Angleton Fire Station #3 Addition

2743 N. Velasco St.
Angleton, TX 77515

Architect
Integrated Architecture & Design, LLC
107 West Way, Suite 16
Lake Jackson, TX 77566
979.297.1411 p. / 979.297.1418 f.

Civil
Baker & Lawson, Inc.
4005 Technology Dr.
Angleton, TX 77515
979.849.6681 p.

Structural
CJG Engineers
3200 Wilcrest Dr., Suite 305
Houston, TX 77042
713.780.3345 p.

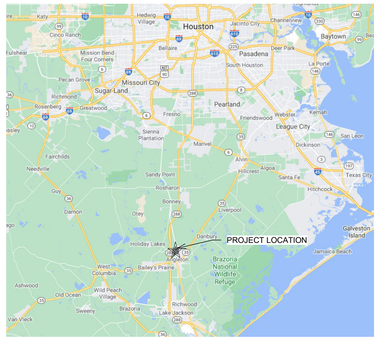
Mechanical,Electrical, & Plumbing
DVO an Urban-Gro Company
825 Town and Country Lane, Suite 1150
Houston, TX 77024
281.293.7500 p.

SCHEMATIC DESIGN	05/02/23
95% CD OWNER REVIEW SET	06/02/23

AC	AIR CONDITION(ING)
ACT	ACOUSTICAL CEILING TILE
ACOUST	ACOUSTICAL
ADJ	ADJUSTABLE
AES	ABOVE EXISTING SLAB
AFF	ABOVE FINISH FLOOR
ALUM	ALUMINUM
A/V	AUDIO/VISUAL
BD	BOARD
BLK	BLACK
BLDG	BUILDING
BLKG	BLOCKING
BM	BEAM
BOT	BOTTOM
CAB	CABINET
CF/CI	CONTRACTOR FURNISHED/ CONTRACTOR INSTALLED
CG	CORNER GUARD
CJ	CONTROL JOINT
CL	CENTER LINE
CLG	CEILING
CLR	CLEAR
CMU	CONCRETE MASONRY UNIT
COL	COLUMN
CONC	CONCRETE
CONT	CONTINUOUS
CPT	CARPET
CT	CERAMIC TILE
CTR	CENTER
DBL	DOUBLE
DIA	DIAMETER
DIM	DIMENSION
DN	DOWN
DR	DOOR
DS	DOWNSPOUT
DTL	DETAIL
DW	DISHWASHER
DWG	DRAWING
EA	EACH
EJ	EXPANSION JOINT
ELECT	ELECTRICAL
ELEV	ELEVATION
ENCL	ENCLOSED
EQ	EQUAL
EQUIP	EQUIPMENT
EW	EACH WAY
EWC	ELECTRIC WATER COOLER
EXIST	EXISTING
EXP	EXPANSION
EXT	EXTERIOR
FD	FLOOR DRAIN
FE	FIRE EXTINGUISHER
FEC	FIRE EXTINGUISHER CABINET
FF	FINISH FLOOR
FIN	FINISH
FIXT	FIXTURE
FLR	FLOOR
FLUOR	FLUORESCENT
GA	GAUGE
GALV	GALVANIZED
GC	GENERAL CONTRACTOR
GD	GRADE
GL	GLASS
GMS	GALVANIZED METAL STUD
GWB	GYPSUM WALLBOARD
GYP BD	GYPSUM BOARD
INT.	INTERIOR
HC	HANDICAPPED
HM	HOLLOW METAL
HD	HAND
HORIZ	HORIZONTAL
HT	HEIGHT
HR	HOUR
HWARE	HARDWARE
INSUL	INSULATION
JT	JOINT
LAM	LAMINATE
LAV	LAVATORY
LLH	LONG LEG HORIZONTAL
LLV	LONG LEG VERTICAL
LT	LIGHT
MANUF/MFR	MANUFACTURER
MAT	MATERIAL
MAX	MAXIMUM
MECH	MECHANICAL
MILL WK	MILLWORK
MIN	MINIMUM
M.O.	MASONRY OPENING
MTD	MOUNTED
MTL	METAL
NIC	NOT IN CONTRACT
NO	NUMBER
NOM	NOMINAL
N.T.S.	NOT TO SCALE
OC	ON CENTER
OF/CI	OWNER FURNISHED/ CONTRACTOR INSTALLED
OF/OI	OWNER FURNISHED/ OWNER INSTALLED
OH	OPPOSITE HAND
OPP	OPPOSITE
PCT	PORCELAIN CERAMIC TILE
PCS	PIECES
PLAM	PLASTIC LAMINATE
PLAS	PLASTIC
PLYWD	PLYWOOD
POL	POLISH(ED)
PT	PRESSURE TREATED
PTD	PAINTED
PL	PLATE
QT	QUARRY TILE
R/RAD	RADIUS(ED)
RCP	REFLECTED CEILING PLAN
RD	ROOF DRAIN
REF/RE:	REFER TO
REINF	REINFORCING/REINFORCED
REQ'D.	REQUIRED
RET	RETARDANT
RM	ROOM
R.O.	ROUGH OPENING
S.B.O.	SUPPLIED BY OWNER
SHT	SHEET
SIM	SIMILAR
SJ	SCORED JOINT
SLT	SEALANT
SPEC'D.	SPECIFIED
SPECS	SPECIFICATIONS
SQ	SQUARE
SS	STAINLESS STEEL
STD	STANDARD
STL	STEEL
STRUCT	STRUCTURAL
SUSP	SUSPENDED
TB	TACKBOARD
TEMP	TEMPORARY/TEMPERED
THR	THRESHOLD
TS	TUBE STEEL COLUMN
TYP	TYPICAL
UNEQ	UNEQUAL
UNO	UNLESS NOTED OTHERWISE
V.I.F.	VERIFY IN FIELD
VAR	VARIES
VCT	VINYL COMPOSITE TILE
VERT	VERTICAL
VTR	VENT THRU ROOF
W	WIDE
W/	WITH
WC	WATER CLOSET
WD	WOOD
WDW	WINDOW
WMB	WHITE MARKER BOARD
WP	WEATHER PROOFING
WT	WEIGHT
WWF	WELDED WIRE FABRIC

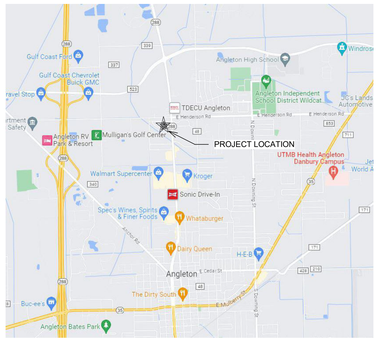
6 ABBREVIATIONS

N.T.S.



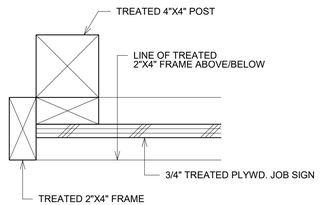
3 REGIONAL MAP

BRAZORIA COUNTY, TEXAS



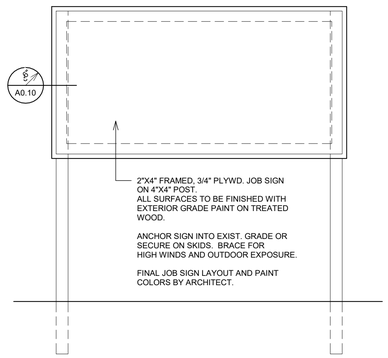
2 PROJECT LOCATION

ANGLETON, TEXAS



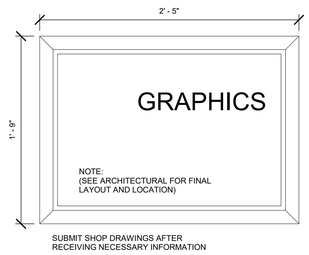
5 JOB SIGN DETAIL

3" = 1'-0"



4 JOB SIGN

1/2" = 1'-0"



SUBMIT SHOP DRAWINGS AFTER RECEIVING NECESSARY INFORMATION

1 ID PLAQUE

1 1/2" = 1'-0"

PROJECT ADDRESS

2743 N. VELASCO ST
ANGLETON, TEXAS 77515

BUILDING CODE

2018 INTERNATIONAL BUILDING CODE - TEXAS AMENDMENTS
2018 MECHANICAL CODE
2017 NATIONAL ELECTRICAL CODE
2018 FIRE CODE
2018 PLUMBING CODE
2018 LIFE SAFETY CODE
2015 ENERGY CONSERVATION CODE
ALL COUNTY ADOPTED ORDINANCES AND CODES
AMERICAN WITH DISABILITIES ACT
2012 TEXAS ACCESSIBILITY STANDARDS

OCCUPANCY USE

STORAGE GROUP S1

CONSTRUCTION TYPE

TYPE II - B (NON-SPRINKLED)

ZONING USE

N/A

PROJECT SCOPE

ENGINE BAYS 3,240 TOTAL SQUARE FEET

SUMMARY OF WORK

NEW PRE-ENGINEERED METAL BUILDING 3 ENGINE BAYS AND STORAGE.

CODE INFORMATION

N.T.S.

INDEX OF DRAWINGS

N.T.S.

ANGLETON
Where the Heart is

Angleton Fire Station #3 Addition

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Angleton, Texas 77515

iAD ARCHITECTS

Integrated Architecture & Design, LLC
107 West Way, Suite 16
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Houston, TX 77024
281.293.7500 p.

iAD PROJECT #	23017
ISSUE DATE:	06/02/23

	06/02/23	95 % OWNER REVIEW SET

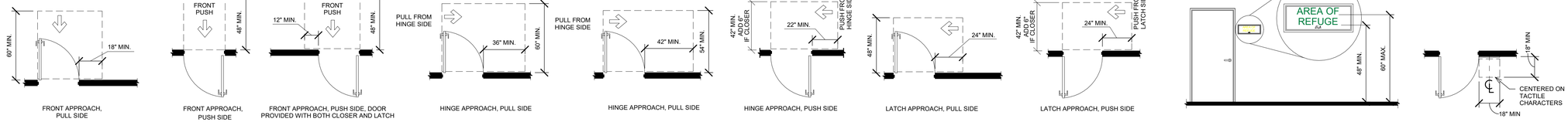
REVISION LOG

GENERAL INFORMATION

A0.10

SCALE: AS NOTED

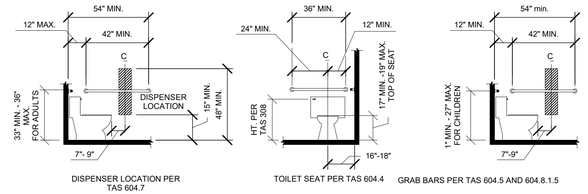
6/2/2023 8:49:44 AM



6 2012 T.A.S. 404

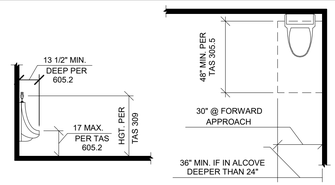
1/4" = 1'-0"

NOTE:
REFER TO THE TEXAS ACCESSIBILITY STANDARDS, SECTION 404 FOR ADDITIONAL INFORMATION ON DOORS, DOORWAYS AND GATES



4 2012 T.A.S. 604

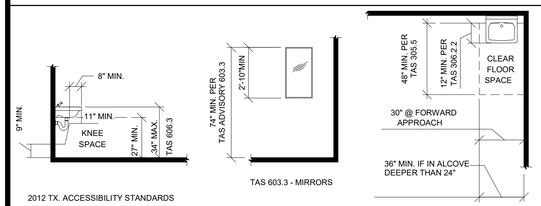
1/4" = 1'-0"



212 TX. ACCESSIBILITY STANDARDS (TAS): 605-URINALS

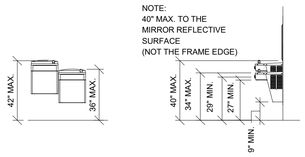
5 2012 T.A.S. 605

1/4" = 1'-0"



3 2012 T.A.S. 606

1/4" = 1'-0"



2 TAS DRINK FOUNTAIN CLEARANCES

1/4" = 1'-0"

ACCESSIBILITY GENERAL NOTES:

1. THE FOLLOWING ILLUSTRATIONS DEPICT SEVERAL OF THE MOST COMMON ELEMENTS OF THE 2012 TEXAS ACCESSIBILITY STANDARDS, AND ARE PROVIDED FOR QUICK REFERENCE ONLY. EACH ILLUSTRATION MAY NOT CONTAIN ALL THE NECESSARY INFORMATION FOR EACH SECTION DEPICTED OR MAY REFERENCE SPECIFIC SUBSECTION FOR FURTHER EXPLANATION.

2. IT IS RECOMMENDED THAT THE GENERAL CONTRACTOR KEEP A COPY OF THE 2012 TEXAS ACCESSIBILITY STANDARDS AT THE JOB SITE (OR IN A READILY ACCESSIBLE LOCATION) FOR THE USE BY ALL PARTIES INVOLVED IN THE CONSTRUCTION PROCESS.

3. A COPY OF THE T.A.S. CAN BE PURCHASED , OR DOWNLOADED EITHER BY INDIVIDUAL SECTION OR IN IT'S ENTIRETY IN A FORMAT FROM THE WEBSITE ADDRESS BELOW.

4. SHOULD QUESTIONS ARISE.
http://www.license.state.tx.us/ab/abtas/htm

GENERAL NOTES

1. MINIMUM CLEAR WIDTH OF ACCESSIBLE ROUTE TO BE 36".
2. RUNNING SLOPE SHALL NOT EXCEED 1:20. (CROSS SLOPE SHALL NOT EXCEED 1:48).
3. 1/4" TO 1/2" CHANGES IN LEVEL REQUIRE EDGE TO BE BEVELED WITH A SLOPE NO GREATER THAN 1:2.
4. THE HIGHEST OPERABLE PART OF CONTROLS, DISPENSERS, RECEPTACLES AND OTHER OPERABLE EQUIPMENT SHALL BE PLACED NO HIGHER THAN 48" AND NO LOWER THAN 15" ABOVE FINISHED FLOOR. THESE REQUIREMENTS SHALL APPLY TO CONTROLS AND OPERATING MECHANISMS WHICH ARE EXPECTED TO BE OPERATED BY OCCUPANTS, VISITORS, OR OTHER USERS OF A BUILDING OF FACILITY AND MAY INCLUDE, BUT ARE NOT LIMITED TO, THERMOSTATS, LIGHT SWITCHES, ALARM ACTIVATING DEVICES, VENTILATORS AND ELECTRICAL OUTLETS.
5. PROVIDE SOLID BLOCKING AT ALL WALL MOUNTED ACCESSORIES AND/OR EQUIPMENT.

RAMPS

1. MAXIMUM SLOPE SHALL BE 1:12.
2. TRANSITIONS SHALL BE FLUSH AND FREE OF ABRUPT CHANGES.
3. MAXIMUM SLOPE OF ADJACENT SURFACES SHALL BE 1:20.
4. MINIMUM CLEAR WIDTH SHALL BE 36"
5. HANDRAILS ARE REQUIRED IF RISE IS GREATER THAN 6" OR RUN EXCEEDS 72".
6. WHEN REQUIRED, HANDRAILS SHALL BE PROVIDED ON BOTH SIDES OF RAMPS.
7. INSIDE RAIL ON SWITCH BACK OR DOGLEG RAMPS SHALL BE CONTINUOUS.
8. WHERE HANDRAILS ARE NOT CONTINUOUS, RAILS SHALL EXTEND AT LEAST 12" BEYOND THE TOP AND BOTTOM EDGES OF RAMP AND EXTEND PARALLEL TO THE GROUND SURFACE.
9. HEIGHT OF HANDRAILS SHALL BE BETWEEN 34"-38". (TYP. AT 35" A.F.F.)
10. CLEAR FLOOR SPACE BETWEEN RAILS AND ANY WALL SHALL BE 1-1/2".
11. GRIPPING SURFACES SHALL BE UNINTERRUPTED BY NEWEL POST, OTHER CONSTRUCTION ELEMENTS OR OBSTRUCTIONS FOR 20% OF LENGTH.
12. HANDRAIL ENDS SHALL BE ROUNDED, OR RETURNED SMOOTHLY TO FLOOR, WALL OR POST.
13. HANDRAILS SHALL NOT ROTATE IN THEIR FITTINGS.
14. DIAMETER OR WIDTH OF GRIPPING SURFACES SHALL BE 1-1/4" TO 2" FOR CIRCULAR CROSS SECTION, OR SHALL PROVIDE AN EQUIVALENT GRIPPING SURFACE TO ROUTE OF TRAVEL. NON-CIRCULAR CROSS SECTIONS SHALL HAVE A PERIMETER OF 4"MINIMUM AND 6-1/4" MAXIMUM, AND A MAXIMUM CROSS SECTION DIMENSION OF 2-1/4".
15. ALL REQUIRED CURB RAMPS SHALL BE PAINTED A CONTRASTING COLOR TO ANY ADJACENT FINISH.
16. SIDES OF REQUIRED CURB RAMPS SHALL HAVE A MAXIMUM SLOPE OF 1:10.

STAIRS

1. ALL STEPS ON ALL FLIGHTS OF STAIRS SHALL HAVE UNIFORM RISER HEIGHTS AND TREAD DEPTHS. MINIMUM TREAD DEPTH SHALL BE 11" MEASURED FROM RISER TO RISER.
2. UNDERSIDE OF NOSINGS SHALL NOT BE ABRUPT. RADIUS OF CURVATURE AT LEADING TREAD EDGE SHALL NOT EXCEED 1/2". RISERS SHALL BE PERMITTED TO SLOPE UNDER THE TREAD AT AN ANGLE OF 30 DEGREES MAXIMUM FROM VERTICAL.
3. HANDRAILS ARE REQUIRED AT BOTH SIDES OF ALL STAIRS.
4. INSIDE RAIL ON SWITCH BACK OR DOGLEG STAIRS SHALL BE CONTINUOUS.
5. WHERE NOT CONTINUOUS, HANDRAIL EXTENSIONS SHALL BE PROVIDED AS FOLLOWS: TOP OF STAIR FLIGHTS - PARALLEL TO FLOOR 12" MINIMUM BEYOND THE TOP RISER NOSING. BOTTOM OF STAIR FLIGHT - CONTINUE SLOPING FOR ONE TREAD WIDTH BEYOND BOTTOM RISER, PARALLEL TO FLOOR.
6. HANDRAIL HEIGHT SHALL BE BETWEEN 34"-38". (TYP. AT 35") MEASURED FROM STAIR NOISING.
7. CLEAR FLOOR SPACE BETWEEN RAIL AND ANY WALL SHALL BE 1-1/2".
8. GRIPPING SURFACES SHALL BE UNINTERRUPTED BY NEWEL POST, OTHER CONSTRUCTION ELEMENTS OR OBSTRUCTIONS FOR MORE THAN 20% OF LENGTH.
9. HANDRAIL ENDS SHALL BE ROUNDED, OR RETURNED SMOOTHLY TO FLOOR, WALL OR POST.
10. HANDRAILS SHALL NOT ROTATE IN THEIR FITTINGS.
11. DIAMETER OR WIDTH OF GRIPPING SURFACES SHALL BE 1-1/4" TO 2", OR SHALL PROVIDE AN EQUIVALENT GRIPPING SURFACE TO ROUTE OF TRAVEL.
12. RISERS SHALL BE A MINIMUM OF 4" AND A MAXIMUM 7" HIGH.

DOORS - REFER TO DIAGRAMS THIS SHEET

1. DOORWAYS SHALL PROVIDE A CLEAR OPENING OF 32" MINIMUM WITH THE DOOR OPENED AT 90 DEGREES.
2. OPENINGS MORE THAN 24" IN DEPTH SHALL PROVIDE A CLEAR OPENING OF 36" MINIMUM.
3. MAXIMUM THRESHOLD HEIGHT SHALL BE 1/2".
4. DOOR HARDWARE - HANDLES, PULLS, LATCHES, LOCKS AND OTHER OPERATING DEVICES SHALL HAVE A SHAPE THAT IS EASY TO GRASP WITH ONE HAND AND DOES NOT REQUIRE TIGHT GRASPING, TIGHT PINCHING OR TWISTING OF THE WRIST TO OPERATE.
5. LEVER-OPERATED MECHANISMS, PUSH-TYPE MECHANISMS, AND U-SHAPED HANDLES ARE ACCEPTABLE DESIGNS.
6. HARDWARE REQUIRED FOR PASSAGE SHALL BE MOUNTED NO HIGHER THAN 48" ABOVE FINISHED FLOOR.
7. DOOR CLOSER - IF A DOOR HAS A CLOSER, THEN THE SWEEP PERIOD OF THE CLOSER SHALL BE ADJUSTED SO THAT FROM AN OPEN POSITION OF 90 DEGREES. THE TIME REQUIRED TO MOVE THE DOOR TO A POSITION OF 12 DEGREES FROM LATCH IS 5 SECONDS MINIMUM.
8. DOOR OPENING FORCE - THE MAXIMUM FORCE FOR PUSHING OR PULLING OPEN A DOOR SHALL BE AS FOLLOWS: A.) EXTERIOR HINGED DOORS: 8 LBS. B.) INTERIOR HINGED DOORS: 5 LBS. C.) SLIDING OR FOLDING DOORS: 5 LBS.
9. AUTOMATIC DOORS AND POWER ASSISTED DOORS - IF AN AUTOMATIC DOOR IS USED, THEN IT SHALL COMPLY WITH ANSI/BHMAA 156.10-1985. SLOWLY OPENING, LOW POWERED, AUTOMATIC DOORS SHALL COMPLY WITH ANSI 156.19.1884. SUCH DOORS SHALL NOT OPEN BACK FASTER THAN 3 SECONDS AND SHALL REQUIRE NOT MORE THAN 15 LBS TO STOP DOOR MOVEMENT. IF A POWER ASSISTED DOOR IS USED, ITS DOOR OPENING FORCE SHALL COMPLY WITH FORCES LISTED ABOVE AND ITS CLOSING FORCE SHALL COMPLY WITH ANSI 156.19.1884.

WATER CLOSETS

1. WATER CLOSETS SHALL BE LOCATED 16" TO 18" TO THE CENTER LINE FROM A SIDE WALL OR PARTITION.
2. THE HEIGHT TO THE TOP OF THE TOILET SEAT SHALL BE 15" TO 19".
3. FOR WATER CLOSETS NOT LOCATED IN TOILET STALLS, THE FOLLOWING GRAB BARS SHALL BE PROVIDED AT A HEIGHT OF 33" TO 36" A.F.F. 1.) SIDE WALL: 42" LONG MINIMUM, 12" FROM BACK WALL. 2.) BACK WALL: 36" LONG MINIMUM, 12" MINIMUM AT EACH SIDE OF WATER CLOSET CENTER LINE.
4. FLUSH CONTROLS SHALL BE 36" MAXIMUM A.F.F. CONTROLS FOR FLUSH VALVES SHALL BE MOUNTED ON THE OPEN AREA SIDE OF THE COMPARTMENT.
5. TOILET PAPER DISPENSERS SHALL BE INSTALLED ON THE SIDE WALL, BELOW THE GRAB BAR, 7" TO 9" ON CENTER BEYOND THE FRONT LEADING EDGE OF WATER CLOSET.

URINALS

1. URINALS SHALL BE WALL HUNG WITH AN ELONGATED RIM 17" MAXIMUM A.F.F.
2. FLUSH CONTROLS SHALL BE A MAXIMUM OF 36" A.F.F.

LAVATORIES AND MIRRORS

1. LAVATORIES SHALL EXTEND A MINIMUM OF 17" FROM THE WALL.
2. CLEARANCE OF 29" MINIMUM AND 36" MAXIMUM SHALL BE PROVIDED FROM FINISH FLOOR TO BOTTOM OF APRON.
3. KNEE CLEARANCE OF 27" MINIMUM SHALL EXTEND 8" MINIMUM UNDER THE EDGE OF THE LAVATORY.
4. TOE CLEARANCE OF 9" MINIMUM SHALL BE PROVIDED FOR THE FULL DEPTH OF THE LAVATORY.
5. HOT WATER AND DRAIN PIPES UNDER LAVATORIES SHALL BE INSULATED OR OTHERWISE CONFIGURED TO PROTECT AGAINST CONTACT.
6. MIRRORS SHALL BE MOUNTED WITH THE BOTTOM EDGE OF THE REFLECTING SURFACE A MAXIMUM OF 40" A.F.F. AND THE TOP EDGE AT A MAXIMUM OF 74" A.F.F.
7. MEDICINE CABINETS, WHEN SPECIFIED, SHALL BE INSTALLED WITH AT LEAST ONE USEABLE SHELF MOUNTED NO HIGHER THAN 48" A.F.F.

GRAB BARS

1. DIAMETER OR WITH OF GRIPPING SURFACE SHALL BE 1-1/4" TO 2" MAXIMUM OR THE SHAPE SHALL PROVIDE AN EQUIVALENT GRIPPING SURFACE.
2. THE SPACE BETWEEN GRAB BARS AND ADJACENT WALLS SHALL BE 1-1/2".
3. GRAB BARS SHALL NOT ROTATE WITHIN THEIR FITTINGS.
4. GRAB BARS AND ADJACENT WALL SURFACES SHALL BE FREE OF SHARP OR ABRASIVE SURFACES.
5. EDGES SHALL HAVE A RADIUS OF 1/8" MINIMUM.
6. GRAB BARS SHALL BE DESIGNED TO RESIST A SINGLE CONCENTRATED LOAD OF 250 LBS. APPLIED ON ANY DIRECTION.

SINKS

1. KNEE CLEARANCE OF 27" HIGH MINIMUM, 30" WIDE MINIMUM AND 11" DEEP MINIMUM SHALL BE PROVIDED UNDER SINKS.
2. HOT WATER AND DRAIN PIPES UNDER SINKS SHALL BE INSULATED OR OTHERWISE CONFIGURED TO PROTECT AGAINST CONTACT.

SIGNAGE

1. SIGNS WHICH DESIGNATE PERMANENT ROOMS AND SPACES SHALL COMPLY WITH THE REQUIREMENTS LISTED BELOW. MOUNTING LOCATIONS AND HEIGHT WHERE PERMANENT IDENTIFICATION IS PROVIDED FOR ROOMS AND SPACES, SIGNS SHALL BE INSTALLED ON THE WALL ADJACENT TO THE LATCH SIDE OF THE DOOR. WHERE NO WALL SPACE IS AVAILABLE ON THE LATCH SIDE, INCLUDING DOUBLE LEAF DOORS, SIGNS SHALL BE PLACED ON THE NEAREST ADJACENT WALL. MOUNTING HEIGHT SHALL BE 48" TO 60" A.F.F. TO THE CENTER LINE OF THE SIGN.
2. EXTERIOR TRAFFIC CROSSING FROM ADA SPACES TO BUILDING ENTRANCE SHALL RECEIVE YELLOW SURFACE MARKINGS 8'-0" WIDE, MINIMUM AND ADA CROSSING WARNING SIGNS FOR AUTO TRAFFIC.

CHARACTER PROPORTIONS

1. WIDTH OF THE UPPERCASE "O" IS 55% MINIMUM AND 110% MAXIMUM OF THE HEIGHT OF THE UPPERCASE "I".

ALARMS

1. VISUAL ALARM SIGNAL APPLIANCES SHALL BE PLACED 80" A.F.F. WITHIN THE SPACE OR 6" BELOW THE CEILING, WHICHEVER IS LOWER.
2. ALARM SYSTEMS SHALL MEET ADA/TAS REQUIREMENTS INCLUDING FLASHING LIGHTS AT 100' MAXIMUM SPACING IN CORRIDORS AND EVENTUALLY LEASED AREAS DURING TENANT FINISH.

CHARACTER HEIGHT

1. CHARACTERS AND NUMBERS ON SIGNS SHALL BE SIZED ACCORDING TO THE VIEWING DISTANCE FROM WHICH THEY ARE TO BE READ. CHARACTER HEIGHT, MEASURED VERTICALLY FROM BASELINE OF THE CHARACTER, SHALL BE 5/8" TO 2", BASED ON THE HEIGHT OF THE UPPER-CASE LETTER "I". LOWER CASE CHARACTER ARE PERMITTED. OVERHEAD SIGNS SHALL HAVE A MINIMUM CLEARANCE OF 80" A.F.F. UNDER LOWEST POINT OF THE SIGN. MINIMUM CHARACTER HEIGHT SHALL BE 3"

RAISED AND BROILED CHARACTERS

1. LETTERS AND NUMBERS SHALL BE RAISED A MINIMUM OF 1/32" UPPER CASE "SAN SERIF" OR "SIMPLE SERIF" TYPE AND SHALL BE ACCOMPANIED WITH GRADE 2 BRAILLE. RAISED CHARACTERS SHALL BE AT LEAST 5/8" HIGH, BUT NO HIGHER THAN 2". PICTOGRAMS SHALL BE ACCOMPANIED BY THE EQUIVALENT VERBAL DESCRIPTION PLACED DIRECTLY BELOW PICTOGRAMS. THE BORDER DIMENSION OF THE PICTOGRAM SHALL BE 6" MINIMUM IN HEIGHT.

FINISH AND CONTRAST

1. THE CHARACTERS AND BACKGROUND OF THE SIGNS SHALL BE NON-GLARE FINISH. CHARACTERS AND SYMBOLS SHALL CONTRAST WITH THEIR BACKGROUND. I.E. LIGHT CHARACTERS ON DARK BACKGROUNDS.

MOUNTING LOCATIONS AND HEIGHTS

1. SIGNS SHALL BE INSTALLED ON THE WALL AND ADJACENT TO THE LATCH SIDE OF THE DOOR. IF NO SPACE IS AVAILABLE ON THE LATCH SIDE OF THE DOOR, SUCH AS WITH DOUBLE LEAF DOORS, THE SIGN SHALL BE PLACED ON THE NEAREST ADJACENT WALL. MOUNTING HEIGHT SHALL BE 60" A.F.F. TO THE CENTER LINE OF THE SIGN. MOUNTING LOCATION SHALL BE SUCH THAT A PERSON MAY APPROACH WITHIN 3" OF THE SIGN WITHOUT ENCOUNTERING A PROTRUDING OBJECT OR STANDING WITHIN THE SWING OF THE DOOR.

T.A.S. 308 REACH RANGES AND 309 OPERABLE PARTS

	AGES 11 THRU 14 OR 15 GRADES 6 THRU 8 OR 9	ADULT
REACH RANGES		
FRONTAL APPROACH	44" MAX.	44" MAX. 15" MIN.)
SIDE APPROACH	44" MAX.	54" MAX. (9" MIN.)
MOUNTING HEIGHTS		
RAMPS AND STAIRS		
TOP OF HANDRAIL GRIPPING SURFACES	34" - 38"	34" - 38"
ELEVATORS		
CAR CONTROL FLOOR BUTTONS		
FRONTAL APPROACH	44" MAX.	48" MAX. (35" MIN.)
SIDE APPROACH	44" MAX.	54" MAX. (35" MIN.)
EMERGENCY/COMMUNICATION		
HIGHEST OPERABLE PART	44" MAX.	48" MAX.
PLATFORM LIFTS		
CONTROLS/OPERATING MECHANISMS	28" TO 44"	28" TO 48"
DRINKING FOUNTAINS AND WATER COOLERS		
FRONTAL APPROACH		
SPOUT HEIGHT (TO OUTLET)	34" MAX.	36" MAX.
KNEE CLEARANCES	27" MAX.	27" MIN.
SIDE APPROACH		
SPOUT HEIGHT (TO OUTLET)	34" MAX.	34" MAX.
WATER CLOSETS		
TOP OF SEAT	15" TO 17"	17" TO 19"
GRAB BARS	25" TO 27"	33" TO 36"
FLUSH CONTROLS	44" MAX.	44" MAX.
TOILET PAPER DISPENSER	19" TO CENTER OF ROLL	19" TO CENTER OF ROLL
URINALS		
RIM OF BASIN	17" MAX.	17" MAX.
FLUSH CONTROLS	44" MAX.	44" MAX.
LAVATORIES AND SINKS		
RIM OF COUNTER SURFACE	32" MAX.	34" MAX.
KNEE CLEARANCE	27" MAX	27" MIN.
TO FAUCET FROM FRONT EDGE	20" MAX.	22" MAX.
MIRRORS		
TO BOTTOM OF REFLECTIVE SURFACE	37" MAX.	40" MAX.
BATHTUBS		
TOP OF SEAT	15" TO 17"	17" TO 19"
GRAB BARS	33" TO 36"	33" TO 36"
HAND SHOWER HEAD MOUNTING	44" MAX.	48" MAX.
SHOWER STALLS		
TOP OF SEAT	17 TO 19"	17 TO 19"
GRAB BARS	25" TO 27"	33" TO 36"
HAND SHOWER HEAD MOUNTING		
FRONTAL APPROACH	44" MAX.	48" MAX.
SIDE APPROACH	44" MAX.	48" MAX.
STORAGE		
FRONTAL APPROACH	45" MAX.	48 MAX.
SIDE APPROACH		
DISTANCE FROM WHEELCHAIR		
0" TO 10"	44" MAX.	48" MAX.
10" TO 21"	44" MAX.	48" MAX.
CONTROLS AND OPERATING MECHANISMS		
HIGHEST OPERABLE PART		
FRONTAL APPROACH	44" MAX.	48" MAX.
SIDE APPROACH	44" MAX.	48" MAX.
TELEPHONES		
HIGHEST OPERABLE PART		
FRONTAL APPROACH	44" MAX.	48" MAX.
SIDE APPROACH	44" MAX.	48" MAX.
FIXED OR BUILT-IN SEATING AND TABLES		
HEIGHT OF TABLES OR COUNTERS	28" TO 32"	28" TO 34"
KNEE CLEARANCES	27" MIN.	27" MIN.
DRESSING AND FITTING ROOMS		
TOP OF BENCH (24"X48")	15" TO 17"	17" TO 19"
FOOD SERVICE LINE		
TOP OF TRAY SLIDE	34" MAX.	34" MAX.
MARKER BOARDS/TACK BOARDS		
HEIGHT OF BOTTOM UNIT	36" MAX.	36" MAX.

1 T.A.S. REACH RANGES AND MOUNTING HEIGHTS

ANGLETON
Where the Heart is

Angleton Fire Station #3 Addition
2743 N. Velasco St.
Angleton, Texas 77515

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iAD PROJECT # 23017
ISSUE DATE: 06/02/23

	06/02/23	95 % OWNER REVIEW SET

REVISION LOG

ADA STANDARDS

A0.11

SCALE: AS NOTED

6/2/2023 8:45:45 AM

BUILDING AREA AND CONSTRUCTION TYPE - IBC - 2018

PROJECT: BC PARKS HQ & MAINTENANCE SHOP

I. BUILDING CLASS

1. PRIMARY OCCUPANCY	USE GROUP CLASS: "S-1", (STORAGE - REPAIR GARAGE)
2. SECONDARY OCCUPANCY	N/A
3. TYPE OF CONSTRUCTION	TYPE II-B; NON SPRINKLED
4. AUTOMATIC FIRE SUPPRESSION	A NFPA 13 Sprinkler System will NOT be installed throughout the facility.
5. ACTUAL BUILDING AREA (SF) - "S-1", (STORAGE - REPAIR GARAGE)	3,090 SQ. FT.
6. BUILDING AREA AND HEIGHT LIMITATIONS: (TABLE 504.3, 504.4, & 506.2)	17,500 SF / 55' HT / 2-STORIES
GROUP "S-1", TYPE II-B OCCUPANCY	
MAXIMUM ALLOWABLE AREA INCREASE	NONE TAKEN

II. FIRE PROTECTION: (TABLE 601)

STRUCTURAL FRAME: (TABLE 601)	0 HOUR
INT/EXT BEARING WALLS: (TABLE 601)	0 HOUR
FLOOR/CEILING: (TABLE 601)	0 HOUR
ROOF/CEILING: (TABLE 601)	0 HOUR
EXT WALLS: (TABLE 602) - LESS THAN 5'	1 HOUR TYPE OF FIRE DOORS ALLOWABLE: 3/4 HOUR
- 5' OR MORE, LESS THAN 10'	1 HOUR TYPE OF FIRE DOORS ALLOWABLE: 3/4 HOUR
- 10' OR MORE, LESS THAN 30'	0 HOUR TYPE OF FIRE DOORS ALLOWABLE: 3/4 HOUR
- 30' OR MORE	0 HOUR
SHAFTS: (SECTION 713)	1 HOUR TYPE OF FIRE DOORS ALLOWABLE: 1 HOUR
FIRE WALLS: (TABLE 706.4; SEC. 714.2)	1 HOUR TYPE OF FIRE DOORS ALLOWABLE: 1/3 HOUR
CORRIDORS: (TABLE 1020.1)	0 HOUR TYPE OF FIRE DOORS ALLOWABLE: 0 HOUR
FIRE DAMPERS: (TABLE 717.3.2.1)	1.5 HOUR (* NOT LESS THAN FLOOR PENETRATION)

III. MEANS OF EGRESS:

A. OCCUPANCY LOADS (TABLE 1004.5)	
STORAGE AREAS	300 GROSS SF PER OCCUPANT - 6
B. EGRESS REQUIREMENTS	
MINIMUM CORRIDOR WIDTH: (SECTION 1020.2)	44"
W/50 OR LESS OCCUPANTS: (SECTION 1020.4, #2)	36"
EGRESS WIDTH PER OCCUPANT: (SECTION 1005.1)	0.3"/OCC. STAIRS AND 0.2"/OCC. OTHER - 2.2" EGRESS WIDTH REQUIRED 72" EGRESS WIDTH PROVIDED
NUMBER OF EXITS REQUIRED: (TABLE 1006.3.2)	2 (1-500 OCCUPANTS), 3 (501-1,000 OCCUPANTS), 4 (1,001 OR MORE OCCUPANTS)
MAX TRAVEL DISTANCE TO EXIT: (TABLE 1017.2)	200' (NON-SPRINKLED BUILDING) "S-1"
MAX LENGTH OF DEAD END CORRIDORS: (1020.4)	GROUP B, E, F, I-1, M, R-1, R-2, R-4, S, & U OCCUPANCIES: 50' ALL OTHERS: 20' UNLIMITED WHEN LESS THAN 2.5 TIMES LEAST WIDTH OF CORRIDOR
EXITS THROUGH ADJOINING ROOMS: (SECTION 1016.2)	PERMITTED THRU ACCESSORY NON-HIGH-HAZARDOUS ROOMS NOT PERMITTED THRU KITCHEN, STORAGE, OR SIMILAR ROOMS
COMMON PATH OF TRAVEL: (TABLE 1006.2.1)	75' TO CHOICE OF 2 EXIT PATHS

IV. OCCUPANCY SEPARATION

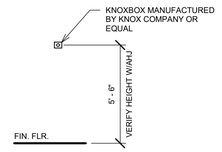
OCCUPANCY SEPARATION REQUIREMENTS: (TABLE 508.4)
NO SEPARATION REQUIRED

V. MISCELLANEOUS DETAILED REQUIREMENTS:

CEILING HEIGHT FOR OCCIPITAL SPACES AND CORRIDORS	(SECTION 1003.2) -	MIN. 7'-6"
CEILING HEIGHT FOR MEANS OF EGRESS	(SECTION 1003.3.1) -	MIN. 6'-8"

VI. PLUMBING FIXTURE REQUIREMENTS:

Min Fixture	Required (S-1) - 6 OCCUPANTS	Provided
Water Closets	1 Men, 1 Women	Facilities provided at adjacent fire station building
Lavatories	1 Men, 1 Women	
Service Sinks	1	



3 KNOX BOX
1/4" = 1'-0"

EXIT ACCESS TRAVEL DISTANCE
(S-1) 200' MAX.

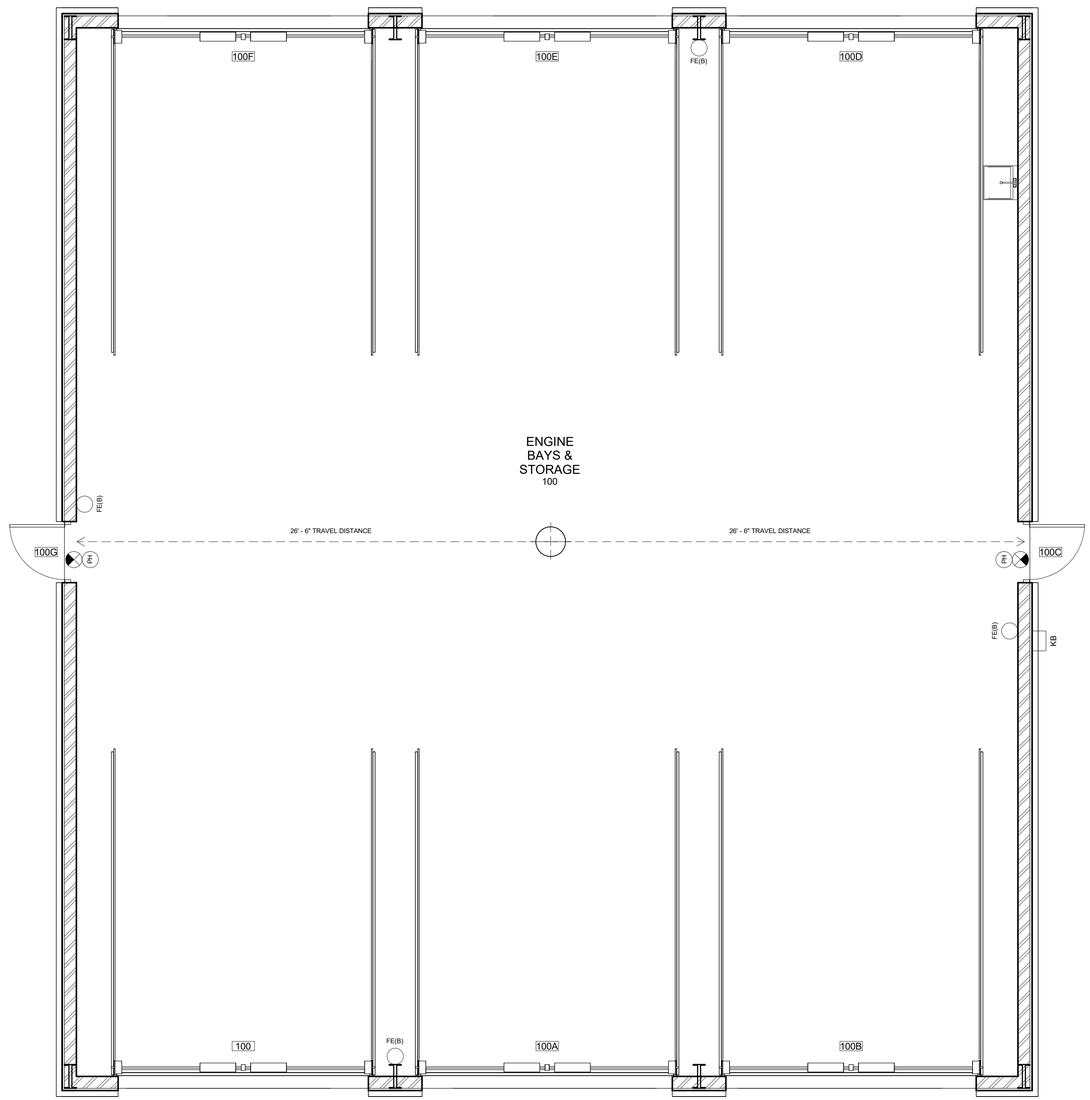
PH — PANIC HARDWARE

EXIT SIGNS

FE(B) — FIRE EXTINGUISHER ON BRACKET

KB — KNOX BOX (VERIFY LOCATION WITH FIRE MARSHAL)

2 LIFE SAFETY LEGEND
1/8" = 1'-0"



1 LIFE SAFETY PLAN
1/4" = 1'-0"
PLAN NORTH

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LIFE SAFETY PLAN

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PLANS FOR CONSTRUCTION OF
ANGLETON FIRE STATION #3
FOR THE
ANGLETON DRAINAGE DISTRICT AND
CITY OF ANGLETON
BRAZORIA COUNTY
B&L JOB No. 15627

CITY OF ANGLETON

CITY COUNCIL

MAYOR
JASON PEREZ

CITY MANAGER
CHRIS WHITTAKER

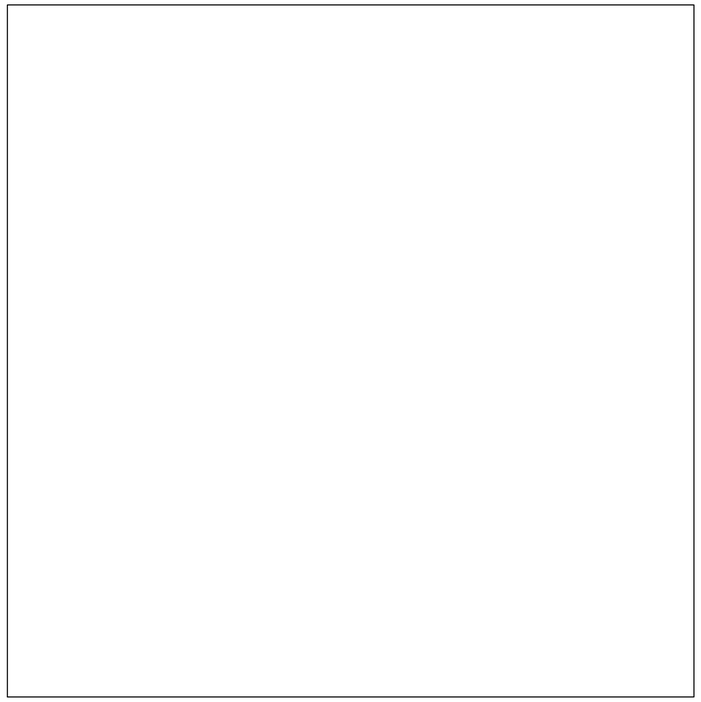
MIKEY SVOBODA
CECIL BOOTH
JOHN WRIGHT
TRAVIS TOWNSEND
MARK GONGORA

ANGLETON DRAINAGE DISTRICT

CHAIRMAN
DAVID SPOOR

BOARD MEMBER
WELDON ZGARBA

BOARD MEMBER
RONNIE SLATE



VICINITY MAP

INDEX OF SHEETS

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TITLE SHEET

C0.00

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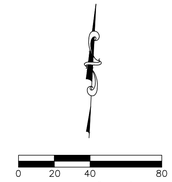
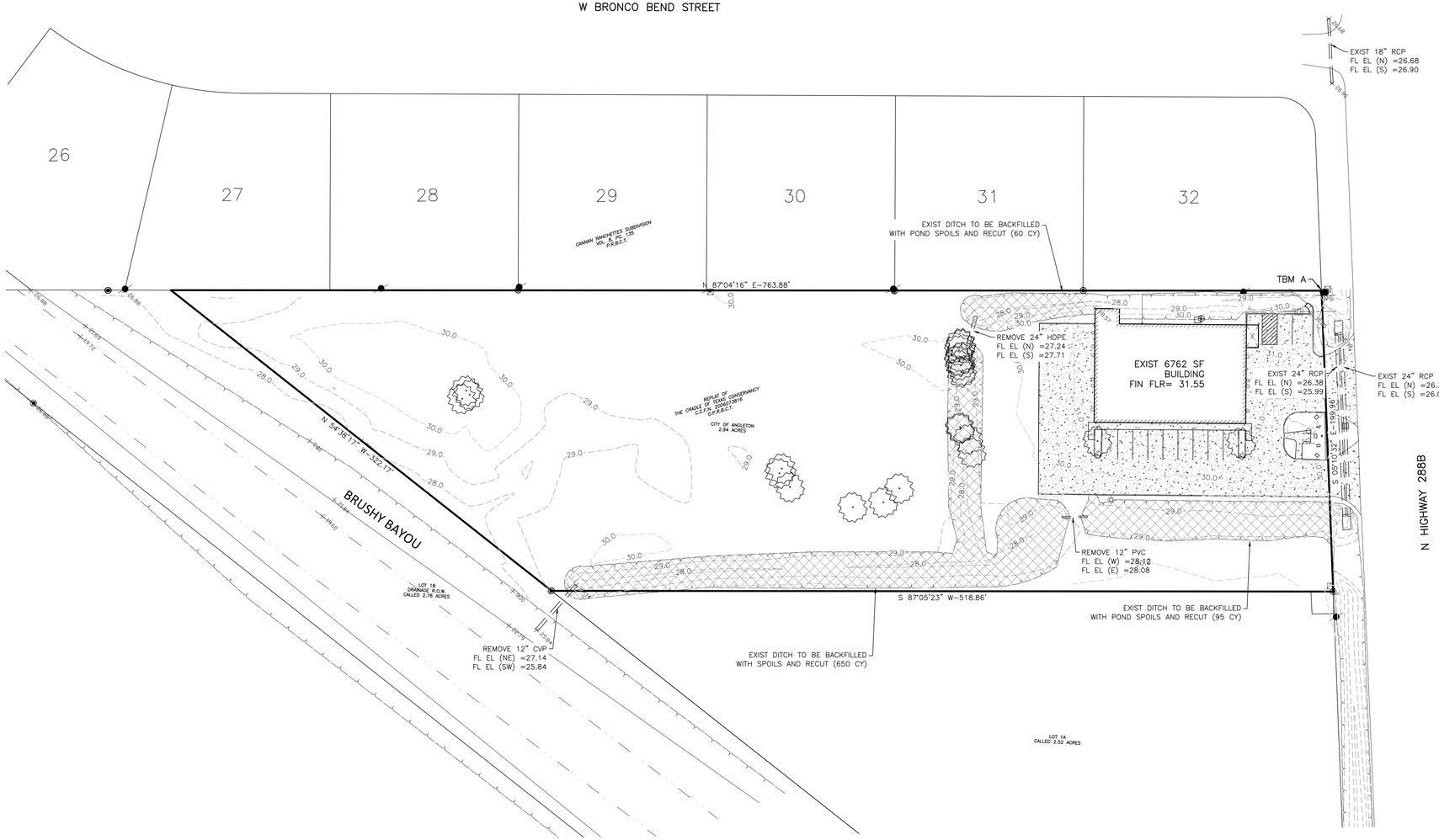
BENCHMARK:
ELEVATIONS BASED ON NAVD88

REFERENCE BENCHMARK: NGS MONUMENT: TXAG REF MON 1 (PID: DR8248), PUBLISHED ELEVATION: 32.0 FEET.

TEMPORARY BENCHMARK A: SET 60D NAIL IN POWER POLE AT NORTHEAST CORNER OF FIRE STATION #3 PROPERTY. ELEVATION: 31.10 FEET

FLOOD ZONE STATEMENT
ACCORDING TO THE FEDERAL EMERGENCY MANAGEMENT AGENCY FLOOD INSURANCE RATE MAP FOR BRAZORIA COUNTY, MAP NUMBER 48039 C 0435K, WITH EFFECTIVE DATE OF DECEMBER 30, 2020, THE PROPERTY LIES FULLY WITHIN ZONE "X" (UNSHADED), AREAS DETERMINED TO BE OUTSIDE THE 500–YEAR FLOODPLAIN. (1988 DATUM).





SYMBOLS

- = FND IMPLEMENT AS NOTED
- = SET 5/8" IRON ROD
- = BENCHMARK
- = GAS VALVE
- = GAS METER
- = IRRIGATION CONTROL
- = WATER VALVE
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[redacted]

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EXISTING CONDITION AND DEMOLITION

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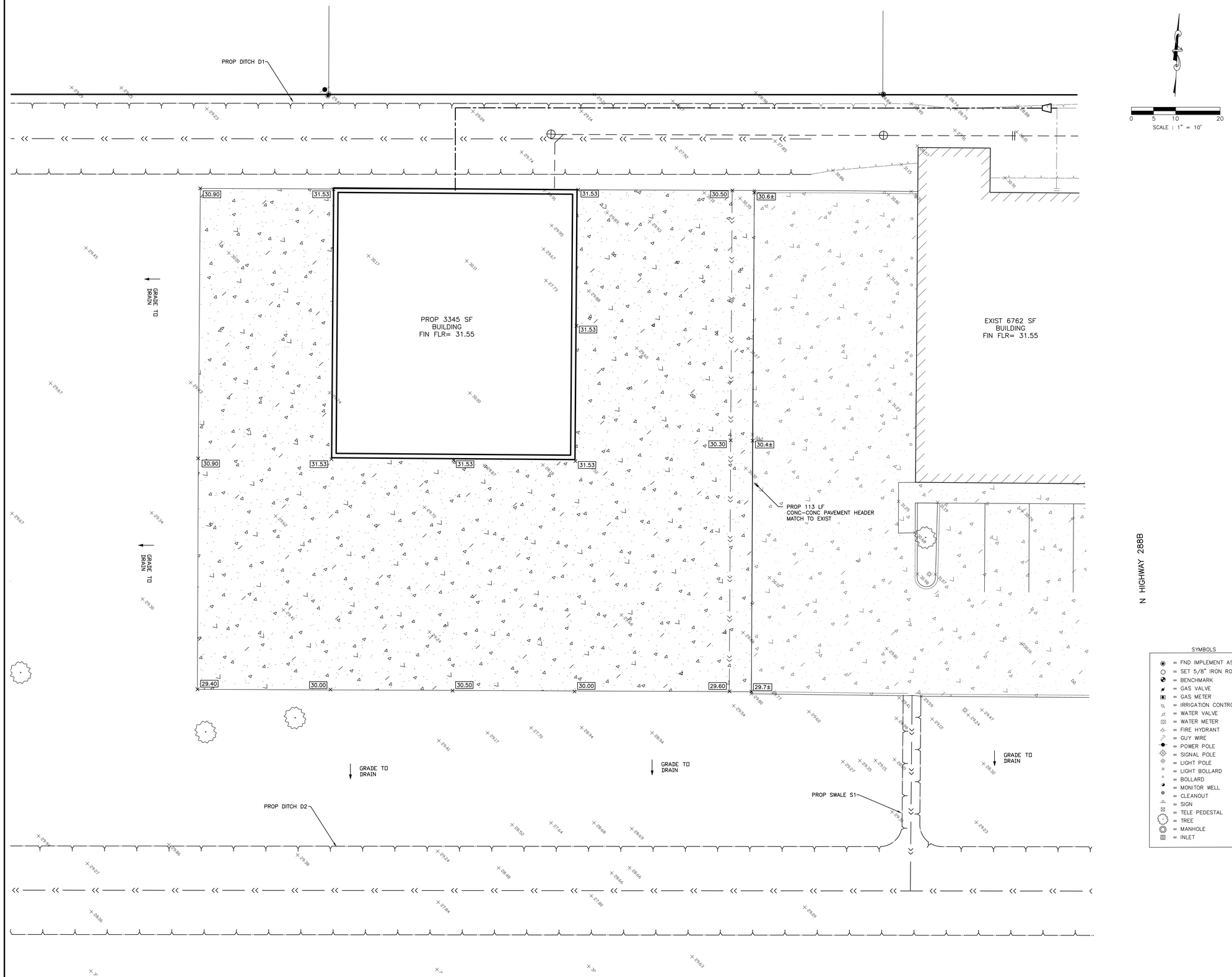

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SITE GRADING PLAN

C2.00

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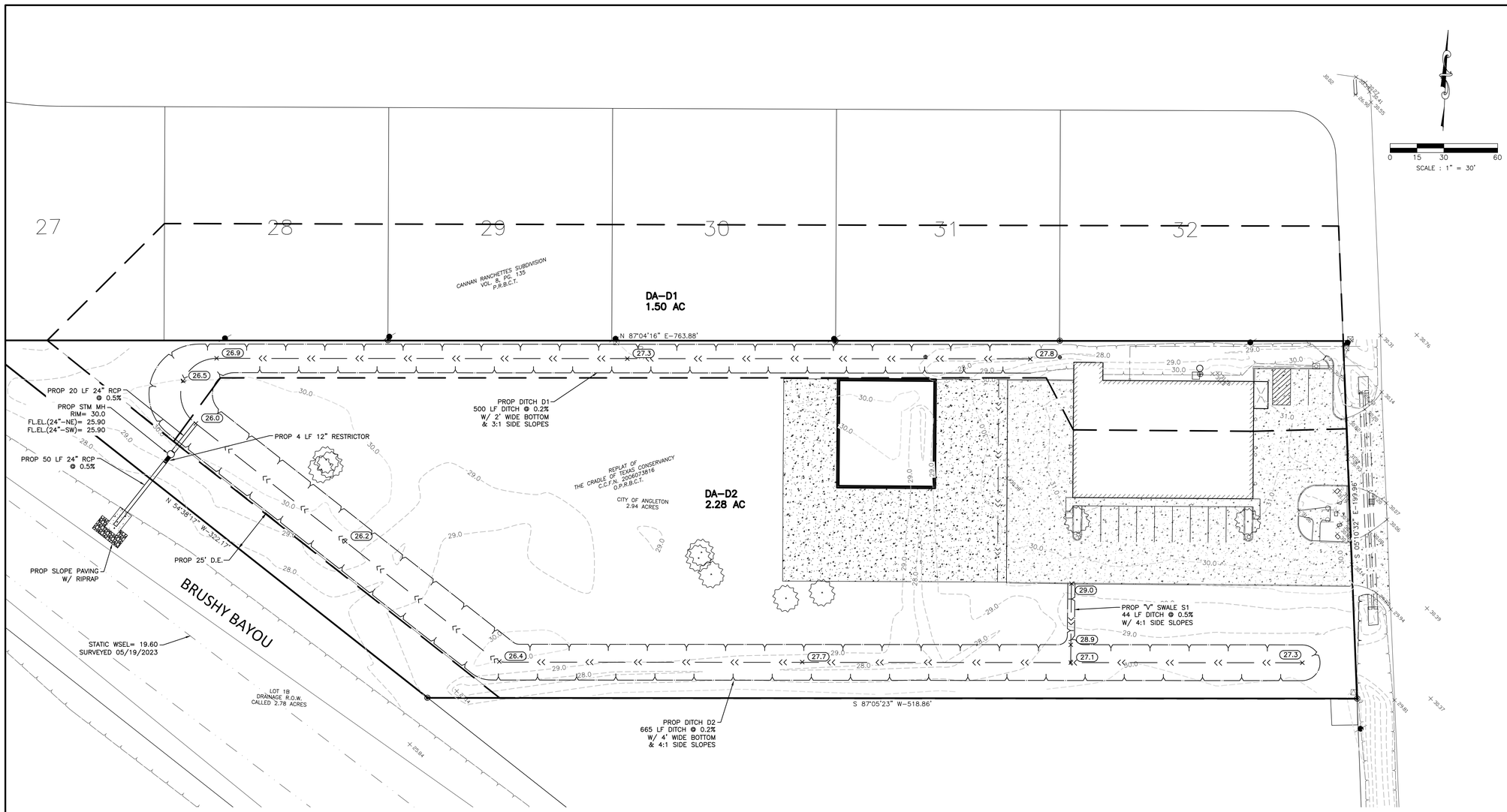

DRAINAGE HYDRAULIC CALCULATIONS FOR THE 100-YEAR STORM EVENT

D.A. NO.	RUN	AREA (AC)	C	Ditch Length	Tc (MIN)	I 100-YR (in/hr)	Q 100-YR (CFS)
DA-D1	DITCH D1	1.5	0.4	500	18.33	11.762	7.1
DA-D2	DITCH D2	2.28	0.4	665	19.43	11.429	10.4

ID	TOTAL DEPTH (FT)	FREEBOARD (FT)	WATER DEPTH (FT)	DITCH BOTTOM WIDTH	CROSS SECTIONAL AREA	SIDE SLOPE (X:1)	WET PERIMETER (FT)	HYDRAULIC RADIUS (R)'	ROUGHNESS COEFFICIENT (N)	AVERAGE SLOPE (S) FT/FT	VELOCITY (V) FPS	CAPACITY (Q) CFS	REQUIRED CAPACITY (Q) CFS
DITCH 1	2.1	0.5	1.6	2	10.88	3	12.1	0.90	0.04	0.0020	1.55	16.9	7.1
DITCH 2	2.4	0.5	1.9	4	22.04	4	19.7	1.12	0.04	0.0020	1.80	39.6	10.4

DETENTION PROVIDED

DITCH D1
AVERAGE AREA= 10.88 SF
LENGTH= 500 FT
VOLUME= 0.124 AC–FT

DITCH D2
AVERAGE AREA= 22.04 SF
LENGTH= 665 FT
VOLUME= 0.337 AC–FT

DETENTION PROVIDED= 0.461 AC–FT

RESTRICTOR CALCULATIONS

HEAD = 28.5 – 26.0 = 2.5

ORIFICE EQUATION	
Q = Cd*A*(2*G*H)^0.5	
Where:	
Cd =	0.8
G =	32.2
H =	2.5
Q =	7.949
A =	0.78
USE 12" Dia.= 0.78 SF FOR RESTRICTOR	

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DRAINAGE AREA MAP

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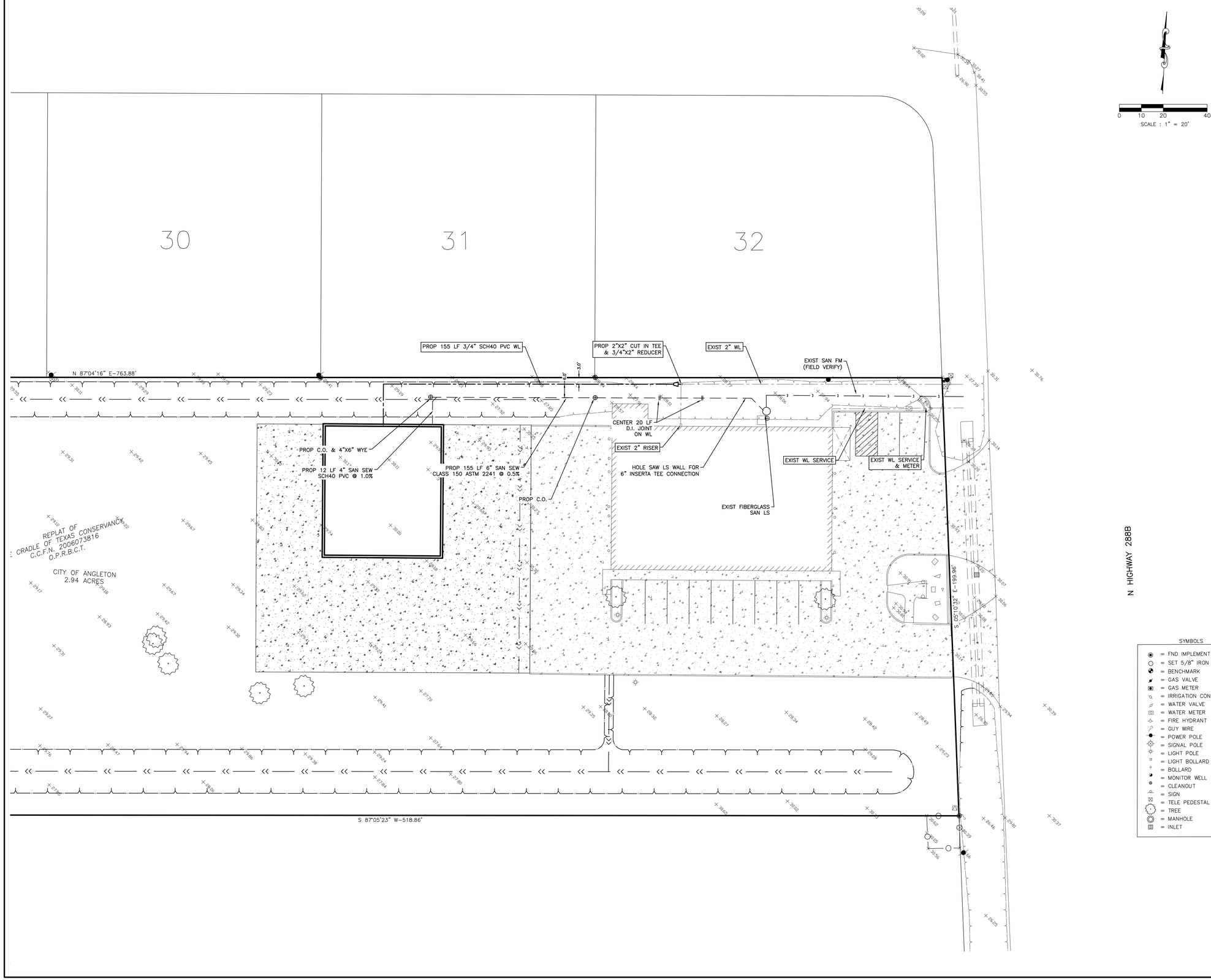

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UTILITY LAYOUT

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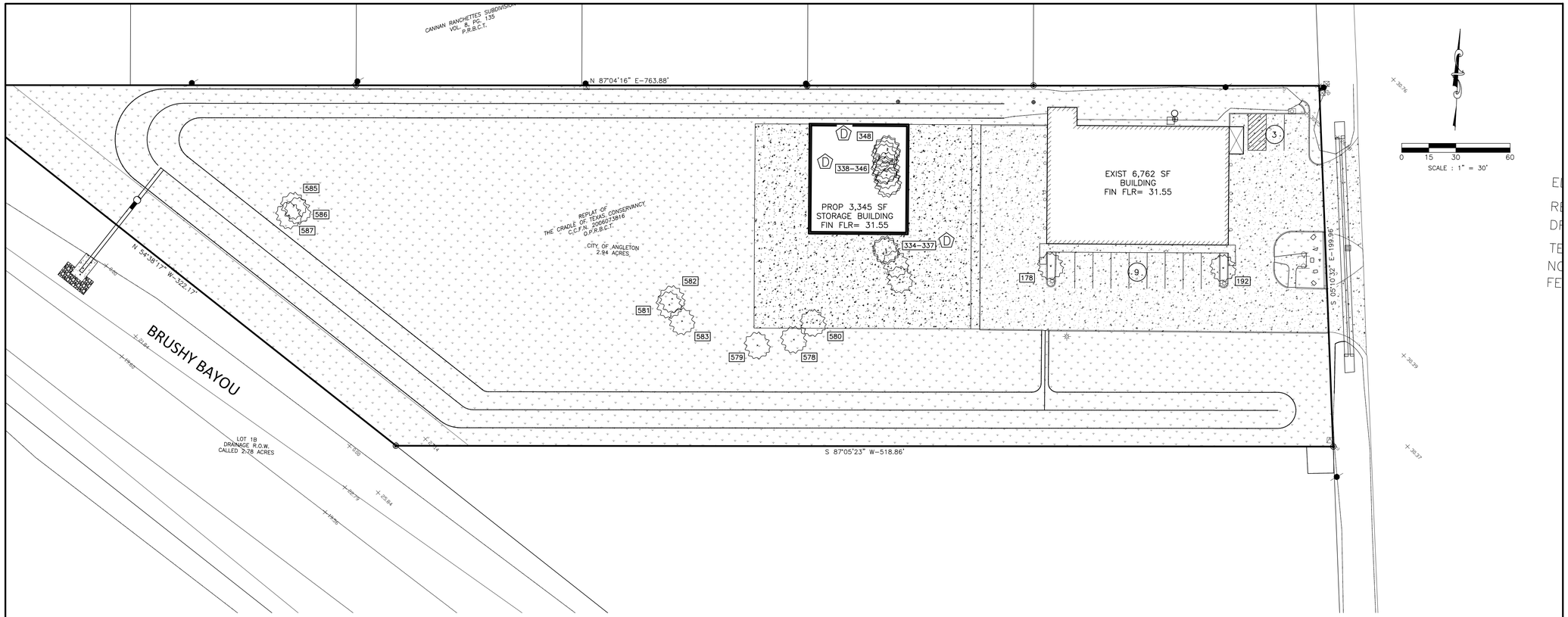

PARKING REQUIREMENTS:

OFF-STREET PARKING (STORAGE OR WAREHOUSING)

FLOOR AREA = 10,107 SF
REQUIRED (1 SPACE PER 1,000 SF) = 10.1 = 10 SPACES

PROVIDED= 11 REGULAR AND 1 HANDICAP = 12 SPACES

HERITAGE TREE PLAN

TREE REPLACEMENT CALCULATIONS:

TOTAL NUMBER OF HERITAGE TREES (OAKS & ELMS): 7
TOTAL CALIPER OF HERITAGE TREES: 152 INCHES

HERITAGE TREES TO REMOVE: 1
CALIPER OF REMOVED HERITAGE TREES: 15 INCHES

HERITAGE & SIGNIFICANT TREES TO PRESERVE: 6
CALIPER OF HERITAGE/SIGNFICANT TREES TO BE PRESERVED: 137 INCHES

REQUIRED REPLACEMENT CALIPER = (15 – 137) X 3 = 0 INCH
= 0 REPLACEMENT TREES

TOTAL REPLACEMENT TREES REQUIRED = 0 TREES

Tree ID	Type	Diameter	Status
178	Crepe Myrtle	6	Preserve
192	Crepe Myrtle	6	Preserve
334	Pine	18	Remove
335	Pine	5	Remove
336	Pine	18	Remove
337	Pine	18	Remove
338	Pine	18	Remove
339	Pine	9	Remove
340	Pine	10	Remove
341	Pine	5	Remove
342	Pine	18	Remove
343	Pine	10	Remove
344	Pine	18	Remove
345	Pine	8	Remove
346	Pine	9	Remove
348	Oak	15	Remove
578	Live Oak	20	Preserve
579	Live Oak	12	Preserve
580	Live Oak	15	Preserve
581	Live Oak	36	Preserve
582	Live Oak	30	Preserve
583	Live Oak	24	Preserve
585	Tallow	24	Preserve
586	Tallow	12	Preserve
587	Tallow	12	Preserve

LEGEND

CONCRETE PAVEMENT TO BE 6" THICK REINFORCED W/ #4 BARS @ 24" O.C. EACH WAY ON 6" LIME STABILIZED SUBGRADE (7% BY WT)

(9) DENOTES PARKING COUNT

LANDSCAPED AREAS
(92,643 SF, 72%)

(D) DENOTES TREE TO BE REMOVED

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LANDSCAPE AND SITE PLAN

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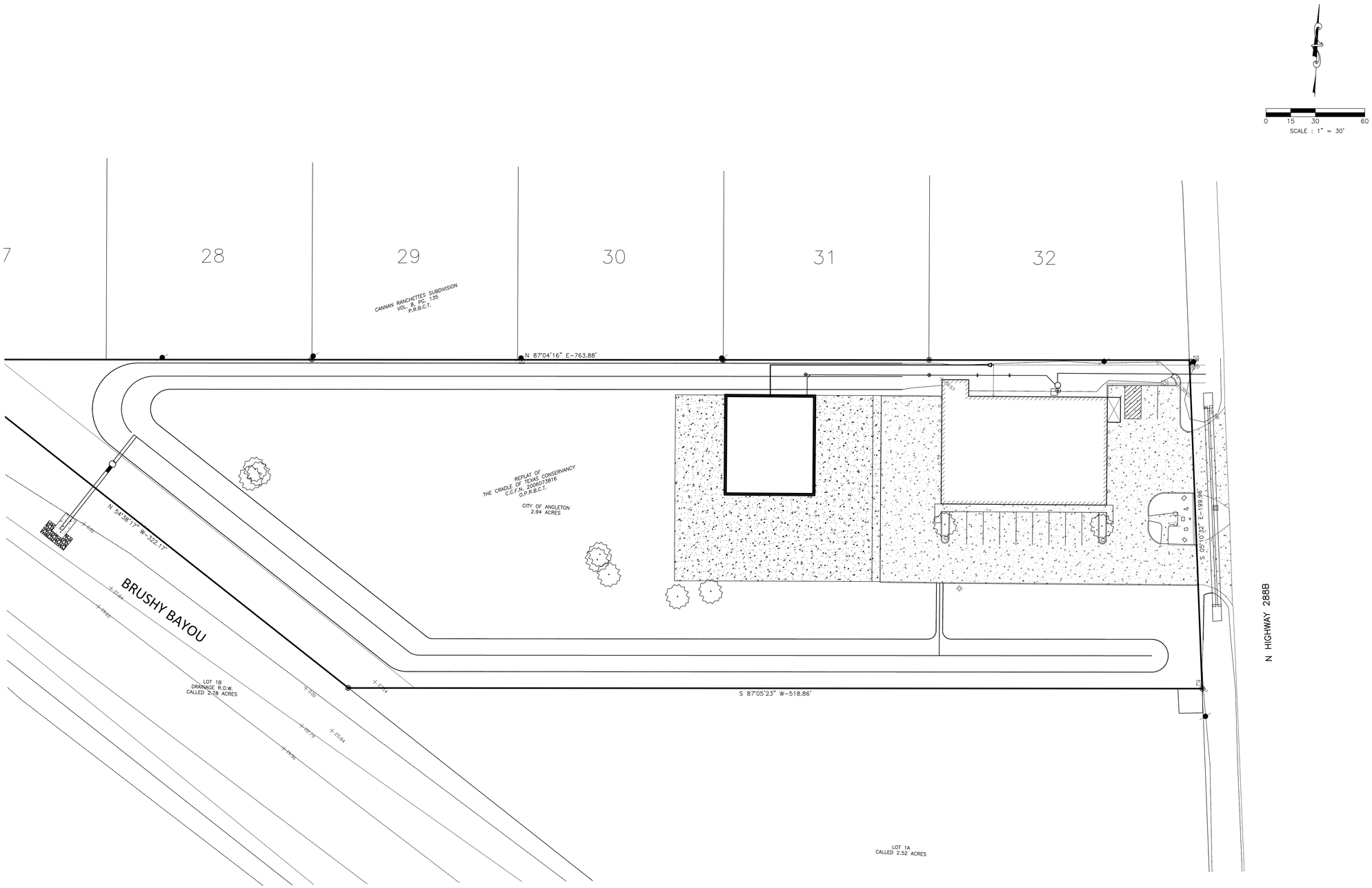

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PROJECT CONSULTANTS

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979.849.6681 p.
Structural
CJG Engineers
3200 Wilcrest Dr., Suite 305
Houston, TX 77042
713.780.3345 p.
Mechanical,Electrical, & Plumbing
DVO an Urban-Gro Company
825 Town & Country Lane, Suite 1150
Houston, TX 77024
281.293.7500 p.

STATE OF TEXAS
MIGUELANGEL A. SAUCEDA
121992
LICENSED
PROFESSIONAL ENGINEER

iAD PROJECT # 23017

ISSUE DATE:

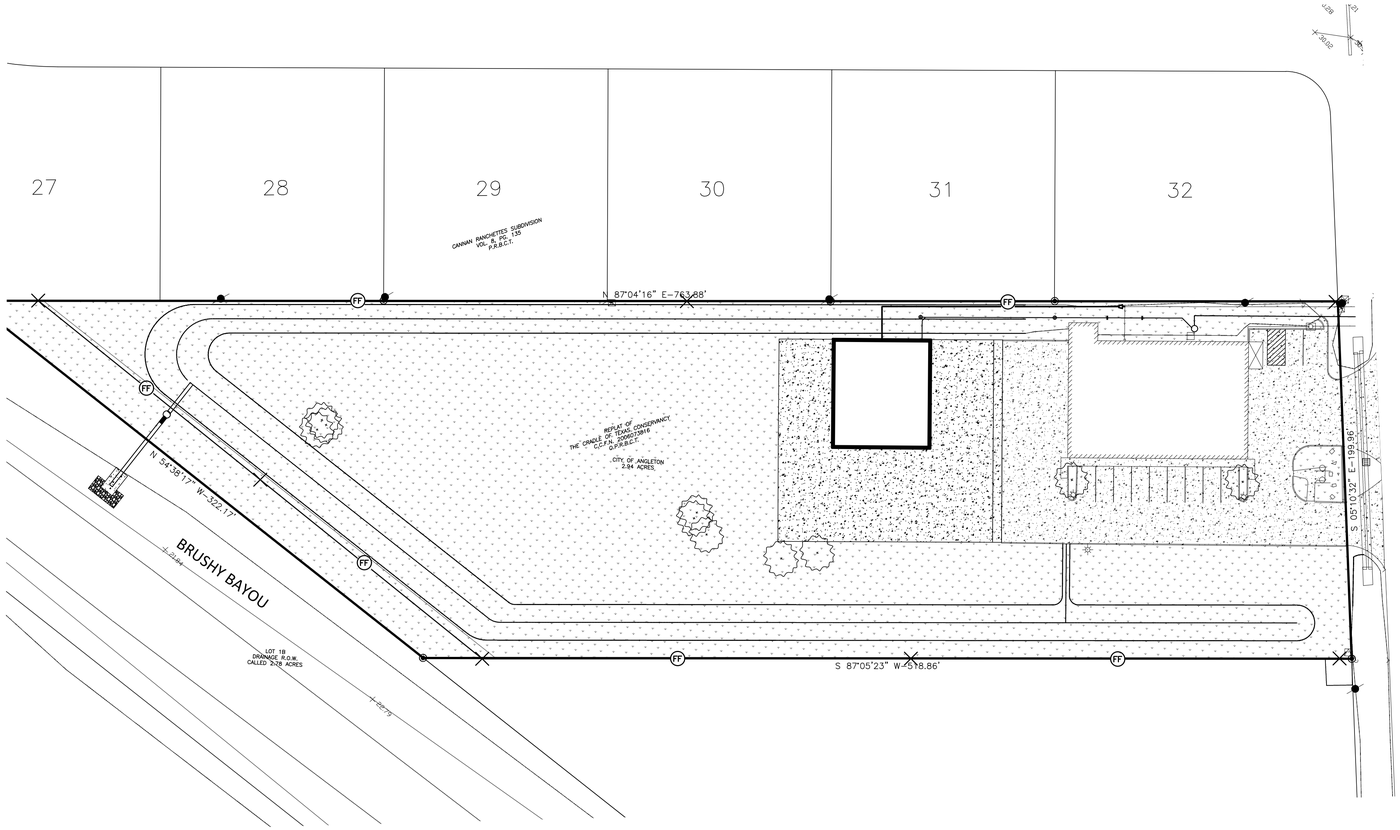
REVISION LOG

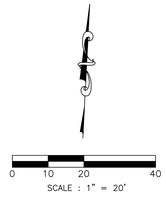
DIMENSION CONTROL PLAN

C6.00

SCALE: AS NOTED

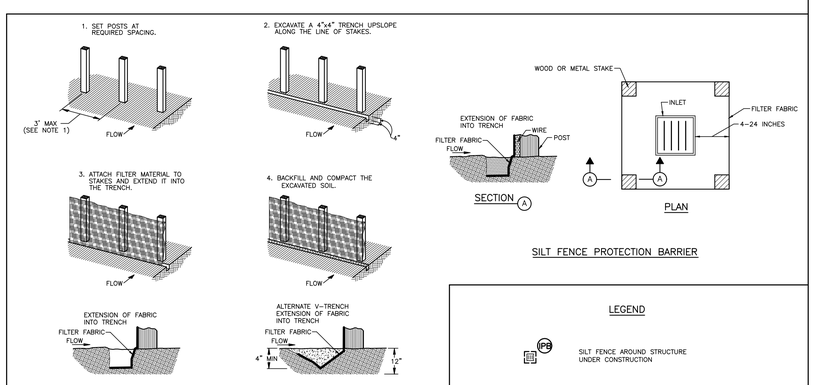
5/23/2023 4:26:40 PM





GENERAL LOCATION MAP

VICINITY MAP
N.T.S.



SILT FENCE PROTECTION BARRIER

CONSTRUCTION NOTES:

1. 1 INCH THICK BY 2 INCH WOODEN STAKES TO BE SET AT MAX SPACING OF 3 FEET AND EMBEDDED A MIN OF 8 INCHES. IF PREASSEMBLED FENCE WITH SUPPORT NETTING IS USED, SPACING OF POST MAY BE INCREASED TO 8 FEET MAX.
2. ATTACH FILTER FABRIC TO WOODEN STAKES. FILTER FABRIC FENCE SHALL HAVE A MIN HEIGHT OF 18 INCHES AND MAX HEIGHT OF 36 INCHES ABOVE NATURAL GROUND.
3. WHEN TWO SECTIONS OF FILTER CLOTH ADJOIN EACH OTHER THEY SHOULD BE OVERLAPPED 6 INCHES AT THE POSTS, AND FOLDED.

FILTER FABRIC FENCE

LEGEND

- SILT FENCE AROUND STRUCTURE UNDER CONSTRUCTION
- SILT FENCE ACROSS EXISTING DITCH REINFORCED FILTER BARRIER
- HYDROMULCH SEED

PROJECT/SITE INFORMATION

PROJECT NAME: ANGLETON FIRE STATION #3

PROJECT ADDRESS/LOCATION: 2743 N. VELASCO ST.

CITY: ANGELTON STATE: TX. ZIP CODE: 77515

LATITUDE: 29°11'30" LONGITUDE: 95°20'04" COUNTY: BRAZORIA

NAME OF RECEIVING WATERS: GULF OF MEXICO

07/01/2023 — MONTH/DAY/YEAR — ESTIMATED CONSTRUCTION START DATE

07/01/2024 — MONTH/DAY/YEAR — ESTIMATED COMPLETION DATE

ESTIMATE OF AREA TO BE DISTURBED: 2.94 ACRES

ESTIMATE OF LIKELYHOOD OF DISCHARGE:

☐ UNLIKELY ☐ ONCE PER WEEK ☐ CONTINUAL
☒ ONCE PER MONTH ☐ ONCE PER DAY

ARE THERE ANY LISTED ENDANGERED OR THREATENED SPECIES, OR DESIGNATED CRITICAL HABITAT IN THE PROJECT AREA?

☐ YES ☒ NO

ELIGIBILITY WITH REGARD TO PROTECTION OF ENDANGERED SPECIES HAS BEEN SATISFIED THROUGH THE INDICATED SECTION OF PART 1.B.3.e.(2) OF THE PERMIT.

(a) ☒ (b) ☐ (c) ☐ (d) ☐

Angleton Fire Station #3 Addition
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REVISION LOG

SWPPP LAYOUT

C7.00

SCALE: AS NOTED

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1. SITE DESCRIPTION

A. NATURE OF THE CONSTRUCTION ACTIVITY:
THE PROJECT CONSISTS OF THE CONSTRUCTION OF ONE 3,345 SF BUILDINGS IN ANGLETON, BRAZORIA COUNTY, TEXAS. THE SITE IS BOUND BY COMMERCIAL PROPERTY TO THE SOUTH, SH288B TO THE EAST, BRUSHY BAYOU TO THE WEST, AND RESIDENTIAL SUBDIVISION TO THE NORTH. CONSTRUCTION SHALL CONSIST OF THE ONE BUILDING, 10,807 SF DRIVEWAY AREA, AND LINEAR DETENTION DITCHES.

B. INTENDED SEQUENCE OF MAJOR SOIL DISTURBING ACTIVITIES:
THE WORK AREA WILL BE CLEARED OF ALL VEGETATIVE MATTER. THEN SUBGRADE WILL BE PREPARED FOR BUILDING PADS AND DRIVE AREAS. STORM WATER FROM THE SITE WILL BE DIRECTED TO THE PROPOSED DITCHES. TRUCKS WILL BE USED TO HAUL WASTE FROM CONSTRUCTION AND DELIVER BASE MATERIAL AND CONSTRUCTION MATERIAL TO THE SITE. THESE TRUCKS WILL BE ROUTED ALONG SH288B FOR INGRESS AND EGRESS. RUTTING ON SITE DURING WET WEATHER WILL PROVIDE POTENTIAL FOR TRACKING MUD ALONG SH288B. CONTRACTOR WILL CLEAN SH288B AS REQUIRED BY TXDOT.

C. TOTAL PROJECT AREA: 2.94 ACRES

D. TOTAL AREA TO BE DISTURBED: 0.82 ACRES

WEIGHTED RUNOFF COEFFICIENT
(BEFORE CONSTRUCTION): 0.31 (AFTER CONSTRUCTION): 0.39

E. REFER TO GENERAL LOCATION MAP AND SITE MAP FOR DRAINAGE PATTERNS AND APPROXIMATE SLOPES ANTICIPATED AFTER MAJOR GRADING ACTIVITIES; AREAS OF SOIL DISTURBANCE; AREAS WHICH WILL NOT BE DISTURBED; LOCTIONS OF MAJOR STRUCTURAL AND NON-STRUCTURAL CONTROLS; LOCATIONS WHERE STABILIZATION PRACTICES ARE EXPECTED TO OCCUR; LOCATION OF OFF-SITE MATERIAL, WASTE, BORROW OR EQUIPMENT STORAGE AREAS; SURFACE WATERS (INCLUDING WETLANDS); AND LOCATIONS WHERE STORM WATER DISCHARGES TO A SURFACE WATER.

F. LOCATION AND DESCRIPTION OF ANY DISCHARGE ASSOCIATED WITH INDUSTRIAL ACTIVITY OTHER THAN CONSTRUCTION:

G. NAME OF RECEIVING WATERS:
DRAINAGE WILL BE COLLECTED IN THE PROPOSED DITCHES WHICH WILL DRAIN TO BRUSHY BAYOU. BRUSHY BAYOU IS MAINTAINED BY THE ANGELTON DRAINAGE DISTRICT. BRUSHY BAYOU OUTFALLS TO BASTROP BAYOU WHICH THEN OUTFALLS INTO THE GULF OF MEXICO.

AREAL EXTENT AND DESCRIPTION OF WETLAND OR SPECIAL AQUATIC SITE AT OR NEAR THE SITE WHICH WILL BE DISTURBED OR WHICH WILL RECEIVE DISCHARGES FROM DISTURBED AREAS OFTHE PROJECT.

NONE

H. REFER TO FEDERAL REGISTER, VOLUME 63, NO.128, MONDAY JULY 6, 1998, PAGES 36497 TO 36515 FOR REQUIREMENTS OF NPDES GENERAL PERMITS FOR STORM WATER DISCHARGES FROM CONSTRUCTION ACTIVITIES IN REGION 6.

I. LISTED ENDANGERED OR THREATENED SPECIES OR CRITICAL HABITAT FOUND IN PROXIMITY TO THE CONSTRUCTION ACTIVITY:

NONE

J. PROPERTY LISTED OR ELIGIBLE FOR LISTING ON THE NATIONAL REGISTER OF HISTORIC PLACES:

NONE

2. CONTROLS

NARRATIVE - SEQUENCE OF CONSTRUCTION ACTIVITIES AND APPROPRIATE CONTROL MEASURES DURING CONSTRUCTION

THE ORDER OF CONSTRUCTION WILL BEGIN WITH STRIPPING OF ALL VEGETATION FROM THE WORK AREA.

1. CONSTRUCT SILT FENCE ALONG THE PERIMETER OF THE WORK AREA.

2. AFTER STRIPPING IS COMPLETED, THE DETENTION DITCHES CAN BE EXCAVATED AND EXCAVATED MATERIAL SPREAD AND COMPACTED ON SITE.

3. FOUNDATIONS FOR THE BUILDING CAN THEN BE PLACED. CONSTRUCTION OF THESE FACILITIES WILL FOLLOW AFTER FOUNDATION PLACEMENT.

4. EXCAVATION OF SUBGRADE AND PROOF ROLLING WILL TAKE PLACE BEFORE PLACEMENT OF THE LIME FOR STABILIZATION OF DRIVE AREAS. CONCRETE DRIVES CAN THEN BE CONSTRUCTED AFTER COMPLETION OF SUBGRADE.

5. AFTER WORK IS COMPLETE, SEEDING AND FERTILIZER WILL BE PLACED ON ALL DISTURBED AREAS. ALL SEEDED AREAS ARE TO IRRIGATED TO ENSURE GROWTH. IRRIGATION SHALL BE CONTINUED UNTIL GROWTH IS ESTABLISHED.

A. EROSION AND SEDIMENT CONTROLS: EROSION AND SEDIMENT CONTROLS SHALL RETAIN SEDIMENT ON SITE TO THE EXTENT PRACTICABLE. CONTROL MEASURES SHALL BE INSTALLED AND MAINTAINED IN ACCORDANCE WITH MANUFACTURER'S SPECIFICATIONS (WHERE APPLICABLE) AND GOOD ENGINEERING PRACTICES. OFFSITE SEDIMENT ACCUMULATIONS MUST BE REMOVED AT A FREQUENCY SUFFICIENT TO MINIMIZE OFFSITE IMPACTS. SEDIMENT MUST BE REMOVED FROM SEDIMENT TRAPS OR SEDIMENTATION PONDS WHEN CAPACITY HAS BEEN REDUCED BY 50%. LITTER, CONSTRUCTION DEBRIS, AND CONSTRUCTION CHEMICALS EXPOSED TO STORM WALL SHALL BE PREVENTED FROM BECOMING A POLLUTANT SOURCE FOR STORM WATER DISCHARGES.

SOIL STABILIZATION PRACTICES:	OWNER/ DEVELOPER	GENERAL CNTRTR.	BUILDER	OTHER
TEMPORARY SEEDING				
PERMANENT PLANTING, SODDING, OR SEEDING		X		
MULCHING- WHERE INDICATED		X		
SOIL RETENTION BLANKET				
VEGETATIVE BUFFER STRIPS				
PRESERVATION OF NATURAL RESOURCES				
OTHER:				

THE FOLLOWING RECORDS SHALL BE MAINTAINED AND ATTACHED TO THIS SWPPP:
DATES WHEN MAJOR GRADING ACTIVITIES OCCUR, DATES WHEN CONSTRUCTION ACTIVITIES TEMPORARILY OR PERMANENTLY CEASE ON A PORTION OF THE SITE, DATES WHEN STABILIZATION MEASURES ARE INITIATED.

STRUCTURAL PRACTICES:	OWNER/ DEVELOPER	GENERAL CNTRTR.	BUILDER	OTHER
SILT FENCES		X		
HAY BALES				
ROCK BERMS				
DIVERSION, INTERCEPTOR, OR PERIMETER DIKES				
DIVERSION, INTERCEPTOR, OR PERIMETER SWALES				
DIVERSION DIKE AND SWALE COMBINATIONS				
PIPE SLOPE DRAINS				
ROCK BEDDING AT CONSTRUCTION EXIT				
TIMBER MATTING AT CONSTRUCTION EXIT				
SEDIMENT TRAPS				
SEDIMENT BASINS				
STORM INLET PROTECTION				
STONE OUTLET STRUCTURES				
OTHER:				

B. STORM WATER MANAGEMENT MEASURES INSTALLED DURING CONSTRUCTION TO CONTROL POLLUTANTS IN STORM WATER DISCHARGES THAT WILL OCCUR AFTER CONSTRUCTION:
DITCHES

C. OTHER CONTROLS

NO SOLID MATERIALS, INCLUDING BUILDING MATERIALS, SHALL BE DISCHARGED TO WATERS OF THE UNITED STATES, EXCEPT AS AUTHORIZED BY A PERMIT ISSUED UNDER SECTION 404 OF THE CLEAN WATER ACT.

WASTE MATERIALS: ALL WASTE MATERIALS WILL BE COLLECTED AND STORED IN A SECURELY LIDDED METAL CONTAINER. THE CONTAINER SHALL MEET ALL STATE AND CITY SOLID WASTE MANAGEMENT REGULATIONS. THE CONTAINER SHALL BE EMPTIED AS NECESSARY AND THE TRASH HAULED TO AN APPROPRIATE DUMP SITE. NO CONSTRUCTION MATERIALS WILL BE BURIED ON SITE.

HAZARDOUS WASTE (INCLUDING SPILL REPORTING): AT A MINIMUM, ANY PRODUCTS IN THE FOLLOWING CATEGORIES ARE CONSIDERED TO BE HAZARDOUS: PAINT, CLEANING SOLVENTS, ASPHALT PRODUCTS, PETROLEUM PRODUCTS, CHEMICAL ADDITIVES FOR SOIL STABILIZATION, AND CONCRETE CURING COMPOUNDS AND ADDITIVES. IN THE EVENT OF A SPILL WHICH MAY BE HAZARDOUS, THE SPILL COORDINATOR SHOULD BE CONTACTED IMMEDIATELY.

SANITARY WASTE: PORTABLE SANITARY FACILITIES WILL BE PROVIDED BY THE CONTRACTOR. ALL SANITARY WASTES WILL BE COLLECTED FROM PORTABLE UNITS AND SERVICED BY A LICENSED SANITARY WASTE MANAGEMENT CONTRACTOR.

OFFSITE VEHICLE TRACKING SHALL BE MINIMIZED BY:
___ HAUL ROADS DAMPENED FOR DUST CONTROL LOADED
X HAUL TRUCKS TO BE COVERED WITH TARPAULIN
X EXCESS DIRT ON ROAD REMOVED DAILY STABILIZED
___ CONSTRUCTION ENTRANCE

OTHER: TRUCKS HAULING VEGETATION AND DEBRIS WILL BE MONITORED, AND SHALL BE COVERED WITH TARPAULINS IF REQUIRED TO PREVENT DUST OR OTHER PARTICLES FROM BLOWING OR FALLING FROM TRUCK.

REMARKS: ALL OPERATIONS WILL BE CONDUCTED IN A MANNER THAT WILL MINIMIZE AND CONTROL THE AMOUNTS OF SEDIMENT THAT MAY ENTER THE RECEIVING WATERS. DISPOSAL AREAS SHALL NOT BE LOCATED IN ANY WETLAND, WATERBODY, OR STREAMBED. CONSTRUCTION STAGING AREAS AND VEHICLE MAINTENANCE AREAS SHALL BE CONSTRUCTED BY THE CONTRACTOR IN A MANNER TO MINIMIZE THE RUNOFF OF POLLUTANTS.

3. MAINTENANCE

ALL EROSION AND SEDIMENT CONTROLS WILL BE MAINTAINED IN EFFECTIVE OPERATING CONDITION. IF A REPAIR IS NECESSARY IT SHALL BE DONE AT THE EARLIEST TIME POSSIBLE, BUT NO LATER THAN SEVEN CALENDAR DAYS AFTER THE GROUND HAS DRIED SUFFICIENTLY TO PREVENT FURTHER DAMAGE FROM HEAVY EQUIPMENT. THE AREAS ADJACENT TO DRAINAGE WAYS SHALL HAVE PRIORITY, FOLLOWED BY DEVICES PROTECTING STORM SEWER INLETS. MAINTENANCE SHALL BE PERFORMED BEFORE THE NEXT ANTICIPATED STORM EVENT OR AS SOON AS PRACTICABLE.

4. INSPECTION

AN INSPECTION WILL BE PERFORMED BY THE PERMITEE EVERY FOURTEEN DAYS AS WELL AS AFTER EVERY ONE-HALF INCH OR GREATER RAINFALL EVENT. AN INSPECTION AND RAINFALL REPORT WILL BE MADE AFTER EACH INSPECTION. ANY DEFICIENCIES WILL BE NOTED AND APPROPRIATE CHANGES SHALL BE MADE TO THE SYSTEM TO COMPLY WITH REQUIREMENTS.

5. NON-STORMWATER DISCHARGES

___ FIRE HYDRANT FLUSHING
X BUILDING WASHDOWN WITHOUT DETERGENTS
X PAVEMENT WASHDOWN WITHOUT DETERGENTS
X CONDENSATE
___ UNCONTAMINATED GROUNDWATER
___ UNCONTAMINATED FOUNDATION DRAINS

P:\PROJECTS\ANGLETON\2023\CONSTRUCTION\Angleton Fire Station #3 Addition.rvt

Angleton Fire Station #3 Addition

2743 N. Velasco St.
Angleton, Texas 77515

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iAD PROJECT # 23017

ISSUE DATE:

REVISION LOG

SWPPP NARRATIVE

C7.01

SCALE: AS NOTED

5/2/2023 4:26:40 PM

Hydrological and Hydraulic Impacts
Fire Station #3- Angleton, Texas
Job # 15627

Brazoria County, Texas

A = 2.94 Acre Development :

Pre Development:

C = 2.44 ac lawn @ 0.20
+ 0.50 ac Conc/Bldg @ 0.85
= 0.31
TC = 15 min + 550 LF grass @ 0.5 fps
= 33.3 Minutes
I = 6.978 in/hr
Q = 100 Year Storm = 7.949 cfs

Post Development

C = 2.12 ac lawn @ 0.20
+ 0.82 ac Conc/Bldg @ 0.85
= 0.39
T/C = 10 min + 225 LF pave @ 1.5 fps
+ 660 KF ditch @ 2.5 fps
= 16.9 Minutes
I = 9.792 in/hr
Q = 100 Year Storm = 14.035 cfs

Required Detention:

0.55 acre - feet

Miguel Sauceda, P.E. June 2, 2023

Drainage Analysis (Brazoria County: Region 1)

Job # 15627 - Fire Station #3, Angleton TX

Rainfall intensity calculations for Brazoria County (Region 1)

I = intensity (in/hr)
b = coefficient
t = time of concentration
d = coefficient
e = coefficient

subscript
i =1 = 2year storm
i =2 = 5 year storm
i =3 = 10 year strom
i =4 = 25 year storm
i =5 = 50 year storm
i =6 = 100 year storm

$i := 1..6$

$b_i :=$	$e_i :=$	$d_i :=$
57.440	0.754	11.511
58.019	0.712	9.236
57.515	0.676	7.777
52.780	0.618	5.022
49.157	0.574	3.081
46.316	0.533	1.555

$T_0 := 33.3$ ENTER PREDEVELOPMENT TIME OF CONCENTRATION

$I_i := \frac{b_i}{(d_i + T_0)^{e_i}}$ $I_6 = 6.978$ $\frac{in}{hr}$ Predevelopment Intensity of interest

$C := 0.31$ ENTER PREDEVELOPMENT C VALUE

$A := 2.94$ ENTER AREA (acres)

$C_f := 1.25$

$Q := C \cdot C_f \cdot I_6 \cdot A$ Must Insert correct subscript for I to obtain the relevant Q

$Q = 7.949$ cfs

$P := 17$ in Enter Atlas 14 Rainfall Depth: Region 1

$V := (C) \cdot A \cdot 43560 \cdot \frac{P}{12}$ For these calculations, total volume storage is assumed to equal (C)*A with A converted to square feet multiplied by rainfall depth (P)

$V = 5.624 \times 10^4$

DEVELOPMENT OF RUNOFF HYDROGRAPH MALCOM'S METHOD AS DESCRIBED IN THE BRAZORIA COUNTY DRAINAGE CRITERIA MANUAL

$T := \frac{V}{1.39 \cdot Q}$ $T = 5.09 \times 10^3$ T = Time to peak, presented as a function of volume and peak flow and therefore indirectly related to time of concentration

$t := 0, 1000 .. 84000$

$f(t) := \left(\frac{Q}{2}\right) \cdot \left(1 - \cos\left(\frac{t \cdot \pi}{T}\right)\right)$ f(t) describes rising limb of hydrograph

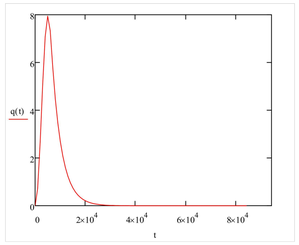
$g(t) := 4.34 \cdot Q \cdot \exp\left[-1.30 \cdot \left(\frac{t}{T}\right)\right]$ g(t) describes descending limb of hydrograph

$q(t) := \text{if}(t \le 1.25 \cdot T, f(t), g(t))$

$Volume_{pre} := \int_0^{86400} q(t)\, dt$

$Volume_{pre} = 5.644 \times 10^4$

Predevelopment hydrograph



$T_0 := 16.9$ min ENTER POST DEVLOPMENT TIME OF CONCENTRATION

$I_i := \frac{b_i}{(d_i + T_0)^{e_i}}$ $I_6 = 9.792$ $\frac{in}{hr}$ Post development I of interest

$C := 0.39$ ENTER POST DEVELOPMENT C FACTOR REVISE Cf AND AREA IF NECESSARY

$C_f := 1.25$ Note. Product of C x Cf =1.00 (maximum)

$Q := C \cdot I_6 \cdot A \cdot C_f$

$Q = 14.035$ cfs

$V := (C) \cdot A \cdot 43560 \cdot \frac{P}{12}$

$V = 7.076 \times 10^4$ cf

$T := \frac{V}{1.39 \cdot Q}$ $T = 3.627 \times 10^3$

$t := 0, 1000 .. 25000$

$f(t) := \left(\frac{Q}{2}\right) \cdot \left(1 - \cos\left(\frac{t \cdot \pi}{T}\right)\right)$

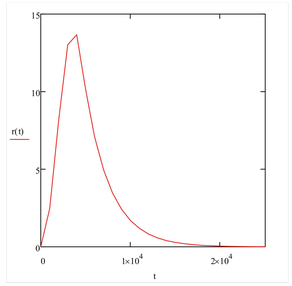
$g(t) := 4.34 \cdot Q \cdot \exp\left[-1.30 \cdot \left(\frac{t}{T}\right)\right]$

$r(t) := \text{if}(t \le 1.25 \cdot T, f(t), g(t))$

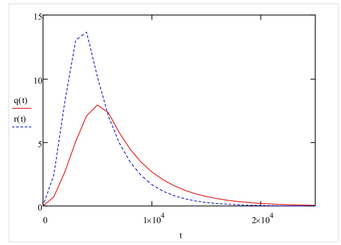
$Volume_{post} := \int_0^{86400} r(t)\, dt$

$Volume_{post} = 7.101 \times 10^4$

Post development hydrograph



Combined pre and post development hydrographs



$f(t) := ((r(t) - q(t))) \cdot 1$

$v(t) := \text{if}(f(t) > 0, f(t), 0)$

THE REQUIRED STORAGE COMPUTED AS THAT PART OF THE POST DEVELOPMENT HYDROGRAPH THAT FALLS ABOVE THE PREDEVELOPMENT HYDROGRAPH

ACRE -FEET

$\frac{\int_0^{86400} v(t)\, dt}{43560} = 0.55$ $ac - ft$

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REVISION LOG

HYDROLOGIC CALCULATIONS

C8.00

SCALE: AS NOTED

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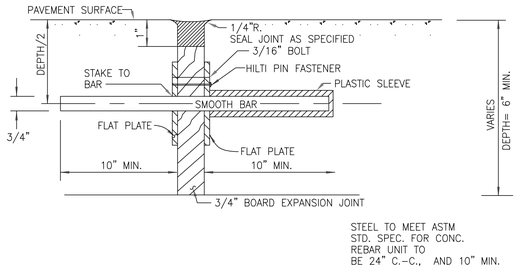
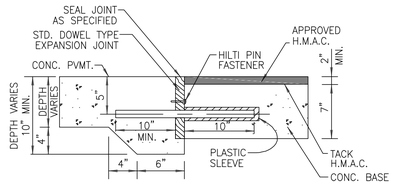


STEEL TO MEET ASTM STD. SPEC. FOR CONC. REBAR UNIT TO BE 24" C.-C., AND 10" MIN.

DOWEL TYPE EXPANSION JOINT

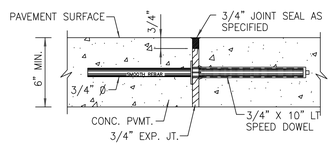
N.T.S.



DOWEL TYPE EXPANSION JOINT

N.T.S.

(CONC. PAVING TO CONC. BASE)



SPEED DOWEL EXPANSION JOINT

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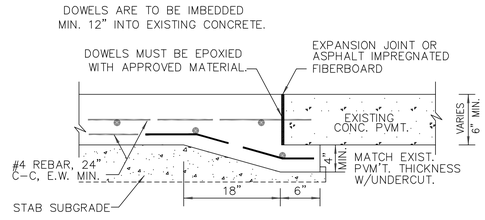
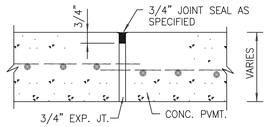


UNDERCUT DETAIL WITH HEADER

N.T.S.



CONSTRUCTION JOINT SEAL

N.T.S.

CONSTRUCTION NOTES:

6 INCH, 5.5 SACK CEMENT PER CUBIC YARD CONCRETE, 3500 PSI REINFORCED CONCRETE WITH #4 BARS 24 INCHES C-C, E.W. IS THE MINIMUM ACCEPTABLE PAVEMENT CONSTRUCTION FOR LOCAL STREETS

TRANSVERSE EXPANSION JOINTS SHALL BE PLACED AT ALL POINTS OF CURVATURE, POINTS OF TANGENCY AND ALL INTERSECTION CURB RETURN POINTS. MAXIMUM SPACING SHALL BE 200' AND BE SEALED WITH SEALANT CONFORMING TO TXDOT ITEM 360 (& ITEM 438) AND TXDOT DMS-6310, CLASS-2.

TRANSVERSE CONTROL JOINTS ARE REQUIRED AT MAXIMUM SPACING OF 20'-0" C-C, AND VERTICAL CURB JOINTS TO BE SEALED WITH SPECIAL JOINT SEALANT ASTM-D-1190-74 OR AASHTO-M173-60 FOR PAVEMENT 8" THICK AND GREATER. (ELASTONETRIC TYPE HOT POURED)

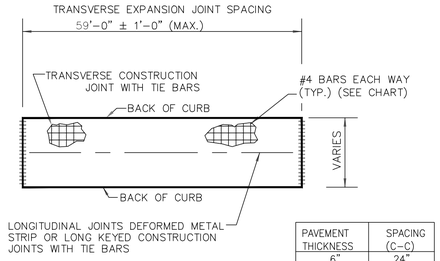
PAVEMENT FINISH SHALL BE BAKER BROOM FINISH. CURING COMPOUND REQUIRED ON ALL CONCRETE.

UNSTABLE SUBGRADE SHALL BE EXCAVATED AND REPLACED WITH CEMENT STABILIZED SAND.

USE 1"x2" REDWOOD STAKES FOR HEADERS.

EDGE ALL SIDES WITH EDGING TOOL.

DOWEL SHALL BE 3/4" DIAMETER, WITH MINIMUM 8" PENETRATION (BOTH SIDES).



PAVEMENT THICKNESS	SPACING (C-C)
6"	24"
7"	18"
8"	18"

PAVING PANEL

N.T.S.

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STATE OF TEXAS
MIGUELANGEL A. SAUCEDA
121992
LICENSED PROFESSIONAL ENGINEER

iAD PROJECT # 23017

ISSUE DATE:

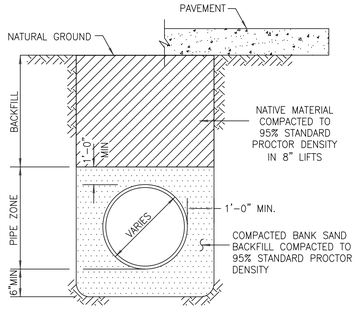
REVISION LOG

CONSTRUCTION DETAILS: PAVEMENT (1 OF 2)

C9.00

SCALE: AS NOTED

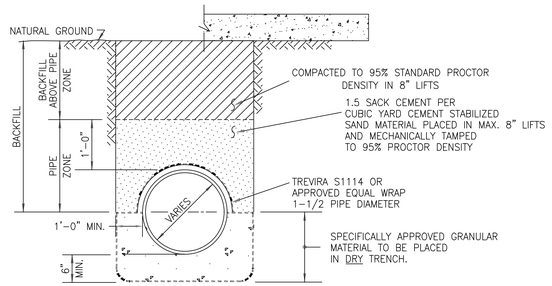
2/21/2023 2:35:43 PM



P.V.C. PIPE BEDDING & BACKFILL

N.T.S.

*SEE CONSTPUCTION NOTES -



MODIFIED "A"

N.T.S.

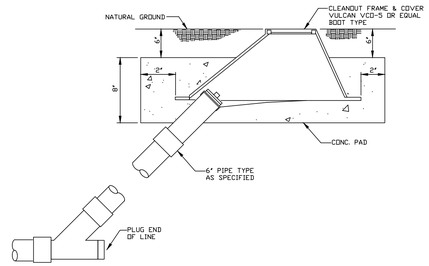
NOTE: C.S.S. SHALL BE INSTALLED A MIN. 1' ABOVE TOP OF PIPE.

SANITARY FORCE MAIN & WATER LINE BEDDING AND BACKFILL

SANITARY SEWER BEDDING AND BACKFILL

NOTES:

1. CONTRACTOR SHALL CONTACT CITY OF SUGAR LAND ENGINEERING DEPARTMENT AT (281) 275-2780 IF WET SAND OR OTHER UNSTABLE SOIL CONDITIONS, HIGH WATER TABLE AND/OR UNDERGROUND OBSTRUCTIONS ARE ENCOUNTERED.
2. SHOULD A CONFLICT ARISE BETWEEN INFORMATION DEPICTED ON APPROVED CONSTRUCTION DRAWINGS AND INFORMATION INCLUDED IN PROJECT SPECIFICATIONS, CITY OF SUGAR LAND DESIGN STANDARDS SHALL GOVERN.
3. SANITARY SEWER MANHOLES SHALL BE CONSTRUCTED A MINIMUM OF FOUR FOOT FROM BACK OF CURB ON CURB AND GUTTER ROADWAYS AND THREE FEET FROM EDGE OF TRAVELLED ROADWAY ON THOSE THOROUGHFARES HAVING NO CURBING, MEASURED FROM OUTSIDE DIAMETER OF MANHOLE. SANITARY SEWER MANHOLES SHALL NOT BE INSTALLED BENEATH STREET PAVING EXCEPT WHERE SPECIFICALLY AUTHORIZED BY CITY ENGINEER AND SO DESIGNATED ON APPROVED CONSTRUCTION DRAWINGS.
4. ALL SUCH MANHOLE COVERS SHALL HAVE THE CITY OF SUGAR LAND EMBLEM AND THE WORDS "SUGAR LAND" AND "SANITARY SEWER" CAST IN RAISED RELIEF AS DEPICTED IN CITY OF SUGAR LAND STANDARD CONSTRUCTION DETAILS SHEETS. ALL SANITARY SEWER MANHOLES SHALL INCORPORATE INFLOW PROTECTORS.
5. MANHOLE RIM ELEVATIONS SHOWN ON PLANS ARE APPROXIMATE ONLY. CONTRACTORS SHALL ADJUST RIM ELEVATIONS TO 0.4 FEET ABOVE FINISHED GRADE WITHIN RIGHTS-OF-WAY AND EASEMENTS AT EACH MANHOLE LOCATION AFTER FINAL GRADING. ADJUSTMENTS TO MANHOLE RIM ELEVATIONS SHALL BE ACCOMPLISHED BY THE USE OF THROAT RINGS ONLY (MAX. OF 24 INCHES PERMITTED). THE AREA ADJACENT TO SANITARY SEWER MANHOLE LOCATIONS SHALL BE GRADED AWAY FROM SUCH MANHOLES SO AS PREVENT ENTRY OF STORM WATER RUNOFF TO THE SANITARY SEWER SYSTEM.
6. DROP CONNECTIONS ARE REQUIRED WHEN INVERT ELEVATION OF SEWER LINE TO BE CONNECTED EXCEEDS 36 INCHES DISTANCE ABOVE INVERT ELEVATION OF MANHOLE BASE. ALL DROP CONNECTIONS SHALL BE CONSTRUCTED OF SAME MATERIALS AS SEWER AND SHALL BE CONSTRUCTED EXTERIOR TO MANHOLE. PIPE CONNECTIONS TO MANHOLES SHALL BE SO CONSTRUCTED AS TO BE WATERTIGHT AND TO ALIGN UPPER INSIDE PIPE WALL ELEVATIONS OF ALL PIPING CONNECTED TO BASE OF MANHOLE UNIFORMLY, REGARDLESS OF PIPE DIAMETERS. DROP ASSEMBLIES SHALL BE BEDDED IN CEMENT STABILIZED SAND. CEMENT STABILIZED SAND SHALL EXTEND A MINIMUM OF SIX INCHES PAST PIPING LATERALLY FROM BASE OF MANHOLE UPWARD TO A POINT SIX INCHES (MINIMUM) ABOVE THE HORIZONTAL SEWER PIPING WHERE CONNECTED TO THE MANHOLE ABOVE THE VERTICAL DROP.
7. CONNECTIONS TO EXISTING AND/OR NEW SANITARY SEWER MANHOLES CONSTRUCTED OF PRECAST CONCRETE NOT HAVING PRECORED HOLES OF CORRECT DIAMETER, LOCATION AND FIELD CORING ONLY SHALL ACCOMPLISH INVERT ELEVATION. IN NO INSTANCE WILL EITHER MANUAL OR PNEUMATIC CHISELS AND/OR HAMMER DRILLS BE UTILIZED TO BREAK HOLES IN PRECAST CONCRETE MANHOLES, PIPE SEGMENTS OR OTHER PRECAST STRUCTURES SUCH AS LIFT STATIONS.
8. BEDDING AND BACKFILL OF SANITARY SEWER PIPING AND MANHOLES SHALL BE ACCOMPLISHED IN ACCORDANCE WITH CITY OF SUGAR LAND DESIGN STANDARDS. A 1.5 SACK MIX IS REQUIRED FOR ALL CEMENT STABILIZED SAND BEDDING AND SUCH BEDDING SHALL BE INSTALLED IN LIFTS OF EIGHT INCHES MAXIMUM.
9. SOLVENT WELDED JOINTS ARE NOT AN ACCEPTABLE JOINING METHOD FOR SANITARY SEWERS CONSTRUCTED OF PVC PIPING MATERIALS AND LOCATED WITHIN RIGHTS-OF-WAY OR EASEMENTS. RUBBER GASKETED BELL AND SPIGOT SANITARY SEWER JOINTS ARE MANDATORY. BELL (FEMALE) ENDS OF PIPE SHALL BE INSTALLED ON UPSTREAM SIDE WITH SPIGOT (MALE) ENDS ORIENTED DOWNSTREAM.
10. SANITARY SEWER SERVICE LEADS SHALL BE EXTENDED TO RIGHTS-OF-WAY AND/OR EASEMENT LINES AS APPLICABLE AND CAPPED/PLUGGED FOR FUTURE CONNECTIONS. SERVICE LEADS ARE TO BE INSTALLED SO AS TO PASS UNDER POTABLE WATER PIPING AT CROSSINGS WHERE POSSIBLE.
11. EACH SANITARY SEWER SERVICE LEAD STUB, PLUGGED WYE BRANCH OUTLET AND STACK SHALL BE MARKED WITH A PRESSURE TREATED 4 X 4 TIMBER AT THE TIME OF CONSTRUCTION, BEGINNING AT THE INVERT ELEVATION OF THE STUB OR WYE AND AT AN ELEVATION TWO FEET BELOW THE CAPPED TERMINATION POINT OF THE STACK AND EXTENDING TWO FEET ABOVE FINISHED GRADE. EACH TIMBER MARKER SHALL BE PAINTED RED AND LABELED "SANITARY SEWER STUB", "SANITARY SEWER WYE" OR "SANITARY SEWER STACK" AS APPROPRIATE WITH STUB, WYE BRANCH OUTLET OR STACK SIZE NOTED.
12. CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING LOCATION OF ALL EXISTING UTILITIES PRIOR TO EXCAVATION. DURING THE COURSE OF ANY AND ALL CLEARING, GRUBBING, FILL, GRADING, EXCAVATION OR OTHER CONSTRUCTION, CONTRACTOR SHALL ENSURE THAT STORM DRAINAGE PATHWAYS ARE MAINTAINED AND REMAIN OPEN TO ENSURE POSITIVE DRAINAGE AND THAT SUCH CONVEYANCES ARE NOT IMPEDED OR BLOCKED IN ANY WAY. STORM SEWER INLETS SHALL BE PROTECTED FROM ENTRY OF SILT, TRASH, DEBRIS AND ANY SUBSTANCES DELETERIOUS TO THE STORM SEWER SYSTEM AND/OR WATERWAYS RECEIVING STORM WATER RUNOFF. CONTRACTOR SHALL AT COMPLETION OF WORK, FILL LOW SPOTS AND GRADE ALL RIGHTS-OF-WAY AND UTILITY EASEMENTS AND REGRADE/RESTORE DITCHES AS NECESSARY TO MAINTAIN AND/OR ESTABLISH POSITIVE DRAINAGE.
13. ALL SANITARY SEWER PIPING AND BEDDING SHALL BE INSPECTED BY CITY CONSTRUCTION INSPECTOR FOR CONFORMANCE WITH CITY INFRASTRUCTURE STANDARDS. IT IS THE CONTRACTOR'S RESPONSIBILITY TO PROPERLY NOTIFY THE CITY OF ALL CONSTRUCTION ACTIVITIES AND TO CONFORM TO CITY OF SUGAR LAND PUBLIC WORKS DEPARTMENT INSPECTION POLICY.
14. C.S.S. 1' ABOVE PIPE AND 6" BELOW PIPE MINIMUM.
15. SEE GENERAL NOTES AND C.S.S. NOTES.



SANITARY SEWER CLEANOUT DETAIL

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STATE OF TEXAS
MIGUELANGEL A. SAUCEDA
121992
LICENSED PROFESSIONAL ENGINEER

iAD PROJECT # 23017

ISSUE DATE:

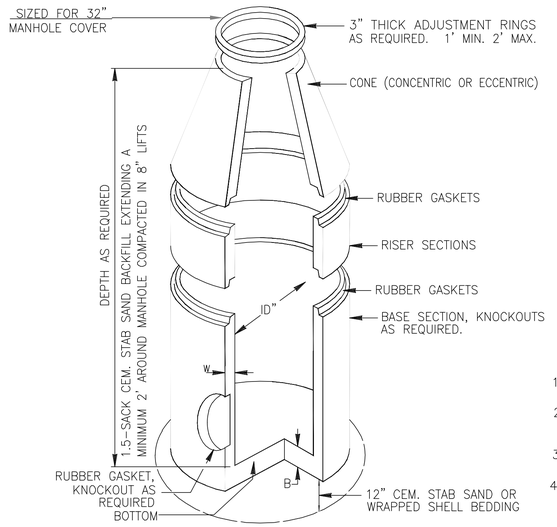
REVISION LOG

CONSTRUCTION DETAILS: SANITARY SEWER & WATERLINE

C9.01

SCALE: AS NOTED

12/2/2023 2:35:43 PM



DIMENSIONS AND WEIGHTS			
I.D. SIZE (in)	W (in)	B (in)	RISER WT/LF (lb)
48	5	6	868
60	6	8	1300
72	7	8	1811
96	9	8	3090

NOTES

1. LIFTING INSERTS AS REQUIRED.
2. ALL JOINTS SHALL BE SEALED WITH APPROVED RUBBER GASKET
3. STRUCTURE TO BE PLACED ON 12" STABILIZED BASE.
4. C.S.S. SHALL BE BROUGHT TO WITHIN 2-FT OF TOP OF MANHOLE.

SPECIFICATIONS:

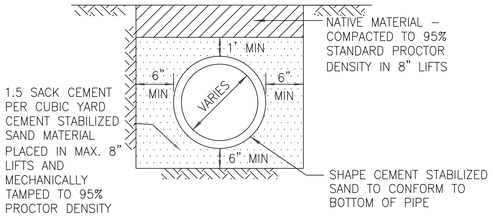
CONCRETE: CLASS 1 CONCRETE WITH A DESIGN STRENGTH OF 4500 PSI AT 28 DAYS. RATES FOR H-20 LOADING.

REINFORCEMENT: STRUCTURAL REINFORCEMENT CONFORMING TO ASTM-C-478.

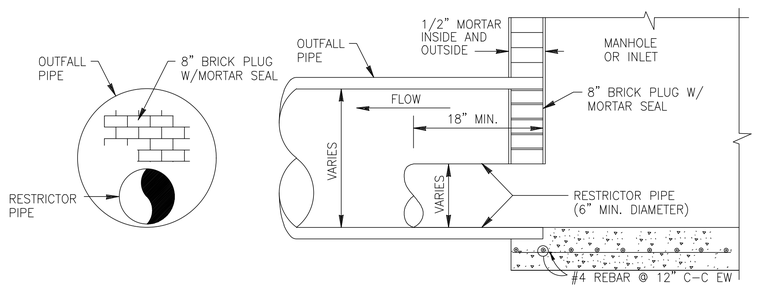
C.I. CASTINGS: CAST IRON FRAMES AND GRATES ARE MANUFACTURED OF GREY CAST IRON CONFORMING TO ASTM A48-76 CLASS 35.

PRECAST CONCRETE MANHOLE

N.T.S.



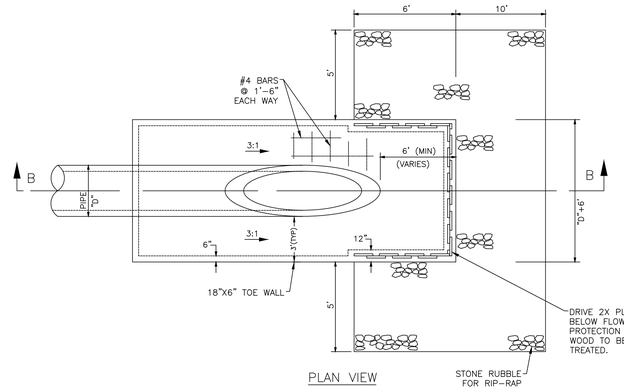
BEDDING DETAIL FOR
REINFORCED CONCRETE PIPE
STORM SEWER
36" DIAMETER & SMALLER



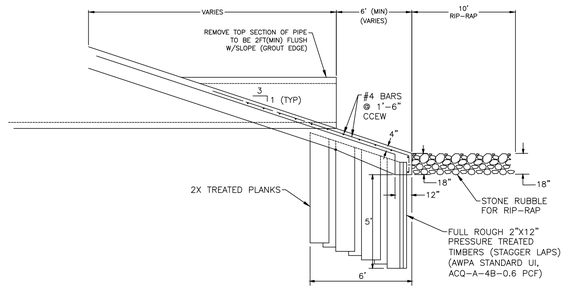
CHOKE OUTFALL RESTRICTOR DETAIL

STORM SEWER CHOKE RESTRICTOR

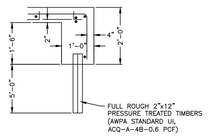
N.T.S.



PLAN VIEW



SECTION B-B



INSET

NOTES:
1. RIP-RAP SHALL BE BROKEN CONCRETE OR NATURAL STONE:
SPEC. GRAVITY - 2.4
SIZE - 0.25 TO 1.25 CF (40-190#)
DIMENSION - >3 IN.
WIDTH - <2.5 X THICKNESS
LENGTH - <3 X THICKNESS

2. ALL PLANKING FOR CUT-OFF WALLS AND RUBBLE RIP-RAP TO BE INCIDENTAL TO THE ITEM-CONCRETE FOR STRUCTURES, CLASS "B" RIP-RAP.

SLOPE PAVING OUTFALL DETAIL
STORM SEWER OUTFALL INTO DISTRICT DITCH
NTS

[redacted]

Angleton Fire Station #3 Addition

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iAD PROJECT #	23017
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REVISION LOG

CONSTRUCTION DETAILS: STORM SEWER

C9.02

SCALE: AS NOTED

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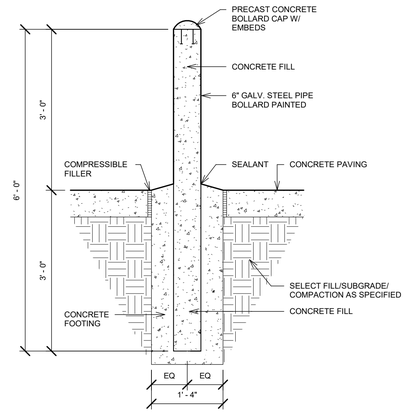
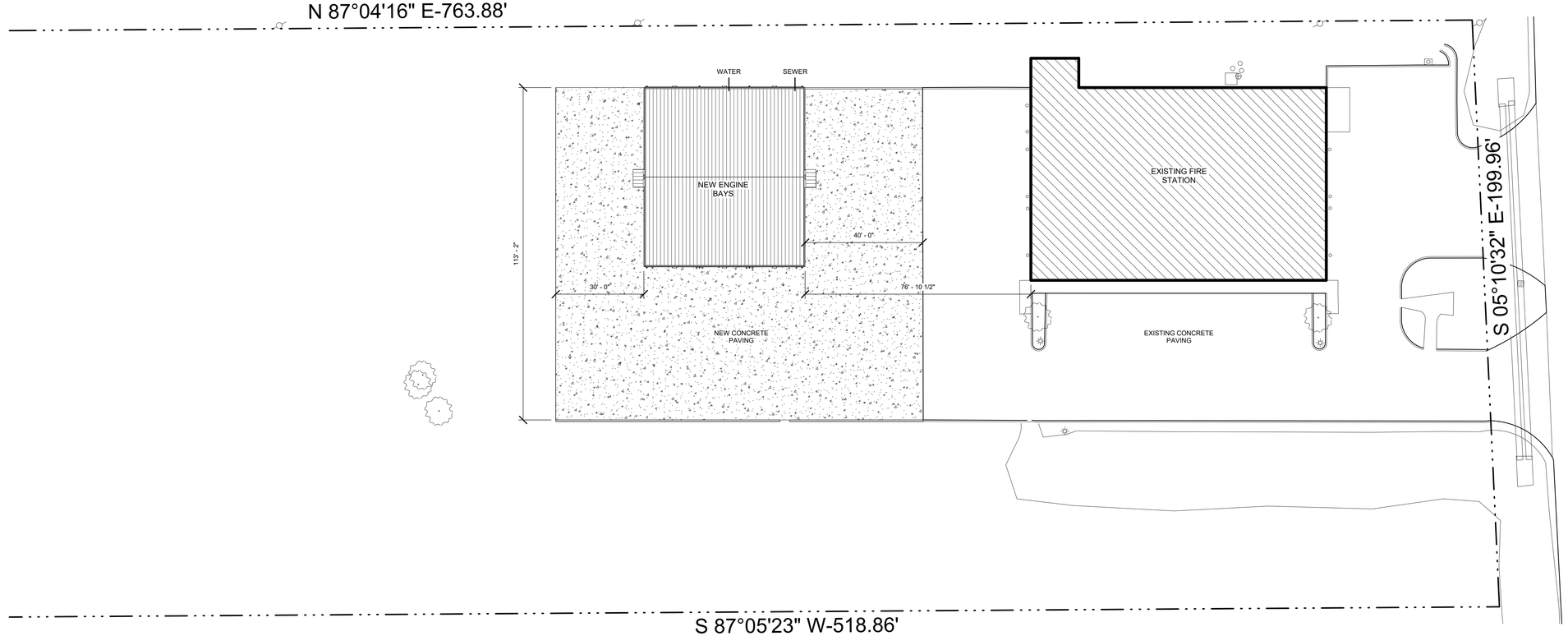


2 PIPE BOLARD

3/4" = 1'-0"



1 SITE PLAN

1" = 20'-0"

PLAN NORTH

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REVISION LOG

SITE PLAN

A1.00

SCALE: AS NOTED

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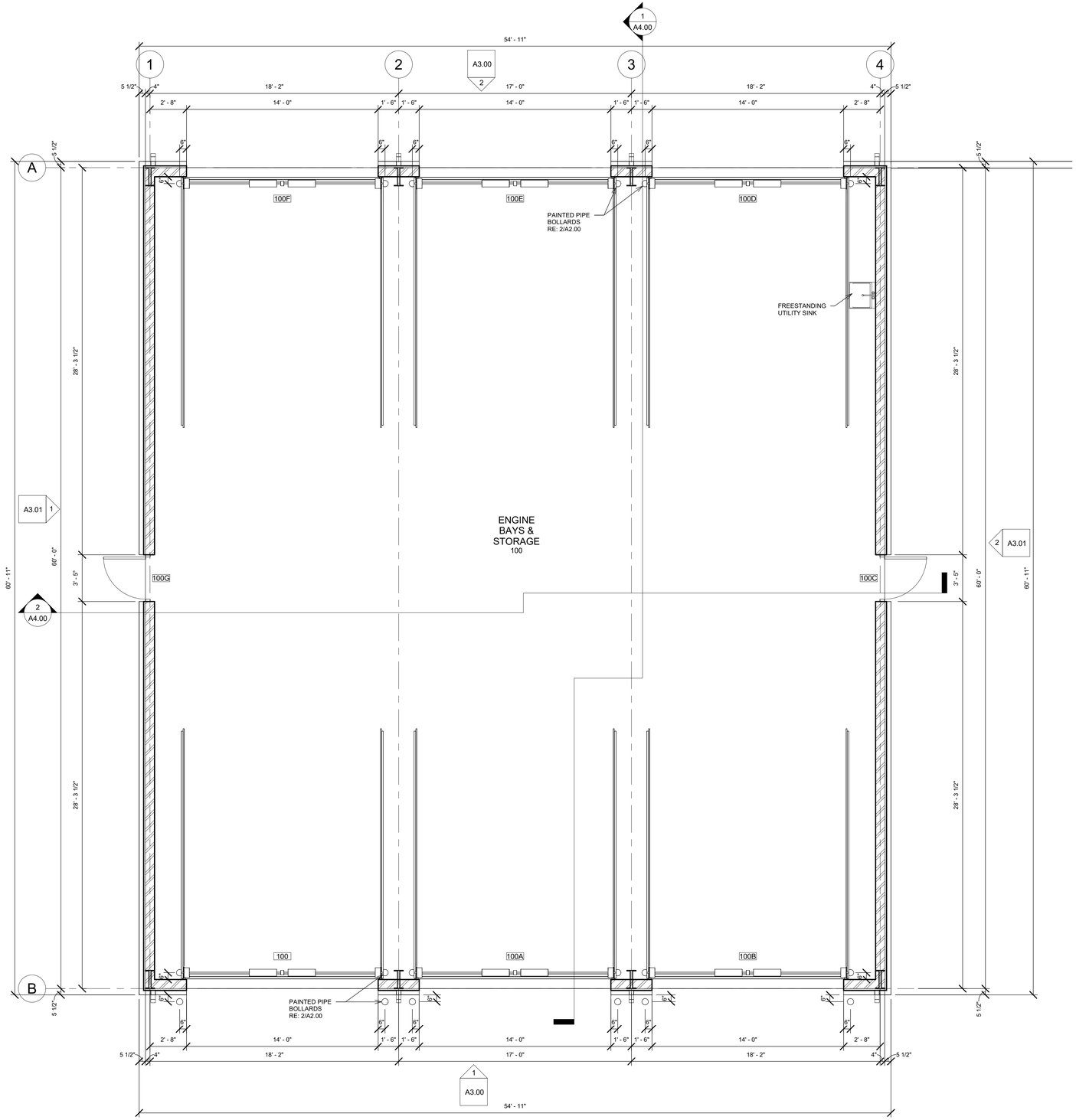

1 GROUND FLOOR PLAN

PLAN NORTH

1/4" = 1'-0"

ANGLETON
Where the Heart is

Angleton Fire Station #3 Addition

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GROUND FLOOR PLAN

A2.00

SCALE: AS NOTED

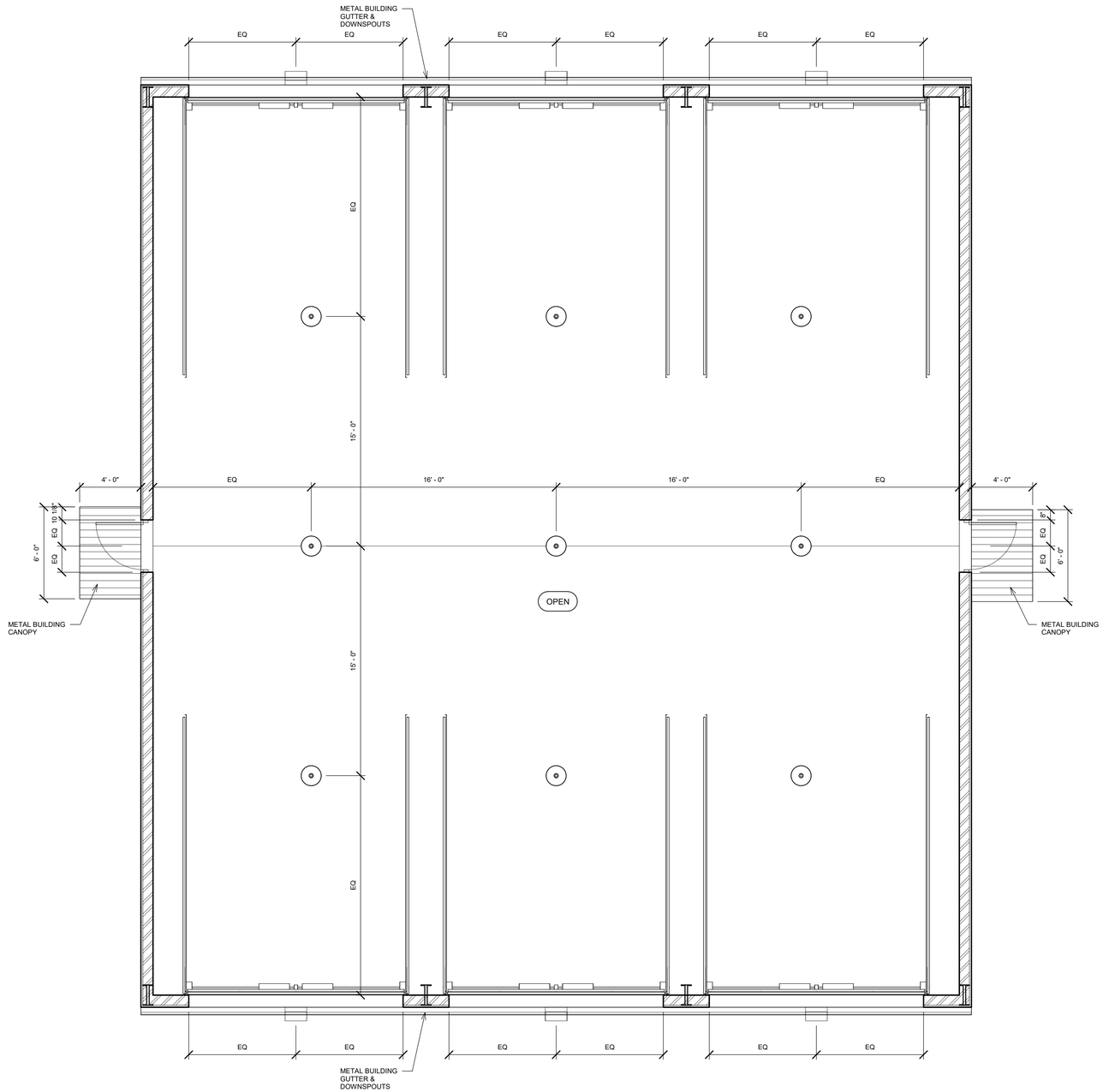
SUSPENDED HIGH BAY LED LIGHT FIXTURE

SURFACE MOUNTED WALL PACK LIGHT FIXTURE

OPEN B.O. CEILING FINISH ELEVATION A.F.F.

2 RCP LEGEND

1/8" = 1'-0"



1 GROUND FLOOR REFLECTED CEILING PLAN

1/4" = 1'-0"

PLAN NORTH

ANGLETON Where the Heart is

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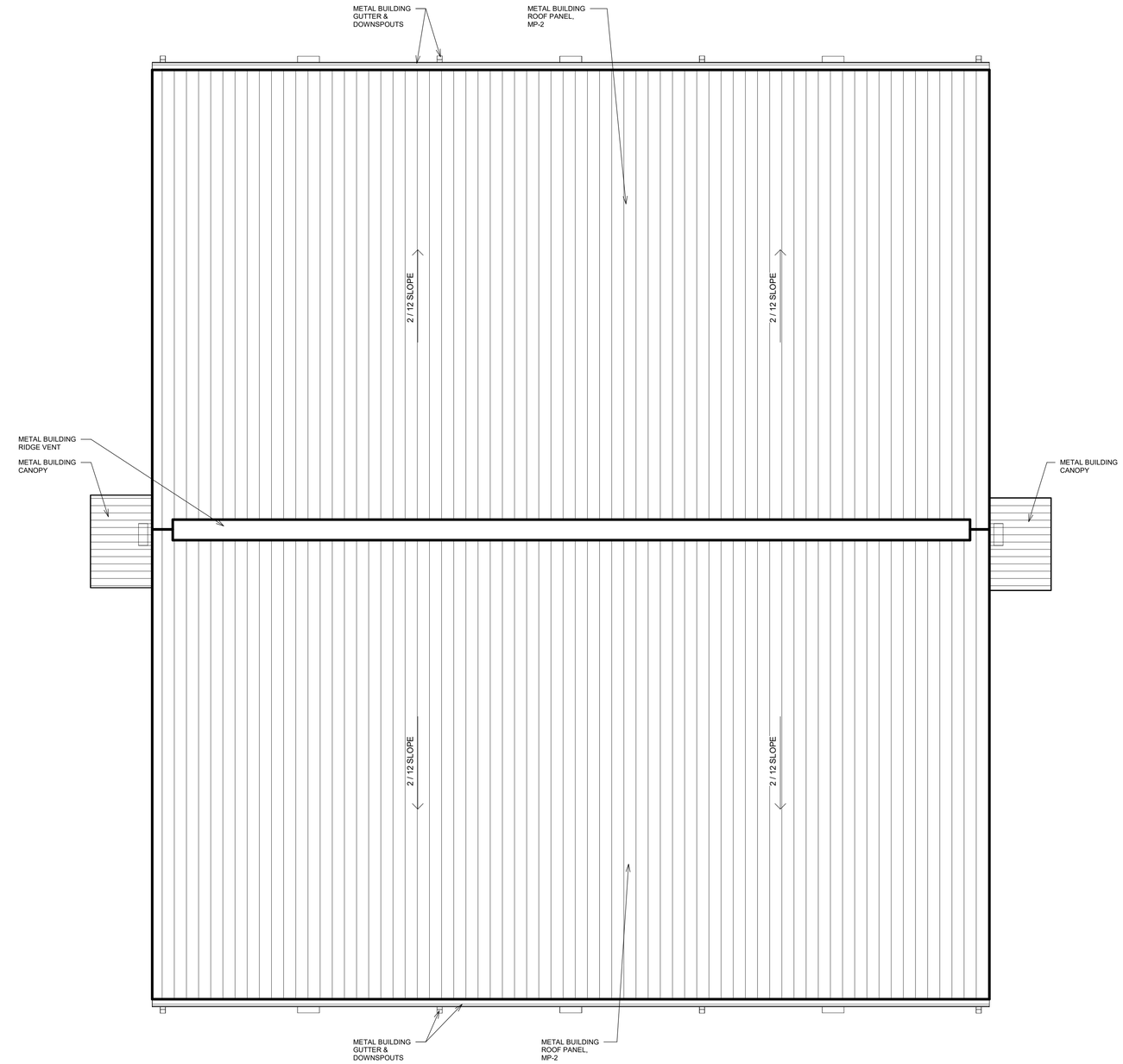
GROUND FLOOR REFLECTED CEILING PLAN

A2.20

SCALE: AS NOTED

6/2/2023 8:40:6 AM



1 ROOF PLAN
1/4" = 1'-0"

PLAN NORTH

ANGLETON
Where the Heart is

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ROOF PLAN

A2.30

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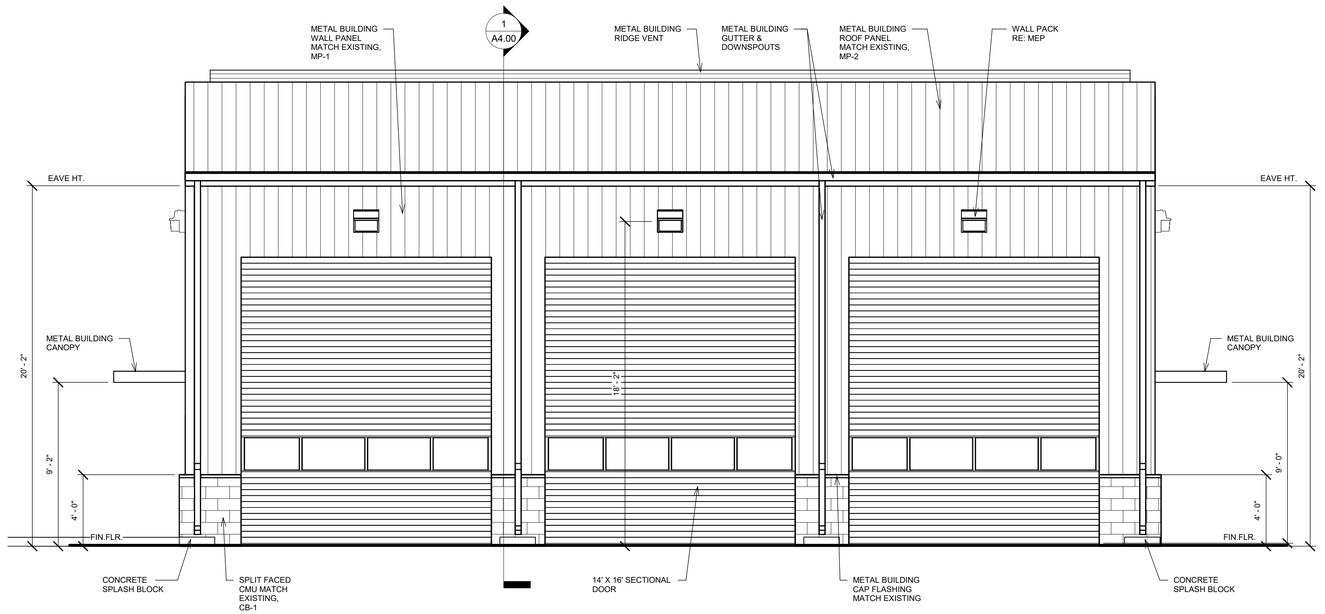
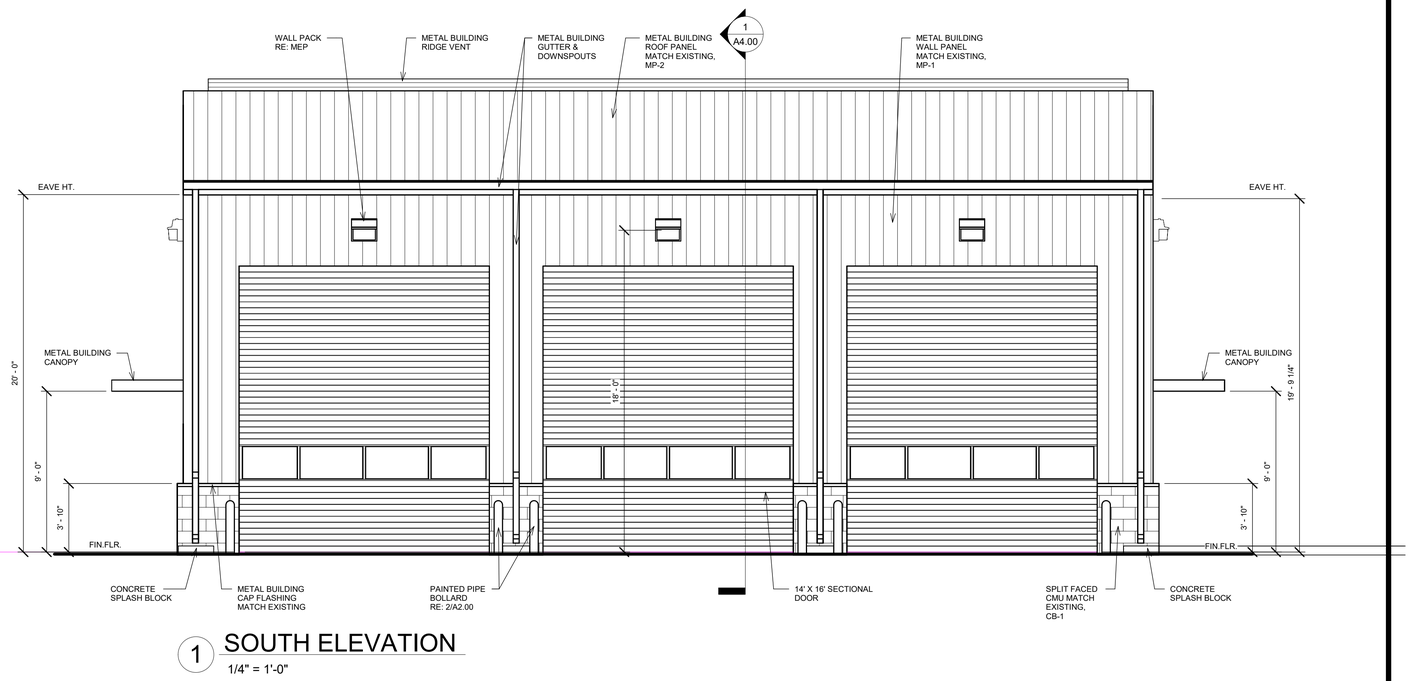


2 NORTH ELEVATION

1/4" = 1'-0"



1 SOUTH ELEVATION

1/4" = 1'-0"

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ELEVATIONS

A3.00

SCALE: AS NOTED

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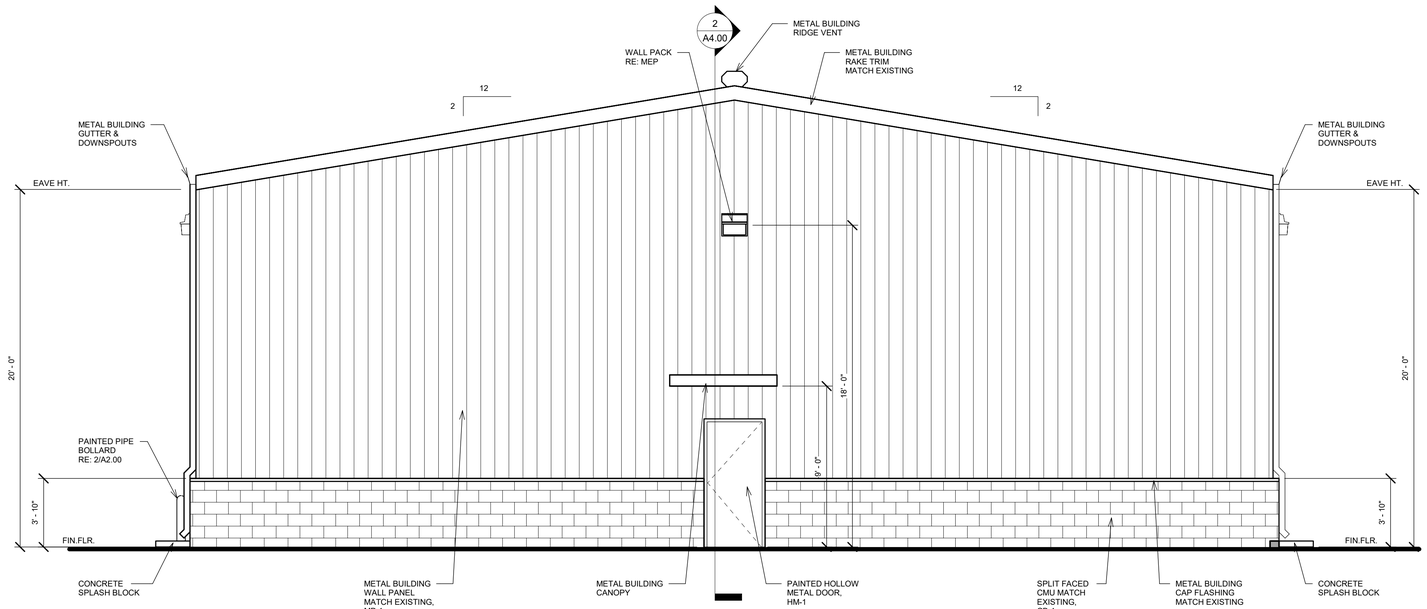
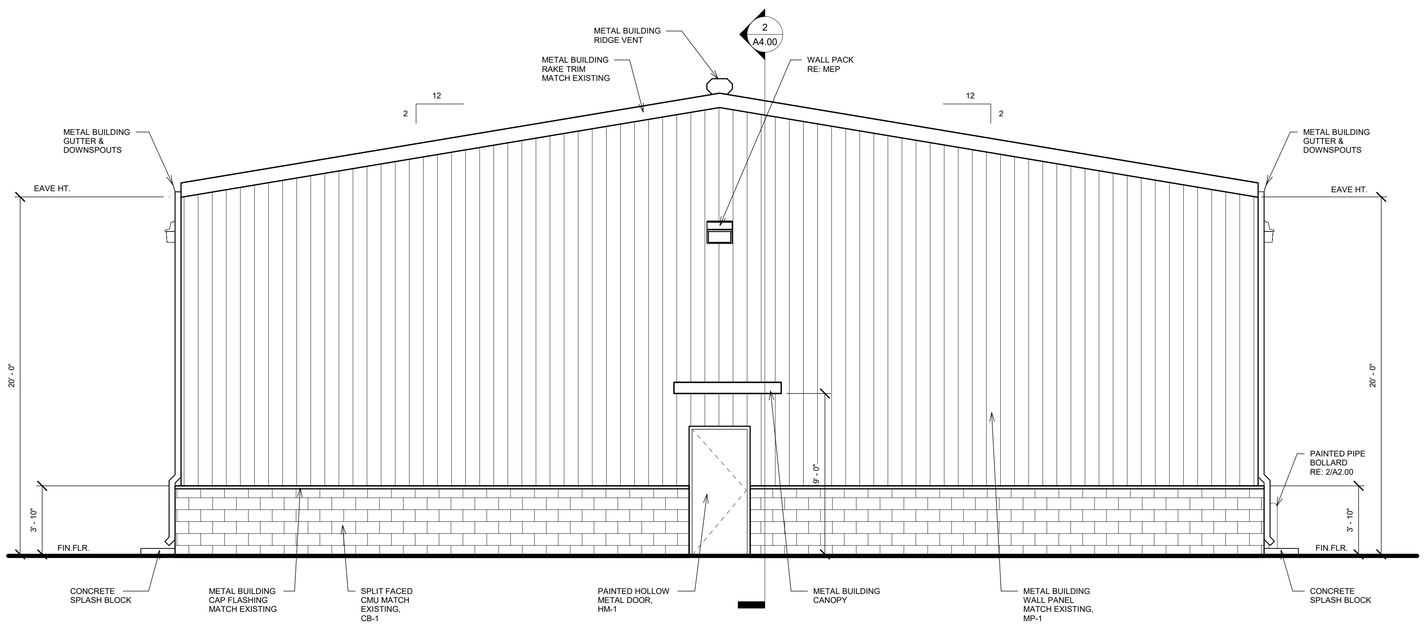


2 EAST ELEVATION

1/4" = 1'-0"



1 WEST ELEVATION

1/4" = 1'-0"

ANGLETON
Where the Heart is

Angleton Fire Station #3 Addition

2743 N. Velasco St.
Angleton, Texas 77515

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Structural
CJG Engineers
3200 Wilcrest Dr., Suite 305
Houston, TX 77042
713.780.3345 p.
Mechanical,Electrical, & Plumbing
DVO an Urban-Gro Company
825 Town & Country Lane, Suite 1150
Houston, TX 77024
281.293.7500 p.

iAD PROJECT #	23017
ISSUE DATE:	06/02/23

	06/02/23	95 % OWNER REVIEW SET

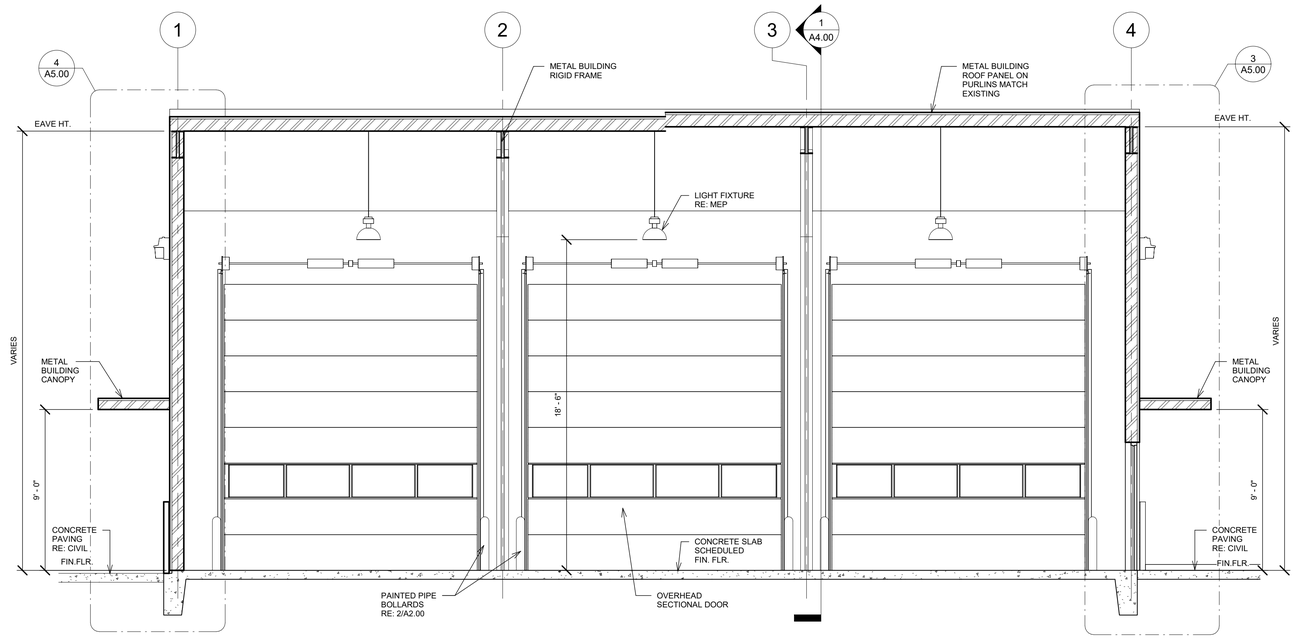
REVISION LOG

ELEVATIONS

A3.01

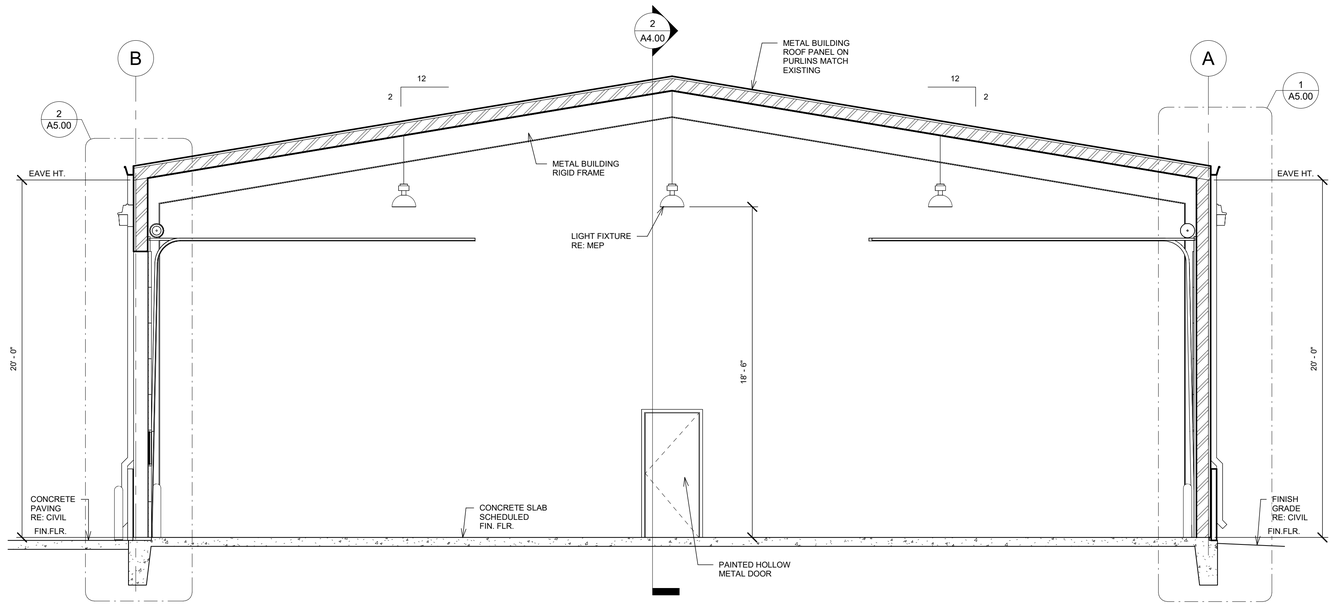
SCALE: AS NOTED

6/2/2023 8:43:52 AM



2 LONGITUDINAL SECTION

1/4" = 1'-0"



1 CROSS SECTION

1/4" = 1'-0"

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iAD PROJECT #	23017
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	06/02/23	95 % OWNER REVIEW SET

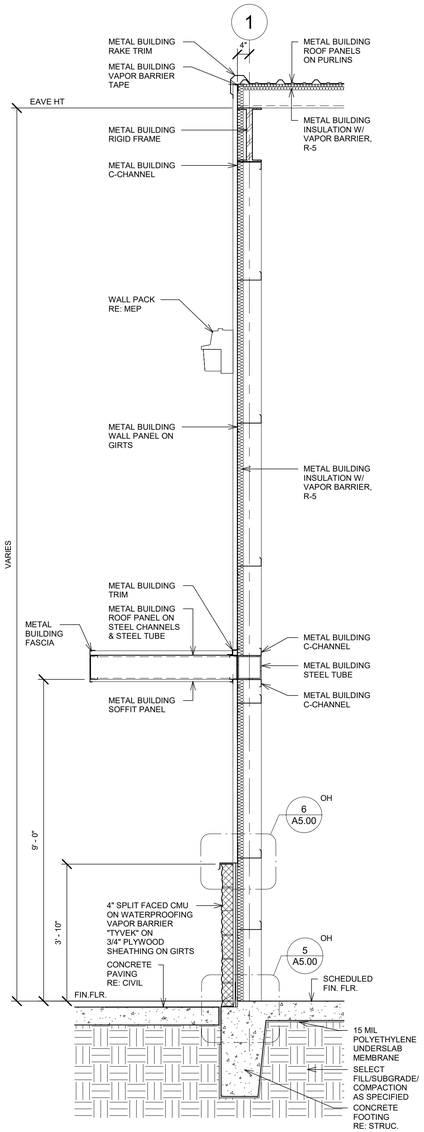
REVISION LOG

BUILDING SECTIONS

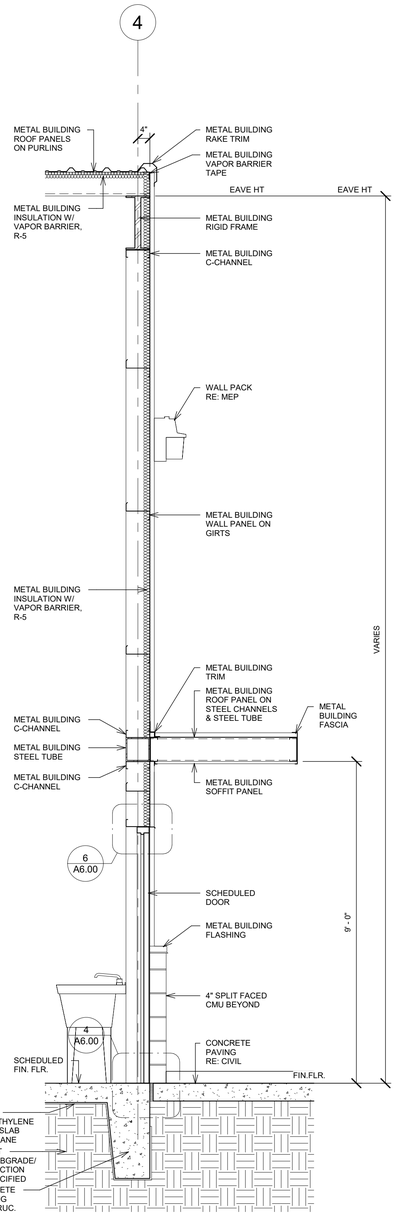
A4.00

SCALE: AS NOTED

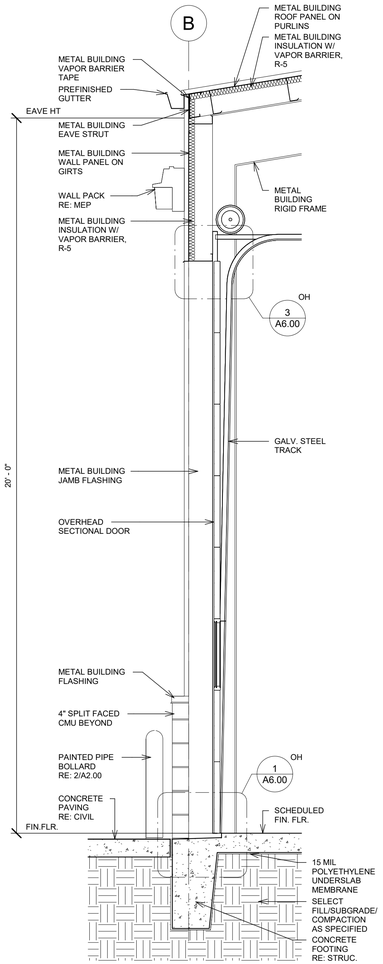
6/2/2023 8:45:53 AM



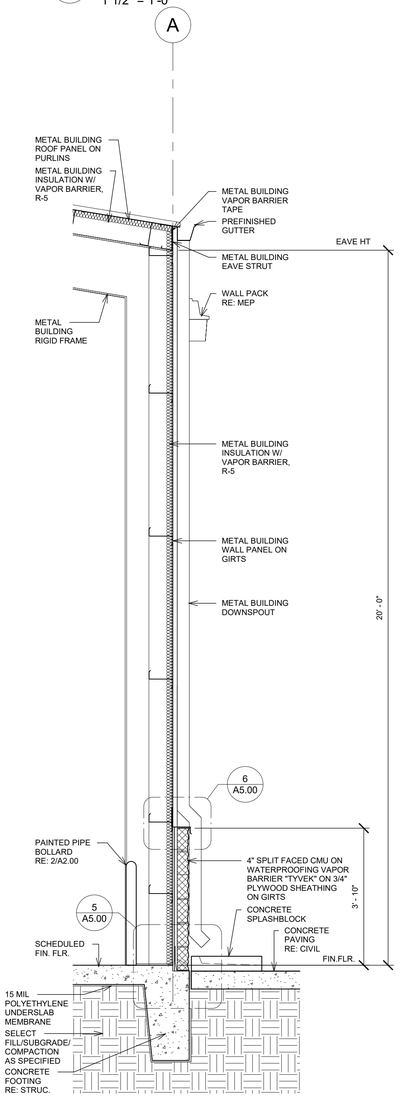
4 WALL SECTION 4
1/2" = 1'-0"



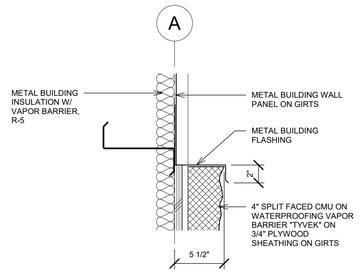
3 WALL SECTION 3
1/2" = 1'-0"



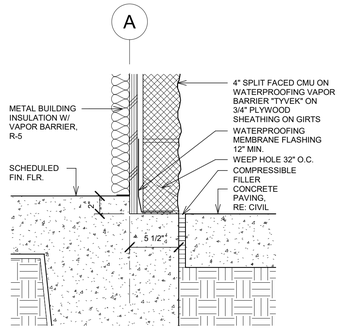
2 WALL SECTION 2
1/2" = 1'-0"



1 WALL SECTION 1
1/2" = 1'-0"



6 CMU WAINSCOT DET.
1 1/2" = 1'-0"



5 CMU LEDGE DET.
1 1/2" = 1'-0"

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REVISION LOG

WALL SECTIONS

A5.00

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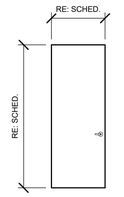
6/5/2023 8:45:05 AM

FLOOR FINISH SCHEDULE

Room	Name	Floor Finish	Base Finish	Wall Finish				Ceiling Finish	Ceiling Height	Notes
				North	South	East	West			
100	ENGINE BAYS & STORAGE	SC-1	-	-	-	-	-	OPEN	OPEN	

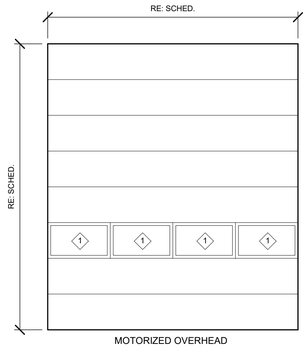
FLOOR DOOR SCHEDULE

Door#	Door Size	Finish	Door Type	Door Material	Frame Type	Frame Material	Hardware Set	Details				Notes
								Head	Jamb	Jamb	Sill	
100	14'-0" X 16'-0"	PAINT	2	STEEL	BY MANF.	BY MANF.		3/A6.00	2/A6.00	2/A6.00	1/A6.00	MOTORIZED
100A	14'-0" X 16'-0"	PAINT	2	STEEL	BY MANF.	BY MANF.		3/A6.00	2/A6.00	2/A6.00	1/A6.00	MOTORIZED
100B	14'-0" X 16'-0"	PAINT	2	STEEL	BY MANF.	BY MANF.		3/A6.00	2/A6.00	2/A6.00	1/A6.00	MOTORIZED
100C	3'-0" X 7'-0"	PAINT	1	HM	A	HM		6/A6.00	5/A6.00	5/A6.00	4/A6.00	
100D	14'-0" X 16'-0"	PAINT	2	STEEL	BY MANF.	BY MANF.		3/A6.00	2/A6.00	2/A6.00	1/A6.00	MOTORIZED
100E	14'-0" X 16'-0"	PAINT	2	STEEL	BY MANF.	BY MANF.		3/A6.00	2/A6.00	2/A6.00	1/A6.00	MOTORIZED
100F	14'-0" X 16'-0"	PAINT	2	STEEL	BY MANF.	BY MANF.		3/A6.00	2/A6.00	2/A6.00	1/A6.00	MOTORIZED
100G	3'-0" X 7'-0"	PAINT	1	HM	B	HM		6/A6.00	5/A6.00	5/A6.00	4/A6.00	



HOLLOW METAL DOOR EXTERIOR

1



MOTORIZED OVERHEAD SECTIONAL DOOR EXTERIOR

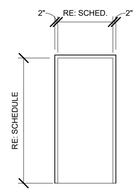
2

8 DOOR TYPES

1/4" = 1'-0"

GLAZING TYPES:

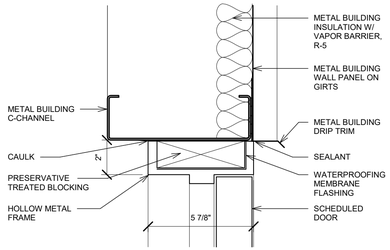
1 BY MANUF. TDI IMPACT RESISTANT GLASS



HOLLOW METAL EXTERIOR

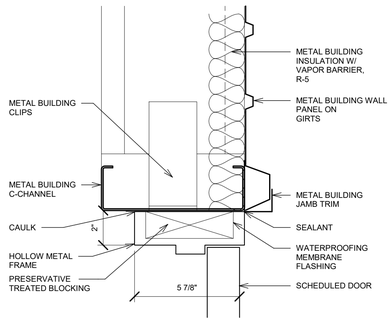
7 DOOR FRAME TYPES

1/4" = 1'-0"



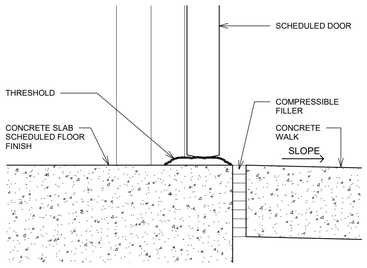
6 HM DOOR HEAD

3" = 1'-0"



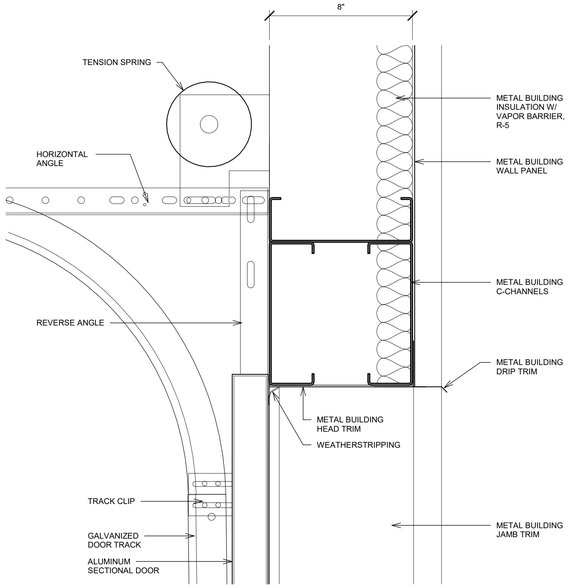
5 HM DOOR JAMB

3" = 1'-0"



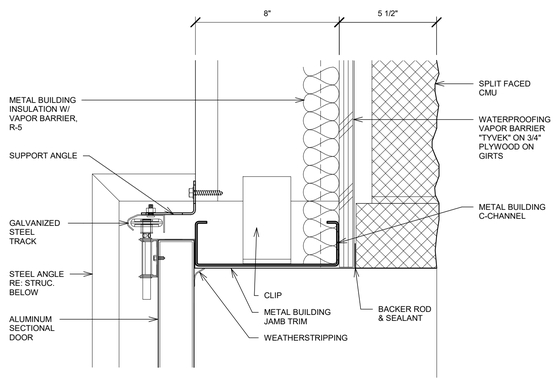
4 HM DOOR SILL

3" = 1'-0"



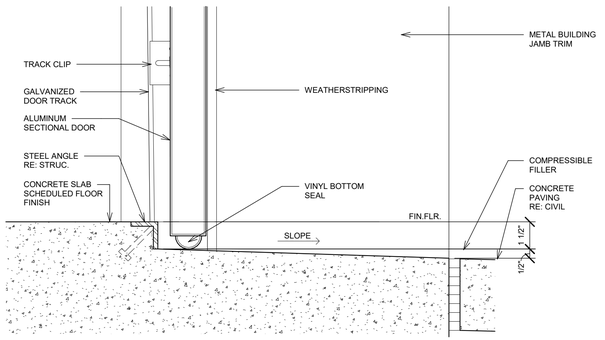
3 SECTIONAL DOOR HD

3" = 1'-0"



2 SECTIONAL DOOR JMB

3" = 1'-0"



1 SECTIONAL DOOR SILL

3" = 1'-0"

FINISH	TAG	MATERIAL NOTES	
FLOORING			
SEALED CONCRETE	SC-1	MANUF:	H & C SEALER
		SERIES:	-
		COLOR:	CLEAR
		NOTES:	-
EXTERIOR			
METAL PANELS	MP-1	MANUF:	WHIRLWIND, ALLIANCE, RED DOT, ETC
		SERIES:	R-PANEL
		COLOR:	MATCH EXISTING
		NOTE:	WALLS - SEE ELEVATIONS
	MP-2	MANUF:	WHIRLWIND, ALLIANCE, RED DOT, ETC
		SERIES:	R-PANEL
		COLOR:	MATCH EXISTING
		NOTE:	ROOF - SEE ELEVATIONS
CMU BLOCK	CB-1	MANUF:	UPCHURCH KIMBROUGH
		SERIES:	SPLIT FACE
		COLOR:	MATCH EXISTING
		NOTE:	WAINSCOT AROUND BUILDING - SEE ELEV.
HOLLOW METAL DOORS/FRAMES	HM-1	MANUF:	SHERWIN WILLIAMS
		COLOR:	MATCH EXISTING
		FINISH:	AS SPECIFIED
		NOTE:	

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iAD PROJECT #	23017
ISSUE DATE:	06/02/23

	06/02/23	95 % OWNER REVIEW SET

REVISION LOG

FINISH & DOOR SCHEDULES, FINISH LEGEND, DOOR & FRAME TYPES,

A6.00

SCALE: AS NOTED

6/2/2023 8:49:56 AM

GENERAL NOTES

A. THE NOTES AND SPECIFICATIONS PROVIDED ON THE STRUCTURAL DRAWINGS ARE EXCERPTS FROM THE RELATING PROJECT SPECIFICATIONS. THEY ARE NEITHER COMPLETE NOR DO THEY REPLACE THE CONTRACT SPECIFICATIONS.

B. MEANS AND METHODS: THE STRUCTURAL DRAWINGS DEPICT THE STRUCTURE IN ITS FINAL CONSTRUCTED CONFIGURATION UNLESS SO STATED OR NOTED. IT IS THE CONTRACTOR'S RESPONSIBILITY TO DESIGN AND PROVIDE ALL TEMPORARY SUPPORTS REQUIRED FOR THE EXECUTION OF THE CONTRACT INCLUDING BUT NOT LIMITED TO: GUYS, BRACES, SHORES, RE-SHORES, FALSEWORK, ANY TEMPORARY SUPPORTS OR TEMPORARY ANCHORS. NEITHER CONSTRUCTION MEANS AND METHODS NOR CONSTRUCTION SAFETY ARE PART OF THE STRUCTURAL ENGINEER'S EXPERTISE OR SCOPE OF WORK. THE GENERAL CONTRACTOR AND HIS SUBCONTRACTORS ARE FULLY RESPONSIBLE FOR THE MEANS AND METHODS USED TO CONSTRUCT THE STRUCTURE AND FOR FULL COMPLIANCE WITH ALL JOB SAFETY RELATED REGULATIONS AND CONDITIONS AT THE SITE. THE CONTRACTOR IS RESPONSIBLE FOR ALL MEANS AND METHODS RELATING TO THE SPECIFIC STRUCTURAL ERECTION ITEMS ADDRESSED IN THE LATEST OSHA REGULATIONS.

C. LIMITED SITE VISITS IF ANY BY THE STRUCTURAL ENGINEER OF RECORD (SER) ARE SOLELY TO OBSERVE COMPLETED PARTS OF THE STRUCTURE. THE STRUCTURAL ENGINEER OF RECORD (SER) IS NEITHER QUALIFIED TO OBSERVE NOR COMMENT ON CONSTRUCTION MEANS AND METHODS AND JOB SITE SAFETY.

D. PRINCIPAL OPENINGS ARE SHOWN ON THE DRAWINGS. SEE ARCHITECTURAL, MECHANICAL AND ELECTRICAL DRAWINGS FOR OPENINGS, SLEEVES, CURBS, INSERTS, DEPRESSIONS, ETC., NOT SHOWN.

E. TYPICAL DETAILS: GENERAL DETAILS AND NOTES ON THESE SHEETS SHALL APPLY UNLESS SPECIFICALLY SHOWN OR NOTED OTHERWISE. CONSTRUCTION DETAILS NOT FULLY SHOWN OR NOTED SHALL BE SIMILAR TO DETAILS SHOWN FOR SIMILAR CONDITIONS. ALL WORK OR CONSTRUCTION SHALL COMPLY WITH ALL APPLICABLE BUILDING CODES, REGULATION AND SAFETY REQUIREMENTS. ALL DETAILS ARE TYPICAL UNLESS NOTED OTHERWISE. DETAILS SHALL APPLY TO ALL SIMILAR AND LIKE CONDITIONS.

F. DISCREPANCIES: THE CONTRACTOR SHALL INFORM THE ENGINEER IN WRITING OF ANY DISCREPANCIES OR OMISSIONS NOTED ON THE DRAWINGS OR IN THE SPECIFICATIONS. UPON RECEIPT OF SUCH INFORMATION, THE ENGINEER WILL SEND WRITTEN INSTRUCTIONS TO ALL CONCERNED. ANY SUCH DISCREPANCY, OMISSION, OR VARIATION NOT REPORTED SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR, AND WORK SHALL BE PERFORMED IN A MANNER AS DIRECTED BY THE ENGINEER AT NO COST TO THE PROJECT.

G. EXCAVATION: THE CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR ALL EXCAVATION PROCEDURES INCLUDING LAGGING, SHORING, AND PROTECTION OF ADJACENT PROPERTY, STRUCTURES, STREETS AND UTILITIES IN ACCORDANCE WITH THE LOCAL BUILDING DEPARTMENT

H. COORDINATION AND OTHER TRADES: IT IS NOT THE INTENT THAT THE STRUCTURAL DRAWINGS BE VIEWED AS STAND ALONE DRAWINGS WITH RESPECT TO PROJECT DIMENSIONS OR ANY OTHER COMPONENT OF THE CONSTRUCTION THAT CAN AND MAY BE IDENTIFIED IN OTHER PARTS OF THE CONTRACT DOCUMENTS. IT REQUIRES THE ENTIRE SET OF CONTRACT DOCUMENTS TO PROPERLY CONSTRUCT THE STRUCTURE AS WELL AS OTHER COMPONENTS OF THE BUILDING. ANCHORS REQUIRED FOR ANCHORING MEP EQUIPMENT AND / OR PIPING ARE NOT SHOWN ON THESE DRAWINGS. THE CONTRACTOR SHALL DETERMINE AND COORDINATE REQUIREMENTS FROM OTHER DISCIPLINES AND SHALL PROVIDE APPROPRIATE ALLOWANCES INTO THE BID. IT IS THE CONTRACTOR'S RESPONSIBILITY TO ASSEMBLE AND COORDINATE THE REQUIREMENTS OF ALL COMPONENTS OF THE CONTRACT DOCUMENTS IN ORDER TO PROPERLY IMPLEMENT THE REQUIREMENTS OF THE CONTRACT. SEE ARCHITECTURAL, ELECTRICAL, AND MECHANICAL DRAWINGS FOR SIZE AND LOCATION OF PIPES, VENTS, CHASES, DUCTS AND OTHER OPENINGS AND DETAILS NOT SHOWN ON THESE STRUCTURAL DRAWINGS. ALL DIMENSIONS ARE TO BE CHECKED AND VERIFIED WITH THE ARCHITECTURAL DRAWINGS.

I. SEE ARCHITECTURAL DRAWINGS FOR ELEVATIONS NOT SHOWN. THE CONTRACTOR SHALL COMPARE THE STRUCTURAL SECTIONS WITH THE ARCHITECTURAL SECTIONS AND REPORT ANY DISCREPANCY TO THE ARCHITECT PRIOR TO FABRICATING OR INSTALLING STRUCTURAL MEMBERS.

J. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO COORDINATE THE GRADES WITH THE CIVIL ENGINEER'S GRADING PLAN AND THE LANDSCAPE ARCHITECT'S PLAN.

K. THE DRAWINGS IN THE STRUCTURAL DOCUMENTS ARE NOT TO BE SCALED FOR ANY PURPOSE, INCLUDING THE DETERMINATION OF QUANTITIES AND THE FIT UP OF MATERIALS.

L. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO OBTAIN ALL CONTRACT DOCUMENTS AND LATEST ADDENDA AND TO PROVIDE SUCH DOCUMENTS TO ALL SUBCONTRACTORS AND MATERIAL SUPPLIERS PRIOR TO THE SUBMITTAL OF SHOP DRAWINGS, FABRICATION OF ANY STRUCTURAL MEMBERS AND ERECTION IN THE FIELD.

M. PRECONSTRUCTION MEETINGS: THE CONTRACTOR IS RESPONSIBLE FOR ARRANGING PRECONSTRUCTION MEETINGS FOR THE FOUNDATION AND SUPERSTRUCTURE ELEMENTS OF THE PRIMARY FRAME WITH A MINIMUM OF TWO WEEKS OF NOTICE PRIOR TO START OF THE RELEVANT WORK. ATTENDEES SHALL INCLUDE THE CONTRACTORS, APPROPRIATE SUBCONTRACTORS, FABRICATORS, INSPECTORS, ARCHITECT/ENGINEERS. THE MEETING AGENDA SHALL INCLUDE THE FOLLOWING ITEMS: REVIEW OF WORK SCOPE, PROJECT SCHEDULE FOR THE ELEMENTS BEING DISCUSSED, CONTACT INFORMATION OF RESPONSIBLE PARTIES, INSPECTION POINTS FOR BOTH SER AND SPECIAL INSPECTOR, REVIEW OF MATERIALS AND ANY SPECIAL DESIGN ISSUES, CLARIFICATIONS, TESTING AND ACCEPTANCE, AND ANY OTHER TOPIC DEEMED APPROPRIATE BY THE CONTRACTOR, ARCHITECT OR STRUCTURAL ENGINEER.

N. SHOP DRAWINGS SHALL BE NEW DRAWINGS PRODUCED BY THE CONTRACTOR. ILLEGIBLE REPRODUCTIONS OF THE DESIGN DRAWINGS WILL BE REJECTED. THE USE OF REPRODUCTIONS OR ELECTRONIC FILES OF THE STRUCTURAL DRAWINGS FOR THE PREPARATION OF SHOP DRAWINGS IS NOT ACCEPTABLE WITHOUT PRIOR WRITTEN AUTHORIZATION OF THE ENGINEER OF RECORD. IF SUCH AUTHORIZATION IS OBTAINED, DO NOT SUBMIT SHOP DRAWINGS WITH THE CONTRACT DOCUMENT TITLE BLOCK AND/OR THE SEAL OF THE REGISTERED ENGINEER OF RECORD AFFIXED. ALTERATION OF A SEALED DOCUMENTS WITHOUT PROPER NOTIFICATION OF THE RESPONSIBLE ENGINEER IS AN OFFENSE OF THE ENGINEERING PRACTICE ACT. THE USE OF REPRODUCTIONS OR ELECTRONIC FILES OF THESE CONTRACT DRAWINGS BY ANY CONTRACTOR, SUBCONTRACTOR, ERECTOR, FABRICATOR, OR MATERIAL SUPPLIER IN LIEU OF PREPARATION OF SHOP DRAWINGS SIGNIFIES HIS ACCEPTANCE OF ALL INFORMATION SHOWN HEREON AS CORRECT, AND OBLIGATES HIMSELF TO ANY JOB EXPENSE, REAL OR IMPLIED, ARISING DUE TO ANY ERRORS OR OMISSIONS THAT MAY OCCUR HEREON. DRAWINGS REQUIRING A SPECIALTY STRUCTURAL ENGINEER (SSR) SHALL HAVE CALCULATIONS AND DRAWINGS SEALED BY A LICENSED ENGINEER IN THE STATE OF THE PROJECT.

O. SHOP DRAWINGS ARE AN AID FOR FIELD PLACEMENT, AND ARE SUPERSEDED BY THE STRUCTURAL DRAWINGS. IT IS NOT THE INTENT THAT THE STRUCTURAL DRAWINGS BE VIEWED AS DETAILED SHOP OR ERECTION DRAWINGS. VARIOUS DIMENSIONS REQUIRED FOR PROPER FIT-UP OF THE COMPONENTS OF THE STRUCTURE MUST BE DETERMINED FROM THE INFORMATION THAT IS PROVIDED ELSEWHERE IN THE CONTRACT DOCUMENTS. IT IS THE CONTRACTOR'S AND THEIR DETAILER'S OR SUBCONTRACTOR'S RESPONSIBILITY TO ESTABLISH AND TO CALCULATE AND VERIFY THESE DIMENSIONS AS REQUIRED TO ACHIEVE PROPER FIT-UP OF MATERIALS AND TO ACHIEVE COMPLIANCE WITH THE REQUIREMENTS OF THE CONTRACT DOCUMENTS. IT SHALL BE THE RESPONSIBILITY OF THE GENERAL CONTRACTOR TO MAKE CERTAIN THAT ALL CONSTRUCTION IS IN FULL AGREEMENT WITH THE LATEST STRUCTURAL DRAWINGS.

P. OMISSION FROM THE SHOP DRAWINGS OF ANY REQUIREMENTS OF THE CONTRACT DOCUMENTS SHALL NOT RELIEVE THE CONTRACTOR OF THE RESPONSIBILITY OF COMPLYING WITH THE OMITTED REQUIREMENTS, EVEN IF THE SHOP DRAWINGS HAVE BEEN REVIEWED, APPROVED AND RETURNED.

Q. SHOP DRAWING REVIEW PROCESS - ALL SHOP DRAWINGS WILL BE REVIEWED AND RETURNED IN THE ORDER RECEIVED UNLESS OTHER SPECIFIC INSTRUCTIONS ARE RECEIVED. FOR PROJECTS WITH MULTIPLE WORK AREAS, THE SHOP DRAWINGS MUST BE DIVIDE INTO THE SAME OR SIMILAR AREAS WITH EACH AREA SUBMITTED INDIVIDUALLY UNDER A SEPARATE TRANSMITTAL. IF THE SHOP DRAWINGS ARE NOT DIVIDED INTO AREAS PER THE CONTRACT DOCUMENTS, THAT SUBMITTAL WILL BE REJECTED. EACH SUBMITTAL WILL BE REVIEWED INDIVIDUALLY AND REQUIRE AN INDIVIDUAL TIME FRAME OF TEN (10) WORKING DAYS PER SUBMITTAL. IF MULTIPLE SUBMITTALS ARE RECEIVED WITHIN THE REVIEW TIME FRAME OF A PRIOR SUBMITTAL, THEY WILL BE REVIEWED CONSECUTIVELY EACH WITH ITS OWN INDIVIDUAL REVIEW TIME FRAME THAT BEGINS ONCE THE PRIOR SUBMITTAL IS RETURNED. THIS GIVES EACH SUBMITTAL A TEN (10) WORKING DAY REVIEW WINDOW.

R. RETURNED SHOP DRAWINGS STAMPED "NOTE MARKINGS" OR "APPROVED AS NOTED" ARE ASSUMED TO BE APPROVED ONCE ALL THE COMMENTS HAVE BEEN INCORPORATED. THE SER WILL ONLY REVIEW SUBMITTALS ONE ADDITIONAL TIME AND ONLY IF THEY ARE MARKED "REVISE AND RESUBMIT" OR "REJECTED". ANY FURTHER REVIEWS OF THE SAME OR SIMILAR SUBMITTALS WILL BE AT THE GENERAL CONTRACTORS EXPENSE WITH PAYMENT FOR SERVICES RENDERED PRIOR TO THE RETURN OF THE APPROVAL DRAWINGS.

S. THE CONTRACTOR SHALL BE RESPONSIBLE FOR DELAYS CAUSED BY REJECTION OF INADEQUATE, INCOMPLETE OR INCORRECT SHOP DRAWINGS.

T. SHOP DRAWINGS THAT ARE NOT SPECIFICALLY REQUIRED BY THE GENERAL NOTES OR SPECIFICATIONS WILL NOT BE REVIEWED OR RETURNED.

U. MINIMUM SHOP DRAWING SUBMITTAL REQUIREMENTS INCLUDE:

- CONCRETE MIX DESIGNS FOR EACH CLASS OF CONCRETE WITH TEST DATA
- CONCRETE ACCESSORIES (VAPOR RETARDER, REINFORCING SUPPORT CHAIRS, VOID FORMS, ETC.)
- CONCRETE REINFORCING SHOP DRAWINGS
- PRE-ENGINEERED METAL BUILDING SHOP DRAWINGS (SEALED BY A LICENSED ENGINEER)
- GLAZED ALUMINUM FRAMING SYSTEMS SHOP DRAWINGS AND CALCULATIONS (SEALED BY LICENSED ENGINEER)
- PRE-FABRICATED CANOPY FRAMING SYSTEMS SHOP DRAWINGS AND CALCULATIONS (SEALED BY A LICENSED ENGINEER)

V. CRANES, CONCRETE TRUCKS AND ALL OTHER HEAVILY LOADED VEHICLES ARE NOT TO BE DRIVEN ACROSS GRADE BEAMS OR BUILDING SLABS.

W. ALL SHORING REQUIRED TO TEMPORARILY SUPPORT CONSTRUCTION LOADS DURING THE CONSTRUCTION OF THE PROJECT SHALL BE DESIGNED AND SEALED BY A LICENSED ENGINEER. ALL EXISTING STRUCTURES AND NEW STRUCTURES SUPPORTING SHORING LOADS SHALL ALSO BE ANALYZED TO DETERMINE IF THEY ARE CAPABLE OF SUPPORTING THE REQUIRED LOADS AND SHALL BE REVIEWED BY A LICENSED ENGINEER. SHOP DRAWINGS AND CALCULATIONS SHALL BE SUBMITTED FOR REVIEW AND APPROVAL.

X. ERECTION OF STRUCTURAL STEEL MAY NOT BEGIN UNTIL CONCRETE FOUNDATION HAS CURED FOR A MINIMUM OF THREE DAYS. STRUCTURAL STEEL OR OTHER HEAVY LOADS SHALL NOT BE STOCKPILED ON ANY SLAB UNTIL IT HAS CURED FOR A MINIMUM OF THREE DAYS.

Y. NON-CONFORMING WORK, REMEDIAL REPAIRS, AND FIELD MODIFICATIONS — ALL NON-CONFORMING WORK AND ASSOCIATED REMEDIAL REPAIRS OR FIELD MODIFICATIONS, INCLUDING ENGINEERING, QUALITY REVIEW AND DRAFTING OF ANY NEW DETAILS OR DOCUMENT REVISIONS, SUBMITTED AS A REQUEST FOR INFORMATION (RFI) AND DEEMED TO REQUIRE ADDITIONAL ENGINEERING OR DRAFTING SERVICES MAY BE BILLED AS AN ADDITIONAL SERVICE AT THE CONTRACTORS EXPENSE AT THE SOLE DISCRETION OF THE SER. THE SER MAY WITHHOLD FUTURE SERVICES UNTIL PAYMENT IS RECEIVED.

Z. NOTE THAT THE GROUND FLOOR SLAB IS A GROUND SUPPORTED SLAB AT GRADE AS PER THE DESIGN RECOMMENDED IN THE GEOTECHNICAL REPORT. IT IS NOT A STRUCTURAL SLAB AND AS SUCH IT IS NOT DESIGNED FOR ANY EXTERNAL UPWARD OR DOWNWARD LOADS, IT IS INTENDED TO BE ENTIRELY SUPPORTED BY THE PREPARED GROUND UNDER THE SLAB. THE CONTRACTOR SHOULD NOTE THAT THE PERFORMANCE OF THE SLAB AS DESIGNED AND INTENDED BY THE GEOTECHNICAL ENGINEER IS HIGHLY DEPENDENT ON HOW WELL THE CONTRACTOR FOLLOWS THE SITE PREPARATION INSTRUCTIONS IN THE GEOTECHNICAL REPORT. THE ARCHITECT SHALL ADVISE THE OWNER THAT THE PERFORMANCE OF THE SLAB INVOLVES SOME RISK, AND THAT SLAB ON GRADE MAY EXPERIENCE VERTICAL MOVEMENTS OF 1-1/2 INCHES OR MORE DEPENDING ON CLIMATIC FACTORS AND IS DEPENDENT ON ENVIRONMENTAL CONDITIONS OVER WHICH THE OWNER HAS CONTROL OF AFTER OCCUPANCY OF THE BUILDING. FURTHERMORE, A SLAB ON GRADE CAN EXPERIENCE VERTICAL MOVEMENT BASED ON CHANGES IN THE MOISTURE CONTENT OF THE UNDERLYING SOILS AND THAT STRUCTURAL SLABS WOULD LIMIT THIS RISK AT A GREATER UP-FRONT COST TO THE PROJECT. THE ARCHITECT, CONTRACTOR AND THE OWNER SHOULD CONSULT WITH THE GEOTECHNICAL ENGINEER IF THERE ARE ANY QUESTIONS CONCERNING CONSTRUCTION, PERFORMANCE AND RISKS INVOLVED WITH GROUND SUPPORTED SLAB AT GRADE CONSTRUCTION.

DESIGN CRITERIA:

BUILDING CODE: INTERNATIONAL BUILDING CODE, 2018 EDITION, ASCE 7-16
TEXAS DEPARTMENT OF INSURANCE (TDI) DESIGNATED CATASTROPHE AREA —INLAND II

LIVE LOAD:

ROOF:	20 PSF
ARCHITECTURAL BARRIER ACT	
GRAB BAR	250 LBS. ANY DIRECTION
TUB OR SHOWER SEAT	250 LBS. ANY DIRECTION
FASTENERS & MOUNTING DEVICES	250 LBS. ANY DIRECTION

WIND LOAD:

VELOCITY (V_{ult})	154 MPH	THREE SECOND GUST (ULTIMATE) ASCE 7-10
VELOCITY (BASIC)	154 MPH	THREE SECOND GUST ASCE 7-16
EXPOSURE	C	
RISK CATEGORY	III	
INTERNAL PRESSURE COEFFICIENT, G_{cpi}	+/- 0.18	

WINDBORNE DEBRIS REGION — IMPACT RESISTANT GLAZING REQUIRED

MAIN WIND FORCE RESISTING SYSTEM (MWFRS):	
MAXIMUM HORIZONTAL INTERIOR PRESSURE	38 PSF
MAXIMUM HORIZONTAL EXTERIOR PRESSURE	57 PSF
MAXIMUM GROSS UPLIFT INTERIOR ZONE	43 PSF
MAXIMUM GROSS UPLIFT EXTERIOR ZONE	61 PSF
CORNER ZONE WIDTH	11'- 0" FROM EACH CORNER

COMPONENTS AND CLADDING — GROSS ROOF UPLIFT IN PSF		
ZONE	EFFECTIVE WIND AREA (SQUARE FEET)	
	50	200
INTERIOR ZONE/ZONE 1	65 PSF	33 PSF
EXTERIOR ZONE/ZONE 2e	65 PSF	33 PSF
EXTERIOR ZONE/ZONE 2n	106 PSF	65 PSF
EXTERIOR ZONE/ZONE 2r	106 PSF	65 PSF
CORNERS AND OVERHANGS/ZONE 3e	106 PSF	65 PSF
CORNERS AND OVERHANGS/ZONE 3r	124 PSF	96 PSF
CORNER ZONE WIDTH	6 '- 0" FROM EACH CORNER	

COMPONENTS AND CLADDING — WALLS IN PSF		
ZONE	EFFECTIVE WIND AREA (SQUARE FEET)	
	50	200
INTERIOR ZONE/ZONE 4	52 PSF	47 PSF
EXTERIOR (CORNER) ZONE/ZONE 5	60 PSF	50 PSF
CORNER ZONE WIDTH	6 '- 0" FROM EACH CORNER	

ALLOWABLE SOIL BEARING CAPACITY:
(AT 8'—0" BELOW EXISTING GRADE)

TOTAL LOAD	3750 PSF
DEAD LOAD	2500 PSF

METAL BUILDING NOTES

1. THE METAL BUILDING FRAME AND COMPONENTS SHALL BE DESIGNED BY A METAL BUILDING MANUFACTURER EXPERIENCED IN METAL BUILDING SYSTEM DESIGN. THE DESIGN SHALL BE IN ACCORDANCE WITH THE "RECOMMENDED DESIGN PRACTICE MANUAL" OF THE METAL BUILDING MANUFACTURER'S ASSOCIATION, THE AISI "SPECIFICATIONS FOR THE DESIGN OF COLD-FORMED STRUCTURAL MEMBERS", AND THE AISC "SPECIFICATION FOR THE DESIGN, FABRICATION AND ERECTION OF STRUCTURAL STEEL FOR BUILDINGS".
2. METAL BUILDING FRAMES AND COMPONENTS SHALL BE DESIGNED TO COMPLY WITH THE CITY OF ANGLETON BUILDING CODE AND ANY OTHER GOVERNING CODES.
3. AT A MINIMUM OF THREE WEEKS BEFORE SCHEDULED FOUNDATION CONSTRUCTION, THE METAL BUILDING MANUFACTURER SHALL SUBMIT ANCHOR BOLT LAYOUT AND METAL BUILDING FOUNDATION REACTIONS FOR VERIFICATION OF FOUNDATION DESIGN. THE METAL BUILDING MANUFACTURER SHALL CAREFULLY EXAMINE THE FOUNDATION DRAWINGS TO VERIFY THAT SUFFICIENT CONCRETE EXISTS IN ALL CASES TO EMBED HIS ANCHOR BOLTS.
4. THE METAL BUILDING MANUFACTURER SHALL SUBMIT FOR REVIEW AND PERMIT APPLICATION, THE STRUCTURAL DESIGN CALCULATIONS AND DRAWINGS STAMPED BY A LICENSED ENGINEER IN THE DISCIPLINE OF STRUCTURAL ENGINEERING, LICENSED IN THE STATE OF TEXAS. THIS ENGINEER SHALL BE THE ENGINEER OF RECORD FOR THE METAL BUILDING SYSTEM
5. ITEMS TO BE DESIGNED, DETAILED AND SUPPLIED BY THE METAL BUILDING MANUFACTURER INCLUDE, BUT NOT LIMITED TO, THE FOLLOWING ITEMS:
   A. WIND FRAMES - TO BE RIGID FRAMES DESIGNED WITH PINNED COLUMN BASES
   B. ROOF PURLINS AND WALL GIRTS
   C. ROOF AND WALL PANELS
   D. OTHER ESSENTIAL STRUCTURAL ITEMS SUCH AS ROOF X-BRACING, FLANGE BRACES, ANCHOR BOLTS, ALL CONNECTIONS, ETC.
   E. HORIZONTAL WIND MEMBERS TO SUPPORT THE TOP OF TILT WALL PANELS OR MASONRY WALLS AS DETAILED
   F. ROOF OPENING FRAMING FOR MECHANICAL UNITS AND ROOF PENETRATIONS
   G. THE METAL BUILDING MANUFACTURER SHALL REVIEW THE ARCHITECTURAL AND MECHANICAL DRAWINGS AND DESIGN HIS STRUCTURE TO SUPPORT ALL HANGING LOADS FROM THE STRUCTURE INCLUDING BUT NOT LIMITED TO, MECHANICAL UNITS, FOLDING PARTITIONS AND BASKETBALL GOALS.
6. ANY SIZE SHOWN ON THE DRAWINGS IS A MINIMUM SIZE. THE METAL BUILDING SUPPLIER MAY INCREASE SIZE, IF REQUIRED, FOR THE METAL BUILDING DESIGN.
7. X-BRACING SHALL BE ROD BRACING WITH TURNBUCKLES ----- NOT CABLE.
8. SEE PLAN FOR REACTIONS IN KIPS FOR OTHER ITEMS CONNECTING TO THE METAL BUILDING COMPONENTS FOR WHICH THE METAL BUILDING STRUCTURE IS TO BE DESIGNED TO SUPPORT. THE METAL BUILDING MANUFACTURER IS TO MAKE PROVISIONS FOR THIS CONNECTION AND COORDINATE AS REQUIRED.
9. THE METAL BUILDING MANUFACTURER IS TO PROVIDE THE DESIGN AND DETAILING FOR OTHER MATERIALS WHICH CONNECT THE METAL BUILDING COMPONENTS AND COORDINATE AS REQUIRED.
10. THE MAXIMUM ALLOWED HORIZONTAL MOVEMENT PARALLEL OR PERPENDICULAR TO THE RIGID FRAME AT THE FRAME EAVE UNDER MAXIMUM WIND LOADS SHALL BE THE EAVE HEIGHT DIVIDED BY 180.
11. THE MAXIMUM ALLOWED VERTICAL MOVEMENT AT THE CENTER OF THE RIGID FRAME UNDER FULL LIVE LOAD SHALL BE THE SPAN OF THE FRAME DIVIDED BY 180. IF THE ROOF SUPPORTS PLASTER OR SHEETROCK CEILINGS, LIMIT THE LIVE LOAD DEFLECTION TO THE SPAN OF THE FRAME DIVIDED BY 360.
12. THE BUILDING SHALL BE DESIGNED FOR A MINIMUM COLLATERAL LOAD OF 3 PSF. THE BUILDING SHALL BE DESIGNED FOR A MINIMUM 10 PSF COLLATERAL LOAD FOR CEILINGS AND MECHANICAL AND ELECTRICAL SYSTEMS WHEN THE BUILDING HAS CONDITIONED SPACE WITH CEILINGS AND LIGHTING.
13. THE METAL BUILDING ENGINEER IS TO PROVIDE TO THE OWNER, A STATE BOARD OF INSURANCE FORM WPI-2.
14. THE METAL BUILDING ENGINEER IS TO PROVIDE SPECIAL INSPECTION WORK AND THE FINAL LETTER OF COMPLIANCE FOR THEIR PORTION OF THE WORK IN COMPLIANCE WITH THE LATEST EDITION OF THE INTERNATIONAL BUILDING CODE SECTION 1705.2.
15. THE CONTRACT OR PURCHASE ORDER BETWEEN THE METAL BUILDING SUPPLIER AND THE CONTRACTOR OR OWNER SHALL BE REVIEWED BY OUR OFFICE PRIOR TO SIGNING, TO ASSURE THAT ALL ITEMS REQUIRED IN THE NOTES AND ON THE DRAWINGS, ARE PROVIDED BY THE METAL BUILDING MANUFACTURER. IF OUR OFFICE DOES NOT REVIEW THE PURCHASE ORDER PRIOR TO SIGNING, WE WILL NOT BE RESPONSIBLE FOR ITEMS REQUIRED IN THE NOTES AND ON THE DRAWINGS THAT ARE EXCLUDED BY THE METAL BUILDING SUPPLIER.

MASONRY WALL NOTES

1. MASONRY CONSTRUCTION SHALL BE PERFORMED IN ACCORDANCE WITH PART 3 OF ACI 531 "BUILDING CODE REQUIREMENTS FOR CONCRETE MASONRY CONSTRUCTION".
2. ALL CONCRETE MASONRY UNITS SHALL BE HOLLOW LOAD BEARING UNITS CONFORMING TO THE REQUIREMENTS OF ASTM C90, TYPE I AND THE QUALITY CONTROL STANDARDS OF THE CONCRETE MASONRY ASSOCIATION.
3. NORMAL WEIGHT CONCRETE MASONRY UNITS (CMU) SHALL CONFORM TO ASTM C90, TYPE II, WITH A MINIMUM DESIGN COMPRESSIVE STRENGTH OF 3,750 PSI. CONCRETE MASONRY UNITS USED BELOW GRADE SHALL BE COMPOSED OF NORMAL WEIGHT AGGREGATE. LIGHT WEIGHT CONCRETE MASONRY UNITS SHALL CONFORM TO ASTM C331 WITH A MINIMUM DESIGN COMPRESSIVE STRENGTH OF 3,750 PSI. CONCRETE MASONRY UNITS USED ABOVE GRADE SHALL BE COMPOSED OF LIGHTWEIGHT AGGREGATE.
4. MASONRY UNITS SHALL HAVE CURED FOR NOT LESS THAN 28 DAYS WHEN PLACED IN THE STRUCTURE.
5. ALL MASONRY UNITS SHALL HAVE A MAXIMUM LINEAR SHRINKAGE OF .065 OF 1% FROM THE SATURATED TO THE OVEN DRY CONDITION, WHEN TESTED IN ACCORDANCE WITH THE METHODS SET FORTH IN THE QUALITY CONTROL STANDARDS OF THE CONCRETE MASONRY ASSOCIATION.
6. BRICK MORTAR SHALL BE FRESHLY PREPARED, UNIFORMLY MIXED, AND-SHALL CONFORM TO ASTM C270, TYPE 'N' WITH A MINIMUM COMPRESSIVE STRENGTH OF 1,800 PSI AT 28 DAYS.
7. HORIZONTAL JOINT REINFORCEMENT SPACED AT 16 INCHES ON CENTER MAX. VERTICALLY SHALL CONFORM TO ASTM A951 WITH A MINIMUM YIELD STRENGTH OF 70,000 PSI AND A MINIMUM SIZE OF 9 GAGE FOR SIDE RODS AND 9 GAGE FOR TRUSS RODS.
8. ALL MASONRY TIES TO BACKUP STRUCTURE SHALL BE HOT DIP GALVANIZED. PROVIDE A HECKMANN NO. 315 ANCHOR WITH NO. 316 TRIANGULAR TIE-ON COLUMNS AT 16 INCHES (15 INCHES AT KING SIZE BRICK) ON CENTER VERTICALLY AND A HECKMANN NO. 191 OR 192 ANCHORS ON EACH SIDE OF ALL BEAMS AT 16 INCHES ON CENTER HORIZONTALLY UNLESS NOTED OTHERWISE ON THE DRAWINGS. MASONRY TIES TO WALL STUDS SHALL BE A HECKMANN NO. 316 TRIANGULAR TIE WITH A HECKMANN NO. 315-C SCREW ON ANCHOR STRAP OR HECKMANN #77 WING NUT POS-I-TIE ANCHOR SPACED 16 INCHES (15 INCHES AT KING SIZE BRICK) ON CENTER HORIZONTALLY AND 16 INCHES ON CENTER VERTICALLY. AT TOP OF WALLS AND AT WALL CORNERS AND INTERSECTIONS PROVIDE TWO VERTICAL ROWS OF ANCHORS SPACED 16 INCHES APART AND 16 INCHES ON CENTER VERTICALLY. TRIANGULAR TIES SHALL EXTEND 3/4 INCH FROM FACE OF MASONRY. ANCHOR STRAPS SHALL BE ATTACHED TO METAL STUDS WITH TWO (2) #10-16x 1-1/2 INCHES CADMIUM PLATED HEX HEAD SHEET METAL SCREWS WITH NEOPRENE WASHER.

ANGLETON
Where the Heart is

Angleton Fire Station #3 Addition

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ISSUED FOR REVIEW & PRICING NOT FOR CONSTRUCTION

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LICENSE NUMBER: 91030

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iAD PROJECT #	23017
ISSUE DATE:	06/02/23

06/02/23	95% OWNER REVIEW SET

REVISION LOG

GENERAL NOTES

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SCALE: AS NOTED

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EARTHWORK

1. SITE PREPARATION FOR THE BUILDING PAD SHALL CONSIST OF THE REMOVAL OF EXISTING PAVEMENT, VEGETATION, ORGANIC MATTER AND ANY ADDITIONAL MATERIAL AS NECESSARY TO PROVIDE THE REQUIRED AMOUNT OF FILL UNDER THE BUILDING.
2. THE SUBGRADE SHALL BE PROOFROLLED WITH A HEAVY, RUBBER-TIRED VEHICLE (STATIC WEIGHT OF AT LEAST 20 TONS AND WITH TIRE PRESSURES OF AT LEAST 90 PSI). THE CONTRACTOR SHALL MAKE AT LEAST TWO COMPLETE PASSES OVER THE AREA WITH THE SECOND PASS PERPENDICULAR TO THE FIRST PASS. AREAS OF THE SUBGRADE THAT ARE OBSERVED TO BE SOFT OR WEAK SHALL BE OVEREXCAVATED AND REPLACED WITH PROPERLY COMPACTED SELECT FILL.
3. SUBGRADE SHALL THEN BE SCARIFIED AND MOISTURE CONDITIONED TO MATCH THE BUILDING PAD PERIMETER TO A [SIX (6)] INCH DEPTH AND THEN RECOMPACTED TO BETWEEN 95 AND 100 PERCENT OF THE MAXIMUM DRY DENSITY AS DETERMINED BY THE STANDARD PROCTOR DENSITY TEST (ASTM D698). THE MOISTURE CONTENT SHALL BE BETWEEN [OPTIMUM AND +3] PERCENT OF THE OPTIMUM MOISTURE CONTENT. PROVIDE A MINIMUM OF FOUR (4) FIELD DENSITY TESTS ON THE SUBGRADE OR ONE (1) FOR EVERY 2,500 SQUARE FEET WHICHEVER IS GREATER.
4. SELECT FILL MATERIAL FOR THE BUILDING PAD SHALL BE AN INORGANIC SANDY CLAY WITH A LIQUID LIMIT BETWEEN 26 AND 40 AND PLASTICITY INDEX BETWEEN 10 AND 20. STRUCTURAL SELECT FILL PAD MATERIAL SHALL BE TESTED FOR ACCEPTABILITY AND A MOISTURE DENSITY CURVE SHALL BE ESTABLISHED.
5. SELECT FILL SHALL BE PLACED IN EIGHT INCH LOOSE LIFTS AND COMPACTED TO BETWEEN [95 AND 100] PERCENT OF THE MAXIMUM DRY DENSITY AS DETERMINED BY THE STANDARD PROCTOR DENSITY TEST (ASTM D698). THE MOISTURE CONTENT SHALL BE BETWEEN [OPTIMUM AND +3] PERCENT OF THE OPTIMUM MOISTURE CONTENT FOR SELECT FILL. SELECT FILL MATERIAL SHALL EXTEND TO 5'-0" BEYOND THE BUILDING PERIMETER. PROVIDE A MINIMUM OF FOUR (4) FIELD DENSITY TESTS ON EACH LIFT OF SELECT FILL OR ONE (1) FOR EVERY 2,500 SQUARE FEET WHICHEVER IS GREATER.
6. SELECT FILL MATERIAL SHALL BE TESTED DURING PLACEMENT OF EACH LIFT FOR THE ATTERBERG LIMITS IN ACCORDANCE WITH ASTM D4318-98 METHOD B "STANDARD TEST METHOD FOR LIQUID LIMIT, PLASTIC LIMIT AND PLASTICITY INDEX OF SOILS" TO VERIFY THAT THE SELECT FILL MATERIAL IS IN ACCORDANCE WITH THE ORIGINALLY APPROVED SELECT FILL MATERIAL. PROVIDE A MINIMUM OF ONE (1) TEST PER LIFT OR ONE (1) FOR EVERY 2,500 SQUARE FEET WHICHEVER IS GREATER WITH A MAXIMUM OF TEN (10) PER LIFT.
7. CONTRACTOR SHALL MAINTAIN A CLEAN EXCAVATION THAT IS FREE OF WATER 100% OF THE TIME. CONTRACTOR SHALL PROVIDE PUMPS AS REQUIRED TO REMOVE ANY WATER AT ALL TIMES.
8. THE SITE SHALL BE GRADED TO PROVIDE POSITIVE DRAINAGE AWAY FROM THE BUILDING PAD DURING BUILDING PAD INSTALLATION AND WHEN THE BUILDING PAD AND BUILDING ARE COMPLETED.
9. PLUMBING AND UTILITY TRENCHES WITHIN THE BUILDING PAD SHALL HAVE PIPING BEDDED ON 6" MINIMUM OF CEMENT STABILIZED SAND WITH 4" MINIMUM ALL AROUND. BACKFILL IN UTILITY TRENCHES SHALL CONSIST OF COMPACTED SELECT FILL. PROVIDE A 1'-0" WIDE BENTONITE CLAY PLUG OR FAT CLAY (PI>50) FOR THE FULL DEPTH AND WIDTH OF THE UTILITY TRENCH TO A MINIMUM OF 1'-0" ABOVE THE BOTTOM OF THE FOUNDATION AT THE EXTERIOR FACE OF BUILDING FOUNDATIONS WHERE UTILITY TRENCHES ENTER THE BUILDING.
10. PROVIDE A MINIMUM [TWELVE (12)] INCH FAT CLAY CAP (PI>50) FOR A MINIMUM OF 5'-0" AROUND THE PERIMETER OF THE BUILDING. THE CAP SHALL EXTEND AS REQUIRED TO COVER THE LIMITS OF THE BUILDING PAD EXCAVATION AND SELECT FILL BUILDING PAD MATERIALS.

SITE DRAINAGE

1. GRADE THE SITE TO PROVIDE POSITIVE DRAINAGE AWAY FROM ALL BUILDINGS AND SLABS. WATER SHALL NOT BE ALLOWED TO POND ADJACENT TO THE BUILDING FOUNDATIONS OR SLABS.
2. AS A MINIMUM REQUIREMENT, ALL DOWNSPOUTS FROM ROOF DRAINS AND GUTTERS SHALL BE COLLECTED AND PIPED AWAY FROM THE BUILDING. WHEN WATER IS NOT PIPED AWAY FROM THE BUILDING, DOWNSPOUTS SHALL DUMP ONTO A CAST IN PLACE 4" THICK X 3'-0" WIDE CONCRETE SWALE REINFORCED WITH #4 AT 12" ON CENTER EACH WAY AND EXTENDING 10'-0" OUT FROM THE BUILDING. REFER TO ARCHITECTURAL AND CIVIL FOR PAVING AND DRAINGAGE.
3. TREES AND VEGETATION SHALL NOT BE ALLOWED WITHIN A DISTANCE EQUAL TO THREE QUARTERS THEIR ULTIMATE HEIGHT AWAY FROM THE BUILDING.
4. IRRIGATE VEGETATION AND SOILS ADJACENT TO BUILDING (NO MORE THAN 15 MINUTES THREE TIMES A WEEK) ON AN AS NEEDED BASIS TO MAINTAIN UNIFORM SOIL MOISTURE CONDITIONS AROUND THE PERIMETER OF THE BUILDING FOLLOWING CONSTRUCTION.

FOUNDATIONS

1. PREPARED GRADE AREA UNDER ALL BUILDING SLABS AND GRADE BEAMS SHALL BE COVERED WITH A 15 MIL WATER VAPOR RETARDER MEETING THE REQUIREMENTS OF ASTM E 1745 (LATEST EDITION), CLASS A OR BETTER WITH MAXIMUM WATER PERMEANCE OF 0.01 PERMS WHEN TESTED IN ACCORDANCE WITH ASTM E96. THE WATER VAPOR RETARDER SHALL BE INSTALLED, LAPPED AND TAPED WITH MANUFACTURER'S APPROVED PRODUCT IN ACCORDANCE WITH THE REQUIREMENTS OF ASTM E 1643 (LATEST EDITION). PENETRATIONS SHALL SEALED IN STRICT ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS AND REQUIREMENTS.
2. FOUNDATION DETAILING SHOWN ON THE DRAWINGS IS BASED ON A FOUNDATION DESIGN SPECIFIED IN THE SOIL REPORT BY ARM SOIL TESTING LLC, REPORT NO. G23-313, DATED MAY 22, 2023. THE RECOMMENDATIONS CONTAINED IN THE GEOTECHNICAL REPORT SHALL NOT SUPERSEDE THE REQUIREMENTS SHOWN ON THE DESIGN DRAWINGS OR IN THE SPECIFICATIONS WHEN THE REQUIREMENTS SHOWN ON THE DRAWINGS ARE GREATER THAN THOSE SHOWN IN THE GEOTECHNICAL REPORT. THE CONTRACTOR IS REQUIRED TO SECURE A COPY OF THE GEOTECHNICAL REPORT FROM THE OWNER AND TO HAVE A COPY ON THE JOB SITE AT ALL TIMES FOR HIS USE AND REFERENCE.
3. A GEOTECHNICAL REPORT WAS NOT AVAILABLE NOR PRODUCED BY THE OWNER FOR OUR USE ON THIS PROJECT. AS A RESULT, FOR THE FOUNDATION PORTIONS OF THIS PROJECT, WE PERFORMED OUR ANALYSIS UTILIZING THE PRESUMPTIVE LOAD-BEARING VALUES OF SOILS SECTION OF THE IBC FOR DETERMINATION OF THE ALLOWABLE VERTICAL AND LATERAL LOADING. SEE IBC 2015 SECTION 1806 AND ASSOCIATED TABLE 1806.2 CLASS 5 SOILS HAVE BEEN ASSUMED FOR USE IN DESIGN ON THE PROJECT.
4. FOUNDATION DETAILING SHOWN ON THE DRAWINGS IS BASED ON A MINIMUM OF FOUR (4) FEET OF SELECT FILL MATERIAL BENEATH THE FLOOR SLAB AND SHALL EXTEND TO 5'-0" BEYOND THE BUILDING PERIMETER.
5. ALL BACKFILL FOR BURIED PIPES AND CONDUIT WITHIN THE BUILDING PAD AND EXTENDING OUT MINIMUM 5'-0" BEYOND THE BUILDING SHALL BE BACKFILLED WITH SELECT FILL BACKFILL. DO NOT USE SAND BACKFILL. A 2'-0" WIDE BENTONITE PLUG SHALL BE PROVIDED IN ALL UTILITY TRENCHES AT THE FACE OF THE BUILDING FOUNDATION. SEE TYPICAL DETAIL FOR PIPES ENTERING THE BUILDING.
6. CONDUITS SHALL NOT BE PLACED IN THE CONCRETE SLAB. CONDUITS SHALL BE PLACED IN THE SELECT FILL MATERIAL BENEATH THE VAPOR RETARDER. ALL PENETRATIONS OF THE VAPOR RETARDER SHALL BE SEALED IN STRICT ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS AND REQUIREMENTS. CONDUIT TRENCHES WITHIN THE BUILDING PAD SHALL BE LIMITED TO A MAXIMUM WIDTH OF TWO FEET AND BE SPACED NO CLOSER THAN FOUR FEET CENTER TO CENTER. CONDUITS STACKED WITHIN A SINGLE TRENCH SHALL BE SEPARATED VERTICALLY BY TWO TIMES THE DIAMETER OF THE LARGEST CONDUIT OR 12 INCHES MINIMUM. COMPACTED SELECT FILL OR OTHER APPROPRIATE COMPACTED FILL MATERIAL SHALL BE USED BETWEEN STACKED CONDUITS.
7. THE FLOOR SLAB SUBGRADE SHALL BE PROPERLY COMPACTED, PROOF ROLLED AND SHALL BE FREE OF STANDING WATER, MUD AND FROZEN SOILS.
8. SLABS ON GROUND SHALL HAVE CONSTRUCTION JOINTS OR CRACK CONTROL JOINTS (REFER TO TYPICAL DETAILS) AT EACH COLUMN LINE AND IN EACH DIRECTION. ADDITIONAL CRACK CONTROL JOINTS SHALL BE PROVIDED SUCH THAT NO AREA BOUNDED BY CONSTRUCTION AND/OR CRACK CONTROL JOINTS CONTAINS MORE THAN 250 SQUARE FEET AND THE RESULTING ASPECT RATIO OF LONG SIDE TO SHORT SIDE DIMENSIONS OF THE BOUNDED SLAB AREA DOES NOT EXCEED 1.5 TO 1. CRACK CONTROL JOINTS SHALL BE MADE USING A "SOFT-CUT" CONCRETE SAW AS SOON AS THE SLAB WILL SUPPORT THE WEIGHT OF THE SAW AND OPERATOR WITHOUT DISTURBING THE FINAL FINISH. THIS SHOULD BE WITHIN THE FIRST SIX HOURS AFTER PLACEMENT. THE CRACK CONTROL JOINTS SHALL BE CUT A MAXIMUM WIDTH OF 1/8 INCH AND A MINIMUM DEPTH OF 1/3 THE SLAB THICKNESS. REFER TO THE TYPICAL DETAILS AND DRAWINGS FOR INFORMATION ON CONTROL JOINTS, CONSTRUCTION JOINTS, REINFORCING DETAILS, JOINT SEALANT, AND TYPICAL JOINT LAYOUT.
9. WHERE SLABS ARE TO RECEIVE SENSITIVE ARCHITECTURAL FLOOR FINISHES, ALL JOINTS IN THE SLAB CONSTRUCTION SHALL BE PLACED TO ALIGN WITH JOINTS IN THE FLOOR FINISHES.
10. DURING CONSTRUCTION, THE CONTRACTOR SHALL PROVIDE ALL TEMPORARY SHORING OF WALLS WHICH ARE ULTIMATELY SUPPORTED TOP AND BOTTOM. SUCH SHORING SHALL NOT BE REMOVED UNTIL ALL SUPPORTING ELEMENTS ARE IN PLACE, THE COMPACTION OF ALL BACKFILL AGAINST THE WALL HAS BEEN COMPLETED, AND THE CONCRETE IN THE WALLS AND SUPPORTING ELEMENTS HAS ATTAINED THE SPECIFIED 28 DAY COMPRESSIVE STRENGTH ($f'c$),
11. EXCAVATIONS FOR SPREAD FOOTING, COMBINED FOOTING, CONTINUOUS FOOTINGS AND/OR MAT FOUNDATIONS SHALL BE CLEANED AND HAND TAMPED TO A UNIFORM SURFACE. FOOTING EXCAVATIONS SHALL HAVE THE SIDE AND BOTTOM TEMPORARILY LINED WITH 6 MIL VAPOR BARRIER IF CONCRETE PLACEMENT DOES NOT OCCUR WITHIN 24 HOURS OF FOOTING EXCAVATION. SEAL SLABS MAY BE REQUIRED BASED ON GROUND WATER CONDITIONS. THE CONTRACTOR IS RESPONSIBLE FOR MEANS, METHODS, AND COST ASSOCIATED WITH ALL SEAL SLABS. REFER TO THE GEOTECHNICAL REPORT FOR GROUND WATER OR POTENTIAL PERCHED WATER CONDITIONS.
12. REINFORCEMENT PLACEMENT SEQUENCE FOR FOOTINGS AND MATS IS NOTED FOR MAJOR REINFORCEMENT BAR LAYERS ONLY. IN SPREAD FOOTINGS OR MATS, THE CONTRACTOR SHALL COORDINATE AND SEQUENCE ALL OTHER BAR PLACEMENTS AS REQUIRED TO CONFORM TO THE CONTRACT DOCUMENTS.
13. FOUNDATION CONDITIONS THAT DIFFER FROM THOSE NOTED IN THE CONTRACT DOCUMENTS OR AS DESCRIBED IN THE GEOTECHNICAL REPORT SHALL BE IMMEDIATELY REPORTED TO THE ARCHITECT, GEOTECHNICAL ENGINEER AND SER BEFORE FURTHER CONSTRUCTION IS ATTEMPTED.
14. CONTRACTOR SHALL NOTIFY THE ARCHITECT AND SER AT LEAST 48 HOURS PRIOR TO PLACEMENT OF CONCRETE IN FOOTINGS.
15. ALL FOOTINGS SHALL BE CONSOLIDATED WITH A CONCRETE VIBRATOR AS PER THE REQUIREMENTS OF ACI 318 AND ACI 308R, LATEST EDITION.
16. DRILLED FOOTINGS SHALL BE POURED IMMEDIATELY UPON COMPLETION OF EXCAVATION AND CLEANING OF FOOTING BEARING SURFACE. UNDER NO CIRCUMSTANCES SHOULD DRILLED FOOTINGS/PIERS SHOULD NOT REMAIN OPEN OVER NIGHT. ALL SPOILS FROM THE DRILLED FOOTING EXCAVATIONS SHALL BE REMOVED FROM THE BUILDING PAD.
17. IF DRILLED AND UNDERREAMED FOOTINGS CANNOT BE FORMED DUE TO CAVING SOILS, THE ARCHITECT, GEOTECHNICAL ENGINEER AND SER SHALL BE NOTIFIED IMMEDIATELY BEFORE FURTHER CONSTRUCTION IS ATTEMPTED.
18. WHERE A DRILLED FOOTING IS SHOWN ON THE PLAN CLOSER THAN 6'-0 FROM ANOTHER FOOTING, DRILL ONE FOOTING, FILL WITH CONCRETE AND LET CURE 24 HOURS PRIOR TO DRILLING THE ADJACENT FOOTING. (6'-0" DIMENSION IS MEASURED BETWEEN EDGE OF BELL FOOTING NOT CENTER TO CENTER.)
19. TOPS OF DRILLED FOOTINGS SHALL NOT HAVE "MUSHROOMED" OR FLARED TOPS. CONTRACTOR SHALL USE SONUTUBE, SURETOP OR APPROVED EQUAL TO FORM TOP OF PIERS TERMINATED AT GRADE LEVEL. CONCRETE OF FLARED TOP FOOTINGS SHALL BE REMOVED PRIOR TO FORMING AND PLACING OF THE CONCRETE IN PIER CAPS OR GRADE BEAMS. TOPS OF ALL PIERS SHALL BE CLEANED PRIOR TO THE PLACEMENT OF CONCRETE.
20. PROVIDE A TREMIE TO PLACE CONCRETE IN DRILLED FOOTINGS SO THAT CONCRETE DOES NOT FREE FALL OVER 10'-0".
21. PROVIDE PIER SLEDS TO MAINTAIN 3" MINIMUM CLEAR COVER ON FOOTING SHAFT REINFORCING, PIERS SLEDS SHALL BE STAGGERED ALONG THE VERTICAL REINFORCING. DO NOT PLACE SLEDS AT THE SAME LOCATION.

CONCRETE

1. ALL CONCRETE REINFORCING BARS SHALL CONFORM TO ASTM A615, GRADE 60, EXCEPT WHERE NOTED. NO. 10 THROUGH NO. 18 BARS SHALL CONFORM TO ASTM A615, GRADE 75. DEFORMED BAR ANCHORS SHALL CONFORM TO ASTM A496, GR 70. ALL BARS SHALL BE NEW OR RECYCLED DOMESTIC BILLET STEEL OF A DOMESTIC MANUFACTURER.
2. CONCRETE IN THE FOLLOWING AREAS SHALL HAVE SAND AND CRUSHED CARBONATE AGGREGATE CONFORMING TO ASTM C33 FOR NORMAL WEIGHT CONCRETE AND LIGHT WEIGHT AGGREGATES CONFORMING TO ASTM C330, TYPE I PORTLAND CEMENT CONFORMING TO ASTM C150, AND THE FOLLOWING DESIGNATED COMPRESSIVE STRENGTH ($f'c$) IN 28 DAYS:

CONCRETE USE OR CLASS	MINIMUM 28 DAY COMPRESSIVE STRENGTH ($f'c$)	MAXIMUM WATER CEMENT RATIO	SLUMP (INCHES)
FOOTINGS	3000 PSI	0.50	5 TO 8
SLABS ON GROUND	3000 PSI	0.45	3 TO 5
ALL OTHER CONCRETE	3000 PSI	0.50	3 TO 5
SLUMP SHALL BE MEASURED FROM SAMPLES TAKEN AT THE POINT OF DISCHARGE UNLESS AGREED TO IN WRITING PRIOR TO CONCRETE PLACEMENT			

NOTE: CONCRETE SUPPLIER SHALL BE AWARE OF CEMENTS THAT CAN CAUSE LATE ETTRINGITE FORMATION IN THE CEMENT PASTE AND BE PREPARED TO SHOW THAT THE CEMENTS USED WILL NOT CAUSE THIS PROBLEM.

3. FLY ASH MAY BE USED AS A POZZOLAN TO REPLACE A PORTION OF THE PORTLAND CEMENT IN A CONCRETE MIXTURE, SUBJECT TO THE APPROVAL OF THE ARCHITECT AND SER. FLY ASH, WHEN USED, SHALL CONFORM TO ASTM C618 TYPE 'C'. CONCRETE MIXTURES CONTAINING FLY ASH SHALL BE PROPORTIONED TO ACCOUNT FOR THE PROPERTIES OF THE SPECIFIC FLY ASH AND TO ACCOUNT FOR THE SPECIFIC PROPERTIES OF THE FLY ASH CONCRETE THUS RESULTING, INCLUDING BUT NOT LIMITED TO WATER CEMENT RATION AND MINIMUM 28 DAY COMPRESSIVE STRENGTH. THE RATIO OF THE AMOUNT BY VOLUME OF FLY ASH TO THE TOTAL AMOUNT BY VOLUME OF CEMENTITIOUS MATERIAL (INCLUDING THE FLY ASH) SHALL NOT EXCEED 25 PERCENT.
4. FLY ASH IS NOT PERMITTED IN SLABS WITHOUT PRIOR WRITTEN APPROVAL FROM THE ARCHITECT AND SER.
5. AIR ENTRAINMENT IS REQUIRED ONLY IN HARD ROCK CONCRETE PERMANENTLY EXPOSED TO WEATHER CONDITIONS. WHERE LIGHTWEIGHT CONCRETE IS SPECIFIED, AIR ENTRAINMENT IS REQUIRED FOR ALL EXPOSURE CONDITIONS. PERCENT AIR ENTRAINMENT LISTED IS PLUS/MINUS 1.5%. DO NOT AIR-ENTRAIN INTERIOR FLOOR SLABS THAT RECEIVE HARD TROWEL FINISH.
6. ALL WELDED WIRE FABRIC SHALL BE SMOOTH ROUND WIRE IN FLAT SHEETS AND SHALL CONFORM TO ASTM A185.
7. CONCRETE PROTECTION FOR REINFORCEMENT SHALL BE AS FOLLOWS; SEE SEC. 7.7 ACI 318, LATEST EDITION FOR CONDITIONS NOT NOTED. PROVIDE CHAIR SUPPORTS (AZTEC CASTLE CHAIR, WHC SERIES 'E' OR EQUAL) TO ADEQUATELY SUPPORT BARS FOR PROPER CLEARANCE AS RECOMMENDED BY THE AMERICAN CONCRETE INSTITUTE AND THE CONCRETE REINFORCING STEEL INSTITUTE. SLAB ON GRADE REINFORCEMENT SHALL BE SUPPORTED AT 45-INCH MAXIMUM INTERVALS OR EVERY THIRD BAR. UTILITY OR CONCRETE BRICKS ARE NOT ALLOWED AS REINFORCING SUPPORTS.

MINIMUM CONCRETE COVER REQUIREMENTS	
LOCATION	MINIMUM COVER
FOOTINGS	3 INCHES
GRADE BEAMS	3 INCHES BOTTOM 2 INCHES SIDES — FORMED SURFACE 3 INCHES SIDES — EARTH FORMED 1 — 1/2 INCHES TOP
SLAB ON GROUND	1 INCH TOP

8. NO HORIZONTAL JOINTS WILL BE PERMITTED IN CONCRETE EXCEPT WHERE THEY NORMALLY OCCUR OR WHERE NOTED. NO JOINTS BETWEEN PILASTERS AND GRADE BEAM THAT ARE MEANT TO BE MONOLITHIC. VERTICAL JOINTS SHALL OCCUR AT CENTER SPANS OR AT LOCATIONS APPROVED BY THE STRUCTURAL ENGINEER.
9. CONSTRUCTION JOINTS BETWEEN PIERS AND PIER CAPS OR GRADE BEAMS, FOOTINGS AND WALLS OR COLUMNS, OR WALLS, COLUMNS, BEAMS AND THE FLOOR SYSTEM THEY SHALL SUPPORT SHALL BE PREPARED BY ROUGHENING THE SURFACE CONTACT SURFACE TO A FULL AMPLITUDE ON 1/4" LEAVING THE CONTACT SURFACE CLEAN AND FREE OF ALL LAITANCE.
10. DETAILING OF CONCRETE REINFORCEMENT AND ACCESSORIES SHALL BE IN ACCORDANCE WITH ACI PUBLICATION 315, LATEST EDITION "DETAILS AND DETAILING OF CONCRETE REINFORCEMENT" AND ACI SP -66 "DETAILING MANUAL". PLACING OF REINFORCING BARS SHALL CONFORM TO THE RECOMMENDATIONS OF ACI 315R "MANUAL OF ENGINEERING AND PLACING DRAWINGS FOR REINFORCED CONCRETE STRUCTURES" AND CRSI "MANUAL OF STANDARD PRACTICE". ALL HOOKED BARS SHOWN IN THE DETAILS SHALL HAVE STANDARD HOOKS UNLESS NOTED OTHERWISE.
11. REINFORCING BARS SHALL NOT BE WELDED WITHOUT APPROVAL OF THE STRUCTURAL ENGINEER. REINFORCING STEEL THAT REQUIRES WELDING SHALL CONFORM TO ASTM A706, WITH GRADES AS SHOWN ABOVE.
12. UNLESS BARS ARE SPECIFICALLY SHOWN IN THE BAR BENDING DIAGRAMS ON THE SCHEDULES, PROVIDE BARS AS FOLLOWS:
    - A) PROVIDE STANDARD 90 DEGREE HOOK ON TOP BARS AT CANTILEVER ENDS.
    - B) SPLICE BOTTOM BARS DIRECTLY OVER MEMBER SUPPORTS, UNLESS NOTED OTHERWISE.
    - C) SPLICE TOP AND INTERMEDIATE BARS AT THE CENTER LINE BETWEEN MEMBER SUPPORTS, UNLESS NOTED OTHERWISE.
    - D) SPLICE VERTICAL BARS IN WALLS ONLY AT FLOOR LINES, UNLESS NOTED OTHERWISE. HORIZONTAL BARS SHALL BE SPLICED AS SPECIFIED FOR TOP, BOTTOM, AND INTERMEDIATE BARS OF BEAMS.
    - E) CENTER BARS NOTED AS "AT SUPT'S." OVER MEMBER SUPPORTS, AND CENTER BARS NOTES AS "BTWN. SUPT'S," BETWEEN SUPPORTS.
    - F) PLACE BARS NOTED AS "2ND LAYER" BELOW THE PRIMARY TOP BARS (OR ABOVE THE PRIMARY BOTTOM BARS) AND PROVIDE #11 SPACER BARS PLACED AT INTERVALS OF 4'-0" BETWEEN THE TWO LAYERS OF BARS.
    - G) SPLICE VERTICAL BARS IN COLUMNS ONLY AT FLOOR LINES, UNLESS NOTED OTHERWISE. COLUMN BAR SPLICES SHALL BE AS SHOWN IN THE COLUMN SCHEDULE.
    - H) PROVIDE CORNER BARS FOR EACH HORIZONTAL BAR AT THE INSIDE AND OUTSIDE FACES OF INTERSECTING BEAMS OR WALLS. REFER TO CORNER BAR DETAILS IN THE TYPICAL DETAILS.
    - I) REFER TO THE COLUMN REINFORCING DIAGRAMS FOR ADDITIONAL TIES ABOVE AND BELOW THE FLOOR FRAMING MEMBERS.
13. BARS SHOWN IN THE SCHEDULE TO HOOK AT DISCONTINUOUS ENDS SHALL HAVE THE HOOK PLACED HORIZONTALLY AT EXTERIOR CORNERS.
14. PROVIDE NO. 3 DOWELS X 2'-0" AT 1'-6" ON CENTER, WITH A 90 DEGREE HOOK AT ALL EDGES OF CONCRETE SLABS, UNLESS DETAILED OTHERWISE.
15. PROVIDE FOUNDATION DOWELS TO MATCH MASONRY WALL REINFORCEMENT. DOWELS SHALL EXTEND INTO THE CONCRETE AND CMU PER THE LAP SCHEDULES.
16. ALL CONTINUOUS REINFORCEMENT SHALL LAP 40 BAR DIAMETERS AT SPLICES. PROVIDE (1) NO. 6 x 6'-0" TOP AND BOTTOM (TWO 36" LEGS WITH 90 DEGREE BEND) AT EACH FACE OF GRADE BEAMS AT CORNERS AND INTERSECTIONS, AND AT 18" ON CENTER VERTICALLY AT WALLS.
17. PROVIDE (1) NO. 4 BAR x 4'-0" FOR ELEVATED SLABS AND (2) NO. 5 BARS x 4'-0" FOR SLAB ON GROUND AT ALL RE-ENTRANT CORNERS. PROVIDE (1) NO. 4 BAR x 4'-0" AROUND ALL RECTANGULAR OPENINGS OR COLUMN BLOCK OUTS UNLESS NOTED OTHERWISE. FOR ELEVATED SLABS, PLACE THE DIAGONAL BARS WITH 1 INCH OF CLEARANCE FROM TOP AND THE SIDES OF THE SLAB AT THE CORNERS. FOR SLAB ON GRADE, PLACE THE BARS AT MID DEPTH OR BELOW THE REINFORCING MAT AND 3 INCHES CLEAR FROM THE CORNER.
18. CONDUITS ARE NOT ALLOWED IN SLABS, BEAMS, WALLS OR COLUMNS. ALL CONDUITS SHALL BE SUSPENDED FROM OR ATTACHED TO THE CONCRETE STRUCTURE.
19. PROVIDE SLEEVES, MECHANICAL OPENINGS, CONDUITS, PIPES, RECESSES, DEPRESSIONS, CURBS AND ALL EMBEDDED ITEMS AS SHOWN ON THE ARCHITECTURAL AND MECHANICAL DRAWINGS OR AS REQUIRED BY EQUIPMENT MANUFACTURERS. MINIMUM CONCRETE BETWEEN SLEEVES SHALL BE 6". SHOP DRAWINGS SHALL CLEARLY INDICATE THE INSTALLATION OF THESE ITEMS. ALL EXPOSED CONCRETE EDGES SHALL BE CHAMFERED TO 3/4"x3/4" MINIMUM UNLESS NOTED OTHERWISE. DO NOT PROVIDE CHAMFERS AT INSIDE FACE OF OVERHEAD DOORS OR AT STOREFRONT OPENINGS.
20. BESIDES FOLLOWING ARTICLE 6.3 OF ACI 318 FOR EMBEDDED ITEMS FOLLOWING REQUIREMENTS SHALL BE MET:
    - A) THE MINIMUM CLEAR DISTANCE BETWEEN CONDUITS AND PIPES SHALL BE 6".
    - B) NONE PERMITTED IN COLUMNS WITHOUT PRIOR APPROVAL
21. ALL CONSTRUCTION JOINTS IN BEAMS AND WALLS SHALL BE PROVIDED WITH SHEAR KEYS AS SHOWN IN THE DETAILS.
22. SLEEVES PASSING HORIZONTALLY THROUGH GRADE BEAMS:
    - A) LOCATE AT MIDDLE THIRD OF BEAM SPAN - MINIMUM 6" AWAY FROM AN INTERIOR MEMBER.
    - B) LOCATE AT MIDDLE THIRD OF BEAM DEPTH.
    - C) MAXIMUM DIAMETER OF SLEEVE TO BE ONE THIRD OF BEAM DEPTH OR 8" (WHICHEVER IS LESS).
    - D) SPACING TO BE AT LEAST THREE SLEEVE DIAMETERS OR 6" (WHICHEVER IS GREATER).
    - E) ADD ONE ADDITIONAL SCHEDULED STIRRUP ON EITHER SIDE OF THE SLEEVE. ADD (2) #5 x 5'-0" TOP AND BOTTOM CENTERED AT SLEEVE.
    - F) NO SLEEVES LONGITUDINALLY IN BEAMS. PASS SLEEVES ONLY AT RIGHT ANGLES TO BEAMS.
23. ALL MIXING, TRANSPORTING, PLACING AND CURING OF CONCRETE SHALL BE DONE IN ACCORDANCE WITH THE RECOMMENDATIONS OF THE AMERICAN CONCRETE INSTITUTE, ACI 301, LATEST EDITION.
24. ALL CONCRETE SHALL BE CONSOLIDATED WITH A CONCRETE VIBRATOR AS PER THE REQUIREMENTS OF ACI 318 AND ACI 308R, LATEST EDITION.
25. HOT WEATHER CONCRETING SHALL CONFORM TO ACI305 AND COLD WEATHER CONCRETING SHALL CONFORM TO ACI 306.
26. ALL BASE PLATES AND ANCHOR RODS SHALL BE PROTECTED WITH 3" (MIN.) OF CONCRETE. ANCHOR RODS SHALL BE FABRICATED FROM FULL BODIED STEEL RODS CONFORMING TO ASTM F1554 [SPECIFY GRADE IF GREATER THAN GR 36 IS REQUIRED], WASHERS CONFORMING TO ASTM F844 AND NUTS CONFORMING TO ASTM A194 OR A563 AND HAVING THE SAME DIAMETER AS THE BOLT DIAMETER. BOLTS SHALL BE SET USING RIGID TEMPLATES.
27. HIGH DENSITY STYROFOAM SHALL BE PANELIZED POLYSTYRENE RIGID FORM INSULATION WITH MINIMUM COMPRESSIVE STRENGTH OF 40 PSI (EPS19) PER ASTM D6817. THICKNESS SHALL BE AS INDICATED IN DETAILS AND DRAWINGS. AVAILABLE MANUFACTURERS INCLUDE: U.C. INDUSTRIES, INC, DOW CHEMICAL COMPANY, AND AMOCO PRODUCTS COMPANY.

ANGLETON
Where the Heart is

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ISSUED FOR REVIEW & PRICING NOT FOR CONSTRUCTION

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ISSUE DATE:	06/02/23

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REVISION LOG

GENERAL NOTES

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SCALE: AS NOTED

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STRUCTURAL TESTING AND INSPECTIONS

EARTHWORK TESTING

1. DURING EARTHWORK OPERATIONS KEEP A COMPETENT TRAINED TECHNICIAN ASSIGNED TO THE PROJECT. SERVICES PROVIDED SHALL INCLUDE:
   - A) OBSERVE STRIPPING OPERATIONS AND EVALUATE THE REQUIRED STRIPPING DEPTH DURING THESE OPERATIONS.
   - B) OBSERVE PROOFROLLING OPERATIONS AFTER SITE STRIPPING. DETERMINE IF ANY SOFT SPOTS NEED TO BE UNDERCUT TO FIRM SOILS, REPLACED WITH SELECT FILL AND RECOMPACTED.
   - C) VERIFY THAT THE SUBGRADE SHALL THEN BE SCARIFIED AND MOISTURE CONDITIONED TO A SIX (6) INCH DEPTH AND THEN RECOMPACTED TO BETWEEN [95 AND 100] PERCENT OF THE MAXIMUM DRY DENSITY AS DETERMINED BY THE STANDARD PROCTOR DENSITY TEST (ASTM D698). THE MOISTURE CONTENT SHALL BE BETWEEN [OPTIMUM AND +3] PERCENT OF THE OPTIMUM MOISTURE CONTENT. PROVIDE A MINIMUM OF FOUR (4) FIELD DENSITY TESTS ON THE SUBGRADE OR ONE (1) FOR EVERY 2,500 SQUARE FEET WHICHEVER IS GREATER.
   - D) STRUCTURAL SELECT FILL PAD MATERIAL SHALL BE TESTED FOR ACCEPTABILITY AND A MOISTURE DENSITY CURVE SHALL BE ESTABLISHED. SELECT FILL MATERIAL SHALL BE AN INORGANIC SANDY CLAY WITH LIQUID LIMIT BETWEEN 26 AND 40 AND PLASTICITY INDEX BETWEEN 10 AND 20.
   - E) SELECT FILL SHALL BE PLACED IN EIGHT INCH LOOSE LIFTS AND COMPACTED TO BETWEEN 95 AND 100 PERCENT OF THE MAXIMUM DRY DENSITY AS DETERMINED BY THE STANDARD PROCTOR DENSITY TEST (ASTM D698). THE MOISTURE CONTENT SHALL BE BETWEEN OPTIMUM AND +3 PERCENT OF THE OPTIMUM MOISTURE CONTENT FOR SELECT FILL.
   - F) SELECT FILL MATERIAL SHALL BE TESTED DURING PLACEMENT OF EACH LIFT FOR THE ATTERBERG LIMITS IN ACCORDANCE WITH ASTM D4318-98 METHOD B "STANDARD TEST METHOD FOR LIQUID LIMIT, PLASTIC LIMIT AND PLASTICITY INDEX OF SOILS" TO VERIFY THAT THE SELECT FILL MATERIAL IS IN ACCORDANCE WITH THE ORIGINALLY APPROVED SELECT FILL MATERIAL. PROVIDE A MINIMUM OF ONE (1) TEST PER LIFT OR ONE (1) FOR EVERY 2,500 SQUARE FEET WHICHEVER IS GREATER WITH A MAXIMUM OF TEN (10) PER LIFT.
   - G) OBSERVE THE EXCAVATION DAILY AND ENSURE THAT THE CONTRACTOR MAINTAINS A CLEAN EXCAVATION THAT IS FREE OF WATER 100% OF THE TIME. CONTRACTOR SHALL PROVIDE PUMPS AS REQUIRED TO REMOVE ANY WATER AT ALL TIMES.
   - H) OBSERVE GRADING OPERATIONS TO ENSURE THAT PROPER DRAINAGE AWAY FROM THE BUILDING PAD IS PROVIDED.

DRILLED FOOTINGS TESTING

1. DURING DRILLED FOOTING OPERATIONS KEEP A COMPETENT TRAINED TECHNICIAN ASSIGNED TO THE PROJECT. SERVICES PROVIDED SHALL INCLUDE:
   - A) OBSERVING THE BOTTOM OF SHAFT FOR CLEANLINESS.
   - B) CHECKING SHAFT FOR CONFORMANCE TO REQUIRED TOLERANCES. FOOTINGS SHALL BE WITHIN 3" OF THEIR REQUIRED LOCATIONS AND SHAFTS SHALL NOT BE OUT OF PLUMB BY MORE THAN 2 PERCENT OF THE SHAFT LENGTH.
   - C) CHECKING SHAFT BOTTOM FOR PROPER BEARING MATERIAL.
   - D) NOTING DEPTH AND DIAMETER OF ALL FOOTINGS.
   - E) VERIFY QUANTITY, SIZE AND LOCATION OF REINFORCEMENT.
   - F) CHECK FOR CAVING OF SHAFT OR BELL WALLS.
   - G) CHECKING THAT THE BELL IS CONCENTRIC WITH THE SHAFT.
2. ENSURE THAT THE SPOILS FROM THE DRILLED FOOTING EXCAVATIONS ARE REMOVED FROM THE BUILDING PAD AND THAT THE PAD IS MOISTURE CONDITIONED AND RECOMPACTED AS SPECIFIED.

CONCRETE TESTING

1. CONCRETE MIX DESIGNS SHALL BE SUBMITTED FOR REVIEW INDICATING CONFORMANCE WITH ACI 318, LATEST EDITION, CHAPTER 5, SECTION 5.3.
2. SLUMP TESTS, CONFORMING TO ASTM C143, SHALL BE TAKEN AT THE POINT OF DISCHARGE AT THE SAME RATE AS NOTED BELOW IN NOTE NUMBER 5.
3. AIR CONTENT TESTS CONFORMING TO ASTM C173, VOLUMETRIC METHOD FOR LIGHTWEIGHT OR NORMAL WEIGHT CONCRETE; ASTM C231 PRESSURE METHOD FOR NORMAL WEIGHT CONCRETE; SHALL BE TAKEN FOR EACH DAY'S POUR OF EACH TYPE OF AIR-ENTRAINED CONCRETE.
4. CONCRETE TEMPERATURE SHALL BE TESTED HOURLY WHEN AIR TEMPERATURE IS 40 DEG F (4 DEG C) AND BELOW, WHEN 80 DEG F (27 DEG C) AND ABOVE, AND EACH TIME A SET OF COMPRESSION TEST SPECIMENS IS MADE.
5. ONE SET OF FOUR COMPRESSION TEST SPECIMENS CONFORMING TO ASTM C31 SHALL BE MOLDED AND STORED FOR LABORATORY-CURED SPECIMENS. COMPRESSIVE STRENGTH TESTS SHALL CONFORM TO ASTM C39 AND SHALL CONSIST OF ONE SET FOR EACH DAY'S POUR EXCEEDING 5 CU. YDS. PLUS ADDITIONAL SETS FOR EACH 50 CU. YDS. MORE THAN THE FIRST 25 CU. YDS OF EACH CONCRETE CLASS PLACED IN ANY ONE DAY. ONE SPECIMEN SHALL BE TESTED AT 7 DAYS, TWO SPECIMENS SHALL BE TESTED AT 28 DAYS, AND ONE SPECIMEN SHALL BE RETAINED FOR LATER TESTING AS REQUIRED.
6. VERIFY CONCRETE IS BEING CONSOLIDATED IN ACCORDANCE WITH THE RECOMMENDATIONS OF ACI 318 AND ACI 308R, LATEST EDITION.
7. VERIFY THAT POST INSTALLED ANCHORS ARE AS SPECIFIED AND THAT THE ANCHORS ARE INSTALLED PER THE MANUFACTURER'S RECOMMENDATIONS AND REQUIREMENTS.

REINFORCING STEEL INSTALLATION

1. DURING CAST-IN-PLACE CONCRETE STRUCTURAL MEMBER REINFORCING PLACEMENT OPERATIONS KEEP A COMPETENT TRAINED TECHNICIAN ASSIGNED TO THE PROJECT. INSPECT REINFORCING UTILIZING ACI 311.4R "GUIDE FOR CONCRETE INSPECTION" AS A GUIDE. SERVICES PROVIDED SHALL INCLUDE:
   - A) VERIFY TYPE AND GRADE OF ALL REINFORCING STEEL.
   - B) VERIFY REBAR IS FREE OF OIL, DIRT, EXCESSIVE RUST AND FROM DAMAGE IN SHIPMENT TO SITE.
   - C) VERIFY REINFORCING IS ADEQUATELY TIED, CHAIRED AND SUPPORTED TO PREVENT DISPLACEMENT DURING CONCRETE PLACEMENT.
   - D) VERIFY MINIMUM AND MAXIMUM CLEAR DISTANCES BETWEEN BARS AND MINIMUM STRUCTURAL DISTANCE TO OUTSIDE OF CONCRETE.
   - E) VERIFY QUANTITY, SIZE AND LOCATION OF REINFORCEMENT.
   - F) VERIFY MINIMUM CONCRETE COVER IS MAINTAINED BETWEEN REBAR AND SURFACE OF CONCRETE.
   - G) VERIFY SIZE AND PLACEMENT OF REBAR. VERIFY LAP LENGTHS, LOCATIONS AND STAGGERS AND VERIFY BENDS FOR MINIMUM DIAMETER, SLOPE AND LENGTH. VERIFY HOOKED BAR LENGTHS AND LOCATIONS.

STRUCTURAL STEEL TESTING

1. CERTIFY WELDERS FOR THE WELD TYPES IN THE PROJECT AND CONDUCT INSPECTIONS AND TESTS AS REQUIRED, AS A MINIMUM, WELDERS SHALL BE AISC CERTIFIED. RECORD TYPES AND LOCATIONS OF DEFECTS FOUND IN WORK. RECORD WORK REQUIRED AND PERFORMED TO CORRECT DEFICIENCIES.
2. VISUALLY INSPECT 100% OF ALL FILLET WELDS.
3. VISUALLY INSPECT 100% OF ALL FULL PENETRATION WELDS. TEST 20% OF ALL FULL PENETRATION WELDS BY ONE OF THE FOLLOWING METHODS: LIQUID PENETRANT INSPECTION (ASTM E165), MAGNETIC PARTICLE INSPECTION (ASTM E709; PERFORMED ON THE ROOT PASS AND ON THE FINISHED WELD; CRACKS AND ZONES OF INCOMPLETE FUSION OR PENETRATION IS NOT ACCEPTABLE), RADIOGRAPHIC INSPECTION (ASTM E94 AND ASTM E142; MINIMUM QUALITY LEVEL OF "2-2T"), OR ULTRASONIC INSPECTION (ASTM E164). IF FAILURE RATE IS 20% OR GREATER, TEST 100% OF WELDS AT CONTRACTOR'S EXPENSE UNTIL FAILURE RATE FALLS BELOW 20%.
4. ALL WELDS THAT FAIL SHALL BE REWELDED AND RETESTED UNTIL THEY PASS THE TEST. TEST TWO ADDITIONAL WELDS AT THE CONTRACTOR'S EXPENSE FOR EVERY WELD FAILURE.
5. VISUALLY INSPECT WELDS ON 100% OF ALL STUDS AND TEST 10% BY THE METHOD DESCRIBED BELOW IN COMPLIANCE WITH AWS D1.1. HEADED STUD SHALL BE TESTED BY ALTERNATELY BENDING 30 DEG. IN OPPOSITE DIRECTIONS FROM ITS ORIGINAL AXIS BY EITHER STRIKING THE STUDS WITH A HAMMER ON THE UNWELDED END OR PLACING A PIPE OR OTHER SUITABLE HOLLOW DEVICE OVER THE STUD AND MANUALLY OR MECHANICALLY BENDING THE STUD. IF FAILURE RATE IS 10% OR GREATER, TEST 100% OF STUDS AT CONTRACTOR'S EXPENSE UNTIL FAILURE RATE FALLS BELOW 10%. IF A VISUAL INSPECTION REVEALS ANY STUD THAT DOES NOT SHOW A FULL 360 DEG. FLASH (AS DEFINED IN AWS D1.1) OR ANY STUD THAT HAS BEEN REPAIRED BY WELDING, SUCH STUD SHALL BE BENT TO AN ANGLE OF APPROXIMATELY 15 DEGREES FROM ITS ORIGINAL AXIS. THE DIRECTION OF BENDING FOR STUDS WITH LESS THAN 360 DEGREES FLASH SHALL BE OPPOSITE TO THE MISSING PORTION OF FLASH.
6. BOLTS SHALL BE VISUALLY INSPECTED WHEN TWIST-OFF SPLINES ARE USED, OTHERWISE BOLTS SHALL BE SNUG TIGHT.
7. ALL FULL PENETRATION WELDS AT MOMENT CONNECTIONS REQUIRING TESTING SHALL BE TESTED AND CERTIFIED BY AN INDEPENDENT TESTING LABORATORY USING NON-DESTRUCTIVE TESTING METHODS. FOR SHOP WELDS, CERTIFICATION SHALL BE SUBMITTED PRIOR TO SHIPPING TO THE JOB SITE. FOR FIELD WELDS, CERTIFICATION SHALL BE SUBMITTED PRIOR FLOOR DECK INSTALLATION AND CONCRETE PLACEMENT AND PRIOR TO COVERING CONNECTIONS WITH FIREPROOFING OR ARCHITECTURAL FINISHES.

SPECIAL INSPECTIONS AND STRUCTURAL TESTING

SPECIAL INSPECTION WORK AND THE FINAL LETTER OF COMPLIANCE HAVE NOT BEEN INCLUDED IN THE STRUCTURAL ENGINEER OF RECORD'S SCOPE OF SERVICES. THE OWNER IS RESPONSIBLE FOR OBTAINING THE SERVICES OF THE SPECIAL INSPECTOR AND THE TESTING LABORATORY. SPECIAL INSPECTIONS CAN BE PROVIDED BY AN INDEPENDENT SPECIAL INSPECTOR APPROVED BY THE BUILDING AUTHORITY. THE SPECIAL INSPECTION WORK DOES NOT INCLUDE THE TESTING LABORATORY SERVICES AS CALLED FOR ON THE DRAWINGS. ARRANGEMENTS FOR SPECIAL INSPECTIONS SHOULD BE MADE PRIOR TO THE COMMENCEMENT OF CONSTRUCTION. THE CONTRACTOR IS RESPONSIBLE FOR NOTIFYING THE TESTING LABORATORY AND SPECIAL INSPECTOR IN A TIMELY MANNER PRIOR TO PROCEEDING WITH CONSTRUCTION OPERATIONS. THE CONTRACTOR SHALL NOT PROCEED WITH ANY WORK REQUIRING INSPECTIONS WITHOUT THE TESTING LABORATORY'S OR SPECIAL INSPECTOR'S PRESENCE.

STRUCTURAL STATEMENT OF SPECIAL INSPECTIONS

THE STRUCTURAL SPECIAL INSPECTOR SHALL KEEP RECORDS OF ALL STRUCTURAL INSPECTIONS AND SHALL FURNISH INSPECTION REPORTS TO THE OWNER AND THE STRUCTURAL REGISTERED DESIGN PROFESSIONAL IN RESPONSIBLE CHARGE (SRDP). DISCOVERED DISCREPANCIES SHALL BE BROUGHT TO THE ATTENTION OF THE CONTRACTOR FOR CORRECTION. IF SUCH DISCREPANCIES ARE NOT CORRECTED, THE DISCREPANCIES SHALL BE BROUGHT TO THE ATTENTION OF THE OWNER AND THE SRDP. THE SPECIAL INSPECTION PROGRAM DOES NOT RELIEVE THE CONTRACTOR OF HIS RESPONSIBILITIES.

A FINAL REPORT OF SPECIAL INSPECTION DOCUMENTING COMPLETION OF ALL SPECIAL INSPECTIONS, TESTING AND CORRECTION OF ANY DISCREPANCIES NOTED IN THE INSPECTIONS SHALL BE SUBMITTED TO THE OWNER AND THE SRDP PRIOR TO ISSUANCE OF A CERTIFICATE OF OCCUPANCY AND USE.

STRUCTURAL SCHEDULE OF SPECIAL INSPECTIONS

QUALIFICATIONS OF INSPECTORS AND TESTING TECHNICIANS

THE QUALIFICATIONS OF ALL PERSONNEL PERFORMING SPECIAL INSPECTION AND TESTING ACTIVITIES ARE SUBJECT TO THE APPROVAL OF THE OWNER. THE CREDENTIALS OF ALL INSPECTORS AND TESTING TECHNICIANS SHALL BE PROVIDED TO THE SPECIAL INSPECTOR FOR THEIR RECORDS.

KEY FOR MINIMUM QUALIFICATION OF INSPECTION AGENTS

WHEN THE REGISTERED DESIGN PROFESSION IN RESPONSIBLE CHARGE OR SPECIAL INSPECTOR OF RECORD DEEMS APPROPRIATE THAT THE INDIVIDUAL PERFORMING THE STIPULATED TEST OR INSPECTION HAVE A SPECIFIC CERTIFICATION, LICENSE OR EXPERIENCE AS INDICATED BELOW, SUCH REQUIREMENT SHALL BE LISTED BELOW AND SHALL BE CLEARLY IDENTIFIED WITHIN THE SCHEDULE UNDER THE AGENT QUALIFICATION DESIGNATION.

PE/SE STRUCTURAL ENGINEER
A LICENSED SE OR PE SPECIALIZING IN THE DESIGN OF BUILDING STRUCTURES

PE/GE GEOTECHNCIAL ENGINEER
A LICENSED PE SPECIALIZING IN SOIL MECHANICS AND FOUNDATIONS

EIT OR ENGINEER IN TRAINING
A GRADUATE ENGINEER WHO HAS PASSED THE FUNDAMENTALS OF ENGINEERING EXAM

EXPERIENCED TESTING TECHNICIAN

ETT OR EXPERIENCED TESTING TECHNICIAN
AN EXPERIENCED TESTING TECHNICIAN WITH A MINIMUM OF 5 YEARS EXPERIENCE WITH THE STIPULATED TEST OR INSPECTION

AMERICAN CONCRETE INSTITUTE (ACI) CERTIFICATION
ACI-CFTT CONCRETE FIELD-TESTING TECHNICIAN - GRADE I
ACI-CCI CONCRETE CONSTRUCTION INSPECTOR
ACI-LTT LABORATORY TESTING TECHNICIAN - GRADE II&2
ACI-STT STRENGTH TESTING TECHNICIAN

AMERICAN WELDING SOCIETY (AWS) CERTIFICATION
AWS-CWI CERTIFIED WELDING INSPECTOR
AWS/AISC-SSI CERTIFIED STRUCTURAL STEEL INSPECTOR

CHAPTER 17 OF THE [2015] INTERNATIONAL BUILDING CODE IS INTERPRETED TO REQUIRE SPECIAL INSPECTION FOR THE FOLLOWING ITEMS IN THE FOLLOWING TABLES:

SCHEDULE OF SPECIAL INSPECTIONS

VERIFICATION/INSPECTION	SOIL/FOUNDATION INSPECTION		
IBC SECTION 1705.6, TABLE 1705.6	EXTENT CONTINUOUS, PERIODIC	COMMENTS	AGENT PE/GE, EIT OR ETT
1. VERIFY MATERIALS BELOW SHALLOW FOUNDATIONS ARE ADEQUATE TO ACHIEVE THE DESIGN BEARING CAPACITY	PERIODIC		ETT
2. VERIFY EXCAVATIONS ARE EXTENDED TO PROPER DEPTH AND HAVE REACHED PROPER MATERIAL	PERIODIC		ETT
3. PERFORM CLASSIFICATION AND TESTING OF COMPACTED FILL MATERIALS	PERIODIC		ETT
4. VERIFY USE OF PROPER MATERIALS, DENSITIES AND LIFT THICKNESSES DURING PLACEMENT AND COMPACTION OF COMPACTED FILL	CONTINUOUS		ETT
5. PRIOR TO PLACEMENT OF COMPACTED FILL, OBSERVE SUBGRADE AND VERIFY THAT SITE HAS BEEN PREPARED PROPERLY	PERIODIC		ETT

SCHEDULE OF SPECIAL INSPECTIONS

VERIFICATION/INSPECTION	CONCRETE INSPECTION		
IBC SECTION 1705.3, TABLE 1705.3	EXTENT CONTINUOUS, PERIODIC	COMMENTS	AGENT PE/GE, EIT OR ETT
1. INSPECT REINFORCEMENT, INCLUDING PRESTRESSING TENDONS, AND VERIFY PLACEMENT	PERIODIC	ACI 318: Ch. 20, 25.2, 25.3, 26.6.1-26.6.3 IBC 1908.4	ETT
2. REINFORCING BAR WELDING:			
A. VERIFY WELDABILITY OF REINFORCING BARS OTHER THAN ASTM A706	PERIODIC	AWS D1.4 ACI 318: 26.6.4	AWS-CWI
B. INSPECT SINGLE-PASS FILLET WELDS, MAXIMUM 5/16"	PERIODIC		
C. INSPECT ALL OTHER WELDS	CONTINUOUS		
3. INSPECT ANCHORS CAST IN CONCRETE	PERIODIC	ACI 318: 17.8.2	ETT
4. INSPECTION OF ANCHORS POST-INSTALLED IN HARDENED CONCRETE MEMBERS			
A. ADHESIVE ANCHORS INSTALLED IN HORIZONTALLY OR UPWARDLY INCLINED ORIENTATIONS TO RESIST SUSTAINED TENSION LOADS	CONTINUOUS	ACI 318: 17.8.2.4	ETT
B. MECHANICAL ANCHORS AND ADHESIVE ANCHORS NOT DEFINED IN 4.A	PERIODIC	ACI 318: 17.8.2	
5. VERIFY USE OF REQUIRED MIX DESIGN	PERIODIC	ACI 318: Ch. 19, 26.4.3, 26.4.4 IBC 1904.1, 1904.2, 1908.2, 1908.3	ETT
6. PRIOR TO CONCRETE PLACEMENT, FABRICATE SPECIMENS FOR STRENGTH TESTS, PERFORM SLUMP AND AIR CONTENT TESTS, AND DETERMINE THE TEMPERATURE OF THE CONCRETE	CONTINUOUS	ASTM C 172 ASTM C 31 ACI 318: 26.4, 26.12 IBC 1908.8	ACI-CFTT OR ACI-STT
7. INSPECT CONCRETE AND SHOTCRETE PLACEMENT FOR PROPER APPLICATION TECHNIQUES	CONTINUOUS	ACI 318: 26.5 IBC 1908.6, 1908.7, 1908.8	ETT
8. VERIFY MAINTENANCE OF SPECIFIED CURING TEMPERATURE AND TECHNIQUES	PERIODIC	ACI 318: 26.5.3-26.5.5 IBC 1908.9	ETT
9. INSPECT PRESTRESSED CONCRETE FOR:			
A. APPLICATION OF PRESTRESSING FORCES	CONTINUOUS	ACI 318: 26.10	ETT
B. GROUTING OF BONDED PRESTRESSING TENDONS	CONTINUOUS		
10. INSPECT ERECTION OF PRECAST CONCRETE MEMBERS	PERIODIC	ACI 318: Ch. 26.8	ETT
11. VERIFY IN-SITU CONCRETE STRENGTH, PRIOR TO STRESSING OF TENDONS IN POST-TENSIONED CONCRETE AND PRIOR TO REMOVAL OF SHORES AND FORMS FROM BEAMS AND STRUCTURAL SLABS	PERIODIC	ACI 318: 26.11.2	ETT
12. INSPECT FORMWORK FOR SHAPE, LOCATION AND DIMENSIONS OF THE CONCRETE MEMBER BEING FORMED	PERIODIC	ACI 318: 26.11.1.2(b)	ETT

SCHEDULE OF SPECIAL INSPECTIONS

VERIFICATION/INSPECTION	STEEL OTHER THAN STRUCTURAL STEEL INSPECTION		
IBC SECTION 1705.2 IBC SECTION 1705.3.1	EXTENT CONTINUOUS, PERIODIC	COMMENTS	AGENT PE/GE, EIT OR ETT
1. MATERIAL VERIFICATION OF STEEL DECK:			
A. IDENTIFICATION MARKINGS TO CONFORM TO ASTM STANDARDS SPECIFIED IN THE APPROVED CONSTRUCTION DOCUMENTS.	PERIODIC	APPLICABLE ASTM MATERIAL STANDARDS	
B. MANUFACTURER'S CERTIFIED TEST REPORTS	PERIODIC		
2. INSPECTION OF WELDING			
A. COLD-FORMED STEEL DECK			
1) FLOOR AND ROOF DECK WELDS	PERIODIC	SDI QA/QC AWS D1.3 IBC 1705.2.2	
B. REINFORCING STEEL			
1. VERIFICATION OF WELDABILITY OF REINFORCING STEEL OTHER THAN ASTM A707	NA	AWS D1.4 ACI 318: SECTION 26.6.4 IBC 1705.3.1	AWS-CWI
2. REINFORCING STEEL RESISTING FLEXURAL AND AXIAL FORCES IN INTERMEDIATE AND SPECIAL MOMENT FRAMES, AND BOUNDARY ELEMENTS OF SPECIAL STRUCTURAL WALLS OF CONCRETE AND SHEAR REINFORCEMENT.	NA		
3. SHEAR REINFORCEMENT	NA		
4. OTHER REINFORCING STEEL	NA		

ANGLETON
Where the Heart is

Angleton Fire Station #3 Addition

2743 N. Velasco St.
Angleton, Texas 77515

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www.iadarchitects.com

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979.849.6681 p.
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TX Engineer Firm No. F-170
3200 Wilcrest Dr., Suite 305
Houston, TX 77042
713.780.3345 p.
Mechanical/Electrical/Plumbing
DVO Engineering
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ENGINEER: HUNTER KORNEGAY
LICENSE NUMBER: 91030

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REVISION LOG

GENERAL NOTES

S0.02

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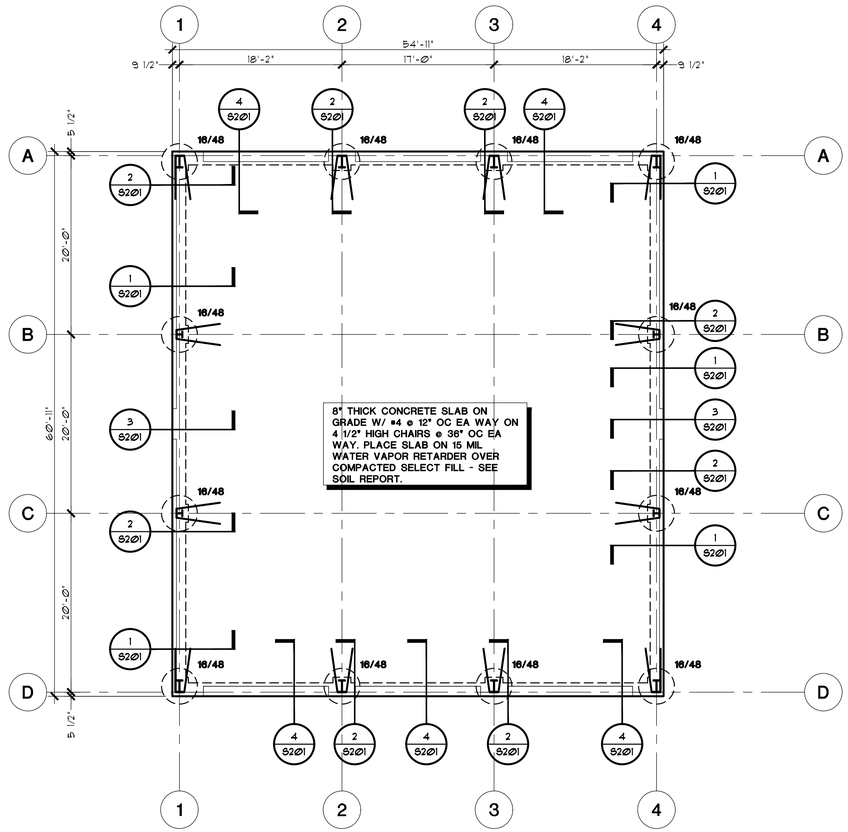

NORTH

FOUNDATION PLAN

SCALE: 1/8"=1'-0"

INDICATES SHAFT DIA. SEE 10/S2.01 FOR REINF.

20/60

INDICATES BELL DIA. SEE 10/S2.01

60° 60° 12"

60° 60° 12"

5 HAIR PIN AT EXTERIOR COLUMNS (TYP)

INDICATES INTERIOR GRADE BEAM SEE 6/S2.01

LEGEND

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FOUNDATION PLAN

S101

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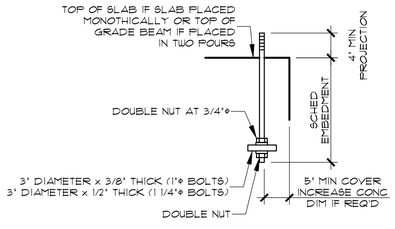
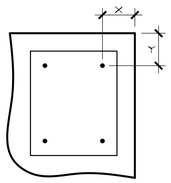
PEMB ANCHOR BOLT SCHEDULE								
BOLT DIAMETER (IN)	ALLOWABLE BOLT SPACING (IN)	REQUIRED EMBED (IN)	MINIMUM NUMBERS OF BOLTS	ALLOWABLE SHEAR ONLY LOAD (KIP)	ALLOWABLE SHEAR ONLY LOAD (KIP)		ALLOWABLE TENSION ONLY LOAD (KIP)	TENSION CONTROLLING EDGE DISTANCE	
					X (IN)	Y (IN)		X (IN)	Y (IN)
1/2"	4"	18"	4	12.5	12	12	22	12	3.5
				4	12	3.5	22	12	3.5
5/8"	4"	18"	4	20	13	13	35	12	4.5
				4.75	12	3.5	34	12	3.5
3/4"	4"	18"	4	30	17	17	51	14	14
				5	12	3.5	34	12	3.5
7/8"	4"	24"	4	41	21	21	68	15	15
				5	12	3.5	46	12	3.5
1"	4"	24"	4	54	25	25	90	21	21
				5	12	3.5	46	12	3.5
1 1/4"	5"	30"	4	87	42	42	140	32	32
				5.25	12	3.5	48	12	3.5
INTERACTION EQUATION FOR SHEAR AND TENSION COMBINED LOADS: B (SHEAR)^N + B (TENSION)^N =1.0 WHERE^N =(5/3) AND B IS THE UTILIZATION RATIO									



TYPICAL DETAIL

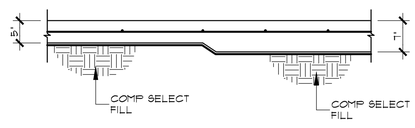


PLAN VIEW

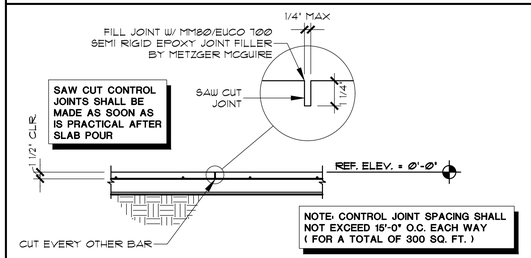
LOADS ARE LRFD:

F' C-3.5 KSI
CRACKED CONCRETE
NO GROUT RQ'D
CAST IN PLACE HEX HEAD F1554 GRADE 36
MIN 3.5 EDGE DISTANCE IN 'Y' DIRECTION AND 12" IN 'X' DIRECTION PER ACI 318.
PLATE WASHER AT BOTTOM OF BOLT 3" DIAMETER x 3/8" THICK FOR BOLTS TO 1" DIAMETER. PLATE WASHER FOR 1.25" BOLT IS 3" DIAMETER x 1/2" THICK.

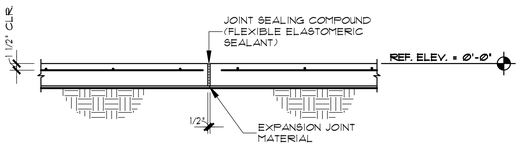
11 METAL BUILDING ANCHOR BOLT SCHEDULE
SCALE:NTS



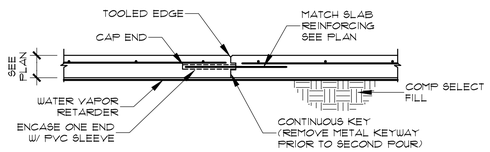
9 DETAIL AT SLAB TRANSITION
SCALE:3/4" = 1'-0"



CONTROL JOINT



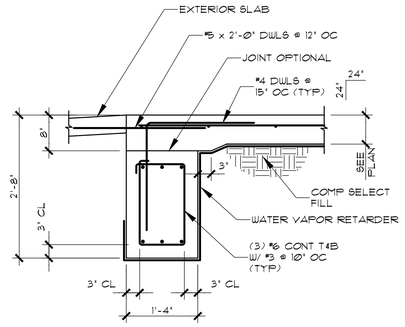
ISOLATION JOINT AS SHOWN ON ARCHITECTURAL OR MECHANICAL



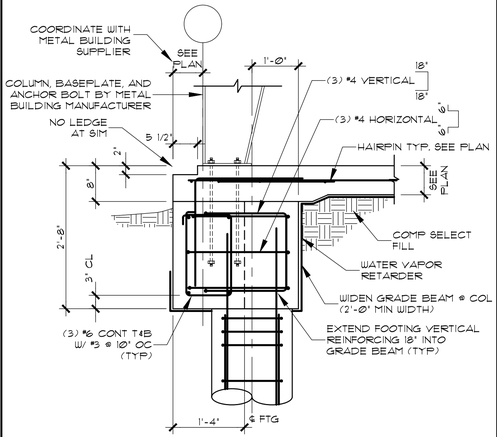
SLAB CONSTRUCTION JOINT

8 SLAB JOINTS
SCALE:NTS

6 DETAIL
SCALE:3/4" = 1'-0"

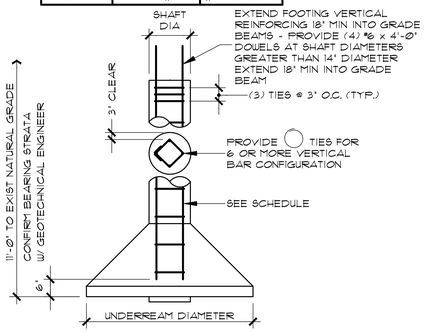


3 GRADE BEAM AT EXTERIOR SLAB
SCALE:3/4" = 1'-0"



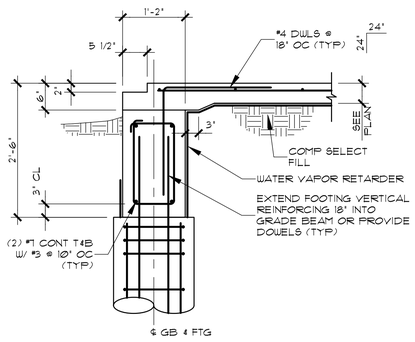
1 METAL BUILDING COLUMN - RECESSED
SCALE:3/4" = 1'-0"

FOOTING SCHEDULE		
SHAFT DIA.	VERT. BARS	TIES
12"	4 - #5	#3 @ 10"
18"	4 - #6	#3 @ 12"
20"	6 - #6	#3 @ 14"
24"	6 - #6	#3 @ 14"

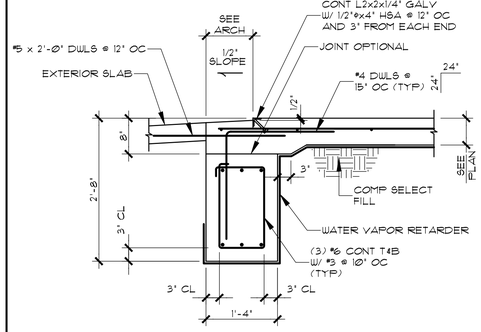


10 DRILLED FOOTING DETAIL
SCALE:NTS

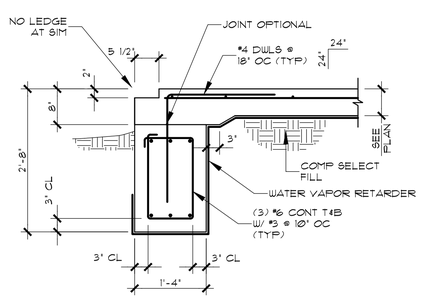
NOTE: WHEN NOT DIMENSIONED ON PLAN, PLACE INTERMEDIATE FOOTING @ EQUAL SPACES BETWEEN COLUMN FOOTINGS.



7 INTERMEDIATE FOOTING DETAIL
SCALE:3/4" = 1'-0"



4 GRADE BEAM AT OVERHEAD DOOR
SCALE:3/4" = 1'-0"



2 EXTERIOR GRADE BEAM AT BRICK LEDGE
SCALE:3/4" = 1'-0"

ANGLETON Where the Heart is

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S201

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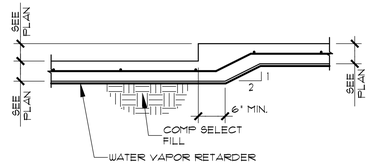
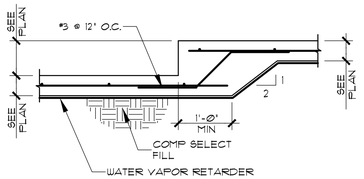
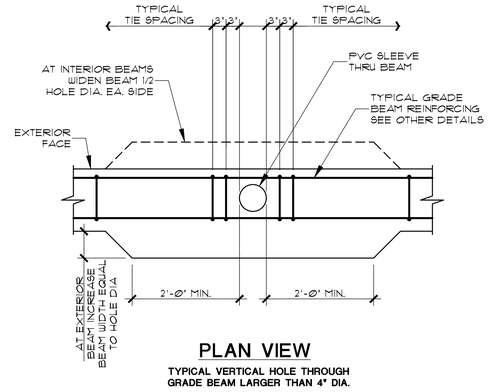


SLAB RECESS LESS THAN 3" DEEP



SLAB RECESS 3" TO 10" DEEP

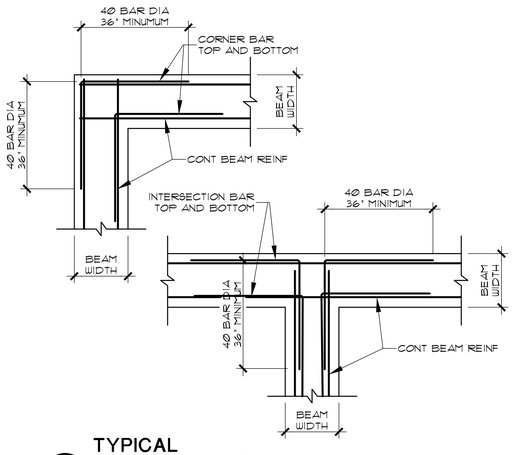
6 SLAB RECESS
SCALE:3/4" = 1'-0"



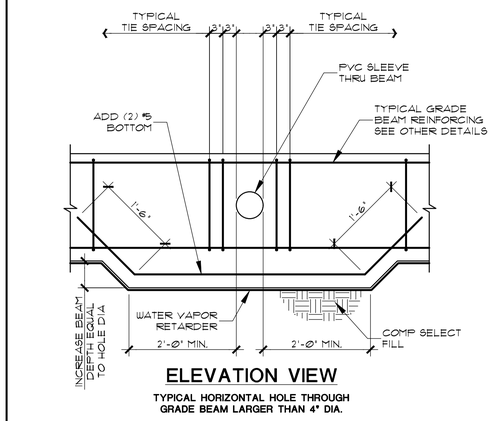
PLAN VIEW

TYPICAL VERTICAL HOLE THROUGH GRADE BEAM LARGER THAN 4" DIA.

3 GRADE BEAM PENETRATION DETAIL
SCALE:3/4" = 1'-0"



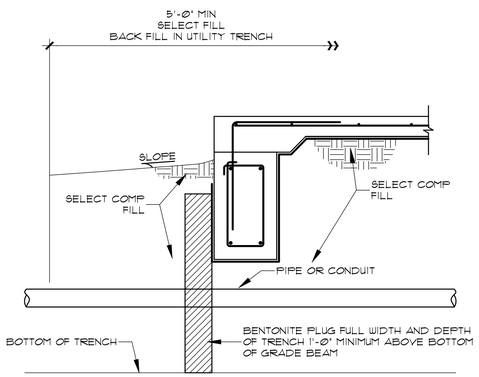
5 TYPICAL CORNER BAR DETAIL
SCALE:3/4" = 1'-0"



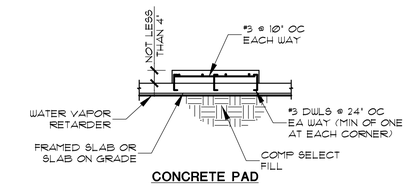
ELEVATION VIEW

TYPICAL HORIZONTAL HOLE THROUGH GRADE BEAM LARGER THAN 4" DIA.

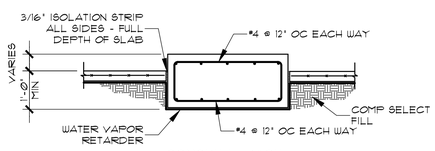
2 GRADE BEAM PENETRATION DETAIL
SCALE:3/4" = 1'-0"



10 PIPE ENTRY DETAIL
SCALE:3/4" = 1'-0"



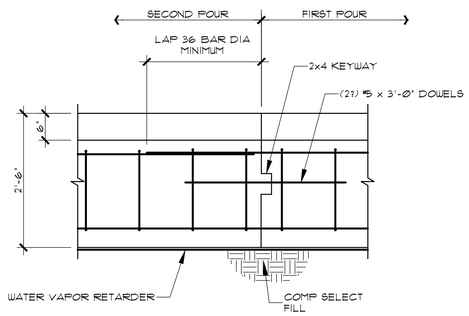
CONCRETE PAD



CONCRETE BASE

NOTE: VERIFY ALL PAD AND BASE LOCATIONS, DIMENSIONS, AND ADEQUACY WITH THE MECHANICAL ENGINEER AND THE INDIVIDUAL EQUIPMENT REQUIREMENTS. MECHANICAL ENGINEER TO SPECIFY ISOLATION DATA. PROVIDE ADDITIONAL LAYER OF REINFORCING FOR PAD THICKNESS GREATER THAN 18".

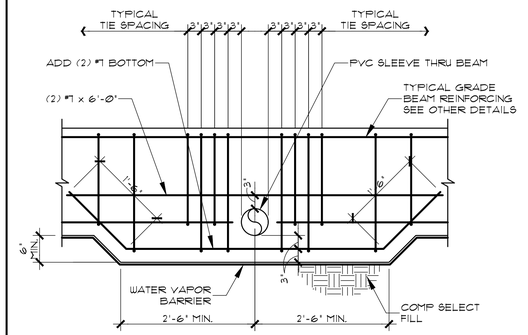
7 PAD AND BASE DETAIL
SCALE:NTS



ELEVATION VIEW

LOCATE JOINTS IN MIDDLE THIRD OF BEAM SPAN BETWEEN SUPPORTS

4 GRADE BEAM CONSTRUCTION JOINT
SCALE:3/4" = 1'-0"



ELEVATION VIEW

TYPICAL HORIZONTAL HOLE THROUGH GRADE BEAM LARGER THAN 4" DIA.

1 GRADE BEAM PENETRATION (MAIN REINF INTERRUPTED)
SCALE:3/4" = 1'-0"

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MECHANICAL SYMBOLS AND ABBREVIATIONS

NOTE: NOT ALL SYMBOLS AND ABBREVIATIONS INDICATED HERE ARE USED IN THE DRAWINGS AND MAY NOT APPLY TO THIS PROJECT. ADDITIONAL SYMBOLS MAY BE INDICATED IN THE DRAWINGS.

MECHANICAL ABBREVIATIONS

AD	ACCESS DOOR
ADJ	ADJUSTABLE
AFF	ABOVE FINISHED FLOOR
AL	ALUMINUM
ALT	ALTERNATE
AP	ACCESS PANEL
APD	AIR PRESSURE DROP
APPROX	APPROXIMATE
ARCH	ARCHITECTURAL
AVG	AVERAGE
BAS	BUILDING AUTOMATION SYSTEM
BOB	BOTTOM OF BEAM
BOD	BOTTOM OF DUCT
BOP	BOTTOM OF PIPE
BTU	BRITISH THERMAL UNITS
BTUH	BRITISH THERMAL UNITS PER HOUR
CAV	CONSTANT AIR VOLUME
CFH	CUBIC FEET PER HOUR
CFM	CUBIC FEET PER MINUTE
CL	CENTERLINE
CLG	CEILING
COND	CONDENSATE
CONTR	CONTRACTOR
COP	COEFFICIENT OF PERFORMANCE
CU	COPPER
DAP	DUCT ACCESS PANEL
DB	DRY BULB
DDC	DIRECT DIGITAL CONTROL
DEG	DEGREES
DIA	DIAMETER
DIM	DIMENSION
DN	DOWN
DWG	DRAWING
DX	DIRECT EXPANSION
EA	EXHAUST AIR
EAT	ENTERING AIR TEMPERATURE
EC	ELECTRICAL CONTRACTOR
EDR	EQUIVALENT DIRECT RADIATION
EFF	EFFICIENCY
ELEC	ELECTRICAL
ELEV	ELEVATION
EM	EMERGENCY
ESP	EXTERNAL STATIC PRESSURE
ETR	EXISTING TO REMAIN
EWT	ENTERING WATER TEMPERATURE
EXH	EXHAUST
EXP	EXPANSION
EXIST	EXISTING
F	FAHRENHEIT
FC	FORWARD CURVED
FLA	FULL LOAD AMPS
FLR	FLOOR
FM	FACTORY MUTUAL
FPD	FLUID PRESSURE DROP
FPI	FINS PER INCH
FPM	FEET PER MINUTE
FPS	FEET PER SECOND
F&T	FLOAT AND THERMOSTATIC
FT	FEET
FTG	FOOTING
GA	GAUGE
GAL	GALLON
GALV	GALVANIZED
GBD	GRAVITY BACKDRAFT DAMPER
GC	GENERAL CONTRACTOR
GPM	GALLONS PER MINUTE
GPH	GALLONS PER HOUR
HP	HORSEPOWER
ID	INSIDE DIAMETER
IE	INVERT ELEVATION
IN	INCHES
LAT	LEAVING AIR TEMPERATURE
LB/HR	POUNDS PER HOUR
LF	LINEAR FEET
LTG	LIGHTING
LWT	LEAVING WATER TEMPERATURE
MAX	MAXIMUM
MBH	THOUSANDS OF BTU PER HOUR
MC	MECHANICAL CONTRACTOR
MCA	MINIMUM CIRCUIT AMPACITY
MCC	MOTOR CONTROL CENTER
MEP	MECHANICAL, ELECTRICAL AND PLUMBING
MER	MECHANICAL EQUIPMENT ROOM
MEZZ	MEZZANINE
MFR	MANUFACTURER
MIN.	MINIMUM
MISC	MISCELLANEOUS
NA	NOT APPLICABLE
NC	NORMALLY CLOSED
NIC	NOT IN CONTRACT
NO	NORMALLY OPEN
NPS	NOMINAL PIPE SIZE
NPSH	NET POSITIVE SUCTION HEAD
NPT	NATIONAL PIPE THREAD
NR	NEAR
NTS	NOT TO SCALE
OA	OUTSIDE AIR
OC	ON CENTER
OED	OPEN END DUCT
OLP	OVERLOAD PROTECTION
OV	OUTLET VELOCITY
PC	PLUMBING CONTRACTOR
PCF	POUNDS PER CUBIC FOOT
PD	PRESSURE DROP
PH	PHASE
PLBG	PLUMBING
POC	POINT OF CONNECTION
PPH	POUNDS PER HOUR
PRV	PRESSURE RELIEF VALVE
PSF	POUNDS PER SQUARE FOOT
PSI	POUNDS PER SQUARE INCH
PSIA	POUNDS PER SQUARE INCH ABSOLUTE
PSIG	POUNDS PER SQUARE INCH GAUGE
PVC	POLYVINYL CHLORIDE
RA	RETURN AIR
REQD	REQUIRED
RF	ROOF
RH	RELATIVE HUMIDITY
RPM	REVOLUTIONS PER MINUTE
SA	SUPPLY AIR
SCH	SCHEDULE
SHT	SHEET
SP	STATIC PRESSURE
SPEC	SPECIFICATION
SQ	SQUARE
S/S	STAINLESS STEEL
STD	STANDARD
STRUCT	STRUCTURAL
T&P	TEMPERATURE AND PRESSURE
TA	TRANSFER AIR
TBR	TO BE REMOVED
TC	TEMPERATURE CONTROL
TEMP	TEMPERATURE
TOB	TOP OF BEAM
TOD	TOP OF DUCT
TOP	TOP OF PIPE
TOS	TOP OF SLAB
TSP	TOTAL STATIC PRESSURE
T STAT	THERMOSTAT
TYP	TYPICAL
UC	UNDERCUT DOOR 1" (BY GENERAL CONTRACTOR)
UNO	UNLESS OTHERWISE NOTED
V	VOLTS
VA	VALVE
VAV	VARIABLE AIR VOLUME
VEL	VELOCITY
VP	VELOCITY PRESSURE
VTR	VENT THRU ROOF
W/	WITH
W/O	WITHOUT
WB	WET BULB
WC	WATER COLUMN
WG	WATER GAUGE
X	EXISTING

MECHANICAL EQUIPMENT ABBREVIATIONS

AC	AIR CONDITIONING UNIT/AIR COMPRESSOR
ACC	AIR COOLED CONDENSER
ACCU	AIR COOLED CONDENSING UNIT
ACU	AIR CONDITIONING UNIT
AHU	AIR HANDLING UNIT
AMD	AIR MIXING DEVICE
ARU	AIR ROTATION UNIT
AS	AIR SEPARATOR
AT	AIR TERMINAL DEVICE
B	BOILER
BBS	BOILER BLOWDOWN SEPARATOR
BC	BOOSTER COIL
BFS	BOILER FEEDWATER SYSTEM
C	CONVECTOR
CC	COOLING COIL
CH	CHILLER
CP	CONDENSATE PUMP
CRU	CONDENSATE RETURN UNIT
CT	COOLING TOWER
CUH	CABINET UNIT HEATER
DC	DUST COLLECTOR
DH	DEHUMIDIFIER
EBB	ELECTRIC BASEBOARD
EF	EXHAUST FAN
EH	EXHAUST HOOD
EJ	EXPANSION JOINT
ET	EXPANSION TANK
EUH	ELECTRIC UNIT HEATER
F	FILTER
FCU	FAN COIL UNIT
FD	FLOOR DRAIN
FOP	FUEL OIL PUMP
FOT	FUEL OIL TANK
FTR	FIN TUBE RADIATION
GF	GAS FURNACE
GV	GRAVITY VENTILATOR
H	HUMIDIFIER
HC	HEATING COIL
HP	HEAT PUMP
HRC	HEAT RECOVERY COIL
HRD	HEAT RECLAIM DEVICE
HX	HEAT EXCHANGER
IAH	INTAKE AIR HOOD
IF	INLINE FAN
IFH	INFRARED HEATER
LP	LOUVERED PENTHOUSE
MAU	MAKE-UP AIR UNIT
MCC	MOTOR CONTROL CENTER
P	PUMP
RAHU	ROOFTOP AIR HANDLING UNIT
RCP	RADIANT CEILING PANEL
REF	ROOF EXHAUST FAN
RF	RETURN FAN
RH	RELIEF HOOD
RTU	ROOFTOP UNIT
RV	ROOF VENTILATOR
SA	SOUND ATTENUATOR
SF	SUPPLY FAN
T	TANK
TXV	THERMAL EXPANSION VALVE
UH	UNIT HEATER
UST	UNDERGROUND STORAGE TANK
UV	UNIT VENTILATOR
V	VALVE
VFD	VARIABLE FREQUENCY DRIVE
VP	VACUUM PUMP

GENERAL

- NEW OR RELOCATED
- EXISTING TO REMAIN
- EXISTING TO BE REMOVED
- (#) MECHANICAL NOTE TAG

PIPING SYSTEMS AND FITTINGS

BBD	BOILER BLOW DOWN
BF	BOILER FEED
BA	BREATHABLE AIR
CWS	CHILLED WATER SUPPLY
CWR	CHILLED WATER RETURN
A	COMPRESSED AIR
CDS	CONDENSER WATER SUPPLY
CDR	CONDENSER WATER RETURN
D	DRAIN LINE
FOF	FUEL OIL FILL
FOS	FUEL OIL SUPPLY
FOR	FUEL OIL RETURN
FOV	FUEL OIL VENT
GCWS	GLYCOL CHILLED WATER SUPPLY
GCWR	GLYCOL CHILLED WATER RETURN
HPWS	HEAT PUMP WATER SUPPLY
HPWR	HEAT PUMP WATER RETURN
HPS	HIGH PRESSURE STEAM
HPC	HIGH PRESSURE CONDENSATE
HWS	HOT WATER SUPPLY
HWR	HOT WATER RETURN
H	HUMIDIFICATION
LP	LIQUEFIED PETROLEUM GAS
LPS	LOW PRESSURE STEAM (10 PSIG)
LPC	LOW PRESSURE CONDENSATE
MU	MAKE-UP WATER
MPS	MEDIUM PRESSURE STEAM
MPC	MEDIUM PRESSURE CONDENSATE
G	NATURAL GAS
N2	NITROGEN
H2	HYDROGEN
O2	OXYGEN
V	VENT LINE
PC	PUMPED CONDENSATE
RHG	REFRIGERANT HOT GAS
RL	REFRIGERANT LIQUID
RS	REFRIGERANT SUCTION
RV	REFRIGERANT VENT
VAC	VACUUM (AIR)

NOTE:
(E) PRIOR TO SYSTEM TYPE
DENOTES EXISTING PIPING
(i.e. (E) HWS - EXISTING HOT WATER SUPPLY)

(# PSIG) = SYSTEM PRESSURE IN PSIG
(i.e. (5 PSIG)G)

	FLANGE
	UNION
	ANCHOR
	PIPE GUIDE
	ECCENTRIC REDUCER
	CONCENTRIC REDUCER
	LINE CONTINUATION BREAK
	PIPELINE STRAINER
	ELBOW DOWN
	ELBOW UP
	TEE DOWN
	TEE UP
	PIPE CAP
	VALVE IN VERTICAL

PIPE VALVES AND SPECIALTIES

	ANGLE VALVE
C.S.	BALANCING VALVE (CIRCUIT SETTER)
	BALL VALVE
	BUTTERFLY VALVE
	BUTTERFLY VALVE WITH ACTUATOR
	CHECK VALVE (ARROW INDICATES FLOW DIRECTION)
	DIAPHRAGM VALVE
	DRAIN VALVE WITH CAPPED OUTLET
	FLOAT OPERATED VALVE
	GATE VALVE
	GLOBE VALVE
	PLUG VALVE
	PRESSURE REDUCING VALVE
	PRESSURE RELIEF VALVE
	SHUTOFF VALVE (SEE SPECIFICATION FOR TYPE)
S	SOLENOID VALVE
	THERMAL EXPANSION VALVE
	TRIPLE DUTY VALVE
	2-WAY CONTROL VALVE
	3-WAY CONTROL VALVE
AV	AUTOMATIC AIR VENT
MV	MANUAL AIR VENT
	BALL JOINT
EJ	EXPANSION JOINT
	FLEXIBLE CONNECTION
FS	FLOW SWITCH
FM	FLOW METER
	PETE'S PLUG
	PRESSURE GAUGE
PS	PRESSURE SWITCH
XX	STEAM TRAP (INDICATE TYPE: T - THERMOSTATIC TRAP; F&T - FLOAT AND THERMOSTATIC TRAP; IB - INVERTED BUCKET TRAP)
	THERMOMETER
	DIRECTION OF FLOW
R	DIRECTION OF PITCH RISE (R) OR DROP (D)

DUCTWORK FITTINGS

SINGLE LINE DUCTWORK / DOUBLE LINE DUCTWORK

- RECTANGULAR/ROUND BRANCH TAKE OFF (SA, RA, AND EA)
- 1/4 D BUT NOT NOT LESS 6"
- 1/4 W BUT NOT NOT LESS 6"
- TEE (FOR LOW PRESSURE SUPPLY AIR DUCTWORK ONLY)
- 15° MAX. FOR DIVERGING TRANSITION, 25° MAX. FOR CONVERGING TRANSITION - ECCENTRIC
- 15° MAX. FOR DIVERGING TRANSITION, 25° MAX. FOR CONVERGING TRANSITION - CONCENTRIC
- DUCT WITH FLOW DIRECTION ARROW
- LINE CONTINUATION BREAK (RECTANGULAR, ROUND)
- SUPPLY AIR (SA) OR OUTDOOR AIR (OA) DUCT UP
- SUPPLY AIR (SA) OR OUTDOOR AIR (OA) DUCT DOWN
- RETURN AIR (RA), RELIEF AIR OR TRANSFER AIR (TA) DUCT UP
- RETURN AIR (RA), RELIEF AIR OR TRANSFER AIR (TA) DUCT DOWN
- EXHAUST AIR (EA) DUCT UP
- EXHAUST AIR (EA) DUCT DOWN
- DUCT RISE/DROP W/ 90° ELBOWS (SUPPLY RECTANGULAR DUCT SHOWN)
- EITHER RADIUS OR SQUARE ELBOW (REFER TO SPECIFICATION FOR ADDITIONAL REQUIREMENTS)
- SQUARE ELBOW WITH TURNING VANES
- DUCT RISE (R) OR DROP (D) W/ 30° ELBOWS (RECTANGULAR DUCTS)
- DUCT CROSS OVER (THIS DUCT RUNS UNDERNEATH)

DIFFUSER, GRILLE, AND REGISTER NOTATION

DUCT SIZE IN INCHES (NET INSIDE DIMENSIONS)
FIRST FIGURE: SIDE SHOWN
SECOND FIGURE: SIDE NOT SHOWN

12x12

A1 — DIFFUSER/GRILLE MARK
000 — CFM
10" — NECK SIZE
(TYP.2) — TYPICAL OF QUANTITY

12"Ø INDICATES ROUND DUCTWORK
12X12⊕ INDICATES OVAL ROUND DUCTWORK

- SQUARE/RECTANGULAR SUPPLY DIFFUSER, GRILLE OR REGISTER
- SUPPLY REGISTER OR GRILLE (VERTICAL MOUNT)
- ROUND DIFFUSER
- EXHAUST OR RETURN REGISTER OR GRILLE (VERTICAL MOUNT)
- RETURN REGISTER OR GRILLE (HORIZONTAL MOUNT)
- EXHAUST REGISTER OR GRILLE (HORIZONTAL MOUNT)
- SIDEWALL REGISTER OR GRILLE WITH DAMPER (DUCT MOUNT)

DAMPERS AND CONTROLS

- MANUAL VOLUME DAMPER
- FIRE DAMPER
- SMOKE DAMPER
- COMBINATION FIRE/ SMOKE DAMPER
- BACKDRAFT DAMPER
- MOTORIZED DAMPER
- SPACE THERMOSTAT
- SPACE HUMIDISTAT
- NIGHT CYCLE CONTROL THERMOSTAT
- TEMPERATURE SENSOR
- HUMIDITY SENSOR
- PRESSURE SENSOR
- DUCT SMOKE DETECTOR
- STARTER
- SWITCH
- CONTROL WIRING

DUCTWORK SPECIALTIES

- DUCT REHEAT COIL
- TEST HOLE
- ACCESS DOOR
- NEW TO EXISTING DUCT CONNECTION
- REMOVE EXISTING DUCTWORK
- FLEXIBLE DUCT
- POINT OF CHANGE IN DUCT CONSTRUCTION BY PRESSURE CLASS
- LINED DUCTWORK

GENERAL NOTES

1. ALL WORK SHALL BE PERFORMED IN A NEAT AND WORKMANLIKE MANNER AND AND SHALL COMPLY WITH ALL ADOPTED LOCAL, STATE, AND NATIONAL CODES.
2. DO NOT SCALE THE DRAWINGS.
3. DRAWINGS ARE DIAGRAMMATIC. CONTRACTOR TO INSTALL PIPE AND DUCTWORK IN A MANNER ACCORDING TO GOOD PRACTICE. ANY MAJOR DEVIATIONS REQUIRED FROM THE DESIGN DRAWINGS SHALL BE VERIFIED WITH THE ENGINEER/ARCHITECT.
4. FINAL ELECTRICAL CONNECTIONS AT OR ABOVE 120V SHALL BE MADE BY THE ELECTRICAL CONTRACTOR.
5. INSTALL BALANCING DAMPERS AND SPLITTER DAMPERS AS SHOWN AND AS REQUIRED FOR PROPER BALANCING OF THE MECHANICAL SYSTEM. PROVIDE TO THE ENGINEER/OWNER A BALANCING REPORT SHOWING RESULTS OF BALANCE TESTING. ALL BALANCE TESTING SHALL MEET THE CURRENT NEBB STANDARDS.
6. DO NOT LOCATE FCU'S, VAV'S, OR FPT'S ABOVE LIGHTS OR CONFERENCE ROOMS.
7. REFER TO STRUCTURAL DRAWINGS AND OTHER DISCIPLINES FOR COORDINATING DUCT ROUTING IN CEILING PLENUM SPACE.
8. PROVIDE A SET OF RECORD DRAWINGS OF THE ACTUAL INSTALLATION. RECORD DRAWINGS SHALL INCLUDE AS A MINIMUM, THE LOCATION AND PERFORMANCE DATA ON EACH PIECE OF EQUIPMENT, GENERAL CONFIGURATION OF DUCT & PIPE DISTRIBUTION SYSTEM INCLUDING SIZES AND THE TERMINAL AIR DESIGN FLOW RATES.
9. AVOID ROUTING OF PIPING OR DUCTWORK ABOVE IT, ELECTRICAL OR FIRE EQUIPMENT ROOMS.
10. PROVIDE APPROPRIATELY RATED FIRE STOPPING FOR PENETRATIONS THROUGH FIRE-RATED WALLS. REFER TO ARCHITECTURAL DRAWINGS FOR LOCATIONS OF FIRE RATED STRUCTURES.
11. COORDINATE THERMOSTAT, SENSOR AND SWITCH LOCATIONS WITH ARCHITECT/OWNER PRIOR TO INSTALLATION.
12. PROVIDE DUCT TRANSITIONS FROM EQUIPMENT CONNECTIONS TO DUCT SIZES SHOWN.
13. FLEXIBLE DUCT SHALL BE INSULATED AND SHALL BE THE SAME SIZE OF THE NECK OF THE AIR DEVICE. FLEXIBLE DUCTWORK SHALL NOT EXCEED 8'-0" IN LENGTH, PROVIDE WRAPPED RIGID ROUND DUCTWORK FOR TAKE-OFFS IN EXCESS OF 8'-0".
14. MAINTAIN A MINIMUM 10'-0" SEPARATION FROM OUTSIDE AIR INTAKES TO EXHAUST TERMINATIONS AND VENTS.
15. MAINTAIN A MINIMUM 5'-0" SEPARATION FROM EXHAUST TERMINATIONS TO OPERABLE WINDOWS.
16. ALL UNLINED DUCTWORK VISIBLE THOUGH THE AIR DEVICE SHALL BE PAINTED FLAT BLACK.
17. CEILING TILES USED TO ACCESS FAN COIL UNITS TO BE LABELED.

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INTERIM REVIEW ONLY
DOCUMENT INCOMPLETE:
Not intended for permit or construction.
06/02/23

iAD PROJECT #	23017
ISSUE DATE:	06/02/23

	06/02/23	95 % OWNER REVIEW SET

REVISION LOG

MECHANICAL SYMBOLS AND ABBREVIATIONS

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SCALE: AS NOTED

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MECHANICAL:
THE CONTRACTOR SHALL PROVIDE THE FOLLOWING ENERGY CODE REQUIREMENTS:
THE FOLLOWING REQUIREMENTS ARE MANDATORY PROVISIONS AND ARE NECESSARY FOR COMPLIANCE WITH THE CODE.

DRAWINGS: CONSTRUCTION DOCUMENTS SHALL REQUIRE THAT WITHIN 90 DAYS AFTER THE DATE OF SYSTEM ACCEPTANCE, RECORD DRAWINGS OF THE ACTUAL INSTALLATION BE PROVIDED TO THE BUILDING OWNER OR THE DESIGNATED REPRESENTATIVE OF THE BUILDING OWNER. RECORD DRAWINGS SHALL INCLUDE AS A MINIMUM: THE LOCATION AND PERFORMANCE DATA ON EACH PIECE OF EQUIPMENT, GENERAL CONFIGURATION OF DUCT AND PIPE DISTRIBUTION SYSTEM INCLUDING SIZES, AND THE TERMINAL AIR OR WATER DESIGN FLOW RATES.

MANUALS: CONSTRUCTION DOCUMENTS SHALL REQUIRE THAT AN OPERATING MANUAL AND A MAINTENANCE MANUAL BE PROVIDED TO THE BUILDING OWNER OR THE DESIGNATED REPRESENTATIVE OF THE BUILDING OWNER WITHIN 90 DAYS AFTER THE DATE OF SYSTEM ACCEPTANCE. THESE MANUALS SHALL BE IN ACCORDANCE WITH INDUSTRY-ACCEPTED STANDARDS (SEE APPENDIX E) AND SHALL INCLUDE, AT A MINIMUM, THE FOLLOWING:
(A) SUBMITTAL DATA STATING EQUIPMENT SIZE AND SELECTED OPTIONS FOR EACH PIECE OF EQUIPMENT REQUIRING MAINTENANCE.
(B) OPERATION MANUALS AND MAINTENANCE MANUALS FOR EACH PIECE OF EQUIPMENT REQUIRING MAINTENANCE, EXCEPT EQUIPMENT NOT FURNISHED AS PART OF THE PROJECT. REQUIRED ROUTINE MAINTENANCE ACTIONS SHALL BE CLEARLY IDENTIFIED.
(C) NAMES AND ADDRESSES OF AT LEAST ONE SERVICE AGENCY.
(D) HVAC CONTROLS SYSTEM MAINTENANCE AND CALIBRATION INFORMATION, INCLUDING WIRING DIAGRAMS, SCHEMATICS, AND CONTROL SEQUENCE DESCRIPTIONS. DESIRED OR FIELD-DETERMINED SET-POINTS SHALL BE PERMANENTLY RECORDED ON CONTROL DRAWINGS AT CONTROL DEVICES OR, FOR DIGITAL CONTROL SYSTEMS, IN PROGRAMMING COMMENTS.
(E) A COMPLETE NARRATIVE OF HOW EACH SYSTEM IS INTENDED TO OPERATE, INCLUDING SUGGESTED SET-POINTS.

2015 IECC SECTION C402.5.5 - OUTDOOR AIR INTAKE AND EXHAUST OPENINGS AND STAIRWAY AND SHAFT VENTS SHALL BE PROVIDED WITH CLASS I MOTORIZED DAMPERS. THE DAMPERS SHALL HAVE AN AIR LEAKAGE RATE NOT GREATER THAN 4 CFM / FT2 OF DAMPER SURFACE AREA AT 1.0 INCH WATER GAUGE AND SHALL BE LABELED BY AN APPROVED AGENCY WHEN TESTED IN ACCORDANCE WITH AMCA 500D FOR SUCH PURPOSE.

OUTDOOR AIR INTAKE AND EXHAUST DAMPERS SHALL BE INSTALLED WITH AUTOMATIC CONTROLS CONFIGURED TO CLOSE WHEN THE SYSTEMS OR SPACES SERVED ARE NOT IN USE OR DURING UNOCCUPIED PERIOD WARM-UP AND SETBACK OPERATION, UNLESS THE SYSTEMS SERVED REQUIRE OUTDOOR OR EXHAUST AIR IN ACCORDANCE WITH INTERNATIONAL MECHANICAL CODE OR THE DAMPERS ARE OPENED TO PROVIDE INTENTIONAL ECONOMIZER COOLING.

EXCEPTIONS: GRAVITY (NONMOTORIZED) DAMPERS SHALL BE PERMITTED TO BE USED AS FOLLOWS:
(A) IN BUILDINGS LESS THAN 3 STORIES IN HEIGHT ABOVE GRADE PLANE.
(B) IN BUILDINGS OF ANY HEIGHT LOCATED IN CLIMATE ZONES 1, 2, OR 3.
(C) WHERE THE DESIGN EXHAUST CAPACITY IS NOT GREATER THAN 300 CFM.

GRAVITY (NONMOTORIZED) DAMPERS SHALL HAVE AN AIR LEAKAGE RATE NOT GREATER THAN 20 CFM / FT2 WHERE NOT LESS THAN 24 INCHES IN EITHER DIMENSION AND 40 CFM / FT2 WHERE LESS THAN 24 INCHES IN EITHER DIMENSION. THE RATE OF AIR LEAKAGE SHALL BE DETERMINED AT 1.0 INCH W.G. WHEN TESTED IN ACCORDANCE WITH AMCA 500D FOR SUCH PURPOSE. THE DAMPERS SHALL BE LABELED BY AN APPROVED AGENCY.

CONTROLS: THERMOSTATIC SETBACK CONTROLS SHALL HAVE THE CAPABILITY TO SET BACK OR TEMPORARILY OPERATE THE SYSTEM TO MAINTAIN ZONE TEMPERATURES DOWN TO 55°F OR UP TO 85°F IN ACCORDANCE WITH 2015 IECC SECTION C403.4.2.1.

IN ACCORDANCE WITH 2015 IECC SECTION C403.4.2.2, AN AUTOMATIC TIME CLOCK OR PROGRAMMABLE CONTROLS SHALL BE CAPABLE OF STARTING AND STOPPING THE SYSTEM FOR SEVEN DIFFERENT DAILY SCHEDULES PER WEEK AND RETAINING THEIR PROGRAMMING AND TIME SETTING DURING A LOSS OF POWER FOR AT LEAST 10 HOURS. ADDITIONALLY, THE CONTROLS SHALL HAVE A MANUAL OVERRIDE THAT ALLOWS TEMPORARY OPERATION OF THE SYSTEM FOR UP TO 2 HOURS; A MANUALLY OPERATED TIMER CAPABLE OF BEING ADJUSTED TO OPERATE THE SYSTEM FOR UP TO 2 HOURS; OR AN OCCUPANCY SENSOR.

(B) AN OCCUPANT SENSOR THAT IS CAPABLE OF SHUTTING THE SYSTEM OFF WHEN NO OCCUPANT IS SENSED FOR A PERIOD OF UP TO 30 MINUTES.
(C) A MANUALLY OPERATED TIMER CAPABLE OF BEING ADJUSTED TO OPERATE THE SYSTEM FOR UP TO TWO HOURS.

CONSTRUCTION DOCUMENTS SHALL REQUIRE THAT ALL HVAC SYSTEMS BE BALANCED IN ACCORDANCE WITH GENERALLY ACCEPTED ENGINEERING STANDARDS (SECTION C408.2.2 OF 2015 IECC). CONSTRUCTION DOCUMENTS SHALL REQUIRE THAT A WRITTEN BALANCE REPORT BE PROVIDED TO THE OWNER OR THE DESIGNATED REPRESENTATIVE OF THE BUILDING OWNER FOR THE HVAC SYSTEMS SERVING ZONES WITH A TOTAL CONDITIONED AREA EXCEEDING 5000 SF.
AIR SYSTEMS SHALL BE BALANCED IN A MANNER TO FIRST MINIMIZE THROTTLING LOSSES. THEN, FOR FANS WITH FAN SYSTEM POWER GREATER THAN 1 HP, FAN SPEED SHALL BE ADJUSTED TO MEET DESIGN FLOW CONDITIONS. EACH SUPPLY OUTLET AND ZONE TERMINAL DEVICE SHALL BE EQUIPPED WITH MEANS FOR AIR BALANCING.
INDIVIDUAL HYDRONIC HEATING AND COOLING COILS SHALL BE EQUIPPED WITH MEANS FOR BALANCING AND MEASURING FLOW. HYDRONIC SYSTEMS SHALL BE PROPORTIONATELY BALANCED IN A MANNER TO FIRST MINIMIZE THROTTLING LOSSES, THEN THE PUMP IMPELLER SHALL BE TRIMMED OR PUMP SPEED SHALL BE ADJUSTED TO MEET DESIGN FLOW CONDITIONS. EACH HYDRONIC SYSTEM SHALL HAVE EITHER THE CAPABILITY TO MEASURE ACROSS THE PUMP, OR TEST PORTS AT EACH SIDE OF EACH PUMP.
EXCEPTIONS: THE FOLLOWING EQUIPMENT IS NOT REQUIRED TO BE EQUIPPED WITH A MEANS FOR BALANCING OR MEASURING FLOW:
1. PUMPS WITH PUMP MOTORS OF 5 HP OR LESS.
2. WHERE THROTTLING RESULTS IN NO GREATER THAN 5 PERCENT OF THE NAMEPLATE HORSEPOWER DRAW ABOVE THAT REQUIRED IF THE IMPELLER WERE TRIMMED.

ALL MECHANICAL/PLUMBING SUPPLY AND RETURN PIPING SHALL BE INSULATED PER THE 2015 INTERNATIONAL ENERGY CONSERVATION CODE - TABLE C403.11.3 - MINIMUM PIPE INSULATION.

MINIMUM PIPE INSULATION THICKNESS

FLUID OPERATING TEMPERATURE RANGE AND USAGE (°F)	INSULATION CONDUCTIVITY		NOMINAL PIPE OR TUBE SIZE (INCHES)				
	CONDUCTIVITY BTU·IN. / (H·FT2·°F)	MEAN RATING TEMPERATURE, °F	< 1	1 TO < 1 1/2	1 1/2 TO < 4	4 TO < 8	≤ 8
> 350	0.32 - 0.34	250	4.5	5.0	5.0	5.0	5.0
251 - 350	0.29 - 0.32	200	3.0	4.0	4.5	4.5	4.5
201 - 250	0.27 - 0.30	150	2.5	2.5	2.5	3.0	3.0
141 - 200	0.25 - 0.29	125	1.5	1.5	2.0	2.0	2.0
105 - 140	0.21 - 0.28	100	1.0	1.0	1.5	1.5	1.5
40 - 60	0.21 - 0.27	75	0.5	0.5	1.0	1.0	1.0
< 40	0.20 - 0.26	50	0.5	1.0	1.0	1.0	1.5

ALL THERMOSTATS TO BE NEW AND PROGRAMMABLE PER THE 2015 INTERNATIONAL ENERGY CONSERVATION CODE - SECTION C403.4.

ALL SUPPLY AND RETURN AIR DUCTS LOCATED IN UNCONDITIONED ATTICS, UNCONDITIONED SPACES INCLUDING MECHANICAL ROOMS, UNCONDITIONED PLENUMS, OUTSIDE OF THE ENVELOPE OR OUTSIDE THE BUILDING SHALL BE INSULATED USING R-8 INSULATION FOR PROJECTS LOCATED IN CLIMATE ZONES 1-4 AND R-12 FOR PROJECTS LOCATED IN CLIMATE ZONES 5-8 AS WELL AS COMPLY WITH THE 2018 INTERNATIONAL ENERGY CONSERVATION CODE. ALL SUPPLY AND RETURN DUCTS LOCATED IN A CONDITIONED SPACE OR CONDITION PLENUM SHALL BE INSULATED USING R-8 INSULATION. EXTERNALLY INSULATED DUCT SHALL BE R-8 PER 2018 INTERNATIONAL ENERGY CONSERVATION CODE. INSULATION SHALL BE CONTINUOUS THROUGH ALL WALLS/CEILINGS INCLUDING RATED WALLS. NO INSULATION / VAPOR BARRIER BREAKS WILL BE ALLOWED. ALL SUPPLY AIR DIFFUSER BACKS TO BE INSULATED PER SPECIFICATIONS ABOVE AND PER LOCATION INSTALLED.

ALL DUCTWORK TO BE SHEET METAL AS SPECIFIED WITH EXTERNAL INSULATION AS SPECIFIED.
ACOUSTICAL LINER IS NOT APPROVED.

ANCHOR AND SUPPORTS MUST MEET VERTICAL AND HORIZONTAL LOADS WITHIN THE STRESS LIMITATIONS SPECIFIED IN THE INTERNATIONAL BUILDING CODE FOR THE MINIMUM BASIC WIND SPEED. ANCHOR AND SUPPORTS TO COMPLY WITH SECTION 1604 - 2015 IBC.

DUCTWORK AND PLENUMS SHALL BE SEALED IN ACCORDANCE WITH SECTION 603.9 OF THE 2015 INTERNATIONAL MECHANICAL CODE AND SECTION C403.11.2 OF THE 2015 INTERNATIONAL COMMERCIAL ENERGY CONSERVATION CODE.

ALL DUCTWORK MATERIALS SHALL BE GALVANIZED STEEL, GAUGES, BRACING, AND SUPPORTS SHALL BE PER SMACNA HVAC DUCT CONSTRUCTION STANDARDS METAL AND FLEXIBLE MANUAL, 3RD EDITION. PLENUMS SHALL BE 18-GAUGE. PROVIDE AIRFOIL TYPE TURNING VANES AT ALL CHANGES IN DIRECTION. EXTRACTORS SHALL HAVE OPERATORS. CROSS-BREAK ALL DUCTS 12 INCHES AND WIDER. DUCT DIMENSIONS SHOWN ON DRAWINGS ARE CLEAR INSIDE DIMENSIONS. SUPPORT DUCTS A MAXIMUM OF 6 FEET ON CENTERS WITH 1" X 26 GAUGE HANGERS. SECURE SUPPORTS WITH A SHEETMETAL SCREW ON BOTTOM, AND 12" CENTERS ON SIDES. DAMPERS SHALL HAVE FELT EDGES AND BE 16 GAUGE. PROVIDE LOCKING QUADRANTS FOR DAMPERS. PROVIDE CONCEALED REGULATORS FOR EXTRACTORS ON BRANCH DUCTS, ON TAKEOFFS TO THE CEILING DIFFUSES. U.L. FIRE DAMPERS WITH ACCESS DOORS SHALL BE PROVIDED AS SHOWN ON THE PLANS OR REQUIRED BY CODE. INSTALL DAMPERS AND ACCESS DOORS PER U.L. REQUIREMENTS.

1.1 15010 MECHANICAL GENERAL

A. REFERENCE: ALL PORTIONS OF GENERAL CONDITIONS APPLY TO MECHANICAL AND PLUMBING WORK.

B. GUARANTEES: PROVIDE WRITTEN ONE YEAR GUARANTEE FOR ALL SYSTEMS AND EQUIPMENT. COMPRESSORS SHALL BE GUARANTEED FOR FIVE YEARS.

C. CODES: COMPLY WITH NATIONAL, STATE AND CITY CODES AND OTHER APPLICABLE STANDARDS. ALL PORTIONS OF THE INTERNATIONAL ENERGY CONSERVATION CODE (IECC) AND CURRENT LOCAL AHJ COMMERCIAL ENERGY CONSERVATION CODES MUST BE COMPLIED WITH.

D. SUPERVISION: PROVIDE SUPERVISOR IN FIELD FOR EACH PHASE OF WORK.

E. COORDINATION: COORDINATE ALL WORK WITH OTHER TRADES. PROVIDE MECHANICAL AND PLUMBING EQUIPMENT WITH ELECTRICAL CHARACTERISTICS COMPATIBLE WITH THAT SHOWN ON THE ELECTRICAL DRAWINGS AND DESCRIBED IN THE ELECTRICAL DIVISION OF THE SPECIFICATIONS. THE ENGINEER RESERVES THE RIGHT TO MOVE SERVICES AS REQUIRED TO COORDINATE THE WORK, AT NO COST TO THE OWNER.

F. THE DRAWINGS ARE SCHEMATIC IN NATURE, AND SHOULD NOT BE SCALED, BUT SHOW THE VARIOUS COMPONENTS OF THE SYSTEMS APPROXIMATELY TO SCALE AND ATTEMPT TO INDICATE HOW THEY ARE TO BE INTEGRATED WITH OTHER PARTS OF THE BUILDING. DETERMINE EXACT LOCATIONS BY JOB MEASUREMENTS, BY CHECKING THE REQUIREMENTS OF OTHER TRADES, AND BY REVIEWING ALL CONTRACT DOCUMENTS. THE DRAWINGS INDICATE GENERAL ROUTING OF THE VARIOUS PARTS OF THE SYSTEMS, BUT DO NOT INDICATE ALL FITTINGS, OFFSETS, AND RUN OUTS WHICH ARE REQUIRED. THE CONTRACT SHALL INCLUDE ALL FITTINGS, OFFSETS, AND RUN OUTS REQUIRED TO FIT THE SYSTEM INTO SPACES ALLOTTED TO THEM.

G. SHOP DRAWINGS AND SUBMITTAL DATA: PAPERLESS SUBMITTAL ONLY TO ENGINEER. ALL SHOP DRAWINGS AND SUBMITTAL DATA SHALL BE AN ELECTRONIC FILE FORMAT ONLY. PDF FORMAT IS ACCEPTABLE. ALL EQUIPMENT AND MATERIALS SHALL BE SUBMITTED, INCLUDING DUCTWORK AND EQUIPMENT CHANGES, AS REQUIRED. SUBMITTED ITEMS THAT DEVIATE FROM THE DRAWINGS AND SPECIFICATIONS SHALL BE HIGHLIGHTED IN YELLOW FOR EASY DISTINCTION. MARK ALL ITEMS AND SHOW THAT THEY COMPLY WITH THE IECC. THE ENGINEER SHALL ISSUE A LETTER STATING THE ACTION TAKEN ON THE SUBMITTAL. THE LETTER SHALL BE COPIED AND ATTACHED TO THE SUBMITTAL, BY THE CONTRACTOR, AND DISTRIBUTED AS REQUIRED.

H. RECORD DATA: OBTAIN, AT CONTRACTOR'S EXPENSE, A SET OF PRINTS AND KEEP THESE ON THE JOB SITE DURING CONSTRUCTION. DURING CONSTRUCTION, MARK ON THESE PRINTS ANY CHANGES THAT ARE MADE, NOTING PARTICULARLY LOCATIONS OF THOSE ITEMS THAT WILL NEED TO BE FOR SERVICING. CONVERT RECORD DATA TO AN ELECTRONIC FORMAT (PDF) AND SUBMIT TO THE ARCHITECT. FURNISH ONE SET OF SHOP DRAWINGS AND MAINTENANCE MANUALS IN BROCHURE FORM. RECORD BROCHURES SHALL BE GIVEN TO THE OWNER AT COMPLETION OF THE WORK.

I. PERMITS, FEES: SECURE AND PAY FOR ALL FEES AND CHARGES FOR THE WORK. FURNISH CERTIFICATES OF ACCEPTANCE AT COMPLETION OF THE JOB FROM CITY.

J. SUBSTITUTIONS: NO SUBSTITUTIONS SHALL BE MADE WITHOUT PRIOR APPROVAL FROM THE ARCHITECT AND ENGINEER.

K. CUTTING AND PATCHING: CUTTING TO BE BY THIS SECTION, WITH PATCHING AND FURRING BY GENERAL CONTRACTOR. PATCHING REQUIRED AFTER COMPLETION OF WORK SHALL BE PAID FOR BY CONTRACTOR.

L. CLEAN UP: CLEAN AND TOUCH-UP PAINT ALL EQUIPMENT AT COMPLETION OF WORK. PROTECT ALL EQUIPMENT FROM DAMAGE DURING CONSTRUCTION. PROVIDE NAME PLATES ON ALL EQUIPMENT.

M. TESTS: TESTS ALL PIPING SYSTEMS PER LOCAL CODE. STERILIZE ALL NEW WATER PIPING PER HEALTH DEPARTMENT REQUIREMENTS.

N. TEST ALL EQUIPMENT AND PROVE PERFORMANCE RESULTS TO ARCHITECT. MODIFY ALL DRIVES, BALANCE ALL AIR AS SHOWN ON THE DRAWINGS. AFTER OWNER HAS OCCUPIED AND IS USING THE BUILDING, MAKE ADDITIONAL INSPECTIONS OF THE SYSTEM. CORRECT ANY OWNER'S OBSERVED TEMPERATURE IMBALANCES. CHECK CORRECT OPERATION OF EQUIPMENT AND VERIFY BY LETTER TO THE ARCHITECT, ON EACH TRIP. LIST IN THE LETTER CORRECTIONS MADE. AT THE OPPOSITE SEASON OF THE STARTUP INSPECT AND VERIFY CORRECT OPERATION OF ALL SYSTEMS. TESTS ALL CONTROL SYSTEMS. TEST REFRIGERANT PIPING PER MANUFACTURE'S RECOMMENDATIONS. FURNISH COMPLETE COPY OF ALL TEST DATA TO ARCHITECT. INSTRUCT OWNER FOR ONE DAY IN OPERATION OF ALL SYSTEMS. FILTERS SHALL BE CLEAN WHEN SYSTEMS ARE ACCEPTED BY THE OWNER. TESTING REGULATIONS MUST MEET LOCAL CITY REQUIREMENTS.

O. EXCAVATING AND BACKFILLING: EXCAVATE TO PROVIDE MINIMUM 2 FEET COVER OVER ALL PIPING AND CONDUIT. BACK FILL TO ORIGINAL COMPACTION. SAW-CUT EXISTING FINISHES AND PATCH TO MATCHING ORIGINAL CONDITIONS.

P. NOISE AND VIBRATION: ALL EQUIPMENT SHALL OPERATE WITH MINIMUM OF NOISE AND VIBRATION. CONTRACTORS SHALL RECTIFY ANY OBJECTIONABLE CONDITIONS.

Q. TEMPORARY SERVICES: FURNISH TEMPORARY UTILITY AS REQUIRED FOR NEW CONSTRUCTION.

R. EQUIPMENT CONNECTIONS: PROVIDE ALL MARTIAL AND LABOR FOR CONNECTING OF ALL EQUIPMENT FURNISHED IN OTHER SECTIONS OR BY OWNER. FIELD VERIFY ALL EQUIPMENT FOR DIMENSIONS AND ROUGHING-IN. FURNISH ALL VALVES, DRAIN PIPING, TRAPS, ETC., AS REQUIRED TO INSTALL THE EQUIPMENT.

S. FLOOR DRAINS: FINAL LOCATION WILL BE DETERMINED BY EQUIPMENT LAYOUT AND LOCATION MUST BE FIELD APPROVED. PROVIDE TRAP PRIMERS TO ALL FLOOR DRAINS.

T. EXAMINATION OF SITE: THE CONTRACTOR IS RESPONSIBLE FOR VISITING THE JOB SITE AND CONFIRMING THE LOCATION OF EXISTING CONDITIONS BEFORE BIDDING. IF EXISTING CONDITIONS REQUIRE MODIFICATION DUE TO ELEVATION, OBSTRUCTION, SIZE, ETC., THE CONTRACTOR WILL ADVISE IN WRITING BEFORE BEGINNING CONSTRUCTION.

END OF SECTION 15010

1.1 15020 MECHANICAL SPECIFICATIONS

A. PROVIDE ALL LABOR AND MATERIALS FOR COMPLETE MECHANICAL SYSTEMS. SYSTEMS MUST COMPLY WITH IECC.

B. PLATES: PROVIDE CHROME PLATED PLATES OVER ALL PIPES THROUGH WALLS, FLOORS, AND CEILINGS. PROVIDE GALVANIZED PIPE SLEEVES FOR ALL LINES THROUGH WALLS, FLOORS, AND ROOFS. SLEEVES IN OUTSIDE WALLS AND ROOF SHALL BE WATER TIGHT. SLEEVES THROUGH WALLS ABOVE CEILINGS SHALL BE AIR TIGHT.

C. DUCT INSULATION:
1. EXTERNAL: ALL DUCTWORK SHALL BE INSULATED AND VAPOR SEALED WITH R-8. EXTERNAL INSULATION SHALL COMPLY WITH IECC, AND BE A MINIMUM OF 3" THICK, WITH A VAPOR BARRIER APPLIED OVER JOINTS. INSULATE OUTER CORES OF DIFFUSES (EXTERNALLY). INSULATION SHALL BE APPLIED PER MANUFACTURE'S RECOMMENDATIONS.
2. INTERNAL: INTERNAL DUCT INSULATION SHALL BE A MINIMUM OF 2" THICK WITH R-8, AND COMPLY WITH IECC. INSULATION SHALL BE APPLIED PER MANUFACTURE'S RECOMMENDATIONS, WITH INSULATING PINS SPEED WASHERS 12" ON CENTERS ON TOPS AND SIDES OF THE DUCT.
3. DUCTWORK SIZES SHOWN ON DRAWINGS ARE INSIDE DIMENSION.
4. ALL SUPPLY DIFFUSER BACKPANS TO BE INSULATED WITH R-8 INSULATION.

D. DUCTWORK: ALL DUCTWORK MATERIALS SHALL BE GALVANIZED STEEL, GAUGES, BRACING, AND SUPPORTS SHALL BE PER SMACNA MANUAL. PLENUMS SHALL BE 18-GAUGE. PROVIDE AIRFOIL TYPE TURNING VANES AT ALL CHANGES IN DIRECTION. EXTRACTORS SHALL HAVE OPERATORS. PAINT FLAT BLACK BEHIND GRILLES. CROSS-BREAK ALL DUCTS 12 INCHES AND WIDER. DUCT DIMENSIONS SHOWN ON DRAWINGS ARE CLEAR INSIDE DIMENSIONS. SUBMIT SHOP DRAWINGS AND CHANGES TO PLAN LAYOUTS AND TO PROVIDE ADEQUATE CLEARANCES. FLEXIBLE DUCTWORK CONNECTIONS SHALL BE PROVIDED FOR ALL FAN UNIT CONNECTIONS. VENTGLAS FABRIC SHALL BE 4" WIDE. SUPPORT DUCTS A MAXIMUM OF 6 FEET ON CENTERS WITH 1" X 26 GAUGE HANGERS. SECURE SUPPORTS WITH A SHEETMETAL SCREW ON BOTTOM, AND 12" CENTERS ON SIDES. DAMPERS SHALL HAVE FELT EDGES AND BE 16 GAUGE. PROVIDE LOCKING QUADRANTS FOR DAMPERS. PROVIDE CONCEALED REGULATORS FOR EXTRACTORS ON BRANCH DUCTS, ON TAKEOFFS TO THE CEILING DIFFUSES. FLEXIBLE DUCTS SHALL BE PRE INSULATED TYPE, AND A MAXIMUM OF 8 FEET LONG. U.L. FIRE DAMPERS WITH ACCESS DOORS SHALL BE PROVIDED AS SHOWN ON THE PLANS OR REQUIRED BY CODE. INSTALL DAMPERS AND ACCESS DOORS PER U.L. REQUIREMENTS. UNITS ABOVE CEILINGS SHALL HAVE AUXILIARY DRAIN PANS. AUXILIARY DRAIN PANS SHALL BE A MINIMUM 4" HIGH AND MADE OUT OF SHEETMETAL. PANS SHALL HAVE AUXILIARY DRAIN AND A FAN FLOAT SWITCH.

E. OUTSIDE AIR INTAKE: THROUGH OUTSIDE WALL OR ROOF LOUVERS WITH MOTORIZED ALUMINUM OBD DAMPERS.

F. FANS: ROOF MOUNTED, CEILING MOUNTED, WALL MOUNTED, VENT SETS OR INLINE TYPE AS SHOWN ON THE DRAWINGS. PROVIDE FACTORY CURBSFOR ALL ROOF MOUNTED FANS OR HOODS. PROVIDE ALUMINUM DISCHARGE GRILLES AS REQUIRED. FANS SHALL BE GREENHECK, LOREN COOK, PENN, OR ACME.

G. UNIT HEATERS: ELECTRIC UNIT HEATERS: HEATERS SHALL BE U.L. LISTED, SUSPENDED FROM STRCUTURE ABOVE AND WITH ALL NECESSARY PARTS FOR A COMPLETE SYSTEM. SYSTEM SHALL HAVE A THERMOSTAT, SAFETY CONTROLS, RELAYS, DISCONNECTS, CONTACTORS, ETC. AND BE SUITABLE FOR SPECIFIED VOLTAGE. LOCATE THERMOSTAT AS DIRECTED BY ARCHITECT. UNITS SHALL BE MANUFACTURED BY MODINE OR APPROVED EQUAL.

END OF SECTION 15020

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ANGLETON Where the Heart is

Angleton Fire Station #3 Addition

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REVISION LOG

MECHANICAL SPECIFICATIONS

M0.01

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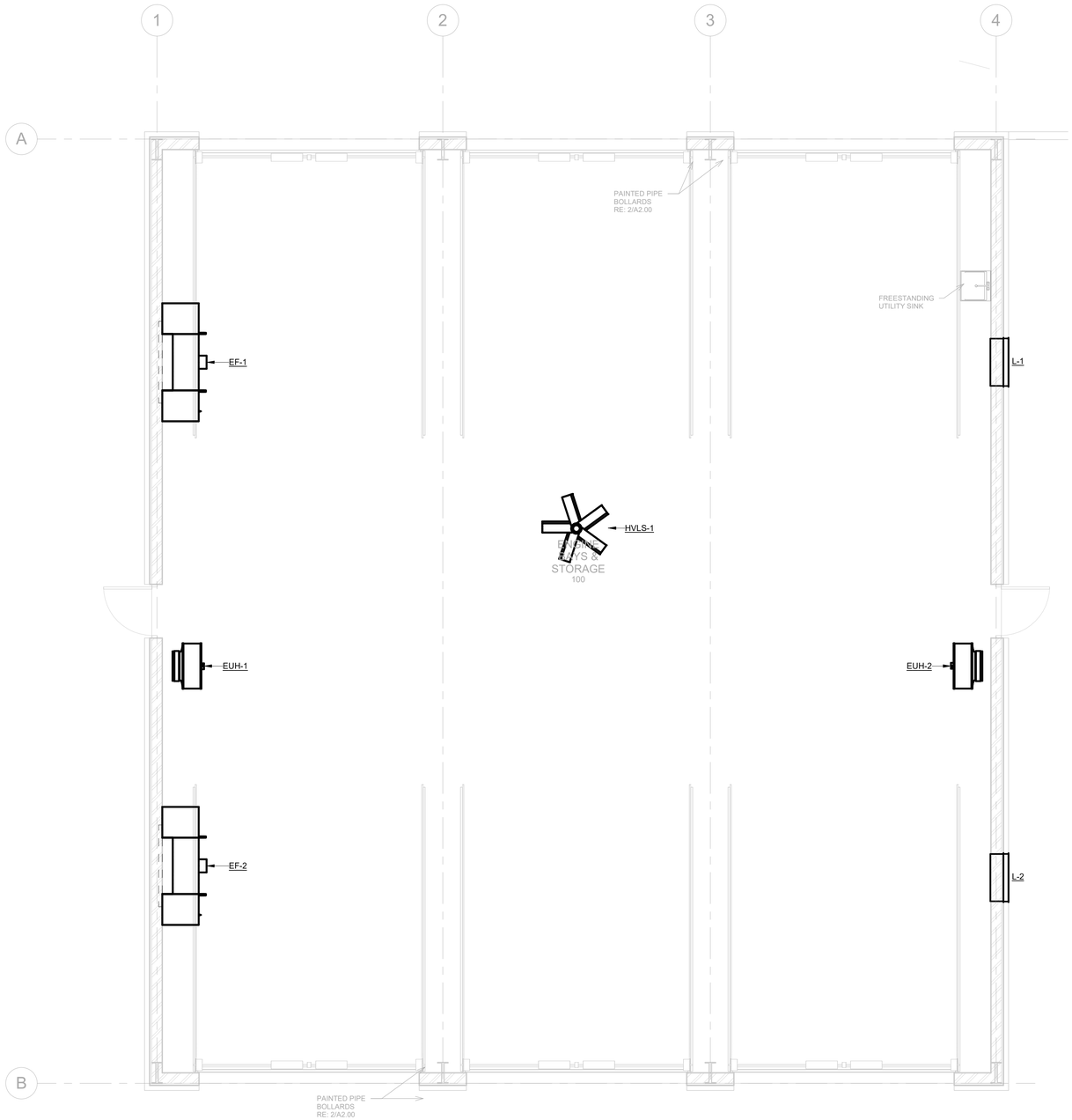

1 PLAN NORTH

MECHANICAL - GROUND FLOOR PLAN

1/4" = 1'-0"

GENERAL MECHANICAL NOTES

A. INSTALL ALL EQUIPMENT PER MANUFACTURER'S RECOMMENDATIONS.

B. COORDINATE LOCATIONS FOR ALL HVAC EQUIPMENT WITH ARCHITECT.

KEYED NOTES

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MECHANICAL FLOOR PLAN

M2.00

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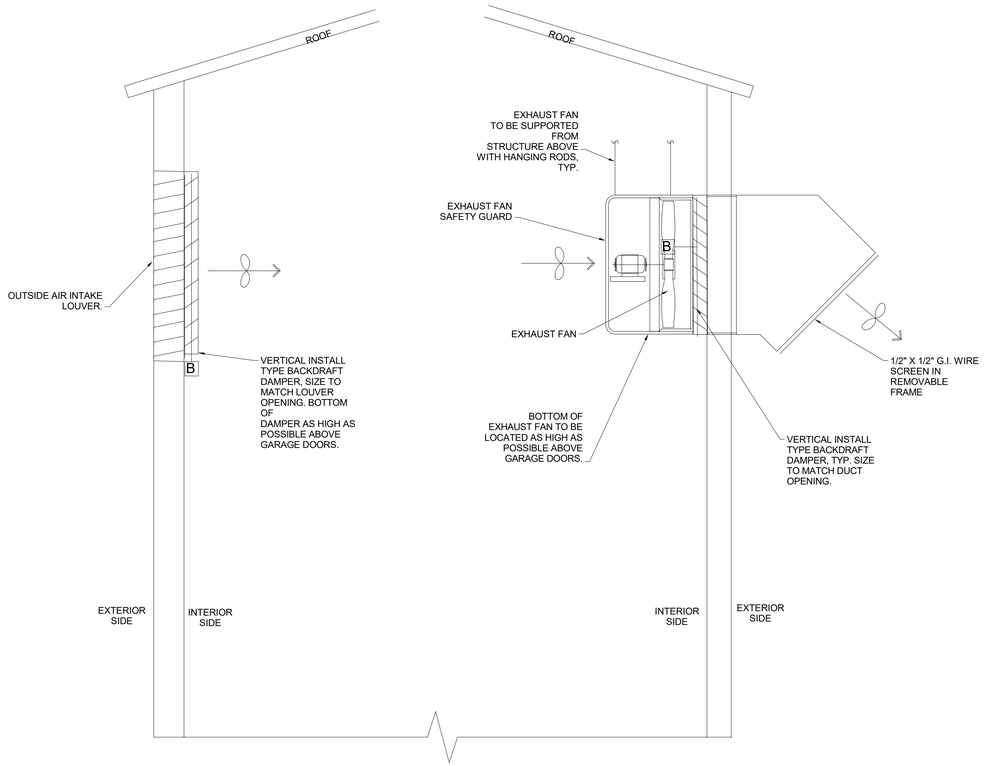

01 EXHAUST FAN DETAIL
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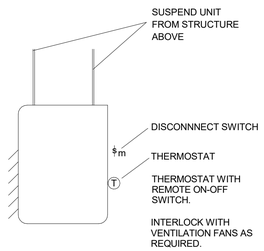

1. UNITS MUST MEET ALL IECC REQUIREMENTS.

02 UNIT HEATER DETAIL
SCALE: NTS

EXHAUST FAN SCHEDULE

MARK	SERVICE	CFM	STATIC PRESS	FAN RPM	DRIVE TYPE	VOLT PHASE	POWER (W) OR (HP)	WEIGHT (LBS)	MANUFACTURER - MODEL
EF-1	TRUCK STORAGE	1,600	0.50	949	BELT	120 / 1	1/2 HP	73	GREENHECK - SBE-1H24
EF-2	TRUCK STORAGE	1,600	0.50	949	BELT	120 / 1	1/2 HP	73	GREENHECK - SBE-1H24

1. ALL FANS TO HAVE DISCONNECT SWITCHES.
2. PROVIDE EF-1 AND EF-2 WITH EXHAUST HOOD / BIRDSCREEN & BACKDRAFT DAMPER. PROVIDE A TIMER SWITCH FOR FANS TO OPERATE CONTINUOUSLY DURING ALL OCCUPIED HOURS.

LOUVER SCHEDULE

MARK	SERVICE	CFM	WIDTH (INCHES)	HEIGHT (INCHES)	VELOCITY (FPM)	FREE AREA (SF)	MANUFACTURER	NOTES
L-1	OUTSIDE AIR	1,600	36	36	328	4.88	RUSKIN - ELF6375DX	1, 2, 3, 4, 5
L-2	OUTSIDE AIR	1,600	36	36	328	4.88	RUSKIN - ELF6375DX	1, 2, 3, 4, 5

1. VERIFY FINAL COLOR / FINISH WITH ARCHITECT FOR ALL LOUVERS.
2. LOUVER TO BE STATIONARY TYPE.
3. LOUVER TO BE OF ALUMINUM MATERIAL.
4. PROVIDE DAMPER AS INDICATED ON DRAWINGS.
5. PROVIDE LOUVER WITH BIRD SCREEN AND INSECT SCREEN.

ELECTRIC UNIT HEATERS

MARK	QTY	TYPE	CFM	BTUH	KW	HP	VOLT PHASE	MANUFACTURER - MODEL
EUH-1	1	HORIZONTAL	380	17,100	5.00	1 / 40	240 / 1	MODINE HER 50
EUH-2	1	HORIZONTAL	380	17,100	5.00	1 / 40	240 / 1	MODINE HER 50

1. PROVIDE TOTALLY ENCLOSED MOTOR
2. ALL FANS TO HAVE DISCONNECT SWITCHES.
3. PROVIDE FACTORY THERMOSTAT.
4. INCLUDE FACTORY SUPPLIED LOCKABLE THERMOSTAT COVER.

HIGH VOLUME LOW SPEED FAN SCHEDULE

MARK	BLADES	SIZE	HP	MAX RPM	VOLT PHASE	AMPS	MOCP	WEIGHT	MANUFACTURER	NOTES
HVLS-1	5	7'	0.25	97	230 / 1	5.0	20	93	GREENHECK DC-5-7-NL	ALL

1. FAN SUPPLIED WITH CONTROL BOX WITH VARIABLE FREQUENCY DRIVE INCLUDING LINE FILTER.
2. CONTRACTOR TO COORDINATE WITH OWNER FOR EXACT FAN LOCATION.
3. CONTRACTOR TO COORDINATE WITH OWNER FOR SWITCH CONTROL LOCATION.
4. PROVIDE WITH 2' EXTENSION TUBE. CONTRACTOR TO VERIFY EXTENSION TUBE LENGTH AND MOUNTING BRACKET WITH MANUFACTURER PRIOR TO ORDERING.
5. BOTTOM OF FAN SHALL BE AT LEAST 19'-6" A.F.F.
6. FANS SHALL BE AT LEAST 2' AWAY, IN ALL DIRECTIONS, FROM POSSIBLE OBSTRUCTIONS.
7. FANS SHALL NOT BE MOUNTED WITHIN 2 TIMES THE FAN DIAMETER OF EXHAUST OR RETURN AIR INTAKES, AND SHALL NOT BE IN DIRECT LINE OF DISCHARGE OF HVAC EQUIPMENT.

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MECHANICAL SCHEDULES

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ELECTRICAL SYMBOLS AND ABBREVIATIONS

NOTE: NOT ALL SYMBOLS AND ABBREVIATIONS INDICATED HERE ARE NECESSARILY USED IN THE DRAWINGS AND MAY NOT APPLY TO THIS PROJECT. ADDITIONAL SYMBOLS MAY BE INDICATED WITHIN THE DRAWINGS.

ELECTRICAL ABBREVIATIONS

A	AMPERE
AC	ABOVE COUNTER
AF	AMP FRAME
AFF	ABOVE FINISHED FLOOR
AFG	ABOVE FINISHED GRADE
AIC	AMPS INTERRUPTING CAPACITY
AL	ALUMINUM
AS	AMP SWITCH
AT	AMP TRIP
ARCH	ARCHITECT
ATS	AUTOMATIC TRANSFER SWITCH
A/V	AUDIO VISUAL
B	PEDESTAL MOUNTED ON BENCH TOP
BF	BELOW FLOOR
BFG	BELOW FINISHED GRADE
BLDG	BUILDING
C	CONDUIT
CAT	CATALOG
CATV	CABLE TELEVISION
CB	CIRCUIT BREAKER
CKT	CIRCUIT
CLG	CEILING MOUNTED
CR	CORROSION RESISTANT
CPT	CONTROL POWER TRANSFORMER
CT	CURRENT TRANSFORMER
CU	COPPER
CL	CENTERLINE
D	DEDICATED DEVICE
DC	DIRECT CURRENT
DISC	DISCONNECT
DWG	DRAWING
EC	ELECTRICAL CONTRACTOR
EM	EMERGENCY
EMT	ELECTRIC METALLIC TUBING
EWC	ELECTRIC WATER COOLER
EX	EXISTING
FLA	FULL LOAD AMPS
GC	GENERAL CONTRACTOR
GFCI	GROUND FAULT CIRCUIT INTERRUPTER
GFPE	GROUND FAULT PROTECTION EQUIPMENT
GND	GROUND
GRC	GALVANIZED RIGID CONDUIT
HH	HANDHOLE
HOA	HAND/OFF/AUTOMATIC
HP	HORSEPOWER
HVAC	HEATING, VENTILATING AND AIR CONDITIONING
Hz	HERTZ (cycle) PER SECOND
IG	ISOLATED GROUND
JB	JUNCTION BOX
KVA	KILOVOLT AMPERE
KVAR	KILOVOLT AMPERE REACTIVE
KW	KILOWATT LS LIMIT SWITCH
LTG	LIGHTING
LV	LOW VOLTAGE
MCA	MINIMUM CIRCUIT AMPS
MCB	MAIN CIRCUIT BREAKER
MCC	MOTOR CONTROL CENTER
MCCB	MOLDED CASE CIRCUIT BREAKER
MISC	MISCELLANEOUS
MLO	MAIN LUGS ONLY
MTD	MOUNTED
MTG	MOUNTING
MTS	MANUAL TRANSFER SWITCH
N/A	NOT APPLICABLE
NC	NORMALLY CLOSED
NEC	NATIONAL ELECTRIC CODE
NIC	NOT IN CONTRACT
NL	NIGHT LIGHT
NO	NORMALLY OPEN
NTS	NOT TO SCALE
OC	OVER CURRENT
OL	OVERLOAD
P	POLE
PB	PULL BOX
PH	PHASE
PNL	PANELBOARD
PR	PAIR
PRI	PRIMARY
PVC	POLYVINYL CHLORIDE CONDUIT
R	RELAY
REC	RECESSED
SC	SHORT CIRCUIT
SN	SOLID NEUTRAL
SP	SPARE
SPD	SURGE PROTECTIVE DEVICE
SS	STAINLESS STEEL
SSRV	SOLID STATE REDUCED VOLTAGE
ST	SHUNT TRIP
STP	SHIELDED TWISTED PAIR
SUSP	SUSPENDED
SW	SWITCH
SWBD	SWITCHBOARD
TC	TELEPHONE CABINET
TCI	TELECOMMUNICATIONS CABLING INSTALLER
TEL/DATA	TELEPHONE/DATA
TEL	TELEPHONE
TR	TAMPER RESISTANT
TTB	TELEPHONE TERMINAL BOARD
TYP	TYPICAL
UG	UNDERGROUND
UTP	UNSHIELDED TWISTED PAIR
UNO	UNLESS NOTED OTHERWISE
V	VOLT
VFD	VARIABLE FREQUENCY DRIVE
W	WATT
WG	WIRE GUARD
WP	WEATHERPROOF
XFMR	TRANSFORMER
XP	EXPLOSION PROOF
Y	WYE

LIGHTING AND CONTROLS

LIGHTING FIXTURES

- SURFACE MOUNTED
- SURFACE MOUNTED DOWNLIGHT
- SURFACE MOUNTED WALL WASHER
- RECESS MOUNTED
- RECESS MOUNTED DOWNLIGHT
- RECESS MOUNTED WALL WASHER
- VOLUMETRIC RECESS MOUNTED
- STRIP
- SCONCE
- EXTERIOR SCONCE
- LOW BAY
- HIGH BAY
- LINEAR WALL MOUNT
- BOLLARD
- POLE MOUNTED (UP TO FOUR HEADS)
- SUSPENDED, PENDENT, OR CABLE HUNG
- CEILING MOUNTED EXIT SIGN
- WALL MOUNTED EXIT SIGN
- CEILING MOUNTED EMERGENCY LIGHTING UNIT
- WALL MOUNTED EMERGENCY LIGHTING UNIT

SHADING INDICATES EMERGENCY LIGHT
XX = TYPE REFERENCE FIXTURE SCHEDULE
x = SWITCH LEG

LIGHTING CONTROLS

- $X WALL MOUNTED SWITCH
  - SUBSCRIPTS:
    - 2 = DOUBLE POLE
    - 3 = 3-WAY
    - 4 = 4-WAY
    - D = DIMMER
    - K = KEY-OPERATED
    - P = PILOT LIGHT
    - T = THERMAL OVERLOAD
    - V = VACANCY SENSOR
    - LV = LOW VOLTAGE
    - O = OCCUPANCY SENSOR
- D DAYLIGHT/OCCUPANCY SENSOR
- E EXTENDED RANGE SENSOR
- 2 STANDARD RANGE SENSOR
- 3 LINE VOLTAGE OCCUPANCY SENSOR
- O OCCUPANCY SENSOR
- PE PHOTOCELL

TELECOMMUNICATIONS

- WALL MOUNTED DATA
- WALL MOUNTED TELEPHONE
- WALL MOUNTED TELEPHONE/DATA
- CEILING MOUNTED DATA
- CEILING MOUNTED TELEPHONE
- CEILING MOUNTED TELEPHONE/DATA
- TV RECESSED TV BOX

2015 COMMERCIAL ENERGY COMPLIANCE COMMISSIONING REQUIREMENTS:

CONTRACTOR SHALL HIRE A THIRD PARTY CERTIFIED COMMISSIONING AGENT TO PERFORM THE COMMISSIONING AND PROVIDE THE PRELIMINARY REPORT OF COMMISSIONING TO THE LOCAL CITY.

A. THE CERTIFICATIONS ACCEPTABLE INCLUDE:
- CBCP - CERTIFIED BUILDING COMMISSIONING PROFESSIONAL- ASSOCIATION OF ENERGY ENGINEERS
- CCP - CERTIFIED COMMISSIONING PROFESSIONAL - BUILDING COMMISSIONING ASSOCIATION
- CPMP - CERTIFIED PROCESS MANAGEMENT PROFESSIONAL - ASHRAE
- CXA - CERTIFIED COMMISSIONING AUTHORITY - AABC COMMISSIONING GROUP
- BSC - BUILDING SYSTEM COMMISSIONING CERTIFICATION - NATIONAL ENVIRONMENTAL BALANCING BUREAU

B. FUNCTIONAL TESTING FOR AUTOMATIC LIGHTING CONTROLS IS REQUIRED PER C408.3. THE CONSTRUCTION DOCUMENTS MUST SPECIFY THAT THE BUILDING OWNER WILL BE GIVEN, WITHIN 90 DAYS FROM THE DATE OF RECEIPT OF CERTIFICATE OF OCCUPANCY, WRITTEN CERTIFICATION THAT THE LIGHTING CONTROLS MEET DOCUMENTED PERFORMANCE CRITERIA.

C. OCCUPANCY SENSORS: FOR PROJECTS WHERE FEWER THAN EIGHT OCCUPANCY SENSORS ARE INSTALLED, EACH MUST BE TESTED. IF MORE THAN SEVEN ARE INSTALLED, AT LEAST 10% (AND AT LEAST ONE) WILL BE TESTED FOR EACH UNIQUE COMBINATION OF SENSOR TYPE AND SPACE GEOMETRY. IF 30% OR MORE FAIL THE ACCEPTANCE CRITERIA, ALL REMAINING IDENTICAL COMBINATIONS MUST BE TESTED. VERIFY:
- PROPER LOCATION AND AIMING.
- CORRECTION OPERATION WHERE THE SENSORS INCLUDE STATUS INDICATORS.
- THE LIGHTS TURN ON TO THE PERMITTED LEVEL WHEN THE SPACE BECOMES OCCUPIED (IF AUTO-ON)
- THE LIGHTS TURN ON ONLY WHEN MANUALLY ACTIVATED (IF MANUAL-ON).
- FALSE-ON TRIGGERING DOES NOT OCCUR BY MOVEMENT IN ADJACENT AREAS OR FROM HVAC OPERATION.

D. TIME-SWITCH CONTROLS VERIFY:
- THE TIME-SWITCH CONTROL IS PROGRAMMED WITH ACCURATE WEEKDAY, WEEKEND AND HOLIDAY SCHEDULES.
- THE TIME SWITCH INCLUDES THE CORRECT TIME AND DATE.
- ANY BATTERY BACKUP IS INSTALLED AND ENERGIZED.
- THE OVERRIDE IS SET TO NO LONGER THAN TWO HOURS.
- SIMULATING AN OCCUPIED CONDITION, THAT ALL LIGHTS CAN BE TURNED ON/OFF BY THEIR LOCAL MANUAL SWITCH, AND THAT THE SWITCH ONLY OPERATES THE LOCAL LIGHTING.
- SIMULATING AN UNOCCUPIED CONDITION, THAT THE CONTROLLED LIGHTING TURNS OFF, AND THAT THE MANUAL OVERRIDE ALLOWS ONLY LOCAL LIGHTING TO TURN ON AND REMAIN ON UNTIL THE NEXT TIME SWEEP OCCURS WITHIN TWO HOURS.

ADDITIONAL TESTING MAY BE REQUIRED BY THE AHJ. THE OWNER MUST BE GIVEN DOCUMENTATION INDICATING THE PROGRAMMING (INCLUDING WEEKDAY, WEEKEND AND HOLIDAY SCHEDULES) AND ALL OTHER SETTINGS.

POWER AND COMMUNICATIONS

RECEPTACLES

DUPLEX	SIMPLEX
STANDARD	STANDARD
AC ABOVE COUNTER	AC ABOVE COUNTER
EMERGENCY	EMERGENCY
GFI	GFI
WP WEATHERPROOF GFI	WP GFI WEATHERPROOF
AC GFI AC	AC GFI ABOVE COUNTER
RECESSED	RECESSED
TAMPER RESISTANT	TAMPER RESISTANT

QUADRUPLEX	MISCELLANIOUS
STANDARD	SPECIAL
AC ABOVE COUNTER	ISOLATED GROUND
EMERGENCY RECEPTACLE	HALF SWITCHED
GFI	USB
WP WEATHERPROOF GFI	HOSPITAL GRADE
AC GFI ABOVE COUNTER	TR HOSPITAL GRADE
RECESSED	DUPLEX CEILING
TAMPER RESISTANT	QUADRUPLEX CEILING

COMBINATION FLOOR BOX DUPLEX	
TELEPHONE/DATA	DUPLEX FLOOR
DATA	QUADRUPLEX FLOOR
TELEPHONE	PEDESTAL RECEPTACLE
	C CLOCK RECEPTACLE

COMBINATION FLOOR BOX QUADRUPLEX
TELEPHONE/DATA
DATA
TELEPHONE

OTHER	SENSORS AND SWITCHES
J JUNCTION BOX	FS FLOW
J WALL MOUNTED JUNCTION BOX	HOA HAND OFF AUTO SELECTION
T THERMOSTAT	LS FLOAT OR LEVEL
POKE THROUGH	ZS LIMIT OR POSITION
DAMPER CONNECTION	PS PRESSURE
M MOTOR CONNECTION	SV SOLENOID VALVE
M ST MOTOR RATED SWITCH	TS TEMPERATURE
CONDUIT UP	
CONDUIT DOWN	
CONDUIT STUBOUT	
SEAL OFF	
POWER POLE	

EQUIPMENT

T TRANSFORMER	F DISCONNECT SWITCH FUSED
PANEL	N DISCONNECT SWITCH NONFUSED
M METER	MOTOR STARTER
G GENERATOR	MOTOR STARTER INTEGRAL DISCONNECT
CIRCUIT BREAKER	MS MULTI-SPEED MOTOR STARTER
ST SHUNT TRIP CIRCUIT BREAKER	SSRV SSRV MOTOR STARTER
HH PRIMARY DISTRIBUTION	VF VARIABLE FREQUENCY DRIVE STARTER
HH SECONDARY DISTRIBUTION	MOTOR CONTROL CENTER
HH COMMUNICATIONS	F STARTER FUSED DISCONNECT
PB PULLBOX	N STARTER NONFUSED DISCONNECT
MGB MAIN GROUNDING BRIDGE	X MECHANICAL EQIPMENT
GROUNDING BRIDGE	

GENERAL NOTES

1. THE ELECTRICAL CONTRACTOR SHALL REPLACE AND/OR REPAIR TO THE SATISFACTION OF THE ARCHITECT AND ENGINEER, ANY ITEMS THAT ARE DAMAGED OR REMOVED BY THE ELECTRICAL CONTRACTOR AT NO ADDITIONAL COST TO THE OWNER.
2. THESE DRAWINGS ARE DIAGRAMMATIC. DO NOT SCALE OFF OF THE ELECTRICAL DRAWINGS. REFER TO THE ARCHITECTURAL DRAWINGS FOR EXACT DIMENSIONS.
3. REFER TO THE ARCHITECTURAL PLANS, ELEVATIONS, AND DIAGRAMS FOR LOCATIONS OF FLOOR AND WALL ELECTRICAL DEVICES. ELECTRICAL DEVICES SHALL BE MOUNTED LONG AXIS VERTICAL AT THE FOLLOWING HEIGHTS AFF TO CENTER OF DEVICE: SWITCHES +48", RECEPTACLES +18", VOICE/DATA JACKS +18", UNLESS NOTED OTHERWISE WITHIN THE DRAWINGS.
4. ON NEW FLOOR PLANS: ALL ITEMS SHOWN IN LIGHT LINE WEIGHT ARE EXISTING TO REMAIN, UNLESS NOTED OTHERWISE. ALL ITEMS SHOWN IN HEAVY LINE WEIGHT ARE NEW OR RELOCATED AS NOTED.
5. ALL 120V BRANCH CIRCUITS SHALL BE 3-WIRE (PHASE, NEUTRAL, GROUND). PHASE, NEUTRAL, AND GROUND CONDUCTORS SHALL BE NO. 12 AWG UNLESS NOTED OTHERWISE. ALL BRANCH CIRCUITS AND FEEDERS SHALL HAVE EQUIPMENT GROUNDING CONDUCTORS INSTALLED IN THE RACEWAY. USE OF THE CONDUIT BODY AS A GROUNDING METHOD IS PROHIBITED.
6. ALL MOUNTING OF ELECTRICAL DEVICES (LUMINAIRES, TRANSFORMERS, PANELS, OUTLETS, CONDUIT RUNS, ETC.) SHALL COMPLY WITH STATE AND LOCAL SEISMIC REQUIREMENTS. ALL LUMINAIRES SHALL BE SUPPORTED INDEPENDENTLY OF THE CEILING SUPPORT HANGERS IN COMPLIANCE WITH IBC AND NEC REQUIREMENTS.
7. ADA COMPLIANCE: ELECTRICAL DEVICES PROJECTING FROM THE WALLS WITH THEIR LEADING EDGES BETWEEN 27" AND 80" AFF SHALL PROTRUDE NO MORE THAN 4" INTO WALKWAYS OR CORRIDORS.
8. BACK TO BACK MOUNTING OF RECEPTACLES OR COMMUNICATION OUTLETS IS NOT PERMITTED. THE MINIMUM SEPARATION BETWEEN DEVICES SHALL BE 6" O.C. IN COMMON WALLS AND 24" O.C. IN SOUND-RATED WALLS.
9. GFCI DEVICES SHALL BE PROVIDED AS NOTED AND SHALL COMPLY WITH NEC AND LOCAL REQUIREMENTS. NO FEED-THRU GFCI PROTECTION SHALL BE PERMITTED FOR DOWNSTREAM DEVICES. GFCI DUPLEX RECEPTACLES SHALL BE UL 943 2006 "LOCK-OUT" ACTION OR "NOTIFICATION" COMPLIANT.
10. ALL RECEPTACLES IN BREAK ROOMS SHALL BE GFCI PROTECTED. PROVIDE REMOTE BLANK FACE GFCI DEVICE IN AN ACCESSIBLE LOCATION AS REQUIRED FOR INACCESSIBLE RECEPTACLES. VERIFY REMOTE BLANK FACE GFCI DEVICE LOCATION WITH ARCHITECT PRIOR TO ROUGH-IN.
11. ALL ELECTRICAL CABINETS, PANELS, DISCONNECTS, TRANSFORMERS, CONTROLS, RECEPTACLES, J-BOXES, ETC., SHALL BE MARKED, TAGGED AND IDENTIFIED. PROVIDE ADHESIVE FILM LABEL, MACHINE PRINTED, IN BLACK, BY THERMAL TRANSFER OR EQUIVALENT PROCESS, WITH MINIMUM LETTER HEIGHT OF 3/8". THE LABEL SHALL IDENTIFY THE ORIGINATING PANEL AND CIRCUIT NUMBER IN THE FOLLOWING FORMAT: PANEL-CKT. NOTE FEEDER SOURCE WHERE APPLICABLE. REFERENCE SPECIFICATIONS FOR ADDITIONAL LABELING REQUIREMENTS. WHERE THE PROJECT SPECIFICATIONS INDICATE MORE STRINGENT LABELING REQUIREMENTS, THOSE REQUIREMENTS SHALL TAKE PRECEDENCE.
12. THE CONTRACTOR SHALL PROVIDE TYPED, UPDATED PANEL DIRECTORIES FOR ALL PANELS AFFECTED BY THIS SCOPE OF WORK.
13. UPON COMPLETION OF THE PROJECT, ALL CHANGES SHALL BE DOCUMENTED, AND REDLINED. AS-BUILT DRAWINGS SHALL BE TURNED OVER TO THE OWNER BY THE CONTRACTOR.
14. TRANSFORMERS INDICATED TO BE SUSPENDED FROM THE STRUCTURE SHALL BE SUPPORTED BY A UNISTRUT FRAME THAT IS ATTACHED TO THE STRUCTURE.
15. 4" CONCRETE HOUSEKEEPING PADS SHALL BE FURNISHED FOR ALL FLOOR MOUNTED ELECTRICAL EQUIPMENT.
16. COORDINATE THE LOCATIONS AND CONTROLS OF ALL APPLICABLE FIRE/SMOKE DAMPERS WITH THE MECHANICAL CONTRACTOR, PRIOR TO CONSTRUCTION.
17. PROVIDE (1) 3/4"C WITH BUSHING AND PULL STRING FROM EACH TELEPHONE, DATA, COMMUNICATION, AND THERMOSTAT OUTLET TO ABOVE THE ACCESSIBLE CEILING, UNLESS NOTED OTHERWISE.
18. COORDINATE THE INSTALLATION OF COMMUNICATIONS CABLING, ROUTING, MOUNTING BOXES, AND TERMINATIONS WITH THE OWNER OR IT MANAGER, PRIOR TO CONSTRUCTION.
19. ALL LOW VOLTAGE AND SYSTEMS CABLING LOCATED ABOVE THE ACCESSIBLE CEILING SHALL BE PROPERLY RATED FOR THE APPLICATION. WITHOUT EXCEPTION, ALL CABLING SHALL BE HUNG FROM BRIDLE-TYPE RINGS OR PLACED IN CABLE TRAYS BY THE ELECTRICAL CONTRACTOR. IN EXPOSED CEILING AREAS, ALL CABLING SHALL BE RUN IN CONDUIT TO THE NEAREST ACCESSIBLE CEILING LOCATION.
20. THE CONTRACTOR SHALL VISIT THE SITE PRIOR TO SUBMITTING A BID TO VERIFY EXISTING CONDITIONS. BY SUBMITTING A BID THE CONTRACTOR ACKNOWLEDGES THAT HE HAS VISITED THE SITE AND THE BID IS ADEQUATE TO PERFORM ALL OF THE WORK NECESSARY TO MAKE THE SYSTEMS COMPLETE AND OPERATIONAL. IF THE CONDITIONS AT THE SITE ARE NOT SUCH THAT THE WORK CAN BE INSTALLED AS SHOWN, CONTRACTOR'S BID SHALL INCLUDE COST TO COVER NECESSARY ADJUSTMENTS AND ADDITIONS, BASED UPON SITE CONDITIONS, TO MAKE THE SYSTEMS COMPLETE AND OPERATIONAL. CONTRACTOR SHALL CONTACT ARCHITECT/ENGINEER WITH ANY FIELD DISCREPANCIES.
21. ON DEMOLITION PLANS: ALL ITEMS SHOWN IN LIGHT LINE WEIGHT ARE EXISTING TO REMAIN, UNLESS NOTED OTHERWISE. ALL ITEMS SHOWN IN HEAVY LINE WEIGHT SHALL BE REMOVED, UNLESS NOTED OTHERWISE.
22. IN REMODEL AREAS WHERE OCCUPANCY SENSING DEVICES ARE SPECIFIED AND ARE REPLACING EXISTING MANUAL SNAP SWITCH CONTROL OF THE LIGHTING, PROVIDE A NEUTRAL CONDUCTOR FROM THE LIGHTING CIRCUIT BEING CONTROLLED TO THE OCCUPANCY SENSING DEVICE (OR SWITCH/POWER PACK, WHERE LOW VOLTAGE SENSORS ARE SPECIFIED). FOR BIDDING PURPOSES, ASSUME THAT THE EXISTING SNAP SWITCHES ARE WIRED WITHOUT A NEUTRAL CONDUCTOR, AND A NEW NEUTRAL CONDUCTOR WILL BE REQUIRED.
23. THE NEW WIRING REQUIRED IN REMODELED AREAS SHALL BE FISHED THROUGH EXISTING WALLS OR CONCEALED IN NEW WALLS OR ABOVE CEILINGS. SURFACE MOUNTED CONDUIT SHALL NOT BE USED IN ANY FINISHED AREAS. CONTRACTOR SHALL NOT ROUTE ANY CONDUIT WITHIN STRUCTURAL OR TOPPING SLABS OF FLOORS UNLESS NOTED TO DO SO.
24. ITEMS THAT ARE SHOWN TO BE REMOVED SHALL BE REMOVED IN THEIR ENTIRETY INCLUDING ALL ASSOCIATED CONDUIT, WIRE, AND HANGERS BACK TO THE POINT OF ORIGIN OR THE NEAREST EXISTING ITEM THAT IS REMAINING, UNLESS NOTED OTHERWISE. WHERE EXISTING DEVICES, SWITCHES, MOTOR CONNECTIONS, ETC. ARE TO BE REMOVED FROM WALLS WHICH ARE REMAINING, WALLS SHALL BE PATCHED TO MATCH ORIGINAL FINISH AFTER CONDUCTORS HAVE BEEN REMOVED. BLANK COVERPLATES OVER EXISTING BOXES ARE NOT ACCEPTABLE. IF EXISTING CONDUITS ARE ROUTED IN CONCRETE FLOOR SLABS, WALLS OR [illegible] BACK TO WITHIN CONCRETE AND FILLED WITH GROUT EVEN FINISH FLUSH WITH CONCRETE SURFACE AFTER [illegible] REMOVED.
25. MAINTAIN CIRCUIT CONTINUITY FOR EXISTING ITEMS T[illegible] RELOCATED.

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ANGLETON Where the Heart is

Angleton Fire Station #3 Addition

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INTERIM REVIEW ONLY
DOCUMENT INCOMPLETE:
Not intended for permit or construction.
06/02/23

iAD PROJECT #	23017
ISSUE DATE:	06/02/23

06/02/23	95 % OWNER REVIEW SET

REVISION LOG

ELECTRICAL SYMBOLS AND ABBREVIATIONS

E0.00

SCALE: AS NOTED

6/2/2023 10:46:45 AM

DIVISION 16 - ELECTRICAL SPECIFICATIONS

Section 16051 - Common Work Results for Electrical

1. Provide all labor, materials, equipment and incidentals for completion of all electrical systems described herein. All electrical equipment and material shall be installed in accordance with requirements, governing authorities, and in a neat and workman like manner by skilled and competent electricians in conformance with the standard practices of the electrical industry. All electrical systems shall be complete and operational to the benefit of the owner.

   A. Good workmanship and appearance are considered equal to proper operation.

   B. The contractor shall provide all foreseeable electrical equipment and accessories necessary, whether specifically stated or not, to make the required electrical systems complete and operational.

2. The electrical contractor shall comply with the requirements of the general conditions, supplemental general conditions of the project specifications, any base building specifications and building criteria, and all contract specifications and documents.

3. Definitions and standards:

   A. "Provide" means contractor is responsible for the furnishing and installation of.

   B. "Exposed" means where it can be seen after the building is completed such as in equipment rooms, unfinished areas, accessible tunnels, etc. where conduit/equipment is accessible.

   C. "Concealed" means where it cannot be seen after the building is completed such as in spaces as chases, trenches, above ceilings, in walls and buried where conduit/wire is inaccessible when building is completed.

   D. Standards for materials: all materials shall be new except as otherwise stated, and shall conform with the current applicable industry standards, NEMA standards and Underwriters Laboratories standards.

4. Coordinate and order the progress of electrical work to conform to the owner's schedule and the progress of the work of the other trades.

5. Apply for and pay for all permits, fees, licenses and inspections for this division of work.

6. Provide temporary lighting and power as required.

7. Visit the project site before submitting a bid as no extras will be allowed for lack of knowledge of obvious existing conditions.

8. Drawings are diagrammatic in nature. Take all dimensions from architectural drawings, certified equipment drawings and from the structure itself before fabricating any work.

9. Comply with the latest federal, state and local codes requirements, and ordinances, with the National Electrical Code of the National Fire Protection Association, and with requirements of the power and telephone companies furnishing services to the project. The following is a brief list of applicable codes:

   A. NFPA No. 70 - National Electrical Code, latest edition

   B. NFPA No. 72 - Fire Alarm, latest edition

   C. NFPA No. 101 - Life Safety Code, latest edition

   D. IBC & UBC, latest edition

   E. Local building codes, latest edition

10. All equipment and materials shall be new unless noted otherwise and acceptable for installation only if labeled or listed as defined in NFPA 70, Article 100, by UL or by a recognized testing laboratory where standards have been established and acceptable to the authority having jurisdiction. Labeled or Listed equipment shall be installed in accordance with any instructions or labeling provided with the equipment.

11. Provide all core drilling, channeling, cutting, patching, sleeves, etc. as required for installation of electrical equipment. Seal holes, providing fireproof sealant where necessary, and refinish all repair work to original condition where damaged by electrical work.

   A. Coordinate core drill locations with structural prior to starting work.

   B. Coordinate underground site utilities with appropriate utility company prior to starting work.

12. Make provisions for safe delivery and secure storage of all materials.

13. Warranties: Provide a written warranty to the owner covering the entire electrical work excluding incandescent and fluorescent lamps, to be free from defective materials, equipment and workmanship for a period of one year after date of acceptance. All equipment or materials that fail during the warranty period shall be replaced or repaired by the electrical contractor in a timely fashion at no cost to the owner.

14. Manufacturers: Subject to compliance with requirements, provide products by the manufacturer(s) specified on the drawings or provide products from manufacturers with similar construction and performance characteristics.

15. Product Alterations and Substitutions: Should the contractor wish to have products considered other than those specified, contractor must submit those items as required in Division 1. Contractor will be required to submit the total savings (anticipated savings) to the owner.

16. Shop Drawings: Submit shop drawings as required in Division 1 for all materials and equipment. If the shop drawings deviate from the contract documents, advise the engineer of the deviations via written format, accompanying the shop drawings. Include the reason for the deviation(s). Coordinate all required changes with the other trades affected. If the changes are occasioned by the contractor, the contractor shall pay any costs involved.
    Shop drawings shall include but are not limited to the following:

    A. Product data for lighting.
    B. Product data for lighting control devices.
    C. Product data for panelboards.
    D. Product data, calculations and drawings for fire alarm system.

16. Project Record Drawings: At completion of work, deliver completed project record documents to architect/engineer. Project record documents shall be in CAD and shall include
    any special systems (fire alarm, etc.) and "project record" shop drawings.

17. Operation and Maintenance Manuals: Submit number as required by Division 1, typed and hard bound to architect for approval prior to scheduling any system demonstration for the owner and fifteen (15) days prior to final observation. Books shall be arranged in sequence to match the specification sections.

Seismic

1. All seismic requirements and design shall be through delegated design. Contractor shall be required to provide all necessary equipment seismic calculations, anchors, supports, etc. as required by A.H.J. for compliance with seismic requirements.

Section 16060 - Grounding and Bonding

1. Conduit systems, supports, cabinets, equipment, transformers, fixtures, the grounded circuit conductor, etc. shall be properly grounded in accordance with the current issue of the National Electrical Code. Provide all bonding jumpers and wire, grounding bushings, clamps, etc. as required for complete grounding.

   A. Connections shall be either bolted-pressure-type, compression type or exothermic-welded type.

2. Provide a separate equipment grounding conductor in all feeder and branch circuits and all flexible and nonmetallic raceways.

3. Grounding Conductor Material: Copper.

Section 16070 - Hangers and Supports

1. Provide hangers and supports for equipment, raceways and cables, including weight of wire in raceways. All systems cabling shall be supported by bridal rings or similar means.

2. Use hot-dipped galvanized material or nonmetallic, U-channel systems for all damp and outdoor locations.

3. Steel material shall be used for dry locations.

Section 16075 - Electrical Identification

1. Provide labeling for raceways, cables and devices.

2. Color Coding of Phase Conductors:

   A. Conductors No. 8 AWG and smaller shall be factory color coded. Wire No. 6 AWG and larger may be color coded by field painting or color taping a 6-inch length of exposed end.

   B. Wiring for control systems shall be color-coded in accordance with the wiring diagrams furnished with the equipment.

277/480 volts	120/208 volts	
Phase a:	brown	black
Phase b:	orange	red
Phase c:	yellow	blue
Neutral:	gray	white
Ground	green	green
Travelers:	purple	pink

Section 16080 - Electrical Testing

1. Provide testing of all electrical systems and components as required by all applicable building codes and ordinances, UL, NEMA, ANSI, ICEA, NECA, etc., and as recommended by the electrical equipment manufacturers.

Section 16095 - Demolition for Remodeling

1. Field check all existing conditions prior to bidding and include an allowance for the removal and relocation of existing conduits, wires, devices, fixtures, or other equipment as indicated or as required to coordinate and adapt new and existing electrical systems to all other work required on this project. No extras will be allowed for alterations of a foreseeable nature required to achieve the end result as indicated on the drawings.

2. Where the reuse of existing conduits, outlets, junction boxes, etc., is permissible, make certain that the wiring for them is continuous from outlet to outlet and that all splices and insulations are in good condition. Provide modifications to assure that circuits, or system shall not pass through outlets or junction boxes which may be rendered inaccessible by changes to be made to the project. Existing conduits, wire, devices, etc., which shall be removed shall become the property of the owner unless otherwise noted.

3. Connect new work to existing in a manner that will assure proper raceway grounding throughout in conformance with the National Electrical Code.

4. Remodel Work, Cutting and Patching: Electrical contractor shall perform all cutting, channeling, chasing, drilling, etc., as required to install or remove electrical equipment in areas of remodeling. This work shall be performed so as to minimize damage to portions of wall finishes, surfaces, plastering, or the structures which are to be reused, resurfaced, plastered, or painted under other divisions of these specifications.

5. Carefully coordinate with the required remodeling work, cutting and patching etc., performed by other trades. Remove or relocate existing electrical conduits, wires, devices, fixtures and other equipment as necessary.

6. All outages on portions of existing electrical systems shall be minimized and shall be at a time and of a duration as accepted by the owner.

Section 16120 - Conductors and Cables 600-V and Less

1. Minimum size No. 12 AWG except for control or signal circuits, which may be No. 14 AWG or smaller. Increase conductor size as necessary to limit branch circuit voltage drop to 3 percent and service/feeder voltage drop to 2 percent.

2. All wiring shall be as follows:

   A. Branch circuits concealed in ceilings, walls, and partitions, and concealed in concrete or below slabs-on-grade: Type THHN-THWN, single conductors in raceway.

   B. Fire alarm circuits: Type THHN-THWN, in raceway or power-limited, fire-protective, signaling circuit cable, Type NPLFP or PLFP.

   C. Class 1 control circuits: Type THHN-THWN, in raceway.

   D. Class 2 control circuits: Type THHN-THWN, in raceway or power-limited cable, concealed in building finishes.

3. All conductors shall be copper; solid conductor for No.12 AWG and smaller, stranded for No. 10 AWG and larger.

4. Splices for No. 6 AWG and smaller shall be made with twist-on wire connectors.

5. Splices for No. 4 AWG and larger shall be made with solderless or compression type CU/ALR lugs.

6. Wiring for control systems shall be installed in conjunction with mechanical and miscellaneous equipment.

7. Install conductor at each outlet, with at least 6 inches of slack to allow for connection to device.

8. Testing: Perform the following field quality-control testing:

   A. Torque test conductor connections and terminations to manufacturer's recommended values.

   B. Perform continuity test on all power and equipment branch circuit conductors. Verify proper phasing connections.

   C. Insulation Test: Measure the insulation of feeder conductors. Measurements shall be taken between conductors, and conductors and ground. Resistance shall be 1,000,000 Ohms or more when tested at 500 Volts by megger without circuit loads.

Section 16130 - Raceways

1. All conductors shall be enclosed by conduit sized in accordance with Chapter 9, Table 4 of the National Electrical Code. Minimum size 1/2 inch. All conduits shall be concealed in finished areas.

2. Galvanized Rigid Metal Conduit (RMC) and Intermediate Metal Conduit (IMC) shall be utilized for above and below grade applications in accordance with Articles 344 and 342 of the National Electrical Code. All couplings shall be threaded.

3. Electrical Metallic Tubing (EMT) shall be utilized for all dry, above grade or above floor feeders and branch circuit homerun applications in accordance with Article 358 of the National Electrical Code. Couplings shall be steel set screw type.

4. Metal-Clad Cable (MC) with separate ground conductor shall be permitted for all concealed, above grade or above floor branch circuit applications excluding homeruns in accordance with Article 330 of the National Electrical Code. Connectors shall be listed for application of service indicated.

5. Flexible Metal Conduit (FMC) shall be utilized for all connections to vibrating equipment such as motors (minimum of 2'-0", maximum of 6'-0"), connections to lay-in type light fixtures or in remodel areas specifically noted for "fishing" in existing walls or non-accessible ceilings.

6. Surface metallic raceways shall be limited to only areas specifically noted and of size and type specified on the drawings.

7. All exposed conduits shall be installed parallel with or perpendicular to building lines.

8. Provide expansion type fittings for all conduits that cross expansion joints.

9. Conduits and/or circuits that penetrate fire-rated construction shall be sealed fire and smoke tight at the penetration in a manner that maintains the fire-resistance rating.

Section 16137 - Boxes, Enclosures and Cabinets

1. Outlet boxes:

   A. Four inch square or octagonal, zinc-coated sheet steel type.

   B. Outlet boxes shall be located so that transmission of sound through common walls will not occur.

   C. Enclosures exposed to weather or damp locations shall be weatherproof type.

2. Provide covers set to be flush with finished walls.

3. Pull Boxes and Junction Boxes: Junction boxes and pull boxes shall be provided as required. Size of boxes shall be in accordance with the current National Electrical Code requirements.

   A. Enclosures shall be NEMA type suitable for the surrounding area and conditions.

4. Floor Boxes: Floor boxes shall be cast metal, fully adjustable, or as specified on the drawings.

Section 16140 - Wiring Devices

1. Receptacles shall be 20 Amp Hubbell HBL5352 series specification grade, or acceptable. GFCI and exterior receptacles shall be Hubbell GF5352 series, or acceptable and if required provide weatherproof in-use metal type cover, or acceptable. Provide device color as directed by the architect, or to match base building standards, whichever is applicable.

2. Quiet operating type switches shall be 120/277-V, 20 Amp Hubbell 1221 series, or acceptable.

3. Provide special purpose outlets as required for equipment provided by others.

4. Device plates shall be high abuse nylon, color as directed by the architect, or to match base building standards, whichever is applicable.

5. Mount devices in accordance with the following schedule except where otherwise noted on the drawings or in areas with counters, baseboard heaters or in areas of block or brick construction:

   Convenience receptacles: long axis vertical at 1'-6" AFF to center *
   Light switches: latch side of door at 4'-0" AFF to center
   Telephone outlets: long axis vertical at 1'-6" AFF to center *

   * Except in areas with counters, baseboard heaters, or in areas of block or brick construction.

Section 16145 - Lighting Control Devices

2. Occupancy Sensors: As specified on the drawings.

3. Multiple Contactors and Relays: Electrically operated and mechanically held, complying with UL 508 and NEMA ICS 2, with current rating for switching as required and control coil voltage to match control power source.

4. Testing: Set and operate devices to demonstrate their functions and capabilities in a methodical sequence that cues and reproduces actual operating functions.

Section 16180 - Equipment Wiring Systems

1. Provide branch circuits to equipment provided by others and to mechanical equipment and make all connections. Temperature control equipment wiring and connections shall be provided by the mechanical contractor.

2. Provide safety switches and/or thermal overload switches as required.

3. Heater units in all motor starters shall be sized for approximately one hundred fifteen percent (115%) of full load motor current. Check and coordinate all thermal protective devices with the equipment they protect.

4. Provide for each motor, one-half (1/2) horsepower and below, a horsepower rated disconnect switch and thermal overload protection unless internally provided with the motor. Thermal overload switches for single phase motors shall be Allen-Bradley Bulletin 600 or acceptable.

5. Carefully coordinate all electrical work with all other applicable divisions.

Section 16442 - Panelboards

1. Provide dead-front, circuit breaker type panels, size, voltage, amperage and number of branches as indicated on the drawings. Breakers shall be thermal magnetic type (bolted) employing quick-make and quick-break mechanism for manual operation as well as automatic operation. Automatic tripping shall be indicated by the breaker handle assuming a distinctive position from the manual "on" and "off" multi-pole breakers shall have a common trip. Tie handles will not be permitted.

2. All spaces shall be fully bussed.

3. Panelboards shall have a grounding bus for the equipment grounding system.

4. Circuit breakers shall have a minimum interrupting capacity as follows, unless otherwise noted:

   120/208 Volts: 10,000 amperes
   277/480 Volts: 14,000 amperes

5. Panelboards shall be a minimum twenty inches (20") wide.

6. All bussing shall be tin-plated, high strength, electrical grade aluminum alloy and extend entire length of the panelboard.

7. Distribution panelboards shall be provided with a hinged lockable door.

8. Lighting and appliance panelboards shall be provided with front cover screwed to the box.

9. Each panelboard shall be provided with a typed directory card installed in a transparent protective cover on inside of door panel.

10. Enclosure: NEMA type suitable for the surrounding area and conditions.

11. Install floor-mounted panelboards on 4 inch high concrete base extending a minimum of 2 inches beyond enclosure.

12. Testing: Test insulation resistance for each panelboard bus, component, connecting supply, feeder, and control circuit. test continuity of each circuit, after installing panelboards and after electrical circuitry has been energized, demonstrate product capability and compliance with requirements. Correct malfunctioning units on-site, where possible, and retest to demonstrate compliance; otherwise, replace with new units and retest.

13. Upon completion of installation, inspect interior and exterior of panelboards. Remove paint splatters and other spots, dirt and debris. Vacuum dirt and debris; do not use compressed air to assist cleaning. Touch up scratched and marred finishes to match original finish.

14. Panelboards shall be as manufactured by Eaton Corp.; Cutler Hammer, General Electric Co., Siemens Energy and Automation, Inc., or Square D Co.

Section 16460 - Transformers (Low Voltage)

1. Transformers rated 15kVA and larger

   A. Comply with 10 CFR 431 (DOE 2016) efficiency levels.
   B. Marked as compliant with DOE 2016 efficiency levels by an NRTL.

2. Cores: Electrical grade, non-aging silicon steel with high permeability and low hysteresis losses.

   A. One leg per phase.

   B. Core volume shall allow efficient transformer operation at 10 percent above the nominal tap voltage.

   C. Grounded to enclosure.

3. Coils: Continuous windings without splices except for taps.

   A. Coil material: Aluminum or Copper.

   B. Internal coil connections: Brazed or pressure type.

   C. Terminal connections: welded or bolted.

4. Encapsulation: Transformers smaller than 30kVA shall have core and coils completely resin encapsulated.

5. Enclosure: Ventilated.

   A. NEMA 250, Type 2: Core and coil shall be encapsulated within resin compound to seal out moisture and air.

   B. KVA Ratings: Based on convection cooling only and not relying on auxiliary fans.

   C. Wiring Compartment: Sized for conduit entry and wiring installation.

   D. Finish: Comply with NEMA 250, gray weather-resistant enamel.

6. Insulation Class, Smaller Than 30kVA: 180 deg C, UL-component-recognized insulation system with a maximum of 115 deg C rise above 40 deg C ambient temperature.

7. Insulation Class, 30kVA and Larger: 220 deg C, UL-component-recognized insulation system with a maximum of 115 deg C rise above 40 deg C ambient temperature.

8. Grounding: Provide ground-bar kit or a ground bar installed on the inside of the transformer enclosure.

9. Electrostatic Shielding: Each winding shall have an independent, single, full-width copper electrostatic shield arranged to minimize interwinding capacitance.

   A. Arrange coil leads and terminal strips to minimize capacitive coupling between input and output terminals.

   B. Include special terminal for grounding the shield.

10. Transformers shall be as manufactured by Eaton Corp.; Cutler Hammer, General Electric Co., Siemens Energy and Automation, Inc., or Square D Co.

Section 16511 - Interior Lighting

1. Manufacturers: Subject to compliance with requirements, provide products by the manufacturers specified on the drawings or provide products from manufacturers with similar construction and photometric characteristics.

2. Fluorescent ballasts shall be electronic programmed rapid start type with less than 10 percent of total harmonic distortion, with input power factor above 97 percent, and provided with internal protection in case operating temperatures exceed a safe level of operation. Fluorescent ballasts shall be as manufactured by Advance, Universal, General Electric or Osram/Sylvania.

3. Exit lights shall conform to local code requirements.

4. Interior emergency fluorescent power supply units shall be self-contained, modular, battery-inverter unit, factory mounted within luminaire body, and shall comply with UL 924.

5. Lamps shall be as manufactured by Osram/Sylvania, Phillips, or General Electric.

6. Color temperature for fluorescent lamps shall be as specified in the drawings.

9. Set luminaires level, plumb, and square with ceiling and walls, and secure according to manufacturer's written instructions and approved submittal materials. Install lamps in each luminaire. Do not support luminaries to the work of other trades unless otherwise specified or noted. All luminaires shall be independently supported from structure. Provide all necessary additional supports and hangers to securely fasten and support all luminaires to structure.

10. Inspect each installed luminaire for damage. Replace damaged luminaires and components. Verify normal operation of each luminaire after installation. Interrupt the electrical supply to verify proper operation of the emergency lighting. If luminaires are malfunctioning, then repair or replace components and retest until luminaire operates properly.

11. Clean luminaires internally and externally after installation per manufacturer's Recommendations.

12. Replace any failed lamps in existing fixtures with matching lamp type and CCT.

Section 16714 - Communication Raceway Systems

1. Provide empty conduit systems with No. 14 AWG pull wire and back boxes. Back boxes shall be 4 inch square galvanized pressed steel with single gang plaster ring. Provide 3/4 inch conduit with pull wire from each back box to 6 inches above nearest accessible ceiling.

2. All equipment, wiring/cable, devices and coverplates shall be provided and installed by the owner.

Section 16720 - Fire Alarm System, Non-coded Addressable

1. Fire alarm device layouts and if applicable one-line diagram are for information only to indicate possible system configuration. The information shown is intended to be used as a guide by the contractor to complete their design and does not include all the necessary items for installation. The contractor shall be responsible for the design and installation of the fire alarm system in compliance with these specifications, NFPA 72, and local codes. The contractor shall prepare fire alarm system drawings sealed by a fire protection engineer for submittal to the authority having jurisdiction and to be used for construction as part of their scope of work.

   A. Relocate existing fire alarm devices and provide new devices as shown.

   B. Provide all necessary conduit and wiring to extend existing base building fire alarm system as necessary.

2. The fire alarm system installation shall comply with NFPA 72, all other code requirements and local authority requirements.

3. Manual pull stations: double-action with station reset to match existing. An integral addressable module shall be provided to communicate with the FACP and if applicable a remote annunciator.

   A. Install such that handle is 48 inches above finished floor.

4. Smoke detectors: photoelectric type with integral led light to match existing .

5. Duct smoke detectors: photoelectric type with air sampling tubes extending the full length of the duct to match existing. Detectors shall be provided with an interface to the air handling unit control for shut down of the unit when smoke is detected.

6. Combination devices: factory-integrated audible and visual devices in a single-mounting assembly to match existing.

   A. Horns to match existing. Horns shall produce the ANSI temporal pattern at a sound-pressure level of 85 db, measured 10 feet from the horn per UL 464. Temporal pattern shall be synchronized.

   B. Visual alarm devices to match existing shall be listed under UL 1971 with clear polycarbonate lens. The word "fire" shall be engraved in minimum 1 inch high letters on faceplate. Strobes shall comply with NFPA 72 requirements for flash frequency and shall be synchronized. Provide candela level as required to suite the space in which it is installed.

   C. Visual devices shall be mounted not less than 80 inches above the finished floor or 6 inches below ceiling, whichever is lower.

7. LED indicating lights with integral test switch shall be provided for detectors that may not be readily visible. Light shall be connected to turn on steady when the associated device is in an alarm or trouble mode. Device shall mount in a single gang stainless steel plate. A red, laminated, phenolic-resin identification plate at the indicating light shall identify, in engraved white letters, device initiating the signal and room where the device is located.

8. The fire alarm control panel (FACP) and annunciator panel (FAAP): existing to remain.

   A. Upgrade and reprogram existing FACP software to reflect remodel conditions as required through a subcontractor to a factory authorized installer.

   B. Revise FAAP configuration and information to reflect remodel changes.

9. Emergency power supply system existing to remain.

   A. Provide new battery calculations as part of the shop drawing submittal as required by the authority having jurisdiction.

10. Provide control and/or monitor modules for devices such as fire/smoke dampers, etc. as required. Addressable modules shall be located within 3'-0" of the monitored switch or circuit.

11. Digital alarm communicator transmitter existing to remain.

12. Functional description of system.

   A. Control of system: by the FACP.

   B. System supervision: automatically detect and report open circuits, shorts, and grounds of wiring for initiating devices, signaling line, and notification appliance circuits.

   C. Transmission to remote alarm receiving station.

   D. Performance of initiating device circuits: NFPA 72, Style B circuits. Circuits shall be installed in conduit.

   E. Performance of notification appliance circuits: NFPA 72, Style Y. Circuits shall be installed in conduit.

   F. Performance of device monitoring signaling line circuits: NFPA 72, Style 4. circuits shall be installed in conduits.

13. Basic alarm performance requirements: unless otherwise indicated, operation of a manual station, automatic alarm operation of a heat detector, operation of a sprinkler flow device, or verified automatic alarm operation of a smoke detector shall initiate the following:

   A. Notification appliance operation.

   B. Identification at the FACP of the device address originating the alarm.

   C. Provide mechanical unit shut down and control of dampers, etc. as required.

   D. Provide control of door hold-opens or other doors as required.

   E. Released doors locked by security system.

14. Testing: test the system according to procedures outline in NFPA 72.

15. Provide certificate of operation at completion of testing and after any malfunctions have been corrected.

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06/02/23

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REVISION LOG

ELECTRICAL SPECIFICATIONS

E0.01

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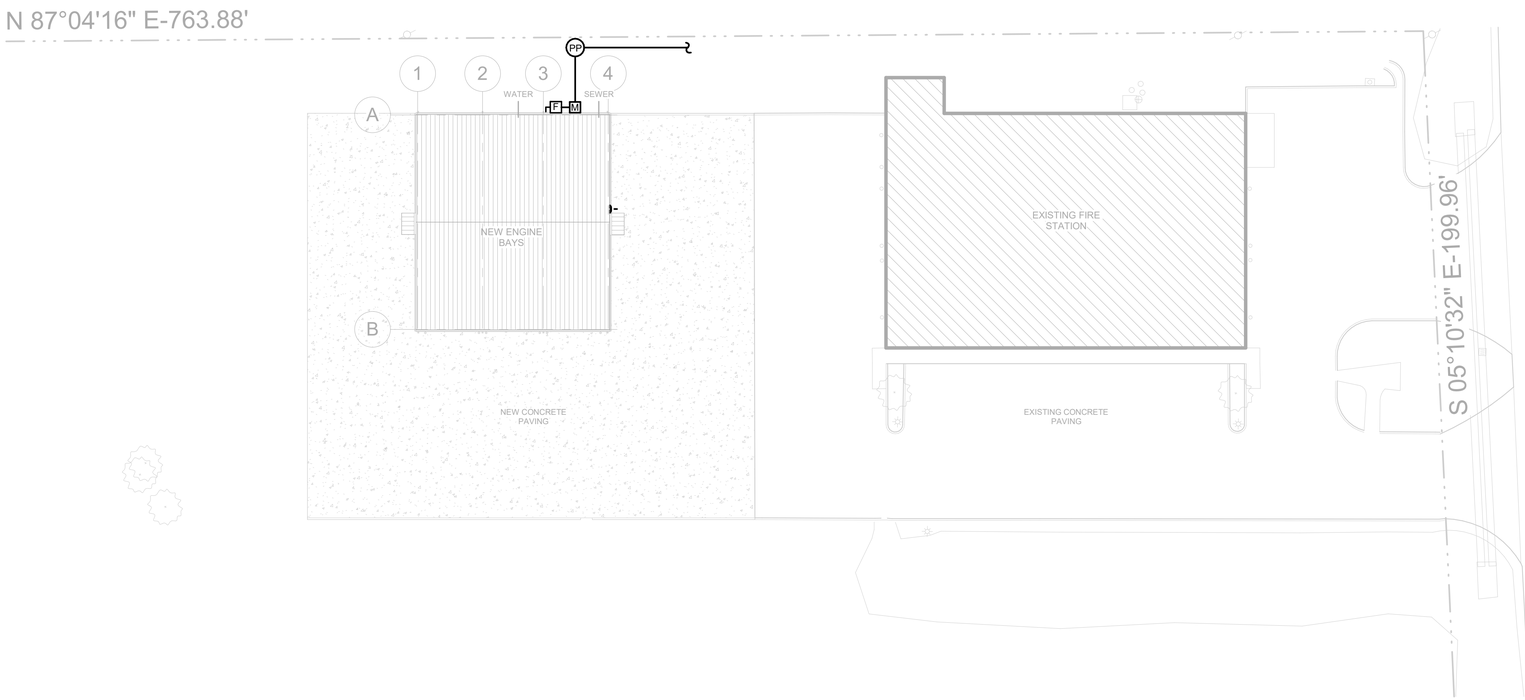

1 ELECTRICAL SITE PLAN

1" = 20'-0"

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ELECTRICAL SITE PLAN

E1.00

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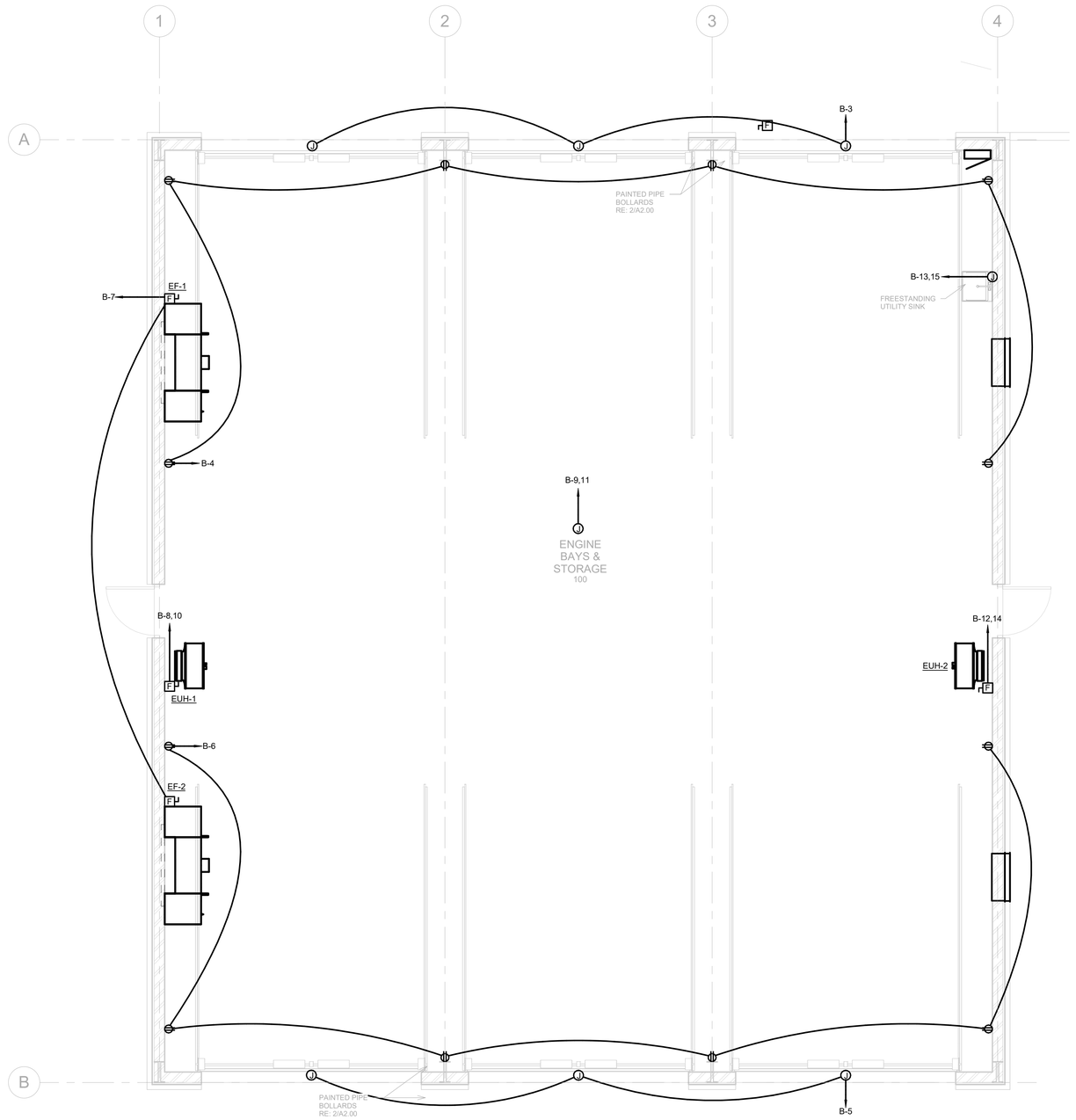

1 POWER - GROUND FLOOR PLAN

1/4" = 1'-0"

PLAN NORTH

GENERAL POWER NOTES

A EXISTING POWER AND TELECOMMUNICATIONS OUTLETS LABELED "(E)" ARE TO REMAIN WHERE SHOWN ON PLAN, UNLESS NOTED OTHERWISE (U.N.O.).

B RETAIN CIRCUIT CONTINUITY FOR ALL DEVICES AFFECTED BY REMODEL WORK THAT ARE TO REMAIN. WHERE EXISTING RECEPTACLES IN EXTERIOR PERIMETER WALL CONFLICT WITH NEW WALL PARTITIONS, REMOVE DEVICE AND REWORK/REWIRE CIRCUIT FOR CONTINUITY AS REQUIRED.

C ELECTRICAL CONTRACTOR SHALL VERIFY THAT ALL EXISTING AND RELOCATED OUTLETS IN PROJECT SCOPE ARE FUNCTIONING. REPLACE DEVICE WITH NEW IF NECESSARY.

D NEW WALL MOUNTED RECEPTACLES AND TELECOMMUNICATIONS OUTLETS SHALL BE MOUNTED AT 18" TO CENTERLINE OF BOX ABOVE FINISHED FLOOR (A.F.F.) U.N.O. TO COMPLY WITH ADA REQUIREMENTS.

E CONTRACTOR SHALL COORDINATE EXACT DEVICE AND EQUIPMENT LOCATIONS WITH OWNER/CLIENT/ARCHITECT OR EQUIPMENT SUBCONTRACTOR.

F RECEPTACLE OUTLETS AND SWITCHES SHALL BE LABELED WITH DESIGNATED PANEL AND CIRCUIT NUMBER ON THE COVER PLATE. JUNCTION BOXES IN CEILING SPACE SHALL HAVE PANEL DESIGNATIONS AND CIRCUIT NUMBERS MARKED ON THE COVER.

G PER 2020 NEC IN OTHER THAN DWELLING UNITS ALL SINGLE PHASE, 150-VOLTS TO GROUND AND 50 AMPS OR LESS, RECEPTACLES INSTALLED IN RESTROOMS, KITCHEN/FOOD PREP AREAS, ROOFTOPS, OUTDOORS, CRAWLSPACES WITHIN SIX FEET OF THE TOP INSIDE EDGE OF A SINK, INDOOR WET LOCATIONS, LOCKER ROOMS WITH ASSOCIATED SHOWERING FACILITIES OR IN GARAGES, SERVICE BAYS, AND SIMILAR AREAS WHERE ELECTRICAL HAND TOOLS OR PORTABLE LIGHTING EQUIPMENT ARE TO BE USED SHALL HAVE GROUND-FAULT CIRCUIT-INTERRUPTER (GFCI) PROTECTION FO RPERSONNEL PER NATIONAL ELECTRICAL CODE (NED) ARTICLE 210.8. GFCI DEVICE SHALL BE INSTALLED IN A READILY ACCESSIBLE LOCATION.

H MULTIWIRE BRANCH CIRCUITS SHALL BE PROVIDED WITH A SIMULTANEOUS DISCONNECTING MEANS TO DISCONNECT ALL UNGROUNDED CONDUCTORS AT THE POINT OF ORIGIN. DISCONNECTION CAN BE ACCOMPLISHED THROUGH LISTED HANDLE TIES USED WITH SINGLE-POLE CIRCUIT BREAKERS OR MULTI-POLE DEVICES.

I GROUNDED AND UNGROUNDED CONDUCTORS OF EACH MULTI-WIRE BRANCH CIRCUIT SHALL BE GROUPED WITH WIRE TIES OR SIMILAR MEANS AT A MINIMUM OF ONE LOCATION WITHIN THE PANELBOARD OR OTHER POINT OF ORIGIN.

J MULTIWIRE BRANCH CIRCUITS SUPPLYING POWER TO PERMANENTLY CONNECTED FREESTANDING PARTITIONS SHALL BE PROVIDED WITH A MEANS TO SIMULTANEOUSLY DISCONNECT ALL UNGROUNDED CONDUCTORS AT THE PANELBOARD WHERE BRANCH CIRCUITS ORIGINATE.

K SCOPE OF WORK INCLUDES FLEX CONNECTION FROM WALL MOUNTED JUNCTION BOX, POWER POLE OR FLOOR MOUNTED POKE-THRU FITTING TO MODULAR FURNITURE. FURNITURE SYSTEM IS A xx-CIRCUIT, xx-WIRE SYSTEM. COORDINATE CONNECTION LOCATIONS AND ADDITIONAL INSTALLATION REQUIREMENTS WITH FURNITURE SUBCONTRACTOR, TELECOMMUNICATIONS CONTRACTOR AND MANUFACTURER'S SPECIFICATIONS PRIOR TO ROUGH-IN. ELECTRICAL CONTRACTOR SHALL MAKE FINAL ELECTRICAL CONNECTIONS TO FURNITURE SYSTEMS.

L WHEN INSTALLED ON THE EDGES OF METAL STUDS OUTLET BOXES ARE REQUIRED TO BE SECURED IN PLACE BY BOX-BACK SUPPORTS PER NEC ARTICLE 314.23.

M PROVIDE SUITABLE FLEXIBLE CORD AND CABLE ASSEMBLY APPROVED FOR EXTRA-HARD USAGE FOR SUSPENDED OUTLET(S). INSTALL STRAIN RELIEF CABLE GRIPS AT THE SUPPLY END AND AT DEVICE PER NEC REQUIREMENTS.

N ELECTRICAL CONTRACTOR SHALL X-RAY CONCRETE FLOORS AND WALLS PRIOR TO ANY REQUIRED SAW CUTTING OR CORE-DRILLING. COORDINATE SCHEDULING WITH GENERAL CONTRACTOR.

O TELECOMMUNICATIONS CABLING SHALL BE INSTALLED BY CLIENT'S VENDOR. ELECTRICAL CONTRACTOR SHALL COORDINATE REQUIRED JUNCTION BOXES AND RACEWAY ROUGH-INS WITH APPROPRIATE VENDOR.

P PROVIDE AND INSTALL 3/4" CONDUIT FOR EACH SINGLE TELECOMMUNICATIONS OUTLET CONTAINING (1) TELECOMMUNICATIONS CABLE. PROVIDE AND INSTALL 1" CONDUIT FOR EACH TELECOMMUNICATIONS OUTLET CONTAINING MULTIPLE TELECOMMUNICATIONS CABLES. CONDUITS TO BE STUBBED A MINIMUM 3" INTO ACCESSIBLE CEILING SPACE. BUSHED. INSTALL INSULATION BUSHING AND PULL STRING. COORDINATE ADDITIONAL INSTALLATION REQUIREMENTS WITH TELECOMMUNICATIONS CONTRACTOR.

Q BACK-TO-BACK OUTLETS IN THE SAME WALL AND THRU-WALL TYPE BOXES ARE NOT PERMITTED. PROVIDE CHASE NIPPLE FOR ALL OUTLETS SHOWN ON OPPOSITE SIDES OF A COMMON WALL TO MINIMIZE SOUND TRANSMISSION.

R ELECTRICAL CONTRACTOR SHALL MAINTAIN DEDICATED ELECTRICAL SPACE IN FRONT AND ABOVE ALL ELECTRICAL EQUIPMENT REQUIRING SERVICING WHILE ENERGIZED. THIS INCLUDES CONTROL PANELS AND ELECTRICAL DISCONNECTS FOR HVAC EQUIPMENT ON LOCATED ON ROOFTOPS AND ABOVE OR BELOW CEILING. PENETRATIONS SUCH AS ROOF JACKS FOR ELECTRICAL POWER, LOW VOLTAGE CONTROL POWER, REFRIGERANT LINES, VENT PIPES, ETC., AND INCLUDING GAS LINES, DUCTWORK, ROOF DRAINS, SCREENING WALLS AND OTHER EQUIPMENT OF ANY TYPE, ARE NOT TO INTRUDE INTO DEDICATED ELECTRICAL SPACE. MINIMUM SPACE IN FRONT OF ELECTRIC EQUIPMENT SHALL BE THE WIDTH OF THE EQUIPMENT OR 30 INCHES, WHICHEVER IS GREATER, 36 INCHES OUT FROM ENCLOSURE FRONT AT THE HEIGHT OF 6.5 FEET.

S HEATING, AIR-CONDITIONING, AND REFRIGERATION EQUIPMENT SHALL BE PROVIDED A 125-VOLT, 15- OR 20-AMPERE RATED RECEPTACLE OUTLET, INSTALLED AT AN ACCESSIBLE LOCATION FOR THE SERVICING OF HEATING, AIR-CONDITIONING, AND REFRIGERATION EQUIPMENT. THE RECEPTACLE SHALL BE LOCATED WITHIN 25 FEET OF THE EQUIPMENT ON THE SAME LEVEL AND SHALL NOT BE CONNECTED TO THE LOAD SIDE OF THE EQUIPMENT DISCONNECTING MEANS. THE RECEPTACLE OUTLET SHALL BE WEATHERPROOF AND GFCI PROTECTED IF INSTALLED OUTDOORS OR IN A WET LOCATION.

T AN INDIVIDUAL DISCONNECTING MEANS SHALL BE PROVIDED LOCATED IN SIGHT FROM EACH MOTOR OR DRIVEN MACHINERY IN ACCORDANCE WITH NEC ARTICLE 430.

U MECHANICAL CONTRACTOR SHALL FURNISH STARTERS FOR ALL THREE-PHASE MECHANICAL EQUIPMENT. STARTERS SHALL BE NEMA RATED AND HAVE OVERLOAD PROTECTION WITH MANUAL RESET. ELECTRICAL CONTRACTOR SHALL INSTALL STARTERS EXCEPT WHERE SUPPLIED AS INTEGRAL PART OF MECHANICAL EQUIPMENT. ELECTRICAL CONTRACTOR SHALL PROVIDE SAFETY DISCONNECT SWITCHES FOR MECHANICAL EQUIPMENT NOT SPECIFICALLY INDICATED TO HAVE MECHANICAL CONTRACTOR PROVIDED DISCONNECTS.

V PROVIDE 120V CONNECTION FOR SMOKE DAMPER AND COORDINATE ADDITIONAL PROVISIONS TO CLOSE DAMPER UPON FIRE ALARM ACTIVATION. CONNECT TO EXISTING CIRCUIT FOR EXISTING SMOKE DAMPER(S) IN THE AREA. REFER TO MECHANICAL DRAWINGS FOR EXACT EQUIPMENT LOCATION.

W ROOM CONTAINING INFORMATION TECHNOLOGY EQUIPMENT IS PRESENT IN THE FLOOR AREA SHOWN ON PLAN. ELECTRICAL INSTALLATION SHALL BE PROVIDED PER NEC CHAPTERS 1 THROUGH 4 NOT USING PERMISSIONS AND RULES REGULATED BY NEC ARTICLE 645. NOT ALL CONDITIONS ARE MET AS SPECIFIED IN ARTICLE 645.4 "SPECIAL REQUIREMENTS FOR INFORMATION TECHNOLOGY EQUIPMENT ROOM" AND THEREFORE ROOM DOES NOT MEET THE DEFINITION OF THE "INFORMATION TECHNOLOGY EQUIPMENT ROOM" AS COVERED IN NEC ARTICLE 645.2 "DEFINITIONS" AND NFPA 75 "STANDARD FOR THE PROTECTION OF INFORMATION TECHNOLOGY EQUIPMENT" PARAGRAPH 3.3.9.

X IF RACEWAYS ARE INSTALLED ON ROOFTOPS OR EXPOSED TO DIRECT SUNLIGHT CORRECTIONS NEED TO BE PROVIDED FOR CONDUCTOR AMPACITY AND OR SIZING BASED ON AMBIENT TEMPERATURE CORRECTION FACTORS. TEMPERATURE CORRECTION FACTORS SHOWN IN NEC TABLE 310.15(B)(3)(C) SHALL BE ADDED TO THE OUTDOOR TEMPERATURE TO DETERMINE THE APPLICABLE AMBIENT TEMPERATURE FOR APPLICATION OF THE CORRECTION FACTORS IN TABLE 310.15(B)(2)(A) OR TABLE 310.15(B)(2)(B).

Y WIRE SIZE REFLECTED ON ONE-LINE, PANEL SCHEDULE AND ANY OTHER CONTRACTURAL DOCUMENTS ARE FOR REFERENCE ONLY. BASED ON THE FIELD CONDITIONS AND RUN LENGTH THE ELECTRICAL CONTRACTOR SHALL UPSIZE WIRE AS REQUIRED TO MAINTAIN LESS THAN 3% VOLTAGE DROP FROM PANEL TO LOAD.

KEYED NOTES

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REVISION LOG

POWER FLOOR PLAN

E2.00

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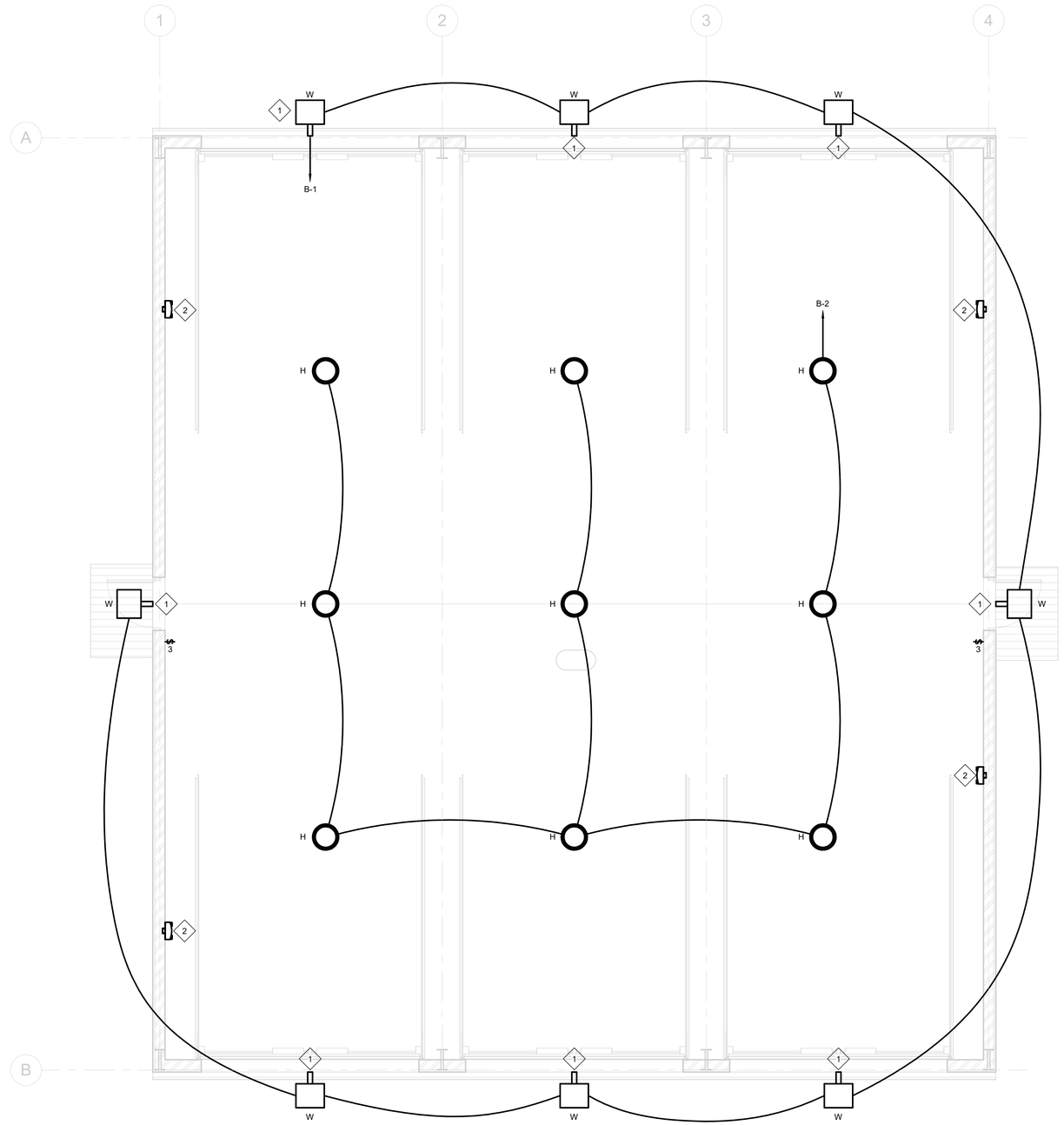

1 LIGHTING FLOOR PLAN

PLAN NORTH

1/4" = 1'-0"

GENERAL LIGHTING NOTES

A LUMINAIRES AND SWITCHES LABELED "(E)" ARE EXISTING TO REMAIN WHERE SHOWN UNLESS OTHERWISE NOTED. MAINTAIN CIRCUIT CONTINUITY FOR THESE DEVICES AS REQUIRED.

B REMOVED LUMINAIRES AND EXIT SIGNS NOT BEING REUSED SHALL BE RETURNED TO BUILDING OWNER FOR FUTURE USE.

C ELECTRICAL CONTRACTOR SHALL INSPECT EXISTING AND RELOCATED FIXTURES IN WORK AREA. REPLACE ALL NECESSARY COMPONENTS, RELAMP AND CLEAN AS REQUIRED TO MAINTAIN LIKE-NEW LIGHT FIXTURE APPEARANCE. ENSURE THAT ALL LAMPS HAVE THE SAME COLOR RENDERING INDEX (CRI) AND COLOR TEMPERATURE (KELVIN), AND ARE OF CLIENT APPROVED MANUFACTURER THROUGHOUT THE AREA OF WORK. VERIFY LIGHT FIXTURE AND LAMP REQUIREMENTS WITH CLIENT PRIOR TO BEGINNING ANY WORK.

D LUMINAIRES SHALL BE FURNISHED AND INSTALLED WITH LAMPS, BALLAST(S), AND MOUNTING HARDWARE. ELECTRICAL CONTRACTOR SHALL SUBMIT FIXTURE CUT SHEETS TO CLIENT AND ARCHITECT FOR THEIR FINAL APPROVAL PRIOR TO ORDERING OF THE LUMINAIRES.

E ELECTRICAL CONTRACTOR SHALL COORDINATE LIGHTING FIXTURE QUANTITIES, MOUNTING REQUIREMENTS, FINISHES, FIXTURE AVAILABILITY AND LEAD TIME FOR DELIVERY TO SITE.

F FLUORESCENT AND LED LUMINAIRES THAT CONTAIN BALLAST(S) AND/OR LED DRIVERS THAT CAN BE SERVICED IN PLACE SHALL HAVE A DISCONNECTING MEANS PER NEC ARTICLE 410.130(G) REQUIREMENTS. DISCONNECTING MEANS IS NOT REQUIRED FOR EMERGENCY ILLUMINATION REQUIRED IN 700.16.

G COORDINATE LAYOUT AND INSTALLATION OF LUMINAIRES AND MOUNTING MEANS WITH OTHER CONSTRUCTION THAT IS SUPPORTED OR THAT PENETRATES CEILINGS, INCLUDING BUT NOT LIMITED TO HVAC EQUIPMENT, FIRE-SUPPRESSION SYSTEM, AND PARTITION ASSEMBLIES PRIOR TO BEGINNING ANY WORK. NOTIFY ENGINEER OF ANY CONFLICTS BETWEEN HVAC EQUIPMENT AND LOCATION OF LUMINAIRES. VERIFY CLEARANCES REQUIRED.

H ALL LUMINAIRES SHALL BE POSITIVELY ATTACHED TO THE SUSPENDED CEILING SYSTEM BY MECHANICAL MEANS. LISTED SUPPORT CLIPS, LISTED FOR USE WITH THE TYPE OF CEILING GRID MEMBER AND LUMINAIRE, ARE PERMITTED AT EACH FIXTURE CORNER. FIXTURES WEIGHING LESS THAN 50 POUNDS SHALL ALSO HAVE A MINIMUM OF TWO NO. 9 GAUGE WIRES CONNECTED FROM THE OPPOSITE CORNERS OF THE FIXTURE HOUSING TO STRUCTURE. FIXTURES ABOVE 50 POUNDS SHALL BE SUPPORTED DIRECTLY FROM THE STRUCTURE. FIXTURES OF SIZES LESS THAN CEILING GRID SHALL BE SUPPORTED INDEPENDENTLY WITH AT LEAST TWO 3/4-INCH LISTED METAL CHANNELS SPANNING AND SECURED TO CEILING TEES AND SUPPORTED WITH WIRES OR ROD TO BUILDING STRUCTURE.

I ALL LUMINAIRES AND FLEXIBLE WIRING WHIPS SHALL BE SUPPORTED INDEPENDENTLY OF THE GRID SUPPORT SYSTEM.

J ELECTRICAL CONTRACTOR SHALL PURCHASE ANY ADDITIONAL LUMINAIRES REQUIRED, DUE TO DAMAGE OR CLIENT REQUEST. MATCH EXISTING LUMINAIRES IN THE AREA.

K MOUNT MULTIPLE LIGHT SWITCHES IN A MULTIPLE GANG BOX WITH SINGLE COVER PLATE.

L MULTIWIRE BRANCH CIRCUITS SHALL BE PROVIDED WITH A SIMULTANEOUS DISCONNECTING MEANS TO DISCONNECT ALL UNGROUNDED CONDUCTORS AT THE POINT OF ORIGIN. DISCONNECTION CAN BE ACCOMPLISHED THROUGH LISTED HANDLE TIES USED WITH SINGLE-POLE CIRCUIT BREAKERS OR MULTI-POLE DEVICES. BRANCH CIRCUIT(S) SERVING EMERGENCY LIGHTING SHALL NOT BE PART OF A MULTI-WIRE BRANCH CIRCUIT.

M GROUNDED AND UNGROUNDED CONDUCTORS OF EACH MULTI-WIRE BRANCH CIRCUIT SHALL BE GROUPED WITH WIRE TIES OR SIMILAR MEANS AT A MINIMUM OF ONE LOCATION WITHIN THE PANELBOARD OR OTHER POINT OF ORIGIN.

N SWITCHES CONTROLLING LIGHTING LOADS: WHERE SWITCHES CONTROL LIGHTING LOADS SUPPLIED BY A GROUNDED GENERAL PURPOSE BRANCH CIRCUIT, THE GROUNDED CIRCUIT CONDUCTOR (NEUTRAL WIRE) FOR THE CONTROLLED LIGHTING CIRCUIT SHALL BE PROVIDED AT THE SWITCH LOCATION. EXISTING SWITCHES IN REMODELED SPACES SHALL NOT BE EXEMPT FROM THIS REQUIREMENT.

O WHERE DIMMING CONTROL IS SPECIFIED AS A PORTION OF A CIRCUIT THAT ALSO HAS SWITCHED LIGHTING IN ADJACENT SPACES, PROVIDE A SEPARATE, DEDICATED NEUTRAL WIRE FROM THE DIMMING DEVICE BACK TO THE ORIGINATING PANEL.

P IN REMODEL AREAS WHERE OCCUPANCY SENSING DEVICES ARE SPECIFIED AND ARE REPLACING EXISTING MANUAL SNAP SWITCH CONTROL OF THE LIGHTING, PROVIDE A NEUTRAL CONDUCTOR FROM THE LIGHTING CIRCUIT BEING CONTROLLED TO THE OCCUPANCY SENSING DEVICE (OR SWITCH/POWER PACK, WHERE LOW VOLTAGE SENSORS ARE SPECIFIED). FOR BIDDING PURPOSES, ASSUME THAT THE EXISTING SNAP SWITCHES ARE WIRED WITHOUT A NEUTRAL CONDUCTOR, AND A NEW NEUTRAL CONDUCTOR WILL BE REQUIRED.

Q ALL SWITCHES SHALL BE LABELED WITH DESIGNATED PANEL AND CIRCUIT NUMBER(S) ON THE COVER PLATE.

R PROVIDE AN UNSWITCHED HOT AT EACH EMERGENCY LIGHT FIXTURE AND EMERGENCY LIGHTING UNIT. EMERGENCY LIGHTING SHALL BE SUPPLIED WITH A BATTERY TO SUPPLY AND MAINTAIN EMERGENCY LIGHTING LEVELS FOR A MINIMUM PERIOD OF 90 MINUTES.

S SHADED LUMINAIRES, EMERGENCY LIGHTING UNITS, AND EXIT SIGNS SHALL BE CONNECTED TO THE NORMAL LIGHTING CIRCUIT IN THE AREA AND CONNECTED AHEAD OF ANY CONTROLS.

T EMERGENCY LUMINAIRES SHALL WITH SWITCH LEG SUBSCRIPT LETTER SHOWN SHALL BE CONTROLLED ALONG WITH OTHER LUMINAIRES SHARING SWITCH LEG SUBSCRIPT LETTER. ELECTRICAL CONTRACTOR SHALL CONNECT EMERGENCY LIGHT FIXTURE PER MANUFACTURER'S WIRING DIAGRAMS. SWITCHED EMERGENCY BALLAST WIRING CONFIGURATION REQUIRES CONNECTION TO SWITCHED AND UNSWITCHED CONDUCTORS OF SAME LIGHTING CIRCUIT.

U ALL EXIT SIGNS ARE NEW, UNLESS NOTED OTHERWISE. MATCH NEW EXIT SIGNS WITH EXISTING. LOCATIONS OF EXIT SIGNS SHALL BE COORDINATED WITH LIFE SAFETY DRAWINGS AND LOCAL AUTHORITIES. PROVIDE SIGNS IN ADDITIONAL LOCATIONS, IF REQUIRED, BY LOCAL AUTHORITIES.

V MOUNT NEW WALL SWITCHES AT 46" TO BOX CENTERLINE ABOVE FINISHED FLOOR (A.F.F.) TO COMPLY WITH ADA STANDARDS.

W ELECTRICAL CONTRACTOR SHALL TEST BATTERIES IN ALL REUSED OR EXISTING EXIT SIGNS, EMERGENCY LIGHT UNITS, AND EMERGENCY FLUORESCENT LUMINAIRES. REPLACE BATTERIES, UNITS, OR BALLASTS IF REQUIRED.

KEYED NOTES

1 ALL EXTERIOR LIGHTS ARE TO BE EQUIPPED WITH A PHOTOCELL AND OPERATED WITH A TIME CLOCK.

2 ALL EMERGENCY EXIT LIGHTS ARE TO BE CONNECTED TO THE NEAREST LIGHTING CIRCUIT.

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LIGHTING CEILING PLAN

E2.20

SCALE: AS NOTED

6/2/2023 10:46:49 AM

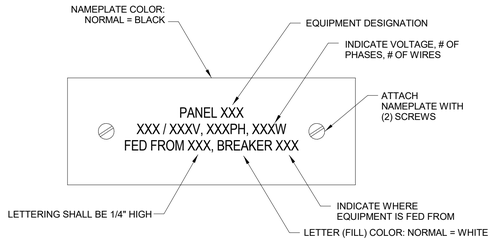
LUMINAIRE SCHEDULE

MARK	MANUFACTURER AND MODEL	VOLTAGE	LAMPS	INPUT WATTAGE	MOUNTING	DESCRIPTION
H	TBD	120	4000 K	150	PENDANT	LED HIGH BAY LIGHTS WITH AUTOMATIC MOTION SENSOR
W	TBD	120	4000 K	82	WALL	LED EXTERIOR WALL PACK
EM	TBD	120	LED	5	WALL	DUAL HEAD EMERGENCY EXIT LIGHT

FEEDER SCHEDULE

TAG	WIRE AND CONDUIT SIZE - X□, XW
200.3N	(3 #3/0 AWG IN 1 1/2" C RMC)
200.3	(3 #3/0 AWG & 1 # 6 GND IN 2" C RMC)

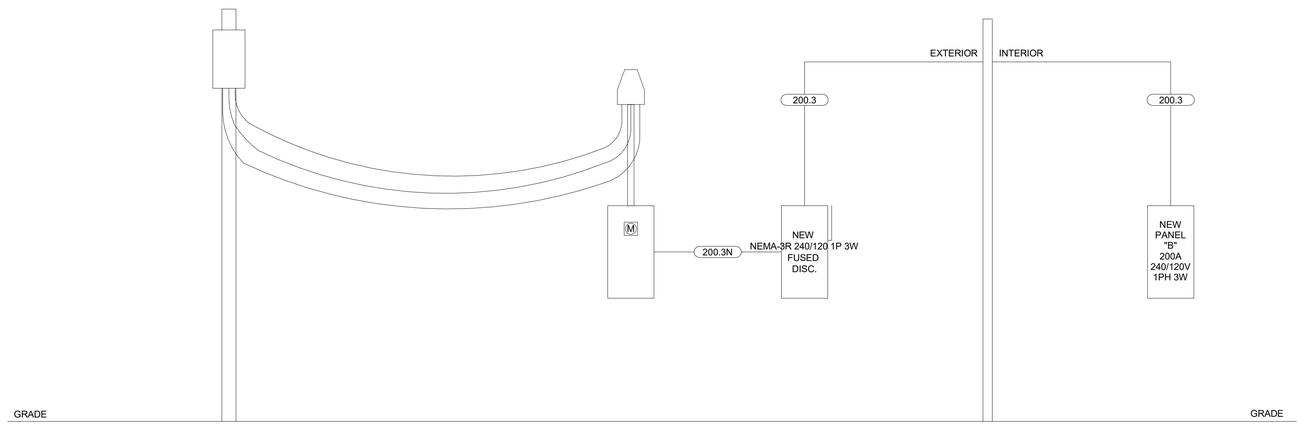
ALL CONDUCTORS TO BE COPPER UNLESS OTHERWISE NOTED. FOR AMPACITIES GREATER THAN 100A ALUMINUM CONDUCTORS MAY BE SUBSTITUTED FOR COPPER CONDUCTORS. ELECTRICAL CONTRACTOR SHALL ASSUME RESPONSIBILITY FOR RE-SIZING CONDUCTORS AND CONDUIT PER APPLICABLE NATIONAL ELECTRIC CODE ARTICLES.



02 PANEL NAME PLATE DETAIL
SCALE: NTS

ONE-LINE DIAGRAM GENERAL NOTES:

A. A PERMANENTLY AFFIXED LABEL SHALL BE APPLIED WITH THE AVAILABLE FAULT CURRENT AT THE TIME OF THE CALCULATION. THE LABEL SHALL BE 2" X 3" IN SIZE AND SHALL BE BLUE LETTERING ON A CONTRASTING BACKGROUND. THIS LABEL SHALL ALSO INCLUDE THE DATE OF CALCULATION PER NEC ELECTRICAL CODE 504.1.1.
B. AVAILABLE UTILITY AIC NOT AVAILABLE AT TIME OF THIS SUBMITTAL, STARTING UTILITY AIC ASSUMES WORST CASE IMPEDANCE OF % ON ___KVA ____ MOUNTED XFMR OF _____ AIC.
C. SHORT CIRCUIT RATING CALCULATED USING POINT TO POINT METHOD
D. CONDUIT TO BUILDINGS SHALL BE DIRECT BURIED 48" BELOW GRADE WITH WARNING TAPE. USE SCH 40 PVC BELOW GRADE AND RIGID GALVANIZED STEEL CONDUIT ABOVE GRADE, UNLESS NOTED OTHERWISE.
E. ALL OUTDOOR ELECTRICAL EQUIPMENT TO BE MOUNTED IN GALVANIZED, WEATHERPROOF, NEMA 3R ENCLOSURES.
F. SQUARE TAGS REFER TO FAULT CURRENT VALUES LOCATED ON THIS PAGE.
G. CIRCULAR TAGS REFER TO ONE-LINE GROUNDING NOTES.



01 ELECTRICAL ONE-LINE DIAGRAM
SCALE: NTS

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ELECTRICAL ONE-LINE AND DETAILS

E6.00

SCALE: AS NOTED

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PANEL: B

Location: ENGINE BAYS & STORAGE 100
Supply From:
Mounting: Surface
Enclosure: Type 1

Volts: 120/240 Single
Phases: 1
Wires: 3

A.I.C. Rating:
Mains Type:
Mains Rating: 200 A
MCB Rating: 200 A

Notes:

CKT	Circuit Description	Trip	Poles	A		B		Poles	Trip	Circuit Description	CKT
1	Exterior Wall Packs	20 A	1	656	1350			1	20 A	Interior High Bay Lights	2
3	Bay Doors - Plan North	20 A	1			1800	1080	1	20 A	Building Receptacles - Plan North	4
5	Bay Doors - Plan South	20 A	1	1800	1080			1	20 A	Building Receptacles - Plan South	6
7	Warehouse Wall Exhaust Fans	20 A	1			960	2500	2	30 A	Unit Heater - 1	8
9	HVLS Fan	20 A	2	600	2500			--	--	--	10
11	--	--	--			600	2500	2	30 A	Unit Heater - 2	12
13	Instant Water Heater	40 A	2	3250	2500			--	--	--	14
15	--	--	--			3250					16
17											18
19											20
21											22
23											24
25											26
27											28
29											30
31											32
33											34
35											36
37											38
39											40
41											42
		Total Load:		13736		12690					
		Total Amps:		114 A		106 A					

Legend:

Load Classification	Connected Load	Demand Factor	Estimated Demand	Panel Totals	
Equipment	11300	100.00%	11300		
Lighting	2006	125.00%	2508	**Total Conn. Load:**	26426
Other	10960	100.00%	10960	**Total Est. Demand:**	26928
Receptacle	2160	100.00%	2160	**Total Conn.:**	110 A
				Total Est. Demand:	112 A
				Spare:	88 A

Notes:

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ELECTRICAL SCHEDULES

E7.00

SCALE: AS NOTED

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PLUMBING SYMBOLS AND ABBREVIATIONS

NOTE: NOT ALL SYMBOLS AND ABBREVIATIONS INDICATED HERE ARE USED IN THE DRAWINGS AND MAY NOT APPLY TO THIS PROJECT. ADDITIONAL SYMBOLS MAY BE INDICATED IN THE DRAWINGS.

PLUMBING ABBREVIATIONS

AB	ABOVE
ACC	ACCESS
ADJ.	ADJUSTABLE
AFF	ABOVE FINISHED FLOOR
AFG	ABOVE FINISHED GRADE
ALT	ALTERNATE
AP	ACCESS PANEL
APPROX.	APPROXIMATELY
ARCH	ARCHITECTURAL
ASSY	ASSEMBLY
AVG	AVERAGE
BFF	BELOW FINISHED FLOOR
BLDG	BUILDING
BOT	BOTTOM
BOP	BOTTOM OF PIPE
BT	BATHTUB
BTU	BRITISH THERMAL UNITS
BTUH	BRITISH THERMAL UNITS PER HOUR
BTW	BETWEEN
CAP	CEILING ACCESS PANEL
CFCI	CONTRACTOR FURNISHED, CONTRACTOR INSTALLED
CFH	CUBIC FEET PER MINUTE
CFM	CUBIC FEET PER HOUR
CL	CENTERLINE
CLG	CEILING
CMU	CONCRETE MASONRY UNIT
CO	CLEANOUT
COND	CONDUCTOR
CONT	CONTRACTOR
COP	COEFFICIENT OF PERFORMANCE
CTR	CENTER
CU	COPPER
CW	COLD WATER
CWFU	COLD WATER FIXTURE UNITS
DD	DRAIN DECK
DEG	DEGREES
DET	DETAIL
DFU	DRAINAGE FIXTURE UNITS
DIA	DIAMETER
DIM	DIMENSION
DN	DOWN
DS	DOWNSPOUT
DT	DRAIN TILE
DWG	DRAWING
E	EXISTING
EA	EACH
EC	ELECTRICAL CONTRACTOR
EEW	EMERGENCY EYEWASH
EFF	EFFICIENCY
EJ	EXPANSION JOINT
ELEC	ELECTRICAL
ELEV	ELEVATION
EM	EMERGENCY
EQUIP	EQUIPMENT
ES	EMERGENCY SHOWER
ET	EXPANSION TANK
ETR	EXISTING TO REMAIN
EWC	ELECTRIC WATER COOLER
EWH	ELECTRIC WATER HEATER
EWT	ENTERING WATER TEMPERATURE
EXH	EXHAUST
EXP	EXPANSION
EXST	EXISTING
EXT	EXTERIOR
F	FUTURE
FCO	FLOOR CLEANOUT
FD	FLOOR DRAIN
FFE	FINISHED FLOOR ELEVATION
FLA	FULL LOAD AMPS
FLR	FLOOR
FM	FACTORY MUTUAL
FP	FIREPROOF
FPM	FEET PER MINUTE
FPS	FEET PER SECOND
F&T	FLOAT AND THERMOSTATIC
FT	FEET
FTG	FOOTING
FU	FIXTURE UNITS
GA	GAUGE
GAL	GALLON
GALV	GALVANIZED
GC	GENERAL CONTRACTOR
GPM	GALLONS PER MINUTE
GPH	GALLONS PER HOUR
HB	HOSE BIBB
HD	HUB DRAIN
HP	HORSE POWER
H.P.	HIGH POINT
HVAC	HEATING, VENTILATING & AIR CONDITIONING
HW	HOT WATER
HWFU	HOT WATER FIXTURE UNITS
HWR	HOT WATER RETURN
ID	INSIDE DIAMETER
IE	INVERT ELEVATION
IN	INCHES
KO	KNOCK-OUT
L	LAVATORY
LB	POUNDS
LB/HR	POUNDS PER HOUR
L.F.	LINEAR FEET
LP	LOW POINT
LTG	LIGHTING
LWT	LEAVING WATER TEMPERATURE
MAX	MAXIMUM
MB	MOP BASIN
MBH	THOUSANDS OF BTU PER HOUR
MC	MECHANICAL CONTRACTOR
MCA	MINIMUM CIRCUIT AMPACITY
MCC	MOTOR CONTROL CENTER
MEP	MECHANICAL, ELECTRICAL AND PIPING
MER	MECHANICAL EQUIPMENT ROOM
MEZZ	MEZZANINE
MFR	MANUFACTURER
MH	MANHOLE
MIN.	MINIMUM
MISC	MISCELLANEOUS
MTD	MOUNTED
MTG	MOUNTING
NA	NOT APPLICABLE
NIC	NOT IN CONTRACT
NO	NUMBER
NPS	NOMINAL PIPE SIZE
NPSH	NET POSITIVE SUCTION HEAD
NPT	NATIONAL PIPE THREAD
NR	NEAR
NTS	NOT TO SCALE
OC	ON CENTER
OD	OUTSIDE DIAMETER
OFCI	OWNER FURNISHED, CONTRACTOR INSTALLED
OFOI	OWNER FURNISHED, OWNER INSTALLED
OLP	OVERLOAD PROTECTION
OV	OUTLET VELOCITY
P	PUMP
PC	PLUMBING CONTRACTOR
PCF	POUNDS PER CUBIC FOOT
PD	PRESSURE DROP
PH	PHASE
PIV	POST INDICATOR VALVE
PLBG	PLUMBING
POC	POINT OF CONNECTION
PP	POLYPROPYLENE
PPH	POUNDS PER HOUR
PRV	PRESSURE RELIEF VALVE
PSF	POUNDS PER SQUARE FOOT
PSI	POUNDS PER SQUARE INCH
PSIA	POUNDS PER SQUARE INCH ABSOLUTE
PSIG	POUNDS PER SQUARE INCH GAUGE
PVC	POLYVINYL CHLORIDE
RAD	RADIUS
RCP	REINFORCED CONCRETE PIPE
RD	ROOF DRAIN
REC	RECESSED
RECPT	RECEPTACLE
REQD	REQUIRED
RF	ROOF
RI	ROUGH-IN
RPM	REVOLUTIONS PER MINUTE
RPZ	REDUCED PRESSURE ZONE VALVE
RV	RELIEF VALVE
S	SLOPE
SCH	SCHEDULE
SDR	STANDARD DIMENSION RATIO
SH	SHOWER
SHT	SHEET
SOG	SLAB ON GRADE
SPEC	SPECIFICATION
SQ	SQUARE
SS	SERVICE SINK
S/S	STAINLESS STEEL
STD	STANDARD
STRU	STRUCTURAL
T&P	TEMPERATURE AND PRESSURE
TBR	TO BE REMOVED
TD	TRENCH DRAIN
TDFU	TOTAL DRAIN FIXTURE UNITS
TEMP	TEMPERATURE
TOB	TOP OF BEAM
TOD	TOP OF DUCT/DECK
TOJ	TOP OF JOIST
TOP	TOP OF PIPE
TOS	TOP OF SLAB
T STAT	THERMOSTAT
TWFU	TOTAL WATER FIXTURE UNITS
TYP	TYPICAL
UNO	UNLESS OTHERWISE NOTED
V	VENT
VEL	VELOCITY
VIB	VALVE IN BOX
VOL	VOLUME
W	WIDTH
W/	WITH
W/O	WITHOUT
WC	WATER COLUMN
WSFU	WATER SUPPLY FIXTURE UNITS
WG	WATER GAUGE

PIPING SYSTEMS LABELS

WATER PIPING SYSTEMS:

SCW	COLD SOFT WATER
HW	COLD WATER
F	FIRE PROTECTION
HW	HOT WATER
HWR	HOT WATER RETURN
NPW	NON-POTABLE WATER
TW	TEMPERED WATER
RO	REVERSE OSMOSIS WATER

GAS AND AIR PIPING SYSTEMS:

A	COMPRESSED AIR
H2	HYDROGEN
G	NATURAL GAS
N2	NITROGEN
VAC	VACUUM (AIR)

WASTE AND VENT SYSTEMS:

CD	CONDENSATE DRAIN
CWV	CLEARWATER VENT
CWW	CLEARWATER WASTE
FM	FORCE MAIN
IW	INDIRECT WASTE
OD	OVERFLOW DRAIN LINE
ST	STORM
SSD	SUBSOIL DRAIN LINE
	UNDERFLOOR FOR WASTE OR SOIL, SUBSOIL, STORM & FORCE MAIN
V	VENT
SAN	WASTE OR SOIL LINE

SITE PIPING SYSTEMS:

F	FIRE MAIN
FM	FORCE MAIN
SAN	SANITARY SEWER
ST	STORM SEWER
W	WATER LINE

NOTE:
(E) PRIOR TO SYSTEM TYPE DENOTES EXISTING PIPING
(F) PRIOR TO SYSTEM TYPE DENOTES FUTURE PIPING

PIPE FITTINGS

- FLANGE
- UNION
- ANCHOR
- PIPE GUIDE
- ECCENTRIC REDUCER
- CONCENTRIC REDUCER
- TEE BRANCH
- LINE CONTINUATION BREAK
- PLUMBING FIXTURE STOPS
- PIPELINE STRAINER
- ELBOW DOWN
- ELBOW UP
- TEE DOWN
- TEE UP
- PIPE CAP
- VALVE IN VERTICAL
- DOUBLE WYE
- WYE
- WYE WITH VENT UP

DRAINS AND CLEANOUTS

- FLOOR DRAIN
- FLOOR SINK
- HUB DRAIN
- FLOOR SINK
- FIXTURE WASTE TRAP
- CLEANOUT (CO)
- FLOOR CLEANOUT (FCO)
- GROUND CLEANOUT (GCO)
- DOUBLE CLEANOUT (DCO)

PIPING VALVES AND SPECIALTIES

- ANGLE VALVE
- BALANCING VALVE
- BALL VALVE
- BUTTERFLY VALVE
- CHECK VALVE
- DIAPHRAGM VALVE
- DRAIN VALVE
- FLOAT OPERATED VALVE
- GAS SHUTOFF VALVE
- GATE VALVE
- GLOBE VALVE
- PLUG VALVE
- POST INDICATOR VALVE (PIV)
- PRESSURE REDUCING VALVE
- PRESSURE RELIEF VALVE
- QUICK OPENING VALVE
- SHUTOFF VALVE
- SOLENOID VALVE
- TRIPLE DUTY VALVE
- 2-WAY CONTROL VALVE (VALVE BODY AS SPECIFIED)
- 3-WAY MIXING VALVE
- 4-WAY VALVE WITH ARROW INDICATING FAIL POSITION
- VALVE IN BOX
- AIR VENT, AUTOMATIC
- AIR VENT, MANUAL (MV)
- BACKFLOW PREVENTER
- CONSTANT FLOW REGULATOR
- DEMOLITION OF PIPING, DEVICE, ETC.
- DIRECTION OF FLOW
- DIRECTION OF PITCH RISE (R) OR DROP (D) (R)
- DRAIN PLUG
- EXPANSION JOINT (EJ)
- FLEXIBLE CONNECTION
- FLOW SWITCH (FS)
- FLOW SENSING DEVICE (FM)
- GAS REGULATOR
- GAS OUTLET
- HOSE BIBB
- PETE'S PLUG
- PRESSURE GAUGE
- PRESSURE SWITCH (PS)
- STEAM TRAP
- THERMOMETER
- WALL HYDRANT (WH)
- WATER HAMMER ARRESTOR

GENERAL NOTES

A. REFER TO SYMBOLS AND ABBREVIATIONS SHEET FOR ADDITIONAL PLUMBING GENERAL NOTES.

B. CONTRACTOR TO VERIFY EXISTING WATER PRESSURE PRIOR TO CONSTRUCTION, AND NOTIFY ENGINEER IF WATER PRESSURE IS DIFFERENT THAN AS STATED IN THE DRAWINGS. CONTRACTOR MAY NEED TO PROVIDE DOMESTIC WATER BOOSTER PUMP IF WATER PRESSURE IS LOW OR A WATER PRESSURE REGULATOR IF PRESSURE IS TO HIGH.

C. VERIFY ALL DIMENSIONS AT JOBSITE.

D. CONTRACTOR SHALL REMOVE ALL NECESSARY EXISTING SERVICES SUCH AS WATER, WASTE, VENT AND GAS PIPING SERVING FIXTURES TO BE REMOVED AND/OR CONNECTIONS TO EQUIPMENT TO BE REMOVED. REMOVE ANY AND ALL UNUSED SERVICE LINES ABOVE CEILINGS, IN WALLS OR BELOW FLOORS.

E. CONTRACTOR SHALL PATCH AND FILL ALL UNUSED EXISTING FLOOR PENETRATIONS.

F. PLUMBING CONTRACTOR SHALL COMPLY WITH ALL FEDERAL, STATE AND LOCAL CODES AND AUTHORITIES HAVING JURISDICTION, AND MAKE FINAL CONNECTIONS TO FIXTURES AND EQUIPMENT. ALL WORK SHALL BE PERFORMED IN A NEAT AND WORKMANLIKE MANNER

G. INSULATE ALL DOMESTIC WATER PIPING SUBJECTED TO FREEZING TEMPERATURE.

H. INSULATE HOT WATER LINES WITH 1" MOLDED FIBERGLASS INSULATION.

I. DO NOT SCALE DRAWINGS. REFER TO ARCHITECTURAL DOCUMENTS FOR EXACT LOCATION OF FIXTURES, EQUIPMENT.

J. ALL WALL HUNG PLUMBING FIXTURES ARE TO BE SUPPORTED BY MEANS OF A CARRIER AS MANUFACTURED BY J.R. SMITH, JOSAM, OR ZURN.

K. PLUMBING CONTRACTOR SHALL COORDINATE ALL PIPING AND EQUIPMENT WITH OTHER TRADES PRIOR TO INSTALLATION OF ANY PIPING OR EQUIPMENT.

L. PLUMBING CONTRACTOR SHALL VERIFY THE EXACT SIZE, LOCATION, DEPTH AND PRESSURE OF ALL EXISTING UTILITY LINES BEFORE COMMENCING WORK.

M. CONTRACTOR SHALL INSPECT SITE THOROUGHLY TO FAMILIARIZE THEMSELVES WITH THE AREA OF WORK. ANY DISCREPANCIES BETWEEN THESE DOCUMENTS AND ACTUAL CONDITIONS SHALL BE REPORTED TO THE ARCHICTECT/ENGINEER FOR RESOLUTIONS PRIOR TO BID PRICING. NO EXTRAS WILL BE ALLOWED DUE TO LACK OF KNOWLEDGE OF EXISTING OR NEW CONDITIONS.

N. VENT PIPING TO BE 2" UNLESS OTHERWISE NOTED.

O. PROVIDE BALL VALVES ON ALL BRANCH LINES FOR BUILDING ISOLATION WHETHER SHOWN OR NOT.

P. MAINTAIN A MINIMUM CLEARANCE OF 10 FEET BETWEEN ALL VENT PENETRATIONS AND AIR INTAKES.

Q. OFFSET ALL PIPING AS REQUIRED TO AVOID STRUCTURAL MEMBERS, CANTS, FLASHING, MECHANICAL OR ELECTRICAL EQUIPMENT.

R. VENT PENETRATIONS THROUGH ROOF TO HAVE CLEARANCE OF 10 FEET, MINIMUM, FROM ANY INTAKE FOR FRESH AIR.

S. COORDINATE ALL WORK WITH OWNER OR REPRESENTATIVES.

T. ALL PIPING SHALL BE RUN CONCEALED UNLESS OTHERWISE NOTED.

U. PLUMBING CONTRACTOR SHALL FURNISH AND INSTALL ALL GAS PIPING AND MAKE ALL FINAL CONNECTIONS. GAS PIPING SHALL BE SCHEDULE 40 BLACK STEEL PIPE AND BANDED MALLEABLE IRON FITTINGS. VERIFY GAS PRESSURE PRIOR TO CONSTRUCTION, AND NOTIFY ENGINEER IF GAS PRESSURE IS DIFFERENT THAN AS STATED IN THE DRAWINGS.

V. ALL UNDERGROUND WATER LINES SHALL BE TYPE "K" COPPER TUBING WITH 1/2" ARMAFLEX INSULATION.

W. PROVIDE BACKFLOW PREVENTER AT THE LOCATIONS REQUIRED BY CODE, AND ALL GOVERNING AUTHORITIES.

X. SANITARY AND WATER SERVICE MAY VARY; SEE SITE PLAN.

Y. REFERENCE ARCHITECTURAL DRAWINGS FOR DIMENSIONS AFFECTING THIS WORK.

Z. ALL WORK SHALL BE SUBJECT TO THE APPROVAL OF THE ARCHITECT.

PRE-CONSTRUCTION CHECK

A. THE PLUMBING CONTRACTOR SHALL PERFORM THE FOLLOWING PRE-CONSTRUCTION CHECK, AFTER THE AWARD OF CONTRACT, AND BEFORE BEGINNING CONSTRUCTION:

B. TEST ALL EXISTING FIXTURES, EQUIPMENT, AND WATER HEATERS TO VERIFY ALL ITEMS ARE FULLY OPERATONAL AND REQUIRE NO REPAIRS.

C. THE CONTRACTOR SHALL NOTIFY THE BUILDING OWNER IN WRITING OF ANY DEFICIENCIES FOUND AND SHALL OBTAIN WRITTEN INSTRUCTIONS FROM THE BUILDING OWNER PRIOR TO BEGINNING CONSTRUCTION REGARDING ANY ACTION TO BE TAKEN. ITEMS NOT ADDRESSED IN THE PRE-CONSTRUCTION CHECK SHALL BE CORRECTED BY THE CONTRACTOR PRIOR TO COMPLETION OF CONSTRUCTION AT NO ADDITIONAL COST TO OWNER.

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ANGLETON Where the Heart is

Angleton Fire Station #3 Addition

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REVISION LOG

PLUMBING SYMBOLS AND ABBREVIATIONS

P0.00

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1.1 15010 PLUMBING GENERAL

A. Reference: All portions of General Conditions apply to Plumbing work.

B. Guarantees: Provide written one year guarantee for all systems and equipment. Compressors shall be guaranteed for five years.

C. Codes: Comply with National, State and City codes and other applicable standards. All portions of the International Energy Conservation Code (IECC) and Current Local AHJ Commercial Energy Conservation Codes must be complied with.

D. Supervision: Provide supervisor in field for each phase of work.

E. Coordination: Coordinate all work with other trades. Provide mechanical and plumbing equipment with electrical characteristics compatible with that shown on the Electrical Drawings and described in the Electrical Division of the specifications. The engineer reserves the right to move services as required to coordinate the work, at no cost to the owner.

F. The drawings are schematic in nature, and should not be scaled, but show the various components of the systems approximately to scale and attempt to indicate how they are to be integrated with other parts of the building. Determine exact locations by job measurements, by checking the requirements of other trades, and by reviewing all Contract Documents. The drawings indicate general routing of the various parts of the systems, but do not indicate all fittings, offsets, and run outs which are required. The Contract shall include all fittings, offsets, and run outs required to fit the system into spaces allotted to them.

G. Shop Drawings and Submittal Data: PAPERLESS SUBMITTAL ONLY TO ENGINEER. All Shop Drawings and Submittal Data shall be an electronic file format only. PDF format is acceptable. All equipment and materials shall be submitted, including piping and equipment changes, as required. Submitted items that deviate from the drawings and specifications shall be highlighted in yellow for easy distinction. Requests for substitutions shall be submitted for review and approval a minimum of 15 business days prior to final bids. Mark all items and show that they comply with the IECC. The Engineer shall issue a letter stating the action taken on the submittal. The letter shall be copied and attached to the submittal, by the contractor, and distributed as required.

H. Record Data: Obtain, at Contractor's expense, a set of prints and keep these on the job site during construction. During construction, mark on these prints any changes that are made, noting particularly locations of those items that will need to be for servicing. Convert record data to an Electronic Format (PDF) and submit to the Architect. Furnish one set of shop drawings and maintenance manuals in brochure form. Record Brochures shall be given to the owner at completion of the work.

I. Permits, Fees: Secure and pay for all fees and charges for the work. Furnish certificates of acceptance at completion of the job from City.

J. Substitutions: No substitutions shall be made without prior approval from the Architect and Engineer.

K. Cutting and Patching: Cutting to be by this section, with patching and furring by General Contractor. Patching required after completion of work shall be paid for by Contractor.

L. Clean Up: Clean and touch-up paint all equipment at completion of work. Protect all equipment from damage during construction. Provide name plates on all equipment.

M. Tests: Tests all piping systems per local code. Sterilize all new water piping per Health Department requirements.

N. Test all equipment and prove performance results to Architect. Modify all drives, balance all systems as shown on the drawings. After Owner has occupied and is using the building, make additional inspections of the system. Correct any Owner's observed temperature imbalances. Check correct operation of equipment and verify by letter to the Architect, on each trip. List in the letter corrections made. At the opposite season of the startup inspect and verify correct operation of all systems. Tests all control systems. Furnish complete copy of all test data to Architect. Instruct owner for one day in operation of all systems. Filters and strainers shall be clean when systems are accepted by the owner. Testing Regulations must meet local City Requirements.

O. Excavating and Backfilling: Excavate to provide minimum 2 feet cover over all piping and conduit. Back fill to original compaction. Saw-cut existing finishes and patch to matching original conditions.

P. Noise and Vibration: All equipment shall operate with minimum of noise and vibration. Contractors shall rectify any objectionable conditions.

Q. Temporary Services: Furnish temporary utility as required for new construction.

R. Equipment Connections: Provide all martial and labor for connecting of all equipment furnished in other sections or by owner. Field verify all equipment for dimensions and roughing-in. Furnish all valves, drain piping, traps, etc., as required to install the equipment.

S. Floor Drains: Final location will be determined by equipment layout and location must be field approved. Provide trap primers to all floor drains.

T. Examination of Site: The contractor is responsible for visiting the job site and confirming the location of existing conditions before bidding. If existing conditions require modification due to elevation, obstruction, size, etc., the contractor will advise in writing before beginning construction.

END OF SECTION 15010

1.2 15030 PLUMBING SPECIFICATIONS

A. Provide all materials and labor for complete plumbing system.

B. Cleanouts "CO":

1. Unfinished Areas and Chases "CO": Smith #4400.
2. Finished Walls "WCO": Smith#4430, With 7" x 7" nickel-bronze plate.
3. Finished Floors "FCO": Smith#4020 with nickel-bronze plate.
4. Outside Areas "GCO": Smith#4240 in concrete pad 24"x 24"x6".
5. Equal Cleanouts: Wade, Mifab, Watts, Zurn, or Josam. Install at changes in direction, maximum of 90' spacing, and base on risers and local code.

C. Valves: Valves to be Nibco or equal by Milwaukee: Ball - #T-FP-600A-LF, Globe - #T-211-B Check - #T-413-Y-LF.

D. Underground valves to be installed in cast iron boxes, with cast iron cover marked "WATER".

E. Pipe Hangers: Securely suspend pipes from building structure.

1. Individual hangers - B-Line #B3100, Standard clevis hanger, pre-galvanized. MSS SP-58 and SP-69, Type 1.
2. Multiple pipes - B-Line #B22SH, 1-5/8" x 1-5/8" pre-galvanized 12 gauge slotted strut trapeze hanger, MSS SP-58 and MSS SP-69 Type 59. Secure with B-Line #B2400 series standard pipe clamps, MSS SP-58 and MSS SP-69 Type 26. Provide B-Line #B199 VibraCushion isolation on copper piping.
3. Wall supports - B-Line #B22SH, 1-5/8" x 1-5/8" pre-galvanized 12 gauge slotted strut anchored to the wall. Secure pipes to strut with B-Line #B2400 series standard pipe clamps. Provide B-Line #B1999 VibraCushion isolation on copper piping.
4. Horizontal Steel Piping shall be supported in accordance with MSS SP-69 Tables 3 and 4.
5. Provide pipe shields in accordance with insulation manufacturers published recommendations per MSS SP-58.
6. Vertical piping floor supports: B-Line #3373, Standard pre-galvanized riser clamps.
7. All materials used in supporting pipe to be pre-galvanized.
8. Provide chrome plated wall, ceiling and floor escutcheons where pipes pass through walls or ceilings in exposed areas.
9. Provide pre-galvanized steel pipe sleeves for pipes through walls, floors, and roofs.

F. Insulation:

1. Insulate hot water piping with MicroLok, fire retardant, white jacketed insulation. All insulation must comply with IECC. Seal all joints with self sealing tape. Fittings shall be pre molded type, sealed as required. Insulate all cold water piping in outside wall chases, or ceilings same as hot water pipe. Exterior piping shall be insulated with water proof-covered insulation and covered with aluminum covers. Provide 18 gauge galvanized saddles at support points as required.
2. Insulate storm drainage piping with minimum 1/2 inch thick MicroLok, fire retardant, white jacketed insulation. Seal all joints with self sealing tape. Fittings shall be pre molded type, sealed as required. Insulate roof drain bodies, vertical pipe to elbow, elbows at roof drains, horizontal runs of storm drainage piping, and first elbow turning down.

G. Sanitary System (Waste and Vent):

1. Below grade: Schedule 40 solid wall PVC pipe conforming to ASTM D2665 and ASTM D1785 and PVC drainage pattern fittings conforming to ASTM D3311 and ASTM D2665 as manufactured by Charlotte Pipe. Install per manufacturer's recommended installation procedures. Buried PVC pipe shall be installed per ASTM D2321. Cellular (Foam) Core piping conforming to ASTM F891 is NOT acceptable.
2. Below grade: Service weight cast iron bell and spigot pipe and fittings conforming to ASTM A-74 as manufactured by Charlotte Pipe, Tyler Pipe, or equal. Make joints with compression gaskets conforming ASTM C564.
3. Above grade: Schedule 40 solid wall PVC pipe conforming to ASTM D2665 and ASTM D1785 and PVC drainage pattern fittings conforming to ASTM D3311 and ASTM D2665 as manufactured by Charlotte Pipe. Install per manufacturer's recommended installation procedures.
4. Above grade: Service weight cast iron bell and spigot pipe and fittings conforming to ASTM A-74 as manufactured by Charlotte Pipe, Tyler Pipe, or equal. Hubless cast iron soil pipe and fittings conforming CISPI 301. All cast iron soil pipe and fittings shall be marked with the Collective Trademark of the Cast Iron Soil Pipe Institute and be listed by NSF International. Install all cast iron soil pipe systems per the Cast Iron Soil Pipe Institute Handbook.

I. Water Systems:

1. Water piping inside the building shall be type "K or L" copper with copper fittings. Underground service lines shall be ductile iron water pipe and fittings or type "K" copper with brazed copper joints. Provide dielectric fittings at points of connection of dissimilar metals.
2. FlowGuard Gold CTS CPVC pipe and fittings shall conform to ASTM D 2846. Pipe and fittings shall be manufactured as a system and be the product of one manufacturer. All pipe and fittings shall be manufactured in the United States. Pipe and fittings shall conform to National Sanitation Foundation (NSF) Standards 14 and 61.

J. Pipe Installation: Install water piping level. Provide drains at low points of system. Sewers and condensate shall be sloped at not less than 1/8 inch per foot. Provide deep seal traps for all floor drains. Pipe shall run parallel to building lines. Full provision shall be made for expansion and contraction of piping. Provide air chambers at each fixture, full line size 12" high. Vent pipes shall be flashed at the roof with approved roof flashing, extending not less than 12" in all directions in all directions. Turn flashing down in to vent 1 inch. Provide a stop valve at every fixture or equipment. All connection to equipment shall be made with unions. Piping shall not contact an electrical conduit at any point. Access doors or panels shall be furnished by this contractor.

K. Piping Joints:

1. Cast Iron Bell and Spigot - Compression gaskets conforming ASTM C564.
2. Cast Iron No-Hub - Standard Duty hubless couplings conforming to CISPI 310, certified by NSF International, and made in the United States.
3. Cast Iron No-Hub - Heavy Duty hubless couplings conforming to ASTM C1540 and manufactured in the United States.
4. Copper pipe - Press type copper fittings with automatic leak detection as manufactured by Viega or equal by Nibco or solder type copper fittings with Lead free solder.
5. Screw Joints - American standard with Teflon tape.
6. Mechanical joints - ASA S 21.11-53
7. Unions - At each item of equipment. Where copper and steel pipes are connected, make connections with insulated type fittings.

P. Plumbing Fixtures:

1. All plumbing fixtures shall meet the requirements for water conservation as required by ANSI and local code.
2. Fixtures and installation must meet all ADA requirements.
3. Reference drawings for Plumbing Fixture Schedules.
4. Acceptable Manufacturers:
   a. Water Closets (Vitreous China): American Standard, Toto, Sloan.
   b. Water Closets (Stainless Steel): Acorn, Bradley, Willoughby.
   c. Lavatories (Vitreous China): American Standard, Toto, Sloan.
   d. Lavatories (Stainless Steel): Advance Tabco, Acorn, Bradley, Willoughby, Elkay, Just.
   e. Lavatories (Decks with integral bowls): Bradley, Sloan, Willoughby.
   f. Urinals (Vitreous China): American Standard, Toto, Sloan.
   g. Urinals (Stainless Steel): Acorn, Bradley, Willoughby.
   h. Mop Sinks/Sevice Sinks: Stern Williams, Fiat.
   i. Drinking Fountains/Electric Water Coolers: Elkay, Halsey Taylor, Haws, Murdock, Oasis.
   j. Drains and Carriers: Jay R. Smith, Wade, Watts, Mifab, Zurn, Josam.
   k. Sinks (Stainless Steel): Elkay, Just.
   l. Faucets (Manual): Delta Teck, Chicago, T&S Brass, Symmons, American Standard, Toto.
   m. Faucets (Sensor): Toto, Sloan, Delta Teck, Chicago, Symmons, Bradley.
   n. Shower Trim: Symmons, Bradley, Chicago, Delta Teck, American Standard, Powers, Leonard.
   o. Emergency Fixtures: Bradley, Guardian, Haws, Encon, Acorn.
   p. Stops, Supplies, P-Traps, Tailpieces: Mcguire.
   q. ADA Covers: Plumberex, Truebro.
   r. Flush Valves: Sloan, Toto, American Standard, Delaney, Zurn.

Q. Plumbing Accessories:

1. Water Hammer Arrestors shall be installed at all fixtures. Minimum size shall be 3/4". Mechanical devices designs shall be used as allowed by code. Provide access doors for maintenance as required by manufacturer.
2. Trap Primer "TP": Traps shall have P.P.P Inc. Oregon #1 trap primers. Provide trap primer distribution unit for one through four drains. Extend 3/8" copper pipe to all fixtures as required by code or showed on the drawings. Inline Floor Drain Trap Sealer "Trap Guard" may be installed if allowed by code.

R. Water Heater:

1. Electric Water Heater shall be heavy gauge steel tanks with glass lining and magnesium anodes. Fiberglass insulated tanks with bonderized steel jackets, baked enamel finish. Provide ASME T&P relief valves. Dual electric heating elements, brass hose bibb for draining tanks. Units placed above ceilings shall have auxiliary drain pans with drains line. All drain and relief lines to be minimum 1" copper. Units shall have three year commercial warranty. Systems must comply with IECC.

S. Electrical: Contractors shall coordinate electrical characteristics with Electrical Contractor. Before ordering any equipment, submit a list of maximum overload circuits for all equipment to the Electrical Contractor and Engineer. This Contractor shall furnish all disconnects, control instruments and wiring diagrams showing terminal identification numbers. Electrical Contractor will do all the electrical wiring for power supply and control.

V. Demolition: Provide materials and labor required for the removal of all plumbing devices as noted on the drawings. Remove all devices related to the demolition of partitions and ceilings of the existing building.

END OF SECTION 15030

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REVISION LOG

PLUMBING SPECIFICATIONS

P0.01

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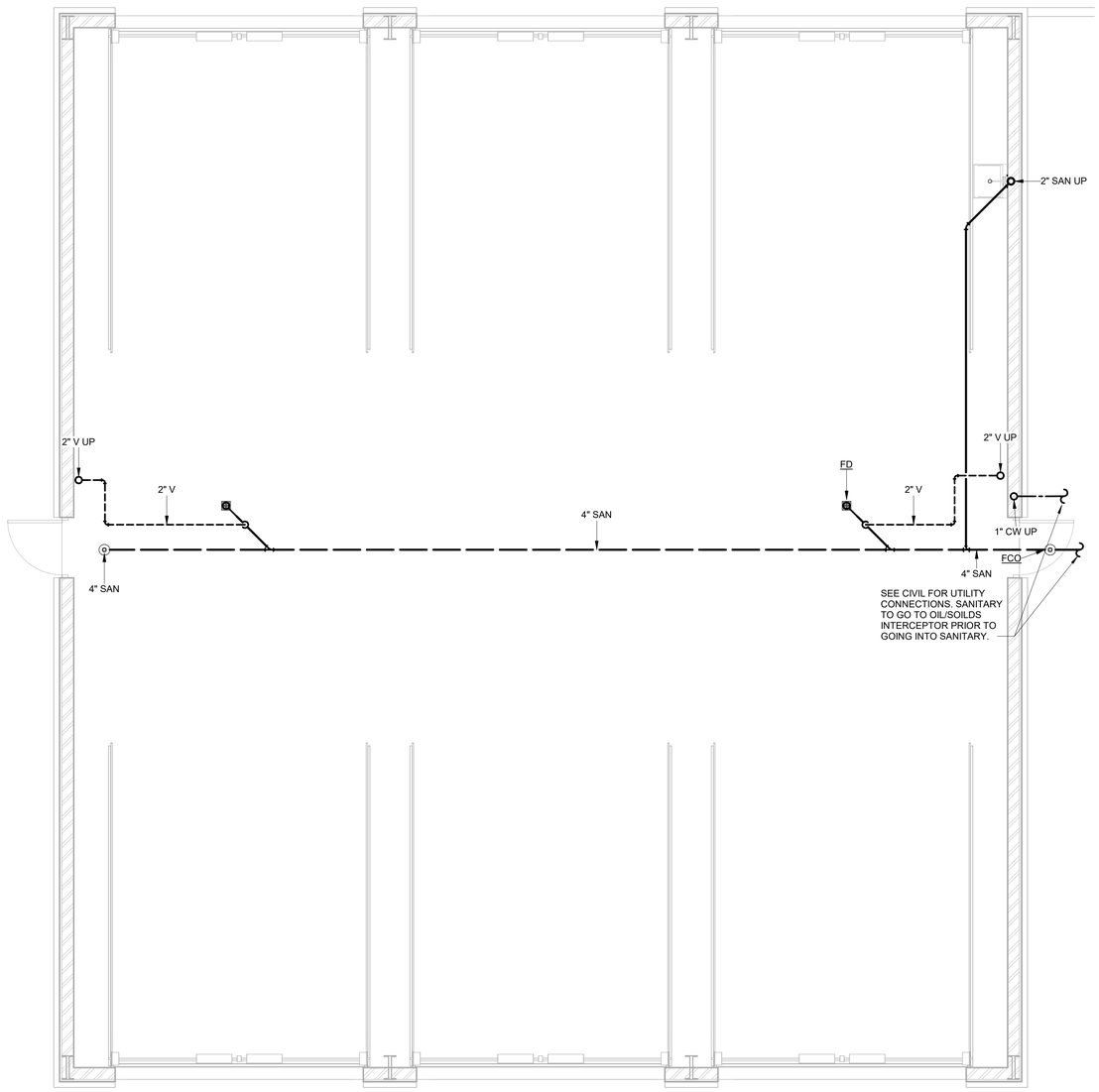

1 PLAN NORTH

PLUMBING - UNDERGROUND FLOOR PLAN

1/4" = 1'-0"

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PLUMBING UNDERFLOOR PLAN

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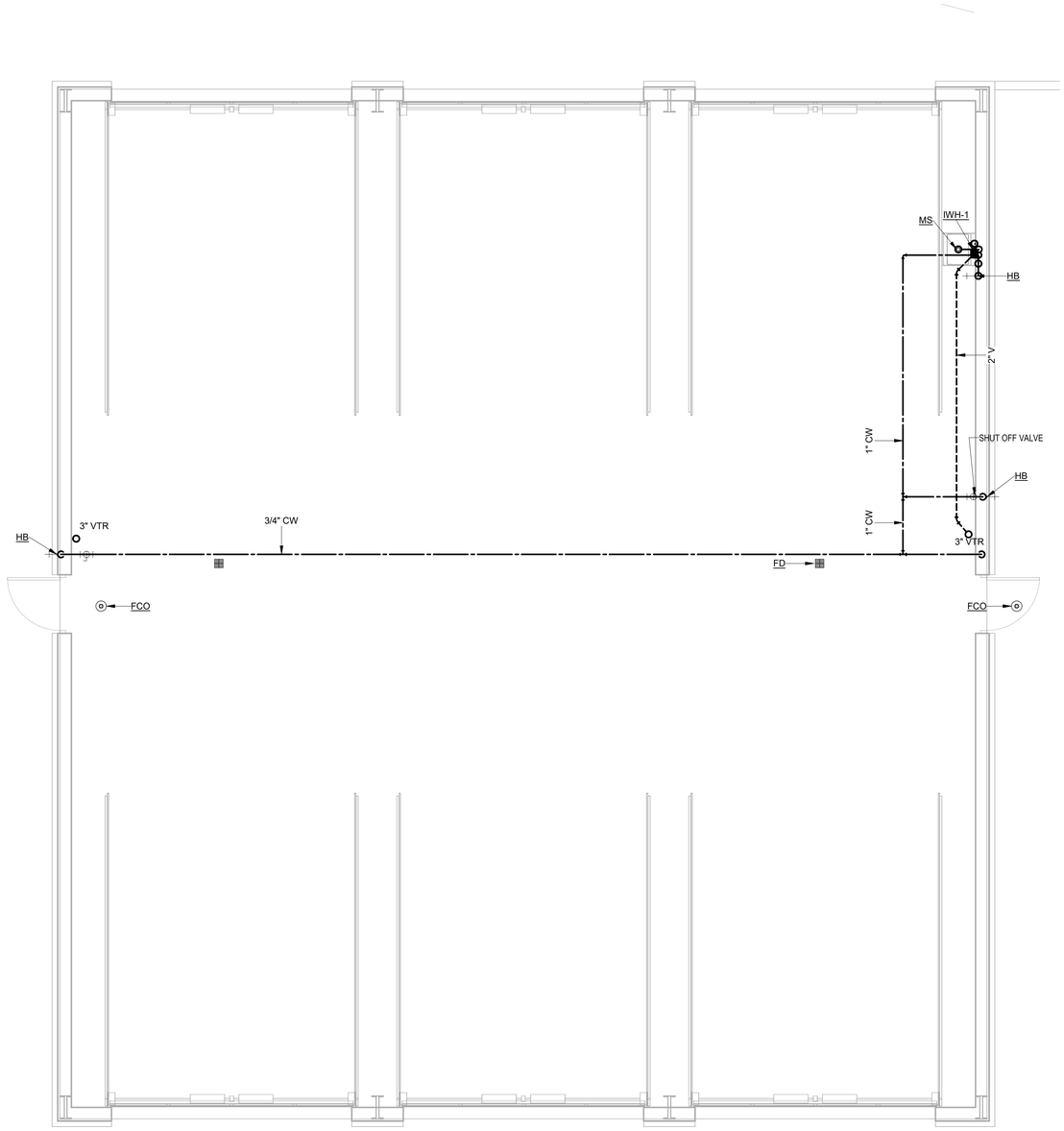

1 PLUMBING - UNDERFLOOR PLAN

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PLUMBING FLOOR PLAN

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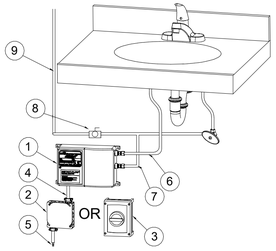
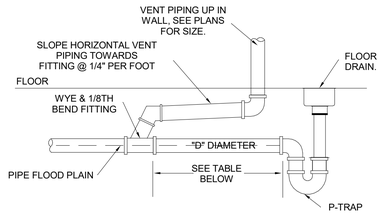


1. Instant-Flow Micro Heater
2. Electrical Junction Supply Box
3. 3095-1 Disconnect Switch
4. Electrical Supply Conduit
5. Electrical Supply Wire
6. 1/2" Hot Water Out
7. 1/2" Cold Water In
8. 1/2" BALL ISOLATION VALVE UNDER COUNTER
9. 1/2" CW PIPING IN WALL

Notes:

1. Heater to be installed below the level of all hot water outlets serviced by the Heater.

06 INSTA HOT WATER HEATER DETAIL
SCALE: NTS



MAXIMUM LENGTHS (REFER TO APPLICABLE CODE)

TRAP ARM PIPE DIAMETER "D" (IN)	DISTANCE TRAP TO VENT MIN (IN)	LENGTH MAX (IN)
1-1/4"	2-1/2"	30
1-1/2"	3	42
2"	4	60
3"	6	72
4"	8	120
EXCEEDING 4	2 x DIAMETER	120

02 FLOOR DRAIN/SINK PIPING DIAGRAM
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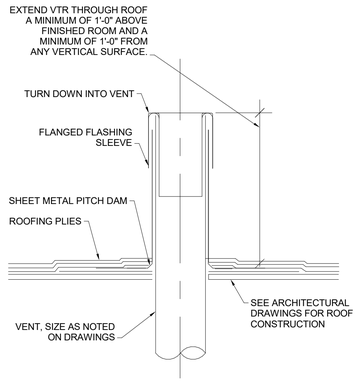

05 VENT THRU ROOF DETAIL
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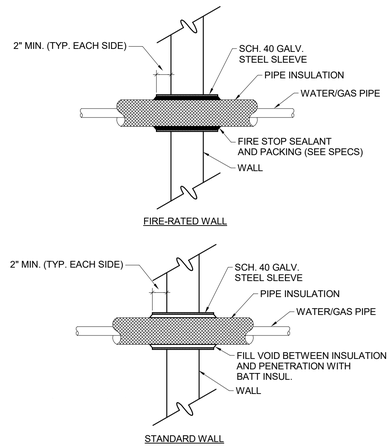

03 TYPICAL PIPING PENETRATION DETAIL
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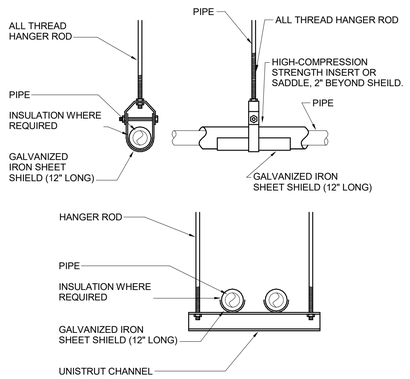

NOTE:

1. ATTACH PIPING SUPPORT TO THE TOP CORD OF THE JOIST OR BEAM.

01 PIPING SUPPORT DETAIL
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PLUMBING DETAILS AND ISOMETRICS

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PLUMBING FIXTURE SCHEDULE

MARK	MANUFACTURER & MODEL	DESCRIPTION	WASTE IN	VENT IN	COLD WATER IN	HOT WATER IN
MS	FIAT TAT1 LAUNDRY TUB - HEAVY DUTY	SINGLE BOWL LAUNDRY TUB WITH LEGS, HEAVY DUTY POLYETHYLENE MATERIAL. 02883906000 HARDWARE KIT - ONE POLISHED CHROME FAUCET WITH SPOUT, ONE P-TRAP AND TWO SUPPLY LINES 02883900100 HARDWARE KIT - ONE SCREW BAG, ONE TAIL NUT , ONE STOPPER AND FOUR LEGS	2"	2"	1/2"	1/2"
FD	ZURN #Z-610 HEAVY DUTY AREA DRAIN	SQUARE TOP DRAIN, DURA-COATED CAST IRON BODY WITH BOTTOM OUTLET, SEEPAGE PAN AND COMBINATION MEMBRANE FLASHING CLAMP AND FRAME FOR HEAVY-DUTY LOOSE, SLOTTED, DURESIST GRATE, WITH SUSPENDED POLYPROPYLENE SEDIMENT BUCKET. RATED FOR VEHICLE TRAFFIC FOR THE GRATE. PROVIDE PRO SET TRAP GUARD INSERT. INSTALL PER MFR'S WRITTEN INSTRUCTIONS.	3"	2"	-	-
TMV	WATTS #LFMMVM1-US	MIXING VALVE: , THERMOSTATIC MIXING VALVE, LISTED UNDER ASSE 1017, ASSE 1069, & ASSE 1070.	-	-	1/2"	1/2"
HB	WOODFORD MODEL #67	FIXTURE: WALL HYDRANT - NON FREEZE , FREEZELESS WALL HYDRANT WITH PATENTED MODEL #50 DOUBLE BACKFLOW PREVENTER. CONFORMS TO ASSE 1052. EXTERIOR FINISH TO BE CHROME PLATED.	-	-	3/4"	-

1. REFERENCE ARCHITECTURAL DRAWINGS FOR ALL PLUMBING FIXTURES REQUIRED TO MEET ADA.
2. REFERENCE ARCHITECTURAL DRAWINGS FOR ALL PLUMBING FIXTURE SINK / LAVATORY / TUBS / WATER CLOSET SIZES AND MOUNTING TYPES.

PIPING MATERIAL SCHEDULE

SERVICE	PIPING	JOINING	INSULATION
SANITARY SEWER AND VENT BELOW GRADE NO FOAM OR CELLUAR CORE PIPING PERMITTED	PVC SCHEDULE 40	SOLVENT WELDED ASTM D2564	N/A
SANITARY SEWER AND VENT ABOVE GRADE NO FOAM OR CELLUAR CORE PIPING PERMITTED	CAST IRON CISPI 301, HUBLESS, SERVICE WEIGHT	NEOPRENE GASKETS AND SS CLAMP AND SHIELD ASSEMBLIES (NO-HUB)	N/A
WATER PIPING BELOW GRADE	ASTM B88, TYPE L HARD OR SOFT DRAWN	ANSI/ASTM B32, "LEAD-FREE" SOLDER	N/A
WATER PIPING ABOVE GRADE	ASTM B88, TYPE L HARD DRAWN	ANSI/ASTM B32, "LEAD-FREE" SOLDER	3/4" OR LESS USE 1/2" THICK FIBERGLASS
			1" OR GREATER USE 1" THICK FIBERGLASS
CONDENSATE DRAINAGE	CPVC SCHEDULE 40	SOLVENT WELDED ASTM D2846, ASTM F 493	N/A

REFER TO SPECIFICATIONS FOR OTHER DETAILS.

1. SEE SPECIFICATION FOR INSULATION JACKETS.
2. UNDER NO CIRCUMSTANCES SHALL PVC PIPING BE USED IN RETURN AIR SPACES.
3. USED MATERIAL ONLY AS APPROVED BY AUTHORITIES HAVING JURISDICTION.
4. ALL MATERIALS USED SHALL HAVE A FLAME SPREAD OF NOT MORE THAN 25 WITHOUT EVIDENCE OF CONTINOUS PROGRSSIVE COMBUSTION AND WITH A SMOKE DEVELOPED RATING OF NOT HIGHER THAN 50. SHOP DRAWINGS SUBMITTAL SHALL SHOW THIS INFORMATION.
5. INSULATION VALUES MUST MEET MIN. REQUIRMENT OF ENERGY CODE ADOPTED BY THE AUTHORITIES HAVING JURISDICTION, OR AS LISTED HERE IN WHICH EVER IS GREATER.

HANGER SPACING TABLE

PIPING MATERIAL	MAXIMUM HORIZONTAL SPACING (feet)	MAXIMUM VERTICAL SPACING (feet)
ABS PIPE	4	10
CAST-IRON PIPE	5a	15
COPPER OR COPPER-ALLOY PIPE	12	10
COPPER OR COPPER-ALLOY TUBING, 1 1/4-INCH DIAMETER AND SMALLER	6	10
COPPER OR COPPER-ALLOY TUBING, 1 1/2-INCH DIAMETER AND LARGER	10	10
CROSS-LINKED POLYETHLENE (PEX) PIPE	2.67 (32 INCHES)	10
CROSS-LINKED POLYETHYLENE/ ALUMINUM/CROSS-LINKED POLYETHYLENE (PEX-AL-PEX) PIPE	2.67 (32 INCHES)	4
CPVC PIPE OR TUBING, 1 INCH AND SMALLER	3	10
CPVC PIPE OR TUBING, 1 1/4 INCHES AND LARGER	4	10
STEEL PIPE	12	15
PVC PIPE	4	10

SHOCK ARRESTOR SCHEDULE

PIPE SIZE	FIXTURE UNITS
1 / 2"	1-11
3 / 4"	12-32
1"	33-60
1-1 / 4"	61-113
1-1 / 2"	114-154
2"	155-330

1. ACCEPTABLE MANUFACTURERS INCLUDE PRECISION PLUMBING PRODUCTS, SIOUX CHIEF, WADE AND MIFAB.

INSTANTANEOUS WATER HEATER SCHEDULE

MARK	GALLONS PER MINUTE	VOLTAGE/PHASE	KW	OUTPUT TEMPERATURE	RECOVERY RATE (GPH)	AMPS	WIRE SIZE	MANUFACTURER MODEL NO.
IWH-1	1G/MIN	240/1	6.5	110°	1	27A	10AWG	EEMAX #SPEX65T

DVO
urban-gro
825 TOWN AND COUNTRY LANE
STE 1150
HOUSTON, TX 77024
P.(281) 293-7500
WWW.DVOENG.COM
REGISTRATION NO. F-24186

ANGLETON
Where the Heart is

Angleton Fire Station #3 Addition

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INTERIM REVIEW ONLY
DOCUMENT INCOMPLETE:
Not intended for permit or construction.
06/02/23

iAD PROJECT #	23017
ISSUE DATE:	06/02/23

	06/02/23	95 % OWNER REVIEW SET

REVISION LOG

PLUMBING SCHEDULES

P7.00

SCALE: AS NOTED

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