may be saved to any button other than dimming rockers. Once set, buttons may be digitally locked to prevent overwriting of the preset levels.
 - 6. All digital parameter data programmed into an individual wall switch shall be retained in non-volatile FLASH memory within the wall switch itself. Memory shall have an expected life of no less than 10 years.
- B. BACnet object information shall be available for the following objects:
 - 1. Button state
 - 2. Switch lock control

3. Switch lock status
- C. Two RJ-45 ports for connection to digital lighting control local network.
- D. Multiple digital wall switches may be installed in a room by simply connecting them to the free topology digital lighting control local network. No additional configuration shall be required to achieve multi-way switching.
- E. Load and Scene button function may be reconfigured for individual buttons from Load to Scene, and vice versa.
 1. Individual button function may be configured to Toggle, On only or Off only.
 2. Individual scenes may be locked to prevent unauthorized change.
 3. Fade Up and Fade Down times for individual scenes may be adjusted from 0 seconds to 18 hours.
 4. Ramp rate may be adjusted for each dimmer switch.
 5. Switch buttons may be bound to any load on any load controller or relay panel and are not load type dependent; each button may be bound to multiple loads.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Do not begin installation until measurements have been verified and work areas have been properly prepared.
- B. If preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.
- C. Verify that required pre-installation meeting specified in Part 1 of this specification has been completed, recorded meeting minutes have been distributed and all outstanding issues noted have been resolved prior to the start of installation.

3.02 INSTALLATION

- A. Install system in accordance with the approved system shop drawings and manufacturer's instructions.
- B. All wiring associated with the specified controls system shall be installed within conduit or conduits unless otherwise indicated on the Drawings. Refer to 26 0533.13 - Conduit for Electrical Systems for requirements.
- C. Install all room/area devices using manufacturer's factory-tested low voltage cable with pre-terminated RJ-45 connectors.
 1. If pre-terminated cable is not used for room/area wiring, each field-terminated cable shall be tested following installation and testing results submitted to the Manufacturer's Representative for approval prior to proceeding with the Work.
 2. If fixtures have internal digital lighting control Control Modules, ensure that they are also connected with low voltage cable.
 3. Install all room to room network devices using manufacturer-supplied network wire or wireless devices. Network wire substitution is not permitted and may result in loss of product warranty.
 4. Low voltage wiring topology must comply with manufacturer's specifications.
 5. Route network wiring as indicated on the Drawings as closely as possible. Document final wiring location, routing and topology on as built drawings.
- D. All line voltage connections shall be tagged to indicate circuit and switched legs.
- E. Test all devices to ensure proper communication.
- F. Calibrate all sensor time delays and sensitivity to guarantee proper detection of occupants and energy savings. Adjust time delay so that controlled area remains lighted while occupied.
- G. Provide written or computer-generated documentation on the configuration of the system including room by room description including:

1. Sensor parameters, time delays, sensitivities, and daylighting setpoints.
 2. Sequence of operation, (e.g. manual ON, Auto OFF. etc.)
 3. Load Parameters (e.g. blink warning, etc.)
- H. Post start-up tuning - Adjust sensor time delays and sensitivities to meet the Owner's requirements 30 days from beneficial occupancy. Provide a detailed report to the Architect / Owner of post start-up activity.
- I. Tighten all panel Class I conductors from both circuit breaker and to loads to torque ratings as marked on enclosure UL label.
- J. All Class II cabling shall enter enclosures from within low-voltage wiring areas and shall remain within those areas. No Class I conductors shall enter a low-voltage area.
- K. Run separate neutrals for any phase dimmed branch load circuit. Different types of dimming loads shall have separate neutral.
- L. Verify all non-panel-based lighting loads to be free from short circuits prior to connection to room controllers.
- M. Remote Access for Network Systems: If "REMOTE ACCESS AND ENHANCED WARRANTY FOR NETWORKED SYSTEMS" is specified in Part 1 of this specification, ensure Segment Manager enclosure is installed in a location with good to excellent cellular phone coverage based on building orientation and geographic location, and mount magnetic antenna for the modem. For cases where alternate mounting locations are not available and a stronger cellular signal is needed, the manufacturer shall offer additional antenna options to improve signal quality. Verify final mounting location with Engineer and Owner prior to proceeding with the Work.

3.03 FIELD QUALITY CONTROL

- A. Manufacturer's Field Service: Engage a factory-authorized service representative to inspect components, assemblies, and equipment installations, including connections, and to assist in testing. Notify Engineer and Manufacturer in writing a minimum of 3 weeks prior to system start-up and testing.
- B. Tests and Inspections: Manufacturer's service representative shall perform the following inspections and prepare reports.
1. Verify Class I and II wiring connections are terminated properly by validating system performance.
 2. Set IP addresses and other network settings of system front end hardware per facilities IT instructions.
 3. Verify / complete task programming for all switches, dimmers, time clocks, and sensors.
 4. Verify that the control of each space complies with the Sequence of Operation.
 5. Correct any system issues and re-test.
- C. Provide a report in table format with drawings, or using a software file that can be opened in the manufacturer's system software including each room or space that has lighting control installed. Indicate the following:
1. Date of test or inspection.
 2. Loads per space, or Fixture Address identification.
 3. Quantity and Type of each device installed
 4. Reports providing each device's settings.

3.04 DEMONSTRATION AND TRAINING

- A. Before Substantial Completion, arrange and provide a one-day Owner instruction period to designated Owner personnel. Set-up, starting of the lighting control system and Owner instruction includes:
1. Confirmation of entire system operation and communication to each device.
 2. Confirmation of operation of individual relays, switches, and sensors.

3. Confirmation of system Programming, photocell settings, override settings, etc.
4. Provide training to cover installation, programming, operation, and troubleshooting of the lighting control system.

3.05 PRODUCT SUPPORT AND SERVICE

- A. Factory telephone support shall be available at no cost to the Owner following acceptance. Factory assistance shall consist of assistance in solving application issues pertaining to the control equipment.

END OF SECTION

SECTION 26 2726 - WIRING DEVICES**PART 1 GENERAL****1.01 SECTION INCLUDES**

- A. Wall switches.
- B. Receptacles.
- C. Wall plates.

1.02 RELATED REQUIREMENTS

- A. Division 01 - General Requirements: Project administrative and procedural requirements.
- B. Division 02 - Existing Conditions: Demolition, cleaning and disposal requirements, cutting and patching requirements, and repairs.
- C. Section 26 0005 - Basic Electrical Requirements.
- D. Section 26 0519 - Low-Voltage Electrical Power Conductors and Cables: Manufactured wiring systems for use with access floor boxes with compatible pre-wired connectors.
- E. Section 26 0526 - Grounding and Bonding for Electrical Systems.
- F. Section 26 0533.16 - Boxes for Electrical Systems.
- G. Section 26 0935 - Distributed Digital Lighting Controls: Lighting controls, to match accessory receptacles and wall plates specified in this section.

1.03 REFERENCE STANDARDS

- A. FS W-C-596 - Connector, Electrical, Power, General Specification for 2017h.
- B. FS W-S-896 - Switches, Toggle (Toggle and Lock), Flush-mounted (General Specification) 2014g, with Amendment (2017).
- C. NECA 1 - Standard for Good Workmanship in Electrical Construction 2015.
- D. NECA 130 - Standard for Installing and Maintaining Wiring Devices 2016.
- E. NEMA WD 1 - General Color Requirements for Wiring Devices 1999 (Reaffirmed 2020).
- F. NEMA WD 6 - Wiring Devices - Dimensional Specifications 2016.
- G. NFPA 70 - National Electrical Code Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
- H. UL 20 - General-Use Snap Switches Current Edition, Including All Revisions.
- I. UL 498 - Attachment Plugs and Receptacles Current Edition, Including All Revisions.
- J. UL 514D - Cover Plates for Flush-Mounted Wiring Devices Current Edition, Including All Revisions.
- K. UL 943 - Ground-Fault Circuit-Interrupters Current Edition, Including All Revisions.

1.04 ADMINISTRATIVE REQUIREMENTS

- A. Coordination:
 - 1. Coordinate the placement of outlet boxes with millwork, furniture, equipment, etc. installed under other sections or by others.
 - 2. Coordinate wiring device ratings and configurations with the electrical requirements of actual equipment to be installed.
 - 3. Coordinate the placement of outlet boxes for wall switches with actual installed door swings.
 - 4. Coordinate the installation and preparation of uneven surfaces, such as split face block, to provide suitable surface for installation of wiring devices.
 - 5. Notify Strategic Energy Solutions, Inc. of any conflicts or deviations from the contract documents to obtain direction prior to proceeding with work.

1.05 SUBMITTALS

- A. Contractor shall provide submittals for equipment listed herein. Refer to Division 01 for submittal procedures.
- B. Product Data: Provide manufacturer's catalog information showing dimensions, colors, and configurations.

1.06 QUALITY ASSURANCE

- A. Conform to requirements of NFPA 70.
- B. Products: Listed, classified, and labeled as suitable for the purpose intended.

PART 2 PRODUCTS**2.01 WIRING DEVICE APPLICATIONS**

- A. Provide wiring devices suitable for intended use and with ratings adequate for load served.
- B. For single receptacles installed on an individual branch circuit, provide receptacle with ampere rating not less than that of the branch circuit.
- C. Provide weather resistant GFCI receptacles with specified weatherproof covers for receptacles installed outdoors, or in damp or wet locations.
- D. Provide tamper resistant receptacles for receptacles in areas listed below.
 - 1. All 15 and 20-ampere 125 and 250-volt nonlocking type receptacles in the areas listed below shall be listed tamper-resistant receptacles, unless otherwise excluded in NEC.
 - a. Business offices, corridors, waiting rooms and the like in clinics, medical and dental offices and outpatient facilities.
- E. Provide GFCI protection for receptacles installed within 6 feet of sinks.
- F. Provide GFCI protection for receptacles installed in kitchens.
- G. Provide GFCI protection for receptacles serving electric drinking fountains.
 - 1. Outlet shall be readily accessible.

2.02 WIRING DEVICE FINISHES

- A. Provide wiring device finishes as described below unless otherwise indicated.
- B. Wiring Devices, Unless Otherwise Indicated: Black with galvanized steel wall plate.
- C. Wiring Devices Installed in Finished Spaces: Black with galvanized steel wall plate.

2.03 ALL WIRING DEVICES

- A. Provide products listed and classified by Underwriters Laboratories Inc. as suitable for the purpose specified and indicated.

2.04 WALL SWITCHES

- A. Manufacturers:
 - 1. Hubbell Incorporated: www.hubbell.com.
 - 2. Leviton Manufacturing Company, Inc: www.leviton.com/#sle.
 - 3. Pass & Seymour, a brand of Legrand North America, Inc: www.legrand.us/#sle.
- B. Wall Switches - General Requirements: AC only, quiet operating, general-use snap switches with silver alloy contacts, complying with NEMA WD 1 and NEMA WD 6, and listed as complying with UL 20and where applicable FS W-S-896; types as indicated on the drawings.
 - 1. Wiring Provisions: Terminal screws for side wiring and screw actuated binding clamp for back wiring with separate ground terminal screw.
- C. Wall Switches: Heavy Duty, AC only general-use snap switch, complying with NEMA WD 6 and WD 1.
 - 1. Body and Handle: Ivory plastic with toggle handle.
 - 2. Ratings:

- a. Voltage: 120 - 277 volts, AC.
- b. Current: 20 amperes.

2.05 RECEPTACLES

- A. Manufacturers:
 1. Hubbell Incorporated: www.hubbell.com.
 2. Leviton Manufacturing Company, Inc: www.leviton.com/#sle.
 3. Lutron Electronics Company, Inc; Designer Style: www.lutron.com.
 4. Pass & Seymour, a brand of Legrand North America, Inc: www.legrand.us/#sle.
 5. Source Limitations: Where wall controls are furnished as part of lighting control system, provide accessory matching receptacles and wallplates by the same manufacturer in locations indicated.
- B. Receptacles - General Requirements: Self-grounding, complying with NEMA WD 1 and NEMA WD 6, and listed as complying with UL 498 and where applicable FS W-C-596; types as indicated on the drawings.
 1. Wiring Provisions: Terminal screws for side wiring or screw actuated binding clamp for back wiring with separate ground terminal screw.
 2. NEMA configurations specified are according to NEMA WD 6.
- C. Convenience Receptacles:
 1. Standard Convenience Receptacles: Industrial specification grade, 20A, 125V, NEMA 5-20R; single or duplex as indicated on the drawings.
- D. GFCI Receptacles:
 1. GFCI Receptacles - General Requirements: Self-testing, with feed-through protection and light to indicate ground fault tripped condition and loss of protection; listed as complying with UL 943, class A.
 2. Standard GFCI Receptacles: Industrial specification grade, duplex, 20A, 125V, NEMA 5-20R.

2.06 WALL PLATES

- A. Manufacturers:
 1. Hubbell Incorporated: www.hubbell-wiring.com/#sle.
 2. Leviton Manufacturing Company, Inc: www.leviton.com/#sle.
 3. Lutron Electronics Company, Inc: www.lutron.com.
 4. Pass & Seymour, a brand of Legrand North America, Inc: www.legrand.us/#sle.
- B. Wall Plates: Comply with UL 514D.
 1. Configuration: One piece cover as required for quantity and types of corresponding wiring devices.
 2. Size: Standard.
 3. Screws: Metal with slotted heads finished to match wall plate finish.
- C. Stainless Steel Wall Plates: Brushed satin finish, Type 302 stainless steel.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that field measurements are as indicated.
- B. Verify that outlet boxes are installed in proper locations and at proper mounting heights and are properly sized to accommodate devices and conductors in accordance with NFPA 70.
- C. Verify that wall openings are neatly cut and will be completely covered by wall plates.
- D. Verify that final surface finishes are complete, including painting.
- E. Verify that branch circuit wiring installation is completed, tested, and ready for connection to wiring devices.

- F. Verify that conditions are satisfactory for installation prior to starting work.

3.02 PREPARATION

- A. Provide extension rings to bring outlet boxes flush with finished surface.
- B. Clean dirt, debris, plaster, and other foreign materials from outlet boxes.

3.03 INSTALLATION

- A. Perform work in accordance with NECA 1 (general workmanship) and, where applicable, NECA 130, including mounting heights specified in those standards unless otherwise indicated.
- B. Coordinate locations of outlet boxes provided under Section 26 0533.16 as required for installation of wiring devices provided under this section.
 - 1. Mounting Heights: Unless otherwise indicated, as follows:
 - a. Wall Switches: 48 inches above finished floor.
 - b. Wall Dimmers: 48 inches above finished floor.
 - c. Receptacles: 18 inches above finished floor or 6 inches above counter.
 - 2. Where multiple receptacles, wall switches, wall dimmers, or low voltage devices are installed at the same location and at the same mounting height, gang devices together under a common wall plate.
 - 3. Locate wall switches on strike side of door with edge of wall plate 3 inches from edge of door frame. Where locations are indicated otherwise, notify Strategic Energy Solutions, Inc. to obtain direction prior to proceeding with work.
- C. Install wiring devices in accordance with manufacturer's instructions.
- D. Install permanent barrier between ganged wiring devices when voltage between adjacent devices exceeds 300 V.
- E. Where required, connect wiring devices using pigtails not less than 6 inches long. Do not connect more than one conductor to wiring device terminals.
- F. Connect wiring devices by wrapping conductor clockwise 3/4 turn around screw terminal and tightening to proper torque specified by the manufacturer. Where present, do not use push-in pressure terminals that do not rely on screw-actuated binding.
- G. Unless otherwise indicated, connect wiring device grounding terminal to branch circuit equipment grounding conductor and to outlet box with bonding jumper.
- H. Provide GFCI receptacles with integral GFCI protection at each location indicated. Do not use feed-through wiring to protect downstream devices.
- I. Install wiring devices plumb and level with mounting yoke held rigidly in place.
- J. Install wall switches with OFF position down.
- K. Install vertically mounted receptacles with grounding pole on top and horizontally mounted receptacles with grounding pole on left.
- L. Install wall plates to fit completely flush to wall with no gaps and rough opening completely covered without strain on wall plate. Repair or reinstall improperly installed outlet boxes or improperly sized rough openings. Do not use oversized wall plates in lieu of meeting this requirement.
- M. Install blank wall plates on junction boxes and on outlet boxes with no wiring devices installed or designated for future use.
- N. Identify wiring devices in accordance with Section 26 0553.

3.04 FIELD QUALITY CONTROL

- A. Inspect each wiring device for damage and defects.
- B. Operate each wall switch and wall dimmer with circuit energized to verify proper operation.
- C. Test each receptacle to verify operation and proper polarity.

- D. Test each GFCI receptacle for proper tripping operation according to manufacturer's instructions.
- E. Correct wiring deficiencies and replace damaged or defective wiring devices.

3.05 CLEANING

- A. Clean exposed surfaces to remove dirt, paint, or other foreign material and restore to match original factory finish.

END OF SECTION

SECTION 26 5100 - INTERIOR LIGHTING**PART 1 GENERAL****1.01 SECTION INCLUDES**

- A. Interior luminaires.
- B. Ballasts and drivers.
- C. LED emergency power supply units.
- D. Luminaire accessories.

1.02 RELATED REQUIREMENTS

- A. Division 01 - General Requirements: Project administrative and procedural requirements.
- B. Division 02 - Existing Conditions: Demolition, cleaning and disposal requirements, cutting and patching requirements, repairs.
- C. Section 26 0005 - Basic Electrical Requirements.
- D. Section 26 0533.16 - Boxes for Electrical Systems.
- E. Section 26 0553 - Identification for Electrical Systems: Identification products and requirements.
- F. Section 26 0935 - Distributed Digital Lighting Control System: Devices for automatic control of lighting, including occupancy sensors, daylighting controls, networked control stations and motion sensors.
- G. Section 26 2726 - Wiring Devices: Manual wall switches and wall dimmers.

1.03 REFERENCE STANDARDS

- A. ANSI C78.379 - Electric Lamps - Classification of the Beam Patterns of Reflector Lamps 2006 (Reaffirmed 2015).
- B. IEC 60529 - Degrees of Protection Provided by Enclosures (IP Code) 2013 (Corrigendum 2019).
- C. IES LM-79 - Approved Method: Optical and Electrical Measurements of Solid-State Lighting Products 2019.
- D. IES LM-80 - Approved Method: Measuring Luminous Flux and Color Maintenance of LED Packages, Arrays, and Modules 2019.
- E. NECA 1 - Standard for Good Workmanship in Electrical Construction 2015.
- F. NECA/IESNA 500 - Standard for Installing Indoor Lighting Systems 2006.
- G. NEMA 410 - Performance Testing for Lighting Controls and Switching Devices 2020.
- H. NEMA LE 4 - Recessed Luminaires, Ceiling Compatibility 2012 (Reaffirmed 2018).
- I. NFPA 70 - National Electrical Code Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
- J. NFPA 101 - Life Safety Code Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
- K. UL 924 - Emergency Lighting and Power Equipment Current Edition, Including All Revisions.
- L. UL 1598 - Luminaires Current Edition, Including All Revisions.
- M. UL 8750 - Light Emitting Diode (LED) Equipment for Use in Lighting Products Current Edition, Including All Revisions.

1.04 ADMINISTRATIVE REQUIREMENTS

- A. Coordination:

1. Coordinate the installation of luminaires with mounting surfaces installed under other sections or by others. Coordinate the work with placement of supports, anchors, etc. required for mounting. Coordinate compatibility of luminaires and associated trims with mounting surfaces at installed locations.
2. Coordinate the placement of luminaires with structural members, ductwork, piping, equipment, diffusers, fire suppression system components, and other potential conflicts installed under other sections or by others.
3. Coordinate the placement of exit signs with furniture, equipment, signage or other potential obstructions to visibility installed under other sections or by others.
4. Notify Strategic Energy Solutions, Inc. of any conflicts or deviations from the contract documents to obtain direction prior to proceeding with work.

1.05 SUBMITTALS

- A. Contractor shall provide submittals for equipment listed herein. Refer to Division 01 for submittal procedures.
- B. Product Data: Provide manufacturer's standard catalog pages and data sheets including detailed information on luminaire construction, dimensions, ratings, finishes, mounting requirements, listings, service conditions, photometric performance, installed accessories, and ceiling compatibility; include model number nomenclature clearly marked with all proposed features.
 1. LED Luminaires:
 - a. Include estimated useful life, calculated based on IES LM-80 test data.
- C. Manufacturer's Installation Instructions: Indicate application conditions and limitations of use stipulated by product testing agency. Include instructions for storage, handling, protection, examination, preparation, and installation of product.
- D. Ballast product specification sheet from manufacturer.

1.06 QUALITY ASSURANCE

- A. Conform to requirements of NFPA 70 and NFPA 101.

1.07 COORDINATION

- A. Coordinate layout and installation of lighting fixtures and suspension system with other construction that penetrates ceilings or is supported by them, including HVAC equipment, fire-suppression system, and partition assemblies.

PART 2 PRODUCTS

2.01 LUMINAIRE TYPES

- A. Furnish products as indicated in luminaire schedule included on the drawings.

2.02 LUMINAIRES

- A. Provide products that comply with requirements of NFPA 70 and NFPA 101.
- B. Provide products that are listed and labeled as complying with UL 1598, where applicable.
- C. Provide products listed, classified, and labeled as suitable for the purpose intended.
- D. Unless otherwise indicated, provide complete luminaires including lamp(s), light engines, drivers and all sockets, ballasts, reflectors, lenses, housings and other components required to position, energize and protect the lamp/light engine and distribute the light.
- E. Unless specifically indicated to be excluded, provide all required conduit, boxes, wiring, connectors, hardware, supports, trims, accessories, etc. as necessary for a complete operating system.
- F. Provide products suitable to withstand normal handling, installation, and service without any damage, distortion, corrosion, fading, discoloring, etc.

- G. Recessed Luminaires:
 - 1. Ceiling Compatibility: Comply with NEMA LE 4.
 - 2. Luminaires Recessed in Insulated Ceilings: Listed and labeled as IC-rated, suitable for direct contact with insulation and combustible materials.
- H. LED Luminaires:
 - 1. Components: UL 8750 recognized or listed as applicable.
 - 2. Tested in accordance with IES LM-79 and IES LM-80.
 - 3. LED Estimated Useful Life: Minimum of 50,000 hours at 70 percent lumen maintenance, calculated based on IES LM-80 test data.
- I. Luminaires Mounted in Continuous Rows: Provide quantity of units required for length indicated, with all accessories required for joining and aligning.

2.03 EMERGENCY LIGHTING UNITS

- A. Description: Emergency lighting units complying with NFPA 101 and all applicable state and local codes, and listed and labeled as complying with UL 924.
- B. Operation: Upon interruption of normal power source or brownout condition exceeding 20 percent voltage drop from nominal, solid-state control automatically switches connected lamps to integral battery power for minimum of 90 minutes of rated emergency illumination, and automatically recharges battery upon restoration of normal power source.
- C. Battery:
 - 1. Sealed maintenance-free nickel cadmium unless otherwise indicated.
 - 2. Size battery to supply all connected lamps, including emergency remote heads where indicated.
- D. Diagnostics: Provide power status indicator light and accessible integral test switch to manually activate emergency operation.
- E. Provide low-voltage disconnect to prevent battery damage from deep discharge.

2.04 BALLASTS AND DRIVERS

- A. Ballasts/Drivers - General Requirements:
 - 1. Provide ballasts containing no polychlorinated biphenyls (PCBs).
 - 2. Minimum Efficiency/Efficacy: Provide ballasts complying with all current applicable federal and state ballast efficiency/efficacy standards.
 - 3. Electronic Ballasts/Drivers: Inrush currents not exceeding peak currents specified in NEMA 410.
- B. Dimmable LED Drivers:
 - 1. Dimming Range: Continuous dimming from 100 percent to 10 percent relative light output unless dimming capability to lower level is indicated, without flicker.
 - 2. Control Compatibility: Fully compatible with the dimming controls to be installed.
- C. Dimmable LED Drivers: Comply with Section 26 0935 - Distributed Digital Lighting Control System

2.05 LED EMERGENCY POWER SUPPLY UNITS

- A. Manufacturers:
 - 1. Iota Engineering, LLC: www.iotaengineering.com/#sle.
 - 2. Lithonia Lighting: www.lithonia.com/#sle.
 - 3. Philips Emergency Lighting/Bodine: www.bodine.com/#sle.
 - 4. Manufacturer Limitations: Where possible, for each type of luminaire provide LED emergency power supply units produced by a single manufacturer.
- B. Description: Self-contained LED emergency power supply units suitable for use with indicated luminaires, complying with NFPA 101 and all applicable state and local codes, and listed and labeled as complying with UL 924.

- C. Operation: Upon interruption of normal power source, solid-state control automatically switches connected lamp(s) to the emergency power supply for minimum of 90 minutes of rated emergency illumination, and automatically recharges battery upon restoration of normal power source.
- D. Battery: Sealed maintenance-free high-temperature nickel cadmium unless otherwise indicated.
- E. Diagnostics: Provide accessible and visible multi-chromatic combination test switch/indicator light to display charge, test, and diagnostic status and to manually activate emergency operation.
- F. Self-Diagnostics: Provide units that self-monitor functionality and automatically perform testing required by NFPA 101 where indicated; provide indicator light(s) to report test and diagnostic status and field selectable audible alert.

2.06 ACCESSORIES

- A. Stems for Suspended Luminaires: Steel tubing, minimum 1/2" size, factory finished to match luminaire or field-painted as directed.
- B. Threaded Rods for Suspended Luminaires: Zinc-plated steel, minimum 1/4" size, field-painted as directed.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that outlet boxes are installed in proper locations and at proper mounting heights and are properly sized to accommodate conductors in accordance with NFPA 70.
- B. Verify that suitable support frames are installed where required.
- C. Verify that branch circuit wiring installation is completed, tested, and ready for connection to luminaires.
- D. Verify that conditions are satisfactory for installation prior to starting work.

3.02 INSTALLATION

- A. Coordinate locations of outlet boxes provided under Section 26 0533.16 as required for installation of luminaires provided under this section.
- B. All wiring associated with the specified controls system shall be installed within conduit or conduits unless otherwise indicated on the Drawings. Refer to 26 0533.13 - Conduit for Electrical Systems for requirements.
- C. Install products in accordance with manufacturer's instructions.
- D. Install luminaires securely, in a neat and workmanlike manner, as specified in NECA 500 (commercial lighting) and NECA 502 (industrial lighting).
- E. Install luminaires plumb and square and aligned with building lines and with adjacent luminaires.
- F. Suspended Ceiling Mounted Luminaires:
 - 1. Do not use ceiling tiles to bear weight of luminaires.
 - 2. Do not use ceiling support system to bear weight of luminaires unless ceiling support system is certified as suitable to do so.
 - 3. Secure pendant-mounted luminaires to building structure.
 - 4. Secure lay-in luminaires to ceiling support channels using listed safety clips at four corners.
 - 5. See appropriate Division 09 section where suspended grid ceiling is specified for additional requirements.
- G. Recessed Luminaires:

1. Install trims tight to mounting surface with no visible light leakage.
 2. Non-IC Rated Luminaires: Maintain required separation from insulation and combustible materials according to listing.
 3. Luminaires Recessed in Fire-Rated Ceilings: Install using accessories and firestopping materials to meet regulatory requirements for fire rating.
- H. Emergency Lighting Units:
1. Unless otherwise indicated, connect unit to unswitched power from same circuit feeding normal lighting in same room or area. Bypass local switches, contactors, or other lighting controls.
- I. LED Emergency Power Supply Units:
1. For field-installed units, install inside luminaire unless otherwise indicated. Where installation inside luminaire is not possible, install on top of luminaire.
- J. Identify luminaires connected to emergency power system in accordance with Section 26 0553.

3.03 FIELD QUALITY CONTROL

- A. Inspect each product for damage and defects.
- B. Operate each luminaire after installation and connection to verify proper operation.
- C. Test LED emergency power supply units and emergency lighting units to verify proper operation upon loss of normal power supply.

END OF SECTION

SECTION 28 4600 - FIRE DETECTION AND ALARM**PART 1 GENERAL****1.01 SECTION INCLUDES**

- A. Fire alarm system design and installation, including all components, wiring, and conduit.
- B. Circuits from protected premises to supervising station, including conduit.
- C. Replacement and removal of existing fire alarm system components, wiring, and conduit indicated.
- D. Maintenance of fire alarm system under contract for specified warranty period.

1.02 RELATED REQUIREMENTS

- A. Division 01 - General Requirements: Project administrative and procedural requirements.
- B. Division 02 - Existing Conditions: Demolition, cleaning and disposal requirements, cutting and patching requirements, repairs.
- C. Section 26 0005 - Basic Electrical Requirements.
- D. Section 26 0505 - Selective Demolition for Electrical.
- E. Section 26 0533.13 - Conduit for Electrical Systems.
- F. Section 26 0533.16 - Boxes for Electrical Systems.

1.03 REFERENCE STANDARDS

- A. ADA Standards - Americans with Disabilities Act (ADA) Standards for Accessible Design 2010.
- B. NFPA 70 - National Electrical Code Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
- C. NFPA 72 - National Fire Alarm and Signaling Code Most Recent Edition Cited by Referring Code or Reference Standard.
- D. NFPA 101 - Life Safety Code Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
- E. UL 268 - Standard for Smoke Detectors for Fire Alarm Systems Current Edition, Including All Revisions.

1.04 SUBMITTALS

- A. Contractor shall provide submittals for equipment listed herein. Refer to Division 01 for submittal procedures.
- B. Evidence of designer qualifications.
- C. Design Documents: Submit all information required for plan review and permitting by authorities having jurisdiction, including but not limited to floor plans, riser diagrams, and description of operation:
 - 1. Copy (if any) of list of data required by authority having jurisdiction.
 - 2. NFPA 72 "Record of Completion", filled out to the extent known at the time.
 - 3. Clear and concise description of operation, with input/output matrix similar to that shown in NFPA 72 Appendix A-7-5-2.2(9), and complete listing of software required.
 - 4. System zone boundaries and interfaces to fire safety systems.
 - 5. Location of all components, circuits, and raceways; mark components with identifiers used in control unit programming.
 - 6. Circuit layouts; number, size, and type of raceways and conductors; conduit fill calculations; spare capacity calculations; notification appliance circuit voltage drop calculations.
 - 7. List of all devices on each signaling line circuit, with spare capacity indicated.

8. Manufacturer's detailed data sheet for each component, including wiring diagrams, installation instructions, and circuit length limitations.
 9. Description of power supplies; if secondary power is by battery include calculations demonstrating adequate battery power.
 10. Certification by either the manufacturer of the control unit or by the manufacturer of each other component that the components are compatible with the control unit.
 11. Certification by the manufacturer of the control unit that the system design complies with the contract documents.
 12. Certification by Contractor that the system design complies with the contract documents.
- D. Evidence of installer qualifications.
- E. Evidence of instructor qualifications; training lesson plan outline.
- F. Evidence of maintenance contractor qualifications, if different from installer.
- G. Inspection and Test Reports:
1. Submit inspection and test plan prior to closeout demonstration.
 2. Submit documentation of satisfactory inspections and tests.
 3. Submit NFPA 72 "Inspection and Test Form," filled out.
- H. Operating and Maintenance Data: Revise and resubmit until acceptable; have one set available during closeout demonstration:
1. Complete set of specified design documents, as approved by authority having jurisdiction.
 2. Additional printed set of project record documents and closeout documents, bound or filed in same manuals.
 3. Contact information for firm that will be providing contract maintenance and trouble call-back service.
 4. List of recommended spare parts, tools, and instruments for testing.
 5. Replacement parts list with current prices, and source of supply.
 6. Detailed troubleshooting guide and large scale input/output matrix.
 7. Preventive maintenance, inspection, and testing schedule complying with NFPA 72; provide printed copy and computer format acceptable to Owner.
 8. Detailed but easy to read explanation of procedures to be taken by non-technical administrative personnel in the event of system trouble, when routine testing is being conducted, for fire drills, and when entering into contracts for remodeling.
- I. Project Record Documents: Have one set available during closeout demonstration:
1. Complete set of floor plans showing actual installed locations of components, conduit, and zones.
 2. "As installed" wiring and schematic diagrams, with final terminal identifications.
 3. "As programmed" operating sequences, including control events by device, updated input/output chart, and voice messages by event.
- J. Closeout Documents:
1. Certification by manufacturer that the system has been installed in compliance with manufacturer's installation requirements, is complete, and is in satisfactory operating condition.
 2. NFPA 72 "Record of Completion", filled out completely and signed by installer and authorized representative of authority having jurisdiction.
 3. Maintenance contract.

1.05 QUALITY ASSURANCE

- A. Designer Qualifications: NICET Level III or IV (3 or 4) certified fire alarm technician or registered fire protection engineer, employed by fire alarm control panel manufacturer, Contractor, or installer, with experience designing fire alarm systems in the jurisdictional area of the authorities having jurisdiction.

- B. Installer Qualifications: Firm with minimum 3 years documented experience installing fire alarm systems of the specified type and providing contract maintenance service as a regular part of their business.
 - 1. Authorized representative of control unit manufacturer; submit manufacturer's certification that installer is authorized; include name and title of manufacturer's representative making certification.
 - 2. Installer Personnel: At least 2 years of experience installing fire alarm systems.
 - 3. Supervisor: NICET level III or IV (3 or 4) certified fire alarm technician; furnish name and address.
- C. Maintenance Contractor Qualifications: Same entity as installer or different entity with specified qualifications.
- D. Instructor Qualifications: Experienced in technical instruction, understanding fire alarm theory, and able to provide the required training; trained by fire alarm control unit manufacturer.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Fire Alarm Control Units and Accessories - Basis of Design: National Time and Signal - Existing System.
- B. Initiating Devices and Notification Appliances:
 - 1. National Time & Signal: www.natsco.net
 - 2. Same manufacturer as control units.
 - 3. Provide initiating devices and notification appliances made by the same manufacturer, where possible.

2.02 FIRE ALARM SYSTEM

- A. Fire Alarm System: Provide modifications and extensions to the existing automatic fire detection and alarm system:
 - 1. Provide all components necessary, regardless of whether shown in the contract documents or not.
 - 2. Protected Premises: Renovated area indicated on plans.
 - 3. Comply with the following; where requirements conflict, order of precedence of requirements is as listed:
 - a. ADA Standards.
 - b. The requirements of the State Fire Marshal.
 - c. The requirements of the local authority having jurisdiction .
 - d. Applicable local codes.
 - e. The contract documents (drawings and specifications).
 - f. NFPA 72; where the word "should" is used consider that provision mandatory; where conflicts between requirements require deviation from NFPA 72, identify deviations clearly on design documents.
 - 4. Evacuation Alarm: Multiple smoke zones; allow for evacuation notification of any individual zone or combination of zones, in addition to general evacuation of entire premises.
 - 5. General Evacuation Zones: Each smoke zone is considered a general evacuation zone unless otherwise indicated, with alarm notification in all zones on the same floor, on the floor above, and the floor below.

2.03 COMPONENTS

- A. General:
 - 1. Provide flush mounted units where installed in finish areas; in unfinished areas, surface mounted unit are acceptable.

2. Provide legible, permanent labels for each control device, using identification used in operation and maintenance data.
- B. Notification Appliances:
- C. Circuit Conductors: Copper or optical fiber; provide 200 feet extra; color code and label.
- D. Locks and Keys: Deliver keys to Owner.
- E. Instruction Charts: Printed instruction chart for operators, showing steps to be taken when a signal is received (normal, alarm, supervisory, and trouble); easily readable from normal operator's station.
 1. Frame: Stainless steel or aluminum with polycarbonate or glass cover.
 2. Provide one for each control unit where operations are to be performed.
 3. Obtain approval of Owner prior to mounting; mount in location acceptable to Owner.
 4. Provide extra copy with operation and maintenance data submittal.

PART 3 EXECUTION

3.01 INSTALLATION

- A. Install in accordance with applicable codes, NFPA 72, NFPA 70, and the contract documents.
- B. Conceal all wiring, conduit, boxes, and supports where installed in finished areas.
- C. Obtain Owner's approval of locations of devices, before installation.
- D. Install instruction cards and labels.

3.02 INSPECTION AND TESTING FOR COMPLETION

- A. Notify Owner 7 days prior to beginning completion inspections and tests.
- B. Notify authorities having jurisdiction and comply with their requirements for scheduling inspections and tests and for observation by their personnel.
- C. Provide the services of the installer's supervisor or person with equivalent qualifications to supervise inspection and testing, correction, and adjustments.
- D. Prepare for testing by ensuring that all work is complete and correct; perform preliminary tests as required.
- E. Provide all tools, software, and supplies required to accomplish inspection and testing.
- F. Perform inspection and testing in accordance with NFPA 72 and requirements of local authorities; document each inspection and test.
- G. Correct defective work, adjust for proper operation, and retest until entire system complies with contract documents.
- H. Diagnostic Period: After successful completion of inspections and tests, Operate system in normal mode for at least 14 days without any system or equipment malfunctions.
 1. Record all system operations and malfunctions.
 2. If a malfunction occurs, start diagnostic period over after correction of malfunction.
 3. Owner will provide attendant operator personnel during diagnostic period; schedule training to allow Owner personnel to perform normal duties.
 4. At end of successful diagnostic period, fill out and submit NFPA 72 "Inspection and Testing Form."

3.03 CLOSEOUT

- A. Closeout Demonstration: Demonstrate proper operation of all functions to Owner.
 1. Be prepared to conduct any of the required tests.
 2. Have at least one copy of operation and maintenance data, preliminary copy of project record drawings, input/output matrix, and operator instruction chart(s) available during demonstration.

3. Have authorized technical representative of control unit manufacturer present during demonstration.
4. Demonstration may be combined with inspection and testing required by authority having jurisdiction; notify authority having jurisdiction in time to schedule demonstration.
5. Repeat demonstration until successful.

3.04 MAINTENANCE

- A. Provide to Owner, at no extra cost, a written maintenance contract for entire manufacturer's warranty period, to include the work described below.
- B. Perform routine inspection, testing, and preventive maintenance required by NFPA 72, including:
 1. Maintenance of fire safety interface and supervisory devices connected to fire alarm system.
 2. Repairs required, unless due to improper use, accidents, or negligence beyond the control of the maintenance contractor.
 3. Record keeping required by NFPA 72 and authorities having jurisdiction.
- C. Provide trouble call-back service upon notification by Owner:
 1. Provide on-site response within 2 hours of notification.
 2. Include allowance for call-back service during normal working hours at no extra cost to Owner.
 3. Owner will pay for call-back service outside of normal working hours on an hourly basis, based on actual time spent at site and not including travel time; include hourly rate and definition of normal working hours in maintenance contract.
- D. Provide a complete description of preventive maintenance, systematic examination, adjustment, cleaning, inspection, and testing, with a detailed schedule.
- E. Maintain a log at each fire alarm control unit, listing the date and time of each inspection and call-back visit, the condition of the system, nature of the trouble, correction performed, and parts replaced. Submit duplicate of each log entry to Owner's representative upon completion of site visit.
- F. Comply with Owner's requirements for access to facility and security.

END OF SECTION

	Name	Employee
Varsity Baseball	Trevor Stevens	District
Varsity Softball	Greg Richardson	District
Girls Varsity Soccer	Denis Dixon	District
Girls Varsity Tennis	Cheryl Kelly	District
JV Baseball	Shawn Smith	District
Girls/Boys Varsity Track	Jeffrey Harris	EDUStaff
JH Boys/Girls Track	Andrea Grove	District
JH Boys/Girls Track	Sarah Vanatta	District
Boys/Girls Varsity Track Asst.	Cheryl Kelly	District



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To: Hazel Park Board of Education
From: Dr. Amy Kruppe, Superintendent
Dr. Stephanie Dulmage, Director of 21st Century Learning
Dr. Carla Postell, Director of Curriculum, Integration, and Instruction
Mrs. Tamaran Dillard, Director of Student Services
Subject: Summer Professional Learning and Project Proposals
Date: March 14, 2022

Description

Based on teacher and administrator feedback, along with a review of data and other processes and procedures, the Curriculum and Special Education Departments have put together a menu of project proposals for the Summer of 2022. The completion of these projects will impact general and special education students and teachers, curriculum and instruction, and special education services and programming.

Funding Source:

- General Fund
- ESSRs
- Title IV

Strategic Goal Alignment - Below are the 4 statements for your reference. Please choose

Curriculum & Instruction: Hazel Park Schools will develop innovative, independent, and persistent learners who think critically, communicate effectively and positively influence the local and global community.

Climate and Culture: The Hazel Park School District will provide a unified system of support for all students, embracing diversity, and fostering a positive school climate.

Resources: The Hazel Park School District will maximize its resources to assure high-quality education by fostering financial stability, preserving and utilizing quality facilities, and integrating state-of-the-art technology.

Recommendation

That the Board of Education approves the Summer 2022 professional learning and project proposals in the amount of \$138,577.

**APPROVED AND RECOMMENDED FOR
BOARD ACTION**

Amy Y. Kruppe, Ed.D.
Superintendent





Budget Details - Project Proposals and Professional Learning

K-5 STEAM Curriculum Development

Budget Item	Number of Staff #s	Hours/Staff Member	Total Hours	Total Expenses
Curriculum Review and Planning Meeting	3	6	18	\$954
K-5 Curriculum Unit Writing	3	30	90	\$4,770
			Grand Total	\$5,724

K-5 Electives Curriculum Development

Budget Item	Number of Staff #s	Hours/Staff Member	Total Hours	Total Expenses
UbD Training and Curriculum Writing Process	6	6	36	\$1,908
K-5 Curriculum Unit Writing	6	30	180	\$9,540
			Grand Total	\$11,448

K- 5 Science Pilot Research and Pilot Materials Selection

Budget Item	Number of Staff #s	Hours/Staff Member	Total Hours	Total Expenses
Science Pilot Meetings - Staff Compensation	3	18	54	\$2,862
			Grand Total	\$2,862

K-5 ELA Pilot Committee - Phase 2 Pilot and Purchase Cont'd

Budget Item	Number of Staff #s	Hours/Staff Member	Total Hours	Total Expenses
ELA Pilot Meetings - Staff Compensation	10	18	180	\$9540
			Grand Total	\$9,540

Tentative K-5 Math and Literacy Professional Learning

Budget Item	Number of Staff #s	Hours/Staff Member	Total Hours	Total Expenses
Planning and Preparation - Staff Compensation	3	15	45	\$2,385
			Grand Total	\$2,385



6-12 Advisory Curriculum Development: Year 2

Budget Item	Number of Staff #s	Number of Days	Hours (per day)	Total Expenses
6-12 Advisory Curriculum Development - Staff Compensation	10	3	6	\$9,540
			Total	\$9,540

9-12 Social Studies Pilot Team Research & Learning

Budget Item	Number of Staff #s	Number of Days	Hours (per day)	Total Expenses
9-12 Social Studies Pilot Team Work -Staff Compensation	3	10	6	\$9,540
			Total	\$9,540

9-12 World Language Curriculum Work

Budget Item	Number of Staff #s	Number of Days	Hours (per day)	Total Expenses
9-12 World Language Curriculum Work - Staff Compensation	3	10	6	\$9,540
			Total	\$9,540

K-12 Project-Based Learning Cohort - Year 2

Budget Item	Number of Staff	Hours/Staff Member	Total Hours	Total Expenses
PBL Unit Design - Staff Compensation	8	15	120	\$6,360
After School Coaching/Training - Staff Compensation	15	6	90	\$4,770
			Total Budget	\$11,130

MTSS Process and Handbook - Revision and Renewal Project

Budget Item	Number of Staff #s	Hours/Staff Member	Total Hours	Total Expenses
MTSS Meetings and Handbook Revisions - Staff Compensation	8	18	144	\$7,632
			Grand Total	\$7,632

MTSS-Specific Professional Development

Budget Item	Number of Staff #s	Training	Total Expenses
Professional Learning	20	609 30,000	30,000



and Training Fees			
			Grand Total
			30,000

New Teacher Onboarding & Training Project

Budget Item	Number of Staff	Hours/Staff Member	Total Hours	Total Expenses
Onboarding Meetings and Development of Materials - Staff Compensation	4	18	72	\$3,816
			Total	\$3,816

Danielson Evaluation Committee

Budget Item	Number of Staff	Hours/Staff Member	Total Hours	Total Expenses
Staff Compensation - Professional Learning and Analysis of Rubric	5	8	40	\$2,120
			Total	\$2,120

LETRS Training for Administrators

Budget Item	Number of Staff #s	Training	Total Expenses
LETRS Training for Administrators	15	\$6,000	\$6,000
LETRS Course Access and Materials	15	164	\$2,460
		Total Budget	\$8,460

Categorical Program Curriculum Project

Budget	Number of Staff	Number of Days	Number of Hours/day	Total Expenses
Categorical Program Curriculum Project - Staff Compensation	4	10	6	\$12,720
			Total Budget	\$12,720

MI HEARTSafe Schools CPR certification

Budget Item	Number of Staff	Hours/Staff Member	Total Hours	Total Expenses
Teacher Pay - Summer Work - CPR classes	2	20	40	\$2,120
			Total	\$2,120



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To: Hazel Park Board of Education
From: Stephanie Dulmage, Director of 21st Century Learning
Subject: Grades 9-12 Progress Toward Mid Year Goal - Required Reporting
Date: March 14, 2022

The requirement to report progress toward mid-year goals extends to grades 9-12 for all schools in the district. The presentation will include an overview of the mid and end of the year goals and the data sources used to measure and monitor progress. The data will include a summary of the overall progress along with the performance of students in various subgroups.

Funding Source: N/A

Strategic Goal Alignment -

Curriculum & Instruction: Hazel Park Schools will develop innovative, independent, and persistent learners who think critically, communicate effectively, and positively influence the local and global community.

Climate and Culture: The Hazel Park School District will provide a unified system of support for all students, embracing diversity, and fostering a positive school climate.

Resources: The Hazel Park School District will maximize its resources to assure high-quality education by fostering financial stability, preserving and utilizing quality facilities, and integrating state-of-the-art technology.

RECOMMENDED FOR BOARD DISCUSSION

Amy Y. Kruppe, Ed.D.
Superintendent





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Mid-Year Goals - Progress Report

Hazel Park School District

Table A: District Goals

Goal Category	Goal Related to Achievement on K - 8 Benchmarks as required by law (MCL 388.1698b, MCL 388.1704a).
Middle of the Year Reading Goal	Hazel Park School District will provide comprehensive opportunities for staff to increase their understanding and implementation of the Essential Literacy Practices, through the Hazel Park Instructional Framework, in order to increase the percentage of K-8 students scoring on or above grade level in Reading (as measured by the i-Ready diagnostic) by 5% by June 2022.
End of the Year Reading Goal	Hazel Park School District will provide comprehensive opportunities for staff to increase their understanding and implementation of the Essential Literacy Practices, through the Hazel Park Instructional Framework, in order to increase the percentage of K-8 students scoring on or above grade level in Reading (as measured by the i-Ready diagnostic) by 10% by June 2022.
Middle of the Year Mathematics Goal	Hazel Park School District will provide comprehensive opportunities for staff to increase their knowledge, skills, and understanding of high-quality math instruction in order to increase the percentage of K-8 students scoring on or above grade level in math (as measured by the i-Ready diagnostic) by 5% by June 2022.
End of the Year Mathematics Goal	Hazel Park School District will provide comprehensive opportunities for staff to increase their knowledge, skills, and understanding of high-quality math instruction in order to increase the percentage of K-8 students scoring on or above grade level in math (as measured by the i-Ready diagnostic) by 10% by June 2022.
Summary of Progress	The results of the Winter reading and math diagnostic indicate the mid-year goal of increasing the percentage of students scoring on or above grade level in grades K-8 by 5% has been achieved. Students in most subgroups met the goal in reading except grades 4, 6, and 7. Students in most subgroups met the goal in math except for special education and grade 7.

Table B: Achievement/Proficiency on Benchmark Assessment - By Student Demographics (As of 2/1/22)

Reporting on subgroups of more than 30 (student privacy)	Fall Diagnostic	Winter Diagnostic	Spring Diagnostic	Fall Diagnostic	Winter Diagnostic	Spring Diagnostic
	Reading	Reading	Reading	Math	Math	Math
All Students	16%	27%		7%	16%	
Econ. Disadvantaged	14%	24%		6%	12%	
Special Education	6%	12%		4%	7%	
English Learner	*	*		*	*	
Female	19%	30%		6%	14%	



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Male	13%	25%		8%	18%	
Black or African American	13%	24%		4%	11%	
White	18%	28%		8%	20%	

* Subgroup of fewer than 30 students

Table C: Achievement/Proficiency on Benchmark Assessment - By Grade Level (As of 2/1/22)

Reporting on subgroups of more than 30 (student privacy)	Fall Diagnostic	Winter Diagnostic	Spring Diagnostic	Fall Diagnostic	Winter Diagnostic	Spring Diagnostic
	Reading	Reading	Reading	Math	Math	Math
Grade K	16%	58%		13%	35%	
Grade 1	9%	32%		3%	14%	
Grade 2	17%	29%		7%	15%	
Grade 3	24%	37%		6%	13%	
Grade 4	13%	17%		5%	14%	
Grade 5	15%	20%		6%	12%	
Grade 6	17%	15%		7%	14%	
Grade 7	16%	17%		6%	10%	
Grade 8	17%	22%		6%	13%	

Table D Achievement/Proficiency on Benchmark Assessment - By Mode of Learning

Reporting on subgroups of more than 30 (student privacy)	Fall Diagnostic	Winter Diagnostic	Spring Diagnostic	Fall Diagnostic	Winter Diagnostic	Spring Diagnostic
	Reading	Reading	Reading	Math	Math	Math
In-Person K-8	15%	27%		11%	16%	
Virtual K-8	28%	36%		13%	25%	



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Building: Hoover Elementary - Grades K-5

Date: 2/7/2022

Table A: Building Goals

Goal Category	Goal Related to Achievement on K - 8 Benchmarks as required by law (MCL 388.1698b, MCL 388.1704a).
Middle of the Year Reading Goal	By February of 2022, the percentage of students meeting their growth goal in reading will increase by 5% as measured by i-Ready.
End of the Year Reading Goal	By May of 2022, the percentage of students meeting their growth goal in reading will increase by 10% as measured by i-Ready.
Middle of the Year Mathematics Goal	By February of 2022, the percentage of students meeting their growth goal in math will increase by 5% as measured by i-Ready.
End of the Year Mathematics Goal	By May of 2022, the percentage of students meeting their growth goal in reading will increase by 10% as measured by i-Ready.
Summary of Progress	<p>Proficiency: The results of the Winter reading and math diagnostic indicate the mid-year goal of increasing the percentage of students scoring on or above grade level by 5% has been achieved. Students in all subgroups, in both reading and math, met the goal.</p> <p>Growth: The results of the Winter reading and math diagnostic indicate that the median progress toward typical growth is beyond 50% (the targeted mid-year percent) for grades K-5. This goal was achieved for most students in grades K-5 and most subgroups except grades K, 1, and 4 in reading. The goal was achieved for students in grades K-5 and all subgroups except grades 3 and 4 in math.</p> <p>Growth data is not available in the Fall for i-Ready diagnostics. Therefore the percentage of students who have achieved at least 50% progress toward the end of year goal was used to monitor student progress. Following the Spring i-Ready diagnostic, the percentage of students meeting their growth goal from Winter to Spring will be published.</p>

Table B: Achievement/Proficiency on Benchmark Assessment - By Student Demographics (As of 2/1/22)

Reporting on subgroups of more than 30 (student privacy)	Fall Diagnostic	Winter Diagnostic	Spring Diagnostic	Fall Diagnostic	Winter Diagnostic	Spring Diagnostic
	Reading	Reading	Reading	Math	Math	Math
All Students	15%	28%		8%	19%	
Econ. Disadvantaged	11%	22%		5%	14%	
Special Education	6%	19%		3%	10%	



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English Learner	*	*		*	*	
Female	18%	29%		8%	14%	
Male	11%	26%		9%	23%	
Black or African American	11%	27%		5%	16%	
White	16%	29%		10%	20%	

* Subgroup of fewer than 30 students

Table C: Achievement/Proficiency on Benchmark Assessment - By Grade (As of 2/1/22)

Reporting on subgroups of more than 30 (student privacy)	Fall Diagnostic	Winter Diagnostic	Spring Diagnostic	Fall Diagnostic	Winter Diagnostic	Spring Diagnostic
	Reading	Reading	Reading	Math	Math	Math
Grade K	6%	47%		10%	34%	
Grade 1	14%	21%		6%	16%	
Grade 2	17%	29%		11%	20%	
Grade 3	23%	34%		11%	20%	
Grade 4	11%	17%		6%	13%	
Grade 5	16%	21%		5%	11%	

Table D: Median Percent Toward Growth Goal and Percent Met Typical Growth Goal - By Student Demographics (As of 2/1/22)

Reporting on subgroups of more than 30 (student privacy)	Winter Median Growth (Beyond 50% Percentile Target)	Winter Percent Met	Spring Growth	Winter Median Growth (Beyond 50% Percentile Target)	Winter Percent Met	Spring Growth
	Reading	Reading	Reading	Math	Math	Math
All Students	51%	25%		55%	21%	
Econ. Disadvantaged	52%	26%		52%	22%	
Special Education	54%	22%		55%	20%	
English Learner	*	*		*	*	



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Female	50%	24%		55%	16%	
Male	52%	25%		63%	26%	
Black or African American	52%	23%		52%	19%	
White	52%	27%		60%	22%	

Table E: Median Percent Toward Growth Goal and Percent Met Typical Growth Goal - By Grade (As of 2/1/22)

Reporting on subgroups of more than 30 (student privacy)	Winter Median Growth (Beyond 50% Percentile Target)	Winter Percent Met	Spring Growth	Winter Median Growth (Beyond 50% Percentile Target)	Winter Percent Met	Spring Growth
	Reading	Reading	Reading	Math	Math	Math
Grade K	49%	11%		68%	22%	
Grade 1	43%	8%		52%	19%	
Grade 2	71%	34%		75%	32%	
Grade 3	79%	41%		37%	14%	
Grade 4	21%	17%		46%	15%	
Grade 5	64%	43%		70%	26%	

Table F: Achievement on Benchmark Assessment - By Mode of Instruction (As of 2/1/22)

- The number of students learning in a virtual setting is below the subgroup of 30 students. Therefore the data will not be publically reported for Hoover Elementary.



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Building: United Oaks Elementary

Date: 2/7/2022

Table A: Building Goals

Goal Category	Goal Related to Achievement on K - 8 Benchmarks as required by law (MCL 388.1698b, MCL 388.1704a).
Middle of the Year Reading Goal	By February of 2022, the percentage of students meeting their growth goal in reading will increase by 5% as measured by i-Ready.
End of the Year Reading Goal	By May of 2022, the percentage of students meeting their growth goal in reading will increase by 10% as measured by i-Ready.
Middle of the Year Mathematics Goal	By February of 2022, the percentage of students meeting their growth goal in math will increase by 5% as measured by i-Ready.
End of the Year Mathematics Goal	By May of 2022, the percentage of students meeting their growth goal in reading will increase by 10% as measured by i-Ready.
Summary of Progress	<p>Proficiency: The results of the Winter reading and math diagnostic indicate the percentage of students scoring on or above grade level by 5% has been achieved. In the area of reading, students in all subgroups met the goal. In the area of math, this goal was achieved by most subgroups except special education and grade 4 students.</p> <p>Growth: The results of the Winter reading and math diagnostic indicate that the median progress toward typical growth is beyond 50% (the targeted mid-year percent) for students in grades K-5. This goal was achieved for all subgroups except grades 1 in reading. The goal was achieved for all subgroups except grades 3 in math.</p> <p>Growth data is not available in the Fall for i-Ready diagnostics. Therefore the percentage of students who have achieved at least 50% progress toward the end of year goal was used to monitor student progress. Following the Spring i-Ready diagnostic, the percentage of students meeting their growth goal from Winter to Spring will be published.</p>

Table B: Achievement/Proficiency on Benchmark Assessment - By Student Demographics (As of 2/1/22)

Reporting on subgroups of more than 30 (student privacy)	Fall Diagnostic	Winter Diagnostic	Spring Diagnostic	Fall Diagnostic	Winter Diagnostic	Spring Diagnostic
	Reading	Reading	Reading	Math	Math	Math
All Students	15%	24%		7%	19%	
Econ. Disadvantaged	15%	36%		6%	16%	
Special Education	8%	21%		6%	9%	



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English Learner	*	*		*	*	
Female	15%	33%		6%	14%	
Male	16%	35%		7%	22%	
Black or African American	16%	34%		5%	13%	
White	14%	34%		7%	22%	

* Subgroup of fewer than 30 students

Table C: Achievement/Proficiency on Benchmark Assessment - By Grade Level (As of 2/1/22)

Reporting on subgroups of more than 30 (student privacy)	Fall Diagnostic	Winter Diagnostic	Spring Diagnostic	Fall Diagnostic	Winter Diagnostic	Spring Diagnostic
	Reading	Reading	Reading	Math	Math	Math
Grade K	20%	64%		17%	38%	
Grade 1	4%	22%		2%	15%	
Grade 2	10%	22%		0%	12%	
Grade 3	21%	37%		4%	11%	
Grade 4	15%	17%		4%	8%	
Grade 5	20%	31%		7%	18%	

Table D: Median Percent Toward Growth Goal and Percent Met Typical Growth Goal - By Student Demographics (As of 2/1/22)

Reporting on subgroups of more than 30 (student privacy)	Winter Median Growth (Beyond 50% Percentile Target)	Winter Percent Met	Spring Percent Met	Winter Median Growth (Beyond 50% Percentile Target)	Winter Percent Met	Spring Growth
	Reading	Reading	Reading	Math	Math	Math
All Students	63%	34%		62%	30%	
Econ. Disadvantaged	63%	34%		59%	27%	



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Special Education	54%	35%		69%	34%	
English Learner	*	*		*	*	
Female	53%	26%		59%	28%	
Male	76%	41%		64%	32%	
Black or African American	53%	31%		56%	27%	
White	69%	36%		66%	33%	

* Subgroup of fewer than 30 students

Table E: Median Percent Toward Growth Goal and Percent Met Typical Growth Goal - By Grade (As of 2/1/22)

Reporting on subgroups of more than 30 (student privacy)	Winter Median Growth (Beyond 50% Percentile Target)		Spring Growth	Winter Median Growth (Beyond 50% Percentile Target)	Winter Percent Met	Spring Growth
	Reading	Reading	Reading	Math	Math	Math
Grade K	55%	23%		63%	27%	
Grade 1	35%	21%		59%	30%	
Grade 2	50%	24%		62%	24%	
Grade 3	75%	39%		49%	13%	
Grade 4	85%	46%		52%	28%	
Grade 5	88%	48%		106%	55%	

Table F: Achievement on Benchmark Assessment - By Mode of Instruction (As of 2/1/22)

- The number of students learning in a virtual setting is below the subgroup of 30 students. Therefore the data will not be publically reported for United Oaks Elementary.



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Building: Webb Elementary

Date: 2/7/2022

Table A: Building Goals

Goal Category	Goal Related to Achievement on K - 8 Benchmarks as required by law (MCL 388.1698b, MCL 388.1704a).
Middle of the Year Reading Goal	By February of 2022, the number of students who are in Tier 1(Proficient) for informational text in September I-Ready will increase by 5%.
End of the Year Reading Goal	By May of 2022, the number of students who are in Tier 1(Proficient) for informational text in September I-Ready will increase by 10%.
Middle of the Year Mathematics Goal	By February of 2022, the percentage of students meeting their growth goal in math will increase by 5% as measured by i-Ready.
End of the Year Mathematics Goal	By May of 2022, the percentage of students meeting their growth goal in reading will increase by 10% as measured by i-Ready.
Summary of Progress	<p>The results of the Winter reading diagnostic indicate that students in grades K-5 met the mid-year growth goal of an increase of 5%for student scoring in Tier 1 (early on to above grade level) in the subdomain of informational text. This goal was achieved for all subgroups except special education and 5th-grade students. The results of the Winter math diagnostic indicate the mid-year goal of increasing the percentage of K-5 students scoring on or above grade level by 5% has been achieved. Most subgroups met the goal except for special education, African American, and grade 5 students.</p> <p>Growth: The results of the Winter reading and math diagnostic indicate that the median progress toward typical growth is beyond 50% (the targeted mid-year percent) for students in grades K-5. This goal was achieved for all subgroups except special education, grades 2 and 5 in reading. The goal was achieved for all subgroups except grades 2 and 5 in math.</p> <p>Growth data is not available in the Fall for i-Ready diagnostics. Therefore the percentage of students who have achieved at least 50% progress toward the end of year goal was used to monitor student progress. Following the Spring i-Ready diagnostic, the percentage of students meeting their growth goal from Winter to Spring will be published.</p>

Table B: Achievement/Proficiency on Benchmark Assessment - By Student Demographics (As of 2/1/22)

Reporting on subgroups of more than 30 (student privacy)	Fall Diagnostic	Winter Diagnostic	Spring Diagnostic	Fall Diagnostic	Winter Diagnostic	Spring Diagnostic
	Reading	Reading	Reading	Math	Math	Math



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All Students	17%	28%		6%	17%	
Econ. Disadvantaged	15%	24%		5%	14%	
Special Education	8%	11%		4%	8%	
English Learner	*	*		*	*	
Female	19%	29%		5%	16%	
Male	16%	26%		7%	16%	
Black or African American	13%	22%		3%	7%	
White	21%	32%		8%	23%	

*Subgroup of fewer than 30 students

Table C: Achievement/Proficiency on Benchmark Assessment - By Grade Level (As of 2/1/22)

Reporting on subgroups of more than 30 (student privacy)	Fall Diagnostic	Winter Diagnostic	Spring Diagnostic	Fall Diagnostic	Winter Diagnostic	Spring Diagnostic
	Reading	Reading	Reading	Math	Math	Math
Grade K	19%	58%		14%	33%	
Grade 1	6%	25%		2%	12%	
Grade 2	22%	34%		8%	15%	
Grade 3	30%	40%		0%	7%	
Grade 4	13%	20%		6%	12%	
Grade 5	10%	9%		4%	7%	

Table D: Median Percent Toward Growth Goal and Percent Met Typical Growth Goal - By Student Demographics (As of 2/1/22)

Reporting on subgroups of more than 30 (student privacy)	Winter Median Growth (Beyond 50% Percentile Target)	Winter Percent Met	Spring Percent Met	Winter Median Growth (Beyond 50% Percentile Target)	Winter Percent Met	Spring Growth
	Reading	Reading	Reading	Math	Math	Math



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All Students	53%	26%		55%	22%	
Econ. Disadvantaged	52%	26%		53%	23%	
Special Education	30%	14%		53%	18%	
English Learner	*	*				
Female	53%	30%		58%	24%	
Male	55%	22%		54%	21%	
Black or African American	55%	25%		50%	21%	
White	52%	27%		60%	23%	

*Subgroup of fewer than 30 students

Table E: Median Percent Toward Growth Goal and Percent Met Typical Growth Goal - By Grade (As of 2/1/22)

Reporting on subgroups of more than 30 (student privacy)	Winter Median Growth (Beyond 50% Percentile Target)	Winter Percent Met	Spring Growth	Winter Median Growth (Beyond 50% Percentile Target)	Winter Percent Met	Spring Growth
	Reading	Reading	Reading	Math	Math	Math
Grade K	86%	29%		66%	30%	
Grade 1	50%	19%		59%	19%	
Grade 2	34%	13%		48%	10%	
Grade 3	67%	38%		50%	21%	
Grade 4	70%	26%		71%	40%	
Grade 5	35%	28%		44%	14%	

Table F: Achievement on Benchmark Assessment - By Mode of Instruction (As of 2/1/22)

- The number of students learning in a virtual setting is below the subgroup of 30 students. Therefore the data will not be publically reported for Webb Elementary.



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Building: Hazel Park Junior High Elementary

Date: 2/7/2022

Table A: Building Goals

Goal Category	Goal Related to Achievement on K - 8 Benchmarks as required by law (MCL 388.1698b, MCL 388.1704a).
Middle of the Year Reading Goal	By February of 2022, the percentage of students meeting their growth goal in reading will increase by 2.5% as measured by i-Ready.
End of the Year Reading Goal	By May of 2022, the percentage of students meeting their growth goal in reading will increase by 5% as measured by i-Ready.
Middle of the Year Mathematics Goal	By February of 2022, the percentage of students meeting their growth goal in math will increase by 2.5% as measured by i-Ready.
End of the Year Mathematics Goal	By May of 2022, the percentage of students meeting their growth goal in reading will increase by 5% as measured by i-Ready.
Summary of Progress	<p>Proficiency: The results of the Winter reading diagnostic indicate the mid-year goal of increasing the percentage of students scoring on or above grade level by 2.5% was not achieved, except for all white students and 8th grade.</p> <p>The results of the Winter math diagnostic indicate the mid-year goal of increasing the percentage of students scoring on or above grade level by 2.5% was not achieved, except for all white students and 8th grade. This goal was achieved for all subgroups except for special education.</p> <p>Growth: The results of the Winter reading diagnostic indicate that the median progress toward typical growth, beyond 50% (the targeted mid-year percent), was not met for students grades 6-8 in the areas of reading. The median progress was met for students in grades 6-8 in math, except for special education.</p> <p>Growth data is not available in the Fall for i-Ready diagnostics. Therefore the percentage of students who have achieved at least 50% progress toward the end of year goal was used to monitor student progress. Following the Spring i-Ready diagnostic, the percentage of students meeting their growth goal from Winter to Spring will be published.</p>



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Table B: Achievement/Proficiency on Benchmark Assessment - By Student Demographics (As of 2/1/22)

Reporting on subgroups of more than 30 (student privacy)	Fall Diagnostic	Winter Diagnostic	Spring Diagnostic	Fall Diagnostic	Winter Diagnostic	Spring Diagnostic
	Reading	Reading	Reading	Math	Math	Math
All Students	17%	19%		7%	13%	
Econ. Disadvantaged	16%	16%		6%	10%	
Special Education	5%	5%		5%	5%	
English Learner	*	*		*	*	
Female	21%	21%		5%	12%	
Male	15%	16%		8%	14%	
Black or African American	14%	14%		4%	10%	
White	12%	22%		10%	15%	

*Subgroup of fewer than 30 students

Table C: Achievement/Proficiency on Benchmark Assessment - By Grade Level (As of 2/1/22)

Reporting on subgroups of more than 30 (student privacy)	Fall Diagnostic	Winter Diagnostic	Spring Diagnostic	Fall Diagnostic	Winter Diagnostic	Spring Diagnostic
	Reading	Reading	Reading	Math	Math	Math
Grade 6	17%	15%		7%	15%	
Grade 7	18%	17%		7%	10%	
Grade 8	19%	22%		7%	14%	

Table D: Median Percent Toward Growth Goal and Percent Met Typical Growth Goal - By Student Demographics (As of 2/1/22)

Reporting on subgroups of more than 30 (student privacy)	Winter Median Growth (Beyond 50% Percentile Target)	Winter Percent Met	Spring Growth	Winter Median Growth (Beyond 50% Percentile Target)	Winter Percent Met	Spring Growth
	Reading	Reading	Reading	Math	Math	Math



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All Students	0%	33%		78%	44%	
Econ. Disadvantaged	0%	29%		53%	41%	
Special Education	0%	19%		0%	37%	
English Learner	*	*		*	*	
Female	26%	37%		82%	44%	
Male	0%	30%		56%	43%	
Black or African American	0%	29%		85%	45%	
White	0%	25%		60%	43%	

*Subgroup of fewer than 30 students

Table E: Median Percent Toward Growth Goal and Percent Met Typical Growth Goal - By Grade (As of 2/1/22)

Reporting on subgroups of more than 30 (student privacy)	Winter Median Growth (Beyond 50% Percentile Target)	Winter Percent Met	Spring Growth	Winter Median Growth (Beyond 50% Percentile Target)	Winter Percent Met	Spring Growth
	Reading	Reading	Reading	Math	Math	Math
Grade 6	0%	31%		65%	39%	
Grade 7	18%	34%		58%	44%	
Grade 8	0%	35%		92%	48%	

Table F: Achievement on Benchmark Assessment - By Mode of Instruction (As of 2/1/22)

- The number of students learning in a virtual setting is below the subgroup of 30 students. Therefore the data will not be publically reported by the building.



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Building: Edison

Date: 2/7/2022

Table A: Building Goals - K-8

Goal Category	Goal Related to Achievement on K - 8 Benchmarks as required by law (MCL 388.1698b, MCL 388.1704a).
Middle of the Year Reading Goal	By February 2022, the percentage of students meeting their reading growth goal in grades K-8 will increase by 2.5% as measured by the iReady Reading Diagnostic.
End of the Year Reading Goal	By May 2022, the percentage of students meeting their reading growth goal in grades K-8 will increase by 5% as measured by the iReady Reading Diagnostic.
Middle of the Year Mathematics Goal	By February 2022, the percentage of students meeting their math growth goal in grades K-8 will increase by 2.5% as measured by the iReady Math Diagnostic.
End of the Year Mathematics Goal	By May 2022, the percentage of students meeting their math growth goal in grades K-8 will increase by 5% as measured by the iReady Math Diagnostic.
Summary of Progress	Edison Max developed a reading and math goal, as required by the state for students in grades K-8. Mid-year data has been aggregated and analyzed but is not reported publicly due to a student of fewer than 30 students across grades K-8.

Advantage

Table A: Building Goals Grades K-8

Goal Category	Goal Related to Achievement on K - 8 Benchmarks as required by law (MCL 388.1698b, MCL 388.1704a).
Middle of the Year Reading Goal	By February 2022, the percentage of students meeting their reading growth goal in grades 5-8 will increase by 2.5% as measured by the iReady Reading Diagnostic.
End of the Year Reading Goal	By May 2022, the percentage of students meeting their reading growth goal in grades 5-8 will increase by 5% as measured by the iReady Reading Diagnostic.
Middle of the Year Mathematics Goal	By February 2022, the percentage of students meeting their math growth goal in grades 5-8 will increase by 2.5% as measured by the iReady Math Diagnostic.
End of the Year Mathematics Goal	By May 2022, the percentage of students meeting their math growth goal in grades 5-8 will increase by 5% as measured by the iReady Math Diagnostic.
Summary of Progress	Advantage developed a reading and math goal, as required by the state for students in grades K-8. Mid-year data has been aggregated and analyzed but is not reported publicly due to a student of fewer than 30 students across grades K-8.



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Building: Hazel Park High School

Table A: Building Goals

Goal Category	Goal Related to Achievement on K - 8 Benchmarks as required by law (MCL 388.1698b, MCL 388.1704a).
Middle of the Year Reading Goal	<p>Goal 1: By February 2022, the SAT reading scores for 11th graders using College Spring will show an improvement of 2.5% as measured by the College Spring SAT Prep test.</p> <p>Goal 2: By February 2022, there will be a 70% passage rate in all English courses.</p>
End of the Year Reading Goal	<p>Goal 1: By June of 2022, the SAT reading overall scores will increase by 5% from the fall assessments as measured by the College Spring SAT Prep test.</p> <p>Goal 2: By June 2022 there will be an increase of at least 5% in the passage rate of all English courses.</p>
Middle of the Year Mathematics Goal	<p>Goal 1: By February 2022, the SAT math scores for 11th graders using College Spring will show an improvement of 2.5% as measured by the College Spring SAT Prep test.</p> <p>Goal 2: By February 2022, there will be a 70% passage rate in all math courses.</p>
End of the Year Mathematics Goal	<p>Goal 1: By June of 2022, the SAT math overall scores will increase by 5% from the fall assessments as measured by the College Spring SAT Prep test.</p> <p>Goal 2: By June 2022 there will be an increase of at least 5% in the passage rate of all math courses.</p>
End of the Year Graduation Goal	<p>Goal 3: By June 2022, the graduation rate at the high school will increase from 80% to 84%.</p>
Summary of Progress	<p>Goal 1: The goal of a 2.5% increase in scores on the Evidence-Based Reading and Writing SAT test was achieved for all students and student groups except. The goal of a 2.5% increase in scores on the Math SAT test was achieved for all students and student groups except white females.</p> <p>Goal 2: A 70% passage rate in all English and math courses was met for all students and student groups.</p> <p>Goal 3: The mid and end of the year graduation goals are the same. The expected graduation rate is 84%. There are currently 68% of students who are on track to graduate. An additional 20% are in 1-2 credit recovery classes. Successful completion will place them on track to graduate by the end of June 2022. To date, this goal has not been achieved. However, with the completion of all credit recovery courses, the projected graduation rate would be 88%.</p>



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Table B: College Spring- Average Scores by Student Demographics (As of January 2022)

Student Population: 11 Grade Students

Reporting on subgroups of more than 30 (student privacy)	October	January	March	October	January	March
	EBRW	EBRW	EBRW	Math	Math	Math
All Students	412	431		400	411	
Econ. Disadvantaged	408	424		392	412	
Special Education	*	*		*	*	
English Learner	*	*		*	*	
Female	422	447		410	418	
Male	401	418		390	408	
Black or African American	396	410		367	385	
White	428	452		429	438	

*Subgroup of fewer than 30 students

Table C: Passing Grades in English and Math Courses by Student Demographics

Reporting on subgroups of more than 30 (student privacy)	Semester 1	Semester 2	Semester 1	Semester 2
	English	English	Math	Math
All Students	97%		91%	
Econ. Disadvantaged	97%		92%	
Special Education	100%		92%	
English Learner	*		*	
Female	96%		96%	
Male	88%		87%	
Black or African American	96%		87%	
White	99%		95%	

*Subgroup of fewer than 30 students



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Table D: Passing Grades in ELA and Math Courses by Grade

Reporting on subgroups of more than 30 (student privacy)	Semester 1	Semester 2	Semester 1	Semester 2
	English	English	Math	Math
Grade 9	97%		98%	
Grade 10	95%		80%	
Grade 11	98%		97%	
Grade 12	99%		94%	

Table E: Progress Toward Graduation by Student Demographics

Student Population: 12th Grade Students

Reporting on subgroups of more than 30 (student privacy)	On Track January	On Track May	On Track with Credit Recovery Course Completion January	On Track with Credit Recovery Course Completion May
All Students	68%		20%	
Econ. Disadvantaged	66%		22%	
Special Education	*		*	
English Learner	*		*	
Female	73%		22%	
Male	65%		19%	
Black or African American	59%		26%	
White	74%		16%	

*Subgroup of fewer than 30 students

Table F: No Virtual Students



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Building: Viking Virtual - All Virtual Students

Table A: Table A: Building Goals

Goal Category	Goal Related to Achievement on K - 8 Benchmarks as required by law (MCL 388.1698b, MCL 388.1704a).
Middle of the Year Reading Goal	By February 2022, there will be a 70% passage rate in all English courses.
End of the Year Reading Goal	By June 2022 there will be an increase of at least 5% in the passage rate of all English courses.
Middle of the Year Mathematics Goal	By February 2022, there will be a 70% passage rate in all math courses.
End of the Year Mathematics Goal	By June 2022 there will be an increase of at least 5% in the passage rate of all math courses.
Middle of the Year Graduation Goal	By February 2022, the percentage of VVA senior students who are on track to graduate will be at or above 70%.
End of the Year Graduation Goal	By June 2022, the graduation rate for VVA will increase from 40% to 65%.
Summary of Progress	<p>The goal of a 70% passage rate in all English courses was not met. The goal of a 70% passage rate in all math courses has been achieved for all student groups.</p> <p>The expected graduation rate of 65% by June 2022 has already been achieved. The current data indicates that 72% of students are on track to graduate with another 7% who will be on track with the completion of 1-2 credit recovery courses. If all students successfully complete courses, the graduation rate would be approximately 79%.</p>

Table B: Passing Grades in English and Math Courses by Student Demographics

Reporting on subgroups of more than 30 (student privacy)	Term 1	Term 2	Term 1	Term 2
	English	English	Math	Math
All Students	65%		71%	
Econ. Disadvantaged	69%		70%	
Special Education	*		*	
English Learner	*		*	
Female	69%		73%	
Male	61%		70%	
Black or African American	63%		68%	
White	68%		76%	



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Table C: Passing Grades in ELA and Math Courses by Grade

Reporting on subgroups of more than 30 (student privacy)	Term 1	Term 2	Term 1	Term 2
	English	English	Math	Math
Grade 9	*		*	
Grade 10	*		*	
Grade 11	*		*	
Grade 12	65%		73%	

Table D: Progress Toward Graduation by Student Demographics
Student Population: 12th Grade Students

Reporting on subgroups of more than 30 (student privacy)	On Track January	On Track May	On Track with Credit Recovery Course Completion January	On Track with Credit Recovery Course Completion May
All Students	72%		7%	
Econ. Disadvantaged	70%		5%	
Special Education	*		*	
English Learner	*		*	
Female	*		*	
Male	*		*	
Black or African American	*		*	
White	*		*	



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Building: Advantage

Table A: Building Goals

Goal Category	Goal Related to Achievement on K - 8 Benchmarks as required by law (MCL 388.1698b, MCL 388.1704a).
Middle of the Year Reading Goal	The percentage of students in grades 9-12 who complete courses will increase by 2.5% by February 2022. Data is reported on the percentage of passed courses in English.
End of the Year Reading Goal	The percentage of students in grades 9-12 who complete courses will increase by an additional 2.5% by June 2022. Data is reported on the percentage of passed courses in English.
Middle of the Year Mathematics Goal	The percentage of students in grades 9-12 who complete courses will increase by 2.5% by February 2022. Data is reported on the percentage of passed courses in Math.
End of the Year Mathematics Goal	The percentage of students in grades 9-12 who complete courses will increase by an additional 2.5% by June 2022. Data is reported on the percentage of passed courses in English.
End of the Year Graduation Goal	By June 2022, the graduation rate for Advantage will increase from 23 to 30%.
Summary of Progress	The goal of a 70% passage rate in all English courses has not been achieved for any student groups. However, all the 70% passage rate in all math courses has been achieved for all students and student groups. The expected graduation rate of 30% by June 2022 has...

Table B: Passing Grades in English and Math Courses by Student Demographics: Term 1 -November 2021

Reporting on subgroups of more than 30 (student privacy)	Term 1	Term 2	Term 1	Term 2
	English	English	Math	Math
All Students	59%		92%	
Econ. Disadvantaged	62%		95%	
Special Education	*		*	
English Learner	*		*	
Female	65%		97%	
Male	52%		90%	
Black or African American	57%		92%	
White	*		*	



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Table D: Passing Grades in ELA and Math Courses by Grade: Term 1 -November 2021

Reporting on subgroups of more than 30 (student privacy)	Term 1	Term 2	Term 1	Term 2
	English	English	Math	Math
Grade 9	*		*	
Grade 10	*		*	
Grade 11	*		*	
Grade 12	64%		95%	

Table D: Progress Toward Graduation by Student Demographics
Student Population: 12th Grade Students

To be updated following the most recent round of grades. Advantage has three terms. Term 2 ended on Friday, March 11, 2022.

Table E: Passing Grades

- The number of students learning in a virtual setting is below the subgroup of 30 students. Therefore the data will not be publically reported by the building.



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Building: INVEST

Table A: Building Goals

Goal Category	Goal Related to Achievement on K - 8 Benchmarks as required by law (MCL 388.1698b, MCL 388.1704a).
Middle of the Year Reading Goal	By February 2022, there will be a 70% passage rate in all English courses.
End of the Year Reading Goal	By June 2022 there will be an increase of at least 5% in the passage rate of all English courses.
Middle of the Year Mathematics Goal	By February 2022, there will be a 70% passage rate in all math courses.
End of the Year Mathematics Goal	By June 2022 there will be an increase of at least 5% in the passage rate of all math courses.
Summary of Progress	The goal of a 70% passage rate in all English and math courses has been achieved for all students and student groups.

Table B: Passing Grades in English and Math Courses by Student Demographics: Term 1 -November 2021

Reporting on subgroups of more than 30 (student privacy)	Term 1	Term 2	Term 1	Term 2
	English	English	Math	Math
All Students	78%		88%	
Econ. Disadvantaged	74%		87%	
Special Education	*		*	
English Learner	79%		86%	
Female	89%		92%	
Male	71%		84%	
Black or African American	*		*	
White	78%		87%	

Table C: Passing Grades in ELA and Math Courses by Grade

Reporting on subgroups of more than 30 (student privacy)	Term 1	Term 2	Term 1	Term 2
	English	English	Math	Math
Grade 9	81%		91%	



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Grade 10	79%		82%	
Grade 11	77%		89%	
Grade 12	77%		91%	



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Building: Michigan Cyber Academy

Table A: Building Goals

Goal Category	Goal Related to Achievement on K - 8 Benchmarks as required by law (MCL 388.1698b, MCL 388.1704a).
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End of the Year Reading Goal	By June 2022 there will be an increase of at least 5% in the passage rate of all English courses.
Middle of the Year Mathematics Goal	By February 2022, there will be a 70% passage rate in all math courses.
End of the Year Mathematics Goal	By June 2022 there will be an increase of at least 5% in the passage rate of all math courses.
Summary of Progress	Note: According to the current record in MI Star 100% of students attending MCA received passing grades in English and Math classes during Term 1 and Term 2 of the 2021-2022 School year. Therefore the data is not displayed or disaggregated by demographics or grade level.

Secondary Mid Year Goals Board Update 2021-2022



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Progress Toward Mid-Year Goals

Data review will include:

- Schools with secondary students (Populations Over 30)
- Progress toward required mid-year goals
- A variety of data sources, depending on the goal selected, such as
 - Passing grades in English and Math courses - grades 9-12
 - Progress Toward Graduation - grade 12
 - College Spring SAT Prep - grade 11
- Disaggregated by student demographics and grade level - [Benchmark Assessment - Mid Year Progress Report](#)
- **Important Note:** Data is not displayed for any group with fewer than 30 students to protect student privacy (State of Michigan requirement)

District Strategic Plan Goal Alignment:

Provide opportunities for teachers to expand instructional strategies to include disciplinary literacy and the 8 mathematical practices to improve EBRW and Math scores on the PSAT and SAT for all student populations by 5% by June 2022.

Data captured in the presentation is used to

- Inform instruction and student support
- Monitor the impact of interventions and progress toward mid year goals
- Provide additional support to students who we have not served well

What are some of the positive trends in grades 9-12? What is present that we can build upon?

College Spring SAT Testing - HPHS

- Average increases on the SAT Prep Test: 33 points on the overall score, 18 points on the EBRW scores, and 14 points math scores
- Of the 85 students who took the October and January test:
 - 54 students improved by average of 87 points
 - 29 students decreased by average of 67 points
 - 2 student scores remaining the same

Passing Grades in English and Math Courses

- As of Term 1 or Semester 1, a 70% passage rate was achieved in all English and math courses for all students and student groups at Hazel Park High School, Michigan Cyber Academy, and INVEST.
- Advantage students are showing a high passage rate in all math courses.
- As of Term 1, a 70% passage rate was achieved in all math course for students at Viking Virtual.

Progress Toward Graduation

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- Viking Virtual Academy has already achieved their goal of 70% of students on track to graduate in June 2022.
- 68% of students at Hazel Park High School are on track to graduate. Another 20% are enrolled in the needed credit recovery courses to graduate on time. With the successful completion of these course, graduation rate could reach 88%.

What surfaces as areas of focus? What do we notice about specific student groups who may have unfinished learning or whose academic needs have not been met?

Progress toward graduation for the following student groups

- Black or African American
- Male
- Virtual Students

Passing Grades in English and Math Courses for the following student groups

- Students electing to complete courses virtually
- Black or African American
- Male
- Reading and Writing - In Some Setting

College Spring Outcomes

- Low percentage of students who have met the EBRW and Math Benchmarks

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Hazel Park High School Mid Year Goals

Reading and Writing:

- **Goal 1:** By February 2022, the SAT reading scores for 11th graders using College Spring will show an improvement of 2.5% as measured by the College Spring SAT Prep test.
- **Goal 2:** By February 2022, there will be a 70% passage rate in all English courses.
- **Goal Status:**
 - The goal of a 2.5% increase in scores on the Evidence-Based Reading and Writing SAT test was achieved for all students and student groups except.
 - A 70% passage rate in all English courses was met for all students and student groups.

Math:

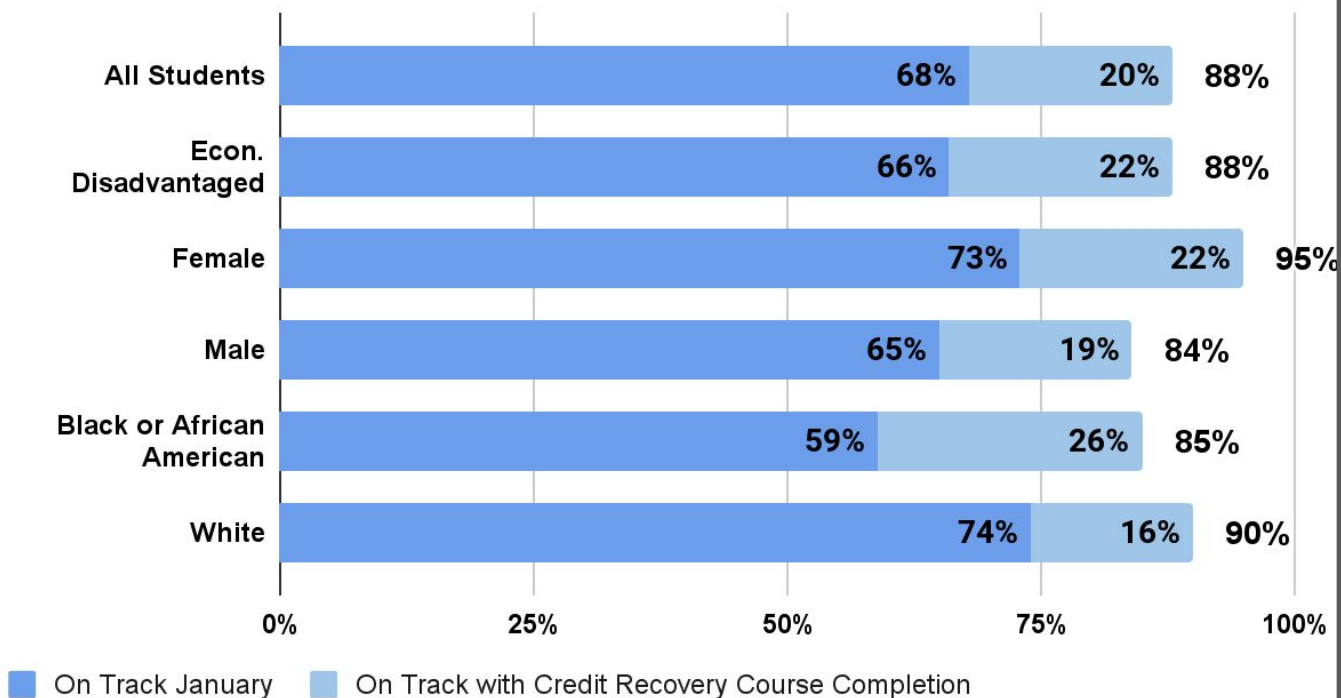
- **Goal 1:** By February 2022, the SAT math scores for 11th graders using College Spring will show an improvement of 2.5% as measured by the College Spring SAT Prep test.
- **Goal 2:** By February 2022, there will be a 70% passage rate in all math courses.
- **Goal Status:**
 - The goal of a 2.5% increase in scores on the Math SAT test was achieved for all students and student groups except white females.
 - A 70% passage rate in all math courses was met for all students and student groups.

Progress Toward Graduation

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- Goal 3: By June 2022, the graduation rate at the high school will increase from 80% to 84%.
- **Goal Status:** The expected end of the year graduation rate is 84%. There are currently 68% of students who are on track to graduate. An additional 20% are in 1-2 credit recovery classes. Successful completion of these courses will place them on track to graduate by the end June 2022. To date, this goal has not been achieved. However, with completion of all credit recovery courses the projected graduation would be 88%.

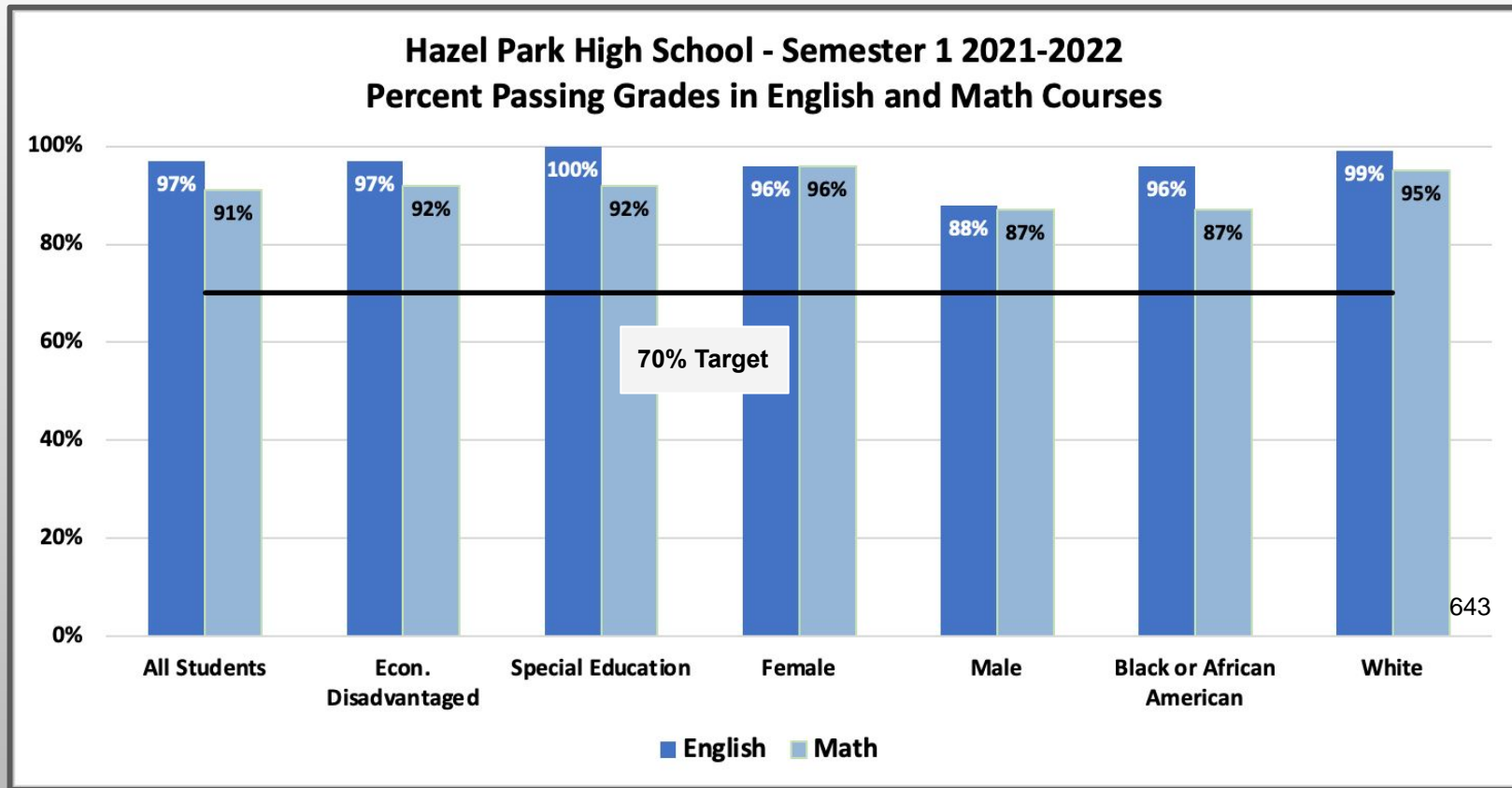
Progress Toward Graduation - Hazel Park High School 2021-2022



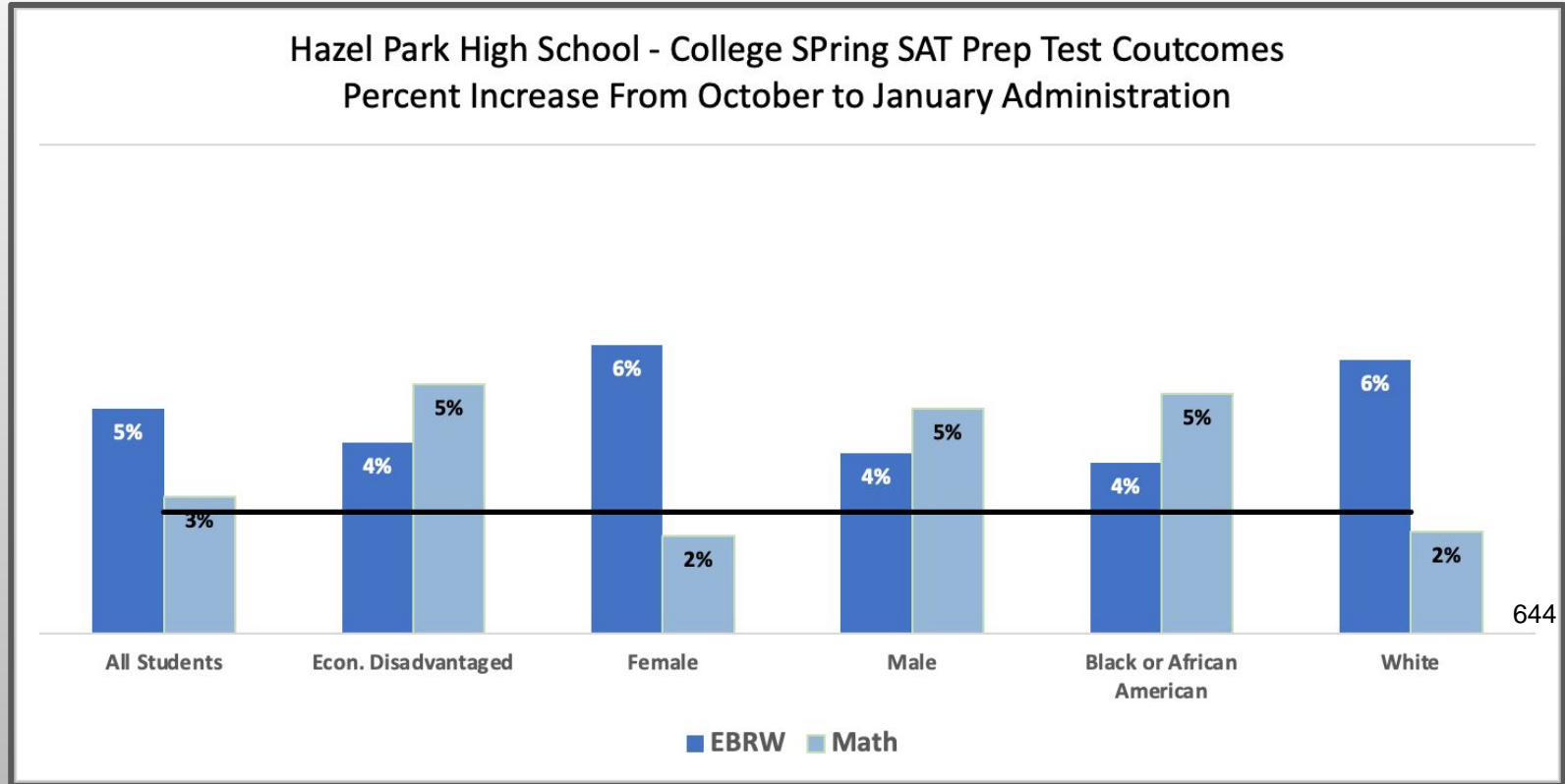
642

One 5th year senior completed graduation requirements by the end of Semester 1.

Hazel Park High School - Passing Grades in English and Math



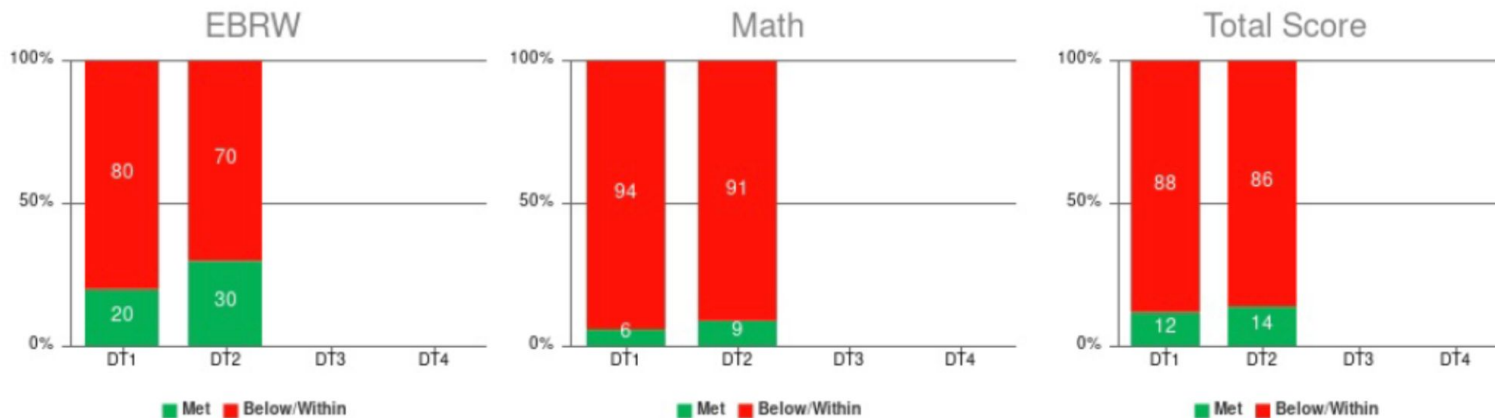
Hazel Park High School - College Spring SAT Prep Score Increase



From College Spring - Students Meeting SAT Benchmark Scores

BENCHMARK SCORES : Students meeting SAT benchmarks have a high possibility of obtaining a passing grade in their related 1st-semester credit-bearing courses. Visit the College Board website for more information.

SHARE OF STUDENTS MEETING BENCHMARK SCORES



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Viking Virtual Academy - Mid Year Goals

Reading and Writing

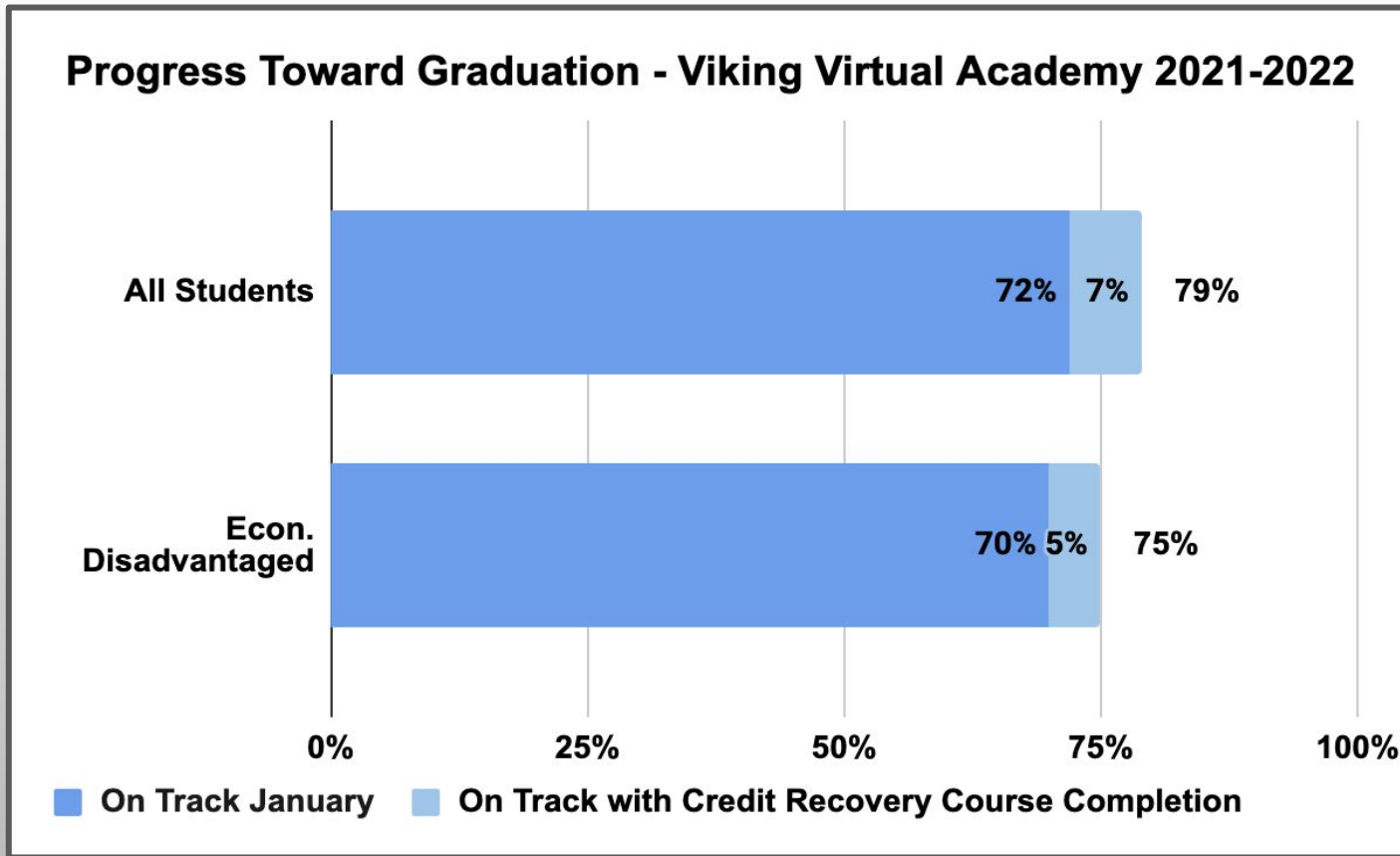
- **Goal 1:** By February 2022, there will be a 70% passage rate in all English courses.
- **Goal Status:**
 - The goal of a 70% passage rate in all English courses was not met.

Math

- **Goal 1:** By February 2022, there will be a 70% passage rate in all math courses.
- **Goal Status:**
 - The goal of a 70% passage rate in all math courses has been achieved for all student groups.

Progress Toward Graduation

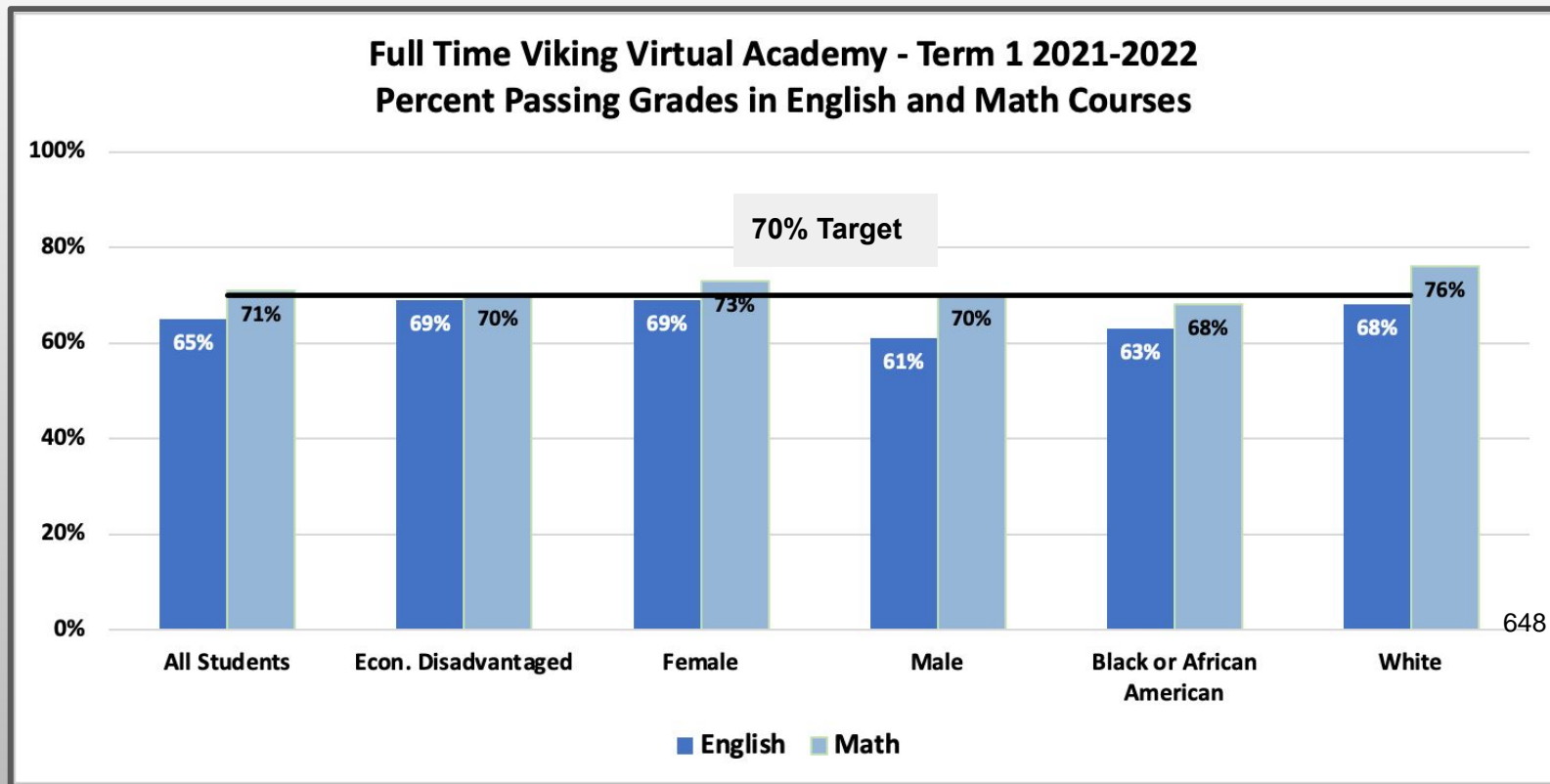
- The expected graduation rate of 65% by June 2022 has already been achieved. The current data indicates that 72% of students are on track to graduate with another 7% who will be on track with the completion of 1-2 credit recovery courses. If all students successfully complete courses, the graduation rate would be approximately 79%.



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Eight 5th year seniors completed graduation requirements by the end of Semester 1.

Viking Virtual - Passing Grades in English and Math



Advantage - Mid Year Goals

Reading and Writing

- **Goal 1:** By February 2022, there will be a 70% passage rate in all English courses.
- **Goal Status:**
 - The goal of a 70% passage rate in all English courses has not been achieved.

Math

- **Goal 1:** By February 2022, there will be a 70% passage rate in all math courses.
- **Goal Status:**
 - The goal of a 70% passage rate in all Math courses has been achieved for all students.

Progress Toward Graduation

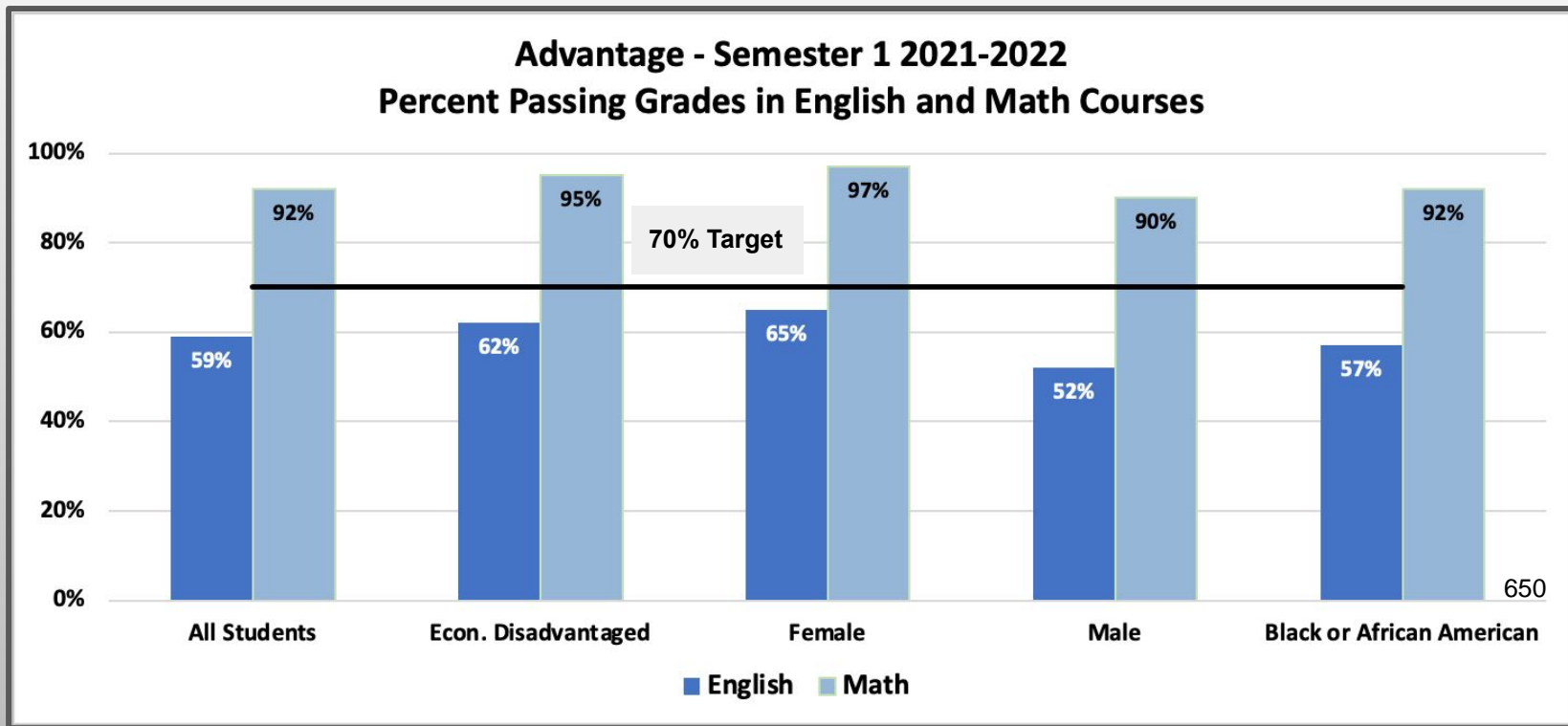
- **Goal:** By June 2022, the graduation rate for Advantage will increase from 23 to 30%.
- **Goal Status:** 29% of students are on track to graduate, 1% away from the target of 30%.

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At this time, **29%** of students 4th year students are on track to graduate. Data will not be displayed by gender, race, ethnicity, special education, or English learners due to student groups of fewer than 30.

Two 5th year seniors completed all graduation requirements.

Advantage- Passing Grades in English and Math



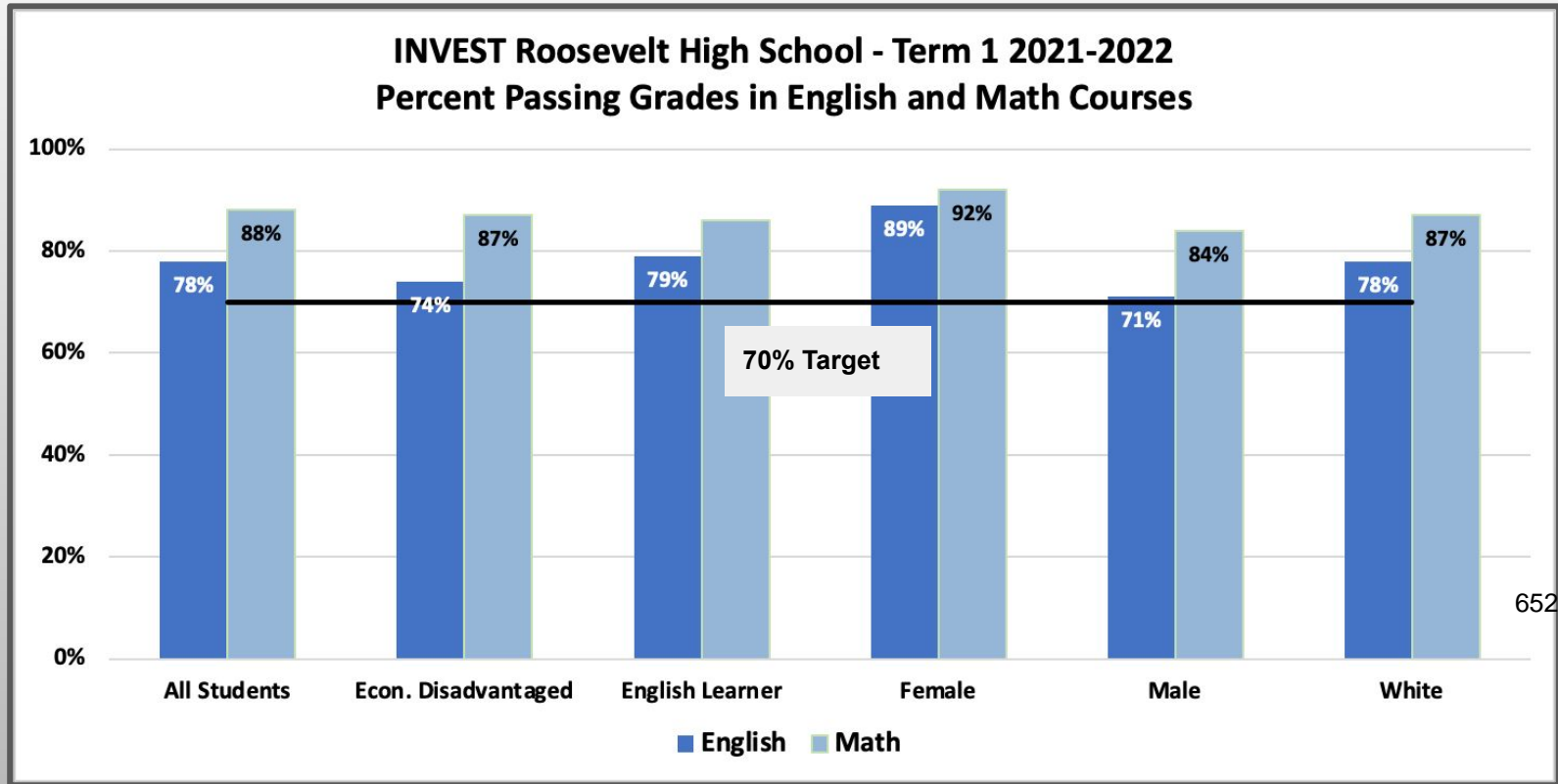
Reading and Writing

- **Goal 1:** By February 2022, there will be a 70% passage rate in all English courses.
- **Goal Status:**
 - The goal of a 70% passage rate in all English courses has been achieved for all students and student groups.

Math

- **Goal 1:** By February 2022, there will be a 70% passage rate in all math courses.
- **Goal Status:**
 - The goal of a 70% passage rate in all Math courses has been achieved for all student groups.

INVEST- Passing Grades in English and Math



Michigan Cyber Academy- Passing Grades in English and Math

Reading and Writing

- **Goal 1:** By February 2022, there will be a 70% passage rate in all English courses.

Math

- **Goal 1:** By February 2022, there will be a 70% passage rate in all math courses.

Note: According to the current record in MI Star 100% of students attending MCA received passing grades in English and Math classes during Term 1 and Term 2 of the 2021-2022 School year. Therefore the data is not displayed or disaggregated by demographics or grade level.

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What are some opportunities for growth in grades 9-12? What actions have we or will we take to support students whose academic needs have not been met?

- Make wellness phone calls to students when they reach 5 absences.
 - Teachers must have at least 2 documented parental contacts prior to a student failing a course. (HPHS also)
- Increased early identification of students who we are failing and communicating with families to potentially move them to Advantage where they may earn more credits (at least 7.5) per school year. (HPHS also)
- Increase the personalized contact with VVA students in order to increase the percentage of classes completed.

What are some opportunities for growth in grades 9-12? What actions have we or will we take to support students whose academic needs have not been met?

HPHS

- Every parent/guardian was mailed their student's graduation credit audit in October and February.
- Every credit deficient student met with their counselor in the fall and each parent was contacted first via phone and then emailed the credit information and ways to make up the credit.
- Every credit deficient 12th grader met with their counselor to set monthly goals.
- Instituted "School Survival" lunch groups for any student that failed after the first report card.
- Conducted a needs assessment asking staff to identify students in need of increased organizational skills. Counselors and counseling intern conduct weekly lunch meetings.
- Held grade level meetings quarterly to review academic data and explain opportunities to recover credit.
- Had students speak at 9th and 10th grade level meetings who have had to complete many credit recovery classes before or during their senior year.
- Instituted before and after school in-person tutoring/homework help and evening Zoom help 4 days per week.
- College Adviser meets with students regularly, provided opportunities to meet college admissions representatives in the fall and most recently provides touring campus opportunities. 655
- Provide targeted SAT prep instructional/practice opportunities in English and Math courses for 11th graders.



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To: Hazel Park Board of Education
From: Thomas Oestrike, Athletic Director
Subject: Formal Request for Travel
Date: March 14, 2022

Description

Hazel Park Dance Teams are formally requesting to travel to the **National Championships** for dance. This is a 3 day- overnight event. Transportation, Food and Lodging will be provided by the dancer's family.

Event Information

Date: Friday, April 8th, 2022- Sunday, April 10th, 2022.

Location of competition: Lawrenceburg Event Center-91 Walnut St, Lawrenceburg, IN **47025**

Location of the Hotel: BAYMONT BY WYDHAM-LAWRENCEBURG 1000 EAST EADS PARKWAY, LAWRENCEBURG, IN 47025

Traveling Time:Approx. 4hr 22min (Depending on the start location)

Director: Shannon Strong-Jones

Coaches: Samantha Richardson, Madison Cassidy

Director/ Coaches Assistants: Amber Hulbert, Makenzy Herman

Dancers Expected to Attend:

Ryleigh Adams Julissa Breneman Aubree Canestrelli Alyssa Cochran Taylor Kilburn Skyyla Morris Lucia Ruiz Emilia Ball, Trinity Cronk, Alexis Ferris, Aaliyah Harris, Ava Parkinson, Sharhonda Shepherd, Jamaria Stephens, Kendall Thornton, Kaylah White, Madelyne Rucks, Olivia Rucks, Caitlyn Weiss, Lia Turner, Allie Kilburn, Gianna Zivojnovity, Sophia Limburger, Serenity Rogers, Aria Mcknight

Itinerary

Friday: Traveling/ PM Solos

Saturday: Team Performances/ Awards

Sunday: AM Team Performance/ Best of the Best Compete/Awards/ Travel Home

Recommendation

That the Board of Education approves the Hazel Park Dance Teams request to travel to the National Championships.

**APPROVED AND RECOMMENDED
FOR BOARD ACTION**

Amy Y. Kruppe, Ed.D.
Superintendent

Certificate of Appreciation

The appreciation of the management and staff of the National Assessment of Educational Progress,
The Nation's Report Card,
is hereby extended to

657

Edison

In recognition of the professional support so instrumental in the successful accomplishment of the
National Assessment of Educational Progress



Peggy G. Carr, Commissioner
National Center for Education Statistics
U.S. Department of Education

