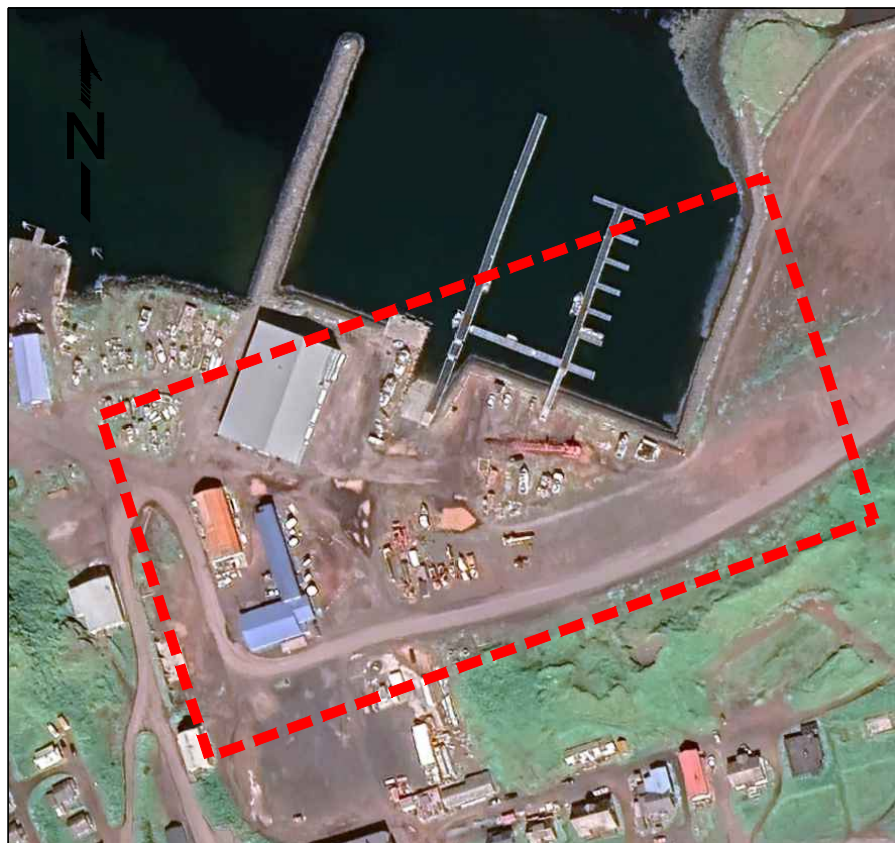


VICINITY MAP



SMALL BOAT HARBOR UTILITY EXPANSION PROJECT

CITY OF SAINT PAUL
950 GORBATCH STREET
SAINT PAUL ISLAND, ALASKA 99660
(907)-341-3994

FEBRUARY 9, 2024

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REVISIONS & ADDENDUMS	#	DATE	REMARKS

MANAGEMENT	DESIGNED	DRAWN	CHECKED	APPROVED	LAST EDIT	PLOT DATE	SUBMITTAL

SMALL BOAT HARBOR UTILITIES
CITY OF SAINT PAUL
COVER SHEET

PROJECT NUMBER: 165.030630
DRAWING FILE NAME: 030630_G-100-COVER.DWG
DRAWING SCALE: AS SHOWN

SHEET NUMBER
G-100

CONSTRUCTION NOTES

1. GENERAL:
 - 1.1. LOCATIONS OF EXISTING UTILITIES ARE APPROXIMATE. ALL BURIED UTILITIES, MAY NOT BE SHOWN OR MAY NOT BE SHOWN ACCURATELY. THE CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING THE EXISTENCE AND LOCATION OF ANY UNDERGROUND OR CONCEALED UTILITY LINES THAT MAY BE REQUIRED TO BE AVOIDED DURING CONSTRUCTION.
 - 1.2. ALL CONSTRUCTION ACTIVITIES FOR WATER & SEWER SHALL BE IN ACCORDANCE WITH THE STATE OF ALASKA DEPARTMENT OF ENVIRONMENTAL CONSERVATION (ADEC) REGULATIONS 18 AAC 70 (WATER QUALITY STANDARDS), AND 18 AAC 72 (WASTEWATER DISPOSAL).
2. BURIED PIPES:
 - 2.1. REMOVE ROCK OR OTHER UNYIELDING MATERIAL, WHEN ENCOUNTERED, TO THE DEPTH SHOWN ON THE PLANS OR AS DIRECTED AND REPLACE WITH APPROVED LOCAL MATERIAL.
 - 2.2. OVER-EXCAVATE AND REMOVE THAWED UNSTABLE MATERIALS (SILT, PEAT, OR ORGANICS) FOUND IN BOTTOM OF EXCAVATION. COORDINATE WITH LOCAL LANDFILL MANAGER FOR DISPOSAL LOCATION OF ANY UNUSABLE MATERIALS.
 - 2.3. PLACE STRUCTURAL FILL AND PIPE BEDDING IN UNIFORM LAYERS NO MORE THAN SIX (6) INCHES DEEP AND COMPACT UNTIL FIRM AND UNYIELDING. ADJUST THE MOISTURE CONTENT TO 2-PERCENT OF THE OPTIMUM MOISTURE CONTENT. COMPACTION SHOULD BE AT LEAST 95-PERCENT OF THE MAXIMUM DENSITY.
 - 2.4. PLACE NON-STRUCTURAL FILL IN UNIFORM LAYERS NO MORE THAN TWELVE (12) INCHES DEEP AND COMPACT BY EXCAVATOR OR OTHER EQUIPMENT TO MINIMIZE SETTLING.
 - 2.5. BEGIN THE PIPE LAYING AT THE DOWNSTREAM END OF THE PIPE. KEEP THE LOWER SEGMENT OF THE PIPE IN CONTACT WITH THE SHAPED BEDDING THROUGHOUT ITS FULL LENGTH. ALL PIPE WILL BE LAID IN PREPARED BEDDING. PIPE WILL BE STRAIGHT AND AT A CONSTANT SLOPE WITHOUT DIPS, SAGS, BENDS, CRESTS, ETC. CORRECT ANY PIPE THAT IS OUT OF ALIGNMENT, UNDULY SETTLED, OR DAMAGED AND RE-LAY OR REPLACE.
3. HDPE PIPE:
 - 3.1. ALL PERSONS PERFORMING HDPE FUSION SHALL BE TRAINED IN THE CORRECT METHOD OF BUTT FUSION IN ACCORDANCE WITH ASTM F2620-6, PPI TN-42 / TR-33, AND QUALIFIED ANNUALLY. THE FUSION OPERATOR SHALL BE THOROUGHLY FAMILIAR WITH AND TRAINED ON THE SPECIFIC EQUIPMENT BEING USED. ALL FUSION EQUIPMENT USED ON THIS PROJECT SHALL BE IN GOOD WORKING ORDER.
 - 3.2. THE CONTRACTOR SHALL ENSURE THAT EACH JOINT IS FUSED AT THE TEMPERATURE AND PRESSURE RECOMMENDED BY THE PIPE MANUFACTURER, AND IN ACCORDANCE WITH ALL THEIR RECOMMENDATIONS, IN ORDER TO ACHIEVE THE MAXIMUM PRESSURE RATING FOR THAT JOINT.
 - 3.3. THE CONTRACTOR WILL KEEP RECORDS OF EACH WELD FOR REVIEW BY THE ENGINEER (I.E. TEMPERATURES, TIME, ETC.)
4. REPORTING, RESULTS AND RED LINES:
 - 4.1. CONTRACTOR TO PROVIDE DAILY REPORTING DURING CONSTRUCTION TO OWNER / REPRESENTATIVE.
 - 4.2. AT A MINIMUM, DAILY REPORTS MUST INCLUDE THE FOLLOWING: DATE, WEATHER, SUMMARY OF WORK PERFORMED, DISTANCE OF PIPES LAID, EXCAVATION AND BACKFILL LOGS, LOCATION OF OPEN TRENCHES, PHOTOS, TEST RESULTS, OUT OF SCOPE WORK, AND REWORK.
 - 4.3. KEEP DETAILED TEST RECORDS AND RESULTS FOR HYDROSTATIC TESTING, FLUSHING AND DISINFECTION. SUBMIT COMPLETE SET AT SUBSTANTIAL COMPLETION. FINAL PAYMENT REQUEST WILL NOT BE APPROVED UNTIL A COMPLETE SET OF TEST RESULTS HAVE BEEN SUBMITTED FOR ALL PIPES, MANHOLES AND THE WET WELL TESTING.
 - 4.4. CONTRACTOR RED LINES WILL BE KEPT THROUGHOUT CONSTRUCTION. RED LINES WILL INCLUDE AT A MINIMUM CHANGES IN ALIGNMENT, LOCATION, ELEVATIONS, OR MATERIALS. RED LINE LOCATIONS WILL BE LABELED BY NORTHEASTINGS.
 - 4.5. UPDATE DRAWINGS WITH RED LINES DAILY. PROVIDE A SET OF CURRENT RED LINES AT EACH PAY REQUEST. PAY REQUESTS WILL ONLY BE PROCESSED FOR WORK THAT HAS RED LINES.
 - 4.6. A COMPLETE SET OF RED LINES WILL BE SUBMITTED AT SUBSTANTIAL COMPLETION. CONTRACTOR WILL PROVIDE A STATEMENT THAT RED LINES ARE ACCURATE.
 - 4.7. ALL SUBMITTALS GO TO THE CITY OF SAINT PAUL'S DESIGNATED REPRESENTATIVE.

MATERIAL SPECIFICATIONS

1. NON-STRUCTURAL MATERIAL: NON-STRUCTURAL MATERIAL NOT MEETING STRUCTURAL FILL OR PIPE BEDDING SPECIFICATIONS MAY BE USED AS BACKFILL ABOVE PIPE BEDDING OUTSIDE OF EXISTING ROADS.
2. STRUCTURAL FILL: AGGREGATE THAT CONTAINS NO MUCK, FROZEN MATERIAL, ROOTS, SOD, OR OTHER DELETERIOUS MATTER. HAS A PLASTICITY INDEX NOT GREATER THAN 6. MEETS THE FOLLOWING GRADING REQUIREMENTS, OR AS APPROVED BY THE ENGINEER:

SIEVE	PERCENT PASSING BY WEIGHT
2 INCH	100
NO. 4	20 - 60
NO. 200	0 - 6
3. PIPE BEDDING: SAND THAT CONTAINS NO MUCK, FROZEN MATERIAL, ROOTS, SOD, OR OTHER DELETERIOUS MATTER. HAS A PLASTICITY INDEX NOT GREATER THAN 6. MEETS THE FOLLOWING GRADING REQUIREMENTS, OR AS APPROVED BY THE ENGINEER:

SIEVE	PERCENT PASSING BY WEIGHT
3/8 INCH	100
NO. 4	95 - 100
NO. 200	0 - 6
4. PLASTIC COVER: 8 MIL POLYETHYLENE OR EQUAL.
5. ALL PIPE AND FITTINGS TO NOT CONTAIN MORE THAN 0.2 PERCENT LEAD WHEN USED WITH RESPECT TO SOLDER AND FLUX AND NOT HAVE MORE THAN A WEIGHTED AVERAGE OF 0.25 PERCENT LEAD WHEN USED WITH RESPECT TO WETTED SURFACES OF PIPES AND FITTINGS.
6. ALL COMPONENTS PROPOSED FOR DIRECT CONTACT WITH WATER MUST BE CERTIFIED BY AN ANSI ACCREDITED ORGANIZATION TO ANS/NSF STANDARD 61.
7. PERFORM FLUSHING AND HYDROSTATIC TESTING ON ALL PIPING PER ASTM F1417 AND ASTM E1003. DISINFECT ALL WATER PIPING ACCORDING TO AWWA C651 FOR DISINFECTION.
8. WATER PIPE SHALL BE HDPE 4710 SDR 11 FOR WATER MAINS AND SERVICES.
9. SEWER PIPE SHALL BE HDPE 3408 SDR 11 FOR FORCE MAINS AND GRAVITY SERVICES.

LINework LEGEND

EXISTING	PROPOSED	DESCRIPTION
		BUILDING
		EDGE OF CONCRETE
		EDGE OF TRAVELED WAY
		BURIED ELECTRIC
		FUEL PIPE
		MAJOR CONTOURS
		MINOR CONTOURS
		PROPERTY LINES
		WATER SERVICE PIPE
		SEWER SERVICE PIPE
		SEWER FORCE MAIN
		ROAD/UTILITY EASEMENT

SYMBOL LEGEND

EXISTING	PROPOSED	DESCRIPTION
		FIRE HYDRANT
		POST / BOLLARD
		MANHOLE
		ELECTRICAL JUNCTION
		SURVEY MONUMENT
		DEMOLITION AREAS
		FLOW DIRECTION
		WELL HEAD
		VALVE
		SATELLITE DISH
		SIGN
		CLEANOUT
		CONCRETE STRUCTURE

DETAIL AND SECTION CALLOUT LEGEND

	DETAIL
	SECTION

ABBREVIATIONS

ACSPI	ALEUT COMMUNITY OF SAINT PAUL ISLAND
ADEC	ALASKA DEPARTMENT OF ENVIRONMENTAL CONSERVATION
ASTM	AMERICAN SOCIETY OF TESTING & MATERIALS
AVG	AVERAGE
AWG	AMERICAN WIRE GAUGE
BOP	BEGINNING OF PROJECT
C	CIVIL
CBSFA	CENTRAL BERING SEA FISHERMEN'S ASSOCIATION
CI	CAST IRON
CIR	CIRCLE
COMP	COMPARTMENT
DEMO	DEMOLITION
DIA, Ø	DIAMETER
DR	DRIVE
DRW	DRAWING
E	EAST, ELECTRICAL
EA	EACH
ELEV	ELEVATION
EO	ELECTRIC OVERHEAD
EOP	END OF PROJECT
FM	FORCE MAIN
FL	FLANGE
FT	FEET
FPS	FEET PER SECOND
G	GENERAL
GPCD	GALLONS PER CAPITA DAY
GPD	GALLONS PER DAY
GPM	GALLONS PER MINUTE
HMWPE	HIGH MOLECULAR WEIGHT POLYETHYLENE
HDPE	HIGH DENSITY POLYETHYLENE
HP	HIGH POINT
ID	INSIDE DIAMETER
IN	INCH
LF	LINEAL FEET
LN	LANE
LP	LOW POINT
LT	LEFT
MAX	MAXIMUM
MH	MANHOLE
MIN	MINIMUM
MJ	MECHANICAL JOINT
N	NORTH
NIC	NOT IN CONTRACT
OC	OFF CENTER
OD	OUTSIDE DIAMETER
OFF	OFFSET
PER	PRELIMINARY ENGINEERING REPORT
PC	POINT OF CURVATURE
PRV	PRESSURE REDUCING VALVE
PSI	POUNDS PER SQUARE INCH
RD	ROAD
ROW	RIGHT OF WAY
RT	RIGHT
S	SOUTH
SEC	SECOND
SS	SANITARY SEWER
TAC	THE ALEUT CORPORATION
TDX	TANADGUSIX CORPORATION
TYP	TYPICAL
UG/E	UNDERGROUND ELECTRIC
VB	VALVE BOX
VSW	VILLAGE SAFE WATER PROGRAM
W	WATER
YRS	YEARS

ROW HATCHING LEGEND

	TDX OWNED
	ABANDON
	ACSPI LEASED
	CBSFA LEASED

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REVISIONS & ADDENDUMS	#	DATE	REMARKS

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DRAWING FILE NAME	DRAWING SCALE
030630_G-101-NOTES, LEGENDS & ABBREVIATIONS.DWG	AS SHOWN

SMALL BOAT HARBOR UTILITIES
CITY OF SAINT PAUL
NOTES, LEGENDS & ABBREVIATIONS

PROJECT NUMBER: 165.030630
 DRAWING FILE NAME: 030630_G-101-NOTES, LEGENDS & ABBREVIATIONS.DWG
 DRAWING SCALE: AS SHOWN

COMMUNITY DATA:

THE CITY OF SAINT PAUL IS A SECOND CLASS CITY LOCATED ON SAINT PAUL ISLAND IN THE BERING SEA OFF THE WEST COAST OF ALASKA. IT IS APPROXIMATELY 750 MILES WEST OF ANCHORAGE AND IS ONLY ACCESSIBLE BY AIR OR SEA. THE COMMUNITY IS LOCATED ABOUT 3 MILES FROM THE 6500-FOOT LONG STATE-OWNED AIRPORT. THE CITY IS HOME TO APPROXIMATELY 360 RESIDENTS AND HOSTS 145 NON-SEASONAL HOMES. THERE ARE APPROXIMATELY 190 SERVICE CONNECTIONS THAT ARE SERVED BY THE TWO LIFT STATIONS. ACCORDING TO THE ALASKA DEPARTMENT OF ENVIRONMENTAL CONSERVATION, THE SAINT PAUL WASTEWATER COLLECTION SYSTEM IS CLASSIFIED AS CLASS 1.

THE HARBOR SEWER CURRENTLY HAS A LIFT STATION FOR THE HARBOR MASTER OFFICE, BUT DUE TO WEATHER RELATED EVENTS THE BUILDING ITSELF IS NO LONGER DEEMED SAFE FOR USE. THE CITY OF SAINT PAUL SEEKS TO CONSTRUCT A NEW HARBOR MASTER OFFICE AT ANOTHER LOCATION. THE NEW HARBOR MASTER OFFICE IS OUT OF THIS PROJECT SCOPE.

SEWER INFRASTRUCTURE CURRENTLY AT THE HARBOR INCLUDE A LIFT STATION SERVICE THE TRIDENT PROCESSING PLANT AND SERVICE LINE CONNECTIONS FOR UNISEA AND UNIPAK PROCESSORS. BLACK WATER LIFT STATIONS FEED INTO AN EXISTING 4" HDPE FORCE MAIN TO THE HARBOR SEPTIC TANKS AT EAST LANDING. EXISTING INFRASTRUCTURE DOES NOT MEET FUTURE DEVELOPMENT NEEDS. FISH WASTE IS SEPARATED FROM THE BLACK WATER SYSTEM. THERE ARE THREE FISH WASTE SEWER FORCE MAINS.

CURRENTLY, THE SMALL BOAT HARBOR & ELLERMAN WATER MAIN ARE NOT DIRECTLY CONNECTED. CONNECTING THEM WILL CREATE A LOOPED SYSTEM.

IMPROVEMENTS:

ALL PROPOSED WORK WILL REQUIRE ADDITIONAL EASEMENTS FROM TDX, CBSFA, AND ACSPI, OUTSIDE OF THE EXISTING HAUL ROAD ROW. THE IMPROVED SYSTEM WILL INCREASE RELIABILITY, RESILIENCE, AND CUSTOMER CONFIDENCE AND WILL SIGNIFICANTLY REDUCE POTENTIAL FOR SYSTEM INTERRUPTIONS DURING MAINTENANCE. THE OPERATION OF THIS NEW LIFT STATION WILL PROVIDE LESS-HAZARDOUS WORKING CONDITIONS DURING MAINTENANCE.

SCOPE OF WORK:

1. THIS PROJECT IS INITIATED BY THE CITY OF SAINT PAUL TO IMPROVE THE SAINT PAUL WATER DISTRIBUTION AND WASTEWATER COLLECTION SYSTEM, PARTICULARLY IN THE SMALL BOAT HARBOR VICINITY.
 2. THE DESIGN IS BASED ON THE 2022 PRELIMINARY ENGINEERING REPORT (PER). KUNA ENGINEERING WAS CONTRACTED BY THE CITY TO DEVELOP THE CONSTRUCTION DOCUMENTS, OBTAIN REQUIRED PERMITS, AND ASSIST WITH CONSTRUCTION ADMINISTRATION.
 3. THE PROPOSED LIFT STATION WILL CONTAIN A CONCRETE WET WELL, ADJACENT TO A LIFT STATION FACILITY TO HOUSE PUMPS, PIPING, AND RELATIVE INSTRUMENTATION.
- A NEW WATER MAIN WILL CONNECT ELLERMAN AND SMALL BOAT HARBOR WATER MAINS.

REFERENCES:

1. 2020 PRELIMINARY ENGINEERING REPORT FOR CITY OF SAINT PAUL WASTEWATER LIFT STATION, POLARCONSULT ALASKA, FEBRUARY 2020.
2. 2022 PRELIMINARY ENGINEERING REPORT FOR CITY OF SAINT PAUL, APPLICATION SUPPLEMENT C, SMALL BOAT HARBOR AREA, POLARCONSULT ALASKA, OCTOBER 2022.

DESIGN CRITERIA:

1. SYSTEM NAME: SAINT PAUL WASTEWATER COLLECTION SYSTEM.
2. DESIGN AND CONSTRUCTION MUST MEET THE STATE OF ALASKA DOMESTIC WASTEWATER TREATMENT AND DISPOSAL STANDARDS (18 AAC 72). CONTRACTOR WILL COMPLY WITH REQUIREMENTS OF ALASKA DEPARTMENT OF ENVIRONMENTAL CONSERVATION'S APPROVAL TO CONSTRUCT. CONTRACTOR WILL CONTACT ENGINEER OF RECORD WITH ANY VARIATIONS FROM THE STANDARDS OR APPROVAL.

LIFT STATION DESIGN CRITERIA	HARBOR LIFT STATION	
	2019 FLOWS	DESIGN
AVERAGE FLOW (GPM)	10.9	150
PEAK FLOW (GPM)	33.9	300
PEAKING FACTOR	3.1	3.1
PUMP RUN TIMES (MIN)	N/A	3.17
AVERAGE PUMP RATE (GPM)	N/A	150
PEAK PUMP RATE (GPM)	N/A	300

TABLE NOTES:

1. WASTEWATER FLOW FOR FULL DEVELOPMENT SCALED FROM EXISTING DEVELOPMENT, WITH CONSTANT PER CAPITA WASTEWATER GENERATION, TO FULL DEVELOPMENT UNDER CURRENT ZONING.
2. PEAKING FACTOR OF 3.1 TIMES AVERAGE FLOW WAS OBSERVED IN ELLERMAN LIFT STATION AND USED FOR ESTIMATING FLOWS IN ALL SERVICE AREAS DUE TO SIGNIFICANTLY LONGER PERIOD OF RECORD.
3. TABLE FROM 2020 PER, TABLE 4-1. THESE ARE THE RECOMMENDED DESIGN CRITERIA.

DESCRIPTION	HARBOR AREA	UNITS
RESIDENTIAL POPULATION DISTRIBUTION	0	PERSON
COMMERCIAL POPULATION DISTRIBUTION	15	PERSON
APPROXIMATE POPULATION AT PLANTS	300	PERSON
EXISTING ESTIMATED DAILY FLOW	15762	GPD
EXISTING AVERAGE DAILY FLOW	11	GPM
EXISTING PEAK FLOW	33.9	GPM
FUTURE DAILY FLOWS	16550	GPD
FUTURE AVERAGE LIFT STATION FLOW	11.5	GPM
FUTURE PEAK LIFT STATION FLOW	35.6	GPM

TABLE NOTES:

1. TABLE FROM 2020 PER, TABLE 4-2. THESE ARE THE EXISTING WASTEWATER LOADINGS.

LIFT STATION	HARBOR LIFT STATION	
	VALUE	UNIT
RECOMMENDED WET WELL DIAMETER:	7	FEET
CYCLE TIME (AVG/PEAK) REASONABLE GROWTH	3.10	-
STATIC HEAD	22.7	FEET
RECOMMENDED PUMP SIZE	150	GPM
FORCE MAIN DIAMETER	4	INCHES
FORCE MAIN LENGTH	2793	FEET
VOLUME PUMPED	432	GALLONS
FORCE MAIN LIQUID VELOCITY	4.64	FT/SEC



REVISIONS & ADDENDUMS	#	DATE	REMARKS

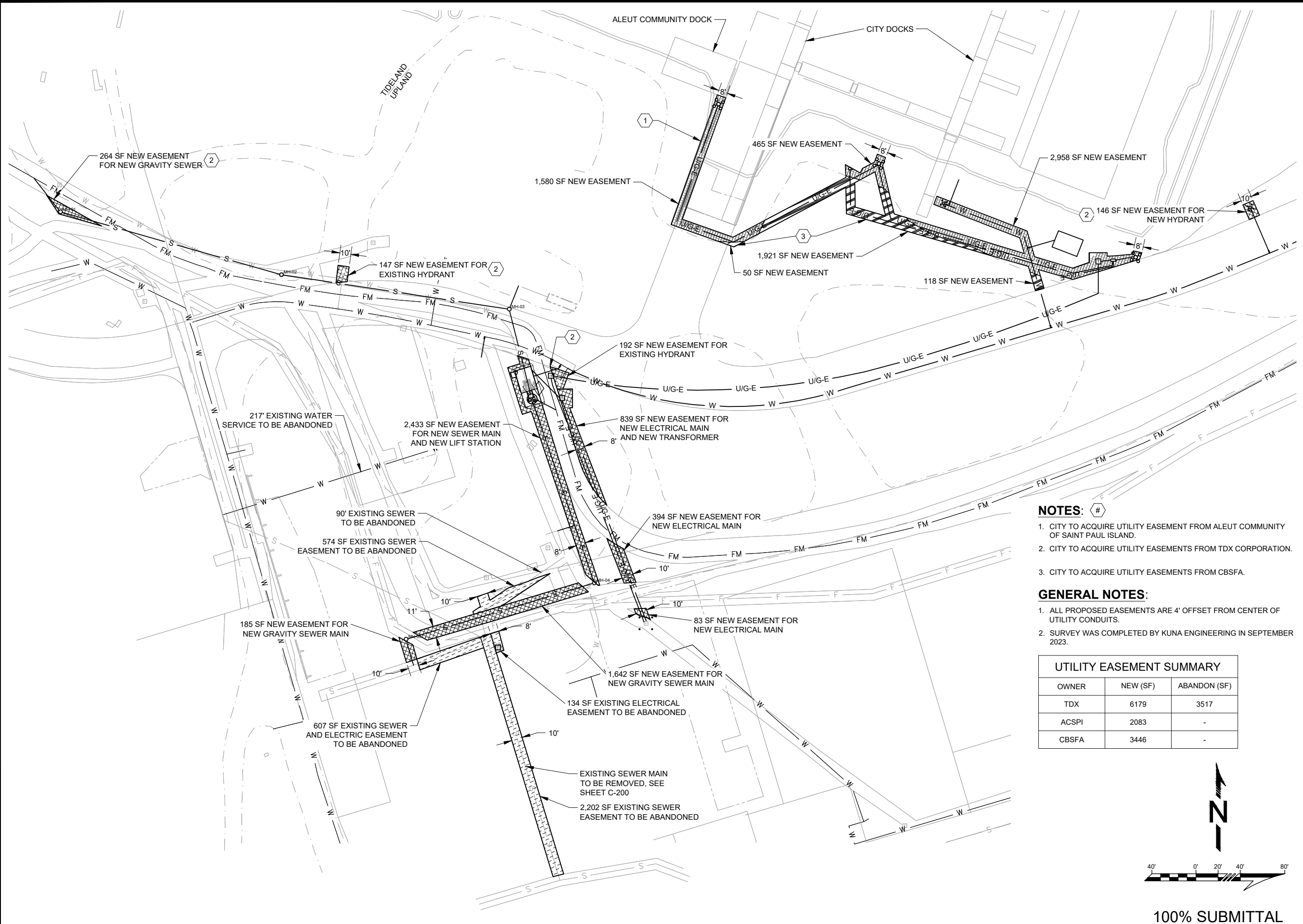
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SMALL BOAT HARBOR UTILITIES
CITY OF SAINT PAUL
SCOPE OF WORK & DESIGN CRITERIA

PROJECT NUMBER: 165.030630
 DRAWING FILE NAME: 030630-G-102-SOW & DESIGN CRITERIA.DWG
 DRAWING SCALE: AS SHOWN

SHEET NUMBER
G-102

100% SUBMITTAL



NOTES: #

- 1. CITY TO ACQUIRE UTILITY EASEMENT FROM ALEUT COMMUNITY OF SAINT PAUL ISLAND.
- 2. CITY TO ACQUIRE UTILITY EASEMENTS FROM TDX CORPORATION.
- 3. CITY TO ACQUIRE UTILITY EASEMENTS FROM CBSFA.

GENERAL NOTES:

- 1. ALL PROPOSED EASEMENTS ARE 4' OFFSET FROM CENTER OF UTILITY CONDUITS.
- 2. SURVEY WAS COMPLETED BY KUNA ENGINEERING IN SEPTEMBER 2023.

UTILITY EASEMENT SUMMARY

OWNER	NEW (SF)	ABANDON (SF)
TDX	6179	3517
ACSPI	2083	-
CBSFA	3446	-

REVISIONS & ADDENDUMS

#	DATE	REMARKS

MANAGEMENT

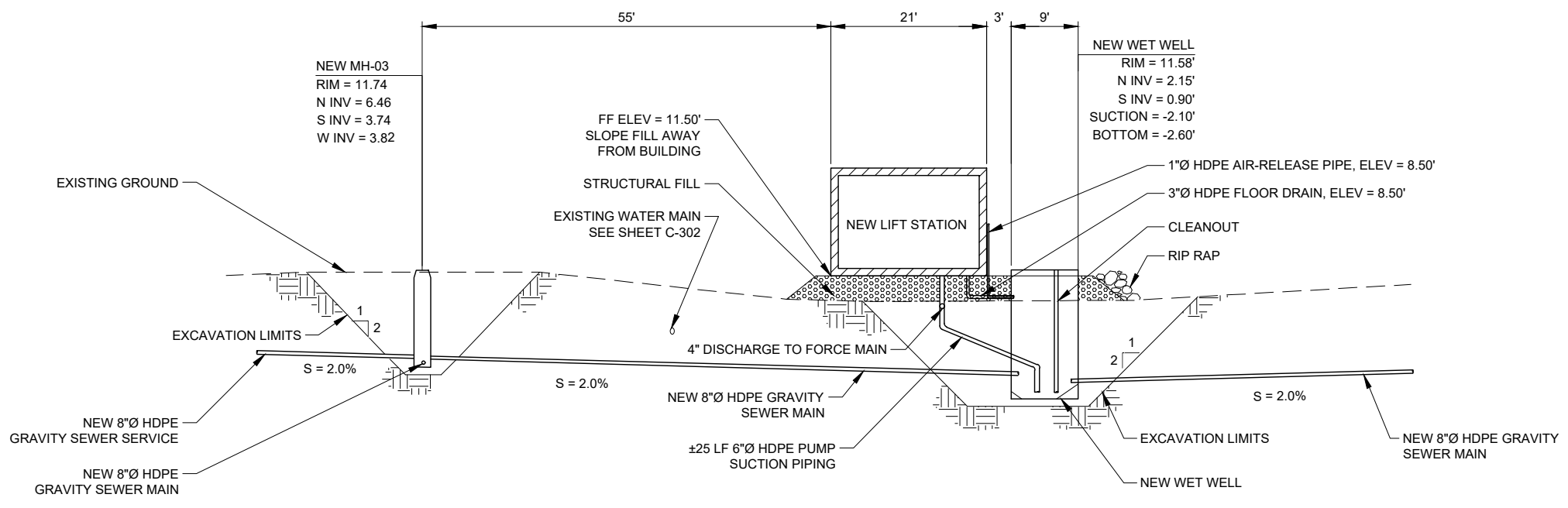
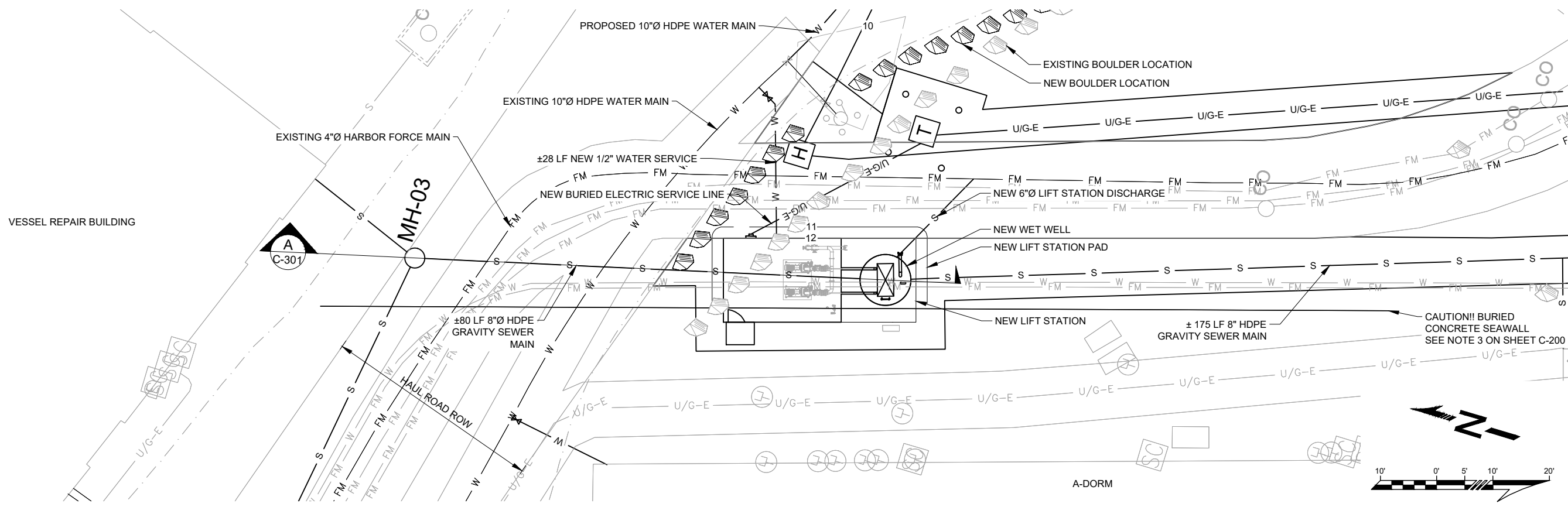
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SMALL BOAT HARBOR UTILITIES
CITY OF SAINT PAUL
UTILITY EASEMENT PLAN

DRAWING FILE NAME: 030630_C-300-UTILITY EASEMENT PLAN.DWG
DRAWING SCALE: AS SHOWN

PROJECT NUMBER: 165.030630

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A SECTION A
SCALE: 1" = 10'

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REVISIONS & ADDENDUMS	#	DATE	REMARKS

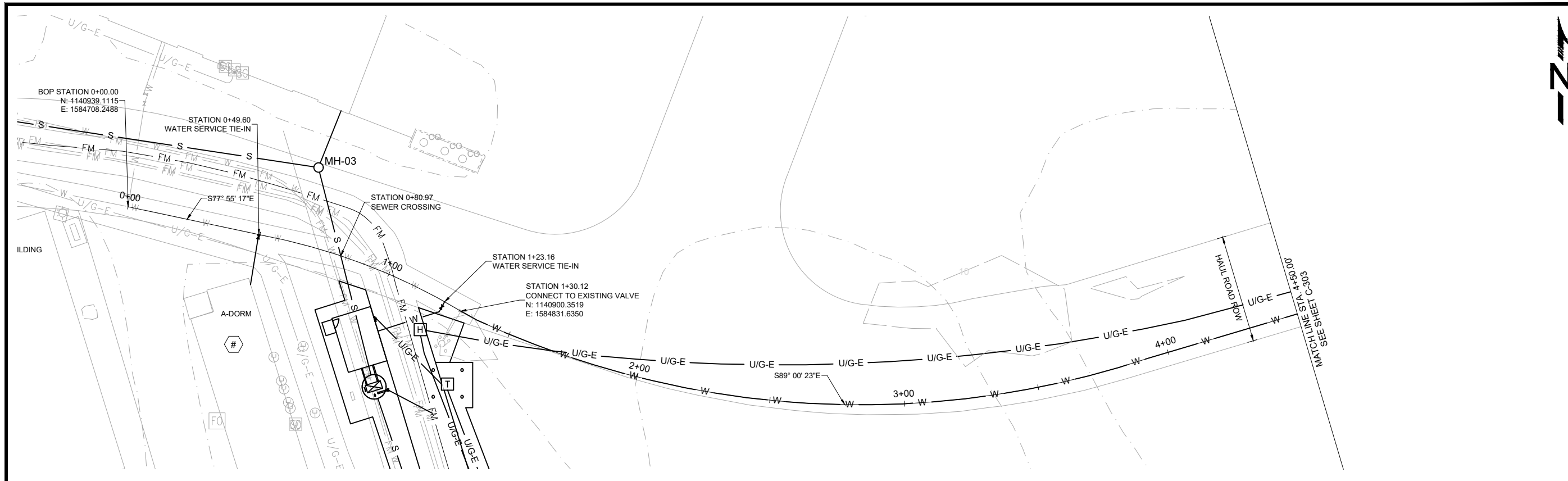
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SMALL BOAT HARBOR UTILITIES
CITY OF SAINT PAUL
LIFT STATION PLAN AND PROFILE

PROJECT NUMBER: 165.030630
DRAWING FILE NAME: 030630-C-301-LIFT STATION P&P.DWG
DRAWING SCALE: AS SHOWN

SHEET NUMBER
C-301

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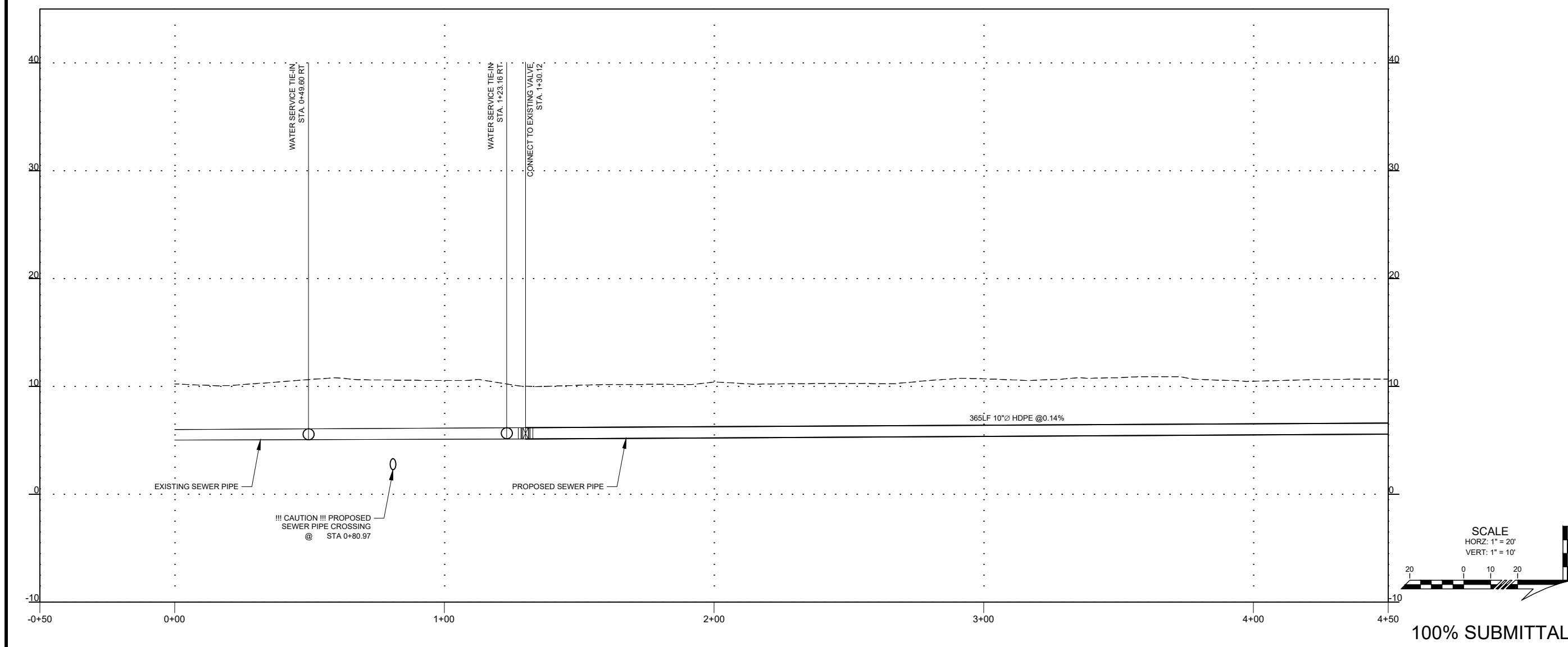
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DATE REMARKS

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PROJECT NUMBER	DRAWING FILE NAME	DRAWING SCALE
165.030630	030630_C-302X-WATER MAIN P&P.DWG	AS SHOWN

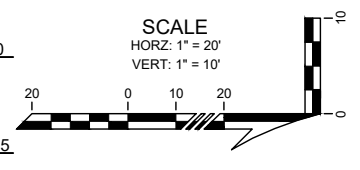
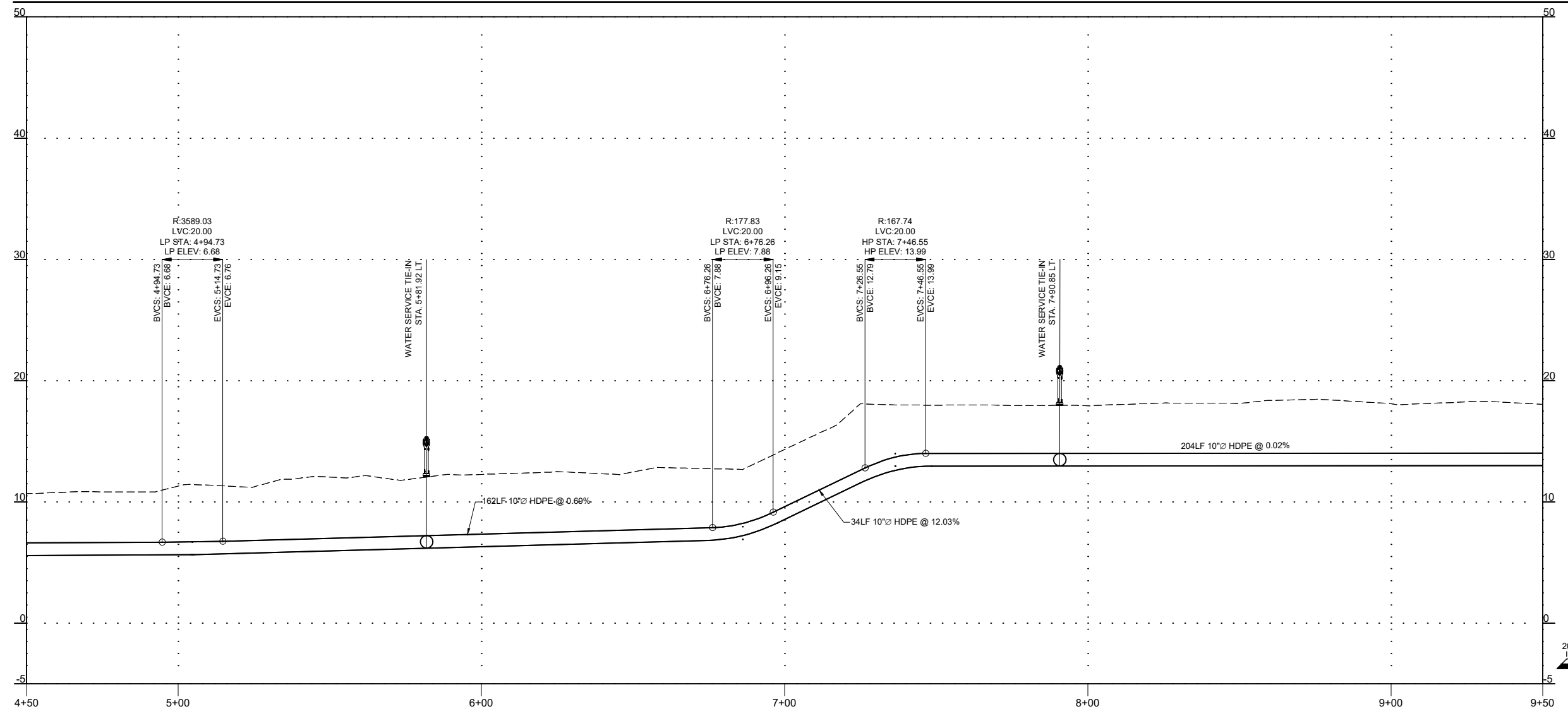
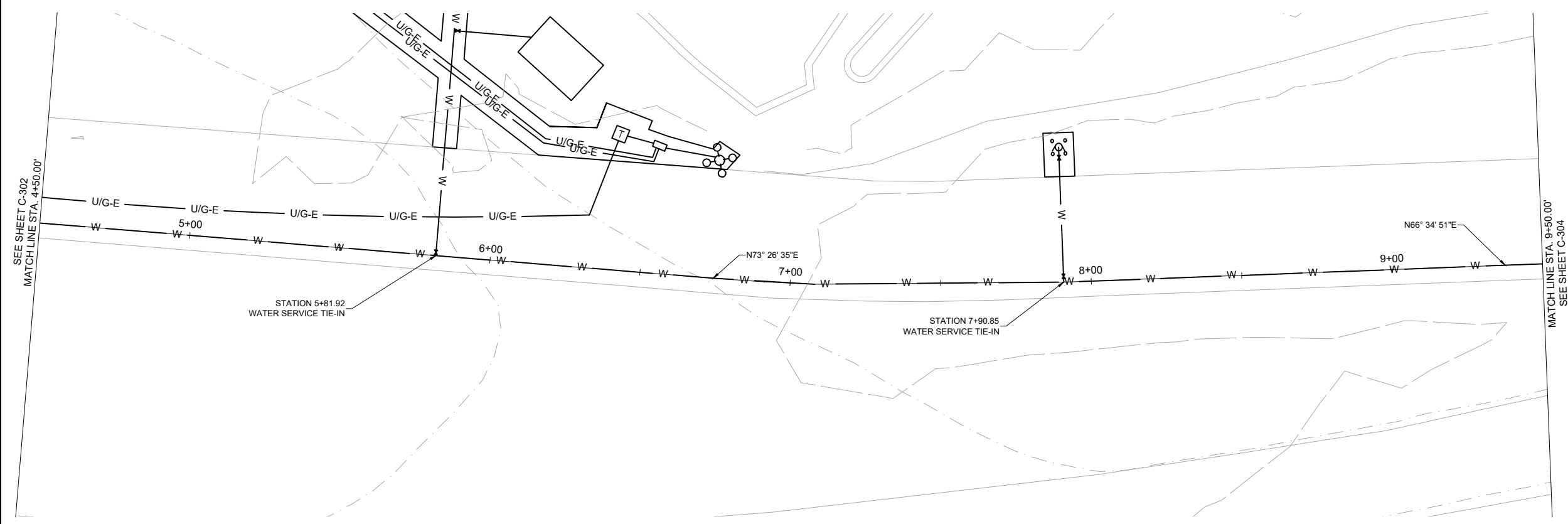
SMALL BOAT HARBOR UTILITIES
CITY OF SAINT PAUL
WATER MAIN PLAN AND PROFILE

SHEET NUMBER
C-302



SCALE
HORZ: 1" = 20'
VERT: 1" = 10'

100% SUBMITTAL



REVISIONS & ADDENDUMS

#	DATE	REMARKS

MANAGEMENT

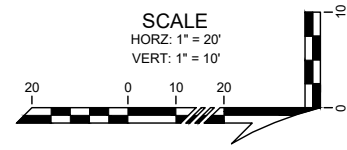
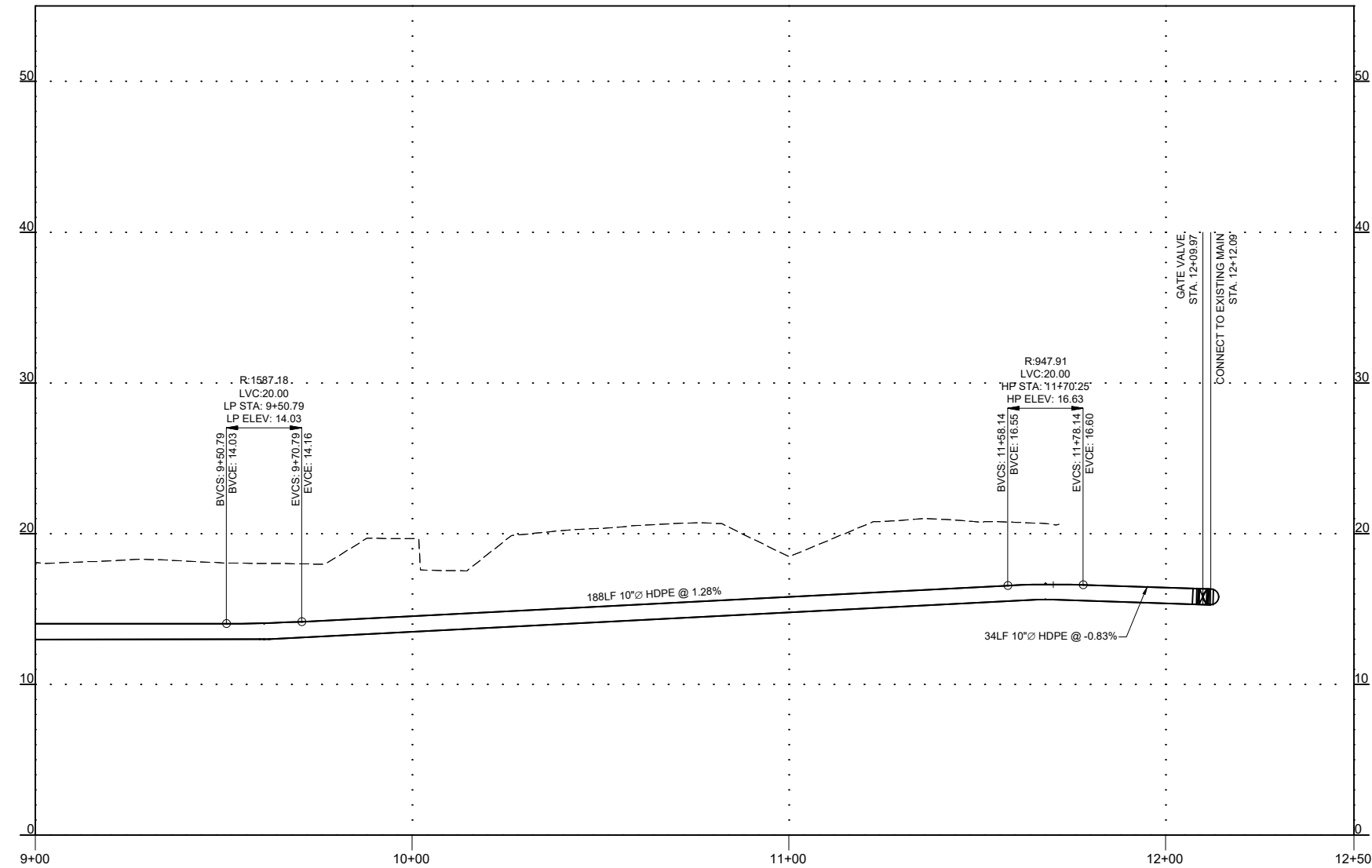
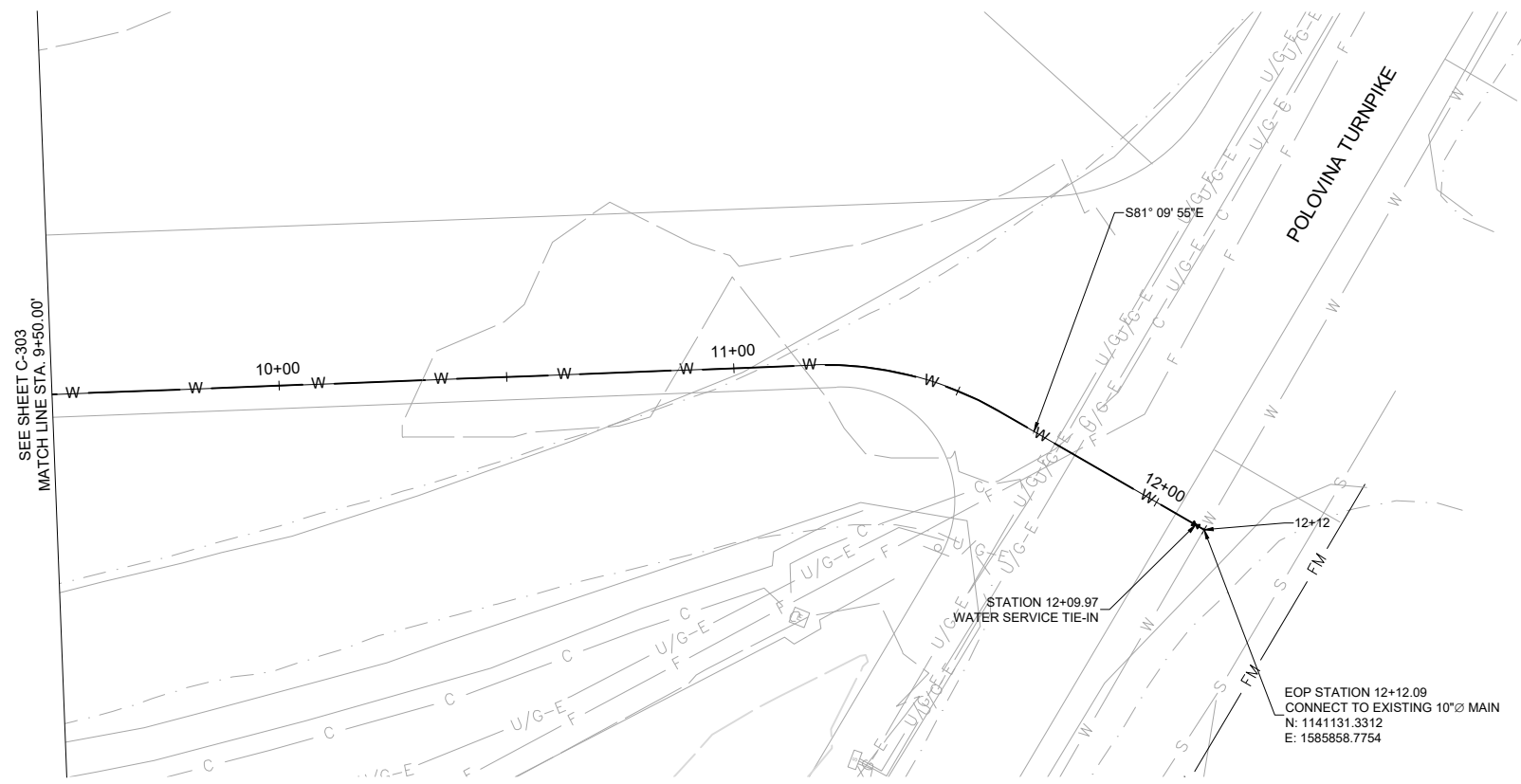
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SMALL BOAT HARBOR UTILITIES
CITY OF SAINT PAUL
WATER MAIN PLAN AND PROFILE

DRAWING FILE NAME: 030630_C-302X-WATER MAIN P&P.DWG
DRAWING SCALE: AS SHOWN

PROJECT NUMBER: 165.030630

100% SUBMITTAL



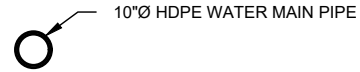
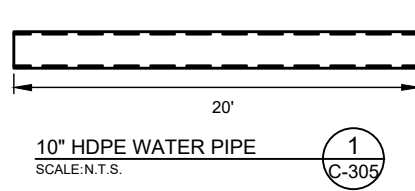
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REVISIONS & ADDENDUMS	
#	DATE

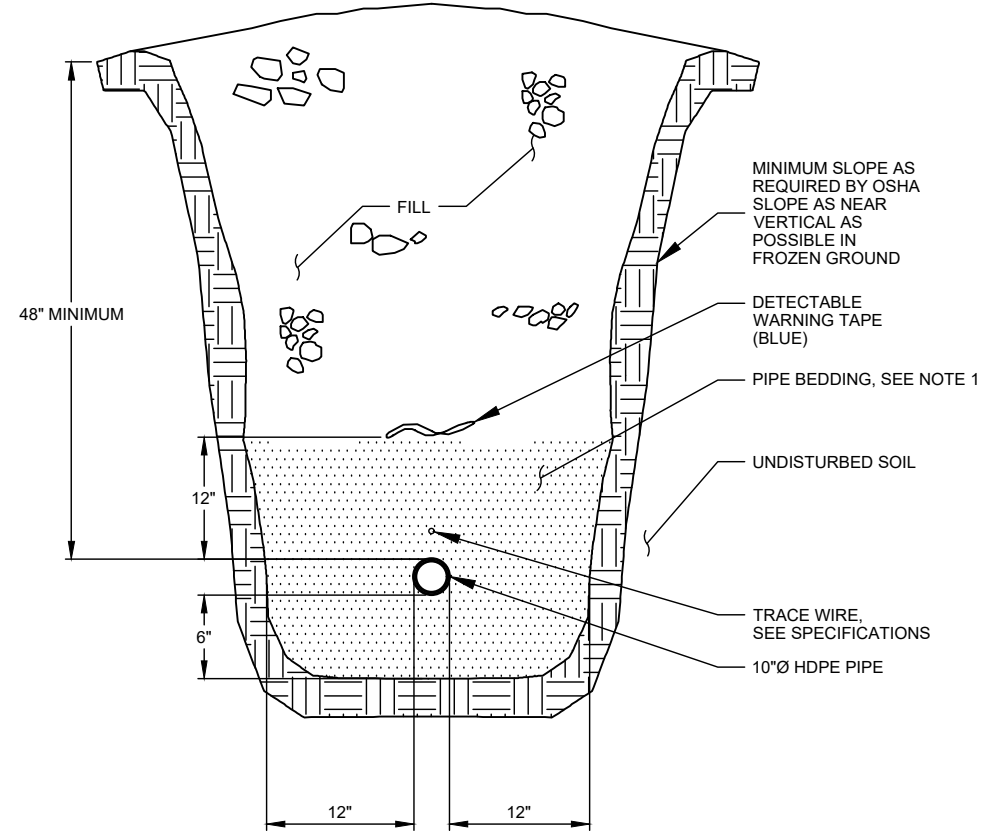
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DESIGNED	BJK
DRAWN	BJK
CHECKED	BJD
APPROVED DEN	
LAST EDIT	2/5/24
PLOT DATE	2/5/24
SUBMITTAL	02/09/24

SMALL BOAT HARBOR UTILITIES
CITY OF SAINT PAUL
WATER MAIN PLAN AND PROFILE

PROJECT NUMBER: 165.030630
DRAWING FILE NAME: 030630_C-302X-WATER MAIN P&P.DWG
DRAWING SCALE: AS SHOWN



NOMINAL CORE PIPE DIAMETER (TYP)	LOCATION
10"	MAINLINES



10" WATER PIPE TRENCH DETAIL (2) C-305
SCALE: N.T.S.

- NOTES:
- NO PIPES SHALL BE INSTALLED WITH LESS THAN 48 INCHES OF COVER.
 - COMPACT WILL BE NATIVE BACKFILL EXCAVATED FROM TRENCH.
 - IF NATIVE BACKFILL MATERIAL IS DEEMED NOT FIT FOR REINSTALLATION, USE STRUCTURAL FILL IN PLACE.

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REVISIONS & ADDENDUMS	#	DATE	REMARKS

MANAGEMENT	DESIGNED	CHK	DRAWN	CHK	CHECKED	APPROVED	LAST EDIT	PLOT DATE	SUBMITTAL

SMALL BOAT HARBOR UTILITIES
CITY OF SAINT PAUL
WATER MAIN FITTINGS & TRENCHING DETAILS

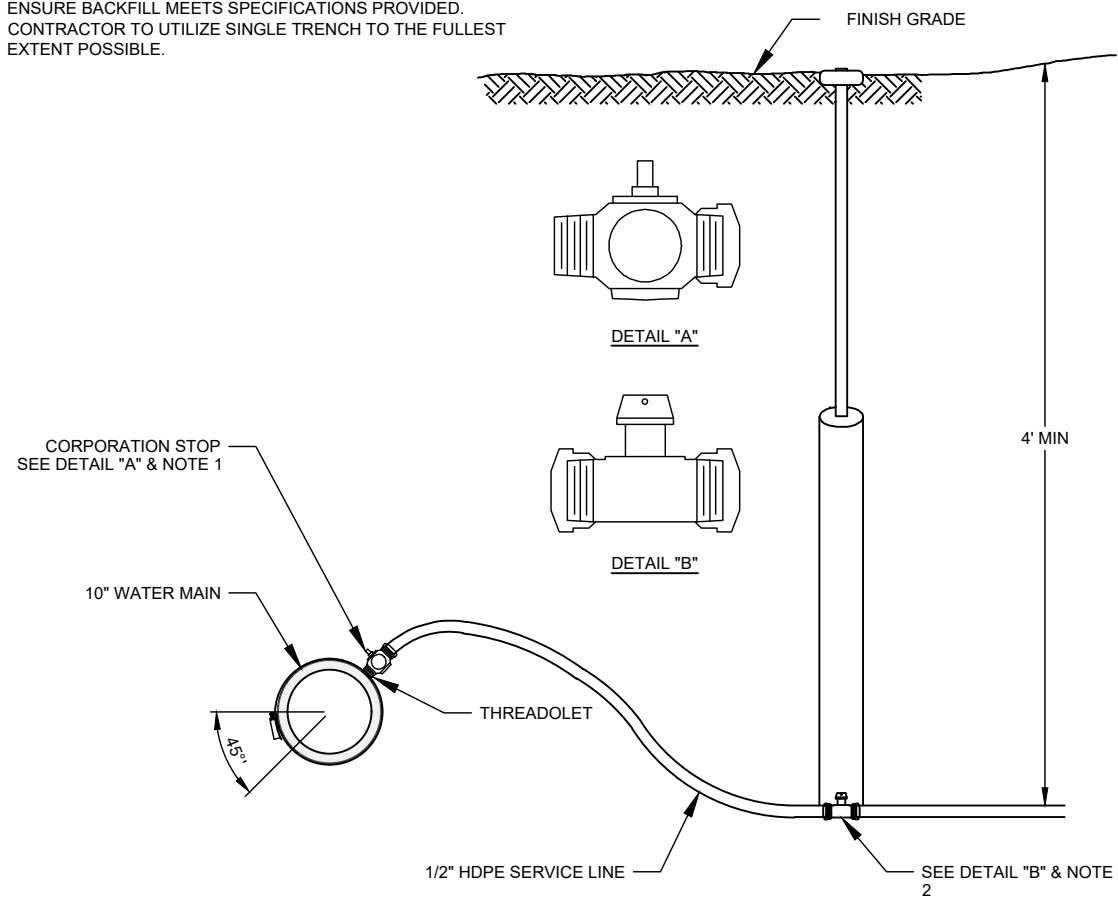
PROJECT NUMBER: 165.030630
DRAWING FILE NAME: 030630-C-305 & C-307-PIPE & TRENCH DETAILS.DWG
DRAWING SCALE: AS SHOWN

SHEET NUMBER
C-305

100% SUBMITTAL

NOTES:

1. FORD CORPORATION STOP, MPT BY BACK JOINT FOR HDPE.
2. FORD SERIES CURB STOP, PACK JOINT OR EQUAL
3. USE ROMAC INDUSTRIES SS SERIES CLAMP MODEL WITH THREADOLET TO CONNECT TO CORPORATION STOP.
4. FIELD LOCATE MIN 10' FROM PROPERTY LINES, SEPTIC, ETC.
5. MAINTAIN 1.5' MINIMUM VERTICAL SEPARATION BETWEEN WATER MAIN AND SEWER MAIN.
6. MAINTAIN 10' MINIMUM HORIZONTAL SEPARATION BETWEEN WATER MAIN AND SEWER MAIN.
5. WATER AND SEWER MAINS ARE TO BE INSTALLED IN SEPARATE TRENCHES TO ACHIEVE SEPARATION REQUIREMENTS.
6. ENSURE BACKFILL MEETS SPECIFICATIONS PROVIDED.
7. CONTRACTOR TO UTILIZE SINGLE TRENCH TO THE FULLEST EXTENT POSSIBLE.

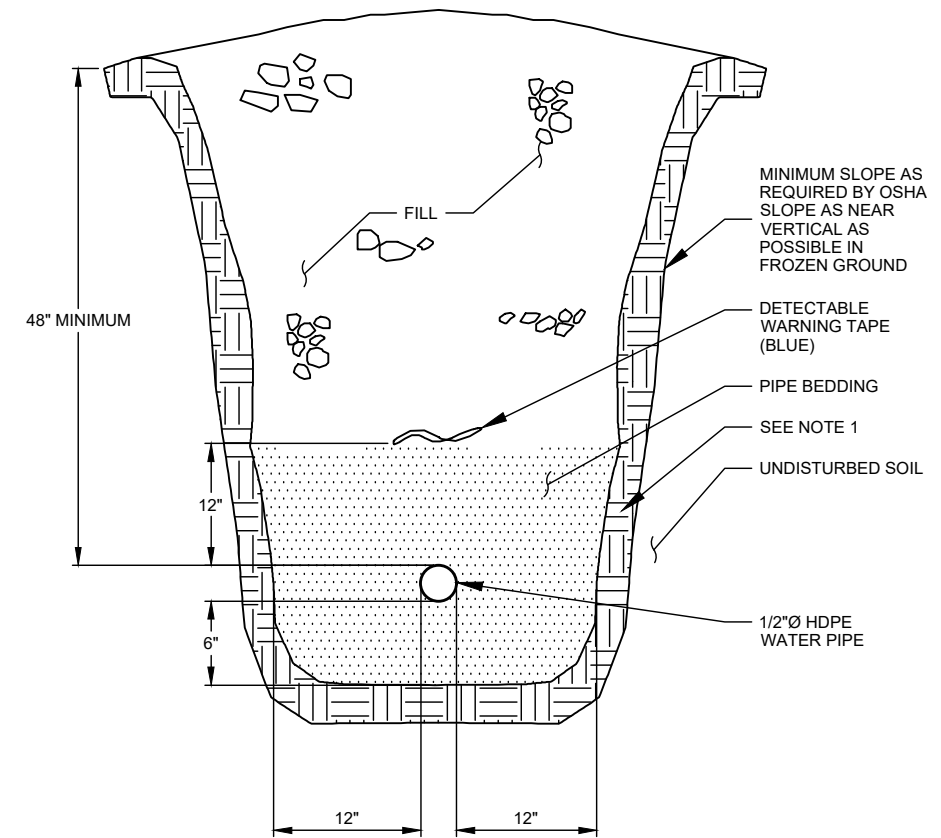


1/2" WATER SERVICE CONNECT
SCALE: N.T.S.



NOTES:

1. NO PIPES SHALL BE INSTALLED WITH LESS THAN 48 INCHES OF COVER.
2. COMPACT WILL BE NATIVE BACKFILL EXCAVATED FROM TRENCH.
3. IF NATIVE BACKFILL MATERIAL IS DEEMED NOT FIT FOR REINSTALLATION, USE STRUCTURAL FILL IN PLACE.



WATER SERVICE TRENCH DETAIL
SCALE: N.T.S.



REVISIONS & ADDENDUMS	#	DATE	REMARKS

MANAGEMENT	DESIGNED	B/K	DRAWN	B/K	CHECKED	B/D	APPROVED	DEN	LAST EDIT	2/5/24	PLOT DATE	2/5/24	SUBMITTAL	02/09/24

SMALL BOAT HARBOR UTILITIES
CITY OF SAINT PAUL
WATER SERVICE & TRENCH DETAILS

PROJECT NUMBER
165.030630

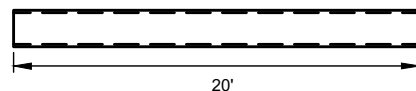
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030630-C-306-WATER SERVICE & TRENCH DETAILS.DWG

DRAWING SCALE
AS SHOWN

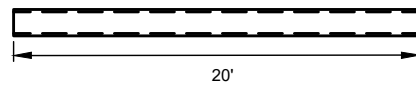
SHEET NUMBER

C-306

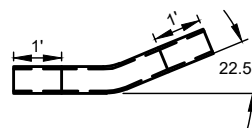
100% SUBMITTAL



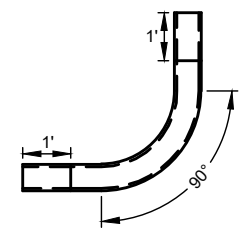
8" HDPE GRAVITY SEWER PIPE
SCALE: N.T.S. **1**
C-307



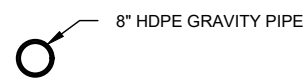
6" HDPE FORCE MAIN PIPE
SCALE: N.T.S. **2**
C-307



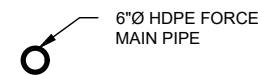
6" 22.5-ANGLE FORCE MAIN FITTING **3**
SCALE: N.T.S. C-307



6" 90-ANGLE FORCE MAIN FITTING **4**
SCALE: N.T.S. C-307

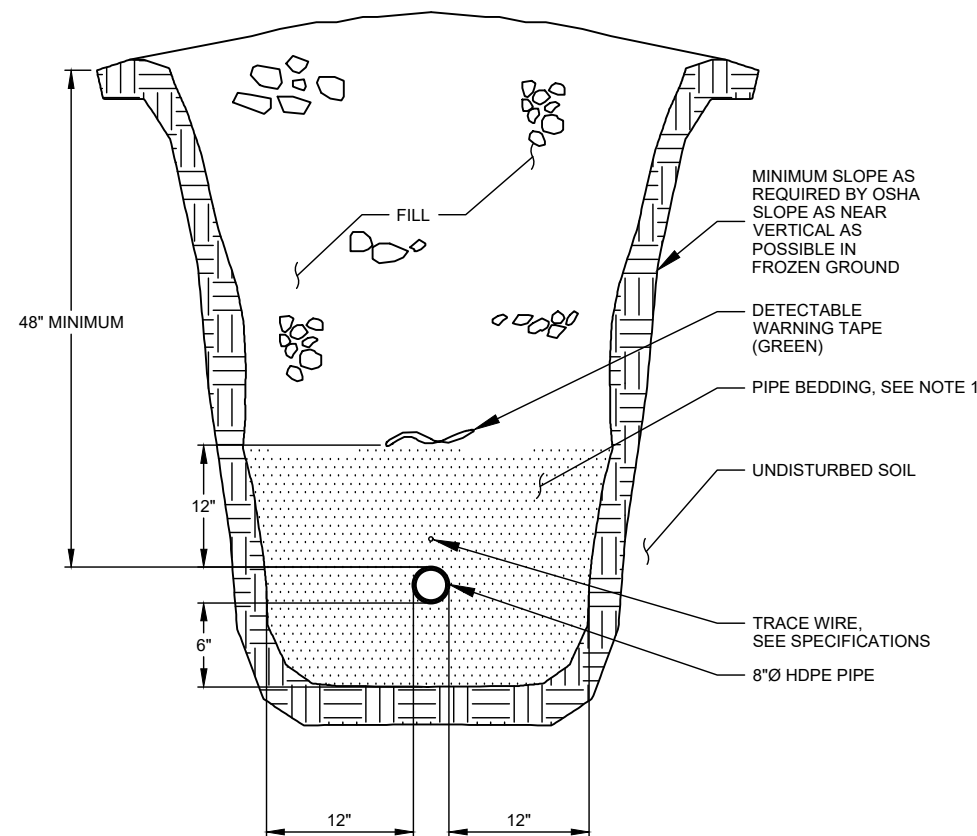


NOMINAL CORE PIPE DIAMETER (TYP)	LOCATION
8"	MAINLINES & SERVICES

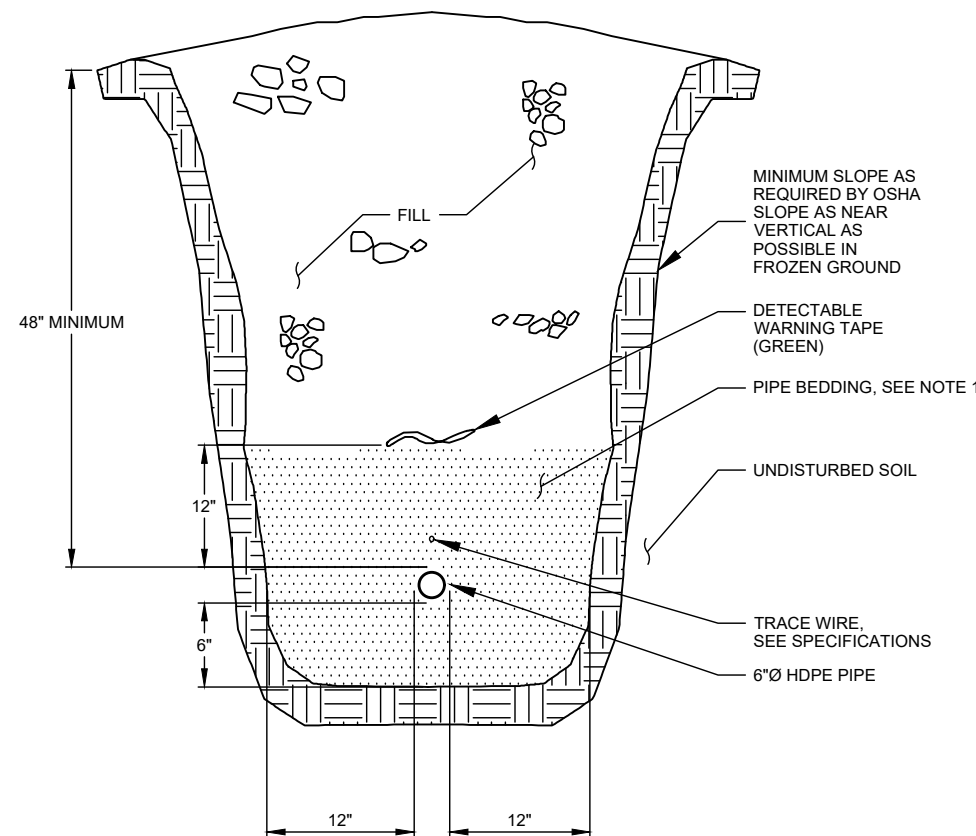


NOMINAL CORE PIPE DIAMETER (TYP)	LOCATION
6"	FORCE MAINS

- NOTES:
- NO PIPES SHALL BE INSTALLED WITH LESS THAN 48 INCHES OF COVER.
 - COMPACT WILL BE NATIVE BACKFILL EXCAVATED FROM TRENCH.
 - IF NATIVE BACKFILL MATERIAL IS DEEMED NOT FIT FOR REINSTALLATION, USE STRUCTURAL FILL IN PLACE.



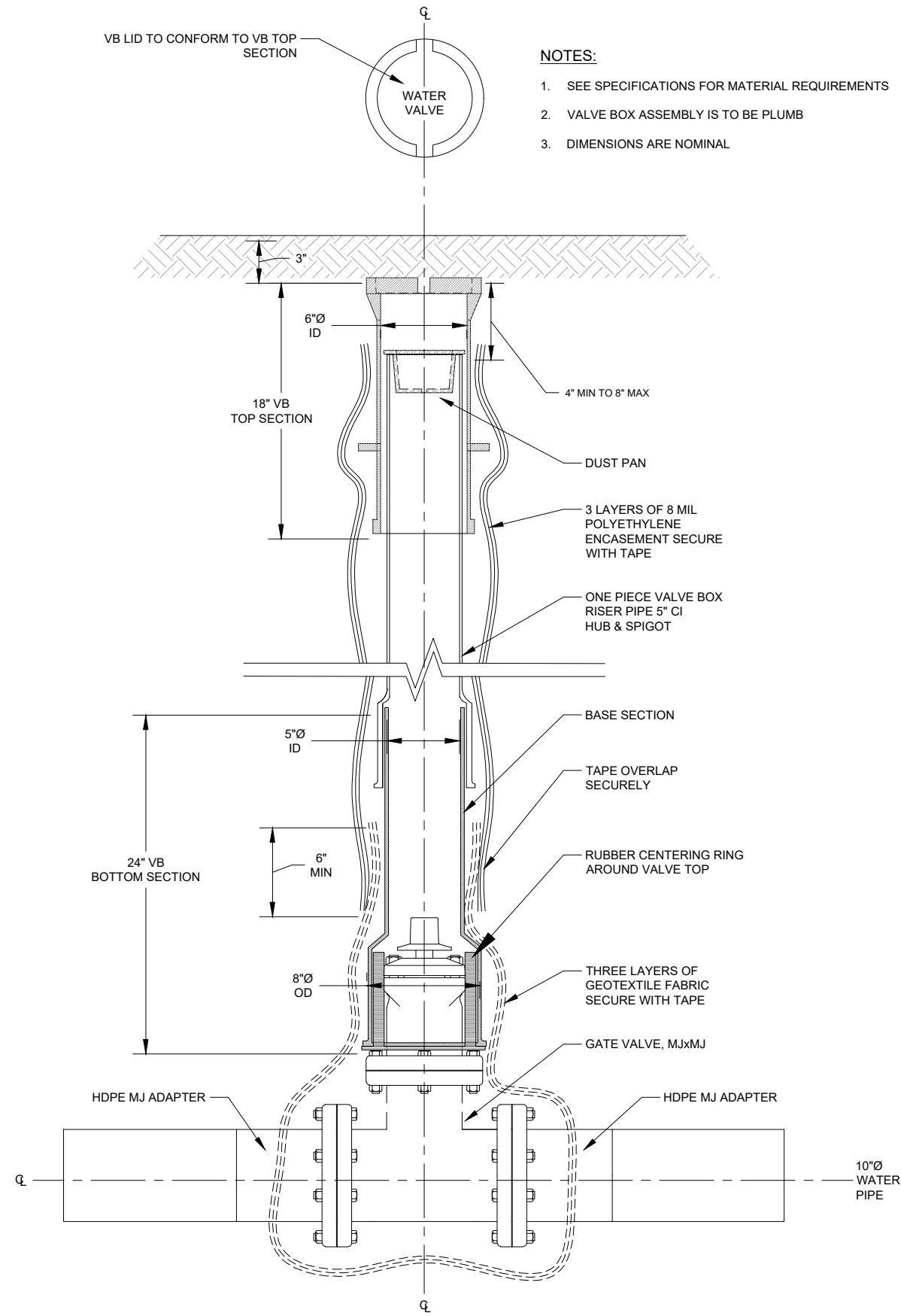
8" SEWER PIPE TRENCH DETAIL **5**
SCALE: N.T.S. C-307



6" SEWER PIPE TRENCH DETAIL **6**
SCALE: N.T.S. C-307

REVISIONS & ADDENDUMS	#	DATE	REMARKS

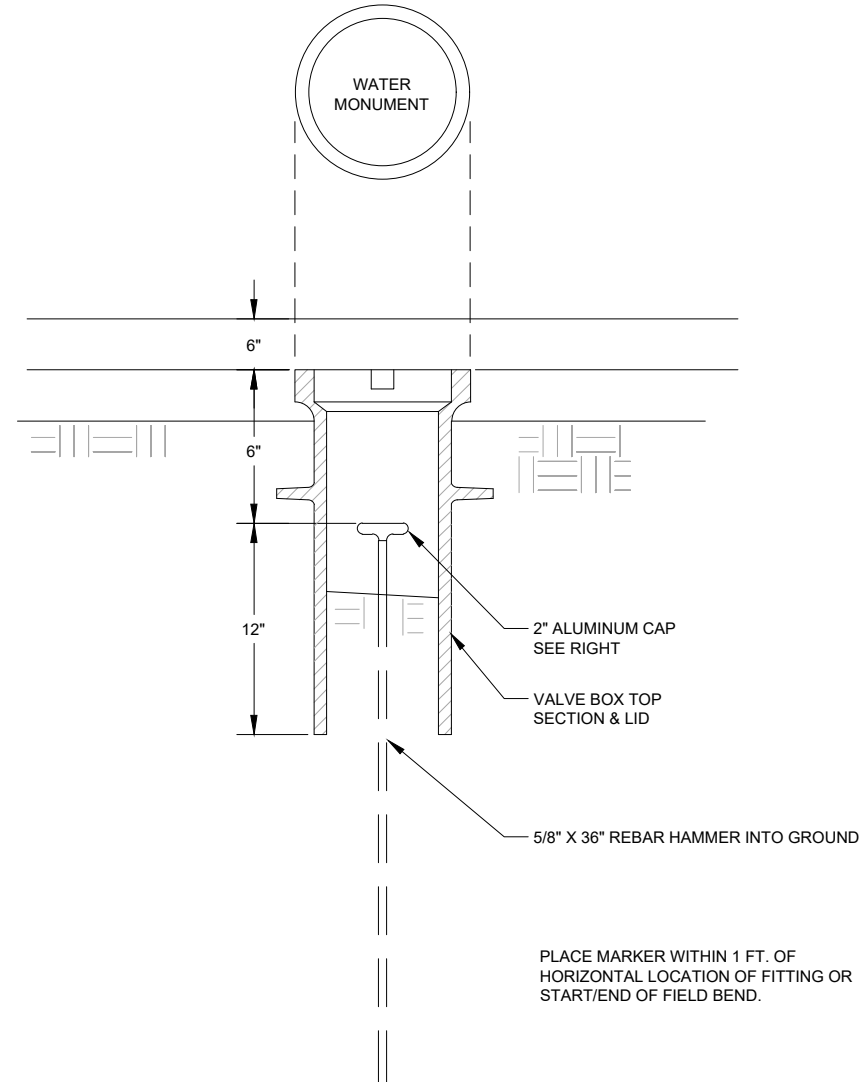
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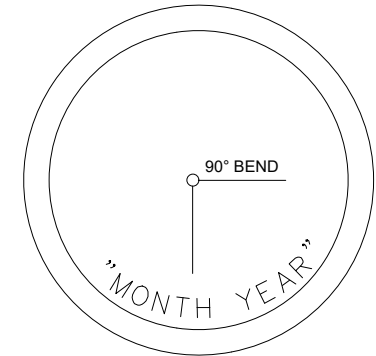
NOTES:

- 1. SEE SPECIFICATIONS FOR MATERIAL REQUIREMENTS
- 2. VALVE BOX ASSEMBLY IS TO BE PLUMB
- 3. DIMENSIONS ARE NOMINAL

TYPICAL VALVE BOX ASSEMBLY 1
SCALE: N.T.S. C-308



TYPICAL PIPE ANGLE MARKER 2
SCALE: N.T.S. C-308



2\"/>

NOTE: DIRECTION OF BEND SHOWN ON ALUMINUM CAP SHALL MATCH DIRECTION OF ACTUAL INSTALLED WATER MAIN BEND.

#	DATE	REMARKS

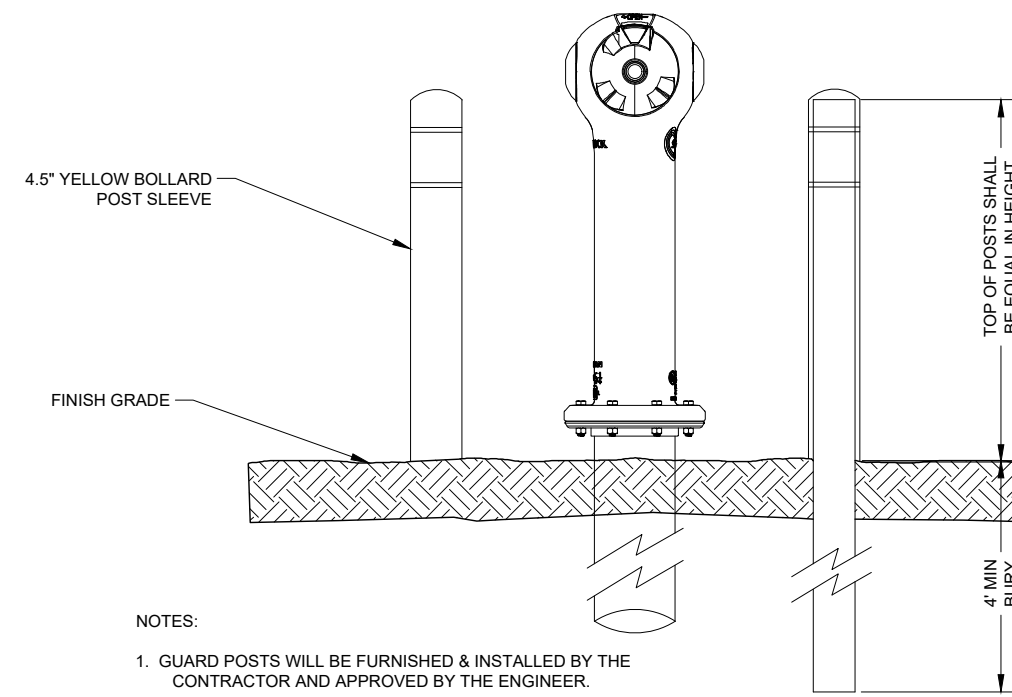
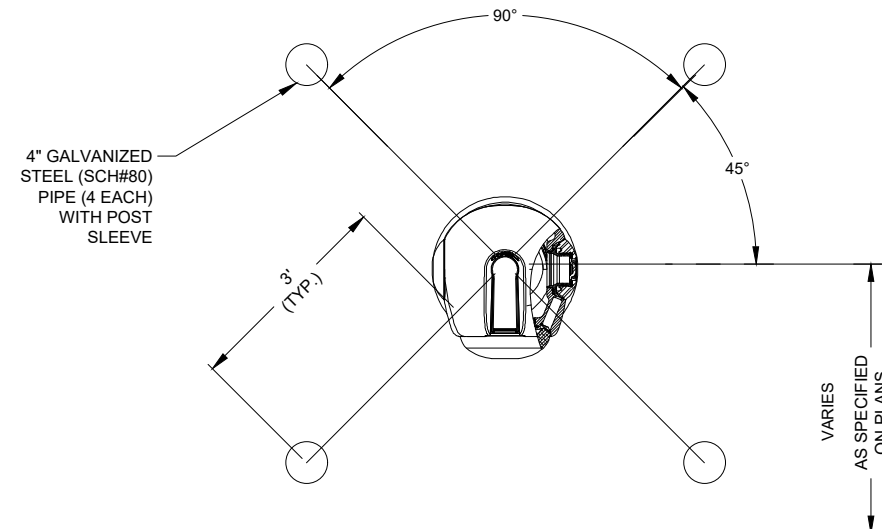
DESIGNED	DRAWN	CHECKED	APPROVED	LAST EDIT	DATE	DATE

MANAGEMENT	DESIGNED	DRAWN	CHECKED	APPROVED	LAST EDIT	DATE	DATE	SUBMITTAL

SMALL BOAT HARBOR UTILITIES	DRAWING SCALE
CITY OF SAINT PAUL	AS SHOWN
WATER MAIN VALVE DETAILS	DRAWING FILE NAME
PROJECT NUMBER 165.030630	030630_C-308-VALVE DETAILS.DWG

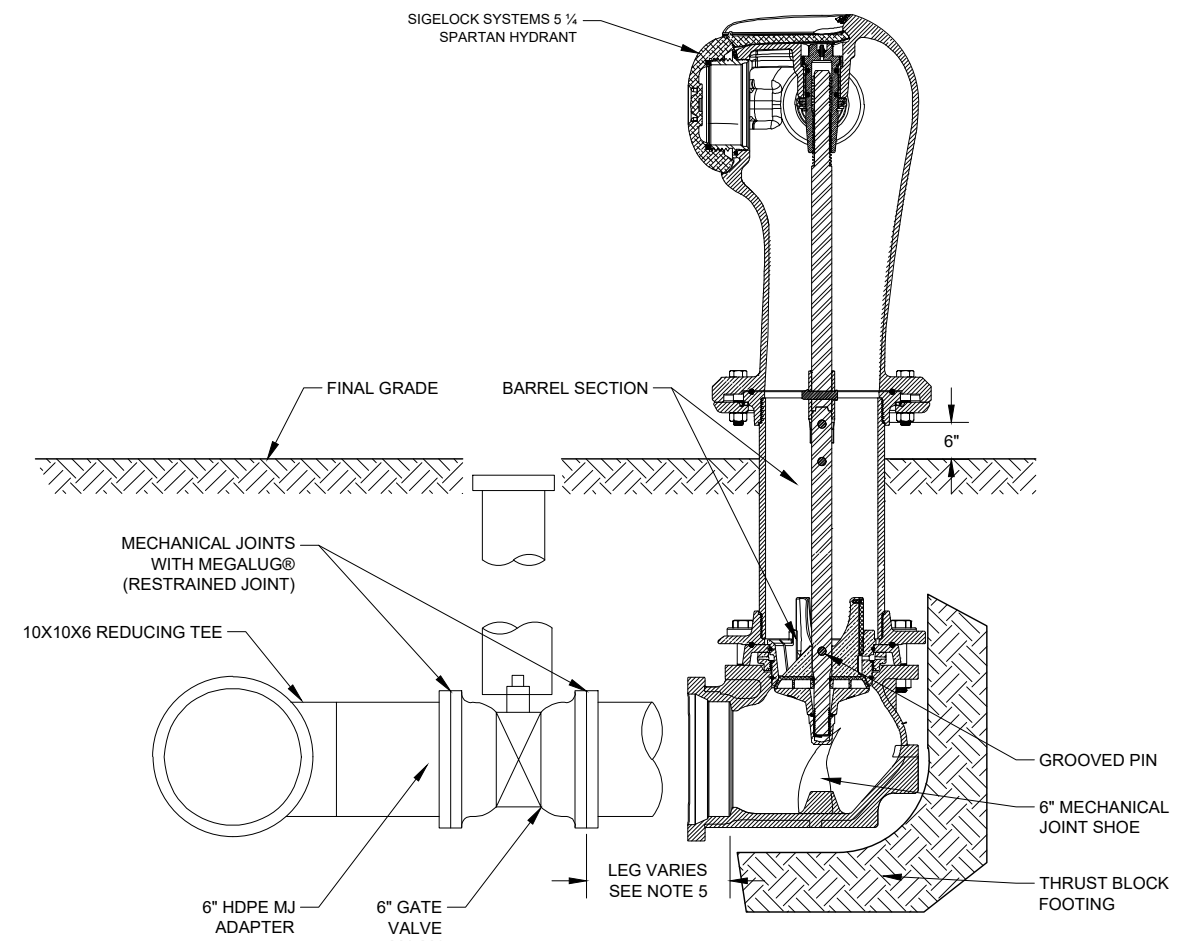
SHEET NUMBER
C-308

100% SUBMITTAL



- NOTES:
1. GUARD POSTS WILL BE FURNISHED & INSTALLED BY THE CONTRACTOR AND APPROVED BY THE ENGINEER.
 2. GUARD POSTS SHALL BE INSTALLED PLUMB AND LOCATED TO ALLOW UNRESTRICTED ACCESS TO PUMPER AND HOSE CONNECTIONS.

HYDRANT BOLLARD DETAIL 1
SCALE: N.T.S. C-309



- HYDRANT INSTALLATION NOTES:
1. HYDRANT BARREL MUST BE INSTALLED PLUMB AND THE LEG SHALL BE LEVEL.
 2. DRAIN PLUGS TO BE PROVIDED BY CONTRACTOR.
 3. HYDRANT GATE VALVE BOX TO BE INSTALLED ACCORDING TO DETAIL FOR TYPICAL VALVE BOX.
 4. ALL PIPE AND FITTINGS FROM THE MAIN TO THE HYDRANT SHOE SHALL BE RESTRAINED BY USE OF MEGALUG® AND OR LOK® GASKETS OR EQUAL.
 5. WHERE NO OFFSET IS CALLED OUT ON THE PLANS, LEG LENGTH = 0 FT.

SPARTAN HYDRANT DETAIL 2
SCALE: N.T.S. C-309

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REVISIONS & ADDENDUMS	#	DATE	REMARKS

MANAGEMENT	DESIGNED [B/K]	DRAWN [B/K]	CHECKED [B/D]	APPROVED [D/E]	LAST EDIT [2/5/24]	PLOT DATE [2/5/24]	SUBMITTAL [02/09/24]

SMALL BOAT HARBOR UTILITIES
CITY OF SAINT PAUL
HYDRANT & BOLLARD DETAILS

PROJECT NUMBER: 165.030630
DRAWING FILE NAME: 030630_C_309-HYDRANT DETAILS.DWG
DRAWING SCALE: AS SHOWN

SHEET NUMBER
C-309

100% SUBMITTAL

REINFORCING BAR HOOK & LAP SCHEDULE

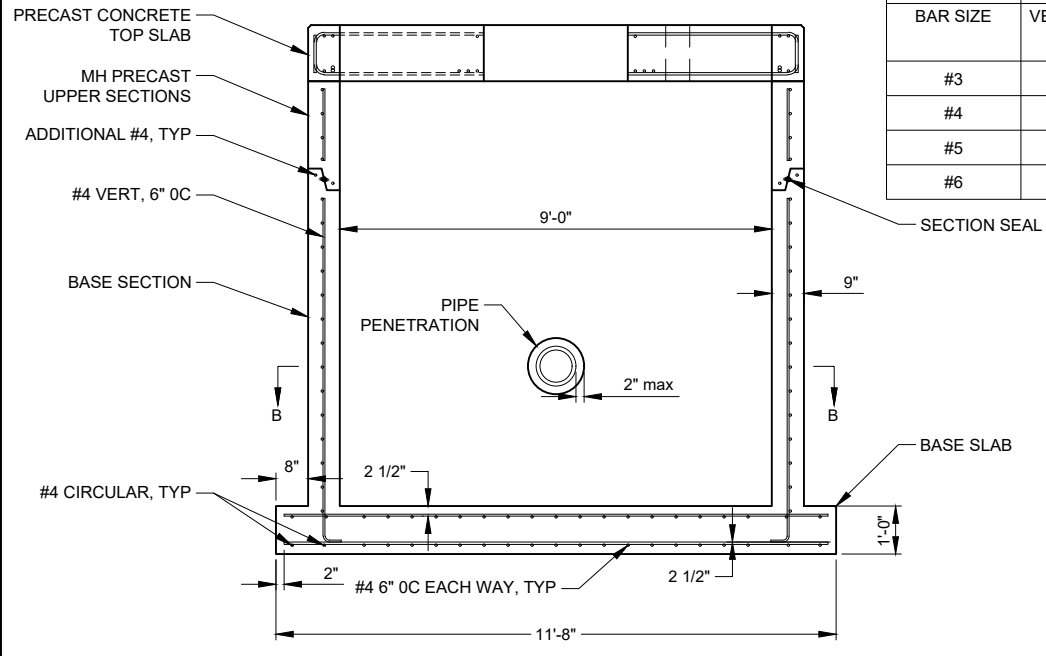
BAR SIZE	LAP SPLICE		STANDARD HOOK	
	VERT & HORIZ	TOP BAR	HOOK LENGTH 'A'	DEVELOPMENT LENGTH (dh)
#3	1'-3"	1'-7"	0'-6"	0'-6"
#4	1'-8"	2'-1"	0'-8"	0'-8"
#5	2'-1"	2'-7"	0'-10"	0'-10"
#6	2'-6"	3'-1"	1'-0"	1'-0"

DESIGN CRITERIA (DC):

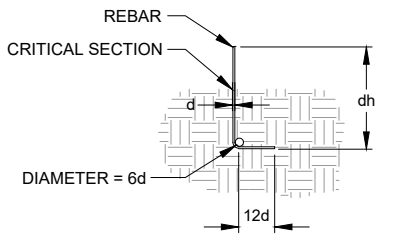
- MAX DEPTH OF BURY = 35 FEET.
- SNOW LOAD = 40 PSF.
- DEAD LOAD = 100 PSF.
- CONCRETE DESIGNED IN ACCORDANCE WITH ACI 318-14.
- BACKFILL MATERIAL MINIMUM REQUIREMENT IS NON FROST SUSCEPTIBLE GRANULAR FILL WITH COMPACTED DENSITY 110 PCF MIN AND MINIMUM ANGLE OF FRICTION = 30 DEGREES.

GENERAL NOTES:

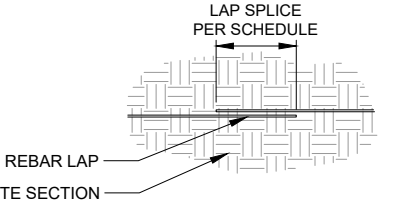
- ALL DRAINAGE STRUCTURES SHALL MEET THE REQUIREMENTS OF ASTM C-478 AND ACI 318-14.
- RUBBER GASKET JOINTS, GROUDED JOINTS, OR PREFORMED PLASTIC TYPE GASKET JOINTS ARE TO BE USED ON MANHOLE JOINTS AND PENETRATIONS TO PROVIDE WATER TIGHT SEALING.
- REDUCING SLAB CONCRETE EXPOSURE CLASS F3/S3/W1/C2, MINIMUM COMPRESSIVE STRENGTH (F_c) = 5000 PSI, MAXIMUM WATER CONTENT (W/CM) = 0.40, TYPE V CEMENT WITH POZZOLAN OR SLAG CEMENT OR ASTM C595 IP, IS, OR IT WITH (HS) DESIGNATION PLUS POZZOLAN OR SLAG CEMENT, IN ACCORDANCE WITH ASTM C1012, 3/4" MAXIMUM AGGREGATE SIZE, 6% MINIMUM AIR CONTENT, AND LESS THAN 0.15 CHLORIDE ION MIX WATER BY WEIGHT OF CEMENT. MAXIMUM PERCENTAGE OF POZZOLANS SHALL CONFORM WITH ACI 318 TABLE 26.4.2.2(b).
- ALL OTHER CONCRETE EXPOSURE CLASS F2/S1/W1/C1 MINIMUM COMPRESSIVE STRENGTH (F_c) = 4500 PSI, TYPE V CEMENT, MAXIMUM WATER CONTENT (W/CM) = 0.45, 3/4" MAXIMUM AGGREGATE SIZE, 6% MINIMUM AIR CONTENT, AND LESS THAN 0.30 CHLORIDE ION MIX WATER BY WEIGHT OF CEMENT.
- ALL BARS SHALL BE CONTINUOUS. CIRCULAR BARS LAPPED A MINIMUM OF 48 BAR DIAMETERS.
- MAINTAIN A MINIMUM OF 1 1/2" OF CONCRETE COVER OVER ALL REBAR.
- EXTEND PIPE A MINIMUM OF 2" INTO MANHOLE.
- PLACE MANHOLE BASE ON 12" MINIMUM COMPACTED AGGREGATE BASE COURSE, GRADING D-1.
- WALL PENETRATION DIAMETER "D" SHALL NOT EXCEED PIPE O.D. + 4 INCHES.
- LIFTING INSERTS SHALL BE DESIGNED FOR A LOAD EQUIVALENT TO FOUR TIMES THE MAXIMUM LOAD TRANSMITTED TO THE INSERT.
- REINFORCEMENT SHALL BE GRADE 60 CONFORMING TO ASTM A615/A 615M.
- CONTRACTOR TO SUBMIT FOR APPROVAL DESIGNS FOR BASE SEAL, SECTION SEAL, ACCESS HATCH, PIPE SEAL, SENSOR HANGERS, AND PIPE SUPPORTS.



1 MANHOLE SECTION
SCALE: 1/2" = 1'
C-400



A STANDARD HOOK
SCALE: N.T.S.

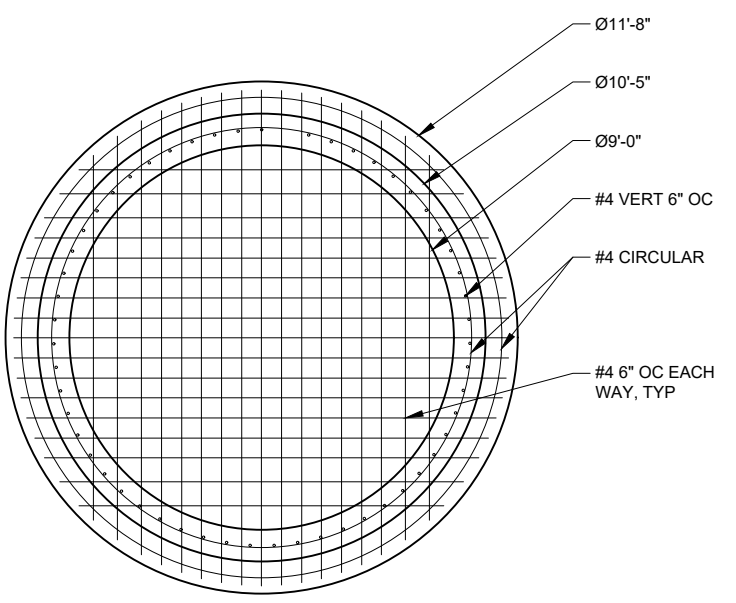


B STANDARD REBAR LAP
SCALE: N.T.S.

REBAR NOTES:

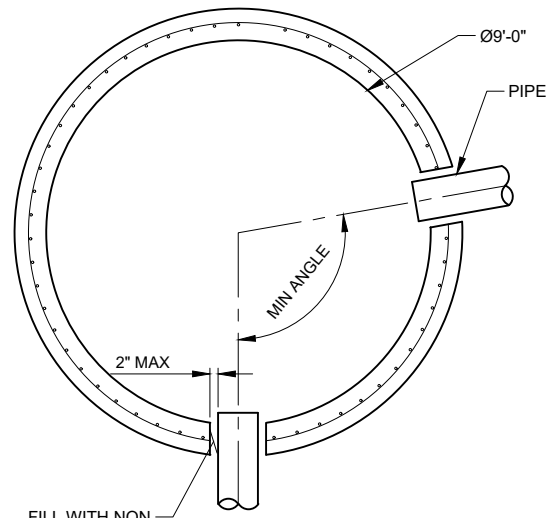
- LAP LENGTHS ARE BASES ON MINIMUM COVER REQUIREMENTS INDICATED.
- TOP BAR LAPS ARE HORIZONTAL LAPS WHERE MORE THAN 12" OF FRESH CONCRETE IS PLACED BELOW THE BARS.

3 TYPICAL REINFORCING HOOK & LAP BAR SCHEDULE
SCALE: 1/2" = 1'
C-400

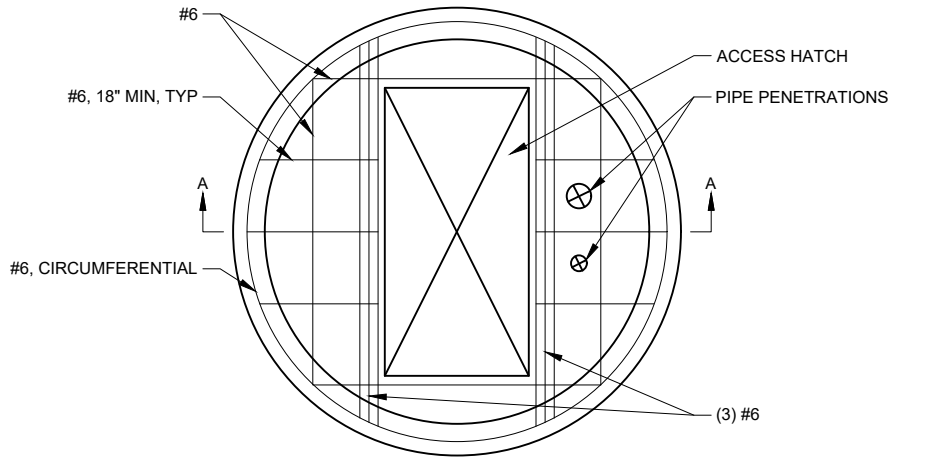


4 BASE SLAB PLAN TOP AND BOTTOM REINFORCEMENT LAYERS
SCALE: 1/2" = 1'
C-400

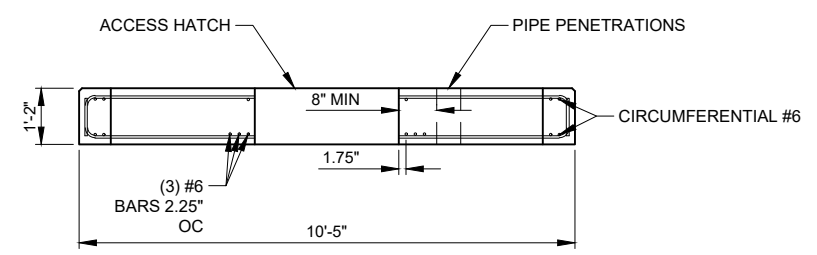
PIPE DIA INCH	MIN ANGLE DEG	PIPE DIA INCH	MIN ANGLE DEG
60	120	30	70
56	115	28	65
52	105	26	65
48	100	24	60
46	95	22	60
44	90	20	55
42	90	18	50
40	85	16	50
38	80	14	45
36	80	12	45
34	75	10	40
32	70	8	40



B SECTION B-B MANHOLE PIPE PENETRATIONS
SCALE: 1/2" = 1'



2 TOP SLAB REINFORCING - PLAN
SCALE: 1/2" = 1'
C-400



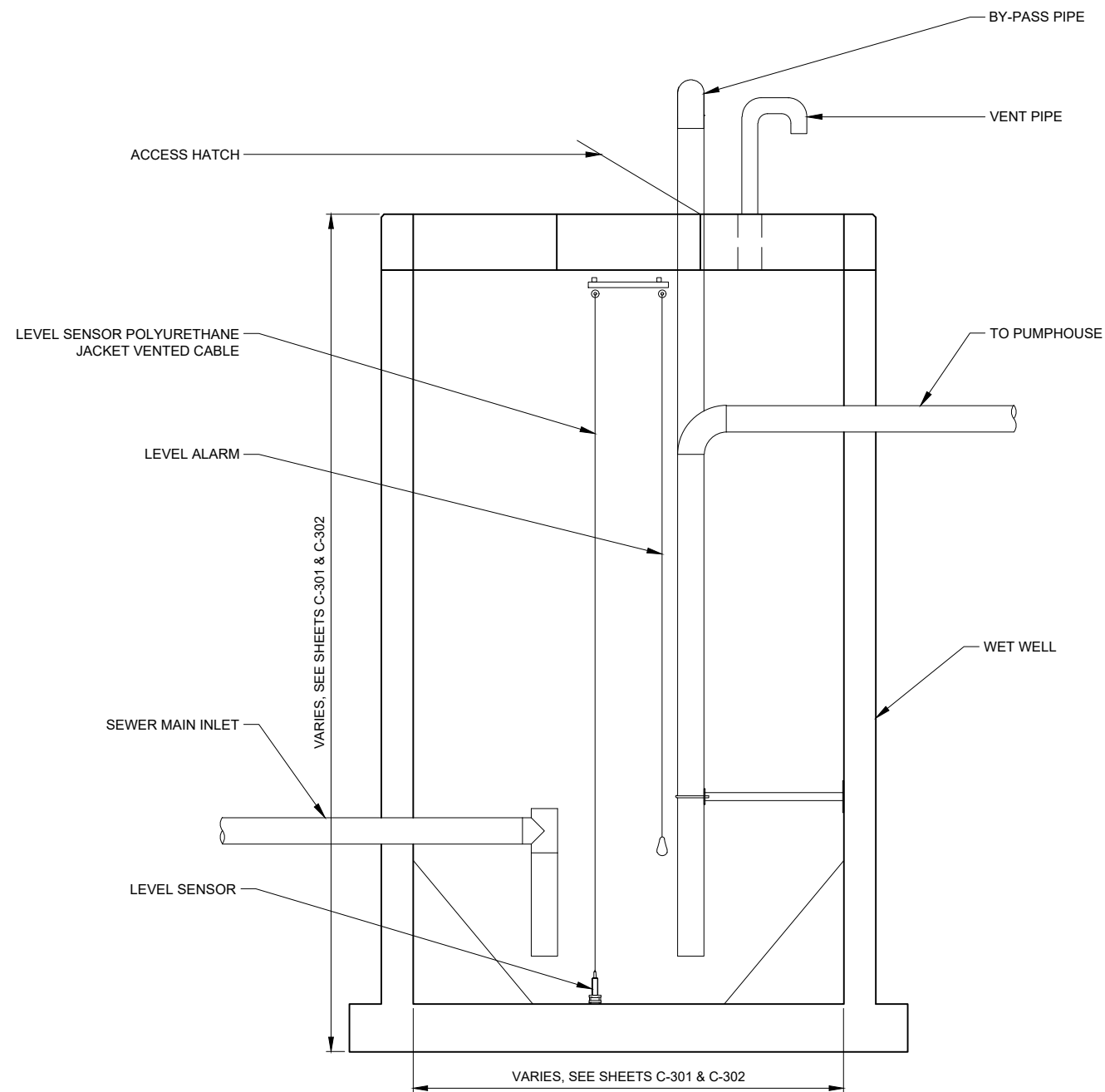
A SECTION A-A TOP SLAB REINFORCING
SCALE: 1/2" = 1'

REVISIONS & ADDENDUMS		MANAGEMENT	
#	DATE	DESIGNED	DRAWN
		IRW	IRW
		CHECKED	BUD
		APPROVED	DEN
		LAST EDIT	2/6/24
		PLOT DATE	2/15/24
		SUBMITTAL	02/09/24
		REMARKS	

SMALL BOAT HARBOR UTILITIES
CITY OF SAINT PAUL
WET WELL DETAILS
PROJECT NUMBER: 165.030630
DRAWING FILE NAME: 030630-C-400X-MH & WET WELL DETAILS.DWG
DRAWING SCALE: AS SHOWN

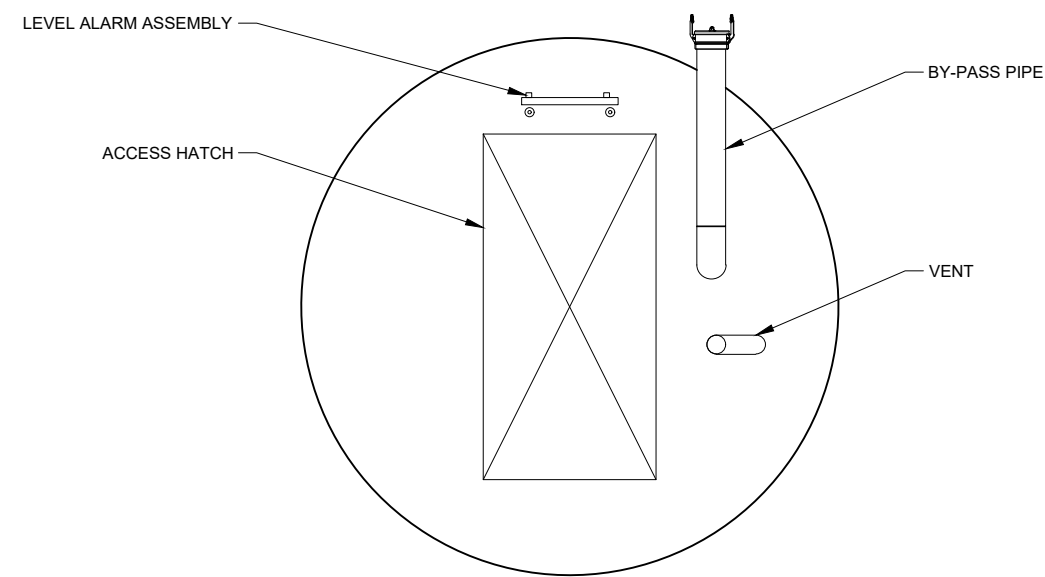
SHEET NUMBER
C-400

100% SUBMITTAL



WET WELL ELEVATION - GENERAL ARRANGEMENT
SCALE: 1/2" = 1'

1
401



WET WELL PLAN - GENERAL ARRANGEMENT
SCALE: 1/2" = 1'

2
401

REVISIONS & ADDENDUMS	
#	DATE

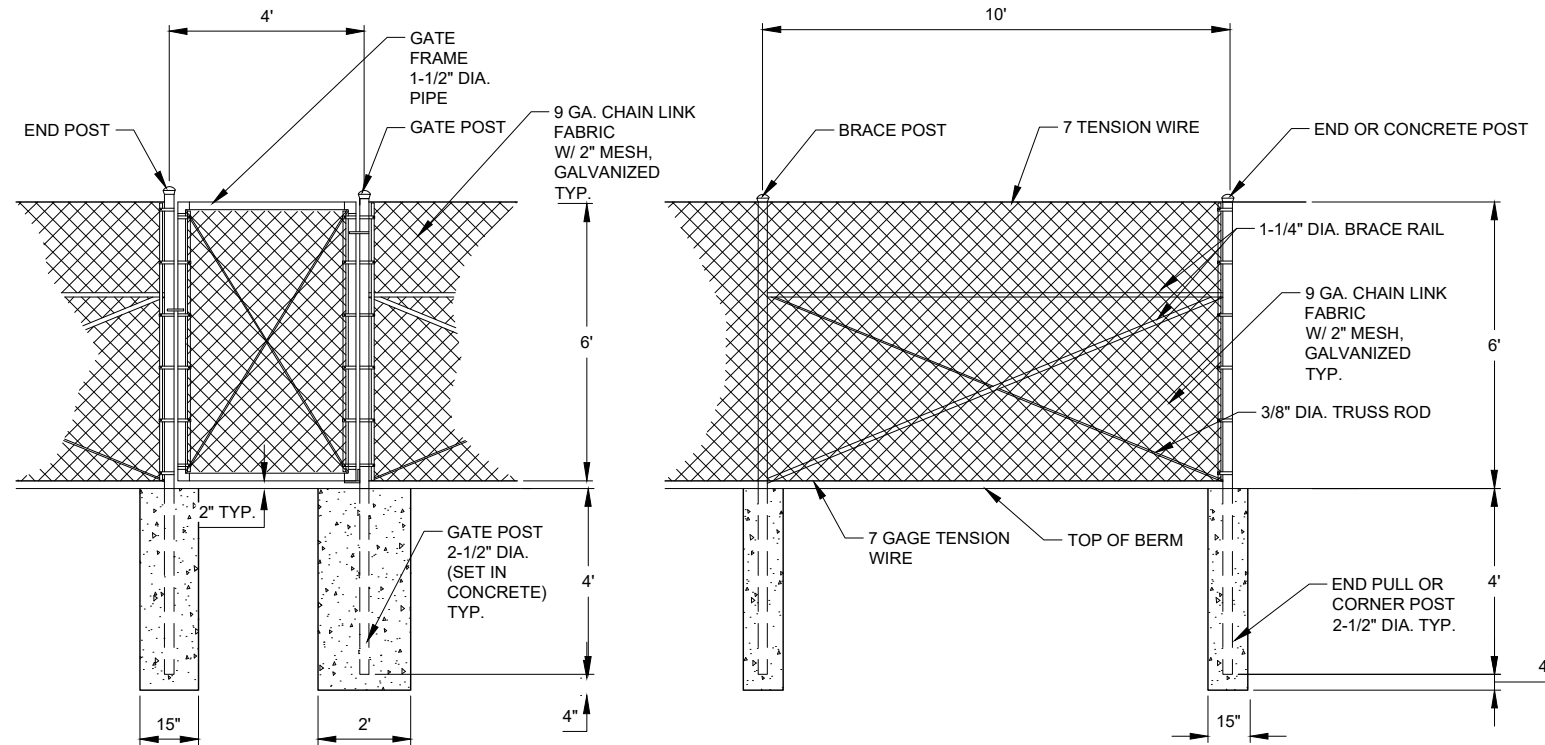
MANAGEMENT						
DESIGNED	FW	DRAWN	FW	CHECKED	BJD	APPROVED

SMALL BOAT HARBOR UTILITIES
CITY OF SAINT PAUL
WET WELL PLAN - GENERAL ARRANGEMENT

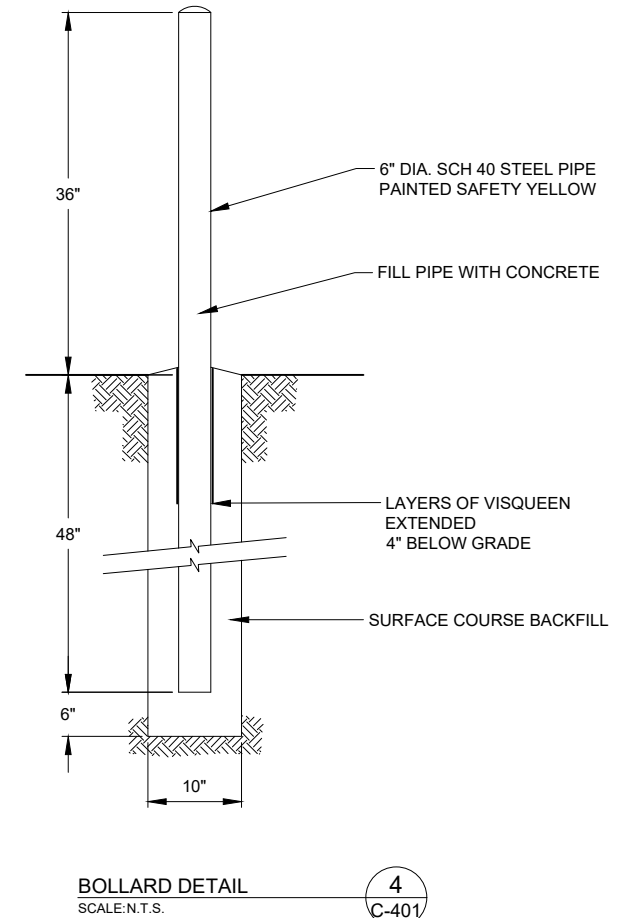
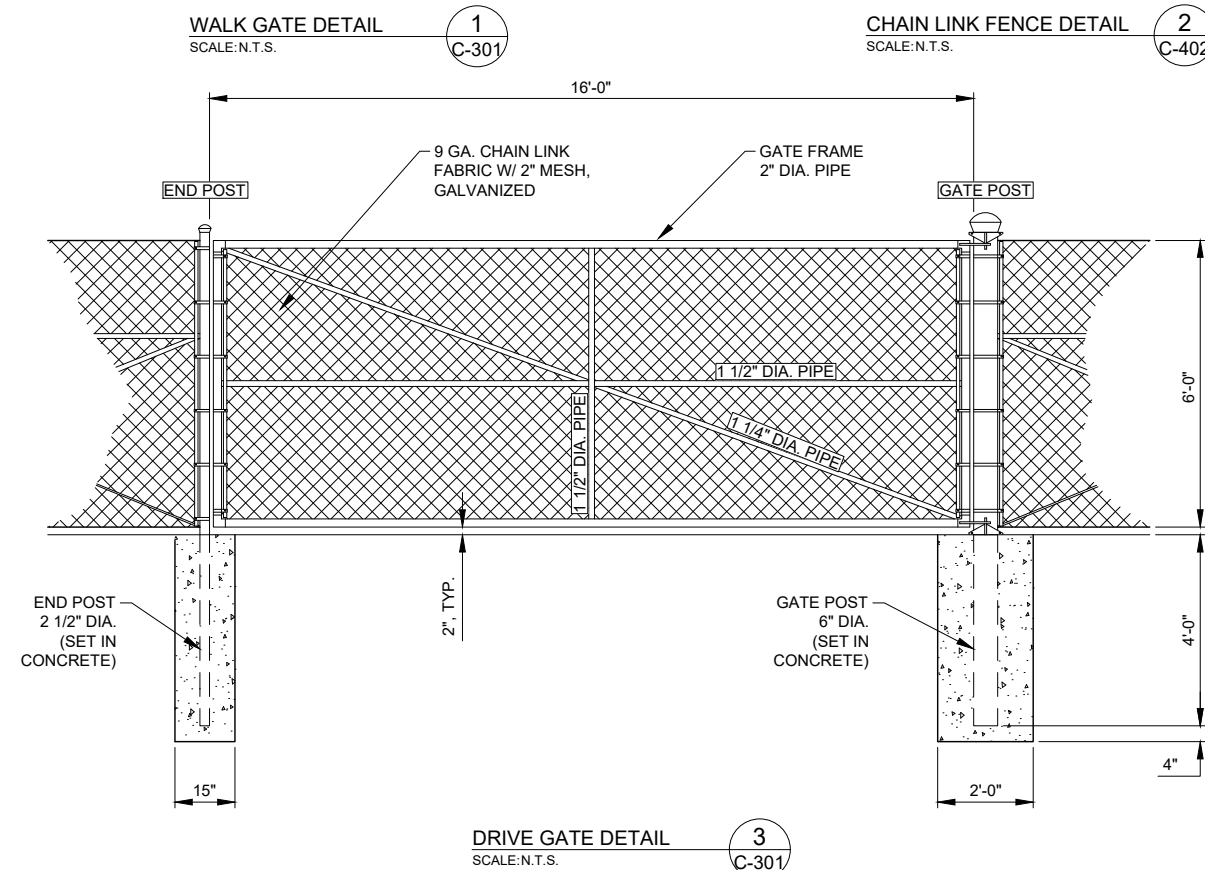
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DRAWING FILE NAME: 030630-C-400X-MH & WET WELL DETAILS.DWG
DRAWING SCALE: AS SHOWN

SHEET NUMBER
C-401

100% SUBMITTAL

**FENCE AND GATE NOTES:**

1. DETAILS SHOWN ARE TO INDICATE GENERAL DESIGN, ONLY. DIMENSIONS MAY VARY SLIGHTLY AMONG MANUFACTURERS.
2. POSTS SHALL BE SPACED EQUAL DISTANCES APART. MAXIMUM SPACING SHALL BE 10 FEET, UNLESS OTHERWISE DIRECTED BY THE ENGINEER.
3. POST TOPS SHALL BE SECURELY FASTENED TO POSTS.
4. BRACE RAILS AND TRUSS RODS SHALL BE SECURELY FASTENED TO POSTS WITH BRACE BANDS WITH THREADED TAKE-UP ADAPTER FOR TRUSS RODS.
5. FABRIC SHALL BE STRETCHED TO A SMOOTH UNIFORM APPEARANCE.
6. BRACE, PULL, END, CORNER, AND GATE POSTS SHALL BE SET IN CONCRETE.
7. GATE FABRIC SHALL BE OF SAME DESIGN AND HEIGHT AS THE LINE FENCE FABRIC.
8. LINE FENCE FABRIC SHALL BE FURNISHED WITH BARBED SELVAGE, TOP AND BOTTOM.
9. GATE FABRIC SHALL BE FURNISHED WITH KNUCKLE SELVAGE, TOP AND BOTTOM.
10. CONCRETE FOR FOOTINGS SHALL BE CLASS W CONCRETE (2,500 PSI).
11. GATE FRAMES MAY BE FABRICATED BY WELDING OR RIVETING AND SHALL BE BRACED TO ELIMINATE SAGGING. HINGES, LATCHES, AND OTHER GATE APPURTENANCES SHALL BE OF SUFFICIENT STRENGTH AND DESIGN TO ASSURE EASY TROUBLE-FREE OPERATION.

**BOLLARD DETAIL NOTE:**

1. MOUND CONCRETE ON TOP TO SHED WATER



REVISIONS & ADDENDUMS		
#	DATE	REMARKS

MANAGEMENT						
DESIGNED FW	DRAWN FW	CHECKED BJD	APPROVED DEN	LAST EDIT 2/26/24	PLOT DATE 2/26/24	SUBMITTAL 02/09/24

SMALL BOAT HARBOR UTILITIES
CITY OF SAINT PAUL
CHAIN LINK FENCE & BOLLARD DETAIL

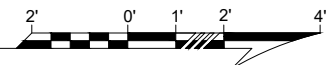
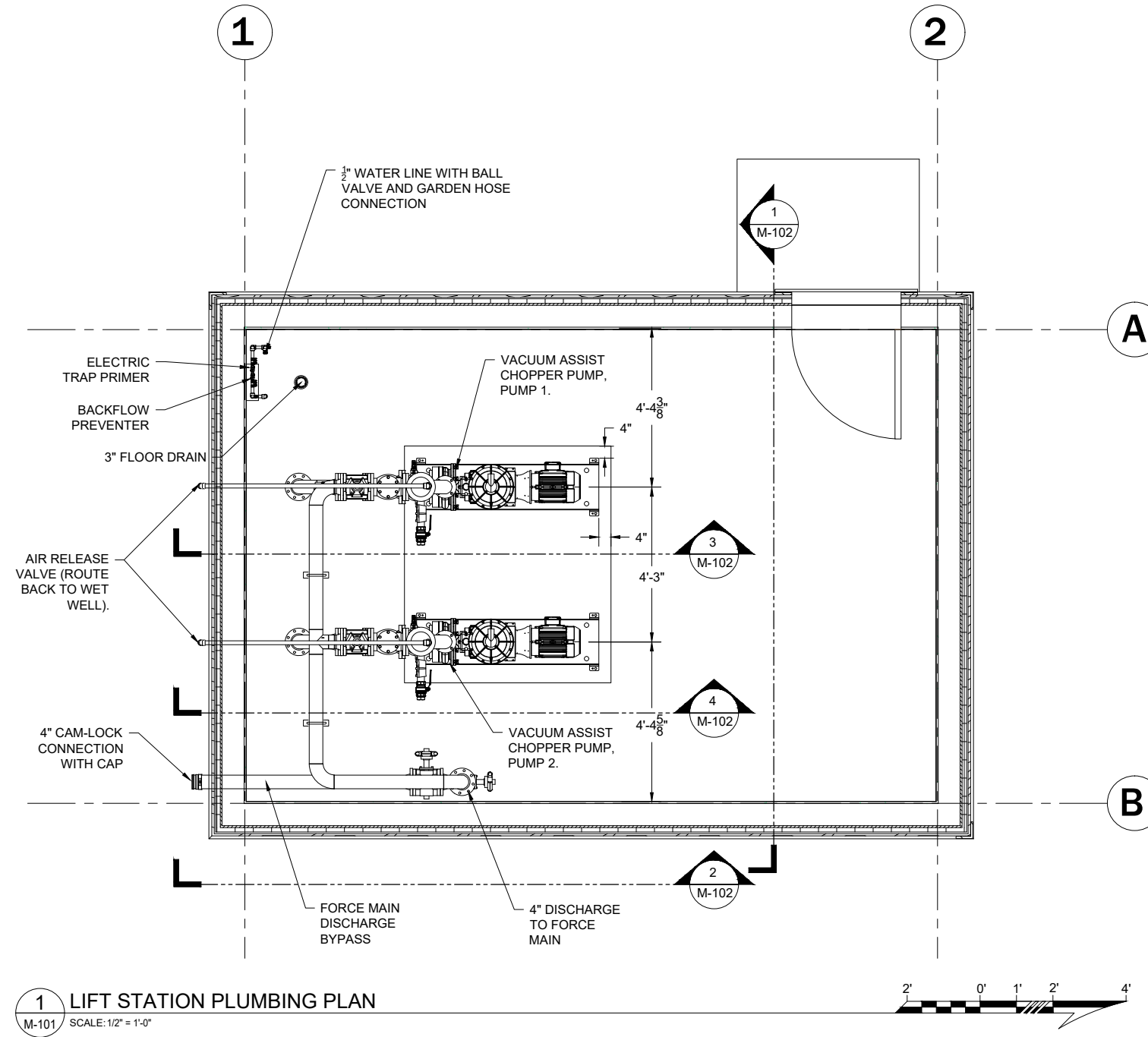
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DRAWING SCALE: AS SHOWN
PROJECT NUMBER: 165-030630

SHEET NUMBER
C-402

100% SUBMITTAL

GENERAL NOTES:

1. CONTRACTOR SHALL VERIFY DIMENSIONS PRIOR TO THE BEGINNING OF CONSTRUCTION.
2. ADDITIONAL FLANGE CONNECTIONS CAN BE UTILIZED IF REQUIRED FOR FABRICATION REQUIREMENTS.
3. SEE CIVIL DRAWINGS FOR WET WELL PLACEMENT AND PIPE ROUTING IN RELATION TO BUILDING.
4. CONNECT TRAP PRIMER LINE TO DRAIN LINE UNDERGROUND.



REVISIONS & ADDENDUMS		
#	DATE	REMARKS

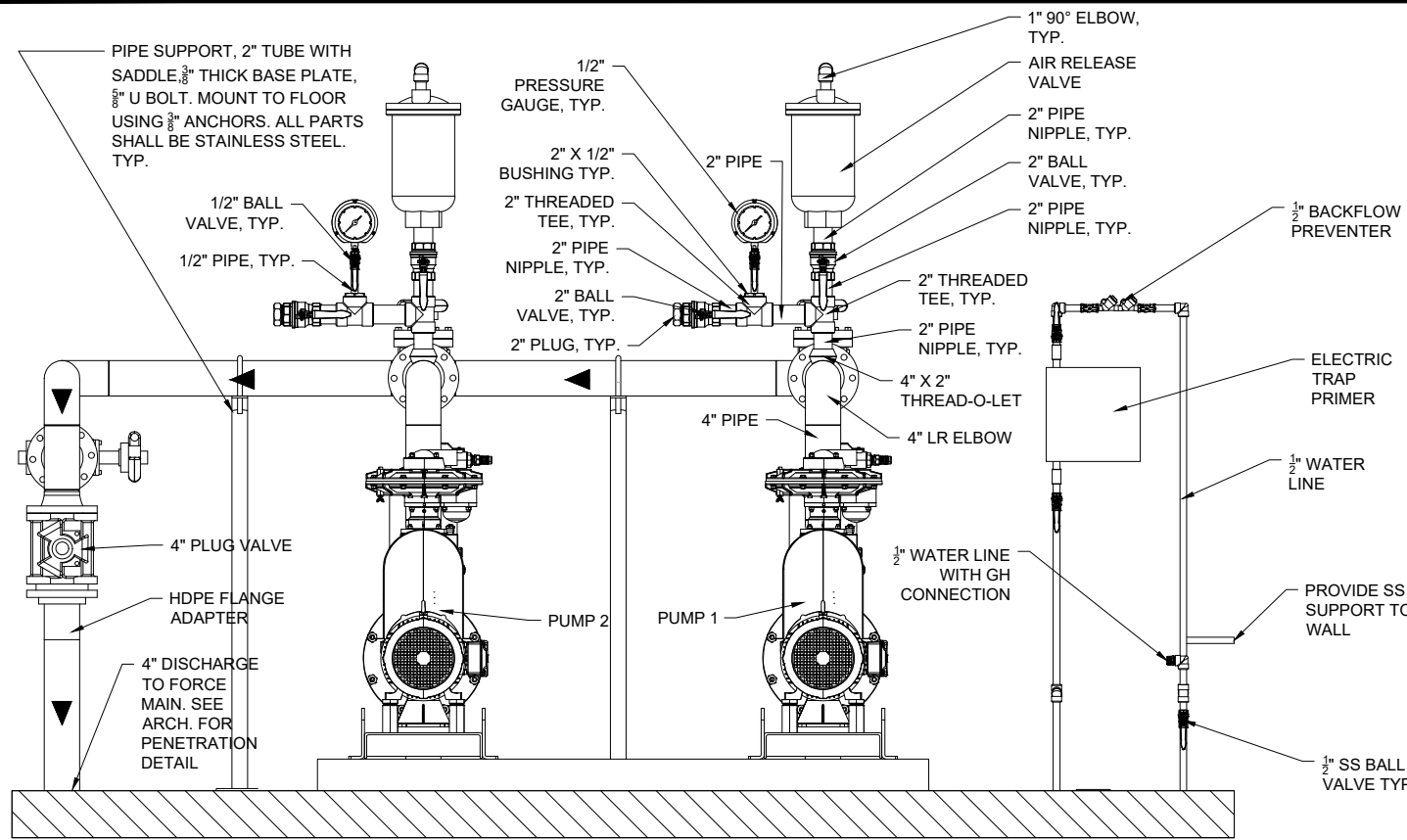
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DRAWN	JDD				
CHECKED					
APPROVED					
LAST EDIT	2/2/24				
PLOT DATE	2/2/24				
SUBMITTAL	02/02/24				

SMALL BOAT HARBOR UTILITIES
CITY OF SAINT PAUL
LIFT STATION PIPING & EQUIPMENT PLAN

PROJECT NUMBER: 165.030630
 DRAWING FILE NAME: M-101
 DRAWING SCALE: AS SHOWN

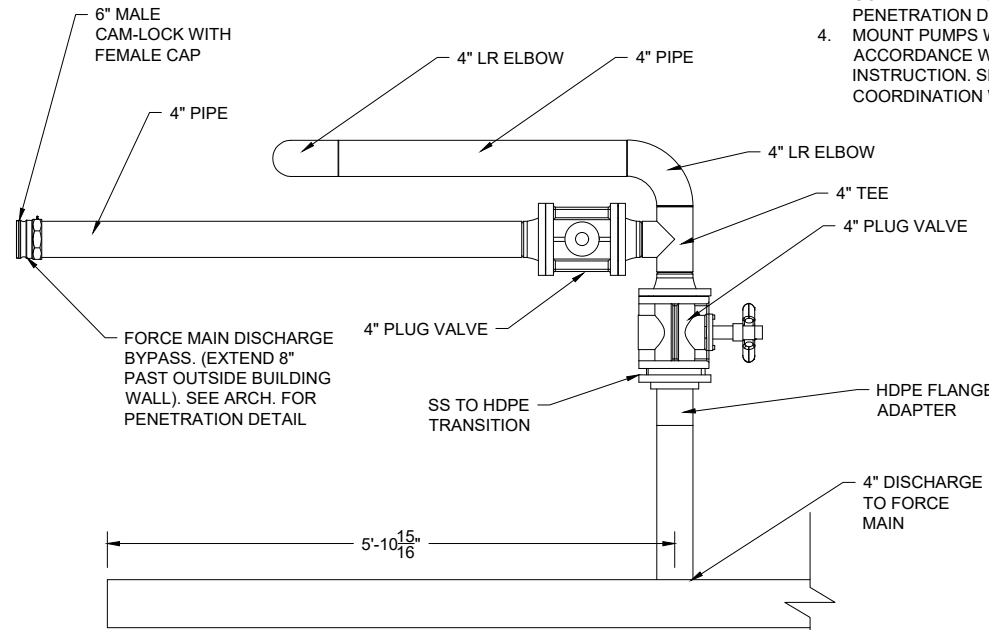
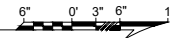
SHEET NUMBER
M-101

100% SUBMITTAL



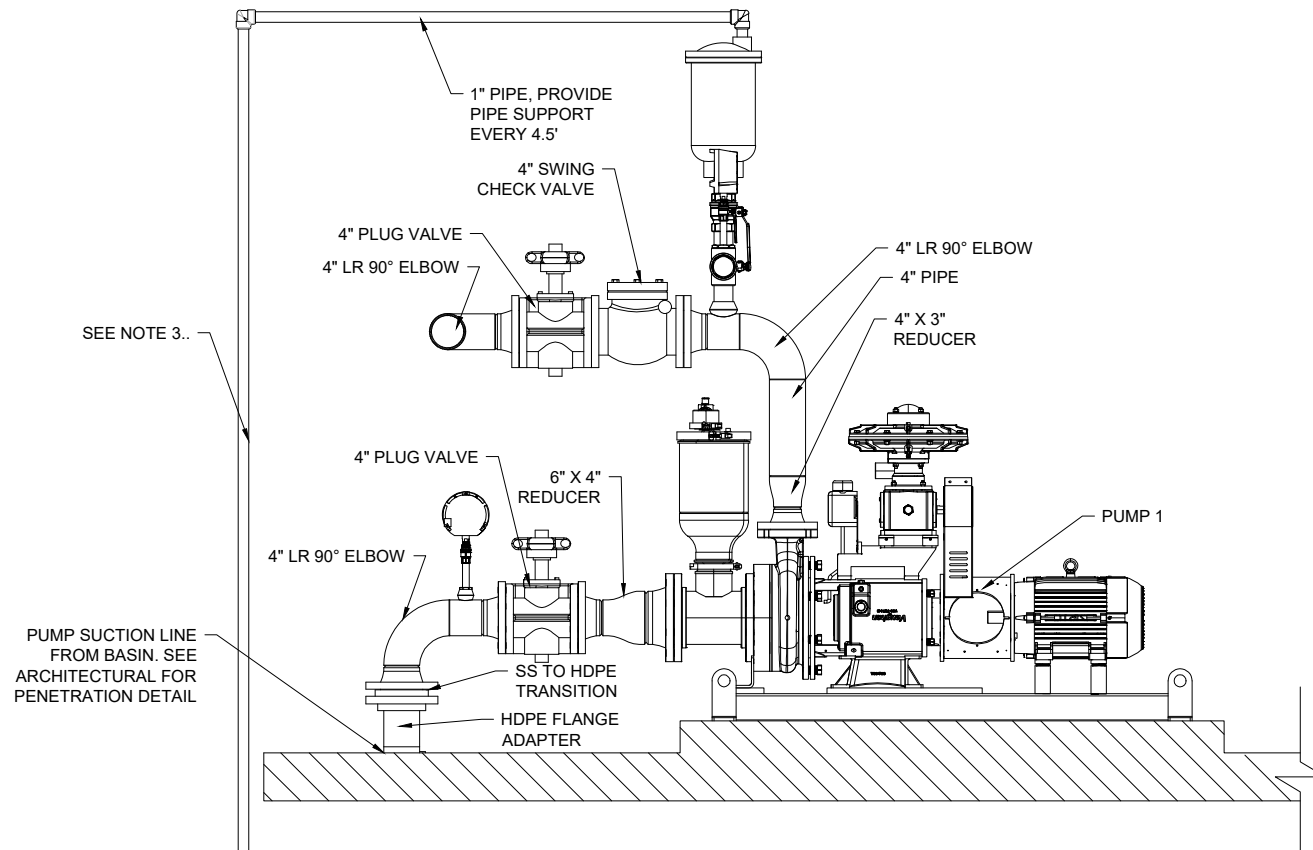
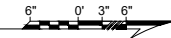
1 ELEVATION SECTION

M-102 SCALE: 1" = 1'-0"



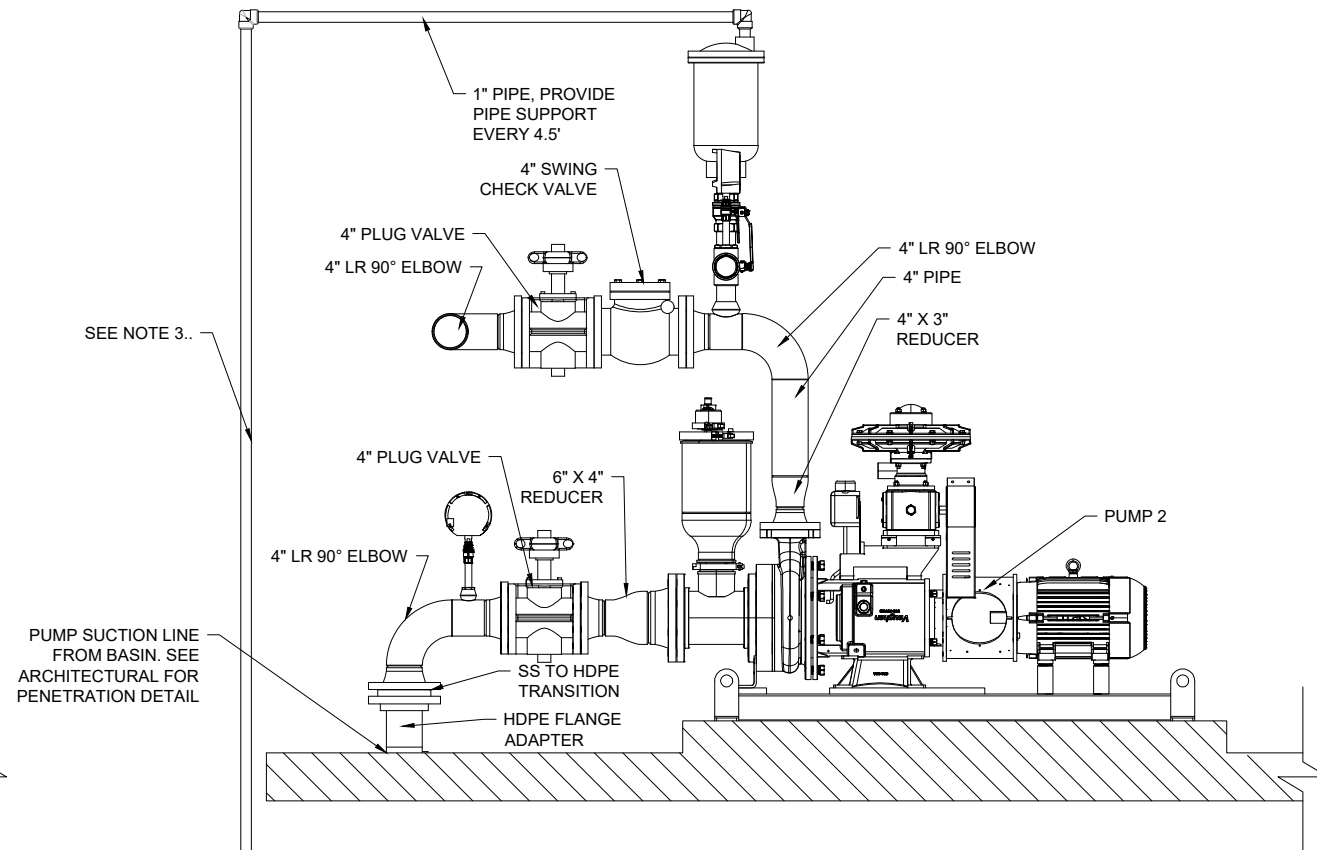
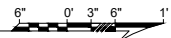
2 DISCHARGE PARTIAL SECTION

M-102 SCALE: 1" = 1'-0"



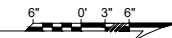
3 PUMP 1 ELEVATION SECTION

M-102 SCALE: 1" = 1'-0"



4 PUMP 2 ELEVATION SECTION

M-102 SCALE: 1" = 1'-0"



GENERAL NOTES:

1. CONTRACTOR SHALL VERIFY DIMENSIONS PRIOR TO THE BEGINNING OF CONSTRUCTION.
2. ADDITIONAL FLANGE CONNECTIONS CAN BE UTILIZED IF REQUIRED FOR FABRICATION.
3. ROUTE 1" AIR RELEASE LINE DOWN ALONG BUILDING, PROVIDE SUPPORTS. ROUTE LINE TO WET WELL AT A 2% SLOPE WITH MINIMUM 3' COVER. SEE ARCH. DRAWINGS FOR BUILDING PENETRATION DETAIL.
4. MOUNT PUMPS WITH ANCHOR BOLTS IN ACCORDANCE WITH MANUFACTURERS INSTRUCTION. SEE STRUCTURAL FOR COORDINATION WITH HOUSE KEEPING PAD.



REVISIONS & ADDENDUMS	#	DATE	REMARKS
MANAGEMENT	DESIGNED	JDD	JDD
	DRAWN	JDD	JDD
	CHECKED	-	-
	APPROVED	2/2/24	2/2/24
	LAST EDIT	2/2/24	2/2/24
	PLOT DATE	2/2/24	2/2/24
	SUBMITTAL	02/02/24	

PROJECT NUMBER	165.030630
DRAWING FILE NAME	M-102
DRAWING SCALE	AS SHOWN

**SMALL BOAT HARBOR UTILITIES
CITY OF SAINT PAUL
PIPING AND EQUIPMENT SECTIONS**

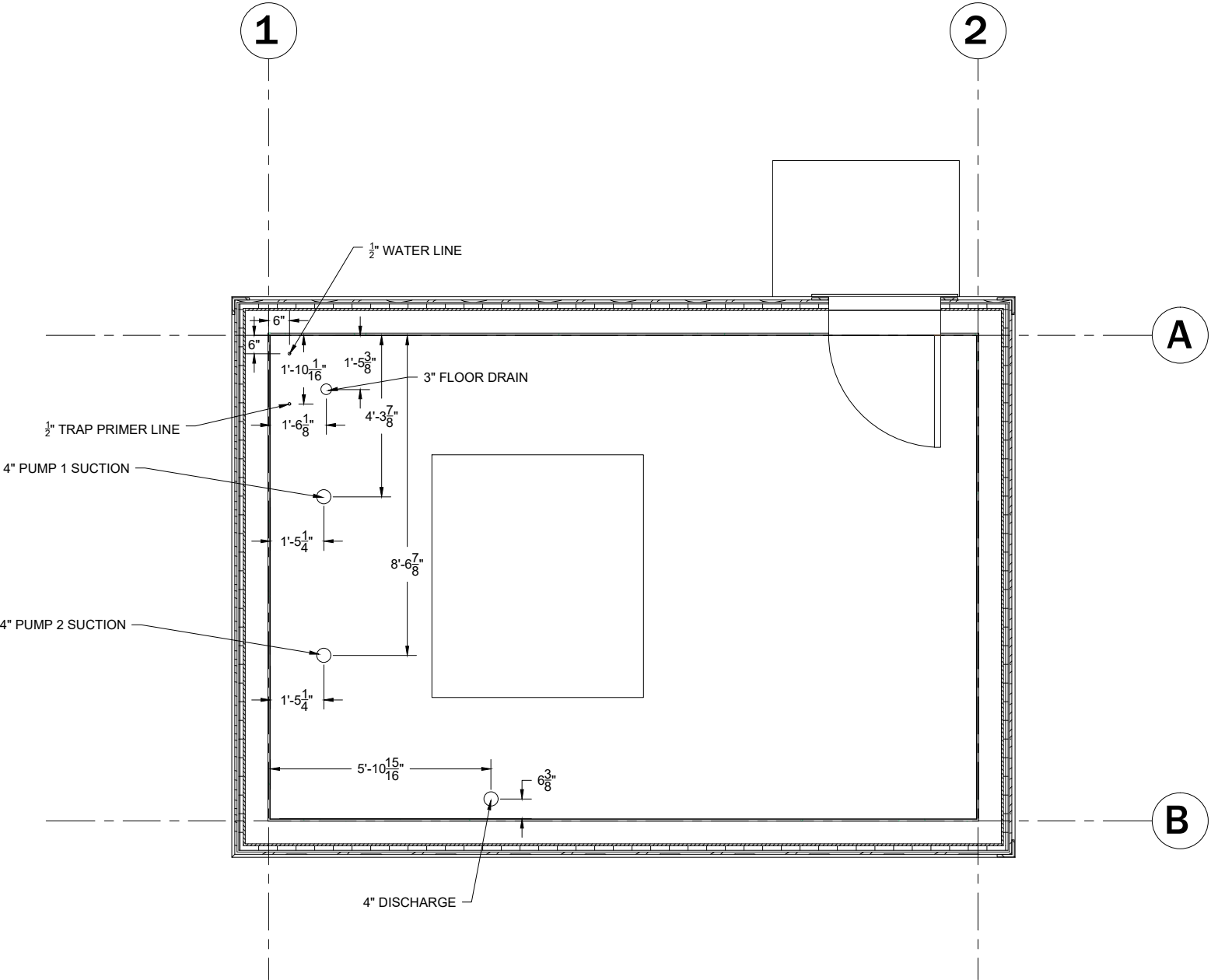
SHEET NUMBER

M-102

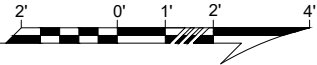
100% SUBMITTAL

GENERAL NOTES:

1. CONTRACTOR SHALL VERIFY DIMENSIONS PRIOR TO THE BEGINNING OF CONSTRUCTION.
2. SEE ARCHITECTURAL DRAWINGS FOR PENETRATION DETAILS.
3. SEE CIVIL DRAWINGS FOR WET WELL PLACEMENT AND PIPE ROUTING IN RELATION TO BUILDING.



1 LIFT STATION PLUMBING PENETRATION PLAN
M-103 SCALE: 1/2" = 1'-0"



REVISIONS & ADDENDUMS	
#	DATE

MANAGEMENT	
DESIGNED	JDD
DRAWN	JDD
CHECKED	-
APPROVED	2/2/24
LAST EDIT	2/2/24
PLOT DATE	2/2/24
SUBMITTAL	02/02/24

SMALL BOAT HARBOR UTILITIES
CITY OF SAINT PAUL
LIFT STATION PIPING PENETRATION PLAN

PROJECT NUMBER: 165.030630
 DRAWING FILE NAME: M-103
 SHEET NUMBER: M-103
 DRAWING SCALE: AS SHOWN

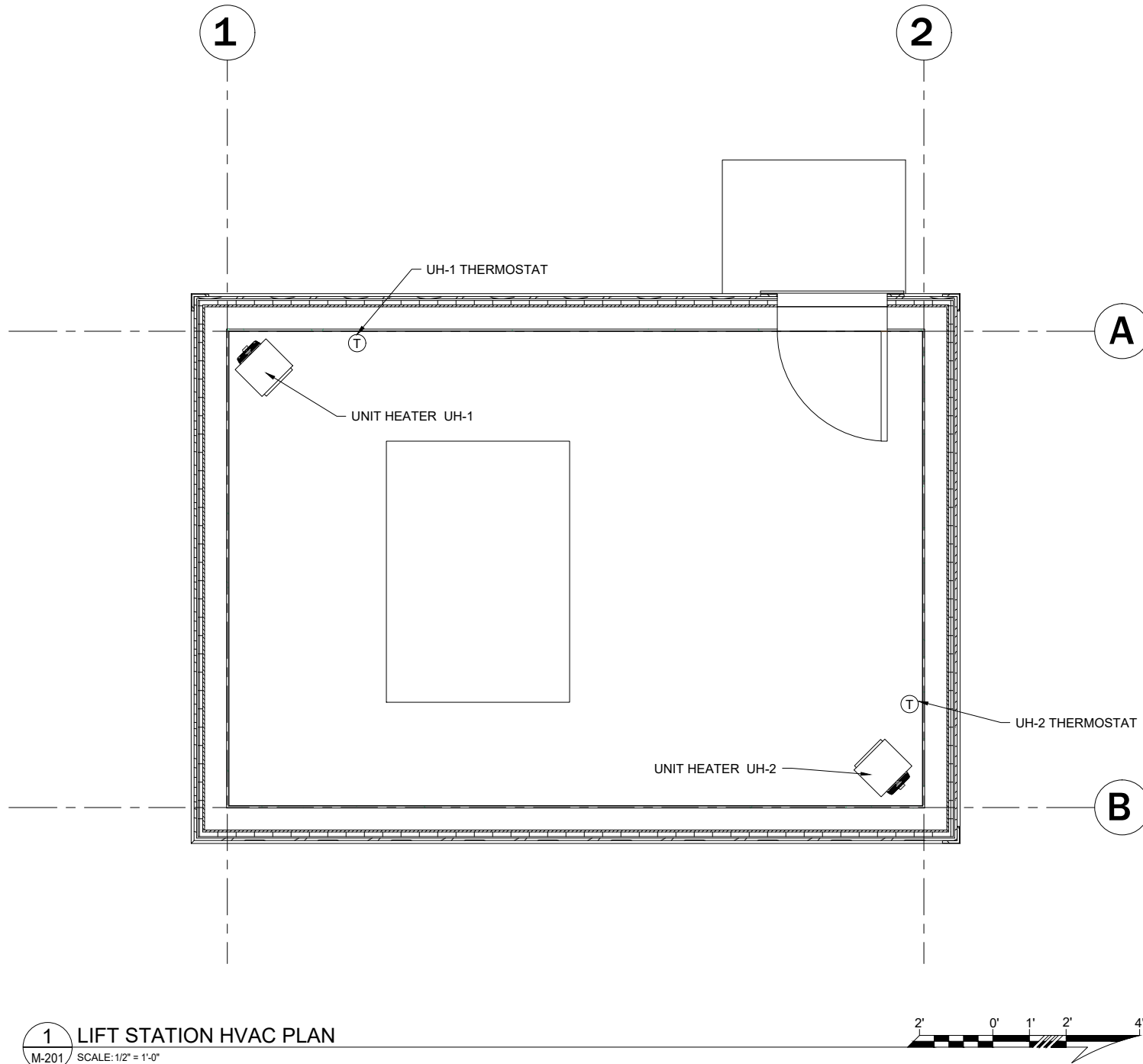
SHEET NUMBER
M-103

100% SUBMITTAL

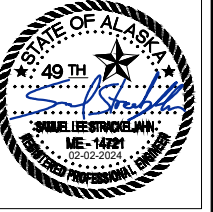
UNIT HEATER SCHEDULE

ITEM	TYPE	RATED CAPACITY (BTU/HR)	DESIGN CAPACITY (BTU/HR)	CFM	ELECTRICAL DATA				BASIS OF DESIGN		NOTE
					HP	V	PH	HZ	MAKE	MODEL	
UH-1	HORIZONTAL ELECTRIC	10,200	4,028	380	1/40	208	3	60	MODINE	HER 30B 3101	1,2
UH-2	HORIZONTAL ELECTRIC	10,200	4,028	380	1/40	208	3	60	MODINE	HER 30B 3101	1,2

NOTES:
 1. HEATER LISTED IS BASIS OF DESIGN, ANY SUBSTITUTION SHALL BE REQUIRED TO BE APPROVED BY ENGINEER.
 2. THERMOSTAT SHALL BE PROVIDED WITH UNIT AND FIELD MOUNTED



GENERAL NOTES:
 1. HEATERS SHALL BE WALL MOUNTED



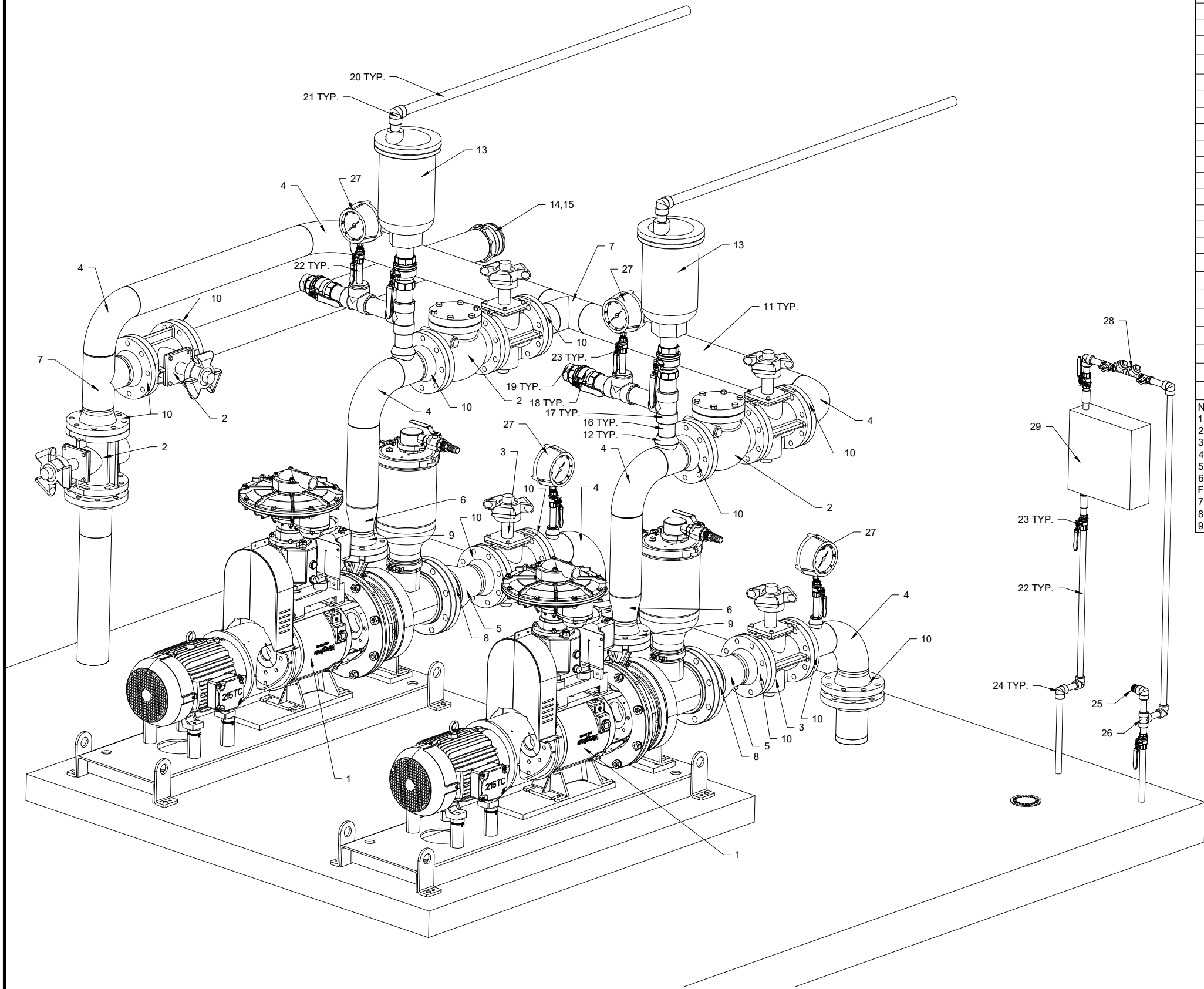
MANAGEMENT	
DESIGNED	JDD
DRAWN	JDD
CHECKED	-
APPROVED	-
LAST EDIT	2/2/24
PLOT DATE	2/2/24
SUBMITTAL	02/02/24

REVISIONS & ADDENDUMS		
#	DATE	REMARKS

SMALL BOAT HARBOR UTILITIES
CITY OF SAINT PAUL
LIFT STATION HVAC PLAN

PROJECT NUMBER: 165.030630
 DRAWING FILE NAME: M-201
 DRAWING SCALE: AS SHOWN

SHEET NUMBER
M-201



BOM						
TAG	DESCRIPTION	SIZE	CLASS/SCH.	MATERIAL	QTY.	NOTES
1	CHOPPER PUMP	-	-	-	2	2
2	SWING CHECK VALVE	4"	CLASS 150	STAINLESS STEEL	2	5
3	PLUG VALVE	4"	CLASS 150	STAINLESS STEEL	6	
4	LR 90° ELBOW	4"	SCH. 40	ASTM A403	7	
5	REDUCER	6" X 4"	SCH. 40	ASTM A403	2	
6	REDUCER	4" X 3"	SCH. 40	ASTM A403	2	
7	TEE	4"	SCH. 40	ASTM A403	2	
8	WN FF FLANGE	6"	CLASS 150	ASTM A182	2	
9	WN FF FLANGE	4"	CLASS 150	ASTM A182	2	
10	WN RF FLANGE	4"	CLASS 150	ASTM A182	13	
11	PIPE	4"	SCH. 40	ASTM A312	20 Ft	1
12	THREAD-O-LET	4" X 2"	CLASS 3000	ASTM A182	2	
13	AIR RELEASE VALVE	2" X 1"	75 psi	ASTM A351 GR. CF8M	2	
14	MALE CAM-LOCK	4"	75 psi	STAINLESS STEEL	1	3
15	CAM-LOCK CAP	4"	75 psi	STAINLESS STEEL	1	4
16	PIPE	2"	SCH. 40	ASTM A312	4 FT	1
17	THREADED TEE	2"	CLASS 3000	ASTM A182	2	
18	FP BALL VALVE	2"	CLASS 3000	STAINLESS STEEL	4	
19	THREADED PLUG	2"	CLASS 3000	CLASS 3000	2	
20	PIPE	1"	SCH. 40	ASTM A312	20 FT	1
21	THREADED 90° ELBOW	1"	CLASS 3000	ASTM A182	2	
22	PIPE	1/2"	SCH.40	ASTM A312	10 Ft	1
23	BALL VALVE	1/2"	CLASS 3000	STAINLESS STEEL	3	
24	THREADED 90° ELBOW	1/2"	CLASS 3000	ASTM A182	6	
25	MNPT TO GH FITTING	1/2"	-	STAINLESS STEEL	1 Ft	
26	THREADED TEE	1/2"	CLASS 3000	ASTM A182	1 Ft	
27	PRESSURE GAUGE	1/2"	-	-	4	8
28	BACKFLOW PREVENTER	1/2"	-	CAST BRONZE		
29	ELECTRIC TRAP PRIMER	1/2"	-	-		9

NOTES:
 1. APPROXIMATE LENGTH
 2. SEE DRAWING M-401 FOR PUMP SCHEDULE
 3. FEMALE NPT PIPE CONNECTION
 4. WITH LOCKING TABS
 5. PROVIDED SEWAGE RATED CHECK VALVE
 6. CONTRACTOR SHALL PROVIDE ASTM A193 B8 STUDS OR BOLTS AND ASTM A194 GR.8 NUTS FOR ALL FLANGE CONNECTIONS.
 7. ADDITIONAL FITTINGS MAY BE REQUIRED, CONTRACTOR TO VERIFY.
 8. 1/2" BOTTOM CONNECTION, 4.5" FACE. SEE SPECS FOR ADDITIONAL INFORMATION.
 9. SEE SPECS FOR ADDITIONAL INFORMATION

KUNA ENGINEERING
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 Anchorage, AK 99503
 Office: 907-339-8500
 www.kunaeng.com
 License Number: AELS128381



REVISIONS & ADDENDUMS	DATE	REMARKS

MANAGEMENT	DESIGNED	JDD	DRAWN	JDD	CHECKED	APPROVED	LAST EDIT	2/2/24	PLOT DATE	2/2/24	SUBMITTAL	02/02/24

SMALL BOAT HARBOR UTILITIES
CITY OF SAINT PAUL
PIPING AND EQUIPMENT ISOMETRIC

PROJECT NUMBER: 165.030630
 DRAWING FILE NAME: M-301
 DRAWING SCALE: AS SHOWN

SEQUENCE OF OPERATION

1. WHEN HAND SWITCH IS IN "AUTO" THE PUMP(S) WILL OPERATE AS FOLLOWS:
 - A. WHEN THE FLUID IN THE WET WELL REACHES LEVEL "D", THE LEAD PUMP SHALL START
 - B. WHEN THE FLUID IN THE WET WELL REACHES LEVEL "C", THE LAG PUMP SHALL START
 - C. WHEN THE FLUID IN THE WET WELL REACHES LEVEL "B", THE HIGH LEVEL ALARM SHALL BE INITIATED
 - D. WHEN THE FLUID IN THE WET WELL REACHES LEVEL "E", THE PUMP(S) SHALL STOP
2. WHEN HAND SWITCH IS MOVED TO "HAND" ENERGIZE THE PUMP
3. PUMP RUN TIME INDICATOR SHALL BE ENGAGED WHEN PUMP IS RUNNING
4. IF ROOM TEMPERATURE DROPS BELOW 45°F, ALARM SHALL BE ACTIVATED

GENERAL NOTES:

1. SEE ELECTRICAL FOR DETAILS OF CONTROL PANEL.
2. VFD USED TO RAMP PUMPS TO FULL SPEED TO ACHIEVE PRIME. ONCE PRIME IS ACHIEVED VFD WILL RAMP DOWN TO RUN PUMP AT SET POINT. VFD SET POINT SPEED WILL BE DETERMINED DURING COMMISSIONING TO ACHIEVE PUMP FLOW RATES LISTED IN TABLE BELOW.

ABBREVIATIONS

- HS - HAND SWITCH
- LS - LEVEL SWITCH
- LIT - LEVEL INDICATION TRANSMITTER
- RTI - RUN TIME INDICATOR
- TS - TEMPERATURE SWITCH
- VFD - VARIABLE FREQUENCY DRIVE
- YA - STATUS ALARM (VISUAL)

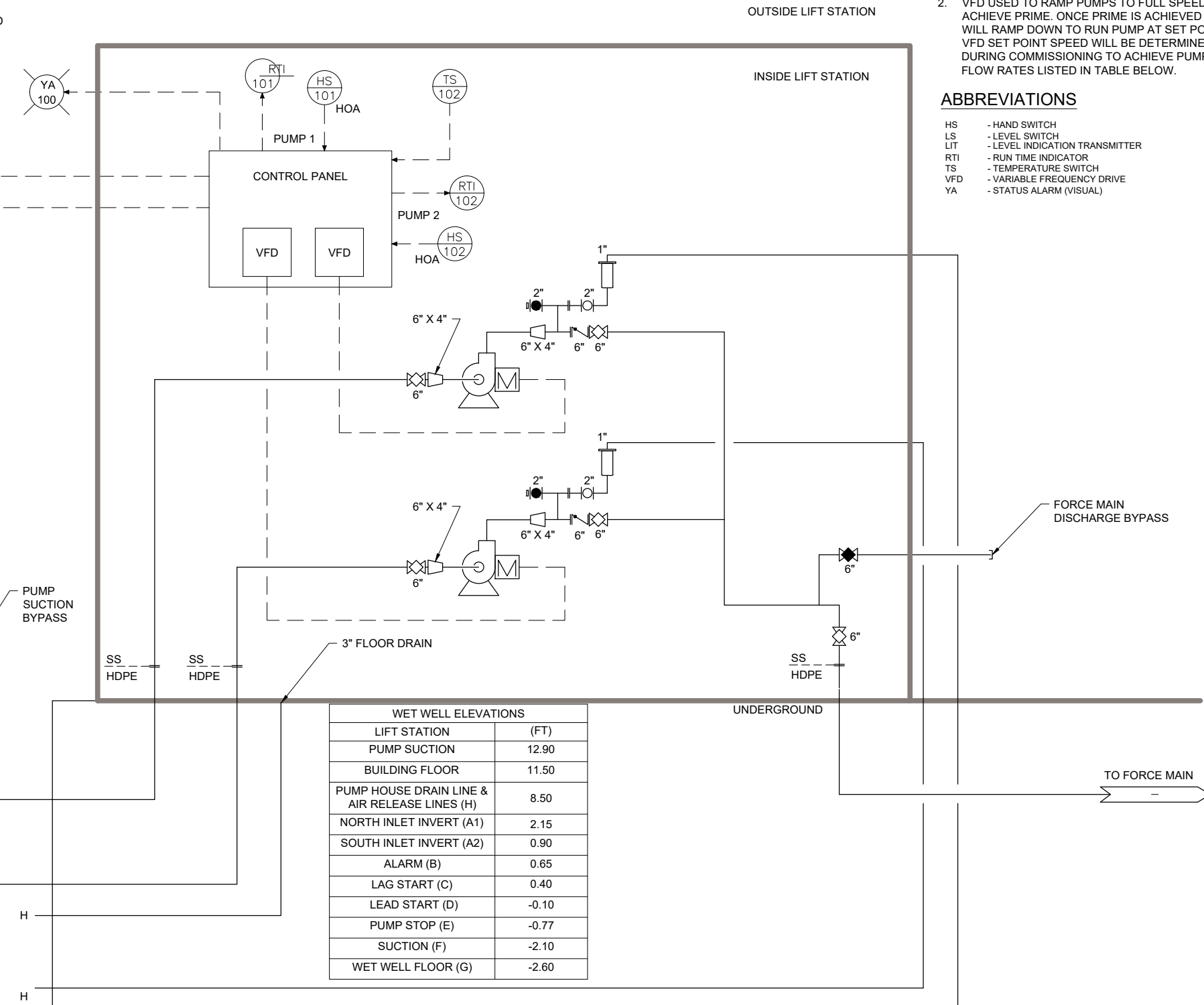


REVISIONS & ADDENDUMS	
#	DATE

MANAGEMENT	
DESIGNED	JDD
DRAWN	JDD
CHECKED	-
APPROVED	-
LAST EDIT	2/2/24
PLOT DATE	2/2/24
SUBMITTAL	02/02/24

SMALL BOAT HARBOR UTILITIES
CITY OF SAINT PAUL
PIPING AND INSTRUMENTATION DIAGRAM
DRAWING FILE NAME: M-401
PROJECT NUMBER: 165.030630
DRAWING SCALE: AS SHOWN

SHEET NUMBER
M-401



WET WELL ELEVATIONS	
LIFT STATION	(FT)
PUMP SUCTION	12.90
BUILDING FLOOR	11.50
PUMP HOUSE DRAIN LINE & AIR RELEASE LINES (H)	8.50
NORTH INLET INVERT (A1)	2.15
SOUTH INLET INVERT (A2)	0.90
ALARM (B)	0.65
LAG START (C)	0.40
LEAD START (D)	-0.10
PUMP STOP (E)	-0.77
SUCTION (F)	-2.10
WET WELL FLOOR (G)	-2.60

PUMP SCHEDULE									
UNIT	MANUFACTURER / MODEL	SERVICE	TYPE	FLOW (GPM)	HEAD (FT)	SPEED (RPM)	MOTOR (HP)	ELECTRICAL (VOLT/PH/Hz)	NOTES
PUMP 1	VAUGHN THE3P6CS	WASTEWATER	CENTRIFUGAL, CHOPPER	150	80	1765	15	208/3/60	1,2
PUMP 2	VAUGHN THE3P6CS	WASTEWATER	CENTRIFUGAL, CHOPPER	150	80	1765	15	208/3/60	1,2

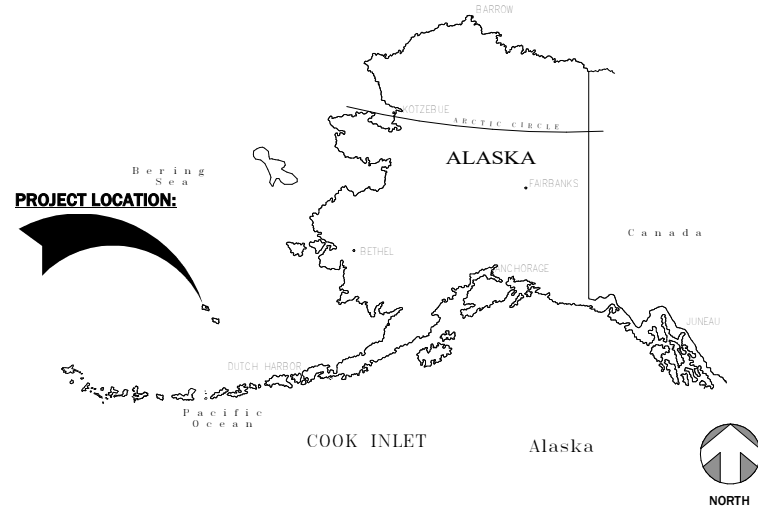
NOTES:
1. VFD CONTROLLED 19' OF SUCTION LIFT
2. PUMP LISTED IS BASIS OF DESIGN, ANY PUMP SUBSTITUTION SHALL BE REQUIRED TO BE APPROVED BY ENGINEER.

100% SUBMITTAL

SMALL BOAT HARBOR UTILITIES

CITY OF SAINT PAUL, ALASKA

LOCATION MAP



ARCH. ABBREVIATIONS

- SEE OTHER DISCIPLINES FOR ADDITIONAL ABBREVIATIONS.
- SOME ABBREVIATIONS LISTED BELOW MAY NOT BE USED IN THIS PROJECT.

(E) EXISTING	ADA AMERICAN DISABILITIES ACT	RD ROOF DRAIN	PLY PLYWOOD
AFB ABOVE FINISHED FLOOR	AFG ABOVE FINISH GRADE	SD STRUCTURAL INSULATED PANEL	RD ROOF DRAIN
CFCI CONTRACTOR FURNISHED CONTRACTOR INSTALLED	CFOI CONTRACTOR FURNISHED OWNER INSTALLED	SIP SPECIFICATION	SIP STRUCTURAL INSULATED PANEL
CMU CONCRETE MASONRY UNIT	CNC CONCRETE	STC SOUND TRANSMISSION CLASS	STC SOUND TRANSMISSION CLASS
CONC CONCRETE	DS DOWNSPOUT	STRUC STRUCTURAL	STRUC STRUCTURAL
ELEC ELECTRICAL	FV FIELD VERIFY	TBD TO BE DETERMINED	TBD TO BE DETERMINED
GYP GYPSUM BOARD	IBC INTERNATIONAL BUILDING CODE	TYP TYPICAL	TYP TYPICAL
INSUL INSULATION	ITSP INSULATED TRANSLUCENT SANDWICH PANEL	UL UNDERWRITERS LABORATORY	UL UNDERWRITERS LABORATORY
MECH MECHANICAL	MFRG MANUFACTURER	VIF VERIFY IN FIELD	VIF VERIFY IN FIELD
MFGD MANUFACTURER'S STANDARD	MIN MINIMUM	VP VAPOR BARRIER	VP VAPOR BARRIER
MRGWB MOISTURE RESISTANT GWB	NIC NOT IN CONTRACT	VTR VENT THROUGH ROOF	VTR VENT THROUGH ROOF
OC ON CENTER	OFD OVERFLOW DRAIN		
OFD OVERFLOW DRAIN	OFOI OWNER FURNISHED OWNER INSTALLED		
OFOI OWNER FURNISHED OWNER INSTALLED	OFCI OWNER FURNISHED CONTRACTOR INSTALLED		
OFCI OWNER FURNISHED CONTRACTOR INSTALLED	OSB ORIENTED STRAND BOARD		
OSB ORIENTED STRAND BOARD	OTS OPEN TO STRUCTURE		
OTS OPEN TO STRUCTURE			

GENERAL NOTES

- ALL CONSTRUCTION SHALL COMPLY WITH APPLICABLE CODES AS ADOPTED AND AMENDED BY AK DEPT. OF PUBLIC SAFETY.
- THESE DRAWINGS ARE SUPPLIED TO THE CONTRACTOR AND OTHERS FOR THEIR USE FOR THIS SPECIFIC PROJECT. COPYRIGHT KUNA ENGINEERING.
- THE ORGANIZATION OF THE DOCUMENTS ARE NOT INTENDED TO CONTROL THE DIVISION OF WORK. DIVISION OF WORK SHALL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR.
- DIMENSIONS ARE TO FACE OF FRAMING, OR GRID LINE, UNLESS OTHERWISE NOTED.
- CONTRACTOR SHALL VERIFY DIMENSIONS, REQUIRED CLEARANCES, AND POWER, HVAC AND PLUMBING REQUIREMENTS FOR ALL OWNER AND N.I.C. ITEMS. NOTIFY ARCHITECT OF ANY DISCREPANCY PRIOR TO COMMENCEMENT OF WORK.
- ALL VAPOR RETARDER IS TO BE SEALED VAPOR TIGHT AT ALL LOCATIONS.
- IT IS THE CONTRACTOR'S RESPONSIBILITY TO INSPECT THE JOB SITE TO FAMILIARIZE HER/HIMSELF WITH ALL THE EXISTING CONDITIONS THAT COULD AFFECT THE INSTALLATION OF ANY WORK SET FORTH IN THESE PLANS.
- THE JOB SITE AT THE COMPLETION OF CONSTRUCTION SHALL BE CLEANED OF ANY DEBRIS OR SPOIL RESULTING FROM THE CONSTRUCTION. AT NO TIME SHALL THIS MATERIAL OBSTRUCT THE NORMAL OPERATION OF THE OWNER.
- ALL EQUIPMENT OR MATERIALS NOT SHOWN OR SPECIFIED ON THE PLANS OR IN THE SPECIFICATIONS, BUT REQUIRED TO COMPLETE THIS INSTALLATION SHALL BE SUPPLIED BY THE CONTRACTOR AS PART OF THE CONTRACT WORK.
- ALL MATERIALS SHALL BE NEW AND OF A GRADE AND QUALITY CONSISTENT WITH THE INTENDED USE AS SPECIFIED AND APPROVED BY THE ARCHITECT.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING THE EXISTENCE AND LOCATION OF ANY UNDERGROUND OR CONCEALED UTILITY LINES THAT MAY BE REQUIRED, OR AVOIDED DURING CONSTRUCTION.
- REFER TO CODE ANALYSIS, PLANS, AND WALL TYPES FOR COMPLETE DESCRIPTIONS OF WALL ASSEMBLIES.
- INSTALL A CONTINUOUS BEAD OF SEAL AT ALL GAP/SEAMS BETWEEN FIXED EQUIPMENT AND WALLS, OR OTHER ASSEMBLIES.
- ALL COLOR SELECTIONS SHALL BE PER COLOR SCHEDULE, ISSUED BY ARCHITECT, AFTER CONTRACTOR SUBMITS SAMPLES.
- REFERENCE ALL DISCIPLINE DRAWINGS FOR COORDINATION WORK.
- INSTALL 2X BLOCKING OR BACKING MATERIAL FOR ALL WALL MOUNTED ITEMS.
- REFER TO STRUCTURAL SHEETS FOR FRAMING DETAILS.

REVISIONS & ADDENDUMS	
#	DATE

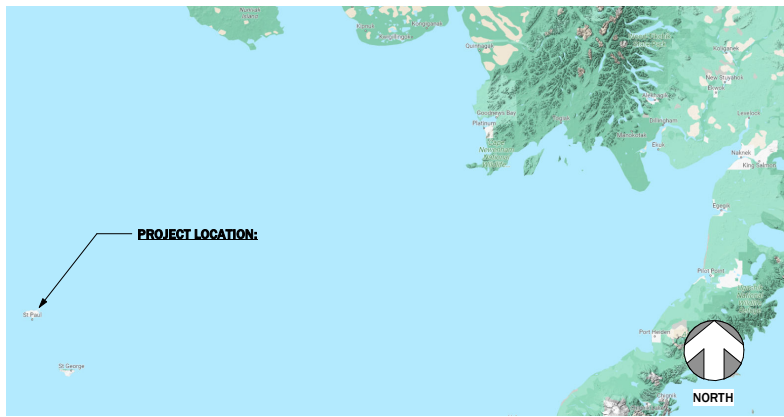
MANAGEMENT					02/02/24
DESIGNED	WTG	VM	WTG	WTG	WTG

SMALL BOAT HARBOR UTILITIES
CITY OF SAINT PAUL
COVER SHEET

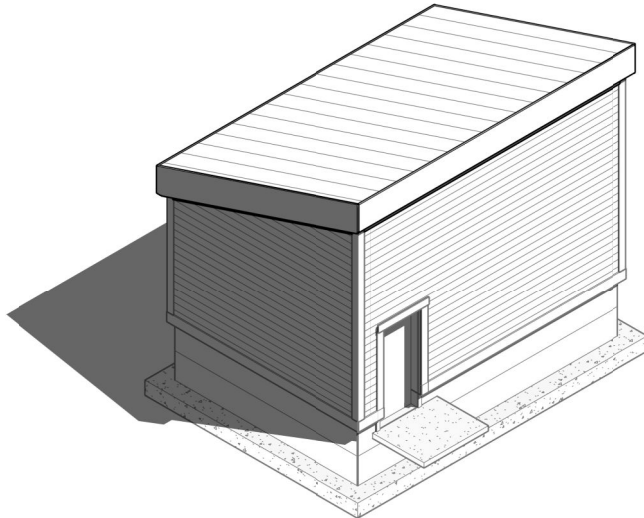
PROJECT NUMBER: 165.030630
DRAWING FILE NAME: 165.030630-A-000

DRAWING SCALE: As indicated

VICINITY MAP



PROJECT RENDERING



11"x17" SHEETS ARE HALF INDICATED SCALE

REVISIONS & ADDENDUMS
DATE REMARKS

MANAGEMENT	
DESIGNED	W/TG
DRAWN	VM
CHECKED	W/TG
APPROVED	
LAST EDIT	
LOT DATE	02/02/24
SUBMITTAL	

PROJECT NUMBER	165.030630
DRAWING FILE NAME	165.030630 - A-001

SMALL BOAT HARBOR UTILITIES
CITY OF SAINT PAUL
CODE ANALYSIS AND PLANS

DRAWING SCALE
1/4" = 1'-0"

SHEET NUMBER
A-001

PROJECT INFORMATION

Project name: City of St. Paul - Small Boat Harbor Utilities

APPLICABLE CODES (WITH STATE OF ALASKA AMENDMENTS)
International Building Code 2021 (IBC 2021), International Fire Code 2021 (IFC 2021), International Mechanical Code 2021 (IMC 2021), Electrical Code 2020, Fire Wall Code 2021, Plumbing Code 2018, Structural Concrete Code 2019, and the Concrete Construction Tolerance Code 2010

BUILDING DATA

Story	Space Name	Occupancy Group	Function of Space	Designed Area (gross sq. ft.)	Area Per Story
1	Equipment Room	S-2	Accessory storage areas, mechanical equipment room	315	315
Total Gross Area:				315	

Sprinkler type	Type of Construction	Fire Separation	High-Rise
Not Sprinklered	VB	-	No

HEIGHTS AND AREAS

Building Area	503	
Single Occupancy		
Occupancy Group	Designed Area (sq. ft.)	Allowed Area (Aa) (sq. ft.)
S-2	315	28,755

Factor Increase was determined by interpolation
Per Section 508.3.1, use area requirements for most restrictive occupancy group per story. Occupancy group with most restrictive area: S-2 = 28,755 sq. ft.

Building Height in Stories

Single Occupancy	504.4
Occupancy Group	
Highest Story Above Grade Plane	Highest Allowable Story Above Grade Plane
S-2	2

Building Height in Feet

Single Occupancy	504.3
Occupancy Group	
Highest Elevation Above Grade Plane	Highest Allowable Elevation Above Grade Plane
S-2	40 ft.
Average Roof Surface Height Above Grade Plane	Highest Allowable Elevation Above Grade Plane
12.0 ft.	40 ft.

EGRESS INFORMATION

Occupant Loads

Story	Space Name	Occupancy Group	Function of Space	Designed Area (gross sq. ft.)	Designed Area (net sq. ft.)	OLF	Occupant Load
1	Equipment Room	S-2	Accessory storage areas, mechanical equipment room	315	-	300	2

Min. Exits per Space

More than one exit must be provided if the space occupant load or maximum common path of egress travel distance are exceeded. More exits may be required under high occupant load or other special conditions (see notes below).

Story	Space Name	Occupancy Group	Function of Space	Cum. Occupant Load of Space	Max Single Exit Cumulative Load of Space	Min. Number of Exits per Space	Max. Common Path of Egress Allowed for Single Exit
1	Equipment Room	S-2	Accessory storage areas, mechanical equipment room	2	29	1	100

Min. Exits per Story

Story	Total Occupancy Load by Story	Minimum Number of Exits or Exit Accesses	Max Exit Access Travel Distance for 1 Exit
1	2	1	75

In addition to single exit eligibility shown above, one exit may be permitted where all spaces are permitted to have one exit and access to a single exit and the exit discharges directly to the exterior at the level of exit discharge

Max. Exit Access Travel Distance

Maximum exit access travel distance serving each space should be at a maximum the values below for each occupancy group.

Occupancy Group	Max Exit Access Travel Distance
S-2	300 ft.

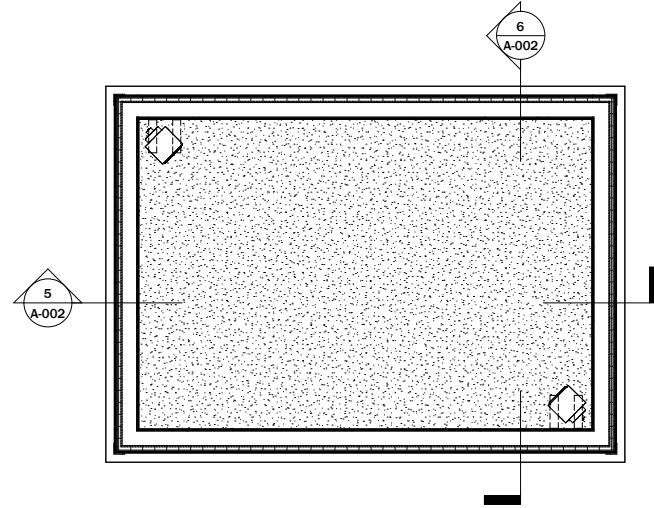
FIRE-RESISTANCE RATINGS

Interior Building Element Fire-Resistance R 704.1

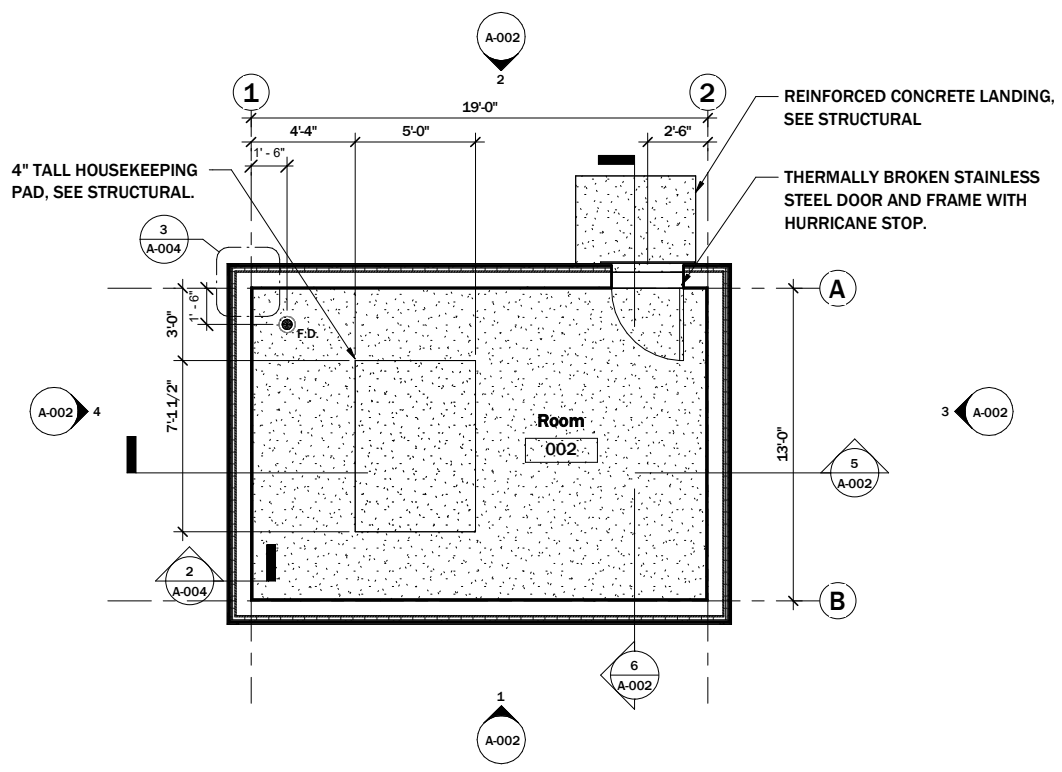
Story	Interior Building Element Type	Min. Fire Resistance Ratings (hrs.)
All	Primary structural frame	0
	Interior Bearing Walls	0
All	Interior Nonbearing walls and partitions	0
	Floor construction and associated secondary structural members	0
All	Roof construction and associated secondary structural members	0

Required Occupancy Separations

PLUMBING	Required Occupancy Separations
N/A - Not Occupied	1210

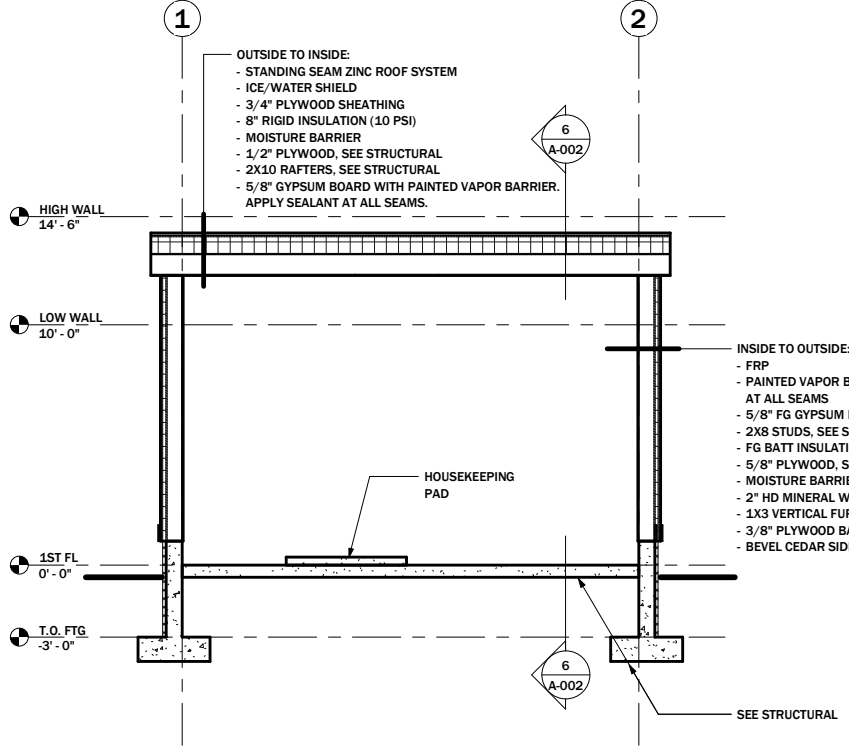


2 REFLECTED CEILING PLAN
SCALE: 1/4" = 1'-0"

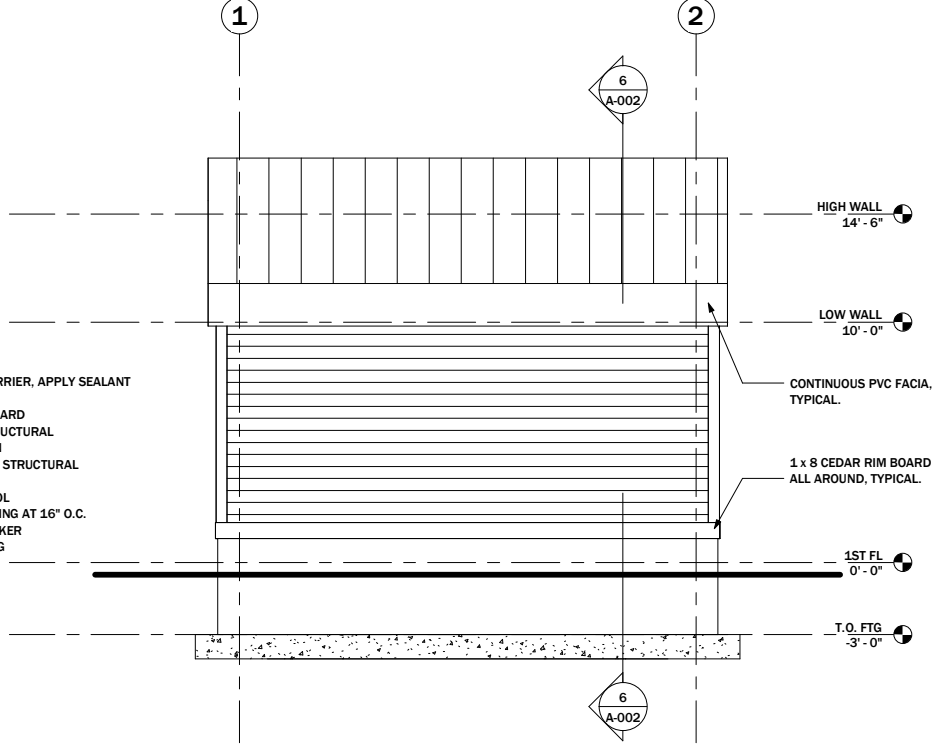


1 FLOOR PLAN
SCALE: 1/4" = 1'-0"

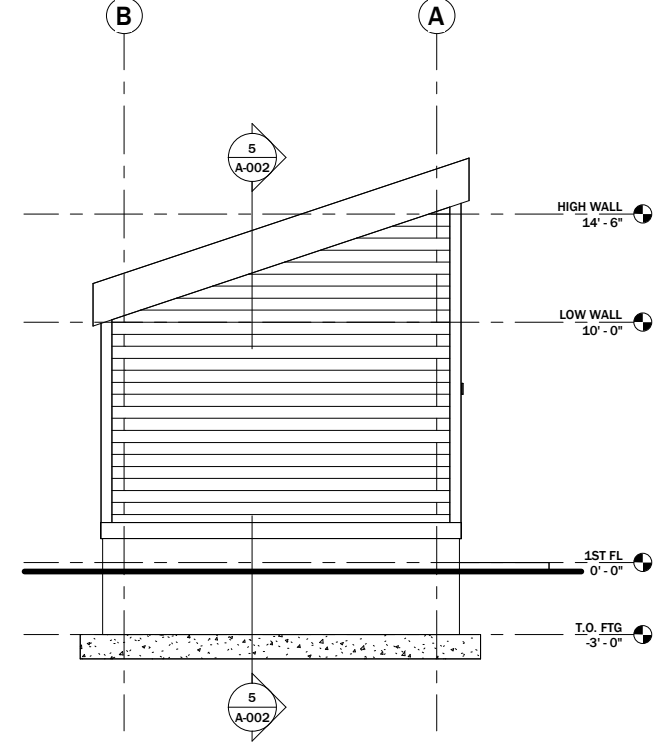
****SEE CIVIL FOR SITE LAYOUT 100% SUBMITTAL**



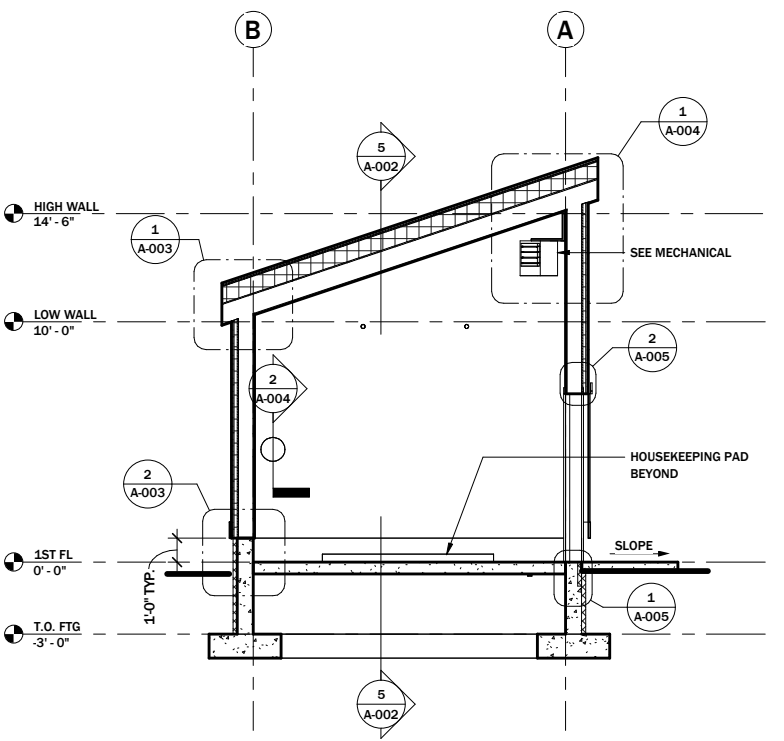
5 BUILDING SECTION - LONG
SCALE: 1/4" = 1'-0"



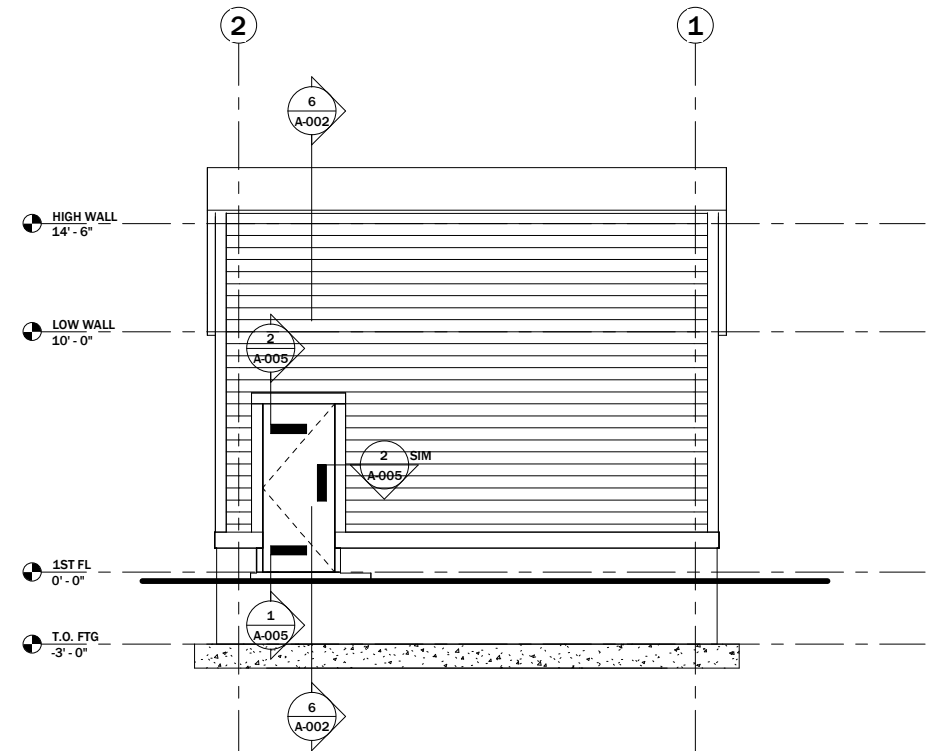
1 SOUTH ELEVATION
SCALE: 1/4" = 1'-0"



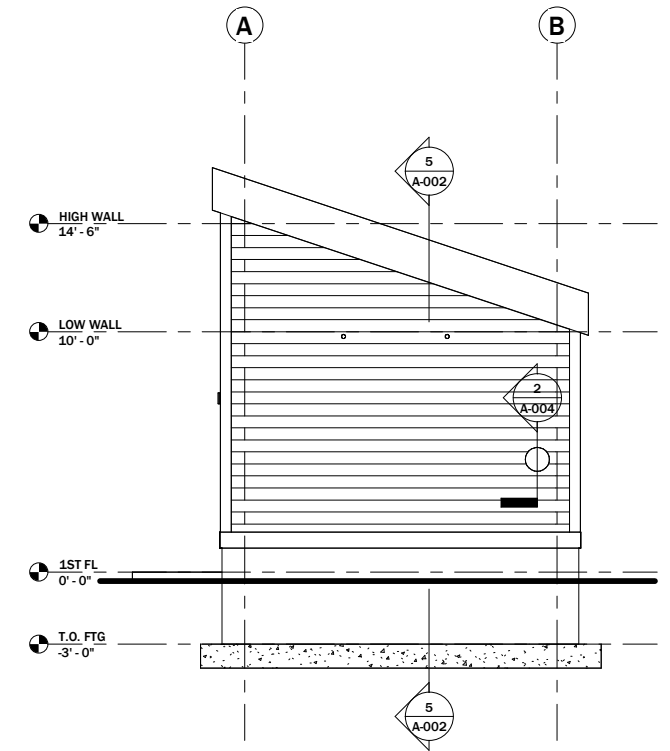
3 EAST ELEVATION
SCALE: 1/4" = 1'-0"



6 BUILDING SECTION - SHORT
SCALE: 1/4" = 1'-0"



2 NORTH ELEVATION
SCALE: 1/4" = 1'-0"



4 WEST ELEVATION
SCALE: 1/4" = 1'-0"

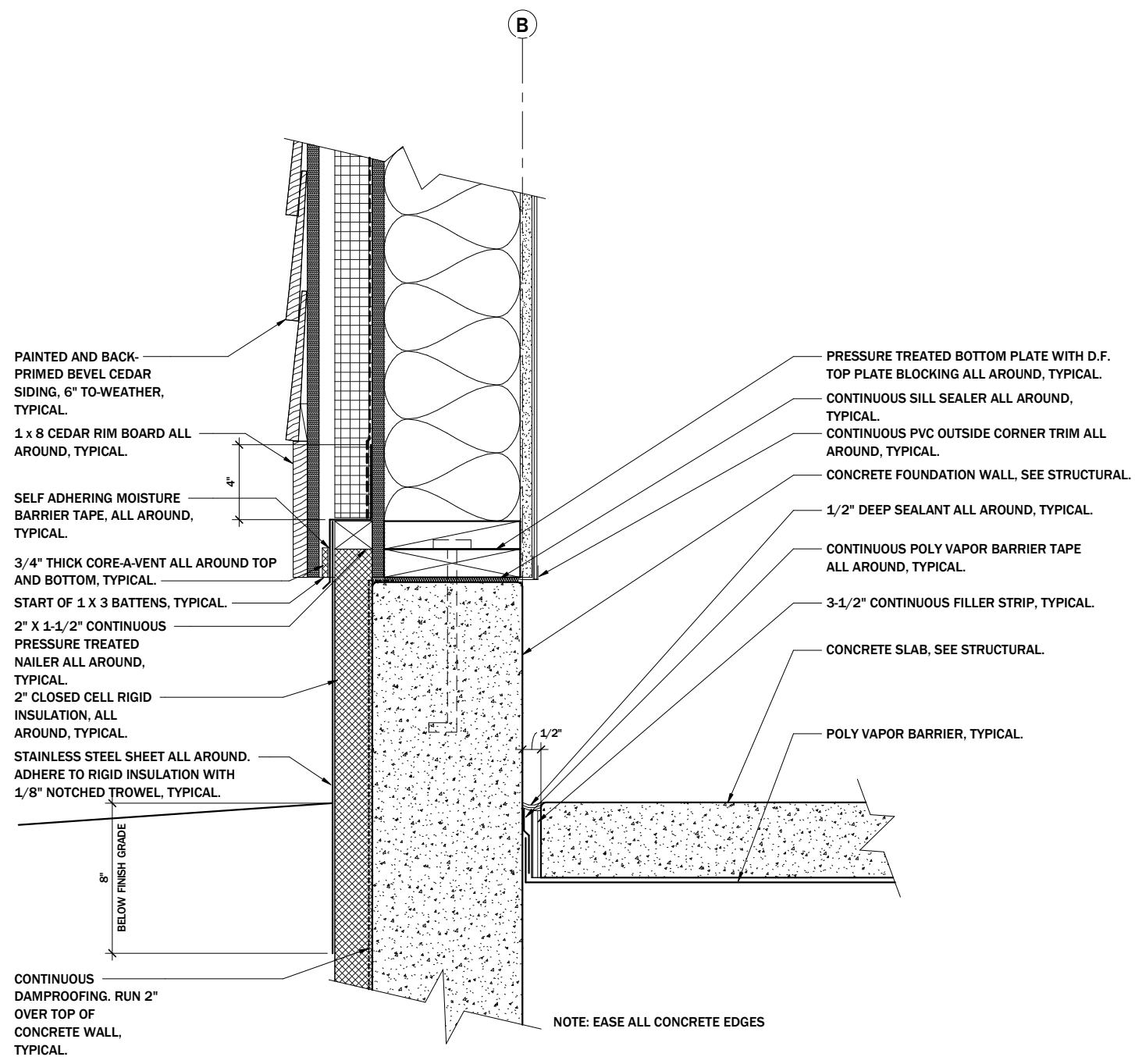
REVISIONS & ADDENDUMS	
#	DATE

MANAGEMENT		WTG	DATE
DESIGNED	DRAWN	CHECKED	APPROVED

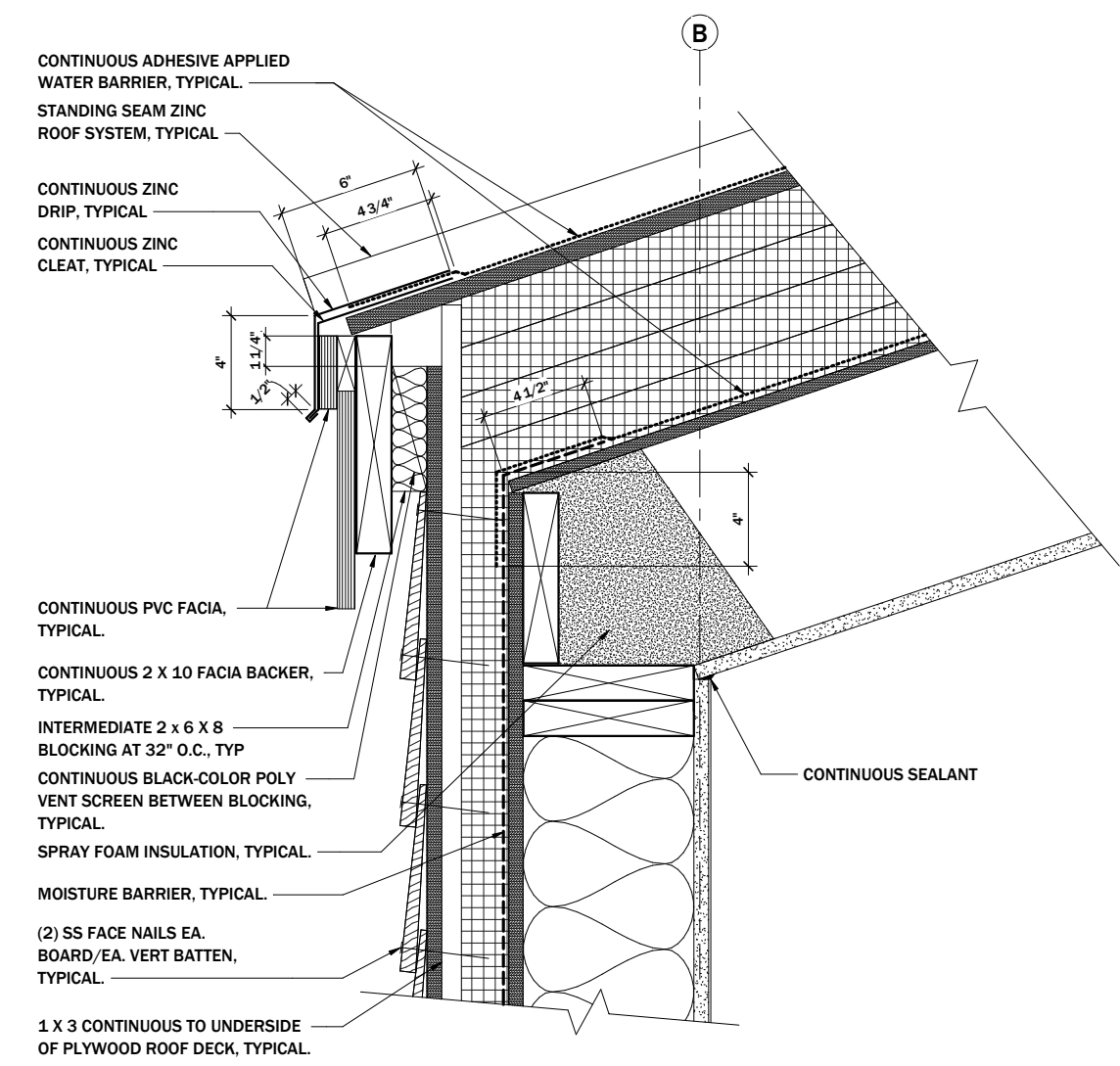
SMALL BOAT HARBOR UTILITIES
CITY OF SAINT PAUL
SECTIONS AND ELEVATIONS

PROJECT NUMBER: 165.030630
DRAWING FILE NAME: 165.030630-A-002
DRAWING SCALE: 1/4" = 1'-0"
SUBMITTAL: 02/02/24

11"x17" SHEETS ARE HALF INDICATED SCALE



2 **DETAIL AT WALL BASE**
SCALE: 3" = 1'-0"



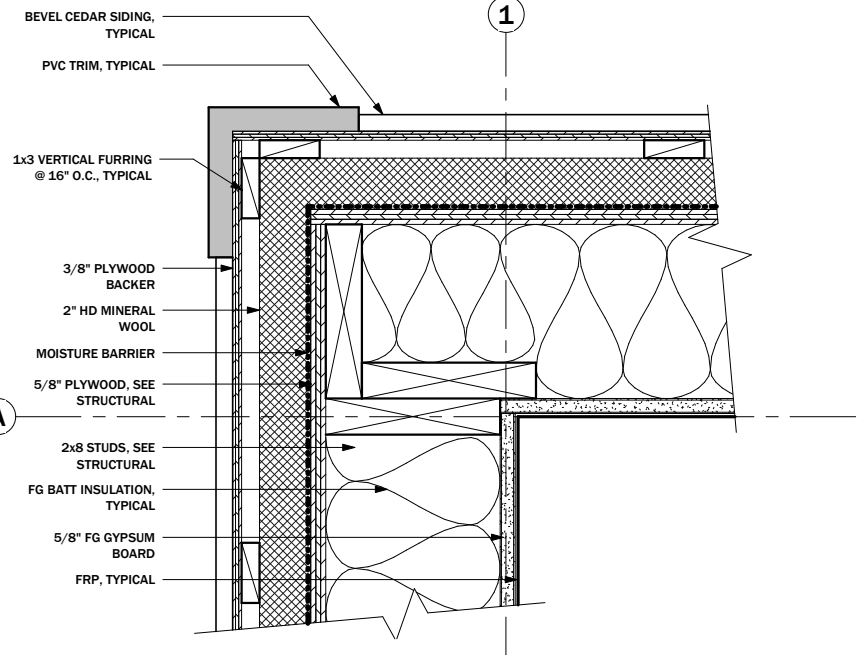
1 **DETAIL AT EAVE**
SCALE: 3" = 1'-0"

REVISIONS & ADDENDUMS	
#	DATE

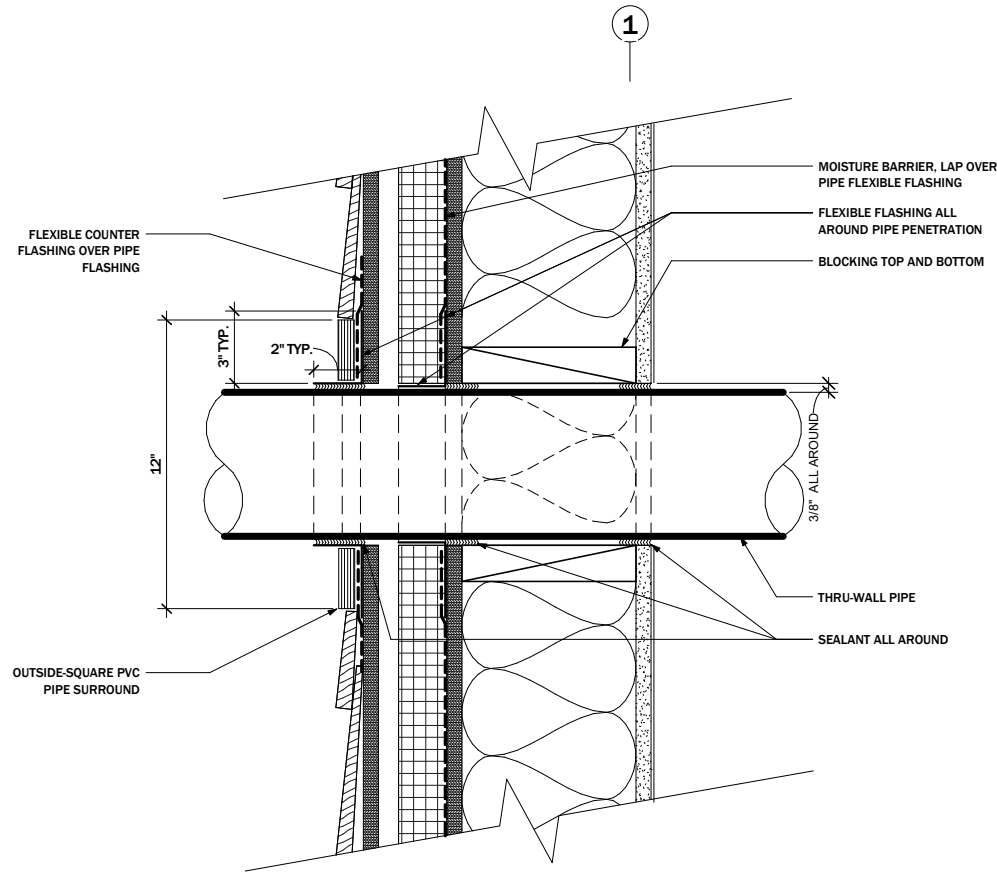
MANAGEMENT		WTG	WTG	WTG	WTG	WTG	WTG
DESIGNED							
DRAWN							
CHECKED							
APPROVED							
LAST EDIT							
PLOT DATE							
SUBMITTAL							

SMALL BOAT HARBOR UTILITIES
CITY OF SAINT PAUL
DETAILS

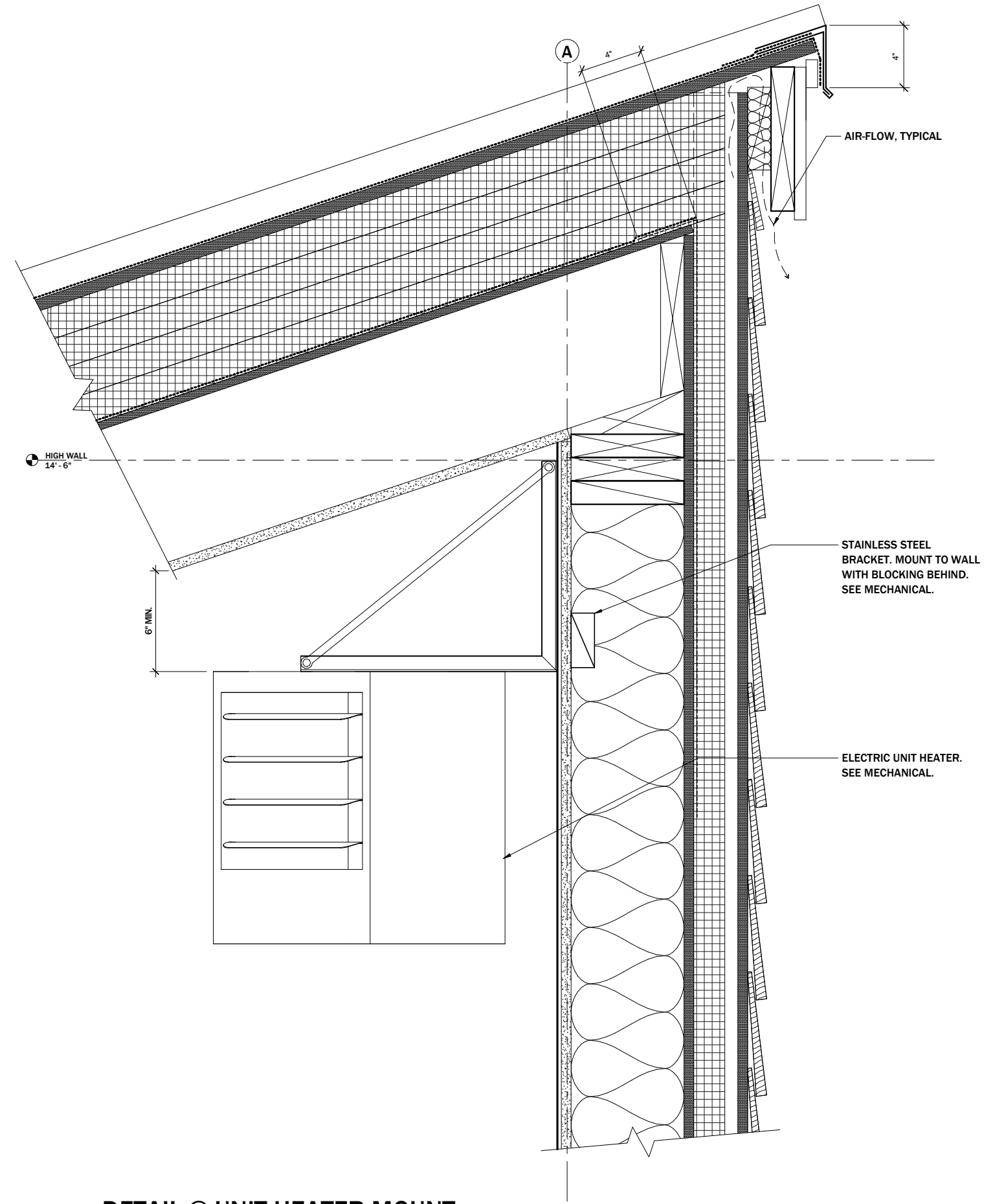
PROJECT NUMBER: 165.030630
DRAWING FILE NAME: 165.030630-A-003
SHEET NUMBER: **A-003**
DRAWING SCALE: 3" = 1'-0"
DATE: 02/02/24



3 EXTERIOR CORNER TRIM AND FLASHING DETAIL
SCALE: 3" = 1'-0"



2 WALL PENETRATION DETAIL, TYPICAL
SCALE: 3" = 1'-0"



1 DETAIL @ UNIT HEATER MOUNT
SCALE: 3" = 1'-0"

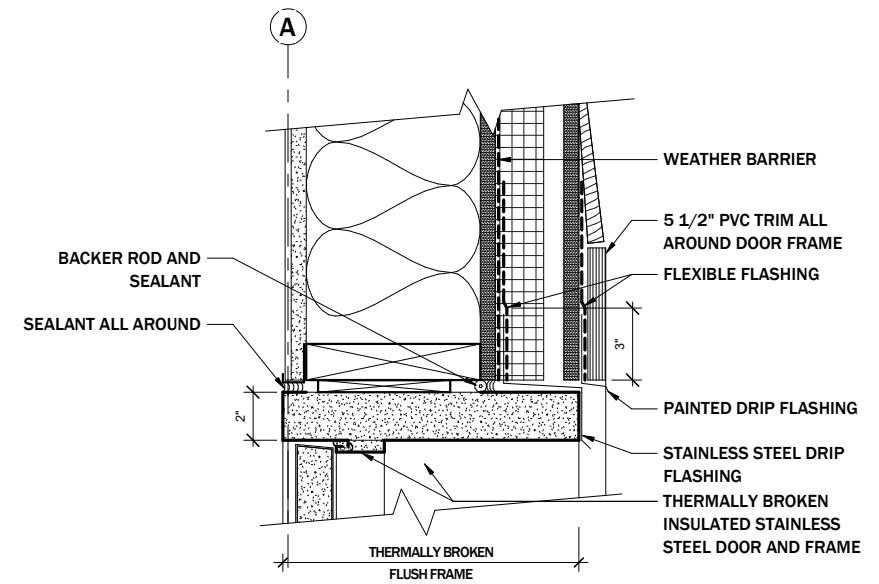
REVISIONS & ADDENDUMS		
#	DATE	REMARKS

MANAGEMENT	
DESIGNED	WTG
DRAWN	VM
CHECKED	WTG
APPROVED	
LAST EDIT	
PLOT DATE	
SUBMITTAL	02/02/24

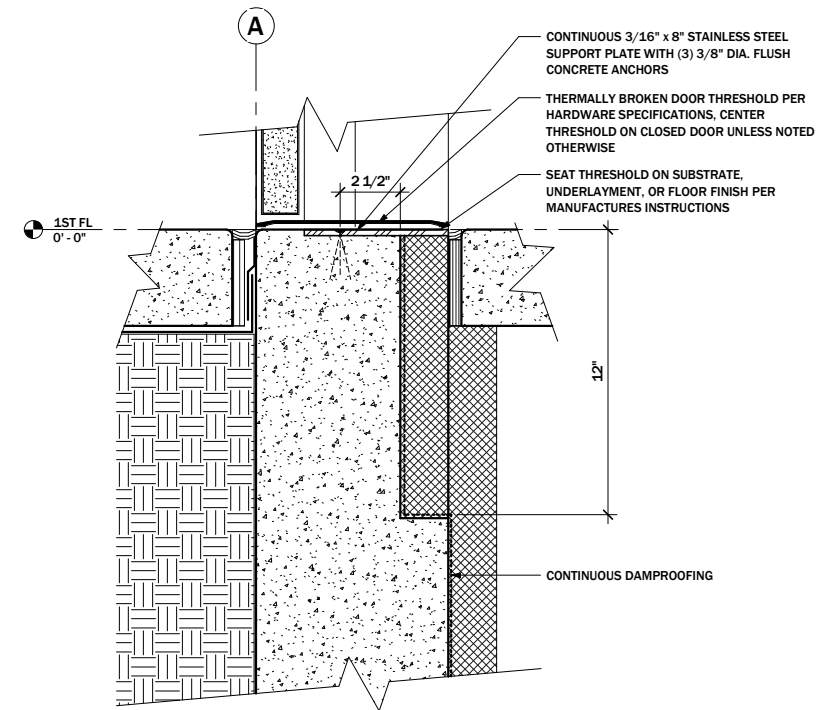
SMALL BOAT HARBOR UTILITIES
CITY OF SAINT PAUL
DETAILS

PROJECT NUMBER: 165.030630
DRAWING FILE NAME: 165.030630-A-004
DRAWING SCALE: 3" = 1'-0"

11"x17" SHEETS ARE HALF INDICATED SCALE



2 DETAIL@ DOOR HEAD / JAMB SIM.
SCALE: 3" = 1'-0"



1 DETAIL @ DOOR THRESHOLD
SCALE: 3" = 1'-0"

REVISIONS & ADDENDUMS	
#	DATE

MANAGEMENT		WTG	WTG	WTG	WTG	WTG	WTG
DESIGNED	DRAWN	CHECKED	APPROVED	LAST EDIT	PLOT DATE	DATE	SUBMITTAL
						02/02/24	

SMALL BOAT HARBOR UTILITIES
CITY OF SAINT PAUL
DETAILS

PROJECT NUMBER
165.030630

DRAWING FILE NAME
165.030630- A-005

DRAWING SCALE
3" = 1'-0"

STRUCTURAL DESIGN DATA:

- 1. CODES
ICC 2021 AS AMENDED BY STATE OF ALASKA.
ASCE 7-16.
- 1.1. SITE AND BUILDING PARAMETERS:
OCCUPANCY CATEGORY.....III
SITE TERRAIN/EXPOSURE CATEGORY.....C
SITE SOIL CLASS.....D
- 1.2. LIVE LOADS:
ROOF.....20 PSF
FLOOR.....NA
- 1.3. SNOW LOADS:
GROUND SNOW LOAD, P_g40 PSF
EXPOSURE FACTOR, C_e1.00
THERMAL FACTOR, C_t1.10
SNOW IMPORTANCE FACTOR, I_s1.10
FLAT ROOF SNOW LOAD, P_f34 PSF
ROOF SLOPE FACTOR, C_s1.00
SLOPED ROOF SNOW LOAD, P_s34 PSF
DRIFT SURCHARGE LOAD, P_dNA
DRIFT SURCHARGE WIDTH, WNA
- 1.4. WIND LOADS:
BASIC WIND SPEED, V170 MPH
BASIC WIND SPEED ASD, V_{ASD}132 MPH
RISK CATEGORY.....III
EXPOSURE CLASSIFICATION.....C
INTERNAL PRESSURE COEFFICIENT.....0.18
DESIGN WIND VELOCITY PRESSURE (26-10.2).....53 PSF
- 1.5. SEISMIC LOADS:
RISK CATEGORY.....III
SEISMIC IMPORTANCE FACTOR, I_e1.25
MAPPED SHORT-PERIOD ACCELERATION, S_s0.24
MAPPED 1-SECOND PERIOD ACCELERATION, S_10.13
SITE CLASS
SHORT-PERIOD DESIGN ACCELERATION, S_{DS}0.26
1-SECOND PERIOD DESIGN ACCELERATION, S_{D1}0.20
SEISMIC DESIGN CATEGORY.....D
BASIC SEISMIC FORCE-RESISTING SYSTEM
DESIGN BASE SHEAR.....0.72 K
SEISMIC RESPONSE COEFFICIENT, C_s0.05
RESPONSE MODIFICATION COEFFICIENT, R6.5
- 1.6. GEOTECHNICAL DATA
DESIGN LOAD BEARING VALUE.....2000 PSF
 - 1.6.1. FOUNDATIONS ARE DESIGNED FOR A MAXIMUM SOIL BEARING PRESSURE OF 2000 PSF UNDER SUSTAINED LOADING.
 - 1.6.2. FOUNDATION SOILS SHALL BE PREPARED IN ACCORDANCE WITH IBC 2021.
- 1.7. RAIN INTENSITY.....0.57 IN/HR
- 2. GENERAL
 - 2.1. ALL WORK IS TO BE IN ACCORDANCE WITH THE 2021 EDITION OF THE INTERNATIONAL BUILDING CODE (IBC) AS AMENDED BY THE STATE OF ALASKA, LOCAL CODE AMENDMENTS, AND GOOD STANDARD PRACTICE. THE CONTRACTOR IS RESPONSIBLE FOR COORDINATION OF THESE DRAWINGS WITH THE ARCHITECTURAL SHEETS FOR OPENING SIZES, PROPER LOCATION OF BEARING WALLS AND BEAMS, AND LOCATION OF MECHANICAL AND ELECTRICAL ITEMS NOT SHOWN ON THE STRUCTURAL DRAWINGS. PROVIDE ADDITIONAL STUDS, JOISTS, OR OTHER FRAMING AS REQUIRED TO PERMIT PROPER INSTALLATION OF MECHANICAL, ELECTRICAL, AND PLUMBING PENETRATIONS.
 - 2.2. PRIOR TO STARTING ANY WORK OR FABRICATION, THE CONTRACTOR SHALL COORDINATE ALL DIMENSIONS AMONG THE DRAWINGS. ANY DISCREPANCIES FOUND AMONG THE DRAWINGS, SITE CONDITIONS, AND THESE NOTES SHALL BE REPORTED TO THE ARCHITECT/ENGINEER.
 - 2.3. THE CONTRACTOR IS RESPONSIBLE FOR MEETING ALL OSHA AND DOSH SAFETY STANDARDS. THE CONTRACTOR IS IN CHARGE OF ALL SAFETY MATTERS ON AND AROUND THE JOB SITE. PROVIDE TEMPORARY ERECTION BRACING AND SHORING AS REQUIRED FOR STABILITY OF THE STRUCTURE DURING ALL PHASES OF THE CONSTRUCTION.

- 3. QUALITY ASSURANCE:
 - 3.1. SPECIAL INSPECTION IS REQUIRED IN ACCORDANCE WITH IBC SECTION 1704. THE OWNER SHALL ENGAGE THE SERVICES OF AN INDEPENDENT, QUALIFIED SPECIAL INSPECTOR. THE FOLLOWING ITEMS REQUIRE SPECIAL INSPECTION: PERIODIC INSPECTION OF THE LATERAL FORCE RESISTING SYSTEM - WOOD DIAPHRAGM NAILING AND ATTACHMENTS TO PERIMETER SHEAR WALLS. CONTINUOUS INSPECTION OF POST INSTALLED ANCHORS.
 - 3.2. SPECIAL INSPECTION IS IN ADDITION TO THE CONTRACTOR'S REQUIRED QUALITY CONTROL INSPECTIONS AND TESTING. THE CONTRACTOR'S QUALITY CONTROL INSPECTIONS AND TESTING SHALL OCCUR PRIOR TO SPECIAL INSPECTION AND REPORTS SHALL BE AVAILABLE TO THE SPECIAL INSPECTOR.
- 4. DEFERRED SUBMITTALS:
 - 4.1. THE FOLLOWING ITEMS ARE NOT INCLUDED IN THESE DRAWINGS AND REQUIRE STRUCTURAL DESIGN TO BE FURNISHED BY THE CONTRACTOR:
 - 4.1.1. ROOFING ATTACHMENT
 - 4.1.2. SEISMIC ANCHORAGE OF MECHANICAL AND ELECTRICAL EQUIPMENT DRAWINGS AND CALCULATIONS FOR BUILDER-DESIGNED COMPONENTS, SEALED BY AN ENGINEER REGISTERED IN THE STATE OF ALASKA, SHALL BE SUBMITTED TO THE ENGINEER FOR REVIEW PRIOR TO SUBMITTING TO BUILDING SAFETY FOR REVIEW. SUBMITTALS OF BUILDER-DESIGNED ITEMS SHALL INCLUDE LOCATIONS, MAGNITUDES, AND DIRECTIONS OF ALL FORCES TRANSFERRED TO THE STRUCTURE. DEFERRED SUBMITTALS MUST BE REVIEWED AND APPROVED PRIOR TO INSTALLATION/CONSTRUCTION.
- 5. SUBMITTALS:
 - 5.1. THE CONTRACTOR SHALL REVIEW, STAMP WITH HIS APPROVAL, DATE AND SIGN ALL SHOP DRAWINGS AND SUBMITTALS REQUIRED BY THE CONTRACT DRAWINGS PRIOR TO SUBMITTAL TO THE ENGINEER. AT THE TIME OF SUBMISSION, THE CONTRACTOR SHALL INFORM THE ENGINEER IN WRITING OF ANY DEVIATION IN THE SHOP DRAWINGS FROM THE REQUIREMENTS OF THE CONTRACT DRAWINGS. DIMENSIONS AND QUANTITIES ARE THE CONTRACTOR'S RESPONSIBILITY AND WILL NOT BE REVIEWED.
- 6. CONCRETE WORK:
 - 6.1. STRUCTURAL CONCRETE SHALL HAVE A 28 DAY STRENGTH, F_c OF 4,000 PSI. MIX SHALL NOT CONTAIN LESS THAN 5-1/2 SACKS OF CEMENT PER CUBIC YARD. MAXIMUM WATER TO CEMENT RATIO EQUALS 0.50. MAXIMUM UN-PLASTICIZED SLUMP SHALL BE 5 INCHES. TOTAL ENTRAINED AIR CONTENT OF 6%.
 - 6.2. REINFORCING STEEL: SHALL BE ASTM A615, GRADE 60 DETAILED OR IN ACCORDANCE WITH ACI 318. BAR LAP SHALL BE IN ACCORDANCE WITH ACI 318 (44 BAR DIAMETER MINIMUM), OR AS DETAILED, IF MORE RESTRICTIVE.
 - 6.3. SUPPORT ALL REBAR ON CHAIRS, DOBIES, OR OTHER APPROVED MEANS. CONTRACTOR SHALL TAKE SPECIAL CARE TO PREVENT DISTURBANCE DURING CONCRETE PLACEMENT TO ENSURE THAT REINFORCEMENT REMAINS AT ITS PROPER ELEVATION AND POSITION.
 - 6.4. ALL CONCRETE WORK SHALL CONFORM TO THE LATEST STANDARDS AND SPECIFICATIONS OF THE AMERICAN CONCRETE INSTITUTE.
- 7. WOOD:
 - 7.1. ALL DIMENSIONAL LUMBER SHALL BE DOUG FIR #2 OR BETTER FOR ALL 2X JOISTS, STUDS, AND PLATES, AND DOUG FIR #1 FOR ALL 4X OR 6X WOOD POSTS AND BEAMS UNLESS NOTED OTHERWISE. WOOD SHALL BE GRADED IN ACCORDANCE WITH THE WESTERN WOODS PRODUCTS ASSOCIATION (WWPA) OR WEST COAST LUMBER INSPECTION BUREAU (WCLIB) LUMBER GRADING CRITERIA. MAXIMUM MOISTURE CONTENT SHALL BE 15%. MINIMUM HEADER SIZE UNLESS NOTED OTHERWISE SHALL BE (2)2X8 HEM-FIR #2.
 - 7.2. ROOFING: 5/8" PLYWOOD ROOF SHEATHING SHALL BE CDX WITH EXTERIOR GLUE, OR BETTER AND SHALL HAVE A PANEL SPAN RATING OF 32/16 - BLOCKED EDGES, MINIMUM NAILING FOR ROOF PANELS SHALL BE (0.148")10d NAILS AT 6" O.C. ALONG PANEL EDGES AND 12" O.C. IN THE FIELD.

- 7.3. WALLS: PLYWOOD WALL SHEATHING SHALL BE 7/16" MIN CDX OR OSB WITH EXTERIOR GLUE, OR BETTER, AND SHALL HAVE A SPAN RATING OF 24/16 - MINIMUM NAILING FOR WALL PANELS SHALL BE 8d (0.131) NAILS AT 6" O.C. ALONG PANEL EDGES AND 12" O.C. IN THE FIELD. BLOCK ALL PANEL EDGES FOR VERTICAL PLYWOOD DIAPHRAGMS. REFER TO SHEARWALL SCHEDULE FOR ADDITIONAL NAILING REQUIREMENTS.
- 7.4. ALL METAL TO WOOD OR WOOD TO WOOD CONNECTIONS SHALL BE STANDARD OR AS DETAILED ON THE DRAWINGS USING A307 BOLTS. ALL BOLTS AND LAG SCREW HEADS IN CONTACT WITH WOOD SHALL HAVE PLATES OR WASHERS AS DETAILED AND OR SPECIFIED.
- 7.5. ALL FRAMING ANCHORS AND HANGERS INDICATED ON THE DRAWINGS ARE "SIMPSON STRONG-TIE" OR EQUAL. UNLESS OTHERWISE DETAILED, ALL BEAMS AND JOISTS SHALL RECEIVE HANGERS WITH A NORMAL LOAD CAPACITY EQUAL TO THE SHEAR CAPACITY OF THE SUPPORTED MEMBER. HANGERS LOCATED IN CONTACT WITH TREATED WOOD OR WET CONDITIONS SHALL BE Z-MAX, STAINLESS STEEL OR HOT DIPPED GALVANIZED.
- 7.6. LAG SCREWS SHALL BE PRE-DRILLED WITH LEAD HOLES AS FOLLOWS:
 - 7.6.1. THE LEAD HOLE FOR THE SHANK SHALL HAVE THE SAME DIAMETER AS THE SHANK, AND THE SAME DEPTH AS THE LENGTH OF THE UNTHREADED SHANK.
 - 7.6.2. THE LEAD HOLE FOR THE THREADED PORTION SHALL HAVE A DIAMETER EQUAL TO 60% TO 70% OF THE SHANK DIAMETER AND A LENGTH EQUAL TO AT LEAST THE LENGTH OF THE THREADED PORTION.
- 7.7. MINIMUM NAILING SHALL EQUAL THAT INDICATED IN IBC TABLE 2304.9.1 UNLESS OTHERWISE INDICATED ON THE DRAWINGS.
 - 7.7.1. RAFTER TO TOP PLATE w/ (3) 16d COMMON (3-1/2" x 0.162") TOENAIL
 - 7.7.2. BLOCKING BETWEEN RAFTERS w/ (3) 16d COMMON (3-1/2" X 0.162") EACH END, TOENAIL
 - 7.7.3. TOP PLATE TO TOP PLATE w/ (3) 16d COMMON (3-1/2" X 0.162") 16" O.C. FACE NAIL
 - 7.7.4. STUD TO TOP OR BOTTOM PLATE w/ (4) 16d COMMON (3-1/2" X 0.162") EACH NAIL
- 7.8. LAMINATED VENEER LUMBER (LVL) MEMBERS ARE TO BE "VERSA-LAM 2.0E" AS MANUFACTURED BY BOISE CASCADE OR OR APPROVED EQUAL. MINIMUM ALLOWABLE DESIGN STRESSES: $F_b=2,800$ PSI, $E=2,000,000$ PSI, $F_v=285$ PSI.
- 7.9. GLUED-LAMINATED BEAMS (GLB) ARE TO BE 24F-1.8E, BALANCED LAY-UP WITH MINIMUM ALLOWABLE DESIGN STRESSES OF $F_b=2,400$ PSI, $E=1,800,000$ PSI, $F_v=265$ PSI. ALL GLUED-LAMINATED LUMBER TO BE FABRICATED IN ACCORDANCE WITH AITC 117 AND PRODUCT STANDARD PS-56.



REVISIONS & ADDENDUMS	
#	REMARKS

MANAGEMENT	
DESIGNED	DJH
DRAWN	RW
CHECKED	JM
APPROVED	JM
LAST EDIT	2/5/24
PLOT DATE	2/5/24
SUBMITTAL	02/09/24

SMALL BOAT HARBOR UTILITIES
CITY OF SAINT PAUL
SPECIFICATIONS & DESIGN DATA

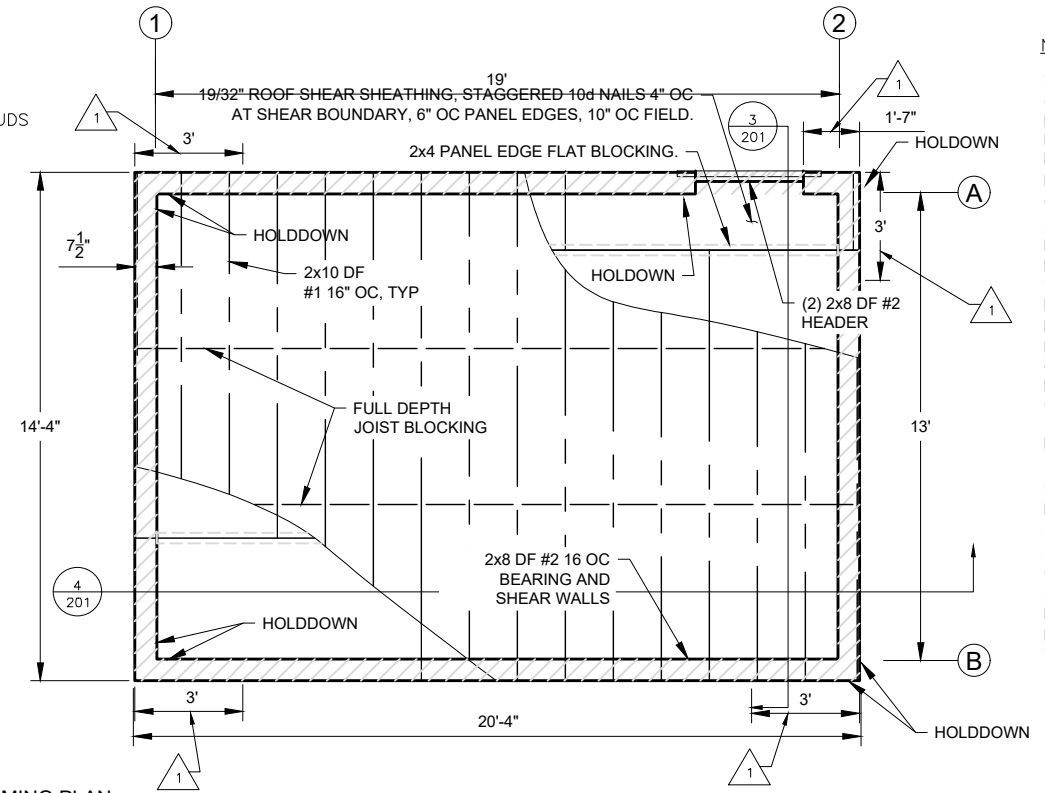
PROJECT NUMBER: 165.030630
DRAWING FILE NAME: S100.DWG
DRAWING SCALE: AS SHOWN

SHEET NUMBER
S-100

100% SUBMITTAL

LEGEND

- SHEAR BOUNDARY
- (2) 2x8 STUDS 16" OC



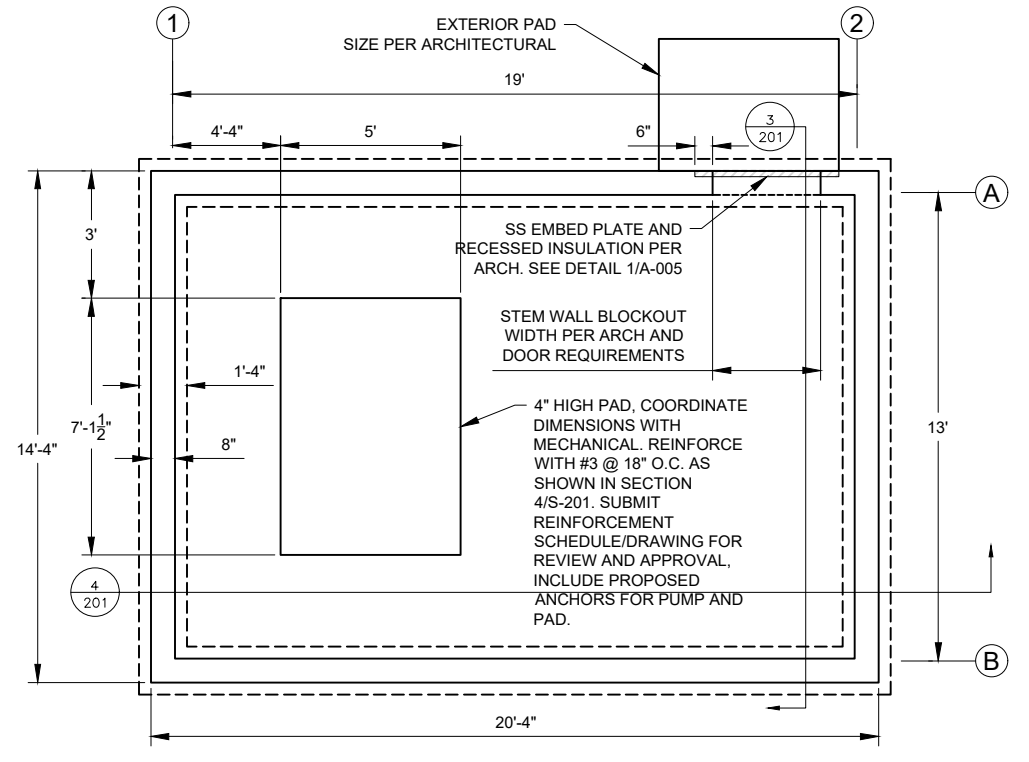
1 ROOF FRAMING PLAN
SCALE: 3/8" = 1'-0"

NOTES

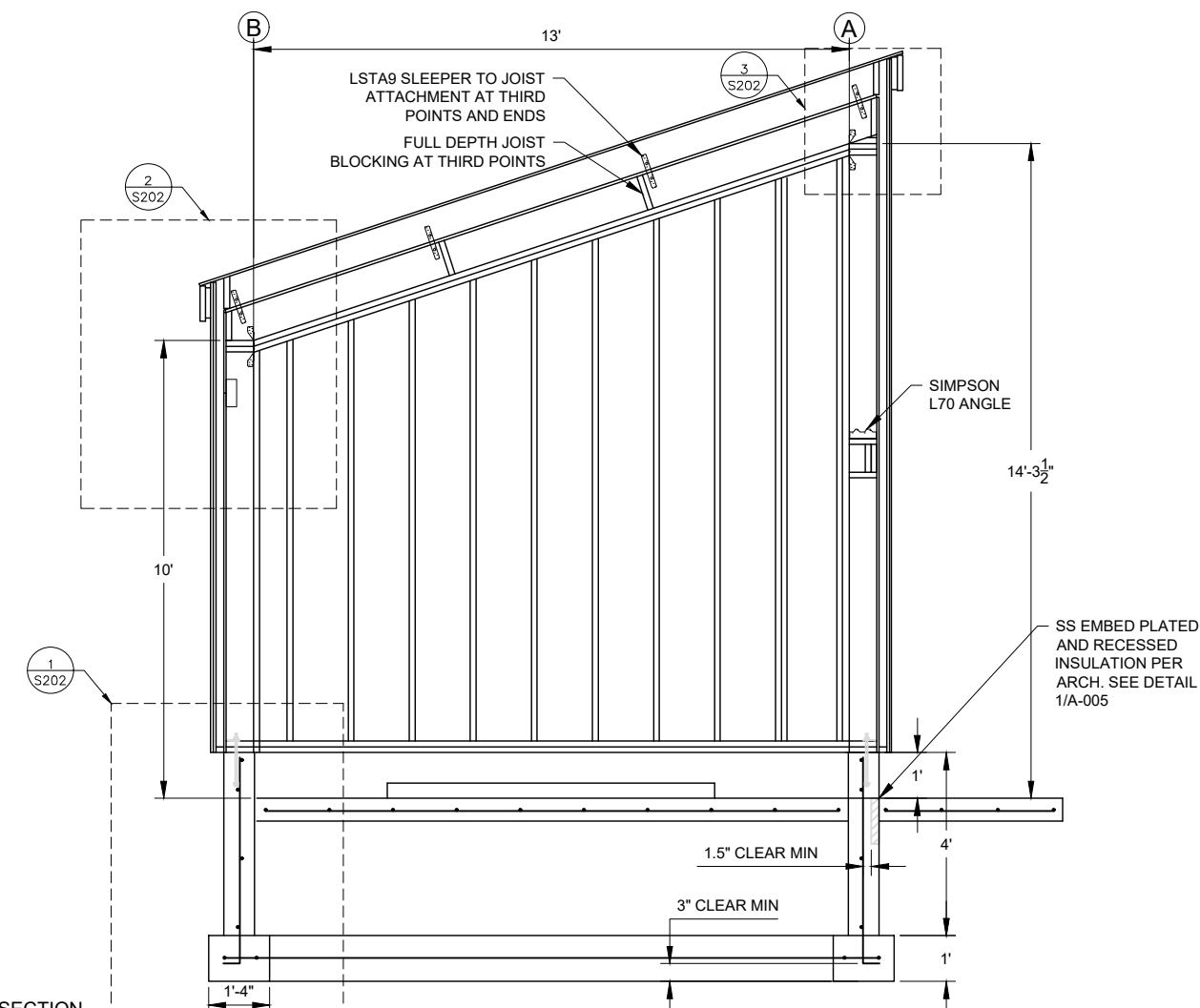
SHEAR WALLS NAILED WITH 8d @ 6" OC PANEL EDGES, 12" FIELD. PANEL EDGES REQUIRE BLOCKING. PANEL ORIENTATION EITHER DIRECTION. END PANELS (AT BUILDING CORNERS) NAILED WITH 10d AT 4" OC. BASE PLATE NAILING (2) ROWS OF 8d NAILS SPACED 4" OC, STAGGERED. HDU5 HOLDDOWN IN DOUBLE STUD AT EA WALL END w/ SB5/8x24 ANCHOR BOLT w/ 18" MIN EMBED. CORNER WALLS CAN SHARE HOLDDOWN IF PANEL EDGES OF THE INTERSECTING WALLS ARE NAILED TO THE SAME HOLDDOWN COLUMN.

SHEAR WALL BASE PLATES BOLTED TO CONCRETE WITH 5/8" ANCHOR BOLTS SPACED 36" OC AND EMBEDDED IN CONCRETE A MINIMUM OF 8". 3"x3"x0.25" PLATE WASHERS INSTALLED SUCH THAT ONE EDGE IS WITHIN 1/2" OF SHEAR WALL SHEATHING.

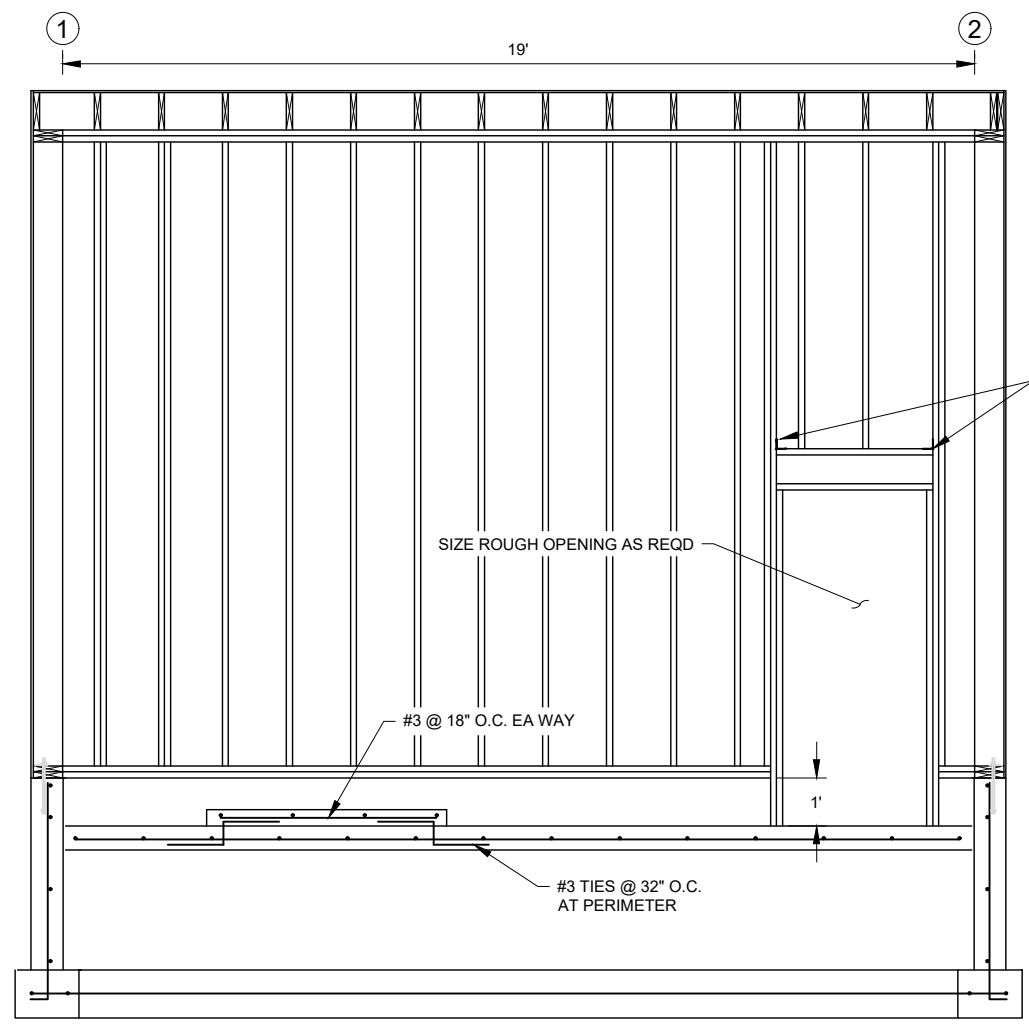
SLEEPERS, BATTENS, AND OUTER SHEATHING NOT SHOWN



2 FOUNDATION PLAN
SCALE: 3/8" = 1'-0"



3 BUILDING SECTION
SCALE: 1/2" = 1'-0"



4 BUILDING SECTION
SCALE: 1/2" = 1'-0"

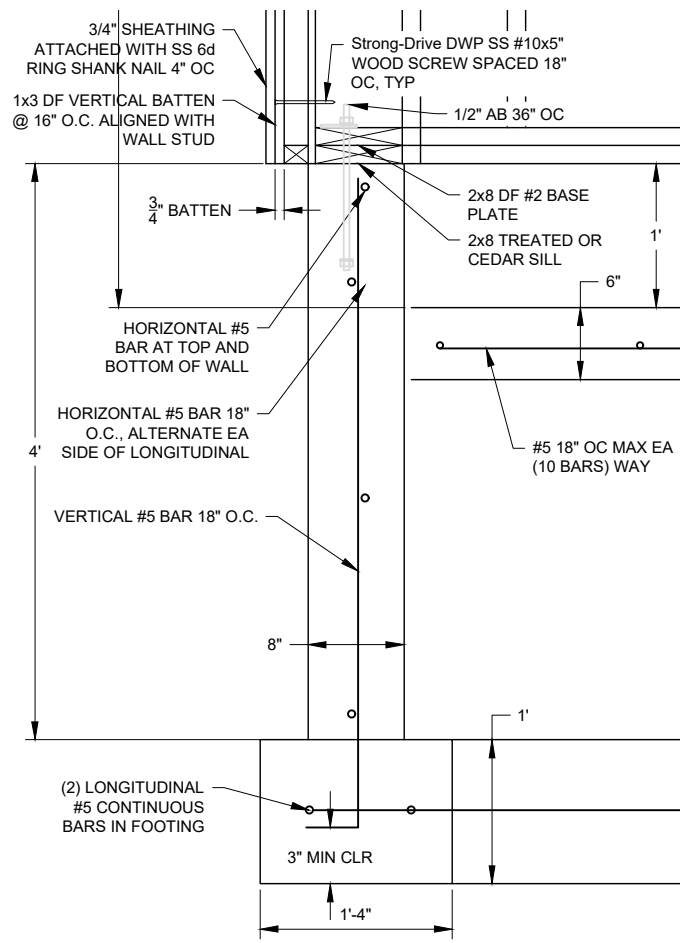
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#	DATE	REVISIONS & ADDENDUMS	REMARKS

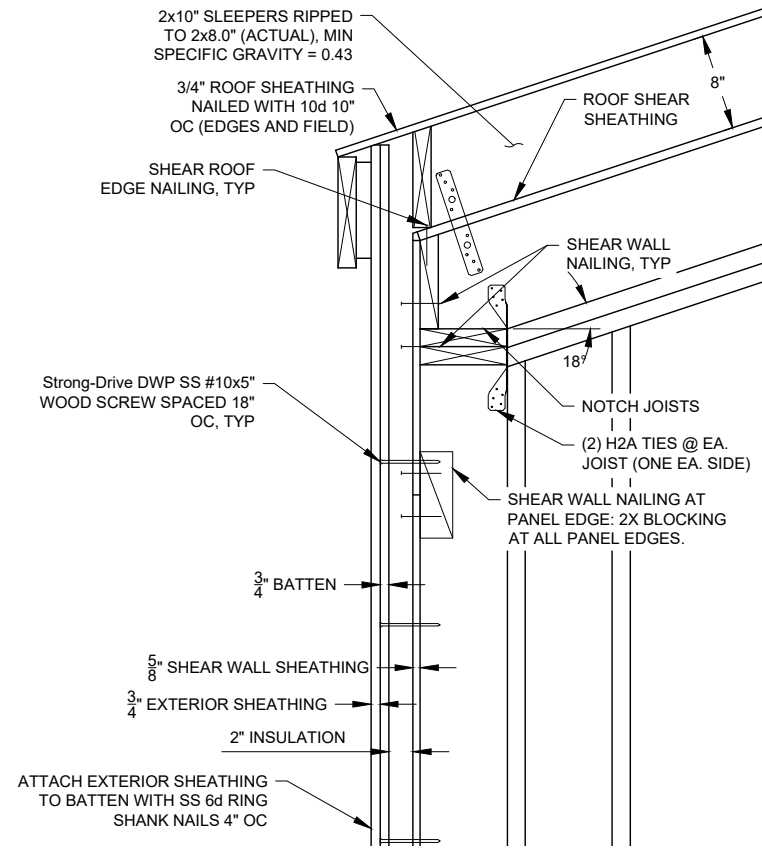
DESIGNED	DRAWN	CHECKED	APPROVED	LAST EDIT	PLOT DATE	SUBMITTAL
DJH	FW	JM	JM	2/5/24	2/5/24	02/09/24

SMALL BOAT HARBOR UTILITIES
CITY OF SAINT PAUL
FRAMING AND FOUNDATION PLAN

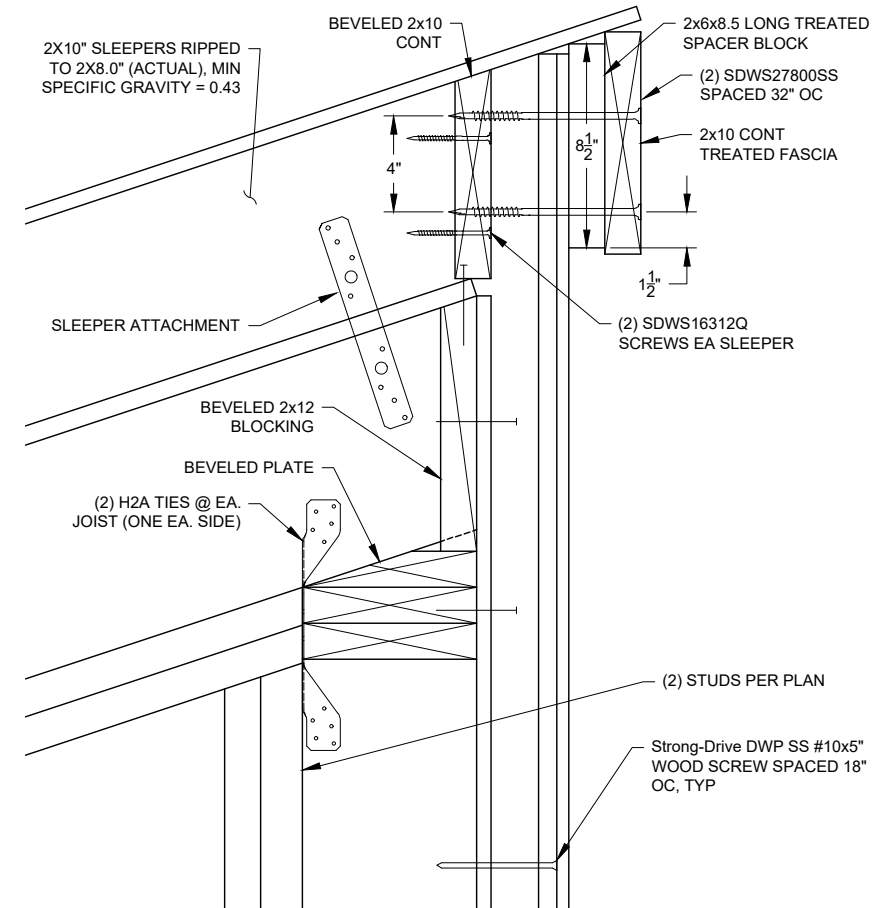
PROJECT NUMBER: 165.030630
DRAWING FILE NAME: S200.DWG
DRAWING SCALE: AS SHOWN



1 FOUNDATION DETAIL
SCALE: 1'-1/2" = 1'-0"



2 FRAMING DETAIL - LOW WALL
SCALE: 1'-1/2" = 1'-0"



3 ROOF FRAMING DETAIL - HIGH WALL
SCALE: 1'-1/2" = 1'-0"

REVISIONS & ADDENDUMS		
#	DATE	REMARKS

MANAGEMENT	DESIGNED	DJH	RW	CHECKED	JM	APPROVED	JM	LAST EDIT	2/5/24	PLOT DATE	2/5/24	SUBMITTAL	02/09/24

SMALL BOAT HARBOR UTILITIES
CITY OF SAINT PAUL
FRAMING SECTIONS AND DETAILS

PROJECT NUMBER: 165.030630
DRAWING FILE NAME: S200.DWG
DRAWING SCALE: AS SHOWN

LIGHTING LEGEND

	LIGHTING FIXTURE - SURFACE (CEILING)
	COMB. EXHAUST FAN, LIGHT FIXTURE - SURFACE (CEILING)
	LIGHTING FIXTURE - RECESSED
	WALL MOUNTED FIXTURE
	2x2 RECESSED FIXTURE
	2x4 RECESSED FIXTURE
	1x4 RECESSED FIXTURE
	2x2 SURFACE MOUNTED FIXTURE
	2x4 SURFACE MOUNTED FIXTURE
	1x4 SURFACE MOUNTED FIXTURE
	PENDANT MOUNTED FIXTURE
	STRIP FIXTURE
	TRACK LIGHTING SYSTEM
	POLE MOUNTED AREA LIGHT
	WALL MOUNTED BUILDING LIGHT
	FLOOD LIGHT
	EXIT SIGN - CEILING MOUNTED (SOLID INDICATES EXIT SIGN FACING)
	EXIT SIGN - WALL MOUNTED (SOLID INDICATES EXIT SIGN FACING)
	EMERGENCY LIGHT
	LIGHT FIXTURE W/ EMERGENCY BATTERY
	PHOTOCELL
	SINGLE POLE SWITCH +48" U.O.N.
	SWITCH WITH DESIGNATION (D - DIMMABLE) +48" U.O.N.
	THREE WAY KEY OPERATED SWITCH +48" U.O.N.
	3-WAY & 4-WAY SWITCH +48" U.O.N.
	SINGLE POLE SWITCH W/ PILOT LIGHT (PL "ON" WHEN LIGHT IS "OFF" - U.O.N.) + 48" U.O.N.
	OCCUPANCY SENSOR - WALL MOUNTED
	OCCUPANCY SENSOR - CEILING MOUNTED
	MOTION SENSOR - WALL MOUNTED

POWER LEGEND

	ELECTRIC METER
	NEW PANELBOARD - SURFACE MOUNTED
	EXISTING PANELBOARD - SURFACE MOUNTED
	NEW PANELBOARD - FLUSH MOUNTED
	EXISTING PANELBOARD - FLUSH MOUNTED
	MOTOR CONNECTION
	GENERATOR
	MOTOR RATED DISCONNECT SWITCH (FRACTIONAL HP) W/ ITP
	DISCONNECT SWITCH
	FUSED DISCONNECT SWITCH
	COMBINATION MOTOR STARTER DISCONNECT
	SOLENOID
	TRANSFORMER

MOUNTING HEIGHTS

MOUNTING HEIGHTS APPLY TO ALL ELECTRICAL DRAWINGS

THE FOLLOWING HEIGHTS ARE ABOVE FINISHED FLOOR OR GRADE, AND SHALL BE USED UNLESS OTHERWISE NOTED	
LIGHT SWITCHES & LIGHT DIMMERS	℄ 45"
DUPLEX RECEPTACLE	℄ 18" U.O.N.
DUPLEX RECEPTACLE GFI	℄ 18" U.O.N.
DUPLEX RECEPTACLE SPLIT-WIRED	℄ 18" U.O.N.
SPECIAL PURPOSE RECEPTACLES	AS REQ. BY EQUIP. SERVED
COMPUTER (DATA) OUTLETS	℄ 18"
WALL-PHONE OUTLETS (LOCATIONS W/ WHEELCHAIR SIDE ACCESS)	℄ 50"
DUPLEX RECEPTACLES (RESTROOMS)	℄ 36"
VOLUME CONTROLS (WALL-MTD.)	℄ 45"
TELEPHONE OUTLETS (FOR DESK PHONES)	℄ 18"
MICROPHONE OUTLETS	℄ 45"
TV OUTLETS	℄ 18" UON
FIRE ALARM MANUAL STATIONS	℄ 45"
FIRE ALARM SIGNALS	℄ 80" (A)
PANELBOARDS	TOP OF BOX 72"
DISCONNECTS, STARTERS, CONTACTORS	TOP OF BOX 66"

VERIFY ALL M.H. WITH OWNER'S REPRESENTATIVE WHEN IN CONFLICT. MODIFY M.H. AS REQUIRED BY LOCAL CONDITIONS AND TYPE OF OCCUPANCY - TYPICAL OF ALL DRAWINGS.

WIRING CIRCUITS LEGEND

	CONDUIT - CONCEALED
	CONDUIT - EXPOSED
	CONDUIT - UNDERGROUND
	CONDUIT - FLEX
	CONDUIT - LIQUID TIGHT FLEX
	SEAL OFF FOR CLASSIFIED LOCATIONS
	HOMERUN (GROUND, NUETRAL, # OF HOT)
	CONDUIT STUB-UP
	CONDUIT STUB-DN
	THERMOSTAT (LINE VOLTAGE)
	HEAT TRACE
	HEAT TRACE POWER POINT

WIRING DEVICES LEGEND

	RECEPTACLE - SINGLE +18" U.O.N.
	RECEPTACLE - DUPLEX +18" U.O.N.
	RECEPTACLE - QUAD +18" U.O.N.
	RECEPTACLE - SPLIT WIRED +18" U.O.N.
	RECEPTACLE - GFCI RECEPTACLE
	RECEPTACLE - GFCI WEATHER PROOF RECEP
	RECEPTACLE - SPECIAL +18" U.O.N.
	RECEPTACLE - FLOOR MOUNTED
	RECEPTACLE - CEILING MOUNTED
	JUNCTION BOX
	PUSH BUTTON (DOORBELL, GARAGE)
	PLUG MOLD
	RECEPTACLE - GFCI QUAD +18" U.O.N.

COMMUNICATIONS LEGEND

	TELECOM OUTLET, 2 JACKS UON
	TELECOM OUTLET - FLOOR MOUNTED, 2 JACKS UON
	TELECOM OUTLET - CEILING MOUNTED, 2 JACKS UON
	EXISTING TELECOM AND/OR DATA OUTLET
	TELEVISION OUTLET
	SPEAKER - WALL MOUNTED
	SPEAKER - CEILING MOUNTED
	BELL
	DOOR-BELL WITH ADA COMPLIANT VISUAL NOTIFICATION DEVICE
	SPEAKER / CLOCK
	CLOCK - WALL MOUNTED
	CLOCK - CEILING MOUNTED
	TELEPHONE TERMINAL BOARD

ELECTRICAL ABBREVIATIONS LIST

AC	ABOVE COUNTER	IBO	INSTALLED BY OTHERS
AFCI	ARC FAULT CIRCUIT INTERRUPTER	INC	INCANDESCENT
AFF	ABOVE FINISHED FLOOR	ITB	INTERCOM TERMINAL BOX
AFG	ABOVE FINISHED GRADE	KEA	KODIAK ELECTRIC ASSOCIATION
AHJ	AUTHORITY HAVING JURISDICTION	KSU	KEY SWITCH UNIT
AMP	AMPERES	LC	LIGHTING CONTACTOR
ATS	AUTOMATIC TRANSFER SWITCH	LPS	LOW PRESSURE SODIUM
BB	BASEBOARD (HEATER)	MAX	MAXIMUM
BCU	BARE COPPER	MCB	MAIN CIRCUIT BREAKER
BFC	BELOW FINISH CEILING (BOTTOM OF DEVICE)	MCC	MOTOR CONTROL CENTER
BLDG	BUILDING	MDP	MAIN DISTRIBUTION PANEL
CB	CIRCUIT BREAKER	MDS	MAIN DISTRIBUTION SWITCHBOARD
CFF	CLEARANCE FINISH FLOOR (SURFACE TO SURFACE)	MH	MOUNTING HEIGHT
CFC	CLEARANCE FINISH CEILING (SURFACE TO SURFACE)	MLO	MAIN LUGS ONLY
CLG	CEILING	MTD	MOUNTED
CKT	CIRCUIT	MTS	MANUAL TRANSFER SWITCH
CO	CONDUIT ONLY	NIC	NOT IN CONTRACT
C	CONDUIT	NL	NIGHT LIGHT
CP	CONTROL PANEL	NTS	NOT TO SCALE
CT	CURRENT TRANSFORMER	OC	ON CENTER
DC	DIRECT CURRENT	OFCl	OWNER FURNISHED CONTRACTOR
DCS	DIGITAL CONTROL SYSTEM	OL	OVERLOAD
DIST	DISTANCE	PA	PUBLIC ADDRESS
(E)	EXISTING	PC	PHOTOCELL
EGC	EQUIPMENT GROUNDING CONDUCTOR	PH	PHASE
EM	EMERGENCY	PL	PILOT LIGHT
EMCS	ENERGY MANAGMENT CONTROL SYSTEM	PNL	PANEL
EO	ELECTRICALLY OPERATED	PTZ	PAN, TILT, ZOOM
EP	EXPLOSION PROOF	QTZ	QUARTZ
EKSU	ELECTRONIC KEY SWITCH UNIT	RIB	RELAY IN BOX
ETR	EXISTING TO REMAIN	ROW	RIGHT OF WAY
EWC	ELECTRIC WATER COOLER	SEC	SECTION
FAAP	FIRE ALARM ANNUNCIATOR PANEL	SSBJ	SUPPLY SIDE BONDING JUMPER
FACP	FIRE ALARM CONTROL PANEL	SSP	SECURITY SYSTEM PANEL
FA	FIRE ALARM	TC	TIME CLOCK
FBO	FURNISHED BY OTHERS	TTB	TELEPHONE TERMINAL BOARD
FWP	FACTORY WIRED PANEL	TTC	TELEPHONE TERMINAL CABINET
GFI	GROUND FAULT INTERRUPTER	UON	UNLESS OTHERWISE NOTED
GND	GROUND	VEL	VERIFY EXACT LOCATION
HID	HIGH INTENSITY DISCHARGE	VOS	VERIFY ON SITE
HIT	HIGH INTENSITY TUNGSTEN	W/	WITH
HP	HORSEPOWER	W/O	WITHOUT
HPS	HIGH PRESSURE SODIUM	WP	WEATHER PROOF
HWH	HOT WATER HEATER	XFRM	TRANSFORMER

THIS IS A STANDARD (TYPICAL) ABBREVIATIONS LIST. NOT ALL ABBREVIATIONS ARE NECESSARILY USED ON THIS PROJECT. ALSO, ADDITIONAL ABBREVIATIONS MAY BE INTRODUCED ON DRAWINGS AND DEFINED THEREIN.

FIRE ALARM SYSTEM LEGEND

	FA MANUAL PULL STATION
	FA HORN STROBE
	FA / ADA STROBE
	MAGNETIC DOOR HOLD OPEN
	FA HEAT DETECTOR (FIXED TEMP. NOTED)
	SMOKE DETECTOR - IONIZATION TYPE
	SMOKE /GO DETECTOR - PHOTO ELECTRIC TYPE W/AUDIO AND CONNECTED TO A STROBE.
	SMOKE DETECTOR - PHOTO ELECTRIC TYPE
	SMOKE DETECTOR - DUCT MOUNTED
	FA SPEAKER
	FIRE ALARM CONTROL PANEL
	FIRE ALARM ANNUNCIATOR PANEL

SECURITY LEGEND

	WALL MOUNT CCTV
	RECESSED CEILING MOUNT CCTV WITH DOME
	CEILING MOUNT DOME
	RACK
	GLASS BREAK SENSOR
	MAGNETIC DOOR SENSOR
	MOTION SENSOR
	KEYPAD
	REMOTE ALARM INPUT MODULE
	CARD READER
	NETWORKED INTELLIGENT CONTROLLER

DRAWING SYMBOLS

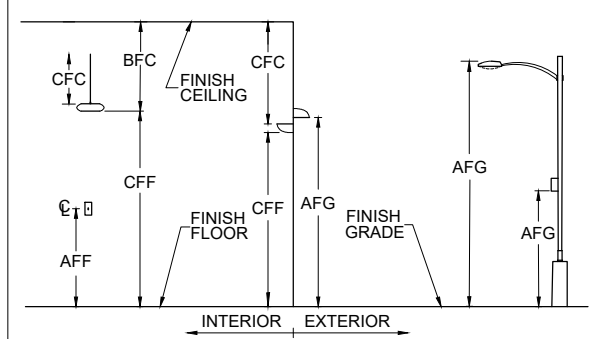
SEE SECTION #, ON SHEET XX

SECTION #/DETAIL #

NORTH ARROW

SCALE BAR

MOUNTING LEGEND



LINE TYPES

EXISTING EQUIPMENT	
NEW EQUIPMENT	

NOTES

SHEET NOTES	
CONSTRUCTION NOTES	

SYMBOL NOTES:

- SYMBOLS DO NOT NECESSARILY APPEAR ON PLANS IN THE SAME SIZE OR PROPORTION AS SHOWN ON THIS LEGEND.
- PLANS DO NOT NECESSARILY USE ALL OF THE SYMBOLS DISPLAYED ON THIS LEGEND.

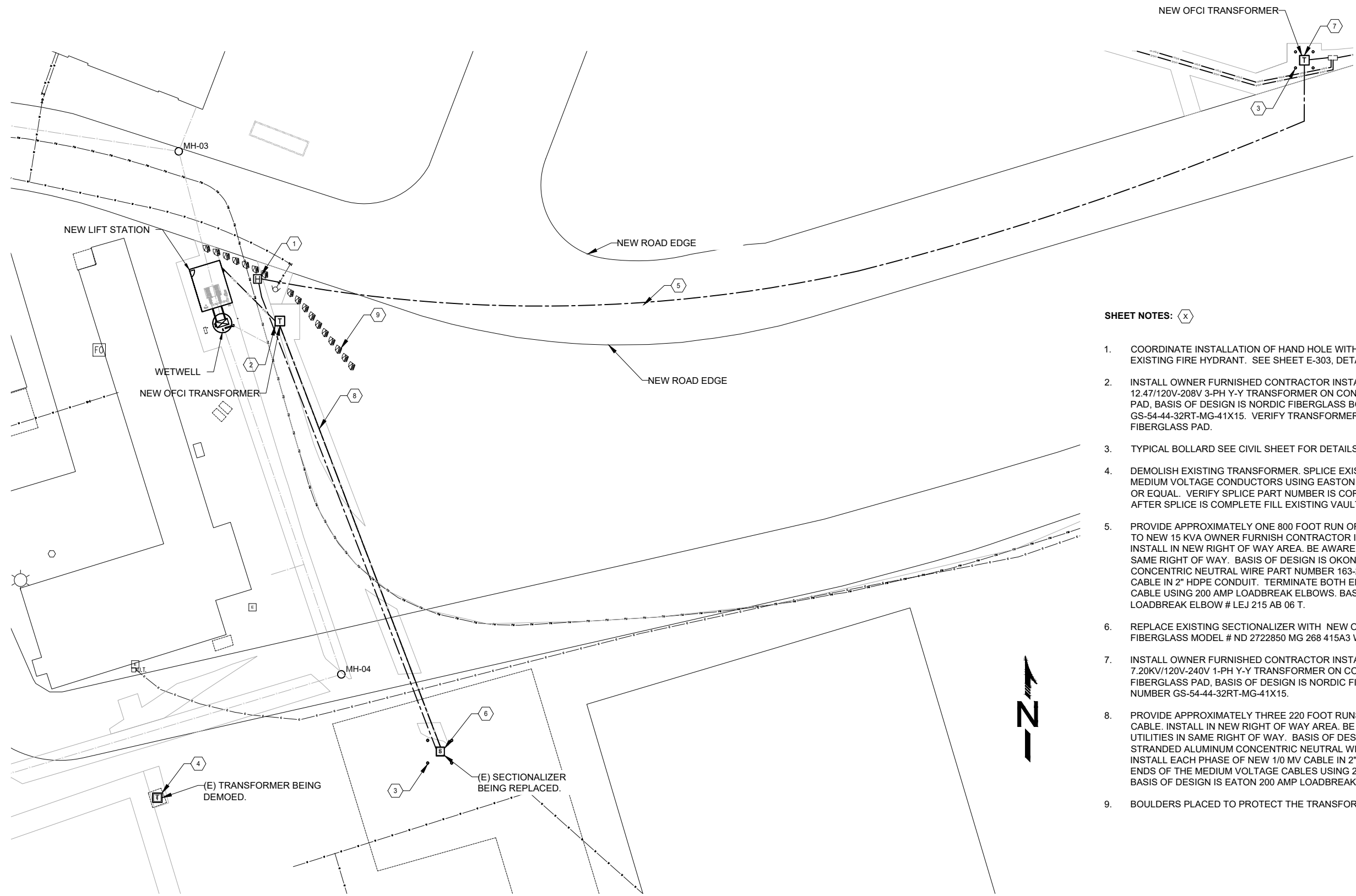
4300 B Street, Suite 605
Anchorage, AK 99503
Office: 907-339-6500
Cell: 907-339-5271
www.kunaeng.com
License Number: AELS129381

REVISIONS & ADDENDUMS	DATE	REMARKS

MANAGEMENT	DESIGNED	WDF	DRAWN	WDF	CHECKED	CO	APPROVED	2/2/24	PLOT DATE	2/2/24	SUBMITTAL	02/02/24

SMALL BOAT HARBOR UTILITIES
CITY OF SAINT PAUL
ELECTRICAL LEGEND AND ABBREVIATIONS

PROJECT NUMBER: 165.030630
DRAWING FILE NAME: 30630-E-001
DRAWING SCALE: AS SHOWN
LEGEND.DWG



SHEET NOTES: (X)

1. COORDINATE INSTALLATION OF HAND HOLE WITH WATER AND SEWER LINES AND EXISTING FIRE HYDRANT. SEE SHEET E-303, DETAIL 2.
2. INSTALL OWNER FURNISHED CONTRACTOR INSTALLED ERMCO 75 KVA 12.47/120V-208V 3-PH Y-Y TRANSFORMER ON CONTRACTOR FURNISHED FIBERGLASS PAD, BASIS OF DESIGN IS NORDIC FIBERGLASS BOX PAD PART NUMBER GS-54-44-32RT-MG-41X15. VERIFY TRANSFORMER WILL FIT ON SPECIFIED FIBERGLASS PAD.
3. TYPICAL BOLLARD SEE CIVIL SHEET FOR DETAILS.
4. DEMOLISH EXISTING TRANSFORMER. SPLICE EXISTING 1/0 CONCENTRIC NEUTRAL MEDIUM VOLTAGE CONDUCTORS USING EASTON COOPER SPLICE PART #SP15A004S OR EQUAL. VERIFY SPLICE PART NUMBER IS CORRECT FOR EXISTING MV CABLE. AFTER SPLICE IS COMPLETE FILL EXISTING VAULT WITH FILL MATERIAL.
5. PROVIDE APPROXIMATELY ONE 800 FOOT RUN OF NEW 1/0 MEDIUM VOLTAGE CABLE TO NEW 15 KVA OWNER FURNISH CONTRACTOR INSTALLED TRANSFORMER. INSTALL IN NEW RIGHT OF WAY AREA. BE AWARE OF EXISTING BURIED UTILITIES IN SAME RIGHT OF WAY. BASIS OF DESIGN IS OKONITE 15kV 1/0 STRANDED ALUMINUM CONCENTRIC NEUTRAL WIRE PART NUMBER 163-23-3072. INSTALL NEW 1/0 MV CABLE IN 2" HDPE CONDUIT. TERMINATE BOTH ENDS OF THE MEDIUM VOLTAGE CABLE USING 200 AMP LOADBREAK ELBOWS. BASIS OF DESIGN IS EATON 200 AMP LOADBREAK ELBOW # LEJ 215 AB 06 T.
6. REPLACE EXISTING SECTIONALIZER WITH NEW ONE. BASIS OF DESIGN NORDIC FIBERGLASS MODEL # ND 2722850 MG 268 415A3 W3B.
7. INSTALL OWNER FURNISHED CONTRACTOR INSTALLED ERMCO 15 KVA 7.20KV/120V-240V 1-PH Y-Y TRANSFORMER ON CONTRACTOR FURNISHED FIBERGLASS PAD, BASIS OF DESIGN IS NORDIC FIBERGLASS BOX PAD PART NUMBER GS-54-44-32RT-MG-41X15.
8. PROVIDE APPROXIMATELY THREE 220 FOOT RUNS OF NEW 1/0 MEDIUM VOLTAGE CABLE. INSTALL IN NEW RIGHT OF WAY AREA. BE AWARE OF EXISTING BURIED UTILITIES IN SAME RIGHT OF WAY. BASIS OF DESIGN IS OKONITE 15kV 1/0 STRANDED ALUMINUM CONCENTRIC NEUTRAL WIRE PART NUMBER 163-23-3072. INSTALL EACH PHASE OF NEW 1/0 MV CABLE IN 2" HDPE CONDUIT. TERMINATE BOTH ENDS OF THE MEDIUM VOLTAGE CABLES USING 200 AMP LOADBREAK ELBOWS. BASIS OF DESIGN IS EATON 200 AMP LOADBREAK ELBOW # LEJ 215 AB 06 T.
9. BOULDERS PLACED TO PROTECT THE TRANSFORMER AND LIFT STATION.

REVISIONS & ADDENDUMS	
#	DATE

MANAGEMENT	
DESIGNED	WDF
DRAWN	WDF
CHECKED	CJO
APPROVED	2/5/24
LAST EDIT	2/5/24
PLOT DATE	2/5/24
SUBMITTAL	02/09/24

SMALL BOAT HARBOR UTILITIES
CITY OF SAINT PAUL
MEDIUM VOLTAGE SITE PLAN WORK

PROJECT NUMBER: 165.030630
DRAWING FILE NAME: 30630-E-100 MV SITE PLANS.DWG
DRAWING SCALE: AS SHOWN

LUMINAIRE SCHEDULE FOR BOAT HARBOR AREA										
QTY	TYPE	ELECTRICAL		DESCRIPTION	LAMPS	MOUNTING	MANUFACTURER	MODEL	MOUNT:	NOTES
		WATTS	VOLTAGE							
4	L20	236	MVOLT	3000K POLE MOUNTED FLOOD LIGHT FIXTURE	38,000LM LED	20' AGL	CREE	OSQL-C-40L-30K7-55-UL-NM-SV-20KV OSQ-ML-C-AA-SV		1
8	L30	447	MVOLT	3000K POLE MOUNTED FLOOD LIGHT FIXTURE	72,000LM LED	30' AGL	CREE	OSQX-C-75L-30K7-55-UL-NM-SV-20KV OSQ-X-C-AA-SV		1

GENERAL NOTES:

A. VERIFY CEILING TYPES THROUGHOUT. PROVIDE ALL MOUNTING HARDWARE AS RECOMMENDED BY THE LIGHTING MANUFACTURER FOR SPECIFIC CEILING TYPES.

B. COORDINATE ALL FIXTURE MOUNTING LOCATIONS WITH OTHER TRADES PRIOR TO INSTALLATION TO ENSURE THAT CONFLICTS DO NOT EXIST. WHERE CONFLICTS EXIST, NOTIFY ENGINEER.

C. LIGHT FIXTURE PACKAGE TO GENERALLY MATCH OWNER'S SUPPLIED SAMPLE DRAWINGS. SUBMIT FULL LIGHTING PACKAGE FOR OWNER REVIEW.

NUMBERED NOTES:

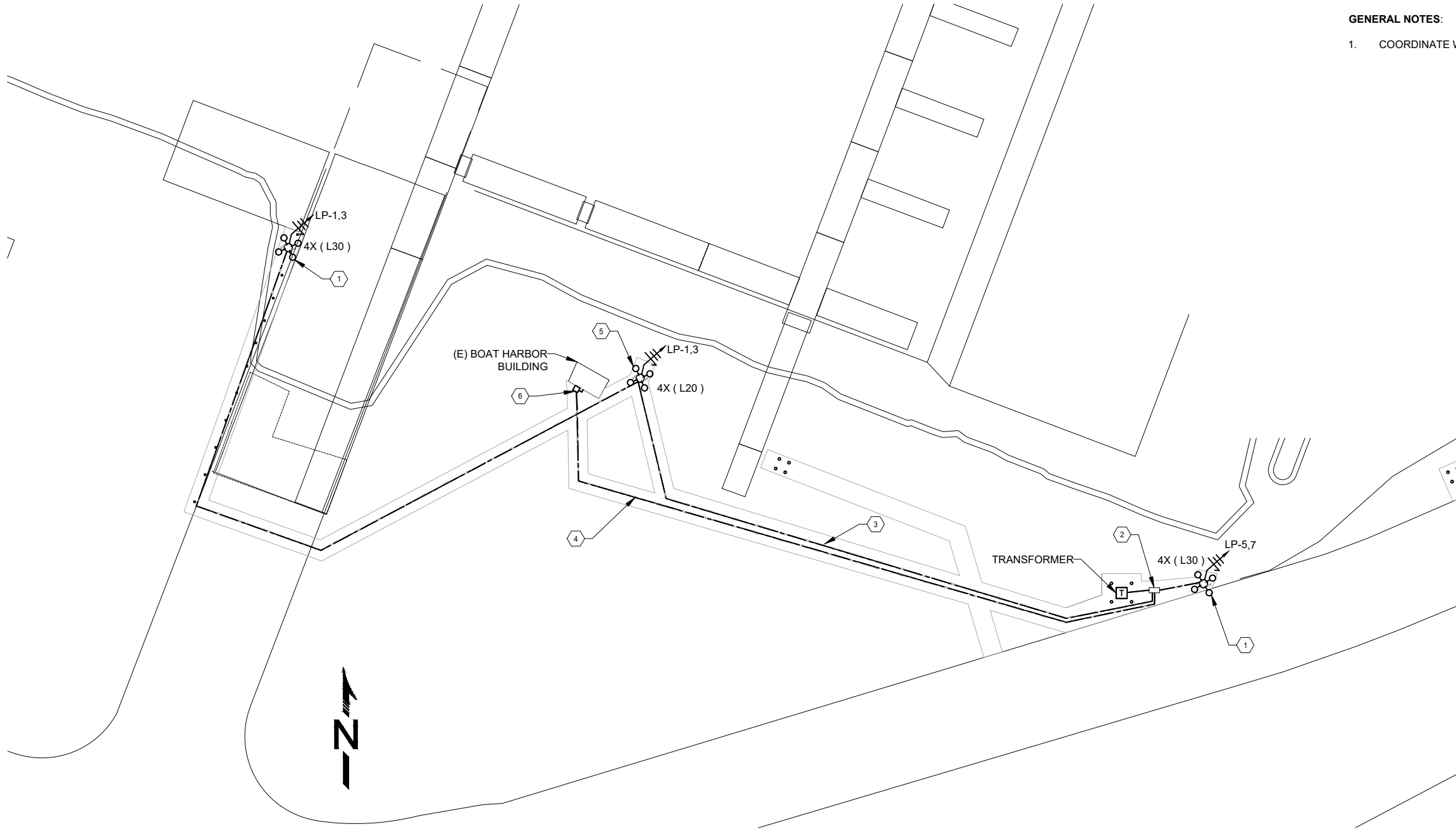
1 ATTACH LIGHT FIXTURES TO A 4 ARM LIGHT BRACKET MOUNTED TO THE TOP OF THE WOOD UTILITY POLE. BASIS OF DESIGN IS UTILITY METALS PART# W4-P-10-13

SHEET NOTES: (X)

1. PROVIDE 40' TALL CLASS 3 WOOD POLE WITH 30" AFG. ATTACH A (4) ARM MOUNTING BRACKET TO THE TOP OF THE POLE WITH (4) FLOOD LIGHTS MOUNTED PER POLE.
2. POWER RAIL FOR MOUNTING METER/ MAIN, DISCONNECT, AND PANELBOARD. SEE SHEET E-303, DETAILS 3.
3. PATH FOR 240V CIRCUIT TO AREA LIGHTING.
4. FEEDER TO EXISTING BOAT HARBOR BUILDING.
5. PROVIDE 30' TALL CLASS 3 WOOD POLE WITH 20" AFG. ATTACH A (4) ARM MOUNTING BRACKET TO THE TOP OF THE POLE WITH (4) FLOOD LIGHTS MOUNTED PER POLE.
6. INSTALL A NEW DISCONNECT ON THE EXISTING HARBOR BUILDING AND THEN TIE THE NEW CIRCUIT INTO THE EXISTING BUILDING ELECTRICAL.

GENERAL NOTES:

1. COORDINATE WITH OWNER FOR AIMING FLOOD LIGHTS.



REVISIONS & ADDENDUMS	
#	DATE

MANAGEMENT					
DESIGNED	WDF	DRAWN	WDF	CHECKED	OIO

SMALL BOAT HARBOR UTILITIES
CITY OF SAINT PAUL
BOAT HARBOR LIGHTING AND POWER SITE PLAN

PROJECT NUMBER: 165.030630
 DRAWING FILE NAME: 30630-E-100 MV SITE PLANS.DWG
 DRAWING SCALE: AS SHOWN
 SUBMITTAL: 02/09/24

1 BOAT HARBOR LIGHT & POWER SITE PLAN
 SCALE: 1" = 25'

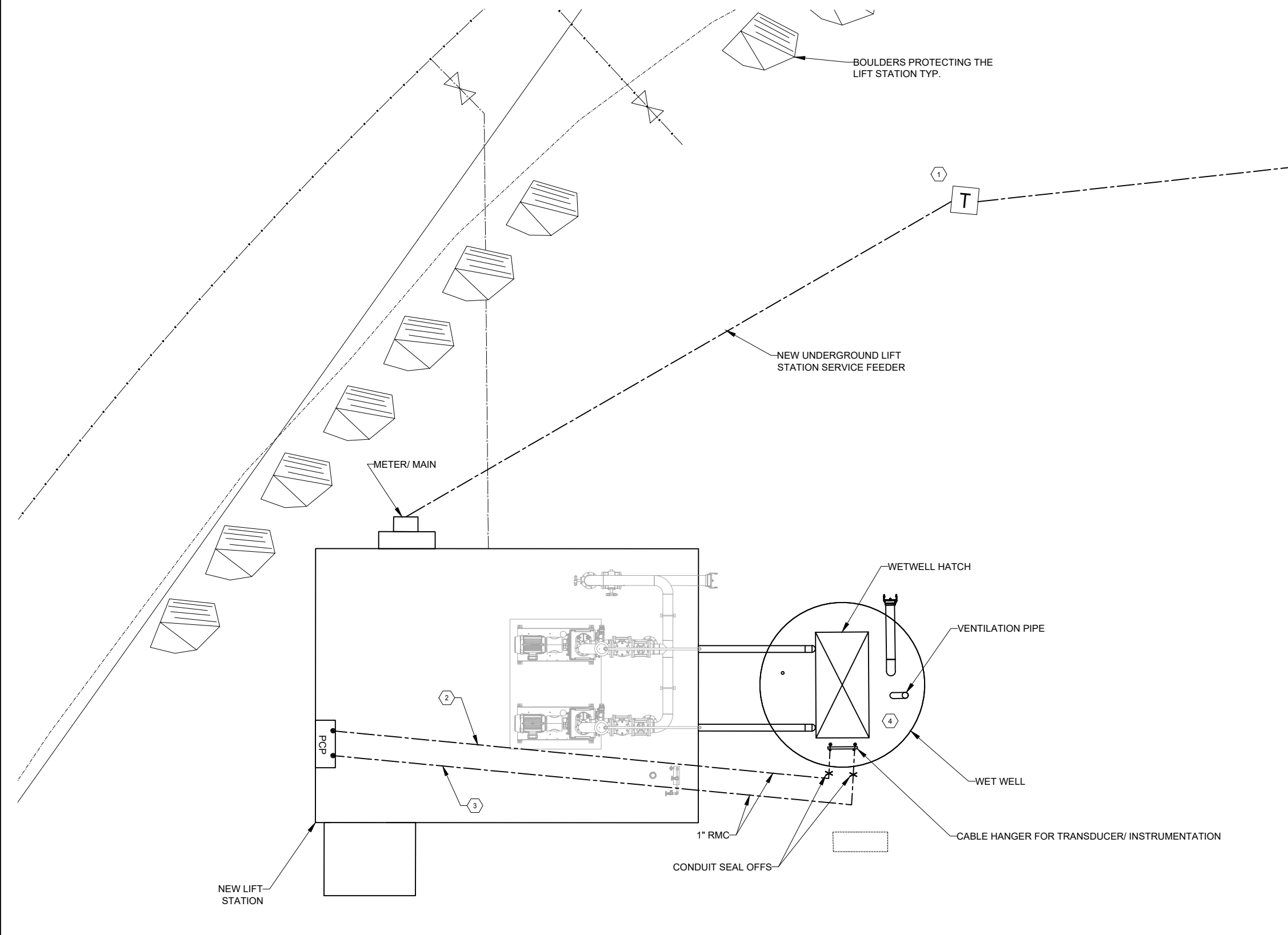


100% SUBMITTAL

SHEET NUMBER
E-102

SHEET NOTES: (X)

- COORDINATE WITH LOCAL UTILITY TO ENERGIZE TRANSFORMER AS NEEDED DURING CONSTRUCTION.
- CONNECTION FROM PCP'S INTRINSICALLY SAFE BARRIER TO WET WELL 4-20MA SUBMERSIBLE LEVEL TRANSDUCER.
- CONNECTION FROM PCP'S INTRINSICALLY SAFE BARRIER TO WET WELL HIGH LEVEL ALARM FLOAT.
- SEE SHEET E-302 DETAILS 1 & 2 FOR HAZARDOUS LOCATION AREAS.



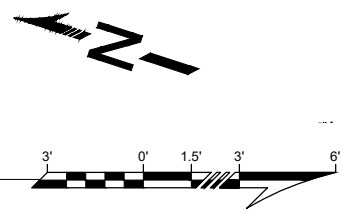
REVISIONS & ADDENDUMS		
#	DATE	REMARKS

MANAGEMENT	
DESIGNED	WDF
DRAWN	WDF
CHECKED	CEO
APPROVED	2/5/24
LAST EDIT	2/5/24
PLOT DATE	02/09/24
SUBMITTAL	02/09/24

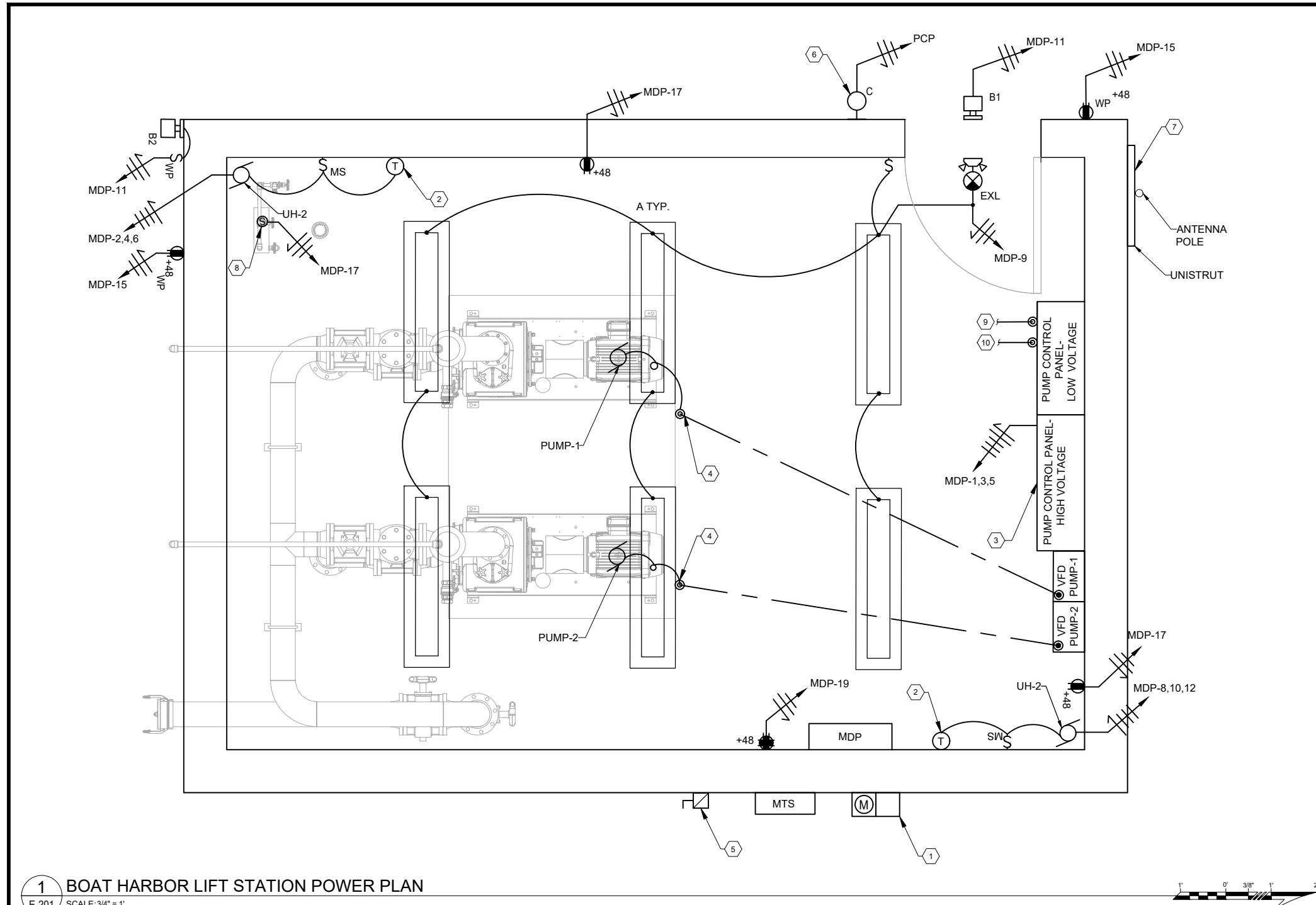
SMALL BOAT HARBOR UTILITIES
CITY OF SAINT PAUL
LIFT STATION SITE PLAN

PROJECT NUMBER: 165.030630
DRAWING FILE NAME: 30630-E-103 LIFT STATION SITE PLAN.DWG
DRAWING SCALE: AS SHOWN

1 BOAT HARBOR LIFT STATION SITE PLAN
E-103 SCALE: 1" = 3'



100% SUBMITTAL



1 BOAT HARBOR LIFT STATION POWER PLAN
E-201 SCALE: 3/4" = 1'

- SHEET NOTES:** (X)
- METER/ MAIN.
 - LINE VOLTAGE THERMOSTAT.
 - PROVIDE STAINLESS STEEL PUMP CONTROL PANEL WITH BUILT IN DISCONNECTS AND EXTERNALLY MOUNTED HEAVY DUTY VFDS. BASIS OF DESIGN IS DUTYMASTER MULTI-PUMP CONTROLLER WITH BUILT IN SCADA. PROVIDE WET WELL FLOAT SWITCH AND 4-20MA SUBMERSIBLE LEVEL TRANSDUCER WITH PUMP CONTROLLER.
 - STUB-UP WHERE CONDUIT COME OUT OF SLAB AND CONNECTS TO PUMP.
 - PROVIDE PLACARD ON SIDE OF BUILDING "BACKUP GENERATOR CONNECTION HERE".
 - CONNECT TO PCP 120 VOLT WARNING LIGHT OUTPUT CIRCUIT.
 - 10', 2" IPS SCHEDULE 80 ALUMINUM SCADA ANTENNA POLE MOUNTED WITH UNISTRUT TO THE OUTSIDE OF THE BUILDING WITH 4' CLEARING THE HIGHEST POINT OF THE ROOF.
 - TRAP PRIMER SOLENOID.
 - CONNECTION FROM PCP'S INTRINSICALLY SAFE BARRIER TO STUB-DOWN INTO SLAB TO WET WELL 4-20MA SUBMERSIBLE LEVEL TRANSDUCER.
 - CONNECTION FROM PCP'S INTRINSICALLY SAFE BARRIER THROUGH STUB-DOWN INTO SLAB TO WET WELL HIGH LEVEL ALARM FLOAT.

QTY	TYPE	ELECTRICAL WATTS VOLTAGE	DESCRIPTION	LAMPS	MOUNTING	MANU- FACTURER	MODEL	NOTES
A		27 MVOLT	SURFACE MOUNTED .5'X2' GASKETED LIGHT FIXTURE	4,000LM LED	SURFACE CEILING	LITHONIA	DMW2 L24 2000LM PFL WD MVOLT 010V 40K 80CRI JSB	
B1		51 MVOLT	OUTDOOR FLOODLIGHT WITH MOTION SENSOR	7,000LM LED	WALL +11 AFF	LITHONIA	RSXF1LED P1 40K AWFD MVOLT AAWB NLTAIR2 PIRHN CCE DDBXD	
B2		72 MVOLT	OUTDOOR FLOODLIGHT	10,000LM LED	WALL +9' AFF	LITHONIA	RSXF1LED P2 40K AWFD MVOLT AAWB CCE DDBXD	
C		17 MVOLT	METALLIC VAPORPROOF LED WITH RED LENSE	1,300LM LED	WALL +7'6" AFF	PHOENIX	VA W 17LED CW FGC / GHR	
EXL		4.3 MVOLT	LED EXIT SIGN WITH EMERGENCY EGRESS LIGHTS		WALL +7'6" AFF	LITHONIA	LHQM LED R HO SD	

GENERAL NOTES:

A. VERIFY CEILING TYPES THROUGHOUT. PROVIDE ALL MOUNTING HARDWARE AS RECOMMENDED BY THE LIGHTING MANUFACTURER FOR SPECIFIC C

B. COORDINATE ALL FIXTURE MOUNTING LOCATIONS WITH OTHER TRADES PRIOR TO INSTALLATION TO ENSURE THAT CONFLICTS DO NOT EXIST. WHERE CONFLICTS EXIST, NOTIFY ENGINEER.

C. LIGHT FIXTURE PACKAGE TO GENERALLY MATCH OWNER'S SUPPLIED SAMPLE DRAWINGS. SUBMIT FULL LIGHTING PACKAGE FOR OWNER REVIEW.



#	DATE	REMARKS

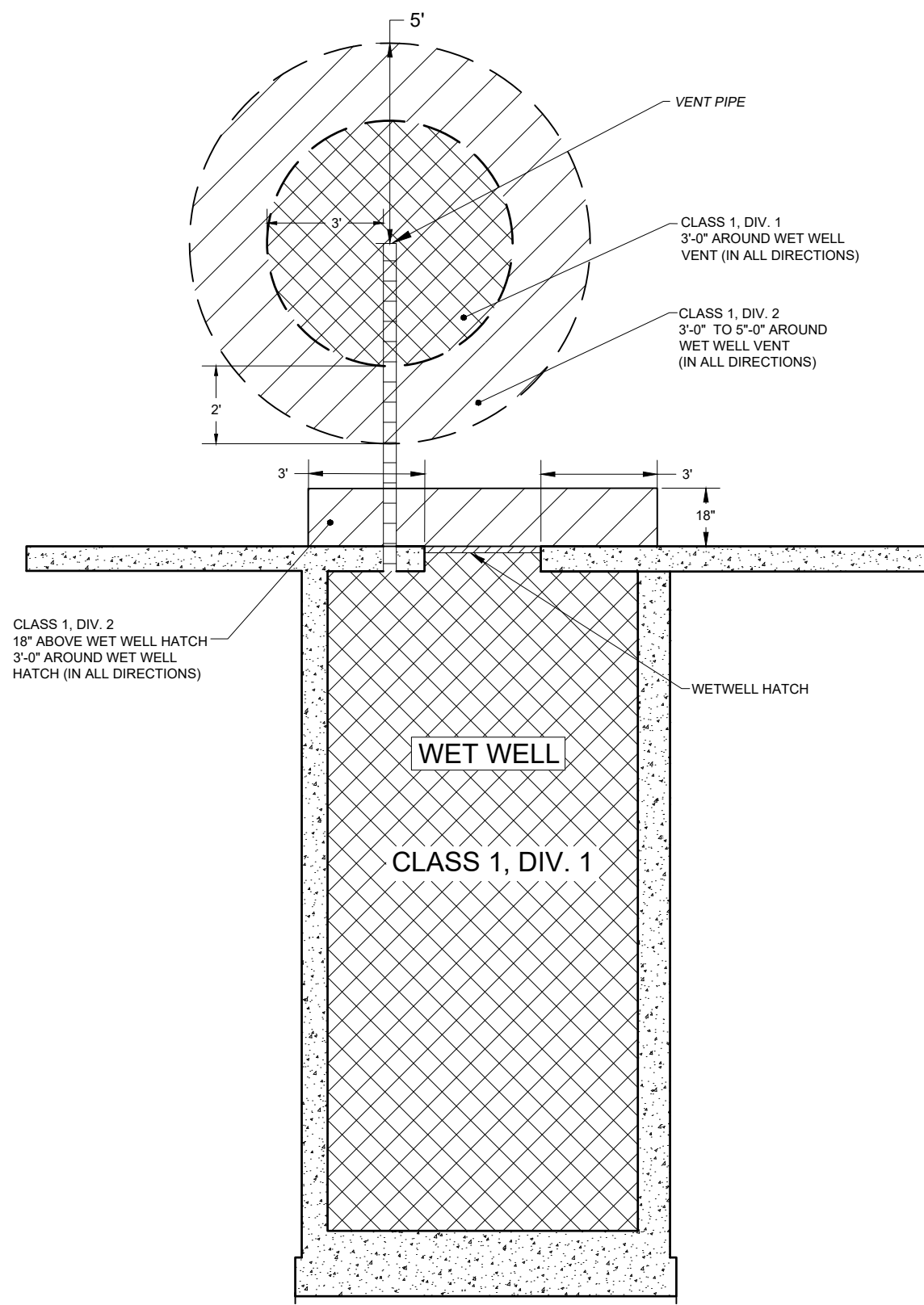
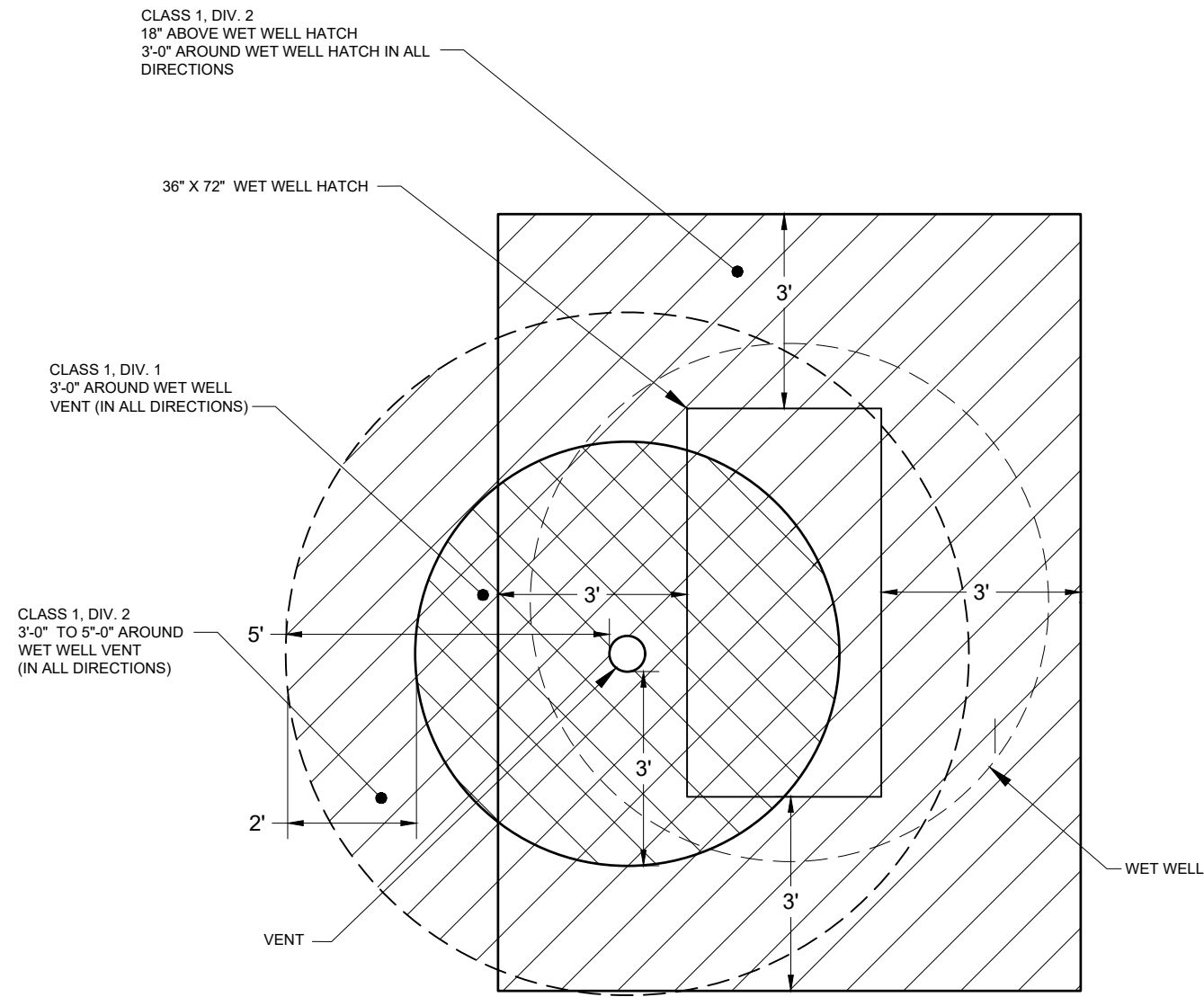
DESIGNED	WDF	DRAWN	WDF	CHECKED	GIO	APPROVED	2/5/24	LAST EDIT	2/5/24	PLOT DATE	2/5/24	SUBMITTAL	02/09/24

SMALL BOAT HARBOR UTILITIES
CITY OF SAINT PAUL
BOAT HARBOR LIFT STATION POWER PLAN

PROJECT NUMBER: 165.030630
DRAWING FILE NAME: 30630-E-201 POWER PLAN.DWG
DRAWING SCALE: AS SHOWN

SHEET NUMBER
E-201

100% SUBMITTAL



1 NFPA 820 HAZARDOUS LOCATIONS - PLAN VIEW
E-302 SCALE: 3/4" = 1'

2 NFPA 820 HAZARDOUS LOCATIONS - ELEVATION VIEW
E-302 SCALE: 1/2" = 1'

100% SUBMITTAL

REVISIONS & ADDENDUMS

#	DATE	REMARKS

MANAGEMENT

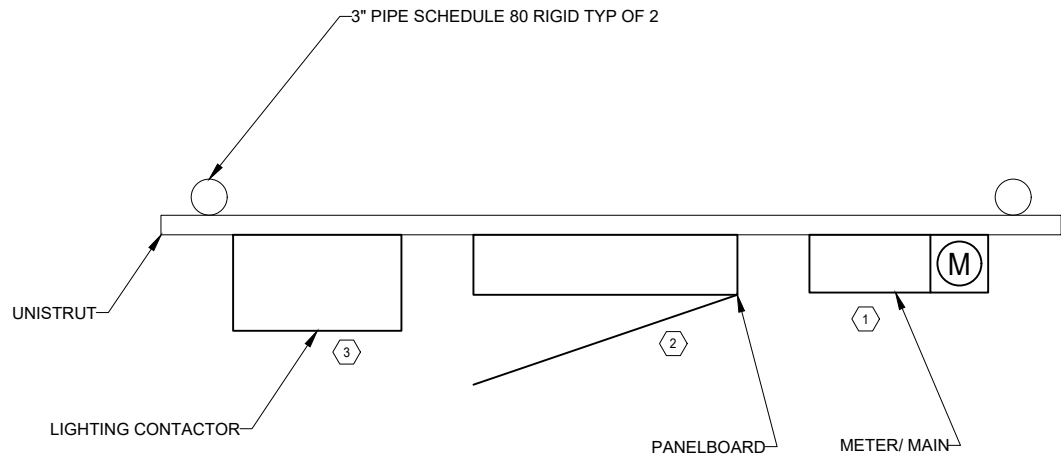
DESIGNED	WDF	WDF	CIO	2/5/24	2/5/24	02/09/24

SMALL BOAT HARBOR UTILITIES
CITY OF SAINT PAUL
HAZARDOUS LOCATION DETAILS

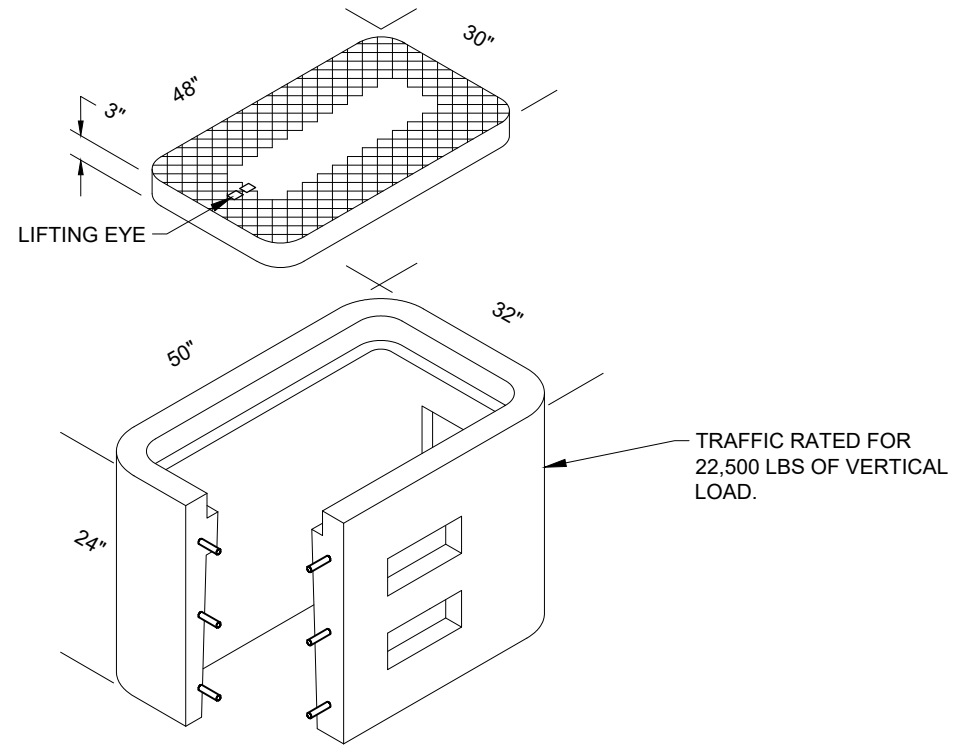
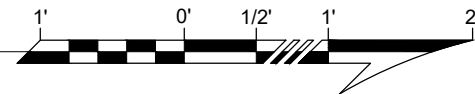
PROJECT NUMBER: 165.030630
DRAWING FILE NAME: 30630-E-300 ELECTRICAL DETAILS.DWG
DRAWING SCALE: AS SHOWN

SHEET NOTES: (X)

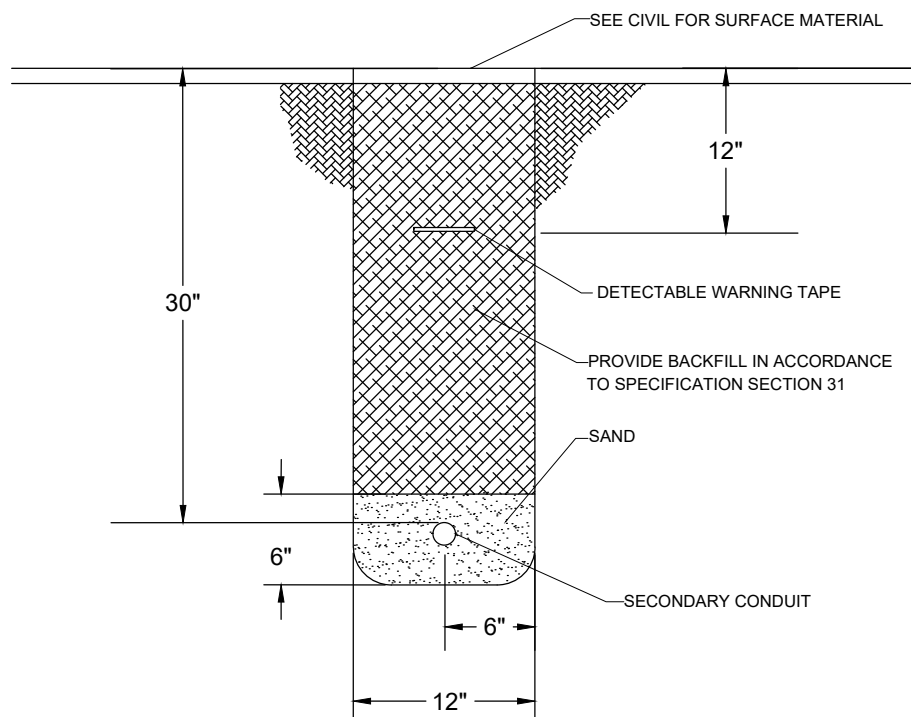
1. BOAT HARBOR AREA LIGHT SERVICE WITH UNDERGROUND CONDUCTORS ORIGINATING FROM PAD MOUNTED TRANSFORMER.
2. BOAT HARBOR AREA LIGHT PANELBOARD "LP".
3. LIGHTING CONTACTOR, SEE SHEET E-303, DETAIL 2.



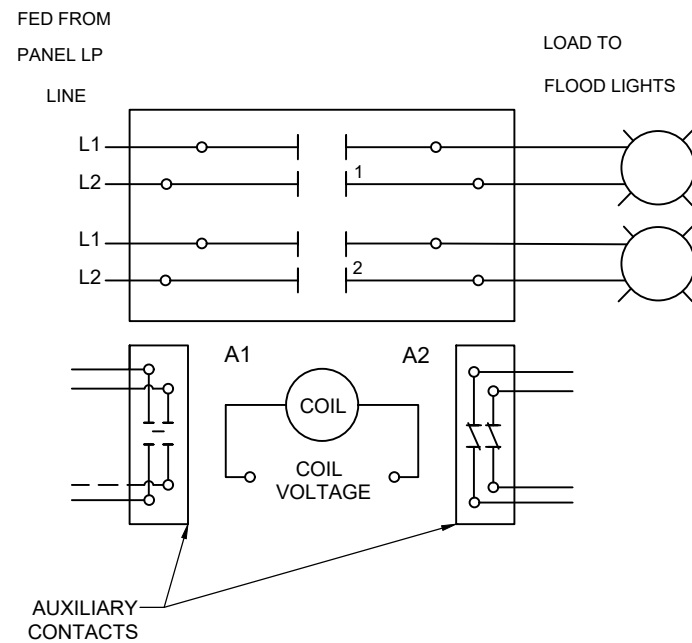
3 POWER RAIL LAYOUT DETAILS
E-303 SCALE: 1-1/2" = 1'



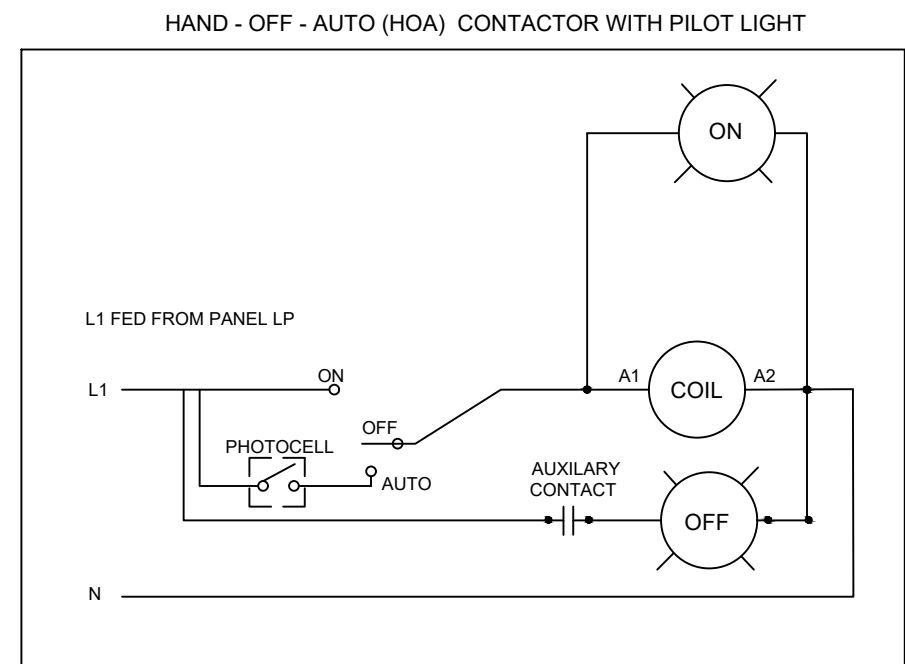
4 HAND HOLE TYPE 1A JUNCTION BOX DETAIL
E-303 SCALE: NTS



1 TYPICAL TRENCH FOR ELECTRICAL SERVICE
E-303 SCALE: NTS



2 LIGHTING CONTACTOR
E-303 SCALE: NTS



REVISIONS & ADDENDUMS		
#	DATE	REMARKS

MANAGEMENT	DESIGNED	WDF	DRAWN	WDF	CHECKED	CIO	APPROVED	2/5/24	LAST EDIT	2/5/24	PLOT DATE	2/5/24	SUBMITTAL	02/09/24

SMALL BOAT HARBOR UTILITIES
CITY OF SAINT PAUL
ELECTRICAL DETAILS

PROJECT NUMBER: 165.030630
DRAWING FILE NAME: 30630-E-300 ELECTRICAL DETAILS.DWG
DRAWING SCALE: AS SHOWN

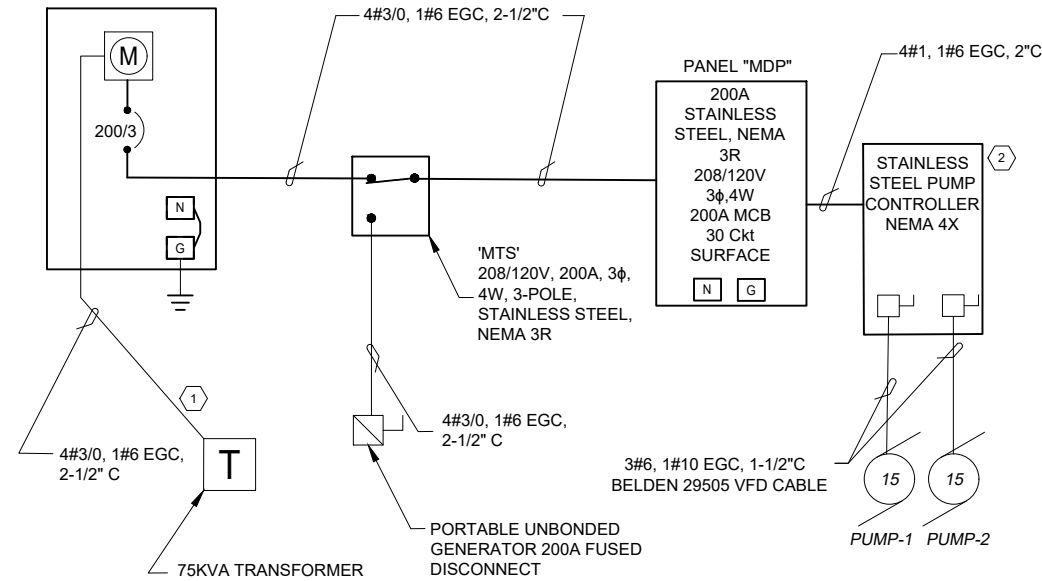
SHEET NUMBER
E-303

100% SUBMITTAL

LIFT STATION EQUIPMENT SCCR SCHEDULE				
ALL EQUIPMENT TO HAVE SCCR EXCEEDING THE AVAILABLE SCA AT THE CALCULATED X/R RATIO. WHERE X/R RATIO IS GREATER THAN THE INDUSTRY STANDARD TEST X/R RATIOS, THE APPROPRIATE MULTIPLICATION FACTOR SHALL BE APPLIED TO PROPERLY RATE THE EQUIPMENT. DOWNSIDE EQUIPMENT AND ASSOCIATED CIRCUIT BREAKER RATINGS MAY BE SATISFIED BY USING FULLY RATED EQUIPMENT OR MANUFACTURER TESTED COMBINATIONS FOR BRANCH CIRCUITS RATED 100AMPS OR LESS PER NEC 240.86(B) TO SERIES RATE FOR THE AVAILABLE SCA AT EQUIPMENT. ALL SERIES RATED EQUIPMENT TO BE CLEARLY LABELED & IDENTIFIED PER NEC 110.22(C). SERIES RATED EQUIPMENT MOTOR LOADS CANNOT EXCEED 1% OF AIC RATING PER NEC 240.86(C).				
CONTRACTOR TO VERIFY ACTUAL EQUIPMENT TO BE PROVIDED WITH SERVING UTILITY PRIOR TO EQUIPMENT PROCUREMENT. ANY DECREASE OF TRANSFORMER %Z, CONDUCTOR LENGTH, OR INCREASE IN TRANSFORMER KVA OR CABLE SIZES TO BE REPORTED TO ENGINEER FOR RECALCULATION OF AVAILABLE FAULT CURRENT PRIOR TO PROCUREMENT OF EQUIPMENT. PROVIDE WARNING PLACARD INSTALLED ON SERVICE DISCONNECT PER NEC 110.24 DENOTING ALL PROJECT PARAMETERS REQUIRED BY NEC.				
ASSUMED UTILITY SYSTEM CONFIGURATION FOR CALCULATION PURPOSES				
SERVICE TRANSFORMER				
KVA	% Z	PF	DATE	SCA (SEC.)
75	1.6	1	12/27/2023	13,012
FOR FAULT CURRENT CALCULATIONS ONLY				
SERVICE AMPS		SERVICE LATERAL		FT
200		4#3/0, 1#6 EGC, 2-1/2" C		40
EQUIPMENT ID			SC AMPS	
SERVICE DISCONNECT			9,729	
PANEL 'MDP'			9,151	

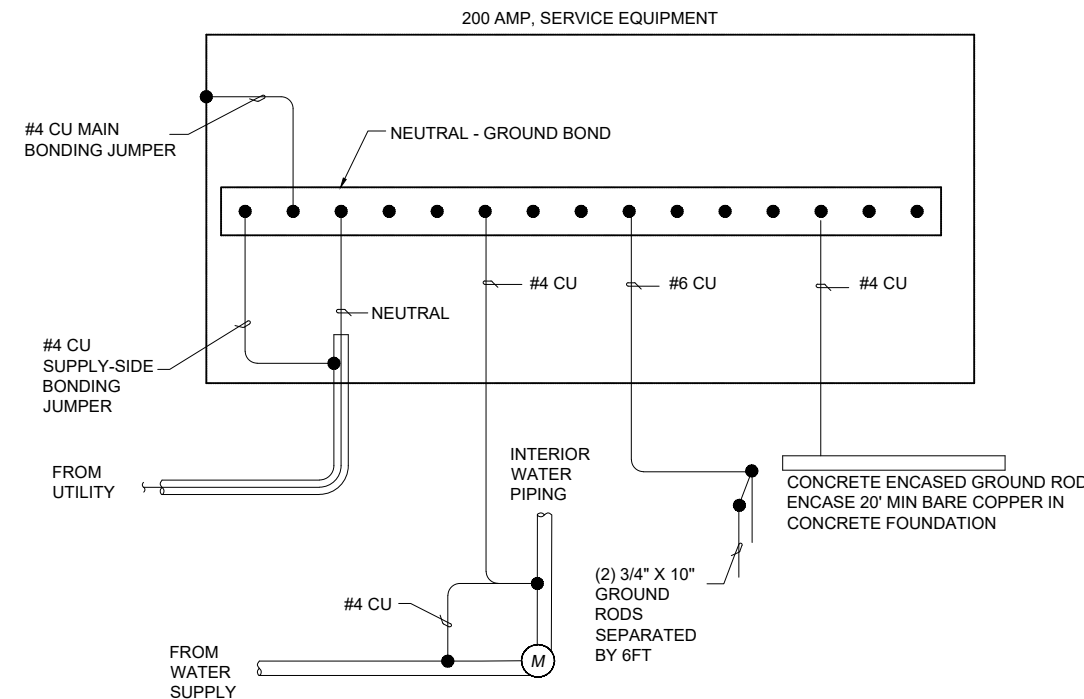
SCHEDULE DISTRIBUTION PANEL 'MDP'													
T TYPE	SPACE #	NO. OF POLES	TRIP RATING	LOAD DESCRIPTION	CONNECTED LOAD (KVA)			BRANCH LOAD VA	LOAD DESCRIPTION	TRIP RATING	NO. OF POLES	SPACE #	T TYPE
					A	B	C						
A	1	3	125	PUMP CONTROLLER	12,442	13.44		1,000	UNIT HEATER 3KW	20	3	2	A
A	3	"	"		12,442		13.44	1,000		"	"	4	A
A	5	"	"		12,442			1,000		"	"	6	A
G	7	1	20	SPARE		1.00		1,000	UNIT HEATER 3KW	20	3	8	A
L	9	1	20	INTERIOR LIGHTS	112		1.11	1,000		"	"	10	A
L	11	1	20	EXTERIOR LIGHTS	140		1.14	1,000		"	"	12	A
G	13	1	20	SPARE		0.00			SPACE	-		14	G
R	15	1	20	EXTERIOR RECEPTACLE	360		0.36		SPACE	-		16	G
R	17	1	20	INTERIOR RECEPTACLES/ TRAP PRIMER	370			0.37	SPACE	-		18	G
R	19	1	20	INTERIOR RECEPTACLES	360	0.36			SPACE	-		20	G
G	21	1	20	SPARE			0.00		SPACE	-		22	G
G	23	1	20	SPARE				0.00	SPACE	-		24	G
G	25	1	20	SPARE				0.00	SPACE	-		26	G
G	27	1	20	SPARE				0.00	SPACE	-		28	G
G	29	1	20	SPARE				0.00	SPACE	-		30	G
CONNECTED LOAD					44.7 KVA	14.80	14.91	14.95	PANEL SPECIFICATIONS				
NEC DEMAND					44.7 KVA				MAINS RATING AMPS - 200 MAIN CIRCUIT BREAKER - MCB SYSTEM VOLTAGE - 208Y 120 V PHASE, NO. OF WIRES - 3 PH 4. WIRE AIC RATING - 10,000 MOUNTING - SURFACE CAPACITY ONE-POLE CIRCUITS - 30 LOCATION NEMA TYPE - STAINLESS STEEL 3R				
CONNECTED LOAD					124 AMPS	123.3	124.2	124.5					
NEC DEMAND					124 AMPS								
PANEL NOTES													
1. "***" INDICATES GFI CIRCUIT BREAKER W/ 30 mA TRIP SETTING 2. PROVIDE 160KA SURGE PROTECTIVE DEVICE IN THIS PANEL 3. ALL CIRCUITS ARE REQUIRED TO HAVE EQUIPMENT GROUNDING CONDUCTOR 4.													
LOAD TYPES: G=GENERAL, L=LIGHTING, M=MOTOR, A=APPLIANCE, F=FEEDER, S=SPARE OR SPACE, R=RECEPTACLE													

CL200 7 JAW METER/ MAIN DISCONNECT SERVICE ENTRANCE RATED, 120V/208V, 3Ø 4-WIRE, STAINLESS STEEL NEMA 3R



1 LIFT STATION RISER DIAGRAM
SCALE: NTS

2 LIFT STATION GROUNDING SYSTEM
SCALE: NTS



SHEET NOTES: (X)

- UNDERGROUND 120/208 VAC SERVICE TO PAD MOUNTED TRANSFORMER.
- PUMP CONTROL PANEL 'PCP' WITH LOCAL DISCONNECTS AND CO-LOCATED VFDs FOR PUMPS 1 AND 2.



REVISIONS & ADDENDUMS	
#	DATE

MANAGEMENT	DESIGNED	WDF	DRAWN	WDF	CHECKED	EJG	APPROVED	2/5/24	LAST EDIT	2/5/24	PLOT DATE	2/5/24	SUBMITTAL	02/09/24

SMALL BOAT HARBOR UTILITIES
CITY OF SAINT PAUL
LIFT STATION - RISER DIAGRAM

DRAWING FILE NAME: 30630-E-600 RISER DIAGRAMS.DWG
 DRAWING SCALE: AS SHOWN

PROJECT NUMBER: 165.030630

BOAT HARBOR EQUIPMENT SCCR SCHEDULE

ALL EQUIPMENT TO HAVE SCCR EXCEEDING THE AVAILABLE SCA AT THE CALCULATED X/R RATIO. WHERE X/R RATIO IS GREATER THAN THE INDUSTRY STANDARD TEST X/R RATIOS, THE APPROPRIATE MULTIPLICATION FACTOR SHALL BE APPLIED TO PROPERLY RATE THE EQUIPMENT. DOWNSTREAM EQUIPMENT AND ASSOCIATED CIRCUIT BREAKER RATINGS MAY BE SATISFIED BY USING FULLY RATED EQUIPMENT OR MANUFACTURER TESTED COMBINATIONS FOR BRANCH CIRCUITS RATED 100AMPS OR LESS PER NEC 240.86(B) TO SERIES RATE FOR THE AVAILABLE SCA AT EQUIPMENT. ALL SERIES RATED EQUIPMENT TO BE CLEARLY LABELED & IDENTIFIED PER NEC 110.22(C). SERIES RATED EQUIPMENT MOTOR LOADS CANNOT EXCEED 1% OF AIC RATING PER NEC 240.86(C).

CONTRACTOR TO VERIFY ACTUAL EQUIPMENT TO BE PROVIDED WITH SERVING UTILITY PRIOR TO EQUIPMENT PROCUREMENT. ANY DECREASE OF TRANSFORMER %Z, CONDUCTOR LENGTH, OR INCREASE IN TRANSFORMER KVA OR CABLE SIZES TO BE REPORTED TO ENGINEER FOR RECALCULATION OF AVAILABLE FAULT CURRENT PRIOR TO PROCUREMENT OF EQUIPMENT. PROVIDE WARNING PLACARD INSTALLED ON SERVICE DISCONNECT PER NEC 110.24 DENOTING ALL PROJECT PARAMETERS REQUIRED BY NEC.

ASSUMED UTILITY SYSTEM CONFIGURATION FOR CALCULATION PURPOSES

SERVICE TRANSFORMER

KVA	%Z	PF	DATE	SCA (SEC.)
50	1.2	1	1/8/2024	10,024
SERVICE AMPS FOR FAULT CURRENT CALCULATIONS ONLY				
SERVICE AMPS	SERVICE LATERAL		FT	
100	3#3, 1#8 EGC, 1-1/2" C		20	
EQUIPMENT ID		SC AMPS		
SERVICE DISCONNECT		7,687		
PANEL "LP"		7,264		
DISCONNECT "BHB"		1,259		

NEW PANEL 'LP' SCHEDULE

TYPE	SPACE #	NO. OF POLES	TRIP RATING	LOAD DESCRIPTION	BRANCH LOAD VA	LOAD (kVA)		BRANCH LOAD VA	LOAD DESCRIPTION	TRIP RATING	NO. OF POLES	SPACE #	TYPE
						A	B						
L	1	2	20	EXTERIOR FLOOD LIGHTS WEST, CENTER	2,732	4.65		1,920	HARBOR BUILDING	20	1	2	F
L	3	"	"				0.00		SPARE	20	1	4	G
L	5	2	20	EXTERIOR FLOOD LIGHTS EAST	1,788	1.79			SPARE	20	1	6	G
L	7	"	"				0.00		SPARE	20	1	8	G
L	9	1	20	LIGHTING CONTACTOR COIL	30	0.03			SPARE	20	1	10	G
G	11	1	20	SPARE			0.00		SPACE		1	12	G
G	13	1	20	SPARE			0.00		SPACE		1	14	G
G	15	1		SPACE			0.00		SPACE		1	16	G
G	17	1		SPACE			0.00		SPACE		1	18	G
CONNECTED LOAD:					6.5 KVA	6.47	0.00	PANEL SPECIFICATIONS					
NEC LOAD:					27.0 AMPS	53.92	0.00	MANS RATING AMPS - 100					
					7.6 KVA			MAIN CIRCUIT BREAKER - MCB 100A					
					31.7 AMPS			SYSTEM VOLTAGE - 240 V 120 V					
PANEL NOTES												PHASE, NO. OF WIRES - 1PH 3. WIRE	
1. ** DENOTED GFI CIRCUIT BREAKER W/ 30 mA TRIP SETTING.												AIC RATING - 10,000	
2. PROVIDE 160kA SURGE PROTECTIVE DEVICE IN THIS PANEL												MOUNTING - SURFACE	
3. ALL CIRCUITS ARE REQUIRED TO HAVE EQUIPMENT GROUNDING CONDUCTOR												CAPACITY ONE-POLE CIRCUITS - 18	
4.												LOCATION - STAINLESS STEEL 3R	
LOAD TYPES: G=GENERAL, L=LIGHTING, M=MOTOR, A=APPLIANCE, F=FEEDER, S=SPARE OR SPACE, R=RECEPTACLE													

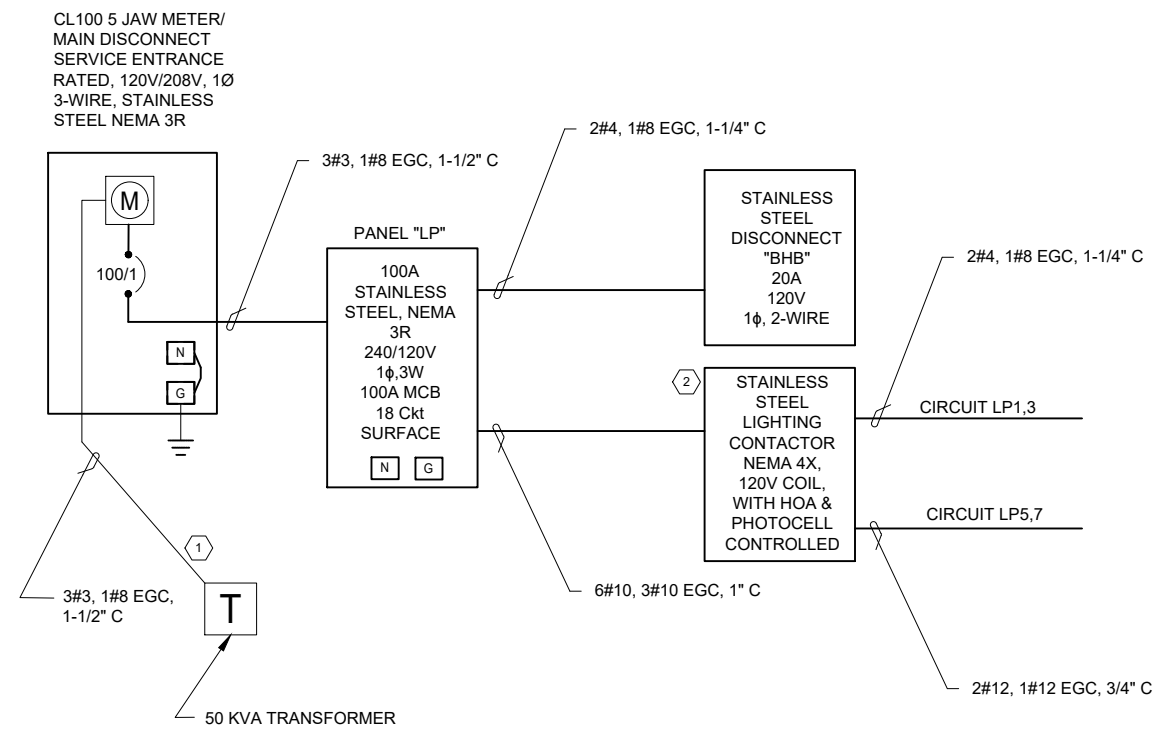
REVISIONS & ADDENDUMS

#	DATE	REMARKS

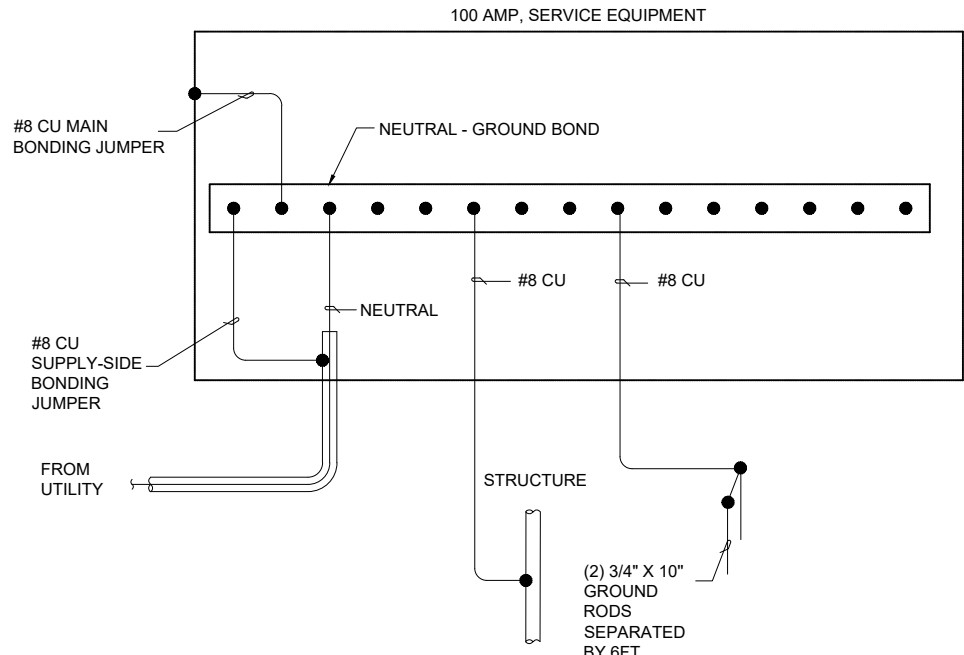
MANAGEMENT	DESIGNED	WDF	DRAWN	WDF	CHECKED	CJO	APPROVED	LAST EDIT	PLOT DATE	SUBMITTAL
								2/5/24	2/5/24	02/09/24
SMALL BOAT HARBOR UTILITIES										
CITY OF SAINT PAUL										
ONE-LINE DAIGRAMS AREA LIGHTS										
PROJECT NUMBER	DRAWING FILE NAME		DRAWING SCALE							
165.030630	30630-E-600 RISER DIAGRAMS.DWG		AS SHOWN							

SHEET NOTES:

- UNDERGROUND 120/240 VAC SERVICE TO PAD MOUNTED TRANSFORMER.
- ADD PHOTOCCELL CONTROL TO LIGHTING CONTACTOR SIEMENS LH CONTACTOR PART# LCE02C004120A OR EQUAL.



1 AREA LIGHTING RISER DIAGRAM
E-602 SCALE:NTS



1 AREA LIGHTING GROUNDING SYSTEM
E-602 SCALE:NTS

100% SUBMITTAL

SHEET NUMBER
E-602