Manor Independent School District

Board of Trustees Board Meeting Agenda Item

January 28, 2025

CONSENT ITEM SHEET

RE: Consider and possible action regarding delivery method for the Fencing Security Project at Manor New Tech Middle School and Manor New Tech High School for construction services, including possible delegation of authority to Superintendent and/or designee to negotiate and execute an agreement.

Supporting Documents:
1. Architect Drawings (Stantec)

District Goals: Goal 5
FACILITIES & MAINTENANCE- By 2026, Manor ISD will proactively provide facilities to ensure 100% of scholars will have safe, well-maintained, environmentally sustainable, and community accessible facilities.

Bottom of Form

Background Information:
This item addresses the selection of a contractor for the Fencing Security Project at Manor New Tech Middle School and Manor New Tech High School. The administration intends to proceed with the project and recommends utilizing a Cooperative Purchase or Interlocal Agreement as the delivery method.

Fiscal Implications:
Not to exceed $1.4M. Funding will come from the interest earned on the 2019 Bond funds.

Administrative Recommendation:
Administration recommends that the Board approve the delivery method for this project to Cooperative Purchasing or Interlocal Agreement for construction services for the Fencing Security Project at Manor New Tech Middle School and Manor New Tech High School. Administration further recommends that the Board delegate authority to the Superintendent to negotiate and execute an agreement for the construction services.

Administration received preliminary pricing from three contractors for the Fence Project. Pricing is currently being evaluated based on key criteria to determine the best vendor for the project. The contractors that have submitted proposals are Balfour Beatty, Noble Texas Builders, and Braun & Butler. The final vendor selection will be made based on a comprehensive review of the full scope of work, with a focus on aligning the project's requirements with cost efficiency.

Proposed Motion:
"I move that the Board select Cooperative Purchase or Interlocal Agreement as the delivery method for construction services for the Fencing Security Project at Manor New Tech Middle School and Manor New Tech High as presented by Administration for this project and authorize the Superintendent to negotiate and execute an agreement from one of the three vendors that submitted proposals."

Mr. Joe Mendez	Dr. Robert Sormani
Contact Person	**Approved by Superintendent**

Stantec Architecture Inc.
1905 Aldrich St, Suite 300
Austin TX 78723-3544
Tel: (512) 867-6000
Fax: (512) 867-6001

ASI 01

To: **Manor ISD**

From: Tanya Berry, Senior Project Manager

Project: **Manor New Tech Fencing**

ASI#: **01**

Date: 10/09/2024

The work shall be carried out in accordance with the following supplemental instructions issued in accordance with the Contract Documents. Proceeding with the work in accordance with these instructions indicates your acknowledgment that there will be no change in the contract sum or contract time. If changes in the contract sum or contract time are warranted, the general contractor shall submit a change order request for review and approval prior to commencement of the work unless otherwise noted below.

Description:

Civil Updates

C001 Site Plan

- Optimized Gate Layout located at the northwest entrance to improve accessibility for fire truck and school bus to enter the parking lot.
- Revised fence at the northwest corner to tie it into the existing utility fence (around equipment) to restrict pedestrian access to space adjacent to property, between the new fence and the existing retaining wall.
- 8’ tall fence will be used on the east side of the building due to 2’ difference in elevation
- Chain linked fences removed from the project in place of the Fortefence (or approved equal), in response to city comments.
- 5’ x 8’ landings added for the pedestrian gates located on the East side of the project adjacent to Joyce Turner Drive to allow for accessible egress. Concrete to slope down from landing to top of curb.

C002 Fencing and Concrete details

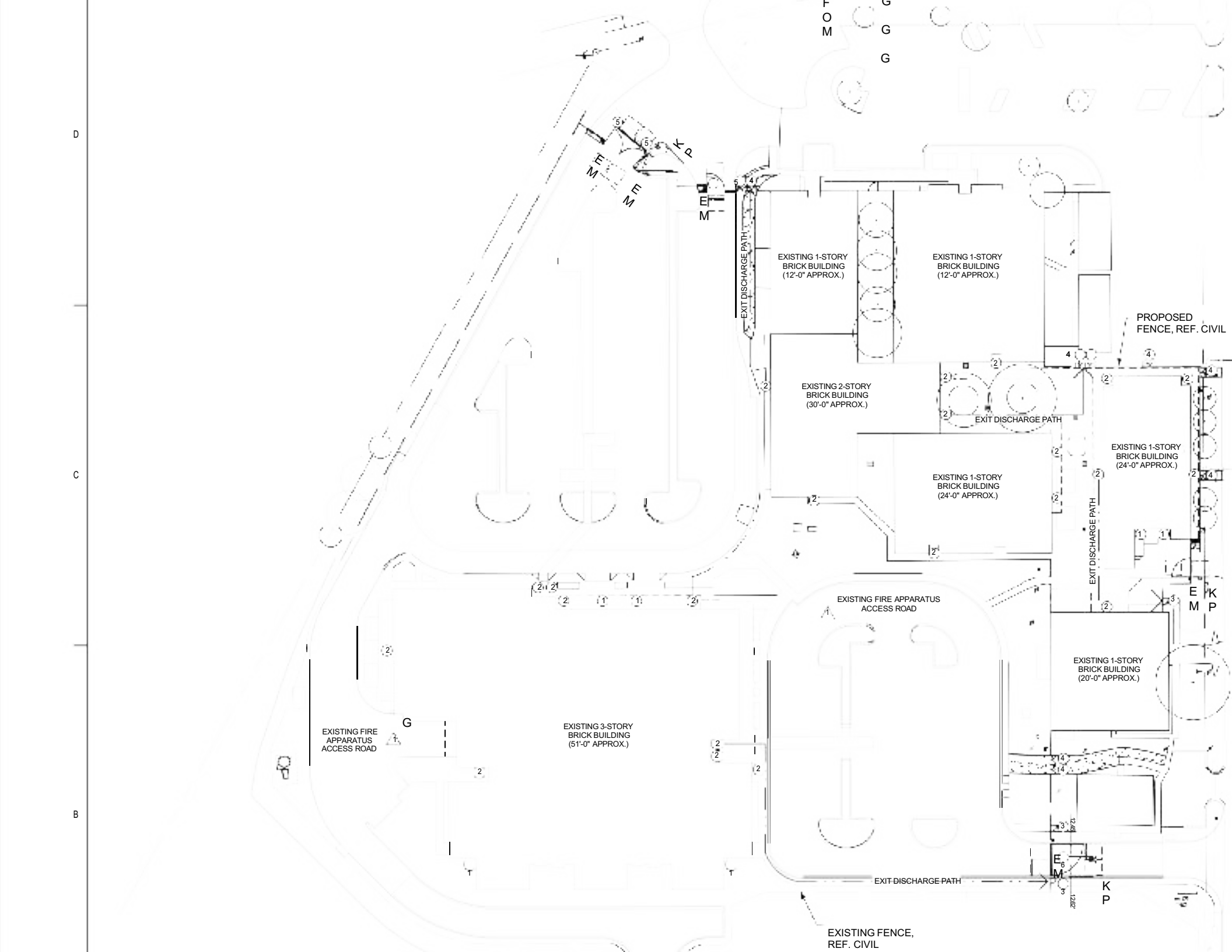
- Chain linked fence detail removed
- ForteFence detail added
- 6” Type IV TXDOT Curb added for protective curb
  - Note: there should be at least a 6” of separation form back of curb to the fence

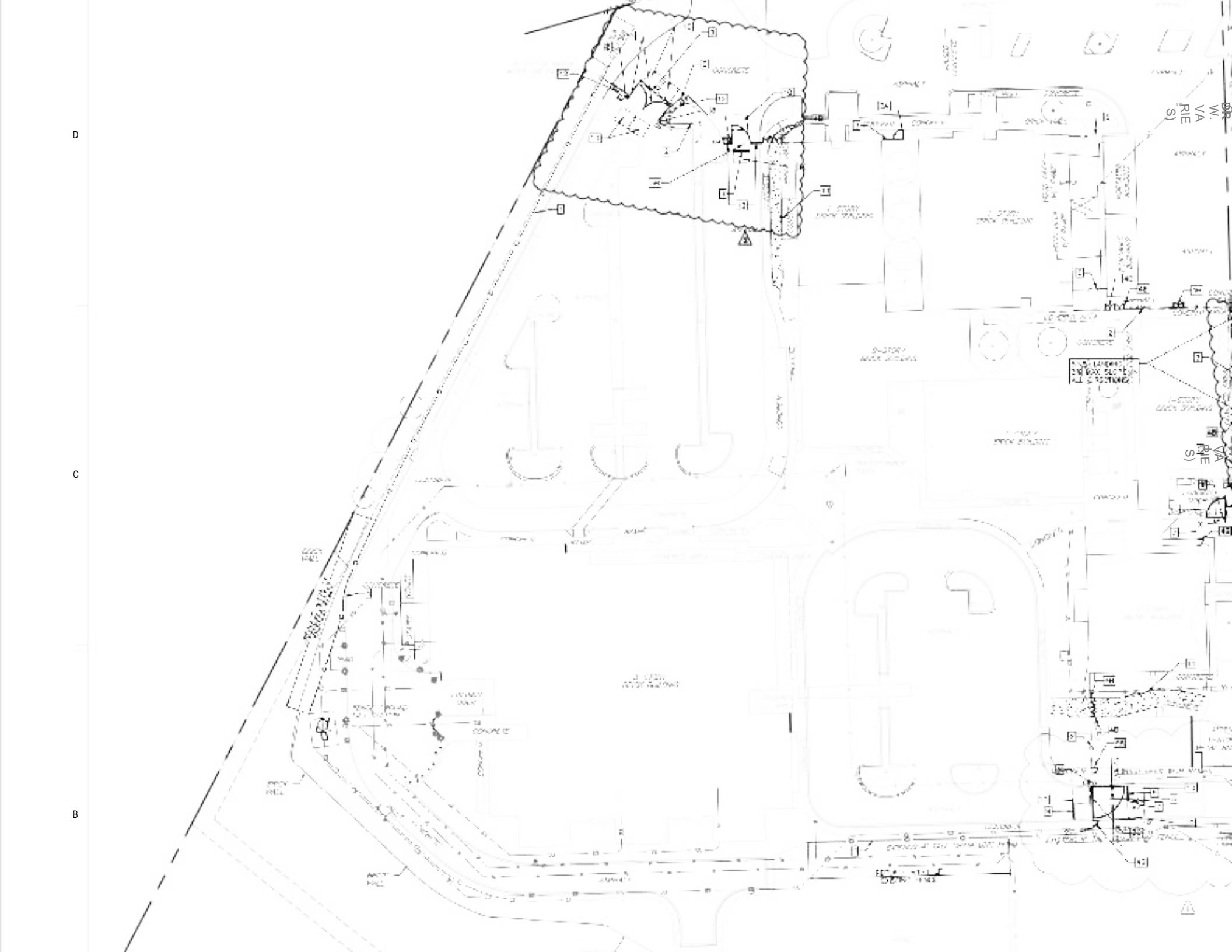
Architecture Updates

G101 life Safety Plan

- Updated note to clarify the intent of pedestrian egress at vehicular gates. Provide red “PUSH TO EXIT” egress button for pedestrian use. Gates shall release (fail safe) upon loss of power to allow for pedestrian egress.

End of ASI #1 Narrative


EXISTING 1-STORY BRICK BUILDING (12'-0" APPROX.)
EXISTING 1-STORY BRICK BUILDING (12'-0" APPROX.)
EXIT DISCHARGE PATH
PROPOSED FENCE, REF. CIVIL
EXISTING 2-STORY BRICK BUILDING (30'-0" APPROX.)
EXIT DISCHARGE PATH
EXISTING 1-STORY BRICK BUILDING (24'-0" APPROX.)
EXISTING 1-STORY BRICK BUILDING (24'-0" APPROX.)
EXIT DISCHARGE PATH
EXISTING FIRE APPARATUS ACCESS ROAD
EXISTING 1-STORY BRICK BUILDING (20'-0" APPROX.)
EXISTING FIRE APPARATUS ACCESS ROAD
EXISTING 3-STORY BRICK BUILDING (51'-0" APPROX.)
EXIT DISCHARGE PATH
EXISTING FENCE, REF. CIVIL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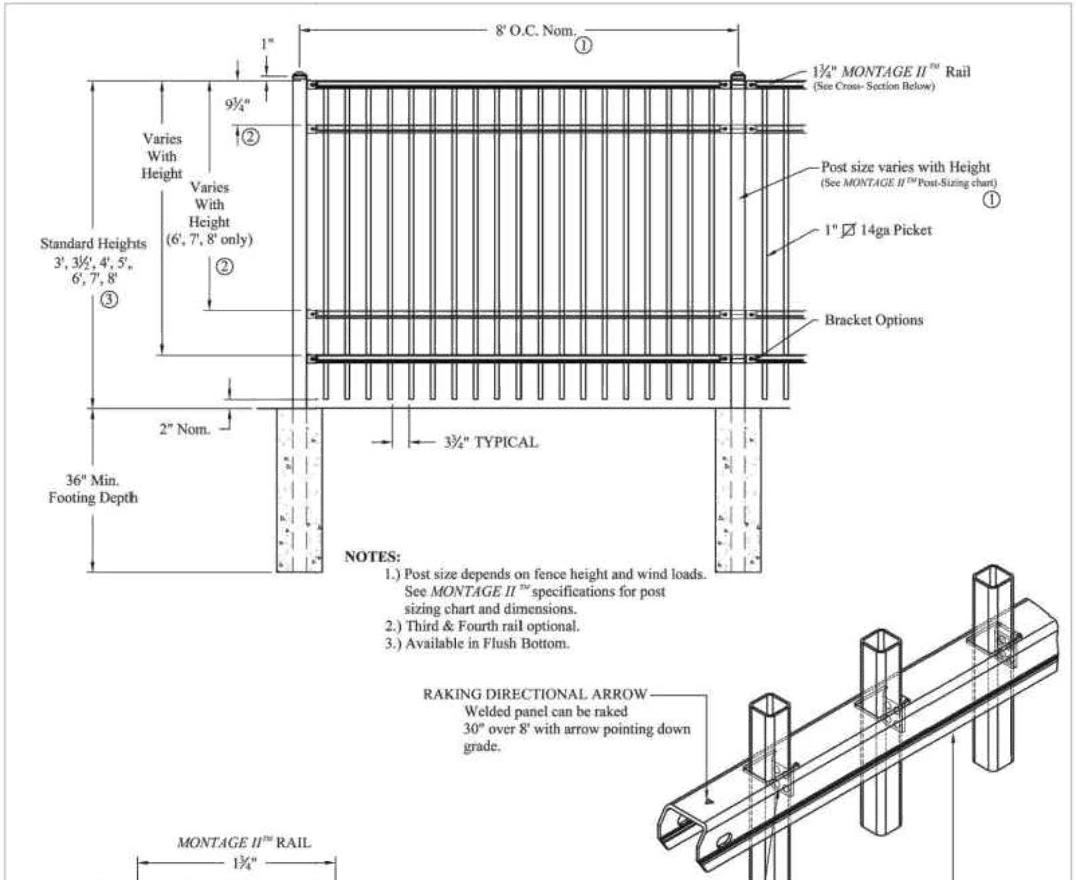
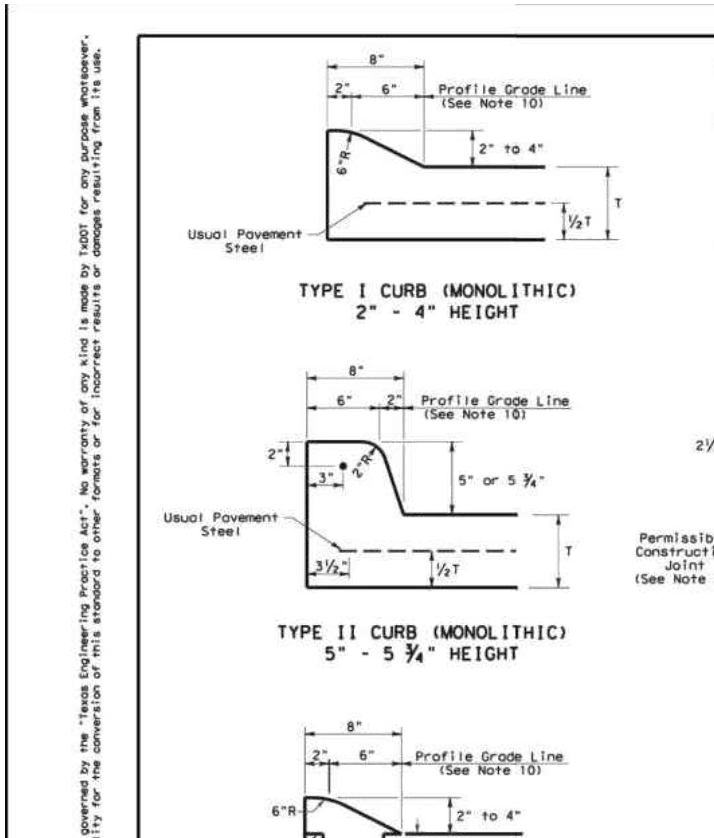
ALL DETAILS ARE NOT TO SCALE





Stantec Architecture Inc.
1905 Aldrich Street, Suite 300
Austin TX 78723-3544

ADDENDUM

Project/File: 214001222
Addendum No.: 01
Date: 8/26/2024, issued 9/4/2024
Project: Manor New Tech Security Fencing

This addendum is to be read with and constitutes part of the tender document.
This addendum is generally separated into sections for convenience; however, all contractors, subcontractors, material suppliers and other involved parties shall be responsible for reading the entire addendum. Failure to list an item(s) in all affected sections of this addendum does not relieve any party affected from performing per instructions, provided the information is set forth one time anywhere in the Addendum.

DETAILS OF THE ADDENDUM:

See below Architectural and Civil scope, respectively.

Architectural Scope

General Drawings:

1. G101:

    Notes added as requested by AHJ. Existing fire apparatus access roads labeled on plan.

Civil Drawings:

1. C001:

    Minimum clear drive widths dimensioned on plan to meet AHJ code requirements.

Regards,

YsaBella Licciardi NCARB
Project Architect
Phone: 206-494-5021
Ysabella.licciardi@stantec.com

MANOR ISD

MANOR NEW TECH SECURITY FENCING

PROJECT TEAM:

OWNER

MANOR INDEPENDENT SCHOOL DISTRICT
10335 US HWY 290E
MANOR, TX 78653
TEL: (512) 278-4000

ARCHITECT

STANTEC
1905 ALDRICH ST
AUSTIN, TX 78723
TEL: (512) 328-0011

CIVIL ENGINEER

STANTEC
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ELECTRICAL ENGINEER

STANTEC
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TECHNOLOGY

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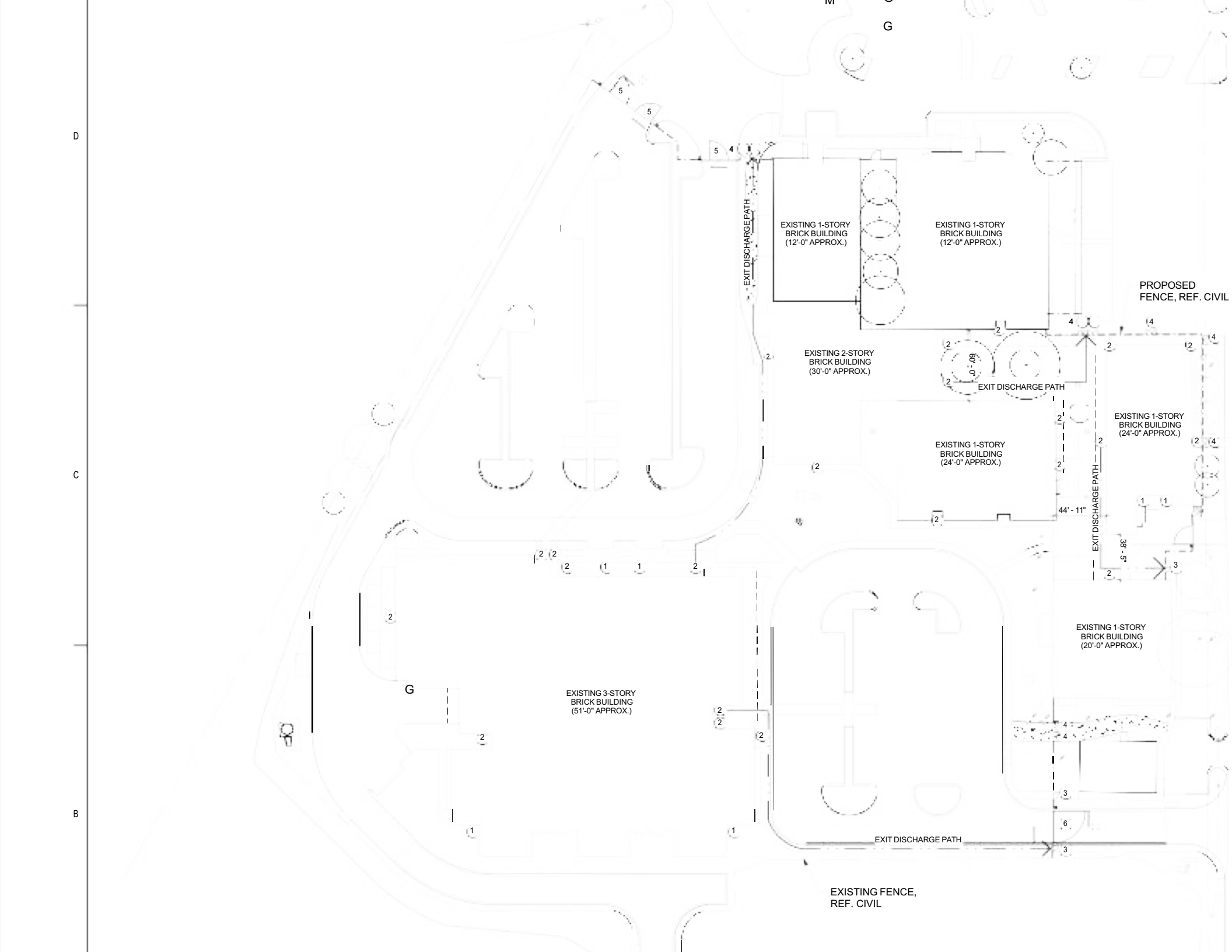
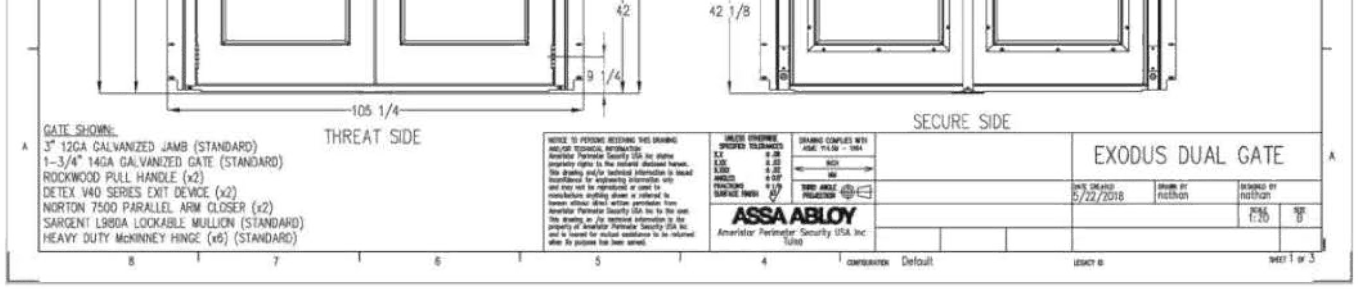

EXISTING 1-STORY BRICK BUILDING (12'-0" APPROX.)
EXISTING 1-STORY BRICK BUILDING (12'-0" APPROX.)
EXIT DISCHARGE PATH
PROPOSED FENCE, REF. CIVIL
EXISTING 2-STORY BRICK BUILDING (30'-0" APPROX.)
60' - 0"
EXIT DISCHARGE PATH
EXISTING 1-STORY BRICK BUILDING (24'-0" APPROX.)
EXISTING 1-STORY BRICK BUILDING (24'-0" APPROX.)
44' - 11"
EXIT DISCHARGE PATH
38' - 5"
EXISTING 1-STORY BRICK BUILDING (20'-0" APPROX.)
EXISTING 3-STORY BRICK BUILDING (51'-0" APPROX.)
EXIT DISCHARGE PATH
EXISTING FENCE, REF. CIVIL



GATE SHOWN:
3" 12GA GALVANIZED JAMB (STANDARD)
1-3/4" 14GA GALVANIZED GATE (STANDARD)
ROCKWOOD PULL HANDLE (x2)
DETEX V40 SERIES EXIT DEVICE (x2)
NORTON 7500 PARALLEL ARM CLOSER (x2)
SARGENT L9808A LOCKABLE MULLION (STANDARD)
HEAVY DUTY McKINNEY HINGE (x6) (STANDARD)

ASSA ABLOY
Ameristar Perimeter Security USA Inc
Tulsa

EXODUS DUAL GATE

DATE CREATED 5/22/2018 | DRAWN BY nathan | DESIGNED BY nathan | SIZE D | REV 0

Default

SHEET 1 OF 3

SECTION

POLYPROPYLENE FIBE
150 mm X 150 mm
(6" X 6" X W1.4 X W
OR ONE LAYER 10M
MORE THAN 450 mm
DIRECTIONS.
REINFORCEMENT SHA
SLAB MID-DEPTH AND
MEANS OF BAR SUPP
STRENGTH AND NUME
DISPLACEMENT AND M
PROPER POSITION DU
THE P.C. CONCRETE
STEEL BE PLACED D
OR SAND CUSHION L

CITY OF AUSTIN
DEPARTMENT OF PUBLIC WORKS

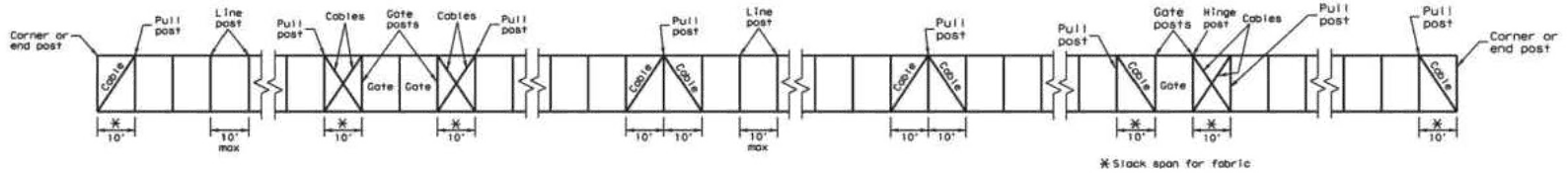
Bill Gordon 3/26/08
ADOPTED

THE ARCHITECT/ENGINEER
RESPONSIBILITY FOR APPR
OF THIS STANDARD.

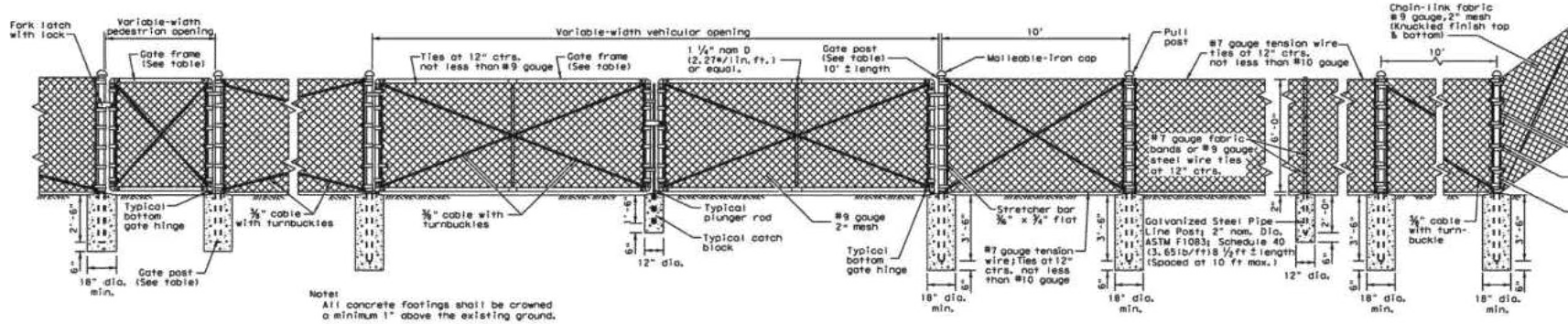
ALL DETAILS ARE NOT LE

DISCLAIMER:
The use of this standard is governed by the "Texas Engineering Practice Act". No warranty of any kind is made by TxDOT for any purpose whatsoever. TxDOT assumes no responsibility for the conversion of this standard to other formats or for incorrect results or damages resulting from its use.

DATE:
FILE:

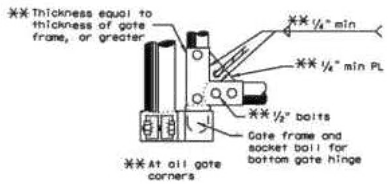


TYPICAL CABLE AND POST ARRANGEMENT



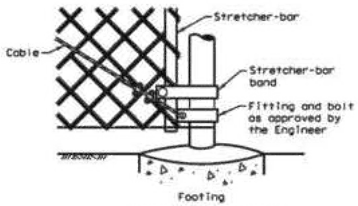
CHAIN-LINK BARRIER FENCE (6 FT.)

Foundation designs shown are "minimums" for a 6 ft. fence. Taller fences may require larger foundation designs.



TYPICAL BOTTOM GATE HINGE

TYPICAL STRETCHER-BAR BAND



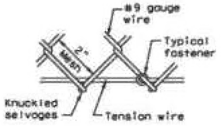
TERMINAL POST DETAIL

GATE (TYPES AND SIZES)	
Single Inclusive Up to 6' Over 6' to 12' Over 12' to 18' Over 18'	Double Inclusive Up to 12' Over 12' to 26' Over 26' to 36' Over 36'

GATE FRAME (WEIGHT)		GATE POST (WEIGHT)	
SIZE	WT./LIN. FT.	SIZE	WT./LIN. FT.
1 ½" nom dia. or equal	2.72 Lbs.	2 ½" nom dia. or equal	5.79 Lbs.
		3 ½" nom dia. or equal	9.11 Lbs.
		6" nom dia.	18.97 Lbs.
		8" nom dia.	24.70 Lbs.

"OPTIONAL" 3 WIRE 45° BARBED WIRE ARM

Barbed wire arm related items shall conform to Item 550, "Chain Link Fence."



FABRIC & TENSION WIRE DETAIL, TOP & BOTTOM

GENERAL NOTES

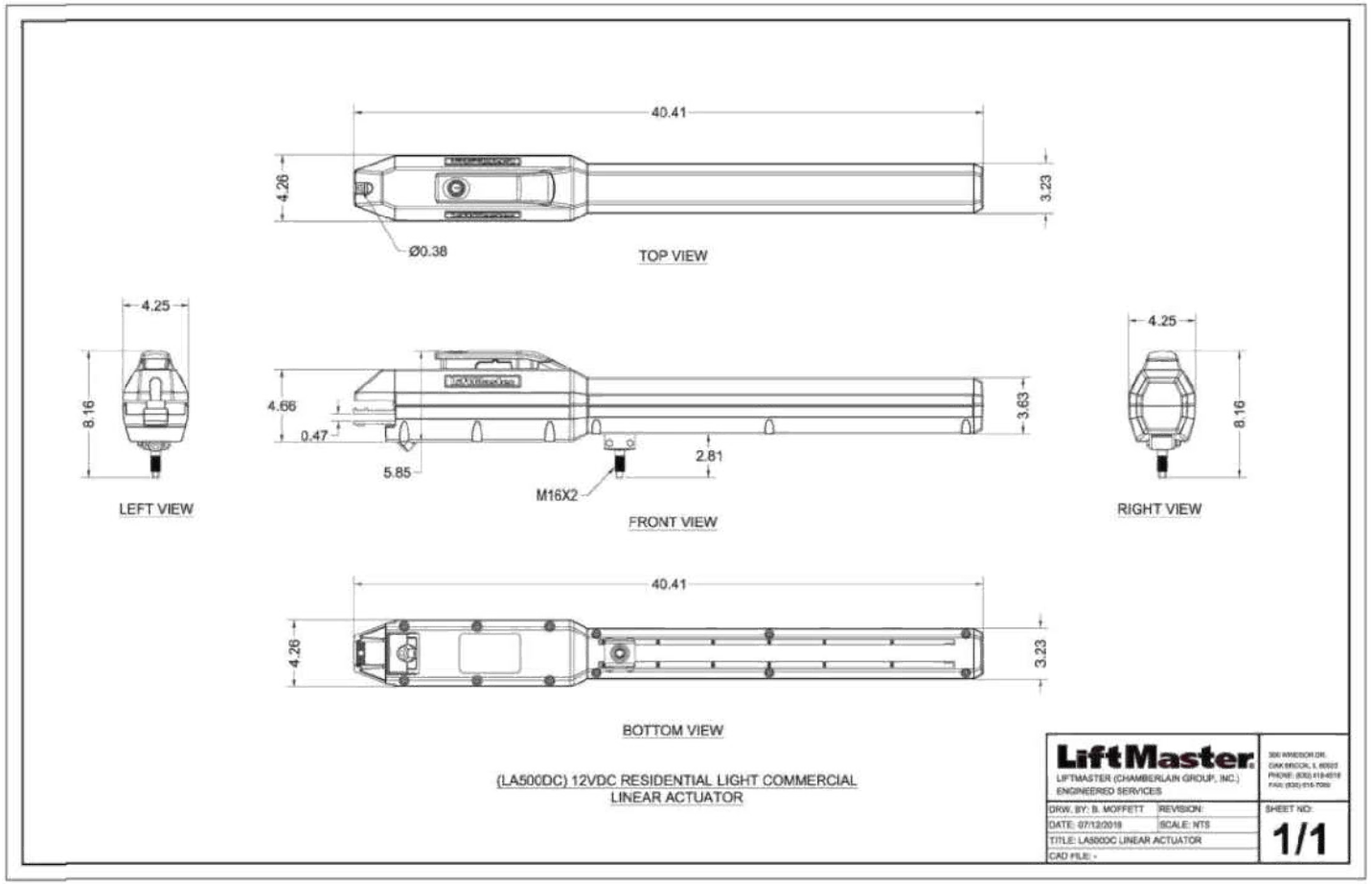
1. Items hereon shall conform to Item 550, "Chain Link Fe
2. Typical installation plan may vary as shown elsewhere directed by the Engineer. Location of gates shown els
3. Gate-frame members shall be bolted, at frame corners, with four ½" bolts per joint.
4. All cable connections are to be made with two ⅜" cable
5. All pull posts and end posts and their foundations sha respective dimensions as those shown for corner post.
6. All pull post shall be furnished with two stretcher ba
7. One end of each turnbuckle may be attached directly to a clevis.
8. Concrete footings are to be crowned at the top to shed

Texas Department of Transp

CHAIN LINK

CLF-1

FILE: clf10.dgn	DN: TxDOT	
©TxDOT 1996	CONT	SECT
REVISIONS	DIST	


40.41
4.26
3.23
Ø0.38
TOP VIEW
4.25
8.16
LEFT VIEW
4.66
0.47
5.85
2.81
3.63
M16X2
FRONT VIEW
4.25
8.16
RIGHT VIEW
40.41
4.26
3.23
BOTTOM VIEW
(LA500DC) 12VDC RESIDENTIAL LIGHT COMMERCIAL
LINEAR ACTUATOR
LiftMaster
LIFTMASTER (CHAMBERLAIN GROUP, INC.)
ENGINEERED SERVICES
300 WINDSOR DR.
OAK BROOK, IL 60523
PHONE: (630) 416-6018
FAX: (630) 416-7099
DRW. BY: B. MOFFETT
REVISION:
DATE: 07/12/2018
SCALE: NTS
TITLE: LA500DC LINEAR ACTUATOR
CAD FILE: -
SHEET NO:
1/1

POWER DEVICES

TV	TELEVISION/LED/MONITOR. RF SIGNAL AND POWER OUTLET (JUNCTION BOX AND CONDUIT BY ELECTRICAL CONTRACTOR, DEVICES BY OTHERS). REFER TO DETAIL ON E500 SERIES DRAWINGS.
TW1	TEACHER'S WORK STATION. REFER TO DETAILS ON E500 SERIES DRAWINGS.
WSX	WORK STATION OUTLET DETAIL. REFER TO DETAILS ON E500 SERIES DRAWINGS.
PR	CEILING MOUNTED VIDEO PROJECTOR STATION. REFER TO DETAIL ON DRAWING E500 SERIES DRAWINGS.

TELECOM OUTLETS

	OUTLET
	OUTLET, CEILING MOUNTED
	FURNITURE SYSTEMS OUTLET
	OUTLET, MOUNTED IN FLOOR BOX
	OUTLET, MOUNTED IN POKE THRU
	OUTLET, MOUNTED IN POWER POLE

TELECOM OUTLET TYPES

#	# INDICATES QUANTITY OF DATA JACKS, PULLSTRING ALWAYS PROVIDED. WHERE NO QUANTITY IS NOTED, 2 DATA JACKS AND PULLSTRING.
AC	MOUNTED 3" ABOVE COUNTER BACKSPLASH
B	BLANK FACEPLATE, ROUGH-IN ONLY
D	DIRECT CONNECTION TO PANEL
M	PATIENT MONITORING
P	PAY TELEPHONE
R	RACEWAY MOUNTED
W	WALL MOUNTED TELEPHONE HANDSET OUTLET
WAP	WIRELESS ACCESS POINT CONNECTION

FIRE ALARM

FAA	FIRE ALARM ANNUNCIATOR
FACP	FIRE ALARM CONTROL PANEL
DH	DOOR HOLDER

WORK DEFINITION

	NEW WORK
	EXISTING
	REMOVE EXISTING
	REMOVE EXISTING ELECTRICAL EQUIPMENT
	FUTURE
	TEMPORARY, AS NOTED
?##	KEY NOTE
???	EQUIPMENT IDENTIFICATION

CIRCUITS

	RACEWAY CONCEALED IN CEILING OR WALL. EXPOSED RACEWAY IS ALLOWED ONLY WHERE NOTED.
	RACEWAY BELOW SLAB OR UNDERGROUND
	RACEWAY UP
	RACEWAY DOWN
	RACEWAY CONTINUATION
	RACEWAY STUB-OUT WITH BUSHING
J	JUNCTION BOX, CEILING OR ABOVE CEILING MOUNTED
J	JUNCTION BOX, WALL MOUNTED
J	JUNCTION BOX, IN-GROUND
PB	PULL BOX

N/A	EXIT SIGN, FILLED SIDES INDICATE ILLUMINATED ANNOTATION, ARROWS INDICATE DIRECTIONAL GRAPHICS
N/A	WALL MOUNTED EXIT SIGN, FILLED SIDES INDICATE ILLUMINATED ANNOTATION, ARROWS INDICATE DIRECTIONAL GRAPHICS
N/A	EXIT SIGN WITH EMERGENCY BATTERY PACK
N/A	WALL MOUNTED EXIT SIGN WITH EMERGENCY BATTERY PACK
N/A	EMERGENCY BATTERY PACK, NUMBER OF LAMPS NOT INDICATED
N/A	WALL MOUNTED EMERGENCY BATTERY PACK, NUMBER OF LAMPS NOT INDICATED
N/A	EMERGENCY WITH REMOTE BATTERY PACK, NUMBER OF LAMPS NOT INDICATED
N/A	WALL MOUNTED EMERGENCY WITH REMOTE BATTERY PACK, NUMBER OF LAMPS NOT INDICATED
	RECESSED LINEAR WALL WASH LUMINAIRE, LENGTH TO SCALE
	LINEAR PENDANT MOUNTED WALL WASH LUMINAIRE, LENGTH TO SCALE
	RECESSED WALL WASH LUMINAIRE
	SURFACE MOUNTED WALL WASH LUMINAIRE
	PENDANT MOUNTED WALL WASH LUMINAIRE
	RECESSED ACCENT LUMINAIRE
	SURFACE MOUNTED ACCENT LUMINAIRE
	PENDANT MOUNTED ACCENT LUMINAIRE
	MONOPOINT LUMINAIRE
N/A	TRACK LIGHTING
N/A	CONTINUOUS SOURCE LUMINAIRE, PATH AS INDICATED
	MULTI-LAMP ACCENT LUMINAIRE, NUMBER OF LAMPS NOT INDICATED
	WALL MOUNTED MULTI-LAMP ACCENT LUMINAIRE, NUMBER OF LAMPS NOT INDICATED
	OVERCOUNTER TASK LUMINAIRE
	UNDERCABINET TASK LUMINAIRE
	FIBER OPTIC REMOTE SOURCE
	STEP LUMINAIRE
	ILLUMINATED SIGN
	WALL MOUNTED ILLUMINATED SIGN
	NIGHT LIGHT
	WALL MOUNTED STROBE LIGHT

LIGHTING CONTROLS

	SINGLE POLE SWITCH
	INDICATES WIRELESS CONTROL
a	LOWER-CASE LETTER(S) NEAR SWITCH DENOTE SWITCH LEG(S)
2	DOUBLE POLE SWITCH
3	THREE-WAY SWITCH
4	FOUR-WAY SWITCH
D	DIMMER SWITCH
K	KEY OPERATED SWITCH
LV	MOMENTARY CONTACT LOW VOLTAGE SWITCH
O	OCCUPANCY SENSOR SWITCH
OD	OCCUPANCY SENSOR/DIMMER SWITCH
P	SWITCH WITH PILOT LIGHT
PC	PHOTOCELL SWITCH
T	TIMER SWITCH
CS#	LOW VOLTAGE CONTROL STATION, # INDICATES STATION IDENTIFICATION
DSC	DIMMING SYSTEM CONTROL PANEL
ELCU	EMERGENCY LIGHTING CONTROL UNIT
LCP	LIGHTING CONTROL PANEL
OS	OCCUPANCY SENSOR SWITCH, CEILING MOUNTED
PS	PHOTO SENSOR CONTROL
PS	PHOTO SENSOR CONTROL, CEILING MOUNTED
R	RELAY
T	LOW VOLTAGE TRANSFORMER

#	# RECEPTACLE, NEMA #
#	# RECEPTACLE, NEMA #, CEILING MOUNTED
#	# COMBINATION RECEPTACLE, NEMA # AND 120V
	FURNITURE SYSTEMS RECEPTACLE, 120V
N/A	INDICATES CONTROLLED
N/A	INDICATES 15A
N/A	INDICATES TWIST LOCK
N/A	INDICATES MOUNTED 3" (75 MM) ABOVE COUNTER BACKSPLASH
N/A	MULTI-SERVICE FLOOR BOX (RECEPTACLES/OUTLETS AS INDICATED)
N/A	MULTI-SERVICE POKE THRU (RECEPTACLES/OUTLETS AS INDICATED)
N/A	MULTI-SERVICE POWER POLE (RECEPTACLES/OUTLETS AS INDICATED)
N/A	MULTI-SERVICE ASSEMBLY (RECEPTACLES/OUTLETS AS INDICATED)
N/A	CLOCK RECEPTACLE, 120V
	CORD DROP, 120V
	CEILING CORD DROP, 120V

RECEPTACLE TYPES

A	ARC FAULT CIRCUIT INTERRUPTER
AT	ARC FAULT CIRCUIT INTERRUPTER AND TAMPER RESISTANT
D	DEDICATED CIRCUIT
G	GROUND FAULT CIRCUIT INTERRUPTER
GT	GROUND FAULT CIRCUIT INTERRUPTER AND TAMPER RESISTANT
IG	ISOLATED GROUND
S	SURGE PROTECTOR
T	TAMPER RESISTANT
U	INTEGRAL USB PORT(S)
WP	GROUND FAULT CIRCUIT INTERRUPTER WITH WEATHER RESISTANT COVER

CONTROLS

	NON-FUSED SAFETY SWITCH
	FUSED SAFETY SWITCH, FUSE RATING INDICATED
	COMBINATION MOTOR STARTER AND FUSED SAFETY SWITCH, FUSE RATING INDICATED
	MOTOR STARTER
	MANUAL MOTOR STARTER
	AUTOMATIC DOOR PUSHPLATE
	DEAD FRONT GFCI
	EMERGENCY SHUTDOWN
	ENCLOSED CIRCUIT BREAKER
	ENCLOSED CONTACTOR
	PUSH BUTTON CONTROL STATION
M	TOGGLE SWITCH, MOTOR RATED
	TOUCHLESS AUTOMATIC DOOR OPENER
DDC	DIRECT DIGITAL CONTROL PANEL
R	RELAY
	THERMOSTAT
TC	TIME CLOCK
VFD	VARIABLE FREQUENCY DRIVE

ELECTRICAL EQUIPMENT

	208V OR 240V POWER PANELBOARD
	480V OR 600V POWER PANELBOARD
	EQUIPMENT CABINET OR PANEL
	EQUIPMENT CONNECTION, FILL INDICATES EMERGENCY CIRCUIT
	GROUND BAR
	MOTOR CONNECTION, 1Ø
	MOTOR CONNECTION, 3Ø
	BUS DUCT
ATS	AUTOMATIC TRANSFER SWITCH
B	BUS DUCT PLUG
SPD	SURGE PROTECTIVE DEVICE
T	TRANSFORMER, NOT TO SCALE
T	TRANSFORMER, DRAWN TO SCALE

BC	BONDING CONDUCTOR
BCU	BARE COPPER
BFC	BELOW FINISHED CEILING
BFG	BELOW FINISHED GRADE
BKR	BREAKER
BLDG	BUILDING
BOF	BOTTOM OF FIXTURE
BTM	BOTTOM
C	CONDUIT
C/W	COMPLETE WITH
CAP	CAPACITY
CATV	CABLE ANTENNA TELEVISION
CB	CIRCUIT BREAKER
CCTV	CLOSED CIRCUIT TELEVISION
CEC	CANADIAN ELECTRIC CODE
CFOI	CONTRACTOR FURNISHED, OWNER INSTALLED
CIRC	CIRCULATING
CKT	CIRCUIT
CL	CENTERLINE
CLG	CEILING
CM	CEILING MOUNTED
CMU	CONCRETE MASONRY UNIT
CO	CONDUIT ONLY
COMM	COMMUNICATIONS
CONC	CONCRETE
CONN	CONNECTION
CONST	CONSTRUCTION
CONT	CONTINUOUS
CONTR	CONTRACTOR
CPT	CONTROL POWER TRANSFORMER
CPU	CENTRAL PROCESSING UNIT
CR	CRITICAL BRANCH
CT	CURRENT TRANSFORMERS
CTR	CENTER
CU	COPPER
CUH	CABINET UNIT HEATER
D	DEDICATED
DC	DIRECT CURRENT
DET	DETAIL
DIAM	DIAMETER
DIM	DIMENSION
DISC	DISCONNECT
DIV	DIVISION
DL	DAMP LOCATION
DN	DOWN
DP	DISTRIBUTION PANEL
DPDT	DOUBLE POLE, DOUBLE THROW
DPR	DAMPER
DPST	DOUBLE POLE, SINGLE THROW
DWG	DRAWING
DWH	DOMESTIC WATER HEATER
EA	EACH
EC	ELECTRICAL CONTRACTOR
EF	EXHAUST FAN
ELEC	ELECTRICAL
ELEV	ELEVATOR
EM	EMERGENCY
EM GEN	EMERGENCY GENERATOR
EMT	ELECTRICAL METALLIC TUBING
ENCL	ENCLOSURE
EP	ELECTRIC-PNEUMATIC
EPO	EMERGENCY POWER OFF
EQ	EQUIPMENT BRANCH
EQUIP	EQUIPMENT
ERL	EXISTING TO BE RELOCATED
ETD	EMERGENCY TRANSFER DEVICE
EWC	ELECTRIC WATER COOLER
EXH	EXHAUST
EXIST, E, EX	EXISTING
EXP	EXPLOSION PROOF
EXTER	EXTERIOR
F&I	FURNISHED AND INSTALLED
FA	FIRE ALARM
FAA	FIRE ALARM ANNUNCIATOR
FACP	FIRE ALARM CONTROL PANEL
FB	FLOOR BOX
FCU	FAN COIL UNIT
FLR	FLOOR
FLUOR	FLUORESCENT
FO	FIBER (FIBRE) OPTIC
FP	FIRE PROTECTION
FS	FUSIBLE SWITCH
FSCS	FIRE FIGHTER SMOKE CONTROL STATION
FU	FUSE
FVNR	FULL VOLTAGE NON REVERSING
FVR	FULL VOLTAGE REVERSING
G, GND	GROUND
G/Y GA	GREEN YELLOW GAUGE

MECH
MET
MFR
MH
MIN
MISC
MLO
MM
MSB
MTD
MTG
MTS
MV
MVCB
MW
N
NAC
NC
NEC
NEMA
NIC
NL
NO
NTS
OC
OD
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POS
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PTZ
PV
PVC
PWR
R
RA
REC
RECP
REQD
REX
RM
RNC
RO
RSC, RGS
SCCR
SEC
SECT
SIM
SM
SMR
SPD
SPDT
SPECS
SPST
SS
ST
STD
SW
SWBD
SWGR
SYS
TBB
TC
TE
TELE
TELECOM
TEMP
TERM
TGB
TMGB
TOF
TP
TR
TSP
TSTAT

1. WHENEVER USED IN THESE SPECIFICATIONS OR DRAWINGS, THE FOLLOWING TERMS SHALL HAVE THE INDICATED MEANINGS:

A. FURNISH: TO SUPPLY AND DELIVER TO THE PROJECT SITE, READY FOR UNLOADING, UNPACKING, ASSEMBLING, INSTALLING, AND SIMILAR OPERATIONS.

B. INSTALL: TO PERFORM ALL OPERATIONS AT THE PROJECT SITE, INCLUDING, BUT NOT LIMITED TO, AND AS REQUIRED: UNLOADING, UNPACKING, ASSEMBLING, ERECTING, PLACING, ANCHORING, APPLYING, WORKING TO DIMENSION, FINISHING, CURING, PROTECTING, CLEANING, TESTING, COMMISSIONING, STARTING UP AND SIMILAR OPERATIONS, COMPLETE, AND READY FOR THE INTENDED USE.

C. PROVIDE: TO FURNISH AND INSTALL COMPLETE, AND READY FOR THE INTENDED USE.

D. FURNISHED BY OWNER (OR OWNER-FURNISHED) OR FURNISHED BY OTHERS: AN ITEM FURNISHED BY THE OWNER OR UNDER OTHER DIVISIONS OR CONTRACTS, AND INSTALLED UNDER THE REQUIREMENTS OF THIS DIVISION, COMPLETE, AND READY FOR THE INTENDED USE, INCLUDING ALL ITEMS AND SERVICES INCIDENTAL TO THE WORK NECESSARY FOR PROPER INSTALLATION AND OPERATION. INCLUDE THE INSTALLATION UNDER THE WARRANTY REQUIRED BY THIS DIVISION.

E. ENGINEER: WHERE REFERENCED IN THIS DIVISION, "ENGINEER" IS THE ENGINEER OF RECORD AND THE DESIGN PROFESSIONAL FOR THE WORK UNDER THIS DIVISION, AND IS A CONSULTANT TO, AND AN AUTHORIZED REPRESENTATIVE OF, THE ARCHITECT, AS DEFINED IN THE GENERAL AND/OR SUPPLEMENTARY CONDITIONS. WHEN USED IN THIS DIVISION, IT MEANS INCREASED INVOLVEMENT BY, AND OBLIGATIONS TO, THE ENGINEER, IN ADDITION TO INVOLVEMENT BY, AND OBLIGATIONS TO, THE "ARCHITECT".

2. AHJ: THE LOCAL CODE AND/OR INSPECTION AGENCY, AUTHORITY HAVING JURISDICTION OVER THE WORK.

3. NRTL: NATIONALLY RECOGNIZED TESTING LABORATORY , AS DEFINED AND LISTED BY OSHA IN 29 CFR 1910.7 (E.G., UL, ETL, CSA), AND ACCEPTABLE TO THE AHJ OVER THIS PROJECT.

4. THE TERMS "EQUIVALENT", OR "EQUAL" ARE USED SYNONYMOUSLY AND SHALL MEAN "ACCEPTED BY OR ACCEPTABLE TO THE ENGINEER AS EQUIVALENT TO THE ITEM OR MANUFACTURER SPECIFIED". "EQUIVALENT" OR "EQUAL" PRODUCTS SHALL BE LABELED, LISTED, CERTIFIED, OR ALL THREE, BY AN NRTL, AND ACCEPTABLE TO THE AHJ OVER THIS PROJECT.

1-3 PRE-BID SITE VISIT

1. PERSONALLY INSPECT THE SITE OF THE PROPOSED WORK AND BECOME FULLY INFORMED OF CONDITIONS UNDER WHICH THE WORK IS TO BE DONE. FAILURE TO DO SO WILL NOT BE CONSIDERED SUFFICIENT JUSTIFICATION TO REQUEST OR OBTAIN EXTRA COMPENSATION OVER AND ABOVE THE CONTRACT PRICE.

1-4 MATERIAL AND WORKMANSHIP

1. PROVIDE ALL MATERIAL AND EQUIPMENT NEW AND IN FIRST CLASS CONDITION. PROVIDE MARKINGS OR A NAMEPLATE FOR ALL MATERIAL AND EQUIPMENT IDENTIFYING THE MANUFACTURER AND PROVIDING SUFFICIENT REFERENCE TO ESTABLISH QUALITY, SIZE AND CAPACITY. ALL WORKMANSHIP SHALL BE OF THE FINEST POSSIBLE BY EXPERIENCED MECHANICS OF THE PROPER TRADE. IN GENERAL, PROVIDE THE FOLLOWING QUALITY GRADE(S) FOR ALL MATERIALS AND EQUIPMENT (LIGHT DUTY AND RESIDENTIAL TYPE EQUIPMENT WILL NOT BE ACCEPTABLE):

A. COMMERCIAL HEAVY DUTY GRADE

2. PROVIDE ALL HOISTS, SCAFFOLDS, STAGING, RUNWAYS, TOOLS, MACHINERY, AND EQUIPMENT REQUIRED FOR THE INSTALLATION AND PERFORMANCE OF THE ELECTRICAL WORK. STORE AND MAINTAIN MATERIAL AND EQUIPMENT IN CLEAN CONDITION, AND PROTECTED FROM WEATHER, MOISTURE, AND PHYSICAL DAMAGE.

3. FURNISH ONLY MATERIAL AND EQUIPMENT THAT ARE LISTED, LABELED, CERTIFIED, OR ALL THREE, BY A NATIONALLY RECOGNIZED TESTING LABORATORY, WHENEVER ANY LISTING OR LABELING EXISTS FOR THE TYPES OF MATERIAL AND EQUIPMENT SPECIFIED. AT A MINIMUM, GENERAL WORK PRACTICES FOR ELECTRICAL CONSTRUCTION SHALL BE IN ACCORDANCE WITH NECA 1 (LATEST EDITION), " STANDARD PRACTICES FOR GOOD WORKMANSHIP IN ELECTRICAL CONSTRUCTION".

1-5 MANUFACTURERS

1. IN OTHER ARTICLES WHERE LISTS OF MANUFACTURERS ARE INTRODUCED, SUBJECT TO COMPLIANCE WITH REQUIREMENTS, PROVIDE PRODUCTS BY ONE OF THE MANUFACTURERS SPECIFIED.

2. WHERE MANUFACTURERS ARE NOT LISTED, PROVIDE PRODUCTS SUBJECT TO COMPLIANCE WITH REQUIREMENTS FROM MANUFACTURERS THAT HAVE BEEN ACTIVELY INVOLVED IN MANUFACTURING THE SPECIFIED PRODUCT FOR NO LESS THAN 5 YEARS.

1-6 COORDINATION

1. COORDINATE ALL WORK WITH OTHER DIVISIONS AND TRADES SO THAT VARIOUS COMPONENTS OF THE ELECTRICAL SYSTEMS ARE INSTALLED AT THE PROPER TIME, FIT THE AVAILABLE SPACE, AND ALLOW PROPER SERVICE ACCESS TO ALL EQUIPMENT. REFER TO ALL DRAWINGS, INCLUDING, BUT NOT LIMITED TO CIVIL, ARCHITECTURAL, STRUCTURAL, MECHANICAL, PLUMBING AND TO RELEVANT EQUIPMENT SUBMITTALS AND SHOP DRAWINGS TO DETERMINE THE EXTENT OF CLEAR SPACES. MAKE ALL OFFSETS REQUIRED TO CLEAR EQUIPMENT, BEAMS AND OTHER STRUCTURAL MEMBERS, AND TO FACILITATE CONCEALING RACEWAYS IN THE MANNER ANTICIPATED IN THE DESIGN. PROVIDE MATERIALS WITH TRIM THAT WILL FIT PROPERLY THE TYPES OF CEILING, WALL, OR FLOOR FINISHES ACTUALLY INSTALLED.

1-7 ORDINANCES, CODES, AND CLIENT

1. COMPLY WITH NATIONAL FIRE PROTECTION ASSOCIATION (NFPA) STANDARDS, STATE AND LOCAL BUILDING CODES, AND ALL OTHER APPLICABLE CODES AND ORDINANCES FOR PERFORMANCE, WORKMANSHIP. EQUIPMENT, AND MATERIALS. ADDITIONALLY, COMPLY WITH RULES AND REGULATIONS OF PUBLIC UTILITIES AND MUNICIPAL DEPARTMENTS AFFECTED BY CONNECTION OF SERVICES.

2. WHERE CONFLICTS BETWEEN VARIOUS CODES, ORDINANCES, RULES, AND REGULATIONS EXIST, COMPLY WITH THE MOST STRINGENT. WHEREVER REQUIREMENTS OF THESE SPECIFICATIONS, DRAWINGS, OR BOTH, EXCEED THOSE OF THE ABOVE ITEMS, THE REQUIREMENTS OF THESE SPECIFICATIONS, DRAWINGS, OR BOTH, SHALL GOVERN. CODE COMPLIANCE, AT A MINIMUM, IS MANDATORY. CONSTRUE NOTHING IN THESE CONSTRUCTION DOCUMENTS AS PERMITTING WORK NOT IN COMPLIANCE, AT A MINIMUM, WITH THESE CODES.

3. PROVIDE AND MAINTAIN ALL NECESSARY SIGNAL LIGHTS AND GUARDS FOR THE SAFETY OF THE PUBLIC

CONTRACTOR FROM RESPONSIBILITY FOR ERRORS IN DIMENSIONS, DETAILS, SIZE OF MEME QUANTITIES; OR FOR OMITTING COMPONENTS OR FITTINGS; OR FOR NOT COORDINATING ITEMS WITH AC BUILDING CONDITIONS.

1-10 ELECTRONIC DRAWING FILES

1. ELECTRONIC FILES FOR AS-BUILT COMPLETION CAN BE PROVIDED TO CONTRACTORS UPON REQUEST

1-11 TRAINING

1. AT A TIME MUTUALLY AGREED UPON BETWEEN THE OWNER AND CONTRACTOR, TRAIN OWNER'S DESIGNATED PERSONNEL ON THE OPERATION AND MAINTENANCE OF THE EQUIPMENT PROVIDED FOR T PROJECT.

2. PROVIDE TRAINING TO INCLUDE BUT NOT BE LIMITED TO AN OVERVIEW OF THE SYSTEM AND/OR EQUIPMENT AS IT RELATES TO THE FACILITY AS A WHOLE; OPERATION AND MAINTENANCE PROCEDURES AND SCHEDULES RELATED TO STARTUP AND SHUTDOWN, TROUBLESHOOTING, SERVICING, PREVENTIVE MAINTENANCE AND APPROPRIATE OPERATOR INTERVENTION; AND REVIEW OF DATA INCLUDED IN THE OPERATION AND MAINTENANCE INSTRUCTIONS.

3. SCHEDULE TRAINING WITH OWNER WITH AT LEAST 7 DAYS IN ADVANCE NOTICE.

1-12 WARRANTIES

1. WARRANT EACH SYSTEM AND EACH ELEMENT THEREOF AGAINST ALL DEFECTS DUE TO FAULTY WORKMANSHIP, INSTALLATION, PRODUCT DESIGN OR MATERIAL FOR A PERIOD OF 12 MONT OF SUBSTANTIAL COMPLETION, UNLESS SPECIFIC ITEMS ARE NOTED TO CARRY A LONGER WARRANTY THE CONSTRUCTION DOCUMENTS OR MANUFACTURER'S STANDARD WARRANTY EXCEEDS REMEDY ALL DEFECTS, OCCURRING WITHIN THE WARRANTY PERIOD(S), AS STATED IN THE GENERAL CONDITIONS.

2. ALSO WARRANT THE FOLLOWING ADDITIONAL ITEMS:

A. ALL RACEWAYS ARE FREE FROM OBSTRUCTIONS, HOLES, CRUSHING, OR BREAKS OF AN

B. ALL RACEWAY SEALS ARE EFFECTIVE.

C. THE ENTIRE ELECTRICAL SYSTEM IS FREE FROM ALL SHORT CIRCUITS AND UNWANTED OPEN CIRCUITS AND GROUNDS.

3. THE ABOVE WARRANTIES SHALL INCLUDE LABOR AND MATERIAL. MAKE REPAIRS OR RE WITHOUT ANY ADDITIONAL COSTS TO THE OWNER.

4. PERFORM THE REMEDIAL WORK PROMPTLY, UPON WRITTEN NOTICE FROM THE ENGINEER OR OWNER.

5. AT THE TIME OF SUBSTANTIAL COMPLETION, DELIVER TO THE OWNER ALL WARRANTIES, IN W PROPERLY EXECUTED, INCLUDING TERM LIMITS FOR WARRANTIES EXTENDING BEYOND THE PERIOD, EACH WARRANTY INSTRUMENT BEING ADDRESSED TO THE OWNER AND STATING THE COMMENCEMENT DATE AND TERM.

1-13 MISCELLANEOUS REMODELING WORK

1. PROVIDE ALL DEMOLITION OF EXISTING ELECTRICAL SYSTEMS AND NEW ELECTRICAL SYST REQUIRED BECAUSE OF BUILDING REMODELING, AS NOTED ON THE DRAWINGS, OR NECESS PROPER OPERATION AND NEW CONSTRUCTION. REMOVE ALL ABANDONED CABLES AND WIRING ABOVE ACCESSIBLE CEILINGS AND VENTILATION SHAFTS.

2. EXERCISE EXTREME CAUTION IN THE INSTALLATION OF THIS WORK TO AVOID AN ELECTRICA ACCIDENT. THE FACILITY IS EXISTING AND MAY REMAIN IN OPERATION DURING THIS WORK. COORDINATE ALL WORK SCHEDULES WITH THE BUILDING MANAGEMENT PRIOR TO DE-ENERGIZING ANY ELECTRICAL CIRCUITS TO AVOID CONFLICTS WITH ANY OTHER TENANT'S OPERATION. ALLOW 3 DAYS PRIOR CONFIRME NOTIFICATION.

3. VERIFY THAT NEW AND EXISTING TO REMAIN INSTALLATIONS ARE CODE COMPLIANT, AND MAKE CORRECTIONS AS REQUIRED.

4. DEVELOP AND MAINTAIN A SET OF "RED-LINE AS-BUILT" DRAWINGS. THESE DRAWINGS SHALL BE MAINTAINED AT THE PROJECT CONSTRUCTION SITE AND AVAILABLE TO THE ENGINEER UPO THEY SHALL BE CURRENT AND SHALL REFLECT ALL ACTUAL ASPECTS OF THE ELECTRICAL I WHICH DEVIATED FROM THE PRESENT ELECTRICAL DESIGN DRAWINGS. THESE DRAWINGS SHALL BE SUBMITTED TO THE ENGINEER WITHIN 10 DAYS OF SUBSTANTIAL COMPLETION OF THE WORK AND MUST INCLUDE ALL PUNCH LIST ITEMS.

5. VERIFY THE LOADING OF EACH CIRCUIT AFFECTED BY THE REMODELING. DO NOT LOAD CIRCUITS TO MO THAN 80% OF THEIR RATING.

6. PROVIDE UPDATED, TYPED DIRECTORY FOR EACH PANELBOARD BEING USED OR MODIFIED UNDER THIS CONTRACT. DESIGNATE NEW CIRCUITS AND AREA BEING SERVED.

7. FLEXIBLE STEEL CONDUIT SHALL BE USED TO WIRE ALL LIGHT FIXTURES AND VIBRATING EQ IN LENGTHS FROM 18 INCHES TO 72 INCHES ONLY.

8. CONDUIT AND CABLE ABOVE CEILING SHALL BE SUPPORTED BY A UNISTRUT AND ALL-THREA TRAPEZE. EACH PIECE OF CONDUIT SHALL BE SECURED TO THE TRAPEZE WITH A CONDUIT STRAP. THE TRAPEZE SUPPORTS SHALL BE INSTALLED PER CODE PLUS A MINIMUM OF 12" ABOVE THE CEILING.

9. NO CHANGE ORDER SHALL BE ISSUED DURING CONSTRUCTION FOR CHANGES DUE TO INCOMPATIBILITY. NO CHANGES SHALL BE MADE TO THE CIRCUITING SHOWN WITHOUT PRIOR WRITTEN APPROVAL OF TH ENGINEER OF RECORD. CIRCUIT NUMBERS SHALL BE INDICATED ON EACH JUNCTION BOX.

10. AT THE TIME OF FINAL PUNCH LIST, AN ELECTRICIAN MAY BE REQUIRED TO ASSIST IN THE REMOVAL OF PANEL COVERS, JUNCTION BOX COVERS, RECEPTACLES, SWITCHES, AND OTHER ELECTRICAL DEVICES.

PART 2 ELECTRICAL WORK

2-1 BUILDING OPERATION

4. USE INSULATED, GROUNDING, OR COMBINATION BUSHINGS WHEREVER CONNECTION IS SUBJECT TO VIBRATION OR MOISTURE, WHEN REQUIRED BY NFPA 70, OR BOTH.

5. INSTALL PLASTIC BUSHINGS ON THE CONNECTIONS OF ALL REUSED CONDUIT.

4-1-4 CONDUCTORS AND CABLES

1. ALL FEEDER AND BRANCH CIRCUIT CONDUCTORS NO. 12 AWG AND LARGER: STRANDED, TYPE THHN-2 OR XHHW-2 INSULATION.

2. ALL BRANCH CIRCUIT WIRING: SHALL NOT BE NOT SMALLER THAN NO. 12 AWG. IF NO CONDUCTOR SIZE IS INDICATED ON THE DRAWINGS FOR A BRANCH CIRCUIT, PROVIDE CONDUCTORS AND CONDUIT SIZED PER NFPA 70 AND BASED ON THE INDICATED BRANCH CIRCUIT OVERCURRENT PROTECTIVE DEVICE (OCPD) RATING AND NUMBER OF POLES. WHERE NO CIRCUIT SIZE (I.E., CONDUCTORS AND OCPD) IS INDICATED ON THE DRAWINGS FOR A BRANCH CIRCUIT, PROVIDE THREE NO. 12 AWG CONDUCTORS, IN 3/4-INCH RACEWAY, AND A 20A CIRCUIT BREAKER.

3. CONDUCTORS FIELD-INSTALLED WITHIN LIGHT FIXTURE CHANNELS: TYPE THHN.

4. CONTROL WIRING: STRANDED COPPER CONDUCTORS, 600V INSULATION, OF THE PROPER TYPE, SIZE AND NUMBER AS REQUIRED TO ACCOMPLISH SPECIFIED FUNCTION. MINIMUM SIZE: NO. 14 AWG, UNLESS NOTED OTHERWISE.

5. CONDUCTOR MATERIAL:

   A. ANNEALED (SOFT) COPPER COMPLYING WITH ICEA S-95-658/NEMA WC70; SOLID CONDUCTOR FOR
      1. NO. 12 AWG AND SMALLER; CONCENTRIC, COMPRESSED-STRANDED FOR NO. 10 AWG AND LARGER.
   B. CONDUCTOR INSULATION TYPES: 90-DEGREE C-RATED, TYPE THHN/THWN-2 OR XHHW-2 COMPLYING WITH ICEA S-95-658/NEMA WC70, UNLESS NOTED OTHERWISE IN THE DRAWINGS.
   C. SIZES OF CONDUCTORS AND CABLES INDICATED OR SPECIFIED ARE IN AMERICAN WIRE GAGE 3. (AWG - BROWN AND SHARPE).
   D. UNLESS INDICATED OTHERWISE, SPECIAL PURPOSE CONDUCTORS AND CABLES, SUCH AS LOW VOLTAGE 4. CONTROL AND SHIELDED INSTRUMENT WIRING, SHALL BE AS RECOMMENDED BY THE SYSTEM EQUIPMENT MANUFACTURER.

4-1-5 INSTALLATION OF CONDUCTORS AND CABLES

1. INSTALL ALL WIRING IN APPROVED RACEWAY AND ENCLOSURES, EXCEPT WHERE SPECIFIED OR INDICATED OTHERWISE.

2. SUPPORT ALL CONDUCTORS AND CABLES IN VERTICAL INSTALLATIONS, AS REQUIRED BY NFPA 70, BY INSTALLING CABLE SUPPORTS OR PLUG-TYPE CONDUIT RISER SUPPORTS OR WIRE-MESH SAFETY GRIPS.

3. INSTALL ALL CONDUCTORS AND CABLE IN CONTINUOUS RACEWAY WITHOUT TAPS OR SPLICES. SPLICE OR TAP ONLY IN APPROVED BOXES AND ENCLOSURES WITH APPROVED SOLDERLESS CONNECTORS; OR CRIMP CONNECTORS AND TERMINAL BLOCKS FOR CONTROL WIRING, AND; KEEP TO THE MINIMUM REQUIRED. INSULATE ALL SPLICES, TAPS AND JOINTS AS REQUIRED BY CODES.

4. ALL MATERIALS USED TO TERMINATE, SPLICE OR TAP CONDUCTORS: DESIGNED PROPERLY SIZED AND UL-LISTED FOR THE SPECIFIC APPLICATION AND CONDUCTORS INVOLVED. INSTALL IN STRICT ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS, USING THE MANUFACTURER'S RECOMMENDED TOOLS.

5. WHERE WIRING IS INDICATED AS INSTALLED, BUT THE CONNECTION IS INDICATED "FUTURE" OR "BY OTHERS" DIVISION, TRADE, OR CONTRACT; LEAVE A MINIMUM 3-FOOT "PIGTAIL" AT THE BOX, TAPE THE ENDS OF THE CONDUCTORS AND COVER THE BOX. IN GENERAL, BRANCH CIRCUIT "HOME RUN" ROUTING IS INDICATED ON THE DRAWINGS, COMPLETE WITH CIRCUIT NUMBERS AND PANELBOARD DESIGNATION. CONTINUE ALL SUCH "HOME RUN" WIRING TO THE DESIGNATED PANELBOARD, AS THOUGH "CIRCUIT RUNS" WERE INDICATED IN THEIR ENTIRETY.

6. WHEN MULTIPLE HOME RUNS ARE COMBINED INTO A SINGLE RACEWAY SUCH THAT THE NUMBER OF CONDUCTORS EXCEEDS FOUR (CONDUCTOR COUNT IS MADE UP OF ANY COMBINATION OF PHASE AND NEUTRAL CONDUCTORS), THE FOLLOWING RESTRICTIONS APPLY, WHICH ARE IN ADDITION TO THOSE IN NFPA 70:

7. EMERGENCY POWER CIRCUITS - INCLUDES ALL CIRCUITS COVERED UNDER ARTICLES 700, 701 AND 702:

   A. MAXIMUM OF 16 CONDUCTORS IN A SINGLE RACEWAY. FOR UP TO EIGHT CONDUCTORS IN A RACEWAY, A MINIMUM RACEWAY SIZE: 3/4-INCH. FOR GREATER THAN EIGHT CONDUCTORS, MINIMUM RACEWAY SIZE: 1-INCH. DO NOT INSTALL ANY OTHER TYPE OF CIRCUIT IN THIS RACEWAY.
   B. THE MINIMUM WIRE SIZE FOR ALL CONDUCTORS IN THIS RACEWAY: NO. 10 AWG.
   C. ONLY 15A AND 20A BRANCH CIRCUIT HOMERUNS MAY BE COMBINED INTO ONE RACEWAY.

8. GFCI CIRCUITS:

   A. DO NOT USE MULTI-CONDUCTOR CIRCUITS, WITH A SHARED NEUTRAL, FOR ANY GFCI CIRCUIT BREAKER OR RECEPTACLE CIRCUIT.
   B. FOR BRANCH CIRCUITS FED FROM GFCI CIRCUIT BREAKERS, LIMIT THE ONE-WAY CONDUCTOR LENGTH TO 100 FEET BETWEEN THE PANELBOARD AND THE MOST REMOTE RECEPTACLE OR LOAD ON THE GFCI CIRCUIT.

9. WIRING SHALL HAVE INSULATION OF THE PROPER COLOR TO MATCH COLOR CODE SYSTEM IN THE TABLE BELOW. ALL CONDUCTORS AND CABLES NOT PROPERLY COLOR CODED SHALL BE REMOVED AND REPLACED AT THE CONTRACTORS EXPENSE. CONDUCTORS SHALL HAVE CONTINUOUS COLOR CODED OUTER JACKET. IN LARGER SIZES, WHERE PROPERLY COLORED INSULATION IS NOT AVAILABLE, USE VINYL PLASTIC ELECTRICAL TAPE OF THE APPROPRIATE COLOR AROUND EACH CONDUCTOR AT ALL TERMINATION POINTS, JUNCTION AND PULL BOXES.

10. WIRING SHALL HAVE INSULATION OF THE PROPER COLOR TO MATCH COLOR CODE SYSTEM IN THE TABLE BELOW. ALL CONDUCTORS AND CABLES NOT PROPERLY COLOR CODED SHALL BE REMOVED AND REPLACED AT THE CONTRACTORS EXPENSE. CONDUCTORS SHALL HAVE CONTINUOUS COLOR CODED OUTER JACKET. IN LARGER SIZES, WHERE PROPERLY COLORED INSULATION IS NOT AVAILABLE, USE VINYL PLASTIC ELECTRICAL TAPE OF THE APPROPRIATE COLOR AROUND EACH CONDUCTOR AT ALL TERMINATION POINTS, JUNCTION AND PULL BOXES.

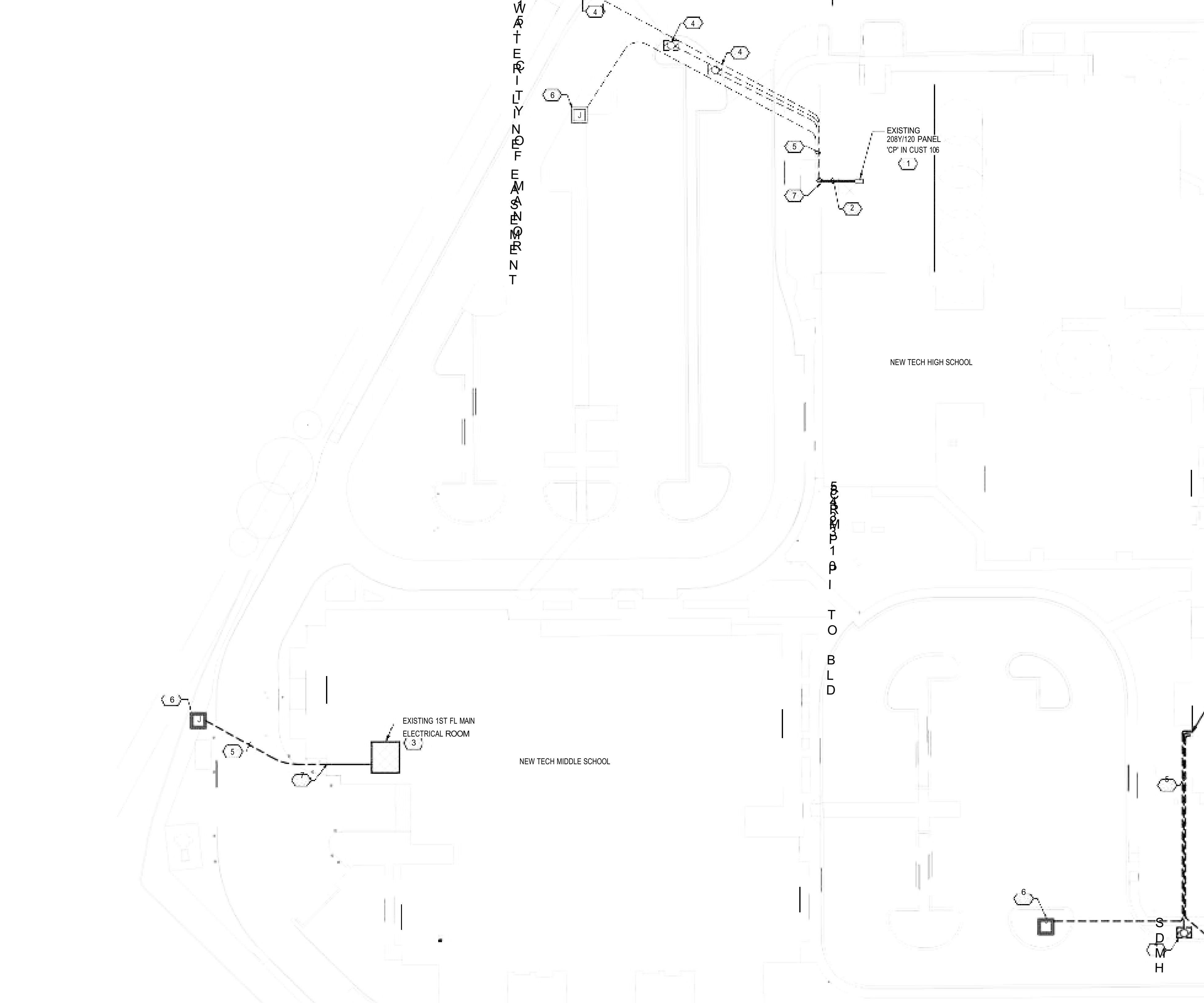
11. REFERENCE DETAIL FOR SYSTEM VOLTAGE:

System Voltage	Conductor Type	Color

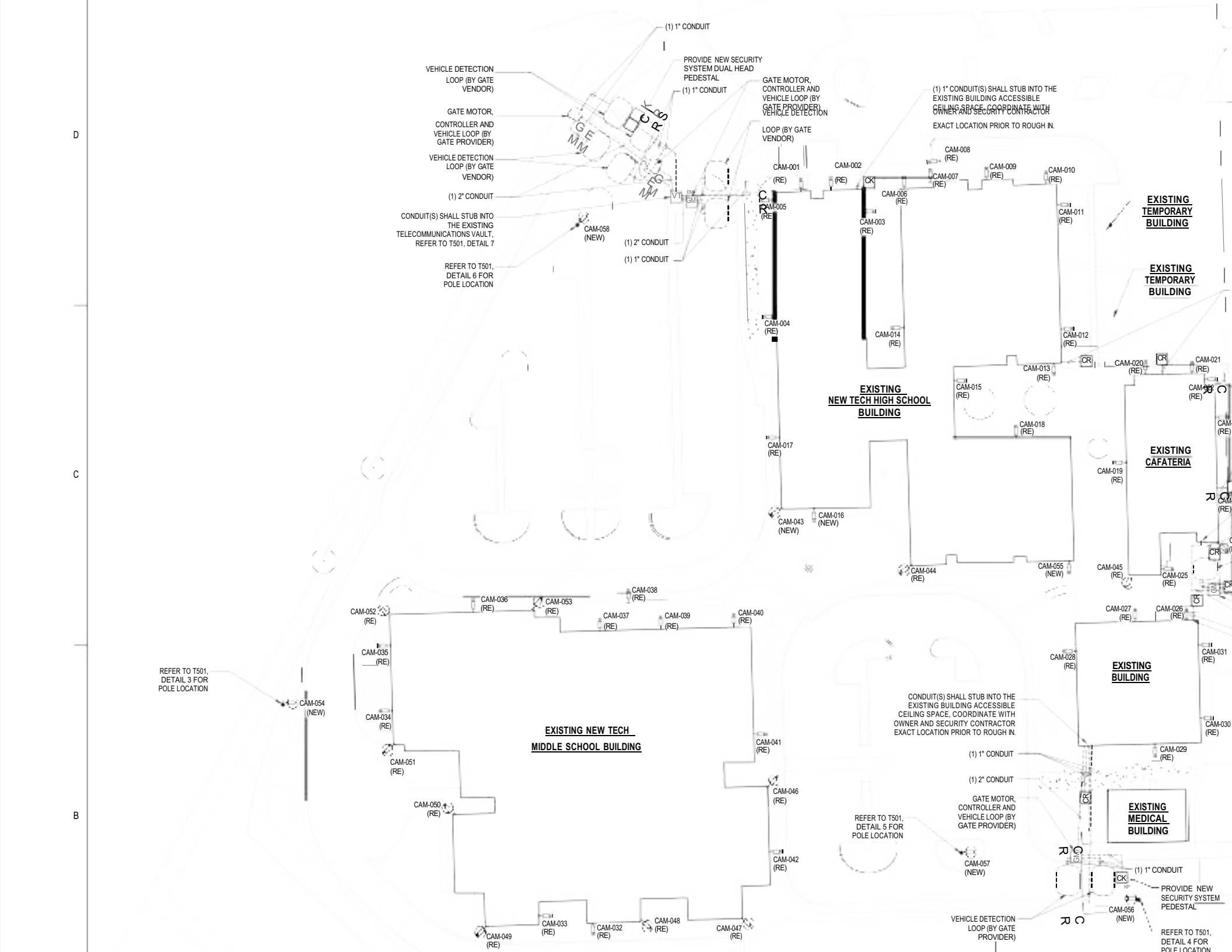
D

C

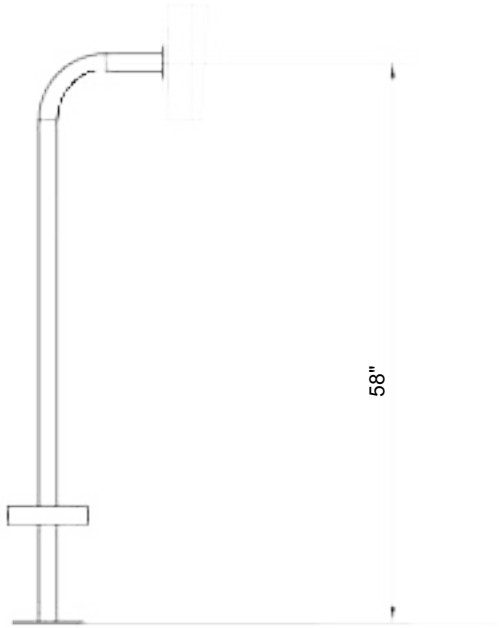
B



EXISTING
208Y/120 PANEL
'CP' IN CUST 106
NEW TECH HIGH SCHOOL
EXISTING 1ST FL MAIN
ELECTRICAL ROOM
NEW TECH MIDDLE SCHOOL
TO BLD
SDMH


(1) 1" CONDUIT
PROVIDE NEW SECURITY SYSTEM DUAL HEAD PEDESTAL
(1) 1" CONDUIT
VEHICLE DETECTION LOOP (BY GATE VENDOR)
GATE MOTOR, CONTROLLER AND VEHICLE LOOP (BY GATE PROVIDER)
VEHICLE DETECTION LOOP (BY GATE VENDOR)
(1) 2" CONDUIT
CONDUIT(S) SHALL STUB INTO THE EXISTING TELECOMMUNICATIONS VAULT, REFER TO T501, DETAIL 7
REFER TO T501, DETAIL 6 FOR POLE LOCATION
CAM-058 (NEW)
(1) 2" CONDUIT
(1) 1" CONDUIT
GATE MOTOR, CONTROLLER AND VEHICLE LOOP (BY GATE PROVIDER)
VEHICLE DETECTION LOOP (BY GATE VENDOR)
(1) 1" CONDUIT(S) SHALL STUB INTO THE EXISTING BUILDING ACCESSIBLE CEILING SPACE, COORDINATE WITH OWNER AND SECURITY CONTRACTOR EXACT LOCATION PRIOR TO ROUGH IN.
CAM-001 (RE)
CAM-002 (RE)
CAM-003 (RE)
CAM-004 (RE)
CAM-005 (RE)
CAM-006 (RE)
CAM-007 (RE)
CAM-008 (RE)
CAM-009 (RE)
CAM-010 (RE)
CAM-011 (RE)
CAM-012 (RE)
CAM-013 (RE)
CAM-014 (RE)
CAM-015 (RE)
CAM-016 (NEW)
CAM-017 (RE)
CAM-018 (RE)
CAM-019 (RE)
CAM-020 (RE)
CAM-021 (RE)
CAM-043 (NEW)
CAM-044 (RE)
CAM-045 (RE)
CAM-055 (NEW)
EXISTING NEW TECH HIGH SCHOOL BUILDING
EXISTING TEMPORARY BUILDING
EXISTING TEMPORARY BUILDING
EXISTING CAFATERIA
REFER TO T501, DETAIL 3 FOR POLE LOCATION
CAM-054 (NEW)
CAM-034 (RE)
CAM-035 (RE)
CAM-036 (RE)
CAM-037 (RE)
CAM-038 (RE)
CAM-039 (RE)
CAM-040 (RE)
CAM-041 (RE)
CAM-042 (RE)
CAM-046 (RE)
CAM-047 (RE)
CAM-048 (RE)
CAM-049 (RE)
CAM-050 (RE)
CAM-051 (RE)
CAM-052 (RE)
CAM-053 (RE)
CAM-032 (RE)
CAM-033 (RE)
EXISTING NEW TECH MIDDLE SCHOOL BUILDING
CAM-025 (RE)
CAM-026 (RE)
CAM-027 (RE)
CAM-028 (RE)
CAM-029 (RE)
CAM-030 (RE)
CAM-031 (RE)
EXISTING BUILDING
CONDUIT(S) SHALL STUB INTO THE EXISTING BUILDING ACCESSIBLE CEILING SPACE, COORDINATE WITH OWNER AND SECURITY CONTRACTOR EXACT LOCATION PRIOR TO ROUGH IN.
(1) 1" CONDUIT
(1) 2" CONDUIT
GATE MOTOR, CONTROLLER AND VEHICLE LOOP (BY GATE PROVIDER)
REFER TO T501, DETAIL 5 FOR POLE LOCATION
CAM-057 (NEW)
EXISTING MEDICAL BUILDING
(1) 1" CONDUIT
PROVIDE NEW SECURITY SYSTEM PEDESTAL
CAM-056 (NEW)
VEHICLE DETECTION LOOP (BY GATE PROVIDER)
REFER TO T501, DETAIL 4 FOR POLE LOCATION
D
C
B

CARD READER AND INTERCOM BOX DETAIL



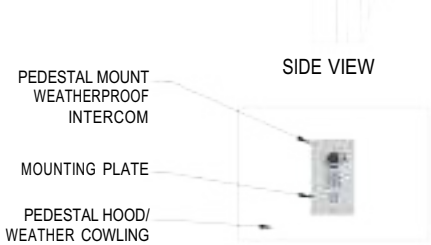
SECURITY PEDESTAL ELEVATION

GENERAL NOTES:

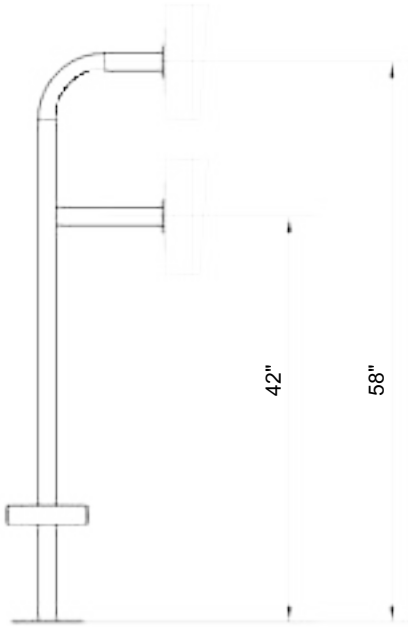
1. UNLESS OTHERWISE NOTED, ALL FASTENERS, SCREWS, BOLTS/ANCHORS AND OTHER MOUNTING ACCESSORIES SHALL BE MADE OF 316 STAINLESS STEEL.

1 T501 TYPICAL CARD READER PEDESTAL DETAIL

NTS



LOWER CARD READER AND INTERCOM BOX DETAIL



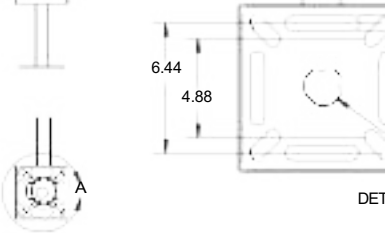
SECURITY PEDESTAL ELEVATION

GENERAL NOTES:

1. UNLESS OTHERWISE NOTED, ALL FASTENERS, SCREWS, BOLTS/ANCHORS AND OTHER MOUNTING ACCESSORIES SHALL BE MADE OF 316 STAINLESS STEEL.

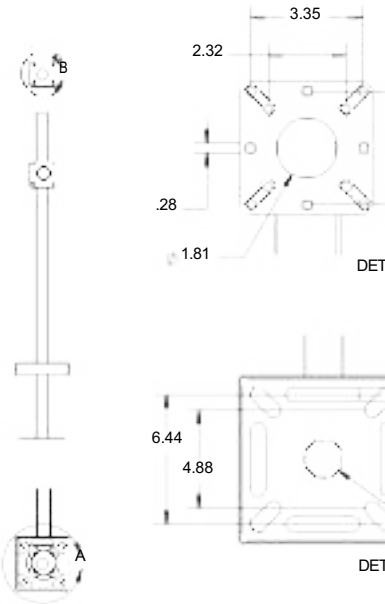
2 T501 TYPICAL CARD READERIINTERCOM PEDESTAL DETAIL

NTS



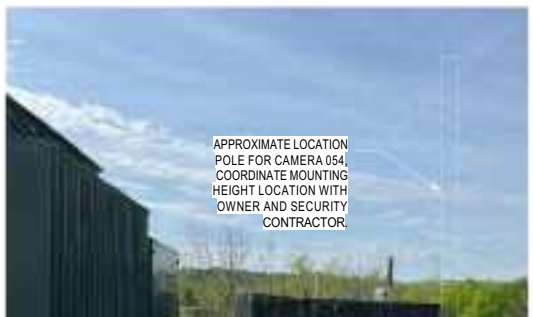
3 T501 CARD READERIINTE

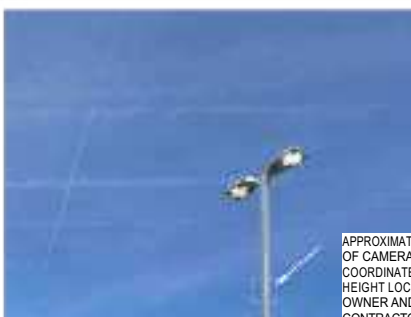
NTS



4 T501 CARD READER PEDE

NTS





MANOR ISD

MANOR NEW TECH SECURITY FENCING

PROJECT TEAM:

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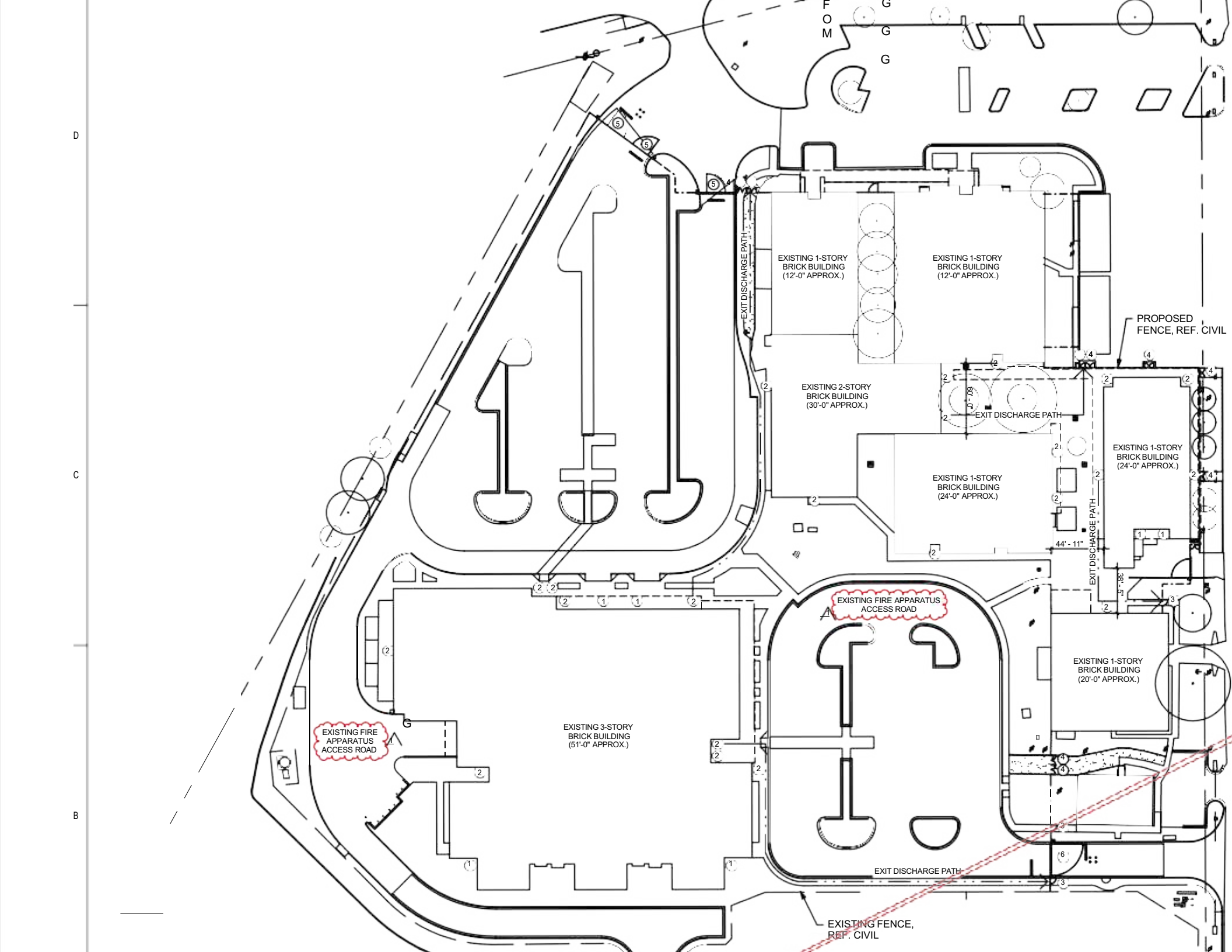
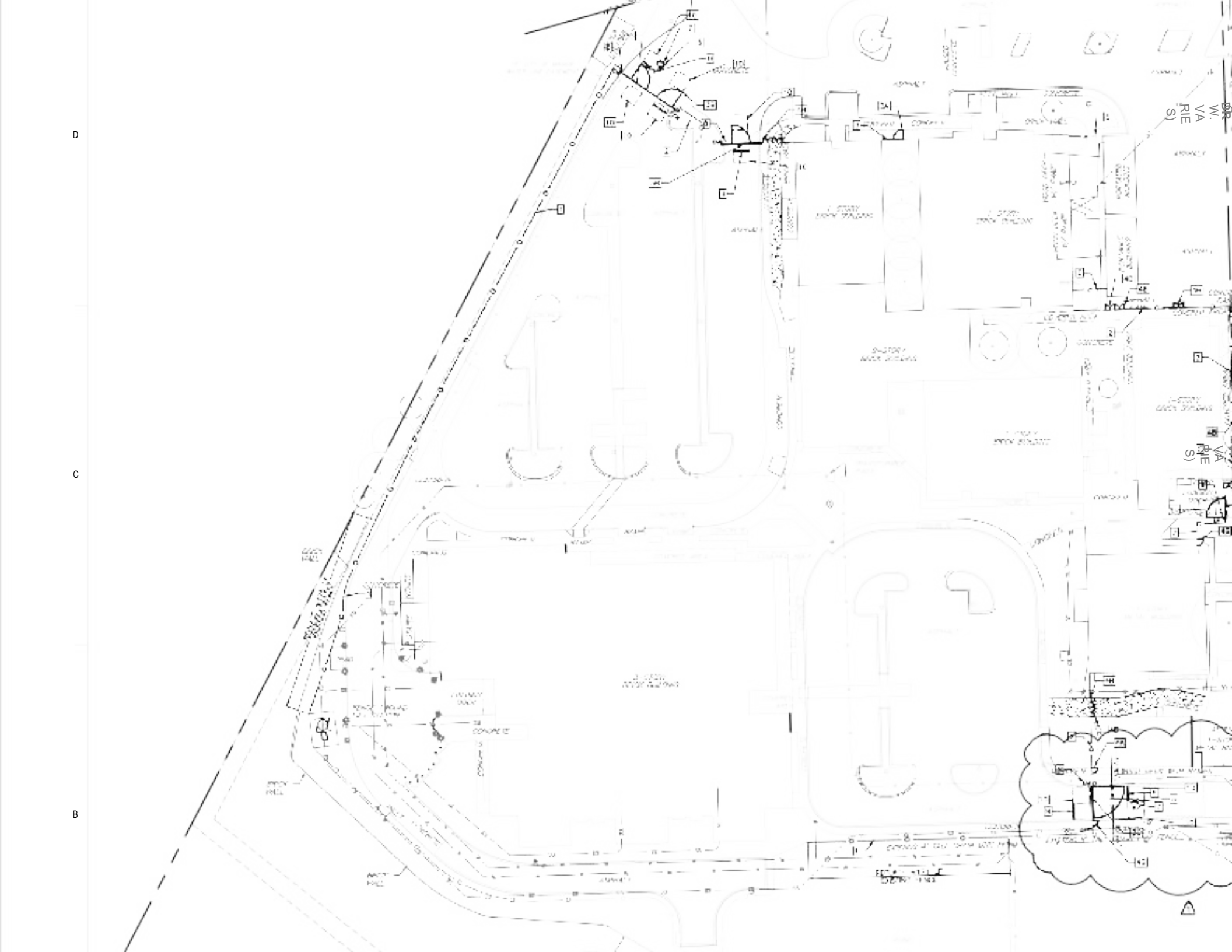
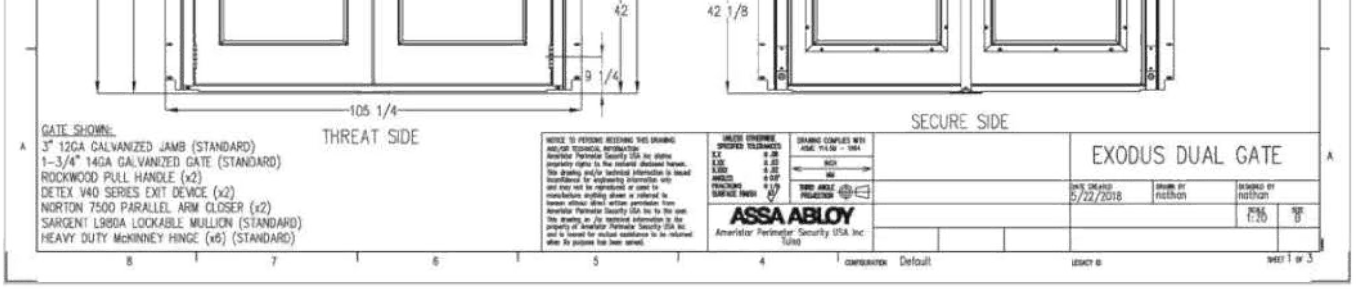

EXISTING 1-STORY BRICK BUILDING (12'-0" APPROX.)
EXISTING 1-STORY BRICK BUILDING (12'-0" APPROX.)
EXIT DISCHARGE PATH
PROPOSED FENCE, REF. CIVIL
EXISTING 2-STORY BRICK BUILDING (30'-0" APPROX.)
60' - 0"
EXIT DISCHARGE PATH
EXISTING 1-STORY BRICK BUILDING (24'-0" APPROX.)
EXISTING 1-STORY BRICK BUILDING (24'-0" APPROX.)
44' - 11"
EXIT DISCHARGE PATH
38' - 5"
EXISTING FIRE APPARATUS ACCESS ROAD
EXISTING 1-STORY BRICK BUILDING (20'-0" APPROX.)
EXISTING FIRE APPARATUS ACCESS ROAD
EXISTING 3-STORY BRICK BUILDING (51'-0" APPROX.)
EXIT DISCHARGE PATH
EXISTING FENCE, REF. CIVIL


D
C
B



GATE SHOWN:
3" 12GA GALVANIZED JAMB (STANDARD)
1-3/4" 14GA GALVANIZED GATE (STANDARD)
ROCKWOOD PULL HANDLE (x2)
DETEX V40 SERIES EXIT DEVICE (x2)
NORTON 7500 PARALLEL ARM CLOSER (x2)
SARGENT L9808A LOCKABLE MULLION (STANDARD)
HEAVY DUTY McKINNEY HINGE (x6) (STANDARD)

ASSA ABLOY
Ameristar Perimeter Security USA Inc
Tulsa

EXODUS DUAL GATE

DATE DRAWN 5/22/2018 | DRAWN BY nathan | DESIGNED BY nathan | SIZE D | SHT 0

CONFIGURATION Default

SHEET 1 OF 3

SECTION

POLYPROPYLENE FIBE
150 mm X 150 mm
(6" X 6" X W1.4 X W
OR ONE LAYER 10M
MORE THAN 450 mm
DIRECTIONS.
REINFORCEMENT SHA
SLAB MID-DEPTH AND
MEANS OF BAR SUPP
STRENGTH AND NUME
DISPLACEMENT AND M
PROPER POSITION DU
THE P.C. CONCRETE.
STEEL BE PLACED D
OR SAND CUSHION L

CITY OF AUSTIN
DEPARTMENT OF PUBLIC WORKS

Bill Gordon 3/26/08
ADOPTED

THE ARCHITECT/ENGINEER
RESPONSIBILITY FOR APPR
OF THIS STANDARD.

ALL DETAILS ARE NOT LE

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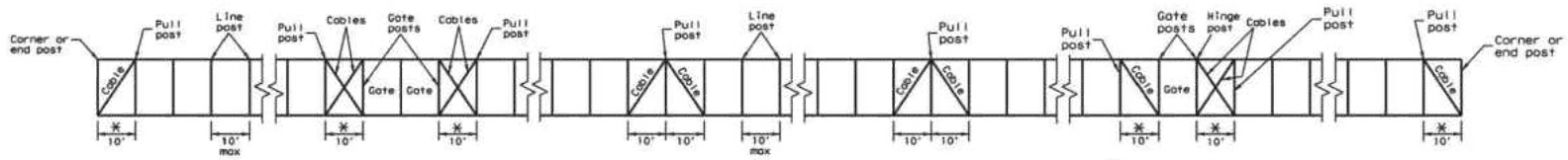
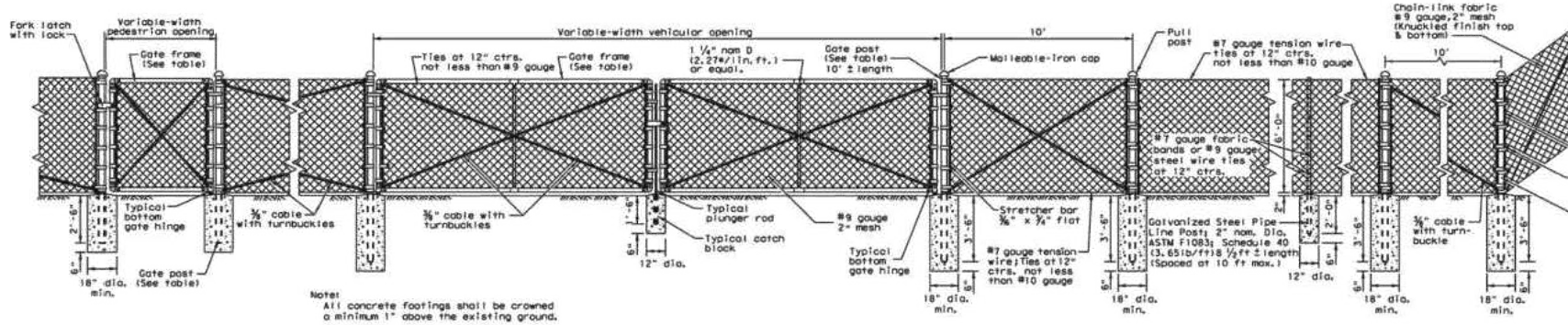
DATE:
FILE:

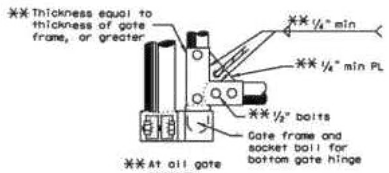


TYPICAL CABLE AND POST ARRANGEMENT



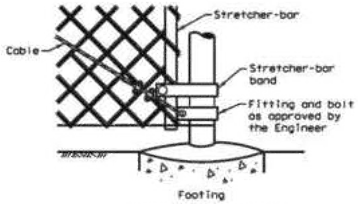
CHAIN-LINK BARRIER FENCE (6 FT.)

Foundation designs shown are "minimums" for a 6 ft. fence. Taller fences may require larger foundation designs.



TYPICAL BOTTOM GATE HINGE

TYPICAL STRETCHER-BAR BAND



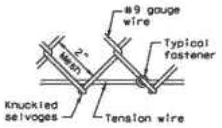
TERMINAL POST DETAIL

GATE (TYPES AND SIZES)	
Single Inclusive	Double Inclusive
Up to 6' Over 6' to 12' Over 12' to 18' Over 18'	Up to 12' Over 12' to 26' Over 26' to 36' Over 36'

GATE FRAME (WEIGHT)		GATE POST (WEIGHT)	
SIZE	WT./LIN. FT.	SIZE	WT./LIN. FT.
1 1/2" nom dia. or equal	2.72 Lbs.	2 1/2" nom dia. or equal	5.79 Lbs.
		3 1/2" nom dia. or equal	9.11 Lbs.
		6" nom dia.	18.97 Lbs.
		8" nom dia.	24.70 Lbs.

"OPTIONAL" 3 WIRE 45° BARBED WIRE ARM

Barbed wire arm related items shall conform to Item 550, "Chain Link Fence."



FABRIC & TENSION WIRE DETAIL, TOP & BOTTOM

GENERAL NOTES

1. Items hereon shall conform to Item 550, "Chain Link Fe
2. Typical installation plan may vary as shown elsewhere directed by the Engineer. Location of gates shown els
3. Gate-frame members shall be bolted, at frame corners, with four 1/2" bolts per joint.
4. All cable connections are to be made with two 3/8" cable
5. All pull posts and end posts and their foundations sha respective dimensions as those shown for corner post.
6. All pull post shall be furnished with two stretcher ba
7. One end of each turnbuckle may be attached directly to a clevis.
8. Concrete footings are to be crowned at the top to shed

Texas Department of Transp

CHAIN LINK

CLF-1

FILE: clf10.dgn	DN: TxDOT	
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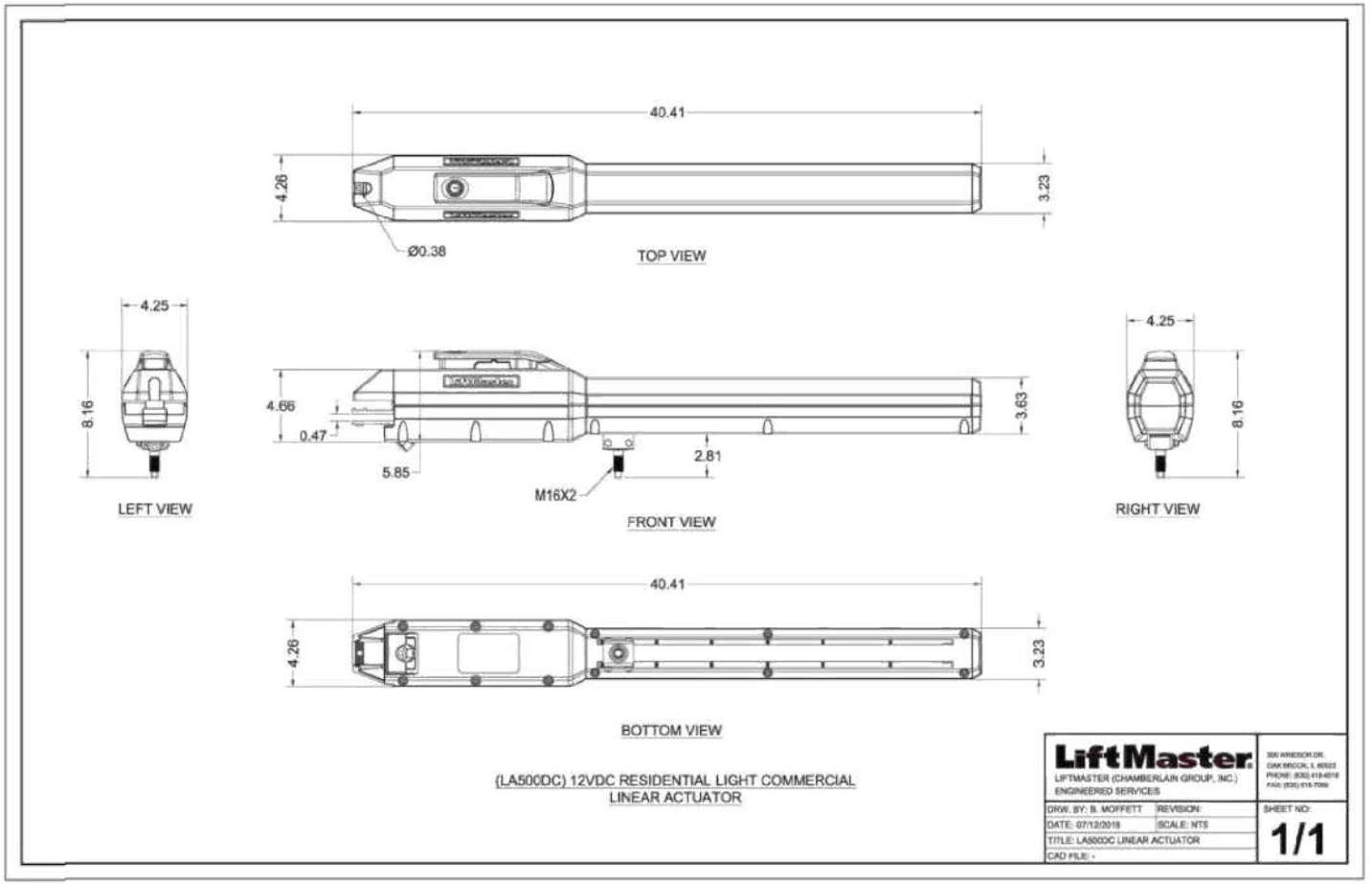
REVISIONS	DIST	


40.41
4.26
3.23
Ø0.38
TOP VIEW
4.25
8.16
LEFT VIEW
4.66
0.47
5.85
2.81
3.63
M16X2
FRONT VIEW
4.25
8.16
RIGHT VIEW
40.41
4.26
3.23
BOTTOM VIEW
(LA500DC) 12VDC RESIDENTIAL LIGHT COMMERCIAL
LINEAR ACTUATOR
LiftMaster
LIFTMASTER (CHAMBERLAIN GROUP, INC.)
ENGINEERED SERVICES
DRW. BY: B. MOFFETT
REVISION:
DATE: 07/12/2019
SCALE: NTS
TITLE: LA500DC LINEAR ACTUATOR
CAD FILE: -
SHEET NO:
1/1

POWER DEVICES

TV — TELEVISION/LED/MONITOR. RF SIGNAL AND POWER OUTLET (JUNCTION BOX AND CONDUIT BY ELECTRICAL CONTRACTOR, DEVICES BY OTHERS). REFER TO DETAIL ON E500 SERIES DRAWINGS.

TW1 — TEACHER'S WORK STATION. REFER TO DETAILS ON E500 SERIES DRAWINGS.

WSX — WORK STATION OUTLET DETAIL. REFER TO DETAILS ON E500 SERIES DRAWINGS.

PR — CEILING MOUNTED VIDEO PROJECTOR STATION. REFER TO DETAIL ON DRAWING E500 SERIES DRAWINGS.

TELECOM OUTLETS

- OUTLET
- OUTLET, CEILING MOUNTED
- FURNITURE SYSTEMS OUTLET
- OUTLET, MOUNTED IN FLOOR BOX
- OUTLET, MOUNTED IN POKE THRU
- OUTLET, MOUNTED IN POWER POLE

TELECOM OUTLET TYPES

- # — # INDICATES QUANTITY OF DATA JACKS, PULLSTRING ALWAYS PROVIDED. WHERE NO QUANTITY IS NOTED, 2 DATA JACKS AND PULLSTRING.
- AC — MOUNTED 3" ABOVE COUNTER BACKSPLASH
- B — BLANK FACEPLATE, ROUGH-IN ONLY
- D — DIRECT CONNECTION TO PANEL
- M — PATIENT MONITORING
- P — PAY TELEPHONE
- R — RACEWAY MOUNTED
- W — WALL MOUNTED TELEPHONE HANDSET OUTLET
- WAP — WIRELESS ACCESS POINT CONNECTION

FIRE ALARM

- FAA — FIRE ALARM ANNUNCIATOR
- FACP — FIRE ALARM CONTROL PANEL
- DH — DOOR HOLDER

WORK DEFINITION

- NEW WORK
- EXISTING
- REMOVE EXISTING
- REMOVE EXISTING ELECTRICAL EQUIPMENT
- FUTURE
- TEMPORARY, AS NOTED
- ?## — KEY NOTE
- ??? — EQUIPMENT IDENTIFICATION

CIRCUITS

- RACEWAY CONCEALED IN CEILING OR WALL. EXPOSED RACEWAY IS ALLOWED ONLY WHERE NOTED. RACEWAY BELOW SLAB OR UNDERGROUND
- RACEWAY UP
- RACEWAY DOWN
- RACEWAY CONTINUATION
- RACEWAY STUB-OUT WITH BUSHING
- J — JUNCTION BOX, CEILING OR ABOVE CEILING MOUNTED
- J — JUNCTION BOX, WALL MOUNTED
- J — JUNCTION BOX, IN-GROUND
- PB — PULL BOX

- N/A — EXIT SIGN, FILLED SIDES INDICATE ILLUMINATED ANNOTATION, ARROWS INDICATE DIRECTIONAL GRAPHICS
- N/A — WALL MOUNTED EXIT SIGN, FILLED SIDES INDICATE ILLUMINATED ANNOTATION, ARROWS INDICATE DIRECTIONAL GRAPHICS
- N/A — EXIT SIGN WITH EMERGENCY BATTERY PACK
- N/A — WALL MOUNTED EXIT SIGN WITH EMERGENCY BATTERY PACK
- N/A — EMERGENCY BATTERY PACK, NUMBER OF LAMPS NOT INDICATED
- N/A — WALL MOUNTED EMERGENCY BATTERY PACK, NUMBER OF LAMPS NOT INDICATED
- N/A — EMERGENCY WITH REMOTE BATTERY PACK, NUMBER OF LAMPS NOT INDICATED
- N/A — WALL MOUNTED EMERGENCY WITH REMOTE BATTERY PACK, NUMBER OF LAMPS NOT INDICATED
- RECESSED LINEAR WALL WASH LUMINAIRE, LENGTH TO SCALE
- LINEAR PENDANT MOUNTED WALL WASH LUMINAIRE, LENGTH TO SCALE
- RECESSED WALL WASH LUMINAIRE
- SURFACE MOUNTED WALL WASH LUMINAIRE
- PENDANT MOUNTED WALL WASH LUMINAIRE
- RECESSED ACCENT LUMINAIRE
- SURFACE MOUNTED ACCENT LUMINAIRE
- PENDANT MOUNTED ACCENT LUMINAIRE
- MONOPOINT LUMINAIRE
- N/A — TRACK LIGHTING
- N/A — CONTINUOUS SOURCE LUMINAIRE, PATH AS INDICATED
- MULTI-LAMP ACCENT LUMINAIRE, NUMBER OF LAMPS NOT INDICATED
- WALL MOUNTED MULTI-LAMP ACCENT LUMINAIRE, NUMBER OF LAMPS NOT INDICATED
- OVERCOUNTER TASK LUMINAIRE
- UNDERCABINET TASK LUMINAIRE
- FIBER OPTIC REMOTE SOURCE
- STEP LUMINAIRE
- ILLUMINATED SIGN
- WALL MOUNTED ILLUMINATED SIGN
- NIGHT LIGHT
- WALL MOUNTED STROBE LIGHT

LIGHTING CONTROLS

- SINGLE POLE SWITCH
- INDICATES WIRELESS CONTROL
- a — LOWER-CASE LETTER(S) NEAR SWITCH DENOTE SWITCH LEG(S)
- 2 — DOUBLE POLE SWITCH
- 3 — THREE-WAY SWITCH
- 4 — FOUR-WAY SWITCH
- D — DIMMER SWITCH
- K — KEY OPERATED SWITCH
- LV — MOMENTARY CONTACT LOW VOLTAGE SWITCH
- O — OCCUPANCY SENSOR SWITCH
- OD — OCCUPANCY SENSOR/DIMMER SWITCH
- P — SWITCH WITH PILOT LIGHT
- PC — PHOTOCELL SWITCH
- T — TIMER SWITCH
- CS# — LOW VOLTAGE CONTROL STATION, # INDICATES STATION IDENTIFICATION
- DSC — DIMMING SYSTEM CONTROL PANEL
- ELCU — EMERGENCY LIGHTING CONTROL UNIT
- LCP — LIGHTING CONTROL PANEL
- OS — OCCUPANCY SENSOR SWITCH, CEILING MOUNTED
- PS — PHOTO SENSOR CONTROL
- PS — PHOTO SENSOR CONTROL, CEILING MOUNTED
- R — RELAY
- T — LOW VOLTAGE TRANSFORMER

- #, # — RECEPTACLE, NEMA #
- #, # — RECEPTACLE, NEMA #, CEILING MOUNTED
- #, # — COMBINATION RECEPTACLE, NEMA # AND 120V
- # — FURNITURE SYSTEMS RECEPTACLE, 120V
- N/A — INDICATES CONTROLLED
- N/A — INDICATES 15A
- N/A — INDICATES TWIST LOCK
- N/A — INDICATES MOUNTED 3" (75 MM) ABOVE COUNTER BACKSPLASH
- N/A — MULTI-SERVICE FLOOR BOX (RECEPTACLES/OUTLETS AS INDICATED)
- N/A — MULTI-SERVICE POKE THRU (RECEPTACLES/OUTLETS AS INDICATED)
- N/A — MULTI-SERVICE POWER POLE (RECEPTACLES/OUTLETS AS INDICATED)
- N/A — MULTI-SERVICE ASSEMBLY (RECEPTACLES/OUTLETS AS INDICATED)
- N/A — CLOCK RECEPTACLE, 120V
- CORD DROP, 120V
- CEILING CORD DROP, 120V

RECEPTACLE TYPES

- A — ARC FAULT CIRCUIT INTERRUPTER
- AT — ARC FAULT CIRCUIT INTERRUPTER AND TAMPER RESISTANT
- D — DEDICATED CIRCUIT
- G — GROUND FAULT CIRCUIT INTERRUPTER
- GT — GROUND FAULT CIRCUIT INTERRUPTER AND TAMPER RESISTANT
- IG — ISOLATED GROUND
- S — SURGE PROTECTOR
- T — TAMPER RESISTANT
- U — INTEGRAL USB PORT(S)
- WP — GROUND FAULT CIRCUIT INTERRUPTER WITH WEATHER RESISTANT COVER

CONTROLS

- NON-FUSED SAFETY SWITCH
- FUSED SAFETY SWITCH, FUSE RATING INDICATED
- COMBINATION MOTOR STARTER AND FUSED SAFETY SWITCH, FUSE RATING INDICATED
- MOTOR STARTER
- MANUAL MOTOR STARTER
- AUTOMATIC DOOR PUSHPLATE
- DEAD FRONT GFCI
- EMERGENCY SHUTDOWN
- ENCLOSED CIRCUIT BREAKER
- ENCLOSED CONTACTOR
- PUSH BUTTON CONTROL STATION
- M — TOGGLE SWITCH, MOTOR RATED
- TOUCHLESS AUTOMATIC DOOR OPENER
- DDC — DIRECT DIGITAL CONTROL PANEL
- R — RELAY
- THERMOSTAT
- TC — TIME CLOCK
- VFD — VARIABLE FREQUENCY DRIVE

ELECTRICAL EQUIPMENT

- 208V OR 240V POWER PANELBOARD
- 480V OR 600V POWER PANELBOARD
- EQUIPMENT CABINET OR PANEL
- EQUIPMENT CONNECTION, FILL INDICATES EMERGENCY CIRCUIT
- GROUND BAR
- MOTOR CONNECTION, 1Ø
- MOTOR CONNECTION, 3Ø
- BUS DUCT
- ATS — AUTOMATIC TRANSFER SWITCH
- B — BUS DUCT PLUG
- SPD — SURGE PROTECTIVE DEVICE
- T — TRANSFORMER, NOT TO SCALE
- T — TRANSFORMER, DRAWN TO SCALE

BC	BONDING CONDUCTOR
BCU	BARE COPPER
BFC	BELOW FINISHED CEILING
BFG	BELOW FINISHED GRADE
BKR	BREAKER
BLDG	BUILDING
BOF	BOTTOM OF FIXTURE
BTM	BOTTOM
C	CONDUIT
C/W	COMPLETE WITH
CAP	CAPACITY
CATV	CABLE ANTENNA TELEVISION
CB	CIRCUIT BREAKER
CCTV	CLOSED CIRCUIT TELEVISION
CEC	CANADIAN ELECTRIC CODE
CFOI	CONTRACTOR FURNISHED, OWNER INSTALLED
CIRC	CIRCULATING
CKT	CIRCUIT
CL	CENTERLINE
CLG	CEILING
CM	CEILING MOUNTED
CMU	CONCRETE MASONRY UNIT
CO	CONDUIT ONLY
COMM	COMMUNICATIONS
CONC	CONCRETE
CONN	CONNECTION
CONST	CONSTRUCTION
CONT	CONTINUOUS
CONTR	CONTRACTOR
CPT	CONTROL POWER TRANSFORMER
CPU	CENTRAL PROCESSING UNIT
CR	CRITICAL BRANCH
CT	CURRENT TRANSFORMERS
CTR	CENTER
CU	COPPER
CUH	CABINET UNIT HEATER
D	DEDICATED
DC	DIRECT CURRENT
DET	DETAIL
DIAM	DIAMETER
DIM	DIMENSION
DISC	DISCONNECT
DIV	DIVISION
DL	DAMP LOCATION
DN	DOWN
DP	DISTRIBUTION PANEL
DPDT	DOUBLE POLE, DOUBLE THROW
DPR	DAMPER
DPST	DOUBLE POLE, SINGLE THROW
DWG	DRAWING
DWH	DOMESTIC WATER HEATER
EA	EACH
EC	ELECTRICAL CONTRACTOR
EF	EXHAUST FAN
ELEC	ELECTRICAL
ELEV	ELEVATOR
EM	EMERGENCY
EM GEN	EMERGENCY GENERATOR
EMT	ELECTRICAL METALLIC TUBING
ENCL	ENCLOSURE
EP	ELECTRIC-PNEUMATIC
EPO	EMERGENCY POWER OFF
EQ	EQUIPMENT BRANCH
EQUIP	EQUIPMENT
ERL	EXISTING TO BE RELOCATED
ETD	EMERGENCY TRANSFER DEVICE
EWC	ELECTRIC WATER COOLER
EXH	EXHAUST
EXIST, E, EX	EXISTING
EXP	EXPLOSION PROOF
EXTER	EXTERIOR
F&I	FURNISHED AND INSTALLED
FA	FIRE ALARM
FAA	FIRE ALARM ANNUNCIATOR
FACP	FIRE ALARM CONTROL PANEL
FB	FLOOR BOX
FCU	FAN COIL UNIT
FLR	FLOOR
FLUOR	FLUORESCENT
FO	FIBER (FIBRE) OPTIC
FP	FIRE PROTECTION
FS	FUSIBLE SWITCH
FSCS	FIRE FIGHTER SMOKE CONTROL STATION
FU	FUSE
FVNR	FULL VOLTAGE NON REVERSING
FVR	FULL VOLTAGE REVERSING
G, GND	GROUND
G/Y GA	GREEN YELLOW GAUGE

MECH	MECHANICAL
MET	METER
MFR	MANUFACTURER
MH	MANHOLE
MIN	MINIMUM
MISC	MISCELLANEOUS
MLO	MAIN LUGS ONLY
MM	MILLIMETER
MSB	MAIN SWITCHBOARD
MTD	MOUNTED
MTG	MOUNTING
MTS	MOUNTED TO SURFACE
MV	MEDIUM VOLTAGE
MVCB	MEDIUM VOLTAGE CIRCUIT BREAKER
MW	MICROWAVE
N	NEUTRAL
NAC	NOTIFICATION APPLIANCE CIRCUIT
NC	NORMALLY CLOSED
NEC	NATIONAL ELECTRICAL CODE
NEMA	NATIONAL ELECTRICAL MANUFACTURERS ASSOCIATION
NIC	NOT IN CONTRACT
NL	NIGHT LIGHT
NO	NORMALLY OPEN
NTS	NOT TO SCALE
OC	ON CENTER
OD	OUTSIDE DIAMETER
OFCI	OWNER FURNISHED, CONTRACTOR INSTALLED
OFE	OWNER FURNISHED EQUIPMENT
OH	OVERHEAD
OL	OVERLOAD
OS	OCCUPANCY SENSOR
OSP	OUTSIDE PLANT
P	POLE
PA	PUBLIC ADDRESS
PB	PUSH BUTTON
PD	POWER DISTRIBUTION
PF	POWER FACTOR
PH	PHASE
PNL	PANEL
POE	POWER OVER ETHERNET
POS	POSITIVE
PR	PAIR
PT	POTENTIAL TRANSFORMER
PTS	POTENTIAL TRANSFORMER SECONDARY
PTZ	PAN TILT ZOOM
PV	PHOTOVOLTAIC
PVC	POLYVINYL CHLORIDE
PWR	POWER
R	RADIUS
RA	RETURN AIR
REC	RECEPTACLE
RECP	RECEPTACLE
REQD	REQUIRED
REX	REMOTE EXCITER
RM	ROOM
RNC	RIGID NONMETALLIC CONDUIT
RO	ROUGH OPENING
RSC, RGS	RIGID STEEL CONDUIT
SCCR	SHORT CIRCUIT CURRENT RATING
SEC	SECONDARY
SECT	SECTION
SIM	SIMILAR
SM	SHEET METAL
SMR	SMOKE MOTOR RELEASE
SPD	SURGE PROTECTIVE DEVICE
SPDT	SINGLE POLE, DOUBLE THROW
SPECS	SPECIFICATIONS
SPST	SINGLE POLE, SINGLE THROW
SS	SAFETY SWITCH
ST	SOLID TOP
STD	STANDARD
SW	SWITCH
SWBD	SWITCHBOARD
SWGR	SWITCHGEAR
SYS	SYSTEM
TBB	TELEPHONE BACKBOARD
TC	TELEPHONE CABINET
TE	TELEPHONE EQUIPMENT
TELE	TELEPHONE
TELECOM	TELECOMMUNICATIONS
TEMP	TEMPERATURE
TERM	TERMINAL
TGB	TELECOMMUNICATIONS GROUNDING BUSBAR
TMGB	TELECOMMUNICATIONS MAIN GROUNDING BUSBAR
TOF	TOP OF FOOTING
TP	TWISTED PAIR
TR	TRANSFORMER
TSP	TWISTED SHIELDED PAIR
TSTAT	THERMOSTAT

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A. FURNISH: TO SUPPLY AND DELIVER TO THE PROJECT SITE, READY FOR UNLOADING, UNPACKING, ASSEMBLING, INSTALLING, AND SIMILAR OPERATIONS.

B. INSTALL: TO PERFORM ALL OPERATIONS AT THE PROJECT SITE, INCLUDING, BUT NOT LIMITED TO, AND AS REQUIRED: UNLOADING, UNPACKING, ASSEMBLING, ERECTING, PLACING, ANCHORING, APPLYING, WORKING TO DIMENSION, FINISHING, CURING, PROTECTING, CLEANING, TESTING, COMMISSIONING, STARTING UP AND SIMILAR OPERATIONS, COMPLETE, AND READY FOR THE INTENDED USE.

C. PROVIDE: TO FURNISH AND INSTALL COMPLETE, AND READY FOR THE INTENDED USE.

D. FURNISHED BY OWNER (OR OWNER-FURNISHED) OR FURNISHED BY OTHERS: AN ITEM FURNISHED BY THE OWNER OR UNDER OTHER DIVISIONS OR CONTRACTS, AND INSTALLED UNDER THE REQUIREMENTS OF THIS DIVISION, COMPLETE, AND READY FOR THE INTENDED USE, INCLUDING ALL ITEMS AND SERVICES INCIDENTAL TO THE WORK NECESSARY FOR PROPER INSTALLATION AND OPERATION. INCLUDE THE INSTALLATION UNDER THE WARRANTY REQUIRED BY THIS DIVISION.

E. ENGINEER: WHERE REFERENCED IN THIS DIVISION, "ENGINEER" IS THE ENGINEER OF RECORD AND THE DESIGN PROFESSIONAL FOR THE WORK UNDER THIS DIVISION, AND IS A CONSULTANT TO, AND AN AUTHORIZED REPRESENTATIVE OF, THE ARCHITECT, AS DEFINED IN THE GENERAL AND/OR SUPPLEMENTARY CONDITIONS. WHEN USED IN THIS DIVISION, IT MEANS INCREASED INVOLVEMENT BY, AND OBLIGATIONS TO, THE ENGINEER, IN ADDITION TO INVOLVEMENT BY, AND OBLIGATIONS TO, THE "ARCHITECT".

2. AHJ: THE LOCAL CODE AND/OR INSPECTION AGENCY, AUTHORITY HAVING JURISDICTION OVER THE WORK.

3. NRTL: NATIONALLY RECOGNIZED TESTING LABORATORY , AS DEFINED AND LISTED BY OSHA IN 29 CFR 1910.7 (E.G., UL, ETL, CSA), AND ACCEPTABLE TO THE AHJ OVER THIS PROJECT.

4. THE TERMS "EQUIVALENT", OR "EQUAL" ARE USED SYNONYMOUSLY AND SHALL MEAN "ACCEPTED BY OR ACCEPTABLE TO THE ENGINEER AS EQUIVALENT TO THE ITEM OR MANUFACTURER SPECIFIED". "EQUIVALENT" OR "EQUAL" PRODUCTS SHALL BE LABELED, LISTED, CERTIFIED, OR ALL THREE, BY AN NRTL, AND ACCEPTABLE TO THE AHJ OVER THIS PROJECT.

1-3 PRE-BID SITE VISIT

1. PERSONALLY INSPECT THE SITE OF THE PROPOSED WORK AND BECOME FULLY INFORMED OF CONDITIONS UNDER WHICH THE WORK IS TO BE DONE. FAILURE TO DO SO WILL NOT BE CONSIDERED SUFFICIENT JUSTIFICATION TO REQUEST OR OBTAIN EXTRA COMPENSATION OVER AND ABOVE THE CONTRACT PRICE.

1-4 MATERIAL AND WORKMANSHIP

1. PROVIDE ALL MATERIAL AND EQUIPMENT NEW AND IN FIRST CLASS CONDITION. PROVIDE MARKINGS OR A NAMEPLATE FOR ALL MATERIAL AND EQUIPMENT IDENTIFYING THE MANUFACTURER AND PROVIDING SUFFICIENT REFERENCE TO ESTABLISH QUALITY, SIZE AND CAPACITY. ALL WORKMANSHIP SHALL BE OF THE FINEST POSSIBLE BY EXPERIENCED MECHANICS OF THE PROPER TRADE. IN GENERAL, PROVIDE THE FOLLOWING QUALITY GRADE(S) FOR ALL MATERIALS AND EQUIPMENT (LIGHT DUTY AND RESIDENTIAL TYPE EQUIPMENT WILL NOT BE ACCEPTABLE):

A. COMMERCIAL HEAVY DUTY GRADE

2. PROVIDE ALL HOISTS, SCAFFOLDS, STAGING, RUNWAYS, TOOLS, MACHINERY, AND EQUIPMENT REQUIRED FOR THE INSTALLATION AND PERFORMANCE OF THE ELECTRICAL WORK. STORE AND MAINTAIN MATERIAL AND EQUIPMENT IN CLEAN CONDITION, AND PROTECTED FROM WEATHER, MOISTURE, AND PHYSICAL DAMAGE.

3. FURNISH ONLY MATERIAL AND EQUIPMENT THAT ARE LISTED, LABELED, CERTIFIED, OR ALL THREE, BY A NATIONALLY RECOGNIZED TESTING LABORATORY, WHENEVER ANY LISTING OR LABELING EXISTS FOR THE TYPES OF MATERIAL AND EQUIPMENT SPECIFIED. AT A MINIMUM, GENERAL WORK PRACTICES FOR ELECTRICAL CONSTRUCTION SHALL BE IN ACCORDANCE WITH NECA 1 (LATEST EDITION), " STANDARD PRACTICES FOR GOOD WORKMANSHIP IN ELECTRICAL CONSTRUCTION".

1-5 MANUFACTURERS

1. IN OTHER ARTICLES WHERE LISTS OF MANUFACTURERS ARE INTRODUCED, SUBJECT TO COMPLIANCE WITH REQUIREMENTS, PROVIDE PRODUCTS BY ONE OF THE MANUFACTURERS SPECIFIED.

2. WHERE MANUFACTURERS ARE NOT LISTED, PROVIDE PRODUCTS SUBJECT TO COMPLIANCE WITH REQUIREMENTS FROM MANUFACTURERS THAT HAVE BEEN ACTIVELY INVOLVED IN MANUFACTURING THE SPECIFIED PRODUCT FOR NO LESS THAN 5 YEARS.

1-6 COORDINATION

1. COORDINATE ALL WORK WITH OTHER DIVISIONS AND TRADES SO THAT VARIOUS COMPONENTS OF THE ELECTRICAL SYSTEMS ARE INSTALLED AT THE PROPER TIME, FIT THE AVAILABLE SPACE, AND ALLOW PROPER SERVICE ACCESS TO ALL EQUIPMENT. REFER TO ALL DRAWINGS, INCLUDING, BUT NOT LIMITED TO CIVIL, ARCHITECTURAL, STRUCTURAL, MECHANICAL, PLUMBING AND TO RELEVANT EQUIPMENT SUBMITTALS AND SHOP DRAWINGS TO DETERMINE THE EXTENT OF CLEAR SPACES. MAKE ALL OFFSETS REQUIRED TO CLEAR EQUIPMENT, BEAMS AND OTHER STRUCTURAL MEMBERS, AND TO FACILITATE CONCEALING RACEWAYS IN THE MANNER ANTICIPATED IN THE DESIGN. PROVIDE MATERIALS WITH TRIM THAT WILL FIT PROPERLY THE TYPES OF CEILING, WALL, OR FLOOR FINISHES ACTUALLY INSTALLED.

1-7 ORDINANCES, CODES, AND CLIENT

1. COMPLY WITH NATIONAL FIRE PROTECTION ASSOCIATION (NFPA) STANDARDS, STATE AND LOCAL BUILDING CODES, AND ALL OTHER APPLICABLE CODES AND ORDINANCES FOR PERFORMANCE, WORKMANSHIP. EQUIPMENT, AND MATERIALS. ADDITIONALLY, COMPLY WITH RULES AND REGULATIONS OF PUBLIC UTILITIES AND MUNICIPAL DEPARTMENTS AFFECTED BY CONNECTION OF SERVICES.

2. WHERE CONFLICTS BETWEEN VARIOUS CODES, ORDINANCES, RULES, AND REGULATIONS EXIST, COMPLY WITH THE MOST STRINGENT. WHEREVER REQUIREMENTS OF THESE SPECIFICATIONS, DRAWINGS, OR BOTH, EXCEED THOSE OF THE ABOVE ITEMS, THE REQUIREMENTS OF THESE SPECIFICATIONS, DRAWINGS, OR BOTH, SHALL GOVERN. CODE COMPLIANCE, AT A MINIMUM, IS MANDATORY. CONSTRUE NOTHING IN THESE CONSTRUCTION DOCUMENTS AS PERMITTING WORK NOT IN COMPLIANCE, AT A MINIMUM, WITH THESE CODES.

3. PROVIDE AND MAINTAIN ALL NECESSARY SIGNAL LIGHTS AND GUARDS FOR THE SAFETY OF THE PUBLIC

CONTRACTOR FROM RESPONSIBILITY FOR ERRORS IN DIMENSIONS, DETAILS, SIZE OF MEME QUANTITIES; OR FOR OMITTING COMPONENTS OR FITTINGS; OR FOR NOT COORDINATING ITEMS WITH AC BUILDING CONDITIONS.

1-10 ELECTRONIC DRAWING FILES

1. ELECTRONIC FILES FOR AS-BUILT COMPLETION CAN BE PROVIDED TO CONTRACTORS UPON REQUEST

1-11 TRAINING

1. AT A TIME MUTUALLY AGREED UPON BETWEEN THE OWNER AND CONTRACTOR, TRAIN OWNER'S DESIGNATED PERSONNEL ON THE OPERATION AND MAINTENANCE OF THE EQUIPMENT PROVIDED FOR T PROJECT.

2. PROVIDE TRAINING TO INCLUDE BUT NOT BE LIMITED TO AN OVERVIEW OF THE SYSTEM AND/OR EQUIPMENT AS IT RELATES TO THE FACILITY AS A WHOLE; OPERATION AND MAINTENANCE PROCEDURES AND SCHEDULES RELATED TO STARTUP AND SHUTDOWN, TROUBLESHOOTING, SERVICING, PREVENTIVE MAINTENANCE AND APPROPRIATE OPERATOR INTERVENTION; AND REVIEW OF DATA INCLUDED IN THE OPERATION AND MAINTENANCE INSTRUCTIONS.

3. SCHEDULE TRAINING WITH OWNER WITH AT LEAST 7 DAYS IN ADVANCE NOTICE.

1-12 WARRANTIES

1. WARRANT EACH SYSTEM AND EACH ELEMENT THEREOF AGAINST ALL DEFECTS DUE TO FAULTY WORKMANSHIP, INSTALLATION, PRODUCT DESIGN OR MATERIAL FOR A PERIOD OF 12 MONT OF SUBSTANTIAL COMPLETION, UNLESS SPECIFIC ITEMS ARE NOTED TO CARRY A LONGER WARRANTY THE CONSTRUCTION DOCUMENTS OR MANUFACTURER'S STANDARD WARRANTY EXCEEDS REMEDY ALL DEFECTS, OCCURRING WITHIN THE WARRANTY PERIOD(S), AS STATED IN THE GENERAL CONDITIONS.

2. ALSO WARRANT THE FOLLOWING ADDITIONAL ITEMS:

A. ALL RACEWAYS ARE FREE FROM OBSTRUCTIONS, HOLES, CRUSHING, OR BREAKS OF AN

B. ALL RACEWAY SEALS ARE EFFECTIVE.

C. THE ENTIRE ELECTRICAL SYSTEM IS FREE FROM ALL SHORT CIRCUITS AND UNWANTED OPEN CIRCUITS AND GROUNDS.

3. THE ABOVE WARRANTIES SHALL INCLUDE LABOR AND MATERIAL. MAKE REPAIRS OR RE WITHOUT ANY ADDITIONAL COSTS TO THE OWNER.

4. PERFORM THE REMEDIAL WORK PROMPTLY, UPON WRITTEN NOTICE FROM THE ENGINEER OR OWNER.

5. AT THE TIME OF SUBSTANTIAL COMPLETION, DELIVER TO THE OWNER ALL WARRANTIES, IN W PROPERLY EXECUTED, INCLUDING TERM LIMITS FOR WARRANTIES EXTENDING BEYOND THE PERIOD, EACH WARRANTY INSTRUMENT BEING ADDRESSED TO THE OWNER AND STATING THE COMMENCEMENT DATE AND TERM.

1-13 MISCELLANEOUS REMODELING WORK

1. PROVIDE ALL DEMOLITION OF EXISTING ELECTRICAL SYSTEMS AND NEW ELECTRICAL SYST REQUIRED BECAUSE OF BUILDING REMODELING, AS NOTED ON THE DRAWINGS, OR NECESS PROPER OPERATION AND NEW CONSTRUCTION. REMOVE ALL ABANDONED CABLES AND WIRING ABOVE ACCESSIBLE CEILINGS AND VENTILATION SHAFTS.

2. EXERCISE EXTREME CAUTION IN THE INSTALLATION OF THIS WORK TO AVOID AN ELECTRICA ACCIDENT. THE FACILITY IS EXISTING AND MAY REMAIN IN OPERATION DURING THIS WORK. COORDINATE ALL WORK SCHEDULES WITH THE BUILDING MANAGEMENT PRIOR TO DE-ENERGIZING ANY ELECTRICAL CIRCUITS TO AVOID CONFLICTS WITH ANY OTHER TENANT'S OPERATION. ALLOW 3 DAYS PRIOR CONFIRME NOTIFICATION.

3. VERIFY THAT NEW AND EXISTING TO REMAIN INSTALLATIONS ARE CODE COMPLIANT, AND MAKE CORRECTIONS AS REQUIRED.

4. DEVELOP AND MAINTAIN A SET OF "RED-LINE AS-BUILT" DRAWINGS. THESE DRAWINGS SHALL BE MAINTAINED AT THE PROJECT CONSTRUCTION SITE AND AVAILABLE TO THE ENGINEER UPO THEY SHALL BE CURRENT AND SHALL REFLECT ALL ACTUAL ASPECTS OF THE ELECTRICAL I WHICH DEVIATED FROM THE PRESENT ELECTRICAL DESIGN DRAWINGS. THESE DRAWINGS SHALL BE SUBMITTED TO THE ENGINEER WITHIN 10 DAYS OF SUBSTANTIAL COMPLETION OF THE WORK AND MUST INCLUDE ALL PUNCH LIST ITEMS.

5. VERIFY THE LOADING OF EACH CIRCUIT AFFECTED BY THE REMODELING. DO NOT LOAD CIRCUITS TO MO THAN 80% OF THEIR RATING.

6. PROVIDE UPDATED, TYPED DIRECTORY FOR EACH PANELBOARD BEING USED OR MODIFIED UNDER THIS CONTRACT. DESIGNATE NEW CIRCUITS AND AREA BEING SERVED.

7. FLEXIBLE STEEL CONDUIT SHALL BE USED TO WIRE ALL LIGHT FIXTURES AND VIBRATING EQ IN LENGTHS FROM 18 INCHES TO 72 INCHES ONLY.

8. CONDUIT AND CABLE ABOVE CEILING SHALL BE SUPPORTED BY A UNISTRUT AND ALL-THREA TRAPEZE. EACH PIECE OF CONDUIT SHALL BE SECURED TO THE TRAPEZE WITH A CONDUIT STRAP. THE TRAPEZE SUPPORTS SHALL BE INSTALLED PER CODE PLUS A MINIMUM OF 12" ABOVE THE CEILING.

9. NO CHANGE ORDER SHALL BE ISSUED DURING CONSTRUCTION FOR CHANGES DUE TO INCOMPATIBILITY. NO CHANGES SHALL BE MADE TO THE CIRCUITING SHOWN WITHOUT PRIOR WRITTEN APPROVAL OF TH ENGINEER OF RECORD. CIRCUIT NUMBERS SHALL BE INDICATED ON EACH JUNCTION BOX.

10. AT THE TIME OF FINAL PUNCH LIST, AN ELECTRICIAN MAY BE REQUIRED TO ASSIST IN THE REMOVAL OF PANEL COVERS, JUNCTION BOX COVERS, RECEPTACLES, SWITCHES, AND OTHER ELECTRICAL DEVICES.

PART 2 ELECTRICAL WORK

2-1 BUILDING OPERATION

4. USE INSULATED, GROUNDING, OR COMBINATION BUSHINGS WHEREVER CONNECTION IS SUBJECT TO VIBRATION OR MOISTURE, WHEN REQUIRED BY NFPA 70, OR BOTH.

5. INSTALL PLASTIC BUSHINGS ON THE CONNECTIONS OF ALL REUSED CONDUIT.

4-1-4 CONDUCTORS AND CABLES

1. ALL FEEDER AND BRANCH CIRCUIT CONDUCTORS NO. 12 AWG AND LARGER: STRANDED, TYPE THHN-2 OR XHHW-2 INSULATION.

2. ALL BRANCH CIRCUIT WIRING: SHALL NOT BE NOT SMALLER THAN NO. 12 AWG. IF NO CONDUCTOR SIZE IS INDICATED ON THE DRAWINGS FOR A BRANCH CIRCUIT, PROVIDE CONDUCTORS AND CONDUIT SIZED PER NFPA 70 AND BASED ON THE INDICATED BRANCH CIRCUIT OVERCURRENT PROTECTIVE DEVICE (OCPD) RATING AND NUMBER OF POLES. WHERE NO CIRCUIT SIZE (I.E., CONDUCTORS AND OCPD) IS INDICATED ON THE DRAWINGS FOR A BRANCH CIRCUIT, PROVIDE THREE NO. 12 AWG CONDUCTORS, IN 3/4-INCH RACEWAY, AND A 20A CIRCUIT BREAKER.

3. CONDUCTORS FIELD-INSTALLED WITHIN LIGHT FIXTURE CHANNELS: TYPE THHN.

4. CONTROL WIRING: STRANDED COPPER CONDUCTORS, 600V INSULATION, OF THE PROPER TYPE, SIZE AND NUMBER AS REQUIRED TO ACCOMPLISH SPECIFIED FUNCTION. MINIMUM SIZE: NO. 14 AWG, UNLESS NOTED OTHERWISE.

5. CONDUCTOR MATERIAL:

   A. ANNEALED (SOFT) COPPER COMPLYING WITH ICEA S-95-658/NEMA WC70; SOLID CONDUCTOR FOR
      1. NO. 12 AWG AND SMALLER; CONCENTRIC, COMPRESSED-STRANDED FOR NO. 10 AWG AND LARGER.
   B. CONDUCTOR INSULATION TYPES: 90-DEGREE C-RATED, TYPE THHN/THWN-2 OR XHHW-2 COMPLYING WITH ICEA S-95-658/NEMA WC70, UNLESS NOTED OTHERWISE IN THE DRAWINGS.
   C. SIZES OF CONDUCTORS AND CABLES INDICATED OR SPECIFIED ARE IN AMERICAN WIRE GAGE 3. (AWG - BROWN AND SHARPE).
   D. UNLESS INDICATED OTHERWISE, SPECIAL PURPOSE CONDUCTORS AND CABLES, SUCH AS LOW VOLTAGE 4. CONTROL AND SHIELDED INSTRUMENT WIRING, SHALL BE AS RECOMMENDED BY THE SYSTEM EQUIPMENT MANUFACTURER.

4-1-5 INSTALLATION OF CONDUCTORS AND CABLES

1. INSTALL ALL WIRING IN APPROVED RACEWAY AND ENCLOSURES, EXCEPT WHERE SPECIFIED OR INDICATED OTHERWISE.

2. SUPPORT ALL CONDUCTORS AND CABLES IN VERTICAL INSTALLATIONS, AS REQUIRED BY NFPA 70, BY INSTALLING CABLE SUPPORTS OR PLUG-TYPE CONDUIT RISER SUPPORTS OR WIRE-MESH SAFETY GRIPS.

3. INSTALL ALL CONDUCTORS AND CABLE IN CONTINUOUS RACEWAY WITHOUT TAPS OR SPLICES. SPLICE OR TAP ONLY IN APPROVED BOXES AND ENCLOSURES WITH APPROVED SOLDERLESS CONNECTORS; OR CRIMP CONNECTORS AND TERMINAL BLOCKS FOR CONTROL WIRING, AND; KEEP TO THE MINIMUM REQUIRED. INSULATE ALL SPLICES, TAPS AND JOINTS AS REQUIRED BY CODES.

4. ALL MATERIALS USED TO TERMINATE, SPLICE OR TAP CONDUCTORS: DESIGNED PROPERLY SIZED AND UL-LISTED FOR THE SPECIFIC APPLICATION AND CONDUCTORS INVOLVED. INSTALL IN STRICT ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS, USING THE MANUFACTURER'S RECOMMENDED TOOLS.

5. WHERE WIRING IS INDICATED AS INSTALLED, BUT THE CONNECTION IS INDICATED "FUTURE" OR "BY OTHERS" DIVISION, TRADE, OR CONTRACT; LEAVE A MINIMUM 3-FOOT "PIGTAIL" AT THE BOX, TAPE THE ENDS OF THE CONDUCTORS AND COVER THE BOX. IN GENERAL, BRANCH CIRCUIT "HOME RUN" ROUTING IS INDICATED ON THE DRAWINGS, COMPLETE WITH CIRCUIT NUMBERS AND PANELBOARD DESIGNATION. CONTINUE ALL SUCH "HOME RUN" WIRING TO THE DESIGNATED PANELBOARD, AS THOUGH "CIRCUIT RUNS" WERE INDICATED IN THEIR ENTIRETY.

6. WHEN MULTIPLE HOME RUNS ARE COMBINED INTO A SINGLE RACEWAY SUCH THAT THE NUMBER OF CONDUCTORS EXCEEDS FOUR (CONDUCTOR COUNT IS MADE UP OF ANY COMBINATION OF PHASE AND NEUTRAL CONDUCTORS), THE FOLLOWING RESTRICTIONS APPLY, WHICH ARE IN ADDITION TO THOSE IN NFPA 70:

7. EMERGENCY POWER CIRCUITS - INCLUDES ALL CIRCUITS COVERED UNDER ARTICLES 700, 701 AND 702:

   A. MAXIMUM OF 16 CONDUCTORS IN A SINGLE RACEWAY. FOR UP TO EIGHT CONDUCTORS IN A RACEWAY, A MINIMUM RACEWAY SIZE: 3/4-INCH. FOR GREATER THAN EIGHT CONDUCTORS, MINIMUM RACEWAY SIZE: 1-INCH. DO NOT INSTALL ANY OTHER TYPE OF CIRCUIT IN THIS RACEWAY.
   B. THE MINIMUM WIRE SIZE FOR ALL CONDUCTORS IN THIS RACEWAY: NO. 10 AWG.
   C. ONLY 15A AND 20A BRANCH CIRCUIT HOMERUNS MAY BE COMBINED INTO ONE RACEWAY.

8. GFCI CIRCUITS:

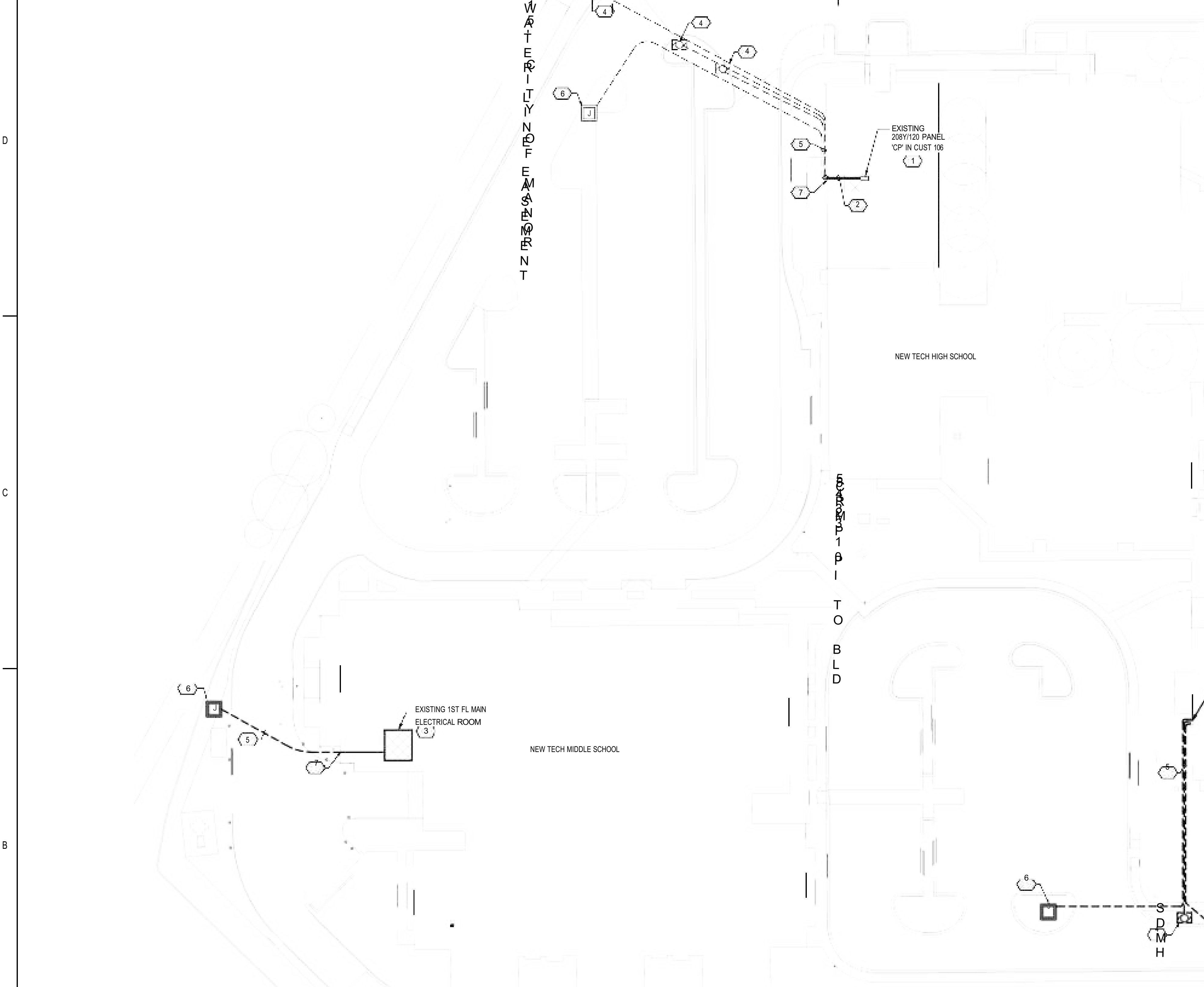
   A. DO NOT USE MULTI-CONDUCTOR CIRCUITS, WITH A SHARED NEUTRAL, FOR ANY GFCI CIRCUIT BREAKER OR RECEPTACLE CIRCUIT.
   B. FOR BRANCH CIRCUITS FED FROM GFCI CIRCUIT BREAKERS, LIMIT THE ONE-WAY CONDUCTOR LENGTH TO 100 FEET BETWEEN THE PANELBOARD AND THE MOST REMOTE RECEPTACLE OR LOAD ON THE GFCI CIRCUIT.

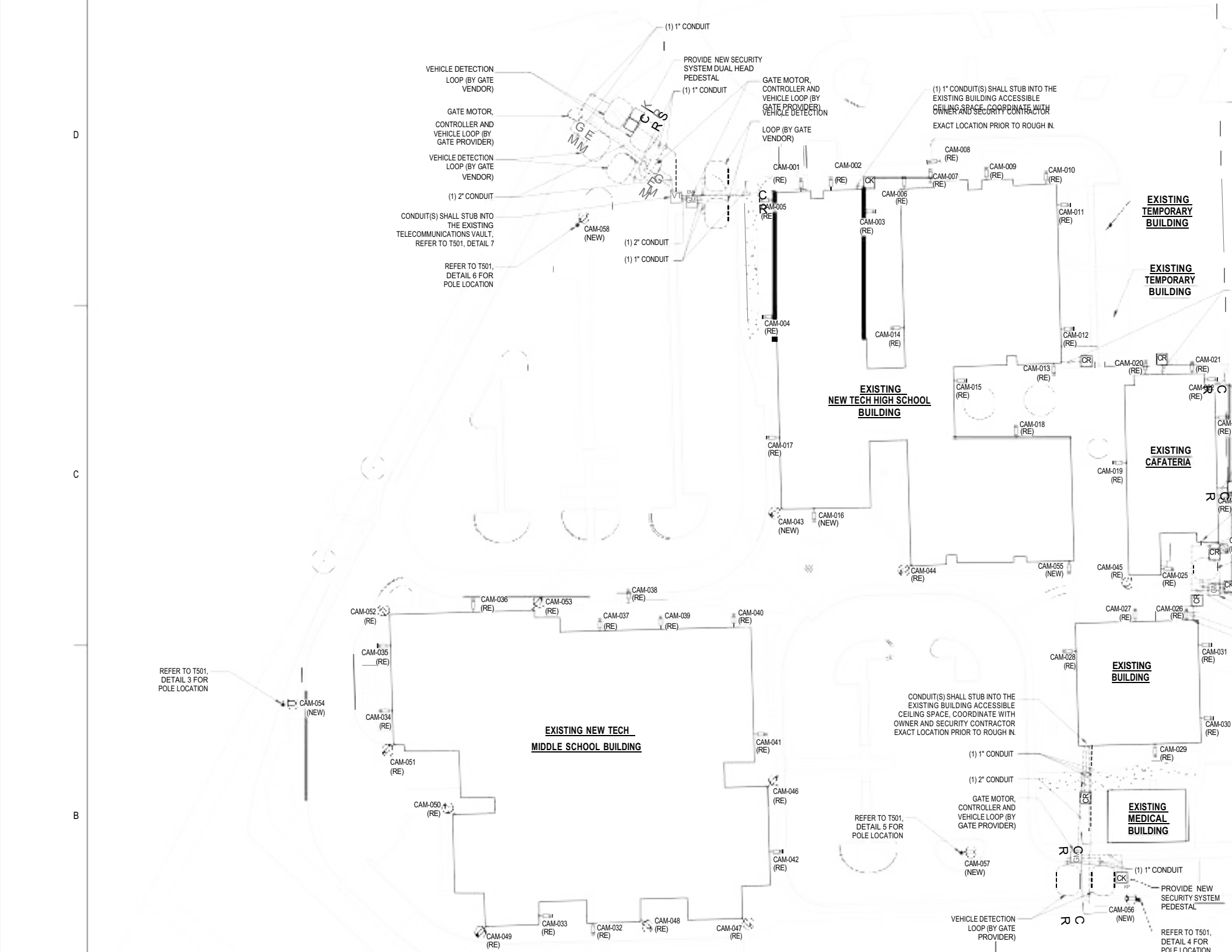
9. WIRING SHALL HAVE INSULATION OF THE PROPER COLOR TO MATCH COLOR CODE SYSTEM IN THE TABLE BELOW. ALL CONDUCTORS AND CABLES NOT PROPERLY COLOR CODED SHALL BE REMOVED AND REPLACED AT THE CONTRACTORS EXPENSE. CONDUCTORS SHALL HAVE CONTINUOUS COLOR CODED OUTER JACKET. IN LARGER SIZES, WHERE PROPERLY COLORED INSULATION IS NOT AVAILABLE, USE VINYL PLASTIC ELECTRICAL TAPE OF THE APPROPRIATE COLOR AROUND EACH CONDUCTOR AT ALL TERMINATION POINTS, JUNCTION AND PULL BOXES.

10. WIRING SHALL HAVE INSULATION OF THE PROPER COLOR TO MATCH COLOR CODE SYSTEM IN THE TABLE BELOW. ALL CONDUCTORS AND CABLES NOT PROPERLY COLOR CODED SHALL BE REMOVED AND REPLACED AT THE CONTRACTORS EXPENSE. CONDUCTORS SHALL HAVE CONTINUOUS COLOR CODED OUTER JACKET. IN LARGER SIZES, WHERE PROPERLY COLORED INSULATION IS NOT AVAILABLE, USE VINYL PLASTIC ELECTRICAL TAPE OF THE APPROPRIATE COLOR AROUND EACH CONDUCTOR AT ALL TERMINATION POINTS, JUNCTION AND PULL BOXES.

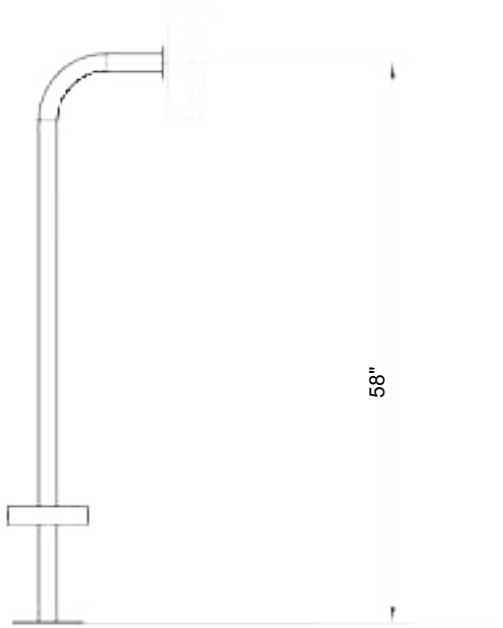
11. REFERENCE DETAIL FOR SYSTEM VOLTAGE:

System Voltage	Conductor Type	Color


EXISTING
208Y/120 PANEL
'CP' IN CUST 106
NEW TECH HIGH SCHOOL
EXISTING 1ST FL MAIN
ELECTRICAL ROOM
NEW TECH MIDDLE SCHOOL
SDMH


(1) 1" CONDUIT
PROVIDE NEW SECURITY SYSTEM DUAL HEAD PEDESTAL
(1) 1" CONDUIT
VEHICLE DETECTION LOOP (BY GATE VENDOR)
GATE MOTOR, CONTROLLER AND VEHICLE LOOP (BY GATE PROVIDER)
VEHICLE DETECTION LOOP (BY GATE VENDOR)
(1) 2" CONDUIT
CONDUIT(S) SHALL STUB INTO THE EXISTING TELECOMMUNICATIONS VAULT, REFER TO T501, DETAIL 7
REFER TO T501, DETAIL 6 FOR POLE LOCATION
CAM-058 (NEW)
(1) 2" CONDUIT
(1) 1" CONDUIT
GATE MOTOR, CONTROLLER AND VEHICLE LOOP (BY GATE PROVIDER)
VEHICLE DETECTION LOOP (BY GATE VENDOR)
(1) 1" CONDUIT(S) SHALL STUB INTO THE EXISTING BUILDING ACCESSIBLE CEILING SPACE, COORDINATE WITH OWNER AND SECURITY CONTRACTOR EXACT LOCATION PRIOR TO ROUGH IN.
CAM-001 (RE)
CAM-002 (RE)
CAM-003 (RE)
CAM-004 (RE)
CAM-005 (RE)
CAM-006 (RE)
CAM-007 (RE)
CAM-008 (RE)
CAM-009 (RE)
CAM-010 (RE)
CAM-011 (RE)
CAM-012 (RE)
CAM-013 (RE)
CAM-014 (RE)
CAM-015 (RE)
CAM-016 (NEW)
CAM-017 (RE)
CAM-018 (RE)
CAM-019 (RE)
CAM-020 (RE)
CAM-021 (RE)
CAM-043 (NEW)
CAM-044 (RE)
CAM-045 (RE)
CAM-055 (NEW)
EXISTING NEW TECH HIGH SCHOOL BUILDING
EXISTING TEMPORARY BUILDING
EXISTING TEMPORARY BUILDING
EXISTING CAFATERIA
EXISTING BUILDING
REFER TO T501, DETAIL 3 FOR POLE LOCATION
CAM-054 (NEW)
CAM-034 (RE)
CAM-035 (RE)
CAM-036 (RE)
CAM-037 (RE)
CAM-038 (RE)
CAM-039 (RE)
CAM-040 (RE)
CAM-041 (RE)
CAM-042 (RE)
CAM-046 (RE)
CAM-047 (RE)
CAM-048 (RE)
CAM-049 (RE)
CAM-050 (RE)
CAM-051 (RE)
CAM-052 (RE)
CAM-053 (RE)
EXISTING NEW TECH MIDDLE SCHOOL BUILDING
CONDUIT(S) SHALL STUB INTO THE EXISTING BUILDING ACCESSIBLE CEILING SPACE, COORDINATE WITH OWNER AND SECURITY CONTRACTOR EXACT LOCATION PRIOR TO ROUGH IN.
(1) 1" CONDUIT
(1) 2" CONDUIT
GATE MOTOR, CONTROLLER AND VEHICLE LOOP (BY GATE PROVIDER)
REFER TO T501, DETAIL 5 FOR POLE LOCATION
CAM-057 (NEW)
VEHICLE DETECTION LOOP (BY GATE PROVIDER)
(1) 1" CONDUIT
PROVIDE NEW SECURITY SYSTEM PEDESTAL
CAM-056 (NEW)
REFER TO T501, DETAIL 4 FOR POLE LOCATION
CAM-025 (RE)
CAM-026 (RE)
CAM-027 (RE)
CAM-028 (RE)
CAM-029 (RE)
CAM-030 (RE)
CAM-031 (RE)
EXISTING MEDICAL BUILDING
D
C
B

CARD READER AND INTERCOM BOX DETAIL



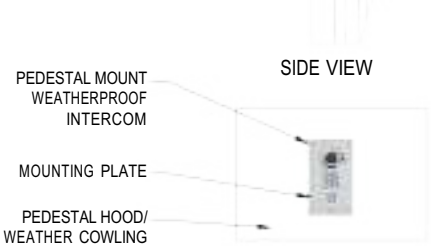
SECURITY PEDESTAL ELEVATION

GENERAL NOTES:

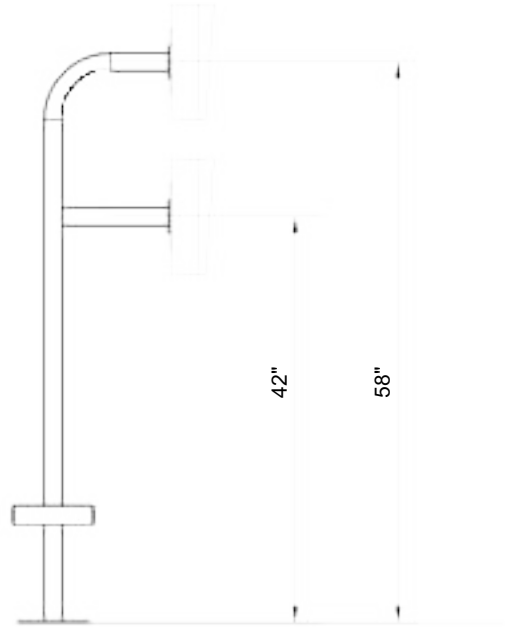
1. UNLESS OTHERWISE NOTED, ALL FASTENERS, SCREWS, BOLTS/ANCHORS AND OTHER MOUNTING ACCESSORIES SHALL BE MADE OF 316 STAINLESS STEEL.

1 TYPICAL CARD READER PEDESTAL DETAIL

T501 NTS



LOWER CARD READER AND INTERCOM BOX DETAIL



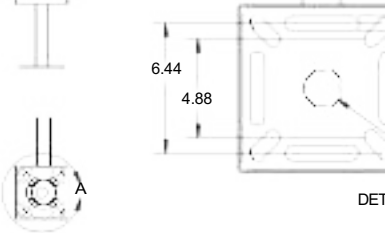
SECURITY PEDESTAL ELEVATION

GENERAL NOTES:

1. UNLESS OTHERWISE NOTED, ALL FASTENERS, SCREWS, BOLTS/ANCHORS AND OTHER MOUNTING ACCESSORIES SHALL BE MADE OF 316 STAINLESS STEEL.

2 TYPICAL CARD READERIINTERCOM PEDESTAL DETAIL

T501 NTS



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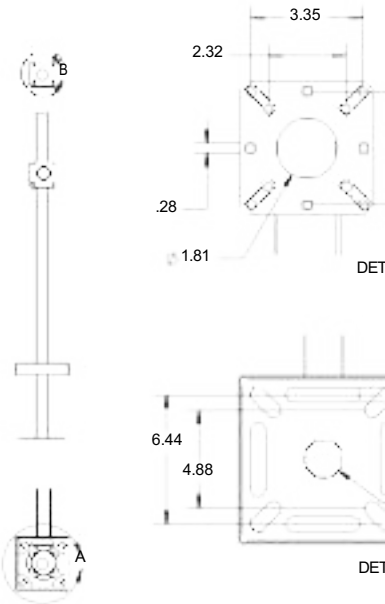
3 CARD READERIINTE

T501 NTS



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DET

4 CARD READER PEDE

T501 NTS