DEPARTMENT OF ADMINISTRATIVE SERVICES (DAS)

Office of School Construction Grants & Review (OSCG&R)

REQUEST FOR REVIEW OF FINAL PLANS
FORM SCG-042

STATUTORY REF.: C.G.S. Sections 10-282, 10-283, 10-291, 10-294, 10-292

DISTRICT NAME:	FACILITY NAME AND ADDRESS:	STATE PROJECT NUMBER:
Madison Public School	New Elementary School 180 Mungertown Rd Madison, CT 06443	076-0067N
		PHASE NUMBER: 1 of 4 - Early Procurement

Estimated date* to begin construction _3/1/2023_____ Estimated date to complete construction ___9/1/2023_____

*** NOTE: Construction must begin within 2 years of grant commitment date to maintain grant eligibility.**

Certification of Approval dates:

	Final Plans & Prof. Cost Estimate	Site Approval (if applicable)
Local Board of Education	09 / 05 / 23	/ /
School Building Committee	08 / 31 / 23	/ /

We hereby certify that these **final plans and project manual(s)** as prepared for bidding and dated ___**7/21/2023**_____, and the **professional cost estimate**, completed in accordance with Level 3 of ASTM International Standard E1557, Standard Classification of Building Elements and Related Sitework-UNIFORMAT II for this project, dated __**8/29/2023**_____, have been reviewed and approved for this project on the dates shown above.

For the Town or Regional Board of Education:

Seth Klaskin

Chairperson's Name (Type or print)	Signature	Date **

For the School Building Committee:

Graham Curtis

Chairperson's Name (Type or print)	Signature	Date **

**** Signature dates cannot precede the date on the submitted plans.**

For the Project Architect/Engineering Firm:

Tecton Architects

Firm Name (Type or print)	Signature	Telephone No.

We hereby request a review of the final Project Plans, Project Manual, Ineligible and Limited Eligible Costs Worksheet (ICW) FORM SCG-4000, and professional cost estimate as noted above. Copies of all the above referenced documents are either attached, or available.

Dr. Craig Cooke

Superintendent's Name (Type or print)	Signature	Date

NOTE: NO PHASE OF THIS SCHOOL CONSTRUCTION PROJECT SHALL GO OUT TO BID, AND NO PURCHASE ORDER OVER $10,000.00 SHALL BE ISSUED, UNTIL YOU HAVE RECEIVED WRITTEN NOTIFICATION FROM THE STATE DEPARTMENT OF ADMINISTRATIVE SERVICES (DAS) INDICATING APPROVAL OF FINAL PLANS, PROJECT MANUAL, AND COST ESTIMATE.

FORM SCG-042 Request for Review of Final Plans

State Project No. 076-0067N

Project Name: Town of Madison - New Elementary School

Name of Contact Person:	Telephone:	Date:
Adam Levitus	203 318 6588	9/13/2023

Certifications of Local Approval:

I certify that I have local jurisdiction over the **State Building Code** and that the plans and project manual dated __7/21/2023_____ for the above referenced project comply with all applicable building codes.

_____ _____ _____

Local Building Official's Name Signature Date

I certify that I have local jurisdiction over the **State Fire Safety Code** and that the plans and project manual dated ___7/21/2023_____ for the above referenced project comply with all applicable fire codes.

_____ _____ _____

Local Fire Marshal's Name Signature Date

I certify that I have local jurisdiction over the **State Health Code** and that the plans and project manual dated ___7/21/2023_____ for the above referenced project comply with all applicable health codes.

_____ _____ _____

Local Health Official's Name Signature Date

I certify that I have local jurisdiction over **Section 504 of the Rehabilitation Act of 1973**, and the Uniform Federal Accessibility Standards (UFAS). I further certify that the plans and project manual dated __7/21/2023_____ for the above referenced project comply with all applicable accessibility codes.

_____ _____ _____

Local Federal 504 Official's Name Signature Date

NOTES:

1.) THE CERTIFICATIONS OF LOCAL APPROVAL NOTED ABOVE MUST BE OBTAINED, AND ARE REQUIRED TO BE PROVIDED, PRIOR TO RECEIVING APPROVAL-TO-BID BY THE STATE DEPARTMENT OF ADMINISTRATIVE SERVICES (DAS) FOR THIS PROJECT. IF THESE CERTIFICATIONS CANNOT BE OBTAINED LOCALLY, PLEASE CONTACT THE DAS, OFFICE OF SCHOOL CONSTRUCTION GRANTS & REVIEW (OSCG&R) FOR ASSISTANCE.

2.) THE OFFICE OF SCHOOL CONSTRUCTION GRANTS & REVIEW (OSCG&R) APPROVED PROJECT PLANS, PROJECT MANUAL AND COST ESTIMATE MUST BE KEPT ON FILE AT THE LOCAL BOARD OF EDUCATION OFFICE UNTIL THE FINAL GRANT PAYMENT HAS BEEN MADE AND THE DAS AUDIT IS COMPLETE ON THIS PROJECT.

3.) ORIGINAL SIGNATURES ARE REQUIRED ON THIS FORM. IF ORIGINAL SIGNATURES ARE NOT AVAILABLE AT THE PLAN REVIEW MEETING, MAIL OR OVERNIGHT DELIVER THIS COMPLETED FORM TO:
The Office of School Construction Grants & Review
450 Columbus Blvd., Suite 1503
Hartford, CT 06103

THIS PROJECT IS PARTICIPATING IN AN ENERGIZE CT DOWNSTREAM PROGRAM PATHWAY; CONTRACTORS SHALL NOT PURSUE OR ACCEPT ANY HVAC, DOMESTIC HOT WATER, FOOD SERVICE OR LIGHTING MIDSTREAM INCENTIVES FOR THIS PROJECT.

DRAWINGS LIST

NEW PK-5 ELEMENTARY SCHOOL

180 Mungertown Road
Madison, CT, 06443

STATE PROJECT NO. 076-0067N
PHASE 1 OF 4

PROJECT MANAGER

COLLIERS PROJECT LEADERS, LLC

135 NEW ROAD, UNIT 2
MADISON, CT 06443

860.395.0055

OWNER

TOWN OF MADISON

8 CAMPUS DRIVE
MADISON, CT 06443

203.245.5600

ARCHITECT

TECTON ARCHITECTS, PC

34 SEQUASSEN STREET, SUITE 200
HARTFORD, CT 06106

CONSTRUCTION MANAGER

GILBANE BUILDING COMPANY

208 NEW LONDON TURNPIKE
GLASTONBURY, CT 06033

860.368.5100

CIVIL ENGINEER & LANDSCAPE ARCHITECT

BENESCH

120 HEBRON AVENUE, FLOOR 2
GLASTONBURY, CT 06033

860.633.8341

STRUCTURAL ENGINEER

MICHAEL HORTON ASSOCIATES, INC.

151 MEADOW STREET
BRANFORD, CT 06405

203.481.8600

MEPFP ENGINEER

KOHLER RONAN

93 LAKE AVENUE
DANBURY, CT 06810

203.778.1017

COMMISSIONING AGENT

BVH INTEGRATED SERVICES

206 West Newberry Road
Bloomfield, CT 06002

860.286.9171

FOOD SERVICE EQUIPMENT

CRABTREE & MCGRATH

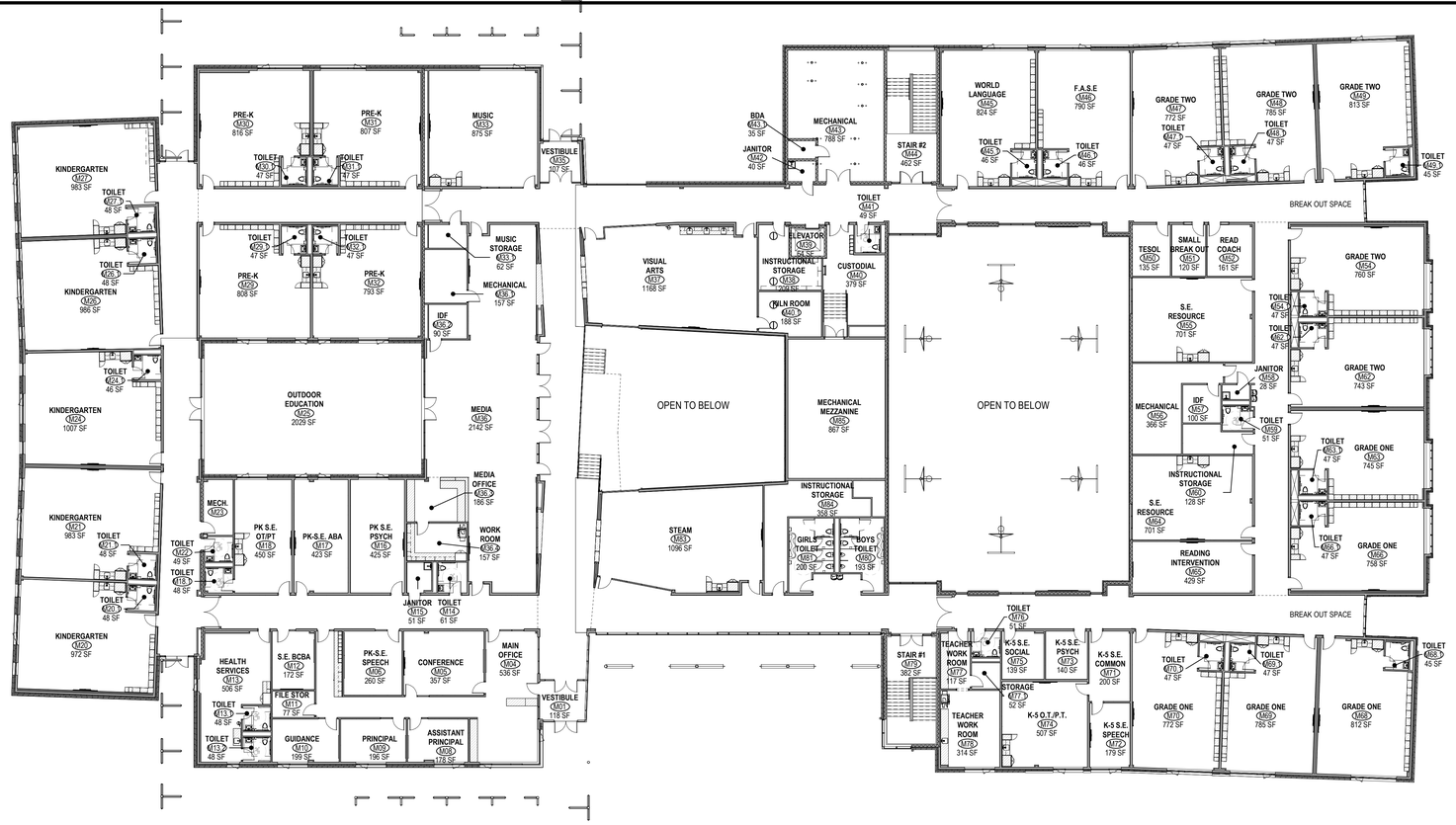
161 WEST MAIN ST.
GEORGETOWN, MA 01833

978.352.8500

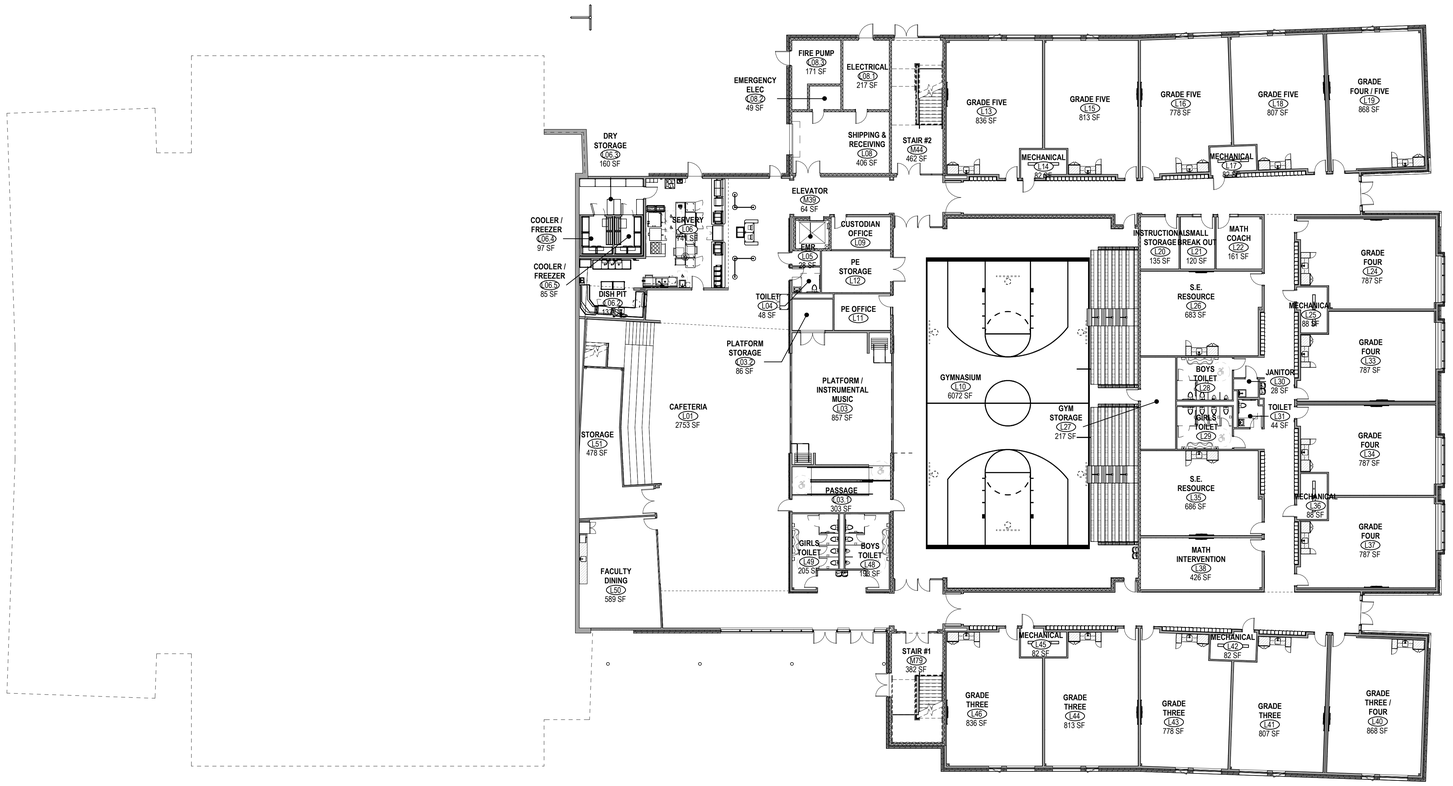
EARLY PROCUREMENT PACKAGE
PHASE 1 OF 4
NOT FOR CONSTRUCTION

PROJECT NAME: NEW PK-5 ELEMENTARY SCHOOL

PROJECT NUMBER: MAD02AR



E10 MAIN LEVEL FLOOR PLAN
1/16" = 1'-0"



K10 LOWER LEVEL FLOOR PLAN
1/16" = 1'-0"

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Tecton ARCHITECTS

Client/ Contractor

MADISON PUBLIC SCHOOLS

10 Campus Drive
Madison, CT, 06443

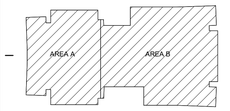
Project

NEW PK-5 ELEMENTARY SCHOOL

180 Mungertown Road
Madison, CT, 06443

STATE PROJECT NO. 076-0067N

Key Plan



PROJECT NORTH

Seals

EARLY PROCUREMENT PACKAGE PHASE 1 OF 4

Issues / Revisions

No.	Date	Description
	03/29/2023	DESIGN DEVELOPMENT REVISIONS
	05/12/2023	DDR SUBMISSION
	07/21/2023	EARLY PROCUREMENT PACKAGE

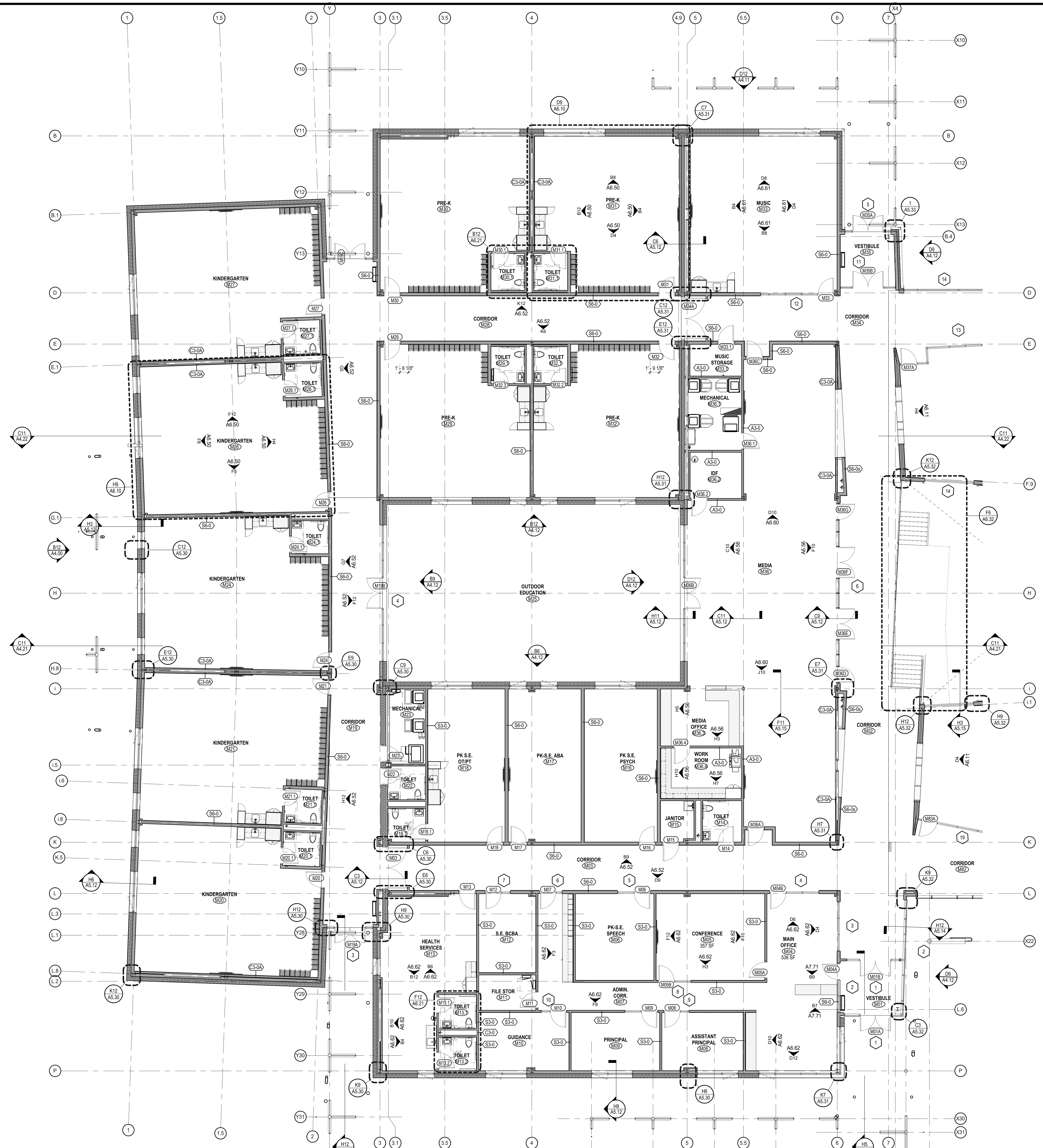
Drawing Title

OVERALL FLOOR PLANS

Project Manager:	PM	Project No:	MAD02AR
Project Architect:	PA	Production Leader:	PL
Project Designer:	ID	Peer Reviewer:	PR

Drawing Number

A1.00



K11 MAIN LEVEL FLOOR PLAN
1/8" = 1'-0"

CONSTRUCTION LEGEND

(line)	NEW CONSTRUCTION	(hatch)	CASEWORK HATCH
FEC	FIRE EXTINGUISHER CABINET	ROOM NAME / NUM	ROOM NAME & ROOM NUMBER
101	DOOR NUMBER, REFER TO DRAWINGS A9.10 & A9.11	A3-0	PARTITION TYPE, REFER TO DRAWINGS A0.20 & A0.21
S.#	STOREFRONT & CURTAIN WALL TAG, REFER TO DRAWINGS A9.20 THRU A9.25		

GENERAL NOTES - CONSTRUCTION

1. ALL WALLS ARE TYPE A3-0 UNLESS OTHERWISE NOTED. PARTITION TYPES CONTINUE AROUND CORNERS UNLESS INDICATED OTHERWISE.
2. WHERE TWO DENOTED WALL TYPES COINCIDE, THE MOST STRINGENT OF BOTH WALL CONSTRUCTION DEFINITIONS APPLIES TO THAT WALL (ie. FIRE CODE GYPSUM, BATT INSULATION). WHERE A RATED CONSTRUCTION BEGINS/ TERMINATES AT AN EXISTING COLUMN ENCLOSURE OR NEW FURRED, NON-RATED ENCLOSURE, THE HIGHER RATING MUST BE PROVIDED. THE INTENT IS TO PROVIDE A COMPLETE ENVELOPE OF INTENDED DESIGN RATINGS.
3. PROVIDE SOLID WOOD BLOCKING FOR ALL INDICATED WALL HUNG EQUIPMENT.
4. FIRE SAFE ALL PENETRATIONS IN RATED WALL ASSEMBLIES. SEE TYPICAL RATED WALL PENETRATION DETAIL.
5. VERIFY LOCATION OF ALL ACCESS PANELS WITH MEP EQUIPMENT.
6. ALL DIMENSIONS SHALL BE FIELD VERIFIED BY THE CONTRACTOR AND ANY DISCREPANCIES SHALL BE PROMPTLY REPORTED TO THE ARCHITECT.
7. WHERE THE DRAWINGS AND SPECIFICATIONS CONFLICT THE MOST STRINGENT, GREATEST QUANTITY AND OR BEST QUALITY SHALL BE USED.
8. FIRE RATED PARTITIONS INDICATED ON THE FLOOR PLANS ARE COMPONENTS OF CONTINUOUS RATED ASSEMBLIES CONSISTING OF WALLS, FLOOR, DOORS, INTERIOR BORROWED LIGHTS, MECHANICAL PENETRATIONS AND CEILINGS. REFER TO PLANS AND SPECIFICATIONS FOR METHODS OR ACHIEVING THE NECESSARY RATINGS. WHERE THE SPECIFIC METHOD OF ACHIEVING THE RATING IS NOT INDICATED, OBTAIN CLARIFICATION FROM ARCHITECT PRIOR TO BIDDING.
9. WHERE DOORS IN METAL STUD PARTITIONS ARE NOT SPECIFICALLY LOCATED ON THE PLANS WITH DIMENSION STRINGS, PROVIDE A MINIMUM HINGE SIDE JAMB DIMENSION OF 6". WHERE DOORS APPEAR TO BE CENTERED WITHIN PARTITIONS, LOCATE THE DOOR IN THE CENTER OF THE PARTITION.
10. CAULK ALL JOINT OR CRACKS WHICH OCCUR WHERE DISSIMILAR MATERIALS INTERSECT PERPENDICULAR TO EACH OTHER AND THE INTERSECTION IS EXPOSED TO VIEW UNLESS INDICATED OTHERWISE ON THE DRAWINGS.
11. ALL SITE ELEMENTS (e.g. FLAT WORK, LANDSCAPING, CONCRETE STAIRS, ETC.) ARE SHOWN FOR REFERENCE ONLY. REFER TO CIVIL DRAWINGS FOR DESIGN AND CONSTRUCTION METHODS

Tecton ARCHITECTS

Client/ Contractor

MADISON PUBLIC SCHOOLS

10 Campus Drive
Madison, CT, 06443

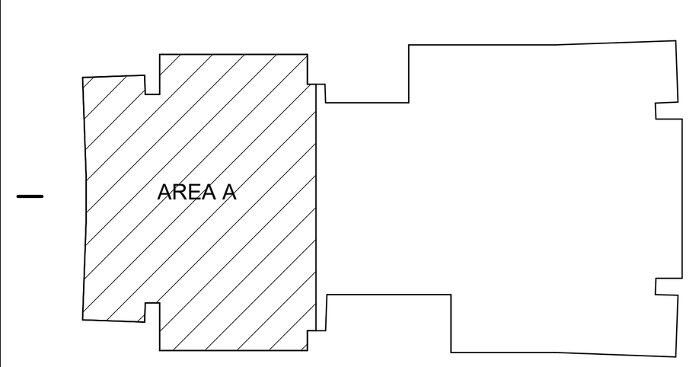
Project

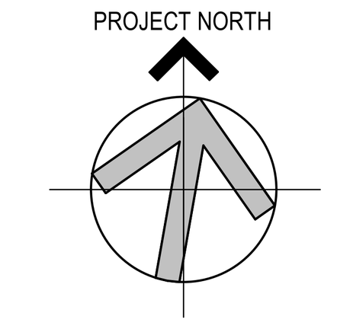
NEW PK-5 ELEMENTARY SCHOOL

180 Mungertown Road
Madison, CT, 06443

STATE PROJECT NO. 076-0067N

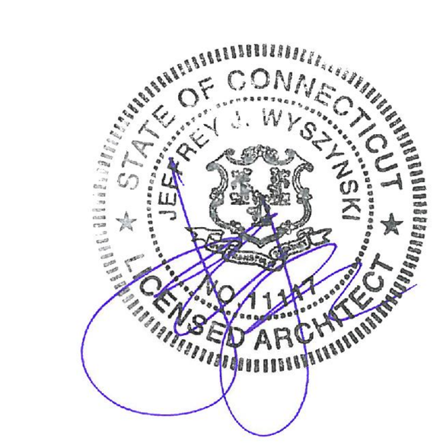
Key Plan





Seals

EARLY PROCUREMENT PACKAGE PHASE 1 OF 4



Issues / Revisions

No.	Date	Description
	03/23/2023	DESIGN DEVELOPMENT
	03/29/2023	DESIGN DEVELOPMENT REVISIONS
	05/12/2023	DDR SUBMISSION
	07/21/2023	EARLY PROCUREMENT PACKAGE

Drawing Title

FLOOR PLAN - MAIN LEVEL AREA A

Project Manager:	PM	Project No:	MAD02AR
Project Architect:	PA	Production Leader:	PL
Project Designer:	ID	Peer Reviewer:	PR

Drawing Number

A1.10A

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CONSTRUCTION LEGEND

NEW CONSTRUCTION	CASEWORK HATCH
FEC — FIRE EXTINGUISHER CABINET	ROOM NAME (N.M#) — ROOM NAME & ROOM NUMBER
101 — DOOR NUMBER, REFER TO DRAWINGS A9.10 & A9.11	A3-0 — PARTITION TYPE, REFER TO DRAWINGS A0.20 & A0.21
S.# — STOREFRONT & CURTAIN WALL TAG, REFER TO DRAWINGS A9.20 THRU A9.25	

GENERAL NOTES - CONSTRUCTION

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K12 MAIN LEVEL FLOOR PLAN

1/16" = 1'-0"

Client/ Contractor

MADISON PUBLIC SCHOOLS

10 Campus Drive
Madison, CT, 06443

Project

NEW PK-5 ELEMENTARY SCHOOL

180 Mungertown Road
Madison, CT, 06443

STATE PROJECT NO. 076-0067N

Key Plan

PROJECT NORTH

Seals

EARLY PROCUREMENT PACKAGE PHASE 1 OF 4

Issues / Revisions

No.	Date	Description
	03/23/2023	DESIGN DEVELOPMENT
	03/29/2023	DESIGN DEVELOPMENT REVISIONS
	05/12/2023	DDR SUBMISSION
	07/21/2023	EARLY PROCUREMENT PACKAGE

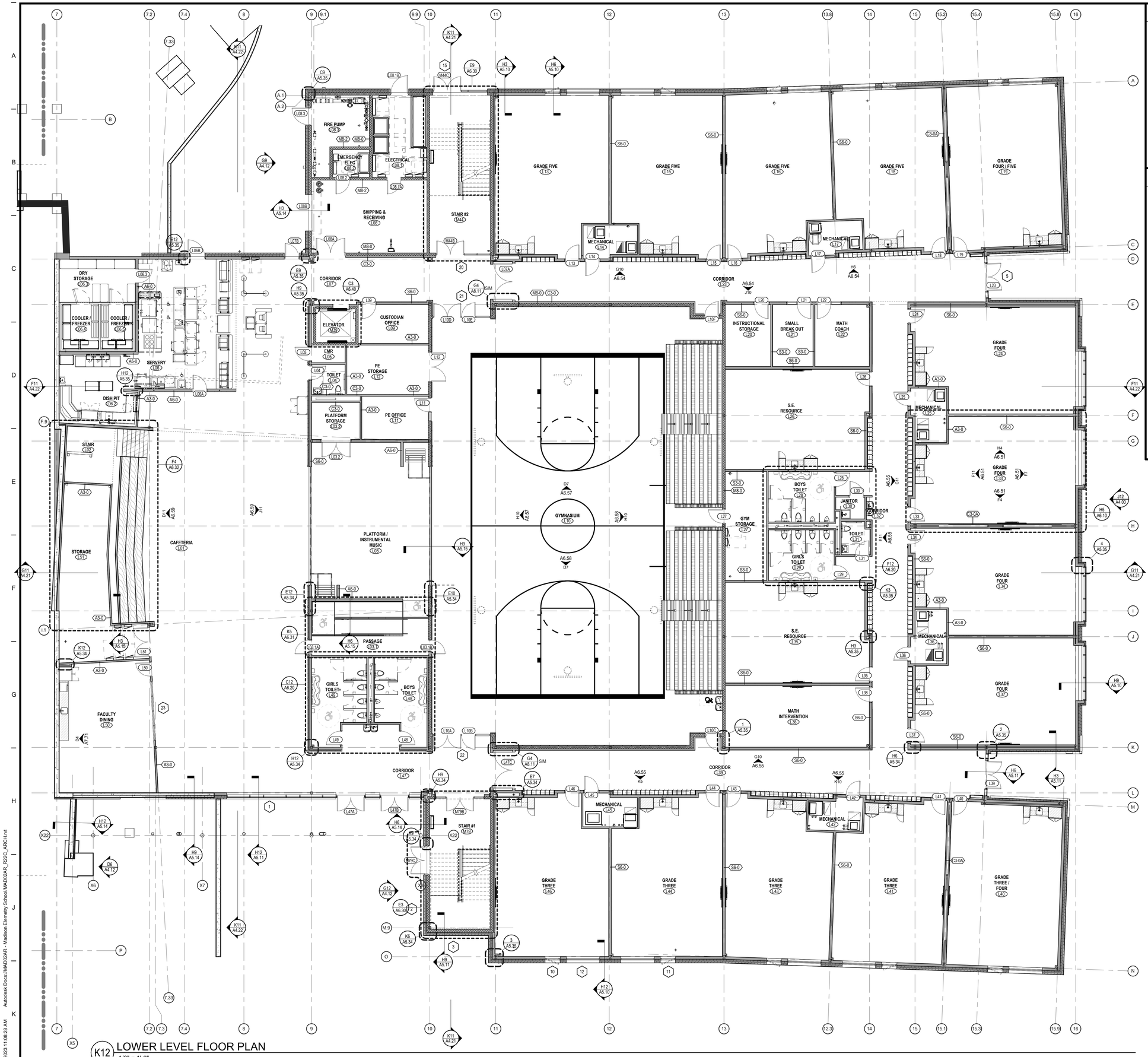
Drawing Title

FLOOR PLAN - MAIN LEVEL AREA B

Project Manager:	PM	Project No:	MAD02AR
Project Architect:	PA	Production Leader:	PL
Project Designer:	ID	Peer Reviewer:	PR

Drawing Number

A1.10B



K12 LOWER LEVEL FLOOR PLAN
1/8" = 1'-0"

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CONSTRUCTION LEGEND

- NEW CONSTRUCTION
- CASEWORK HATCH
- FEC — FIRE EXTINGUISHER CABINET
- ROOM NAME (NUM) — ROOM NAME & ROOM NUMBER
- 101 — DOOR NUMBER, REFER TO DRAWINGS A9.10 & A9.11
- A3-0 — PARTITION TYPE, REFER TO DRAWINGS A0.20 & A0.21
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Tecton ARCHITECTS

Client/ Contractor

MADISON PUBLIC SCHOOLS

10 Campus Drive
Madison, CT, 06443

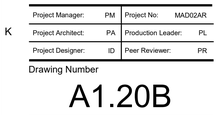
Project

NEW PK-5 ELEMENTARY SCHOOL

180 Mungertown Road
Madison, CT, 06443

STATE PROJECT NO. 076-0067N

Key Plan



PROJECT NORTH

Seals

EARLY PROCUREMENT PACKAGE PHASE 1 OF 4

Issues / Revisions

No.	Date	Description
	03/23/2023	DESIGN DEVELOPMENT
	03/29/2023	DESIGN DEVELOPMENT REVISIONS
	05/12/2023	DDR SUBMISSION
	07/21/2023	EARLY PROCUREMENT PACKAGE

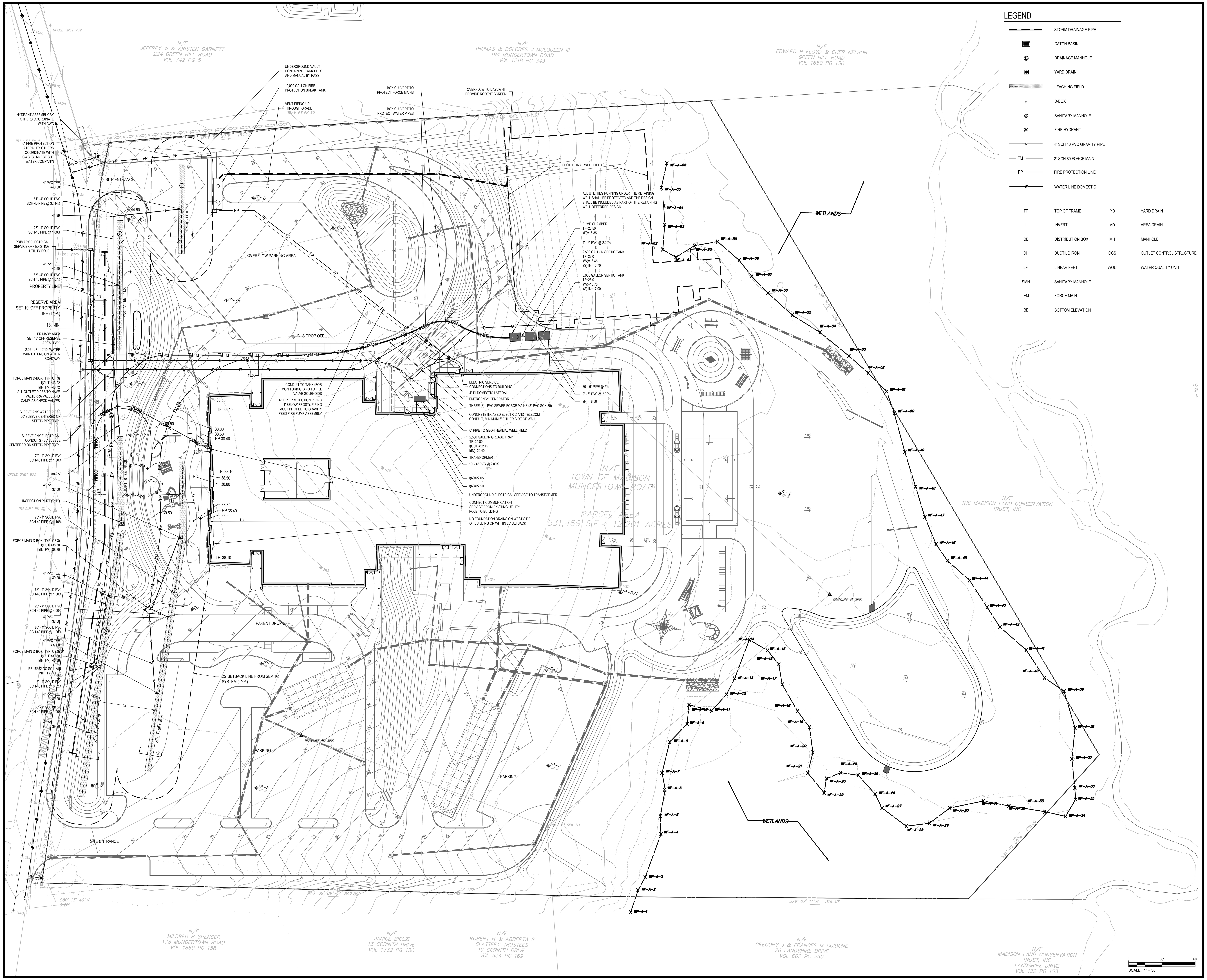
Drawing Title

FLOOR PLAN - LOWER LEVEL AREA B

Project Manager:	PM	Project No:	MAD02AR
Project Architect:	PA	Production Leader:	PL
Project Designer:	ID	Peer Reviewer:	PR

Drawing Number

A1.20B



Tecton ARCHITECTS

benesch
Alfred Benesch & Company
120 Hebron Avenue, 2nd Floor
Glastonbury, Connecticut 06033
860-633-8341

Client/ Contractor

MADISON PUBLIC SCHOOLS

10 Campus Drive
Madison, CT, 06443

Project

NEW PK-5 ELEMENTARY SCHOOL

180 Mungertown Road
Madison, CT, 06443

STATE PROJECT NO. 076-0067N

Seals

DESIGN DEVELOPMENT PHASE 1 OF TBD

Issues / Revisions

No.	Date	Description
	03/23/2023	DESIGN DEVELOPMENT
	05/12/2023	DDR SUBMISSION
	07/06/2023	WWC COMMENTS
	07/21/2023	EARLY RELEASE WATER PIPE

Drawing Title

UTILITY & SEPTIC PLAN

Project Manager:	RD	Project No:	70804.00
Landscape Architect:	RD	Production Leader:	AW
Civil Engineer:	WW	Peer Reviewer:	TS

Drawing Number

C3.0

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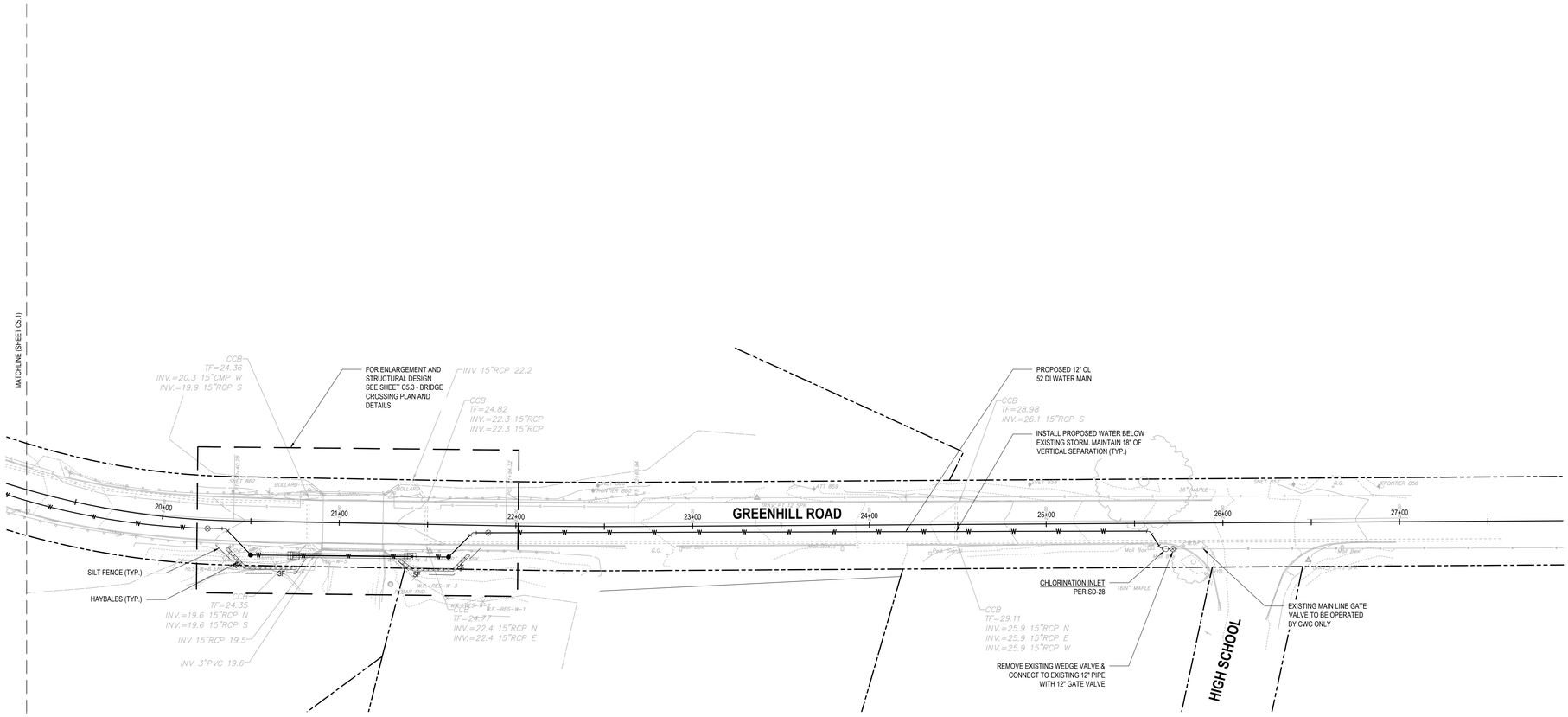
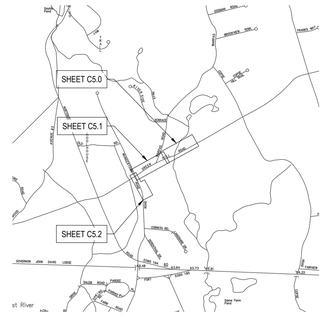
10/17/2022 1:28:17 PM

MADISON WATER MAIN EXTENSION

GREEN HILL ROAD TO MUNGERTOWN ROAD
SUBMITTED: 12/29/2022
REVISED: 04/06/2023

SHEET LIST





LOCUS MAP

SCALE: 1" = 1,500'

WATER MAIN INSTALLATION NOTES:

1. PROJECT MUST BE BUILT TO CT WATER COMPANY SPECIFICATIONS.
2. CLASS 52 DUCTILE IRON PIPE REQUIRED.
3. COPPER AND/OR DUCTILE IRON SERVICE LATERAL MATERIAL REQUIRED.
4. GATE VALVES TO THE OPEN RIGHT
5. FIRE HYDRANTS OPEN TO THE RIGHT, WITH 5.5' BURY DEPTH. CWC WILL FURNISH MATERIALS INCLUDING TEE, VALVE, PIPE, HYDRANT, AND ACCESSORIES. FIRE HYDRANTS TO BE INSTALLED WITH FACE OF HYDRANT 3-FEET OFF FACE OF CURB. HYDRANTS ARE NOT TO BE INSTALLED IN SIDEWALKS. WHERE 3-FEET CANNOT BE OBTAINED, INSTALL HYDRANT BEHIND SIDEWALK UNLESS OTHERWISE NOTED OR AS DIRECTED BY A CT WATER COMPANY PROJECT MANAGER. 10-FEET HORIZONTAL SEPARATION REQUIRED BETWEEN HYDRANTS, SEWER MANHOLES AND STORM DRAINS. ***FIRE HYDRANTS ARE TO BE INSTALLED WITH FINISH GRADE AT THE BURY LINE CAST INTO THE LOWER BARREL. CONTRACTOR IS RESPONSIBLE FOR ADJUSTMENTS OF WATER MAIN AND LATERAL ELEVATION TO ACHIEVE PROPER BURY DEPTH. ANY COSTS RELATED TO ADJUSTMENTS REQUIRED BY CT WATER COMPANY WILL BE THE RESPONSIBILITY OF THE INSTALLATION CONTRACTOR AND/OR APPLICANT OF RECORD.
6. ALL WATER MAIN PIPING AND APPURTENANCES MUST BE POLYETHYLENE ENCASED IN ACCORDANCE WITH AWWA ANSI-AWWA C105/A21.5-99(10). POLYETHYLENE ENCASEMENT SHALL BE V-BIO ENHANCED POLYETHYLENE ENCASEMENT STYLE ONLY AND CONSIST OF THREE CO-EXTRUDED LAYERS OF LINEAR LOW-DENSITY POLYETHYLENE (LLDPE) FILM THAT ARE FUSED INTO ONE.
7. MEGALUG RESTRAINTS REQUIRED ON ALL FITTINGS, BENDS, OFFSETS, TEES, GATE VALVES AND HYDRANTS.
8. FIELD LOK (U.S. PIPE) OR SURE STOP 350 (MCWANE) RESTRAINING GASKETS ARE REQUIRED TWO (2) PIPE JOINTS BEFORE AND AFTER EACH FITTING AND ON THE LAST THREE (3) PIPE LENGTHS ON DEAD ENDS.
9. THRUST BLOCKING IS REQUIRED ON ALL BENDS, TEES, OFFSETS, HYDRANTS AND DEAD ENDS.
10. ALL WATER MAINS SHALL BE INSTALLED TO A DEPTH OF 4-FEET OF COVER BASED ON THE ROADWAY GRADE, EXCEPT AS NOTED.
11. 3-FT MINIMUM HORIZONTAL SEPARATION REQUIRED BETWEEN WATER AND ANY OTHER UTILITY/UNDERGROUND STRUCTURE. 10-FT MINIMUM HORIZONTAL SEPARATION REQUIRED BETWEEN WATER AND SEWER/SEPTIC ("SEWER"). SEWER MUST BE SLEEVED WHERE WATER CROSSES SEWER IF WATER IS BELOW AND/OR WHEN 18" VERTICAL SEPARATION CANNOT BE ACHIEVED WHEN WATER IS ABOVE. 4-FEET MINIMUM HORIZONTAL SEPARATION REQUIRED BETWEEN WATER MAIN AND DRAINAGE WHEN AT LIKE ELEVATIONS.
12. WATER MAINS TO BE DEFLECTED UNDER ALL STORM DRAINS UNLESS OTHERWISE NOTED OR AS DIRECTED BY A CT WATER COMPANY PROJECT MANAGER. A VERTICAL CLEARANCE OF 18" TO BE MAINTAINED BETWEEN STORM DRAIN AND WATER MAINS. THE CONTRACTOR IS RESPONSIBLE FOR PROPER COMPACTION AROUND AND UNDER EXISTING DRAINAGE FACILITIES WHICH MAY INCLUDE REMOVAL AND RESETTING TO PROPER GRADE.
13. ANGLE OF BENDS TO BE FIELD DETERMINED.
14. MAXIMUM ALLOWABLE DEFLECTION PER FULL LENGTH PUSH-ON JOINT FOR 4" TO 12" IS FIVE (5) DEGREES AND THREE (3) DEGREES FOR 14" AND GREATER DUCTILE IRON PIPE.
15. EXISTING SERVICES TO SITE THAT WILL NO LONGER BE USED MUST BE TERMINATED AT THE WATER MAIN BY EXPOSING AND SHUTTING OFF THE CORPORATION VALVE. THE LINE MUST BE SERVED IMMEDIATELY AFTER THE CORPORATION VALVE. SAID SERVICES MUST BE SHOWN ON PLANS.
16. WHERE A WATER SUPPLY WELL FOR ANY PURPOSE EXISTS OR IS APPROVED WITHIN THE LIMITS OF THIS PROJECT, ALL SERVICE LINES CONNECTED TO THE PUBLIC WATER SUPPLY REQUIRE A REDUCED PRESSURE PRINCIPLE BACKFLOW PREVENTER (RPD), AND MUST MEET THE REQUIREMENTS OF SEC. 19A-209A OF THE CONNECTICUT GENERAL STATUTES ("CGS"), AND SEC. 19-13-B38A OF THE PUBLIC HEALTH CODE.
17. WHERE AN AIR RELIEF IS REQUIRED, CWC WILL PERFORM TAP AND INSTALL. WHILE THE INSTALLATION CONTRACTOR IS RESPONSIBLE FOR THE EXCAVATION AND RESTORATION UNLESS OTHERWISE NOTED. LABOR AND MATERIALS FOR THE INSTALLATION(S) WILL BE CHARGED TO THE PROJECT.
18. WHEN THE INSTALLATION OF UNDERGROUND INFRASTRUCTURE DEVIATES FROM THE CT WATER COMPANY APPROVED PLAN(S), THE APPLICANT, AT ITS COST, WILL BE HELD LIABLE FOR THE RELOCATION OF INFRASTRUCTURE AS REQUIRED TO THE SATISFACTION OF THE CT WATER COMPANY. FAILURE TO CORRECT ANY DEVIATION DEEMED UNACCEPTABLE TO THE CT WATER COMPANY MAY RESULT IN LITIGATION.
19. WHEN INSTALLING WATER MAIN UNDER THE GUARDRAILS, INSTALL A STEEL PLATE ABOUT 1FT ABOVE THE WATER MAIN, TO PROTECT WATER MAIN DURING FUTURE REPLACEMENT OF GUARDRAIL.
20. WATER MAIN MUST BE INSTALLED UNDER ALL DRAINAGE WITH 18 INCHES OF SEPARATION TO OBTAIN PROPER BURIAL DEPTH OF FIVE (5) FEET, SEE NOTE 12 FOR ADDITIONAL INFORMATION.
21. START OF WATER MAIN EXTENSION:
    - 21.1. CT WATER REQUIRES 1 WEEK NOTICE PRIOR TO START
    - 21.2. CT WATER WILL OPERATE ALL EXISTING SYSTEM VALVES

0 30' 60'
SCALE: 1" = 30'

Tecton ARCHITECTS

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Alfred Benesch & Company
120 Hebron Avenue, 2nd Floor
Glastonbury, Connecticut 06033
860-633-8341

Client/ Contractor

MADISON PUBLIC SCHOOLS

10 Campus Drive
Madison, CT, 06443

Project

NEW PK-5 ELEMENTARY SCHOOL

180 Mungertown Road
Madison, CT, 06443

STATE PROJECT NO. 076-0067N

Seals

Issues / Revisions

No.	Date	Description
1	03/06/2023	WWC SUBMISSION
	07/21/2023	EARLY RELEASE WATER PIPE

Drawing Title

WATER MAIN EXTENSION

Project Manager:	RD	Project No:	70804.00
Landscape Architect:	RD	Production Leader:	AW
Civil Engineer:	WW	Peer Reviewer:	TS

Drawing Number

C5.0

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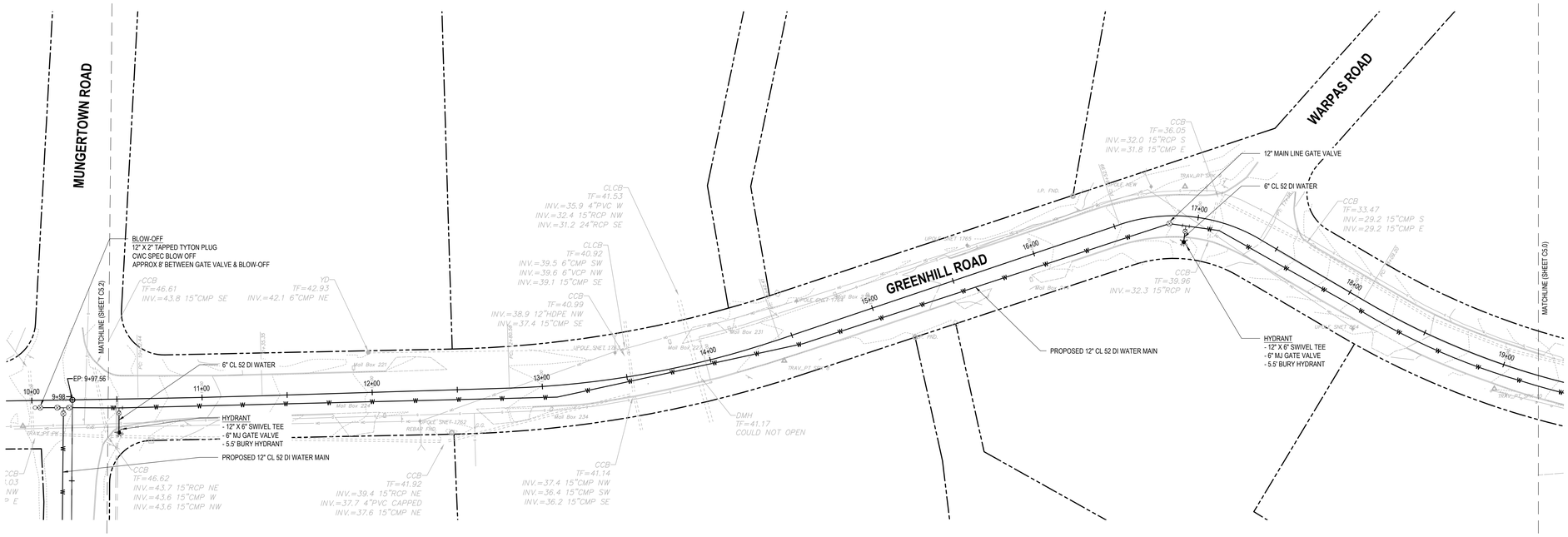
LOCUS MAP
SCALE: 1" = 1,500'



Tecton ARCHITECTS

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Issues / Revisions

No.	Date	Description
1	03/06/2023	WWC SUBMISSION
	07/21/2023	EARLY RELEASE WATER PIPE

Drawing Title

WATER MAIN EXTENSION

Project Manager:	RD	Project No:	70804.00
Landscape Architect:	RD	Production Leader:	AW
Civil Engineer:	WW	Peer Reviewer:	TS

Drawing Number

C5.1

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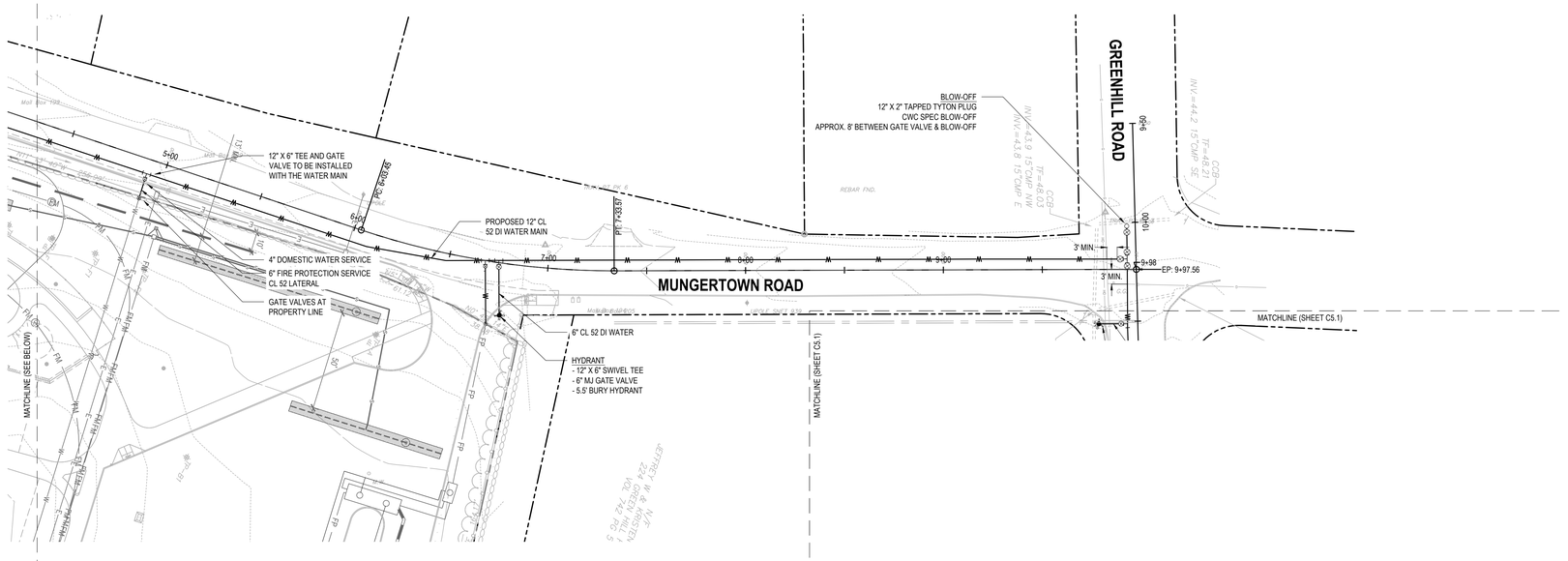

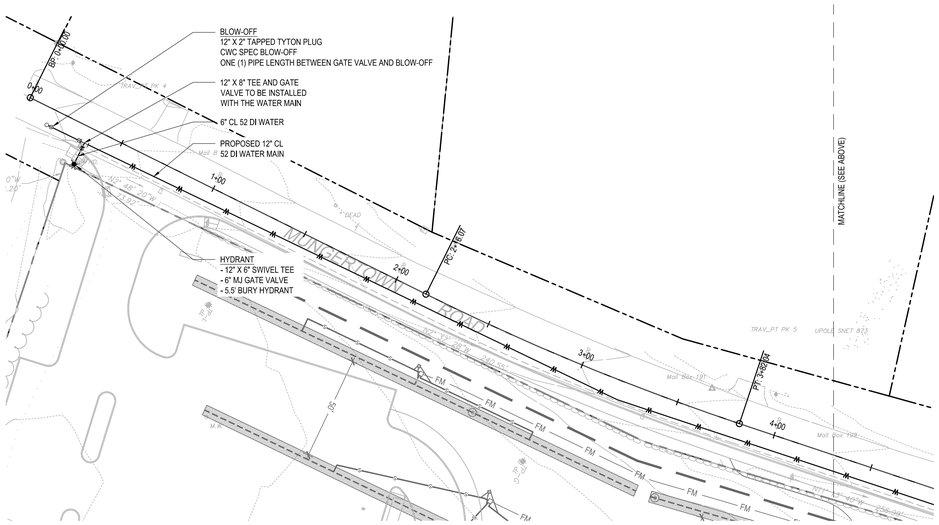

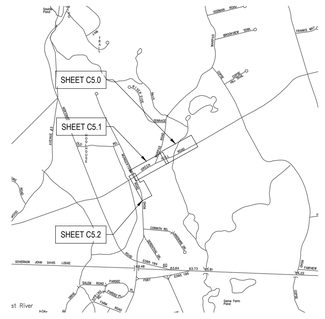

LOCUS MAP
SCALE: 1" = 1,500'

Tecton ARCHITECTS

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STATE PROJECT NO. 076-0067N

Seals

STATE OF CONNECTICUT · WILLIAM G. WALTER · LICENSED PROFESSIONAL ENGINEER

Issues / Revisions

No.	Date	Description
1	03/06/2023	WWC SUBMISSION
	07/21/2023	EARLY RELEASE WATER PIPE

Drawing Title

WATER MAIN EXTENSION

Project Manager:	RD	Project No:	70804.00
Landscape Architect:	RD	Production Leader:	AW
Civil Engineer:	WW	Peer Reviewer:	TS

Drawing Number

C5.2

SCALE: 1" = 30'

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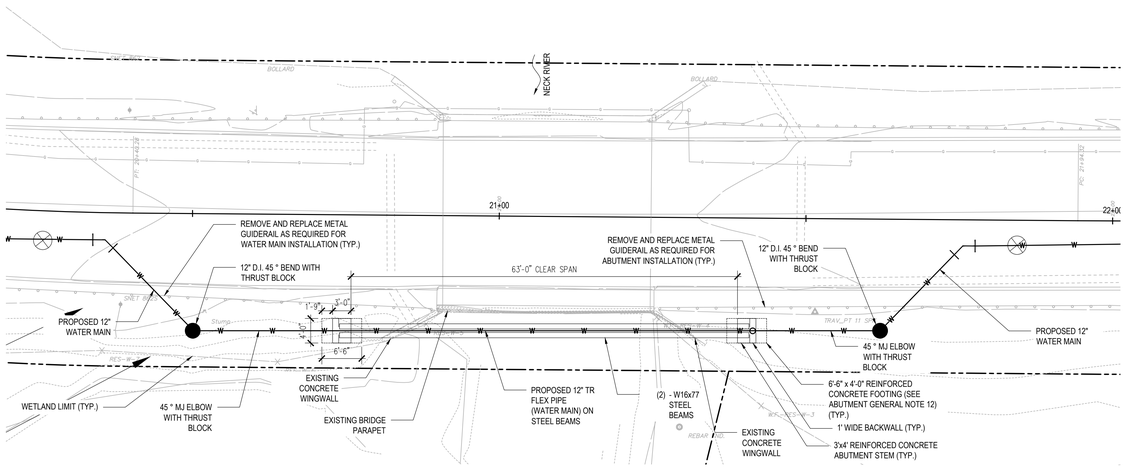
STRUCTURAL STEEL GENERAL NOTES:

1. ALL STRUCTURAL STEEL TO BE ASTM A36 MINIMUM. ALL ITEMS SHOWN ARE CONSIDERED SECONDARY MEMBERS - NO CVN TESTING REQUIRED.
2. ALL FABRICATED STRUCTURAL STEEL TO BE GALVANIZED TO ASTM A123.
3. ALL DIMENSIONS AND DETAILS TO BE FIELD VERIFIED PRIOR TO FABRICATION.
4. ALL COMMERCIAL PIPE BRACKETS, ROLLERS, ETC. TO BE CARBON STEEL, GALVANIZED TO ASTM A153.
5. EPOXY ANCHOR BOLTS TO CONFORM TO ASTM A449 - GALVANIZED TO ASTM A153. ANCHOR NUTS SHALL CONFORM TO A563-DH; FLATWASHERS - ASTM F436. ALL ANCHOR HARDWARE TO BE GALVANIZED TO ASTM A153. ANCHORS TO BE DOUBLE NUTTED.
6. ROLLER SUPPORT RODS TO CONFORM TO ASTM A449 - GALVANIZED TO ASTM A153. ROD NUTS SHALL CONFORM TO A563-DH; FLATWASHERS - ASTM F436. ALL ANCHOR HARDWARE TO BE GALVANIZED TO ASTM A153. ANCHORS TO BE DOUBLE NUTTED AT TOP AND BOTTOM ENDS.
7. ALL WELDING TO BE IN ACCORDANCE WITH AASHTO/AWS D1.5 BRIDGE WELDING CODE, CURRENT EDITION, AND CTDOT FORM 818 STANDARD SPECIFICATIONS. NON-DESTRUCTIVE WELD TESTING PER AASHTO/AWS D1.5, AND CONTRACT PLANS AND SPECS.
8. ALL MATERIALS AND WORKMANSHIP TO BE PERFORMED IN ACCORDANCE WITH CTDOT FORM 818 STANDARD SPECIFICATIONS AND IT'S LATEST REVISIONS, AASHTO STANDARD SPECIFICATIONS FOR HIGHWAY BRIDGES, LATEST EDITION, AND IT'S LATEST REVISIONS, AND PROJECT SPECIFICATIONS.

ABUTMENT GENERAL NOTES:

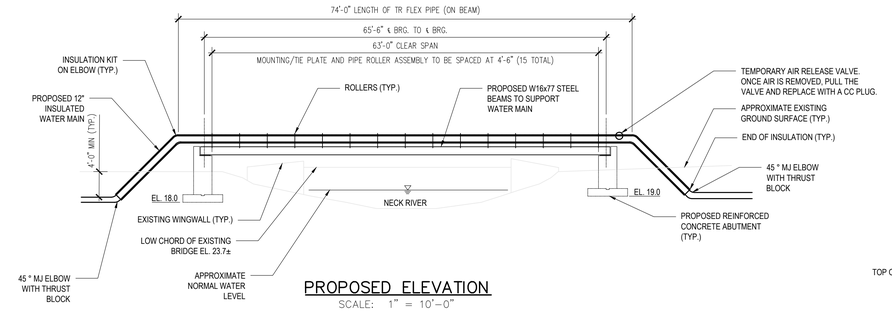
1. SPECIFICATIONS: CONNECTICUT DEPARTMENT OF TRANSPORTATION FORM 818 (2020) INCLUDING SUPPLEMENTAL SPECIFICATIONS DATED JANUARY 2023.
2. DESIGN SPECIFICATIONS: INTERNATIONAL BUILDING CODE 2018
3. MATERIALS:
   FOOTING CONCRETE - PCC03340 fc = 3,000 PSI
   ABUTMENT AND WALL CONCRETE - PCC03340 fc = 3,000 PSI
   REINFORCEMENT - (ASTM A615 GRADE 60) Fy = 60,000 PSI (GALVANIZED)
4. CONCRETE COVER: ALL REINFORCEMENT SHALL HAVE 2" COVER UNLESS DIMENSIONED OTHERWISE.
5. EXPOSED EDGES OF CONCRETE SHALL BE BEVELED 1" x 1" UNLESS DIMENSIONED OTHERWISE.
6. CONSTRUCTION JOINTS: CONSTRUCTION JOINTS OTHER THAN SHOWN ON THE PLANS SHALL NOT BE PERMITTED WITHOUT PRIOR APPROVAL FROM THE ENGINEER. REINFORCEMENT SHALL PASS THROUGH CONSTRUCTION JOINTS.
7. ASSUMED ALLOWABLE BEARING CAPACITY OF FOUNDATION SOIL = 1.5 TSF AND UNIT WEIGHT OF BACKFILL MATERIALS = 125 PCF.
8. ASSUMED LATERAL ACTIVE PRESSURE = 35 PSF PER FOOT (DEPTH) OF WALL.
9. FACTOR OF SAFETY AGAINST SLIDING = 1.66, FACTOR OF SAFETY AGAINST OVERTURNING = 4.87
10. ANY UNSUITABLE MATERIAL SHALL BE REMOVED AND REPLACED WITH CONTROLLED FILL MATERIALS. SUBGRADE SHALL BE COMPACTED TO OBTAIN REQUIRED BEARING CAPACITY OF 1.5 TSF.
11. EXCAVATION FOR THE ABUTMENT FOOTING SHALL BE PERFORMED IN COMPLIANCE WITH OSHA REGULATIONS.
12. ADJACENT ROADWAY EMBANKMENT SHALL BE SUPPORTED BY A TEMPORARY EARTH RETAINING SYSTEM AS NECESSARY DURING EXCAVATION WORK.



PROPOSED PLAN

SCALE: 1" = 10'-0"

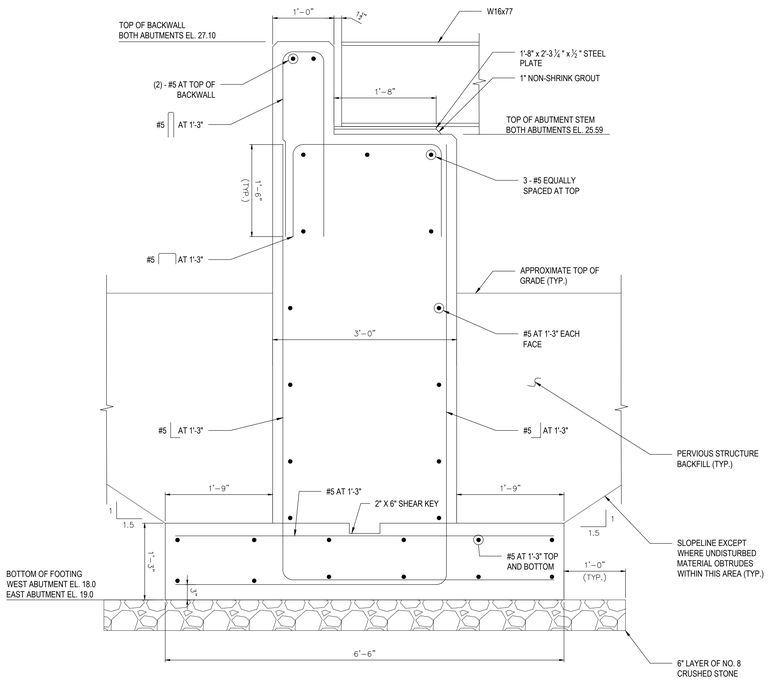
NOTES:
1. FOR THRUST BLOCK DETAILS SEE DRAWING NO. C5.4



PROPOSED ELEVATION

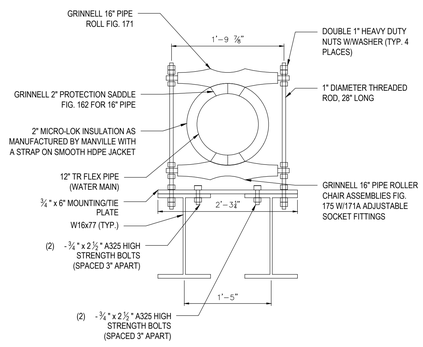
SCALE: 1" = 10'-0"

NOTES:
1. FOR THRUST BLOCK DETAILS SEE DRAWING NO. C5.4



TYPICAL ABUTMENT DETAIL

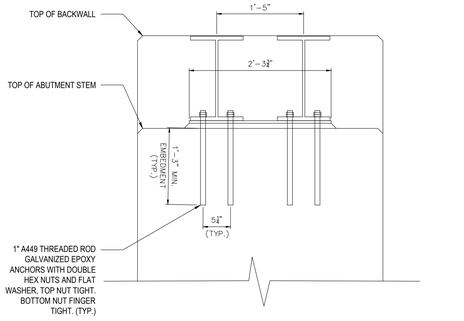
SCALE: 1" = 1'-0"



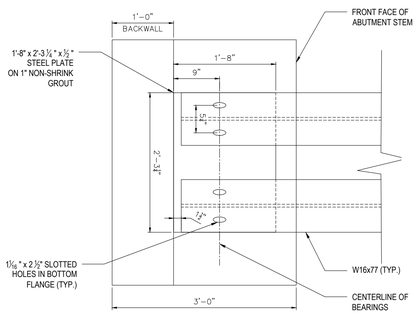
NOTES:
1. ALL PIPE ROLLER SUPPORT ITEMS TO BE MANUFACTURED BY GRINNELL OR APPROVED EQUAL
2. ALL PIPE ROLLER SUPPORT ITEMS TO BE HOT DIPPED GALVANIZED

PIPE ROLLER SUPPORT DETAIL

SCALE: 1" = 1'-0"



ELEVATION



PLAN

NOTES:
1. WEST ABUTMENT SHOWN, EAST ABUTMENT SIMILAR

ANCHORAGE DETAILS

SCALE: 1" = 1'-0"

LOCUS MAP

SCALE: 1" = 1,500'

Tecton ARCHITECTS

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STATE PROJECT NO. 076-0067N

Seals

Issues / Revisions

No.	Date	Description
1	03/06/2023	IWWC SUBMISSION
	07/21/2023	EARLY RELEASE WATER PIPE

Drawing Title

BRIDGE CROSSING PLAN AND DETAILS

Project Manager:	RD	Project No:	70804.00
Landscape Architect:	RD	Production Leader:	AW
Civil Engineer:	WW	Peer Reviewer:	TS

Drawing Number

C5.3

0 30' 60'
SCALE: 1" = 30'

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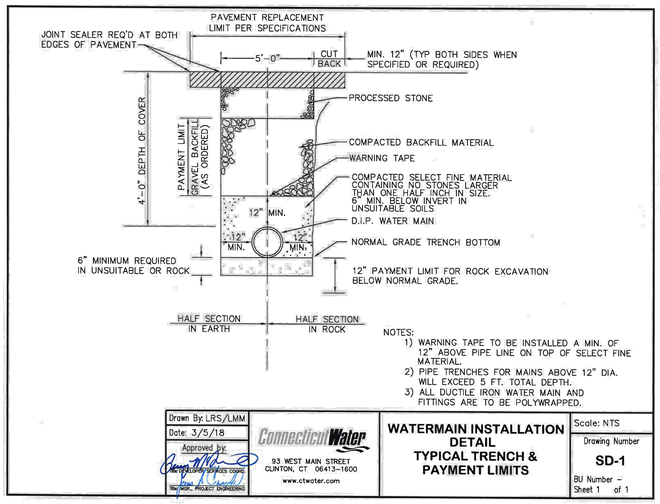
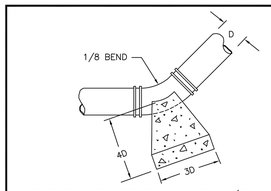
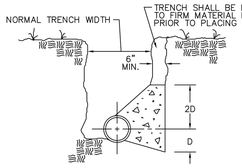


NOTES:
1) WARNING TAPE TO BE INSTALLED A MIN. OF 12" ABOVE PIPE LINE ON TOP OF SELECT FINE MATERIAL.
2) PIPE TRENCHES FOR MAINS ABOVE 12" DIA. WILL EXCEED 5 FT. TOTAL DEPTH.
3) ALL DUCTILE IRON WATER MAIN AND FITTINGS ARE TO BE POLYWRAPPED.

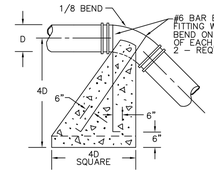
Drawn By: LRS/LMM Date: 3/5/18 Approved by:	ConnecticutWater 93 WEST MAIN STREET CLINTON, CT 06413-1600 www.ctwater.com	**WATERMAIN INSTALLATION DETAIL TYPICAL TRENCH & PAYMENT LIMITS**	Scale: NTS Drawing Number **SD-1** BU Number – Sheet 1 of 1



HORIZONTAL THRUST BLOCK DETAIL (PLAN VIEW)



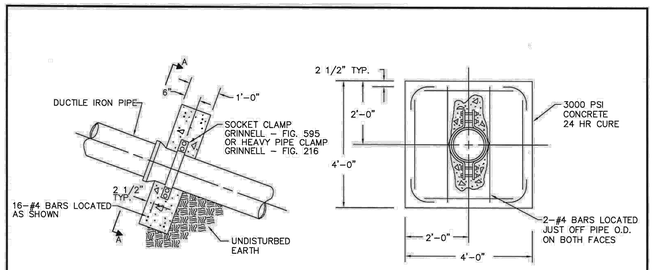
HORIZONTAL THRUST BLOCK DETAIL



VERTICAL THRUST BLOCK DETAIL

NOTES:
1) 3000 PSI CONCRETE TO BE USED FOR THRUST BLOCKS.
2) D–DIAMETER OF WATER MAIN.
3) MEGA–LUG RESTRAINING GLANDS SHALL BE USED ON ALL MJ FITTINGS.
4) SOLID CONCRETE BLOCKS WITH WEDGES WILL BE PERMITTED ON MAINS UP TO 10" ALL 12" OR LARGER SHALL BE POURED THRUST BLOCKS.
5) LOCKING GASKETS SHALL BE INSTALLED A MIN. 2 FULL PIPE LENGTHS ON EITHER SIDE OF A BEND.

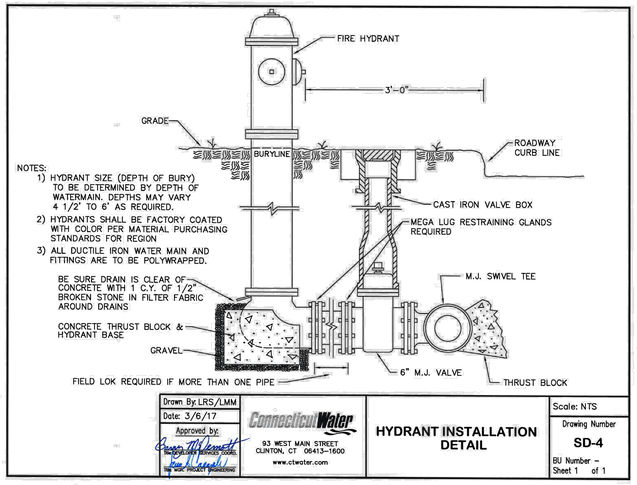
Drawn By: LRS Date: 1/30/12 Approved by:	ConnecticutWater 93 WEST MAIN STREET CLINTON, CT 06413-1600 www.ctwater.com	**THRUST BLOCK DETAILS**	Scale: NTS Drawing Number **SD-2** BU Number – X Sheet 1 of 1



VIEW A–A

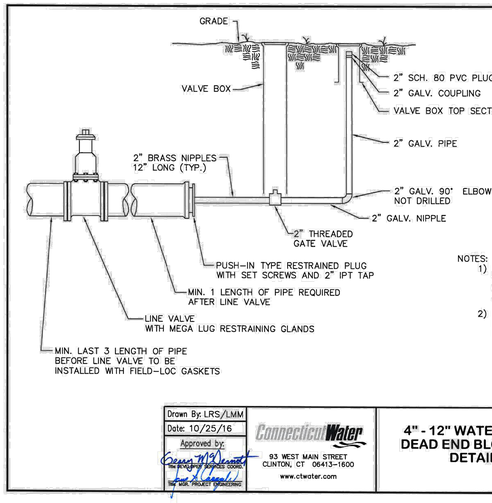
NOTE: ALL DIMENSIONS ARE MINIMUM, AND WILL BE DETERMINED BY CWC CONSIDERING PIPE SIZE, OPERATING PRESSURE AND SOIL CONDITIONS.

Drawn By: LRS/LMM Date: 1/10/17 Approved by:	ConnecticutWater 93 WEST MAIN STREET CLINTON, CT 06413-1600 www.ctwater.com	**STOP COLLAR DETAIL**	Scale: NTS Drawing Number **SD-3** BU Number – X Sheet 1 of 1



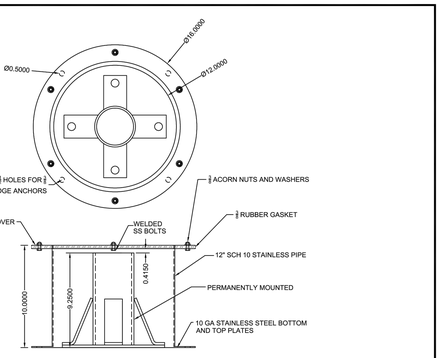
NOTES:
1) HYDRANT SIZE (DEPTH OF BURY) TO BE DETERMINED BY DEPTH OF WATERMAIN. DEPTHS MAY VARY 4 1/2' TO 6' AS REQUIRED.
2) HYDRANTS SHALL BE FACTORY COATED WITH COLOR PER MATERIAL PURCHASING STANDARDS FOR REGION
3) ALL DUCTILE IRON WATER MAIN AND FITTINGS ARE TO BE POLYWRAPPED.

Drawn By: LRS/LMM Date: 3/6/17 Approved by:	ConnecticutWater 93 WEST MAIN STREET CLINTON, CT 06413-1600 www.ctwater.com	**HYDRANT INSTALLATION DETAIL**	Scale: NTS Drawing Number **SD-4** BU Number – Sheet 1 of 1

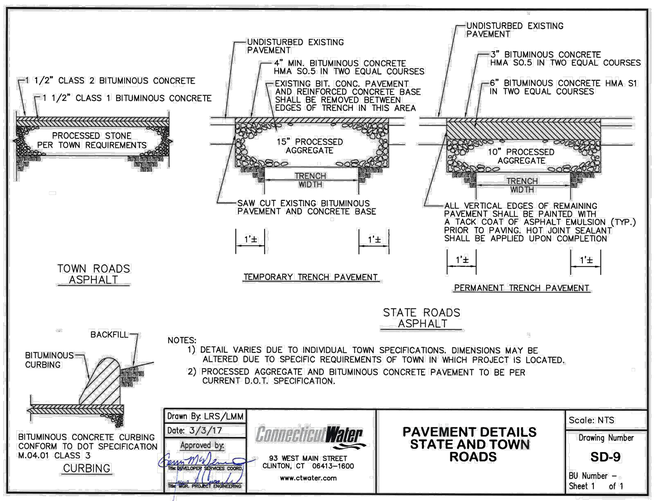


NOTES:
1) IF BLOW–OFF IS NOT REQUIRED, STANDARD PUSH IN PLUG OR CAP CAN BE INSTALLED WITH A THRUST BLOCK.
2) NO SERVICE CONNECTIONS BETWEEN LINE VALVE AND BLOW–OFF ASSEMBLY.

Drawn By: LRS/LMM Date: 10/25/16 Approved by:	ConnecticutWater 93 WEST MAIN STREET CLINTON, CT 06413-1600 www.ctwater.com	**4" - 12" WATER MAIN DEAD END BLOW-OFF DETAIL**	Scale: NTS Drawing Number **SD-5** BU Number – Sheet 1 of 1

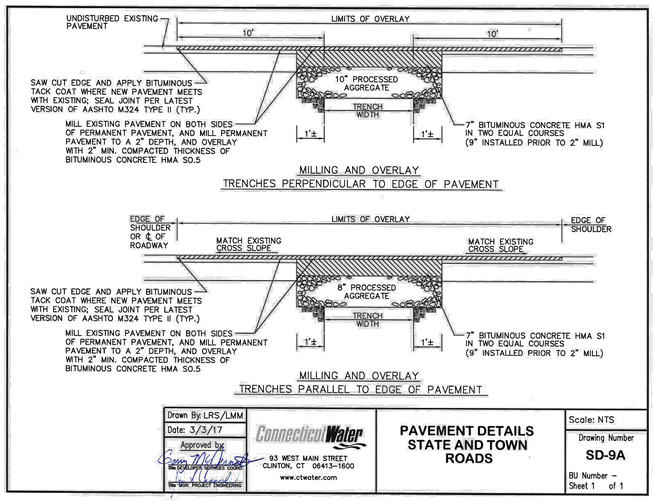


Drawn By: JNG Date: 3/30/2020 Approved by:	ConnecticutWater 93 WEST MAIN STREET CLINTON, CT 06413-1600 www.ctwater.com	**DAVIT MOUNT CASING DETAIL**	Scale: NTS Drawing Number **SD-030** BU Number – X Sheet 1 of 1

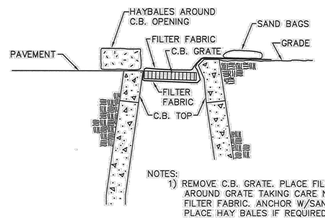


NOTES:
1) DETAIL VARIES DUE TO INDIVIDUAL TOWN SPECIFICATIONS. DIMENSIONS MAY BE ALTERED DUE TO SPECIFIC REQUIREMENTS OF TOWN IN WHICH PROJECT IS LOCATED.
2) PROCESSED AGGREGATE AND BITUMINOUS CONCRETE PAVEMENT TO BE PER CURRENT D.O.T. SPECIFICATION.

Drawn By: LRS/LMM Date: 3/3/17 Approved by:	ConnecticutWater 93 WEST MAIN STREET CLINTON, CT 06413-1600 www.ctwater.com	**PAVEMENT DETAILS STATE AND TOWN ROADS**	Scale: NTS Drawing Number **SD-9** BU Number – Sheet 1 of 1



Drawn By: LRS/LMM Date: 3/3/17 Approved by:	ConnecticutWater 93 WEST MAIN STREET CLINTON, CT 06413-1600 www.ctwater.com	**PAVEMENT DETAILS STATE AND TOWN ROADS**	Scale: NTS Drawing Number **SD-9A** BU Number – Sheet 1 of 1



NOTES:
1) REMOVE C.B. GRATE. PLACE FILTER FABRIC AROUND GRATE TAKING CARE NOT TO DAMAGE FILTER FABRIC. ANCHOR W/SAND BAGS. PLACE HAY BALES IF REQUIRED.
2) SILT BARRIER REQUIRED ON ALL CATCH BASINS IN WORK AREA.

Drawn By: LLO Date: 4/2/03 Approved by:	ConnecticutWater 93 WEST MAIN STREET CLINTON, CT 06413-1600 www.ctwater.com	**CATCH BASIN SILT BARRIER DETAIL**	Scale: NTS Drawing Number **SD-10** BU Number – Sheet 1 of 1

benesch
Alfred Benesch & Company
120 Hebron Avenue, 2nd Floor
Glastonbury, Connecticut 06033
860-633-8341

Client/ Contractor

MADISON PUBLIC SCHOOLS

10 Campus Drive
Madison, CT, 06443

Project

NEW PK-5 ELEMENTARY SCHOOL

180 Mungertown Road
Madison, CT, 06443

STATE PROJECT NO. 076-0067N

PROJECT NORTH

Seals

Issues / Revisions

No.	Date	Description
1	03/06/2023	WWC SUBMISSION
	07/21/2023	EARLY RELEASE WATER PIPE

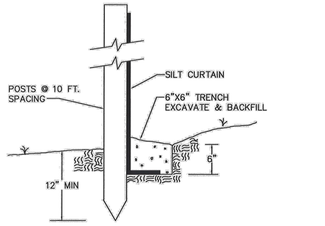
Drawing Title

WATER MAIN EXTENSION DETAILS

Project Manager:	RD	Project No:	70804.00
Landscape Architect:	RD	Production Leader:	AW
Civil Engineer:	WW	Peer Reviewer:	TS

Drawing Number

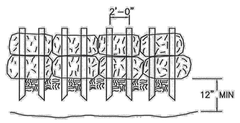
C5.4



SILT FENCE DETAIL

NOT TO SCALE

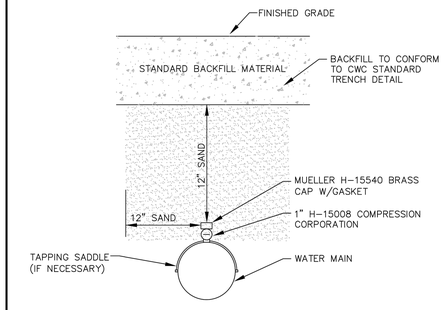
NOTES:
1. EXCAVATE TRENCH.
2. SECURE HAYBALES WITH TWO (2) STAKES.
3. BACKFILL AND COMPACT THE EXCAVATED SOIL ON THE UPHILL SIDE OF THE BARRIER.



HAY BALE BARRIER DETAIL

NOT TO SCALE

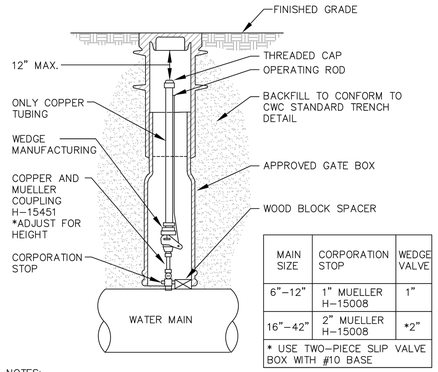
Drawn By: LRS Date: 4/2/03 Approved by: Title: CHIEF OF ENGINEERING	ConnecticutWater 93 WEST MAIN STREET CLINTON, CT 06413-1600 www.ctwater.com	**EROSION & SEDIMENT CONTROL DETAILS**	Scale: NTS Drawing Number **SD-11** BU Number – Sheet 1 of 1



WATER SERVICE ABANDONMENT DETAIL

N.T.S.

Revision	Description	Date	By	Approved By
Drawn By: FHG Date: 1/12/21 Approved by: Distribution Project Supervisor Distribution System Engineering	ConnecticutWater 93 WEST MAIN STREET CLINTON, CT 06413-1600 www.ctwater.com	WATER SERVICE ABANDONMENT DETAIL 3/4" THRU 2"	Scale: N.T.S. Drawing Number **SD-27** BU Number – Sheet 1 of 1	



MAIN SIZE	CORPORATION STOP	WEDGE VALVE
6"–12"	1" MUELLER H-15008	1"
16"–42"	2" MUELLER H-15008	*2"

* USE TWO-PIECE SLIP VALVE BOX WITH #10 BASE

NOTES:

1). CANNOT BE USED AS FUTURE CUSTOMER SERVICE CONNECTION.

2). A CHLORINATION/SAMPLING ASSEMBLY SHALL BE REMOVED (*SEE SD-27) ONCE WATER MAIN PASSES SAMPLING. CORPORATION SHALL EITHER BE CONVERTED TO AIR VALVE OR ABANDONED PRIOR TO FINAL PAVEMENT RESTORATION.

CHLORINATION INLET/BLOW-OFF DETAIL

N.T.S.

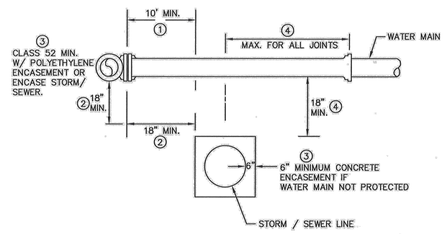
Revision	Description	Date	By	Approved By
Drawn By: FHG Date: 2/11/19 Approved by: Distribution Project Supervisor Distribution Rehabilitation Manager	ConnecticutWater 93 WEST MAIN STREET CLINTON, CT 06413-1600 www.ctwater.com	CHLORINATION INLET/BLOW-OFF DETAIL	Scale: N.T.S. Drawing Number **SD-28** BU Number – Sheet 1 of 1	

① WHENEVER POSSIBLE MAINTAIN A MINIMUM 10' SEPARATION FROM GRAVITY STORM OR SEWER LINES. ALWAYS MAINTAIN A MINIMUM 10' HORIZONTAL SEPARATION FROM FORCE SEWER MAIN.

② IF 10' SEPARATION IS NOT POSSIBLE MAINTAIN A MINIMUM OF 18" HORIZONTAL SEPARATION WITH BOTTOM OF WATER MAIN A MINIMUM 18" ABOVE TOP OF STORM OR SEWER LINE

③ IF MINIMUM SEPARATION IS NOT POSSIBLE USE A MINIMUM CLASS 52 DUCTILE IRON PIPE WITH POLYETHYLENE ENCASEMENT, OR CONCRETE ENCASEMENT OF GRAVITY LINE

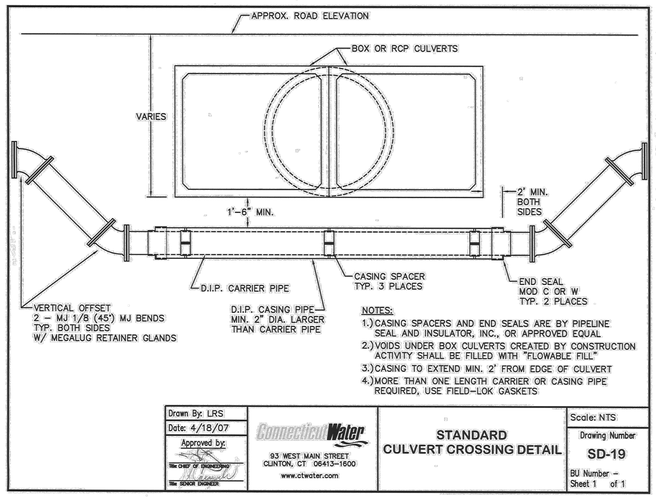
④ WHEN CROSSING GRAVITY LINES MAINTAIN A MINIMUM 18" VERTICAL SEPARATION WITH JOINTS SPACED AS FAR AS POSSIBLE FROM GRAVITY LINES



SEPARATION FROM STORM AND SEWER LINES DETAIL

NTS

Drawn By: LRS Date: 4/27/07 Approved by: Title: Title: Senior Engineer	ConnecticutWater 93 WEST MAIN STREET CLINTON, CT 06413-1600 www.ctwater.com	**SEPARATION FROM STORM AND SEWER LINES DETAIL**	Scale: NTS Drawing Number **SD-22** BU Number – Sheet 1 of 1



NOTES:
1.) CASING SPACERS AND END SEALS ARE BY PIPELINE SEAL AND INSULATOR, INC., OR APPROVED EQUAL
2.) VOIDS UNDER BOX CULVERTS CREATED BY CONSTRUCTION ACTIVITY SHALL BE FILLED WITH "FLOWABLE FILL"
3.) CASING TO EXTEND MIN. 2' FROM EDGE OF CULVERT
4.) MORE THAN ONE LENGTH CARRIER OR CASING PIPE REQUIRED, USE FIELD-LOK GASKETS

Drawn By: LRS Date: 4/18/07 Approved by: Title: CHIEF OF ENGINEERING Title: SENIOR ENGINEER	ConnecticutWater 93 WEST MAIN STREET CLINTON, CT 06413-1600 www.ctwater.com	**STANDARD CULVERT CROSSING DETAIL**	Scale: NTS Drawing Number **SD-19** BU Number – Sheet 1 of 1

10/17/2022 1:28:17 PM C:\Users\RachelP\Documents\MAD20AR_R22C_ARCH_RachelP541TW7.rvt

Tecton ARCHITECTS

benesch

Alfred Benesch & Company
120 Hebron Avenue, 2nd Floor
Glastonbury, Connecticut 06033
860-633-8341

Client/ Contractor

MADISON PUBLIC SCHOOLS

10 Campus Drive
Madison, CT, 06443

Project

NEW PK-5 ELEMENTARY SCHOOL

180 Mungertown Road
Madison, CT, 06443

STATE PROJECT NO. 076-0067N

PROJECT NORTH

Seals

Issues / Revisions

No.	Date	Description
1	03/06/2023	WWC SUBMISSION
	07/21/2023	EARLY RELEASE WATER PIPE

Drawing Title

WATER MAIN EXTENSION DETAILS

Project Manager:	RD	Project No:	70804.00
Landscape Architect:	RD	Production Leader:	AW
Civil Engineer:	WW	Peer Reviewer:	TS

Drawing Number

C5.5

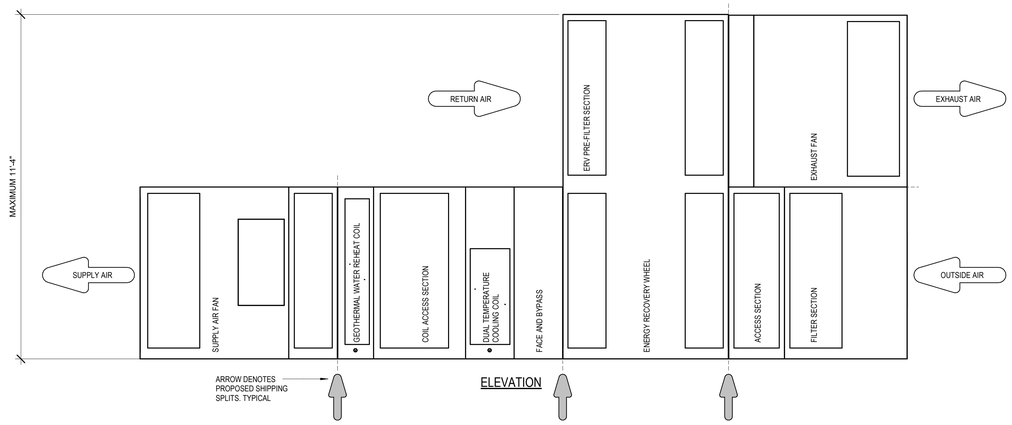
DEDICATED OUTDOOR AIR UNITS

UNIT NO	LOCATION	SERVES	SUPPLY FAN SECTION: VENT AIR	SUPPLY CFM	ESP (in. wg)	TOTAL SP (in. wg)	FAN TYPE	FAN RPM	MAX BHP	HP	V-BANK PRE FILTER	V-BANK FINAL FILTER	CFM	EXHAUST FAN SECTION: ESP (in. wg)	TSP SP (in. wg)	FAN TYPE	FAN RPM	MAX BHP	HP	EXH PRE FILTER	HEAT EXCHANGER DATA: SUMMER OA EDB °F	SUMMER OA EWB °F	SUMMER OA LDB °F	SUMMER OA LWB °F	SUMMER EA EDB °F	SUMMER EA EWB °F	SUMMER EA LDB °F	SUMMER EA LWB °F	WINTER OA EDB °F	WINTER OA LDB °F	WINTER EA EDB °F	WINTER EA EWB °F	WINTER EA LDB °F	WINTER EA LWB °F	HP	MAKE/MODEL
DOAS-1	STAGE MEZZANINE	BUILDING VENTILATION	18,000	18,551	1.65"	4.91"	PLENUM, ARRAY	1,971	20.9	15 EACH	MERV-8	MERV-13	17,400	1.25"	3.03"	PLENUM, ARRAY	1,707	13.12 TOTAL	7.5 EACH	MERV 8	88°F	73°F	79.7°F	66.8°F	75.0°F	62.5°F	83.5°F	69.5°F	0°F	0°F	68.0°F	53.0°F	20.6°F	20.5°F	-	15000 POLY S

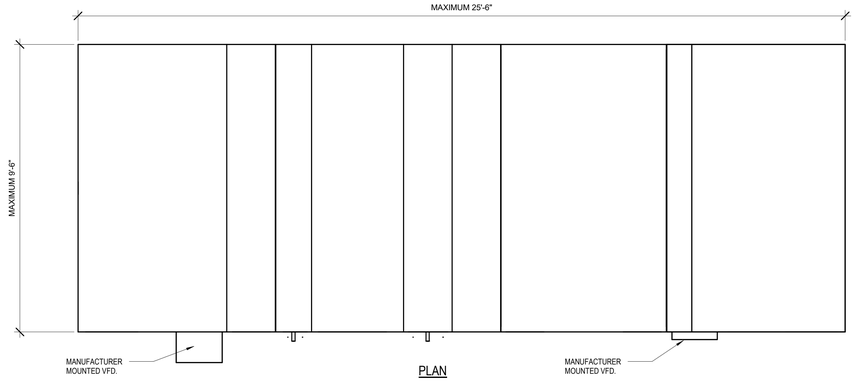
DUAL TEMP COIL (COOLING BASED ON 13,500 CFM): CAP MBH	AIR: EAT	AIR: LAT	AIR: APD	WATER: EWT	WATER: LWT	WATER: GPM	WATER: WATER PD	FACE VEL FPM	ROWS FINS	DUAL TEMP COIL (HEATING BASED ON 13,500 CFM): CAP MBH	AIR: EAT	AIR: LAT	AIR: APD	WATER: EWT	WATER: LWT	WATER: GPM	WATER: WATER PD	FACE VEL FPM	ROWS FINS	REHEAT COIL: CAP MBH	AIR: EAT	AIR: LAT	AIR: APD	WATER: EWT	WATER: LWT	WATER: GPM	WATER: WATER PD	FACE VEL FPM	ROWS FINS	ELECTRICAL: VOLTS	ELECTRICAL: PH	ELECTRICAL: HZ	MAKE/MODEL
505.5 - T 367.8 - S	79.7°F DB 66.8°F WB	55.0°F DB 54.7°F WB	0.91"	44°F	58°F	75.7	13.52'	550 MAX	8/101	951.8	45.0°F	110.°F	0.67"	130°F	110°F	98.5	18.5'	550 MAX	8/101	682.9	55.0°F	88.9°F	0.36"	90°F	70°F	68.3	3.2'	480	4/144	460	3	60	TRANE / CSSA040

NOTES:

1. PROVIDE ALL EQUIPMENT REQUIRED FOR LOW AMBIENT OPERATION.
2. DOAS-1 SHALL BE FURNISHED WITH FACTORY INSTALLED VARIABLE FREQUENCY DRIVES. ALL FAN MOTORS SHALL BE INVERTOR DUTY RATED FOR USE WITH VARIABLE FREQUENCY DRIVES.
3. DOAS-1 DUAL TEMP COIL & GLYCOL COILS SHALL BE BASED ON 20% GLYCOL SOLUTION.



ELEVATION



PLAN

GENERAL AIR HANDLING UNITS

1. BASIS OF DESIGN MANUFACTURER IS BASED ON EQUIPMENT MANUFACTURER, TRANE.
2. APPROXIMATE WEIGHT OF BASIS OF DESIGN PRODUCT, 12,250 LBS.
3. PROPOSED SHIPPING SPLITS HAVE BEEN NOTED FOR REFERENCE ONLY. FINAL UNIT SHIPPING SPLIT LOCATIONS SHALL BE CONFIRMED DURING COORDINATION.

2 / M4.00 DOAS UNIT DIAGRAM & CONFIGURATION
SCALE: NONE

KOHLER RONAN, LLC
93 Lake Avenue, Danbury, CT 06810
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www.kohlerronan.com
E-mail: krcte@kohlerronan.com

Client/ Contractor

MADISON PUBLIC SCHOOLS

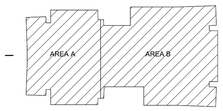
Project

NEW PK-5 ELEMENTARY SCHOOL

180 Mungertown Road
Madison, CT, 06443

STATE PROJECT NO. 076-0067N

Key Plan



Seals

GENERAL CONSTRUCTION PHASE 1 OF 4

Issues / Revisions

No.	Date	Description
	07/21/2023	EARLY PROCUREMENT PACKAGE

Drawing Title

SCHEDULES - MECHANICAL

Partner:	CR	Project No:	MAD02AR
Project Designer:	FMD	Project Reviewer:	KR

Drawing Number

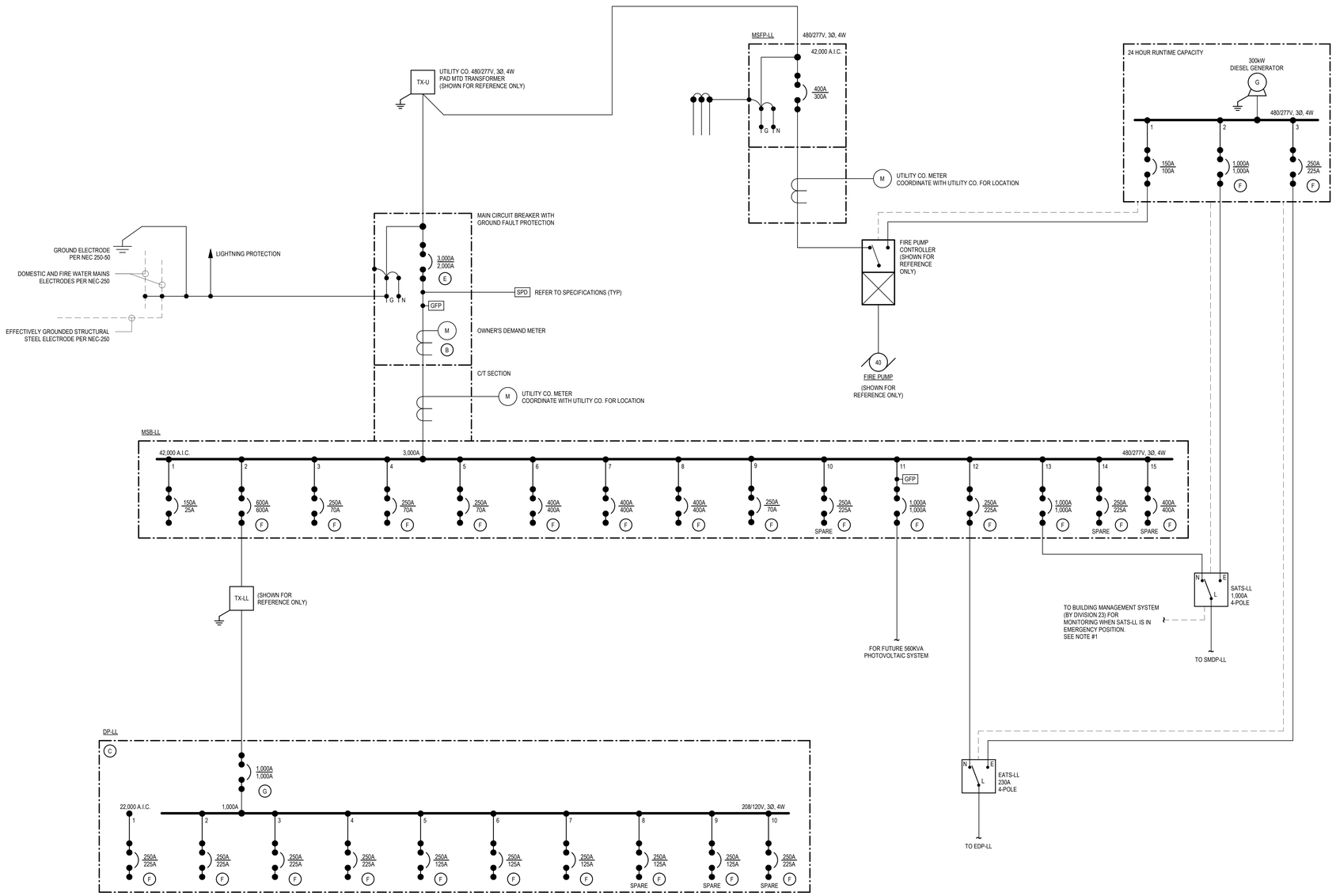
M4.00

NOTES

1. A LOAD DROP SCHEME TO BE IMPLEMENTED BY DIVISION 23 TO REDUCE HVAC LOAD ON THE GENERATOR. UPON LOSS OF UTILITY POWER, THE BMS SHALL RECEIVE A SIGNAL FROM STANDBY TRANSFER SWITCH SATS-LL TO CONFIRM POWER LOSS. SATS-LL SHALL BE FURNISHED WITH A FACTORY INSTALLED LOAD SHED RELAY FOR CONNECTION TO THE BMS BY DIVISION 23. COORDINATE WITH THE MECHANICAL CONTRACTOR.

EQUIPMENT SCHEDULE

A	300 kVA DRY-TYPE TRANSFORMER 480V PRIMARY, 208Y/120V SECONDARY. 115 DEGREE C TEMP. RISE.
B	INTEGRAL PEAK DEMAND CAPABLE METER WITH BACNET IP INTERFACE, CONNECTION TO BMS SHALL BE BY DIV. 23, SQUARE D #PM5563RD OR EQUIVALENT
C	INTEGRAL PEAK DEMAND CAPABLE METER WITH BACNET MS/TP INTERFACE, CONVERT TO BACNET IP, CONNECTION TO BMS SHALL BE BY DIV. 23, SQUARE D #EM3560 OR EQUIVALENT
E	PROVIDE CIRCUIT BREAKER WITH ELECTRONIC TRIP UNIT, LONG TIME, SHORT TIME AND INSTANTANEOUS ADJUSTMENT, INTEGRAL ENERGY REDUCTION MAINTENANCE SWITCH
F	PROVIDE SELECTIVELY COORDINATING CIRCUIT BREAKER WITH ELECTRONIC TRIP UNIT, LONG TIME, SHORT TIME AND INSTANTANEOUS ADJUSTMENT, SQUARE D MISSION CRITICAL OR EQUIVALENT
G	PROVIDE CIRCUIT BREAKER WITH ELECTRONIC TRIP UNIT, LONG TIME, SHORT TIME AND INSTANTANEOUS ADJUSTMENT



1 E4.01 SINGLE LINE DIAGRAM
NONE

Tecton ARCHITECTS

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www.kohlerromaan.com
E-mail: tecton@kohlerromaan.com

Client/ Contractor

MADISON PUBLIC SCHOOLS

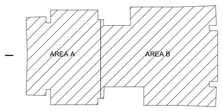
Project

NEW PK-5 ELEMENTARY SCHOOL

180 Mungertown Road
Madison, CT, 06443

STATE PROJECT NO. 076-0067N

Key Plan



Seals

GENERAL CONSTRUCTION PHASE 1 OF 4

Issues / Revisions

No.	Date	Description
	07/21/2023	EARLY PROCUREMENT PACKAGE

Drawing Title

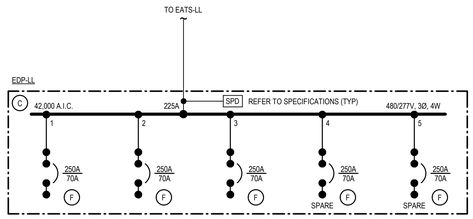
SINGLE LINE DIAGRAM - ELECTRICAL

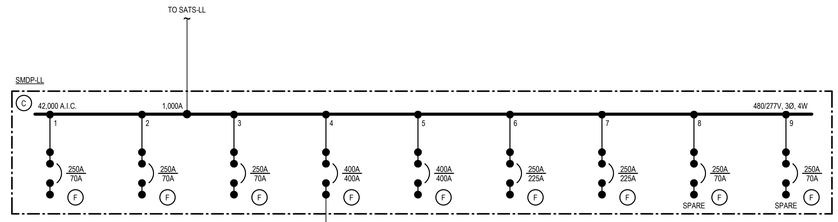
Partner:	CR	Project No:	MAD02AR
Project Designer:	RM	Project Reviewer:	JO'C

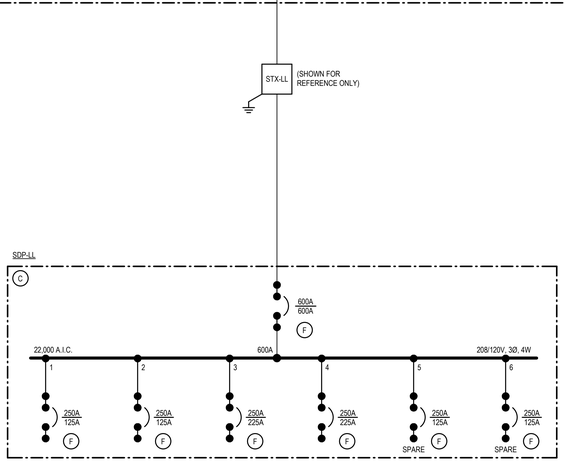
Drawing Number

E4.01

EQUIPMENT SCHEDULE	
C	INTEGRAL PEAK DEMAND CAPABLE METER WITH BACNET MS/TP INTERFACE, CONVERT TO BACNET IP, CONNECTION TO BMS SHALL BE BY DIV. 23, SQUARE D #EM3560 OR EQUIVALENT
F	PROVIDE SELECTIVELY COORDINATING CIRCUIT BREAKER WITH ELECTRONIC TRIP UNIT, LONG TIME, SHORT TIME AND INSTANTANEOUS ADJUSTMENT, SQUARE D MISSION CRITICAL OR EQUIVALENT







1 E4.02 SINGLE LINE DIAGRAM
NONE

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E-mail: felix@kohlerroman.com

Client/ Contractor

MADISON PUBLIC SCHOOLS

Project

NEW PK-5 ELEMENTARY SCHOOL

180 Mungertown Road
Madison, CT, 06443

STATE PROJECT NO. 076-0067N

Key Plan

Seals

GENERAL CONSTRUCTION PHASE 1 OF 4

Issues / Revisions

No.	Date	Description
	07/21/2023	EARLY PROCUREMENT PACKAGE

Drawing Title

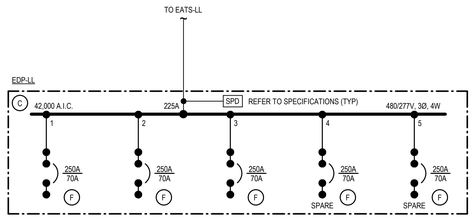
SINGLE LINE DIAGRAM - ELECTRICAL

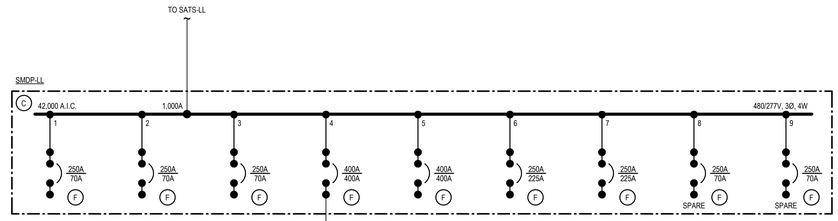
Partner:	CR	Project No:	MAD02AR
Project Designer:	RM	Project Reviewer:	JO'C

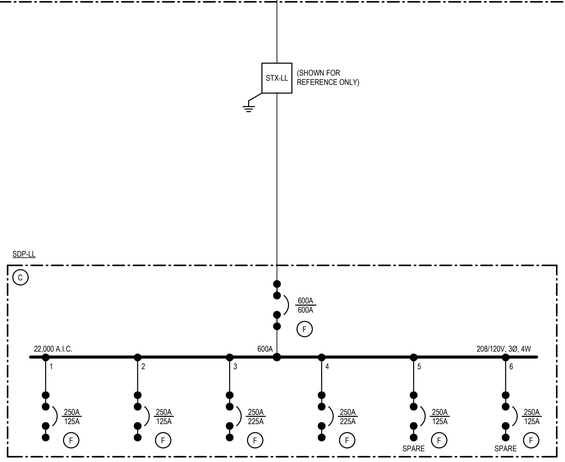
Drawing Number

E4.02

EQUIPMENT SCHEDULE	
C	INTEGRAL PEAK DEMAND CAPABLE METER WITH BACNET MS/TP INTERFACE, CONVERT TO BACNET IP, CONNECTION TO BMS SHALL BE BY DIV. 23, SQUARE D #EM3560 OR EQUIVALENT
F	PROVIDE SELECTIVELY COORDINATING CIRCUIT BREAKER WITH ELECTRONIC TRIP UNIT, LONG TIME, SHORT TIME AND INSTANTANEOUS ADJUSTMENT, SQUARE D MISSION CRITICAL OR EQUIVALENT







1 SINGLE LINE DIAGRAM
E4.02 NONE

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New York, NY 10016
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E-mail: felix@kohlerroman.com

Client/ Contractor

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Project

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Key Plan

Seals

GENERAL CONSTRUCTION PHASE 1 OF 4

Issues / Revisions

No.	Date	Description
	07/21/2023	EARLY PROCUREMENT PACKAGE

Drawing Title

SINGLE LINE DIAGRAM - ELECTRICAL

Partner:	CR	Project No:	MAD02AR
Project Designer:	RM	Project Reviewer:	JO'C

Drawing Number

E4.02

8/25/2023 4:39:20 PM Autodesk Docs://MAD02AR - Madison Elementy School/22081_MAD02AR_K922_MEP.rvt

BUILDING MORE THAN BUILDINGS®

Gilbane

8/2/2023

Madison Elementary Phase 1 Estimate

Project Summary

Trade Summary		Elementary School	
		GSF:	91,101
CSI #	Description	Subtotal	$/GSF
23	Heating, Ventilating & AC - Procurement Only	$341,250	$3.75
26	Electrical - Procurement Only	$1,024,530	$11.25
33	Site Utilities - Procurement Only	$320,945	$3.52
Total Direct Work		**$1,686,725**	**$18.51**
Escalation (2 Months - .83%)		$13,999.82	$0.15
Design Contingency 5%		$84,336	$0.93
CM Contingency 2.5%		$42,168	$0.46
Subtotal:		$140,504	$1.54
Preconstruction Services (w/Owner's Cost)		$0	$0.00
General Conditions / Field Office Support (w/Phase 2)		$0	$0.00
Insurance (CM/Subcontractor) - 2.91%		$55,912	$0.61
Subtotal:		$55,912	$0.61
Builders' Risk Insurance (w/Owner's Cost)		$0	$0.00
Building Permits (Excluded)		$0	$0.00
CT Education Fee $.26/$1000 - .02%		$501	$0.01
CM Payment & Performance Bond - .6%		$11,568	$0.13
Fee - 1.7%		$32,776	$0.36
Subtotal:		$44,845	$0.49
Total Construction Cost		**$1,927,986**	**$21.16**

BUILDING MORE THAN BUILDINGS®

Gilbane

Madison Elementary Phase 1 Estimate
Elementary School

Program GSF: 91,101

	Systems & Descriptions	Quantity	Unit	Unit Cost	Total Cost	Subtotal	Trade Total
23 Heating, Ventilating & Air Conditioning							
1	Equipment						
2	Air-Handlers						
3	DOAS-1 - HWC, CHWC, RHC, ERW - 42 Tons, 18,000 CFM	1	LS	$312,500.00	312,500		
4	Installation	1	EA		w/ Phase 2		
5	Warranties, Turnover Coordination	1	LS	$28,750.00	28,750		
6							
7	Equipment Subtotal:					$ 341,250	
8							
9	**Heating, Ventilating & Air Conditioning Total:**	**91,101**	**SF**	**$ 3.75**			**$ 341,250**
26 Electrical							
1	Large Power & Distribution						
2	Emergency Generators						
3	300 kW 480/277V Diesel Outdoor Generator	1	LS	$275,000.00	275,000		
4	Installation	1	EA		w/ Phase 2		
5	Switchboards	1	LS	$419,160.00	419,160		
6	MDB-1 - 3,000 Amp 480/277V	1	EA		Included Above		
7	Installation	1	EA		w/ Phase 2		
8	MDFP-1 400A 480/277V Fire Pump Service Switch	1	EA		Included Above		
9	Installation	1	EA		w/ Phase 2		
10	DP-LL 1,000 Amp 208/120V	1	EA		Included Above		
11	Installation	1	EA		w/ Phase 2		
12	Panelboards	1	LS	$149,080.00	149,080		
13	SMDP-LL 400A, 480/277V	1	EA		Included Above		
14	Installation	1	EA		w/ Phase 2		
15	SDP-LL 250A, 480/277V	1	EA		Included Above		
16	Installation	1	EA		w/ Phase 2		
17	EDP-LL 225A, 480/277V	1	EA		Included Above		
18	Installation	1	EA		w/ Phase 2		
19	PPM-MLB 400A, 480/277V	1	EA		Included Above		
20	Installation	1	EA		w/ Phase 2		
21	KP-LL 225A, 208/120V	1	EA		Included Above		
22	RP-LL 225A, 208/120V	1	EA		Included Above		
23	RP-MLA 225A, 208/120V	1	EA		Included Above		
24	RP-MLB 225A, 208/120V	1	EA		Included Above		
25	Installation	4	EA		w/ Phase 2		
26	RPM-MLB 125A, 208/120V	1	EA		Included Above		
27	RPM-MLA 125A, 208/120V	1	EA		Included Above		
28	RP-LL-Gym 125A, 208/120V	1	EA		Included Above		
29	SRP-LL-Gym 125A, 208/120V	1	EA		Included Above		
30	SKP-LL 125A, 208/120V	1	EA		Included Above		
31	SRP-MLA 125A, 208/120V	1	EA		Included Above		
32	SRP-MLB 125A, 208/120V	1	EA		Included Above		
33	ELP-MLA 100A, 480/277V	1	EA		Included Above		
34	ELP-MLB 100A, 480/277V	1	EA		Included Above		
35	ELP-LL 100A, 480/277V	1	EA		Included Above		
36	LP-LL 100A, 480/277V	1	EA		Included Above		
37	LP-MLA 100A, 480/277V	1	EA		Included Above		
38	LP-MLB 100A, 480/277V	1	EA		Included Above		
39	SLP-MLA 100A, 480/277V	1	EA		Included Above		
40	SLP-MLB 100A, 480/277V	1	EA		Included Above		
41	SLP-LL 100A, 480/277V	1	EA		Included Above		
42	Installation	16	EA		w/ Phase 2		
43	Automatic Transfer Switches	1	LS	$19,470.00	19,470		
44	400A SATS-LL, 480/277V	1	EA		Included Above		
45	Installation	1	EA		w/ Phase 2		
46	230A EATS-LL, 480/277V	1	EA		Included Above		
47	Installation	1	EA		w/ Phase 2		
48	Fire Pump ATS / Controller				w/ Phase 2		
49	Transformers	1	LS	$32,010.00	32,010		
50	TX-LL - 300 kVA	1	EA		Included Above		
51	Installation	1	EA		w/ Phase 2		
52	STX-LL - 75 kVA	1	EA		Included Above		
53	Installation	1	EA		w/ Phase 2		
54	Safety, Service & Disconnect Switches						

BUILDING MORE THAN BUILDINGS®

Gilbane

Madison Elementary Phase 1 Estimate
Elementary School

Program GSF: 91,101

	Systems & Descriptions	Quantity	Unit	Unit Cost	Total Cost	Subtotal	Trade Total
55	Elevator Fused Disconnect Switch	1	EA		w/ Phase 2		
56	Installation	1	EA		w/ Phase 2		
57	Elevator Lighting Control Fused Disconnect Switch	1	EA		w/ Phase 2		
58	Installation	1	EA		w/ Phase 2		
59	Short Circuit Studies	1	LS	$29,810.00	29,810		
60	Equipment Logistics/Handling, Warranties, Coordination	1	LS	$100,000.00	100,000		
61							
62	Large Power & Distributions Subtotal:					$ 1,024,530	
63							
64	**Electrical Total:**	**91,101**	**SF**	**$ 11.25**			**$ 1,024,530**
	33 Site Utilities						
1	Water Service						
2	Material Only						
3	12"	2,592	LF	$100.00	259,200		
4	6"	451	LF	$75.00	33,825		
5	4"	349	LF	$80.00	27,920		
6							
7	Water Service Subtotal:					$ 320,945	
8							
9	**Site Construction Total:**	**91,101**	**SF**	**$ 3.52**			**$ 320,945**
	Direct Work Total:	**91,101**	**SF**	**$ 18.51**			**$ 1,686,725**

BUILDING MORE THAN BUILDINGS®

Gilbane

8/29/2023

Madison Elementary Phase 1 Estimate

Project Summary

Trade Summary		Elementary School	
		GSF:	91,101
Uniformat	Description	Subtotal	$/GSF
D30	Heating, Ventilating & Air Conditioning - Procurement Only	$341,250	$3.75
D50	Electrical - Procurement Only	$1,024,530	$11.25
G30	Liquid & Gas Utilities - Procurement Only	$320,945	$3.52
Total Direct Work		**$1,686,725**	**$18.51**
Escalation (2 Months - .83%)		$13,999.82	$0.15
Design Contingency 5%		$84,336	$0.93
CM Contingency 2.5%		$42,168	$0.46
Subtotal:		$140,504	$1.54
Preconstruction Services (w/Owner's Cost)		$0	$0.00
General Conditions / Field Office Support (w/Phase 2)		$0	$0.00
Insurance (CM/Subcontractor) - 2.91%		$55,912	$0.61
Subtotal:		$55,912	$0.61
Builders' Risk Insurance (w/Owner's Cost)		$0	$0.00
Building Permits (Excluded)		$0	$0.00
CT Education Fee $.26/$1000 - .02%		$501	$0.01
CM Payment & Performance Bond - .6%		$11,568	$0.13
Fee - 1.7%		$32,776	$0.36
Subtotal:		$44,845	$0.49
Total Construction Cost		**$1,927,986**	**$21.16**

BUILDING MORE THAN BUILDINGS®

Gilbane

Madison Elementary Phase 1 Estimate
Elementary School

Program GSF: 91,101

	Systems & Descriptions	Quantity	Unit	Unit Cost	Total Cost	Subtotal	Trade Total
D30 Heating, Ventilating & Air Conditioning							
1	D3040 HVAC Major Equipment						
2	D3040 HVAC Major Equipment						
3	Air-Handlers						
4	DOAS-1 - HWC, CHWC, RHC, ERW - 42 Tons, 18,000 CFM	1	LS	$312,500.00	312,500		
5	Installation	1	EA		w/ Phase 2		
6	Warranties, Turnover Coordination	1	LS	$28,750.00	28,750		
7							
8	D3040 HVAC Major Equipment Subtotal:					$ 341,250	
9							
10	**D30 Heating, Ventilating & Air Conditioning Total:**	**91,101**	**SF**	**$ 3.75**			**$ 341,250**
D50 Electrical							
1	D5020 Electrical Service & Distribution						
2	D5023 Large Power & Distribution						
3	Emergency Generators						
4	300 kW 480/277V Diesel Outdoor Generator	1	LS	$275,000.00	275,000		
5	Installation	1	EA		w/ Phase 2		
6	Switchboards	1	LS	$419,160.00	419,160		
7	MDB-1 - 3,000 Amp 480/277V	1	EA		Included Above		
8	Installation	1	EA		w/ Phase 2		
9	MDFP-1 400A 480/277V Fire Pump Service Switch	1	EA		Included Above		
10	Installation	1	EA		w/ Phase 2		
11	DP-LL 1,000 Amp 208/120V	1	EA		Included Above		
12	Installation	1	EA		w/ Phase 2		
13	Panelboards	1	LS	$149,080.00	149,080		
14	SMDP-LL 400A, 480/277V	1	EA		Included Above		
15	Installation	1	EA		w/ Phase 2		
16	SDP-LL 250A, 480/277V	1	EA		Included Above		
17	Installation	1	EA		w/ Phase 2		
18	EDP-LL 225A, 480/277V	1	EA		Included Above		
19	Installation	1	EA		w/ Phase 2		
20	PPM-MLB 400A, 480/277V	1	EA		Included Above		
21	Installation	1	EA		w/ Phase 2		
22	KP-LL 225A, 208/120V	1	EA		Included Above		
23	RP-LL 225A, 208/120V	1	EA		Included Above		
24	RP-MLA 225A, 208/120V	1	EA		Included Above		
25	RP-MLB 225A, 208/120V	1	EA		Included Above		
26	Installation	4	EA		w/ Phase 2		
27	RPM-MLB 125A, 208/120V	1	EA		Included Above		
28	RPM-MLA 125A, 208/120V	1	EA		Included Above		
29	RP-LL-Gym 125A, 208/120V	1	EA		Included Above		
30	SRP-LL-Gym 125A, 208/120V	1	EA		Included Above		
31	SKP-LL 125A, 208/120V	1	EA		Included Above		
32	SRP-MLA 125A, 208/120V	1	EA		Included Above		
33	SRP-MLB 125A, 208/120V	1	EA		Included Above		
34	ELP-MLA 100A, 480/277V	1	EA		Included Above		
35	ELP-MLB 100A, 480/277V	1	EA		Included Above		
36	ELP-LL 100A, 480/277V	1	EA		Included Above		
37	LP-LL 100A, 480/277V	1	EA		Included Above		
38	LP-MLA 100A, 480/277V	1	EA		Included Above		
39	LP-MLB 100A, 480/277V	1	EA		Included Above		
40	SLP-MLA 100A, 480/277V	1	EA		Included Above		
41	SLP-MLB 100A, 480/277V	1	EA		Included Above		
42	SLP-LL 100A, 480/277V	1	EA		Included Above		
43	Installation	16	EA		w/ Phase 2		
44	Automatic Transfer Switches	1	LS	$19,470.00	19,470		
45	400A SATS-LL, 480/277V	1	EA		Included Above		
46	Installation	1	EA		w/ Phase 2		
47	230A EATS-LL, 480/277V	1	EA		Included Above		
48	Installation	1	EA		w/ Phase 2		
49	Fire Pump ATS / Controller				w/ Phase 2		
50	Transformers	1	LS	$32,010.00	32,010		
51	TX-LL - 300 kVA	1	EA		Included Above		
52	Installation	1	EA		w/ Phase 2		
53	STX-LL - 75 kVA	1	EA		Included Above		
54	Installation	1	EA		w/ Phase 2		
55	Safety, Service & Disconnect Switches						

BUILDING MORE THAN BUILDINGS®

Gilbane

Madison Elementary Phase 1 Estimate
Elementary School

Program GSF: 91,101

	Systems & Descriptions	Quantity	Unit	Unit Cost	Total Cost	Subtotal	Trade Total
56	Elevator Fused Disconnect Switch	1	EA		w/ Phase 2		
57	Installation	1	EA		w/ Phase 2		
58	Elevator Lighting Control Fused Disconnect Switch	1	EA		w/ Phase 2		
59	Installation	1	EA		w/ Phase 2		
60	Short Circuit Studies	1	LS	$29,810.00	29,810		
61	Equipment Logistics/Handling, Warranties, Coordination	1	LS	$100,000.00	100,000		
62							
63	D5020 Electrical Service & Distribution Subtotal:					$ 1,024,530	
64							
65	**D50 Electrical Total:**	**91,101**	**SF**	**$ 11.25**			**$ 1,024,530**
	G30 Liquid & Gas Utilities						
1	G3010 Water Utilities						
2	G3011 Site Domestic Water Distribution						
3	Material Only						
4	12"	2,592	LF	$100.00	259,200		
5	6"	451	LF	$75.00	33,825		
6	4"	349	LF	$80.00	27,920		
7							
8	G3010 Water Utilities Subtotal:					$ 320,945	
9							
10	**G30 Liquid & Gas Utilities Total:**	**91,101**	**SF**	**$ 3.52**			**$ 320,945**
	Direct Work Total:	**91,101**	**SF**	**$ 18.51**			**$ 1,686,725**

PROJECT MANUAL FOR:

MADISON PUBLIC SCHOOLS
NEW PK-5 ELEMENTARY SCHOOL

180 MUNGERTOWN ROAD
MADISON, CT

STATE PROJECT #: 076-0067N
TECTON PROJECT #: MAD-02-AR

VOLUME I OF 1

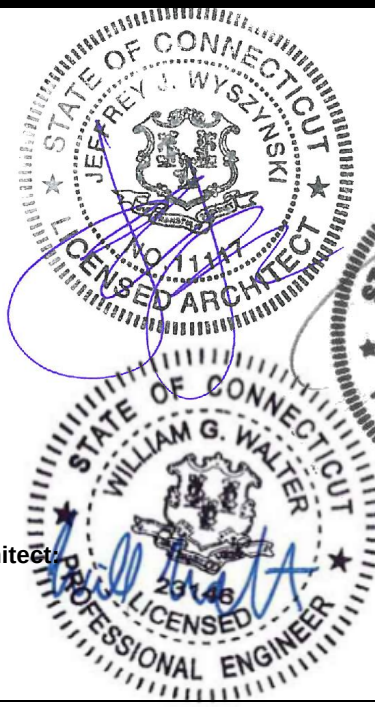
JULY 21, 2023 – EARLY PROCUREMENT PACKAGE
PHASE 1 OF 4

Owner:
Town of Madison, CT
8 Campus Drive
Madison, CT 06443
203-245-5600

Owner's Project Manager:
Colliers Project Leaders
135 New Road, Unit 2
Madison, CT 06443
860-395-0055

Construction Manager:
Gilbane Building Company
208 New London Turnpike
Glastonbury, CT 06033
860-368-5100

Civil Engineer/Landscape Architect:
Benesch
120 Hebron Avenue, Floor 2
Glastonbury, CT 06033
860-633-8341



Architect:
Tecton Architects, pc
34 Sequassen Street, Suite 200
Hartford, CT 06106
860-548-0802

MEP Engineer:
Kohler Ronan
93 Lake Avenue
Danbury, CT 06810
203-778-1017

Structural Engineer:
Michael Horton Associates
151 Meadow Street
Branford, CT 06405
203-481-8600

Food Service Consultant:
Crabtree McGrath Associates, Inc.
161 West Main Street
Georgetown, MA 01833
978-352-8500

Building Official: _____ (Print Name)	_____ (Signature)	_____ (Date)
Fire Marshal: _____ (Print Name)	_____ (Signature)	_____ (Date)
Section 504 Official: _____ (Print Name)	_____ (Signature)	_____ (Date)
Health Inspector: _____ (Print Name)	_____ (Signature)	_____ (Date)

PROJECT MANUAL AND SPECIFICATIONS
VOLUME I OF 1

Building Official: _____ (Print Name)	_____ (Signature)	_____ (Date)
Fire Marshal: _____ (Print Name)	_____ (Signature)	_____ (Date)
Section 504 Official: _____ (Print Name)	_____ (Signature)	_____ (Date)
Health Inspector: _____ (Print Name)	_____ (Signature)	_____ (Date)

END OF SECTION

ADVERTISMENT FOR BIDS
MADISON NEW PK-5 ELEMENTARY SCHOOL
EQUIPMENT & MATERIAL PRE-PURCHASE
STATE PROJECT NO. 076-0067 N
GILBANE JOB NO. J09867.000
TOWN OF MADISON BID NO. _____

1. Sealed bids for the bid packages listed below for the Town of Madison's New PK-5 Elementary School Project will be received by Gilbane Building Company at Gilbane Building Company's Glastonbury Office at 208A New London Turnpike, Glastonbury CT 06033 until the specified bid due date/time listed on 00 42 26 EX.A Proposal Form Exhibit A. Bids will be opened and read aloud shortly following the close of the bid period, refer to Bid Opening Logistics below. Late bids or bids received at any other location will not be accepted.

   Public Bid Opening Logistics: Please be advised of the following public bid opening process:
   a. The bid opening will be held via live video conference ONLY. Bidders will NOT be permitted to attend the bid opening in person.
   b. The live video conference of the public bid opening will open/begin for bidders to join at the specified bid due date/time.
   c. Bids will be opened and read aloud on the live video conference fifteen (15) minutes following the close of the bid period.
   d. Bids will be opened and publicly read aloud in alphabetical order by Bid Package within the specified Bid Package due date/time indicated on 00 42 26-EX.A Proposal Form – Exhibit A.
   e. Access Information for Live Video Conference of Bid Opening:
      i. Join URL: _____
      ii. Meeting ID: _____
      iii. Passcode: _____

2. Bidders, at the time the bid is submitted, must be prequalified with the State of Connecticut Department of Administrative Services (DAS) in accordance with C.G.S §4b-91, for the bid package(s) listed below. In accordance with C.G.S. §4a-100, §4b-91, and §4b-101, any trade contractor submitting a bid is required to submit their DAS Update (Bid) Statement with their bid. Failure to submit this item with the bid will result in rejection of the bid. All lower tier subcontractors with contracts in excess of $500,000 must be pre-qualified in the applicable classification at the time of performance of their work. In the event of a re-bid, the Bidder's Prequalification Update (Bid) Statement must be resubmitted with each bid submission. Failure to resubmit the Bidder's Prequalification Update (Bid) Statement with a re-bid submission will result in rejection of the bid.

3. The contracts to be awarded are subject to contract compliance requirements of the Connecticut Commission on Human Rights and Opportunities as mandated by Sections 4a-60 and 4a- 60a of the Connecticut General Statutes; and, Sections 46a-71(d) and 46a-81i(d) of the Connecticut General Statutes. There are Contract Compliance Regulations codified at Section 46a-68j-21 through 43 of the Regulations of Connecticut State Agencies, which establish a procedure for awarding all contracts covered by Sections 4a-60 and 46a-71(d) of the Connecticut General Statutes. Prevailing wage rates as outlined in Connecticut General Statutes 31-53 apply.

4. Each Bid shall be accompanied by a bid security in the form of a Bid Bond in an amount not less than Ten Percent (10%) of the total amount of the base bid drawn in favor of Gilbane Building Company. Said surety shall be issued by a surety that is licensed to do business in the State of Connecticut and is rated A-(VII) or better by A.M. Best. Bids received without such bid bond will be considered non-responsive and therefore rejected, no exceptions. In the event of a re-bid, each bid must be accompanied by a new Bid Bond. Bid Bonds submitted for previous bids are not valid and will not be accepted. Bids received for re-bids without such bid bond will be considered non-responsive and therefore rejected, no exceptions. **Reference 00 61 26 Trade Contract Bid Bond Form in the Gilbane Project Manual.**

5. Madison Elementary School is a new 92,000sf building on the open site of 180 Mungertown Road. Construction on the new building is scheduled to start in January of 2024 and complete in May of 2025. Construction of the new building is not phased.

   The new building is a combination of one and two story wings with a gymnasium, kitchen, cafeteria, media center and classrooms. It is a steel structure with the exterior comprised mainly of steel stud backup walls with brick façade and metal panel trim. The interior partitions are largely drywall, and the floors are a combination of resilient and carpet flooring. The mechanical system is a geo-exchange system with heat pumps, an indoor DOA unit, and VRF units throughout the building spaces. The new school will have all new services including water, fire, electric and tele/data.

   The work has been divided into the following bid packages:

Bid Package Name & Number	**DAS Prequalification Classification**	**Bid Due Date/Time**
23A – DOA Unit Furnish-Only	HVAC	_____ @ _____
26A – Electrical Switchgear Furnish-Only	Electrical	_____ @ _____
31A – Ductile Iron Water Pipe Furnish-Only	Site	_____ @ _____

6. There will be a non-mandatory Pre-bid meeting for this bid at 2:00 PM on DATE. The Pre-bid meeting will be held at 208A New London Turnpike, Glastonbury, CT 06033. Due to these bids being "Furnish-Only", a jobsite walk will not be conducted.

7. The Bid Documents* are accessible via the below:
   a) Download free of charge from the Gilbane File share link below: https://gfs.gilbaneco.com/portal/s/095863349501476026385
   b) Sets of the plans and specifications must be ordered and reserved prior to pick-up and may be obtained at Burke Reprographics LLC, 504 Skokorat Road, Beacon Falls, CT 06403, CT (203-592-5714 or brian@burkereprographics.com). It is the sole responsibility of the Trade Contractor to verify the correct sets of prints are received.

   *The below listing outlines the Bid Documents located on the DatAnywhere link:
   - Gilbane Project Manual Dated 08/21/2023
   - Bid Set Drawings Dated 07/21/2023
   - Bid Set Specs Dated 07/21/2023
   - Any Supplements issued during the bid period

8. This project is being performed under the Construction Management at Risk (CMR) form of construction. With respect to this project, the Construction Manager is the representative of the Owner. Each Trade Contractor's contract shall be with the Construction Manager. The Owner has contracted with Gilbane Building Company to serve as the CMR.

9. No oral, telephone or telegraphic proposals will be considered. All bids shall stand available for acceptance for a period of sixty (60) days from the date proposals are received.

10. The Owner and/or Construction Manager reserves the right to reject any or all bids, without stating reasons therefore, including without limitation the right to reject any or all nonconforming, non-responsive, unbalanced, or conditional bids and to reject the bid of any bidder if the Owner and/or Construction Manager believes that it would not be in the best interest of the Owner or the project to make an award to that bidder, whether because the bid is not responsive or the bidder is unqualified or of doubtful financial ability or fails to meet any other pertinent standard or criteria established by the Owner and/or Construction Manager. The Owner and/or Construction Manager reserves the right to waive informalities and to negotiate contract terms

with one or more bidders without reopening the bidding process insofar as such negotiations are not violative of applicable competitive bidding statutes or law. In evaluating bids, the Owner and/or Construction Manager will consider the qualifications of the bidder, whether or not the bids comply with the prescribed requirements, and such alternates, unit prices, and other data, as may be requested in the Form of Bid or prior to Notice of Award. The Owner and/or Construction Manager may consider the qualification and experience of subcontractors and other persons and organizations proposed for those portions of the work as to which the identity of subcontractors and other persons and organizations must be submitted as provided by the bid documents. The Owner and/or Construction Manager reserves the right to require, prior to Notice of Award, a statement of facts in detail of the business and technical organization and plant of the bidder available for the contemplated work, including financial resources, present commitments, and experience of the bidder in performance of comparable work.

11. Gilbane Building Company is an Affirmative Action Equal Opportunity Employer M/F/H/V.

Stephanie Greenman
Preconstruction Manager
Gilbane Building Company

GENERAL INSTRUCTIONS TO BIDDERS
MADISON NEW PK-5 ELEMENTARY SCHOOL
EQUIPMENT & MATERIAL PRE-PURCHASE
STATE PROJECT NO. 076-0067 N
GILBANE JOB NO. J09867.000
TOWN OF MADISON BID NO. _____

1. SUBMISSION OF BIDS:

Bids must be made in accordance with the following instructions and format provided in the Bid Form and must be fully completed.

Bid Envelope Check List

- ☐ Sealed envelope addressed to;
  Gilbane Building Company
  c/o Town of Madison
  208A New London Turnpike
  Glastonbury, CT 06033
  Ref: Madison New PK-5 Elementary School
- ☐ Company name and bid package number in the upper left hand corner of the envelope
- ☐ Bid form – two (2) copies, at least one must be an original
- ☐ Bid form signed
- ☐ Bid Bond, ten percent (10%) with Gilbane Building Company as the obligee.
- ☐ Bidder Prequalification Update Statement (refer to 00 45 13 Bidder Qualifications)

2. RECEIPT OF CONTRACT DOCUMENTS:

Upon receipt of the Bid Package the bidder shall immediately check that all documents listed in item 4 of these instructions and all Drawings and Specifications listed in the Bid Form have been received. If an item(s) is missing contact the Gilbane Purchasing Department immediately.

3. PRE-BID CONFERENCE:

The Pre-Bid Conference will be held at 2:00 p.m. on DATE at Gilbane's Office at 208A New London Turnpike, Glastonbury, CT 06033. Because this is a Furnish-Only bid, a walk-through of the site will not occur. To the extent possible, questions should be submitted to Joi Therrien (JTherrien@gilbaneco.com) prior to this conference. Agenda items include review of bidding procedure, bid format, site utilization, schedule, scope, questions and answers. Minutes will be forwarded to all plan holders and published on the File Share Link:
https://securecc.smartinsight.co/#/PublicBidProject/709980

4. EXAMINATION OF SITE AND CONTRACT DOCUMENTS:

A. Before submitting a bid, the bidder is required to carefully examine the Contract Documents, conditions and limitations affecting the work to be performed under this Contract. Include all costs for same.

B. By submitting a bid, the bidder agrees they have examined the Contract Documents, noted all conditions and limitations affecting the work and fully understands the nature of the

work, general and local conditions, and accepts the standard Gilbane contract form, a sample of which is included in the bid documents.

C. By submitting a bid, the bidder agrees that they will not make any claim for damages or additional compensation because of lack of information, or because of any misunderstanding, or because of any misinterpretation of the requirements of the Contract.

D. The Contract Documents (bid package) include the following:
1. Proposal Form
2. General Instruction to Bidders
3. Sample Contract Between Construction Manager and Trade Contractor
4. Trade Contract Conditions
5. Gilbane Building Company Safety Plan
6. Gilbane Project Manual
7. State of Connecticut Department of Labor Wage and Workplace Standards Division Minimum Rates and Classifications.
8. Non Resident Contractors Tax Status Requirements
9. Specifications as Listed
10. Drawings as Listed
11. Supplements (when issued)
12. Pre-Bid Conference Meeting Minutes (when issued)
13. Scope Review Meeting Minutes (when issued)

5. SUBMISSION OF BIDS:

A. Submit one (1) original bid and one (1) copy of the bid, original signatures are to be on both bid forms, sealed in an envelope plainly marked in the upper left hand corner with the name of the bidder, the words "BID DOCUMENT". The project name and bid package number and name, as well as the bid date and time shall be marked on the lower left hand corner of the envelope. If forwarded by mail or delivery service, the sealed envelope containing the bid must be enclosed in the delivery pouch addressed to:

Gilbane Building Company
208A New London Turnpike
Glastonbury, CT 06033
Ref: Madison New PK-5 Elementary School

B. The bids must be received at the above office by the time and date stipulated on the Bid Form. Faxed and emailed bids are not acceptable. Late bids will be rejected and returned unopened. All bids will be opened and read aloud shortly following the close of the bid period, refer to Bid Opening Logistics for details.

6. BID BOND:

Each Bid shall be accompanied by a bid security in the form of a Bid Bond in an amount not less than Ten Percent (10%) of the total amount of the base bid drawn in favor of Gilbane Building Company. Said surety shall be issued by a surety that is licensed to do business in the State of Connecticut and is rated A-(VII) or better by A.M. Best. Bids received without such bid bond will be considered non-responsive and therefore rejected, no exceptions. In the event of a re-bid, each bid must be accompanied by a new Bid Bond. Bid Bonds submitted for previous bids are not valid and will not be accepted. Bids received for re-bids without such bid bond will be considered non-

responsive and therefore rejected, no exceptions. **Reference 00 61 26 Trade Contract Bid Bond Form in the Gilbane Project Manual.**

7. PREPARATION OF BIDS:

A. Bid Forms shall be complete without alterations, erasures, corrections or qualifications.

B. Bids containing conditions, omissions, alterations, items not called for, or irregularities of any kind, may be rejected for failure to comply with the requirements stated herein.

C. Include the full business address of the bidder. Signature shall be in longhand and your name typed. Partnerships must sign the bid. In case of a bid submitted by a Corporation, the bid shall be signed by an officer duly authorized to sign on behalf of the Corporation.

D. Scope of Work items which have inadvertently been duplicated in more than one bid package must be included in the bid amount for each package containing the Work item, regardless of the duplication. Do not assume Scope of Work items will be provided by the other bid package(s). Notify the Owner and Construction Manager immediately upon discovery of a duplicated item. Should the Construction Manager request a credit for the duplicated item after the bid, claims of omission of pricing in the bid due to the duplicate item in another bid package will not be accepted.

8. EXPLANATION TO BIDDERS:

A. The bidder shall, in the event of any discrepancies, omissions or errors in the Contract Documents, or in the event of doubt on the part of a bidder as to their intent or meaning, direct inquiries via email to Joi Therrien at (JTherrien@gilbaneco.com). When using email, type "Madison New PK-5 Elementary School Bid RFI" in the subject line and type the question in the body of the email, do not attach a separate form.

B. Where appropriate, interpretations will be confirmed by Supplement to all bidders. Direction received from other parties and/or not confirmed via supplement shall not be considered. Supplements will be posted to the project File Share Link and a notice of the posting will be issued to all bidders. Documents associated with the Supplement will be posted to the project File Share Link, issued directly by the Construction Manager as appropriate.

C. Such bid supplements, issued during the bidding period, shall be acknowledged on the Bid Form and shall be included in the Contract at the time of award.

D. Such supplements may or may not contain design document addenda issued by the project designers.

E. Such Supplements may or may not contain architectural addenda.

9. ACCEPTANCE OR REJECTION OF BIDS:

A. Bids will be opened publicly and read aloud shortly after the bid closing time.

B. **AFTER REVIEW OF ALL FACTORS, TERMS AND CONDITIONS, INCLUDING PRICE, THE OWNER RESERVES THE RIGHT TO REJECT ANY AND ALL BIDS, OR ANY**

PART THEREOF, OR WAIVE DEFECTS IN SAME, OR ACCEPT ANY PROPOSAL DEEMED TO BE IN THE BEST INTEREST OF THE OWNER.

C. Gilbane Building Company and the Owner reserve the right to award a contract to the bidder considered best qualified for the work. The Owner and/or Construction Manager may make such investigations as they deem necessary to determine the ability of the bidder to perform the work, and the bidder shall furnish to the Owner and/or Construction Manager all such information and data for this purpose. Gilbane Building Company and the Owner reserve the right to reject any bid if the evidence submitted by, or investigation of, such bidder fails to satisfy the Owner and/or Construction Manager that such bidder is properly qualified to carry out the obligations of the Contract. In considering past performance the Owner and/or Construction Manager shall evaluate the skill, ability and integrity of bidders in terms of the bidders' fulfillment of contract obligations and of the bidders' experience or lack of experience with projects within the past five (5) years of similar nature, size and scope as the project for which the bids are submitted.

D. Bidders, at the time the bid is submitted, must be prequalified with the State of Connecticut Department of Administrative Services (DAS) in accordance with C.G.S §4b-91, for the bid packages listed in the 00 11 13 Advertisement for Bids. Bidders must include the DAS Update Statement with the bid. The Invitation to Bid identifies which DAS prequalification, if any, is required for the bid package. Bid packages for which there is no DAS prequalification category, the bidder may be required to provide a fully completed AIA A305 Contractor's Qualification Statement after the bid submission. Bidders are reminded that any bid/contract in excess of $500,000 must be DAS prequalified, regardless of tier. The Construction Manager will require verification of all subcontract values and prequalification status. Lower tier subcontractors without the appropriate DAS prequalification will not be permitted to work on the project.

10. FORM OF CONTRACT:

The successful bidder is required to execute an Agreement between the Construction Manager and Trade Contractor in accordance with the sample form in Section 00 52 26 of the Gilbane Project Manual.

After the Construction Manager has received approval from the Owner, the Trade Contractor will be notified that he has been successful. The Trade Contractor shall submit within ten (10) days after receipt, the bonds referenced herein, the appropriate insurance certificates, and the executed contracts. Failure to do so within ten (10) days after receipt of contract may be considered default under the obligation of the bid bond.

11. TAXES:

This project is sales tax exempt in accordance with the State of Connecticut General Statutes. Bids must include all applicable taxes (sales & use, payroll, etc.) in the bid amount and exclude exempt taxes.

12. TAX BONDS:

If applicable, the successful bidder must become a "verified contractor" with the State of Connecticut Department of Revenue Services and provide a copy of the "Nonresident Contractor Notice of Verified Status" letter to the Construction Manager. In accordance with C.G.S §12-430(7), the successful bidder must provide the letter prior to the release of the first progress

payment under the Contract or the Construction Manager must remit five percent (5%) of the total contract value directly to the State. This five percent withholding is in addition to the Project retainage. The Trade Contractor must file a tax return with the State to receive the funds withheld for taxes.

13. SECURITY FOR FAITHFUL PERFORMANCE:

Security for faithful performance shall be in accordance with Article 6.1 Sample Trade Contract Agreement in Section 00 52 26 of the Gilbane Project Manual. Bidders are to include the costs for a one hundred percent (100%) Performance Bond and a one hundred percent (100%) Labor and Material Payment Bond in the bid price. Section 00 61 13 Bond Forms contains the bond forms which must be utilized for the project.

14. PERMITS:

The contractor will be responsible for securing all necessary permits, state and local, as required by the Town of Madison. The Owner will waive its application and permit fees for the Project. Each bidder shall exclude in his bid all costs for the State's portion of the building permits as may be required for his portion of the work. The General Building Permit will be obtained and paid for by others.

15. INSURANCE:

Each bidder must include in their proposal all cost associated with providing insurance coverage as specified in Article 6.3 of the Sample Trade Contract Agreement in Section 00 52 26 of the Gilbane Project Manual of the Gilbane Project Manual. Any variation must be shown on a certificate submitted with the proposal for review.

Certificates of Insurance shall be delivered to the Construction Manager within ten (10) calendar days, following receipt of the Notice of Award letter and Contracts.

A Certificate of Insurance must be supplied to the Construction Manager prior to any work commencing in the field.

17. ENGINEERING/LAYOUT:

Each bidder must include in their bid all costs for engineering, surveying and field measurements which will be required to complete their work. Base lines and bench marks will be provided and maintained by the Construction Manager.

18. LABOR STANDARDS - EEO:

For all Suppliers and Trade Contractors, whose scope of work includes onsite labor, employed on this project are required to implement an Equal Opportunity Program within their organization. Proper steps should be taken to establish non-discrimination because of race, color, creed, sex, or national origin. The President's Executive Order No. 11246 and modifications thereto, as well as all other existing Federal and State Legislation on Equal Employment Opportunities will be adhered to in the carrying out of the Contract. See also, Article 25, below.

Each Trade Contractor must document that a minimum of 15% minority and 6.9% female labor hours have been employed on the site compared to the total labor hours for the work. Daily Reports

shall include the gender and ethnicity of each worker, direct or subcontracted, engaged in the work of the bid package.

Failure of the Trade Contractor to achieve the minimum goals set forth above, absent documented good faith, shall subject the Trade Contractor to suspension of payments from the Construction Manager until the minimum levels of minority and female hours are obtained or adequate good faith documentation is submitted.

19. SMALL/MINORITY/WOMEN OWNED BUSINESS ENTERPRISES:

The Project is subject to the requirements of the Connecticut Commission on Human Rights and Opportunity (CHRO). Unless otherwise noted, each bid package has a twenty-five percent (25%) SBE and six and one quarter percent (6.25%) M/WBE participation goal.

It is mandatory that Section G, of the Proposal Form, be completed and submitted with the bid. The amount of participation included will be considered when evaluating the proposals. Note that bidders must document their good faith efforts to obtain SBE and M/W/DVBE participation during the bidding.

The successful bidder is required to file, and shall cause each of their subcontractors to file, with the commission such compliance reports at such times as the commission may direct. Compliance reports shall contain such information as to the practices, policies, programs, and employment policies, employment programs, and employment statistics of the contractor and each subcontractor and be in such form as the commission may prescribe (C.G.S. Sec. 46a-68e). In addition to the reports required by CHRO, the Trade Contractor shall substantiate the participation and shall submit copies of subcontracts or purchase orders signed by both parties. As the work proceeds and payments are processed, the Trade Contractor shall submit satisfactory evidence such as cancelled checks. The total of all satisfactory evidence shall equal the participation commitment.

Failure to substantiate participation required by contract, will result in a default under the obligation of the Bid Bond. No monies shall be paid to the Trade Contractor until copies of contracts and/or purchase orders for the full amount of participation have been submitted. Release of retainage will be conditional upon approval of verified documentation totaling the participation commitment. The value of unsubstantiated participation may be deducted from monies due on the Trade Contractor's account.

S/MBE participation shall be counted toward the goals and/or requirements for this project as follows:

a) The dollar value of the contract or subcontract awarded to a certified small or minority or women business enterprise will be counted toward such a goal or requirement in full provided item (c) below is satisfied.

b) In the case of a joint venture with a certified S/MBE, the portion of the dollar value of the contract equal to the percentage of the ownership and control of the joint venture by the S/MBE will be counted toward the applicable goal or requirement provide item (c) below is satisfied.

c) Only expenditures to certified S/MBEs that perform a commercially useful function in the work of a contract or subcontract may be counted toward the applicable goal or requirement. An S/MBE is considered to perform a commercially useful function when it is responsible for

execution of a distinct element of the work of a contract or subcontract and carries out its responsibilities by actually performing, managing, and supervising the work involved. If an S/MBE subcontracts a greater portion of the work of the contract than allowable by State Statute or regulation, the S/MBE will be deemed not to be performing a commercially useful function and the full amount of the contracted work shall not be counted toward the goal or requirement, rather only that portion which the S/MBE is performing a commercially useful function will be counted. The S/MBE may present evidence to rebut this presumption.

d) Dollar value of materials and supplies obtained from certified S/MBE suppliers may be counted toward S/MBE goals or requirements only as allowable by State Statute or regulation.

20. PROMOTIONAL INFORMATION:

There shall be no information divulged concerning this Project to anyone including, for example, information in application for permits, variances, and other approval except such as is necessary to secure the same provided that all such applications shall be first submitted to the Construction Manager for approval by the Owner. The Trade Contractor shall not further refer to the Project in any of their promotional materials without the Owner's prior written consent obtained through the Construction Manager.

21. PAYROLLS:

The prevailing wage rates for the Project are subject to annual adjustment in accordance with §31-55a of the Connecticut General Statutes. Bidders shall anticipate and include all annual adjustments to the prevailing wages rates within the lump sum bid price. Subsequent to Contract award each Trade Contractor will be required to submit certified payrolls monthly, in accordance with Connecticut law, on the forms provided by the Construction Manager and the Connecticut Department of Labor as a condition for payment.

22. DEBARMENT:

Bidders are to identify if they or any proposed subcontractors have been debarred in the past or are currently debarred from participating in any public works project, for the local, state or federal governments. Is so, provide details of such debarment. Contractors who are currently debarred are unacceptable.

23. RETAINAGE

In accordance with Connecticut State law, retainage shall be five percent (5%).

24. MONTHLY PAYMENT APPLICATIONS

Gilbane has automated its monthly payment application process and utilizes an online web-based application provided by Textura LLC. The successful bidder will be required to participate and will implement Textura on the project.

If the successful bidder has no previous experience with Textura, they will be required to enroll and participate in either Textura’s computer based, pre-recorded training course, or a web-based training session provided by Textura’s representatives. Participation will require a computer with internet access, an e-mail address, and a phone. Once registered, the monthly requisition process will take place through the Textura online application.

Textura will automatically generate the contractor's AIA G702/703 and Lien Release Documents. Any additional documentation required as part of the Gilbane application process must be uploaded in the form of a PDF prior to your submission.

There is a nominal fee to use this service. These costs are summarized in Section 00 62 90.9 of this project manual. The costs of using this service must be included in your bid. If you have any questions regarding Textura's Terms & Conditions, costs of service, or training implementation please feel free to contact Textura at 866-TEXTURA (839-8872).

State of Connecticut
Department of Administrative Services (DAS)
Contractor Prequalification Forms

IMPORTANT INFORMATION – PLEASE READ

For Projects with estimated Construction Costs greater than $500,000

WHEN YOU SUBMIT A BID YOU MUST INCLUDE WITH YOUR OTHER DOCUMENTS THE FOLLOWING:

A "DAS Update (Bid) Statement".

This document may be found and completed on-line at the Bid Statement Online Application.

Go to the DAS Homepage (www.ct.gov/DAS), click on "Doing Business with the State", click on "Apply for DAS Construction Contractor Prequalification", click on "Documents/Forms", click on "Update Bid Statement", and then click on "Bid Statements".

Follow instructions in the "Instructions for Prequalification".

Go to the DAS Homepage (www.ct.gov/DAS), click on "Doing Business with the State", click on "Apply for DAS Construction Contractor Prequalification", click on "How To", and then click on "View Instructions for Prequalification".

Should you have any questions or concerns, please call (860) 713-5280.

State of Connecticut
Department of Administrative Services (DAS) Contractor Prequalification
Update Bid Statement

(Statement to be included with the bid)

Public Act No. 04-141 - AN ACT REVISING PREQUALIFICATION REQUIREMENTS FOR STATE CONSTRUCTION CONTRACTS.

On and after October 1, 2004, each bid submitted for a contract shall include a copy of a prequalification certificate issued by the Commissioner of Administrative Services. The bid shall also be accompanied by an update statement in such form as the Commissioner of Administrative Services prescribes. The form for such update statement shall provide space for information regarding all projects completed by the bidder since the date the bidder's prequalification certificate was issued or renewed, all projects the bidder currently has under contract, including the percentage of work on such projects not completed, the names and qualifications of the personnel who will have supervisory responsibility for the performance of the contract, any significant changes in the bidder's financial position or corporate structure since the date the certificate was issued or renewed, any change in the contractor's qualification status and such other relevant information as the Commissioner of Administrative Services prescribes. Any bid submitted without a copy of the prequalification certificate and an update statement shall be invalid.

Name of Project that company is bidding on:		
Project Number:		
Name of Company:		
FEIN:		
Company Address:		
Prequalification Contact and Telephone Number		
Date of Prequalification with the DAS:	**Single Limit:**	**Aggregate Work Capacity (AWC):**
* This amount equals your company's AWC minus the Total $ Amount of Work Remaining.		*** Remaining Aggregate Work Capacity:**

Please list all of your company's (100%) completed projects since date of Prequalification:
(Please add additional page(s) if required)

Name of Project	Owner of Project	Date Project Completed	Total Contract Amount

(Please add additional page(s) if required. Please total the Work Remaining column)

Name of Project	Owner of Project	Total Contract Amount	% Complete	Work Remaining ($)
			Total $ Amount of Work Remaining →	

Please list the names and titles of the personnel who will have supervisory responsibility for the performance of the contract being bid on:
(Please add additional page(s) if required)

Individual Name	Title of individual

Have there been any changes in your company's financial condition or business organization, which might affect your company's ability to successfully complete this contract?

Yes or No

If yes, please explain:

I, certify under penalty of law that all of the information contained in this Update Statement is true and accurate to the best of my knowledge as of the date below.

_____ _____
Signature **Date**

It is the responsibility of the Awarding Authority to determine if any of the information provided above will impact the contractor's performance on this project.

The DAS' Contractor Prequalification Program can be reached at (860) 713-5280

Rev.12.22.2004

PROPOSAL FORM
FOR
MADISON NEW PK-5 ELEMENTARY SCHOOL
EQUIPMENT & MATERIALS PRE-PURCHASE
GILBANE JOB NO. J09867.000
STATE PROJECT NO. 076-0067 N
BID PACKAGE No. 23A – DOA UNIT (FURNISH-ONLY)

PRE-BID CONFERENCE:
DATE & TIME: Reference 00 42 26 Exhibit A
LOCATION:
Gilbane Office
208A New London Turnpike
Glastonbury, CT 06033

PROPOSAL FORM DUE:
DATE & TIME: Reference 00 42 26 Exhibit A
LOCATION:
Gilbane Office
208A New London Turnpike
Glastonbury, CT 06033
Ref: Madison New PK-5 ES Bid

DEADLINE FOR SUBMISSION OF QUESTIONS: Reference 00 42 26 Exhibit A
To: Joi Therrien (Jtherrien@gilbaneco.com)

Proposal Addressed To: Gilbane Building Company
Stephanie Greenman
Chief Purchasing Agent

FIRM NAME:

_____
_____
_____

☐ DAS Contractor Prequalification Update Statement
☐ Bid Bond Included
☐ Bid is Signed

The Undersigned:

A. Proposes to furnish all labor, materials, equipment, and services as required to satisfactorily complete all **DOA Unit (Furnish-Only) Work** herein described as Bid Package **No. 23A** as required for the construction activities at the Madison New PK-5 Elementary School Project, all in accordance with the Drawings and Specifications as prepared by Tecton Architects, PC, the Gilbane Project Manual, and this Proposal Form.

B. All work required by the foregoing documents will be accomplished for the Lump Sum Bid Price of

_____

_____ Dollars ($_____).
(Show amount in both words and figures. In case of discrepancy, amount shown in words will govern.)

The lump sum bid price above INCLUDES all applicable sales and/or use taxes; INCLUDES all insurance premiums required to meet contractual insurance requirements; and INCLUDES all premiums for a Performance Bond and a Labor and Material Payment Bond in the sum of one hundred percent of the Contract price.

C. Bidder agrees that if written notice of the acceptance of this bid is mailed or delivered to the undersigned within thirty (30) calendar days after the Proposal Due Date, or any time thereafter before it is withdrawn, the undersigned shall meet a representative of the Gilbane Glastonbury office or a mutually agreed upon location to execute the Contract. Performance and Payment Bonds and the appropriate insurance certificates will be delivered to the Construction Manager at the time of execution of the Contract. Failure to execute said contract within ten (10) calendar days after receipt of contract may be considered a default under the obligation of the bid bond.

D. The above price includes all stipulations and requirements of the following Supplements:

Supplement __ dated _____

Supplement __ dated _____

Supplement __ dated _____

Supplement __ dated _____

Supplement __ dated _____

Supplement __ dated _____

which have been received and accepted by the undersigned. Note that it is incumbent of the bidder to include all Supplements issued in the bid. Failure to acknowledge a supplement does not relieve the bidder from the requirements of the supplement.

E. MILESTONE SCHEDULE DATES & SCHEDULE PROCEDURES

The Milestone Schedule dates for this bid package are:

1. Anticipated Date of Contract Award: 10/27/2023
2. Deliver DOA Unit & All Associated Components: 08/30/2024
3. Project Substantial Completion: 05/31/2025

F. TRADE SUBCONTRACTORS AND MAJOR SUPPLIERS

The following trade subcontractors are proposed for the item of work listed. Trade subcontractors are subject to review per the General Conditions.

ITEM OF WORK	TRADE SUBCONTRACTORS	
_____	_____	EMR: _____
_____	_____	EMR: _____
_____	_____	EMR: _____
_____	_____	EMR: _____

G. UTILIZATION OF MINORITY CONTRACTORS AND SUPPLIERS

1. The contract to be awarded is subject to contract compliance requirements mandated by Sections 4a-60 and 4a- 60a of the Connecticut General Statutes; and, Sections 46a-71(d) and 46a-81i(d) of the Connecticut General Statutes. There are Contract Compliance Regulations codified at Section 46a-68j-21 through 43 of the Regulations of Connecticut State Agencies, which establish a procedure for awarding all contracts covered by Sections 4a-60 and 46a-71(d) of the Connecticut General Statutes.

2. The Bidder will endeavor to obtain a minimum goal of twenty-five percent (25%) of the awarded amount to small business enterprises, with six and one quarter percent (6.25%) of the awarded amount to minority business trade subcontractors and/or suppliers certified by the **State of Connecticut.**

3. The successful Trade Contractor shall substantiate this participation within ten (10) days after receipt of Notice of Award. Refer to the General Instruction to Bidders for further information.

4. Indicate here the utilization of certified S/MBEs included in the base bid. Failure to comply with M/WBE participation goals may constitute a non-responsive proposal. IF NO INDICATION IS GIVEN, IT SHALL BE INTERPRETED THAT ZERO M/WBE PARTICIPATION IS INCLUDED.

   This proposal includes:

Name of Diverse Business Enterprise:	**Diverse Business Enterprise Certification (i.e. SBE, MBE, WBE, etc.)**	**Scope of Services Provided by Diverse Business Enterprise as part of this Bid Package:**	**Cost of Services:**
			$
			$
			$

5. S/MBE participation shall count toward stipulated contractual goals or requirements only allowed by Connecticut General Statutes and CHRO Regulations.

H. UNIT PRICES

Unit Prices shall be used, where applicable, to make adjustments to the cost of the Work due to changes. All Unit Prices submitted shall be complete in-place prices (unless noted otherwise) and include all costs for overhead, profit, labor, materials, equipment, and any other incidentals related to the completion of the Work, and shall remain firm for the period of the contract. Unit prices listed are for additive work. Deductive unit prices in all cases are to calculated the same as additive unit prices (100% if used in conjunction with an allowance).

UNIT PRICES: None.

Changes in the Work. All bidders are herein advised that they are to provide, in the space provided below, a written description of how they would price lump sum changes. It is understood that the Unit Prices which you would insert in this Proposal Form response would be one element of the Change pricing, however, it is necessary to determine up front and reach agreement on, your intended method of determining units of labor productivity and material pricing as well. Bidders are to be explicit as to what Manual(s), if any, are intended to be utilized. Once accepted by the Construction Manager, provide copies of all applicable pricing manuals for use by the Construction Manual in evaluating Change Order pricing.

_____

_____

_____
_____
_____
_____
_____
_____

Provide labor rates which may be used, subject to review and approval, in pricing any extra work that may be required. Rates are to be complete billing rates and are to include actual wages, taxes, fringes, and insurance, but exclude allowable overhead and profit. The maximum allowable mark-up for overhead and profit combined, inclusive of all lower tier sub-trade contractors and vendor's mark-ups, is fifteen percent (15%) total. Base price on current rates in effect at time of bid. As prevailing wages and fringes rate change, these increases will be added to the labor rates at actual cost. Increases in wage rates are subject to audit. Complete the attached Wage Rate Breakdown Form for each classification of worker anticipated to work on the Project.

It is understood that certain taxes are applicable only up to specified earnings ceilings. When used in pricing changes orders, these labor rates are subject to audit to determine if those earnings ceilings have been exceeded. The Trade Contractor agrees to immediately refund to the Construction Manager any overpayment that, pursuant to an audit, has been determined to have been made by the Construction Manager to the Trade Contractor.

I. ALTERNATE PRICES

An Alternate Price shall include all costs associated with the changes, omissions, additions or other adjustments to the Work of this Bid Package (Contract) which are described in the Alternate, or are reasonably inferable therefrom. Claims for extras resulting from changes caused by the acceptance or rejection of any Alternate will not be allowed. Alternate Prices shall also include all costs of overhead, profit and bonds associated with the work of the Alternate, whether additive or deductive.

The Drawings, Specifications and other Contract Documents shall be considered appropriately modified by either the acceptance or rejection of the various Alternates. The Owner and the Construction Manager expressly reserve the right to accept or reject any, or all, Alternate Prices, and in any sequence prior to or after award. Acceptance or rejection of any Alternate does not relieve the Bidder of timely completion of the Work within the time periods indicated.

ATTENTION BIDDERS:

Alternates in which there is no cost impact to your bid shall be filled in as Zero Dollars ($0.00).

Alternates in which the Bidder lists "N/A" or "Not Applicable" shall be considered Zero Dollars ($0.00) and have no cost impact to the Bidder or the project should the Alternate Price be accepted.

Alternates in which the Bidder states "No Bid" and/or leaves the price blank (i.e. no response provided) whether intentional or unintentional for an alternate that is considered as part of the award process, shall be deemed non-responsive and subject to rejection.

ALTERNATES: None.

J. ALLOWANCES

The Bidder includes the following Allowances and rates in the total Lump Sum Amount of the Base Bid for this Bid Package. Further to Article 14 in the Trade Contract Conditions and unless noted otherwise below, the following allowance amounts include the Trade Contractor's cost of materials less applicable discounts, delivery to

the site, applicable taxes, unloading, handling, installation, allowable overhead and profit. All other costs associated with completing the work described in the allowance is included in the base bid but outside of the allowance amount.

ALLOWANCES: None.

K. COST AND QUANTITY BREAKDOWN

In order to properly evaluate the Proposal, provide the following information. The Scope of Work to be awarded will not be influenced by the cost and quantity information requested here.

1. COST BREAKDOWN

Total Material ..... $ _____
Total Subcontractor/Equipment Cost..... $ _____
Total Bond Cost ..... $ _____
Total Applicable Sales and Use Taxes..... $ _____
Total Bid ..... $ _____

2. QUANTITY BREAKDOWN (*Note: The items listed below are not intended to be an all inclusive listing, but merely to highlight some items of work.)*

THE INFORMATION LISTED BELOW IN THE QUANTITY BREAKDOWN SECTION IS REQUIRED AT THE TIME OF BID SUBMISSION.

Item	Quantity	Total Cost
Shop Drawings & Submittals	LS	$_____
CHRO Administration	LS	$_____
DOAS-1	LS	$_____
Trucking	EA	$_____
Other	LS	$_____
Total Bid	LS	$_____

L. SCOPE OF WORK

1. Description of Work Included

Except for those items (if any) specifically noted in the section below entitled "Description of Work Excluded", the Work of this Bid Package shall INCLUDE all of the following:

a. All items of work required by, and/or specified in, those Sections of the Specifications which are listed herein, under Section M SPECIFICATIONS.

b. All items of work related to the "Scope of Work", which are shown on the Drawings listed herein under Section N Contract Drawings.

c. The following "Significant Items of Work" are related to those required by the above referenced documents and are to be provided under, and hereby form a part of, the Scope of Work of this Bid Package (Contract). Should any conflict exist between this written scope of work and the scope of work inferred by the above referenced documents, this scope of work shall govern. All items are furnished and installed by this Trade Contractor unless noted otherwise.

GENERAL SCOPE OF WORK

1. Trade Contractors will not be allowed to mobilize on-site until the following items have been submitted: fully executed Contract, fully executed and complaint Performance Bond & Material and Payment Bond, and Certificate of Insurance. In addition, prior to starting any work, this Trade Contractor is required to provide a written Safety Program with Job Hazard Analysis, material status report and a list of all materials required under this Contract with indication of which materials require submittal for approval as outlined in the specifications and a schedule of anticipated date(s) of submittal for each.

2. The items listed herein are not intended to be an all-inclusive listing of the specified Contract Scope of Work, but merely highlight the major items of work. Review the Contract Documents for work by this Trade Contractor included within the other specification sections. This Trade Contractor will be responsible for all work within its scope of work contained in other specifications, or on drawings whether or not specifically listed within this Bid Package Description.

3. Participate in Pre-bid Meetings and any activities necessary during the execution of your work to and provide LEED® equivalent documentation, including but not limited to, Construction Waste Management, Green Building Materials, use of local materials, etc. All costs associated shall be included in the Trade Contractor's bid.

4. Review the scope of work closely and include all cost to provide all work as required by this bid package. Should an item be duplicated in another bid package, do not delete the item from your bid. Notify the Construction Manager immediately. Failure to include costs for a duplicated item will not alleviate the Trade Contractor's responsibility to provide full credit for the item should it be deleted from the bid package after a contract is awarded.

5. Each Trade Contractor will perform a First Delivery Inspection of materials with the Construction Manager to confirm that materials meet the Project Specifications and approved submittals. These reports shall be turned in with the daily report no more than 24 hours after material arrival. Submission of the First Delivery Inspection Report is a condition of monthly payment. All delays that result from failure to confirm materials delivered with the Construction Manager are at the Trade Contractor's cost, including those of other Trade Contractors on this Project. The Construction Manager will provide a form for this use, which is to be jointly filled out by the Construction Manager and the Trade Contractor, but initiated by the Trade Contractor. It is the Trade Contractor's responsibility to perform subsequent delivery inspections to ensure compliance with Specifications. Include Benchmarking of initial installations in accordance with the Quality Plan in the Project Manual.

6. Gilbane has automated its monthly payment application process and solely utilizes an online web-based application provided by Textura LLC. Trade contractors will be required to participate and must implement Textura on the project.

   Textura will automatically generate the AIA G702/703 and Lien Release Documents. Any additional documentation required as part of the Gilbane application process must be uploaded in the form of a PDF prior to your submission.

   There is a nominal fee to use this service. These costs are summarized in the Textura brochure included in Section 00 62 90.8 of the Gilbane Project Manual. The costs of using this service must be included in your bid.

If you have any questions regarding Textura's Terms and Conditions, costs of service, or training implementation please contact Textura at 866-TEXTURA (839-8872).

7. Temporary toilet facilities will be provided by the Construction Manager at the site for the Trade Contractor's use.

8. The Town of Madison has waived building permit fees. The State of Connecticut Education Fee shall be paid by the Construction Manager. Obtain any and all other permits, as required to complete the work of this bid package and furnish copies of all licenses and permits to the Construction Manager. The Construction Manager will obtain the general building permit.

9. The Procore electronic submittal process requires the Trade Contractor to provide electronic submission (shop drawings and as-builts, O&Ms), and one (1) hard copy of any full size shop drawings after review, i.e. steel shop drawings, MEP coordination drawings, rebar shop drawings. These are for the Construction Manager's use. It remains the Trade Contractor's responsibility to obtain copies of all documents as they require, this includes but is not limited to documents produced by other Trade Contractors.

10. The requirement for samples remains unchanged. The Trade Contractor is responsible to arrange delivery to the jobsite of physical samples of each required item. All submittals intended for color selection and verification shall be provided as physical samples. The Trade Contractor shall be solely responsible for any cost resulting from color variation introduced by the use of electronic media in the submittal process.

11. It is the Trade Contractor's responsibility to complete Submittals in a timely fashion, and to monitor the status of the A/E review. The Trade Contractors shall provide a Submittal Schedule no later than ten (10) days following the receipt of the Notice of Award. All submittals must be received by Construction Manager within 20 days of Notice of Award, or earlier as required to meet delivery schedules or as required for proper review and coordination of submittals from other Trade Contractors. Costs and/or delays incurred by others resulting from another Trade Contractor not adhering to the requirements described herein will be solely borne by the offending contractor. Include in the schedule the duration for preparing shop drawings for each equipment or material which are required per the Contract Documents, and for equipment or materials that will take more than 4 weeks to arrive following shop drawing approval.

12. Trade Contractor meetings shall be conducted weekly. Trade Contractor attendance is mandatory starting 6 weeks prior to the Trade Contractor's mobilization onsite and shall continue weekly until the Trade Contractor's work is complete and accepted. Trade Contractor's representative shall be its Project Superintendent/Foreman who shall have decision making authority to commit the Trade Contractor to sequencing and durations, knowledge of material deliveries, and overall familiarity with the Project. If the Project Superintendent/Foreman does not meet the above criteria, then the Project Manager shall additionally attend. There will be a separate weekly meeting for Project Managers for overall safety, schedule, and cost review. Project Manager attendance at the Trade Meeting does not relieve the obligation to attend the Project Manager weekly meetings.

13. **Liquidated damages** for failure to complete the construction as defined in the General Conditions will be assessed to the responsible Trade Contractor(s) for each calendar day after the date for Substantial Completion until Substantial Completion is achieved. If the Trade Contractor fails to achieve Substantial Completion of the work in accordance with the Project Schedule, the Owner shall be entitled to retain or recover from the Trade Contractor, as liquidated damages and not as a penalty, the per diem amounts identified below, commencing upon the first calendar day following the Substantial Completion date in the Schedule, and continuing until the actual Date of Substantial Completion. Such liquidated damages are hereby agreed to be a reasonable pre-estimate of damages the Owner will incur as a result of delayed completion of the Work. Liquidated damages shall be in the amount of Five Thousand dollars ($5,000.00) per calendar day. The Owner may deduct liquidated damages from any unpaid amounts then or thereafter due under the Trade Contract

Agreement. Any liquidated damages not so deducted shall be payable to the Owner, at the demand of Owner, together with interest from the date of the demand.

14. Whenever the contract documents require a certified engineer's stamp, review or report, it shall be understood to mean a professional engineer licensed in the applicable discipline, fully insured and registered in the State of Connecticut.

15. Should the Architect allow the use of its CAD files and/or BIM model for coordination or other purposes, this Trade Contractor shall sign the required release forms.

16. Participate in inspection walkthroughs as requested by the Construction Manager. Provide suitable access for inspectors to perform all tests or inspections. Trade Contractor-supplied temporary ladders and lifts to perform their work are to be available for the use of all parties.

17. All Warranties and Guarantees shall commence at the substantial completion date of the project.

18. All reference in the contract documents to the Construction Manager/General Contractor/Contractor as performing any field work or providing services in connection with any aspect of the Work shall be understood to mean the Trade Contractor. The Construction Manager will not layout, log, record, or otherwise provide actual work or service related to the Trade Contractor's scope of work, inclusive of Division 0 and Division 1 specifications.

19. In accordance with Construction Manager/ Owner Agreement, retainage shall be Five percent (5%). An additional Two Percent (2%) of the contract value shall be withheld from the payment requisition pending the State Commission on Human Rights and Opportunities' ("CHRO") approval of the Trade Contractor's Affirmative Action Plan.

20. Trade Contractor shall be responsible for the deductible in the event of a Builders Risk claim.

SPECIFIC ITEMS:

1. Provide all labor (off-site), materials, equipment, engineering, and services required to furnish complete the DOAS-1 unit and all associated components as noted on the drawings, in the specifications, and as described herein.

2. All references in the contract documents to the Construction Manager/General Contractor/Contractor as performing any field work or providing services in connection with any aspect of the Work shall be understood to mean this Trade Contractor. The Construction Manager will not layout, log, record, or otherwise provide actual work or service related to the Trade Contractor's scope of work, inclusive of Division 0 and Division 1 specifications.

3. Perform all work as specified in the following Specification Sections and as shown on the drawings (all drawings). The work specified in the following specification sections is the sole responsibility of this Trade Contractor unless modified below:

All Division 00	Bidding and Contracting Requirements (Gilbane Project Manual)
23 74 33	Dedicated Outdoor-Air Units

4. This bid package (BP23A) is a furnish-only bid package for DOAS-1. The receiving and installing mechanical contractor (BP23B) shall receive, unload, and install DOAS-1.

5. Coordinate delivery with the Construction Manager and BP23B. Delivery shall be during normal business hours. A representative from BP23A shall be present for the full duration of delivery and offloading to confirm acceptable receipts of material and equipment by BP23A.

6. BP23A shall be responsible for all submittals (Action, Informational, and Closeout) as noted in Part 1 of Specification 237433 except for:
    a. Field quality-control reports (by BP23B)
    b. Start-up service reports (by BP23B)
    c. Coordination drawings (by BP23B); however, shop drawings and submittals by BP23A for DOAS-1 shall provide fully dimensioned information so BP23B can fully coordinate their work as part of the project's BIM Coordination phase in December of 2023 and January of 2024.
    d. Attic stock filters and gaskets noted in 237433-1.06 (Maintenance Material Submittals).

7. Provide all closeout submittals within one hundred and twenty (120) days from Notice of Award.

8. Provide the Manufacturer's Warranty for DOAS-1 and all parts furnished under this Bid Package, BP23A. Warranty shall commence following Substantial Completion of the building as determined by the Architect and issued via AIA Document G704. Include costs necessary to extend the start of manufacturer's warranties from date of delivery to date of Substantial Completion. Include site visits during the installation of DOAS-1 as required by the manufacturer to maintain the manufacturer's warranty. The workmanship warranty for installation of DOAS-1 and all parts shall be provided by the installing mechanical contractor (BP23B).

9. DOAS-1 will be installed inside the building, not on the roof. Take note of the requirements stated on M4.00 for shipping splits. Coordinate final splits with the Construction Manager and BP23B.

10. Furnish a complete set of filters with delivery of DOAS-1.

2. Description of Work Excluded

The following specific item(s) of work contained in the above referenced documents are EXCLUDED from the work of this Bid Package (Contract):

1. As noted in Specific Scope of Work section.

M. SPECIFICATIONS

The following Specifications Sections, together with the Drawings and other related items of work as described herein, further define the Scope of Work of the Bid Package (Contract):

1. Work related to this trade as defined in the following Specification Sections:

    All specifications as listed in the Project Manual for Madison New PK-5 Elementary School, Table of Contents, dated July 21, 2023, as prepared by Tecton Architects, PC. Note this list may be modified by Bid Supplements and Addenda.

N. CONTRACT DRAWINGS

1. The following drawings are included in the Scope of Work of this Bid Package:

All other drawings sections as listed in the Project Manual for Madison New PK-5 Elementary School, Table of Contents, dated July 21, 2023, as prepared by Tecton Architects, PC. Note this list may be modified by Bid Supplements and Addenda.

O. The undersigned represents that this Proposal is made in good faith, without fraud, collusion, or connection of any kind with any other bidder of the same work, that he is competing in his own interest and in his own behalf, without connection of obligation to any undisclosed person, that no other person has any interest in regard to all conditions pertaining to the Work and in regard to the place where it is to be done, has made his own examination and estimates and from them makes this Proposal.

The undersigned represents that he has reviewed the Trade Contract Agreement issued as part of the bidding documents, agrees that if selected for award he will execute the Trade Contract Agreement without exceptions, exclusions, qualifications, clarifications and/or alterations, and is authorized to make such representation on behalf of the Bidder.

The undersigned represents that he has reviewed the insurance requirements in Article 6 of the Trade Contract Agreement, has included all costs to fully comply with same, and is authorized to make this representation on behalf of the Bidder.

Bidder:_____ _____
(Legal Signature) (Type/Print Name)

_____
(Title)

Firm:_____ Address:_____

Business Phone No.: (___)_____ _____

Email: _____

This bidder is a (an): _____Individual, Partnership, Corporation

Current Experience Modification Rating _____ Federal ID# _____

OSHA Incident Rates: Recordable _____

List here by title and number all licenses held by the bidder associated with the performance of this work.

License Title	License Number
_____	_____
_____	_____
_____	_____

Indicate the name of the health plan(s) to which benefits will be paid for all employees working on this project._____

The full names, addresses and telephone numbers of all persons interested in this Proposal, as principals are as follows:

_____

_____

NOTE: This Proposal must bear the written signature of the Bidder.

a. If the Bidder is an Individual doing business under a name other than his own name, the Proposal must so state, giving the address of the Individual.
b. If the Bidder is a Partnership, the Proposal must so state, setting forth the names and addresses of all Partners, and must be signed by a Partner so designated as such.
c. If the Bidder is a Corporation, the Proposal must be signed by a duly authorized officer or agent of such Corporation.

PLACEHOLDER FOR

BP26A PROPOSAL FORM

PROPOSAL FORM
FOR
MADISON NEW PK-5 ELEMENTARY SCHOOL
EQUIPMENT & MATERIALS PRE-PURCHASE
GILBANE JOB NO. J09867.000
STATE PROJECT NO. 076-0067 N
BID PACKAGE No. 31A – DUCTILE WATER PIPE (FURNISH-ONLY)

PRE-BID CONFERENCE:
DATE & TIME: Reference 00 42 26 Exhibit A
LOCATION:
Gilbane Office
208A New London Turnpike
Glastonbury, CT 06033

PROPOSAL FORM DUE:
DATE & TIME: Reference 00 42 26 Exhibit A
LOCATION:
Gilbane Office
208A New London Turnpike
Glastonbury, CT 06033
Ref: Madison New PK-5 ES Bid

DEADLINE FOR SUBMISSION OF QUESTIONS: Reference 00 42 26 Exhibit A
To: Joi Therrien (Jtherrien@gilbaneco.com)

Proposal Addressed To: Gilbane Building Company
Stephanie Greenman
Chief Purchasing Agent

FIRM NAME:

_____
_____
_____

☐ DAS Contractor Prequalification Update Statement
☐ Bid Bond Included
☐ Bid is Signed

The Undersigned:

A. Proposes to furnish all labor, materials, equipment, and services as required to satisfactorily complete all **Ductile Water Pipe (Furnish-Only) Work** herein described as Bid Package **No. 31A** as required for the construction activities at the Madison New PK-5 Elementary School Project, all in accordance with the Drawings and Specifications as prepared by Tecton Architects, PC, the Gilbane Project Manual, and this Proposal Form.

B. All work required by the foregoing documents will be accomplished for the Lump Sum Bid Price of

_____

_____ Dollars ($_____).
(Show amount in both words and figures. In case of discrepancy, amount shown in words will govern.)

The lump sum bid price above INCLUDES all applicable sales and/or use taxes; INCLUDES all insurance premiums required to meet contractual insurance requirements; and INCLUDES all premiums for a Performance Bond and a Labor and Material Payment Bond in the sum of one hundred percent of the Contract price.

C. Bidder agrees that if written notice of the acceptance of this bid is mailed or delivered to the undersigned within thirty (30) calendar days after the Proposal Due Date, or any time thereafter before it is withdrawn, the undersigned shall meet a representative of the Gilbane Glastonbury office or a mutually agreed upon location to execute the Contract. Performance and Payment Bonds and the appropriate insurance certificates will be delivered to the Construction Manager at the time of execution of the Contract. Failure to execute said contract within ten (10) calendar days after receipt of contract may be considered a default under the obligation of the bid bond.

D. The above price includes all stipulations and requirements of the following Supplements:

Supplement __ dated _____

Supplement __ dated _____

Supplement __ dated _____

Supplement __ dated _____

Supplement __ dated _____

Supplement __ dated _____

which have been received and accepted by the undersigned. Note that it is incumbent of the bidder to include all Supplements issued in the bid. Failure to acknowledge a supplement does not relieve the bidder from the requirements of the supplement.

E. MILESTONE SCHEDULE DATES & SCHEDULE PROCEDURES

The Milestone Schedule dates for this bid package are:

1. Anticipated Date of Contract Award: 10/27/2023
2. Deliver Ductile Water Piping (Complete Package) 04/05/2024
3. Project Substantial Completion: 05/31/2025

F. TRADE SUBCONTRACTORS AND MAJOR SUPPLIERS

The following trade subcontractors are proposed for the item of work listed. Trade subcontractors are subject to review per the General Conditions.

ITEM OF WORK	TRADE SUBCONTRACTORS	
_____	_____	EMR: _____
_____	_____	EMR: _____
_____	_____	EMR: _____
_____	_____	EMR: _____

G. UTILIZATION OF MINORITY CONTRACTORS AND SUPPLIERS

1. The contract to be awarded is subject to contract compliance requirements mandated by Sections 4a-60 and 4a- 60a of the Connecticut General Statutes; and, Sections 46a-71(d) and 46a-81i(d) of the Connecticut General Statutes. There are Contract Compliance Regulations codified at Section 46a-68j-21 through 43 of the Regulations of Connecticut State Agencies, which establish a procedure for awarding all contracts covered by Sections 4a-60 and 46a-71(d) of the Connecticut General Statutes.

2. The Bidder will endeavor to obtain a minimum goal of twenty-five percent (25%) of the awarded amount to small business enterprises, with six and one quarter percent (6.25%) of the awarded amount to minority business trade subcontractors and/or suppliers certified by the **State of Connecticut.**

3. The successful Trade Contractor shall substantiate this participation within ten (10) days after receipt of Notice of Award. Refer to the General Instruction to Bidders for further information.

4. Indicate here the utilization of certified S/MBEs included in the base bid. Failure to comply with M/WBE participation goals may constitute a non-responsive proposal. IF NO INDICATION IS GIVEN, IT SHALL BE INTERPRETED THAT ZERO M/WBE PARTICIPATION IS INCLUDED.

   This proposal includes:

Name of Diverse Business Enterprise:	**Diverse Business Enterprise Certification (i.e. SBE, MBE, WBE, etc.)**	**Scope of Services Provided by Diverse Business Enterprise as part of this Bid Package:**	**Cost of Services:**
			$
			$
			$

5. S/MBE participation shall count toward stipulated contractual goals or requirements only allowed by Connecticut General Statutes and CHRO Regulations.

H. UNIT PRICES

Unit Prices shall be used, where applicable, to make adjustments to the cost of the Work due to changes. All Unit Prices submitted shall be complete in-place prices (unless noted otherwise) and include all costs for overhead, profit, labor, materials, equipment, and any other incidentals related to the completion of the Work, and shall remain firm for the period of the contract. Unit prices listed are for additive work. Deductive unit prices in all cases are to calculated the same as additive unit prices (100% if used in conjunction with an allowance).

UNIT PRICES:

1. 12” Ductile ..... $_____/LF
2. 6” Ductile ..... $_____/LF
3. 4” Ductile ..... $_____/LF
4. 12” Gate Valve..... $_____/LF
5. 6” Gate Valve..... $_____/LF
6. 4” Gate Valve..... $_____/LF

Changes in the Work. All bidders are herein advised that they are to provide, in the space provided below, a written description of how they would price lump sum changes. It is understood that the Unit Prices which you

would insert in this Proposal Form response would be one element of the Change pricing, however, it is necessary to determine up front and reach agreement on, your intended method of determining units of labor productivity and material pricing as well. Bidders are to be explicit as to what Manual(s), if any, are intended to be utilized. Once accepted by the Construction Manager, provide copies of all applicable pricing manuals for use by the Construction Manual in evaluating Change Order pricing.

_____
_____
_____
_____
_____
_____
_____
_____

Provide labor rates which may be used, subject to review and approval, in pricing any extra work that may be required. Rates are to be complete billing rates and are to include actual wages, taxes, fringes, and insurance, but exclude allowable overhead and profit. The maximum allowable mark-up for overhead and profit combined, inclusive of all lower tier sub-trade contractors and vendor's mark-ups, is fifteen percent (15%) total. Base price on current rates in effect at time of bid. As prevailing wages and fringes rate change, these increases will be added to the labor rates at actual cost. Increases in wage rates are subject to audit. Complete the attached Wage Rate Breakdown Form for each classification of worker anticipated to work on the Project.

It is understood that certain taxes are applicable only up to specified earnings ceilings. When used in pricing changes orders, these labor rates are subject to audit to determine if those earnings ceilings have been exceeded. The Trade Contractor agrees to immediately refund to the Construction Manager any overpayment that, pursuant to an audit, has been determined to have been made by the Construction Manager to the Trade Contractor.

I. ALTERNATE PRICES

An Alternate Price shall include all costs associated with the changes, omissions, additions or other adjustments to the Work of this Bid Package (Contract) which are described in the Alternate, or are reasonably inferable therefrom. Claims for extras resulting from changes caused by the acceptance or rejection of any Alternate will not be allowed. Alternate Prices shall also include all costs of overhead, profit and bonds associated with the work of the Alternate, whether additive or deductive.

The Drawings, Specifications and other Contract Documents shall be considered appropriately modified by either the acceptance or rejection of the various Alternates. The Owner and the Construction Manager expressly reserve the right to accept or reject any, or all, Alternate Prices, and in any sequence prior to or after award. Acceptance or rejection of any Alternate does not relieve the Bidder of timely completion of the Work within the time periods indicated.

ATTENTION BIDDERS:

Alternates in which there is no cost impact to your bid shall be filled in as Zero Dollars ($0.00).

Alternates in which the Bidder lists "N/A" or "Not Applicable" shall be considered Zero Dollars ($0.00) and have no cost impact to the Bidder or the project should the Alternate Price be accepted.

Alternates in which the Bidder states "No Bid" and/or leaves the price blank (i.e. no response provided) whether intentional or unintentional for an alternate that is considered as part of the award process, shall be deemed non-responsive and subject to rejection.

ALTERNATES: None.

J. ALLOWANCES

The Bidder includes the following Allowances and rates in the total Lump Sum Amount of the Base Bid for this Bid Package. Further to Article 14 in the Trade Contract Conditions and unless noted otherwise below, the following allowance amounts include the Trade Contractor's cost of materials less applicable discounts, delivery to the site, applicable taxes, unloading, handling, installation, allowable overhead and profit. All other costs associated with completing the work described in the allowance is included in the base bid but outside of the allowance amount.

ALLOWANCES: None.

K. COST AND QUANTITY BREAKDOWN

In order to properly evaluate the Proposal, provide the following information. The Scope of Work to be awarded will not be influenced by the cost and quantity information requested here.

1. COST BREAKDOWN

Total Material ..... $ _____
Total Bond Cost ..... $ _____
Total Applicable Sales and Use Taxes..... $ _____
Total Bid ..... $ _____

2. QUANTITY BREAKDOWN (*Note: The items listed below are not intended to be an all inclusive listing, but merely to highlight some items of work.)*

THE INFORMATION LISTED BELOW IN THE QUANTITY BREAKDOWN SECTION IS REQUIRED AT THE TIME OF BID SUBMISSION.

Item	Quantity	Total Cost
Shop Drawings & Submittals	LS	$_____
CHRO Administration	LS	$_____
12" Pipe	LF	$_____
6" Pipe	LF	$_____
4" Pipe	LF	$_____
12" Gate Valve	EA	$_____
6" Gate Valve	EA	$_____
4" Gate Valve	EA	$_____
Other	LS	$_____
Total Bid	LS	$_____

L. SCOPE OF WORK

1. Description of Work Included

Except for those items (if any) specifically noted in the section below entitled "Description of Work Excluded", the Work of this Bid Package shall INCLUDE all of the following:

a. All items of work required by, and/or specified in, those Sections of the Specifications which are listed herein, under Section M SPECIFICATIONS.

b. All items of work related to the "Scope of Work", which are shown on the Drawings listed herein under Section N Contract Drawings.

c. The following "Significant Items of Work" are related to those required by the above referenced documents and are to be provided under, and hereby form a part of, the Scope of Work of this Bid Package (Contract). Should any conflict exist between this written scope of work and the scope of work inferred by the above referenced documents, this scope of work shall govern. All items are furnished and installed by this Trade Contractor unless noted otherwise.

GENERAL SCOPE OF WORK

1. Trade Contractors will not be allowed to mobilize on-site until the following items have been submitted: fully executed Contract, fully executed and complaint Performance Bond & Material and Payment Bond, and Certificate of Insurance. In addition, prior to starting any work, this Trade Contractor is required to provide a written Safety Program with Job Hazard Analysis, material status report and a list of all materials required under this Contract with indication of which materials require submittal for approval as outlined in the specifications and a schedule of anticipated date(s) of submittal for each.

2. The items listed herein are not intended to be an all-inclusive listing of the specified Contract Scope of Work, but merely highlight the major items of work. Review the Contract Documents for work by this Trade Contractor included within the other specification sections. This Trade Contractor will be responsible for all work within its scope of work contained in other specifications, or on drawings whether or not specifically listed within this Bid Package Description.

3. Participate in Pre-bid Meetings and any activities necessary during the execution of your work to and provide LEED® equivalent documentation, including but not limited to, Construction Waste Management, Green Building Materials, use of local materials, etc. All costs associated shall be included in the Trade Contractor's bid.

4. Review the scope of work closely and include all cost to provide all work as required by this bid package. Should an item be duplicated in another bid package, do not delete the item from your bid. Notify the Construction Manager immediately. Failure to include costs for a duplicated item will not alleviate the Trade Contractor's responsibility to provide full credit for the item should it be deleted from the bid package after a contract is awarded.

5. Each Trade Contractor will perform a First Delivery Inspection of materials with the Construction Manager to confirm that materials meet the Project Specifications and approved submittals. These reports shall be turned in with the daily report no more than 24 hours after material arrival. Submission of the First Delivery Inspection Report is a condition of monthly payment. All delays that result from failure to confirm materials delivered with the Construction Manager are at the Trade Contractor's cost, including those of other Trade Contractors on this Project. The Construction Manager will provide a form for this use, which is to be jointly filled out by the Construction Manager and the Trade Contractor, but initiated by the Trade Contractor. It is the Trade Contractor's responsibility to perform subsequent delivery inspections to ensure compliance with Specifications. Include Benchmarking of initial installations in accordance with the Quality Plan in the Project Manual.

6. Gilbane has automated its monthly payment application process and solely utilizes an online web-based application provided by Textura LLC. Trade contractors will be required to participate and must implement Textura on the project.

   Textura will automatically generate the AIA G702/703 and Lien Release Documents. Any additional documentation required as part of the Gilbane application process must be uploaded in the form of a PDF prior to your submission.

   There is a nominal fee to use this service. These costs are summarized in the Textura brochure included in Section 00 62 90.8 of the Gilbane Project Manual. The costs of using this service must be included in your bid. If you have any questions regarding Textura's Terms and Conditions, costs of service, or training implementation please contact Textura at 866-TEXTURA (839-8872).

7. Temporary toilet facilities will be provided by the Construction Manager at the site for the Trade Contractor's use.

8. The Town of Madison has waived building permit fees. The State of Connecticut Education Fee shall be paid by the Construction Manager. Obtain any and all other permits, as required to complete the work of this bid package and furnish copies of all licenses and permits to the Construction Manager. The Construction Manager will obtain the general building permit.

9. The Procore electronic submittal process requires the Trade Contractor to provide electronic submission (shop drawings and as-builts, O&Ms), and one (1) hard copy of any full size shop drawings after review, i.e. steel shop drawings, MEP coordination drawings, rebar shop drawings. These are for the Construction Manager's use. It remains the Trade Contractor's responsibility to obtain copies of all documents as they require, this includes but is not limited to documents produced by other Trade Contractors.

10. The requirement for samples remains unchanged. The Trade Contractor is responsible to arrange delivery to the jobsite of physical samples of each required item. All submittals intended for color selection and verification shall be provided as physical samples. The Trade Contractor shall be solely responsible for any cost resulting from color variation introduced by the use of electronic media in the submittal process.

11. It is the Trade Contractor's responsibility to complete Submittals in a timely fashion, and to monitor the status of the A/E review. The Trade Contractors shall provide a Submittal Schedule no later than ten (10) days following the receipt of the Notice of Award. All submittals must be received by Construction Manager within 20 days of Notice of Award, or earlier as required to meet delivery schedules or as required for proper review and coordination of submittals from other Trade Contractors. Costs and/or delays incurred by others resulting from another Trade Contractor not adhering to the requirements described herein will be solely borne by the offending contractor. Include in the schedule the duration for preparing shop drawings for each equipment or material which are required per the Contract Documents, and for equipment or materials that will take more than 4 weeks to arrive following shop drawing approval.

12. Trade Contractor meetings shall be conducted weekly. Trade Contractor attendance is mandatory starting 6 weeks prior to the Trade Contractor's mobilization onsite and shall continue weekly until the Trade Contractor's work is complete and accepted. Trade Contractor's representative shall be its Project Superintendent/Foreman who shall have decision making authority to commit the Trade Contractor to sequencing and durations, knowledge of material deliveries, and overall familiarity with the Project. If the Project Superintendent/Foreman does not meet the above criteria, then the Project Manager shall additionally attend. There will be a separate weekly meeting for Project Managers for overall safety, schedule, and cost review. Project Manager attendance at the Trade Meeting does not relieve the obligation to attend the Project Manager weekly meetings.

13. **Liquidated damages** for failure to complete the construction as defined in the General Conditions will be assessed to the responsible Trade Contractor(s) for each calendar day after the date for Substantial Completion until Substantial Completion is achieved. If the Trade Contractor fails to achieve Substantial Completion of the work in accordance with the Project Schedule, the Owner shall be entitled to retain or recover from the Trade Contractor, as liquidated damages and not as a penalty, the per diem amounts identified below, commencing upon the first calendar day following the Substantial Completion date in the Schedule, and continuing until the actual Date of Substantial Completion. Such liquidated damages are hereby agreed to be a reasonable pre-estimate of damages the Owner will incur as a result of delayed completion of the Work. Liquidated damages shall be in the amount of Five Thousand dollars ($5,000.00) per calendar day. The Owner may deduct liquidated damages from any unpaid amounts then or thereafter due under the Trade Contract Agreement. Any liquidated damages not so deducted shall be payable to the Owner, at the demand of Owner, together with interest from the date of the demand.

14. Whenever the contract documents require a certified engineer's stamp, review or report, it shall be understood to mean a professional engineer licensed in the applicable discipline, fully insured and registered in the State of Connecticut.

15. Should the Architect allow the use of its CAD files and/or BIM model for coordination or other purposes, this Trade Contractor shall sign the required release forms.

16. Participate in inspection walkthroughs as requested by the Construction Manager. Provide suitable access for inspectors to perform all tests or inspections. Trade Contractor-supplied temporary ladders and lifts to perform their work are to be available for the use of all parties.

17. All Warranties and Guarantees shall commence at the substantial completion date of the project.

18. All reference in the contract documents to the Construction Manager/General Contractor/Contractor as performing any field work or providing services in connection with any aspect of the Work shall be understood to mean the Trade Contractor. The Construction Manager will not layout, log, record, or otherwise provide actual work or service related to the Trade Contractor's scope of work, inclusive of Division 0 and Division 1 specifications.

19. In accordance with Construction Manager/ Owner Agreement, retainage shall be Five percent (5%). An additional Two Percent (2%) of the contract value shall be withheld from the payment requisition pending the State Commission on Human Rights and Opportunities' ("CHRO") approval of the Trade Contractor's Affirmative Action Plan.

20. Trade Contractor shall be responsible for the deductible in the event of a Builders Risk claim.

SPECIFIC ITEMS:

1. Furnish all water pipe, domestic water pipe, and fire protection pipe as shown on the drawings unless noted on the drawings as "by others". Furnish all fittings, bends, and valves shown on the drawing unless noted otherwise in this specific scope of work section.

2. All references in the contract documents to the Construction Manager/General Contractor/Contractor as performing any field work or providing services in connection with any aspect of the Work shall be understood to mean this Trade Contractor. The Construction Manager will not layout, log, record, or otherwise provide actual work or service related to the Trade Contractor's scope of work, inclusive of Division 0 and Division 1 specifications.

3. Perform all work as specified in the following Specification Sections and as shown on the drawings (all drawings). The work specified in the following specification sections is the sole responsibility of this Trade Contractor unless modified below:

   All Division 00 Bidding and Contracting Requirements (Gilbane Project Manual)
   Connecticut Water Service Purchasing Standards for Waterworks Material, dated December 2022

4. Receiving, offloading, and installation of all work furnished by this bid package (BP31A) is by others (BP31B). Installation by BP31B must commence by 6/1/24. All pipe, fittings, and valves furnished by BP31A must be furnished to the site no later than 5/31/24.

5. Pipe may be delivered sooner than 5/31/24. if it is delivered sooner than 5/31/24, it may be offloaded at another Town property. Offloading shall still be performed by BP31B.

6. Coordinate all deliveries with the Construction Manager and the installing contractor (BP31B).

7. The following items shall be furnished by others:
   a. All fire hydrant laterals, including the MJ gate valves and hydrants are by Connecticut Water Co.
   b. Blow off assemblies, including laterals and gate valves at the assembly are by BP31B. Gate valves at the tee shall be furnished by BP31A.
   c. Chlorination inlets
   d. Underground vault and manual bypass
   e. 10,000 gallon fire protection break tank
   f. Pipe rollers/supports at the bridge are by BP31B
   g. Steel plates at road guardrails are by BP31B

2. Description of Work Excluded

The following specific item(s) of work contained in the above referenced documents are EXCLUDED from the work of this Bid Package (Contract):

1. As noted in Specific Scope of Work section.

M. SPECIFICATIONS

The following Specifications Sections, together with the Drawings and other related items of work as described herein, further define the Scope of Work of the Bid Package (Contract):

1. Work related to this trade as defined in the following Specification Sections:

   All specifications as listed in the Project Manual for Madison New PK-5 Elementary School, Table of Contents, dated July 21, 2023, as prepared by Tecton Architects, PC. Note this list may be modified by Bid Supplements and Addenda.

N. CONTRACT DRAWINGS

1. The following drawings are included in the Scope of Work of this Bid Package:

All other drawings sections as listed in the Project Manual for Madison New PK-5 Elementary School, Table of Contents, dated July 21, 2023, as prepared by Tecton Architects, PC. Note this list may be modified by Bid Supplements and Addenda.

O. The undersigned represents that this Proposal is made in good faith, without fraud, collusion, or connection of any kind with any other bidder of the same work, that he is competing in his own interest and in his own behalf, without connection of obligation to any undisclosed person, that no other person has any interest in regard to all conditions pertaining to the Work and in regard to the place where it is to be done, has made his own examination and estimates and from them makes this Proposal.

The undersigned represents that he has reviewed the Trade Contract Agreement issued as part of the bidding documents, agrees that if selected for award he will execute the Trade Contract Agreement without exceptions, exclusions, qualifications, clarifications and/or alterations, and is authorized to make such representation on behalf of the Bidder.

The undersigned represents that he has reviewed the insurance requirements in Article 6 of the Trade Contract Agreement, has included all costs to fully comply with same, and is authorized to make this representation on behalf of the Bidder.

Bidder:_____ _____
(Legal Signature) (Type/Print Name)

_____
(Title)

Firm:_____ Address:_____

Business Phone No.: (___)_____ _____

Email: _____

This bidder is a (an): _____Individual, Partnership, Corporation

Current Experience Modification Rating _____ Federal ID# _____

OSHA Incident Rates: Recordable _____

List here by title and number all licenses held by the bidder associated with the performance of this work.

License Title	License Number
_____	_____
_____	_____
_____	_____

Indicate the name of the health plan(s) to which benefits will be paid for all employees working on this project._____

The full names, addresses and telephone numbers of all persons interested in this Proposal, as principals are as follows:

_____

_____

NOTE: This Proposal must bear the written signature of the Bidder.

a. If the Bidder is an Individual doing business under a name other than his own name, the Proposal must so state, giving the address of the Individual.
b. If the Bidder is a Partnership, the Proposal must so state, setting forth the names and addresses of all Partners, and must be signed by a Partner so designated as such.
c. If the Bidder is a Corporation, the Proposal must be signed by a duly authorized officer or agent of such Corporation.

Madison New PK-5 Elementary School
Equipment Material Pre-Purchase
State Job No. 076-0076 N
Gilbane Job No. J09867.000
Town of Madison Bid No. _____

Proposal Form - Exhibit A

Revision 0

Bid Package Name & No.	Pre-Bid Conference Date	Pre-Bid Conference Time	Deadline for Questions	Proposal Due Date	Proposal Due Time
23A - DOA Units	09/__/2023	2:00 PM	09/__/2023	09/__/2023	XX:XX PM
26A - Electrical	09/__/2023	2:00 PM	09/__/2023	09/__/2023	XX:XX PM
31A - Sitework	09/__/2023	2:00 PM	09/__/2023	09/__/2023	XX:XX PM

QUALIFICATION / PREQUALIFICATION OF BIDDERS

Any Bidder whose bid is in excess of $500,000 and/or as listed below must be prequalified by the State of Connecticut Department of Administrative Services for the Prequalification Classification for which the bid is submitted at the time of contract execution. Note the prequalification classification next to the subject bid packages listed below. Each bid submitted for a bid package that has a prequalification requirement must include a copy of the **Bidder's Prequalification Update Statement***. Bids falling under the DAS prequalification requirements from Bidders that are not prequalified at the time of contract will be rejected.

*Note: The Bidder's DAS Prequalification Certificate is NOT a substitute for the Bidder's Prequalification Update Statement. In the event of a re-bid, the Bidder's Prequalification Update Statement must be resubmitted with each bid submission.

Bids for which there is no DAS prequalification category may be required to submit a fully completed and duly executed AIA Document A305 – 1986 Contractor's Qualification Statement after the bid submission. Failure to submit a requested A305 when requested may be grounds for rejection.

Bid Package Name & Number	DAS Prequalification Classification
23A – DOA Unit Furnish-Only	HVAC
26A – Electrical Switchgear Furnish-Only	Electrical
31A – Ductile Iron Water Pipe Furnish-Only	Sitework

Gilbane Building Company

Trade Contract Agreement

(GBC Form Trade Contract Agreement – 2021)

Agreement # **J09867.000-0001-000**

Made as of **02/22/2023**

Vendor # **SAMVE001**

Description: **Sample Trade Contract Agreement**

Between The "Construction Manager" or "Contractor":

Gilbane Building Company

208A New London Turnpike Glastonbury, CT 06033 US

And the "Trade Contractor" or "Subcontractor":

Sample Vendor

7 Jackson Walkway Providence, RI 02940 US

The Project Name:

New PK-5 Elementary School

180 Mungertown Madison, CT 06443 US

The Owner Name:

Town of Madison

8 Campus Drive Madison, CT 06443 US

The Architect:

Tecton Architects, PC

Jeff Wyszynski

ARTICLE 1

THE WORK

1.1 The Trade Contractor and the Construction Manager agree that the labor, services, materials and equipment to be furnished and the work to be performed by the Trade Contractor shall include the following described items (herein the "Work") in connection with the construction of the Project:

Furnish all labor, materials, equipment, and services required to complete all {Insert Bid Package No. and Name} work for the New PK-5 Elementary School Project. All work shall be in strict accordance with the following:

1. Bid Package {Insert BP No. & Name} proposal form Dated {XX/XX/XX} (if applicable)
2. Contract Agreement between {Owner Name} and Gilbane Building Company Dated {XX/XX/XX}
3. {Insert Project Specific Gilbane Project Manual Dated XX/XX/XX}
4. {Insert Project Specific Construction Documents (i.e. Drawings, Specification, Addenda) Dated XX/XX/XX}
5. Supplement 1 - Dated {XX/XX/XX}
6. Supplement 2 - Dated {XX/XX/XX} (if applicable)
7. Supplement 3 - Dated {XX/XX/XX} (if applicable)
8. Supplement 4 - Dated {XX/XX/XX} (if applicable)
9. Scope Review Meeting Minutes for {BP No. & Name} Dated {XX/XX/XX} {Required}
10. This agreement includes Zero percent (0%) SBE participation and Zero percent (0%) MBE participation. Trade Contractor shall endeavor to obtain and report participation when possible. {If no participation, include this line and delete the one below}
11. This agreement includes the following amounts and corresponding percentages of S/M/WBE Participation of the total value of this Trade Contract Agreement. Trade Contractor shall document participation in accordance with the contract documents. {If any participation, include this line and delete the one above}
a. {Insert Written Amount} dollars ($XX,XXX.00) of SBE participation (XX% SBE participation)
{Insert Written Amount} dollars ($XX,XXX.00) of MBE participation (XX% MBE participation)
{Insert Written Amount} dollars ($XX,XXX.00) of WBE participation (XX% WBE participation)
12. {Bid Package Specific - Accepted Alternate No. and Description} has been accepted and is included in this Trade Contract Agreement (if applicable)
13. Master Service Agreement/Contract Rider between {Trade Contractor} and Gilbane Dated XX/XX/XXXX (If applicable)

1.2 The Trade Contractor shall be held accountable for, and the Work also includes but is not limited to, the following: furnish all labor, staff, administration, and supervision; furnish, supply and/or install all equipment, material, supplies, tools, machinery, apparatus, scaffolding, hoisting, transportation, unloading and handling; do all things required to fully complete the Work described above on the Project; all in strict compliance with the requirements, terms and conditions set forth in this Agreement (hereinafter "Agreement"); the Plans, Drawings and Specifications prepared by the Architect/Engineer; and the Contract Documents as defined in this Agreement. (hereinafter included as part of the "Work").

1.3 The Trade Contractor expressly represents and warrants to Construction Manager that Trade Contractor holds special knowledge, training, and experience in such Work, and that Trade Contractor shall provide everything required or necessary to complete such Work to the highest standards of such workmanship in the industry, regardless of whether all items, materials, equipment or requirements are expressed, identified or detailed in this Agreement, the Contract Documents, or in the Plans and Specifications.

1.4 The Trade Contractor represents and warrants to the Construction Manager that, prior to executing this Trade Contract Agreement, Trade Contractor has carefully read and studied the Contract Documents, the Plans, Specifications and the Project Bid Manual and all aspects and conditions involved or affecting the Trade Contractor's Work, and has resolved to Trade Contractor's satisfaction every issue relating to the Work. Trade Contractor further represents and warrants to Construction Manager that Trade Contractor has had adequate time to obtain any written clarifications, interpretations or information related to its Work. The Trade Contractor shall carefully study and compare the Contract Documents and shall at once report to the Construction Manager any error, inconsistency or omission he may discover.

1.5 By executing this Trade Contract Agreement, Trade Contractor represents that there are no substitutions to the requirements of the Contract Documents other than those items that are specifically identified in writing, provided to, and approved in writing by, Construction Manager prior to the full execution of this Trade Contract Agreement.

ARTICLE 2

TIME OF COMMENCEMENT AND COMPLETION

2.1 The Trade Contractor shall proceed with the Work at such time(s) and in such sequences as Construction Manager may direct, including but not limited to additional shifts as necessary and required to comply with the Construction Manager's Schedule, as referenced below, which Schedule may be subject to reasonable adjustment by Construction Manager as working conditions require. The Trade Contractor shall execute the Work with promptness and diligence so as to maintain and to meet the Project milestones, Construction Manager's Schedule or updates thereto, and duration of time for such Work. The Trade Contractor shall be required to and agrees to complete portions and the whole of the Work by the following anticipated dates:

The work shall be completed in accordance with the Project Schedule. Modifications to the Project Schedule shall be in accordance with the General Conditions of the Contract for Construction. The following milestone dates apply:

1. Commence Work for the Proposal: {XX/XX/XX}
2. Bid Package Substantial Completion: {XX/XX/XX}
3. Project Substantial Completion: {XX/XX/XX}

2.2 The Trade Contractor is cautioned that schedules and milestones are subject to review and revision, and in such event, such revisions will be made available for the Trade Contractor's information at the jobsite office of the Construction Manager. It is the sole responsibility of the Trade Contractor to attend job meetings, keep itself informed of any revisions, and conform to any such revisions.

2.3 In the event that the Trade Contractor should fail to maintain the Construction Manager's Schedule, milestones as established above, or the duration of times in the Construction Manager's Schedule, the Construction Manager reserves the right, after forty-eight (48) hours written notice, either by letter or email to the Trade Contractor, to procure the materials,

equipment, and labor necessary to proceed with, or to complete the Work, or any portion thereof, and charge the cost, expense and damages thereof to the Trade Contractor, and/or to exercise such other remedies as are available in this Agreement or otherwise under applicable law.

ARTICLE 3

THE CONTRACT SUM

3.1 The Construction Manager agrees to pay the Trade Contractor for the satisfactory performance of the Work the total sum of:

ZERO DOLLARS 0/100

Contract Amount: **$ .00**

Diverse Business participation: **$ .00**

The contract sum was derived as follows:

{BP No.} Base Bid: {$X,XXX}
Accepted Alternate No.#: {$X,XXX}
Accepted Alternate No.#: {$X,XXX} (if applicable)
Total Contract Value: {$X,XXX}

The following unit prices and labor rates are in accordance with Section H of the proposal form:

{List unit prices, descriptions & values}

Labor Rates without 15% Overhead & Profit:
*Rates are valid through XX/XX/XXXX. Revised rates shall be provided to the CM upon receipt for work occurring after XX/XX/XXXX.

Journeyman Straight Time: $
Journeyman Premium Portion Only Time and One Half: $
Journeyman Premium Portion Only Double Time: $

Foreman Straight Time: $
Foreman Premium Portion Only Time and One Half: $
Foreman Premium Portion Only Double Time: $

The following Allowances are in accordance with Section J of the proposal form:

{List Allowance numbers, description, & values}

The following alternates in accordance with section I of the proposal form are currently on hold and shall remain valid until acceptance by the Owner or until such a time as the progress of the Work renders the Alternate void: (if applicable)

{List alternate numbers, description & vales}

In current funds subject to additions and deductions for changes, as may be agreed upon, and to make payments on account thereof as follows:

3.2 On the established day of each month, the Trade Contractor shall deliver to the Construction Manager a detailed statement acceptable to the Construction Manager, and if required, supported by receipts, vouchers, etc. showing values of all materials delivered and Work completed up to the established billing date for which payment is requested. Monthly and final payments will be made to the Trade Contractor by electronic funds transfer within seven (7) calendar days after receipt of payment by the Construction Manager from the Owner. The retained percentage will be forwarded as soon as received by the Construction Manager from the Owner. It is specifically understood and agreed that payment to the Trade Contractor is dependent, as a strict condition precedent, upon the Construction Manager receiving contract payments, including retainage from the Owner. Further, progress construction payments to the Trade Contractor are only required to be made from the funds received from the Owner for Work performed by the Trade Contractor. Prior to submission of the first statement, the Trade Contractor will deliver to the Construction Manager, for review and approval, a detailed breakdown of this contract sum showing a schedule of values for the various parts of the Work. Once accepted, this schedule of values will be used as a basis for checking the Trade Contractor's monthly statement. This schedule of values shall not be front-end loaded.

3.3 The amount of each progress payment to the Trade Contractor shall be equal to the percentage of completion allowed to the Construction Manager for the Work of the Trade Contractor, applied to the Contract Amount or Sum of the Agreement, plus the amount allowed for materials and equipment suitably stored by the Trade Contractor, less the percentage retained from payments to the Construction Manager. The Construction Manager shall make available to the Trade Contractor evidence of percentages of completion certified on its account.

3.4 The Trade Contractor shall, with the second and each succeeding monthly request for payment, submit receipts and/or an affidavit and waiver of lien showing all payments made for labor, services, equipment and materials and on account for all Work covered in the previous months' request for payment. Affidavit and waiver of liens are required to be submitted from Trade Contractors' suppliers and/or trade subcontractors (all tiers) monthly. The Trade Contractor agrees to use the progress payment waiver as well as the release and the final waiver and release forms as referenced or incorporated into this Agreement. The Trade Contractor shall be required to execute a final waiver and release as a condition precedent to receiving final payment.

3.5 Ten percent (10%) of each payment shall be retained, at the discretion of the Construction Manager, unless specific provisions to the contrary are indicated in the Contract

Documents.

3.6 No payment made under this Agreement, including the final payment, shall be evidence of proper performance of the Work, either wholly or in part, and no payment shall be construed as an acceptance of defective, non-compliant or improper Work or materials.

3.7 Provided the Construction Manager is not in default of the payment terms to this Agreement, the Trade Contractor shall save and keep the Construction Manager, its Surety, if applicable, the Owner, and the Owner's property free and clear from all mechanics' and materialmen's' liens, construction liens, and all other liens as well as any and all bond claimants, bond claims, or any other claims or actions, legal or equitable, arising out of the Trade Contractor's Work hereunder. In the event that any such lien, bond or other claim or action is asserted, threatened or filed by anyone claiming by, thru, or under the Trade Contractor, then the Trade Contractor shall remove and discharge same, either by bonding or otherwise removing, paying or releasing same, within five (5) calendar days of the notice of such lien, claim or action.

3.8 At all times, Construction Manager, in its sole discretion, shall have the right but not the obligation to make direct payment or joint check payment to any of the Trade Contractor's lower tier subcontractors, materialmen, laborers, suppliers and/or lienors, and to automatically deduct such amounts from the Trade Contractor's Contract Amount. Trade Contractor hereby agrees to cooperate as necessary to facilitate such direct or joint check payments and will promptly execute any and all documents reasonably requested by Construction Manager for that purpose. Notwithstanding the foregoing, and unless a condition of the initial contract award, Construction Manager shall pay Trade Contractor's Trade-Subcontractors, materialmen, laborers, suppliers, and/or lienors directly only after (1) providing fourteen (14) day's prior written notice of intent to do so and (2) Trade Contractor fails to cure the condition that is the basis for such proposed direct payment during the fourteen (14) day notice period.

3.9 The Trade Contractor further agrees that a material breach by Trade Contractor of any other Agreement between Construction Manager and Trade Contractor, shall constitute a breach under this Agreement. In the event of such a breach, in addition to any other right or remedy at law or in equity, the Construction Manager shall also have the right to apply any payments due Trade Contractor under this or other Agreement(s) as a set-off to satisfy any unpaid expenses, costs, claims, or Damages incurred by Construction Manager under this Agreement.

3.10 The Construction Manager shall have the right, at Construction Manager's sole discretion, to process all Trade Contractor payments, including all progress payments as well as the final payment, using an Electronic Billing System ("Electronic Billing System"), which is an automated third party web-based system that operates as an automated clearing house for electronic payments. Construction Manager may elect to withdraw or terminate use of the Electronic Billing System in its sole discretion. Any Trade Contractor cost of registering with or using the Electronic Billing System is included herein. Trade Contractor shall comply with the billing instructions included in the Prime Contract and/or provided by the Construction Manager in writing, including any instructions related to the Electronic Billing System.

ARTICLE 4

THE CONTRACT DOCUMENTS

4.1 The Contract Documents consist of: (i) this Agreement and any documents referred to herein or exhibits attached hereto; (ii) the Contract between the Owner and the Construction Manager ("Prime Contract"), including all conditions, exhibits and documents referred to or incorporated into the Prime Contract, including but not limited to the Drawings, Plans and Specifications for the Project; and (iii) any modifications or amendments to this Agreement as provided herein.

4.2 The Trade Contractor agrees to perform the Work in strict compliance with the Contract Documents, and subject to the final approval of the Architect/Engineer and/or other specified representative of the Owner.

4.3 To the extent of Trade Contractor's Work, the Trade Contractor agrees to be bound to and assume toward the Construction Manager all of the obligations and responsibilities that the Construction Manager, by those documents, assumes toward the Owner. Contract Documents are available, at reasonable times, at the office of the Construction Manager for examination by the Trade Contractor.

4.4 If there is a provision for liquidated damages in the Contract Documents, the Trade Contractor shall be liable to the Construction Manager for any liquidated damages for which the Construction Manager is held responsible by reason of the failure of the Trade Contractor to prosecute the Work pursuant to this Agreement. The flow down of such liquidated damages to the Trade Contractor is not intended as the Construction Manager's sole and exclusive remedy for the Trade Contractor's untimely performance or delays, and Construction Manager further reserves all other rights, remedies and damages as set forth in this Trade Contractor Agreement or in equity.

ARTICLE 5

INDEMNITY

5.1 **FOR GOOD AND VALUABLE CONSIDERATION, THE RECEIPT WHEREOF IS HEREBY ACKNOWLEDGED, AND TO THE FULLEST EXTENT PERMITTED BY LAW, THE TRADE CONTRACTOR AGREES TO INDEMNIFY, DEFEND AND HOLD THE CONSTRUCTION MANAGER, THE OWNER, THE ARCHITECT/ENGINEER, AND ALL OF THEIR AGENTS AND EMPLOYEES HARMLESS FROM AND AGAINST ANY AND ALL CLAIMS, DAMAGES, LOSSES, LIABILITIES, DEDUCTIBLES AND EXPENSES, INCLUDING BUT NOT LIMITED TO REASONABLE ATTORNEYS' FEES ARISING OUT OF OR RESULTING FROM THE PERFORMANCE OR FAILURE IN PERFORMANCE OF THE TRADE CONTRACTOR'S WORK UNDER THIS AGREEMENT PROVIDED THAT ANY SUCH CLAIM, DAMAGE, LOSS, OR EXPENSE ARISES OUT OF OR RESULTS FROM ANY OF THE FOLLOWING:**

(a) BODILY INJURY, SICKNESS, DISEASE, OR DEATH, OR INJURY TO OR DESTRUCTION OF TANGIBLE PROPERTY INCLUDING THE LOSS OF USE RESULTING THEREFROM, TO THE EXTENT CAUSED BY ANY NEGLIGENT ACT OR OMISSION OF THE TRADE CONTRACTOR OR ANYONE DIRECTLY OR INDIRECTLY EMPLOYED BY THE TRADE CONTRACTOR, OR ANYONE FOR WHOSE ACTS THE TRADE CONTRACTOR MAY BE LIABLE, REGARDLESS OF WHETHER CAUSED IN PART BY A PARTY INDEMNIFIED HEREUNDER;

(b) ANY ACT OR OMISSION OF THE TRADE CONTRACTOR OR ANY OF ITS TRADE-SUBCONTRACTORS, OF ANY TIER OR ANY PERSON OR ENTITY FOR WHOSE ACTS OR OMISSIONS ANY OF THEM MAY BE LIABLE;

(c) THE INACCURACY OF ANY WARRANTY OR REPRESENTATION BY THE TRADE CONTRACTOR GIVEN IN ACCORDANCE WITH OR CONTAINED IN THE CONTRACT DOCUMENTS;

(d) ANY BREACH OF THIS AGREEMENT BY THE TRADE CONTRACTOR AND/OR ITS TRADE-SUBCONTRACTORS OF ANY TIER;

(e) ANY CLAIMS BY EMPLOYEES OF THE TRADE CONTRACTOR AND/OR ITS TRADE-SUBCONTRACTORS OF ANY TIER, INCLUDING, WITHOUT LIMITATION,

THOSE ALLEGING EMPLOYMENT DISCRIMINATION, WRONGFUL TERMINATION OR SEXUAL HARASSMENT;
(f) ANY CLAIMS OF THE TRADE-SUBCONTRACTORS OF ANY TIER, INCLUDING WITHOUT LIMITATION, THOSE FOR ADDITIONAL COMPENSATION AND CLAIMS AGAINST THE TRADE CONTRACTOR'S OR CONSTRUCTION MANAGER'S BOND; OR
(g) ANY OTHER WRONGFUL OR NEGLIGENT ACT OR OMISSION OF THE TRADE CONTRACTOR OR ANY OF ITS TRADE-SUBCONTRACTORS, OF ANY TIER OR ANY PERSON OR ENTITY FOR WHOSE ACTS OR OMISSIONS ANY OF THEM MAY BE LIABLE.

SUCH OBLIGATIONS SHALL NOT BE CONSTRUED TO NEGATE, ABRIDGE, OR OTHERWISE REDUCE ANY OTHER RIGHT OR OBLIGATION OF INDEMNITY WHICH WOULD OTHERWISE EXIST AS TO ANY PARTY OR PERSON DESCRIBED IN THIS PARAGRAPH. IN ANY AND ALL CLAIMS AGAINST THE CONSTRUCTION MANAGER, OR ANY OF ITS AGENTS OR EMPLOYEES, BY ANY EMPLOYEE OF THE TRADE CONTRACTOR, OR ANYONE DIRECTLY OR INDIRECTLY EMPLOYED BY THE TRADE CONTRACTOR, OR ANYONE FOR WHOSE ACTS HE MAY BE LIABLE, THE INDEMNIFICATION OBLIGATION UNDER THIS PARAGRAPH 5.1 SHALL NOT BE LIMITED IN ANY WAY BY ANY LIMITATION ON THE AMOUNT OR TYPE OF DAMAGES, COMPENSATION, OR BENEFITS PAYABLE BY OR FOR THE TRADE CONTRACTOR UNDER WORKER'S COMPENSATION ACTS, DISABILITY BENEFIT ACTS, OR OTHER EMPLOYEE BENEFIT ACTS.

The provisions of this subparagraph 5.1 and the obligations of the Trade Contractor hereunder shall survive Final Completion or Termination of this Agreement.

5.2 The obligations of the Trade Contractor under paragraph 5.1 shall not extend to the liability of the Architect/Engineer, his agents, or employees, arising out of: the preparation or approval of maps, drawings, opinions, reports, surveys, change orders, designs, or specifications and/or the giving of or failure to give directions or instructions by the Architect/Engineer, his agents or employees, providing such giving or failure to give is the primary cause of the injury or damage.

ARTICLE 6

PERFORMANCE BOND AND LABOR AND MATERIAL BOND; INSURANCE

6.1 If required by the Construction Manager in Article 12 of this Agreement, the Trade Contractor shall provide with this executed agreement a 100% Performance Bond and a 100% Labor and Material Payment Bond, both issued in an amount equal to the Contract Sum of this Agreement. Bonds and the accompanying Power of Attorney shall be issued on bond forms acceptable to the Construction Manager and shall name the Construction Manager as the Obligee. Such bonds shall be issued by a Surety currently listed on the US Treasury's Listing of Certified Companies and have a minimum AM Best Rating of A-, FSC VII, unless otherwise agreed by the Construction Manager in writing. Notwithstanding any other provisions of the Agreement to the contrary, failure to timely issue the bonds in accordance with the provisions of this Article shall be deemed a material breach of this Agreement. The penal sum of any bonds issued by any of the Trade Contractor's sureties shall be automatically and immediately increased in an amount equal to any increase in the Trade Contract Sum without notice to Trade Contractor or any of Trade Contractor's sureties.

6.2 The Trade Contractor is required to comply with the Construction Manager's Trade Contractor prequalification procedures which, include in part allowing the Construction Manager to review the Trade Contractor's most current reviewed, compiled, or audited financial statement. At any time during the performance of this Agreement, upon the request of the Construction Manager, the Trade Contractor shall provide its most current financial information to the Construction Manager for review. Failure to comply with this requirement shall constitute a material breach of this Agreement.

6.3 Before the commencement of its Work, entering the Project site (at any time), or no later than ten (10) days after signing the Trade Contract, Trade Contractor shall provide evidence that it has obtained the insurance required by this Article as well as that which is legally required by any US federal or state laws where the work is performed. This insurance shall be placed with a company or companies rated A-, FSC VII or better by A.M. Best and licensed to do business in the jurisdiction(s) in which the work is performed.

The commercial general liability, excess liability, pollution liability and professional liability insurance required in this Article shall be maintained continuously until the later of the period of the statute of limitations or the statute of repose for the types of claims covered by the particular policy type. All other insurance required in this Article shall be maintained continuously until final payment is made to Trade Contractor for its work.

Any insurance required of Trade Contractor shall protect the Trade Contractor from claims which may arise for which the Trade Contractor may be legally liable, whether such operations be by the Trade Contractor, by a its trade subcontractor, or by anyone directly or indirectly employed by any of them, or by anyone for whose acts any of them may be liable. The insurance limits and types required in this Article are minimum requirements (and are subject to any broader terms required by Owner) and are denominated in US Dollars.

Trade Contractor shall require, except as it relates to limits of liability, its subcontractors of all tiers to meet the same insurance requirements as are required of it in this Agreement.

If the Project is insured by a wrap-up insurance program, then Trade Contractor shall refer to both the Project wrap-up manual and any insurance related addendum to the Prime Contract (incorporated herein as a Contract Document) for any additional or alternate insurance obligations.

If the Trade Contractor shall fail to provide any or all of the required insurance described hereunder, Construction Manager may elect to take out said prescribed insurance in the name and at the expense of Subcontractor without limitation of any other rights that Contractor may have.

It is solely Trade Contractor's obligation to ensure that it provides the appropriate insurances required in the jurisdiction(s) in which the work is being performed, and that it has included all relevant costs. Trade Contractor waives any rights it has against Construction Manager for premiums, claims, penalties, deductibles, or other costs incurred as a result of Trade Contractor's failure to provide insurance required by law.

(a) **Workers' Compensation and Employer's Liability**. Trade Contractor shall provide workers compensation and employer's liability insurance in any jurisdiction(s) where the work is being performed or where benefits may be applied. The workers' compensation insurance shall include a Voluntary Compensation Coverage Endorsement. When performing work in any monopolistic state or territory the Trade Contractor shall provide evidence of "stop gap" insurance in addition to workers' compensation. Trade Contractor shall provide the insurance required in this Article whether or not Trade Contractor hires all or none of its employees directly, uses temporary employees and/or uses other labor services. Trade Contractor shall require any firm providing labor services to it to provide all of the same workers' compensation and employer's liability coverages as are required of Trade Contractor in this Article and shall require the firm providing the labor services to schedule the Trade Contractor on an Alternate Employer Endorsement attached to its workers' compensation policy. Trade Contractor agrees to comply with any requests by the Construction Manager to verify coverage is being provided for leased or temporary employees. If Trade Contractor is leasing labor to Construction Manager, then Trade Contractor shall attach the alternate employer endorsement to its workers' compensation policy, and shall schedule the Construction Manager and this Agreement on the form. The employer's liability (or "stop gap" in monopolistic states) coverage shall provide limits of not less than $500,000 bodily injury by accident per accident, $500,000 bodily injury by disease policy limit, and $500,000 bodily injury by disease per employee. When working on

projects governed by defense base act including public works jobs where required and military bases trade contractor is responsible to ensure that it has purchased this coverage. For all jobs with exposure to the United States longshoreman act or maritime act, trade contractor shall ensure that workers compensation policies are endorsed to cover such exposures.

(b) **Commercial General Liability ("CGL")**. Trade Contractor shall provide CGL coverage equivalent to the most recent edition of the ISO CG 00 01 occurrence form. This insurance shall:

(1) Include coverage for explosion, collapse and underground hazards (the "XCU" hazards)

(2) Include contractual liability coverage for bodily injury and property damage arising out of premises-ongoing operations and products-completed operations without any limitation;

(3) Not include any residential limitations (or exclusions) or prior work exclusions unless approved in writing by Construction Manager's risk manager;

(4) Provide limits not less than $1,000,000 per occurrence (Bodily Injury and Property Damage), $1,000,000 personal and advertising injury, $2,000,000 general aggregate, $2,000,000 products-completed operations aggregate and $5,000 medical expense. The general aggregate limit shall be on a per project basis;

(5) Not contain a subsidence exclusion; and

(6) Not contain, if trade contractor is installing any EIFS system, an EIFS exclusion (or must contain an EIFS liability policy in the amount of $1,000,000/$2,000,000).

If Trade Contractor's work is to be performed within fifty (50) feet of any railroad property, or affecting any railroad bridge or trestle, tracks, roadbeds, tunnel, underpass or crossing, then the most current version of endorsement ISO CG 24 17 (or its equivalent) shall be attached to the CGL.

(c) **Business Automobile Liability Policy ("BAP")**. Trade Contractor shall provide BAP insurance with limits not be less than $1,000,000 combined single limit for each accident which includes coverage for claims for damages due to bodily injury or property damage arising out of the ownership, maintenance, or use of any land motor vehicle (including trailer or semitrailer) designed for use on public roads. Coverage shall be provided for any owned, non-owned or hired vehicle. This insurance shall also include contractual liability coverage. If the Commercial general liability form edition date is 12/04 or later then the commercial auto policy must also include the CA 0051 endorsement: Mobile equipment subject to the motor vehicle laws endorsement.

If Trade Contractor will be hauling or transporting any hazardous materials as defined in paragraph (f) below, then this insurance shall include the most current version of the ISO CA 99 48 Broadened Pollution Liability Endorsement and the MCS 90 endorsements, or their equivalent.

If Contractor's work is to be performed within fifty (50) feet of any railroad property or affecting any bridge or trestle, tracks, roadbeds tunnels, underpass or crossing, then the most current version of ISO CA 20 70 (or its equivalent) shall be attached to the auto policy.

(d) **Excess (or Umbrella) Liability**. Trade Contractor shall provide occurrence-based follow-form excess (or umbrella) liability insurance which shall provide coverage excess over its employer's liability, CGL and BAP insurance. The excess (or umbrella) coverage limits shall not be less than $5,000,000 each occurrence and $5,000,000 annual aggregate.

If Trade Contractor's Work requires it to provide a crane used to hoist, lower and horizontally move a suspended load then:

(1) If the crane is a tower crane, such limits shall be increased to $25,000,000 per occurrence/$25,000,000 in aggregate; or

(2) If the crane is other than a tower crane, then such limits shall be increased to $10,000,000 per occurrence/$10,000,000 in aggregate.

The liability limits required by Trade contractor under this agreement for the primary CGL insurance and the Excess liability insurance may be satisfied thru any combination of limits contained on either the primary or excess liability or combined policies of insurance.

(e) **Professional Liability**. If the Trade Contractor's scope of work (including the scope of any of its subcontractors or subconsultants) includes providing professional services that include, but are not limited to, performing: architecture, engineering, landscape architecture, land surveying or planning, geological investigation, interior design/space planning, preparation and signing or stamping of drawings, maps, surveys or construction specifications, consulting, programming or design and development of computer software or websites by the Trade Contractor or by subcontractors on behalf of the Trade Contractor, the Trade Contractor shall provide professional liability insurance with limits not less than $1,000,000 each claim and $1,000,000 annual aggregate. Such coverage shall include a prior acts endorsement and shall be maintained for at least 6 years (or the statutory period of repose under prevailing state law) after completion of the work or such longer time as required by the General Contract Documents. If Trade Contractor is subcontracting out its entire scope of professional services, then in lieu of Trade Contractor providing professional liability insurance, Construction Manager will accept proof of the professional liability insurance required in this Article from each person or entity who is performing the professional services on behalf of Trade Contractor.

The retroactive date on all professional liability policies provided by Trade Contractor or any of its subcontractors shall precede the start of any work.

(f) **Contractor's Pollution Liability**. If the Trade Contractor's scope of work (including the scope of any of its subcontractors or subconsultants) includes providing pollution services that include, but are not limited to, performing: investigation and characterization of contamination of land, groundwater or structures, demolition of structures, abatement of hazardous or regulated materials (Hazardous or regulated materials shall include, but are not limited to, asbestos, petroleum products, lead, mold, mercury or polychlorinated biphenyls ("PCBs")), remediation of contaminated soil or groundwater including transportation and disposal of contaminated media, installation or removal of underground storage tanks, or any storage, transportation or disposal of materials that are hazardous or regulated under environmental laws by the Trade Contractor or by subcontractors on behalf of the Trade Contractor, the Trade Contractor shall provide Contractor's Pollution Liability Insurance with limits not less than $5,000,000 each occurrence and $5,000,000 annual aggregate.

If Trade Contractor is subcontracting out its entire scope of pollution services, Construction Manager may accept proof of the pollution liability insurance required in this Article from each person or entity who is performing the pollution services on behalf of Trade Contractor.

If Trade Contractor's scope of work includes mold/fungus remediation or the Project involves any residential, health care, custodial care or educational occupancy, then the contractor's pollution liability insurance shall include mold/fungus liability coverage in the amount of the contractor's pollution limits required herein.

All insurance required in this paragraph shall include coverage for bodily injury and property damage liability, defense costs, and clean-up costs and shall provide non-owned off-site disposal coverage if hazardous or regulated materials will be transported to a disposal site. The retroactive date on all pollution liability policies provided by Trade Contractor or any of its subcontractors shall precede the start of any work. Owner, Construction Manager and all required indemnitee parties shall be included as additional insured.

(g) **Contractor's Equipment; Property; Riggers Liability Contractor's Equipment; Property; Riggers Liability.** Trade Contractor shall maintain all-risk property insurance including coverage for the full replacement cost value of (i) its tools, equipment (including mechanical heavy equipment) and other property, whether owned, rented or borrowed, the capital value of which is not intended to be incorporated into the Project and (ii) any property intended to be incorporated into its Work while in-transit to the Project Site or stored away from the Project Site.

If Trade Contractor's Work includes move management services such that it is responsible for: moving of personal property from one location to another (or within a single location), storage of personal property at one or more locations and/or installation of personal property then it shall provide an installation floater covering such exposures for the full replacement cost of such property.

To the extent the Trade Contractor's Work requires it to provide a crane to hoist, lower or otherwise move a suspended load, then it shall provide riggers liability insurance. The limit for this coverage shall equal or exceed the full replacement cost value of the most expensive hoist intended to be made within its Scope of Work. This insurance shall name Construction Manager and Owner as loss payees to this insurance.

(h) **Cyber Liability Insurance.** If the Trade Contractor's scope of work involves working on Building Information Systems, Security / Access Control Systems or Tel/Data Systems, the Trade Contractor shall provide Cyber Liability Insurance, with limits not less than $2,000,000 per occurrence or claim, $2,000,000 aggregate. Coverage shall be sufficiently broad to respond to the duties and obligations as is undertaken by Vendor in this agreement and shall include, but not be limited to, claims involving: infringement of intellectual property (including but not limited to infringement of copyright, trademark, and trade dress), invasion of privacy violations, information theft, damage to or destruction of electronic information, release of private information, alteration of electronic information, extortion, and network security. The policy shall provide coverage for breach response costs as well as regulatory fines and penalties as well as credit monitoring expenses with limits sufficient to respond to these obligations.

(i) **Additional Insured**. For purposes of this Article "Additional Insureds" shall mean (1) the Construction Manager (and its partners or members if Construction Manager is a joint venture or LLC), (2) Owner, (3) both Owner and Construction Manager's officers, directors and employees, (4) any person or entity requested by Construction Manager or Owner, and (5) any other person or entity required to be added as an additional insured by the Contract Documents. The Additional Insureds shall be named as additional insureds on Trade Contractor's CGL, BAP, excess liability, umbrella liability and contractor's pollution liability insurance policies. Such additional insured coverage shall:

1. Be provided on a primary, non-contributory basis;
2. Provide additional insured status to all indemnitee parties for whom you have agreed by this written contract or agreement to provide such coverage;
3. Provide the Additional Insureds with coverage for actual or alleged bodily injury, property damage and personal and advertising liability arising out of any premises-ongoing operations and/or products-completed operations;
4. Be provided on any version of ISO forms CG 20 10 (10 01) and CG 20 37 (10 01), or an equivalent that has been approved by Construction Manager prior to the Trade Contractor entering the site; and
5. Remain in effect for the same duration that the insurance required under this Article shall be in effect.

If Trade Contractor's policy limits are greater than the minimum limits of liability required in this Article for a type of insurance, then the full extent of those policy limits shall also be available to the Additional Insureds. Any of Trade Contractor's excess or umbrella liability policies shall be expressly endorsed to state that coverage for the Additional Insureds is primary and that the insurer will not seek contribution from any other insurance available to the Additional Insured.

(j) **Self-Insured Retentions (SIR's); Deductibles**. Trade Contractor is responsible for any Deductible or Self Insured retentions. Any SIR in excess of $250,000 must be approved by Construction Manager. Trade Contractor shall be considered a self-insurer with respect to its additional insured obligations under paragraph (h) for any self-insured retention or deductible applied by its insurer to any of the Additional Insureds.

(k) **Certificates of Insurance**. Trade Contractor shall provide a Certificate of Insurance to the Construction Manager to evidence its compliance with the insurance obligations in the Contract. The Certification of Insurance shall:

1. State the additional insured form, primary and non-contributory and waiver of subrogation coverage being provided in the description of operations section.Any schedule required in such endorsements shall include all parties as additional insureds including any and all indemnities as specified in the Prime Contract.Acceptable language shall include "for whom you have agreed in a written contract";
2. Include evidence of §6.3(i) any self-insured retentions and (ii) project name and number; and
3. Include as an attachment a hard copy of any compliant documentation which evidences the CGL additional insured endorsement coverage required in §6.3(i) above.

Construction Manager's acceptance of any certificate of insurance or coverage provision in no way waives Construction Manager's right to later assert that Trade Contractor did not provide insurance in conformance with the Contract Documents. If Trade Contractor fails to comply with its insurance obligations under the Contract Documents, then Construction Manager may withhold monthly progress payments and may be considered a material breach of this agreement.

Upon request, Trade Contractor shall provide Construction Manager with any certificate of insurance, coverage provision or certified copy of any insurance policy applicable to coverage required of Trade Contractor in the Contract Documents. Trade Contractor shall endorse its policies to provide a minimum of 30 days' cancelation notice to Construction Manager. Evidence of the insurance required in this Article shall also be provided any time after the work is completed but Trade Contractor has re-entered the Project site.

(l) **Waiver**. Trade Contractor agrees to waive any right of action against Construction Manager (and its partners if CM is a joint venture or its members if an LLC), Owner, and any others required to be provided a waiver by the Contract Documents (collectively the "Waiver Parties") for recovery of loss and/or damages to the extent covered, or that should have been covered, by the insurance required of Trade Contractor in the Contract Documents or any other insurance provided by Trade Contractor which is applicable to the Project. Such waivers shall be provided by specific endorsement if the policy itself does not otherwise provide the required language.

ARTICLE 7

WARRANTY

7.1 The Trade Contractor warrants to the Owner and the Construction Manager that all materials and equipment furnished will be new unless otherwise specified, and that all Work will be of good quality, free from faults and defects and in conformance with the Contract Documents.

7.1.1 All work not conforming to these requirements, including substitutions not properly approved and authorized, may be considered defective.

7.1.2 If required by the Construction Manager, the Trade Contractor shall furnish satisfactory evidence as to the kind and quality of materials and equipment. In addition to any other warranty or guarantee as required by the Contract Documents or this Agreement, the Trade Contractor agrees to promptly make good, without cost to the Owner or Construction Manager, any and all defects, due to faulty workmanship, equipment and/or materials, which may appear within a guarantee or warranty period so established in the Contract Documents.

7.1.3 If no such period is otherwise stipulated in the Contract Documents, then such warranty and guarantee shall be for a period of one (1) year from date of substantial completion of the entire Project. The extent or limitations on warranties granted by manufacturer or other parties by others shall not relieve the Trade Contractor of any of its responsibilities pursuant to the Trade Contract Agreement or otherwise at law or in equity.

7.2 The warranty of materials, equipment and workmanship defined in 7.1 and its subparts is separate from, independent of, and in addition to any other guarantees or warranties required by the Contract Documents. To the extent of Trade Contractor's Work, the Trade Contractor shall extend to Construction Manager the same warranties and guarantees that the Construction Manager may be obligated to extend to the Owner or others by the Contract Documents.

7.3 Warranty and guaranty documentation issued by the Trade Contractor shall clearly define what is to be warrantied or guaranteed; the extent, terms, conditions, time and effective dates, which shall comply with the Contract Documents. The Trade Contractor further agrees to provide any and all warranty and guarantee documentation as required by the terms of the Contract Documents as a condition precedent to final payment.

7.4 Warranties or guarantees shall not commence to run until:

a. The actual completion of the Trade Contractor's work,
b. The date of Substantial Completion of the project,
c. The Owner is in possession of and accepts all the specified guaranty and/or warranty documentation,
d. All turnover meetings, training, and other activities are complete, and
e. The Owner has received the specified close out documentation including, without limitation, any tools, materials and manuals for the operation and maintenance of the system/equipment.

7.5 If specified in the Contract Documents and prior to the date of Substantial Completion of the project the Owner or Construction Manager occupies or uses any separate unit of the Work, the Trade Contractor shall include all costs associated with extending the guarantee/warranty period to cover the period in advance of the date of Substantial Completion of the project and the specified period after the date of Substantial Completion. The Trade Contractor shall also provide maintenance during this extended period.

7.6 If repairs or corrections are required in connection with the guaranteed Work, the Trade Contractor shall, promptly, within 48 hours after receipt of notice from the Construction Manager or Owner and without expense to the Owner or Construction Manager, commence and continue to effect such repairs or corrections to:

a. Place in satisfactory condition all of such guaranteed Work and correct all defects therein; and
b. Make good all damage to the structure, finishes or site or equipment or contents thereof, which, in the opinion of the Architect, Engineer and Construction Manager is the result of the use of materials, equipment or workmanship which are inferior, defective or not in accordance with the terms of the Contract;
c. Repair or replace any adjoining or obstructing trade work necessarily disturbed by the remediation of Trade Contractor's defective Work, regardless of whether that work was initially part of Trade Contractor's scope.

7.7 Notifications by Owner of defects shall stop the warranty time period. The guarantee or warranty period for that replaced or restored work shall be reinstated for the remaining time period, starting on the date of acceptance of the replaced or restored work.

7.8 If the Trade Contractor after notice fails to proceed within 48 hours to commence and continue to comply with the terms of the guarantee, the Owner or Construction Manager may have the defect corrected in which case the Trade Contractor and his surety, if applicable, shall be liable for all expenses incurred.

7.9 All special guarantees or warranties applicable to specific parts of the Work that may be set forth in the Contract Documents shall be subject to the terms of this Article at a minimum during the first year of the life of such special guarantee.

7.10 Nothing contained in this Article shall be construed to establish a period of limitation with respect to any other obligation which the Trade Contractor might have in law or equity.

7.11 In the event the Work of the Trade Contractor is to be modified by another Trade Contractor, either before or after inspection, the first Trade Contractor shall remain responsible in all respects under the warranty given in Article 7 and under any other warranties provided in the Contract Documents or by law. However, the first Trade Contractor shall not be responsible for any defects in material or workmanship introduced by the Trade Contractor modifying its work. Both the first Trade Contractor and the Trade Contractor making the modifications shall each be responsible solely for the work done by each. The Trade Contractor modifying the earlier work shall be responsible for any damage to or defect introduced into the Work, which it is modifying.

7.12 In the event the Project or Trade Contractor's Work involves the construction of a condominium, then to the extent of the Trade Contractor's Work, the Trade Contractor shall extend to Construction Manager the same warranties and guarantees which the Construction Manager is obligated or required to extend to any person(s), company, corporation, partnership, developer, limited liability company, business entity, condominium association, unit owner, or any owner by any applicable rule, code, ordinance or law. The Trade Contractor shall further extend directly to any person(s), company, corporation, partnership, developer, limited liability company, business entity, condominium association, unit owner, or any other owner all warranties, guarantees, or protections as may be required by any applicable rule, code, ordinance, requirement or law.

ARTICLE 8

CHANGES IN THE WORK

8.1 The Construction Manager reserves the right, in Construction Manager's sole discretion, to require changes, deviations, additions or deletions to the Work in writing (hereinafter "Change"), and any adjustment in the Contract Sum or Time shall be pursuant to the procedures and conditions set forth in this Agreement.

8.2 Before proceeding with any Change including, but not limited to, any addition, deletion, deviation or other change, and as a condition precedent thereto, the Trade Contractor shall first obtain either a written Change Order (hereinafter "Change Order") or a written Subcontract Change Directive (hereinafter "SCD") from the Construction Manager's Authorized Representative.

8.2.1 Change Order. As a condition precedent to be a valid and enforceable Change Order, the Change Order must be prepared on the Construction Manager's form and be fully executed by the Trade Contractor and one of the Construction Manager's Authorized Representatives.

8.2.2 Subcontract Change Directive ("SCD"). As a condition precedent to be a valid and enforceable SCD, the SCD must be prepared and executed by one of the Construction Manager's Authorized Representatives. The Construction Manager shall have the right to issue an SCD to Trade Contractor, at any time, directing a Change prior to any agreement on any adjustment, if any, to the Contract Sum or the Contract Time for Trade Contractor's Work, or both.

8.2.3 Upon receipt of either a Change Order or an SCD, the Trade Contractor shall proceed diligently with the performance of the Work, including the SCD. If an SCD is issued by Construction Manager, then the Trade Contract shall continue to diligently proceed with such Change pending a final resolution of any adjustments in the Contract Sum and/or Contract Time (hereinafter "Change Claim") pursuant to the terms and conditions set forth in this Article. For the avoidance of doubt, as used herein, a "Change Claim" shall be inclusive of any and all amounts, costs, payments, compensation, time, extensions, overhead, profit, claims and issues of the Trade Contractor arising from or related to such Change, without exception. A Change Order is deemed a final and conclusive resolution and settlement of the Trade Contractor's Change Claim arising from or related to the Change. With respect to any Trade Contractor Change Claim, as a condition precedent, the Trade Contractor shall have first received an SCD from the Construction Manager and shall have timely complied with the procedures and conditions set forth in this Article 8, including Subsection 8.3. Pending a final determination of the Change Claim, Trade Contractor may request payment for certain costs completed under the SCD in its application for payment, however such request is subject to the approval of the Construction Manager and Owner. Any payment issued for SCD is without prejudice to Construction Managers right and defenses, and is subject to a reservation of the procedures and conditions set forth herein. Any failure of the Trade Contractor to diligently proceed with a Change Order or an SCD as set forth in this Article 8 shall be a material breach of this Agreement.

8.3 Notwithstanding any other term or provision in this Agreement, as a condition precedent to any Trade Contractor's Change Claim, Trade Contractor shall, within seventy-two (72) hours of the occurrence giving rise to such Change Claim, provide Construction Manager with a separate written "Notice of Change Claim" specifying that such Change constitutes extra work for which it believes it is entitled to adjustments in Contract Sum and/or Contract Time, including the amount of such adjustments (hereinafter "Claim Notice"). Trade Contractor shall provide all documentary and other written information in support of such Change Claim within five (5) business days of Trade Contractor's Notice of Change Claim to Construction Manager. In addition, Trade Contractor shall provide all supplementary information, including any supporting labor, material or other costs documentation or information, requested by Construction Manager within five (5) business days of Construction Manager's request. At all times material hereto, the Trade Contractor shall have no communications directly with the Owner or Architect. Failure of the Trade Contractor to timely provide such written Notice of Change Claim, the documentary and other written information in support, and/or the supplemental information requested by the Construction Manager relating to such Change Claim shall be a complete waiver by Trade Contractor to any adjustment in Contract Sum and Contract Time related to such Change. In the event of a disagreement as to any adjustment arising from Trade Contractor's Change Claim and SCD as set forth in this Article, then a final determination of the Change Claim shall be made in one of the following methods at Construction Manager's discretion:

(a) by mutual acceptance of a lump sum properly itemized and supported by sufficient substantiating data to permit evaluation and agreed upon by the Construction Manager and the Trade Contractor; or
(b) by unit prices stated in the Contract Documents; or
(c) if no such unit prices are set forth and if the parties cannot agree upon a lump sum, then by actual net cost in money to the Trade Contractor of materials and labor (including insurance and applicable taxes) required, plus rental of plant equipment (other than small tools and small equipment) plus compensation for overhead and for profit not to exceed the mark-up set forth in Article 12 of this Agreement. Field overhead will not be considered as part of actual net cost; or,
(d) by the method provided in subparagraph (i) or (ii) below:

(i) For a Change arising from Owner direction, Trade Contractor shall be entitled to the additional compensation and/or schedule extension as agreed to and actually paid by, or in the case of a schedule extension, granted by, the Owner. In the event disagreement arises from the Owner's direction, then Trade Contractor agrees to be bound by the Owner's determination as to whether or not there shall be reimbursement or schedule extension, and to the Owner's determination as to the amount to be paid and/or schedule extension to be granted, if any; or,

(ii) The cost of such work shall be determined by the Construction Manager on the basis of reasonable expenditures and savings of those performing the work attributable to the Change, including, in the case of an increase in the Contract Sum, a reasonable allowance for overhead and profit not to exceed the rates in Article 12 of this Agreement. Further, in such case, and also under clauses 8.3 (c) and 8.4 (d)(ii), the Trade Contractor shall keep and present, in such form as the Construction Manager may prescribe, an itemized accounting together with appropriate supporting records, costs and data for inclusion in a change order. Unless otherwise provided in the Contract Documents or this Agreement, cost shall be limited to the following: cost of materials including sales tax and cost of delivery, cost of construction labor including social security, old age and unemployment insurance and fringe benefits required by Agreement or custom; workers or workmen's compensation insurance; bond premiums; rental value of equipment and machinery; and the additional costs of supervision and field office personnel directly attributable to the Change subject to the Trade Contractor complying with and timely providing all such appropriate supporting records, costs and data. Pending final determination of cost, any payments, on account shall be made as determined by the Construction Manager. The amount of credit to be allowed by the Trade Contractor for any deletion, including de-scoping any Work, in the Change which results in a net decrease in the Contract Sum will be the amount of the actual net cost as confirmed by the Construction Manager. When both additions and credits covering related work or substitutions are involved in any one Change, the allowance for overhead and profit shall be figured on the basis of the net increase, if any, with respect to that Change.

8.4 **Construction Manager's Audit.** Construction Manager's duly authorized representative shall have access, at all reasonable times, to all Trade Contractor's personnel as well as to all Trade Contractor's original books, records, correspondence, instructions, plans, drawings, receipts, vouchers, costs records, project files and reports, and memoranda of every description pertaining to Change for the purpose of auditing and verifying Trade Contractor's net cost arising from the Change, or for any other reasonable purpose. Construction Manager's representative shall have the right to reproduce any of the aforesaid documents. Trade Contractor shall preserve, and shall cause its subcontractors to preserve all the aforesaid documents for a period of not less than two (2) years after final payment or termination of Work or such longer time as may be required by the Contract Documents or applicable law.

8.5 Notwithstanding any other provisions, terms or conditions set forth in this Agreement, including Article 8, and for the avoidance of any doubt, Construction Manager shall not be liable to Trade Contractor for any Changes nor for any Change Claims unless and, as a condition precedent, Trade Contractor has received either: (i) an SCD has been issued and executed by Construction Manager Authorized Representative, or (ii) a Change Order has been fully executed by the Trade Contractor and Construction Manager, in each event as set forth in this

Article. As used in this Article 8, the Construction Manager's Authorized Representative shall be the Project Executive, Project Manager or Chief Purchasing Agent for the Project (herein "Construction Manager's Authorized Representative"). The Construction Manager may, from time to time, authorize other employees to act as the Construction Manager's Authorized Representative. Such authorization shall, in writing, identify the individual employee, and the extent of their authority to bind the Construction Manager. Unless so authorized, Construction Manager's Superintendent and other Project personnel shall not be deemed Construction Manager's Authorized Representative and shall have no authority to issue any Change Order or an SCD, nor shall anyone other than the Construction Manager's Authorized Representatives be authorized to amend, modify, alter or change this Agreement in any manner. The failure of Trade Contractor to secure a compliant Change Order or SCD shall be a complete waiver by Trade Contractor to any Change Claim by Trade Contractor, including but not limited to, any claim for any additional amounts, costs, payments, compensation, extras, repairs to others work, extensions, overhead, profit, or any other remedy or relief. Trade Contractor represents and warrants that all Work shall be performed and timely completed by Trade Contractor for the Lump Sum Amount set forth in the Contract Sum in Article 3 of this Agreement unless only a Change Order or SCD has been issued pursuant to this Article 8. Neither the conduct of the parties nor the statement, action, promise or activity of any representative of the Construction Manager shall be deemed a waiver, modification, release, excuse or change to the absolute requirement for written a Change Order or SCD to adjust the Contract Sum or Time.

ARTICLE 9

TRADE CONTRACTOR RESPONSIBILITIES

9.1 The Trade Contractor shall provide sufficient, safe, and proper facilities at all times for the inspection of the Work by the Construction Manager, Architect, and the Owner, or their authorized representatives. The Trade Contractor shall, within twenty-four (24) hours for emergencies involving life-safety, and within forty-eight (48) hours for non-emergency life-safety matters, of receipt of notice from the Construction Manager, proceed to promptly and continuously, until complete, take down all portions of the Work and remove from the grounds and Project site all materials, equipment and/or Work which the Construction Manager, Architect, the Owner, or their authorized representatives shall fail to approve or shall condemn as unsound, defective, improper, non-compliant, or in any way failing to conform strictly to the Contract Documents or this Agreement. The Trade Contractor shall at its own expense promptly repair, remedy, replace and correct such Work regardless of whether Trade Contractor disagrees with the reason for such Work being condemned or rejected. Further, the Trade Contractor shall at its own expense repair and remedy all work damaged or destroyed thereby.

9.2 The Trade Contractor agrees, in the performance of this Agreement, to comply with all applicable federal, state, municipal, and local laws, ordinances, codes and governing regulations, to pay all costs and expenses required thereby; to pay all fees, charges, and assessments, and to pay all fringe and other benefits required by Agreement or law. If the Trade Contractor observes that portions of the Contract Documents are at variance with applicable laws, statutes, ordinances, building codes, rules and regulations, the Trade Contractor shall promptly notify the Construction Manager in writing, and necessary changes shall be accomplished by appropriate modification. If the Trade Contractor performs any Work knowing it to be contrary to such laws, ordinances, rules and regulations without such notice to the Construction Manager, he shall assume full responsibility therefore and shall bear all costs attributable thereto. The Trade Contractor shall comply with all applicable federal, state, municipal and local employment and immigration laws and shall act in accordance with all rules, regulations and procedures that may be required to ensure full compliance with all such laws and, if requested or required by Construction Manager, Architect, and/or Owner. At all times, upon request, the Trade Contractor shall certify in writing that it is in compliance with all such laws. The Trade Contractor shall timely procure and pay for any necessary or required licenses, tax, fine, fee, or permit related to its Work, and shall reimburse and save the Construction Manager and Owner harmless from any violation, fine, tax, fee, proceeding, claim, cost or issue associated with any such laws. The Trade Contractor expressly acknowledges and agrees to adhere to, and implement as part of its safety program, Construction Manager's Safety Non-Negotiables, a copy of which has been provided to Trade Contractor.

9.2.1 The Trade Contractor shall pay all sales, use, consumer, and other similar taxes for the Work or portions thereof furnished or provided by the Trade Contractor which are legally required at the time bids or proposals are received, whether or not yet effective. Such taxes are included in the Trade Contract Sum.

9.2.2 In the event of a breach of this Section 9.2 (including any of its sub parts) results in an assessment against and/or payment by either the Owner or the Construction Manager, any amount reasonably required to resolve the claim shall be deducted by the Construction Manager. If the amount of such unpaid taxes exceeds the total of the unpaid Trade Contract Sum and other amounts due to the Trade Contractor, the Trade Contractor agrees to pay the amount of such excess to the Construction Manager.

9.2.3 State and local governments may require foreign contractors post a bond to assure payment of expenses allocated in this Section 9.2. Providing such bonds and the cost thereof are included by the Trade Contractor in the Trade Contract Sum.

9.3 The Trade Contractor shall pay all royalties and license fees. Further, the Trade Contractor shall defend all lawsuits, proceedings, issues, or claims, including attorneys' fees, for any alleged or asserted infringement of any patent, intellectual, or other property right, and shall save the Owner and Construction Manager harmless from loss on account thereof, except that the Owner shall be responsible for all such loss when a particular design, process or the product of a particular manufacturer or manufacturers is specified, unless otherwise addressed in the Contract Documents or if the Trade Contractor has reason to believe or should have known that the design, process or product specified is an infringement of a patent, intellectual or property right. In the event the Trade Contractor has reason to believe or should have known that a design, process or product specified is or may be an infringement of a patent, intellectual, or other property right, then the Trade Contractor shall be responsible for such loss, damages and attorneys' fees, unless Trade Contractor first provided prompt written notice of all such information to the Construction Manager.

9.4 In the event the Trade Contractor, at any time, should:

(a) Refuse, fail or neglect to supply sufficient and properly skilled workers, supervision, equipment, and materials of the proper quality;
(b) fail in any respect to prosecute the Work timely, in compliance with this Agreement;
(c) fail in the performance of any obligation or duty of this Agreement;
(d) become insolvent, enter bankruptcy either voluntarily or involuntarily, have a receiver appointed or make an assignment for the benefit of creditors;
(e) materially change its financial condition, transfer any material assets, change control or management without Construction Managers' prior written consent;
(f) become (or if any of its essential personnel becomes) the subject of criminal, debarment or other regulatory proceedings, which in Construction Manager's sole judgment undermines Trade Contractor's ability to perform the Work;
(g) enter into any unauthorized assignment or delegation of this Agreement without Construction Manager's prior written consent;
(h) have any lien, encumbrance, bond claim, dispute, delay or other claim asserted, filed or threatened under Trade Contractor's scope of Work or that arises out of Trade Contractor's involvement in the Project, and Trade Contractor has not promptly removed, satisfied or paid same;
(i) fail to remove or otherwise remedy any defective, non-compliant or unapproved Work; and/or
(j) fail to properly remedy a noticed violation of this Agreement.

Each above event shall constitute a "breach" of this Agreement.

9.4.1 In the event of a breach, Construction Manager after forty-eight (48) hours written notice to the Trade Contractor, shall have the right, but not the obligation, to exercise any and all remedies under this Agreement in addition to those available at law or in equity, or both, including without prejudice to any other remedy, the following contractual remedies:

(a) Investigate the cause of such breach or failure and correct same in any way or manner whatsoever, including, but not without limitation to, the supplementation of Trade Contractor's forces, and deduct all such corrective costs, expenses, losses, delay damages, and any other Damages as provided in this Agreement from Trade Contractor's Contract Amount; and/or

(b) Take charge of and complete the performance of this Agreement and the Trade Contractor's Work without termination of this Agreement, and in such event shall be permitted to take possession of all Trade Contractor's materials, equipment, tools and appliances for such Work, and deduct all such corrective, repair, remediation or completion costs, expenses, delay damages, and any other Damages as provided in this Agreement from Trade Contractor's Contract Amount; and/or,

(c) Terminate further performance by the Trade Contractor under this Agreement without further notice or payment, and renegotiate and re-execute a contract or contracts for the completion of the Trade Contractor's Work with such persons, firms or companies as may be appropriate in the opinion of the Construction Manager, and in such event, deduct any and all costs, damages, expenses, completion costs, remediation expenses, delay damages, and any other damages as provided in this Agreement from Trade Contractor's Contract Amount; and/or,

(d) Allow the Trade Contractor to continue performance and accrue and accumulate any and all costs, expenses, delay damages or other Damages as provided in this Agreement, and deduct same from Trade Contractor's Contract Amount; and/or,

(e) Pursue any and all other remedies that Construction Manager may have at law or in equity.

In the event the Trade Contractor should violate any term or provision of this Agreement, then Trade Contractor, and its Surety, if applicable, shall be deemed to be liable to the Construction Manager for any and all resulting Damages, losses, costs, expenses, incidental damages, consequential damages, indirect damages, completion damages, correction damages, remediation damages, clean-up costs, repairs, delay damages, including but not limited to liquidated damages, extended field office overhead, extended home office overhead, additional field condition costs, additional supervision, as well as all attorneys' fees (including but not limited to the costs of the Construction Manager's in-house counsel), and such other damages or remedies as may be available in this Agreement, at law or in equity (herein collectively referred to as "Damages"). In the circumstances where Construction Manager has undertaken any involvement in the repair, correction, or completion of Trade Contractor's Work, then in addition to the above and to the extent not inconsistent with the Contract Documents, the Construction Manager's contract damages shall also be deemed to include all administrative overhead costs in an amount not less than those percentages for overhead & profit stated in Article 12.1 herein.

9.4.2 In addition to Construction Manager's rights and remedies as set forth in this Agreement, in the event the Trade Contractor's unpaid Contract Balance is not sufficient to fully pay for all such Damages, then in that event, Trade Contractor, and its Surety, if applicable, shall promptly pay upon demand Construction Manager for any deficiency so that all such Damages are fully paid. In addition, the Construction Manager shall have the right to withhold payment to the Trade Contractor in the event that the Trade Contractor has been declared in default or breach of this Agreement, or should a bona fide dispute exist regarding the amount due Trade Contractor, notwithstanding whether the Construction Manager has received payment from the Owner for any labor, services and materials furnished by Trade Contractor. In the event of such declaration of default, breach or bona fide dispute which is not cured or remedied by Trade Contractor, or should the Construction Manager terminate the Trade Contractor, then all further payments under this Agreement shall cease until all Trade Contractor's Work has been fully remedied and completed. If the unpaid balance of the Contract Sum exceeds all Damages, as defined in Section 9.4.1, then such excess should be paid to the Trade Contractor after all Trade Contractor's Work has been remedied and completed and all material claims or disputes resolved, and subject to all other terms, conditions and provisions of this Agreement. For the avoidance of doubt, a bona fide dispute shall include, but not be limited to, any breach described in Section 9.4 of this Agreement.

9.4.3 In the event that a Termination for Cause is not upheld by a properly empowered judicial or arbitral authority, then the Termination for Cause shall be deemed a Termination for Convenience and construed under Section 9.4.4 hereof.

9.4.4 Notwithstanding the above paragraph, the Construction Manager reserves the right to terminate this Agreement for its convenience upon written notice to the Trade Contractor. In such instance the Trade Contractor will be paid its share of the Contract Amount proportionate to the percentage of its Work completed and other reasonable cancellation costs incurred as a result of said termination less any amounts previously paid or for any Damages caused by any breach. No payments shall be made for anticipated overhead and profit. Prior to making any payments under this clause, the Construction Manager shall have the right to audit the records of the Trade Contractor.

9.5 The Trade Contractor agrees to adhere to the federal occupational safety and health act, state and local safety regulations and the Construction Manager's safety and health program so as to avoid injury or damage to persons or property, and to be directly responsible for damage to persons and property resulting from failure to do so.

9.6 In the event the Trade Contractor, after a twenty-four (24) hour written notice from the Construction Manager, fails to take corrective action to insure compliance with said safety regulations or removal of rubbish and debris resulting from his Work, the Construction Manager shall undertake these obligations and charge the cost of same to the Trade Contractor's account without further notice to the Trade Contractor.

9.7 The Trade Contractor agrees to immediately notify the Construction Manager's representative on the jobsite of any accident, injury or damage to any persons or property on the Project site or related to the Project, and shall promptly provide the Construction Manager's representative a complete copy of all accident reports, photographs and videotapes and other documentation related to such accident in forms acceptable or requested by the Construction Manager. All such reports shall be signed by the Trade Contractor or his authorized representative, and shall be submitted to the Construction Manager no later than five (5) calendar days from the date of such occurrence.

9.8 The Trade Contractor shall procure its materials from such sources, and employ such labor subject to contract terms and conditions in order to ensure harmonious labor relations on the site and prevent strikes or labor disputes by its employees or other trade employees. The Trade Contractor, in the event of a labor dispute including but not limited to strikes, shall take whatever action is required in order to prevent the disruption, delay, interruption, or adverse impact of any trade's work on the Project site.

9.9 The Trade Contractor will not assign this Agreement, nor any moneys due or to become due under this Agreement, nor any Damages, claims, suits, rights or interests under this Agreement, nor sublet the whole or any part of the Work to be performed hereunder, without the prior written consent of the Construction Manager. In the event the Trade Contractor has failed to secure such prior written consent of the Construction Manager, then any such assignment or delegation of performance shall be deemed invalid, void and unenforceable. Further, the Trade Contractor shall not sell, change, assign, escrow, or transfer, directly or indirectly, any ownership, stock, membership or control of the Trade Contactor greater than a ten percent (10%) cumulative interest during the duration of the Project, without the prior written consent of the Construction Manager. The foregoing sentence shall not apply if Trade Contractor is a publicly traded company regulated by, and subject to the oversight of, the Securities & Exchange Commission. Any violation of this section shall be a material breach of this Agreement. In the event that Construction Manager provides such consent, any assignee hereunder shall strictly comply with all the requirements of this Agreement, and further Trade Contractor shall also remain fully liable for the Trade-Subcontractor's or other assignee's obligations under this Agreement, unless otherwise released in writing by Construction Manager. The Trade Contractor acknowledges that this Trade Contract may at any time, and without prior notice or further consent, be assigned by the Construction Manager including, without limitation, as may be directed by the Owner pursuant to the terms of the Prime Contract, or by agreement between the Construction Manager and the Owner (or any lender, Owner's agent, or other party authorized to act on the Owner's behalf).

9.10 The Trade Contractor agrees that all disputes concerning the jurisdiction of trades shall be adjusted in accordance with any plan for the settlement of jurisdictional disputes which may be in effect either nationally or in the locality in which the Work is being done. The Trade Contractor shall be bound by, and shall abide by, all such adjustments and settlements of jurisdictional disputes, whether or not the Trade Contractor is signature bound by the Agreement establishing the impartial jurisdictional disputes board and/or its successors. The Trade Contractor agrees not to cause a work stoppage due to the jurisdictional assignment of work.

9.11 The Trade Contractor shall submit to the Construction Manager upon request, copies of orders placed for the various materials required for the Project or authentic stock lists if such material is normally a stock item. Order copies need not reflect prices but shall indicate type of material, quantity, vendor name, and address, etc. The Trade Contractor shall be required to submit to the Construction Manager a monthly material status report, or more often if required by the Construction Manager, as a prerequisite for the monthly progress payment. The Trade Contractor shall notify the Construction Manager immediately upon learning of a change of status of any material, equipment, or supplies.

9.12 The Trade Contractor shall continuously and adequately protect all Work from damage due to his Work and will immediately replace or pay for the replacement of all damaged Work at its own expense and cost.

9.13 The Trade Contractor agrees to maintain experienced and skilled workers and the necessary materials, supplies, tools and equipment to meet the requirements of this Agreement and to maintain the Construction Manager's Schedule. The Trade Contractor shall carry on its Work promptly and efficiently and at a speed that will not cause any delay. In the event the Trade Contractor falls behind in the progress of his Work, in the sole judgment of the Construction Manager, then the Trade Contractor agrees to take such steps as are necessary, in the judgment of the Construction Manager, to improve the rate of progress of Trade Contractor's Work to comply with the requirements of this Agreement, including but not limited to, increasing the skill and supervision of its workers, working sufficient overtime hours, adding shifts of its workforce, working additional days, and/or increasing its workforce to meet such schedules, milestones and requirements of this Agreement at no extra cost to the Construction Manager or Owner. In addition, if requested by the Construction Manager, the Trade Contractor shall promptly, and within forty-eight (48) hours of such request, provide to the Construction Manager for approval a remediation and recovery schedule demonstrating the manner in which the required rate of progress will be regained and attained by Trade Contractor. Failure of the Trade Contractor to immediately comply with this paragraph, the Construction Manager's scheduling requests, its approved remediation schedule, or to improve the rate of progress as requested by the Construction Manager, shall be a material breach of this Agreement. The Construction Manager shall be entitled to all rights, remedies and Damages as set forth in this Agreement, as well as any other remedies at law or in equity. Permitting the Trade Contractor to continue performance after breach of this or any other provision of this Agreement shall not be deemed a waiver, release or discharge of any right, claim, interest or remedy against the Trade Contractor.

9.13.1 It is expressly agreed that time is of the essence of this Agreement, and that the payment of the consideration herein expressed to be paid by Construction Manager is executory and strictly conditioned upon timely completion of Trade Contractor's Work and proper performance of Trade Contractor's obligations under this Agreement. Unless otherwise agreed by Trade Contractor and Construction Manager, Trade Contractor shall bear the risk of loss of any of Trade Contractor's Work (including property intended to become a part of its Work) and shall insure it on a 100% replacement cost basis, until such Work or property is delivered to the project site and/or accepted by the Construction Manager.

9.14 The Trade Contractor agrees to employ competent administrative, supervisory, and field personnel to accomplish the Work, including layout, engineering, preparation and checking of shop drawings. If required, the Trade Contractor shall substantiate this employment of competent personnel to the Construction Manager's satisfaction before initiating any Work.

9.15 The Trade Contractor shall insure that all construction tools, equipment, temporary facilities, and other items used in accomplishing the Work, whether purchased, rented, or otherwise provided by the Trade Contractor or provided by others, are in a safe, sound, and good condition, must be capable of performing the functions for which they are intended and must be maintained in conformance with applicable laws and regulations.

9.16 Construction Manager shall not be liable to the Trade Contractor for any delay, loss of efficiency, interruption, disruption, loss of productivity or the like (herein "delay") resulting from: (1) fire, weather, flood, wind, lightning, storm, earthquake, rain, acts of God or other causalities whether by man or nature; (2) any act, neglect or fault of the Owner, Architect, or Engineer, or Construction Manager, or any of their representatives, agents, employees, independent contractors or trade contractors; (3) any delay in transportation or availability of any materials involved in the Project to be ordered by Trade Contractor or its subs or vendors; (4) any labor disputes, strikes, riots, or other labor issues involving Trade Contractor's or its subcontractor's work force; (5) any act of terrorism or threats of terrorism; or (6) any other causes.

9.16.1 Further, Trade Contractor's sole and exclusive remedy shall be a reasonable, but uncompensated, extension of time as reasonably determined by Construction Manager for Trade Contractor to complete its Work pursuant to this Agreement.

9.16.1.1 Notwithstanding Section 9.16.1, and as the sole exceptions thereto, Trade Contractor may be entitled to certain compensation for delays subject to the following strict conditions precedent:

a. the Owner agrees to, and actually, pays Construction Manager for such delay to Trade Contractor; or
b. separate trade contractor(s) either agree to pay, or Construction Manager assesses and recovers payment from such separate trade contractor(s) for such delay to Trade Contractor;

In the event of either (a) or (b), the Trade Contractor's sole and exclusive remedy for compensation for such delay shall be limited to the amount actually paid to Construction Manager specifically for Trade Contractor delay "costs" (which are defined as Trade Contractor's out of pocket costs and expenses without markup, profit, loss or other delay damages ("Costs")).

9.16.1.2 Notwithstanding anything to the contrary in this Agreement, in the event that the Prime Contract precludes damages for delay, Trade Contractor understands and acknowledges that Trade Contractor shall also not be entitled to recover any compensation for delays as precluded by the Prime Contract.

9.16.2 Any claim by Trade Contractor for compensation or time extension, in each case, shall be subject to the additional strict condition precedents:

a. the Trade Contractor shall within three (3) business days of the beginning of such delay serve Construction Manager with a separate written letter titled "Notice of Delay and Request for Extension of Time" (herein "Delay Extension Request"); such Delay Extension Request shall not be deemed valid or compliant if contained in any daily log, meeting minutes, e-mail or other document other than a Delay Extension Request; and
b. such Delay Extension Request shall include a description of the specific event that is the basis for such an extension of time, the cause of the alleged delay, an estimate of the period of delay, and a general description and estimate of all costs Trade Contractor claims it has or will suffer from such delays.

In the event the Trade Contractor fails to timely, fully and properly serve Construction Manager with such written Delay Extension Request as set forth in this Section, then the Trade Contractor shall have waived and released any entitlement to an extension, compensation or costs, and any other right or remedy. Subject to the above terms and conditions precedent, it is expressly agreed that Trade Contractor's claim for such delays shall also be strictly limited to its Costs. Under no circumstances shall Trade Contractor be entitled to any extension of time, cost, compensation, or other remedy to the extent that Trade Contractor caused or contributed, in whole or in part, to such delay, or to the extent Trade Contractor could have reasonably avoided or mitigated such delay or costs.

9.16.3 Nothing in this Article 9 shall be construed to limit the Construction Manager's ability to compensate, settle claims, or otherwise mitigate delay claims asserted or threatened by third parties (including but not limited to a separate trade contractor) for the delays caused by the Trade Contractor.

9.17 Right-To-Know Laws. Each Trade Contractor is required to implement the provisions of the right-to-know law, if any, as enacted by the state in which the Work is being performed. Before using on site any material listed in the right-to-know substance list, each Trade Contractor will furnish the Construction Manager a copy of the material safety data sheet for that substance.

9.18 In the event the Trade Contractor employs independent contractors, as well as payroll labor, to discharge its obligations hereunder, the Trade Contractor acknowledges and understands that it does so at its own risk and that federal, state and/or local agencies may dispute the independent contractor status and assess penalties, fines, and costs should there be a determination to reclassify such workers. In that event, the Trade Contractor agrees that it will defend, indemnify and hold the Construction Manager and the Owner harmless from any fines, costs, Damages, penalties, attorneys' fees, and causes of action, including without limitation, personal injury or property damage, arising out of or relating in any way to such a determination.

9.19 Trade Contractor shall inspect the Work Site or Job Site and all surfaces as well as all conditions, areas or structure(s) related to its Work, and all Work performed by others which relates to Trade Contractor's Work, prior to performance of its scope of Work, and Trade Contractor shall notify Construction Manager in writing immediately of any deficiencies or problems that would adversely affect Trade Contractor's Work, the quality and timeliness of its Work, the finished product, and/or in any way adversely affect the Project site. By commencing Work, Trade Contractor accepts full responsibility for all surfaces, areas and structure(s) which interface with its Work, and further represents that it has thoroughly examined the Contract Documents, the Project site, the Construction Manager's Schedule, or amendments thereto, and all conditions, and has determined that he accepts all conditions and matters effecting the proper and timely execution of the Work. Failure to timely provide written notice to Construction Manager of such deficiencies or problems before commencing Work shall be deemed a complete waiver and/or release against any Work, problem or condition affecting its Work or the Work performed by others, and shall also be a waiver for any related claims by the Trade Contractor arising therefrom.

9.20 **TO THE EXTENT ALLOWED BY APPLICABLE LAW, THE TRADE CONTRACTOR HEREBY WAIVES TRIAL BY JURY IN ANY ACTION OR PROCEEDING TO WHICH THE TRADE CONTRACTOR MAY BE A PARTY ARISING OUT OF OR IN ANY WAY PERTAINING TO THIS AGREEMENT OR THE ENFORCEMENT THEREOF. IT IS AGREED AND UNDERSTOOD THAT THIS WAIVER CONSTITUTES A WAIVER OF TRIAL BY JURY OF ALL CLAIMS AGAINST ALL PARTIES TO SUCH ACTIONS OR PROCEEDINGS, INCLUDING CLAIMS AGAINST PARTIES WHO ARE NOT PARTIES TO THIS AGREEMENT. THIS WAIVER IS KNOWINGLY, WILLINGLY AND VOLUNTARILY MADE BY THE TRADE CONTRACTOR AND THE TRADE CONTRACTOR HEREBY REPRESENTS THAT NO REPRESENTATIONS OF FACT OR OPINION HAVE BEEN MADE BY ANY INDIVIDUAL TO INDUCE THIS WAIVER OF TRIAL BY JURY OR TO IN ANY WAY MODIFY OR NULLIFY ITS EFFECT. THE TRADE CONTRACTOR FURTHER REPRESENTS THAT IT HAS HAD THE OPPORTUNITY TO DISCUSS THIS WAIVER WITH INDEPENDENT LEGAL COUNSEL. NOTWITHSTANDING THE FOREGOING, IN THE EVENT ANY LITIGATION HEREUNDER INCLUDES THE OWNER AS A THIRD PARTY WHETHER BY IMPLEADER OR OTHERWISE, AND THE OWNER HAS NOT WAIVED RIGHT TO TRIAL BY JURY, THIS PROVISION SHALL BE DEEMED TO BE OF NO FORCE AND EFFECT.**

9.21 This Agreement and all disputes arising out of this Agreement shall be governed by (a) the law specified for such disputes in the Contract Documents, or, if none is specified, (b) the law of the place where the Project is located.

9.22 Notwithstanding the event of any claim, dispute, or other matter in question arising out of or relating to this Agreement or the breach thereof, the Trade Contractor shall carry on the work and maintain the Substantial Completion Date and the Construction Manager shall continue to make payments not subject to a bona fide dispute in accordance with this Agreement.

ARTICLE 10

CONSTRUCTION MANAGER RESPONSIBILITIES

10.1 The Construction Manager shall be bound to the Trade Contractor by the terms of this Agreement. To the extent that the provisions of the Prime Contract apply to the Work of the Trade Contractor as defined in this Agreement, the Construction Manager shall assume toward the Trade Contractor all the obligations and responsibilities that the Owner, by those documents, assumes toward the Construction Manager. The Construction Manager shall have the benefit of all rights, remedies, and redress against the Trade Contractor which the Owner, by those documents, has against the Construction Manager. Where any provision of the Prime Contract is inconsistent with any provision of this Agreement, this Agreement shall govern.

10.2 The Construction Manager shall not give instructions or orders directly to employees or workers of the Trade Contractor, except to persons designated as authorized representatives of the Trade Contractor.

ARTICLE 11

EQUAL OPPORTUNITY

11.1 During the performance of this Agreement, the Trade Contractor agrees not to discriminate against any employee or applicant for employment because of race, color, religion, sex, or national origin. The Trade Contractor will take affirmative action to ensure that applicants are employed without regard to their race, color, religion, sex, or national origin. The Trade Contractor will comply with all provisions of Executive Order No. 11246, Section 503 of the Rehabilitation Act of 1973, as Amended, the Vietnam Era Veterans' Readjustment Assistance Act of 1974, as Amended, (38 U.S.C. §§ 4212, *et seq.*) and their implementing regulations at 41 CFR Chapter 60.

11.2 The E.E.O. Certificate of Assurance (Exhibit A) is attached hereto and incorporated herein as if made a part hereof.

ARTICLE 12

ALTERATIONS

12.1 The overhead and profit allowable under this Agreement shall not exceed the overhead and/or profit markup or rate set forth in the Contract Documents applicable to Trade Contractors, and to the extent not set forth in the Contract Documents or not involving an Owner Change, then subject to the condition precedent that the Trade Contractor shall be issued a Change Order, the overhead and/or profit markup or rate shall not exceed the following amounts applied to the net increase only:

The maximum allowable mark-up for overhead is ten percent (10%) and profit is five percent (5%) for a combined total of fifteen percent (15%). The maximum allowable mark-up, inclusive of all lower tier sub-trade contractors and vendor's mark-ups, is fifteen percent (15%) total.

12.2 The requirements of Article 6.2 herein are hereby waived, Article 6.1 shall prevail. {Use if P&P bonds are required and CDI is not being used}

12.2 The requirements of Article 6.1 herein are hereby waived, Article 6.2 shall prevail. {Use if CDI is being utilized and P&P bonds are not required}

12.3 The Trade Contractor hereby agrees to defend, indemnify and hold the Construction Manager and the Owner harmless from and against any and all claims which arise out of or result from the Trade Contractor's negligence, errors, acts or omissions in the performance of the design services required under this Agreement.

12.4 In accordance with Connecticut State law, retainage shall be five percent (5%).

12.5 It is understood that certain taxes are applicable only up to specified earnings ceilings. When used in pricing changes orders, these labor rates are subject to audit to determine if those earnings ceilings have been exceeded. The Trade Contractor agrees to immediately refund to the Construction Manager any overpayment that, pursuant to an audit, has been determined to have been made by the Construction Manager to the Trade Contractor.

12.6 The Trade Contractor is required to provide Performance and Payment Bonds as described in Article 6.1 and included the cost for such bonds. {Only add if P&P bonds are required}

12.7 The builders risk policy has a deductible of $XX,XXX and Trade Contractor shall be responsible for the deductible in the event of a claim.

ARTICLE 13

COMPLETE AGREEMENT

13.1 This Agreement, together with all documents, specifications, drawings, incorporated herein by reference, constitutes the entire Agreement between the Construction Manager and Trade Contractor. There are no terms, conditions, or provisions, either oral or written, between the parties hereto, other than those contained herein. This Agreement supersedes any and all written representations, inducements, or understandings of any kind or nature between the parties hereto, relating to the particular Project involved herein.

13.2 The said parties for themselves, their heirs, successors, executors, administrators and assigns, do hereby agree to the full performance of the covenants herein contained.

13.3 All terms, conditions, stipulations, covenants, promises and agreements contained in this Agreement shall be considered severable in the event one or more of them shall be determined hereafter by a court of competent jurisdiction to be invalid. The Construction Manager and the Trade Contractor's express intent is for this Agreement, except for any portion thereof so declared invalid, to remain valid, binding and in full force. Further, to the extent the Court determines that any such term, covenant or provision, or part thereof, is invalid or unenforceable, then the Court is directed to reform such provision to provide an enforceable provision which is in conformity with the intent of the original provision and the global intent of this overall Agreement.

13.4 It is understood and agreed by both Parties that any attempt by either Party to amend, modify or change this Agreement shall not be binding or enforceable unless and until and as a condition precedent the Construction Manager has affirmatively agreed to each such modification(s) or amendment in writing by an authorized representative of the Construction Manager.

ARTICLE 14

ORDER OF PRECEDENCE

14.1 In the event of any conflict or discrepancy in the provisions of the Contract Documents, the documents shall be interpreted on the basis of the following order or priority:

.1 Agreement between Construction Manager and Trade Contractor
.2 Agreement between Owner and Construction Manager
.3 Scope Review Meeting Minutes (if any)
.4 Supplement, with later date having greater priority (if any)
.5 Gilbane Building Company Proposal Form (if any)
.6 Trade Contract Conditions
.7 Specifications
.8 Drawings, large scale details and/or schedules
.9 Drawings, small scale

ARTICLE 15

DISPUTE RESOLUTION PROCESS

15.1 Trade Contractor and Construction Manager (the "Parties") agree that any and all disputes, differences, claims, or issues arising from this Agreement or involving the Project, including further any party seeking any payment, cost, expense, compensation, loss, time, adjustment, change, request for equitable adjustment, delay, acceleration, damage, remedy, recover or relief of any type or nature shall be collectively referred to as a "Claim" in this Article of the Agreement. Trade Contractor and Construction Manager agree that any Claim shall

be subject to mediation and binding arbitration pursuant to the terms, conditions and procedures in the Dispute Resolution Process set forth in the Trade Contract Conditions incorporated into and made a part of this Agreement.

Diverse Business Participation

Name	Classification	Amount

Cost Distribution

Job	Phase/ Category Code	Description	Amount
J09547.000	00.010.020000.X TC	Existing Conditions	$0.00

Attachments

Number	Title	Date	Description

EXHIBIT A

The person(s) whose signature(s) appear(s) on the Trade Contract Agreement with Gilbane Building Company is/are authorized to sign these certificates, and to commit the Trade Contractor to all provisions within Exhibit A. Trade Contractor's failure or refusal to comply with this Exhibit A shall be considered a material breach of the Trade Contract Agreement.

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EXHIBIT A-1:

TRADE CONTRACTOR'S CERTIFICATE OF EQUAL EMPLOYMENT OPPORTUNITY COMPLIANCE

The Trade Contractor agrees and certifies, unless otherwise exempt, that it is in compliance with the applicable requirements of Executive Orders No. 11246, 11701 and 11758 as amended, or will take steps to comply with such requirements prior to acceptance of any contract or purchase order from Gilbane Building Company ("the Company"). This agreement and certificate shall form a part of, and be deemed incorporated in, each order submitted to you for services or materials exceeding the applicable amount and so long as required by Executive Orders No.11246, 11701 and 11758, as amended, and regulations issued thereunder by the Office of Federal Contract Compliance.

During the performance of this contract, the Trade Contractor agrees as follows:

1. EQUAL OPPORTUNITY CLAUSE (Applicable to contractors with $10,000 or more in contracts under Executive Order No. 11246)

1.1. The Trade Contractor will not discriminate against any employee or applicant because of race, color, religion, sex, sexual orientation, gender identity or national origin. The Trade Contractor will take affirmative action to ensure that applicants are employed, and that employees are treated during employment without regard to their race, color, religion, sex, sexual orientation, gender identity or national origin. Such action shall include, but not be limited to the following: employment, upgrading, demotion, or transfer; recruitment or recruitment advertising; layoff or termination; rates of pay or other forms of compensation; and selection for training, including apprenticeship. The Trade Contractor agrees to post in conspicuous places, available to employees and applicants for employment, notices setting forth the provisions of this nondiscrimination clause.

1.2 The Trade Contractor will, in all solicitations or advertisements for employees placed by or on behalf of the Trade Contractor, state that all qualified applicants will receive consideration for employment without regard to race, color, religion, sex, sexual orientation, gender identity or national origin.

1.3 The Trade Contractor will send to each labor union or representative of workers with which it has a collective bargaining agreement or other contract or understanding, a notice advising the labor union or workers' representative of the Trade Contractor's commitments under Section 202 of Executive Order No.11246 of September 24, 1965 and shall post copies of the notice in conspicuous places available to employees and applicants for employment.

1.4 The Trade Contractor will comply with all provisions of Executive Order No.11246 of September 24, 1965, and of the rules, regulations and relevant orders of the Secretary of Labor.

1.5 The Trade Contractor will furnish all information and reports required by Executive Order No. ·11246 of September 24, 1965, and by the rules, regulations, and orders of the Secretary of Labor, or pursuant thereto, and will permit access to its books, records, and accounts by the contracting agency and the Secretary of Labor for purposes of investigation to ascertain compliance with such rules, regulations and orders.

1.6 In the event of the Trade Contractor's non-compliance with the nondiscrimination clauses of this contract or with any of such rules, regulations, or orders, this contract may be canceled, terminated or suspended in whole or in part, and the Trade Contractor may be declared ineligible for further Government contracts in accordance with procedures authorized in Executive Order No. 11246 of September 24, 1965, and such other sanctions may also be imposed and remedies invoked as provided in Executive Order No.11246 of September 24, 1965, or by rule, regulation, or order of the Secretary of Labor, or as otherwise provided by law.

1.7 The Trade Contractor will include the provisions of Paragraphs (1) through (7) in every subcontract or purchase order unless exempt by rules, regulations, or orders of the Secretary of Labor issued pursuant to Section 204 Executive Order No.11246 of September 24, 1965, so that such provisions will be binding upon each subcontractor or vendor. The Trade Contractor will take such action with respect to any subcontract or purchase order as the contracting agency may direct as a means of enforcing such provisions including sanctions for non-compliance; providing, however, that in the event the Trade Contractor becomes involved in, or is threatened with, litigation with a subcontractor or vendor as a result of such direction by the contracting agency, the Trade Contractor may request the United States to enter into such litigation to protect the interest of the United States.

2. CERTIFICATE OF NON-SEGREGATED FACILITIES (Applicable to contractors with $10,000 or more in contracts under Executive Order 11246)

Trade Contractor does not maintain or provide for its employees any segregated facilities at any of its establishments and does not permit its employees to perform their services at any location, under its control, where segregated facilities are maintained. Trade Contractor certifies further that it will not maintain or provide for its employees any segregated facilities at any of its establishments, and that it will not permit its employees to perform their services at any location, under its control, where segregated facilities are maintained.

Trade Contractor agrees that a breach of this certification is a violation of the Equal Opportunity Clause in this contract. As used in this certification, "segregated facilities" mean any waiting rooms, work areas, rest rooms and wash rooms, restaurants, and other eating areas, time clocks, locker rooms and other storage or dressing areas, parking lots, drinking fountains, recreation or entertainment areas, transportation, and housing facilities which are segregated by explicit directive or are in fact segregated on the basis of race, creed, color, or national origin, because of habit, local custom, or otherwise.

Trade Contractor further agrees that (except where it has obtained identical certifications from proposed subcontractors for specific time periods) it will obtain identical certifications from proposed subcontractors prior to the award of subcontracts exceeding $10,000 which are not exempt from the provisions of the Equal Opportunity Clause; that it will retain such certifications in its files; and that it will forward the following notice to such proposed subcontractors (except where the proposed subcontractors have submitted identical certifications for specific time periods).

NOTICE TO PROSPECTIVE SUBCONTRACTORS OF REQUIREMENT FOR CERTIFICATION OF NON-SEGREGATED FACILITIES

A certificate of non-segregated facilities must be submitted prior to the award of a subcontract exceeding $10,000 that is not exempt from the provisions of the Equal Opportunity Clause. The certification may be submitted either for each subcontract or for all subcontracts during a period (i.e., quarterly, semi-annually, or annually).

3. AFFIRMATIVE ACTION COMPLIANCE PROGRAM (Applicable to contractors with 50 or more employees and $50,000 or more in contracts under Executive Order 11248)

Trade Contractor agrees to develop a written Affirmative Action Compliance Program for each of its establishments as required by 41 CFR 6-1.40.

4. EMPLOYERS INFORMATION REPORT (Applicable to contractors with 50 or more employees and $50,000 or more in contracts under Executive Order 11246)

Trade Contractor has filed: Standard Form 100, entitled "Equal Employment Opportunity Employer Information Report" (EEO-1); or EEOC Form 164, State and Local Government Information (EEO-4); or EEOC Form 68A and B, Elementary-Secondary Staff Information (EEO-5); or EEOC Form 221, Higher Education Staff Information (EEO-6), as required by 29 CFR 1602.3 and 41 CFR 6-1.7.

5. EMPLOYMENT OF VETERANS (Applicable to contractors with $10,000 or more in contracts under Executive Order 11701)

Trade Contractor agrees and certifies that it will comply with the requirements of 41 CFR 60-300.5(a). This regulation prohibits discrimination against qualified protected Veterans, and requires affirmative action by covered prime contractors and subcontractors to employ and advance in employment qualified protected Veterans.

6. EMPLOYMENT OF INDIVIDUALS WITH DISABIITIES (Applicable to contractors with $2,500 or more in contracts under Executive Order 11758)

Trade Contractor agrees and certifies that it will comply with the Affirmative Action Clause set forth in 41 CFR 60-741.4 to promote affirmative action in the employment and advancement of qualified individuals with disabilities. This contract clause is incorporated herein by reference.

EXHIBIT A-2:

TRADE CONTRACTOR'S ACKNOWLEDGEMENT OF GILBANE BUILDING COMPANY'S ZERO-TOLERANCE HARASSMENT POLICY

1. Trade Contractor acknowledges and understands that Gilbane Building Company does not tolerate unlawful harassment, including sexual harassment or harassment on the basis of age, citizenship status, ancestry, color, religious creed, creed, denial of family and medical care leave, disability including HIV and AIDS, marital status, including registered domestic partners, medical condition, pregnancy, childbirth and other pregnancy-related conditions, genetic information, military and veteran status, including protected veteran status, national origin, race, sex, gender, gender identity, gender expression, transgender status, sexual orientation and/or any other categories or status that are protected by applicable federal, state or local law. In addition, Gilbane Building Company will not tolerate any type of bullying and/or inappropriate conduct on the Project.

2. Trade Contractor agrees that it will not tolerate unlawful harassment, including sexual harassment or harassment on the basis of age, citizenship status, ancestry, color, religious creed, creed, denial of family and medical care leave, disability including HIV and AIDS, marital status, including registered domestic partners, medical condition, pregnancy, childbirth and other pregnancy-related conditions, genetic information, military and veteran status, including protected veteran status, national origin, race, sex, gender, gender identity, gender expression, transgender status, sexual orientation and/or any other categories or status that are protected by applicable federal, state or local law. In addition, Trade Contractor will not tolerate any type of bullying and/or inappropriate conduct on the Project.

3. Trade Contractor is obligated to uphold Gilbane Building Company's Zero Tolerance of harassment, bias and hate, including any form of vandalism, physical destruction of property, defacement in the form of any graffiti (e.g., images drawn, sprayed, or etched, stickers, non-work-related posters, etc.) on temporary facilities or in the general workplace. Graffiti that exhibits harassment, hate or intolerance that is motivated by bias against a person's race, religion, disability, sexual orientation, ethnicity, gender, or gender identity will be investigated and may be reported to the authorities for legal action where appropriate. All personnel on the Project will be required to acknowledge this policy statement as part of the Project orientation.

4. Trade Contractor understands, acknowledges and agrees that, if any of its personnel (or the personnel of any of its vendors, suppliers, subcontractors, etc.) are found to be in violation of Gilbane Building Company's Zero Tolerance policy, such personnel may be immediately removed from the work site, may no longer be permitted to work on the Project under this Trade Contract Agreement and may be permanently banned from all Gilbane Building Company projects. Trade Contractor shall not be entitled to reimbursement for any additional costs or any extensions of time due to Gilbane Building Company's enforcement of this Zero Tolerance Policy. Further, should any removed personnel bring any civil action against Gilbane Building Company, its parents or subsidiaries related to its enforcement of this policy, Trade Contractor shall be fully responsible for any such claims and shall be obligated to defend, indemnify and hold Gilbane Building Company harmless from any and all such claims.

EXHIBIT A-3:

GILBANE BUILDING COMPANY'S SUPPLIER CODE OF CONDUCT

Gilbane Building Company adheres to the highest standards of ethical and honest conduct, and we are guided by the following Core Values:

Integrity
Tough-mindedness
Teamwork
Dedication to Excellence
Loyalty
Discipline
Caring
Entrepreneurship

Likewise, we expect every subcontractor, vendor, consultant or other contractor to Gilbane Building Company (individually "you" and collectively "Supplier" or "Suppliers", each of which is deemed to include your officers, director, employees, agents and representatives and your sub-tier contractors or consultants at every level in connection with the Agreement between you and Gilbane Building Company) to do the same. Consistent with that expectation, Gilbane Building Company requires Suppliers' strict compliance with the requirements of this Supplier Code of Conduct, the terms of which are hereby incorporated by reference in your contract with Gilbane Building Company as material terms. Gilbane Building Company also requires you to incorporate this Supplier Code of Conduct in every sub-tier agreement that you execute in connection with your Agreement with Gilbane Building Company.

Reading and understanding this Supplier Code of Conduct is essential to the proper performance of your company's Agreement with Gilbane Building Company. If you believe a violation of the Supplier Code of Conduct has occurred, you have a duty to report your concerns using the procedures outlined below. All reports will be promptly investigated, and Gilbane Building Company will receive reports and hold such reports in the strictest confidence whenever possible. Gilbane Building Company prohibits retaliation against any person making a good faith report concerning matters addressed within this Supplier Code of Conduct.

There are multiple federal, state and local laws and regulations that specifically address prohibited conduct and set forth both corporate and personal sanctions for violations of those laws. Even if not expressly stated in one or more of these laws or regulations, a violation may provide the factual basis for a civil or criminal violation of one or more applicable laws, for termination of your contract for default, or for other sanctions. The Project Owner may also have contractual requirements applicable to Suppliers at the Project. Whether expressly stated or not, as between or among this Supplier Code of Conduct, the Project Owner's contractual requirements, federal state and local laws and regulations, the most stringent requirement will apply to Supplier.

You are expected to report any actual or suspected violations of the Supplier Code of Conduct. To report actual or suspected violations of this Supplier Code of Conduct, or if you have a question, you may contact the Gilbane Building Company Ethics Hotline at **1-844-240-0004** (see Section VI below for a complete listing of Toll-Free numbers available by country). To the fullest extent possible, your report will be kept in confidence.

Fundamental Principles

1.1 Safety, Environmental Protection, and Regulatory Compliance

Suppliers must comply with all environmental, health and safety laws, regulations and standards applicable to the project, job-site, or office location. It is each Supplier's responsibility to ensure that its employees and its sub-tier contractors or consultants at every level understand and comply with the laws, regulations and policies that are relevant to their specific job functions. Failure to comply with laws, regulations and standards can result in civil and criminal liability against you and/or your employees.

1.2 Quality and Truthfulness

Gilbane Building Company's clients expect and are entitled to receive work that fully complies with the contract plans and specifications. There is no place for substandard work and no tolerance of efforts to pass off substandard work as acceptable. Similarly, Gilbane Building Company's clients expect and are entitled to receive specific materials and equipment as required in the contract plans and specifications. Gilbane Building Company will not tolerate improper product substitutions or inadequate quality assurance. In addition, preparation of or use of false or fraudulent documents may be considered a crime, depending on the circumstances, and Gilbane Building Company will not tolerate such conduct by any of its Suppliers.

1.3 Drugs and Alcohol

Gilbane Building Company is committed to maintaining a drug-free work place . All Suppliers must comply with Gilbane Building Company policies and laws regarding the abuse of alcohol and the unauthorized possession, sale, and use of controlled substances. Possessing, using, selling, or offering illegal drugs is strictly prohibited under all circumstances. Likewise, Suppliers' employees are prohibited from reporting for work at any Gilbane Building Company site while under the influence of alcohol or any controlled substance.

It is essential that Suppliers' employees understand that some states may have laws that differ substantially from federal law regarding the use, possession, and sale of certain controlled substances. Gilbane Building Company meets or exceeds federal standards for controlled substances. Therefore, in jurisdictions where local law is more stringent than federal law, Gilbane Building Company will follow local law. In jurisdictions where federal law is more stringent than local law, Gilbane Building Company will comply with federal law.

1.4 Open and Fair Competition

In bidding and negotiating Government contracts, all employees must comply with Gilbane Building Company's Supplier Code of Conduct and with the spirit and intent of any applicable laws or regulations. Under the Federal Procurement Integrity Act (FPIA), no one is allowed to solicit or to receive certain proprietary information or knowingly disclose such information to any person other than one authorized by the agency head or the contracting officer to review such information.

There is a fundamental rule that must be observed without exception: Suppliers shall not seek, solicit, take, or otherwise come into possession of oral or written information that would jeopardize the integrity of the procurement process. However, this policy is not meant to discourage site visits or requests for clarifications directed to a Gilbane Building Company client prior to a bid opening or submission of a proposal.

1.5 Discrimination and Harassment

Gilbane Building Company is committed to providing equal opportunity to all qualified workers. Gilbane Building Company does not tolerate unlawful harassment, including sexual harassment or harassment on the basis of age, citizenship status, ancestry, color, religious creed, creed, denial of family and medical care leave, disability including HIV and AIDS, marital status, including registered domestic partners, medical condition, pregnancy, childbirth, and other pregnancy-related conditions, genetic information, military and veteran status, including protected veteran status, national origin, race, sex, gender, gender identity, gender expression, transgender status, sexual orientation and/or any other categories or status that are protected by applicable federal, state or local law. In addition, Gilbane Building Company will not tolerate any type of bullying and/or inappropriate conduct. Further, Gilbane Building Company will not tolerate any form of vandalism, physical destruction of property, defacement in the form of any graffiti on temporary facilities or in the general workplace. Suppliers are expected to comply with Gilbane Building Company's Zero-Tolerance Harassment Policy, which is included in this Exhibit A to your contract with Gilbane Building Company.

1.6 Combatting Trafficking in Persons and Fair Treatment of Labor

Gilbane Building Company respects and protects the rights of those who work on our projects. We provide reasonable working conditions and fair wages. The U.S. Government has a zero-tolerance policy for its contractors and their employees, which prohibits any trafficking in persons including the trafficking-related activities described in FAR 52.222-50 (collectively known as "human trafficking"). Consistent with the U.S. Government's zero-tolerance policy, Suppliers shall comply with all federal, state and local laws concerning employment and fair treatment of labor and shall not engage in any forms of prohibited human trafficking during the performance of its work, including, but not limited to (a) engaging in severe forms of trafficking in persons, (b) procuring commercial sex acts, (c) using forced labor, (d) destroying, concealing, confiscating, or otherwise denying access by an employee to the employee's identity or immigration documents, such as passports or driver's licenses, (e) using misleading or fraudulent recruiting practices, (f) charging employees recruitment fees, (g) failing to provide or pay for return transportation for employees at the end of employment (except where legally exempted), (h) providing or arranging housing that fails to meet the host country housing and safety standards, and (i) when required by law to do so, failing to provide an employment contract, recruitment agreement, or other required work document detailing the specific terms of employment in writing, in a language understandable to the employee.

In addition to the Gilbane Building Company Ethics Hotline (details below), persons reporting actual or suspected human trafficking or forced labor violations may utilize the **Global Human Trafficking Hotline at 1-844-888-FREE or help@befree.org**.

Efforts to Influence Others

2.1 Anti-Corruption Laws

Gilbane Building Company has a policy of never offering or accepting kickbacks, gratuities or bribes, whether directly or indirectly, in connection with a business transaction. Efforts to gain an improper advantage by giving or soliciting gratuities, bribes, kickbacks, meals, gifts or other things of value are improper, and Gilbane Building Company will not condone any conduct that violates this principle.

No Supplier shall offer or give a gift(s) or entertainment of any value to Gilbane Building Company clients, prospective clients or other individuals who are employees or officials of federal, state, county or municipal governmental bodies or other public agencies, public institutions or authorities, or any representatives of such public entities in connection with Gilbane Building Company work.

The Anti-Kickback Act of 1986 prohibits Suppliers and their employees from accepting, soliciting or offering "kickbacks," which generally include offering, soliciting, providing, or accepting money or anything of value to secure U.S. Government work or to receive favorable treatment in connection with prime contracts or subcontracts. It also prohibits the inclusion of kickbacks into the contract price of any U.S. Government prime or subcontract. Violations of the Anti-Kickback Act may result in criminal sanctions, fines and imprisonment, and significant civil penalties against violators.

In addition, no Supplier is authorized to offer or give money, or any other item of value to a foreign official on behalf of Gilbane Building Company. The Foreign Corrupt Practices Act of 1977 (the FCPA) prohibits offering or giving money, or any other item of value, to win or retain business or to influence any act or decision of any governmental official, political party, candidate for political office or official of a public international organization. Stated concisely, the FCPA prohibits the payment of bribes, kickbacks, or other inducements to foreign officials. This prohibition extends to payments to a sales representative or agent if there is reason to believe that the payment will be used indirectly for a prohibited payment to foreign officials. Violation of the FCPA is a crime that can result in severe fines and criminal penalties. In addition to the FCPA, the United Kingdom's Bribery Act may also be applicable to Gilbane Building Company's work overseas. Other anti-corruption and procurement integrity laws may also apply, depending on the jurisdiction.

2.2 Gifts and Entertainment

No Supplier shall give any Gilbane Building Company employee any gratuities, compensation, gifts or entertainment of more than incidental value, or any advances, loans, lavish

entertainment or substantial favors. Gifts or entertainment of more than incidental value should be considered those for which the employee would not normally be in a position to reciprocate equally under normal expense account procedures. For purposes of this provision, incidental gift or entertainment is considered to be $100 or less in value per individual occurrence. In addition, Supplier and its employees shall not perform any services at the personal homes or other properties of Gilbane Building Company employees unless such work is performed at prevailing market rates and without providing any discounts or performing any "free" work.

2.3 Political Activity

The following political activities are prohibited at Gilbane Building Company sites:

- Demonstrating;
- Circulating petitions;
- Soliciting votes or contributions;
- Conducting or participating in opinion polls;
- Fundraising;
- Posting signs in and around Gilbane Building Company offices, trailers or other Gilbane Building Company property that endorse a political candidate, political point of view or ballot initiative;
- Wearing clothing, pins, hats or similar materials that endorse a political candidate, political point of view or ballot initiative; and,
- All other political activities that are not considered part of the Supplier's normal duties[1].

Reporting of Ethics Problems

Every Supplier is responsible for reporting illegal, unethical or questionable behavior or other violations of this Supplier Code of Conduct to the Gilbane Building Company Ethics Hotline.

3.1 Gilbane Building Company Ethics Hotline

Gilbane Building Company has established an Ethics Hotline to provide a means to report concerns or to raise questions about possible ethics violations or fraud. The Gilbane Building Company Ethics Hotline service is provided by a third party, Lighthouse Services, Inc. Depending on the Supplier's location, there are multiple avenues available to report concerns, all of which are available 24 hours a day:

Toll-Free Hotline:

1.English speaking USA and Canada: 1-844-240-0004
2.Spanish speaking USA and Canada: 1-800-216-1288
3.French speaking Canada: 1-855-725-0002
4.Spanish speaking Mexico: 01-800-681-5340
5.Chinese speaking China: 400-720-9500
6.All other countries: 800-603-2869 (must dial country access code first)

Website: www.lighthouse-services.com/gilbaneco

Email: reports@lighthouse-services.com(must include Company name with report)
Fax: (215) 689-3885 (must include Company name with report)

ANONYMOUS REPORTS

Callers to the dial-in Gilbane Building Company Ethics Hotline can report their concerns or complaints anonymously if they choose to do so. Callers will be assigned a case number by which they can track the status of their reports without revealing their identities. While Gilbane Building Company encourages utilization of the anonymous reporting method, please note that, because the source of the report will remain unknown, direct follow-up with the person making the report will not be possible except through the independent third-party administered dial-in Ethics Hotline.

3.2 Protection for Whistleblowers

Gilbane Building Company prohibits retaliation against any person who, in good faith, seeks help regarding a violation of this Supplier Code of Conduct or reports known or suspected violations. Any Supplier's actual or attempted reprisal or retaliation against a reporting employee who sought help or filed a report in good faith will constitute a material breach of the Agreement by the Supplier, which could result in consequences up to and including termination of Supplier's contract with Gilbane Building Company. Supplier agrees that, in addition to its indemnification obligations contained in the Agreement, it will defend, indemnify and hold Gilbane Building Company harmless from any fines, costs, damages, penalties, attorneys' fees, and causes of action arising out of or resulting from such actual reprisal or retaliation or other employment action by Supplier or anyone for whom Supplier is responsible.

3.3 Suppliers' Duty to Cooperate

Supplier shall cooperate with Gilbane Building Company in all respects during the course of Gilbane Building Company's investigation of reports concerning actual or suspected violations of this Supplier Code of Conduct. Among other things, Supplier is expected promptly to investigate any of its employee(s) and/or its sub-tier contractors or consultants at any level upon notice by Gilbane Building Company that such employee(s) or sub-tier contractors or consultants are alleged to be the subject of an Ethics Hotline report or complaint. Supplier shall timely notify Gilbane Building Company of its investigation findings upon completion. Upon request, Supplier shall provide Gilbane Building Company with records that Gilbane Building Company deems in its sole judgment to be pertinent to the investigation, any investigation reports completed by the Supplier into the matter, and access to Supplier's employees available for interview by Gilbane Building Company's representatives. Supplier's failure or refusal to comply with this provision shall constitute a material breach of the Agreement.

Conclusion

First and foremost, when in doubt of any of the above, ask. As noted above, the specific rules related to the expected standards of conduct can be complicated. If you are not sure of the correct course of conduct, ask the authorized Gilbane Building Company representative for your Agreement or contact the Gilbane Building Company Ethics Hotline.

EXHIBIT A-4:

WORKFORCE DIVERSITY COMMITMENT

Gilbane Building Company has a long-standing commitment to building winning partnerships with the small and diverse business community. We believe in the culture of inclusion wherein the input by all leads to better outcomes. Specifically, Gilbane Building Company recognizes the importance of small, minority, women, disabled veteran, and other recognized disadvantaged business enterprises to the economics of the construction industry, the communities they serve and to our success. Gilbane Building Company is strongly committed to promoting and increasing the participation of small, minority, women, and disabled veteran business enterprises within its purchasing and contracting practices. Gilbane Building Company is proud to formalize its long-standing commitment to the development and growth of a diverse supplier base through the inclusion of trade contractors, suppliers and professional services firms from a wide variety of backgrounds. Gilbane Building Company believes being proactive in the procurement process provides the most opportunity for everyone to participate.

In witness whereof they have hereunder set their hands the day and date first above written.

Signatures

Sample Vendor
Trade Contractor

Gilbane Building Company
Construction Manager

SUPPLY BOND

KNOW ALL MEN BY THESE PRESENTS, That _____
_____(herein called Principal), as Principal, and
_____ a corporation organized and existing under the laws of the State of _____(herein called Surety), as Surety, are held and firmly bound unto Gilbane Building Company, 7 Jackson Walkway, Providence, RI 02940 (herein called Obligee), in the just and full sum of _____
_____ ($) Dollars, to the payment of which sum, well and truly to be made, the Principal and Surety bind themselves, and their respective heirs, administrators, executives, successors, and assigns, jointly and severally, firmly by these presents.

WHEREAS, the Principal has entered into a certain written contract with the Obligee dated _____,
To furnish the following briefly described supplies: _____
_____
_____
_____
which contract is hereby referred to and made a part hereof as fully and to the same extent as if copied at length herein.

NOW THEREFORE, THE CONDITION OF THIS OBLIGATION IS SUCH, that if Principal shall fully indemnify and reimburse the Obligee for any loss that Obligee may suffer through the failure of the Principal to furnish said supplies in accordance with the terms of said contract, at the time(s), and in the manner therein specified, then this obligation shall be void; otherwise it shall remain in full force and effect.

PROVIDED HOWEVER, it shall be a condition precedent to the right of recovery hereunder, that in the event of any default on the part of the Principal, a written statement of the particular facts showing the date and nature of such default shall be immediately delivered to the Surety by certified mail at its home office.

AND PROVIDED FURTHER, that no action, suit or proceeding shall be had or maintained against the Surety on this instrument unless the same be brought or instituted and process served upon Surety within six months after all the supplies that are to be furnished by the terms of said contract have been furnished; nor, in any event, shall any action, suit, or proceeding be had or maintained against Surety on this instrument, unless the same be brought or instituted and process served upon the Surety prior to the expiration of one year from the date fixed in said contract for the completion thereof.

IN WITNESS WHEREOF, the Principal and Surety have signed and sealed this instrument this ___ day of _____, 20__.

Principal _____(seal)
_____

Surety _____(seal)
_____
Attorney-in-Fact

TRADE CONTRACT
BID BOND

Bond No. _____

PRINCIPAL (TRADE CONTRACTOR):
(Name and Address)

SURETY:
(Name and Address of Surety Company Office)

CONSTRUCTION MANAGER:
Gilbane Building Company
208 New London Turnpike Glastonbury CT 06033

PROJECT: Madison New PK-5 Elementary School 180 Mungertown Road, Madison, CT
Bond Amount: (10% of bid amount)

The Trade Contractor and Surety are bound to Construction Manager in the Bond Amount set forth above, for the payment of which the Trade Contractor and Surety bind themselves, their heirs, executors, administrators, successors and assigns, jointly and severally, as provided herein. The conditions of this Bond are such that if Construction Manager accepts the bid of the Trade Contractor within the time specified in the bid documents, or within such time period as may be agreed to by Construction Manager and Trade Contractor, and the Trade Contractor either (a) enters into a contract with the Construction Manager in accordance with the terms of such bid, and gives such bond or bonds as may be specified in the bidding or Contract Documents, with a surety admitted in the jurisdiction of the Project and otherwise acceptable to Construction Manager, for the faithful performance of such Contract and for the prompt payment of labor and material furnished in the prosecution thereof; or (b) pays Construction Manager the difference, not to exceed the Bond Amount between the amount specified in said bid and such larger amount for which Construction Manager may in good faith contract with another party to perform the work covered by said bid, then this obligation shall be null and void, otherwise to remain in full force and effect. The Surety hereby waives any notice of an agreement between Construction Manager and Trade Contractor to extend the time in which Construction Manager may accept the bid. Waiver of notice by the Surety shall not apply to any extension exceeding one hundred twenty (120) days in the aggregate beyond the time for acceptance of bids specified in the bid documents, and the Construction Manager and Trade Contractor shall obtain the Surety's consent for an extension beyond one hundred twenty (120) days.

When this Bond has been furnished to comply with a statutory or other legal requirement in the location of the Project, any provision in this Bond conflicting with said statutory or legal requirement shall be deemed deleted herefrom and provisions conforming to such statutory or other legal requirement shall be deemed incorporated herein. When so furnished, the intent is that this Bond shall be construed as a statutory bond and not as a common law bond.

TRADE CONTRACTOR AS PRINCIPAL	SURETY
Company Name	Name
_____	_____
Name	Name
Title	Title
Witness:	Witness:
_____	_____

PROJECT STARTUP INFORMATION AND PROCEDURES
BILLING INSTRUCTIONS FOR TRADE CONTRACTORS
MADISON NEW PK-5 ELEMENTARY SCHOOL
EQUIPMENT & MATERIAL PRE-PURCHASE
STATE PROJECT NO. 076-0067 N
GILBANE JOB NO. J09867.000
TOWN OF MADISON BID NO. _____

Our Purchasing Department has awarded your firm a contract on the above referenced project. **Gilbane will solely use Textura Contract Payment systems to manage trade contractor pay applications and compliance documentation. Please sign up online with Textura at…** http://www.texturallc.com

In order to expedite payments and to avoid any misunderstanding as to the proper billing procedures to be followed, the following instructions shall be adhered to:

1. **The following are items that the trade contractor must comply with immediately following the contract award for issuance of payment.**

   A. Submit for approval a listing of all sub-trade contractors and major suppliers to be listed each month on the Contractor's Sworn Statement.

   B. **Schedule of Values**

   Submit for approval a detailed Schedule of Values of your Contract amount. This breakdown shall be divided into both labor and material line items for each area/scope of work in your Contract Specifications. If additional work is awarded by Change Order, each change must be broken down on a separate page of their own. Quantities shall be noted when applicable on material items. (List separate line items for: shop drawings, allowances, clean up, safety, site supervision and coordination, closeout, etc.)

   Submit first schedule of values immediately upon contract award for approval of format. Final form to be submitted on AIA form G702 and G703 through Textura Contract Payment System.

   C. Submit to both Gilbane's Purchasing Department Insurance Certification as required in your Contract and Project Specifications.

   D. Material Status Reports

   Submit initial report in format corresponding to Schedule of Values immediately upon contract award. Material Status Reports must be updated and uploaded into Textura Contract Payment System with the monthly progress applications.

   F: For Bonding Requirements, if any, please contact our Purchasing Department.

   G. Signing Authority

   Provide a letter from an Officer of the Company naming the persons within your organization that are authorized to sign Contracts, Contract Amendments, Requisitions, Sworn Statements, Waivers, Releases, Warranties, and any other documents required.

2. **Billing Instructions:**

A draw calendar will be posted in Textura and at the request of the Project Team, the pay application and all supporting documents requested for payment **MUST** be completed with Textura **no later than noon on the 20th** of each month to include work completed through the last day of that month. The application will be reviewed by the Gilbane project staff. If necessary, it will be returned for corrections.

When submitting monthly pay applications; work completed must be projected through the end of each month. **Applications posted in Textura after noon on the 20th will not be considered for payment until the following month. If the 20th of the month falls on a weekend, then the application must be posted in Textura on the Friday prior to the 20th. No exceptions will be made so please plan accordingly.**

Please note: The above dates noted for submission of monthly pay applications are subject to change once Project requirements are finalized.

When submitting monthly Application for Payment; Prime Contractor is required to fully execute and sign the following documents through Textura Contract Payment System:

1. **Contractor's Sworn Statement.** Prime contractor must list all sub-trade contractors and major suppliers working on the Project. Contractor Sworn Statement must include Total Contract or Purchase Order amount; total paid to date amount and balance amount due sub-trade contractors and major suppliers. Prime Contractor will be required to attach/upload into Textura Contractor Payment System their sub-trade contractors and major suppliers lien waivers and Union Conformation Letter.

2. **Prime Contractor Unconditional Waiver of Lien:** Textura Contractor Payment System will generate an unconditional waiver of lien document. This document must be electronically signed and submitted along with monthly Application for Payment. Textura will not release Waiver of Lien to Gilbane until payment for current application is received by Prime Contractor.

3. **Minority Business Enterprise Participation Affidavit**: Attach/upload to Textura Contractor Payment System.

4. **Material Status Report:** Attach/Upload to Textura Contractor Payment System.

5. Certified payrolls must be current, with Monthly Utilization Report for previous month. **These documents should be mailed hard copy to jobsite address**.

3. **<u>Extra Work</u>**

A. You are cautioned concerning any extra work. This department will not under any circumstances make payment to you for extra work included as part of your monthly Request for Payment unless a Contract Amendment has been issued or a separate Purchase Order written.

B. Daily Time and Material slips will be processed only ***if they are signed daily by the Gilbane Project Manager or his designee***. Original invoices for material and equipment and certified payrolls will be required as back-up to any authorized time and material work.

4. **Contract Closeout**

A. When your Contract has reached substantial completion, request for contract closeout must be made in writing to the Project Manager. Final billing must include Gilbane Building Company General Guarantee, General Release and Waiver of Lien, Final Sworn Statement, Final Subs/Supplier's Waiver with the amount paid, and Final MBE Affidavit, forms to be provided prior to contract completion by the Project Accountant These documents will need to fully executed and completed through Textura Contract Payment System.

5. **Special Note**

Under certain circumstances, the Owner, Architect or Project Specifications may require additional information from the Trade Contractor not contained in the aforementioned instructions. If this should occur, a separate instruction will be issued by this office or included as an addendum to the attached index of forms to be used on the project. Please be advised that the trade contractor shall not be compensated for such requests for additional information.

6. **Project Site Office**

New PK-5 Elementary School
180 Mungertown Road, Madison, CT 06443

7. **Contact**

Any questions relating to billings, payment, waivers, suppliers' waivers and required documents shall be addressed to:

Project Accountant

8. **Safety Requirements**

The trade contractor shall submit copies of any routine accident reports to the Construction Manager within 24 hours. Any major accident shall be reported immediately to the Construction Manager. The Safety Plan included in the bid documents shall be strictly adhered to, and the Safety Assignment Notice completed and returned to the jobsite.

9. **Stored Material**

To be eligible for payment for off-site stored materials, Trade Contractor must comply with the following:

A. Trade contractor must request to bill for stored materials at least two weeks prior to billing. Required documentation must accompany the request to ensure adequate time to schedule inspection. Required documents include:

    1. Fully executed Bill of Sale naming both Gilbane and Owner as purchasers with a guarantee of material delivery service to the project site.
        i. Schedule "A" to the Bill of Sale shall list each item for which payment is requested and must be substantiated with supplier' invoices. Store Materials must be billed at cost.
    2. Fully executed Bailment Agreement

3. "All Risk" Insurance Certificate listing "Owner and Gilbane are Loss Payees with respect to Stored Materials"
    i. Policy should have a deductible not to exceed $10,000.
    ii. Trade Contractor is responsible for the deductible.
    iii. Policy must provide a minimum of thirty (30) days' notice of cancellation to the certificate holder
4. Affirmation of Surety Company to be obtained if materials are part of a bonded contract

B. Materials must be in manufactured state and cannot be raw materials

C. Retainage on stored materials will be in accordance with contract terms

D. Provide access for Gilbane representative to inspect "off-site" stored materials and verify requirements of the Bill of Sale and Bailment Agreement.

10. **MBE/EEO Utilization Reports**

Gilbane will monitor actual performance regarding the Projects M/WBE and EEO goals through the utilization of various reports provided by the Trade Contractors. These reports will be required as a condition for payment to the Trade Contractor.

Requirements

A. Remittance of Daily Force and Activities Reports which identified the number, trade classification and equal opportunity code (EQC) for every employee and the respective totals for each through SmartApp online system.

B. Minority Business Enterprise Participation Affidavit form (attached) must be submitted monthly with Contractor's Sworn Statement and Subs/Supplier's Waivers along with the Requisition.

11. **Project Startup Information**

A. Project Mailing Address/Delivery Address:

New PK-5 Elementary School
ATTN: Gilbane Building Company
180 Mungertown Road, Madison, CT 06443

B. Subcontractor Coordination Meetings as determined by the Project Manager.

C. Material Deliveries -- Coordinate with the jobsite.

D. **Shop Drawings/Submittals** -- Quantities and format is described in the General Conditions.

E. MSDS Information must accompany all material deliveries in accordance with the Hazard Communication Program.

F. Material Status Reports are required every month with billing. If they are not submitted, the requisition will not be accepted.

If you have any questions as to the proper execution or use of these forms or any questions concerning these instructions, do not hesitate to contact the Project Accountant.

By earnestly following these instructions, a significant contribution will be made to the success of the project to the benefit of all concerned.

Very truly yours,

GILBANE

Project Accountant

Gilbane Building Company
Materials Status Report

Project: **Madison New PK-5 Elementary School** **Job Number:** **J09867.000** **Page:** _____

Trade: _____ **Subcontractor:** _____

#	SUBCONTRACTOR OR SUPPLIER Phone Number:	MATERIAL	P.O. No.	DATE	SHOP DRAWINGS		DELIVERY		REMARKS
					Submitted	Approved	Promised	Required	
	Ph:								
	Ph:								
	Ph:								
	Ph:								
	Ph:								
	Ph:								
	Ph:								
	Ph:								

CONTRACTOR'S SWORN STATEMENT

State of _____

County of _____ SS.

To all whom it may concern

_____ of City of _____ County of _____, and State of _____, being duly sworn, deposes and says that he is the _____ of the _____ hereinafter called the Contractor; and being duly authorized makes this statement its behalf; that the Contractor in the performance of a certain contract dated _____ with _____ (Owner) for the _____ (Work), Architect/Engineer's Job No._____, furnished labor or materials or both, supervision of construction or alteration, and/or otherwise in connection with the site development and/or the erection and construction of a certain building or buildings, structures and installations situated on the following property, viz: _____ in the City of _____, County of _____, State of _____; that the following are the names of every person, firm or corporation furnishing material to, and of every unpaid laborer of and of every Subcontractor for, said Contractor in connection with said contract, and that the amounts due or to become due to such Subcontractors, persons, firms, corporations, laborers and others, for work done and materials furnished to the date of _____ are fully and correctly set forth opposite their names respectively; and that all other statements herein contained are true and correct.

SUBCONTRACTS

Name	Total Net Amount of Subcontract	Total Net Amount Earned to Date	Total Paid	Amount Included in This Application

MATERIALS

Name	Purchase Price of Material Furnished	Paid	Balance

LABOR

Name	Amount Due

Any deponent further says that the Contractor ____ has ____ not employed, or procured material from, or subcontracted with, any person, firm or corporation other than those above mentioned, for labor or material for said building, other than the sums above set forth.

_____

Subscribed and sworn to before me this _____ day of _____ A.D. 20____.

_____

Notary Public in and for _____ County.

My commission expires _____

SUB-SUB WAIVER OF LIEN
(Interim)

I, the undersigned, being a duly authorized Agent/Officer of the company stated below, do hereby affirm that all bills against _____ for labor, materials, services, etc. provided to said Company for **Gilbane Building Company's** project entitled **Madison New PK-5 Elementary School Project** have been fully paid covering work completed through period ending _____ and our right of lien is hereby waived.

_____
(Company)

_____
(Signature)

_____
(Title)

Sworn to and subscribed before me this

_____day of_____20_____.

My commission expires_____

Given under my hand and notarial seal this

_____day of _____20_____.

_____
Notary Public
(SEAL)

SUPPLIER'S WAIVER OF LIEN
(Interim)

I, the undersigned, being a duly authorized Agent/Officer of the company stated below, do hereby affirm that all bills against _____ for materials, services, etc. provided to said Company for **Gilbane Building Company's** project entitled **Madison New PK-5 Elementary School Project** have been fully paid covering work completed through period ending _____ and our right of lien is hereby waived.

_____
(Company)

_____
(Signature)

_____
(Title)

Sworn to and subscribed before me this

_____day of_____20_____.

My commission expires_____

Given under my hand and notarial seal this

_____day of _____20_____.

_____
Notary Public
(SEAL)

Madison New PK-5 Elementary School
State Project No. 076-0067 N
Gilbane Job No. J09867.000

Diverse Business Enterprise Participation Monthly Affidavit

This form shall be completed and submitted monthly during the requisition process as a condition of payment. Please note that these figures will be verified with the Diverse Business Enterprise(s) identified. If there are outstanding issues that result in a failure to meet the contractual Participation Amount, please indicate in the "Explanation" column, and attach supporting documentation for same. Also note that copies of invoices and cancelled checks for payment to all Diverse Business Enterprise(s) are required.

Month / Year: [_____]
Prime Trade Contractor Name: [_____]
Prime Trade Contract – Original Contract Amount: [_____]
Prime Trade Contract – Participation Amount: [_____]
Prime Trade Contract – Revised Contract Amount (w/ Change Orders): [_____]
Prime Trade Contract – % Complete: [_____]

Diverse Business Enterprise Name	Diverse Business Enterprise Original Contract Amount	Change Orders To Date	Revised Contract Amount	% Complete To Date	Amount Paid To Date	Balance Amount Due	Retainage %	Retainage Amount	Explanation

I declare, under penalty of perjury, that the information provided in this verification form and supporting documents is true and correct.

Prime Trade Contractor – Signature: _____

Prime Trade Contractor – Printed Name: [_____]
Date: [_____]

Diverse Business Enterprise Participation Monthly Affidavit

NOTARY CERTIFICATE

Sworn before me this [ ] day of [ ], 20[ ].

Notary Signature: _____

Commission Expires: [ ]

Diverse Business Enterprise Participation Monthly Affidavit

BILL OF SALE OF PERSONAL PROPERTY

KNOW ALL MEN BY THESE PRESENTS, THAT, _____ for and in consideration of the sum of _____ and other good and valuable consideration, upon the receipt of payment of which, the Undersigned ("Seller") does by these present GRANT, BARGAIN, AND SELL unto _____ ("Purchaser") the goods and chattels located at _____ as described on Schedule "A" attached hereto and by this reference made a part of hereof (the "Property").

IN CONSIDERATION OF THE FOREGOING AND THE COVENANTS HEREIN CONTAINED, SELLER AGREES AS FOLLOWS:

1. Seller does hereby covenant and warrant to the Purchaser that Seller is the lawful owner of the Property; that the Property is free from all liens and claims whatsoever; that Seller has good right to sell the same; that Seller will warrant and defend same against the claims and demands of all persons.

2. Seller will provide safe and proper storage for the Property and will cause to be placed conspicuously and securely on the Property a sign or signs which will show that the Property is the property of the Purchaser.

3. The Property shall be held at Seller's risk, and shall be kept insured against fire, theft and all other hazards by Seller at Seller's expense while its custody or control in an amount equal to the replacement cost thereof, with loss payable to Purchaser. Copies of certificates evidencing such insurance will be furnished to Purchaser.

4. The Purchaser shall have the right to inspect the Property at any time during normal business hours at the storage facilities of the Seller. The failure to inspect shall not be deemed a waiver of any of the rights of the Purchaser, and if the Property is found to be defective, in materials or workmanship, stolen or lost, in whole or in part, the Seller shall replace the same at its own cost.

5. The Property shall be subject to removal by Purchaser, at any time upon Purchaser's instructions.

6. Seller does hereby warrant to purchaser that the value of the property described herein is $_____.

FURTHER
IN WITNESS WHEREOF, The Undersigned has set his hand this _____ day of _____, 20___.

SELLER:_____
(TITLE)

WITNESS:

_____

State of _____

County of _____

This is to certify that _____, personally known to me to be the same person whose name subscribed to the foregoing Bill of Sale appeared before me, _____, a notary public, this _____ day of _____, 20_____ and expressly acknowledged to me that the execution of said foregoing Bill of Sale is his free and voluntary act.

My Commission expires: _____

SCHEDULE "A" OF BILL OF SALE

Date: _____
Contractor's Name: _____
Bid Package #: _____
Project Title: _____

The following material has been manufactured or purchased by _____, is specifically intended for use on _____ and is stored at _____.

The total value of the material is $_____.

DESCRIPTION	NUMBER	VALUE	DATE MOVED "ON-SITE"

Notary signature: _____

Date: _____ My Commission Expires: _____

ORACLE

Oracle's Textura Payment Management: Work Faster and More Efficiently

What Is Textura Payment Management (TPM®)?

Oracle's TPM is an Internet-based construction invoicing and payment solution. With the TPM system, subcontractors can electronically sign and submit their pay applications—including invoices, sworn statements, and conditional and/or unconditional lien waivers. Payments are made electronically via ACH (Automated Clearing House) resulting in faster access to your funds. In addition, TPM facilitates submission and tracking of compliance documents and sub-tier waivers. In short, TPM has revolutionized the construction payment process. Thousands of subcontractors currently use TPM to submit their pay applications every month.

Sign Pay Applications and Submit Electronically

TPM automatically generates the required Pay Application documents and transmits them to your GC electronically at the click of a button.

- Invoices are created by simply entering a percent complete or dollar value by line item of your budget
- Electronic submission of documents eliminates the expense and inconvenience of fax or hand delivery
- Invoice amounts are verified with lien waiver and payment amounts, reducing the risk of error

Receive Payments via ACH

TPM uses the secure ACH network for electronic deposit of funds to accelerate draw payments.

- ACH will deliver funds faster than a manual check. Payments are made through TPM directly by the GC and are subject to the terms of your contract.
- ACH works like direct deposit. Funds are immediately available, no waiting for checks to clear.
- TPM alerts you via email that payment has been disbursed.

Know What is Happening, When It Happens

TPM offers complete visibility throughout the draw process and notifies users of critical events.

- Receive real-time notifications when a draw is opened, change order issued, payment disbursed, etc.
- Receive email reminders to update expiring insurance documents and notification of non-compliance.
- Online invoice approval and rejection ensures that both parties are informed of final invoice amounts.

Manage Documents Online

Project documents created in or uploaded to the system are available for viewing, printing or downloading to your computer. TPM will store these documents for a minimum of ten years.

- Pay Application backup documents are submitted quickly and easily via an upload attachment feature.
- Electronic submission & tracking of legal documents such as insurance certificates reduces payment holds.
- Possibility for lost or delayed documents resulting in held payments is virtually eliminated

What Does It Cost to Use TPM?

0.22 % of contract value*

- Maximum – $5,000
- Sub-tier subcontractors – $100

Payment Methods

- ACH (default) or Credit Card

**Plus applicable taxes*

Technical Requirements:

TPM is completely web-based- there is no software to install. Users need only:

- Internet access (high-speed recommended)
- Email access for each user
- Adobe Acrobat Reader 6.0 or higher (free download)

Free Training & Support:

Our Training Supports your training needs with:

- Free webinars
- Individual training by phone
- Training videos
- Live in-app chat

Support representatives are available to answer your questions at 866 -TEXTURA (866-839-8872).

BAILMENT AGREEMENT

This BAILMENT AGREEMENT (the Agreement") is entered into on _____ ,_____, between GILBANE BUILDING COMPANY ("Gilbane"), located in _____, and _____ ("Bailee"), located at _____.

I. GENERAL

A. Gilbane and Bailee have entered into this Agreement to have Bailee hold Gilbane's property for purposes of construction and construction-related activities in accordance with the requirements of Bailee's Subcontractor Number with Gilbane for the Project known as _____ (the "Project").

B. All Services performed by Bailee under this Agreement shall be in the capacity of independent contractor and not as agent of Gilbane.

II. ITEMS TO BE STORED

A. Bailee will hold for Gilbane as Stored Items, those items indicated on the attached Schedule "A" of the Bill of Sale purchased by Bailee on Gilbane's behalf pursuant to the specifications in Subcontract Number _____.

B. Bailee shall be responsible for the security and condition of the Stored Items until such items have been delivered to the Project site and have been inspected and accepted in accordance with Subcontractor Number _____.

III. MANNER OF STORAGE

A. Bailee will hold the Stored Items at the following premises: _____, located at _____
_____,
in the manner specifically outlined below. Gilbane or the Architect (or their respective representatives) may periodically inspect the Stored Items to determine that the manner of storage complies with the requirements set forth below Gilbane or the Architect (or their respective representatives) will not be required to give Bailee any notice of when an inspection will occur; Bailee agrees to permit immediate entry to the premises for inspection during normal working hours.

B. The Stored Items shall be stored in discrete locations at the Bailee's premises. The location of these discrete units shall be reported to Gilbane on a monthly basis. All Stored Items shall be marked as required in Section IV below. Stored Items shall be stored indoors, or if outdoors, on dunnage and protected in whatever manner is required to preserve their quality and condition. Bailee will carry out all additional

instructions given by Gilbane or the Architect (or their respective representatives) with respect to the manner of storage during any inspection of the Stored Items.

IV. TITLE AND APPROPRIATE MARKINGS

A. Gilbane retains title to all the Stored Items while such items are within Bailee's possession, custody or control pursuant to this Agreement.

B. Each item/piece/container of Stored Material shall bear the following notation "Property of GILBANE BUILDING CO, *Madison New PK-5 Elementary School."*

C. The area in which the items are stored shall be posted with signs at obvious locations reading as follows:
"The Stored Material in this area is the property of GILBANE BUILDING CO, *Madison New PK-5 Elementary School."*

D. The notations required by IV B and IV C shall be applied by paint (or by any other method that is weatherproof and will withstand exposure to the elements for up to two years) such that all markings remain legible. The method of marking shall be approved by Gilbane.

V. DURATION

This Agreement shall terminate when all the Stored Items have been delivered to the Project Site and are accepted in accordance with Subcontractor Number _____.

VI. ASSIGNMENT

A. This Storage Agreement may not be assigned by Bailee and any act by Bailee purporting to effect an assignment shall be void and of no effect.

B. This Storage Agreement may be assigned by Gilbane to any person who succeeds to Gilbane's interest in the Project. In the event of such assignment, this Storage Agreement shall vest in Gilbane's assignee, who all assume Gilbane's obligations hereunder; and Bailee shall continue to be bound by its terms.

VII. INSURANCE

Bailee shall bear all risk of loss with respect to the Stored Items for duration of this Agreement. Bailee will provide Gilbane with a Certificate of Insurance certifying that Bailee's All Risk Insurance covers the Stored Items to their full invoiced value wherever located until the items become subject to The Project Sites All Risk Insurance Policies.

VIII. ENTIRE CONTRACT

This Agreement complements Subcontractor Number _____ and may not be changed, modified or discharged except by written instrument, duly executed by each party.

IX. GOVERNING LAW

This Agreement shall be governed by the law of the State of the State in which the Project is located.

IN WITNESS WHEREOF, this Agreement has been executed this _____ day of _____, _____.

ATTEST:

By:_____

GILBANE BUILDING COMPANY

By:_____
_____

ATTEST:

By:_____

[Bailee]

By:_____
_____

Gilbane

Trade Contract Conditions

Madison New PK-5 Elementary School

J09867.000

180 Mungertown Road

Madison, CT 06443

Table of Contents

These Trade Contract Conditions are intended to supplement the Trade Contract Agreement; however, should any of the terms, provisions or conditions set forth in these Trade Contract Conditions be deemed to be in conflict or inconsistent with any term, provision or requirement set forth in the Trade Contract Agreement, then it is understood, acknowledged and agreed that the terms, provisions and conditions in the Trade Contract Agreement shall take precedence, control and govern.

In the event of a conflict between the Prime Contract (including its General Conditions, if any) and these Trade Contract Conditions, the more stringent shall apply.

Article 1 – General Definitions

In the event of a conflict between any of the definitions in this Article 1 and any of the definitions contained within the Contract Documents, the definitions in the Contract Documents shall control.

1.1 "Provide", or "perform": To supply, install and connect, complete and ready for safe and regular operation of particular work referred to unless specifically noted otherwise.

1.2 "Furnish only", “furnish” or “supply”: to purchase, procure, acquire and deliver complete with all related accessories to the site or other designated location and transfer to others for installation.

1.3 "Install": To receive, unload, distribute, construct, erect, mount, and connect complete with related accessories.

1.4 "Product": The term “product” shall include materials, equipment and systems.

1.5 “Approval”: where required for an item, shall be obtained from the Architect through the Construction Manager in writing.

1.6 “As Indicated”: The term “as indicated” shall mean a reference to example details, notes, or schedules on the drawings, other paragraphs or schedules in the Specifications, and similar requirements in the Contract Documents to define the Work and is not meant to limit the scope. Where terms such as “Shown”, “Noted”, “Scheduled”, and “Specified” are used instead of “Indicated”, it is for purpose of helping the reader accomplish the reference, and no limitation of location is intended except as specifically noted.

1.7 “Suitable”, “reasonable”, “proper”, “correct” and “necessary”: Such terms shall mean as suitable, reasonable, proper, correct, or necessary for the purpose intended as required by the Contract Documents, subject to the judgment of the Architect or the Construction Manager.

1.8 “Including”, “Such as”: The terms “including” and “such as” shall always be taken in most inclusive sense, namely, “including, but not limited to”, and “such as, but not limited to”.

1.9 “Option”: The term “option” shall mean a choice from the specified products or procedures, which shall be made by the Trade Contractor. The choice is not “whether” the work is to be performed, but “which” product or “which” procedure is to be used.

1.10 “Exposed”: The term “exposed” shall mean any item or surface, exterior or interior, which can be seen by a person outside the building or seen by a person inside any usable space within the building during normal activity.

1.10.1 Mechanical and electrical rooms, air handling rooms, storage rooms and penthouses shall be considered to have exposed surfaces, as shall the mechanical and electrical construction within them.

1.10.2 The interiors of closets and alcoves shall be considered exposed surfaces and shall be finished to match the finish of the adjoining room or space, unless another finish is shown.

1.10.3 The interiors of cabinets shall be considered exposed, but a finish different from that of the exterior may be permitted or required.

1.10.4 Spaces which are not normally occupied or used by occupants or building staff, such as, shafts, hoist ways, tunnels, ceiling plenums, attics, and crawl spaces shall be considered “concealed” spaces, unless finishes are shown or specified for their surfaces.

1.11 “At no additional cost”: The term “at no additional cost” shall mean at no additional cost to the Owner, the Architect, or the Construction Manager, and that all such costs are included in the Trade Contract amount.

1.12 “Testing Laboratory”: An independent entity engaged to perform specific inspections or tests of the Work, either at the project site or elsewhere; and to report and interpret the results of those inspections or tests.

1.13 Unless specifically noted otherwise in the contract documents, the term “overhead” as used in Article 12.1 of the Trade Contract and elsewhere with similar meaning shall be understood to include but not necessarily be limited to the following:

1.13.1 Salaries, fringes and other compensation of the Trade Contractor’s personnel stationed at the Trade Contractor’s principal office or offices other that the project site office.

1.13.2 Salaries, fringes and other compensation of the Trade Contractor’s personnel stationed at the project in “non-working” supervisory and/or administrative roles.

1.13.3 Expenses of the Trade Contractor’s principal office and offices including the project site office. These expenses include, without limitation, heat, light, power, stationery & supplies, postage & shipping, office equipment (fax, telephone, copiers, computers, printers, software, furniture, radios, telephones, parking, all company vehicles, etc.), lease line cost, drinking water, coffee, first aid, shop drawings, submittals, samples, as-built drawings, blueprinting, photocopying, record storage, trailers.

1.13.4 Trade Contractor’s capital expenses including interest on the Trade Contractor’s capital employed for the Work.

1.13.5 Penalties, fines, and costs imposed by governmental authorities in connection with or resulting from any violation of, or noncompliance with laws, regulations, codes, ordinances or directives.

1.13.6 The cost of small tools (valued at $250 or less per unit purchase price) and associated consumables.

1.13.7 Incidentals.

1.14 “Submittals” include, but are not limited to, Shop Drawings, Product Data, Samples, Mock-ups, Benchmarks, Warranty, Maintenance Manuals, Waivers, and Releases.

1.15 “Drawings” are drawings, diagrams, schedules and other data categorized as the following:

1.15.1 “Design Drawing”: are drawings, diagrams, schedules and other data specifically prepared by a discipline of the design team, stamped and sealed by the Designer of Record, as a representing the design intent.

1.15.2 “Coordination Drawing”: drawings showing work with horizontal and vertical dimensions required to avoid interference with structural, framing MEP rough-ins, fire protection, elevators, adjacent Trade Contactor’s scope of work, and other thru floor and wall penetrations.

1.15.3 “Shop Drawing”: are drawings, diagrams, schedules and other data specifically prepared for the Work by the Trade Contractor or any Trade-Subcontractor, manufacturer, supplier or distributor to illustrate some portion of the Work.

1.16 "Product Data" are illustrations, standard schedules, performance charts, instructions, brochures, diagrams and other information furnished by the Trade Contractor to illustrate a material, product or system for some portion of the Work.

1.17 "Samples" are physical examples, which illustrate materials, equipment or workmanship and establish standards by which the Work will be judges, but not used in the actual Work.

1.18 A "Request for Information" (RFI) means a written request to obtain information not contained, or inferable from, the Contract Documents. An RFI form will be used to obtain clarifications of the content or intent of drawings or specifications issued by the Design Engineer. The Request for Information creates a written record of the question and the response.

1.19 "Mock-ups" are full-size, unless noted otherwise, models of a structure, component or assembly used for demonstration, study, or testing prior to commencing full production. Mock-ups are not incorporated into the actual Work.

1.20 "Benchmarks" are portions of the actual Work in place used to establish a standard of measurement, evaluation or quality. Furnish complete as-built drawings, operating and maintenance manuals, spare parts, attic stock and other required close-out information or materials no later than 30 days prior to substantial completion. Perform training of Owner's personnel prior to beneficial occupancy.

1.21 "OEM" means Original Equipment Manufacturer.

1.22 "Maintained assets" means items on drawings or specification documents that require the submittal of electronic data. Such asset data include but are not limited to doors, escalators, elevators, plumbing fixtures, air handling units, fans, pumps, heat exchangers, boilers, chillers, compressors, exhaust hoods, kitchen equipment, sub-stations, switchgear, transformers, panels, motor control centers, emergency generators, fire alarm systems, fire pumps, biomedical equipment, laboratory equipment, hospital gas systems, roofing system, security systems, cameras, badge readers, computers, and vehicles. Bulk and general construction items such as concrete, structural steel, siding, casework, and wall, floor or ceiling materials will not be included with the exception of roofing, or any other element requiring routine or scheduled periodic maintenance in accordance with the manufacturer's written recommendations.

1.23 "Electronic Documentation" means software-based originals of hard copy documents resident in formats such as word processing, spreadsheet, graphic, or read-only applications.

1.24 "Electronic Data" means information elements of measurable, extractable, and/or sortable value. This information will typically be delivered in spreadsheets, database tables, or, in less typical cases, tables within word processing documents.

Article 2 – Construction Manager's Right to Reject

2.1 The Construction Manager shall have the authority to reject Work which does not conform to the Contract Documents and to require any special inspection and testing in accordance with the Contract Documents.

2.2 The Construction Manager may reject any means, methods, techniques, sequences or procedures proposed by the Trade Contractor which might constitute or create a hazard to the Work, or to persons or property, or which will not provide Work in accordance with the Contract Documents.

Article 3 – Supervision and Construction Procedures

3.1 The Trade Contractor shall supervise and direct the Work, using his best skill and attention. He shall be solely responsible for all construction means, methods, techniques, sequences and procedures and for coordinating all portions of the Work under the Trade Contract subject to the overall coordination of the Construction Manager.

3.2 The Trade Contractor shall be responsible to the Owner and the Construction Manager for the acts, omissions, materials and work of his employees and all his Trade-Subcontractors and their agents and employees and other persons performing any of the Work under a contract with the Trade Contractor.

3.3 Observations, inspections, tests or approvals by persons other than the Trade Contractor shall not relieve the Trade Contractor from his obligations to perform the Work in accordance with the Contract Documents.

3.4 The Trade Contractor shall do and be responsible for the correct laying out of the Work as per Contract Documents from control established by others including all necessary leveling and checking. The Trade Contractor shall periodically check the established base lines and benchmarks, and shall lay out all partition lines and other significant reference lines or points which will enable them to accurately place their boxes, openings, sleeves, conduits, pipe, duct, controls, hangers, inserts and other devices. Trade Contractor shall be responsible for laying out his Work from these reference points. The Trade Contractor shall also make all field measurements required for the work.

3.5 Trade Contractor shall study and compare the Contract Documents, materials and other information provided by the Owner and Construction Manager and shall take field measurements of any existing condition related to the Work, observe any conditions at the site affecting the Work and report promptly any errors, inconsistencies or omissions discovered.

3.6 Claims for Concealed or Unknown Conditions: If conditions are encountered at the site which are (1) subsurface or otherwise concealed physical conditions which differ materially from those indicated in the Contract Documents or (2) unknown physical conditions of an unusual nature which differ materially from those ordinarily found to exist and generally recognized as inherent in construction activities of the character provided for in the Construction Documents, then the observing party shall give notice to the other party promptly before conditions are disturbed and in no event later than two (2) days after first observance of the conditions.

3.7 Any requests for pricing or proposal responses from the Construction Manager throughout the duration of the Project shall be responded to, in writing, by Trade Contractor within five (5) business days. Trade Contractor's response to Construction Manager's request for a price or a proposal shall include a complete justification and backup materials for such price or proposal within said five (5) business days, unless agreed otherwise by Construction Manager. Failure to timely, fully and properly respond and provide such price, proposal and supporting information shall be deemed a breach of the Trade Contract Agreement. Under no circumstances shall the Trade Contractor price or proposal be deemed accepted or be deemed a change unless and until Trade Contractor has strictly complied with terms and conditions for Changes of the Trade Contract Agreement. Further, under no circumstances shall Trade Contractor markup the price or proposal with rates that are higher than are permitted under the terms of the Trade Contract Agreement.

Article 4 – Labor and Materials

4.1 The Trade Contractor shall at all times enforce strict discipline and good order among his employees and shall not employ on the Work any unfit person or anyone not skilled in the task assigned to him. Harassment, offensive language and/or physical altercations will not be permitted on the grounds. Violation will be cause for immediate debarment from the site, and Trade Contractor shall be liable for the violations of its employees and its Trade- Subcontractor at any tier. Workers shall be courteous and professional in manner while on the premises.

4.2 The Trade Contractor shall accept delivery, unload, store, protect, provide security, distribute, install and clean any materials, systems and equipment furnished by others which are a part of the Work. The Trade Contractor shall document receipt of such materials, systems and equipment on forms acceptable to the Construction Manager.

4.3 Whenever the Trade Contractor has knowledge that any actual or potential labor dispute is delaying or threatens to delay the timely performance of the Work of this Agreement, the Trade Contractor shall immediately give notice thereof to the Construction Manager. The Trade Contractor shall then confirm the notice, in writing, within twenty-four (24) hours of the giving thereof and shall include all relevant information with respect thereto. No claims will be accepted for costs incurred as a result of labor disputes.

4.4 Trade Contractor shall be responsible for employing skilled and competent personnel and Trade-Subcontractors whom will work compatibly with all other Trade Contractors and all other subcontractors and suppliers at the work site and who will comply with all rules established for work at the site including but not limited to rules regarding reserved gate site access and site visitation. There shall be no manifestations on the site of any dispute between any labor organization and the Trade Contractor or its Trade-Subcontractors. Trade Contractor agrees to employ workers, agents, suppliers and Trade-Subcontractors who will perform the work under this Agreement whether or not other employees or workers on the site are members or non-members of any labor or collective bargaining organization. Trade Contractor acknowledges that a project site dual gate system may need to be implemented by Construction Manager and will follow all directives in the use of the dual gate system.

4.5 Trade Contractor shall provide to Construction Manager, in writing, the business name, business address for each and every Trade-Subcontractor, supplier or vendor performing work at the Project. Such information must be provided to Construction Manager no later than ten (10) days after entering into a contract with such subcontractors, suppliers, or vendors; or within (3) business days before such Trade-Subcontractor, supplier or vendor provides labor, materials or services at the Project or as otherwise requested by Construction Manager, whichever occurs first. Trade Contractor's failure to comply with this Section shall constitute a material breach of this Agreement.

4.6 Trade Contractor agrees not to participate in or permit any cessation of Trade Contractor's Work which is a result of any labor dispute, regardless of whether said labor dispute involves Construction Manager, Trade Contractor or any other employer on the project. If, for any reason, there is a work stoppage, picketing, boycott, violation of work site rules or any other interference with the work by employees of Trade Contractor, its Trade-Subcontractors or their agents or suppliers, which in the sole judgment of Construction Manager will cause or is likely to cause a delay in the progress of construction, then upon forty-eight (48) hours written notice, delivered either in hand, by electronic mail, by overnight carrier (e.g., Federal Express or UPS), or registered mail, Construction Manager shall have the right to declare Trade Contractor in default of the Trade Contract Agreement and upon the giving of such notice, Construction Manager shall have the right to take those steps which it is afforded by this Agreement and by Law. In such event, Construction Manager may require Trade Contractor to provide as-built reproducible drawings or electronic files at Trade Contractor's expense with forty-eight (48) hours' notice. In such an eventuality, any costs to complete the work of Trade Contractor which exceed the unpaid balance of the Contract Price, shall be paid to Construction

Manager along with reasonable attorney's fees within thirty (30) days after presentation of documented written demand for such excess has been made upon Trade Contractor by Construction Manager.

Article 5 – Superintendent and Key Personnel

5.1 The Trade Contractor shall employ a competent superintendent and/or Lead Foreman and necessary assistants to coordinate all the Trade Contractor's work force including Trade-Subcontractors, who shall be in attendance at the Project site during the progress of the Work. Construction Manager has the right, in Construction Manager's sole discretion, to require the removal and replacement of any of Trade Contractor's or any of its Trade-Subcontractor's personnel without liability to Trade Contractor. Construction Manager may exercise such right of removal by written notice to Trade Contractor, and Trade Contractor shall immediately comply. The superintendent shall be satisfactory to the Construction Manager, and shall not be changed except with the consent of the Construction Manager, unless the superintendent proves to be unsatisfactory to the Trade Contractor or ceases to be in his employ. The superintendent shall represent the Trade Contractor and all communications given to the superintendent shall be as binding as if given to the Trade Contractor and has the authority to make commitments on behalf of the Trade Contractor with regard to cost, schedule and manpower issues. All communications shall be confirmed in writing upon request.

5.2 A duly authorized representative of the Trade Contractor shall be available for emergency telephone communication from the Owner or Construction Manager on a twenty-four (24) hour basis, seven (7) days a week during the performance of the work. His or her emergency contact information shall be provided to the Construction Manager within ten (10) days of contract execution.

5.3 The Trade Contractor shall identify the key personnel he intends to assign to the project to the Construction Manager within forty-eight (48) hours after the Trade Contractor has been notified to proceed. The Construction Manager reserves the right to approve the Trade Contractor's proposed personnel, and anyone not so approved shall be immediately replaced with someone acceptable to Construction Manager. If, in the course of construction, the Construction Manager feels that it would be in his best interest to request a change in the Trade Contractor's personnel, he may do so; and, the Trade Contractor shall immediately assign an acceptable replacement at no additional cost.

5.4 To ensure a safe working environment and the effective coordination of the work, the Trade Contractor's superintendent must be able to effectively communicate both orally and in writing with the Construction Manager's project staff and the workforce under the superintendent's control.

Article 6 – Drawings and Specifications at the Site

6.1 The Trade Contractor shall maintain at the site a set of all Drawings, Specifications, Addenda, Bulletins, Proposal Requests, Trade Contract Change Orders and other Modifications, in good order and marked currently to record all changes made during construction, including any changes in locations, sizing and arrangement of the various components of the Work or any other variations from the Drawings or Shop Drawings. The Trade Contractor shall mark each drawing as the Work shown thereon is completed in the field, revising any or adding lines, dimensions, elevations, depths, notes or any other information required to accurately record "As-Built" conditions. These Drawings, marked to record all changes during construction, and approved Shop Drawings, Product Data and Samples shall be delivered to the Construction Manager upon completion of the Work.

6.2 In addition to maintaining and delivering to the Construction Manager those record Drawings required by this Article and the Contract Documents, the Trade Contractor shall also prepare and submit to the Construction Manager, upon substantial completion of the Trade Contractor's Work, "As-Built" Drawings in the format as required by the Contract Documents.

Article 7 – Communications

7.1 Written notice shall be deemed to have been duly served if delivered in person to the individual or member of the firm or entity or to an officer of the corporation for whom it was intended, or if delivered at or sent by email, registered or certified mail to the last business address known to him who gives the notice.

7.2 The Construction Manager may call for meetings of the Trade Contractors, Trade-Subcontractors, and material suppliers as it deems necessary for the proper coordination of the work. Project manager, superintendent and / or foreman and any additional persons with appropriate expertise according to the subject matter shall attend meetings. The person(s) must be knowledgeable of the material status, schedule durations and work activities of all of their work at the project site including the work of their Trade-Subcontractors and empowered to make binding commitments on behalf of the Trade Contractor and its Trade-Subcontractors. Such meetings shall be held at the jobsite on regular working days during regular working hours. The Trade Contractor and Trade-Subcontractors may be required to attend meetings before and/or after their mobilization on the project site. Meeting participation requirements are not limited to the Trade Contractor's mobilization period. Unless otherwise directed by the Construction Manager, attendance shall be mandatory for all parties notified. Without limiting required meeting types, several typical meetings are indicated as follows:

A. Preconstruction Meetings. Immediately after the Trade Contract Agreement is awarded, one or more meetings will be scheduled at the project site to review project procedures, designation of name and title of the authorized person or persons representing the Trade Contractor and responsible for project management and/or field operation, designation of Emergency Contact(s), designation of representative for progress meetings, the requirements for daily, weekly and monthly reports and other submittals required to perform and administer the project.

B. Project scheduling meetings.

C. Computer software training (as required)

D. Weekly Trade Contractor meetings

E. Principal meetings (as required)

F. Safety Committee Meetings (as required)

G. Incident and Injury Free Training meetings (as required)

H. Quality inspections (for example, mockup review, bench mark review, first delivery inspections)

I. Safety orientation meeting

J. Daily Huddle

K. Building envelope review efforts (as required)

L. Punchlist Review meeting

M. BIM, VDC and/or MEP coordination meetings

N. Submittal review meetings

O. Commissioning activities

7.3 The Construction Manager requires project reports documenting the project, updates, in the format as required by the Construction Manager. Without limiting the reports required, several typical reporting requirements are indicated as follows:

A. **Daily Force and Activity Reports** shall be prepared and submitted by each Trade Contractor, including similar data for each of his Trade-Subcontractors. This report will be on a form approved by the Construction Manager and will indicate Supervisors, Journeymen, Laborers or Helpers and, by composition of the crew, the activities, related to the contractors' schedule, that are being performed and will include information or material deliveries, test and other significant events. This report shall also substantiate compliance with EEO and residency requirements, if applicable. Each Daily Force and Activity Report shall be delivered to the Construction Manager at the job-site by 9:00 a.m. on the next business day.

B. **Separate Daily Documentation of any "Changes in the Work"** being performed on a basis described in Article 8 of the Trade Contract Agreement.

C. **Monthly Economic Inclusion Business and Workforce Compliance Reports**, for targeted business and workforce participation, etc., in accordance with project requirements and as may be required by governing bodies to be submitted through the Construction Manager and/or Owner.

D. Certified Payroll

Up-to-date Certified Payrolls shall be submitted by the Trade Contractor to the Construction Manager no later than the end of the calendar month in which the work occurs.

E. **Material and Equipment Planning and Tracking Plan**. A Material Status Report (MSR) must be completed by each Trade Contractor as set forth in Article 9.11 of the Trade Contract Agreement and as noted herein. The items listed should correspond to the items listed on the Submittal Schedule. At a minimum, this report must be updated and submitted monthly prior to the Application for Payment, or more often as required by the Construction Manager. It is mandatory that the Trade Contractor maintain an accurate and current Material Status Report. The Trade Contractor shall provide the following information on each MSR: name of Trade-Subcontractor, vendor, supplier, distributor, or manufacturer and contact information (direct line phone, email, and address) along with Purchase Order number and job number. Failure to do so will result in The Trade Contractor being unable to invoice for work related to the failure and/or payment being withheld related to the failure. This information is vital for identifying delivery dates that adversely affect the overall project schedule and allows for expediting of these items. Trade Contractor must immediately notify Construction Manager of any changes to material release and lead times that may affect the project schedule.

F. **Weekly Minutes/Reports of Safety Program "Tool Box" Meeting** and other Safety information.

G. **Job Cost Breakdown Reports**. The Trade Contractor shall submit job cost breakdown reports for record and tax purposes to the Construction Manager. The first report shall be submitted thirty (30) days after the date of each Notice to Proceed on any portion of Work and shall be consistent in format with the schedule of values. Another report shall be submitted at the completion of the job and shall include all additions and deletions. Interim reports on various elements of the work shall be submitted as required by the Owner for investment, tax credit, pollution control, financing, and other purposes.

H. **Monthly Progress Payment Applications** shall be submitted by the Trade Contractor in Textura and in keeping with the Owner's payment application requirements and as descried herein. The following documents are required in order for the Trade Contractor to submit a draft, or "pencil," requisition:

a. Updated and compliant Material Status Report

b. Updated Trade Contractor open changes log

c. Daily Work Reports, current to within five (5) working days from time of invoice submission

d. Safety Task Assessments

The Construction Manager will only open the draw for submissions of the Trade Contractor's monthly draft (pencil) payment requisitions in Textura for Trade Contractors who have provided the above stated documentation within 5 days of schedule draw opening. The Construction Manager will not allow such Trade Contractor to submit an invoice for that month. These requirements are in addition to all other stated payment requirements.

I. **Open Changes Log** must be submitted as noted in Item H and shall contain all information pertinent to the additional work/cost. This includes but is not limited to Trade Contractor's change item tracking number, Gilbane's change item tracking number, current submitted price or estimated price, and type of change item (quote/proposal or T&M).

J. **Time and Material Tickets** where applicable (See Article 13)

K. **Safety Incident information** associated with any worker(s) employed by the Trade Contractor and Trade-Subcontractors.

Article 8 – Submittals and Requests for Information

8.1 Procore

8.1.1 The Owner and Gilbane have agreed to utilize Procore, which is an internet-based program designed to enhance collaboration amongst the project team members, or such other internet-based program as required by Construction Manager in its sole discretion. Procore, or such other designated program, shall be utilized as the electronic platform for all project controls. Trade Contractor and all of its Trade-Subcontractors shall utilize Procore on the project at no additional charge to Construction Manager.

8.1.2 Trade Contractors that do not utilize Procore, and instead provide hard copies of required documentation, will be subject to backcharge for related document transmission fees, Gilbane personnel time and document reproduction fees. Any submittals not submitted by the Trade Contractor through Procore will not constitute a "submission" by the Trade Contractor. Trade Contractor shall notify Gilbane of any issues relating to the use of Procore at time of bid.

8.2 Submittals

8.2.1 General Submittal Requirements.

8.2.1.1 The Trade Contractor shall review, approve and submit all Submittals required by the Contract Documents through the Construction Manager with reasonable promptness and in such sequence as to cause no delay in the Work, delay in the work of any separate contractor, or delay in the coordination of submittals of any separate contractor. Submittals shall be submitted in a timely manner necessary to support the Project Schedule, including required

times for submittal review and approval and subsequent procurement, fabrication and lead times required by the Trade Contractor for materials and or equipment to be delivered to the Project. In the event there is no submittal date identified, Trade Contractor shall review, approve and submit through the Construction Manager all Submittals required by the Contract Documents within twenty (20) days after Trade Contractor's receipt of the Trade Contract Agreement. Whenever the Contract Documents require a certified engineer's stamp, review or report, it shall be understood to mean an engineer licensed and registered in the State of the Project and paid for by the Trade Contractor.

8.2.1.2 Submittals forwarded by the Trade Contractor to the Construction Manager shall be in conformance with the requirements of the Contract Documents. The Trade Contractor shall notify the Construction Manager in writing of any deviations in the Submittals from the requirements of the Contract Documents at the time of submission.

8.2.1.3 By approving and submitting Submittals, the Trade Contractor represents that he has determined and verified all materials, field measurements, and field construction criteria related thereto, or will do so, and that he has checked and coordinated the information contained within such Submittals with the requirements of the Work and of the Contract Documents.

8.2.1.4 The Construction Manager will review such Submittals with reasonable promptness, checking only for completeness and conformance with the Contract Documents. The Construction Manager will return to the Trade Contractor, without review, any Submittals not bearing the Trade Contractor's approval stamp or other mark showing that they have been reviewed and approved by the Trade Contractor. The Construction Manager will return to the Trade Contractor for correction or completion, any Submittals found not to be complete or in proper form. The Construction Manager, if he finds Submittals to be in order, will forward the Submittals to the Architect/Engineer.

8.2.1.5 Approval of the Trade Contractor's Submittals does not constitute a complete check, but indicates only that design, general method of construction and detailing is satisfactory. The Work shall be in accordance with the approved construction documents and other submittals. The Trade Contractor shall not be relieved of responsibility related to deviations from the requirements of the Contract Documents, by the Construction Manager's and/or Owner's approval of Trade Contractor's design and construction documents such as Shop Drawings, Product Data, Samples or other submittals unless the Trade Contractor has specifically informed the Construction Manager in writing of such deviations at the time of, and as a part of the submittal and (1) the Construction Manager has given written approval to the specific deviation(s) as a minor change in the Work, or (2) a Subcontract Change Order has been issued authorizing the deviation.

The Trade Contractor shall not be relieved from responsibility for errors or omissions in the Shop Drawings, Product Data or Samples by the Construction Manager's forwarding or the Architect/Engineer's approval thereof.

8.2.1.6 The Trade Contractor shall direct specific attention, in writing or on resubmitted design and construction documents or other submittals such as Shop Drawings, Product data, Samples or similar submittals, to revisions other than those requested by the Construction Manager and Architect on previous submittals. In the event Trade Contractor fails to provide specific written notice as required hereunder, the Architect's approval of a resubmission shall not apply to such revisions.

8.2.1.7 The Trade Contractor shall resubmit Submittals, as required, until Architect's acceptance is obtained. Submittals that are rejected or require revisions shall be corrected and resubmitted to the Construction Manager within ten (10) days after the Construction Manager sends the Submittals back to the Trade Contractor. No portion of the Work requiring submission of Shop Drawings, product Data or Samples shall be commenced until the Submittal has been accepted by the Architect/Engineer. All such portions of the Work shall be in accordance with accepted (pursuant to the Contract Documents) Submittals, which copies shall be maintained on the job site.

8.2.1.8 The Trade Contractor shall be responsible for the delays caused by rejection of the Submittal of inadequate or incorrect shop drawings and manufacturers data. Trade Contractor is allowed two (2) reviews for required submittals. Additional reviews required in addition to this, as a result of incorrect submittal information submitted by the Trade Contractor, may result in additional costs from the Architect if incurred by the Construction Manager.

8.2.1.9 Substitutions may only be made with the consent and approval of the Construction Manager and Owner and, if appropriate, in accordance with a Trade Contract Change Order.

8.2.1.10 The Trade Contractor shall prepare a schedule of required Submittals not later than ten (10) days after contract award. The schedule shall include a complete list of items requiring Submittals to be reviewed by the Construction Manager and approved by the Architect and the anticipated date of submission. The schedule is to be submitted on a form approved by the Construction Manager. The schedule shall be updated monthly or as required by the Construction Manager. All Submittals, other than those required to be made through Procore, shall be accompanied by a transmittal letter and reference shall be indicated to the item numbers of the above-mentioned schedule.

8.2.1.11 All Submittals shall be transmitted to the Construction Manager and shall include:

A. Date and revision dates.

B. Project title and number.

C. The names of:

i. Architect/Engineer

ii. Construction Manager

iii. Trade Contractor

iv. Contract Number

v. Supplier

vi. Manufacturer

vii. Separate detailer when pertinent

D. Number of Shop Drawings, Product Data and Sample submitted. (System to be established by Construction Manager).

E. Identification of product or material.

F. Relation to adjacent structure or materials.

G. Field dimensions, clearly identified as such.

H. Specification Section number and paragraph.

I. Applicable standards, such as ASTM number or Federal Specification.

J. Identification of deviations from Contract Documents.

8.2.1.12 After review by the Architect, the Construction Manager will return Submittals, which will have been stamped by the Architect as follows, unless noted otherwise:

A. "Accepted"

B. "Reviewed"

C. "Accepted as Noted"

D. "Reviewed as Noted"

E. "Revise and Resubmit"

F. "Accepted for Record"

G. "Accepted and Resubmit for Record"

H. "Rejected"

I. "Void"

J. "Record Only"

8.3 Requests for Information (RFI).

8.3.1 General RFI Requirements.

8.3.1.1 Each RFI must reference a drawing, detail or specification and provide a clear, concise explanation of the Request for Information. Each RFI shall be submitted through Procore. Any other transmissions of RFIs from the Trade Contractor will not be accepted or acknowledged.

8.3.1.2 The Trade Contractor is responsible to submit its RFIs in a timely manner so as not to impact the progress of Work and in accordance with the requirements of the Contract Documents. The Construction Manager will forward RFI responses to the originating Trade Contractor and any other Trade Contractor whose work may be affected by the response.

8.3.1.3 In the event the Trade Contractor believes a response to an RFI constitutes a Change, or otherwise impacts the cost of, and/or time of performance of, its work, Trade Contractor shall follow the notice provisions for Changes set forth in the Trade Contract Agreement.

8.4 Coordination Drawing Process – Reference 00 74 00 BIM Standards

8.4.1 Coordination Requirements –

Trade Contractor's scope requiring spatial clearance or integration with adjoining Trade Contractors' scope are required to prepare and actively participate in scheduled Construction Manger coordination meetings. Coordination efforts can include, but are not limited to:

- Site Civil Utilities
- Foundation penetration and foundation embeds
- Structural Systems to MEP+FP and architectural elements
- Enclosure Systems
- Interiors and MEP+FP

If BIM Standards/BIM Execution Plan is referenced in the project manual, the BIM Standards/BIM Execution Plan supersede, or are an addition to any Trade Contractor's requirements in this section. Any Trade Contractor not identified in the BIM Standards/BIM Execution Plan, but requiring coordination with adjoining Trades, is required to participate and produce coordination drawings. No extra compensation will be paid for relocating any in place work that has been installed without proper coordination between all trades involved. If any improperly coordinated work, or work installed that is not in accordance with the approved coordination process, necessitates additional work by the other trades, the costs of all such additional work shall be borne solely by the Trade Contractor(s) responsible.

8.4.2 Conformance to Design –

The design drawings and associated models/files (if provided) are representational in nature. The respective trade contractors are responsible for; filed verification of all on-site conditions relevant to their work and all associated cost of installing the final coordinated systems.

In the Trade Contractor's process, minor changes routings that do not affect the intended function may be made as required to avoid space conflicts, when mutually agreed, but items may not be resized or exposed and concealed items relocated without the Architect/Engineer's and Construction Manager's written approval. No changes shall be made affecting the function or esthetic design of the building, without written approval. If conflicts or interferences cannot be satisfactorily resolved, the Architect and Construction Manager shall be notified and their decision obtained. No unauthorized deviations will be permitted, and if any are made without knowledge or agreement of the Architect/Engineer and/or Construction Manager, this unauthorized work will be subject to removal and correction by the respective Trade Contractors at no additional cost to the Owner or Construction Manager. All Design changes and subsequent document updates formally issued and approved shall be updated and shown as it relates to this effort. The coordination drawings may lack complete data in certain instances pending receipt of shop drawings, but sufficient space shall be allotted for the items affected.

8.4.3 Coordination Schedule –

The Construction Manager shall issue the project schedule containing milestones and overall coordination information. Immediately after award and distribution, the Trade Contactor must inform the Construction Manager of any scheduling constraints or issues. It is the Trade Contractor's responsibility to inform document and work for successful resolution. Trade Contractor shall allocate and assume the responsibility of providing proper resources and manpower required to meet the coordination schedule. The Trade Contractor is responsible to attend, with the appropriate staff, all Coordination meetings per Construction Manager's direction. It is expected that any preparation, additional meetings, and correspondence needed for successful coordination is the responsibility and discretion of the Trade Contractor. Each Trade Contractors is responsible for the delivery of their scope of work as it relates of the coordination effort. All work performed by subcontractors hired by individual Trade Contractors shall also be subject to the Master Project Schedule as well as the Coordination Schedule with the sole responsibility of deliverables residing with the Trade Contractor. The Trade Contractor will be held responsible for delays and re-work as it relates to any 3rd party subcontracts.

8.4.4 Coordination Leadership –

The Construction Manager, or delegated Trade Contractor (if not noted or defined, shall be the HVAC Trade Contractor) shall lead the coordination process. The lead is responsible for distributing the project sheet title block, schedule meeting to comply with the project schedule, identify areas of conflict, elevate to the Construction Manager issues that cannot reach resolution, aggregate and

"submit for record" signed off coordination drawings, per defined area. All Trade Contractor will be required to submit generated files and participate in the coordination effort/meetings as it facilitates work in the Field.

8.4.5 Coordination Drawings –

All work on the coordination drawings shall be performed by competent drafter/modeler and shall be clear and fully legible. The Architect/Construction Manager shall be the judge of the acceptability of the deliverables and files. Coordination Drawings shall show layout, routing, sizes, elevations, or any element that pertains to the coordination effort, to include access or clearance zones, overlayed on the architectural and structural backgrounds as necessary.

Coordination drawings are a part of the ship drawing process and should be the first evolution, where further detail and definition is added to reach the shop drawing submittal. The coordination drawing submitted invidiously by the Trade Contractor or aggregated into a combined coordination sign-off, shall contain a signature of a Trade Contractor representative and denotes the acceptance and intent to facilitate the work as shown on the coordination drawing.

Sign-Off Requirements

1) Model/file/sheet – Designated Lead to Generate & Submit to Construction Manager
    a. Dated and named per signed off area
    b. Viewpoints generated within per zone/area of sign off
2) Official Coordination Submittal for Record – Designated Lead to Compile
    a. (PDF) Language outlining particular sign off, with signatures & comments from each trade
    b. Coordination Drawings
        i. Single overlay of all trade overhead routing with an architectural/structural background
        ii. Single overlay of all trade (RCP) on ceiling elements (sprinklers, Diffusers, lights, etc.)
        iii. Individual trade routing architectural/structural background
        iv. Individual trade RCP information on architectural background
        v. Individual trade Plan/in wall drawing if applicable on architectural background

Coordination drawings shall be further updated and to reflect the field conditions, work performed, and any subsequent changes. These documents and files shall represent the record documents and basis of the required "as-built" drawings and files.

8.5 Record Documents and Turnover

In Addition to maintaining and delivering to the Construction Manager those record Drawings required by the Contract Documents, the Trade Contractor shall also prepare and submit to the Construction Manager, upon completion of the Work, "As-Built" Drawings in the format required but the Contract Documents.

8.5.1 Each Trade Contractor shall keep a complete record of his own work and shall indicate deviations from the Drawings as to the installation of his own work. All information shall be recorded in a neat, legible and accurate manner. All changes, revisions or additions made in the installation of the work which differs from that required but the Drawings must be noted.

8.5.2 Upon completion of the work, the Trade Contractor shall forward the marked-up Drawings, suitable for preparation of composite "As-Built Drawings" to the Construction Manager for review and transmittal to the Architect. All changes shall be indicated in contrasting colors or highlighting.

8.5.3 The Construction Manager may require the Trade Contractor to submit progress As-Built and/or Record drawings during the course of the project. If the Trade Contractor fails to do so, payment will not be made for all installed work that is required to be documented via As-Built or Record drawing.

8.6 The Trade Contractor, prior to or at the time of Substantial Completion for the Work and during administrative closeout of the project, shall submit one copy of all specified warranties and guarantees to the Construction Manager for review, approval and subsequent transmittal to the Architect and Owner. At no time shall Trade Contractor withhold such specified warranties and guarantees due to a payment dispute, backcharge dispute, and/or other dispute with Construction Manager and/or Owner. Trade Contractor's obligation to provide such specified warranties and guarantees is an independent obligation that must be timely satisfied regardless of payment status. Failure to comply with this Article may result in costs, expenses and damages (including, but not limited to, delay damages and/or liquidated damages) for which the Trade Contractor shall be responsible.

8.7 Owner's Maintenance Manual ("O&M Manual"): The Trade Contractor, during the course of the work, shall maintain, coordinate and collect copies of warranties, guarantees, certificates, installation drawings, manufacturer's maintenance and operations manuals, parts lists, keying schedules, and any other items identified or required by the Contract Documents and at the acceptance of the project, shall assemble this material into a manual and forward to the Construction Manager for incorporation in the Operations and Maintenance Manual for the project in accordance with the timing requirements of the Contract Documents. At no time shall Trade Contractor withhold such operations manuals, parts lists, and keying schedules due to a payment dispute, backcharge dispute, and/or other dispute with Construction Manager and/or Owner. Trade Contractor's obligation to provide this information is an independent obligation that must be timely satisfied regardless of payment status. Failure to comply with this Article may result in costs, expenses and damages (including, but not limited to, delay damages and/or liquidated damages) for which the Trade Contractor shall be responsible.

8.7.1 The O&M Manual shall include identification of vendors. Specifically, Trade Contractor shall identify the Trade-Subcontractor, Trade Contractor, supplier, distributor and/or manufacturer that is responsible for the installation, service and/or warranty of each maintainable asset. Data shall include the firm's name, address, contact person, phone number, e-mail address, web site address, date of acceptance, warranty provider, warranty term and any other pertinent information necessary for the Owner to obtain service.

8.7.2 O&M Manuals, Warranties, and As-Builts/Record Drawings are required by the Trade Contractor a minimum thirty (30) days prior to substantial completion of the building. The Trade Contractor shall be required to provide full-time maintenance of all systems provided by the Trade Contractor until all O&M Manuals, Warranties, and As-Builts/Record Drawings are approved by the design team and Owner Training has been performed and videos of the training have been transmitted to the Construction Manager. "Full-time" maintenance shall be a Trade Contractor representative being onsite every business day between the hours of 7:00am and 5:00pm.

8.8 Electronic Data and Documentation Submittal Specification

8.8.1 Trade Contractor shall provide construction documentation in electronic documentation format as specified below. The intent is to support the Owner's computerized asset, maintenance, or space management systems. Trade Contractor is responsible to pursue, obtain and furnish to

Construction Manager the complete asset data required from project participants that are under its Trade Contract Agreement Work.

The submittal of all specified data in electronic format is to occur concurrently with the progress of the Work. Timely and accurate submittals of requisite data will be a condition precedent for issuance of monthly payments. All submittals shall be completed a minimum of thirty (30) days prior to Substantial Completion or Owner Occupancy, whichever occurs first. Any performance-related data should be submitted no later than thirty (30) days after its measurement and recording in the field. Any deviations identified by Gilbane are to be promptly corrected by the submitting project participant(s) and resubmitted.

8.8.2 Equipment Tagging. The Trade Contractor shall ensure that manufacturer's equipment tags are fixed to all maintainable equipment items and easily accessible after equipment installation. These permanent tags include, but are not limited to, equipment model number and serial number.

8.8.3 Submittal of Construction Documents. All documents provided in paper format shall also be provided to Construction Manager in an electronic format (electronic documentation such as MS Word, MS Excel, or Adobe PDF) per project requirements. Documents that need to be provided in electronic format include but are not limited to:

A. Drawings (e.g., as-builts, shop drawings, floor plans)

B. Submittals

C. Operations and Maintenance manuals

D. Testing and Balancing reports

E. Commissioning report

Article 9 – Substitutions

9.1 By executing the Trade Contract Agreement, you are representing that there are no substitutions to the requirements of the Contract Documents other than those items that are specifically identified in writing, provided to, and approved in writing by, Construction Manager prior to the full execution of this contract.

9.2 If the Trade Contractor proposed to use a material, product, equipment or item which, while suitable for the intended use, deviates in any way from the detailed requirements of the Contract Documents, Trade Contractor shall inform the Architect through the Construction Manager in writing of the specific, detailed nature of all such deviations at the time the material, product, equipment or item is submitted for approval, and shall request a written approval of the deviation from the requirements of the Contract Documents. Trade Contractor shall be liable for any deviation that the Trade Contractor has failed to obtain such written approval. Any stamp of "approval" shall not be deemed written approval of any such deviation(s).

9.3 By submitting a request for approval of a deviation or substitute, Trade Contractor warrants to Construction Manager and Owner that: (i) it has investigated the proposed substitute product and determined that it is equal in all respects to the specified material; and (ii) it will coordinate the installation of the substitute, and make the changes required to incorporate the substitute into the Work, without additional cost to Construction Manager and/or Owner. If such substitution causes additional work or cost to any other Trade Contractor, those costs will be borne solely by the Trade Contractor furnishing and/or installing the substituted item. Trade Contractor shall provide, upon Construction Manager's or Architect's or Owner's request, without cost to any of them, evidence demonstrating to a reasonable certainty that the proposed substitution or deviation: (a) will provide a quality of result at least equal to the specified material; (b) is at least equal in serviceability to the specified material; (c) will not entail changes in details and construction of related Work other than those approved by Architect to be performed at no additional cost to Construction Manager or Owner; and (d) will provide a cost advantage or other benefit to Owner. If, in the opinion of Construction Manager, Architect and/or Owner, the evidence presented by Trade Contractor does not provide a sufficient basis for such reasonable certainty, Construction Manager, Architect and/or Owner may reject such substitution or deviation without further investigation. Such rejection shall not relieve the Trade Contractor from complying with the Specifications at no additional cost to the Owner or Construction Manager.

Article 10 – Separate Trade Contracts

10.1 Mutual Responsibility of Trade Contractors

10.1.1 Should the Trade Contractor cause damage to the work or property of the Owner, the Construction Manager, any separate trade contractor or other contractor, the Trade Contractor shall, upon due notice, promptly remedy such damages as well as be responsible for any loss, cost, expense or damages arising from such incident. If such separate trade contractor or other contractor sues the Owner or the Construction Manager on account of any damage alleged to have been caused by the Trade Contractor, the Owner or Construction Manager shall notify the Trade Contractor who shall protect, defend, indemnify and hold harmless the Owner and Construction Manager from such claims as also set forth in the Trade Contract Agreement. Trade Contractor shall further be responsible to Owner and Construction Manager for such proceedings at the Trade Contractor's expense, and if any judgment or award against the Owner or Construction Manager arises therefrom, the Trade Contractor shall pay or satisfy it and shall reimburse the Owner or Construction Manager for all attorney's fees and court costs which the Owner or Construction Manager has incurred arising from Trade Contractor's Work, acts or omissions.

10.1.2 Should the Trade Contractor sustain any damage through any act or omission of any other Trade Contractor having a contract with the Construction Manager for the performance of work upon the site or of work which may be necessary to be performed for the proper prosecution of the Work to be performed hereunder, or through any act of omission of a Trade-Subcontractor of such Trade Contractor, the Trade Contractor, as an inducement to be awarded this Agreement, shall have no claim and hereby agrees to waive any claim against the Owner, Architect, Construction Manager or the Owner's consultants for such damage, except and solely to the extent Trade Contractor has been provided a written change order or written Subcontract Change Directive by an authorized Representative of Construction Manager as set forth in the Trade Contract Agreement.

10.1.3 Should any other contractor having or who shall hereafter have a contract with the Construction Manager for the performance of work upon the site sustain any damage through any act or omission of a Trade-Subcontractor of the Trade Contractor, the Trade Contractor agrees to reimburse such other contractor for all such damages and costs, and shall defend and hold the Owner, Architect and Construction Manager harmless from all claims.

10.1.4 Trade Contractor shall coordinate its work with other trade contractors so as to not cause interference, disruption or delays to the work or to the Project schedule.

10.1.5 In the event the Trade Contractor's operations cause any damage, interference, or inconvenience to work being carried out under any other trade contract agreement, the Trade Contractor shall restore, replace, rectify, or otherwise make good any damage to the satisfaction of the Construction Manager or to the other Trade Contractors.

10.1.6 Trade Contractor agrees that he has become familiar with the site, has reviewed the Plans and Specifications covering the Work of his and other trades and thereby accepts responsibility for all necessary coordination of his Work with the work of other Trade Contractor(s) affected.

Article 11 – Tests

11.1 If the Contract Documents, laws, ordinances, rules, regulations or order of any public authority having jurisdiction require any portion of the Work to be inspected, tested or approved, the Trade Contractor shall give the Construction Manager timely notice of its readiness so the Architect/Engineer and Construction Manager may observe such inspection, testing or approval. The Trade Contractor shall bear all costs of such inspections, tests or approvals unless otherwise provided. In this section, "timely notice shall be no less than three (3) business days written notice.

11.2 In addition to the requirements of Article 11.1, in the event that the Architect/Engineer or Construction Manager otherwise determines that any Work requires special inspection, testing and/or approval, then Trade Contractor shall give Construction Manager no less than three (3) business days' advance written notice of such special inspections or testing being performed. If the Trade Contractor fails to timely provide such notice, or if such special inspection or testing, or any testing or inspection, reveals a failure of the Work to comply with the requirements of the Contract Documents, the Trade Contractor shall bear all costs and Damages to remedy and shall cure such Work and such non-compliance, including compensation for the Architect/Engineer's and Construction Manager's additional services and supervision made necessary by such failure.

11.3 Required certificates of inspection, testing or approval shall be secured by the Trade Contractor at Trade Contractor's sole expense, and promptly delivered to the Construction Manager.

11.4 Neither the observations of the Architect/Engineer or the Construction Manager, in their administration of the Construction Contract, nor inspections, test or approvals by persons other than the Trade Contractor, shall relieve the Trade Contractor from his obligation to perform the Work in accordance with the Contract Documents.

11.5 The Trade Contractor shall deliver test samples of any of the materials specified in any of the applicable Sections of the Contract Documents to an independent testing laboratory selected and approved by the Owner and Construction Manager, if so required. This may apply to materials proposed for use, materials already delivered to the job, or materials already incorporated into the construction.

11.6 The Trade Contractor shall maintain a file of all test reports. In addition to delivery of a copy of all tests, inspections or other reports to the Construction Manager upon receipt by the Trade Contractor; at the completion of the project, these reports shall also be submitted as an Appendix to the Operations and Maintenance Manual.

11.7 Any materials which fail to meet the requirements of these Contract Documents shall not be used whether previously approved by the Architect. If they have been delivered to the project site, they shall be removed. If they have already been incorporated into the Work, the Construction Manager or the Architect may order them removed, or, at the discretion of the Owner, through the Construction Manager, they may be permitted to remain in place provided that the Trade Contractor agrees to a proper deduction from the Contract Sum of any credit required by the Owner to accept such materials.

11.8 The cost to retest or re-inspect Work, which previously failed such testing or inspection, shall be borne solely by the Trade Contractor.

Article 12 – Completion and Final Payment

12.1 When the Work is substantially completed, the Trade Contractor shall notify the Construction Manager, in writing, that the work will be timely ready for final inspection and test on a definite date. Notice shall be given at least fifteen (15) days in advance of said date. If the Architect/Engineer and Construction Manager concur that the Work will be ready for final inspection or test on the date given, the Architect/Engineer and the Construction Manager will make such inspection. The Trade Contractor is required to furnish access for the final inspection. As an additional condition precedent to Final Payment, the Work shall be found acceptable under the Contract Documents and the Contract fully performed, and the Trade Contractor shall document the turnover of spare stock of materials, spare parts, accessories and special tools to the Owner through the Construction Manager.

12.2 As an additional condition to final payment, neither application for final payment nor for the remaining retained percentage shall be made until the Trade Contractor has submitted to the Construction Manager (1) an affidavit in the form acceptable to Construction Manager which affidavit shall generally release all claims, and shall certify that all payrolls, bills for materials and equipment, supplies, Trade- Subcontractors and all other indebtedness connected with the Trade Contractor's Work have been paid (2) consent of surety, if any, to final payment (3) properly executed "Release and Waiver of Lien and Bonds" on forms provided by the Construction Manager, (4) specified warranties and guarantees, (5) substantiation that contractual DBE requirements have been met, if required by the Contract Documents; and (6) if required, other data establishing payment or satisfaction of all such obligations, such as receipts, releases and waivers of liens arising out of the Contract. If any Trade-Subcontractor fails or refuses to timely submit any such information or documents, the Trade Contractor shall be in breach of the Contract and Final Payment shall not be due.

12.3 The act of acceptance of final payment by the Trade Contractor shall be deemed to be Trade Contractor's full and complete waiver and release of all claims, disputes, differences, demands, arbitration, payments, delays, liens, bond claims, changes, extras, acceleration, and actions at law or in equity, whether known or unknown against Construction Manager, Architect/Engineer, and Owner.

Article 13 – Time and Material Work

13.1 In the event that a Trade Contractor is directed to proceed with a Change pursuant to Change Order for Time and Material or a Subcontractor Change Directive, in each event pursuant to the terms and subject to the conditions and provisions of the Trade Contract Agreement, the Trade Contractor shall keep and present to the Construction Manager an itemized and certified accounting together with supporting data, including Time and Material tickets. Time and Material tickets will only be considered when authorized pursuant to either a Change Order or a Subcontractor Change Directive, and the work noted on said tickets has been verified at the time it was performed, in writing, by the Construction Manager's Authorized Representative. Any Time and Material tickets for work alleged to have been performed by the Trade Contractor, in which the Construction Manager's Authorized Representative has not been notified and has not agreed to track on a Time & Materials ("T&M") basis, is done at the Trade Contractor's expense. No compensation will be made for such tickets. Also, all Time and Material work verification slips are to be presented by the Trade Contractor to the Construction Manager on a DAILY BASIS, on the SAME DAY the work is performed. It is understood that the Construction Manager's signature on a T&M ticket is for verification of the time and materials expended, and shall not alter the contractual obligations of the Trade Contractor, nor be a Change Order, Subcontractor Change Directive, change, extra or otherwise create any liability on behalf of Construction Manager without the authorization of a Change Order for Time and Material or a

Subcontractor Change Directive issued by Construction Manager pursuant to the express terms, conditions and provisions of the Trade Contract Agreement.

Article 14 – Allowances

14.1 If the Trade Contractor shall include in the Trade Contract Sum an Allowance authorized pursuant to the Contract Documents, then subject to the express terms for such Allowance set forth in the Contract Documents, the following will apply:

14.1.1 These Allowance costs shall only include the out-of-pocket direct costs that the Trade Contractor pays to third parties, and shall not include any of Trade Contractor's overhead, supervision, general condition costs, general requirements costs, profit or any other costs of Trade Contractor's operations.

14.1.2 For the avoidance of doubt, the Trade Contractor shall not apply mark-up or any overhead and profit to the reimbursable costs within the Allowance.

14.1.3 Whenever the third party direct out-of-pocket costs are more than or less than the Allowance amount, the Trade Contract Sum shall be adjusted accordingly by Trade Contract Change Order, but again subject to any terms, conditions or provisions of the Contract Documents. It is specifically understood that all unspent portions of Allowance amounts will be subtracted from the Trade Contract Sum and returned to the Construction Manager by Trade Contract Change Order.

14.1.4 These Allowances are only to be used where specifically authorized in advance and in writing by the Construction Manager. Costs charged against these allowances will be determined based upon a lump sum, unit price, or actual time and material costs as directed by the Construction Manager.

14.2 If the Trade Contractor Allowances for an item will exceed the amount agreed-upon for such Allowance item, the Trade Contractor shall not proceed with the portion of the Work that will exceed the Allowance amount until receipt of a Change Order or a Subcontractor Change Directive adding the additional cost overrun of such Allowance.

Article 15 – Quality

15.1 Trade Contractor shall participate in the Quality Control Program by maintaining a complete and up-to-date set of Contract Documents related to its installations, providing advance notification (minimum forty-eight (48) hours, preferably seventy-two (72) hours) of anything that would require a quality control activity, such that progress is not interrupted, providing recommendations for resolution of conflicts/discrepancies, and appointing a responsible party to participate in the quality assurance and quality control activities identified within the Contract Documents, including providing immediate response and correction of deficiencies. This provision shall also apply to all associated Trade Subcontractors, manufacturers, etc.

15.2 Quality Assurance (QA): QA meetings will occur prior to the start of select work, for example a preconstruction meeting and pre-installation meetings. Trade Contractor shall have its identified Project Manager and Project Foreman in attendance at these meetings, and shall coordinate attendance by its installing Trade Subcontractors and/or manufacturer as needed. Any action items resulting from these meetings will be noted in the Construction Manager's quality issues list for resolution with a responsible

party and due date. Trade Contractor shall respond to all quality issues for which it is assigned responsibility by the due date.

15.3 Quality Control (QC): QC activities shall occur on a continuous basis to ensure that ongoing work is compliant with project requirements. All QC activities will be documented by Construction Manager as installation is inspected for compliance, deficiencies and issues added to the Rolling Completion List (RCL). Trade Contractor shall notify Construction Manager of the following QC inspection occasions at least forty-eight (48) hours before they occur. Trade Contractor is responsible to designate a representative to participate in the inspection and that representative should have the authority to direct the removal of any material or equipment that does not conform to requirements. Potential QC inspections include, but are not limited to, the following:

A. First Delivery Inspections (Present delivery ticket to Gilbane at start of this inspection.)

B. Mock-ups

C. First Equipment-In-Place

D. Benchmark/Follow-up Inspection

E. Closure Inspection (below grade, in-wall, or above ceiling): Prior to any work being covered, the Trade Contractor will notify Construction Manager that it is complete and ready for inspection. Trade Contractor will sign off on completed areas of concealed work prior to calling for an inspection.

F. Activation Inspection: If more than one Trade Contractor's work is associated with the operation of the equipment being inspected, coordinate inspection with all required contractors.

G. Start-up Inspection: Turnover Inspection

H. Final Inspection

15.4 Non-conforming materials and/or equipment will not be allowed to be set into place and will be removed from the site. In no case will such materials be used on the project. Non-conforming conditions will not be allowed AND non-conforming equipment may require removal from the project in the Construction Manager's sole discretion.

15.5 Rolling Completion Lists (RCL) will be maintained by Construction Manager. This tool is used to track deficiencies, noted as incomplete, missing, or not meeting the requirements, throughout the life of a project. QC activities, field observations of noncompliance, Owner observations, Architect Field Observation Reports, and Inspection and Testing Agency reports will be compiled into the RCL and it will identify the location of the deficiency, the party responsible for resolution, and the inspection and correction dates. Trade Contractor shall correct the deficiency for which it is responsible and shall implement necessary measures to ensure that those deficiencies (or others) are not repeated.

15.6 Eleven months after the time of substantial completion, members of the original project team will conduct a walk -through of spaces turned over to the owner. Trade Contractor may be required to attend that meeting and/or to participate in follow up activities as a result of that meeting.

Article 16 – Temporary Services and Systems

16.1 Electric power for use in temporary trailers shall be available to the Trade Contractor from a central location in the trailer area. The Trade Contractor shall furnish any required extensions from this location at his own expense.

16.2 Potable water shall be available to the Trade Contractor at a central location. Extensions of the water supply for Trade Contractor's exclusive use shall be the responsibility of the Trade Contractor.

16.3 The Construction Manager will provide temporary toilets, excluding Trade Contractor's trailer hookup.

16.4 The Construction Manager will provide temporary fire safety equipment for general use. Trade Contractor shall provide its own fire extinguishers for its trailers, and for use, as required when cutting and burning are performed.

16.5 The Construction Manager will provide rubbish containers and rubbish disposal service unless noted otherwise in the Proposal Form. The Trade Contractor must not use these containers for the disposal of earth, surplus or slop concrete, hazardous materials, masonry, regulated materials, and/or steel stock. Each Trade Contractor must dispose of these elements at his own expense. Trade Contractors are responsible to separate their rubbish as required by the Construction Manager and all agencies having jurisdiction. Any resorting of debris by the Construction Manager to correct the disposal of this Trade Contractors debris will be backcharged to this Trade Contractor.

16.6 For further description and location of temporary services and system, refer to the Site Utilization Plan and the following paragraphs.

Each Trade Contractor shall be responsible for furnishing, installing or otherwise providing any or all of the following temporary facilities, structures or services as may be necessary or required for or during, performance of the work of his Contract

16.6.1 Temporary field office facilities complete, including all furniture, heat, cooling, lighting, telephone, plumbing and toilet fixtures as he may require for his exclusive use. (Site location and number are subject to approval of the Construction Manager).

16.6.2 Temporary storage facilities, sheds or buildings as may be required for the proper protection or storage of materials and/or equipment. (Site location and number are subject to approval of Construction Manager).

16.6.3 Temporary extension from, and hookup to, all temporary utilities which have been provided to a common point for use by the Trade Contractor during construction.

16.6.4 Maintenance, cleanup and removal of all temporary facilities provided by the Trade Contractor for his exclusive use.

16.6.5 Furnishing, erection, maintenance and removal of all temporary hoists and scaffolding as may be required by the Trade Contractor for the performance of his Work.

16.6.6 Temporary drainage and dewatering measures including all pumping, drainage, erosion control or other work required to protect the Work of the Trade Contractor while in progress.

16.6.7 All temporary facilities, structures, services or items of work specifically required or defined in the Scope of Work of the Contract (Bid Package) or otherwise required by the Contract Documents for his work.

16.6.8 Distribution of drinking water for his employees and Trade-Subcontractors.

16.6.9 At the end of the day's work, all Work subject to damage by adverse weather conditions shall be covered or otherwise protected as required. Weather protection shall be adequate to

permit each Trade Contractor to work on a continuous basis without shutdown due to temperature or weather conditions as far as possible.

16.6.10 Provide snow removal as necessary to perform your work except access to site, which is by others.

16.7 Temporary Electric System

16.7.1 Concurrent with excavation operations, the central electrical service will be installed from the Utility Company's service point to the central distribution point on-site. Distribution from this point to the central connection point in the trailer area will be installed, including any transformers, main disconnect switch or switches, any metering, supports, protective enclosure and grounding.

Service will terminate in a panel board equipped with circuit breakers. Service characteristics available will be 120/208 volts, three phase, 4 wire, unless otherwise specified. Total capacity to be shared shall be 400 amps. Use of electricity for basic heating of trailers will not be allowed.

As excavation progresses, the distribution will be extended underground to the designates (on Site Utilization Plan) distribution locations will provide:

a. Panel board for breakers for lighting and hand tool circuits throughout the area served.

b. Panel board and breakers for twenty (20) 20 amp circuits for connection of bench tools, such as pipe threaders, etc.

The distribution will be extended upward to other floors of the building as indicated.

As the Work progresses and structure and decks are constructed, the lighting/hand tool circuits will be installed throughout the building according to the following criteria.

Temporary lighting shall be installed in all areas and rooms, including all platforms, levels and stairways but excluding crawl spaces, duct and riser shafts per OSHA Standard 1926.56. Any temporary lighting required beyond the foregoing shall be provided by the party requiring the same and the work will be paid for by that Trade Contractor.

16.7.2 Operations and Maintenance

The system will be operated during normal work week, defined as five (5) days, including 1/2 hour before regular working hours and 1/2 hour after regular working hours for every trade.

Maintenance of the electrical service beyond the duration defined above will be at the expense of the Trade Contractor requesting the service. Charges for maintenance of the services will be made from the trade contractor responsible for operating the utility service to the Trade Contractor and will not involve (nor occur cost to) the Construction Manager or Owner.

16.7.3 Relocation to allow construction to proceed and removal when permanent power is available will be coordinated with the Construction Manager as part of the maintenance service.

16.7.4 The Electrical Trade Contractor may be requested in the Bid Package "Scope of Work" to include part or all of the above described temporary service and distribution and/or maintenance.

16.7.5 Payment for Electrical Energy. The Construction Manager will pay for the cost of all energy consumed by all trades during the construction period metered through this system.

16.8 Temporary Heating (Address only if applicable to your project)

16.8.1 Construction Heating. Each Trade Contractor shall be responsible for providing his own temporary heat and weathertight enclosures as required for the satisfactory performance of his work and to comply with the construction schedule. Temporary heat systems must be approved by the Construction Manager.

16.8.2 Temporary Use of Building System

It is not anticipated that the permanent building system will be utilized to provide "temporary heat" during the major portion of construction operations.

It is anticipated that activation, testing and balancing of the building heating/cooling system will be critical to the completion and acceptance of the project and therefore actuation, of the permanent system will be scheduled for the earliest possible time.

Within these parameters, the Trade Contractor must provide any supplemental heat required to perform his work.

In the proposal form, the Trade Contractor may be requested to indicate an amount included for "supplemental heat" (not construction heating) as the Construction Manager may request proposals for providing an interim heating system from the Mechanical Trade Contractor.

16.8.3 Temporary humidity control system will only be available after the temporary heat system is activated in the building. Trade Contractor shall take this into account with regard to drying and curing times as well as dimensional stability of permanently installed work of this bid package.

16.9 Temporary Water

16.9.1 Temporary water distribution as indicated on Site Utilization will be provided for the use of all Trade Contractors and to provide a temporary fire protection system.

16.9.2 The temporary fire protection system shall be installed using the permanent standpipes and risers, and shall be installed as rapidly as construction permits.

16.9.3 Temporary fire standpipe connections, including pipe fittings, and valves shall be provided at the location of each permanent hose rack or station as shown on the contract drawings.

16.9.4 At each temporary riser connection shall be provided a temporary hose rack, 100 feet of 1-1/2" UL approved fire hose system with brass couplings and a 1-1/2" nozzle. The system shall also provide 2-1/2" valved, capped connection at each location together with 1-1/2" valved connection with a pair of hose bibs. Hose adaptors on the discharge side of the 2-1/2" valve shall be compatible with hose fittings used by the local fire department.

16.10 Housekeeping – Cleaning, Rubbish and Trash Removal

16.10.1 Each Trade Contractor shall be responsible for daily and final cleanup and continuous removal of all rubbish and debris generated and associated with its work from the building and site, including sweeping its work area with sweeping compound. The Construction Manager shall provide, erect, locate, and maintain a rubbish chute and/or dumpster for use of most trades. Each Trade Contractor shall be responsible to deposit his daily rubbish into these chutes or dumpster locations as designated and provided by the Construction Manager. Failure of a Trade Contractor to do so will require that this be done by the Construction Manager after proper notice to the Trade Contractor and labor for doing so shall be charged to the responsible Trade Contractor.

16.10.2 The job-site shall be maintained in a neat orderly condition and kept free from accumulations of waste materials and rubbish during the entire construction period. Trade Contractor will

remove their crates, cartons and other flammable waste materials or trash from the work areas at the end of each working day.

16.10.3 Each Trade Contractor shall be responsible for cleaning all surfaces as necessary to make them free of spatters or other deposits of paint, plaster, mortar, concrete, adhesives, roofing, dirt, soil, oil, or any other material foreign to the surface involved. The Construction Manager shall back-charge to the responsible party the cost of cleaning which is required by accidental soiling or damage by another Trade Contractor.

16.10.4 Each Trade Contractor is responsible to share the task of litter cleanup (e.g. coffee cups, lunch wrappers, etc.)

16.10.5 This Trade Contractor shall make all efforts to minimize dust and airborne debris. This includes utilizing wet cutting operations where permitted and providing and maintaining all required dust partitions. Other measures shall be required if, in the estimation of the Construction Manager, the existing dust control methods are not sufficient.

16.10.6 In the states of Connecticut, Massachusetts and Rhode Island those Trade Contractors who are not signatory to the Laborer's Union shall collect and deposit identifiable rubbish and debris from their operation to a central location or container on each level of the building as designated by the Construction Manager for further disposal by others on a daily basis. Debris collected in the immediate area of the trash chute shall be deposited directly into the trash chute by all Trade Contractors.

16.11 Vehicle Cleaning – Trucking

16.11.1 The Construction Manager (on the Site Utilization Plan) will designate the wash-down area to be utilized by the Trade Contractors. The "wheel wash station" will be equipped with a hose connection and drainage area. The Trade Contractor shall provide manpower, hose and other supplemental scrapers, brushes, etc., which may be required to satisfactorily clean his vehicles leaving the site. The construction of this temporary facility may be included in the "Scope of Work" of the excavation or site Preparation Bid Package, Review scope of work carefully.

16.11.2 All vehicles shall be cleaned of all mud and debris before leaving the site. Each Trade Contractor shall be responsible for providing whatever personnel may be required to perform the required vehicle cleaning throughout the progress of his work. The wash-down area shall not be used for cleaning out of concrete mix trucks.

16.11.3 Cleaning of concrete equipment shall be performed at locations designated by the Construction Manager. Cleaning shall be conducted in such a manner as to prevent spillage of fluid or concrete to the ground or penetration of existing ground soil. The responsible Trade Contractor shall remove from the site all residue accumulated from the cleaning operations of concrete equipment.

16.11.4 All trucks leaving the site with earthen materials or loose debris shall be loaded in a manner that will prevent dropping of materials on streets, and are to have suitable coverings fastened over the load before they enter surrounding paved streets. Trucks bringing earthen materials over paved streets to the site shall be similarly loaded and covered. The Trade Contractor shall conform to all local regulations regarding load limits and be responsible for any costs due to failure to comply with the above.

16.12 Site Security, Personnel & Property Protection

16.12.1 At no time remove, alter or render ineffective any barricades, railings or cover on the project without written permission of the Construction Manager. Where these safety devices are to be

turned over to others, upon completion of the work, the devices shall be repaired or replaced so that they meet the required standards prior to turnover. Replace guardrails and other safety structures which you have removed to perform your work, coordinate with the Construction Manager. Closely follow safety procedures while structures are removed.

16.12.2 The Trade Contractor shall provide and maintain proper warnings and detour signs at all pedestrian and vehicular closures, intersections, and along detours, directing traffic around closed portions of roadways. He shall, at his own expense, wherever necessary or required, provide and maintain fences, temporary roadways, temporary cross signs, watchmen, warning lights and take such other precautions as may be necessary to protect life and property, and shall be responsible for all damages occasioned in any way by his act or neglect. All barricades and obstructions shall be illuminated at night, and all lights shall be kept on from one-half hour before sunset, until one-half hour after sunrise.

Article 17 – Dispute Resolution Process

17.1 Dispute Resolution – Claim Definition

17.1.1 The Trade Contractor and the Construction Manager (the "Parties") agree that any and all disputes, differences, claims, or issues arising from this Agreement or involving the Project, including further any party seeking any payment, cost, expense, compensation, loss, time, adjustment, change, request for equitable adjustment, delay, acceleration, damage, remedy, recover or relief of any type or nature shall be collectively referred to as a "Claim" in this Article of the Agreement.

17.2 Claim Notice Requirements

17.2.1 All notice requirements for any claim by Trade Contractor shall be governed by the requirements set forth in this Agreement and the Contract Documents and, nothing in this Article shall excuse, relieve or discharge such requirements. In addition to the notice requirements in this Agreement or the Contract Documents the Trade Contractor shall also provide Construction Manager with a separate Formal Written Notice within three (3) business days after the occurrence of the event giving rise to the Claim. The Formal Written Notice must be labeled in Bold text at the top of the letter, "Trade Contractor's Formal Written Notice of Claim" and shall include specific details and basis for such Claim. Timely submission of such Formal Written Notice is a strict condition precedent to any right or remedy of Trade Contractor to pursue any relief relating to such Claim and, Trade Contractor's failure to timely and properly serve such Formal Written Notice on Construction Manager shall waive the Claim. Daily logs, meeting minutes or other project records and documents shall not constitute a Formal Written Notice. It is specifically understood and agreed that Trade Contractor's failure to timely serve such Formal Written Notice would prejudice Construction Manager's rights and remedies with the respect to: (i) investigating such Claim; (ii) its ability to take remediation and/or mitigation actions; and/or, (iii) the Owner, Architect, Engineer, separate trade contractor, separate contractor or others and, therefore, such failure shall be an absolute waiver of the Claim.

17.3 Owner Claims

17.3.1 In the event the Prime Contract includes any dispute resolution process ("Owner's Dispute Resolution Process"), then to the extent that the Claims between the Construction Manager

and Owner include or involve the Trade Contractor and/or any of its Trade-Subcontractors, vendors, suppliers at any tier or any of their acts, omissions, work or obligations, Trade Contractor consents, accepts and agrees to be bound to the Owner's Dispute Resolution Process and will require its Trade-Subcontractors to so consent, accept and agree as well. In addition, the Construction Manager shall have the right to add Trade Contractor, in Construction Manager's sole discretion, as a party to Owner's Dispute Resolution Process. Construction Manager shall be deemed to have exercised such exclusive right by giving written notice to Trade Contractor. Upon Construction Manager exercising such right and giving such written notice, Trade Contractor hereby consents, accepts and agrees to be a party, and shall be legally bound by any resolution, decision, finding, determination, award, judgment, holding or result of the Owner's Dispute Resolution Process. Trade Contractor shall assist the Construction Manager and provide promptly upon written request of Construction Manager, and without subpoena or other legal process, full access to any documents, information, data, cost data, witnesses, employees, experts or other items maintained or within the control of the Trade Contractor related to the Project or any Claim. Trade Contractor's consent and agreement to the terms and conditions of this Article is part of this Agreement's consideration and is a material inducement for Construction Manager to enter into the Trade Contract Agreement.

17.3.2 For purposes of this Article 17.3.2, "Payment Bond" means any payment bond issued by Construction Manager including, without limitation, payment bonds issued pursuant to the Federal Miller Act (40 U.S.C. 3131 et seq.), payment bonds issued pursuant to state Little Miller Acts, and payment bonds issued on private commercial projects. For any Claim subject to the Owner's Dispute Resolution Process, Trade Contractor agrees to forebear in filing any suit or action, including any suit or action against Construction Manager's surety under a Payment Bond, or to stay any suit or action that has been filed, including any suit or action against Construction Manager's surety under a Payment Bond, until the Owner's Dispute Resolution Process is exhausted. It is understood by Trade Contractor that the stay of any suit or action pursuant to this Article is not a waiver of the Trade Contractor's Payment Bond rights, including any rights under the Federal Miller Act or any state Little Miller Act. Furthermore, it is understood by Trade Contractor that its agreement in Article 17.3.1 above to be bound to and by the Owner's Dispute Resolution Process is not a waiver of the Trade Contractor's Payment Bond rights, including any rights under the Federal Miller Act or any state Little Miller Act.

17.4 Mediation

17.4.1 Subject to the Exclusions (hereinafter defined) and/or Owner's Dispute Resolution Process as set forth in this Article, Claims shall be subject to non-binding Mediation as a condition precedent to binding Arbitration. The Trade Contractor and Construction Manager shall endeavor to resolve their Claims by a meeting of each company's respective senior management representatives. Such senior management representatives' meeting shall be conducted within a reasonable time of either Party's request, but only after a failure of the Parties to reach a resolution of the Claim at the project management level at the site. In the event that the senior management meeting is not successful, then the Claim shall be mediated using a mediator mutually agreed upon by the Parties. A request for mediation shall be made in writing, delivered to the other Party to this Agreement. If the Parties are unable to mutually agree upon a mediator, location and date for the mediation within sixty (60) days of either Party's initial written request to mediate, then either Party may proceed to administration of the mediation by the American Arbitration Association ("AAA") in accordance with its Construction Industry Mediation Procedures in effect on the date of this Agreement. Any mediation shall also comply with any Mediation Statutes and Laws in effect where the Project

is located. The parties shall share the mediator's fee, costs and any filing fees equally. Each party shall bear its own legal fees. Mediation shall be held in the place where the Project is located, unless another location is mutually agreed upon. Agreements reached in writing at mediation, and signed by the Parties, shall be fully binding upon the Parties and may be enforceable as a settlement agreement in any court having jurisdiction thereof.

17.5 Arbitration

17.5.1 Subject to the Exclusions and/or Owner's Dispute Resolution Process as set forth in this Article, any Claim not settled at mediation shall be subject to binding Arbitration pursuant to the terms and conditions set forth herein. The Parties shall first attempt to agree upon an arbitrator in a private arbitration utilizing the Construction Industry Rules of the American Arbitration Association, and the Arbitration requirements set forth herein. If the Parties cannot agree upon such an arbitrator, then the Claims shall be resolved in accordance with the Construction Industry Arbitration Rules of the American Arbitration Association, except there shall be a waiver of any fast track arbitrations, and the fast track arbitration procedure of the AAA shall not apply.

17.5.2 Notwithstanding any rule of the AAA to the contrary, Construction Manager shall have the right to reject any arbitrator appointed by the AAA within a period of thirty days (30) after his or her appointment.

17.5.3 The Parties shall be permitted to have full and complete discovery as set forth herein. Any arbitration award or judgment on the award rendered by the arbitrator(s) may be entered in any court having jurisdiction thereof, unless they mutually agree otherwise in writing. Claims shall be heard by a single arbitrator, unless the claim amount exceeds $750,000, in which case the dispute shall be heard by a panel of three arbitrators. The Federal Rules of Civil Procedure shall apply, and there shall be no limitation imposed by the Arbitration panel limiting the witness, depositions, or discovery unless dictated by the Federal Rules of Civil Procedure unless otherwise agreed in writing by the Parties; except as follows:

17.5.3.1 In the event a Claim between the Trade Contract and Construction Manager is for an amount less than $100,000, then the Parties agree: (i) to limit depositions to three representatives for each Party; and (ii) to be limited to request e-discovery e-mails of only three (3) records custodians of the other Party; in each event unless otherwise agreed in writing by the Parties.

17.5.3.2 In no event, regardless of the amount in controversy, shall either Party be permitted to seek e-discovery e-mails from more than five (5) records custodians of the other Party, unless otherwise agreed in writing by the Parties

17.5.4 The Parties agree that the Arbitrator or arbitration panel hearing the case shall be either an attorney who has worked in house with a contractor or construction management firm, or as a former judge, in each event who has ten or more years of experience in commercial construction litigation matters.

17.5.5 The place of arbitration shall be where the Project is located unless otherwise agreed by the Parties. The arbitration shall be governed by the laws of the State where the Project is located, except any disputes concerning the arbitrability of any issue shall be governed by the Federal Arbitration Act and not by any state act(s). Hearings will take place pursuant to the standard procedures that contemplate in-person hearings. The arbitrator(s) will have no authority to award punitive damages. Any award in an arbitration initiated under this clause shall be limited to monetary damages and shall include no injunction or direction to any party other than the direction to pay a monetary amount. Arbitrator(s) will have the authority to allocate the costs

of the arbitration process among the parties, but shall not have the authority to allocate attorneys' fees and taxable costs except as a cost or damage for failure of a party to indemnify or defend the other, when applicable. The award of the arbitrator(s) shall be accompanied by a reasoned opinion, and arbitrators shall issue such written opinion within sixty (60) days of the conclusion of evidence and closing arguments received by the arbitration panel. Except as may be required by law or requested by any government agency or entity, neither a party nor the arbitrator(s) may disclose the existence, content, or results of any arbitration hereunder without the prior written consent of both parties, which consent may not be unreasonably withheld, conditioned or delayed when a reasonable basis is provided as a basis to disclose such results.

17.5.6 The Parties agree that failure or refusal of a party to pay its required share of the deposits for compensation of the arbitrator(s) or administrative charges shall constitute a waiver by that Party to present evidence or cross-examine witness. In addition, in such event, should such Party continue to fail and/or to fully refuse to cure the non-payment within twenty (20) days after written notice, then such failure to pay shall be deemed a default and shall entitle the other Party to a default judgment of liability in its favor. The other Party shall then be permitted to present evidence for any and all damages, loss and liability claimed against the non-paying Party without cross-examination or objection by the non-paying Party for entry of a final monetary award or judgment in favor of the other Party.

17.5.7 Trade Contractor hereby consents and agrees that any Claim against Construction Manager's or its Surety under a payment bond, whether on a public or private project, shall be subject to this Article 17; Construction Manager's surety on any payment bond shall be entitled to all of the rights and dispute resolution procedures afforded Construction Manager under this Article. Trade Contractor's surety on any payment and/or performance bond issued by Trade Contractor and its surety agrees to participate and be bound by all dispute resolution proceedings under this Article, including, but certainly not limited to, arbitration. Trade Contractor shall also flow down this specific requirement in all of its agreements, for every tier, related to the Project.

17.5.8 The Parties hereby agree that the provisions stated in this Agreement with respect to payment(s), withholding of payment(s), interest applicable to payment(s) and recovery of attorneys' fees in relation to collection of payment(s) from a Claim supersede and replace the terms of any prompt payment act, statute, or law. To the extent permitted by law, the provisions of any prompt payment act, statute or law shall not apply to this Agreement, and are hereby waived by the Parties.

17.5.9 The Parties expressly agree that any arbitration pursuant to this Article may be joined or consolidated with any arbitration involving any other person or entity (i) necessary to resolve the claim, dispute or controversy, or (ii) substantially involved in or affected by such claim, dispute or controversy. Both the Construction Manager and Trade Contractor will include appropriate provisions in all contracts they execute with other parties in connection with the Project to require such joinder or consolidation and to require resolution of claims via arbitration.

17.6 Continuing Performance

17.6.1 The existence of a Claim shall not be grounds for any nonperformance by Trade Contractor, or its surety; nor shall it be grounds to limit the right of Construction Manager to proceed with any remedies under this Agreement for any breach or default by Trade Contractor. Trade Contractor shall proceed diligently with performance of this Agreement and with the

performance of its Work pending any Dispute Resolution Process as set forth in this Article or as set forth in the Prime Contract's dispute resolution process.

17.7 Claims Expressly Excluded from Arbitration

17.7.1 Notwithstanding any other term, provision or condition set forth in this Article, any Claim involving a matter that is, or should be, defended by insurance and/or have insurance coverage shall be excluded from any arbitration terms, requirements or provisions in this Article, except to the extent such insurance coverage involves Contractor Default Insurance. For the avoidance of doubt, Contractor Default Insurance shall not be deemed a basis for such exclusion from Arbitration. The intent of this section is to exclude, except for Contractor Default Insurance, arbitration requirements for any Claim that is, or should be, subject of insurance coverage or may involve the interests of a third party or insurance company who has not agreed to Arbitration and, further to avoid multiple proceedings or the possibility of inconsistent verdicts.

17.8 Election to Litigation

17.8.1 As a material inducement for Construction Manager to enter into this Agreement with Trade Contractor, it is agreed the Construction Manager shall have the right, at all times and in its sole discretion, to elect to proceed to litigation with any Claim involving Trade Contractor rather than arbitrate the Claim as set forth in Article 15.4. Construction Manager shall issue written notice to Trade Contractor that Construction Manager has elected to proceed with litigation rather than arbitration. In such event, the jury trial waiver in Article 9.20 herein shall be given full force and effect. The Construction Manager may make such election in writing served on Trade Contractor at any time prior to the selection of the arbitrators or prior to the time to reject an arbitrator has passed, whichever is later.

17.8.2 In any part of this Article of the Dispute Resolution Process shall be adjusted or determined to be contrary to the applicable Laws, then all remaining terms, provisions and articles, in all other respects, shall be and remain legally effective and binding upon the Parties.

BUSINESS CREDENTIALING SERVICES (BCS) PROCEDURE

Gilbane Building Company ("Gilbane") has partnered with Business Credentialing Services ("BCS") to assist in its management of certificates of insurance ("COI"). For certain projects. BCS will be asked to compare a successful bidder's certificate of insurance to the insurance requirements for the project. When BCS is used for a project, the successful bidder's compliance with contractual requirements must be evidenced before commencing work or entering the job site. As insurance policies approach renewal, BCS will notify each successful bidder of the need to submit updated insurance information. BCS may contact the successful bidder with questions and may even ask to speak to its insurance advisor if necessary, it is a contract requirement that any successful bidder, and its insurance advisor(s), cooperate with BCS in resolving any non-conformities with certificate of insurance requirements.

The successful bidder must follow these procedures:

Initial Contract Award.

1. Upon notice of award to bidder, the successful bidder shall go to the following website and register with BCS using its contract number and the name of the project (to be supplied by Gilbane): https://www.businesscredentialingservices.com/
2. The successful bidder shall follow the instructions for submitting certificates of insurance including any additional documentation required to be attached.

Insurance Renewals.

1. Upon renewal of the successful bidder's insurance policies, BCS will provide instructions on how to submit updated insurance information.
2. The successful bidder must follow the instructions for submitting updated certificates of insurance including any additional documentation required to be attached.

Project: Abatement and Demolition of the Washington Elementary School PLACEHOLDER

Minimum Rates and Classifications for Building Construction

ID#: 23-50154

Connecticut Department of Labor
Wage and Workplace Standards

By virtue of the authority vested in the Labor Commissioner under provisions of Section 31-53 of the General Statutes of Connecticut, as amended, the following are declared to be the prevailing rates and welfare payments and will apply only where the contract is advertised for bid within 20 days of the date on which the rates are established. Any contractor or subcontractor not obligated by agreement to pay to the welfare and pension fund shall pay this amount to each employee as part of his/her hourly wages.

Project Number:
State#: 156-0142
Project Town: West Haven
FAP#:
Project: Abatement and Demolition of the Washington Elementary School

CLASSIFICATION	Hourly Rate	Benefits
1b) Asbestos/Toxic Waste Removal Laborers: Asbestos removal and encapsulation (except its removal from mechanical systems which are not to be scrapped), toxic waste removers, blasters.**See Laborers Group 7**		
1c) Asbestos Worker/Heat and Frost Insulator	45.56	32.65
2) Boilermaker	45.21	29.05
3a) Bricklayer, Cement Mason, Concrete Finisher (including caulking), Stone Masons	39.4	34.62 + a
3b) Tile Setter	37.1	30.52
3c) Tile and Stone Finishers	30.0	25.30
3d) Marble & Terrazzo Finishers	31.07	24.23
3e) Plasterer	42.77	29.63

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------LABORERS------

4) Group 1: General laborers, carpenter tenders, concrete specialists, wrecking laborers and fire watchers.	33.5	25.59
4) Group 1a: Acetylene Burners (Hours worked with a torch)	34.5	25.59
4a) Group 2: Mortar mixers, plaster tender, power buggy operators, powdermen, fireproofer/mixer/nozzleman (Person running mixer and spraying fireproof only).	33.75	25.59
4b) Group 3: Jackhammer operators/pavement breaker, mason tender (brick), mason tender (cement/concrete), forklift operators and forklift operators (masonry).	34.0	25.59
4c) **Group 4: Pipelayers (Installation of water, storm drainage or sewage lines outside of the building line with P6, P7 license) (the pipelayer rate shall apply only to one or two employees of the total crew who primary task is to actually perform the mating of pipe sections) P6 and P7 rate is $26.80.	34.5	25.59
4d) Group 5: Air track operator, sand blaster and hydraulic drills.	34.25	25.59
4e) Group 6: Blasters, nuclear and toxic waste removal.	36.5	25.59
4f) Group 7: Asbestos/lead removal and encapsulation (except it's removal from mechanical systems which are not to be scrapped).	36.5	25.59
4g) Group 8: Bottom men on open air caisson, cylindrical work and boring crew.	31.78	25.59
4h) Group 9: Top men on open air caisson, cylindrical work and boring crew.	31.24	25.59
4i) Group 10: Traffic Control Signalman	20.1	25.59

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4j) Group 11: Toxic Waste Removers A or B With PPE	36.5	25.59
5) Carpenter, Acoustical Ceiling Installation, Soft Floor/Carpet Laying, Metal Stud Installation, Form Work and Scaffold Building, Drywall Hanging, Modular-Furniture Systems Installers, Lathers, Piledrivers, Resilient Floor Layers.	37.61	27.61
5a) Millwrights	38.02	28.41
6) Electrical Worker (including low voltage wiring) (Trade License required: E1,2 L-5,6 C-5,6 T-1,2 L-1,2 V-1,2,7,8,9)	42.6	33.21+3% of gross wage
7a) Elevator Mechanic (Trade License required: R-1,2,5,6)	61.42	37.335+a+b
-----LINE CONSTRUCTION----		
Groundman	26.5	6.5% + 9.00
Linemen/Cable Splicer	48.19	6.5% + 22.00
8) Glazier (Trade License required: FG-1,2)	41.18	24.55 + a
9) Ironworker, Ornamental, Reinforcing, Structural, and Precast Concrete Erection	42.37	40.02 + a
----OPERATORS----		
Group 1: Crane Handling or Erecting Structural Steel or Stone; Hoisting Engineer (2 drums or over). (Trade License Required)	52.78	27.80 + a
Group 1a: Front End Loader (7 cubic yards or over); Work Boat 26 ft. and Over	48.37	27.80 + a

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Group 2: Cranes (100 ton rate capacity and over); Bauer Drill/Caisson. (Trade License Required)	52.41	27.80 + a
Group 2a: Cranes (under 100 ton rated capacity).	51.51	27.80 + a
Group 2b: Excavator over 2 cubic yards; Pile Driver ($3.00 premium when operator controls hammer)	48.0	27.80 + a
Group 3: Excavator; Gradall; Master Mechanic; Hoisting Engineer (all types of equipment where a drum and cable are used to hoist or drag material regardless of motive power of operation), Rubber Tire Excavator (Drott-1085 or similar);Grader Operator; Bulldozer Finegrade. (slopes, shaping, laser or GPS, etc.). (Trade License Required)	47.1	27.80 + a
Group 4: Trenching Machines; Lighter Derrick; CMI Machine or Similar; Koehring Loader (Skooper); Goldhofer.	46.64	27.80 + a
Group 5: Specialty Railroad Equipment; Asphalt Spreader, Asphalt Reclaiming Machine; Line Grinder; Concrete Pumps; Drills with Self Contained Power Units; Boring Machine; Post Hole Digger; Auger; Pounder; Well Digger; Milling Machine (over 24 mandrel).	45.92	27.80 + a
Group 5 continued: Side Boom; Combination Hoe and Loader; Directional Driller.	45.92	27.80 + a
Group 6: Front End Loader (3 up to 7 cubic yards); Bulldozer (rough grade dozer).	45.55	27.80 + a
Group 7: Asphalt Roller; Concrete Saws and Cutters (ride on types); Vermeer Concrete Cutter; Stump Grinder; Scraper; Snooper; Skidder; Milling Machine (24" and under mandrel).	45.14	27.80 + a
Group 8: Mechanic; Grease Truck Operator; Hydroblaster; Barrier Mover; Power Stone Spreader; Welding; Work Boat Under 26 ft.; Transfer Machine; Rigger Foreman.	44.67	27.80 + a
Group 9: Front End Loader (under 3 cubic yards); Skid Steer Loader regardless of attachments; (Bobcat or Similar); Forklift, Power Chipper; Landscape Equipment (including Hydroseeder); Vacuum Excavation	44.14	27.80 + a

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Truck and Hydrovac Excavation Truck (27 HG pressure or greater).		
Group 10: Vibratory hammer; ice machine; diesel and air, hammer, etc.	41.69	27.80 + a
Group 11: Conveyor, earth roller, power pavement breaker (whiphammer), robot demolition equipment.	41.69	27.80 + a
Group 12: Wellpoint Operator.	41.61	27.80 + a
Group 13: Compressor Battery Operator.	40.92	27.80 + a
Group 14: Elevator Operator; Tow Motor Operator (solid tire no rough terrain).	39.54	27.80 + a
Group 15: Generator Operator; Compressor Operator; Pump Operator; Welding Machine Operator; Heater Operator.	39.06	27.80 + a
Group 16: Maintenance Engineer.	38.28	27.80 + a
Group 17: Portable Asphalt Plant Operator; Portable Crusher Plant Operator; Portable Concrete Plant Operator; Portable Grout Plant Operator; Portable Water Filtration Plant Operator.	43.46	27.80 + a
Group 18: Power Safety Boat; Vacuum Truck; Zim Mixer; Sweeper; (Minimum for any job requiring a CDL license); Rigger; Signalman.	40.54	27.80 + a
------PAINTERS (Including Drywall Finishing)------		
10a) Brush and Roller	37.62	24.55
10b) Taping Only/Drywall Finishing	38.37	24.55

10c) Paperhanger and Red Label	38.12	24.55
10e) Blast and Spray	40.62	24.55
11) Plumber (excluding HVAC pipe installation) (Trade License required: P-1,2,6,7,8,9 J-1,2,3,4 SP-1,2)	48.28	35.50
12) Well Digger, Pile Testing Machine	37.26	24.05 + a
Roofer: Cole Tar Pitch	44.5	23.30 + a
Roofer: Slate, Tile, Composition, Shingles, Singly Ply and Damp/Waterproofing	43.0	23.30 + a
15) Sheetmetal Worker (Trade License required for HVAC and Ductwork: SM-1,SM-2,SM-3,SM-4,SM-5,SM-6)	41.89	43.22
16) Pipefitter (Including HVAC work) (Trade License required: S-1,2,3,4,5,6,7,8 B-1,2,3,4 D-1,2,3,4, G-1, G-2, G-8 & G-9)	48.28	35.50
------TRUCK DRIVERS------		
17a) 2 Axle, Helpers	32.16	30.51 + a
17b) 3 Axle, 2 Axle Ready Mix	32.27	30.51 + a
17c) 3 Axle Ready Mix	32.33	30.51 + a
17d) 4 Axle	32.39	30.51 + a
17e) 4 Axle Ready Mix	32.44	30.51 + a

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17f) Heavy Duty Trailer (40 Tons and Over)	34.66	30.51 + a
17g) Specialized Earth Moving Equipment (Other Than Conventional Type on-the-Road Trucks and Semi-Trailers, Including Euclids)	32.44	30.51 + a
17h) Heavy Duty Trailer up to 40 tons	33.39	30.51 + a
17i) Snorkle Truck	32.54	30.51 + a
18) Sprinkler Fitter (Trade License required: F-1,2,3,4)	47.55	32.27 + a
19) Theatrical Stage Journeyman	25.76	7.34

Welders: Rate for craft to which welding is incidental.

**Note: Hazardous waste removal work receives additional $1.25 per hour for truck drivers.*

***Note: Hazardous waste premium $3.00 per hour over classified rate*

Crane with 150 ft. boom (including jib) - $1.50 extra
Crane with 200 ft. boom (including jib) - $2.50 extra
Crane with 250 ft. boom (including jib) - $5.00 extra
Crane with 300 ft. boom (including jib) - $7.00 extra
Crane with 400 ft. boom (including jib) - $10.00 extra

All classifications that indicate a percentage of the fringe benefits must be calculated at the percentage rate times the "base hourly rate".

Apprentices duly registered under the Commissioner of Labor's regulations on "Work Training Standards for Apprenticeship and Training Programs" Section 31-51-d-1 to 12, are allowed to be paid the appropriate percentage of the prevailing journeymen hourly base and the full fringe benefit rate, providing the work site ratio shall not be less than one full-time journeyperson instructing and supervising the work of each apprentice in a specific trade.

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The Prevailing wage rates applicable to this project are subject to annual adjustments each July 1st for the duration of the project.

Each contractor shall pay the annual adjusted prevailing wage rate that is in effect each July 1st, as posted by the Department of Labor.

It is the contractor's responsibility to obtain the annual adjusted prevailing wage rate increases directly from the Department of Labor's website.

The annual adjustments will be posted on the Department of Labor's Web page: www.ct.gov/dol. For those without internet access, please contact the division listed below.

The Department of Labor will continue to issue the initial prevailing wage rate schedule to the Contracting Agency for the project.

All subsequent annual adjustments will be posted on our Web Site for contractor access.

Contracting Agencies are under no obligation pursuant to State labor law to pay any increase due to the annual adjustment provision.

Effective October 1, 2005 - Public Act 05-50: any person performing the work of any mechanic, laborer, or worker shall be paid prevailing wage

All Person who perform work ON SITE must be paid prevailing wage for the appropriate mechanic, laborer, or worker classification.

All certified payrolls must list the hours worked and wages paid to All Persons who perform work ON SITE regardless of their ownership i.e.: (Owners, Corporate Officers, LLC Members, Independent Contractors, et. al)

Reporting and payment of wages is required regardless of any contractual relationship alleged to exist between the contractor and such person.

~~Unlisted classifications needed for work not included within the scope of the classifications listed may be added after award only as provided in the labor standards contract clause (29 CFR 5.5 (a) (1) (ii)).

Please direct any questions which you may have pertaining to classification of work and payment of prevailing wages to the Wage and Workplace Standards Division, telephone (860)263-6790.

As of: July 13, 2023

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PART 1 - GENERAL

1.01 RELATED DOCUMENTS

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

B. Section 019113 – General Commissioning Requirements (For reference only)

1.02 SUMMARY

A. This Section includes ac, enclosed controllers rated 600 V and less, of the following types:

1. Variable frequency controllers.

B. Variable frequency controllers provided by the equipment manufacturers shall be in accordance with specifications here in. All startup services and commissioning shall be included as part of the manufacture's unit startup under the respective section.

1.03 SUBMITTALS

A. Product Data: For each type of enclosed controller. Include dimensions and manufacturer's technical data on features, performance, electrical characteristics, ratings, and finishes.

B. Shop Drawings: For each enclosed controller.

1. Include dimensioned plans, elevations, sections, and details, including required clearances and service space around equipment. Show tabulations of installed devices, equipment features, and ratings. Include the following:

a. Each installed unit's type and details.
b. Nameplate legends.
c. Short-circuit current rating of integrated unit.
d. Listed and labeled for series rating of overcurrent protective devices in combination controllers by an NRTL acceptable to authorities having jurisdiction.
e. Features, characteristics, ratings, and factory settings of individual overcurrent protective devices in combination controllers.

2. Wiring Diagrams: Power, signal, and control wiring.

C. Coordination Drawings: Floor plans, drawn to scale, showing dimensioned layout, required working clearances, and required area above and around enclosed controllers where pipe and ducts are prohibited. Show enclosed controller layout and relationships between electrical components and adjacent structural and mechanical elements. Show support locations, type of support, and weight on each support. Indicate field measurements.

D. Qualification Data: For manufacturer and testing agency.

E. Field quality-control test reports.

F. Operation and Maintenance Data: For enclosed controllers to include in emergency, operation, and maintenance manuals. In addition to items specified in Division 01 Section "Operation and Maintenance Data," include the following:

1. Routine maintenance requirements for enclosed controllers and all installed components.
2. Manufacturer's written instructions for testing and adjusting overcurrent protective devices.

G. Load-Current and List of Settings of Adjustable Overload Relays: Compile after motors have been installed and arrange to demonstrate that dip switch settings for motor running overload protection suit actual motor to be protected.

1.04 QUALITY ASSURANCE

A. Manufacturer Qualifications: A qualified manufacturer. Maintain, within 100 miles of Project site, a service center capable of providing training, parts, and emergency maintenance and repairs.

B. Source Limitations: Obtain enclosed controllers of a single type through one source from a single manufacturer.

C. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.

D. Comply with NFPA 70.

E. Product Selection for Restricted Space: Drawings indicate maximum dimensions for enclosed controllers, minimum clearances between enclosed controllers, and for adjacent surfaces and other items. Comply with indicated maximum dimensions and clearances.

1.05 DELIVERY, STORAGE, AND HANDLING

A. Store enclosed controllers indoors in clean, dry space with uniform temperature to prevent condensation. Protect enclosed controllers from exposure to dirt, fumes, water, corrosive substances, and physical damage.

B. If stored in areas subject to weather, cover enclosed controllers to protect them from weather, dirt, dust, corrosive substances, and physical damage. Remove loose packing and flammable materials from inside controllers; install electric heating of sufficient wattage to prevent condensation.

1.06 PROJECT CONDITIONS

A. Interruption of Existing Electrical Service: Do not interrupt electrical service to facilities occupied by Owner or others unless permitted under the following conditions and then only after arranging to provide temporary electrical service according to requirements indicated:

1. Notify Owner no fewer than two days in advance of proposed interruption of electrical service.
2. Indicate method of providing temporary utilities.
3. Do not proceed with interruption of electrical service without Owner's written permission.

B. Environmental Limitations: Rate equipment for continuous operation, capable of driving full load without derating, under the following conditions, unless otherwise indicated:

1. Ambient Temperature: Local Site Conditions.
2. Humidity: Less than 90 percent (noncondensing) at 104 deg F.
3. Altitude: Not exceeding 3300 feet

1.07 COORDINATION

A. Coordinate layout and installation of enclosed controllers with other construction including conduit, piping, equipment, and adjacent surfaces. Maintain required workspace clearances and required clearances for equipment access doors and panels.

B. Coordinate features of enclosed controllers and accessory devices with pilot devices and control circuits to which they connect.

C. Coordinate features, accessories, and functions of each enclosed controller with ratings and characteristics of supply circuit, motor, required control sequence, and duty cycle of motor and load.

1.08 EXTRA MATERIALS

A. Furnish extra materials described below that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.

1. Spare Fuses: Furnish one spare for every five installed, but no fewer than one set of three of each type and rating.

1.09 WARRANTY

A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components of variable frequency drives and controllers that fail in materials or workmanship within specified warranty period.

1. Warranty Period: minimum 24 months from substantial completion.

PART 2 - PRODUCTS

2.01 VARIABLE FREQUENCY CONTROLLERS

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

1. ABB Power Distribution, Inc.; ABB Control, Inc. Subsidiary, Model ACH580
2. Yaskawa
3. Emerson, Model Varidyne 2

B. All variable frequency drives (VFDs) shall meet IEE standard 519.

C. All variable frequency drives shall be able to communicate with the Building Management System (BAS) controls through Bacnet.

D. Description: NEMA ICS 2, pulse-width-modulated, variable frequency controller; listed and labeled as a complete unit and arranged to provide variable speed of an NEMA MG 1, Design B, 3-phase, induction motor by adjusting output voltage and frequency.

E. Design and Rating: Match load type such as fans, blowers, and pumps; and type of connection used between motor and load such as direct or through a power-transmission connection.

F. Isolation Transformer: Match transformer voltage ratings and capacity to system and motor voltages; and controller, motor, and load characteristics.

G. Output Rating: 3-phase; 6 to 60 Hz, with voltage proportional to frequency throughout voltage range.

H. Unit Operating Requirements:

1. Input ac voltage tolerance of 380 to 500 V, plus or minus 10 percent.
2. Input frequency tolerance of 50/60 Hz, plus or minus 6 percent.
3. Minimum Efficiency: 96 percent at 60 Hz, full load.
4. Minimum Displacement Primary-Side Power Factor: 96 percent.
5. Overload Capability: 1.1 times the base load current for 60 seconds; 2.0 times the base load current for 3 seconds.
6. Starting Torque: 100 percent of rated torque or as indicated.
7. Speed Regulation: Plus or minus 1 percent.
8. Ambient Temperature: Local Site Conditions.

I. Isolated control interface allows controller to follow control signal over an 11:1 speed range.

1. Electrical Signal: 4 to 20 mA at 24 V.

J. Internal Adjustability Capabilities:

1. Minimum Speed: 5 to 25 percent of maximum rpm.
2. Maximum Speed: 80 to 100 percent of maximum rpm.
3. Acceleration: 2 to a minimum of 22 seconds.
4. Deceleration: 2 to minimum of 22 seconds.
5. Current Limit: 50 to a minimum of 110 percent of maximum rating.

K. Self-Protection and Reliability Features:

1. Input transient protection by means of surge suppressors.
2. Under- and overvoltage trips; inverter overtemperature, overload, and overcurrent trips.
3. Motor Overload Relay: Adjustable and capable of NEMA 250, Class 10 performance.
4. Notch filter to prevent operation of the controller-motor-load combination at a natural frequency of the combination.
5. Instantaneous line-to-line and line-to-ground overcurrent trips.
6. Loss-of-phase protection.
7. Reverse-phase protection.
8. Short-circuit protection.
9. Motor overtemperature fault.

L. Multiple-Motor Capability: Controller suitable for service to multiple motors and having a separate overload relay and protection for each controlled motor. Overload relay shall shut off controller and motors served by it when overload relay is tripped.

M. Automatic Reset/Restart: Attempts three restarts after controller fault or on return of power after an interruption and before shutting down for manual reset or fault correction. Restarting during deceleration shall not damage controller, motor, or load.

N. Power-Interruption Protection: Prevents motor from re-energizing after a power interruption until motor has stopped.

O. Status Lights: Door-mounted LED indicators shall indicate the following conditions:

1. Power on.
2. Run.
3. Overvoltage.
4. Line fault.
5. Overcurrent.
6. External fault.

P. Panel-Mounted Operator Station: Start-stop and auto-manual selector switches with manual speed control potentiometer and elapsed time meter.

Q. Indicating Devices: Meters or digital readout devices and selector switch, mounted flush in controller door and connected to indicate controller output current, voltage, and frequency.

R. Integral Disconnecting Means: NEMA KS 1, nonfusible switch with lockable handle.

S. Isolating Switch: Non-load-break switch arranged to isolate variable frequency controller and permit safe troubleshooting and testing.

T. Remote Indicating Circuit Terminals: Mode selection, controller status, and controller fault.

U. EMI / RFI filters. All VFDs shall include EMI/RFI filters. The VFD shall comply with standard EN 61800-3 for the First Environment, restricted level with up to 100' of motor cables. No Exceptions. Certified test lab test reports shall be provided with the submittals.

V. The VFD shall have 5% equivalent impedance internal reactors to reduce the harmonics to the power line and to add protection from AC line transients. The 5% equivalent impedance may be from dual (positive and negative DC bus) reactors, or 5% AC line reactors. VFDs with only one DC reactor shall add an AC line reactor.

W. The VFD shall include a coordinated AC transient protection system consisting of 4-120 joule rated MOV's (phase to phase and phase to ground), a capacitor clamp, and 5% equivalent impedance internal reactors.

X. The VFD shall include a fireman's override input. Upon receipt of a contact closure from the fireman's control station, the VFD shall operate in one of two modes: 1) Operate at a programmed predetermined fixed speed or operate in a specific fireman's override PID algorithm that automatically adjusts motor speed based on override set point and feedback. The mode shall override all other inputs (analog/digital, serial communication, and all keypad commands), except customer defined safety run interlock, and force the motor to run in one of the two modes above. "Override Mode" shall be displayed on the keypad. Upon removal of the override signal, the VFD shall resume normal operation.

Y. VFD's shall be coordinated and sized to provide the rated motor amps; indicated on the reviewed shop drawings; for the equipment served.

Z. Provide variable speed controllers whether indicated or implied in the specifications, schedules, plans, sequences of operation and flow and control diagrams for all motors ≥10hp.

2.02 ENCLOSURES

A. Description: Flush- or surface-mounting cabinets as indicated. NEMA 250, Type 1, unless otherwise indicated to comply with environmental conditions at installed location.

1. Outdoor Locations: NEMA 250, Type 3R.
2. Other Wet or Damp Indoor Locations: NEMA 250, Type 3R.

2.03 ACCESSORIES

A. Devices shall be factory installed in controller enclosure, unless otherwise indicated.

B. Push-Button Stations, Pilot Lights, and Selector Switches: NEMA ICS 2, heavy-duty type.

C. Stop and Lockout Push-Button Station: Momentary-break, push-button station with a factory-applied hasp arranged so padlock can be used to lock push button in depressed position with control circuit open.

D. Control Relays: Auxiliary and adjustable time-delay relays.

E. Elapsed Time Meters: Heavy duty with digital readout in hours.

F. Phase-Failure and Undervoltage Relays: Solid-state sensing circuit with isolated output contacts for hard-wired connection. Provide adjustable undervoltage setting.

G. Current-Sensing, Phase-Failure Relays for Bypass Controllers: Solid-state sensing circuit with isolated output contacts for hard-wired connection; arranged to operate on phase failure, phase reversal, current unbalance of from 30 to 40 percent, or loss of supply voltage; with adjustable response delay.

H. All accessories required for proper operation at the local site ambient conditions.

2.04 FACTORY FINISHES

A. Finish: Manufacturer's standard white paint applied to factory-assembled and -tested enclosed controllers before shipping.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Examine areas and surfaces to receive enclosed controllers for compliance with requirements, installation tolerances, and other conditions affecting performance.

1. Proceed with installation only after unsatisfactory conditions have been corrected.

3.02 APPLICATIONS

A. Select features of each enclosed controller to coordinate with ratings and characteristics of supply circuit and motor; required control sequence; duty cycle of motor, controller, and load; and configuration of pilot device and control circuit affecting controller functions.

B. Select horsepower rating of controllers to suit motor controlled.

3.03 INSTALLATION

A. For control equipment at walls, bolt units to wall or mount on lightweight structural-steel channels bolted to wall. For controllers not at walls, provide freestanding racks complying with Division 26 Section "Hangers and Supports for Electrical Systems."

3.04 IDENTIFICATION

A. Identify enclosed controller, components, variable frequency drives, and control wiring according to Division 26 Section "Identification for Electrical Systems."

3.05 CONTROL WIRING INSTALLATION

A. Install wiring between enclosed controllers according to Division 26 Section "Low-Voltage Electrical Power Conductors and Cables."

B. Bundle, train, and support wiring in enclosures.

C. Connect hand-off-automatic switch and other automatic-control devices where applicable.

1. Connect selector switches to bypass only manual- and automatic-control devices that have no safety functions when switch is in hand position.
2. Connect selector switches with enclosed controller circuit in both hand and automatic positions for safety-type control devices such as low- and high-pressure cutouts, high-temperature cutouts, and motor overload protectors.

3.06 CONNECTIONS

A. Conduit installation requirements are specified in other Division 26 Sections. Drawings indicate general arrangement of conduit, fittings, and specialties.

B. Ground equipment according to Division 26 Section "Grounding and Bonding for Electrical Systems."

3.07 FIELD QUALITY CONTROL

A. Prepare for acceptance tests as follows:

1. Test insulation resistance for each enclosed controller element, bus, component, connecting supply, feeder, and control circuit.

2. Test continuity of each circuit.

B. Manufacturer's Field Service: Engage a factory-authorized service representative to perform the following:

1. Inspect controllers, wiring, components, connections, and equipment installation. Test and adjust controllers, components, and equipment.
2. Assist in field testing of equipment including pretesting and adjusting of solid-state controllers.
3. Report results in writing.

3.08 ADJUSTING

A. Set field-adjustable switches and circuit-breaker trip ranges.

3.09 DEMONSTRATION

A. Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain enclosed controllers. Refer to Division 01 Section "Demonstration and Training."

3.10 COMMISSIONING (FOR REFERENCE ONLY)

A. Where indicated in the equipment or commissioning specifications, engage a factory-authorized service representative, to perform startup service as per functional test sheets and requirements of Section 019113 – General Commissioning Requirements.

B. Complete installation and startup checks and functional tests according to Section 019113 – General Commissioning Requirements and manufacturers written instructions.

C. Operational Test: After the electrical system has been energized, start units to confirm proper unit operation. Rectify malfunctions, replace defective parts with new one and repeat the start up procedure.

D. Verify that equipment is installed and commissioned as per requirements of section 019113 and manufacturers written instructions/requirements.

END OF SECTION

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

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

B. Refer to specification section 232913 “Variable Frequency Motor Controllers and Enclosed Controllers” for VFD requirements.

C. Section 019113 – General Commissioning Requirements. (For Reference Only)

D. Drawing M4.00, Mechanical - Schedules

1.02 SUMMARY

A. Section includes factory-packaged units capable of supplying up to 100 percent outdoor air and providing energy recovery, preheat, cooling and heating.

1.03 ACTION SUBMITTALS

A. Product Data: For each air-handling unit indicated.

1. Plans, elevations, sections, and attachment details.
2. Include details of equipment assemblies. Indicate dimensions, weights, loads, required clearances, method of field assembly, components, and location and size of each field connection.
3. Unit dimensions and weight.
4. Cabinet material, metal thickness, finishes, insulation, and accessories.
5. Fans:

    a. Certified fan-performance curves with system operating conditions indicated.
    b. Certified fan-sound power ratings.
    c. Fan construction and accessories.
    d. Motor ratings, electrical characteristics, and motor accessories.

6. Certified coil-performance ratings with system operating conditions indicated.
7. Dampers, including housings, linkages, and operators.
8. Filters with performance characteristics.
9. Diagrams for power, signal, and control wiring.
10. Trap dimensions including calculations.

B. CT High Performance Building Submittals:

1. Product Data for Prerequisite EA 2: Documentation indicating that units comply with applicable requirements in ASHRAE/IESNA 90.1.
2. Product Data for Prerequisite IEQ 1: Documentation indicating that units comply with ASHRAE 62.1, Section 5 - "Systems and Equipment."
3. Product Data for Credit IEQ 1: Documentation indicating that units are equipped with a direct outdoor airflow-measuring device capable of measuring the minimum outdoor airflow with accuracy within 15 percent of the design minimum airflow rate, as defined by ASHRAE 62.1.

4. Product Data for Credit IEQ 4.1: For solvent cements and adhesive primers, documentation including printed statement of VOC content.
5. Laboratory Test Reports for Credit IEQ 4: For solvent cements and adhesive primers, documentation indicating that products 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."
6. Product Data for Credit IEQ 5: Documentation indicating that units include minimum MERV 13 filters rated according to ASHRAE 52.2.

C. Delegated-Design Submittal: For vibration isolation indicated to comply with performance requirements and design criteria, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation.

1. Base Details: Detail fabrication including anchorages and attachments to structure and to supported equipment. Include adjustable motor bases, rails, and frames for equipment mounting.
2. Design Calculations: Calculate requirements for selecting vibration isolators and for designing vibration isolation bases.

1.04 INFORMATIONAL SUBMITTALS

A. Coordination Drawings: Floor plans and other details, drawn to scale, on which the following items are shown and coordinated with each other, using input from installers of the items involved:

1. Mechanical-room layout and relationships between components and adjacent structural and mechanical elements.
2. Support location, type, and weight.
3. Field measurements.

B. Seismic Qualification Certificates: For air-handling units, accessories, and components, from manufacturer.

1. Basis for Certification: Indicate whether withstand certification is based on actual test of assembled components or on calculation.
2. Dimensioned Outline Drawings of Equipment Unit: Identify center of gravity and locate and describe mounting and anchorage provisions.
3. Detailed description of equipment anchorage devices on which the certification is based and their installation requirements.

C. Source quality-control reports.

D. Field quality-control reports.

E. Startup service reports.

F. Sample Warranty: For special warranty.

1.05 CLOSEOUT SUBMITTALS

A. Operation and Maintenance Data: For air-handling units to include in emergency, operation, and maintenance manuals.

1.06 MAINTENANCE MATERIAL SUBMITTALS

A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.

1. Filters: One set(s) for each air-handling unit.
2. Gaskets: One set(s) for each access door.

1.07 QUALITY ASSURANCE

A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

B. NFPA Compliance: Comply with NFPA 90A for design, fabrication, and installation of air-handling units and components.

C. ARI Certification: Air-handling units and their components shall be factory tested according to ARI 430, "Central-Station Air-Handling Units," and shall be listed and labeled by ARI.

D. ASHRAE Compliance: Applicable requirements in ASHRAE 62.1, Section 5 - "Systems and Equipment" and Section 7 - "Construction and Startup."

E. ASHRAE/IESNA 90.1 Compliance: Applicable requirements in ASHRAE/IESNA 90.1, Section 6 - "Heating, Ventilating, and Air-Conditioning."

F. Comply with NFPA 70.

1.08 WARRANTY

A. Special Warranty: Manufacturer agrees to replace components of units that fail in materials or workmanship within specified warranty period.

1. Warranty Period for Heat Exchangers: Five years from date of Substantial Completion.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

A. Manufacturers: Trane custom is the basis of the design. Alternate products shall be considered based on meeting the requirements for “Buy America”

2.02 PERFORMANCE REQUIREMENTS

A. General Fabrication Requirements: Comply with requirements in ASHRAE 62.1, Section 5 - "Systems and Equipment," and Section 7 - "Construction and System Start-up."

B. Delegated Design: Engage a qualified professional engineer, as defined in Section 014000 "Quality Requirements," to design vibration isolation.

C. Cabinet Thermal Performance:

1. Maximum Overall U-Value: Comply with requirements in ASHRAE/IESNA 90.1.
2. Include effects of metal-to-metal contact and thermal bridges in the calculations.

D. Cabinet Surface Condensation:

1. Cabinet shall have additional insulation and vapor seals if required to prevent condensation on the interior and exterior of the cabinet.
2. Portions of cabinet located downstream from the cooling coil shall have a thermal break at each thermal bridge between the exterior and interior casing to prevent condensation from occurring on the interior and exterior surfaces. The thermal break shall not compromise the structural integrity of the cabinet.

E. Maximum Cabinet Leakage: 0.5 percent of the total supply-air flow at a pressure rating equal to the fan shut-off pressure.

F. Cabinet Deflection Performance:

1. Walls and roof deflection shall be within 1/200 of the span at the design working pressure equal to the fan shut-off pressure. Deflection limits shall be measured at any point on the surface.
2. Floor deflections shall be within 1/240 of the span considering the worst-case condition caused by the following:

    a. Service personnel.
    b. Internal components.
    c. Design working pressure defined for the walls and roof.

G. Electrical components, devices, and accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

2.03 UNIT CASINGS

A. General Fabrication Requirements for Casings:

1. Type: Double wall insulated.
2. Forming: Form walls, roofs, and floors with at least two breaks at each joint.
3. Casing Joints: Sheet metal screws or pop rivets.
4. Sealing: Seal all joints with water-resistant sealant.
5. Factory Finish for Galvanized-Steel Casings: Immediately after cleaning and pretreating, apply manufacturer's standard two-coat, baked-on enamel finish, consisting of prime coat and thermosetting topcoat.
6. Airstream Surfaces: Surfaces in contact with the airstream shall comply with requirements in ASHRAE 62.1.

B. Casing Insulation and Adhesive:

1. Type: Foam Injected with Thermal Break
2. Insulation Value: Minimum of R-13
3. Materials: ASTM C 1071, Type II.
4. Location and Application: Encased between outside and inside casing.

C. Inspection and Access Panels and Access Doors:

1. Panel and Door Fabrication: Formed and reinforced, double-wall and insulated panels of same materials and thicknesses as casing.

2. Access Doors:

    a. Hinges: A minimum of two ball-bearing hinges or stainless-steel piano hinge and two wedge-lever-type latches, operable from inside and outside. Arrange doors to be opened against air-pressure differential.
    b. Gasket: Neoprene, applied around entire perimeters of panel frames.
    c. Fabricate windows in all access doors of double-glazed, wire-reinforced safety glass with an air space between panes and sealed with interior and exterior rubber seals.
    d. Size: At least 24 inches wide by full height of unit casing up to a maximum height of 72 inches for all areas requiring access for service or sized as needed to remove largest interior component such as fans. For access to coils doors shall be no smaller than 18” wide.

3. Locations and Applications:

    a. Fan Section: Doors.
    b. Access Section: Doors.
    c. Coil Sections: Doors.
    d. Damper Section: Doors.
    e. Wheel: Doors
    f. Filter Section: Doors large enough to allow periodic removal and installation of filters.
    g. Mixing Section: Doors.

4. Service Light: Marine LED (100-W equivalent) vaporproof fixture with switched junction box located outside adjacent to door.

    a. Locations: Each section accessed with door except wheel.

D. Condensate Drain Pans:

1. Fabricated with two percent slope in at least two planes to collect condensate from cooling coils (including coil piping connections, coil headers, and return bends) and from humidifiers and to direct water toward drain connection.

    a. Length: Extend drain pan downstream from leaving face to comply with ASHRAE 62.1.
    b. Depth: A minimum of 2 inches deep.

2. Integral part of floor plating.
3. Double-wall, stainless-steel sheet with space between walls filled with foam insulation and moisture-tight seal.
4. Drain Connection: Located at lowest point of pan and sized to prevent overflow. Terminate with threaded nipple on one end of pan.

    a. Minimum Connection Size: NPS 1.

5. Units with stacked coils shall have an intermediate drain pan to collect condensate from top coil.

E. Air-Handling-Unit Mounting Frame: 8” high Formed galvanized-steel channel or structural channel supports, designed for low deflection, welded with integral lifting lugs, size to allow for proper condensate drain trap.

2.04 FAN, DRIVE, AND MOTOR SECTION

A. Direct drive fan array system

1. The fan array system shall consist of multiple, direct driven, arrangement with a minimum plenum fans as scheduled. Fans shall have a sharply rising pressure characteristic extending through the operating range and continuing to rise beyond the peak efficiency to ensure quiet and stable operation. Fans shall have a non-overloading design with self-limiting horsepower characteristics and shall reach a peak in the normal selection area. All fans shall be capable of operating over the minimum pressure class limits as specified in AMCA's standard 2408-69.
2. The fan array shall consist of multiple fan and motor "cells", spaced in the air way tunnel cross section to provide a uniform air flow and velocity profile across the entire air way tunnel cross section and components contained therein.
3. The fan array shall produce a uniform air flow profile and velocity profile within the airway tunnel of the air handling unit not to exceed the specified cooling coil and/or filter bank face velocity when measured at a point 12" from the intake side of the fan array intake plenum wall, and at a distance of 48" from the discharge side of the fan plenum wall.
4. Each fan/motor assembly shall be removable through an access door located on the side of the fan wall array.
5. Plenum fans shall have factory connected direct drive ECM or induction fan motor. Manufacturers that offer belt drive fans in lieu of direct drive fans shall not be acceptable.
6. Furnish spring loaded or gravity damper assembly at the inlet of each fan to prevent positive supply fan chamber from flowing to negative inlet chamber when individual fan motor fails or is cycled off.
7. Air handling cabinet shall be furnished with inward swinging door to assure air tight door seal of positive pressure system.
8. Each fan array system shall be configured with airflow monitoring as a total airflow of each fan section. Include a transducer for each fan array to directly read cfm with an analogue output to the building automation system without external converters.

B. Plenum fans

1. The fan construction shall be in accordance with the class required or specified in the project fan schedule.
2. The manufacturer shall certify the sound power level ratings in the eight octave bands and shall have sound power levels in compliance with DIN EN ISO 3745 AND ISO 13347-3.
3. The fans shall have been statically and dynamically balanced by the fan manufacturer. An IRD or PMC analyzer shall have been used to measure velocity, the final balanced reading shall not exceed 0.1 inches/second. Balancing and vibration tests shall have been done according to G6.3 DIN ISO 1940 Part 1.
4. All fans shall be certified to bear the AMCA® rating seal for air and sound, according to standards AMCA 210-99
5. The fans shall be compliant and listed to ErP 2015, CE and UL/CSA.
6. The bearings shall be designed for continuous intensive operation and shall be rated for a minimum L-10 life 40,000 hours at the maximum speed for its class.
7. The fan wheel shall be aluminum or high performance composite.
8. The fan and motor assembly shall conform to EN61800-5-1;CE standards and have approval 1004-7+60730;c22.2 Nr.77+ and CAN/CSA-E60730-1

C. ECM motors

1. RPM modulation controls are built into the ECM motors. RPM modulation does not require a VFD.
2. Motors shall be IP54 and rated for outdoor use.
3. Motors under 1.7Hp, shall be designed for 60 Hz, single phase. Motors 1.7 Hp and over shall be 3 phase 460V.
4. Motor insulation class shall be of Type F.
5. The motors shall have self-regulating temperature control. The motor will slow down if the temperature gets too high and use power from the mains to heat itself if the temperature is too cold.
6. Motors shall have reverse polarity and locked motor protection
7. The motors shall have a built in soft-start feature and line under-voltage/phase failure detection.
8. The fan and motor shall have an Integrated PID controller, AM-MODBUS-W, AM-Premium-W, A-G-247NW Hand held controller and Control input 0-10 VDC/PWM.
9. The motor shall have EMC interference immunity and emission according to EN 61000-6-2 and EN 61000-6-4 respectively.
10. The motor shall have some moisture resistance and condensation holes for moisture to escape the motor.
11. Each fan shall motor be supplied with an expansion data card or transducer, which indicates airflow in Cubic Feet per Minute. Data card shall provide a digital CFM readout, and a (4-20 ma) (0-10 volt) output control signal for use in the BMS. BACnet input as an option.

D. Fan array system electrical

1. Furnish a complete electrical cabinet with hinged doors as an integral design of the AHU. Single point 460/3/60 power block to each fan array shall be located within the electrical cabinet. All individual fan disconnects, overloads and switching must be located within the cabinet.
2. Fan Array designs shall be in accordance with specific system requirements. Please see system requirements before electrical design of Fan Array System is to commence.
3. Fan Array Electrical designs shall be in accordance with the NEC, UL 508A, and Local Codes.
4. The unit shall be completely factory-wired, requiring only field wiring to the line side of the main power disconnect switches at the electrical control panel.
5. Disconnect switch for each fan Motor with circuit Protection
6. All motors in the Fan array shall be provided with individual Motor Protection for thermal overload protection. All motor circuit protectors shall be mounted and located in a remote motor circuit protector panel as needed that is separate from the main enclosure. Motor circuit protector enclosure must be located and mounted at a minimal distance from motors in the Fan array.
7. Each fan shall be capable of individual speed controls to isolate fans and turn them off though BAS supplied speed signal for low load conditions.
8. Each induction fan shall be provided with a dedicated micro variable frequency drive to control each fan individually.

2.05 DUAL TEMPERATURE COOLING COIL SECTION

A. General Requirements for Coil Section:

1. Performance Ratings: Tested and rated according to ARI 410 and ASHRAE 33.

2. Fabricate coil section to allow removal and replacement of coil for maintenance and to allow in-place access for service and maintenance of coil(s).
3. Coils shall not act as structural component of unit.

B. Minimum Working-Pressure/Temperature Ratings: 200 psig, 325 deg F.

C. Source Quality Control: Factory tested to 300 psig.

D. Leak Test: Coils shall be leak tested with air underwater.

E. Fin and Tube Joints: Mechanical bond.

F. Tubes: ASTM B 743 copper, 5/8" tube diameter, minimum 0.025 inch thick.

G. Fins: Aluminum, minimum 0.010 inch thick.

H. Headers: Seamless copper tube with brazed joints, prime coated with red brass threaded connections.

I. Frames: ASTM A 666, Type 316 stainless steel, minimum 0.0625 inch thick.

2.06 REHEAT COIL

A. Each coil shall have been hydrostatically tested up to 150 psig for ≤200f and five times the operating pressure for >200f and shall be designed for continuous operation at 200 psig and 220 deg. F.

B. Water or glycol coils shall have copper headers and red brass threaded connections. Drain and vent connections shall be incorporated into the header and extended to the exterior of the casing.

C. The coil frame material shall be galvanized steel.

D. The tubes shall be copper with a nominal diameter of 5/8" and 0.025'' thick wall.

E. Heat transfer fins shall be aluminum and shall have a nominal thickness of 0.010''.

F. Piping connections shall be red brass MPT. Piping connection must extend beyond the AHU casing such that a pipe wrench may be attached to the coil nipple from the exterior of the unit when the field pipe connection is completed.

2.07 AIR FILTRATION SECTION

A. General Requirements for Air Filtration Section:

1. Comply with NFPA 90A.
2. Provide minimum arrestance according to ASHRAE 52.1, and a minimum efficiency reporting value (MERV) according to ASHRAE 52.2.
3. Provide filter holding frames arranged for flat or angular orientation, with access doors on both sides of unit. Filters shall be removable from one side or lifted out from access plenum.

B. Extended-Surface, Disposable Panel Filters:

1. Factory-fabricated, dry, extended-surface type.
2. Thickness: 2 inches.
3. Merv (ASHRAE 52.2): 8.
4. Media: Fibrous material formed into deep-V-shaped pleats with antimicrobial agent and held by self-supporting wire grid.
5. Media-Grid Frame: Nonflammable cardboard.
6. Mounting Frames: Welded, galvanized steel, with gaskets and fasteners, suitable for bolting together into built-up filter banks.

C. Extended-Surface, Nonsupported-Media Filters:

1. Factory-fabricated, dry, extended-surface, self-supporting type.
2. Merv (ASHRAE 52.2): 13.
3. Media: Fibrous material with antimicrobial agent constructed so individual pleats are maintained in tapered form by flexible internal supports under rated-airflow conditions.
4. Filter-Media Frame: Polyurethane.
5. Mounting Frames: Welded, galvanized steel, with gaskets and fasteners, suitable for bolting together into built-up filter banks with space for prefilter.

D. Filter Gage:

1. 3-1/2-inch-diameter, diaphragm-actuated dial in metal case.
2. Vent valves.
3. Black figures on white background.
4. Front recalibration adjustment.
5. 2 percent of full-scale accuracy.
6. Range: 0- to 3.0-inch wg
7. Accessories: Static-pressure tips with integral compression fittings, 1/4-inch plastic tubing, and 2- or 3-way vent valves.

2.08 DAMPERS

A. General Requirements for Dampers: Leakage rate, according to AMCA 500, "Laboratory Methods for Testing Dampers for Rating," shall not exceed 2 percent of air quantity at 2000-fpm face velocity through damper and 4-inch wg pressure differential. Maximum leakage rat of 4 cfm/sf at 1-inch wg pressure differential.

B. Damper Operators: Provided under requirements in Section 230900 "Instrumentation and Control for HVAC."

C. Face and bypass dampers: Mechanically interlocked to operate inversely to one another with face damper sized the match coil and bypass sized to equal the pressure drop of the face damper and coil. Low-leakage, double-skin, airfoil-blade, extruded-aluminum dampers with compressible jamb seals and extruded-vinyl blade edge seals in opposed-blade arrangement with cadmium-plated steel operating rods rotating in stainless-steel sleeve bearings mounted in a single extruded-aluminum frame, and with operating rods connected with a common linkage. Leakage rate shall not exceed 5 cfm/sq. ft. at 1-inch wg and 9 cfm/sq. ft. at 4-inch wg. Note controls control to removed mechanical interlock in the field to allow independent control of dampers.

D. Outside and Exhaust air dampers

1. Parallel multiple-blade ultralow leak dampers.

2.09 SOURCE QUALITY CONTROL

A. Fan Sound-Power Level Ratings: Comply with AMCA 301, "Methods for Calculating Fan Sound Ratings from Laboratory Test Data." Test fans according to AMCA 300, "Reverberant Room Method for Sound Testing of Fans." Fans shall bear AMCA-certified sound ratings seal.

B. Fan Performance Rating: Factory test fan performance for airflow, pressure, power, air density, rotation speed, and efficiency. Rate performance according to AMCA 210, "Laboratory Methods of Testing Fans for Aerodynamic Performance Rating."

C. Water Coils: Factory tested to 300 psig according to ARI 410 and ASHRAE 33.

2.10 AIR-TO-AIR ENERGY RECOVERY

A. Heat Wheels:

1. Basis-of-Design Product: Subject to compliance with requirements, provide product indicated on Drawings or comparable product by one of the following:

    a. Loren Cook Company.
    b. SEMCO Incorporated.
    c. Trane; American Standard Inc.
    d. Daiken

2. Casing:

    a. Segmented split wheel type for ease of removal due to limited space conditions.
    b. Galvanized steel, with manufacturer's standard paint coating.
    c. Integral purge section limiting carryover of exhaust air to between 0.05 percent at 1.6-inch wg and 0.20 percent at 4-inch wg differential pressure.
    d. Casing seals on periphery of rotor, on duct divider, and on purge section.
    e. Support rotor on grease-lubricated ball bearings with extended grease fittings. Mount horizontal wheels on tapered roller bearing.

3. Rotor: Aluminum, segmented wheel, strengthened with radial spokes, with nontoxic, noncorrosive, silica-gel desiccant coating. Construct media for passing maximum 500-micrometer solids.
4. Drive: Fractional horsepower motor and gear reducer, with speed changed by variable frequency controller, and self-adjusting multilink belt around outside of rotor.
5. Controls:

    a. Starting relay, factory mounted and wired, and manual motor starter for field wiring.
    b. Variable frequency controller, factory mounted and wired,
    c. Pilot-Light Indicator: Display rotor rotation and speed.
    d. Speed Settings: Adjustable settings for maximum and minimum rotor speed limits.

2.11 ELECTRICAL POWER CONNECTIONS

A. General Electrical Power Connection Requirements: Factory-installed and -wired switches, motor controllers, transformers, and other necessary electrical devices shall provide a individual power feeds to fans and wheel VFD.

B. Enclosure: NEMA 250, Type 3R, field mounted adjacent to unit with hinged access door in unit cabinet having a lock and key or padlock and key,

C. Wiring: Numbered and color-coded to match wiring diagram.

D. Wiring Location: Install factory wiring outside an enclosure in a raceway.

E. Power Interface: Field power interface shall be to NEMA KS 1, heavy-duty, nonfused disconnect switch.

F. Factory Wiring: Branch power circuit to each motor and to controls with one of the following disconnecting means:

1. NEMA KS 1, heavy-duty, nonfusible switch.
2. UL 489, motor-circuit protector (circuit breaker) with field-adjustable, short-circuit trip coordinated with motor locked-rotor amperes.

G. Factory-Mounted, Overcurrent-Protection Service: For each motor.

H. Controls: Factory wire unit-mounted controls where indicated.

I. Lights: Factory wire unit-mounted lights.

J. Control Relays: Auxiliary and adjustable time-delay relays.

2.12 CONTROLS

A. Control equipment and sequence of operation are specified in Sections 230900 "Instrumentation and Control for HVAC." And 230993 "Sequence of operations."

B. Control Wiring: Factory wire connection for controls' power supply.

2.13 ACCESSORIES

A. Service Lights and Switch: Factory installed in each accessible section with weatherproof cover. Factory wire lights to a single-point field connection.

2.14 VARIABLE FREQUENCY CONTROLLER

A. All variable frequency drives (VFDs) shall meet IEE standard 519.

B. All variable frequency drives shall be able to communicate with the Building Management System (BAS) controls through Bacnet.

C. Description: NEMA ICS 2, pulse-width-modulated, variable frequency controller; listed and labeled as a complete unit and arranged to provide variable speed of an NEMA MG 1, Design B, 3-phase, induction motor by adjusting output voltage and frequency.

D. Design and Rating: Match load type such as fans, motors; and type of connection used between motor and load such as direct or through a power-transmission connection.

E. Isolation Transformer: Match transformer voltage ratings and capacity to system and motor voltages; and controller, motor, and load characteristics.

F. Output Rating: 3-phase; 6 to 60 Hz, with voltage proportional to frequency throughout voltage range.

G. Automatic Reset/Restart: Attempts three restarts after controller fault or on return of power after an interruption and before shutting down for manual reset or fault correction. Restarting during deceleration shall not damage controller, motor, or load.

H. Power-Interruption Protection: Prevents motor from re-energizing after a power interruption until motor has stopped.

PART 3 - EXECUTION

3.01 EXAMINATION (FOR REFERENCE ONLY)

A. Examine areas and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.

B. Examine casing insulation materials and filter media before air-handling unit installation. Reject insulation materials and filter media that are wet, moisture damaged, or mold damaged.

C. Examine roughing-in for steam, hydronic, and condensate drainage piping systems and electrical services to verify actual locations of connections before installation.

D. Proceed with installation only after unsatisfactory conditions have been corrected.

3.02 INSTALLATION (FOR REFERENCE ONLY)

A. Equipment Mounting: Install air-handling units on concrete bases using elastomeric mounts. Secure units to anchor bolts installed in concrete bases. Comply with requirements for concrete bases specified in Section 033000 " Concrete." Comply with requirements for vibration isolation devices specified in Section 230548 "Vibration and Seismic Controls for HVAC Piping and Equipment."

1. Minimum Deflection: 1/2 inch.
2. Install stainless-steel plate to equally distribute weight over elastomeric pad.
3. Install dowel rods to connect concrete base to concrete floor. Unless otherwise indicated, install dowel rods on 18-inch centers around the full perimeter of concrete base.
4. Install epoxy-coated anchor bolts that extend through concrete base and anchor into structural concrete floor.
5. Place and secure anchorage devices. Use setting drawings, templates, diagrams, instructions, and directions furnished with items to be embedded.
6. Install anchor bolts to elevations required for proper attachment to supported equipment.

B. Arrange installation of units to provide access space around air-handling units for service and maintenance.

C. Do not operate fan system until filters (temporary or permanent) are in place. Replace temporary filters used during construction and testing, with new, clean filters.

D. Install filter-gage, static-pressure taps upstream and downstream of filters. Mount filter gages on outside of filter housing or filter plenum in accessible position. Provide filter gages on filter banks, installed with separate static-pressure taps upstream and downstream of filters.

3.03 CONNECTIONS (FOR REFERENCE ONLY)

A. Comply with requirements for piping specified in other Sections. Drawings indicate general arrangement of piping, fittings, and specialties.

B. Install piping adjacent to air-handling unit to allow service and maintenance.

C. Connect piping to air-handling units with flexible connectors.

D. Connect condensate drain pans using NPS 1-1/4, ASTM B 88, Type K copper tubing. Extend to nearest equipment or floor drain. Construct deep trap at connection to drain pan and install cleanouts at changes in direction.

E. Hot- and Chilled-Water Piping: Comply with applicable requirements in Section 232113 "Hydronic Piping." Install shutoff valve and union or flange at each coil supply connection. Install balancing valve and union or flange at each coil return connection.

F. Connect duct to air-handling units with flexible connections. Comply with requirements in Section 233300 "Air Duct Accessories."

3.04 FIELD QUALITY CONTROL

A. Manufacturer's Field Service: Engage a factory-authorized service representative to inspect, test, and adjust components, assemblies, and equipment installations, including connections.

B. Perform tests and inspections.

1. Manufacturer's Field Service: Engage a factory-authorized service representative to inspect components, assemblies, and equipment installations, including connections, and to assist in testing.

C. Tests and Inspections:

1. Leak Test: After installation, fill water coils with water, and test coils and connections for leaks.
2. Fan Operational Test: After electrical circuitry has been energized, start units to confirm proper motor rotation and unit operation.
3. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.

D. Air-handling unit or components will be considered defective if unit or components do not pass tests and inspections.

E. Prepare test and inspection reports.

3.05 STARTUP SERVICE

A. Engage a factory-authorized service representative to perform startup service.

1. Complete installation and startup checks according to manufacturer's written instructions.
2. Verify that shipping, blocking, and bracing are removed.
3. Verify that unit is secure on mountings and supporting devices and that connections to piping, ducts, and electrical systems are complete. Verify that proper thermal-overload protection is installed in motors, controllers, and switches.
4. Verify proper motor rotation direction, free fan wheel rotation, and smooth bearing operations. Reconnect fan drive system, align belts, and install belt guards.
5. Verify that bearings, and other moving parts are lubricated with factory-recommended lubricants.
6. Verify that outdoor- and return-air dampers open and close.
7. Comb coil fins for parallel orientation.
8. Install new, clean filters.
9. Verify that manual and automatic volume control and fire and smoke dampers in connected duct systems are in fully open position.

B. Starting procedures for air-handling units include the following:

1. Energize motor; verify proper operation of motor, drive system, and fan wheel. Adjust fan to indicated rpm.
2. Measure and record motor electrical values for voltage and amperage.
3. Manually operate dampers from fully closed to fully open position and record fan performance.

C. Startup services shall be performed in the presence of the commissioning agent.

3.06 ADJUSTING (FOR REFERENCE ONLY)

A. Adjust damper linkages for proper damper operation.

B. Comply with requirements in Section 230593 "Testing, Adjusting, and Balancing for HVAC" for air-handling system testing, adjusting, and balancing.

3.07 CLEANING (FOR REFERENCE ONLY)

A. After completing system installation and testing, adjusting, and balancing air-handling unit and air-distribution systems and after completing startup service, clean air-handling units internally to remove foreign material and construction dirt and dust. Clean fan wheels, cabinets, dampers, coils, and filter housings, and install new, clean filters.

3.08 DEMONSTRATION

A. Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain air-handling units.

3.09 COMMISSIONING (FOR REFERENCE ONLY)

A. Where indicated in the equipment or commissioning specifications, engage a factory-authorized service representative, to perform startup service as per functional test sheets and requirements of Section 019113 – General Commissioning Requirements.

B. Complete installation and startup checks and functional tests according to Section 019113 – General Commissioning Requirements and manufacturers written instructions.

C. Operational Test: After electrical system has been energized, start units to confirm proper unit operation. Rectify malfunctions, replace defective parts with new one and repeat the startup procedure.

D. Verify that equipment is installed and commissioned as per requirements of section 019113 and manufacturers written instructions/requirements.

END OF SECTION

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

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

B. Section 019113 “Building Commissioning Requirements". (For reference only as this is part of the installation contractors scope of work).

1.02 SUMMARY

A. Section Includes:

1. Service and distribution switchboards rated 600 V and less.
2. Surge protection devices.
3. Disconnecting and overcurrent protective devices.
4. Instrumentation.
5. Accessory components and features.
6. Identification.

B. Related Requirements

1. Section 260573 "Overcurrent Protective Device Coordination Study" for arc-flash analysis and arc-flash label requirements.

1.03 ACTION SUBMITTALS

A. Equipment shall be submitted with short circuit, overcurrent protection coordination, and arc flash studies as noted in specification 260100 General Electrical Requirements.

B. Product Data: For each switchboard, overcurrent protective device, surge protection device, ground-fault protector, accessory, and component.

1. Include dimensions and manufacturers' technical data on features, performance, electrical characteristics, ratings, accessories, and finishes.

C. Shop Drawings: For each switchboard and related equipment.

1. Include dimensioned plans, elevations, sections, and details, including required clearances and service space around equipment. Show tabulations of installed devices, equipment features, and ratings.
2. Detail enclosure types for types other than NEMA 250, Type 1.
3. Detail bus configuration, current, and voltage ratings.
4. Detail short-circuit current rating of switchboards and overcurrent protective devices.
5. Include descriptive documentation of barriers specified for electrical insulation and isolation.
6. Detail utility company's metering provisions with indication of approval by utility company.
7. Detail features, characteristics, ratings, and factory settings of individual overcurrent protective devices and auxiliary components.
8. Include time-current coordination curves for each type and rating of overcurrent protective device included in switchboards. Submit on translucent log-log graft paper; include selectable ranges for each type of overcurrent protective device.

9. Include diagram and details of proposed mimic bus.
10. Include schematic and wiring diagrams for power, signal, and control wiring.

D. Delegated Design Submittal:

1. For arc-flash hazard analysis.
2. For arc-flash labels.

1.04 INFORMATIONAL SUBMITTALS

A. Qualification Data: For Installer, testing agency.

B. Field Quality-Control Reports:

1. Test procedures used.
2. Test results that comply with requirements.
3. Results of failed tests and corrective action taken to achieve test results that comply with requirements.

C. Delegated Design Submittal: Arc Flash Study

1. An arc flash study shall be performed on all new electrical switchgear, switchboards and panelboards and labels shall be affixed to the front of the equipment indicating the proper clothing to wear as a result of the study.

1.05 CLOSEOUT SUBMITTALS

A. Operation and Maintenance Data: For switchboards and components to include in emergency, operation, and maintenance manuals.

1. In addition to items specified in Section 017823 "Operation and Maintenance Data," include the following:

a. Routine maintenance requirements for switchboards and all installed components.
b. Manufacturer's written instructions for testing and adjusting overcurrent protective devices.
c. Time-current coordination curves for each type and rating of overcurrent protective device included in switchboards. Submit on translucent log-log graft paper; include selectable ranges for each type of overcurrent protective device.

1.06 QUALITY ASSURANCE

A. Installer Qualifications: An employer of workers qualified as defined in NEMA PB 2.1 and trained in electrical safety as required by NFPA 70E.

B. Testing Agency Qualifications: Accredited by NETA.

1. Testing Agency's Field Supervisor: Certified by NETA to supervise on-site testing.

1.07 DELIVERY, STORAGE, AND HANDLING

A. Deliver switchboards in sections or lengths that can be moved past obstructions in delivery path.

B. Handle and prepare switchboards for installation according to NECA 400, NEMA PB 2.1.

1.08 FIELD CONDITIONS

A. Installation Pathway: Remove and replace access fencing, doors, lift-out panels, and structures to provide pathway for moving switchboards into place.

B. Environmental Limitations:

1. Do not deliver or install switchboards until spaces are enclosed and weathertight, wet work in spaces is complete and dry, work above switchboards is complete, and HVAC system is operating and maintaining ambient temperature and humidity conditions at occupancy levels during the remainder of the construction period.
2. Rate equipment for continuous operation under the following conditions unless otherwise indicated:

    a. Ambient Temperature: Not exceeding 104 deg F.
    b. Altitude: Not exceeding 6600 feet.

C. Unusual Service Conditions: NEMA PB 2, as follows:

1. Ambient temperatures within limits specified.
2. Altitude not exceeding 6600 feet.

1.09 COORDINATION,

A. Coordinate layout and installation of switchboards and components with other construction that penetrates walls or is supported by them, including electrical and other types of equipment, raceways, piping, encumbrances to workspace clearance requirements, and adjacent surfaces. Maintain required workspace clearances and required clearances for equipment access doors and panels.

B. Coordinate sizes and locations of concrete bases with actual equipment provided. Cast anchor-bolt inserts into bases. Concrete, reinforcement, and formwork requirements are specified with concrete.

1.10 WARRANTY

A. Manufacturer's Warranty: Manufacturer's agrees to repair or replace surge protection devices that fail in materials or workmanship within specified warranty period.

1. Warranty Period: Five years from date of Substantial Completion.

PART 2 - PRODUCTS

2.01 SWITCHBOARDS

A. Basis-of-Design Product: Subject to compliance with requirements, provide product indicated on drawings as manufactured by Square D; a brand of Schneider Electric or comparable product by one of the following manufacturers in the next paragraph.

B. Manufacturers: Subject to compliance with performance and site condition requirements, one of the manufacturers listed below may be provided in lieu of the Basis of Design manufacturer. Naming these products does not imply that their standard construction or configuration is

acceptable or meets the specifications. Alternate equipment proposed must meet the specifications including all architectural, acoustic, mechanical, electrical, and structural details, all scheduled performance and the job design, plans and specifications, and space constraints.

1. Eaton.
2. ABB

C. Source Limitations: Obtain switchboards, overcurrent protective devices, components, and accessories from single source from single manufacturer.

D. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

E. Comply with NEMA PB 2.

F. Comply with NFPA 70.

G. Comply with UL 891.

H. Front-Connected, Front-Accessible Switchboards:

1. Main Devices: Fixed, individually mounted.
2. Branch Devices: Panel mounted.
3. Sections front and rear aligned.

I. Nominal System Voltage: As per the contract drawings.

J. Main-Bus Continuous: As per the contract drawings.

K. Indoor Enclosures: Steel, NEMA 250, Type 1.

L. Enclosure Finish for Indoor Units: Factory-applied finish in manufacturer's standard gray finish over a rust-inhibiting primer on treated metal surface.

M. Barriers: Between adjacent switchboard sections and separation of utility compartments.

N. Service Entrance Rating: Switchboards intended for use as service entrance equipment shall contain from one to six service disconnecting means with overcurrent protection, a neutral bus with disconnecting link, a grounding electrode conductor terminal, and a main bonding jumper.

O. Utility Metering Compartment: Barrier compartment and section complying with utility company's requirements; hinged sealable door; buses provisioned for mounting utility company's current transformers and potential transformers or potential taps as required by utility company. If separate vertical section is required for utility metering, match and align with basic switchboard. Provide service entrance label and necessary applicable service entrance features.

P. Customer Metering Compartment: A separate customer metering compartment and section with front hinged door, and section with front hinged door, for indicated metering, and current transformers for each meter. Current transformer secondary wiring shall be terminated on shorting-type terminal blocks.

Q. Bus Transition and Incoming Pull Sections: Matched and aligned with basic switchboard.

R. Hinged Front Panels: Allow access to circuit breaker, metering, accessory, and blank compartments.

S. Pull Box on Top of Switchboard:

1. Adequate ventilation to maintain temperature in pull box within same limits as switchboard.
2. Set back from front to clear circuit-breaker removal mechanism.
3. Removable covers shall form top, front, and sides. Top covers at rear shall be easily removable for drilling and cutting.
4. Bottom shall be insulating, fire-resistive material with separate holes for cable drops into switchboard.
5. Cable supports shall be arranged to facilitate cabling and adequate to support cables indicated, including those for future installation.

T. Buses and Connections: Three phase, four wire unless otherwise indicated.

1. Provide phase bus arrangement A, B, C from front to back, top to bottom, and left to right when viewed from the front of the switchboard.
2. Phase- and Neutral-Bus Material: Hard-drawn copper of 98 percent conductivity.
3. Copper feeder circuit-breaker line connections.
4. Load Terminals: Insulated, rigidly braced, runback bus extensions, of same material as through buses, equipped with mechanical connectors for outgoing circuit conductors. Provide load terminals for future circuit-breaker positions at full-ampere rating of circuit-breaker position.
5. Ground Bus: 1/4-by-2-inch-hard-drawn copper of 98 percent conductivity, equipped with mechanical connectors for feeder and branch-circuit ground conductors.
6. Main-Phase Buses and Equipment-Ground Buses: Uniform capacity for entire length of switchboard's main and distribution sections. Provide for future extensions from both ends.
7. Disconnect Links:

    a. Isolate neutral bus from incoming neutral conductors.
    b. Bond neutral bus to equipment-ground bus for switchboards utilized as service equipment or separately derived systems.

8. Neutral Buses: 100 percent of the ampacity of phase buses unless otherwise indicated, equipped with mechanical connectors for outgoing circuit neutral cables. Brace bus extensions for busway feeder neutral bus.

U. Future Devices: Equip compartments with mounting brackets, supports, bus connections, and appurtenances at full rating of circuit-breaker compartment.

2.02 SURGE PROTECTION DEVICES

A. Basis-of-Design Product: Subject to compliance with requirements, provide product indicated on drawings as manufactured by Square D; a brand of Schneider Electric or comparable product by one of the following manufacturers in the next paragraph.

B. Manufacturers: Subject to compliance with performance and site condition requirements, one of the manufacturers listed below may be provided in lieu of the Basis of Design manufacturer. Naming these products does not imply that their standard construction or configuration is acceptable or meets the specifications. Alternate equipment proposed must meet the

specifications including all architectural, acoustic, mechanical, electrical, and structural details, all scheduled performance and the job design, plans and specifications, and space constraints.

1. Eaton.
2. ABB.

C. SPDs: Comply with UL 1449, Type 1.

D. Features and Accessories:

1. Integral disconnect switch.
2. Indicator light display for protection status.
3. Form-C contacts rated at 5 A and 250-V ac, one normally open and one normally closed, for remote monitoring of protection status. Contacts shall reverse on failure of any surge diversion module or on opening of any current-limiting device. Coordinate with building power monitoring and control system.
4. Surge counter.

E. Peak Surge Current Rating: The minimum single-pulse surge current withstand rating per phase shall not be less than 200 kA. The peak surge current rating shall be the arithmetic sum of the ratings of the individual MOVs in a given mode.

F. Protection modes and UL 1449 VPR for grounded wye circuits with 480Y/277 V, three-phase, four-wire circuits shall not exceed the following:

1. Line to Neutral: 1200 V for 480Y/277 V.
2. Line to Ground: 1200 V for 480Y/277 V.
3. Line to Line: 2000 V for 480Y/277 V.

G. SCCR: Equal or exceed 100 kA.

H. Nominal Rating: 20 kA.

2.03 DISCONNECTING AND OVERCURRENT PROTECTIVE DEVICES

A. Molded-Case Circuit Breaker (MCCB): Comply with UL 489, with interrupting capacity to meet available fault currents.

1. Thermal-Magnetic Circuit Breakers: Inverse time-current element for low-level overloads and instantaneous magnetic trip element for short circuits. Adjustable magnetic trip setting for circuit-breaker frame sizes 100 A and larger.
2. Adjustable Instantaneous-Trip Circuit Breakers: Magnetic trip element with front-mounted, field-adjustable trip setting.
3. Electronic trip circuit breakers with rms sensing: Refer to contract drawings for electronic trip circuit breakers; field-replaceable rating plug or field-replicable electronic trip; and the following field-adjustable settings:

    a. Instantaneous trip.
    b. Long- and short-time pickup levels.
    c. Long and short time adjustments.
    d. Ground-fault pickup level, time delay, and I squared t response.

4. Energy Reduction Maintenance Switch (ERMS); with lockable switch and indicator light for activating the ERMS and confirming its activation; for circuit-breaker frame sizes

1,200 A and larger. The switch shall have a dry contact for connection to the BMS system to indicate a notification signal when the ERMS is activated. Purpose of the signal is to notify the Owner that after the maintenance work is completed the circuit breaker should be put back into normal operation mode.

5. GFCI Circuit Breakers: Single- and double-pole configurations with Class A ground-fault protection (6-mA trip).
6. MCCB Features and Accessories:

    a. Standard frame sizes, trip ratings, and number of poles.
    b. Lugs: Mechanical style, suitable for number, size, trip ratings, and conductor material.
    c. Ground-Fault Protection: Integrally mounted relay and trip unit with adjustable pickup and time-delay settings, push-to-test feature, and ground-fault indicator.
    d. Shunt Trip: 120-V trip coil energized from separate circuit, set to trip at 55 or 75 percent of rated voltage.
    e. Undervoltage Trip: Set to operate at 35 to 75 percent of rated voltage without intentional time delay.

2.04 INSTRUMENTATION

A. Multifunction Digital-Metering Monitor: Microprocessor-based unit suitable for three- or four-wire systems and with the following features:

1. Switch-selectable digital display of the following values with maximum accuracy tolerances as indicated:

    a. Phase Currents, Each Phase: Plus or minus 0.5 percent.
    b. Phase-to-Phase Voltages, Three Phase: Plus or minus 0.5 percent.
    c. Phase-to-Neutral Voltages, Three Phase: Plus or minus 0.5 percent.
    d. Megawatts: Plus or minus 1 percent.
    e. Megavars: Plus or minus 1 percent.
    f. Power Factor: Plus or minus 1 percent.
    g. Frequency: Plus or minus 0.1 percent.
    h. Accumulated Energy, Megawatt Hours: Plus or minus 1 percent; accumulated values unaffected by power outages up to 72 hours.
    i. Megawatt Demand: Plus or minus 1 percent; demand interval programmable from five to 60 minutes.
    j. Contact devices to operate remote impulse-totalizing demand meter.

2. Mounting: Display and control unit flush or semiflush mounted in instrument compartment door.

B. Impulse-Totalizing Demand Meter:

1. Comply with ANSI C12.1.
2. Suitable for use with switchboard watt-hour meter, including two-circuit totalizing relay.
3. Cyclometer.
4. Four-dial, totalizing kilowatt-hour register.
5. Positive chart drive mechanism.
6. Capillary pen holding a minimum of one month's ink supply.
7. Roll chart with minimum 31-day capacity; appropriate multiplier tag.
8. Capable of indicating and recording five-minute integrated demand of totalized system.

2.05 IDENTIFICATION

A. Service Equipment Label: NRTL labeled for use as service equipment for switchboards with one or more service disconnecting and overcurrent protective devices.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Receive, inspect, handle, and store switchboards according to NECA 400 and NEMA PB 2.1.

1. Lift or move panelboards with spreader bars and manufacturer-supplied lifting straps following manufacturer's instructions.
2. Use rollers, slings, or other manufacturer-approved methods if lifting straps are not furnished.
3. Protect from moisture, dust, dirt, and debris during storage and installation.
4. Install temporary heating during storage per manufacturer's instructions.

B. Examine switchboards before installation. Reject switchboards that are moisture damaged or physically damaged.

C. Examine elements and surfaces to receive switchboards for compliance with installation tolerances and other conditions affecting performance of the Work or that affect the performance of the equipment.

D. Proceed with installation only after unsatisfactory conditions have been corrected.

3.02 INSTALLATION (FOR REFERENCE ONLY)

A. Install switchboards and accessories according to NECA 400 and NEMA PB 2.1.

B. Equipment Mounting: Install switchboards on concrete base, 4-inch nominal thickness. Comply with requirements for concrete base specified in Section 033000 "Cast-in-Place Concrete" or Section 033053 "Miscellaneous Cast-in-Place Concrete."

1. Conduits shall enter either above or below a switchboard as noted on the drawings. Install conduits entering the vertical section where the conductors will terminate. When entering underneath, install with couplings flush with the concrete base. Extend 2 inches above concrete base after switchboard is anchored in place.
2. Install dowel rods to connect concrete base to concrete floor. Unless otherwise indicated, install dowel rods on 18-inch centers around the full perimeter of concrete base.
3. For supported equipment, install epoxy-coated anchor bolts that extend through concrete base and anchor into structural concrete floor.
4. Place and secure anchorage devices. Use setting drawings, templates, diagrams, instructions, and directions furnished with items to be embedded.
5. Install anchor bolts to elevations required for proper attachment to switchboards.
6. Anchor switchboard to building structure at the top of the switchboard if required or recommended by the manufacturer.

C. Temporary Lifting Provisions: Remove temporary lifting eyes, channels, straps and brackets, and temporary blocking of moving parts from switchboard units and components.

D. Comply with mounting and anchoring requirements specified in Division 26 Section "Vibration and Seismic Controls for Electrical Systems."

E. Operating Instructions: Frame and mount the printed basic operating instructions for switchboards, including control and key interlocking sequences and emergency procedures. Fabricate frame of finished wood or metal and cover instructions with clear acrylic plastic. Mount on front of switchboards.

F. Install filler plates in unused spaces of panel-mounted sections.

G. Install overcurrent protective devices, surge protection devices, and instrumentation.

1. Set field-adjustable switches and circuit-breaker trip ranges.

H. Comply with NECA 1.

3.03 CONNECTIONS (FOR REFERENCE ONLY)

A. Bond conduits entering underneath the switchboard to the equipment ground bus with a bonding conductor sized per NFPA 70.

B. Support and secure conductors within the switchboard according to NFPA 70.

C. Extend insulated equipment grounding cable to busway ground connection and support cable at intervals in vertical run.

3.04 IDENTIFICATION (FOR REFERENCE ONLY)

A. Identify field-installed conductors, interconnecting wiring, and components; provide warning signs complying with requirements for identification specified in Section 260553 "Identification for Electrical Systems."

B. Switchboard Nameplates: Label each switchboard compartment with a nameplate complying with requirements for identification specified in Section 260553 "Identification for Electrical Systems."

C. Device Nameplates: Label each disconnecting and overcurrent protective device and each meter and control device mounted in compartment doors with a nameplate complying with requirements for identification specified in Section 260553 "Identification for Electrical Systems."

3.05 FIELD QUALITY CONTROL

A. Testing Agency: Owner will engage a qualified testing agency to perform tests and inspections.

B. Testing Agency: Engage a qualified testing agency to perform tests and inspections.

C. Manufacturer's Field Service: Engage a factory-authorized service representative to test and inspect components, assemblies, and equipment installations, including connections.

D. Perform tests and inspections with the assistance of a factory-authorized service representative.

E. Tests and Inspections:

1. Acceptance Testing:

a. Test insulation resistance for each switchboard bus, component, connecting supply, feeder, and control circuit. Open control and metering circuits within the switchboard and remove neutral connection to surge protection and other electronic devices prior to insulation test. Reconnect after test.
b. Test continuity of each circuit.

2. Test ground-fault protection of equipment for service equipment per NFPA 70.
3. Perform each visual and mechanical inspection and electrical test stated in NETA Acceptance Testing Specification. Certify compliance with test parameters.
4. Correct malfunctioning units on-site where possible, and retest to demonstrate compliance; otherwise, replace with new units and retest.
5. Perform the following infrared scan tests and inspections, and prepare reports:

a. Initial Infrared Scanning: After Substantial Completion, but not more than 60 days after Final Acceptance, perform an infrared scan of each switchboard. Remove front panels so joints and connections are accessible to portable scanner.
b. Follow-up Infrared Scanning: Perform an additional follow-up infrared scan of each switchboard 11 months after date of Substantial Completion.
c. Instruments and Equipment:

1) Use an infrared scanning device designed to measure temperature or to detect significant deviations from normal values. Provide calibration record for device.

6. Test and adjust controls, remote monitoring, and safeties. Replace damaged and malfunctioning controls and equipment.

F. Switchboard will be considered defective if it does not pass tests and inspections.

G. Prepare test and inspection reports, including a certified report that identifies switchboards included and that describes scanning results. Include notation of deficiencies detected, remedial action taken, and observations after remedial action.

3.06 ADJUSTING (FOR REFERENCE ONLY)

A. Adjust moving parts and operable components to function smoothly and lubricate as recommended by manufacturer.

B. Set field-adjustable circuit-breaker trip ranges as per selective coordination study.

3.07 PROTECTION (FOR REFERENCE ONLY)

A. Temporary Heating: Apply temporary heat, to maintain temperature according to manufacturer's written instructions, until switchboard is ready to be energized and placed into service.

3.08 DEMONSTRATION

A. Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain switchboards, overcurrent protective devices, instrumentation,

and accessories, and to use and reprogram microprocessor-based trip, monitoring, and communication units.

END OF SECTION

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

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

1.02 SUMMARY

A. Section Includes:

1. Distribution panelboards.
2. Lighting and appliance branch-circuit panelboards.

1.03 DEFINITIONS

A. SVR: Suppressed voltage rating.

B. SPD: Surge protective device.

1.04 SUBMITTALS

A. Equipment shall be submitted with short circuit, overcurrent protection coordination, and arc flash studies as noted in specification 260100 General Electrical Requirements.

B. Product Data: For each type of panelboard, switching and overcurrent protective device, surge protective device, accessory, and component indicated. Include dimensions and manufacturers' technical data on features, performance, electrical characteristics, ratings, and finishes.

C. Shop Drawings: For each panelboard and related equipment.

1. Include dimensioned plans, elevations, sections, and details. Show tabulations of installed devices, equipment features, and ratings.
2. Detail enclosure types and details for types other than NEMA 250, Type 1.
3. Detail bus configuration, current, and voltage ratings.
4. Short-circuit current rating of panelboards and overcurrent protective devices.
5. Detail features, characteristics, ratings, and factory settings of individual overcurrent protective devices and auxiliary components.
6. Include wiring diagrams for power, signal, and control wiring.
7. Include time-current coordination curves for each type and rating of overcurrent protective device included in panelboards. Submit on translucent log-log graft paper; include selectable ranges for each type of overcurrent protective device.

D. Qualification Data: For qualified testing agency.

E. Field Quality-Control Reports:

1. Test procedures used.
2. Test results that comply with requirements.
3. Results of failed tests and corrective action taken to achieve test results that comply with requirements.

F. Panelboard Schedules: For installation in panelboards. Submit final versions after load balancing.

G. Operation and Maintenance Data: For panelboards and components to include in emergency, operation, and maintenance manuals. In addition to items specified in Division 01 Section "Operation and Maintenance Data," include the following:

1. Manufacturer's written instructions for testing and adjusting overcurrent protective devices.
2. Time-current curves, including selectable ranges for each type of overcurrent protective device that allows adjustments.

H. Delegated Design Submittal: Arc Flash Study

1. An arc flash study shall be performed on all new electrical switchgear, switchboards and panelboards and labels shall be affixed to the front of the equipment indicating the proper clothing to wear as a result of the study.

I. Panelboards shall not be submitted for generator power distribution when distributing to life safety and standby automatic transfer switches. Switchboards shall be submitted for this purpose.

1.05 QUALITY ASSURANCE

A. Testing Agency Qualifications: Member company of NETA or an NRTL.

1. Testing Agency's Field Supervisor: Currently certified by NETA to supervise on-site testing.

B. Source Limitations: Obtain panelboards, overcurrent protective devices, components, and accessories from single source from single manufacturer.

C. Product Selection for Restricted Space: Drawings indicate maximum dimensions for panelboards including clearances between panelboards and adjacent surfaces and other items. Comply with indicated maximum dimensions.

D. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

E. Comply with NEMA PB 1.

F. Comply with NFPA 70.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Remove loose packing and flammable materials from inside panelboards; install temporary electric heating (250 W per panelboard) to prevent condensation.

B. Handle and prepare panelboards for installation according to NECA 407, NEMA PB 1.

1.07 PROJECT CONDITIONS

A. Environmental Limitations:

1. Do not deliver or install panelboards until spaces are enclosed and weathertight, wet work in spaces is complete and dry, work above panelboards is complete, and temporary HVAC system is operating and maintaining ambient temperature and humidity conditions at occupancy levels during the remainder of the construction period.
2. Rate equipment for continuous operation under the following conditions unless otherwise indicated:

    a. Ambient Temperature: Not exceeding 23 deg F to plus 104 deg F.
    b. Altitude: Not exceeding 6600 feet.

B. Service Conditions: NEMA PB 1, usual service conditions, as follows:

1. Ambient temperatures within limits specified.
2. Altitude not exceeding 6600 feet.

1.08 COORDINATION

A. Coordinate layout and installation of panelboards and components with other construction that penetrates walls or is supported by them, including electrical and other types of equipment, raceways, piping, encumbrances to workspace clearance requirements, and adjacent surfaces. Maintain required workspace clearances and required clearances for equipment access doors and panels.

B. Coordinate sizes and locations of concrete bases with actual equipment provided. Cast anchor-bolt inserts into bases. Concrete, reinforcement, and formwork requirements are specified in Division 03.

1.09 WARRANTY

A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace parts that fail in materials or workmanship within specified warranty period.

1. Warranty Period: Five years from date of Substantial Completion.

1.10 EXTRA MATERIALS

A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.

1. Keys: Two spares for each type of panelboard cabinet lock.
2. Circuit Breakers Including GFCI and Ground Fault Equipment Protection (GFEP) Types: Two spares for each panelboard.

PART 2 - PRODUCTS

2.01 GENERAL REQUIREMENTS FOR PANELBOARDS

A. Fabricate and test panelboards according to IEEE 344 to withstand seismic forces defined in Division 26 Section "Vibration and Seismic Controls for Electrical Systems."

B. Enclosures: Flush- and surface-mounted cabinets.

1. Rated for environmental conditions at installed location.

a. Indoor Dry and Clean Locations: NEMA 250, Type 1.
b. Kitchen Areas: NEMA 250, Type 1, stainless steel.
c. Other Wet or Damp Indoor Locations: NEMA 250, Type 4.

2. Front: Secured to box with concealed trim clamps. For surface-mounted fronts, match box dimensions; for flush-mounted fronts, overlap box.
3. Hinged Front Cover: Entire front trim hinged to box and with standard door within hinged trim cover.
4. Finishes:

a. Panels and Trim: Steel, factory finished immediately after cleaning and pretreating with manufacturer's standard two-coat, baked-on finish consisting of prime coat and thermosetting topcoat.
b. Back Boxes: Galvanized steel.

5. Directory Card: Inside panelboard door, mounted in metal frame with transparent protective cover.

C. Incoming Mains Location: As per project requirements.

D. Phase, Neutral, and Ground Buses:

1. Material: Hard-drawn copper, 98 percent conductivity.
2. Equipment Ground Bus: Adequate for feeder and branch-circuit equipment grounding conductors; bonded to box.

E. Conductor Connectors: Suitable for use with conductor material and sizes.

1. Material: Hard-drawn copper, 98 percent conductivity.
2. Main and Neutral Lugs: Mechanical type.
3. Ground Lugs and Bus-Configured Terminators: Mechanical type.
4. Feed-Through Lugs: Mechanical type, suitable for use with conductor material. Locate at opposite end of bus from incoming lugs or main device.
5. Subfeed (Double) Lugs: Mechanical type suitable for use with conductor material. Locate at same end of bus as incoming lugs or main device.

F. Future Devices: Mounting brackets, bus connections, filler plates, and necessary appurtenances required for future installation of devices.

G. Panelboard Short-Circuit Current Rating: Fully rated to interrupt symmetrical short-circuit current available at terminals.

2.02 DISTRIBUTION PANELBOARDS

A. Basis-of-Design Product: Subject to compliance with requirements, provide product indicated on drawings as manufactured by Square D; a brand of Schneider Electric or comparable product by one of the following manufacturers in the next paragraph.

B. Manufacturers: Subject to compliance with performance and site condition requirements, one of the manufacturers listed below may be provided in lieu of the Basis of Design manufacturer.

Naming these products does not imply that their standard construction or configuration is acceptable or meets the specifications. Alternate equipment proposed must meet the specifications including all architectural, acoustic, mechanical, electrical, and structural details, all scheduled performance and the job design, plans and specifications, and space constraints.

1. Eaton.
2. ABB.

C. Panelboards: NEMA PB 1, power and feeder distribution type.

D. Doors: Secured with vault-type latch with tumbler lock; keyed alike.

1. For doors more than 36 inches high, provide two latches, keyed alike.

E. Mains: As per the contract drawings.

F. Branch Overcurrent Protective Devices for Circuit-Breaker Frame Sizes 125 A and Smaller: Bolt-on circuit breakers.

G. Branch Overcurrent Protective Devices for Circuit-Breaker Frame Sizes Larger than 125 A: Bolt-on circuit breakers; plug-in circuit breakers where individual positive-locking device requires mechanical release for removal.

2.03 LIGHTING AND APPLIANCE BRANCH-CIRCUIT PANELBOARDS

A. Basis-of-Design Product: Subject to compliance with requirements, provide product indicated on drawings as manufactured by Square D; a brand of Schneider Electric or comparable product by one of the following manufacturers in the next paragraph.

B. Manufacturers: Subject to compliance with performance and site condition requirements, one of the manufacturers listed below may be provided in lieu of the Basis of Design manufacturer. Naming these products does not imply that their standard construction or configuration is acceptable or meets the specifications. Alternate equipment proposed must meet the specifications including all architectural, acoustic, mechanical, electrical, and structural details, all scheduled performance and the job design, plans and specifications, and space constraints.

1. Eaton.
2. ABB.

C. Panelboards: NEMA PB 1, lighting and appliance branch-circuit type.

D. Mains: As per the contract drawings.

E. Branch Overcurrent Protective Devices: Bolt-on circuit breakers, replaceable without disturbing adjacent units.

F. Doors: Concealed hinges; secured with flush latch with tumbler lock; keyed alike.

2.04 DISCONNECTING AND OVERCURRENT PROTECTIVE DEVICES

A. Basis-of-Design Product: Subject to compliance with requirements, provide product indicated on drawings as manufactured by Square D; a brand of Schneider Electric or comparable product by one of the following manufacturers in the next paragraph.

B. Manufacturers: Subject to compliance with performance and site condition requirements, one of the manufacturers listed below may be provided in lieu of the Basis of Design manufacturer. Naming these products does not imply that their standard construction or configuration is acceptable or meets the specifications. Alternate equipment proposed must meet the specifications including all architectural, acoustic, mechanical, electrical, and structural details, all scheduled performance and the job design, plans and specifications, and space constraints.

1. Eaton.
2. ABB.

C. Molded-Case Circuit Breaker (MCCB): Comply with UL 489, with interrupting capacity to meet available fault currents.

1. Thermal-Magnetic Circuit Breakers: Inverse time-current element for low-level overloads, and instantaneous magnetic trip element for short circuits. Adjustable magnetic trip setting for circuit-breaker frame sizes 100 A and larger.
2. Adjustable Instantaneous-Trip Circuit Breakers: Magnetic trip element with front-mounted, field-adjustable trip setting.
3. Electronic trip circuit breakers with rms sensing: Refer to contract drawings for electronic trip circuit breakers; field-replaceable rating plug or field-replicable electronic trip; and the following field-adjustable settings:

    a. Instantaneous trip.
    b. Long- and short-time pickup levels.
    c. Long- and short-time time adjustments.
    d. Ground-fault pickup level, time delay, and I^2t response.

4. Energy Reduction Maintenance Switch (ERMS); with lockable switch and indicator light for activating the ERMS and confirming its activation; for circuit-breaker frame sizes 1,200 A and larger. The switch shall have a dry contact for connection to the BMS system to indicate a notification signal when the ERMS is activated. Purpose of the signal is to notify the Owner that after the maintenance work is completed the circuit breaker should be put back into normal operation mode.
5. GFCI Circuit Breakers: Single- and two-pole configurations with Class A ground-fault protection (5-mA trip).
6. Ground-Fault Equipment Protection (GFEP) Circuit Breakers: Class B ground-fault protection (30-mA trip).
7. Molded-Case Circuit-Breaker (MCCB) Features and Accessories:

    a. Standard frame sizes, trip ratings, and number of poles.
    b. Lugs: Mechanical style, suitable for number, size, trip ratings, and conductor materials.
    c. Application Listing: Appropriate for application; Type SWD for switching LED lighting loads.
    d. Shunt Trip: 120-V trip coil energized from separate circuit, set to trip at 55 or 75 percent of rated voltage.
    e. Multipole units enclosed in a single housing or factory assembled to operate as a single unit.
    f. Handle Padlocking Device: Fixed attachment, for locking circuit-breaker handle in on or off position.

2.05 PANELBOARD SUPPRESSORS

A. Basis-of-Design Product: Subject to compliance with requirements, provide product indicated on drawings as manufactured by Square D; a brand of Schneider Electric or comparable product by one of the following manufacturers in the next paragraph.

B. Manufacturers: Subject to compliance with performance and site condition requirements, one of the manufacturers listed below may be provided in lieu of the Basis of Design manufacturer. Naming these products does not imply that their standard construction or configuration is acceptable or meets the specifications. Alternate equipment proposed must meet the specifications including all architectural, acoustic, mechanical, electrical, and structural details, all scheduled performance and the job design, plans and specifications, and space constraints.

1. Current Technology; a subsidiary of Danahar Corporation.
2. Eaton.
3. ABB.
4. Liebert Corporation.

C. Surge Protection Device: IEEE C62.41-compliant, integrally mounted, solid-state, parallel-connected, non-modular type, with sine-wave tracking suppression and filtering modules, UL 1449, second edition, short-circuit current rating matching or exceeding the panelboard short-circuit rating, and with the following features and accessories:

1. Accessories:

    a. LED indicator lights for power and protection status.
    b. Audible alarm, with silencing switch, to indicate when protection has failed.
    c. One set of dry contacts rated at 5 A and 250-V ac, for remote monitoring of protection status.

D. Surge Protection Device: IEEE C62.41-compliant, integrally mounted, bolt-on, solid-state, parallel-connected, modular (with field-replaceable modules) type, with sine-wave tracking suppression and filtering modules, UL 1449, second edition, short-circuit current rating matching or exceeding the panelboard short-circuit rating, and with the following features and accessories:

1. Accessories:

    a. Fuses rated at 200-kA interrupting capacity.
    b. Fabrication using bolted compression lugs for internal wiring.
    c. Integral disconnect switch.
    d. Redundant suppression circuits.
    e. Redundant replaceable modules.
    f. Arrangement with wire connections to phase buses, neutral bus, and ground bus.
    g. LED indicator lights for power and protection status.
    h. Audible alarm, with silencing switch, to indicate when protection has failed.
    i. Form-C contacts rated at 5 A and 250-V ac, one normally open and one normally closed, for remote monitoring of system operation. Contacts shall reverse position on failure of any surge diversion module or on opening of any current-limiting device. Coordinate with building power monitoring and control system.
    j. Six-digit, transient-event counter set to totalize transient surges.

2. Peak Single-Impulse Surge Current Rating: 120 kA per mode/240 kA per phase.

3. Minimum single-impulse current ratings, using 8-by-20-mic.sec. waveform described in IEEE C62.41.2.

    a. Line to Neutral: 70,000 A.
    b. Line to Ground: 70,000 A.
    c. Neutral to Ground: 50,000 A.

4. Withstand Capabilities: 12,000 IEEE C62.41, Category C3 (10 kA), 8-by-20-mic.sec. Surges with less than 5 percent change in clamping voltage.
5. Protection modes and UL 1449 SVR for grounded wye circuits with 480Y/277-V, three-phase, four-wire circuits shall be as follows:

    a. Line to Neutral: 800 V for 480Y/277.
    b. Line to Ground: 800 V for 480Y/277.
    c. Neutral to Ground: 800 V for 480Y/277.

2.06 METERING

A. Power metering shall be provided where indicated on the drawings.

B. Power meter shall transmit data to the building automation system. Communication protocol shall match building automation system protocol. Data shall be updated at 1 second intervals.

C. Metering values shall include, but shall not be limited to, current, current demand, kilowatt hours, kilowatt demand, power factor, voltage, and frequency.

D. Power metering shall be capable of monitoring the following parameters and initiate serial alarm commands:

1. Voltage over/under.
2. Over/under currents.
3. Phase loss.

PART 3 - EXECUTION

3.01 EXAMINATION (FOR REFERENCE ONLY)

A. Receive, inspect, handle, and store panelboards according to NECA 407, NEMA PB 1.1.

B. Examine panelboards before installation. Reject panelboards that are damaged or rusted or have been subjected to water saturation.

C. Examine elements and surfaces to receive panelboards for compliance with installation tolerances and other conditions affecting performance of the Work.

D. Proceed with installation only after unsatisfactory conditions have been corrected.

3.02 INSTALLATION (FOR REFERENCE ONLY)

A. Install panelboards and accessories according to NECA 407, NEMA PB 1.1.

B. Temporary Lifting Provisions: Remove temporary lifting eyes, channels, and brackets and temporary blocking of moving parts from panelboards.

C. Comply with mounting and anchoring requirements specified in Division 26 Section "Vibration and Seismic Controls for Electrical Systems."

D. Mount panelboards such that no overcurrent protection device actuating handle when in highest position is located more than 6'-7" above finished floor.

E. Mount panelboard cabinet plumb and rigid without distortion of box. Mount recessed panelboards with fronts uniformly flush with wall finish and mating with back box.

F. Install overcurrent protective devices and controllers not already factory installed.

1. Set field-adjustable circuit-breaker trip ranges as per selective coordination study.

G. Install filler plates in unused spaces.

H. Stub four 1-inch empty conduits from panelboard into accessible ceiling space or space designated to be ceiling space in the future. Stub four 1-inch empty conduits into raised floor space or below slab not on grade.

I. Comply with NECA 1.

3.03 IDENTIFICATION (FOR REFERENCE ONLY)

A. Identify field-installed conductors, interconnecting wiring, and components; provide warning signs complying with Division 26 Section "Identification for Electrical Systems."

B. Create a directory to indicate installed circuit loads after balancing panelboard loads; incorporate Owner's final room designations. Obtain approval before installing. Use a computer or typewriter to create directory; handwritten directories are not acceptable.

C. Panelboard Nameplates: Label each panelboard with a nameplate complying with requirements for identification specified in Division 26 Section "Identification for Electrical Systems."

D. Device Nameplates: Label each branch circuit device in distribution panelboards with a nameplate complying with requirements for identification specified in Division 26 Section "Identification for Electrical Systems."

3.04 FIELD QUALITY CONTROL

A. Testing Agency: Contractor shall perform tests and inspections.

B. Manufacturer's Field Service: Engage a factory-authorized service representative to inspect, test, and adjust components, assemblies, and equipment installations, including connections.

C. Perform tests and inspections.

1. Manufacturer's Field Service: Engage a factory-authorized service representative to inspect components, assemblies, and equipment installations, including connections, and to assist in testing.

D. Acceptance Testing Preparation:

1. Test insulation resistance for each panelboard bus, component, connecting supply, feeder, and control circuit.
2. Test continuity of each circuit.

E. Tests and Inspections:

1. Perform each visual and mechanical inspection and electrical test stated in NETA Acceptance Testing Specification. Certify compliance with test parameters.
2. Correct malfunctioning units on-site, where possible, and retest to demonstrate compliance; otherwise, replace with new units and retest.
3. Perform the following infrared scan tests and inspections and prepare reports:

    a. Initial Infrared Scanning: After Substantial Completion, but not more than 60 days after Final Acceptance, perform an infrared scan of each panelboard. Remove front panels so joints and connections are accessible to portable scanner.
    b. Follow-up Infrared Scanning: Perform an additional follow-up infrared scan of each panelboard 11 months after date of Substantial Completion.
    c. Instruments and Equipment:

        1) Use an infrared scanning device designed to measure temperature or to detect significant deviations from normal values. Provide calibration record for device.

F. Panelboards will be considered defective if they do not pass tests and inspections.

G. Prepare test and inspection reports, including a certified report that identifies panelboards included and that describes scanning results. Include notation of deficiencies detected, remedial action taken, and observations after remedial action.

3.05 ADJUSTING (FOR REFERENCE ONLY)

A. Adjust moving parts and operable component to function smoothly, and lubricate as recommended by manufacturer.

B. Set field-adjustable circuit-breaker trip ranges as specified in Division 26 Section "Overcurrent Protective Device Coordination Study."

C. Load Balancing: After Substantial Completion, but not more than 60 days after Final Acceptance, measure load balancing and make circuit changes.

1. Measure as directed during period of normal system loading.
2. Perform load-balancing circuit changes outside normal occupancy/working schedule of the facility and at time directed. Avoid disrupting critical 24-hour services such as fax machines and on-line data processing, computing, transmitting, and receiving equipment.
3. After circuit changes, recheck loads during normal load period. Record all load readings before and after changes and submit test records.
4. Tolerance: Difference exceeding 20 percent between phase loads, within a panelboard, is not acceptable. Rebalance and recheck as necessary to meet this minimum requirement.

END OF SECTION

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

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

B. Section 019113 “Building Commissioning Requirements". (For reference only as this is part of the installation contractors scope of work).

1.02 SUMMARY

A. This Section includes equipment for utility company's electricity metering and electricity metering for Owner.

1.03 SUBMITTALS

A. Product Data: Include construction details, material descriptions, dimensions of individual components and profiles, and finishes. Describe electrical characteristics, features, and operating sequences, both automatic and manual. Include the following:

1. Electricity-metering equipment.

B. Shop Drawings for Electricity-Metering Equipment:

1. Dimensioned plans and sections or elevation layouts.
2. Wiring Diagrams: Power, signal, and control wiring specific to this Project. Identify terminals and wiring designations and color codes to facilitate installation, operation, and maintenance. Indicate recommended types, wire sizes, and circuiting arrangements for field-installed wiring, and show circuit protection features.

C. Field quality-control test reports.

D. Operation and Maintenance Data: For electricity-metering equipment to include in emergency, operation, and maintenance manuals.

E. In addition to submitting the shop drawings to the engineer for review the contractor shall also submit the shop drawings to the utility company for review and comment. If the contractor fails to submit the shop drawings to the utility company and changes are required in construction the contractor shall make the changes at no cost to the Owner.

1.04 QUALITY ASSURANCE

A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.

1.05 DELIVERY, STORAGE, AND HANDLING

A. Receive, store, and handle modular meter center as specified in NECA 400.

1.06 COORDINATION

A. Electrical Service Connections: Coordinate with utility companies and components they furnish as follows:

1. Comply with requirements of utilities providing electrical power and communication services.
2. Coordinate installation and connection of utilities and services, including provision for electricity-metering components.

PART 2 - PRODUCTS

2.01 EQUIPMENT FOR ELECTRICITY METERING FOR UTILITY COMPANY

A. Current-Transformer Cabinets: Comply with requirements of electrical power utility company.

B. Meter Sockets: Comply with requirements of electrical power utility company.

2.02 EQUIPMENT FOR ELECTRICITY METERING FOR OWNER

A. Manufacturers:

1. E-MON L.P.
2. National Meter Industries, Inc.
3. Osaki Meter Sales, Inc.
4. Power Measurement.
5. Square D; Schneider Electric.
6. Eaton.
7. ABB.

B. Kilowatt-Hour/Demand Meter: Electronic single- and three-phase meters, measuring electricity use and demand.

1. Voltage and Phase Configuration: Meter shall be designed for use on circuits with voltage rating and phase configuration indicated for its application.
2. Display: Digital liquid crystal, indicating accumulative kilowatt hours, current time and date, current demand, historic peak demand, and time and date of historic peak demand.
3. Demand Signal Communication Interface: Match signal to remote building automation system input and arrange to convey the instantaneous, integrated, demand level measured by meter to provide data for processing and possible programmed demand control action by destination system.
4. Programmable Contact Module: Unit shall have push-button switches and a display for setting the demand level at which an integral set of Form C contacts shall be operated to initiate indicated action.
5. Enclosure: NEMA 250, Type 1 minimum, with hasp for padlocking or sealing.
6. Identification: Comply with Division 26 Section "Identification for Electrical Systems."
7. Memory Backup: Self-contained to maintain memory throughout power outages of 72 hours, minimum.
8. Sensors: Current-sensing type, with current or voltage output, selected for optimum range and accuracy for ratings of circuits indicated for this application.

    a. Type: solid core.

9. Meter Accuracy: Nationally recognized testing laboratory certified to comply with ANSI C12.1.
10. Current-Transformer Cabinet: Listed or recommended by metering equipment manufacturer for use with sensors indicated.

PART 3 - EXECUTION

3.01 INSTALLATION (FOR REFERENCE ONLY)

A. Comply with equipment installation requirements in NECA 1.

B. Install equipment for utility company metering. Install raceways and equipment according to utility company's written requirements. Provide empty conduits for metering leads and extend grounding connections as required by utility company.

C. Install modular meter center according to NECA 400 switchboard installation requirements.

3.02 FIELD QUALITY CONTROL

A. Test Owner's electricity-metering installation for proper operation, accuracy, and usability of output data.

1. Connect a load of known kilowatt rating, 1.5 kW minimum, to a circuit supplied by metered feeder.
2. Turn off circuits supplied by metered feeder and secure them in off condition.
3. Run test load continuously for eight hours, minimum, or longer to obtain a measurable meter indication. Use test load placement and setting that ensures continuous, safe operation.
4. Check and record meter reading at end of test period and compare with actual electricity used based on test load rating, duration of test, and sample measurements of supply voltage at test load connection. Record test results.
5. Repair or replace deficient or malfunctioning metering equipment, or correct test setup; then retest. Repeat for each meter in installation until proper operation of entire system is verified.

END OF SECTION

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

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

B. Section 019113 “Building Commissioning Requirements". (For reference only as this is part of the installation contractors scope of work).

1.02 SUMMARY

A. Section includes packaged diesel engine generators for emergency use with the following features:

1. Diesel engine.
2. Diesel fuel-oil system.
3. Control and monitoring.
4. Generator overcurrent and fault protection.
5. Generator, exciter, and voltage regulator.
6. Outdoor engine generator enclosure.
7. Vibration isolation devices.
8. Finishes.

B. Related Requirements:

1. Section 263600 "Transfer Switches" for transfer switches, including sensors and relays to initiate automatic-starting and -stopping signals for engine generators.

1.03 DEFINITIONS

A. EPS: Emergency power supply.

B. EPSS: Emergency power supply system.

C. Operational Bandwidth: The total variation, from the lowest to highest value of a parameter over the range of conditions indicated, expressed as a percentage of the nominal value of the parameter.

1.04 ACTION SUBMITTALS

A. Equipment shall be submitted with short circuit, overcurrent protection coordination, and arc flash studies as noted in specification 260100 General Electrical Requirements.

B. Product Data: For each type of product.

1. Include rated capacities, operating characteristics, electrical characteristics, and furnished specialties and accessories.
2. Include thermal damage curve for generator.
3. Include time-current characteristic curves for generator protective device.
4. Include fuel consumption in gallons per hour at 0.8 power factor at 0.5, 0.75, and 1.0 times generator capacity.

5. Include generator efficiency at 0.8 power factor at 0.5, 0.75, and 1.0 times generator capacity.
6. Include airflow requirements for cooling and combustion air in cubic feet per minute at 0.8 power factor, with air-supply temperature of 95, 80, 70, and 50 deg F. Provide Drawings indicating requirements and limitations for location of air intake and exhausts.
7. Include generator characteristics, including, but not limited to, kilowatt rating, efficiency, reactances, and short-circuit current capability.

C. Shop Drawings:

1. Include plans and elevations for engine generator and other components specified. Indicate access requirements affected by height of subbase fuel tank.
2. Include details of equipment assemblies. Indicate dimensions, weights, loads, required clearances, method of field assembly, components, and location and size of each field connection.
3. Identify fluid drain ports and clearance requirements for proper fluid drain.
4. Design calculations for selecting vibration isolators and seismic restraints and for designing vibration isolation bases.
5. Vibration Isolation Base Details: Detail fabrication, including anchorages and attachments to structure and supported equipment. Include base weights.
6. Include diagrams for power, signal, and control wiring. Complete schematic, wiring, and interconnection diagrams showing terminal markings for EPS equipment and functional relationship between all electrical components.

1.05 INFORMATIONAL SUBMITTALS

A. Qualification Data: For Installer and manufacturer.

B. Source Quality-Control Reports: Including, but not limited to, the following:

1. Certified summary of prototype-unit test report.
2. Certified Test Reports: For components and accessories that are equivalent, but not identical, to those tested on prototype unit.
3. Certified Summary of Performance Tests: Certify compliance with specified requirement to meet performance criteria for sensitive loads.
4. Report of factory test on units to be shipped for this Project, showing evidence of compliance with specified requirements.
5. Report of sound generation.
6. Report of exhaust emissions showing compliance with applicable regulations.
7. Certified Torsional Vibration Compatibility: Comply with NFPA 110.

C. Warranty: For special warranty.

1.06 CLOSEOUT SUBMITTALS

A. Operation and Maintenance Data: For engine generators to include in emergency, operation, and maintenance manuals.

1. In addition to items specified in Section 017823 "Operation and Maintenance Data," include the following:

a. List of tools and replacement items recommended to be stored at Project for ready access. Include part and drawing numbers, current unit prices, and source of supply.
b. Operating instructions laminated and mounted adjacent to generator location.

c. Training plan.

1.07 MAINTENANCE MATERIAL SUBMITTALS

A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.

1. Fuses: One for every 10 of each type and rating, but no fewer than one of each.
2. Indicator Lamps: Two for every six of each type used, but no fewer than two of each.
3. Filters: One set each of lubricating oil, fuel, and combustion-air filters.
4. Tools: Each tool listed by part number in operations and maintenance manual.

1.08 QUALITY ASSURANCE

A. Installer Qualifications: An authorized representative who is trained and approved by manufacturer.

1.09 WARRANTY

A. Manufacturer's Warranty: Manufacturer agrees to repair or replace components of packaged engine generators and associated auxiliary components that fail in materials or workmanship within specified warranty period.

1. Warranty Period: Comprehensive and cover parts, labor, and travel for five (5) years from date of Substantial Completion.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

A. Basis-of-Design Product: Subject to compliance with requirements, provide product indicated on drawings as manufactured by Cummins Power Generation; Industrial Business Group. Model # 300DQDAC with 80°C alternator and Quiet Site 2 aluminum enclosure or comparable product by one of the following manufacturers in the next paragraph.

B. Manufacturers: Subject to compliance with performance and site condition requirements, one of the manufacturers listed below may be provided in lieu of the Basis of Design manufacturer. Naming these products does not imply that their standard construction or configuration is acceptable or meets the specifications. Alternate equipment proposed must meet the specifications including all architectural, acoustic, mechanical, electrical, and structural details, all scheduled performance and the job design, plans and specifications, and space constraints.

1. Caterpillar, Inc.; Electric Power Division.
2. MTU Onsite Energy Corporation.

C. Source Limitations: Obtain packaged engine generators and auxiliary components from single source from single manufacturer.

2.02 PERFORMANCE REQUIREMENTS

A. B11 Compliance: Comply with B11.19.

B. NFPA Compliance:

1. Comply with NFPA 37.
2. Comply with NFPA 70.
3. Comply with NFPA 110 requirements for Level 1 EPSS.

C. UL Compliance: Comply with UL 2200.

D. Engine Exhaust Emissions: Comply with EPA Tier 3 requirements and applicable state and local government requirements.

E. Noise Emission: Comply with applicable state and local government requirements for maximum noise level at adjacent property boundaries due to sound emitted by engine generator, including engine, engine exhaust, engine cooling-air intake and discharge, and other components of installation.

F. Environmental Conditions: Engine generator system shall withstand the following environmental conditions without mechanical or electrical damage or degradation of performance capability:

1. Ambient Temperature: 0 to 104 deg F.
2. Relative Humidity: Zero to 95 percent.
3. Altitude: Sea level to 1000 feet.

2.03 ENGINE GENERATOR ASSEMBLY DESCRIPTION

A. Factory-assembled and -tested, water-cooled engine, with brushless generator and accessories.

B. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

C. Service Load: 375 kVA.

D. Power Factor: 0.8, lagging.

E. Frequency: 60 Hz

F. Voltage: Refer to drawings.

G. Phase: Refer to drawings.

H. Governor: Adjustable isochronous, with speed sensing.

I. Mounting Frame: Structural steel framework to maintain alignment of mounted components without depending on concrete foundation. Provide lifting attachments sized and spaced to prevent deflection of base during lifting and moving.

1. Rigging Diagram: Inscribed on metal plate permanently attached to mounting frame to indicate location and lifting capacity of each lifting attachment and engine generator center of gravity.

J. Capacities and Characteristics:

1. Power Output Ratings: Nominal ratings as indicated at 0.8 power factor excluding power required for the continued and repeated operation of the unit and auxiliaries, with capacity as required to operate as a unit as evidenced by records of prototype testing.
2. Nameplates: For each major system component to identify manufacturer's name and address, and model and serial number of component.

K. Engine Generator Performance for Sensitive Loads:

1. Oversizing generator compared with the rated power output of the engine is permissible to meet specified performance.

    a. Nameplate Data for Oversized Generator: Show ratings required by the Contract Documents rather than ratings that would normally be applied to generator size installed.

2. Steady-State Voltage Operational Bandwidth: 1 percent of rated output voltage, from no load to full load.
3. Transient Voltage Performance: Not more than 10 percent variation for 50 percent step-load increase or decrease. Voltage shall recover and remain within the steady-state operating band within 0.5 second.
4. Steady-State Frequency Operational Bandwidth: Plus or minus 0.25 percent of rated frequency, from no load to full load.
5. Steady-State Frequency Stability: When system is operating at any constant load within the rated load, there shall be no random speed variations outside the steady-state operational band and no hunting or surging of speed.
6. Transient Frequency Performance: Less than 2-Hz variation for 50 percent step-load increase or decrease. Frequency shall recover and remain within the steady-state operating band within three seconds.
7. Output Waveform: At no load, harmonic content, measured line to neutral, shall not exceed 2 percent total with no slot ripple. Telephone influence factor, determined according to NEMA MG 1, shall not exceed 50 percent.
8. Sustained Short-Circuit Current: For a three-phase, bolted short circuit at system output terminals, system shall supply a minimum of 300 percent of rated full-load current for not less than 10 seconds and then clear the fault automatically, without damage to winding insulation or other generator system components.
9. Excitation System: Performance shall be unaffected by voltage distortion caused by nonlinear load.

    a. Provide permanent magnet excitation for power source to voltage regulator.

10. Start Time: Comply with NFPA 110, Type 10, system requirements.

2.04 DIESEL ENGINE

A. Fuel: ASTM D975 diesel fuel oil, Grade 2-D S15.

B. Rated Engine Speed: 1800 rpm.

C. Lubrication System: Engine or skid mounted.

1. Filter and Strainer: Rated to remove 90 percent of particles 5 micrometers and smaller while passing full flow.

2. Thermostatic Control Valve: Control flow in system to maintain optimum oil temperature. Unit shall be capable of full flow and is designed to be fail-safe.
3. Crankcase Drain: Arranged for complete gravity drainage to an easily removable container with no disassembly and without use of pumps, siphons, special tools, or appliances.

D. Jacket Coolant Heater: Electric-immersion type, factory installed in coolant jacket system. Comply with NFPA 110 requirements for Level 1 equipment for heater capacity and with UL 499. 1,500 watts at 120 volts.

E. Cooling System: Closed loop, liquid cooled, with radiator factory mounted on engine generator mounting frame and integral engine-driven coolant pump.

1. Coolant: Solution of 50 percent ethylene-glycol-based antifreeze and 50 percent water, with anticorrosion additives as recommended by engine manufacturer.
2. Size of Radiator: Adequate to contain expansion of total system coolant, from cold start to 110 percent load condition.
3. Expansion Tank: Constructed of welded steel plate and rated to withstand maximum closed-loop coolant-system pressure for engine used. Equip with gage glass and petcock.
4. Temperature Control: Self-contained, thermostatic-control valve modulates coolant flow automatically to maintain optimum constant coolant temperature as recommended by engine manufacturer.
5. Coolant Hose: Flexible assembly with inside surface of nonporous rubber and outer covering of aging-, UV-, and abrasion-resistant fabric.

    a. Rating: 50-psig maximum working pressure with coolant at 180 deg F, and noncollapsible under vacuum.
    b. End Fittings: Flanges or steel pipe nipples with clamps to suit piping and equipment connections.

F. Muffler/Silencer: Critical type, sized as recommended by engine manufacturer and selected with exhaust piping system to not exceed engine manufacturer's engine backpressure requirements.

1. Minimum sound attenuation of 25 dB at 500 Hz.

G. Air-Intake Filter: Heavy-duty, engine-mounted air cleaner with replaceable dry-filter element and "blocked filter" indicator.

H. Starting System: 24 V electric, with negative ground.

1. Components: Sized so they are not damaged during a full engine-cranking cycle, with ambient temperature at maximum specified in "Performance Requirements" Article.
2. Cranking Motor: Heavy-duty unit that automatically engages and releases from engine flywheel without binding.
3. Cranking Cycle: As required by NFPA 110 for system level specified.
4. Battery: Lead acid, with capacity within ambient temperature range specified in "Performance Requirements" Article to provide specified cranking cycle at least three times without recharging.
5. Battery Cable: Size as recommended by engine manufacturer for cable length indicated. Include required interconnecting conductors and connection accessories.
6. Battery Compartment: Factory fabricated of metal with acid-resistant finish and thermal insulation. Thermostatically controlled heater shall be arranged to maintain battery above 50 deg F regardless of external ambient temperature within range specified in

"Performance Requirements" Article. Include accessories required to support and fasten batteries in place. Provide ventilation to exhaust battery gases.

7. Battery Stand: Factory-fabricated, two-tier metal with acid-resistant finish designed to hold the quantity of battery cells required and to maintain the arrangement to minimize lengths of battery interconnections.
8. Battery-Charging Alternator: Factory mounted on engine with solid-state voltage regulation and 35-A minimum continuous rating.
9. Battery Charger: Current-limiting, automatic-equalizing, and float-charging type designed for lead-acid batteries. Unit shall comply with UL 1236 and include the following features:

    a. Operation: Equalizing-charging rate of 10 A shall be initiated automatically after battery has lost charge until an adjustable equalizing voltage is achieved at battery terminals. Unit shall then be automatically switched to a lower float-charging mode and shall continue to operate in that mode until battery is discharged again.
    b. Automatic Temperature Compensation: Adjust float and equalize voltages for variations in ambient temperature from minus 40 deg F to 140 deg F to prevent overcharging at high temperatures and undercharging at low temperatures.
    c. Automatic Voltage Regulation: Maintain constant output voltage regardless of input voltage variations up to plus or minus 10 percent.
    d. Ammeter and Voltmeter: Flush mounted in door. Meters shall indicate charging rates.
    e. Safety Functions: Sense abnormally low battery voltage and close contacts providing low battery voltage indication on control and monitoring panel. Sense high battery voltage and loss of ac input or dc output of battery charger. Either condition shall close contacts that provide a battery-charger malfunction indication at system control and monitoring panel.
    f. Enclosure and Mounting: NEMA 250, Type 1 wall-mounted cabinet.

2.05 DIESEL FUEL-OIL SYSTEM

A. Comply with NFPA 30.

B. Piping: Fuel-oil piping shall be Schedule 40 black steel, complying with requirements in Section 231113 "Facility Fuel-Oil Piping." Cast iron, aluminum, copper, and galvanized steel shall not be used in the fuel-oil system.

C. Main Fuel Pump: Mounted on engine to provide primary fuel flow under starting and load conditions.

D. Fuel Filtering: Remove water and contaminants larger than 1 micron.

E. Relief-Bypass Valve: Automatically regulates pressure in fuel line and returns excess fuel to source.

F. Subbase-Mounted, Double-Wall, Fuel-Oil Tank: Factory installed and piped, complying with UL 142 fuel-oil tank. Features include the following:

1. Tank level indicator.
2. Fuel-Tank Capacity: 600 gallons.
3. Leak detection in interstitial space.
4. Vandal-resistant fill cap.
5. Containment Provisions: Comply with requirements of authorities having jurisdiction.
6. Fuel filling shall have a square, fuel spill containment with drain that routes the spilt fuel into the main tank. Drain shall have a 1/2” NPT plug.

2.06 CONTROL AND MONITORING

A. Automatic-Starting System Sequence of Operation: When mode-selector switch on the control and monitoring panel is in the automatic position, remote-control contacts in one or more separate automatic transfer switches initiate starting and stopping of engine generator, through normally closed contacts in the automatic transfer switch. When mode-selector switch is switched to the on position, engine generator starts. The off position of same switch initiates engine generator shutdown. When engine generator is running, specified system or equipment failures or derangements automatically shut down engine generator and initiate alarms.

B. Provide minimum run time control set for 30 minutes, with override only by operation of a remote emergency-stop switch.

C. Comply with UL 508A.

D. Configuration: Operating and safety indications, protective devices, basic system controls, and engine gages shall be grouped in a common control and monitoring panel mounted on the engine generator. Mounting method shall isolate the control panel from engine generator vibration. Panel shall be powered from the engine generator battery.

E. Control and Monitoring Panel:

1. Digital controller with integrated LCD display, controls, and microprocessor, capable of local and remote control, monitoring, and programming, with battery backup.
2. Analog control panel with dedicated gages and indicator lights for the instruments and alarms indicated below.
3. Instruments: Located on the control and monitoring panel and viewable during operation.

    a. Engine lubricating-oil pressure gage.
    b. Engine-coolant temperature gage.
    c. DC voltmeter (alternator battery charging).
    d. Running-time meter.
    e. AC voltmeter, for each phase connected to a phase selector switch.
    f. AC ammeter, for each phase connected to a phase selector switch.
    g. AC frequency meter.
    h. Generator-voltage-adjusting rheostat.

4. Controls and Protective Devices: Controls, shutdown devices, and common visual alarm indication as required by NFPA 110 for Level 1 system, including the following:

    a. Cranking control equipment.
    b. Run-Off-Auto switch.
    c. Control switch not in automatic position alarm.
    d. Overcrank alarm.
    e. Overcrank shutdown device.
    f. Low water temperature alarm.
    g. High engine temperature pre-alarm.
    h. High engine temperature.
    i. High engine temperature shutdown device.
    j. Overspeed alarm.
    k. Overspeed shutdown device.

l. Low-fuel main tank.

1) Low-fuel-level alarm shall be initiated when the level falls below that required for operation for the duration required for the indicated EPSS class.

m. Coolant low-level alarm.
n. Coolant low-level shutdown device.
o. Coolant high-temperature prealarm.
p. Coolant high-temperature alarm.
q. Coolant low-temperature alarm.
r. Coolant high-temperature shutdown device.
s. EPS load indicator.
t. Battery high-voltage alarm.
u. Low-cranking voltage alarm.
v. Battery-charger malfunction alarm.
w. Battery low-voltage alarm.
x. Lamp test.
y. Contacts for local and remote common alarm.
z. Low-starting air pressure alarm.
aa. Low-starting hydraulic pressure alarm.
bb. Remote manual-stop shutdown device.
cc. Air shutdown damper alarm when used.
dd. Air shutdown damper shutdown device when used.
ee. Generator overcurrent-protective-device not-closed alarm.

F. Connection to Datalink:

1. A separate terminal block, factory wired to Form C dry contacts, for each alarm and status indication.
2. Provide connections for datalink transmission of indications to remote data terminals via Ethernet and BACnet IP. Coordinate with division 23.

G. Common Remote Panel with Common Audible Alarm: Comply with NFPA 110 requirements for Level 1 systems. Include necessary contacts and terminals in control and monitoring panel. Remote panel shall be powered from the engine generator battery.

H. Remote Alarm Annunciator: An LED indicator light labeled with proper alarm conditions shall identify each alarm event, and a common audible signal shall sound for each alarm condition. Silencing switch in face of panel shall silence signal without altering visual indication. Connect so that after an alarm is silenced, clearing of initiating condition will reactivate alarm until silencing switch is reset. Cabinet and faceplate are surface- or flush-mounting type to suit mounting conditions indicated.

1. Overcrank alarm.
2. Coolant low-temperature alarm.
3. High engine temperature prealarm.
4. High engine temperature alarm.
5. Low lube oil pressure alarm.
6. Overspeed alarm.
7. Low-fuel main tank alarm.
8. Low coolant level alarm.
9. Low-cranking voltage alarm.
10. Contacts for local and remote common alarm.
11. Audible-alarm silencing switch.
12. Air shutdown damper when used.

13. Run-Off-Auto switch.
14. Control switch not in automatic position alarm.
15. Fuel tank derangement alarm.
16. Fuel tank high-level shutdown of fuel-supply alarm.
17. Lamp test.
18. Low-cranking voltage alarm.
19. Generator overcurrent protective device not closed.

I. Supporting Items: Include sensors, transducers, terminals, relays, and other devices and include wiring required to support specified items. Locate sensors and other supporting items on engine or generator unless otherwise indicated.

J. Remote Emergency-Stop Switch: Flush; wall mounted, unless otherwise indicated; and labeled. Push button shall be protected from accidental operation.

2.07 GENERATOR OVERCURRENT AND FAULT PROTECTION

A. Overcurrent protective devices for the entire EPSS shall be coordinated to optimize selective tripping when a short circuit occurs. Coordination of protective devices shall consider both utility and EPSS as the voltage source.

1. Overcurrent protective devices for the EPSS shall be accessible only to authorized personnel.

B. Generator Circuit Breaker: Molded-case, electronic trip type; 100 percent rated; complying with UL 489.

1. Tripping Characteristic: Designed specifically for generator protection.
2. Trip Rating: Refer to drawings.
3. Shunt Trip: Connected to trip breaker when engine generator is shut down by other protective devices.
4. Mounting: Adjacent to or integrated with control and monitoring panel.

C. Generator Protector: Microprocessor-based unit shall continuously monitor current level in each phase of generator output, integrate generator heating effect over time, and predict when thermal damage of alternator will occur. When signaled by generator protector or other engine generator protective devices, a shunt-trip device in the generator disconnect switch shall open the switch to disconnect the generator from load circuits. Protector performs the following functions:

1. Initiates a generator overload alarm when generator has operated at an overload equivalent to 110 percent of full-rated load for 60 seconds. Indication for this alarm is integrated with other engine generator malfunction alarms. Contacts shall be available for load shed functions.
2. Under single- or three-phase fault conditions, regulates generator to 300 percent of rated full-load current for up to 10 seconds.
3. As overcurrent heating effect on the generator approaches the thermal damage point of the unit, protector switches the excitation system off, opens the generator disconnect device, and shuts down the engine generator.
4. Senses clearing of a fault by other overcurrent devices and controls recovery of rated voltage to avoid overshoot.

D. Ground-Fault Indication: Comply with NFPA 70, "Emergency System" signals for ground fault.

1. Indicate ground fault with other engine generator alarm indications.

2.08 GENERATOR, EXCITER, AND VOLTAGE REGULATOR

A. Comply with NEMA MG 1.

B. Drive: Generator shaft shall be directly connected to engine shaft. Exciter shall be rotated integrally with generator rotor.

C. Electrical Insulation: Class H.

D. Stator-Winding Leads: Brought out to terminal box to permit future reconnection for other voltages if required.

E. Range: Provide limited range of output voltage by adjusting the excitation level.

F. Construction shall prevent mechanical, electrical, and thermal damage due to vibration, overspeed up to 125 percent of rating, and heat during operation at 110 percent of rated capacity.

G. Enclosure: Dripproof.

H. Voltage Regulator: Solid-state type, separate from exciter, providing performance as specified and as required by NFPA 110.

1. Adjusting Rheostat on Control and Monitoring Panel: Provide plus or minus 5 percent adjustment of output-voltage operating band.

I. Strip Heater: Thermostatically controlled unit arranged to maintain stator windings above dew point.

J. Windings: Two-thirds pitch stator winding and fully linked amortisseur winding.

K. Subtransient Reactance: 15 percent, maximum.

L. Starting KVA: 1,372 KVA.

2.09 OUTDOOR ENGINE GENERATOR ENCLOSURE

A. Description: Vandal-resistant, sound-attenuating, weatherproof aluminum housing, wind resistant up to 100 mph. Multiple panels shall be lockable and provide adequate access to components requiring maintenance. Panels shall be removable by one person without tools. Instruments and control shall be mounted within enclosure.

1. Sound Attenuation Level: 73 dBA at 23 feet.

B. Description: Prefabricated or pre-engineered, aluminum-clad, integral structural-steel-framed, erected on concrete foundation.

C. Structural Design and Anchorage: Comply with ASCE/SEI 7 for wind loads of up to 100 mph.

D. Hinged Doors: With padlocking provisions.

E. Space Heater: Thermostatically controlled and sized to prevent condensation.

F. Lighting: Provide weather-resistant LED lighting with 30-fc average maintained.

G. Thermal Insulation: Manufacturer's standard materials and thickness selected in coordination with space heater to maintain winter interior temperature within operating limits required by engine generator components.

H. Muffler Location: Within enclosure.

I. Engine-Cooling Airflow through Enclosure: Maintain temperature rise of system components within required limits when unit operates at 110 percent of rated load for two hours with ambient temperature at top of range specified in system service conditions.

1. Louvers: Fixed-engine, cooling-air inlet and discharge. Storm-proof and drainable louvers prevent entry of rain and snow.
2. Automatic Dampers: At engine cooling-air inlet and discharge. Dampers shall be closed to reduce enclosure heat loss in cold weather when unit is not operating.
3. Ventilation: Provide temperature-controlled exhaust fan interlocked to prevent operation when engine is running.

J. Interior Lights with Switch: Factory-wired, vapor-proof luminaires within housing; arranged to illuminate controls and accessible interior. Arrange for external electrical connection.

1. AC lighting system and connection point for operation when remote source is available.
2. DC lighting system for operation when remote source and generator are both unavailable.

K. Convenience Outlets: Factory-wired GFCI. Arrange for external electrical connection.

2.10 VIBRATION ISOLATION DEVICES

A. Restrained Spring Isolators: Freestanding, steel, open-spring isolators with seismic restraint.

1. Housing: Steel with resilient, vertical-limit stops to prevent spring extension due to wind loads or if weight is removed; factory-drilled baseplate bonded to 1/4-inch-thick, elastomeric isolator pad attached to baseplate underside; and adjustable equipment-mounting and -leveling bolt that acts as blocking during installation.
2. Outside Spring Diameter: Not less than 80 percent of compressed height of the spring at rated load.
3. Minimum Additional Travel: 50 percent of required deflection at rated load.
4. Lateral Stiffness: More than 80 percent of rated vertical stiffness.
5. Overload Capacity: Support 200 percent of rated load, fully compressed, without deformation or failure.
6. Minimum Deflection: 1 inch.

B. Comply with requirements in Section 232116 "Hydronic Piping Specialties" for vibration isolation and flexible connector materials for steel piping.

C. Comply with requirements in Section 233113 "Metal Ducts" for vibration isolation and flexible connector materials for exhaust shroud and ductwork.

D. Vibration isolation devices shall not be used to accommodate misalignments or to make bends.

2.11 FINISHES

A. Indoor and Outdoor Enclosures and Components: Manufacturer's standard finish over corrosion-resistant pretreatment and compatible primer.

2.12 SOURCE QUALITY CONTROL

A. Prototype Testing: Factory test engine generator using same engine model, constructed of identical or equivalent components and equipped with identical or equivalent accessories.

1. Tests: Comply with NFPA 110, Level 1 Energy Converters and with IEEE 115.

B. Project-Specific Equipment Tests: Before shipment, factory test engine generator and other system components and accessories manufactured specifically for this Project. Perform tests at rated load and power factor. Include the following tests:

1. Test components and accessories furnished with installed unit that are not identical to those on tested prototype to demonstrate compatibility and reliability.
2. Test generator, exciter, and voltage regulator as a unit.
3. Full-load run.
4. Maximum power.
5. Voltage regulation.
6. Transient and steady-state governing.
7. Single-step load pickup.
8. Safety shutdown.
9. Provide 14 days' advance notice of tests and opportunity for observation of tests by Owner's representative.
10. Report factory test results within 10 days of completion of test.

PART 3 - EXECUTION

3.01 EXAMINATION (FOR REFERENCE ONLY)

A. Examine areas, equipment bases, and conditions, with Installer present, for compliance with requirements for installation and other conditions affecting packaged engine generator performance.

B. Examine roughing-in for piping systems and electrical connections. Verify actual locations of connections before packaged engine generator installation.

C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.02 INSTALLATION (FOR REFERENCE ONLY)

A. Comply with NECA 1 and NECA 404.

B. Comply with packaged engine generator manufacturers' written installation and alignment instructions and with NFPA 110.

C. Equipment Mounting:

1. Install packaged engine generators on cast-in-place concrete equipment bases. Comply with requirements for equipment bases and foundations specified in Section 033000 "Cast-in-Place Concrete" or Section 033053 "Miscellaneous Cast-in-Place Concrete."

2. Coordinate size and location of concrete bases for packaged engine generators. Cast anchor-bolt inserts into bases. Concrete, reinforcement, and formwork requirements are specified with concrete.
3. Install packaged engine generator with restrained spring isolators having a minimum deflection of 1 inch on 4-inch-high concrete base. Secure enclosure to anchor bolts installed in concrete bases. Concrete base construction is specified in Division 26 Section "Vibration and Seismic Controls for Electrical Systems."

D. Install packaged engine generator to provide access, without removing connections or accessories, for periodic maintenance.

E. Cooling System: Install Schedule 40 black steel piping with welded joints for cooling water piping between engine generator and heat exchanger. Piping materials and installation requirements are specified in Section 232113 "Hydronic Piping."

1. Install isolating thimbles where exhaust piping penetrates combustible surfaces. Provide a minimum of 9 inches of clearance from combustibles.
2. Insulate cooling-system piping and components according to requirements in Section 230719 "HVAC Piping Insulation."

F. Exhaust System: Install Schedule 40 black steel piping with welded joints and connect to engine muffler. Install thimble at wall. Piping shall be same diameter as muffler outlet.

1. Piping materials and installation requirements are specified in Section 232113 "Hydronic Piping."
2. Install flexible connectors and steel piping materials according to requirements in Section 232116 "Hydronic Piping Specialties."
3. Insulate muffler/silencer and exhaust system components according to requirements in Section 230719 "HVAC Piping Insulation."
4. Install isolating thimbles where exhaust piping penetrates combustible surfaces with a minimum of 9 inches of clearance from combustibles.

G. Drain Piping: Install condensate drain piping to muffler drain outlet with a shutoff valve, stainless-steel flexible connector, and Schedule 40 black steel pipe with welded joints.

1. Piping materials and installation requirements are specified in Section 232113 "Hydronic Piping."
2. Drain piping valves, connectors, and installation requirements are specified in Section 232116 "Hydronic Piping Specialties."

H. Fuel Piping:

1. Diesel storage tanks, tank accessories, piping, valves, and specialties for fuel systems are specified in Section 231113 "Facility Fuel-Oil Piping."
2. Copper and galvanized steel shall not be used in the fuel-oil piping system.

I. Electrical Wiring: Install electrical devices furnished by equipment manufacturers but not specified to be factory mounted.

J. Refer to drawings for location of remote alarm annunciator.

3.03 CONNECTIONS (FOR REFERENCE ONLY)

A. Piping installation requirements are specified in other Sections. Drawings indicate general arrangement of piping and specialties.

B. Connect fuel, cooling-system, and exhaust-system piping adjacent to packaged engine generator to allow space for service and maintenance.

C. Connect cooling-system water piping to engine generator and heat exchanger with flexible connectors.

D. Connect engine exhaust pipe to engine with flexible connector.

E. Connect fuel piping to engines with a gate valve and union and flexible connector.

1. Additional requirements for diesel storage tanks, tank accessories, piping, valves, and specialties for fuel systems are specified in Section 231113 "Facility Fuel-Oil Piping."

F. Ground equipment according to Section 260526 "Grounding and Bonding for Electrical Systems."

G. Connect wiring according to Section 260519 "Conductors and Cables." Provide a minimum of one 90-degree bend in flexible conduit routed to the engine generator from a stationary element.

H. Balance single-phase loads to obtain a maximum of 10 percent unbalance between any two phases.

3.04 IDENTIFICATION (FOR REFERENCE ONLY)

A. Identify system components according to Section 230553 "Identification for HVAC Piping and Equipment" and Section 260553 "Identification for Electrical Systems."

B. Install a sign indicating the generator neutral is bonded to the main service neutral at the main service location.

3.05 FIELD QUALITY CONTROL

A. Manufacturer's Field Service: Engage a factory-authorized service representative to test and inspect components, assemblies, and equipment installations, including connections. Contractor shall provide all fuel for testing and shall fill tank completely prior to turning over to owner. Load testing shall be 100% of the rating of the generator for four continuous hours.

B. Tests and Inspections:

1. Perform tests recommended by manufacturer and in "Visual and Mechanical Inspection" and "Electrical and Mechanical Tests" subparagraphs below, as specified in the NETA ATS. Certify compliance with test parameters.

a. Visual and Mechanical Inspection:

1) Compare equipment nameplate data with Drawings and the Specifications.
2) Inspect physical and mechanical condition.
3) Inspect anchorage, alignment, and grounding.

4) Verify that the unit is clean.

b. Electrical and Mechanical Tests:

1) Perform insulation-resistance tests according to IEEE 43.

a) Machines Larger Than 200 hp: Test duration shall be 10 minutes. Calculate polarization index.
b) Machines 200 hp or Less: Test duration shall be one minute. Calculate the dielectric-absorption ratio.

2) Test protective relay devices.
3) Verify phase rotation, phasing, and synchronized operation as required by the application.
4) Functionally test engine shutdown for low oil pressure, overtemperature, overspeed, and other protection features as applicable.
5) Perform vibration test for each main bearing cap.
6) Conduct performance test according to NFPA 110.
7) Verify correct functioning of the governor and regulator.

2. NFPA 110 Acceptance Tests: Perform tests required by NFPA 110 that are additional to those specified here, including, but not limited to, single-step full-load pickup test.
3. Battery Tests: Equalize charging of battery cells according to manufacturer's written instructions. Record individual cell voltages.

a. Measure charging voltage and voltages between available battery terminals for full-charging and float-charging conditions. Check electrolyte level and specific gravity under both conditions.
b. Test for contact integrity of all connectors. Perform an integrity load test and a capacity load test for the battery.
c. Verify acceptance of charge for each element of the battery after discharge.
d. Verify that measurements are within manufacturer's specifications.

4. Battery-Charger Tests: Verify specified rates of charge for both equalizing and float-charging conditions.
5. System Integrity Tests: Methodically verify proper installation, connection, and integrity of each element of engine generator system before and during system operation. Check for air, exhaust, and fluid leaks.
6. Exhaust-System Back-Pressure Test: Use a manometer with a scale exceeding 40-inch wg. Connect to exhaust line close to engine exhaust manifold. Verify that back pressure at full-rated load is within manufacturer's written allowable limits for the engine.
7. Exhaust Emissions Test: Comply with applicable government test criteria.
8. Voltage and Frequency Transient Stability Tests: Use recording oscilloscope to measure voltage and frequency transients for 50 and 100 percent step-load increases and decreases, and verify that performance is as specified.
9. Harmonic-Content Tests: Measure harmonic content of output voltage at 25 percent and 100 percent of rated linear load. Verify that harmonic content is within specified limits.
10. Noise-Level Tests: Measure A-weighted level of noise emanating from engine generator installation, including engine exhaust and cooling-air intake and discharge, at four locations 25 feet from edge of the generator enclosure, and compare measured levels with required values.

C. Coordinate tests with tests for transfer switches and run them concurrently.

D. Test instruments shall have been calibrated within the past 12 months, traceable to NIST Calibration Services, and adequate for making positive observation of test results. Make calibration records available for examination on request.

E. Leak Test: After installation, charge exhaust, coolant, and fuel systems and test for leaks. Repair leaks and retest until no leaks exist.

F. Operational Test: After electrical circuitry has been energized, start units to confirm proper motor rotation and unit operation for generator and associated equipment.

G. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.

H. Remove and replace malfunctioning units and retest and reinspect as specified above.

I. Retest: Correct deficiencies identified by tests and observations, and retest until specified requirements are met.

J. Report results of tests and inspections in writing. Record adjustable relay settings and measured insulation resistances, time delays, and other values and observations. Attach a label or tag to each tested component, indicating satisfactory completion of tests.

K. Infrared Scanning: After Substantial Completion, but not more than 60 days after final acceptance, perform an infrared scan of each power wiring termination and each bus connection while running with maximum load. Remove all access panels, so terminations and connections are accessible to portable scanner.

1. Follow-up Infrared Scanning: Perform an additional follow-up infrared scan 11 months after date of Substantial Completion.
2. Instrument: Use an infrared scanning device designed to measure temperature or to detect significant deviations from normal values. Provide calibration record for device.
3. Record of Infrared Scanning: Prepare a certified report that identifies terminations and connections checked and that describes scanning results. Include notation of deficiencies detected, remedial action taken, and observations after remedial action.

3.06 MAINTENANCE SERVICE

A. Initial Maintenance Service: Beginning at Substantial Completion, maintenance service shall include 12 months' full maintenance by skilled employees of manufacturer's authorized service representative. Include quarterly preventive maintenance and exercising to check for proper starting, load transfer, and running under load. Include routine preventive maintenance as recommended by manufacturer and adjusting as required for proper operation. Parts shall be manufacturer's authorized replacement parts and supplies.

3.07 DEMONSTRATION

A. Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain packaged engine generators.

END OF SECTION

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

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

1.02 SUMMARY

A. Section includes automatic transfer switches rated 600 V and less.

1.03 ACTION SUBMITTALS

A. Product Data: For each type of product.

1. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for transfer switches.
2. Include rated capacities, operating characteristics, electrical characteristics, and accessories.

B. Shop Drawings:

1. Include plans, elevations, sections, details showing minimum clearances, conductor entry provisions, gutter space, and installed features and devices.
2. Include material lists for each switch specified.
3. Single-Line Diagram: Show connections between transfer switch, power sources, and load; and show interlocking provisions for each combined transfer switch.

1.04 INFORMATIONAL SUBMITTALS

A. Qualification Data: For manufacturer-authorized service representative and testing agency.

B. Field quality-control reports.

1.05 CLOSEOUT SUBMITTALS

A. Operation and Maintenance Data: For each type of product to include in emergency, operation, and maintenance manuals.

1. In addition to items specified in Section 017823 "Operation and Maintenance Data," include the following:

a. Features and operating sequences, both automatic and manual.
b. List of all factory settings of relays; provide relay-setting and calibration instructions, including software, where applicable.

1.06 QUALITY ASSURANCE

A. Testing Agency Qualifications:

1. Member company of NETA.

a. Testing Agency's Field Supervisor: Certified by NETA to supervise on-site testing.

1.07 WARRANTY

A. Manufacturer's Warranty: Manufacturer agrees to repair or replace components of transfer switch or transfer switch components that fail in materials or workmanship within specified warranty period.

1. Warranty Period: Five years from date of Substantial Completion.

PART 2 - PRODUCTS

2.01 PERFORMANCE REQUIREMENTS

A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

B. Comply with NEMA ICS 1.

C. Comply with NFPA 110.

D. Comply with UL 1008 unless requirements of these Specifications are stricter.

E. Indicated Current Ratings: Apply as defined in UL 1008 for continuous loading and total system transfer.

F. Tested Fault-Current Closing and Short-Circuit Ratings: Adequate for duty imposed by protective devices at installation locations in Project under the fault conditions indicated, based on testing according to UL 1008.

1. Short-time withstand capability for three cycles.

G. Repetitive Accuracy of Solid-State Controls: All settings shall be plus or minus 2 percent or better over an operating temperature range of minus 20 to plus 70 deg C.

H. Resistance to Damage by Voltage Transients: Components shall meet or exceed voltage-surge withstand capability requirements when tested according to IEEE C62.62. Components shall meet or exceed voltage-impulse withstand test of NEMA ICS 1.

I. Electrical Operation: Accomplish by a nonfused, momentarily energized solenoid or electric-motor-operated mechanism. Switches for emergency or standby purposes shall be mechanically and electrically interlocked in both directions to prevent simultaneous connection to both power sources unless closed transition.

J. Neutral Switching: Where four-pole switches are indicated, provide overlapping neutral contacts.

K. Factory Wiring: Train and bundle factory wiring and label, consistent with Shop Drawings, by color-code or by numbered or lettered wire and cable shrinkable sleeve markers at terminations. Color-coding and wire and cable markers are specified in Section 260553 "Identification for Electrical Systems."

1. Designated Terminals: Pressure type, suitable for types and sizes of field wiring indicated.
2. Power-Terminal Arrangement and Field-Wiring Space: Suitable for top, side, or bottom entrance of feeder conductors as indicated.
3. Control Wiring: Equipped with lugs suitable for connection to terminal strips.

4. Accessible via front access.

L. Enclosures: General-purpose NEMA 250, Type 1, complying with NEMA ICS 6 and UL 508, unless otherwise indicated.

2.02 CONTACTOR-TYPE AUTOMATIC TRANSFER SWITCHES

A. Basis-of-Design Product: Subject to compliance with requirements, provide product indicated on drawings as manufactured by Schneider Electric; ASCO Power Technologies. 7000 Series or comparable product by one of the following in the next paragraph.

B. Manufacturers: Subject to compliance with performance and site condition requirements, one of the manufacturers listed below may be provided in lieu of the Basis of Design manufacturer. Naming these products does not imply that their standard construction or configuration is acceptable or meets the specifications. Alternate equipment proposed must meet the specifications including all architectural, acoustic, mechanical, electrical, and structural details, all scheduled performance and the job design, plans and specifications, and space constraints.

1. Caterpillar, Inc.; Electric Power Division.
2. Cummins Power Generation.
3. MTU Onsite Energy Corporation.

C. Comply with Level 1 equipment according to NFPA 110.

D. Switch Characteristics: Designed for continuous-duty repetitive transfer of full-rated current between active power sources.

1. Limitation: Switches using molded-case switches or circuit breakers or insulated-case circuit-breaker components are unacceptable.
2. Switch Action: Double throw; mechanically held in both directions.
3. Contacts: Silver composition or silver alloy for load-current switching. Contactor-style automatic transfer-switch units, rated 600 A and higher, shall have separate arcing contacts.
4. Conductor Connectors: Suitable for use with conductor material and sizes.
5. Material: Hard-drawn copper, 98 percent conductivity.
6. Main and Neutral Lugs: Mechanical type.
7. Ground Lugs and Bus-Configured Terminators: Mechanical type.
8. Ground bar.
9. Connectors shall be marked for conductor size and type according to UL 1008.

E. Automatic Open-Transition Transfer Switches: Interlocked to prevent the load from being closed on both sources at the same time.

1. Sources shall be mechanically and electrically interlocked to prevent closing both sources on the load at the same time.

F. Manual Switch Operation: Under load, with door closed and with either or both sources energized. Transfer time is same as for electrical operation. Control circuit automatically disconnects from electrical operator during manual operation.

G. Manual Switch Operation: Unloaded. Control circuit automatically disconnects from electrical operator during manual operation.

H. Electric Switch Operation: Electrically actuated by push buttons designated "Normal Source" and "Alternative Source." Switch shall be capable of transferring load in either direction with either or both sources energized.

I. Signal-Before-Transfer Contacts: A set of normally open/normally closed dry contacts operates in advance of retransfer to normal source. Interval shall be adjustable from 1 to 30 seconds.

J. Automatic Transfer-Switch Controller Features:

1. Controller operates through a period of loss of control power.
2. Undervoltage Sensing for Each Phase of Normal and Alternate Source: Sense low phase-to-ground voltage on each phase. Pickup voltage shall be adjustable from 85 to 100 percent of nominal, and dropout voltage shall be adjustable from 75 to 98 percent of pickup value. Factory set for pickup at 90 percent and dropout at 85 percent.
3. Voltage/Frequency Lockout Relay: Prevent premature transfer to generator. Pickup voltage shall be adjustable from 85 to 100 percent of nominal. Factory set for pickup at 90 percent. Pickup frequency shall be adjustable from 90 to 100 percent of nominal. Factory set for pickup at 95 percent.
4. Time Delay for Retransfer to Normal Source: Adjustable from zero to 30 minutes, and factory set for 10 minutes. Override shall automatically defeat delay on loss of voltage or sustained undervoltage of emergency source, provided normal supply has been restored.
5. Test Switch: Simulate normal-source failure.
6. Switch-Position Pilot Lights: Indicate source to which load is connected.
7. Source-Available Indicating Lights: Supervise sources via transfer-switch normal- and emergency-source sensing circuits.

    a. Normal Power Supervision: Green light with nameplate engraved "Normal Source Available."
    b. Emergency Power Supervision: Red light with nameplate engraved "Emergency Source Available."

8. Unassigned Auxiliary Contacts: Two normally open, single-pole, double-throw contacts for each switch position, rated 10 A at 240-V ac.
9. Transfer Override Switch: Overrides automatic retransfer control so transfer switch will remain connected to emergency power source regardless of condition of normal source. Pilot light indicates override status.
10. Engine Starting Contacts: One isolated and normally closed, and one isolated and normally open; rated 10 A at 32-V dc minimum.
11. Engine Shutdown Contacts: Time delay adjustable from zero to five minutes, and factory set for five minutes. Contacts shall initiate shutdown at remote engine-generator controls after retransfer of load to normal source.
12. Engine-Generator Exerciser: Solid-state, programmable-time switch starts engine generator and transfers load to it from normal source for a preset time, then retransfers and shuts down engine after a preset cool-down period. Initiates exercise cycle at preset intervals adjustable from 7 to 30 days. Running periods shall be adjustable from 10 to 30 minutes. Factory settings shall be for 7-day exercise cycle, 20-minute running period, and 5-minute cool-down period. Exerciser features include the following:

    a. Exerciser Transfer Selector Switch: Permits selection of exercise with and without load transfer.
    b. Push-button programming control with digital display of settings.
    c. Integral battery operation of time switch when normal control power is unavailable.

K. Large-Motor-Load Power Transfer:

1. In-Phase Monitor: Factory-wired, internal relay controls transfer so contacts close only when the two sources are synchronized in phase and frequency. Relay shall compare phase relationship and frequency difference between normal and emergency sources and initiate transfer when both sources are within 15 electrical degrees, and only if transfer can be completed within 60 electrical degrees. Transfer shall be initiated only if both sources are within 2 Hz of nominal frequency and 70 percent or more of nominal voltage.
2. Motor Disconnect and Timing Relay Controls: Designated starters in loss of power scenario shall disconnect motors before transfer and reconnect them selectively at an adjustable time interval after transfer. Control connection to motor starters shall be through wiring external to automatic transfer switch. Provide adjustable time delay between 1 and 60 seconds for reconnecting individual motor loads. Provide relay contacts rated for motor-control circuit inrush and for actual seal currents to be encountered.
3. Programmed Neutral Switch Position: Switch operator with programmed neutral position arranged to provide a midpoint between the two working switch positions, with an intentional, time-controlled pause at midpoint during transfer. Adjustable pause from 0.5 to 30 seconds minimum, and factory set for 0.5 second unless otherwise indicated. Time delay occurs for both transfer directions. Disable pause unless both sources are live.

2.03 POWER METER

A. The power meter shall conform to the requirements of:

1. UL 3111-1 Electrical Measuring and Testing Equipment
2. CAN/CSA-C22.2 No. 23-M89-CSA Safety Requirements for Electrical and Electronic Measuring and Test Equipment
3. The Power Meter shall be capable of operating without modification at a nominal frequency of 45 to 66Hz.
4. The Power Meter shall be rated for an operating temperature of -4°F to 158°F and a storage temperature of -22°F to 176°F and shall be rated for an 85% non-condensing, relative humidity.
5. The Power Meter shall accept inputs from industry standard instrument transformers (120 VAC secondary PT's and 5A secondary CT's). Direct phase voltage connections, 0 to 600VAC nominal, shall be possible without the use of PT's.
6. The Power Meter shall accept single, 3 phase, or three & four wire circuits. A fourth CT input shall be available to measure neutral or ground current.
7. The Power Meter shall contain a built-in discrete contact to wire an ATS 14A auxiliary contact to indicate switch position.
8. The Power Meter shall accept AC voltage from the sensing lines for operation. Additional provisions shall be provided for external DC voltage input range 9-36 VDC with a nominal of 24 VDC.
9. The Power Meter shall be equipped with a continuous duty, long-life, 4 line x 20 character green backlit LCD.
10. All setup parameters required by the Power Meter shall be stored in non-volatile memory and retained in the event of a control power interruption.
11. The Power Meter shall be flush mountable on a surface.
12. The Power Meter enclosure shall be sealed to IP-51 (NEMA 1) and the faceplate shall be sealed to IP-65 (NEMA 4). All push buttons shall be sealed tact switches.
13. The Power Meter shall send, when prompted, information to a central location equipped with a manufacturer supplied critical power management system or 3rd party monitor through manufacturer supplied communication modules. All 3rd party monitor must utilize industry standard open protocols Modbus/RTU, Modbus/TCP or SNMP.

14. An embedded RS-485 port will be provided which shall enable communication at 9600, 19.2K, 38.4K, or 57.6K baud. DIP switches shall be provided on the RS-485 port allowing a user to select 2-wire or 4-wire communication as well as the option to activate a terminating resistor on the port.
15. The Power Meter shall provide Maximum Demand calculations for the past 24 months, as per standards with 15 minute averages.
16. The following data will be available on the display and Modbus registers of the Power Meter:

    a. Line-to-neutral voltages (V_{AN}, V_{BN}, and V_{CN})
    b. Line-to-neutral voltage average (V_{AVE})
    c. Line-to-line voltages (V_{AB}, V_{BC}, and V_{CA})
    d. Line-Line voltage average (V_{LAVE})
    e. Current on each phase (I_A, I_B, and I_C)
    f. Current on the neutral conductor (I_N)
    g. Average current (I_{AVE})
    h. Active power, KW per phase and total (W_A, W_B, W_C, and W_T)
    i. Apparent power, KVA per phase and total (VA_A, VA_B, VA_C, and VA_T)
    j. KW Hours importing, exporting and net (KWH_{IMP}, KWH_{EXP}, and KWH_{NET})
    k. KVAR Hours leading, lagging and net ($KVARH_{LEAD}$, $KVARH_{LAG}$ and $KVARH_{NET}$)
    l. Power Factor (PF)
    m. Signal Frequency (Hz)
    n. Digital Input

17. For ease of operator viewing, the LCD display can be configured to remain on continuously, with no detrimental effect on the life of the Power Meter.
18. The display's contrast shall be configurable in intervals of 10% (ranging 0% - 100%).
19. Setup of a system requirements shall be allowed from the front of the Power Meter.

2.04 SOURCE QUALITY CONTROL

A. Factory Tests: Test and inspect components, assembled switches, and associated equipment according to UL 1008. Ensure proper operation. Check transfer time and voltage, frequency, and time-delay settings for compliance with specified requirements. Perform dielectric strength test complying with NEMA ICS 1.

B. Prepare test and inspection reports.

1. For each of the tests required by UL 1008, performed on representative devices, for emergency systems. Include results of test for the following conditions:

    a. Overvoltage.
    b. Undervoltage.
    c. Loss of supply voltage.
    d. Reduction of supply voltage.
    e. Alternative supply voltage or frequency is at minimum acceptable values.
    f. Temperature rise.
    g. Dielectric voltage-withstand; before and after short-circuit test.
    h. Overload.
    i. Contact opening.
    j. Endurance.
    k. Short circuit.
    l. Short-time current capability.
    m. Receptacle withstand capability.
    n. Insulating base and supports damage.

PART 3 - EXECUTION

3.01 INSTALLATION (FOR REFERENCE ONLY)

A. Floor-Mounting Switch: Anchor to floor by bolting.

1. Install transfer switches on cast-in-place concrete equipment base(s). Comply with requirements for equipment bases and foundations specified in Section 033000 "Cast-in-Place Concrete" or section 033053 "Miscellaneous Cast-in-Place Concrete."
2. Coordinate size and location of concrete bases. Cast anchor-bolt inserts into bases.
3. Provide workspace and clearances required by NFPA 70.

B. Power Meter: Where equipment is not integral to the ATS enclosure, the power meter and display shall be mounted in its own enclosure adjacent to the ATS with center of display 60 inches above finished floor. Coordinate location with other equipment in room and provide all fittings, boxes, and wire. Power metering equipment that is not immediately adjacent to switch being monitored shall be provided a label identifying the load it is monitoring.

C. Identify components according to Section 260553 "Identification for Electrical Systems."

D. Set field-adjustable intervals and delays, relays, and engine exerciser clock.

E. Comply with NECA 1.

3.02 CONNECTIONS (FOR REFERENCE ONLY)

A. Wiring to Remote Components: Match type and number of cables and conductors to generator sets, motor controls, control, and communication requirements of transfer switches as recommended by manufacturer. Increase raceway sizes at no additional cost to Owner if necessary to accommodate required wiring.

B. Wiring Method: Install cables in raceways and cable trays except within electrical enclosures. Conceal raceway and cables except in unfinished spaces.

1. Comply with requirements for raceways and boxes specified in Section 260533 "Raceways and Boxes for Electrical Systems."

C. Wiring within Enclosures: Bundle, lace, and train conductors to terminal points with no excess and without exceeding manufacturer's limitations on bending radii.

D. Ground equipment according to Section 260526 "Grounding and Bonding for Electrical Systems."

E. Connect wiring according to Section 260519 "Conductors and Cables."

F. Route and brace conductors according to manufacturer's written instructions and Section 260529 "Hangers and Supports for Electrical Systems." Do not obscure manufacturer's markings and labels.

G. Brace and support equipment according to Division 26 Section "Vibration and Seismic Controls for Electrical Systems."

H. Final connections to equipment shall be made with liquidtight, flexible metallic conduit no more than 18 inches in length.

3.03 FIELD QUALITY CONTROL

A. Testing Agency: Engage a qualified testing agency to perform tests and inspections.

B. Manufacturer's Field Service: Engage a factory-authorized service representative to test and inspect components, assemblies, and equipment installations, including connections.

C. Perform the following tests and inspections with the assistance of a factory-authorized service representative:

1. After installing equipment, test for compliance with requirements according to NETA ATS.
2. Visual and Mechanical Inspection:

    a. Compare equipment nameplate data with Drawings and Specifications.
    b. Inspect physical and mechanical condition.
    c. Inspect anchorage, alignment, grounding, and required clearances.
    d. Verify that the unit is clean.
    e. Verify appropriate lubrication on moving current-carrying parts and on moving and sliding surfaces.
    f. Verify that manual transfer warnings are attached and visible.
    g. Verify tightness of all control connections.
    h. Inspect bolted electrical connections for high resistance using one of the following methods, or both:

        1) Use of low-resistance ohmmeter.
        2) Verify tightness of accessible bolted electrical connections by calibrated torque-wrench method according to manufacturer's published data.

    i. Perform manual transfer operation.
    j. Verify positive mechanical interlocking between normal and alternate sources.
    k. Perform visual and mechanical inspection of surge arresters.
    l. Inspect control power transformers.

        1) Inspect for physical damage, cracked insulation, broken leads, tightness of connections, defective wiring, and overall general condition.
        2) Verify that primary and secondary fuse or circuit-breaker ratings match Drawings.
        3) Verify correct functioning of drawout disconnecting contacts, grounding contacts, and interlocks.

3. Electrical Tests:

    a. Perform insulation-resistance tests on all control wiring with respect to ground.
    b. Perform a contact/pole-resistance test. Compare measured values with manufacturer's acceptable values.
    c. Verify settings and operation of control devices.
    d. Calibrate and set all relays and timers.
    e. Verify phase rotation, phasing, and synchronized operation.
    f. Perform automatic transfer tests.
    g. Verify correct operation and timing of the following functions:

        1) Normal source voltage-sensing and frequency-sensing relays.
        2) Engine start sequence.
        3) Time delay on transfer.
        4) Alternative source voltage-sensing and frequency-sensing relays.

5) Automatic transfer operation.
6) Interlocks and limit switch function.
7) Time delay and retransfer on normal power restoration.
8) Engine cool-down and shutdown feature.

4. Measure insulation resistance phase-to-phase and phase-to-ground with insulation-resistance tester. Include external annunciation and control circuits. Use test voltages and procedure recommended by manufacturer. Comply with manufacturer's specified minimum resistance.

   a. Check for electrical continuity of circuits and for short circuits.
   b. Inspect for physical damage, proper installation and connection, and integrity of barriers, covers, and safety features.
   c. Verify that manual transfer warnings are properly placed.
   d. Perform manual transfer operation.

5. After energizing circuits, perform each electrical test for transfer switches stated in NETA ATS and demonstrate interlocking sequence and operational function for each switch at least three times.

   a. Simulate power failures of normal source to automatic transfer switches and retransfer from emergency source with normal source available.
   b. Simulate loss of phase-to-ground voltage for each phase of normal source.
   c. Verify time-delay settings.
   d. Verify pickup and dropout voltages by data readout or inspection of control settings.
   e. Perform contact-resistance test across main contacts and correct values exceeding 500 microhms and values for one pole deviating by more than 50 percent from other poles.
   f. Verify proper sequence and correct timing of automatic engine starting, transfer time delay, retransfer time delay on restoration of normal power, and engine cool-down and shutdown.
   g. Verify proper readings of installed power meter with portable measurement equipment.
   h. Verify BMS/ATS Monitoring System is reporting information correctly.

6. Ground-Fault Tests: Coordinate with testing of ground-fault protective devices for power delivery from both sources.

   a. Verify grounding connections and locations and ratings of sensors.

D. Coordinate tests with tests of generator and run them concurrently.

E. Report results of tests and inspections in writing. Record adjustable relay settings and measured insulation and contact resistances and time delays. Attach a label or tag to each tested component indicating satisfactory completion of tests.

F. Transfer switches will be considered defective if they do not pass tests and inspections.

G. Remove and replace malfunctioning units and retest as specified above.

H. Prepare test and inspection reports.

I. Infrared Scanning: After Substantial Completion, but not more than 60 days after Final Acceptance, perform an infrared scan of each switch. Remove all access panels so joints and connections are accessible to portable scanner.

1. Instrument: Use an infrared scanning device designed to measure temperature or to detect significant deviations from normal values. Provide calibration record for device.
2. Record of Infrared Scanning: Prepare a certified report that identifies switches checked and that describes scanning results. Include notation of deficiencies detected, remedial action taken, and observations after remedial action.
3. Follow-up Infrared Scanning: Perform an additional follow-up infrared scan of each switch 11 months after date of Substantial Completion.

3.04 DEMONSTRATION

A. Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain transfer switches and related equipment.

B. Training shall include testing ground-fault protective devices and instructions to determine when the ground-fault system shall be retested. Include instructions on where ground-fault sensors are located and how to avoid negating the ground-fault protection scheme during testing and circuit modifications.

C. Coordinate this training with that for generator equipment.

END OF SECTION