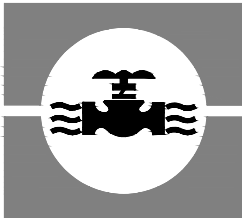


TUNTUTULIAK, ALASKA
WATER TREATMENT PLANT & WASHETERIA
LAGOON UPGRADES

WASHETERIA SEWER SYSTEM UPGRADES

ISSUED FOR CONSTRUCTION
SEPTEMBER 2011



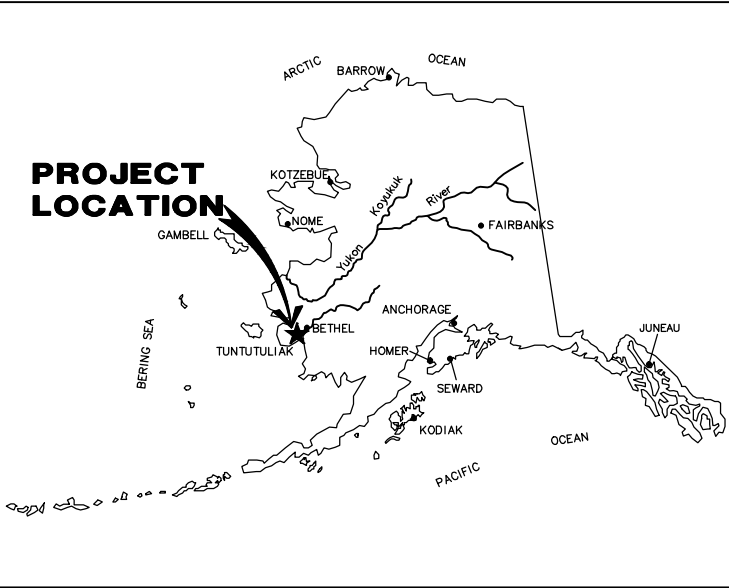
In Cooperation with the State of Alaska
Department of Environmental Conservation
VILLAGE SAFE WATER PROGRAM
& the Environmental Protection Agency

SHEET INDEX

SHT NO.	DWG. NO.	TITLE
GENERAL		
1	G001	COVER SHEET & INDEX
2	G002	GENERAL NOTES & VICINITY MAP
3	G003	LEGEND & ABBREVIATIONS
SURVEY		
4	V001	SURVEY CONTROL SHEET
CIVIL		
5	C101	SITE PLAN
6	C102	PLAN & PROFILE
7	C201	BUILDING ELEVATIONS
8	C501	BOARDWALK DETAILS
9	C502	INSULATED PIPE DETAILS
10	C503	OUTFALL & FENCE DETAILS
11	CS001	PIPING NOTES
△△ 12	CS101	BUILDING FLOOR PLAN
13	CS501	GREYWATER SUMP DETAILS
△△ 14	CS502	SETTLING TANK & CLARIFIED SUMP DETAILS
15	CS503	SEWER HOLDING TANK & RAMP DETAILS
△ 16	CS504	BACKWASH DETENTION TANKS & MISC. DETAILS
STRUCTURAL		
17	S101	FLOOR FRAMING PLAN
18	S501	STRUCTURAL NOTES
MECHANICAL		
19	M001	MECHANICAL FLOOR PLAN
20	M002	MECHANICAL DETAILS
ELECTRICAL		
21	E001	ELECTRICAL LEGEND, SITE PLAN & ABBREVIATIONS
22	E002	ELECTRICAL SPECIFICATIONS
23	E101	ELECTRICAL FLOOR PLAN
24	E501	PANEL SCHEDULES & ALARM SCHEMATIC
25	E502	BOILER CONTROL PANEL
26	E503	BOILER CONTROL SCHEMATIC

△△ REVISED OCTOBER 2011

△△ REVISED NOVEMBER 2011



LOCATION MAP

PROJECT NUMBER (CONSULTANT) 81801.00 (vsw) 11-VSW-WTL-005-01

VSW PROJECT ENGINEER EMILY KLOC

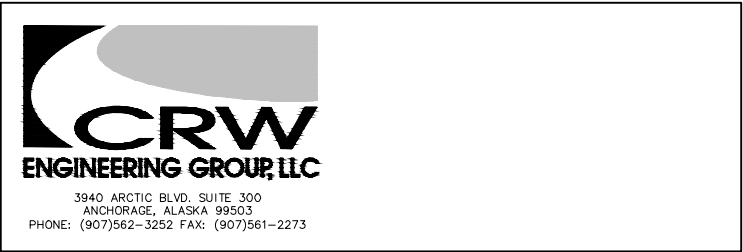
CONSTRUCTION FOREMAN

FINAL DESIGN (DATE) 09/14/11

ADEC APPROVAL (DATE) XX/XX/11

CONSTRUCTION PERIOD (FROM) (To)

AS-BUILTS (DATE)



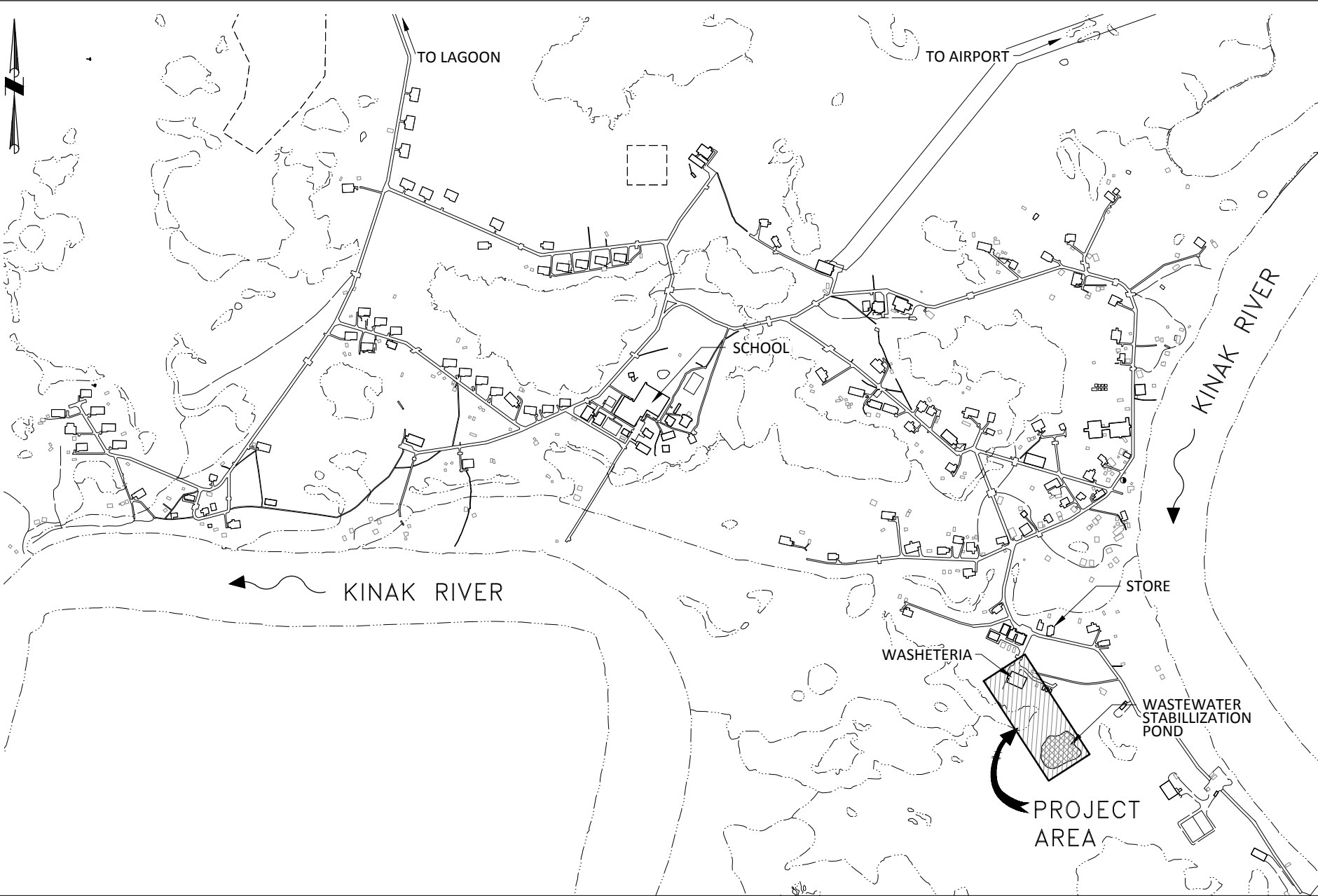
CONSULTANT

STATUS:
ISSUED FOR CONSTRUCTION

DATE:
SEPTEMBER 2011

PROJECT STATUS

File: J:\Jobsdata\81801.00 Tuntutuliak WTP & Wastewater Lagoon\00 CADD\01 Working Set\General\Wasteteria\81801.00 Wasteteria Vic Map & Legend.dwg



1
G002 VICINITY MAP - TUNTUTULIAK
Scale: 1" = 250'

GENERAL SCOPE OF WORK

THIS PROJECT WILL PROVIDE UPGRADES TO THE EXISTING WASHETERIA SEWER SYSTEM INCLUDING:

- INSTALLATION OF NEW BLACKWATER HOLDING TANK
- REPLACEMENT OF EXISTING PIPING & SUPPORTS BETWEEN WASHETERIA & WASTEWATER STABILIZATION POND
- NEW FENCING AROUND POND
- NEW GREYWATER SUMP & SETTLING TANK
- BOILER & PUMP UPGRADES
- BATHROOM/SHOWER UPGRADES

COMMUNITY DATA

POPULATION	
TUNTUTULIAK RESIDENT (2010 U.S. CENSUS)	408
DESIGN LIFE	
DESIGN POPULATION (2031)	20 YEARS (2031) 730 PEOPLE
ESTIMATED WASTEWATER GENERATION	
TUNTUTULIAK WASHETERIA	2,060 GPD (COMBINED GREYWATER & BLACKWATER)

GENERAL NOTES

1. THESE DRAWINGS HAVE BEEN DEVELOPED FOR CONSTRUCTION BY LOCAL FORCE ACCOUNT METHODS. AS SUCH, THE DRAWINGS STAND ALONE AND INCLUDE ALL NECESSARY CONSTRUCTION AND MATERIALS SPECIFICATIONS TO ENSURE THE PROJECT AS CONSTRUCTED MEETS THE DESIGN INTENT. ANY CHANGES TO CONSTRUCTION METHODS OR MATERIALS SHALL BE APPROVED IN ADVANCE BY THE ENGINEER.
2. THESE DRAWINGS ARE DIAGRAMATIC AND DO NOT NECESSARILY REFLECT ALL FEATURES OF THE REQUIRED WORK. EXISTING FIELD CONDITIONS SHALL BE VERIFIED PRIOR TO CONSTRUCTION. CONTACT THE ENGINEER IMMEDIATELY FOR CLARIFICATION OF QUESTIONS AND RESOLUTION OF APPARENT CONFLICTS.
3. ALL WORK SHALL BE COORDINATED WITH EXISTING OPERATORS AND TRIBAL COUNCIL. ANY DISRUPTIONS IN USE OF THE FACILITY BY THE COMMUNITY MUST BE PRECEDED BY A MINIMUM OF 7 DAYS NOTICE POSTED ON THE WASHETERIA DOOR. NO CLOSURES SHALL BE PERMITTED UNLESS APPROVED BY THE ENGINEER.
4. SATISFACTORY MEANS OF EXIT FOR PERSONS USING THE FACILITY SHALL BE MAINTAINED AT ALL TIMES.

QUALITY CONTROL

1. MANUFACTURER'S INSTRUCTIONS SHALL BE FULLY COMPLIED WITH, INCLUDING EACH STEP IN SEQUENCE. SHOULD MANUFACTURER'S INSTRUCTIONS CONFLICT WITH PROJECT DRAWINGS, REQUEST CLARIFICATION FROM THE ENGINEER PRIOR TO PROCEEDING.
2. COMPLY WITH PROJECT DRAWINGS AS A MINIMUM QUALITY FOR THE WORK EXCEPT WHEN MORE STRINGENT TOLERANCES, CODES OR OTHER REQUIREMENTS INDICATE HIGHER STANDARDS OR MORE PRECISE WORKMANSHIP.
3. ALL MATERIALS, SUPPLIES AND EQUIPMENT INCORPORATED INTO THE PROJECT SHALL BE NEW.

AS-BUILT DRAWINGS

1. THE PROJECT SUPERINTENDENT SHALL MAINTAIN A CLEAN SET OF AS-BUILT RECORD DRAWINGS SHOWING THE LOCATIONS, SWING TIES AND DIMENSIONS TO ALL FACILITIES CONSTRUCTED OR FOUND DURING THE COURSE OF THIS WORK. ALL ELEVATIONS SHALL BE MARKED ASB (AS-BUILT) WITH THE CORRECT VALUE INSERTED. DRAWINGS SHALL BE KEPT CURRENT IN RED PENCIL ON A DAILY BASIS IN A NEAT, LEGIBLE FASHION. A COPY OF THE AS-BUILT DRAWINGS SHALL BE SUBMITTED TO THE ENGINEER UPON COMPLETION OF CONSTRUCTION.

PRODUCTS OPTIONS/SUBSTITUTIONS

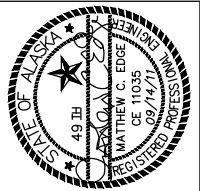
1. "OR APPROVED EQUAL" IS ALWAYS IMPLIED AFTER A BRAND NAME, PATENTED PROCESS OR CATALOG NUMBER. ANY BRAND OR PROCESS APPROVED BY THE ENGINEER MAY BE SUBSTITUTED. THE ONLY EXCEPTION IS WHERE NO SUBSTITUTION IS SPECIFIED.

ASSOCIATED PROJECTS

1. THIS PLAN SET INCLUDES PROPOSED UPGRADES TO THE TUNTUTULIAK WASHETERIA/WTP FACILITY. PROPOSED WTP UPGRADES ARE INCLUDED IN A SEPARATE PLAN SET ISSUED FOR CONSTRUCTION ON 7/29/11.

Alaska Department of
Environmental Conservation
Division of Water

Village Safe Water Program
555 Cordova Street 4th Floor
Anchorage, Alaska 99501



CRW
ENGINEERING GROUP LLC

3940 ARCTIC BLVD, SUITE 300
ANCHORAGE, ALASKA 99503
PHONE: (907) 562-3252
FAX: (907) 561-2273

TUNTUTULIAK, ALASKA

WASHETERIA SEWER SYSTEM UPGRADES

GENERAL NOTES AND VICINITY MAP


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1	ISSUED FOR CONSTRUCTION	TRT	9/2011

Plot Date	9/14/11
Designed	MCE
Drawn	CFP
Approved	

Sheet No.	G002
SHEET	2 OF 26

CIVIL LEGEND

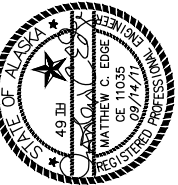
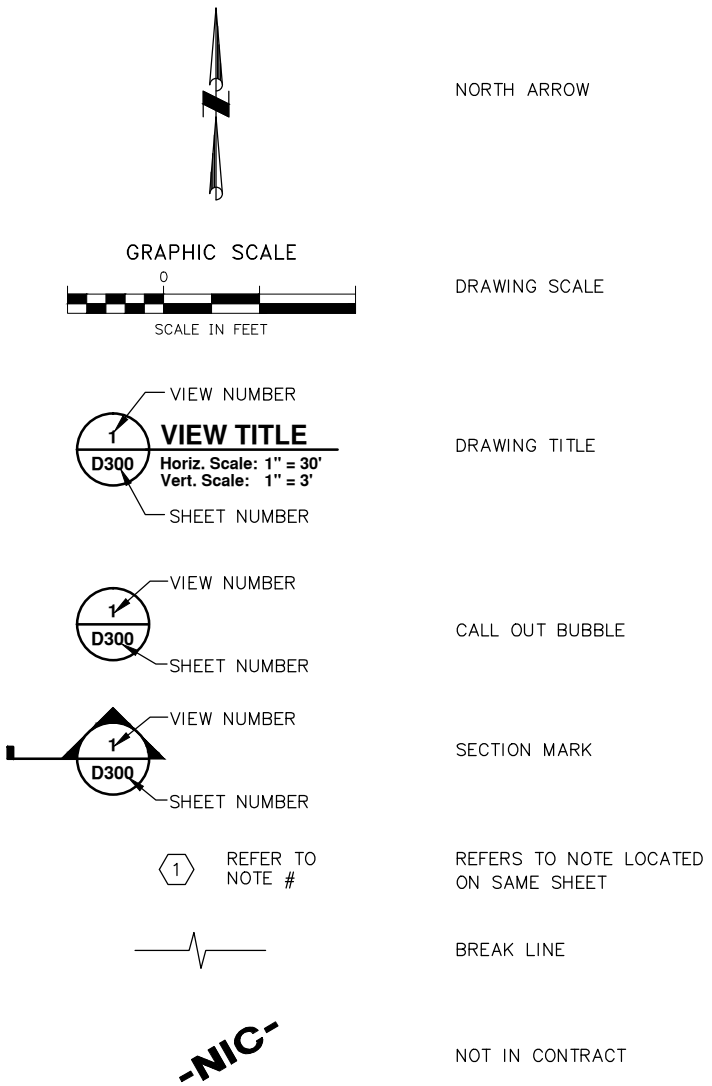
PLAN		
PROPOSED (P)	EXISTING (E)	DESCRIPTION
		RIGHT OF WAY
		PROPERTY LINE
		EASEMENT LINE
		EDGE OF BOARDWALK
		EDGE OF WATER
		TOP OF EMBANKMENT
		CONTOUR LINE
		WELL
10+00		PROJECT BASELINE STATION
		UTILITY POLE
		GUY WIRE
		FENCE
		TREE OR BRUSH LINE
		OVERHEAD ELECTRIC LINE
		AT-GRADE FUEL LINE
		SANITARY SEWER LINE
		WATER LINE
		GREY WATER LINE (AT-GRADE)
		BACKWASH LINE (ELEVATED)
		SUMP DISCHARGE (ELEVATED)
		BACKWASH DRAIN (AT-GRADE)
		CLARIFIED EFFLUENT

PROFILE		
PROPOSED (P)	EXISTING (E)	DESCRIPTION
	_____	EXISTING GRADE BELOW PIPE
		HELICAL PIER

COMMON ABBREVIATIONS

AVB – ATMOSPHERIC VACUUM BREAKER	EQPT – EQUIPMENT	MP – METERING PUMP
AFF – ABOVE FINISH FLOOR ELEV	FCV – FLOW CONTROL VALVE	MV – MODULATING VALVE
AIR – AIR	FD – FLOOR DRAIN	MXR – MECHANICAL MIXER
ARV – AIR RELEASE VALVE	FDN – FOUNDATION	NC – NORMALLY CLOSED
ASSY – ASSEMBLY	FE – FIRE EXTINGUISHER	NIC – NOT IN CONTRACT
BFP – BACK FLOW PREVENTOR	FF – FINISH FLOOR	NO – NORMALLY OPEN
BOP – BOTTOM OF PIPE	FL – FLUORIDE	NT – NEUTRALIZER
BP – BY-PASS	FM – FLOW METER	NTS – NOT TO SCALE
BW – BACKWASH	FP – CHEMICAL FEED PUMP	O – ORTHOPHOSPHATE
BWP – BACKWASH PUMP	FRP – FIBERGLASS REINFORCED	OD – OUTSIDE DIAMETER
BWS – BACKWASH SUPPLY	POLYETHYLENE	OC – ON CENTER
BWW – BACKWASH WASTE	FT – FEET	P – PRESSURE
CARV – COMBINATION AIR VACUUM/ AIR RELEASE VALVE	FW – FILTERED WATER	PD – PULSATION DAMPER
C/C – CENTER TO CENTER	GA – GAUGE	pH – pH ADJUSTMENT
CFM – CUBIC FEET PER MINUTE	GALV – GALVANIZED	Po – POLYMER
CFR – CONSTANT FLOW REGULATOR	GPD – GALLONS PER DAY	PP – PRESSURE PUMP
CHEM – CHEM	GPM – GALLONS PER MINUTE	PW – POTABLE WATER
CI – CAST IRON	GV – GATE VALVE	P&ID – PROCESS AND INSTRUMENTATION DIAGRAM
CIRC – CIRCULATING	GR – GLYCOL RETURN	PRV – PRESSURE REGULATING VALVE
CKV – CHECK VALVE	GS – GLYCOL SUPPLY	PSF – POUNDS PER SQUARE FOOT
CL – CHLORINE/CENTERLINE	GSF – GREENSAND FILTER	PSI – POUNDS PER SQUARE INCH
CLR – CLEAR	H OR HORIZ – HORIZONTAL	PT – POINT
CNR – CORNER	HS – HYDRONIC SYSTEM	REQD – REQUIRED
CONC – CONCRETE	HS CARV – HIGH SOLIDS COMBINATION AIR VACUUM/AIR RELEASE VALVE	RPBFP – REDUCED PRESSURE BACKFLOW PREVENTOR
CONN – CONNECTION	HW – HOT WATER	RW – RAW WATER
CONSTR – CONSTRUCT OR CONSTRUCTION	HWG – HOT WATER GENERATOR	SCHED – SCHEDULE
CP – CIRCULATION PUMP	ID – INSIDE DIAMETER	SS – STAINLESS STEEL
CPLG – COUPLING	IE – INVERT ELEVATION	STA – STATION
CTR – CENTER	ILSM – IN-LINE STATIC MIXER	STD – STANDARD
CU – COPPER	INFL – INFLUENT	T – TEMPERATURE
CW – COLD WATER	IV – ISOLATION VALVE	TB – TURBIDIMETER
D – DRAIN	KMnO ₄ – POTASSIUM PERMANGANATE	TH – THERMOMETER
DIA – DIAMETER	LS – LEVEL SENSOR	TP – TRANSFER PUMP
DIM – DIMENSION	M – METER	TW – TREATED WATER
DIP – DUCTILE IRON PIPE	MAX – MAXIMUM	TV – THROTTLING VALVE
DP – DIFFERENTIAL PRESSURE	MCC – MOTOR CONTROL CENTER	TYP – TYPICAL
EA – EACH	MECH – MECHANICAL	UH – UNIT HEATER
EFL – EFFLUENT	MFR – MANUFACTURER	V OR VERT – VERTICAL
EL OR ELEV – ELEVATION	MGD – MILLION GALLONS PER DAY	W – WASHER
ELEC – ELECTRIC OR ELECTRICAL	MIN – MINIMUM	W/ – WITH
EQ – EQUAL		WHA – WATER HAMMER ARRESTOR
EQ SP – EQUAL SPACING		WST – WATER STORAGE TANK

REFERENCE



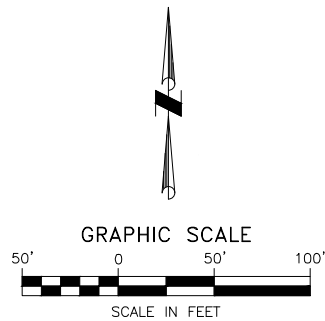
TUNTUTULIAK, ALASKA
WASHETERIA SEWER SYSTEM UPGRADES

LEGEND & ABBREVIATIONS

[illegible]

Plot Date	9/14/11
Designed	MCE
Drawn	CFP
Approved	

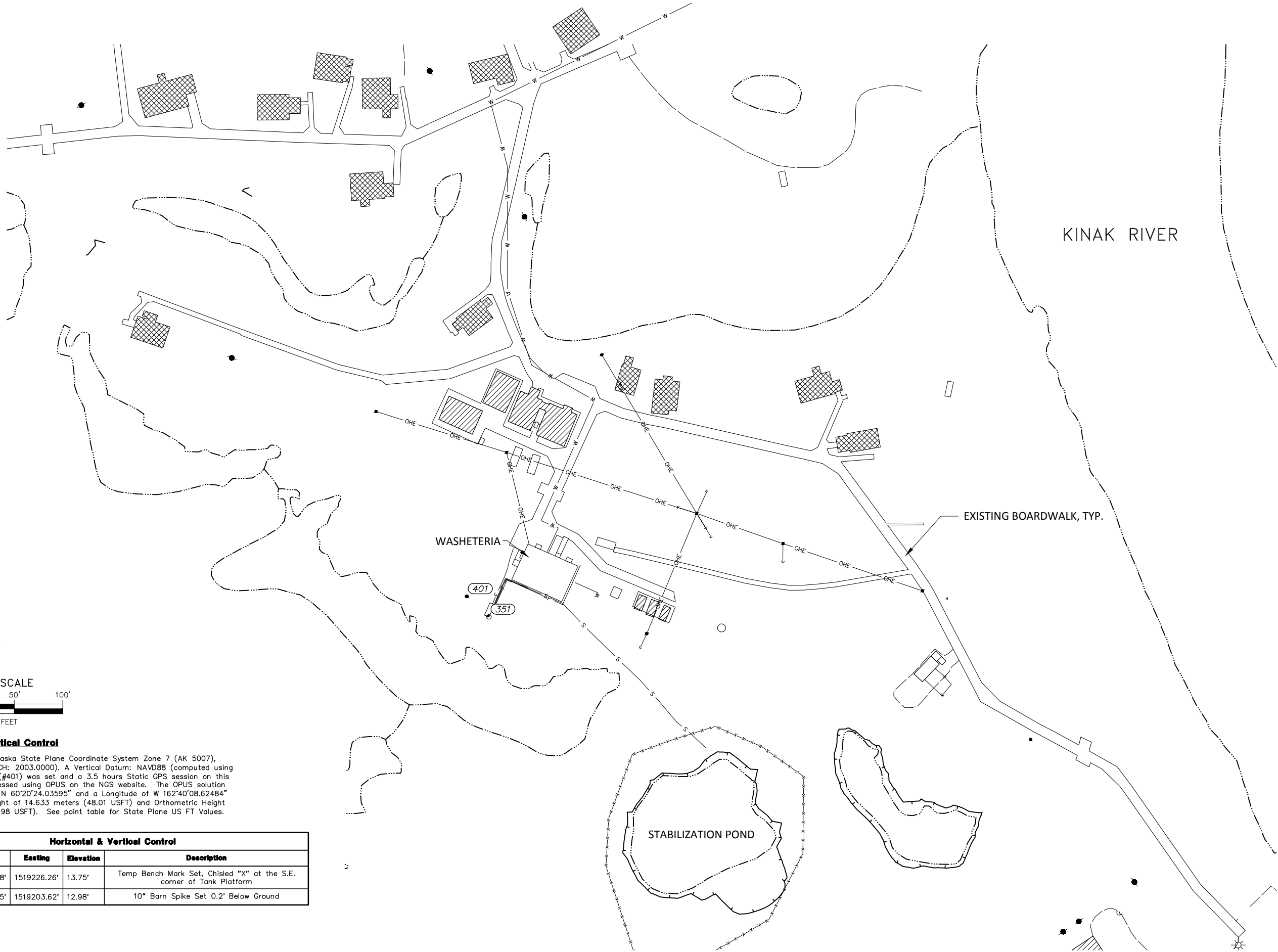
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Horizontal & Vertical Control

Horizontal Datum: Alaska State Plane Coordinate System Zone 7 (AK 5007), NAD83(CORS96)(EPOCH: 2003.0000). A Vertical Datum: NAVD88 (computed using GEOID99). A spike (#401) was set and a 3.5 hours Static GPS session on this point was then processed using OPUS on the NGS website. The OPUS solution return a Latitude of N 60°20'24.03595" and a Longitude of W 162°40'08.62484" with an Ellipsoid Height of 14.633 meters (48.01 USFT) and Orthometric Height of 3.955 meters (12.98 USFT). See point table for State Plane US FT Values.

Horizontal & Vertical Control				
Point No	Northing	Eastng	Elevation	Description
351	2316758.68'	1519226.26'	13.75'	Temp Bench Mark Set, Chisled "X" at the S.E. corner of Tank Platform
401	2316779.85'	1519203.62'	12.98'	10" Barn Spike Set 0.2' Below Ground



Plot	Date	Designed	Drawn	Approved
9/14/11				

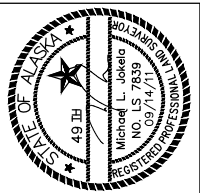
Sheet No.	V001
SHEET	4 OF 26

NO.	REVISION	BY	DATE
1	ISSUED FOR CONSTRUCTION	TRT	9/2011

TUNTUTULIAK, ALASKA

WASHETERIA SEWER SYSTEM UPGRADES

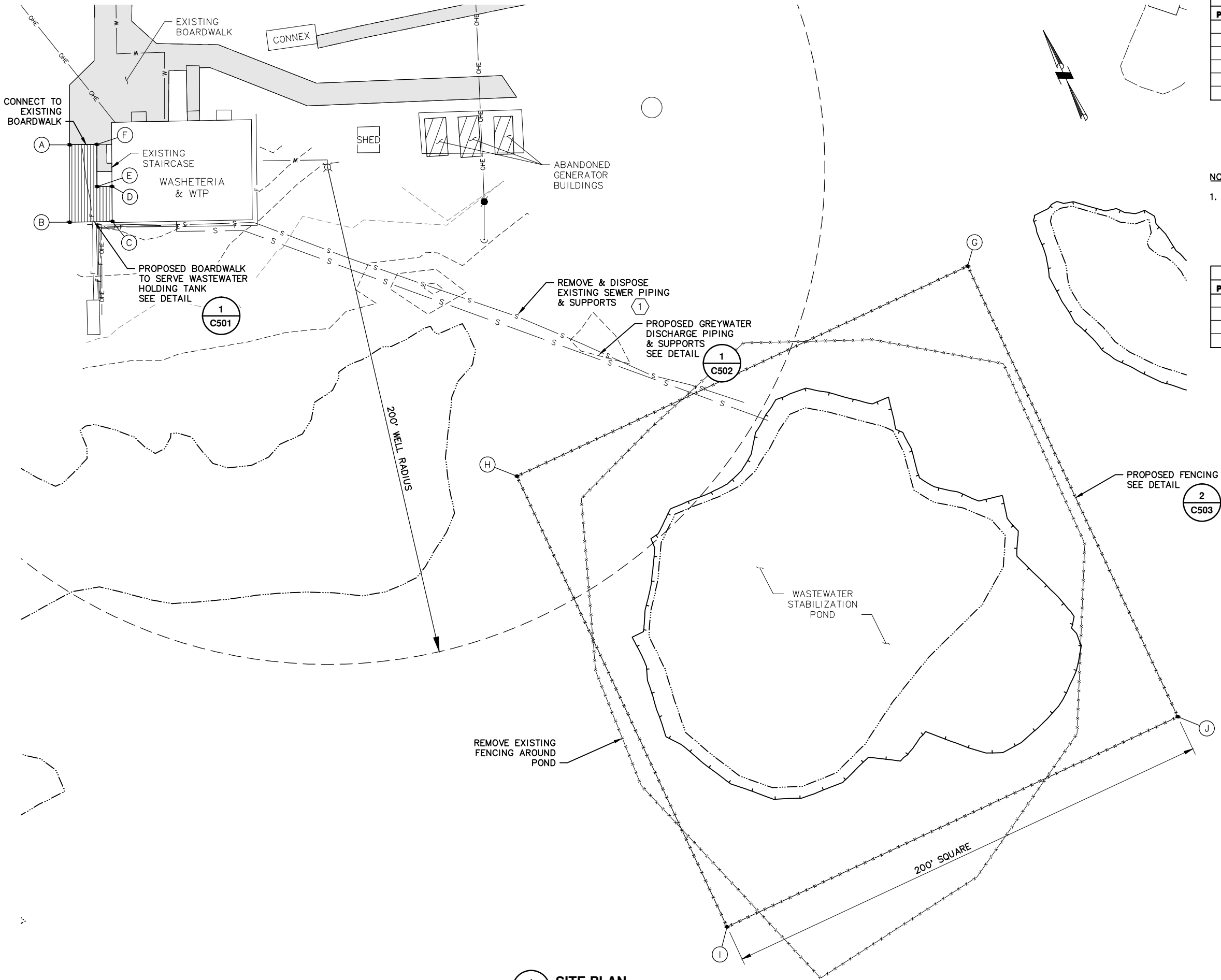
SURVEY CONTROL SHEET



Alaska Department of
Environmental Conservation
Division of Water

Village Safe Water Program
555 Cordova Street 4th Floor
Anchorage, Alaska 99501

File: J:\jobsdata\81801.00 Tuntutuliak WTP & Washeteria Lagoon\00 CADD\01 Working Set\01 Civil\81801.00 TUN - SITE PLAN.dwg



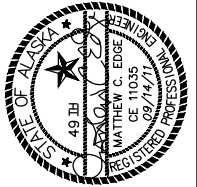
BOARDWALK POINT TABLE			
POINT	DESCRIPTION	NORTHING	EASTING
A	CNR BOARDWALK	2316832.81	1519247.43
B	CNR BOARDWALK	2316804.59	1519234.19
C	CNR BOARDWALK	2316797.60	1519249.98
D	CNR BOARDWALK	2316810.40	1519255.84
E	CNR BOARDWALK	2316812.90	1519250.38
F	CNR BOARDWALK	2316828.26	1519257.40

NOTE:
1. HAUL EXISTING PIPE & SUPPORTS TO COMMUNITY LANDFILL. SUPPORTS THAT CANNOT BE REMOVED SHALL BE CUT OFF 6" BELOW GRADE.

FENCE POINT TABLE			
POINT	DESCRIPTION	NORTHING	EASTING
G	CNR FENCE	2316635.92	1519554.17
H	CNR FENCE	2316635.92	1519354.17
I	CNR FENCE	2316435.92	1519354.17
J	CNR FENCE	2316435.92	1519554.17

1 SITE PLAN
C101 Scale: 1" = 20'

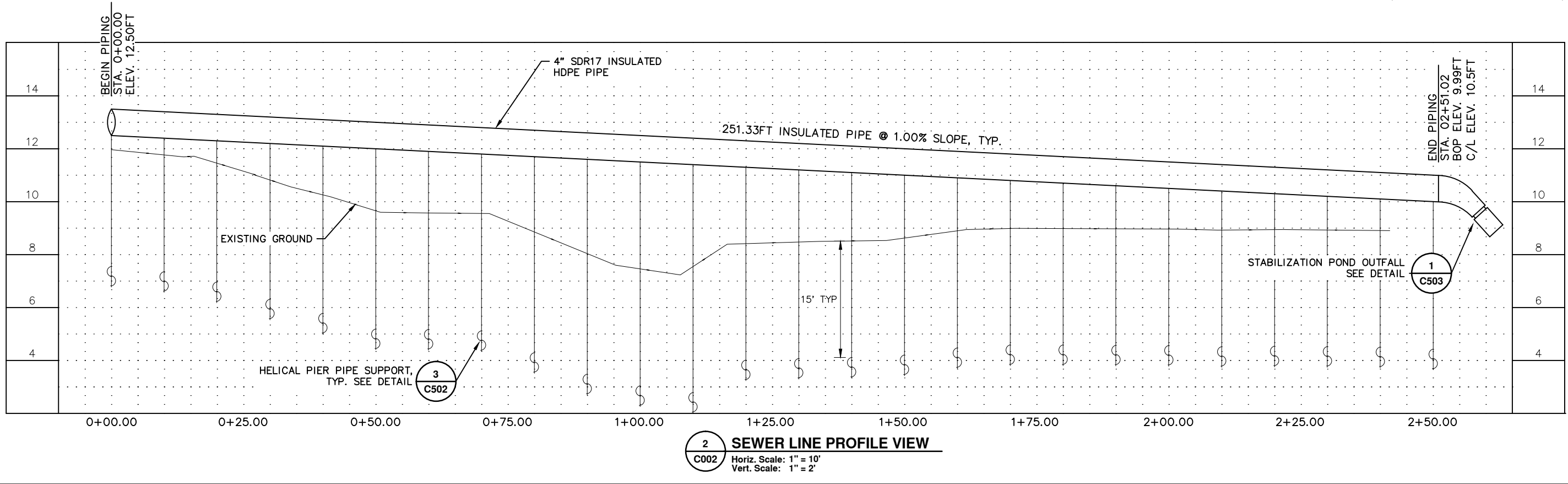
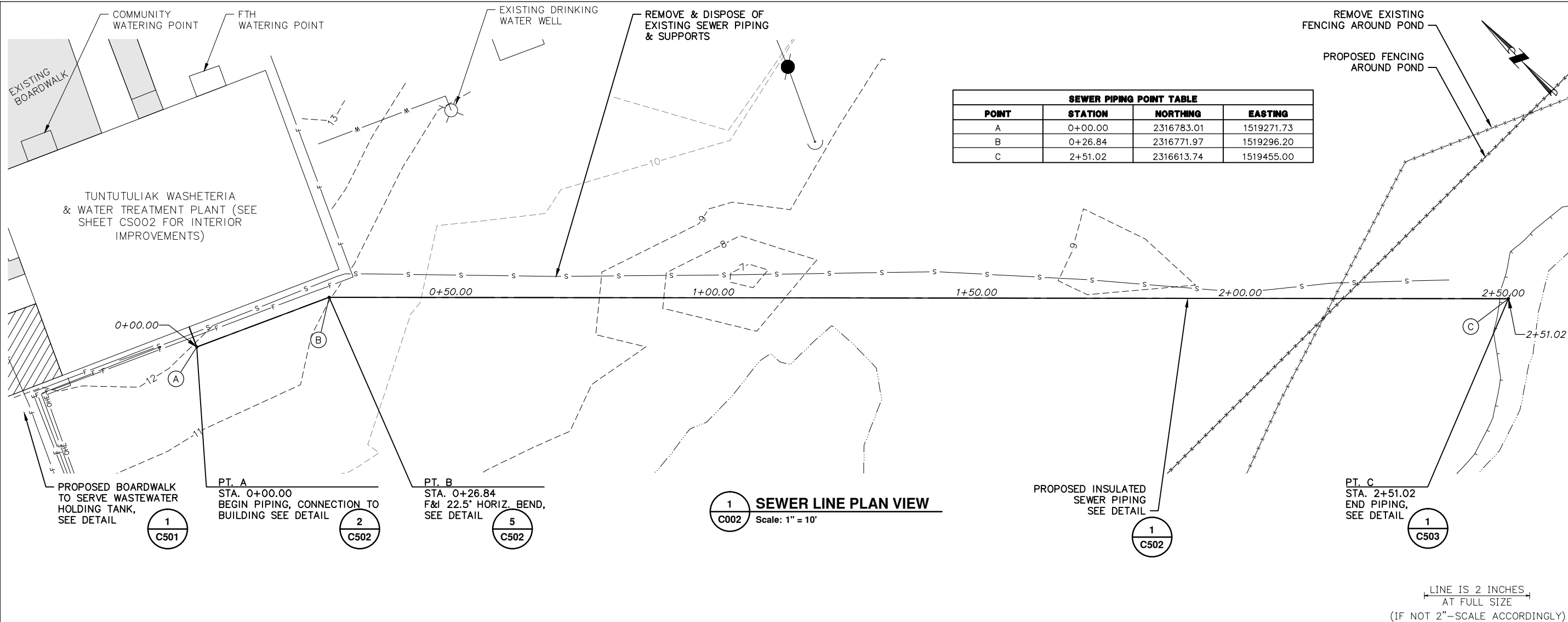
LINE IS 2 INCHES
AT FULL SIZE
(IF NOT 2"=SCALE ACCORDINGLY)



NO.	REVISION	BY	DATE
1	ISSUED FOR CONSTRUCTION	TRT	9/2011

Plot Date	9/14/11
Designed	MCE
Drawn	CFP/CMK
Approved	

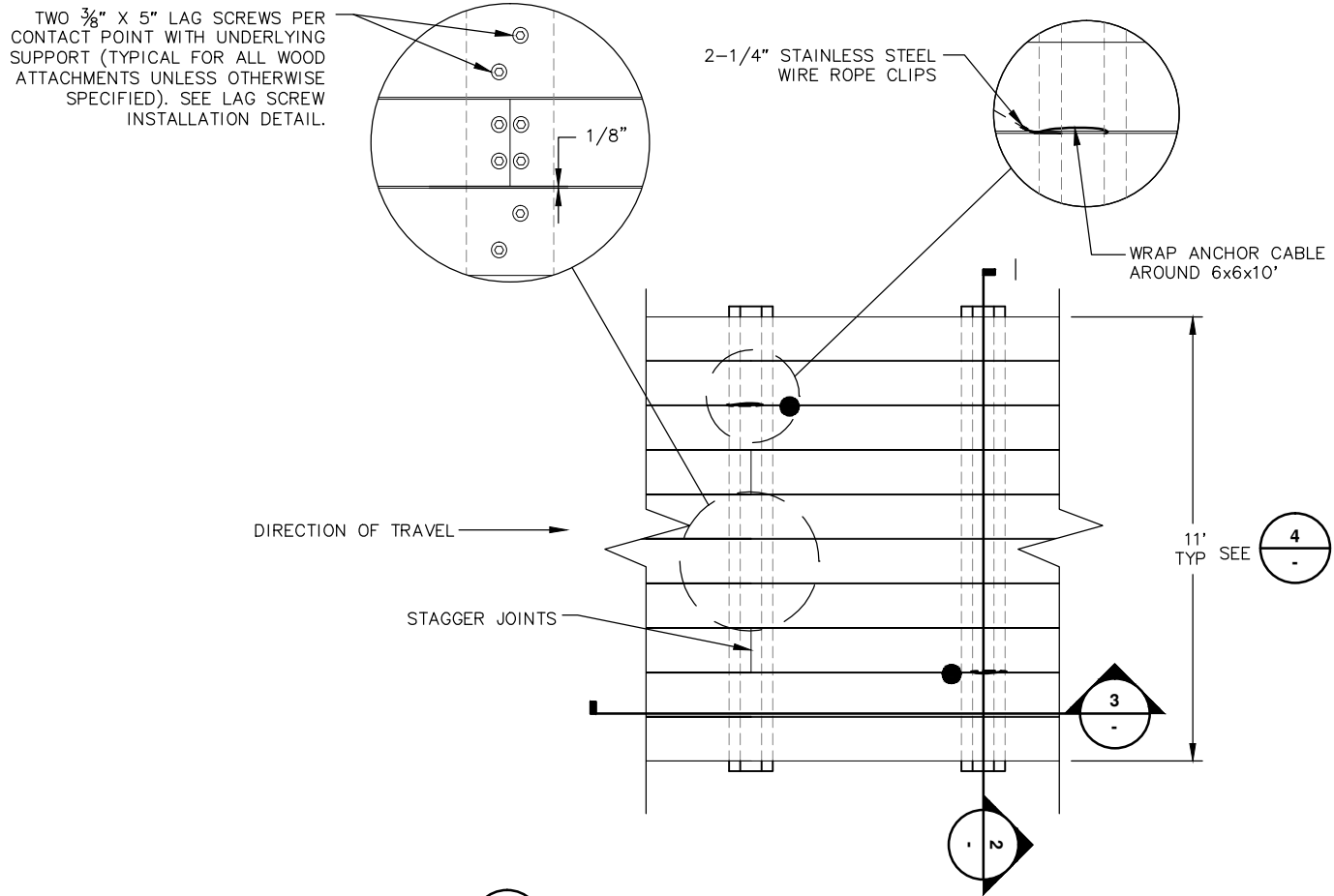
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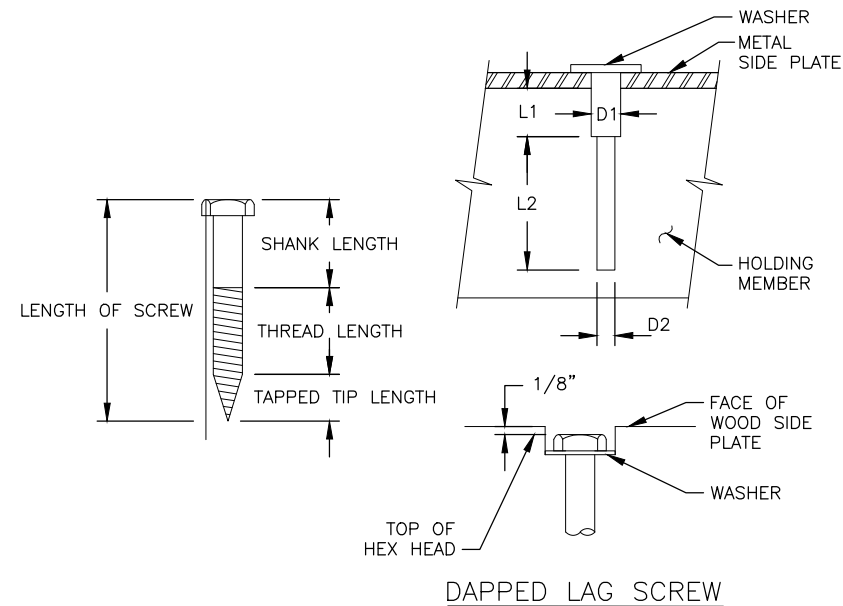


LINE IS 2 INCHES
AT FULL SIZE
(IF NOT 2"—SCALE ACCORDINGLY)

File: J:\Jobsdata\81801.00 Tuntutuliak WTP & Wastewater Lagoon\00 CADD\01 Working Set\01 Civil\81801.00 TUN - BWALK DETAILS.dwg



1 BOARDWALK PLAN VIEW
C501 Scale: NTS

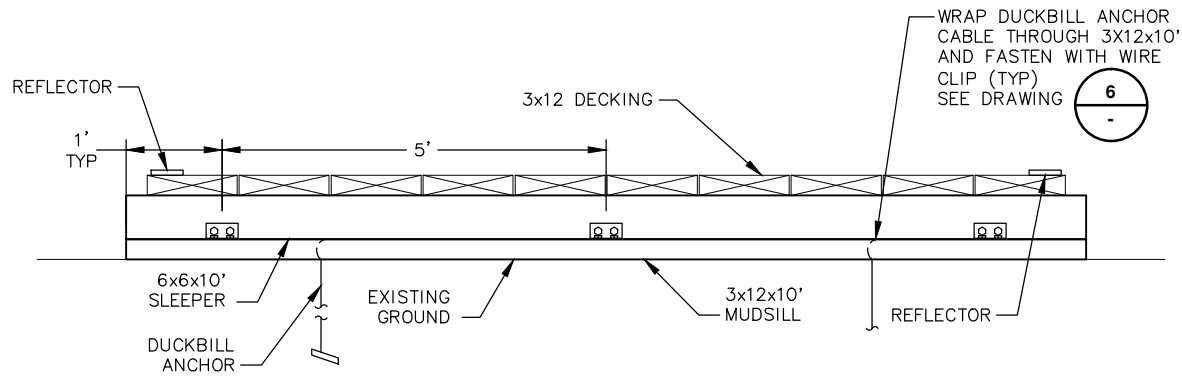


5 LAG SCREW INSTALLATION DETAIL
C501 Scale: NTS

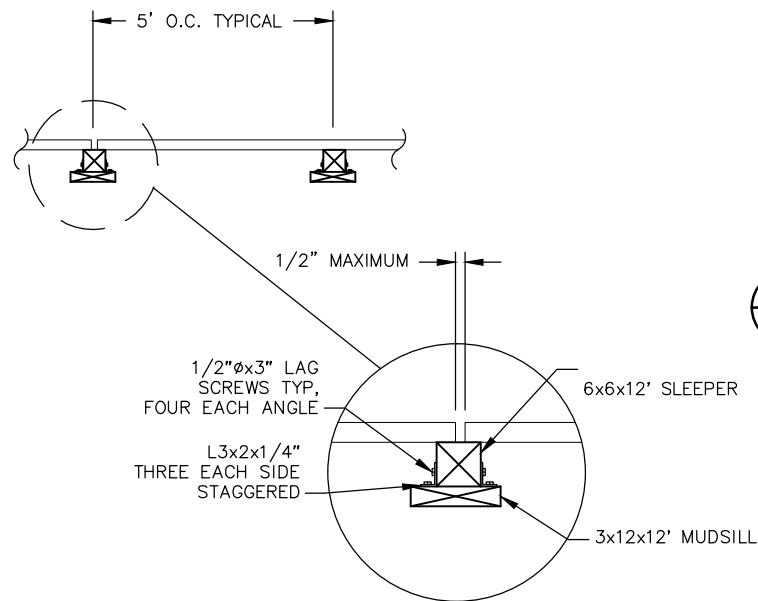
L1=LEAD HOLE:
SHANK LENGTH-SIDE PLATE THICKNESS-WASHER THICKNESS
D1=SHANK DIAMETER
L2=THREAD LENGTH
D2=0.75 D1 (GROUP I SPECIES-HOLDING MEMBER)
0.67 D1 (GROUP II SPECIES-HOLDING MEMBER)
0.55 D1 (GROUP III & IV SPECIES-HOLDING MEMBER)

NOTES

- SPECIES GROUPINGS ARE AS DEFINED IN NATIONAL DESIGN SPECIFICATION, LATEST EDITION.
- FOR THIS PROJECT, WOOD HOLDING MEMBERS SHALL BE CONSIDERED GROUP III.
- LAG SCREWS SHALL CONFORM TO ASTM A307, "LOW-CARBON STEEL EXTERNALLY AND INTERNALLY THREADED STANDARD FASTENERS." DIMENSIONS SHALL CONFORM TO ANSI/ASME B18.2.1.
- THE THREADED PORTION OF THE SCREW SHALL BE INSERTED IN ITS LEAD HOLE BY TURNING WITH A WRENCH, AND NOT DRIVING WITH A HAMMER.
- SOAP OR OTHER LUBRICANT MAY BE USED ON THE SCREWS OR IN THE LEAD HOLE TO FACILITATE INSERTION AND PREVENT DAMAGE TO THE SCREW.
- LAG SCREWS SHALL BE DAPPED IN DECKING UNITS AND OTHER WEARING SURFACES AS SHOWN.



2 AT-GRADE SECTION
C501 Scale: NTS



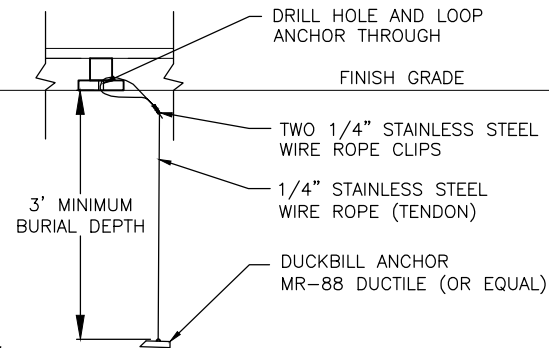
3 BOARDWALK SECTION DETAILS
C501 Scale: NTS

NOTES:

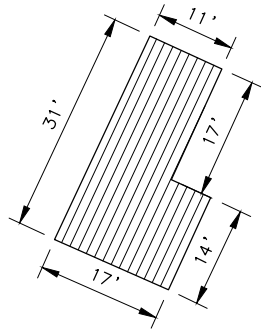
- ANCHOR SHALL BE EMBEDDED NO LESS THAN 3' BELOW GROUND SURFACE.
- PROVIDE 6" OF SLACK IN CABLE TO ALLOW FOR FREEZE/THAW MOVEMENT.
- OPPOSING ANCHORS, AS SHOWN ABOVE, INSTALLED EVERY 10FT ON AT-GRADE SECTION

INSTALLATION:

- DRIVE ANCHOR TO A DEPTH NO LESS THAN 3' BELOW GROUND SURFACE.
- APPLY TENSILE LOAD TO ANCHOR TENDON TO LOCK ANCHOR.
- VERIFY ANCHOR LOCK BY APPLYING ADDITIONAL LOAD.
- LOOP TENDON THROUGH SLEEPER AND MUDSILL.
- SECURE EXCESS TENDON USING WIRE ROPE CLIPS. SADDLE OF WIRE ROPE CLIP MUST BE INSTALLED ON LIVE SIDE OF TENDON.



6 DUCKBILL INSTALLATION DETAIL
C501 Scale: NTS

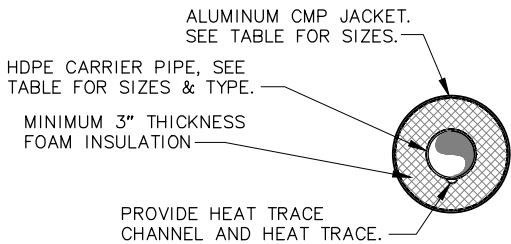


4 BOARDWALK DIMENSIONS
C501 Scale: NTS

NO.	REVISION	DATE	BY	DATE
1	ISSUED FOR CONSTRUCTION	9/2011	TRT	

Plot Date	9/14/11
Designed	MCE
Drawn	CFP
Approved	

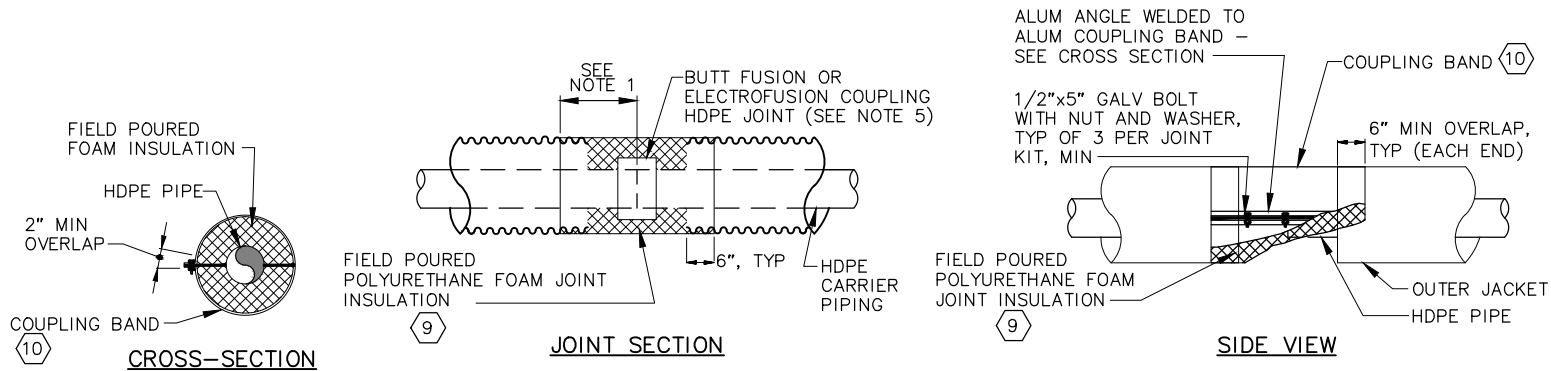
File: J:\Jobsdata\81801.00 Tuntutuliak WTP & Washeteria Lagoon\00 CADD\01 Working Set\01 Civil\81801.00 TUN - Insulated Pipe Details.dwg



HDPE CARRIER PIPE NOMINAL ϕ	CMP JACKET ϕ
4" SDR17	12"

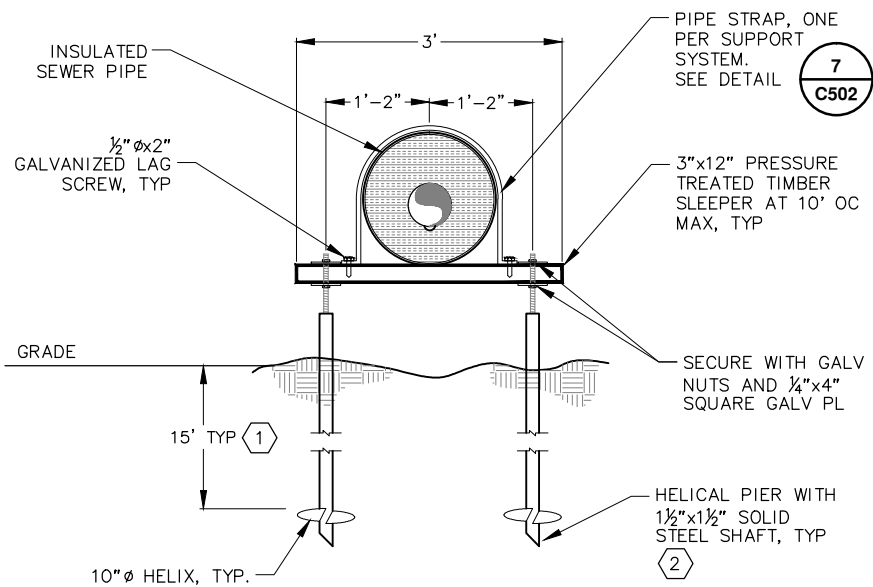
1 TYPICAL INSULATED PIPE DETAIL

C502 Scale: NTS



2 TYPICAL INSULATED JOINT KIT

C502 Scale: NTS



3 HELICAL PIER SUPPORT DETAIL

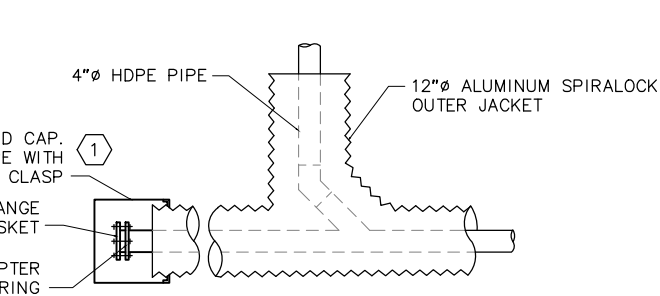
C502 Scale: NTS

NOTES:

- DEPTH IS MEASURED TO UPPER HELIX.
- MINIMUM TORQUE OF 1,500 FT-LBS DESIRED. CONTACT ENGINEER IF TORQUE IS NOT ACHIEVED AT STANDARD DEPTH.

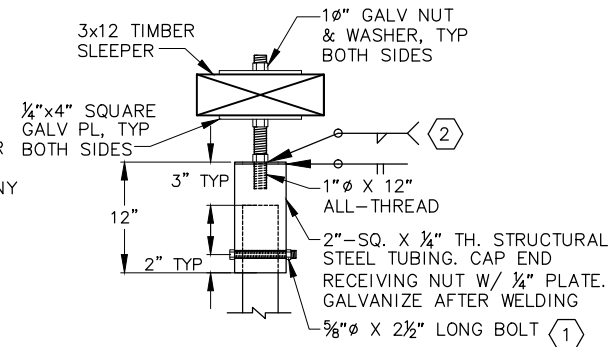
HELICAL PIER NOTES:

- CAP MAY BE WELDED TO PIER IN LIEU OF USING BOLTED CONNECTION. FIELD COAT ANY WELDS W/ GALVANIZING COMPOUND.
- PROVIDE HOLE IN TOP PLATE TO RECEIVE 1" ϕ ALL THREAD.



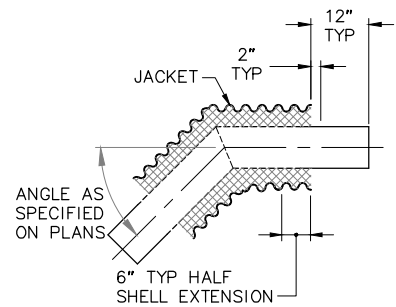
4 TYPICAL WYE DETAIL

C502 Scale: NTS



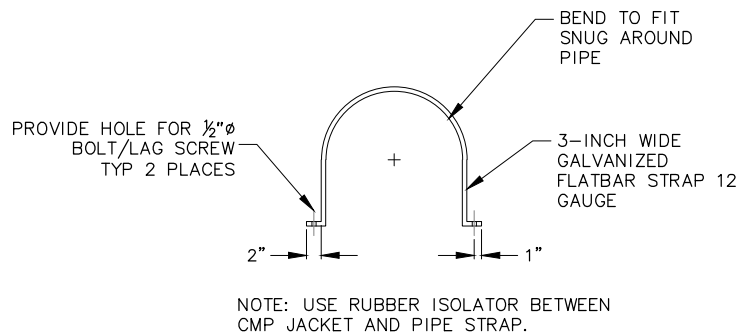
6 HELICAL PIER CAP DETAIL

C502 Scale: NTS



5 TYPICAL FITTING DETAIL

C502 Scale: NTS



7 PIPE STRAP DETAIL

C502 Scale: NTS

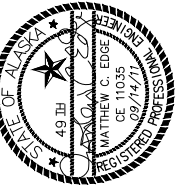
INSULATED PIPE NOTES

- A MINIMUM OF 3 INCHES OF URETHANE FOAM THICKNESS SHALL BE PROVIDED BETWEEN THE HDPE CARRIER PIPE AND OUTER JACKET. ENTIRE LENGTH OF CARRIER PIPE SHALL BE CENTERED WITHIN PRE-INSULATED PIPE CROSS SECTION. URETHANE FOAM INSULATION SHALL HAVE THE FOLLOWING CHARACTERISTICS:
 - MAXIMUM K-FACTOR (ASTM C177): 0.155 BTU-in/hr-ft²-F
 - CORE DENSITY RANGE (ASTM D1622): MIN 2.5 TO MAX 4 lbs/ft³
 - MINIMUM COMPRESSIVE STRENGTH (ASTM D1621): 35 PSI (FOAM SAMPLE TESTED PARALLEL AND PERPENDICULAR TO AXIS OF PIPE).
 - MINIMUM CLOSED CELL CONTENT (ASTM D1621): 90% POROSITY
 - MAXIMUM WATER ABSORPTION (ASTM D2824): 0.05 lbs/ft²
 - MAXIMUM WATER VAPOR PERMEABILITY (ASTM C3550): 5.0 lbs/ft²
 - DIMENSIONAL STABILITY (ASTM D2126): 1% AT -20°F, AND 3% AT +100°F (MAXIMUM LINEAR CHANGE)
 - MAXIMUM VOID SIZE: 0.25 IN. MEASURED RADIALY.
- HIGH DENSITY POLYETHYLENE (HDPE) PIPE SHALL HAVE A CELL CLASSIFICATION OF 345444C IN ACCORDANCE WITH ASTM D 3350.
- LENGTHS OF MANUFACTURED PIPE SEGMENTS SHALL BE MAXIMIZED TO THE EXTENT POSSIBLE TO MINIMIZE THE NUMBER OF JOINTS IN EACH INSTALLED PIPELINE.
- TO ENSURE WATER TIGHTNESS, ALL HDPE PIPELINES ASSEMBLIES SHALL BE SUCCESSFULLY HYDROSTATICALLY TESTED. SUBMIT A TESTING PLAN FOR ENGINEER'S REVIEW AND APPROVAL PRIOR TO CONSTRUCTION. HYDROSTATICALLY TESTED PIPES SHALL BE TESTED TO 100 PSI AND SHALL HOLD TEST PRESSURE FOR A MINIMUM OF 3 HOURS. MAKE-UP WATER SHALL NOT BE ALLOWED. ALL TESTING SHALL BE DONE IN ACCORDANCE WITH RECOMMENDED STANDARDS OF THE PLASTIC PIPE INSTITUTE.
- ALL BUTT-FUSING AND ELECTRO-FUSING SHALL BE PERFORMED IN STRICT ACCORDANCE WITH THE MANUFACTURER'S INSTRUCTIONS IN THE PROPER AMBIENT ENVIRONMENT BY QUALIFIED, EXPERIENCED PERSONNEL. BUTT FUSING SHALL BE PROVIDED TO THE MAXIMUM EXTENT PRACTICAL.
- ELECTRO-FUSION COUPLINGS: COUPLINGS SHALL BE ONE-PIECE CONSTRUCTION, TUBULAR, AND OF THE SAME MATERIAL AS THE ADJACENT HDPE PIPE. COUPLINGS SHALL HAVE ATTACHED AROUND THE CIRCUMFERENCE OF EACH END A FUSION WIRE WHICH WHEN ENERGIZED SHALL PROVIDE A COMPLETE WATERTIGHT FUSION WELD. COUPLINGS SHALL BE CAPABLE OF SUSTAINING PIPELINE PRESSURE WITHOUT DAMAGE. AT ALL TIMES, PROTECT THE FUSION SITE FROM INCLEMENT WEATHER AND PROVIDE RECOMMENDED AMBIENT TEMPERATURES FOR PROPER ELECTRO-FUSION.
- PIPE JACKETING SHALL BE CLASS 5052-H32 MARINE GRADE ALUMINUM METAL WITH 16-GAUGE (0.60-INCH) WALL THICKNESS WITH SPIRAL LOCKSEAM. THE PIPE SHALL BE FACTORY-JACKETED WITH MINIMUM 16 GAUGE ALUMINUM CORRUGATED SPIRAL SHEETS AND SHALL HAVE AN INTERNAL WATERTIGHT LOCKSEAM. MANUFACTURER: SPIR-L-OK BY SPIRALTEC OR APPROVED EQUAL.
- PROVIDE 12" MINIMUM HDPE PIPE EXTENSION BEYOND EACH INSULATED PIPE SECTION FOR JOINT, TYPICAL EACH END OF ARCTIC PIPE SECTION. EXTEND PIPE EXTENSION AS NECESSARY FOR OPERATION OF BUTT FUSION EQUIPMENT.
- JOINT KIT INSULATION SHALL BE PROVIDED IN TWO-PART LIQUID FORM SUCH THAT IT CAN BE COMBINED AND POURED IN THE FIELD AFTER HDPE PIPE JOINT FUSION. POUR-FOAMING SHALL BE PERFORMED IN STRICT ACCORDANCE WITH THE MANUFACTURER'S INSTRUCTIONS IN THE PROPER AMBIENT CONDITIONS BY QUALIFIED, EXPERIENCED PERSONNEL.
- JOINTS SHALL BE PROVIDED WITH 16 GA ALUMINUM COUPLING BANDS AS SHOWN.

Alaska Department of
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Village Safe Water Program
555 Cordova Street 4th Floor
Anchorage, Alaska 99501



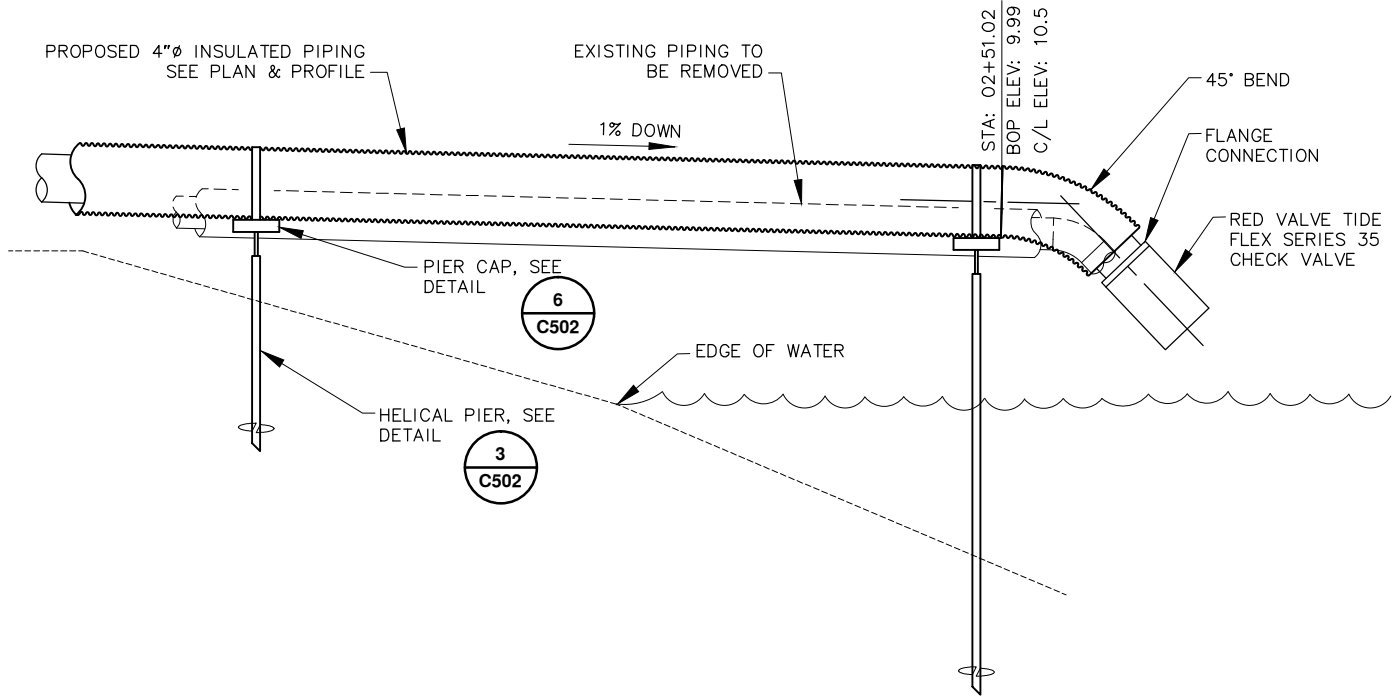
TUNTUTULIAK, ALASKA
WASHETERIA SEWER SYSTEM UPGRADES
INSULATED PIPE DETAILS

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1	ISSUED FOR CONSTRUCTION	9/2011		

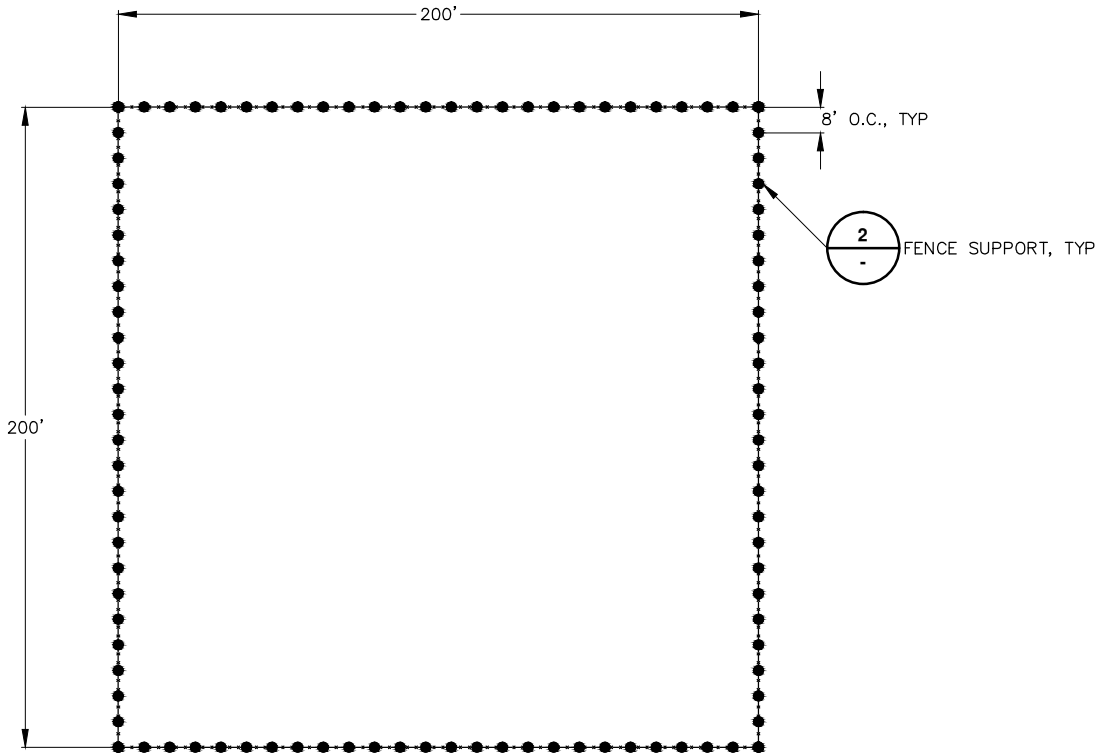
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Sheet No. C502
SHEET 9 OF 26

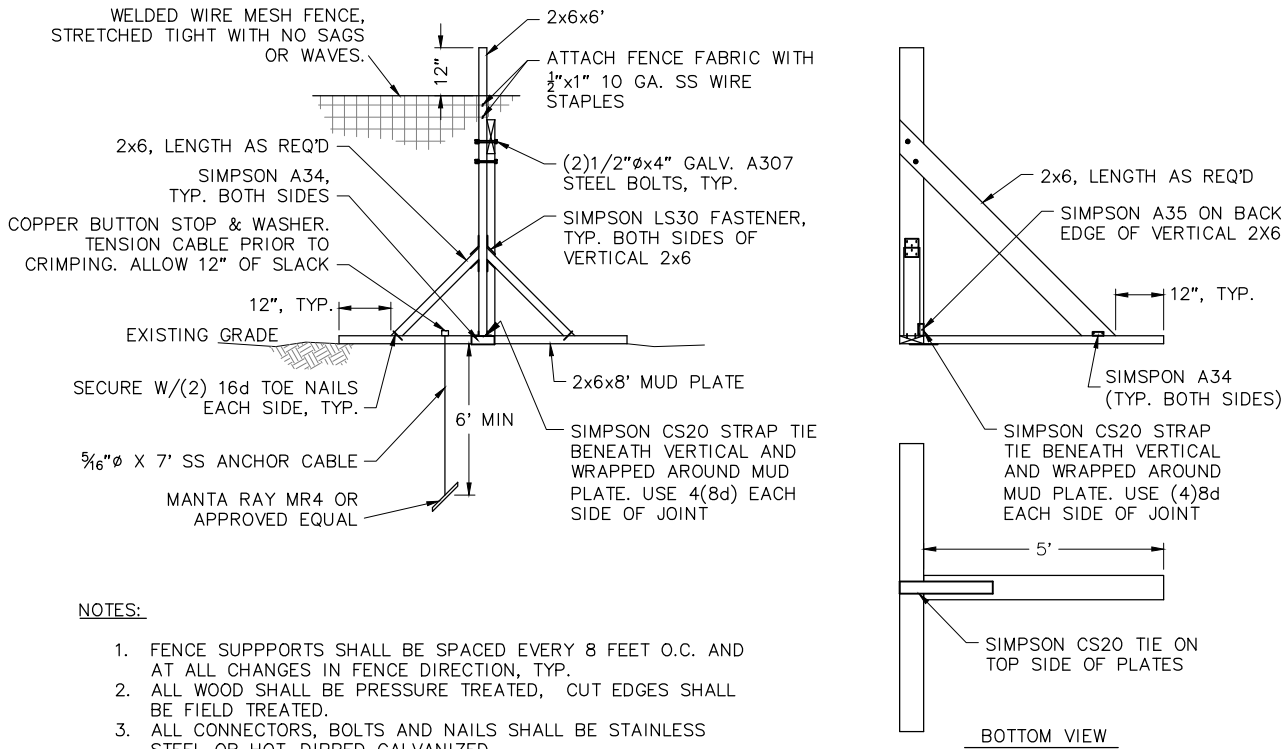
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1 STABILIZATION POND OUTFALL DETAIL
C503 Scale: NTS



3 STABILIZATION POND FENCE PLAN
C503 Scale: NTS



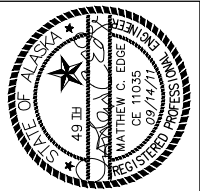
2 STABILIZATION POND FENCE SUPPORT
C503 Scale: NTS

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Sheet No.	C503
SHEET	10 OF 26

TUNTUTULIAK, ALASKA
WASHETERIA SEWER SYSTEM UPGRADES
OUTFALL & FENCING
DETAILS



Alaska Department of
Environmental Conservation
Division of Water
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Anchorage, Alaska 99501

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GENERAL

1. INSTALL PIPING TO MEET REQUIREMENTS OF LOCAL AND STATE CODES; EXERCISE CARE IN THE TRANSPORTING AND HANDLING TO AVOID DAMAGE TO PIPE AND FITTINGS; STORE MATERIALS ON THE SITE SO AS TO PREVENT DAMAGE; KEEP MATERIALS CLEAN, DRY, AND FREE FROM DELETERIOUS CONDITIONS; DO NOT STORE MATERIAL DIRECTLY ON THE GROUND.
2. NO PLUMBING FIXTURE, DEVICE, EQUIPMENT, OR PIPE CONNECTION SHALL BE INSTALLED THAT WILL PROVIDE A CROSS CONNECTION BETWEEN A POTABLE WATER SUPPLY AND ANY SOURCE OF NON-POTABLE WATER.
3. WATER LINES SHALL BE COLOR CODED AND FLOW DIRECTION SHALL BE INDICATED. REFER TO SCHEDULE FOR COLOR CODE.
4. RUN PIPES PARALLEL WITH THE LINES OF THE BUILDING WHEREVER POSSIBLE; NO WATER PIPE SHALL BE BURIED IN FLOORS EXCEPT FLOOR DRAIN TRAP PRIME PIPING, AND ANY LINES SPECIFICALLY INDICATED ON THE DRAWINGS OR APPROVED BY THE OWNER’S REPRESENTATIVE.
5. ALL MATERIALS AND COMPONENTS THAT COME INTO CONTACT WITH DRINKING WATER SHALL BE ANSI/NSF 60– AND 61– APPROVED.

PIPING

1. POLYVINYL CHLORIDE (PVC) PIPE AND FITTINGS: PVC COMPOUND FOR PIPE AND FITTINGS SHALL BE TYPE 1, GRADE 1 PER ASTM D1784, NSF CERTIFIED FOR POTABLE WATER USE. MINIMUM PRESSURE RATING SHALL CONFORM TO ASTM D1785, SCHEDULE 80. PIPE SHALL BE MARKED WITH ASTM D1785 TO INDICATE MANUFACTURER’S TRADEMARK, MATERIALS DESIGNATION, NSF MARK, SCHEDULE, SIZE AND ASTM DESIGNATION. JOINTS FOR PRESSURIZED PIPE SHALL BE SOLVENT-WELDED OR, IF OPERATING TEMPERATURES WILL NOT EXCEED 100° F, FLANGED. PRESSURIZED PIPE SHALL NOT BE THREADED, AS DOING SO WILL REDUCE THE PRESSURE RATING AND LONG-TERM DURABILITY OF THE PIPE.
2. SCHEDULE 80 PVC FITTINGS: PHYSICAL DIMENSIONS AND TOLERANCES FOR SOCKET FITTINGS SHALL CONFORM TO ASTM D2464 AND TO ASTM D2467 FOR THREADED FITTINGS. THREADED FITTINGS SHALL HAVE TAPERED PIPE THREADS CONFORMING TO ANSI/ASME B1.20.1. FITTINGS SHALL BE MARKED IN ACCORDANCE WITH ASTM D2464 AND D2467 TO INDICATE MANUFACTURER’S TRADEMARK, MATERIALS DESIGNATION, NSF MARK, SCHEDULE, SIZE AND ASTM DESIGNATION. FITTING JOINTS FOR PRESSURIZED PIPE SHALL BE SOLVENT-WELDED OR, IF OPERATING TEMPERATURES WILL NOT EXCEED 100° F, GASKETED, FLANGED JOINTS MAY BE USED.
3. UNLESS OTHERWISE SHOWN OR SPECIFIED, ALL PROCESS PIPING AND FITTINGS SHALL BE COMPRISED OF SCHEDULE 80 PVC. PVC PIPE AND FITTINGS SHALL NOT BE USED FOR PRESSURIZED AIR SYSTEMS. FILTER FACE PIPING AND SUBMERGED PROCESS PIPING SHALL BE COMPRISED OF SCHEDULE 40 TYPE 304 STAINLESS STEEL PER ASTM A312, BUTT-WELDED WITH BACKING RINGS. STAINLESS STEEL PIPING SHALL JOIN TO PRESSURE VESSELS AND PVC PIPE USING GASKETED, 150-LB ANSI B16.5 FLANGED JOINTS. AIR PIPING SHALL BE COMPRISED OF PAINTED ASTM A106 SEAMLESS BLACK STEEL, WITH 150-LB ANSI B16.3 MALLEABLE IRON THREADED FITTINGS.
4. ALL CHANGES IN PIPE SIZE SHALL BE MADE WITH REDUCING FITTINGS ONLY; REDUCING BUSHINGS WILL NOT BE PERMITTED. ALL CHANGES IN DIRECTION (EXCEPT FOR MINOR MISALIGNMENTS) SHALL BE MADE BY THE APPROPRIATE USE OF 45° WYES (WITH SCREWED PLUG), LONG OR SHORT SWEEP BENDS, OR EQUIVALENT FITTINGS; USE OF LONG SWEEP BENDS IS PREFERRED OVER THE SHORT TYPE; SLIP JOINTS WILL BE PERMITTED ONLY IN TRAP SEALS OR ON THE INLET SIDE OF THE TRAPS; PIPE BENDING WILL NOT BE PERMITTED.
5. PIPE DRAINAGE: ALL LINES SHALL BE INSTALLED SO AS TO BE DRAINED; DRAINAGE CAN BE ACCOMPLISHED BY USING DRAIN BIBBS WHERE SHOWN AND BY PLUGGED OR CAPPED FITTINGS; PIPE DRAINS SHALL CONSIST OF ½-INCH GLOBE VALVE WITH RENEWABLE DISKS AND ¾-INCH HOSE NIPPLES; ALL OTHER LOW POINTS ARE TO BE PROVIDED WITH ½-INCH SCREWED BRASS PLUGS.
6. DIELECTRIC UNIONS SHALL BE INSTALLED BETWEEN FERROUS AND NON-FERROUS METALLIC PIPE AND AT CONNECTIONS TO WATER HEATERS. UNIONS SHALL BE PROVIDED ADJACENT TO ALL EQUIPMENT FOR DISCONNECTION, AND SHALL NOT BE CONCEALED IN WALLS, CEILINGS, OR PARTITIONS.
7. PIPES PASSING THROUGH WALLS SHALL BE PROVIDED WITH SCHEDULE 80 PVC PIPE SLEEVES, WITH PROTRUSION BEYOND WALL ALLOWING PLACEMENT OF ESCUTCHEONS.
8. ESCUTCHEONS SHALL BE PROVIDED AT ALL FINISHED SURFACES WHERE EXPOSED PIPING, BARE OR INSULATED, PASSES THROUGH FLOORS, WALLS, OR CEILINGS; TO BE FASTENED SECURELY TO PIPE OR PIPE COVERING AND ARE CHROME PLATED IRON OR CHROME PLATED BRASS, EITHER ONE PIECE OR SPLIT PATTERN, HELD IN PLACE BY INTERNAL SPRING TENSION OR SET SCREW.
9. SWING JOINTS, OFFSETS, EXPANSION JOINTS, AND THE LIKE, SHALL BE PROVIDED WHERE NECESSARY TO ACCOMMODATE EXPANSION OF PIPING, WHICH WILL BE APPROXIMATELY 4-INCHES PER 100 FEET OF PVC WATER PIPING PER 100° F TEMPERATURE INCREASE.

PIPE INSTALLATION

1. SOLVENT-WELDED PVC JOINTS: PROVIDE SOLVENT-WELDED JOINTS IN ACCORDANCE WITH PIPE MANUFACTURER’S INSTRUCTIONS. JOINING SURFACES MUST BE SOFTENED AND MADE SEMI-FLUID PRIOR TO AND DURING ASSEMBLY OF PIPE. SUFFICIENT CEMENT SHALL BE APPLIED TO COMPLETELY FILL GAP BETWEEN PIPE AND FITTINGS. USE A MITER BOX TO PROVIDE SQUARE SAW CUTS FOR MAXIMUM BONDING AREA. COMPLETELY REMOVE RAISED BEADS AND BURRS FROM PIPE CUT TO AVOID STRIPPING SOLVENT WHEN PIPE IS INSERTED INTO FITTING. BEVEL PIPE ENDS TO ANGLE OF 10 TO 15 DEGREES PRIOR TO APPLICATION OF SOLVENT CEMENT. USE APPROPRIATELY-SIZED APPLICATOR FOR THE SIZE OF PIPE AND FITTINGS BEING JOINED.
2. FLANGED PVC JOINTS: PROVIDE FLANGED JOINTS IN ACCORDANCE WITH PIPE MANUFACTURER’S INSTRUCTIONS. IN BETWEEN FLANGE FACES, PROVIDE FULL-FACED, CHEMICALLY-RESISTANT ELASTOMERIC GASKETS HAVING A DUROMETER "A" HARDNESS OF 50 TO 70. ENSURE THAT BOLT HOLES ARE PROPERLY ALIGNED AND THAT MATING FLANGES ARE NOT SEPARATED BY EXCESSIVE DISTANCE PRIOR TO INSERTING BOLTS. TIGHTEN BOLTS IN DIAMETRICALLY-OPPOSITE FASHION USING A TORQUE WRENCH. DO NOT EXCEED MANUFACTURER’S RECOMMENDED TORQUES. DO NOT OVERTIGHTEN BOLTS OR ATTEMPT TO PULL FLANGES TOGETHER BY BOLT TIGHTENING, AS DOING SO WILL OVERSTRESS THE FLANGES, CAUSING CRACKING AND JOINT WEAKENING.
3. THREADED PVC JOINTS: PROVIDE THREADED JOINTS IN ACCORDANCE WITH PIPE MANUFACTURER’S INSTRUCTIONS. PROTECT PIPE WALLS FROM VISE JAWS USING THICK CANVAS OR RUBBER WRAP. CUT THREADS FULL AND CLEAN WITH SHARP DIES; REAM ENDS OF PIPE AFTER THREADING AND BEFORE ASSEMBLY TO REMOVE BURRS; LEAVE NOT MORE THAN THREE (3) PIPE THREADS EXPOSED AT EACH CONNECTION; JOINT SEALER TEFLON THREAD TAPE. DO NOT USE A STILLSON WRENCH TO ASSEMBLE PVC THREADED JOINTS. AVOID OVER-TIGHTENING. DO NOT APPLY SOLVENT CEMENT TO CONTACT THREADED PIPE AND FITTINGS. AVOID SCREWING METALLIC MALE THREADS INTO PLASTIC FEMALE THREADS, EXCEPT THOSE THAT HAVE METAL REINFORCEMENTS.
4. PRESSURE-TESTING: HYDROSTATICALLY TEST ALL PROCESS PIPING TO 150% OF MAXIMUM OPERATING PRESSURE. PERFORM TESTING IN ACCORDANCE WITH PIPE MANUFACTURER’S INSTRUCTIONS.

PIPE HANGERS AND SUPPORTS


1. SEISMIC BRACING: BRACE ALL PIPING 2½-INCH INSIDE DIAMETER AND LARGER FOR SEISMIC ZONE 2B FORCES IN ACCORDANCE WITH THE LATEST EDITION OF THE UNIFORM BUILDING CODE; LATERAL SUPPORTS FOR SEISMIC LOADS SHALL BE PROVIDED AT ALL CHANGES IN PIPE DIRECTION.
2. STANDARD HANGERS AND SUPPORTS: MSS SP-58 OR FS WW-H-171; TYPE AS REQUIRED FOR CONDITIONS OR AS INDICATED; HANGER RODS CARBON STEEL, ASTM A575; CONCRETE INSERTS MSS SP-58 OR FS WW-H-171; CONCRETE INSERTS (MANUFACTURED CONTINUOUS) UNISTRUT P-3200 SERIES OR APPROVED EQUIVALENT, GALVANIZED. USE ISOLATION STRIPS OR BRASS/COPPER HANGERS FOR COPPER PIPE.
3. MANUFACTURER’S HANGERS AND SUPPORTS: UNISTRUT, B-LINE OR APPROVED EQUIVALENT; TYPE AS REQUIRED FOR CONDITIONS OR AS INDICATED; CONTINUOUS CONCRETE INSERTS UNISTRUT P-3200 SERIES, HOT-DIPPED GALVANIZED TO ASTM A123 OR A153, 2 OZ./SQ. FT. COATING WEIGHT; INDIVIDUAL INSERTS UNISTRUT M26 OR APPROVED EQUIVALENT, SWIVEL-TYPE CONCRETE INSERT, HOT-DIPPED GALVANIZED TO ASTM A123 OR A153, 2 OZ./SQ. FT. COATING WEIGHT. USE ISOLATION STRIPS OR BRASS/COPPER HANGERS FOR COPPER PIPE.
4. METAL FRAMING: UNISTRUT 1⅝-INCH CHANNEL WIDTH SERIES OR APPROVED EQUIVALENT, CONTINUOUS SLOT CHANNEL, HOT-DIPPED GALVANIZED TO ASTM A123 OR A153.
5. END CLOSURES, JOINT COVERS, CLOSURE STRIPS, PARTS, SCREWS AND NUTS: ELECTRO-GALVANIZED, FS QQ-Z-325 OR CADMIUM PLATED.
6. CONCRETE AND FABRICATED HANGERS AND SUPPORTS: COMPLETE INSTALLATION TO PRESENT NEAT ORDERLY APPEARANCE; DO NOT BLOCK OPENINGS OR PASSAGEWAYS WITH PIPING; RUN PIPING PARALLEL TO WALLS OF BUILDING; KEEP PIPING FREE FROM CONTACT WITH STRUCTURE OR INSTALL ITEMS; ALLOW CLEARANCES FOR PIPE EXPANSION AND CONTRACTION; ANCHOR HORIZONTAL RUNS OVER 50 FEET AT MIDPOINT TO FORCE EXPANSION EQUALLY TOWARD ENDS.
7. PLACEMENT OF VERTICAL PIPING: SECURE AT SUFFICIENTLY CLOSE INTERVALS TO KEEP PIPE IN ALIGNMENT AND TO SUPPORT WEIGHT OF PIPE AND CONTENTS; INSTALL SUPPORTS AT EACH FLOOR OR VERTICALLY AT INTERVALS OF NOT MORE THAN 10 FEET; IF PIPING IS TO STAND FREE OF SUPPORT, OR IF NO STRUCTURAL ELEMENT IS AVAILABLE FOR SUPPORT DURING CONSTRUCTION, SECURE IN POSITION WITH WOODEN STAKES OR BRACES FASTENED TO PIPE.
8. PLACEMENT OF HORIZONTAL PIPING: SUPPORT AT SUFFICIENTLY CLOSE INTERVALS TO MAINTAIN ALIGNMENT AND PREVENT SAGGING; INSTALL HANGERS AT ENDS OF RUNS OR BRANCHES AND AT EACH CHANGE OF DIRECTION OR ALIGNMENT; SUPPORT SPACING SHALL NOT EXCEED THE MANUFACTUR’S RECOMMENDATIONS NOR AS LISTED BELOW:

PIPE	SIZE	SUPPORT SPACING (FEET)
HDPE	2-INCH	4.9
	3-INCH	6.0
	4-INCH	6.8
	6-INCH	8.3
COPPER	UNDER 1½"	6
	1½" TO 4-INCH	8
	OVER 4-INCH	16
PVC	UNDER 2½"	4
	2½" AND OVER	6

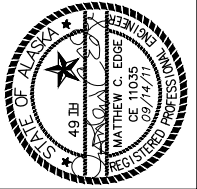
VALVES

1. GENERAL: ALL VALVES AND ACCESSORIES SHALL BE INSTALLED IN A MANNER AND LOCATION AS SHOWN ON THE DRAWINGS OR AS REQUIRED FOR THE APPLICATION AND IN ACCORDANCE WITH MANUFACTURER’S INSTRUCTIONS; SIZE OF VALVE EQUAL TO LINE PIPING IN WHICH VALVE IS INSTALLED UNLESS OTHERWISE NOTED ON DRAWINGS; SUPPORT ALL VALVES WHERE NECESSARY.
2. STORAGE AND HANDLING: STORE VALVES, OPERATORS AND ACCESSORIES IN AN AREA PROTECTED FROM WEATHER, MOISTURE, OR POSSIBLE DAMAGE; DO NOT STORE MATERIAL DIRECTLY ON THE GROUND; TRANSPORT AND HANDLE ITEMS WITH CARE TO PREVENT INTERIOR OR EXTERIOR DAMAGE; REPAIR OR REPLACE DAMAGED MATERIAL TO SATISFACTION OF OWNER’S REPRESENTATIVE.
3. PVC VALVES – GENERAL: USE PVC BALL VALVES FOR ALL LIQUID CHEMICAL AND PROCESS WATER SERVICE.
4. PVC BALL VALVES: RATING 150 PSI; PVC BODY AND TRIM; SCREWED UNION ENDS; VALVE CAN BE REMOVED FROM THE LINE WITHOUT INSTALLING ADDITIONAL UNIONS; TFE SEATS; VITON "O"RING STEM SEALS; LEVER HANDLE OPERATOR WITH OPEN/CLOSED STOPS.
5. PVC BALL CHECK VALVES: RATING 150 PSI; PVC BODY AND TRIM; SCREWED UNION ENDS; VALVE CAN BE REMOVED FROM THE LINE WITHOUT INSTALLING ADDITIONAL UNIONS; VITON "O" RING BALL AND BODY SEALS.
6. DISC CHECK VALVES (2½-INCHES AND SMALLER): HORIZONTAL LIFT CHECK FOR HORIZONTAL LINE INSTALLATION; VERTICAL LIFT CHECK FOR VERTICAL LINE INSTALLATION; RATING 300 PSI, W.O.G.; MUST BE SUITABLE FOR SEDIMENT CARRYING WATER; BRONZE BODY AND TRIM; SCREWED ENDS; RENEWABLE COMPOSITION DISC AS REQUIRED FOR SPECIFIC APPLICATION.
7. SWING CHECK VALVES (3-INCHES AND LARGER);FULL OPENING, WITH OUTSIDE LEVER WITH ADJUSTABLE WEIGHTS; AWWA C 508; IRON BODY, BRONZE MOUNTED; FLANGED ENDS; BRONZE DISC FACING; STAINLESS STEEL HINGE PINS; RIGHT HAND SIDE OUTSIDE LEVER POSITION WHEN FACING THE VALVE INLET; LEVER SEAL HINGE PIN EXTENDED THROUGH OUTSIDE LUBRICATED BRONZE BUSHING AND "O" RING SEALS; GREASE FITTINGS FOR OUTSIDE LUBRICATION OF LEVER SEALS.
8. ACCESSORIES: PROVIDE ALL ACCESSORIES NECESSARY FOR PROPER VALVE OPERATION AS SPECIFIED OR REQUIRED FOR THE APPLICATION.
9. VALVE OPERATORS: VALVES SHALL BE INSTALLED WITH THE OPERATOR IN A POSITION FOR CONVENIENT OPERATION; PARTICULAR CARE SHALL BE TAKEN TO INSURE THAT SPACE IS AVAILABLE FOR OPERATION OF LEVER OR HAND WHEEL OPERATED VALVES WITHOUT INTERFERENCE FROM WALLS, PIPING OR EQUIPMENT; OPERATORS FOR MANUAL VALVES SHALL BE LEVER OR HAND WHEEL AS IS STANDARD WITH THE MANUFACTURER UNLESS ANOTHER TYPE OF OPERATOR IS SPECIFIED OR REQUIRED BY THE MANUFACTURER.
10. PLUMBING VALVES: ISOLATION VALVES SHALL BE BALL VALVES UNLESS OTHERWISE SPECIFIED OR INDICATED; VALVES SHALL BE PVC WITH SOLVENT WELD ENDS FOR PVC PIPING.
11. VALVE IDENTIFICATION: IDENTIFY VALVES OF THE PLUMBING SYSTEMS TO INDICATE THEIR FUNCTION AND SYSTEM SERVED; ALL OTHER VALVES PROVIDE WITH NUMBERED BRASS DISCS ATTACHED TO VALVE BY BRASS CHAIN; PROVIDE VALVE CHART INDICATING VALVE TAG NUMBER, LOCATION OF VALVE, SERVICE, AND NORMAL POSITION OF VALVE; VALVES SHALL BE TAGGED WITH A PERMANENT LABEL UNDER HAND WHEEL INDICATING TYPE OF DISC INSTALLED; ALL VALVES MUST BE FULLY IDENTIFIED BY THE MANUFACTURER INCLUDING SIZE, MANUFACTURER’S NAME, AND PRESSURE RATNG.
12. ADJUSTMENTS: CHECK AND ADJUST VALVES AND ACCESSORIES FOR SMOOTH OPERATION; LUBRICATE IN ACCORDANCE WITH MANUFACTURER’S RECOMMENDATIONS.
13. TESTING: TEST ALONG WITH PIPING AS DESCRIBED ABOVE.
14. AIR RELEASE VALVES SHALL BE LOCATED AT HIGH POINTS AS REQUIRED AND SHOWN ON THE DRAWINGS.

Alaska Department of
Environmental Conservation
Division of Water



Village Safe Water Program
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TUNTUTULIAK, ALASKA

WASHETERIA SEWER SYSTEM UPGRADES

PIPING NOTES

NO.	REVISION	BY	DATE
1	ISSUED FOR CONSTRUCTION	TRT	9/2011

Plot Date: 9/14/11	Designed: MCE	Drawn: CFP	Approved: _____
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Sheet No. CS001

SHEET 11 OF 25

OPERATIONAL NARRATIVE:

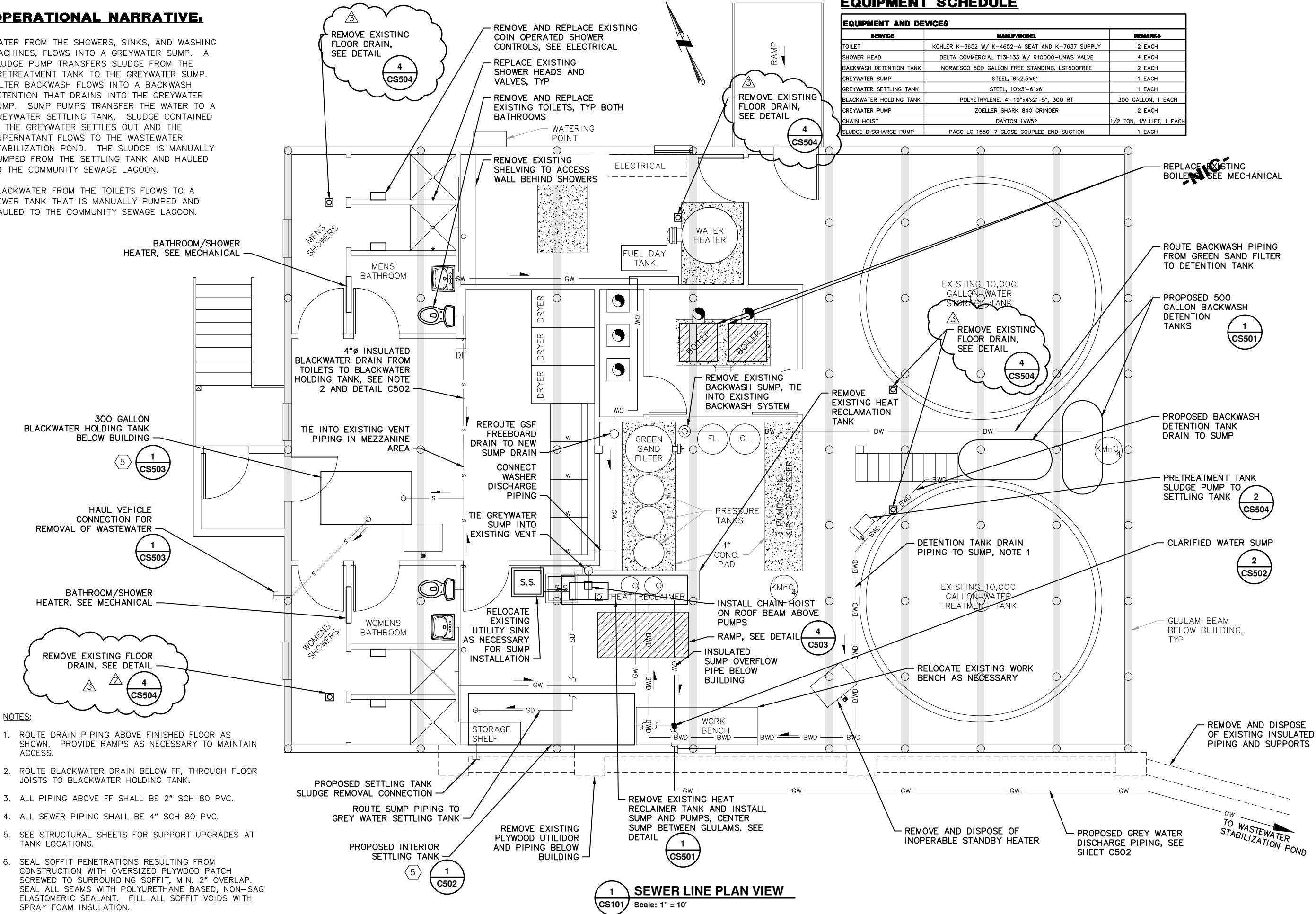
WATER FROM THE SHOWERS, SINKS, AND WASHING MACHINES, FLOWS INTO A GREYWATER SUMP. A SLUDGE PUMP TRANSFERS SLUDGE FROM THE PRETREATMENT TANK TO THE GREYWATER SUMP. FILTER BACKWASH FLOWS INTO A BACKWASH DETENTION THAT DRAINS INTO THE GREYWATER SUMP. SUMP PUMPS TRANSFER THE WATER TO A GREYWATER SETTLING TANK. SLUDGE CONTAINED IN THE GREYWATER SETTLES OUT AND THE SUPERNATANT FLOWS TO THE WASTEWATER STABILIZATION POND. THE SLUDGE IS MANUALLY PUMPED FROM THE SETTLING TANK AND HAULED TO THE COMMUNITY SEWAGE LAGOON.

BLACKWATER FROM THE TOILETS FLOWS TO A SEWER TANK THAT IS MANUALLY PUMPED AND HAULED TO THE COMMUNITY SEWAGE LAGOON.

EQUIPMENT SCHEDULE

EQUIPMENT AND DEVICES		
SERVICE	MANUF/MODEL	REMARKS
TOILET	KOHLER K-3652 W/ K-4652-A SEAT AND K-7637 SUPPLY	2 EACH
SHOWER HEAD	DELTA COMMERCIAL T13H133 W/ R10000-UNWS VALVE	4 EACH
BACKWASH DETENTION TANK	NORWESCO 500 GALLON FREE STANDING, LST500FREE	2 EACH
GREYWATER SUMP	STEEL, 8'x2.5'x6'	1 EACH
GREYWATER SETTLING TANK	STEEL, 10'x3'-6"x6'	1 EACH
BLACKWATER HOLDING TANK	POLYETHYLENE, 4'-10"x4'x2'-5", 300 RT	300 GALLON, 1 EACH
GREYWATER PUMP	ZOELLER SHARK 840 GRINDER	2 EACH
CHAIN HOIST	DAYTON 1VWS2	1/2 TON, 15' LIFT, 1 EACH
SLUDGE DISCHARGE PUMP	PACO LC 1550-7 CLOSE COUPLED END SUCTION	1 EACH

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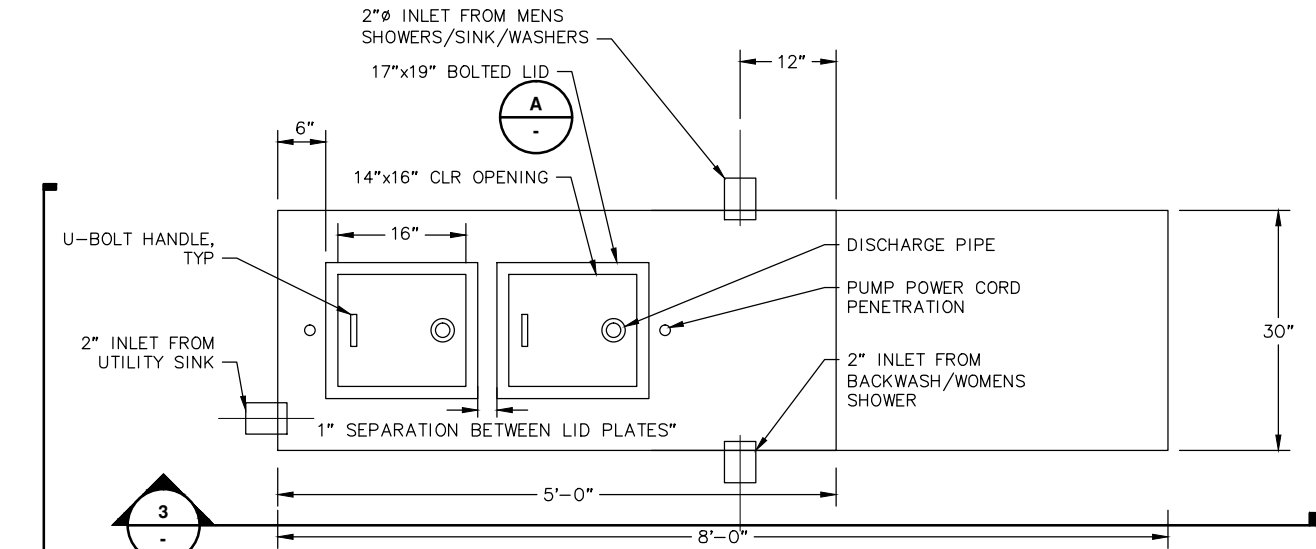
- ROUTE DRAIN PIPING ABOVE FINISHED FLOOR AS SHOWN. PROVIDE RAMPS AS NECESSARY TO MAINTAIN ACCESS.
- ROUTE BLACKWATER DRAIN BELOW FF, THROUGH FLOOR JOISTS TO BLACKWATER HOLDING TANK.
- ALL PIPING ABOVE FF SHALL BE 2" SCH 80 PVC.
- ALL SEWER PIPING SHALL BE 4" SCH 80 PVC.
- SEE STRUCTURAL SHEETS FOR SUPPORT UPGRADES AT TANK LOCATIONS.
- SEAL SOFFIT PENETRATIONS RESULTING FROM CONSTRUCTION WITH OVERSIZED PLYWOOD PATCH SCREWED TO SURROUNDING SOFFIT, MIN. 2" OVERLAP. SEAL ALL SEAMS WITH POLYURETHANE BASED, NON-SAG ELASTOMERIC SEALANT. FILL ALL SOFFIT VOIDS WITH SPRAY FOAM INSULATION.

1 SEWER LINE PLAN VIEW
Scale: 1" = 10'

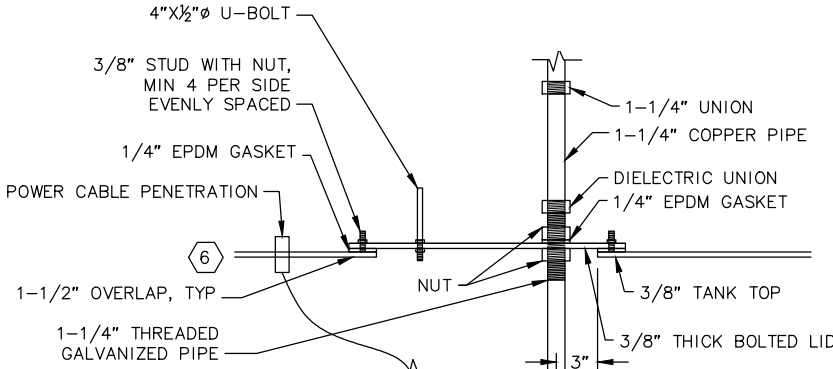
NO.	REVISION	DATE	BY
1	ISSUED FOR CONSTRUCTION	9/2011	TRT
2	REMOVE FLOOR DRAINS	10/2011	TRT
3	ADD ADDITIONAL CALLOUTS	11/2011	MDM

Plot Date	11/17/11
Designed	MCE
Drawn	CFP
Approved	

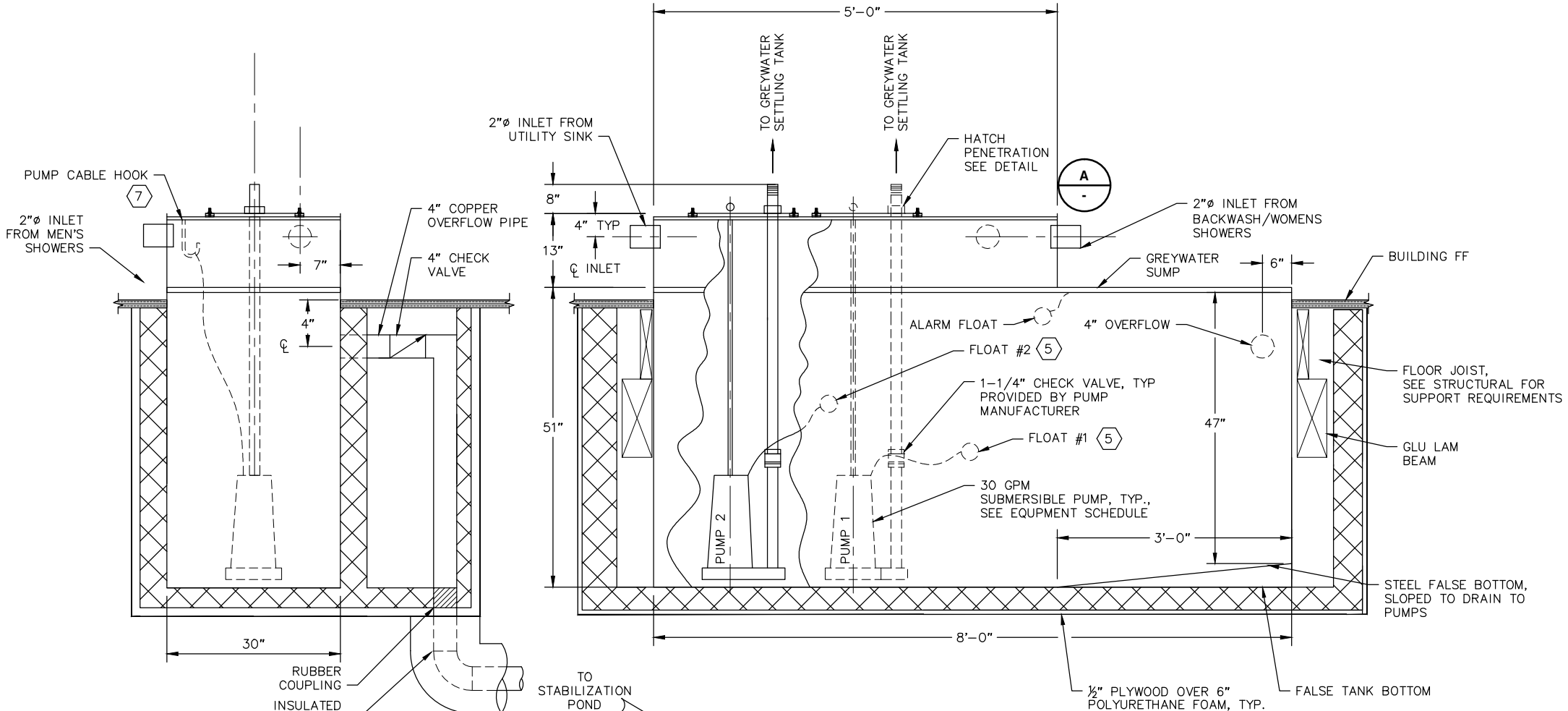
File: J:\Jobsdata\81801.00 Tuntutuliak WTP & Washeteria Lagoon\00 CADD\01 Working Set\01 Civil\81801.00 TUN - Greywater Sump Details.dwg



1 GREYwater SUMP PLAN VIEW
CS501 Scale: NTS



A HATCH DETAIL
CS501 Scale: NTS



2 GREYwater SUMP DETAIL
CS501 Scale: NTS

3 GREYwater SUMP DETAIL
CS501 Scale: NTS

TANK NOTES:

1. TANK SHALL BE CONSTRUCTED OF 12 GA STEEL AND IN ACCORDANCE WITH UL142.
2. TANK SHALL BE FACTORY COATED ON INTERIOR AND EXTERIOR IN ACCORDANCE WITH AWWA M42.
3. NUMBER & LOCATION OF BAFFLES/SUPPORTS TO BE DETERMINED BY TANK MANUFACTURER.
4. SEE STRUCTURAL FOR TANK SUPPORT.
5. FIELD SET FLOAT ELEVATIONS FOR PUMP ON. SEE TABLE FOR FLOAT SETTINGS.

FABRICATION:

1. FINISH EXPOSED SURFACES SMOOTH, SHARP, AND TO WELL-DEFINED LINES.
2. FURNISH NECESSARY RABBETS, LUGS, AND BRACKETS SO WORK CAN BE ASSEMBLED IN NEAT, SUBSTANTIAL MANNER.
3. CONCEAL FASTENINGS WHERE PRACTICAL; WHERE EXPOSED, FLUSH COUNTERSINK.
4. DRILL METALWORK AND COUNTERSINK HOLES AS REQUIRED FOR ATTACHING HARDWARE OR OTHER MATERIALS.
5. ROUND SHARP EDGES TO SMALL UNIFORM RADIUS. GRIND BURRS, JAGGED EDGES, AND SURFACE DEFECTS SMOOTH.
6. MAINTAIN 1" CLEAR FROM EDGE OF LID TO STUD PENETRATION HOLE.
7. PROVIDE HOOK NEAR EDGE OF TANK OPENINGS TO SECURE PUMP LIFT CABLE.

INSTALLATION:

1. INSTALL METAL FABRICATIONS PLUMB OR LEVEL, ACCURATELY FITTED, FREE FROM DISTORTION OR DEFECTS.
2. INSTALL RIGID, SUBSTANTIAL, AND NEAT IN APPEARANCE.
3. ERECT STEEL IN ACCORDANCE WITH APPLICABLE PORTIONS OF AISC CODE OF STANDARD PRACTICE, EXCEPT AS MODIFIED.
4. INSTALL MANUFACTURED PRODUCTS IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS.
5. ALLOW FOR ERECTION LOADS, AND FOR SUFFICIENT TEMPORARY BRACING TO MAINTAIN TRUE ALIGNMENT UNTIL COMPLETION OF ERECTION AND INSTALLATION OF PERMANENT ATTACHMENTS.
6. OBTAIN ENGINEER APPROVAL PRIOR TO SITE CUTTING OR MAKING ADJUSTMENTS NOT SCHEDULED.
7. AFTER ERECTION, APPLY PRIME OR GALVANIZE COATING TO WELDS, ABRASIONS, AND SURFACES NOT IN CONTACT WITH CONCRETE.

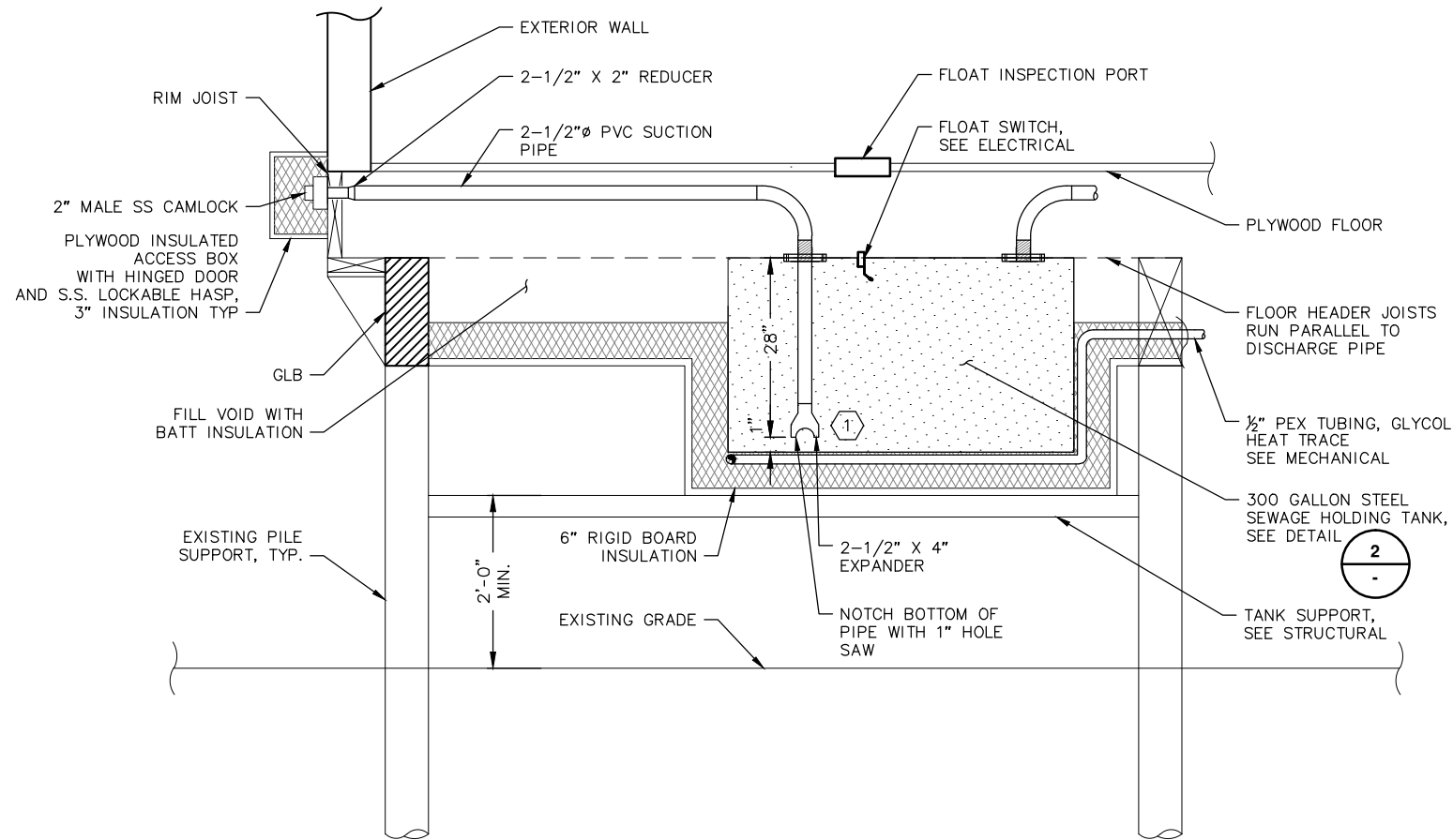
PUMP	FLOAT HEIGHT
1	26"
2	34"

NO.	REVISION	DATE
1	ISSUED FOR CONSTRUCTION	9/2011

Plot Date	9/14/11
Designed	MCE
Drawn	CFP
Approved	



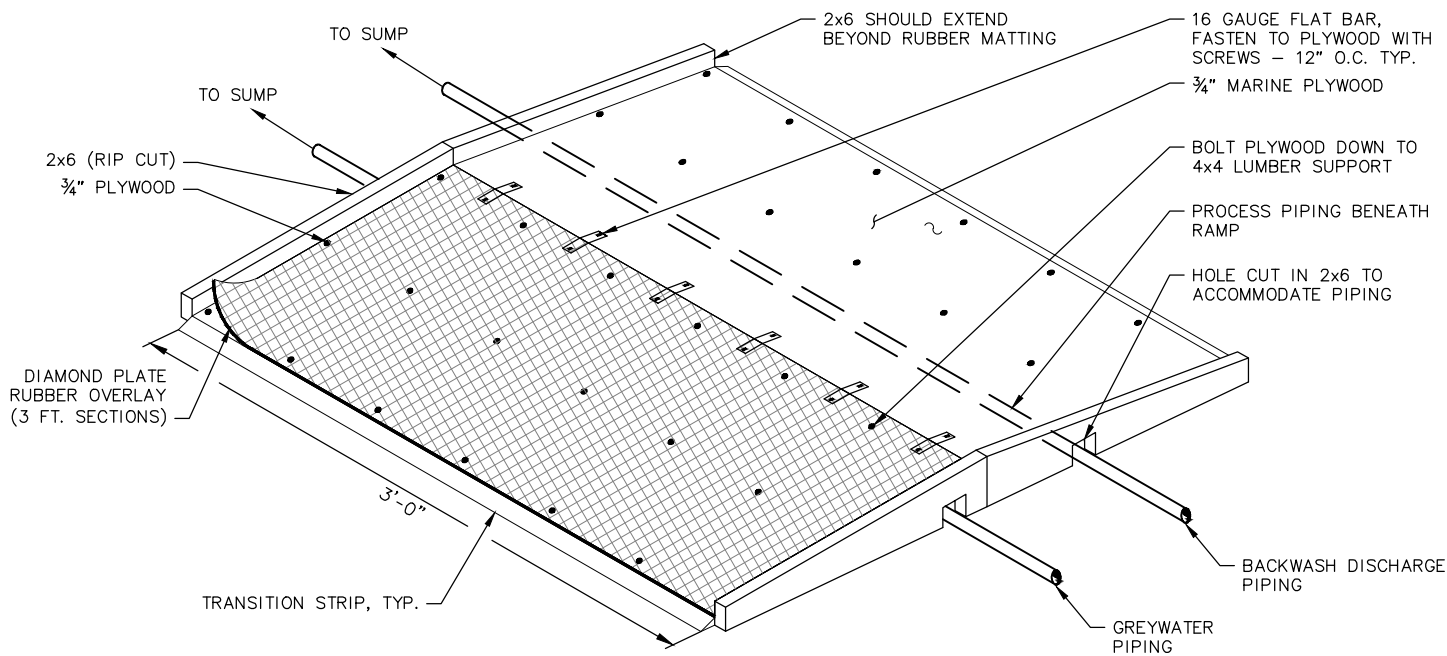
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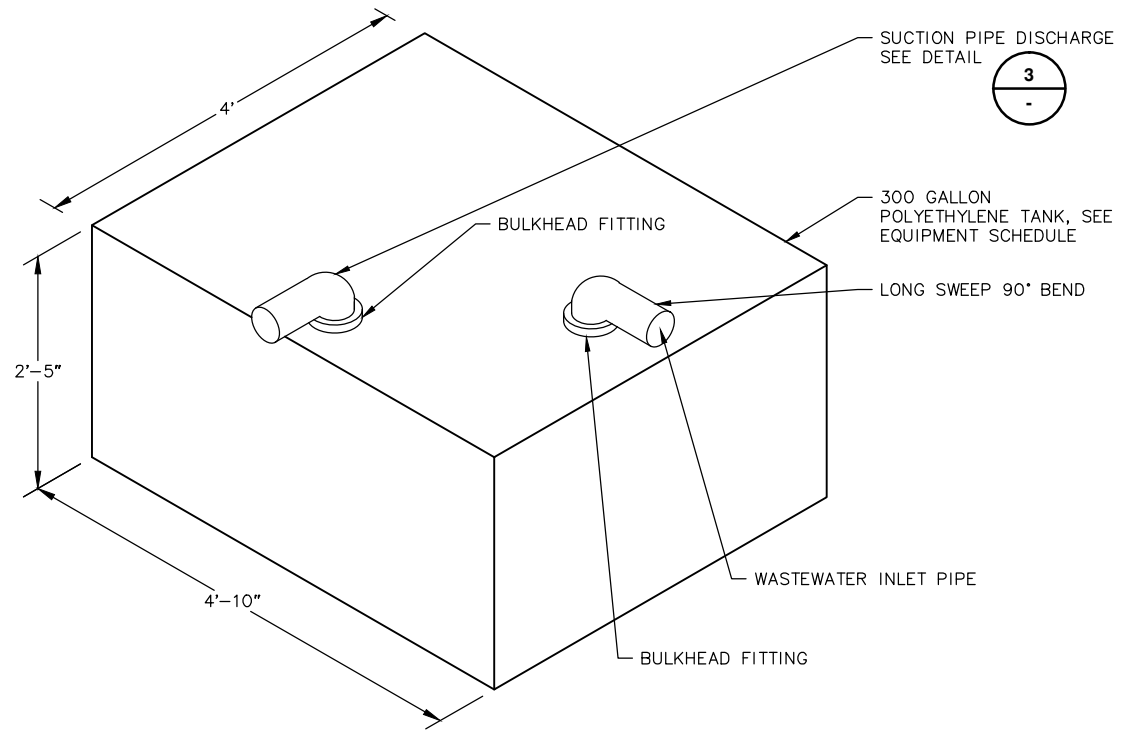
1 BLACKWATER HOLDING TANK SECTION
CS503 Scale: NTS

NOTES:

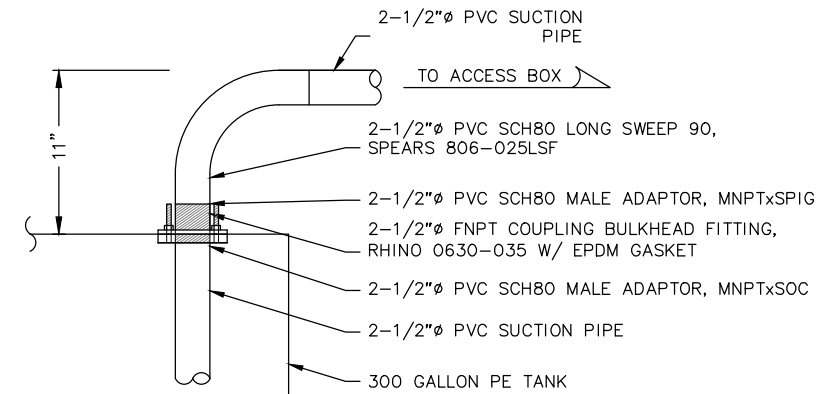
1. EXTEND END OF SUCTION PIPE TO SIT 1" ABOVE BOTTOM OF TANK.
2. USE 1" HOLE SAW TO NOTCH BOTTOM OF PIPE.



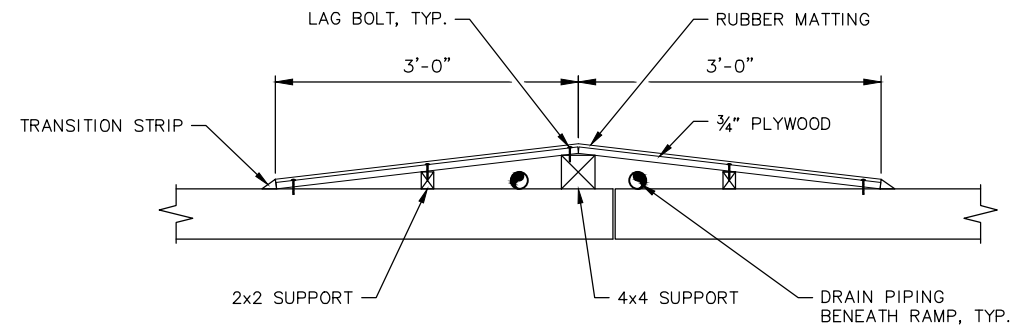
4 TYPICAL RAMP DETAIL
CS503 Scale: NTS



2 BLACKWATER TANK DETAIL
CS503 Scale: NTS



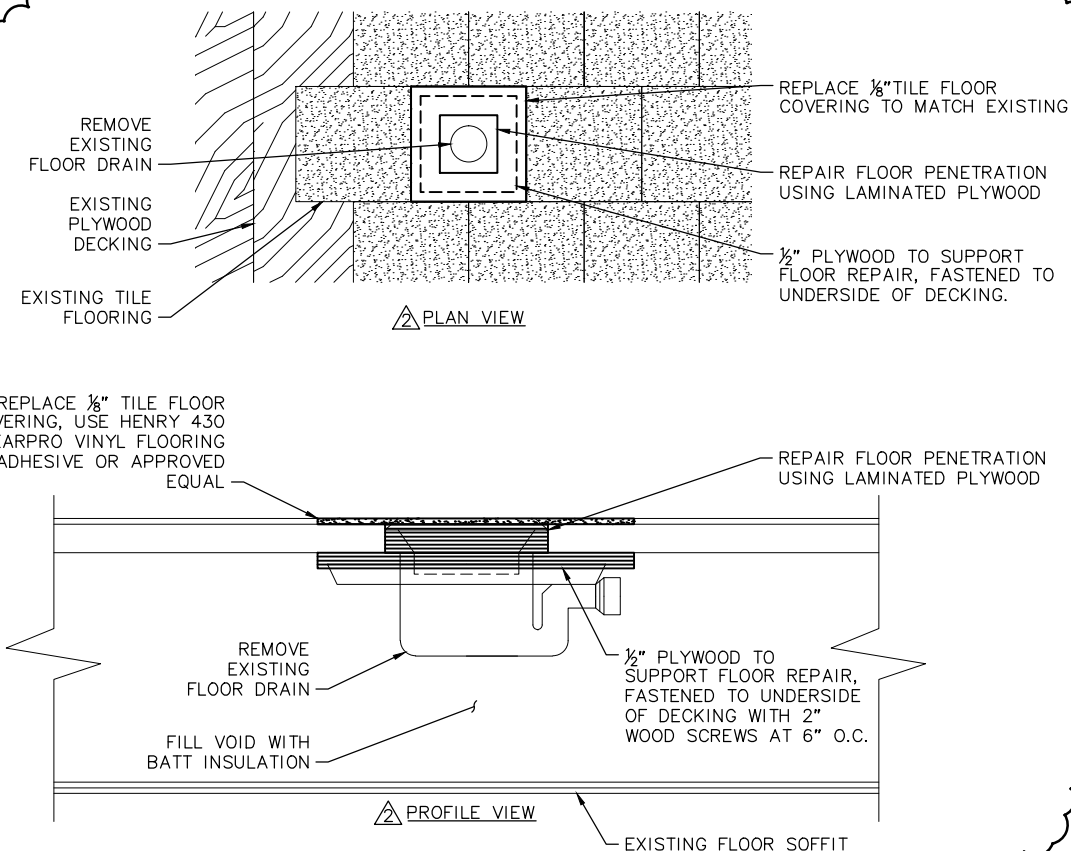
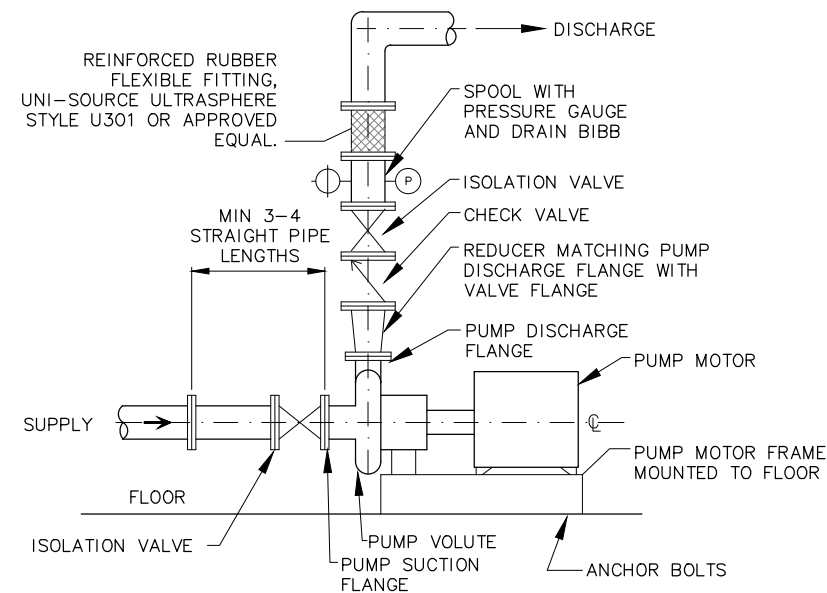
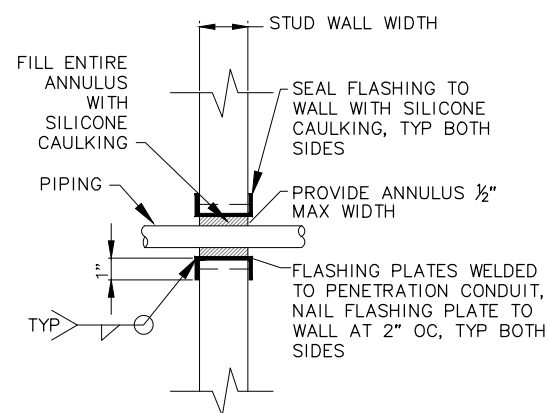
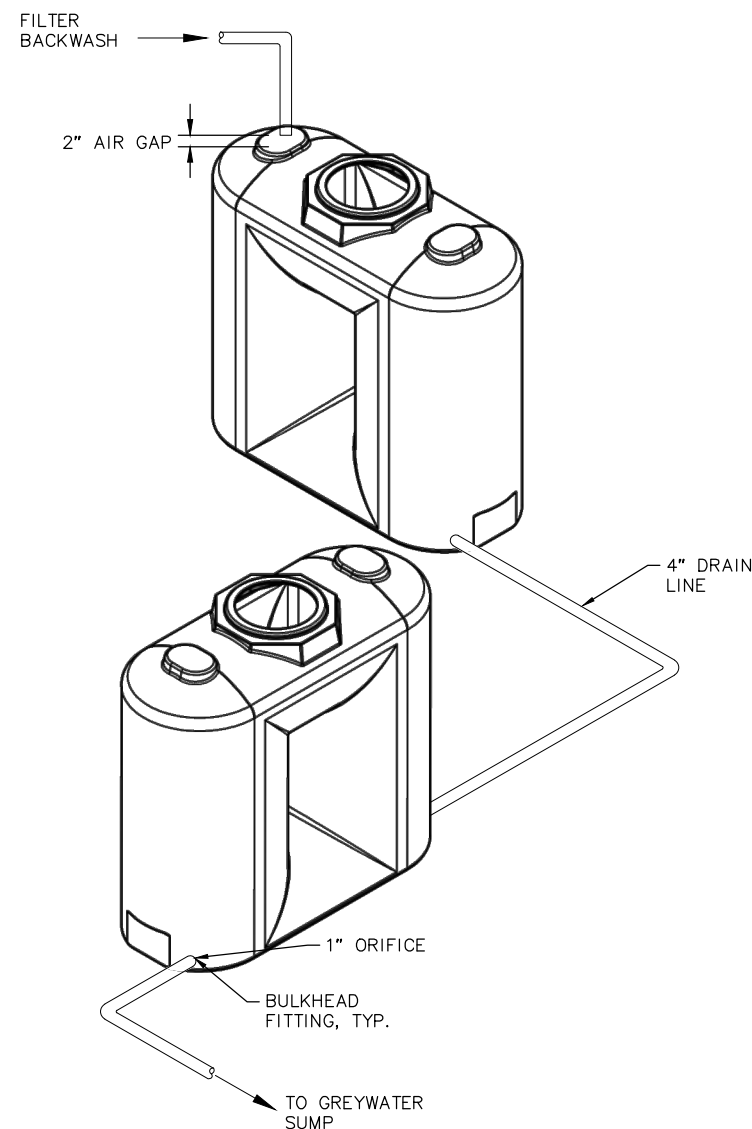
3 SUCTION PIPE CONNECTION
CS503 Scale: NTS



5 TYPICAL RAMP SECTION
CS503 Scale: NTS

NO.	REVISION	DATE	BY	TRT	DATE
1	ISSUED FOR CONSTRUCTION	9/2011			

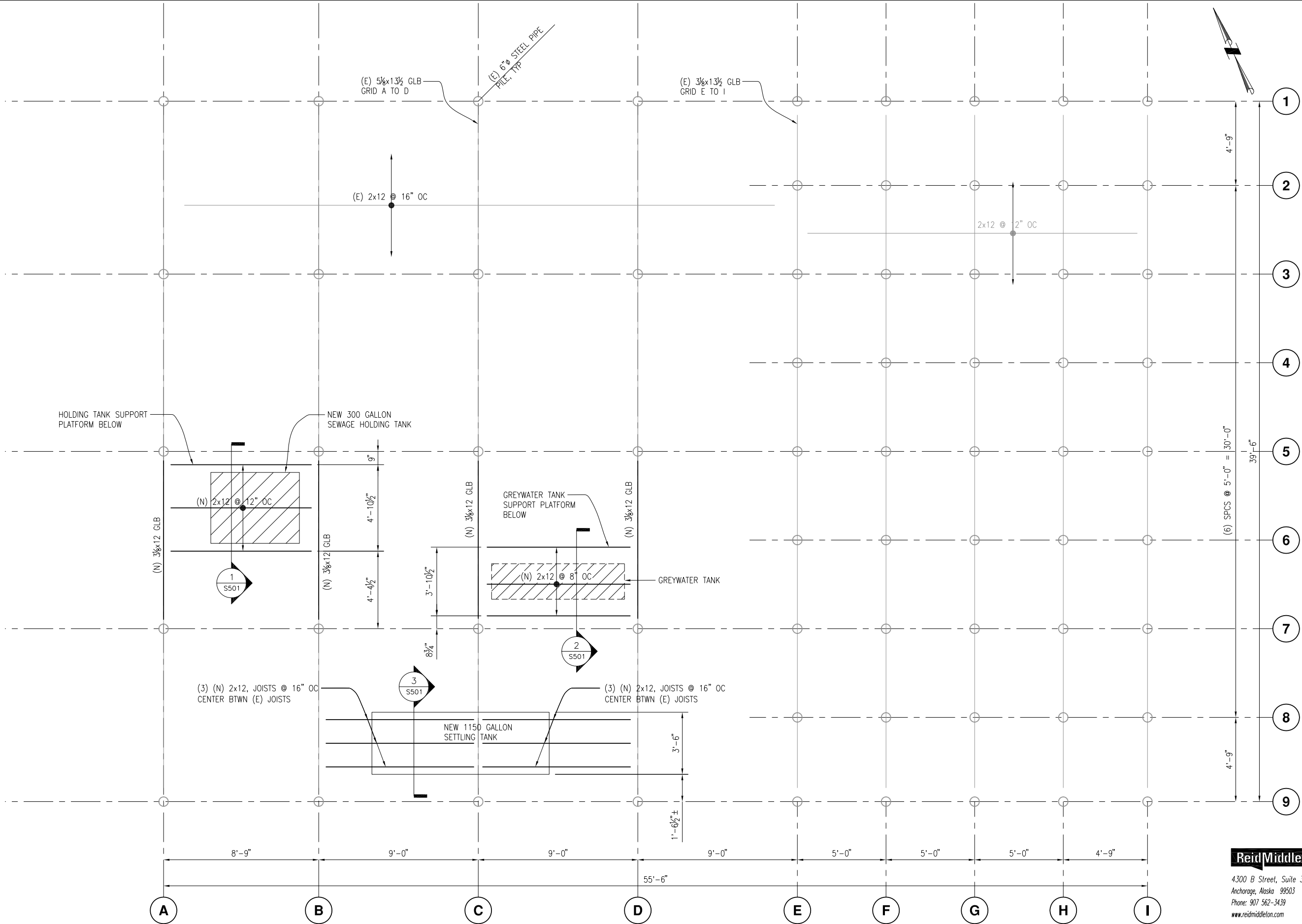
Plot Date	9/14/11
Designed	MCE
Drawn	JHR
Approved	



NO.	REVISION	BY	DATE
1	ISSUED FOR CONSTRUCTION	TRT	9/2011
2	REMOVE FLOOR DRAINS	TRT	10/2011

Plot Date	10/25/11
Designed	MCE
Drawn	CFP
Approved	

File: I:\Jobs\4011\051-Tuntutuliak Wastewater Sewer System Upgrade\Drawings\11-051-S101-FRmngPlan.dwg



1 TANK SUPPORT PLAN
SCALE $\frac{3}{8}'' = 1'-0''$

LINE IS 2 INCHES ±
AT FULL SIZE
(IF NOT 2"=SCALE ACCORDINGLY)

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Phone: 907-562-3439
www.reidmiddleton.com

Alaska Department of
Environmental Conservation
Division of Water

Village Safe Water Program
555 Cordova Street 4th Floor
Anchorage, Alaska 99501



CRW
ENGINEERING GROUP LLC
3940 ARCTIC BLVD., SUITE 300
ANCHORAGE, ALASKA 99503
PHONE: (907) 562-3252
FAX: (907) 561-2275

TUNTUTULIAK, ALASKA
WASTEWATER - SEWER SYSTEM UPGRADES
FLOOR FRAMING PLAN

NO.	REVISION	BY	DATE
1	ISSUED FOR CONSTRUCTION		SEPT 2011

Plot Date	9/12/11
Designed	KA
Drawn	CSB
Approved	KA

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GENERAL STRUCTURAL NOTES

THE CONTRACTOR SHALL VERIFY AND COORDINATE ALL DIMENSIONS AMONG THE DRAWINGS BEFORE STARTING ANY WORK OR FABRICATION. ANY DISCREPANCIES FOUND AMONG THE DRAWINGS, SITE CONDITIONS, SPECIFICATIONS AND THESE NOTES SHALL BE REPORTED TO THE ENGINEER AT ONCE.

ALL CONSTRUCTION SHALL COMPLY WITH THE INTERNATIONAL BUILDING CODE 2006.

SAFETY – THE CONTRACTOR IS RESPONSIBLE FOR MEETING ALL FEDERAL, STATE AND LOCAL SAFETY STANDARDS. THE CONTRACTOR IS IN CHARGE OF ALL SAFETY MATTERS ON AND AROUND THE JOB SITE.

STRUCTURAL DESIGN DATA

STRUCTURAL DESIGN IS IN ACCORDANCE WITH THE INTERNATIONAL BUILDING CODE 2006.

STRUCTURES HAVE BEEN DESIGNED FOR THE FOLLOWING OPERATIONAL LOADS ON THE COMPLETED STRUCTURES. CONTRACTOR IS RESPONSIBLE FOR TEMPORARY SHORING AND BRACING DURING CONSTRUCTION.

LIVE LOADS:

SNOW 30 PSF BASIC + DRIFT, $I_s = 1.1$

LIVE LOADS 125 PSF UNLESS INDIVIDUAL MECHANICAL EQUIPMENT GOVERNS.

WIND LOADS: BASIC WIND SPEED (3-SECOND GUST) = 125 MPH, EXPOSURE B, $I_w = 1.15$.

SEISMIC LOADS: SITE CLASS E, $S_s = 0.35$, $S_1 = 0.10$, $I_e = 1.25$, BASIC FORCE RESISTING SYSTEM = BEARING WALL SYSTEM W/ LIGHT FRAMED WOOD SHEAR PANELS RATED FOR SHEAR RESISTANCE, ANALYSIS PROCEDURE = LINEAR STATIC.

LATERAL FORCES ARE TRANSFERRED TO THE SHEAR WALLS BY FLEXIBLE DIAPHRAGMS. LATERAL FORCES IN THE WALLS ARE CALCULATED BY THE TRIBUTARY AREA METHOD.

STRUCTURAL STEEL

MATERIALS:

CHANNELS, ANGLES, & PLATES	ASTM A 36
BOLTS	ASTM A 307
WELD FILLER METAL	
MINIMUM TENSILE STRENGTH	70 KSI
MINIMUM YIELD STRENGTH	58 KSI
CVN TOUGHNESS	20 FT-LBS @ -20°F AND 40 FT-LBS @ 50°F
ELONGATION	22% MINIMUM

PAINTING OF STRUCTURAL STEEL NOT EXPOSED TO VIEW OR EXPOSED TO THE ELEMENTS IS NOT REQUIRED. PAINTING EXPOSED STRUCTURAL STEEL WITH AN EXTERIOR EPOXY PAINT.

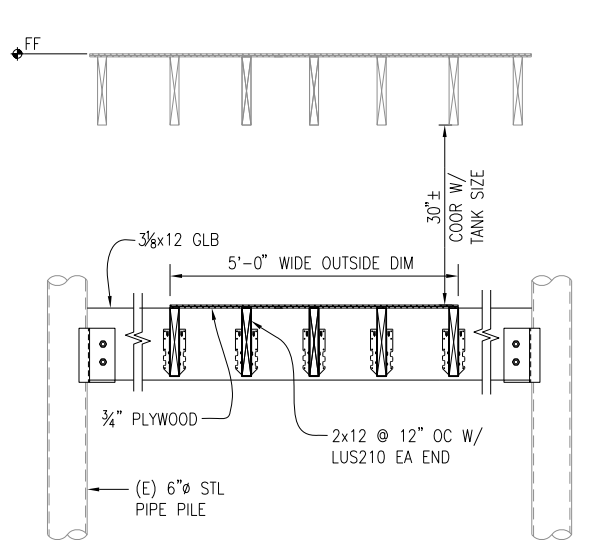
STRUCTURAL TIMBER NOTES

MATERIALS:

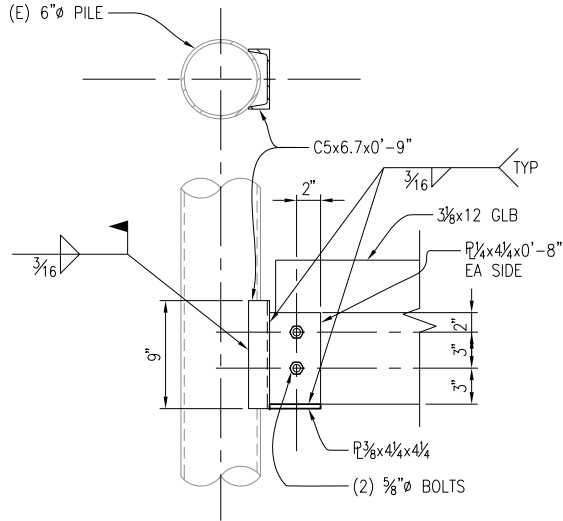
- A. SAWN LUMBER AND TIMBER:
- SPECIES: HEM-FIR
GRADE: NO. 2
- B. GLUE LAMINATED TIMBER:
- SPECIES: DF/DF
GRADE: 24 F-V8
- C. 3/4-INCH PLYWOOD SHEATHING: APA 48/24 SPAN RATING. EXTERIOR GRADE. FASTEN PLYWOOD PANEL EDGES TO SUPPORTS WITH 10d COMMON NAILS (GALVANIZED) AT 6-INCHES ON CENTER. FASTEN PLYWOOD TO INTERMEDIATE SUPPORTS WITH 10d COMMON NAILS AT 12-INCHES ON CENTER.
- D. 1/2-INCH PLYWOOD SHEATHING: APA 32/16 SPAN RATING. EXTERIOR GRADE. FASTEN PLYWOOD PANEL EDGES TO SUPPORTS WITH 10d COMMON NAILS (GALVANIZED) AT 6-INCHES ON CENTER. FASTEN PLYWOOD TO INTERMEDIATE SUPPORTS WITH 10d COMMON NAILS AT 12-INCHES ON CENTER.
- E. METAL HANGERS: METAL HANGERS SHALL BE AS MANUFACTURED BY SIMPSON STRONG-TIE OR APPROVED EQUAL.

ABBREVIATIONS

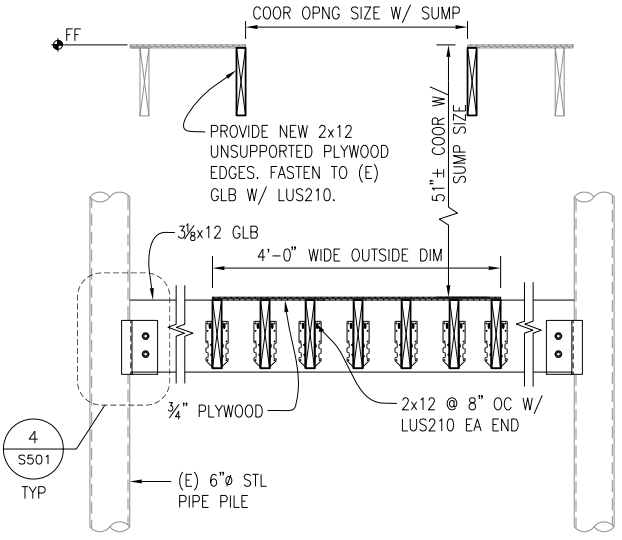
(E)	EXISTING
(N)	NEW
BTWN	BETWEEN
COOR	COORDINATE
DIIM	DIMENSION
EA	EACH
GLB	GLUE LAM BEAM
PSF	POUNDS PER SQUARE FOOT
W/	WITH



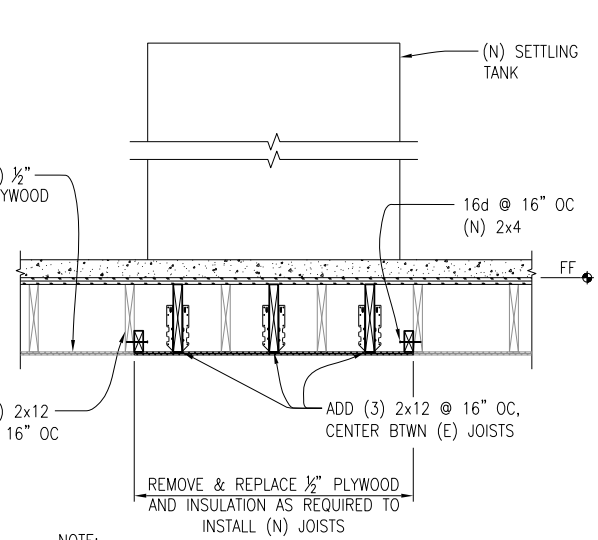
1 HOLDING TANK FRAMING
SCALE 3/4" = 1'-0"



4 GLB SUPPORT BRACKET
SCALE 1 1/2" = 1'-0"



2 GREYWATER SUMP PLATFORM FRAMING
SCALE 3/4" = 1'-0"

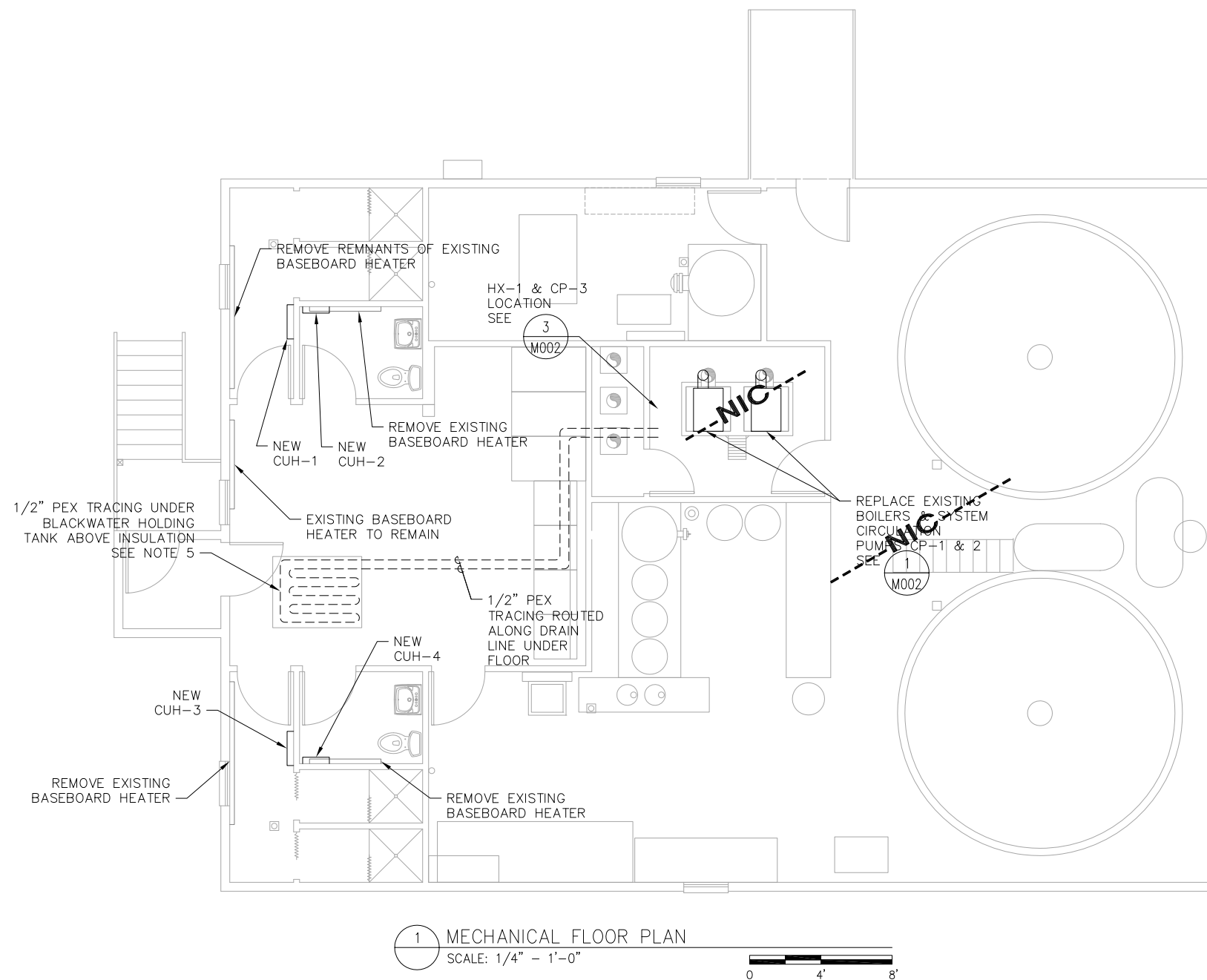


3 SETTLING TANK
SCALE 3/4" = 1'-0"

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www.reidmiddleton.com

LINE IS 2 INCHES ±
AT FULL SIZE
(IF NOT 2"–SCALE ACCORDINGLY)



- ## GENERAL NOTES
1. CONNECT NEW HEATING TERMINAL UNITS TO EXISTING PIPING ABOVE MEZZANINE LEVEL. INSULATE NEW PIPING WITH 1" FIBERGLASS/ALL SERVICE JACKET.
 2. ~~REPLACE EXISTING BOILERS WITH NEW BOILERS AND REVISE NEAR BOILER PIPING AS SHOWN.~~
 3. FIELD LOCATE HX-1 AND CP-3 NEAR BOILERS,
 4. ROUTE 1/2" OXYGEN BARRIER PEX TRACING TUBING UNDER FLOOR, PARALLEL WITH DRAIN PIPING. IF NECESSARY TO RUN TRACING TUBING EXPOSED BELOW BUILDING, INSULATE WITH TWO-INCH THICKNESS 3.75 LB/FT³ POLYURETHANE CLOSED CELL FOAM INSULATION AND ALUMINUM JACKET.
 5. INSTALL TRACING TUBING ON BOTTOM OF BLACKWATER HOLDING TANK AS SHOWN WITH 6" SPACING. INSTALL SO TUBING IS IN DIRECT CONTACT WITH TANK BOTTOM. SEE DRAWING CS503 FOR TANK DETAILS.
 6. INSULATE NEW PIPING WITH 1" FIBERGLASS/ALL SERVICE JACKET.

BOILERS					
TAG	MAKE & MODEL NO.	FUEL RATE GAL/HR	OUTPUT MBH	BURNER	ACCESSORIES
B-1 & 2	WEIL-MCLAIN AWCO-9	255	295	BECKETT	NIC MANUAL RESET HIGH LIMIT CONTROL

PUMPS						
TAG	SERVICE	FLOW GPM	HEAD FEET	MOTOR HP	VOLTAGE /PHASE	MANUFACTURER/MODEL/REMARKS
BP-1&2	BOILER CIRCULATION	40	8	1/2	NIC	GRUNDFOS UP640-40/4, OPERATE ON-A GALL-FOR BOILER
CP-1&2	SYSTEM CIRCULATION	80	20	3/4	NIC	GRUNDFOS UP650-80/3, MAIN & STANDBY
CP-3	HOLDING TANK HEAT	1	4	1/25	120/1	GRUNDFOS UM15-10B7

HEAT EXCHANGERS													
TAG	SERVICE	CAPACITY BTUH	HOT SIDE					COLD SIDE					MANUFACTURER/MODEL /COMMENTS
			FLUID	T IN	T OUT	FLOW	DELTA P	FLUID	T IN	T OUT	FLOW	DELTA P	
HX-1	BLACKWATER TANK TRACING	1350	WATER	180°F	160 °F	0.5 GPM	0.2 PSI	50% PG	80°F	83°F	1 GPM	0.5 PSI	GRAHAM MODEL GB30-10, BRAZED SS PLATE HEAT EXCHANGER, SS MNPT CONNECTIONS.

UNIT HEATERS								
TAG	SERVICE	AIRFLOW CFM	CAPACITY BTU/HR	EGT °F	GLYCOL GPM	MOTOR POWER	VOLTAGE /PHASE	MANUFACTURER/MODEL/REMARKS
CUH-1	MEN'S SHOWER	130	12,000	190	1	66.8W	120/1	BEACON/MORRIS TWIN-FLO III, F120 SURFACE MOUNT
CUH-2	MEN'S TOILET	95	9,180	190	1	30.7W	120/1	BEACON/MORRIS TWIN-FLO III, F84 SURFACE MOUNT
CUH-3	WOMEN'S SHOWER	130	12,000	190	1	66.8W	120/1	BEACON/MORRIS TWIN-FLO III, F120 SURFACE MOUNT
CUH-4	WOMEN'S TOILET	95	9,180	190	1	30.7W	120/1	BEACON/MORRIS TWIN-FLO III, F84 SURFACE MOUNT

MISCELLANEOUS EQUIPMENT

AIR SEPARATORS - ~~AS-1 SPIROVENT SE~~ **NIC 2-1/2" MODEL VSR250**, AS-2: SPIROVENT JUNIOR 3/4" MODEL VJR075FT

EXPANSION TANKS - ~~BOILER SYSTEM, ET-1 BLADDER TYPE, 11.3 GAL ACCEPTANCE, AMTROL AX-10V OR EQUAL~~

BLACKWATER TANK TRACING: ET-2 BLADDER TYPE, 0.9 GAL ACCEPTANCE, AMTROL EXTROL 15 OR EQUAL

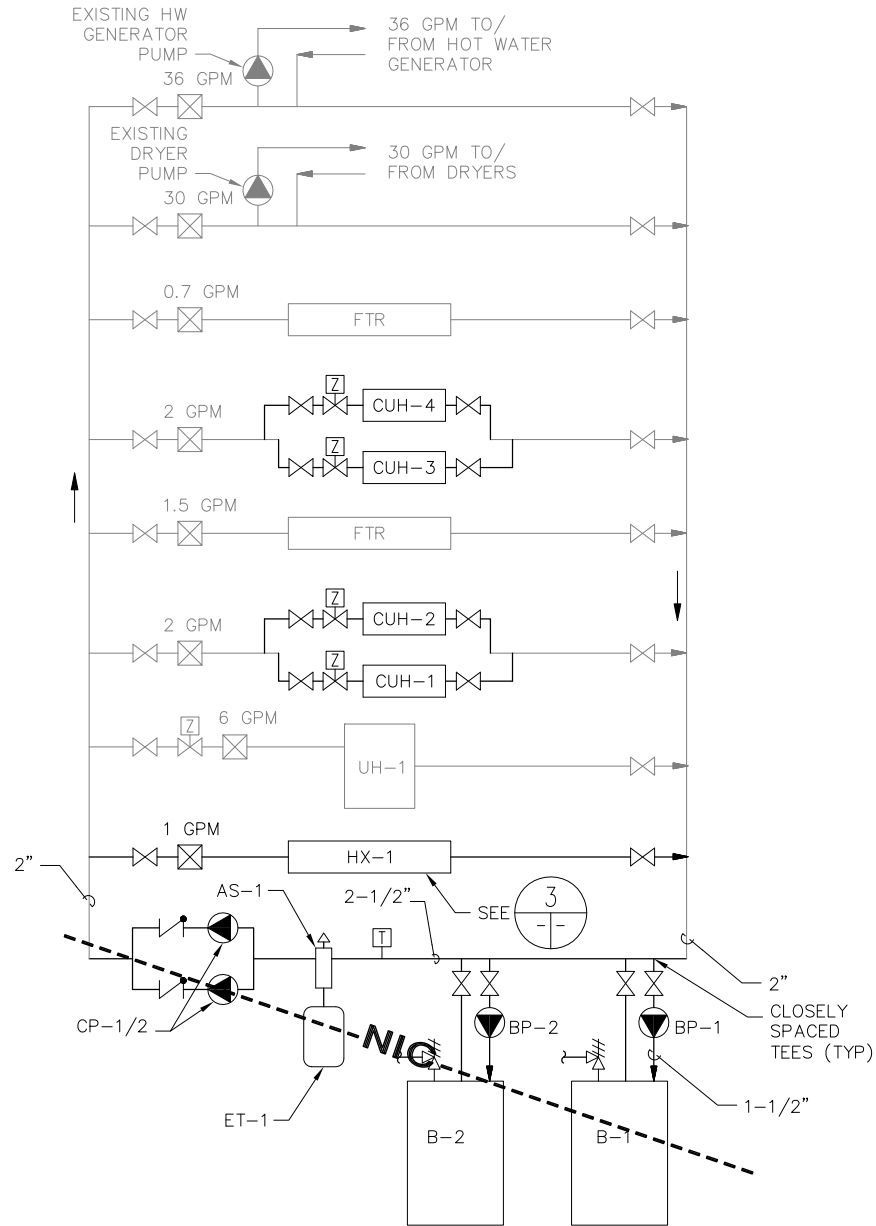
GLYCOL FILL SYSTEM - AXIOM MODEL MF200 W/PRESSURE SWITCH & GAUGE.

~~BOILER CONTROLLER -~~ **NIC-BOILER CONTROL-262**

TEMPERATURE CONTROL TC-1 - TEKMAR MIXING CONTROL 360.

CONTROL VALVE FOR HX-1 - 2-WAY BALL VALVE WITH 24V FLOATING ACTION ACTUATOR. BELIMO B215HT029+TF24-3 US OR EQUAL.

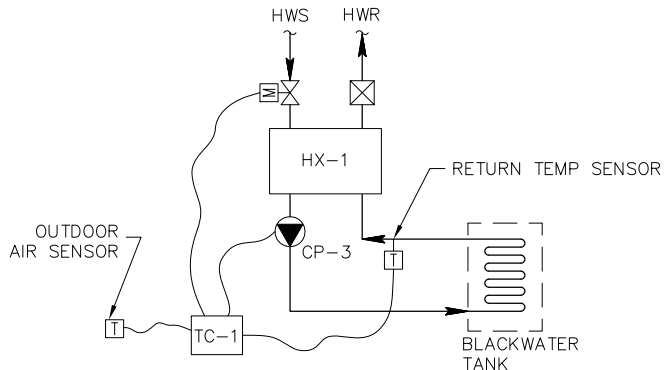
File: P:\Projects\CRW\Tuntutuliak WTP\Draws\Mech\M2 - DETAILS.dwg



1 BOILER SCHEMATIC
SCALE: NONE

BOILER CONTROL SEQUENCE

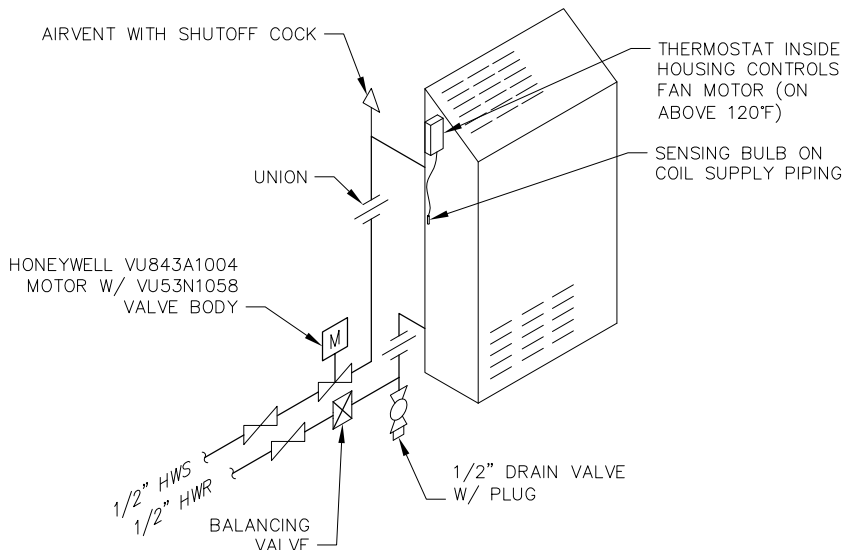
BOILER CONTROL MONITORS OUTSIDE AND SUPPLY TEMP SENSORS AND FIRES B-1 AND B-2 IN SEQUENCE TO MAINTAIN HEATING WATER SUPPLY TEMP PER THE FOLLOWING OUTDOOR RESET SCHEDULE: 180F AT MINUS 30F OUTSIDE, 140F AT 60F OUTSIDE. PROVIDE A POWERED SIGNAL TO THE DHW CONTACTS ON THE BOILER CONTROLLER WHEN HW GENERATOR PUMP RUNS TO OVERRIDE OUTDOOR RESET AND SET SYSTEM SUPPLY TEMP AT 180F. PROVIDE A POWERED SIGNAL TO THE SETPOINT CONTACTS WHEN THE DRYER PUMP RUNS TO OVERRIDE OUTDOOR RESET AND SET THE SYSTEM SUPPLY TEMP AT 190F. WARM WEATHER SHUTDOWN STOPS CP-1 OR 2 (AS SELECTED BY MANUAL SWITCH) ABOVE 65F OUTSIDE.



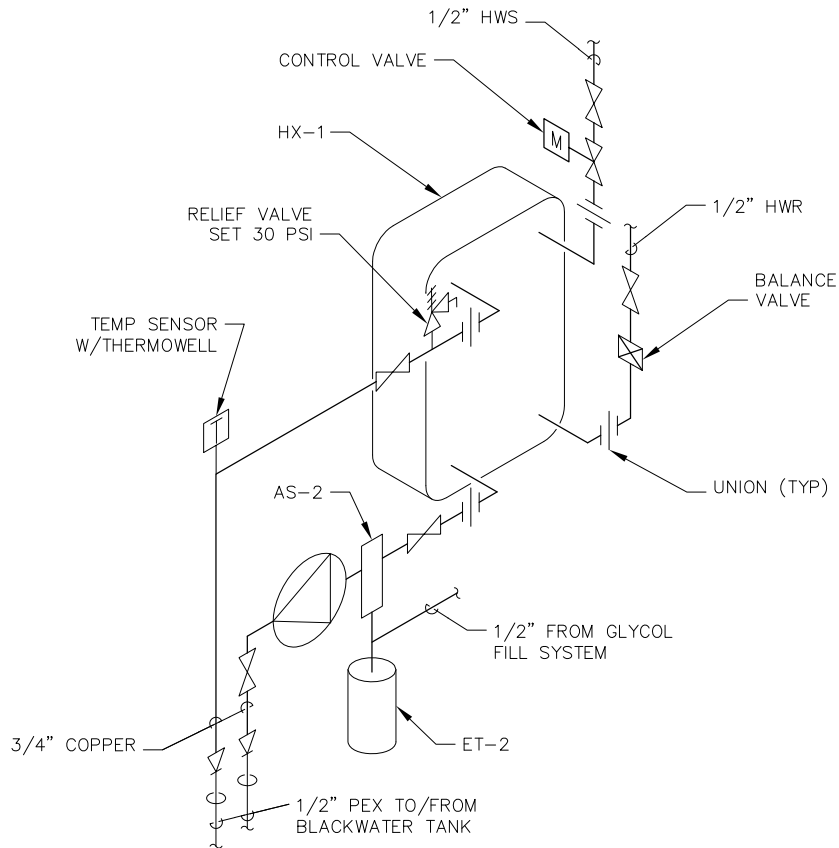
2 HX-1 CONTROL SCHEMATIC
SCALE: NONE

HX-1 CONTROL SEQUENCE

TC-1 MONITORS RETURN AND OUTSIDE TEMP SENSORS AND MODULATES CONTROL VALVE TO MAINTAIN RETURN TEMPERATURE PER THE FOLLOWING OUTDOOR RESET SCHEDULE: 80F AT MINUS 30F OUTSIDE, 50F AT 40F OUTSIDE, CP-3 RUNS BELOW 40F OUTSIDE TO CIRCULATE GLYCOL TO BLACKWATER TANK.



4 CABINET UNIT HEATER DETAIL
SCALE: NONE












































3 HX-1 PIPING
SCALE: NONE

LINE IS 2 INCHES
AT FULL SIZE
(IF NOT 2"—SCALE ACCORDINGLY)

File: J:\Jobsdata\81801.00 Tuntutuliak WTP & Washeteria Lagoon\00 CADD\01 Working Set\03 Electrical\WASHETERIA\81801.00 LEGEND.dwg

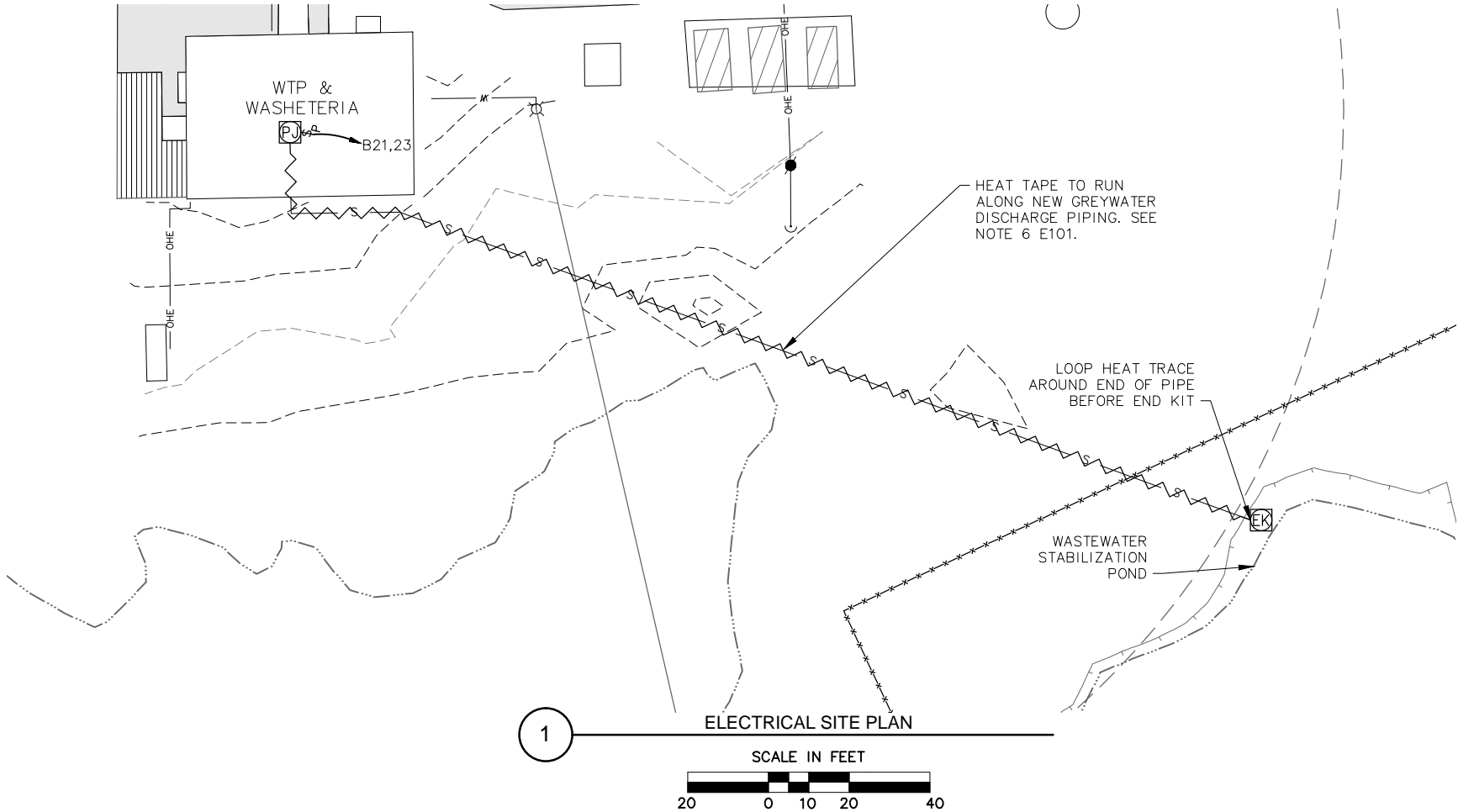
LEGEND

	EXPOSED CONDUIT
	CONDUIT/CABLE RUN UNDERGROUND
	HEAT TRACE
	HOMERUN TO PANEL "X", CIRCUITS NO. Y AND Z CONDUIT RUNS NOT DEFINED ARE 1/2" C with 3#12.
	GROUND
	CONDUIT RUN – CHANGE IN ELEVATION
	GROUND ROD
	LIQUID-TIGHT FLEXIBLE CONDUIT
	SHEET NOTE "X"
	PANELBOARD
	CONTROL PANEL
	MAGNETIC MOTOR STARTER
	KILOWATT-HOUR METER
	MOLDED CASE CIRCUIT BREAKER, X = AMPERE RATING, Y = NO. OF POLES THERMAL/MAGNETIC UON
	INSTRUMENT DEVICE LOCATION (SEE TAG)
	NORMALLY OPEN CONTACT
	NORMALLY CLOSED CONTACT
	TRANSFORMER
	METER BASE
	PILOT LIGHT R=RED, B=BLUE, A=AMBER, G=GREEN
	RELAY COIL
	JUNCTION BOX
	THERMOSTAT
	SINGLE POLE SWITCH/DISCONNECT, HP RATED VERIFY SIZE WITH MOTOR/LOAD SERVED
	120V TWIST LOCK RECEPTACLE, NEMA
	TRANSFORMER
	2 POSITION SWITCH
	CHEMICAL PUMP
	MOTOR, HP AS SHOWN, SINGLE PHASE
	MOTOR, HP AS SHOWN, THREE PHASE
	VARIABLE FREQUENCY DRIVE
	SOLENOID VALVE
	COIN METER BOX

	AQUASTAT
	VENT MOTOR
	VALVE ACTUATOR
	HEAT TRACE POWER POINT
	HEAT TRACE END KIT
	TWO POLE SWITCH WITH PILOT LIGHT, 20A RATED
	HP RATED SWITCH
	FLOAT SWITCH

ABBREVIATIONS

A	AMPERE
AFF	ABOVE FINISH FLOOR
AIC	AMPERES INTERRUPTING CAPACITY
ATS	AUTOMATIC TRANSFER SWITCH
AWG	AMERICAN WIRE GAGE
BCP	BOILER CONTROL PANEL
bcu+	BARE COPPER
BLDG	BUILDING
CIRC	CIRCULATION
C	CONDUCTOR
C	CONDUIT
CP	CONTROL PANEL
CT	CURRENT TRANSFORMER
DGP	DRYER CONTROL PANEL
DWG	DRAWING
EMT	ELECTRICAL METALLIC TUBING
ENT	ELECTRICAL NON-METALLIC TUBING
EOL	END OF LINE RESISTOR
FCP	FCP
G	GROUND CONDUCTOR
GFI	GROUND FAULT INTERRUPTER
H	HOT CONDUCTOR
HID	HIGH INTENSITY DISCHARGE
HOA	HAND-OFF-AUTO
HP	HORSE POWER
HWG	HOT WATER GENERATOR
IMC	INTERMEDIATE METAL CONDUIT
KVA	KILO-VOLT-AMPERES
KW	KILOWATT
LTFMC	LIQUID TIGHT FLEXIBLE METAL CONDUIT
LTFNC	LIQUID TIGHT FLEXIBLE NON-METALLIC CONDUIT
MCM	THOUSAND CIRCULAR MILLS
MCP	MAGNETIC ONLY CIRCUIT PROTECTOR
N	NEUTRAL CONDUCTOR
NEMA	NATIONAL ELECTRICAL MANUFACTURES ASSOCIATION
NMC	NON METALLIC CABLE
P	POLE
RCP	RECEPTACLE
RMC	RIGID METAL CONDUIT, GALVANIZED
SCD	STREAMING CURRENT DETECTOR
SL	SWITCH LEG
TWSH	TWISTED/SHIELDED
TYP	TYPICAL
U/G	UNDERGROUND
UON	UNLESS OTHERWISE NOTED
V	VOLTS
XFMR	TRANSFORMER



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TUNTUTULIAK, ALASKA

WASHETERIA – SEWER SYSTEM UPGRADES

ELECTRICAL LEGEND, SITE PLAN
& ABBREVIATIONS

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Drawn TRK

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Sheet No. E001

SHEET 21 OF 26

File: J:\Jobsdata\81801.00 Tuntutuliak WTP & Washeteria Lagoon\00 CADD\01 Working Set\03 Electrical\WASHETERIA\81801.00 LEGEND.dwg

ELECTRICAL SPECIFICATIONS

SCOPE OF WORK: Furnish and install all material and equipment as required for the installation as specified here and as shown on the drawings.

STANDARDS, CODES AND REGULATIONS: Contractor shall comply with the latest adopted edition of the National Electrical Code (NEC), International Building Code (IBC), and International Fire Code (IFC) including all state and local amendments to these codes.

DRAWINGS: The drawings are diagrammatic, not necessarily showing all offsets or exact locations of fixtures, equipment, etc., unless specifically dimensioned. Review the drawings and specifications for equipment furnished by other crafts but installed in accordance with this section. Bring questionable or obscure items, apparent conflicts between plans, specifications, governing codes and/or utilities regulations to the attention of the Engineer. Codes, ordinances, regulations, manufacturer's instructions or standards take precedence when they are more stringent or conflict with the drawings and specifications.

RECORD DRAWINGS: Mark up a clean set of drawings as the work progresses to show the dimensioned location and routing of all electrical work that will become permanently concealed. Show routing of work in permanently concealed blind spaces within buildings and structures. Show complete routing and sizing of any significant revisions to the systems shown.

WORKMANSHIP: Installation of all work shall be made so that its several component parts shall function as a workable system complete with all accessories necessary for its operation. All material and equipment shall be installed in accordance with the manufacturer's recommendations, instructions and/or installation drawings and in accordance with NECA standards. Materials and equipment shall be new and shall conform to applicable industry standards, NEMA standards and Underwriters Laboratories (U/L) standards.

OPERATION AND MAINTENANCE MANUALS: Provide operation and maintenance manuals for training of the owner's personnel. Describe in the manuals the procedures necessary to operate the system including start-up, operation, emergency operation and shutdown. Provide instructions and a schedule of preventive maintenance in tabular form for all routine cleaning, inspection and lubrication with recommended lubricants. Provide instructions for minor repair or adjustments required for preventive maintenance routines. Provide manufacturer's descriptive literature including approved shop drawings covering devices used in any contractor-provided equipment or systems with illustration, exploded views, etc. Provide a non-password protected PDF file of each manual in its entirety on a CD in addition to the required hard copies.

REFERENCE SYMBOLS: The Electrical "LEGEND" on the drawings is a standardized version, and all symbols shown may not be used. Use the "LEGEND" as a reference for the symbols used on the drawings.

IDENTIFICATION: Provide engraved three-layer laminated plastic nameplates with black letters on a white background to identify all electrical distribution and control equipment, loads served and as noted on the drawings. Letter heights shall be 1/8 inch for individual switches, motor starters and loads served and 1/4 inch on panelboards. Secure nameplates to equipment fronts using screws, rivets or adhesives.

CONDUITS: Mark all conduits entering or leaving panelboards/control panels with an indelible black marker with the circuit numbers of the circuits contained inside.

JUNCTION BOXES: Mark all circuit numbers of wiring on all junction boxes with sheet steel covers. Mark with indelible black marker. Mark all other special system junction boxes with sheet steel covers.

CONDUIT: In General, all wiring below 8'AFF shall be installed in galvanized rigid steel or intermediate metal raceway with cast boxes and gasketed covers. EMT and pressed steel shall be permitted at or above 8' unless otherwise noted (See WIRING METHODS at the end of the specifications). All metallic fittings, connectors, boxes, etc., shall be approved for use as a grounding means. Utilize short extensions (36 inches maximum) of flexible, low temperature, liquidtight flexible metallic conduit for connection of all motors and other equipment subject to vibration and where conduits transition between structures or on risers from below grade. Paint all exposed raceways to match the surface to which it is attached or crosses. Otherwise paint industrial gray. Completely and thoroughly swab raceway system before installing conductors. An equipment ground wire is required in all conduits whether shown or not.

CONDUCTORS: Conductors shall be copper, solid or stranded, with type XHHW-2, 90° insulation. Minimum branch circuit conductor size shall be #12 AWG. Minimum control circuit conductor size for field wiring shall be #14 AWG unless noted otherwise on drawings. Pull all conductors into the raceway at the same time. Use UL listed wire-pulling lubricant for pulling #4 AWG and larger wires. Color code conductors as follows: 480V systems: brown (AØ), orange (BØ), yellow (CØ). NOTE: The 480Y Neutral is not used and is terminated at the ATS. 208Y/120 volt systems: black (AØ), red (BØ), blue (CØ), white (N) and green or bare (G). 240/120 volt systems: black (L1), red (L2), white (N), green or bare (G). Use properly sized insulated spring wire connectors with plastic caps for all conductors #8 AWG and smaller. Terminate #6 AWG and larger conductors with crimp or compression type connectors installed with tool recommended by connection manufacturer and insulate with properly sized 600-volt rated heat shrink tubing.

CIRCUIT BREAKERS: Molded case circuit breakers shall be bolt-on with common trip handle for all poles. Thermal magnetic trip type unless specifically shown as magnetic only (MCP).

LIGHTING EQUIPMENT: Provide all lighting equipment or approved equal as shown on the drawings and described in the "fixture schedule". Provide lighting equipment complete, wired, assembled, with proper flanges, mounting supports, hardware, etc. Provide high power factor, regulating or constant wattage type ballasts for HID fixtures.

EQUIPMENT CONNECTIONS: Provide wiring and connection to equipment requiring electrical power but specified under other divisions of the specifications. Equipment shall include but is not limited to motors, pumps, dispensing equipment, etc. Review equipment submittal from the other trades prior to installation and electrical rough-in. Verify location, size, type of connections, and that equipment is ready for electrical connection. Make wiring connections in control panel or in wiring compartment of pre-wired equipment in accordance with the manufacturer's instructions. Provide interconnecting wiring and disconnects where required.

DISCONNECT SWITCHES: Provide 600V and 250V heavy duty non-fusible quick-make, quick break, load interrupter, enclosed knife switches with externally operable handle interlocked to prevent opening front cover with switch in on position, handle lockable in off position. For motors under 1HP, specification grade snap switched rated for HP duty may be used. Where locking is required, provide suitable cover plate with locking feature.

POWER CONTACTORS: Provide full voltage HP rated contactors, NEMA rated, AC general-purpose, class A, with coil voltage as shown. Provide with NEMA 12 rated enclosure, pilot devices as shown on drawings.

EQUIPMENT MOUNTING: Provide all bracing as required to securely mount enclosures, fixtures and devices. Unless otherwise noted use galvanized hardware and galvanized formed steel components such as Unistrut or equal. When bolting to structure, verify that the original structural and performance (i.e. water tight) characteristics are maintained.

WIRING METHODS: Unless noted otherwise, enclosures, junction boxes and other equipment shall be installed in accordance with the following schedule:

Exterior – Cast weatherproof device boxes with gasketed covers, RMC or LTFMC. NEMA 4X enclosure rating. NOTE: Receptacles shall retain their weatherproof rating while in use.

WTP/Mechanical Area – Surface mounted EMT, LTFMC, Cast device boxes, NEMA 12 enclosure ratings.

Laundry/Restroom/showers– Flush mounted pressed steel device and junction boxes with brushed stainless steel covers, concealed wiring: EMT, ENT or non-metallic cable (NMC).

Alaska Department of
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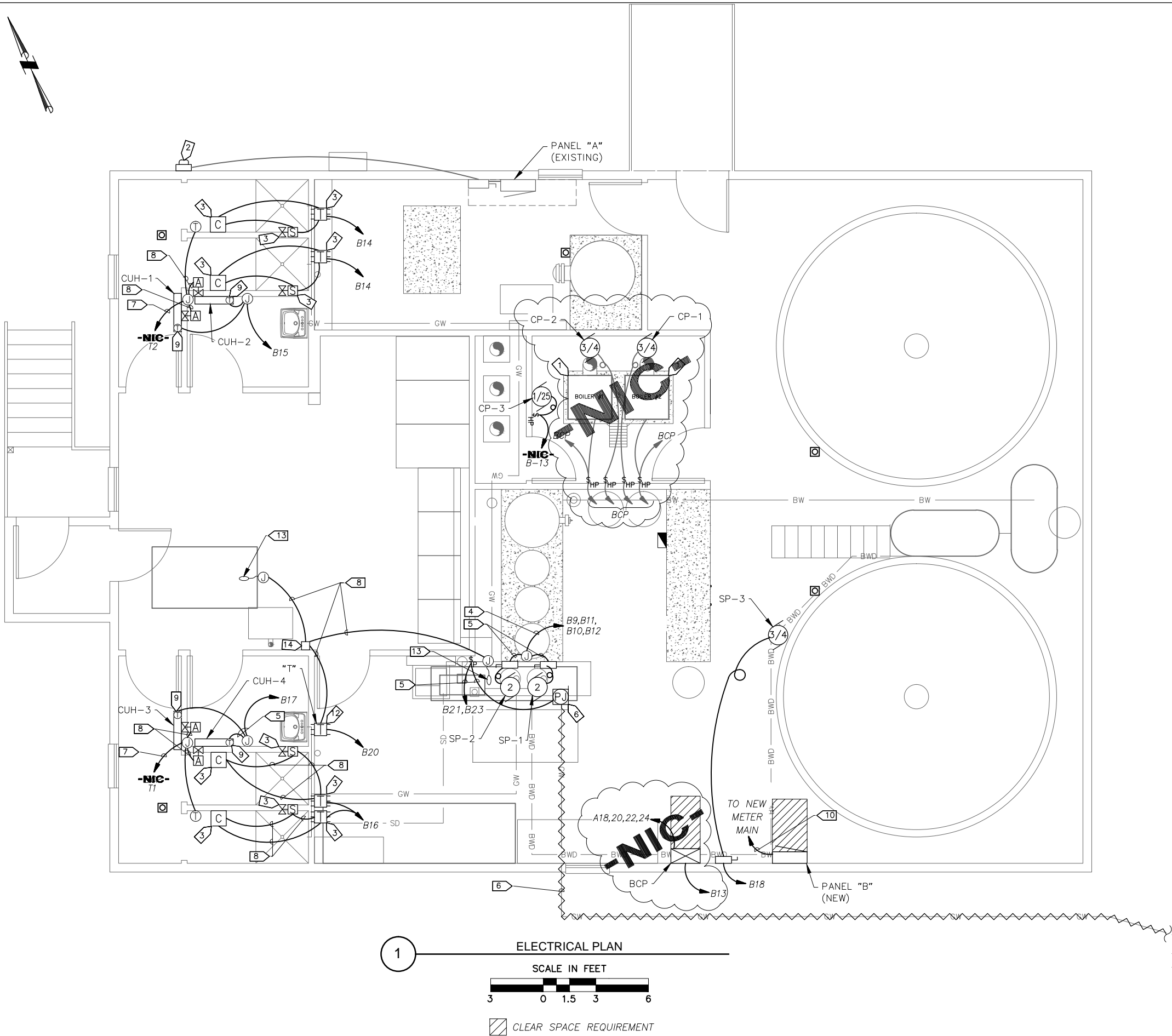
TUNTUTULIAK, ALASKA

WASHETERIA – SEWER SYSTEM UPGRADES

ELECTRICAL SPECIFICATION

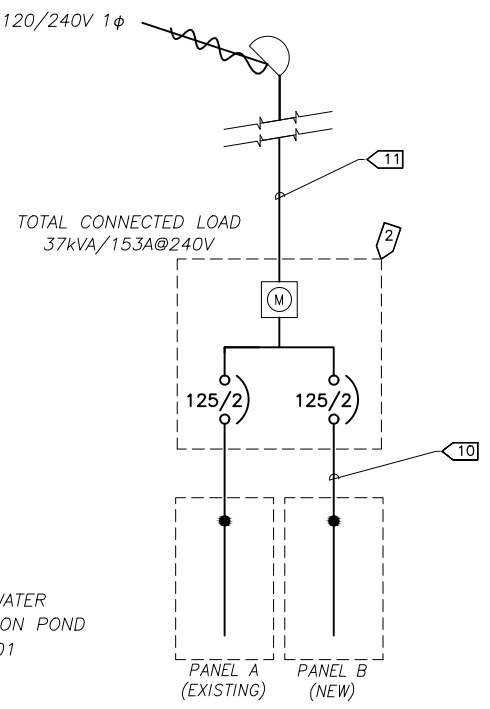
NO. 1	REVISION ISSUED FOR CONSTRUCTION	BY	DATE				
		TRK	9/2011				
Plot Date	9/14/11	Designed	TRK	Drawn	TRK	Approved	WMM
Sheet No.		E002					
SHEET		22		OF		26	

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NOTES

- NEW BOILERS, IF IN GOOD CONDITION, USE EXISTING CONDUIT, CONDUCTORS AND SWITCHES FOR THE BOILERS AND CP-1,2, IF NOT, REPLACE. HOMERUN CONDUCTORS TO BCP AS SHOWN ON NEW BOILER CONTROL SCHEMATIC 1/E503.
- NEW METER MAIN COMBO WITH 2-125A MAINS MILLBANK OR EQUAL.
- REPLACE COIN-OPS AND SOLENOID VALVES IN SHOWERS. MONARCH HM6 SERIES COIN OPERATED METER WITH HRV TIMER, SHOWER SOLENOID AND 24VAC TRANSFORMER. COORDINATE INSTALLATION W/PIPING INSTALLATION. CONCEAL CONDUIT IN SHOWER AREA.
- 1/2"C, 5#12 (4H, G).
- 1/2"C, 3#12 (2H, G).
- HEAT TAPE, 5W/FT@50°F, 240V, SELF-REGULATING, CORROSIVE RESISTANT OUTER JACKET. RAYCHEM 5BTV2-CT, POWER POINT JBS-100 AND END KIT E-150 OR EQUAL.
- 1/2"C, 5#14 (2-24VAC, 2COM, G). CLASS II CIRCUIT.
- 1/2"C, 3#14 (24VAC, COM, G). CLASS II CIRCUIT.
- VERIFY CUH HEATER UNITS HAVE INTEGRAL T STAT WITH OFF DETENT OR PROVIDE DISCONNECT.
- 2"C, 3#2 (2H, N), 1#4 (G)
- 2"C, 3#4/O (2H, N).
- MULTI-CIRCUIT, CLASS 2 TRANSFORMER 3-72VA, 24VAC CIRCUITS, 120V. JUSTIN, INC. P/N C2288-24 OR EQUAL.
- AVOCADO-STYLE SINGLE-DUTY NORMALLY OPEN FLOAT SWITCH, 24VAC, USA BLUE BOOK OR EQUAL.
- HIGH LEVEL ALARM INDICATOR ENCLOSURE, SEE 1/E501.



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TUNTUTULIAK, ALASKA

WASHETERIA - SEWER SYSTEM UPGRADES

ELECTRICAL FLOOR PLAN

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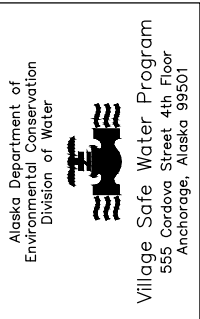
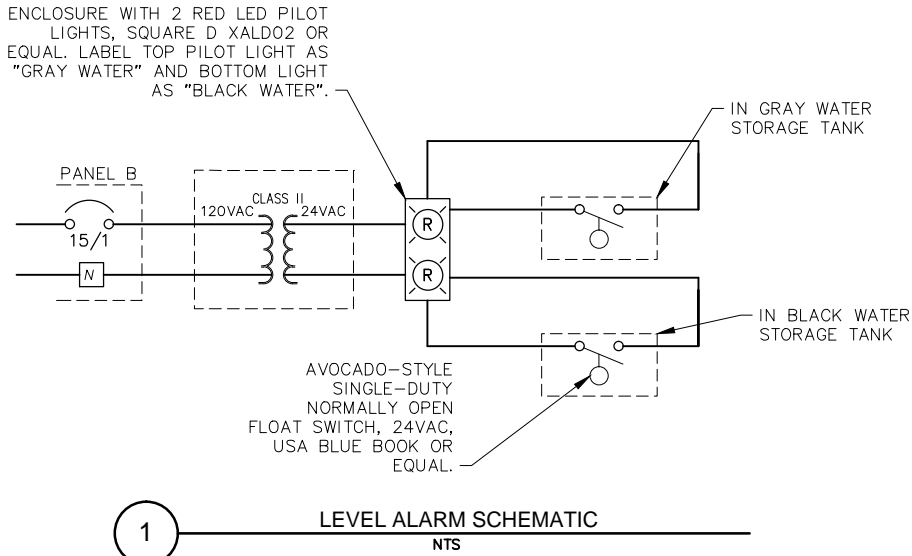
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SHEET 23 OF 26

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PANEL "A" SCHEDULE (EXISTING)								
Location: Electrical Room			125A Main			10000 AIC		
Served from Transfer Switch			240/120V			Surface Mounted NEMA 1		
POLE #	AMP TRIP	LOAD DESCRIPTION	POLE kVA	MLO L1 L2	POLE kVA	LOAD DESCRIPTION	AMP TRIP	POLE #
1		Lighting Laundry	0.4	0.4				2
3		Lighting Men's Showers	0.4		0.4			4
5		Day Tank	0.2	0.7		0.5 Backwash Pump		6
7		Lighting Treatment Area	0.4		0.9	0.5		8
9		Lighting Boiler Room, Loft	0.4	1.4		1.0 Pressure Pump #1		10
11		Receptacles	0.3		1.3	1.0		12
13		Receptacles	0.3	1.3		1.0 Pressure Pump #2		14
15		Flow Switches, FP 220	0.2		1.2	1.0		16
17		Air Compressor	0.9	1.8		0.9 Boiler #1	15/1	18
19			0.9		1.8	0.9 Boiler #1	15/1	20
21		Washer #1	0.8	2		1.2 CP-1	30/1	22
23		Washer #2	0.8		2	1.2 CP-2	30/1	24
25		Washer #3	0.8	2		1.2 HWG Circ Pump		26
27		Washer #4	0.8		1.2	0.4 Dryer Circ Pump, Dampers		28
29	15/2	Dryer #1	0.4	1.6		1.2 Transfer Pump		30
31			0.4		0.4			32
33	15/2	Dryer #2	0.4	0.4				34
35			0.4		0.6	0.2 Stratotherm Watering Point	15/1	36
37	15/2	Dryer #3	0.4	0.6		0.2 Alarm Panel		38
39			0.4		0.8	0.4 Fuel Transfer Pump		40
41		Intermediate Fuel Control Panel	0.2	0.4		0.2 Glycol Circ Pump, Well Heat Tape		42
* = Class B GFCI				12.6	10.6	Total kVA = 23.2 kVA		
						Total Amps @ 240V = 96.7 A		

PANEL "B" SCHEDULE								
Location: Treatment Area			125A Main			10000 AIC		
Served from Meter Main Combo			240/120V			Surface Mounted NEMA 1		
POLE #	AMP TRIP	LOAD DESCRIPTION	POLE kVA	MLO L1 L2	POLE kVA	LOAD DESCRIPTION	AMP TRIP	POLE #
1			0.0	0		0.0		2
3			0.0		0	0.0		4
5			0.0	0		0.0		6
7			0.0		0.2	0.2 Transformer T	15/1	8
9	30/2	SP-1	1.2	2.4		1.2 SP-2	30/2	10
11			1.2		2.4	1.2		12
13	15/1	CP-3	0.2	0.4		0.2 Mens Showers Coin-op	15/1	14
15	15/1	CUH-1,2	0.5		0.7	0.2 Womens Showers Coin-op	15/1	16
17	15/1	CHU-3,4	0.5	1.8		1.3 Sludge Pump (SP-3)	30/1	18
19	20/2	Heat Tape	0.5		0.5	0.0		20
21			2.7	2.7		0.0		22
23			2.7		2.7	0.0		24
25			0.0	0		0.0		26
27			0.0		0	0.0		28
29			0.0	0		0.0		30
31			0.0		0	0.0		32
* = Class B GFCI				7.3	6.5	Total kVA = 13.8 kVA		
						Total Amps @ 240V = 57.5 A		

-NIC-



TUNTUTULIAK, ALASKA

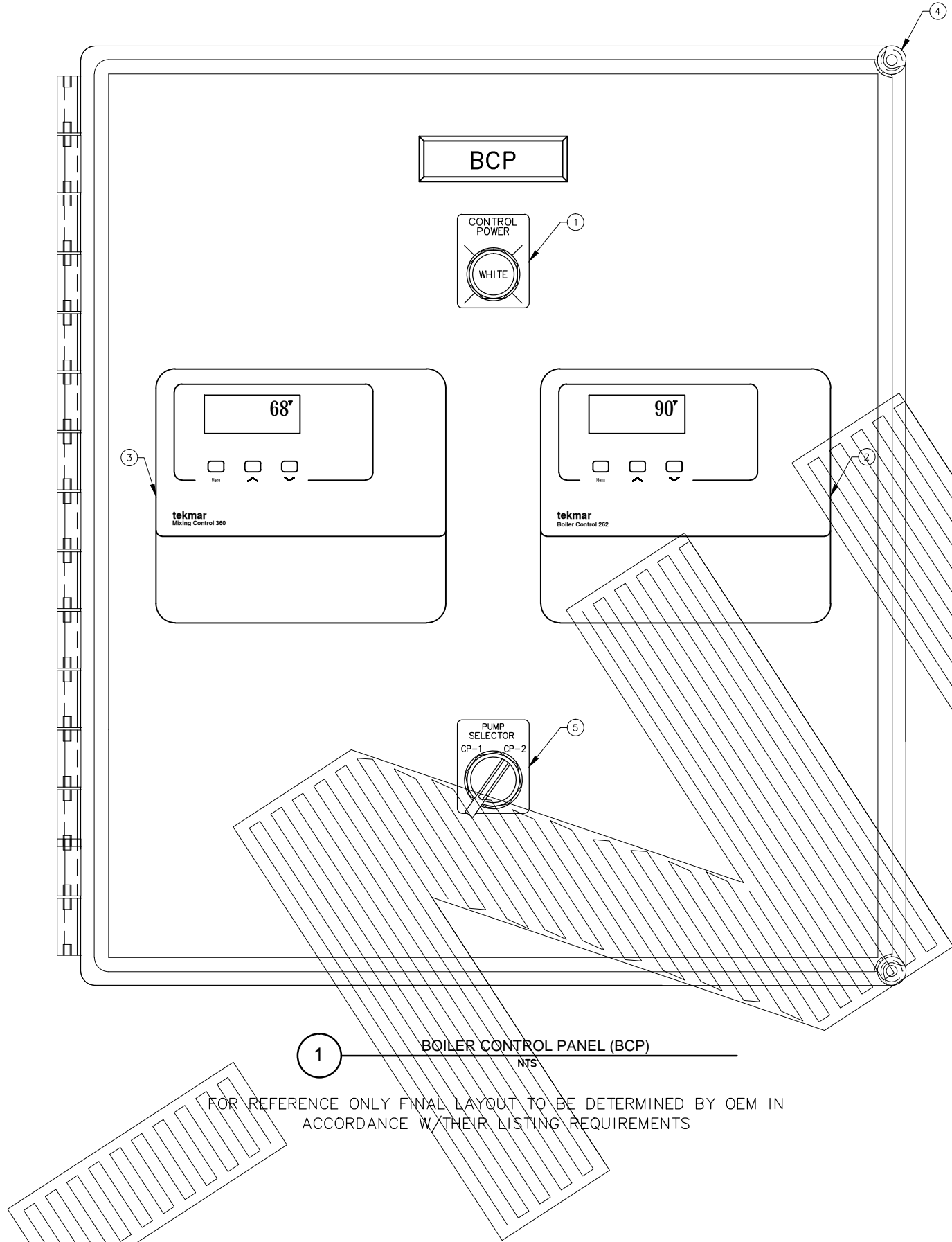
WASHETERIA – SEWER SYSTEM UPGRADES

PANEL SCHEDULES &
ALARM SCHEMATIC

NO.	REVISION	BY	DATE
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1 BOILER CONTROL PANEL (BCP)
NTS

FOR REFERENCE ONLY FINAL LAYOUT TO BE DETERMINED BY OEM IN ACCORDANCE WITH THEIR LISTING REQUIREMENTS

FUNCTIONAL NARRATIVE

The Boiler Control Panel (BCP) controls the Holding Tank heat loop, and demand from Men's Bathroom heat loop, Women's Bathroom heat loop, UH-1 Heat Loop, Hot Water Generator (HWG) loop, the Dryer heat loop and controls the Boilers.

A Tekmar 262 receives demand signals from the Tekmar 360, the HWG loop and the Dryer heat loop and controls the Boilers and circulation pumps CP-1 and CP-2 (only one pump runs at a time).

The Holding Tank heat loop is controlled by a Tekmar 360. When the outside temperature sensor goes below the set point, the Tekmar 360 starts pump CP-3 and sends a demand signal to the Tekmar 262.

The Men's and Women's Bathroom loops are both on thermostats that control actuator valves. When a thermostat goes below the set point, the valves controlled by the thermostat open and a demand signal is sent to the Tekmar 360 which sends a demand signal to the Tekmar 262.

The UH-1 heat loop is on a thermostat that controls a solenoid valve, when the temperature goes below the set point a demand signal is sent to the Tekmar 360 which sends a demand signal to the Tekmar 262.

The HWG loop is on an aquastat that controls a circulating pump, when the water temperature goes below the set point the circulation pump starts and a demand signal is sent to the Tekmar 262.

The Dryer Heat loop is controlled by the Dryer Control Panel (DCP). When a dryer starts, the DCP starts a circulating pump and a demand signal is sent to the Tekmar 262.

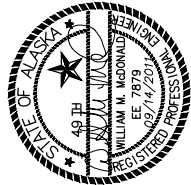
COMPONENT SCHEDULE

ITEM #	DESCRIPTION	MANUFACTURER	QTY
1	Pilot Light, 120V, LED, NEMA 4X,	Allen Bradley CAT.#800HC-QRH10*, where *= lens tint as shown	1
2	Boiler Control	Tekmar 262	1
3	Mixing Control	Tekmar 360	1
4	NEMA 4X NONMETALLIC Enclosure	Hoffman of equal	1
5	2-Position Selector Switch, 120V, NEMA 4X, provide CAM and Contact Blocks as required	Allen Bradley or equal	1
6	Multi-Circuit Class 2 Transformer 3-72VA, 24VAC circuits, 120V.	Justin, Inc. P/N C2288-24 or equal	1

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TUNTUTULIAK, ALASKA

WASHETERIA – SEWER SYSTEM UPGRADES

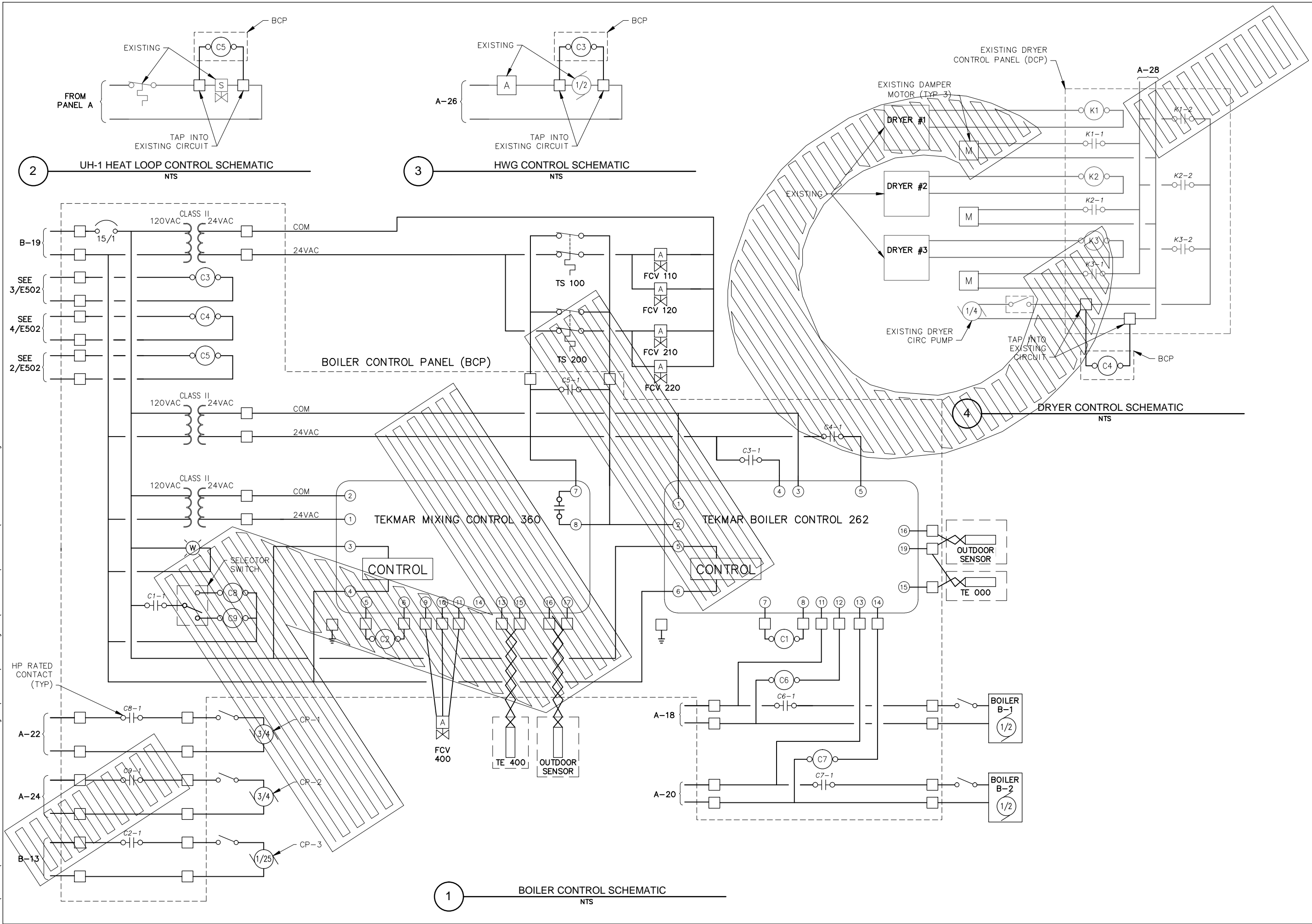
BOILER CONTROL PANEL (BCP)

NO.	REVISION	BY	DATE
1	ISSUED FOR CONSTRUCTION	TRK	9/2011

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Sheet No.	E502
SHEET	25 OF 26

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