CITY OF THORNE BAY, ALASKA

WASTEWATER DISINFECTION IMPROVEMENTS

MARCH 2018

CITY OF THORNE BAY
P.O. BOX 19110
THORNE BAY, ALASKA 99919
(907) 828-3380
FAX (907) 828-3374
www.thornebay-ak.gov

CITY OF THORNE BAY, AK

IN COOPERATION WITH THE
STATE OF ALASKA
DEPARTMENT OF
ENVIRONMENTAL CONSERVATION

VILLAGE SAFE WATER

VILLAGE SAFE
WATER PROGRAM

LOCATION MAP

SHEET INDEX

PROJECT NUMBER (CONSULTANT) 50093-01 (VSW) 17-VSW-KTB-009-00

PROJECT NUMBER (FEDERAL) 17-VSW-KTB-009-00

VSW PROJECT ENGINEER DOUG POAGE, P.E.

ONSITE CONSTRUCTION MANAGER

FINAL DESIGN (DATE) 2018-03-9

ADEC APPROVAL (DATE) 2018-02-26

CONSTRUCTION PERIOD (FROM) 2018-04 TO 2018-07

AS-BUILTS (DATE)

DOWL
WWW.DOWL.COM
3535 College Road, Suite 100
Fairbanks, Alaska 99709
907-374-0275

CONSULTANT

EDC, INC.
213 W. FIREWEED LANE
ANCHORAGE, AK 99503
(907) 276-7933
LICENSE NO. AECC705

SUBCONSULTANT

Project Status:
FINAL BID SET - AFC
Date:
MARCH 2018

FINAL BID SET
APPROVED FOR CONSTRUCTION

GENERAL NOTES:

1. THE LOCATION OF EXISTING UTILITIES SHOWN IS APPROXIMATE AND THE CONTRACTOR SHALL FIELD VERIFY PRIOR TO CONSTRUCTION. THE CONTRACTOR IS REQUIRED TO TAKE ALL PRECAUTIONARY MEANS TO PROTECT EXISTING UTILITIES.
2. WHERE CONDITIONS ARE ENCOUNTERED WHICH APPEAR DIFFERENT FROM THOSE INDICATED ON THE PLANS OR IN THE SPECIFICATIONS, THE CONTRACTOR SHALL NOTIFY THE ENGINEER PRIOR TO THE PERFORMANCE OF WORK.
3. CONSTRUCTION SAFETY AND SANITATION FACILITIES SHALL BE PROVIDED BY THE CONTRACTOR AND MAINTAINED PER THE REQUIREMENTS OF AUTHORITIES HAVING JURISDICTION.
4. THE CONTRACTOR SHALL PROTECT ADJACENT PRIVATE AND PUBLIC PROPERTY FROM DAMAGE DURING CONSTRUCTION. ANY DISTURBED PROPERTY OR SECTION CORNERS ARE TO BE RESET BY A PROFESSIONAL LAND SURVEYOR LICENSED IN THE STATE OF ALASKA AT THE CONTRACTORS EXPENSE.
5. THE CONTRACTOR SHALL BE RESPONSIBLE FOR CONTACTING ANY AND ALL UTILITIES IN THE AREA PRIOR TO BEGINNING ANY WORK ON THIS PROJECT.
6. THE CONTRACTOR SHALL REPLACE EXISTING FENCING AND ROADSIDE APPURTENANCES DISPLACED OR DAMAGED BY CONSTRUCTION.
7. ALL AREAS OF DISTURBANCE SHALL BE RECLAIMED TO A CONDITION THAT IS EQUAL TO OR BETTER THAN THE ORIGINAL. TOPSOIL IS TO BE SALVAGED AND REPLACED.
8. ANY REMOVED STRUCTURES SHALL BE DISPOSED OF OFF THE SITE IN A LAWFUL MANNER.
9. CONTRACTOR SHALL BE RESPONSIBLE FOR DUST CONTROL, USING WATER OR OTHER METHODS APPROVED BY THE ENGINEER.
10. CONTRACTOR SHALL PROVIDE A SET OF AS-BUILT DRAWINGS PRIOR TO THE FINAL ACCEPTANCE AND FINAL PAYMENT.
11. THE CONTRACTOR SHALL COMPLY WITH ALL CONDITIONS IDENTIFIED IN THE OWNER OBTAINED PERMITTING, IF APPLICABLE, SEE THE PROJECT SPECIFICATIONS FOR ADDITIONAL DETAILS.
12. ALL ABANDONED PIPES AND VALVES SHALL BE EITHER REMOVED COMPLETELY, OR PLUGGED WITH CONCRETE AND ALL VALVE BOXES SHALL BE REMOVED.
13. CONTRACTOR SHALL PREPARE AND SUBMIT FOR ENGINEER APPROVAL A TEMPORARY BYPASS PLAN THAT ALLOWS THE WASTEWATER PLANT TO CONTINUE OPERATING 24 HOURS PER DAY. TEMPORARY BYPASS AND THE PLAN APPROVAL IS INCIDENTAL TO THE WORK.

NOTICE TO BIDDERS

THE SCOPE OF WORK INCLUDES MODIFICATIONS TO THE ABANDONED CONCRETE CONTACT RACEWAY TO INCLUDE A UV DISINFECTION SYSTEM. THE BIDS SHALL INCLUDE A BASE BID AND ONE ADDITIVE ALTERNATE.

CONTRACTORS ARE TO PROVIDE A BASE BID FOR THE FOLLOWING:

- CONSTRUCT SITE MODIFICATIONS, AND ELECTRICAL IMPROVEMENTS, ASSOCIATED WITH THE INSTALLATION OF THE CITY-PROCURED UV SYSTEM. CONCRETE RACEWAY IS TO BE MODIFIED AS DESIGNED AND THE CONTROLS AND MAINTENANCE EQUIPMENT SHALL BE FURNISHED AND INSTALLED AS DESIGNED. FURNISH AND INSTALL THE UV SYSTEM ELECTRICAL POWER SUPPLY, CONTROLS AND ALL ASSOCIATED ELECTRICAL COMPONENTS.

CONTRACTORS ARE TO PROVIDE AN ADDITIVE ALTERNATE BID FOR THE FOLLOWING:

- FURNISH AND INSTALL THE SPECIFICED BACK-UP GENERATOR AND AUTOMATIC TRANSFER SWITCH. THE ADDITIVE ALTERNATE BID SHALL INCLUDE ALL WORK ASSOCIATED WITH THE GENERATOR, INCLUDING THE SITE MODIFICATIONS, CONCRETE PAD, CONDUITS BETWEEN GENERATOR AND ELECTRIC ROOM, AUTOMATIC TRANSFER SWITH, AND ASSOCIATED POWER CABLES AND CONDUITS

COMMON ABBREVIATIONS

ABAND.	ABANDON IN-PLACE	FND	FOUNDATION	SCH	SCHEDULE
BH	BOREHOLES	FT	FEET	SD	STORM DRAIN
C	COMMUNICATION	GPD	GALLONS PER DAY	SE	SOUTHEAST
C.B.	CATCH BASIN	HDPE	HIGH DENSITY POLYTHENE	SF	SQUARE FEET
CL	CENTERLINE	I.E.	INVERT ELEVATION	S.S.	STAINLESS STEEL
CL	CLASS	INV.	INVERT	STA.	STATION
CONC	CONCRETE	INV. EL.	INVERT ELEVATION	STL	STEEL
CP	CONTROL POINT	LF	LINEAL FEET	SW	SOUTHWEST
CSP	CORRUGATED STEEL PIPE	MH	MANHOLE	SY	SQUARE YARD
CY	CUBIC YARDS	MIN.	MINIMUM	TBC	TYPICAL
DEMO	DEMOLITION	MG/L	MILLIGRAMS PER LITER	TOC	TOP OF CONCRETE
DH	DRILL HOLE	ML	MILLILITER	TOS	TOP OF SLAB
DIA.	DIAMETER	N	NORTH / NORTHING	TEL	UNDERGROUND TELEPHONE
D.I.	DUCTILE IRON PIPE	NE	NORTHEAST	(TYP.)	TYPICAL
E	EAST / EASTING	NPW	NON-POTABLE WATER	UGP	UNDERGROUND POWER
EG	EXISTING GRADE	NW	NORTHWEST	UNK	UNKNOWN LOCATION
EL.	ELEVATION	O.D.	OUTSIDE DIAMETER	U/S	UPSTREAM
ELEC./E	ELECTRICAL	OE	OVERHEAD ELECTRIC	UV	ULTRAVIOLET
ELEV.	ELEVATION	OHP	OVERHEAD POWER	UW	UTILITY WATER
EOP	EDGE OF PAVEMENT	PP	POWER POLE	W	WEST OR WATER
EX.	EXISTING	PROP	PROPERTY	WALL	TOP OF RETAINING WALL
FFE	FINISHED FLOOR ELEVATION	PVC	POLYVINYL CHLORIDE PIPE	WSE	WATER SURFACE ELEV
FG	FINISHED GRADE	S	SOUTH OR SEWER	WW	WASTEWATER
FL	FLOWLINE OR FLANGE	S=	SLOPE	@	AT

GENERAL PROJECT LEGEND

EXISTING ITEMS

- EX. MAJOR CONTOUR (5.00')
- EX. MINOR CONTOUR (1.00')
- EXISTING EDGE OF ASPHALT
- EXISTING BUILDING OUTLINE
- EXISTING BUILDING OVERHANG
- EXISTING BORE HOLE
- EXISTING CONTROL POINT
- EXISTING TOP BACK OF CURB
- EXISTING CURB FLOWLINE
- EXISTING FENCE
- EXISTING EDGE OF GRAVEL
- EXISTING LANDSCAPING
- EXISTING MAILBOX
- EXISTING SIGN
- EXISTING STRUCTURE
- EXISTING TRAFFIC CONTROL LINES
- EXISTING COMMUNICATION LINE
- EX. OVERHEAD COMMUNICATION LINE
- EXISTING COMMUNICATION BOX
- EXISTING ELECTRIC LINE
- EXISTING OVERHEAD ELECTRIC LINE
- EXISTING UTILITY POLE
- EXISTING UTILITY ANCHOR
- EXISTING LIGHT
- EXISTING ELECTRIC METER
- EXISTING SANITARY SEWER LINE
- EXISTING SANITARY SEWER MANHOLE

EXISTING ITEMS

- EXISTING STORM DRAIN LINE
- EXISTING STORM DRAIN CULVERT
- EXISTING STORM DRAIN CATCH BASIN
- EXISTING TELEPHONE LINE
- EXISTING TELEPHONE PULL BOX
- EXISTING WATER LINE
- EXISTING WATER VALVE
- EXISTING FIRE HYDRANT
- EXISTING VEGETATION
- EXISTING TREE
- EXISTING EASEMENT
- EXISTING PROPERTY LINE

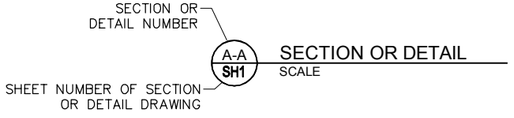
PROPOSED ITEMS

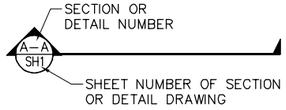
- PROPOSED MAJOR CONTOUR (5.00')
- PROPOSED MINOR CONTOUR (1.00')
- PROPOSED BUILDING OUTLINE
- PROPOSED BOLLARD
- PROPOSED FENCE
- PROPOSED EDGE OF ASPHALT
- PROPOSED EDGE OF CONCRETE
- PROPOSED CONCRETE HATCH
- PROPOSED EDGE OF GRAVEL
- PROPOSED GRAVEL HATCH
- PROPOSED SIGN
- PROPOSED STRUCTURE
- PROPOSED SIDEWALK EDGE

PROPOSED ITEMS

- PROPOSED COMMUNICATION LINE
- PROPOSED OVERHEAD COMM LINE
- PROPOSED ELECTRIC LINE
- PROPOSED OVERHEAD ELCTRIC LINE
- PROPOSED UTILITY POLE
- PROPOSED UTILITY ANCHOR
- PROPOSED LIGHT
- PROPOSED ELECTRIC TRANSFORMER
- PROPOSED JUNCTION BOX
- PROPOSED FIBER OPTICS LINE
- PROPOSED GAS LINE
- PROPOSED SANITARY SEWER LINE
- PROPOSED SANITARY SEWER MH
- PROPOSED SANITARY SEWER CLEANOUT
- PROPOSED STORM DRAIN LINE
- PROPOSED DRAINAGE SWALE
- PROPOSED STORM DRAIN CULVERT
- PROPOSED TELEPHONE LINE
- PROPOSED WATER LINE
- PROPOSED WATER VALVE
- PROPOSED FIRE HYDRANT
- PROPOSED YARD HYDRANT
- PROPOSED UTILITY WATER MAIN
- PROPOSED FORCE MAIN

DETAIL AND SECTION DESIGNATION





FINAL BID SET

APPROVED FOR CONSTRUCTION

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VILLAGE SAFE WATER

STATE OF ALASKA — 49TH — REGISTERED PROFESSIONAL ENGINEER — Drew A. Nelson — CE-13867 — 2018-3-9

DOWL — www.dowl.com — 3535 College Road, #100 Fairbanks, Alaska 99709 907-374-0275 — AECI.US

GENERAL NOTES, LEGEND, & ABBREVIATIONS

	DATE	BY	REVISION

Project No. 1529.50093.01
Date 2018-03-09
Designed PY
Drawn DW
Approved CN

Sheet No. G01

SHEET 1 OF 23

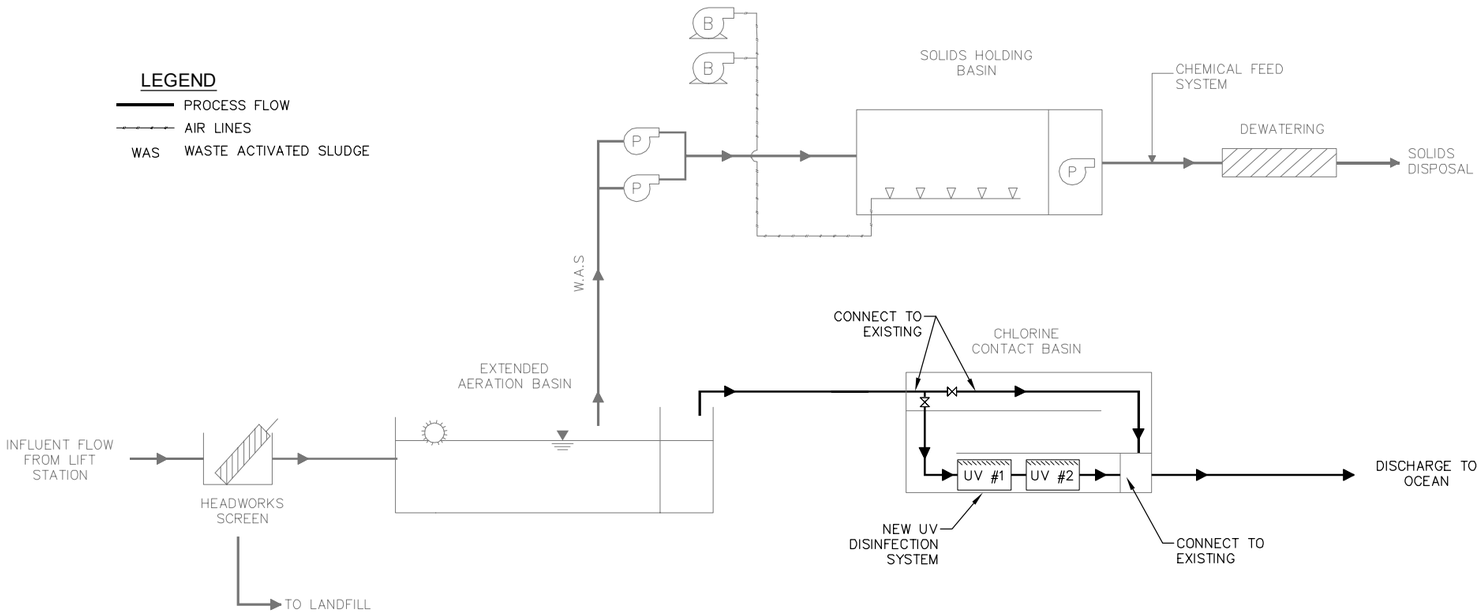
DESIGN CRITERIA

EXISTING FACILITY

DESIGN POPULATION=	900	PEOPLE
FACILITY DESIGN AVERAGE DAY=	0.14	MGD
FACILITY DESIGN MAX DAY=	0.42	MGD
FACILITY DESIGN PEAK HR=	292	GPM
EFFLUENT BOD=	30	MG/L
EFFLUENT TSS=	30	MG/L

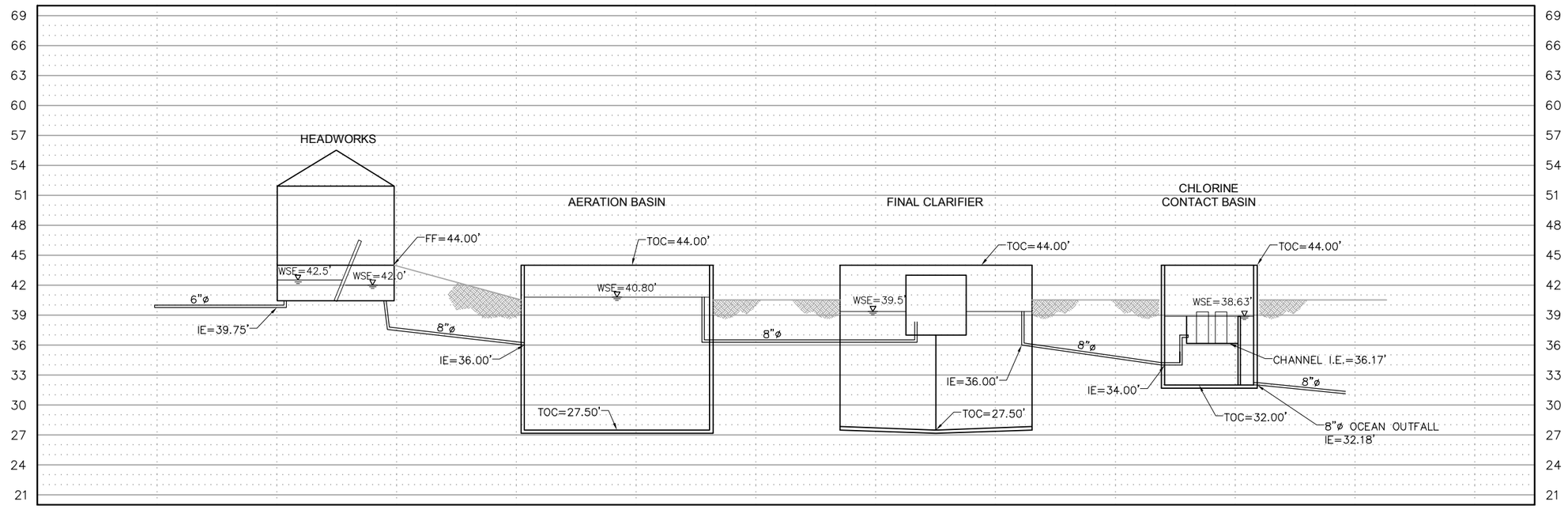
UV DISINFECTION SYSTEM

NUMBER OF UNITS=	2 @ 100%	
STYLE=	OPEN CHANNEL	
FLOW CONTROL=	WEIR	
DESIGN FLOW (PEAK HR)=	292	GPM
FECAL COLIFORM AVERAGE MONTH=	200	#/100ML
FECAL COLIFORM MAX. DAY=	800	#/100ML
UV TRANSMITTANCY=	65%	
EFFLUENT TSS=	30	MG/L
EFFLUENT BOD=	30	MG/L
AIR TEMPERATURE MAX.=	90	°F
AIR TEMPERATURE MIN.=	−4	°F



PROCESS FLOW DIAGRAM

HYDRAULIC GRADE - TREATMENT PROCESS



NOTES:
1. THE HYDRAULIC PROFILE IS BASED ON THE EXISTING RECORD DRAWINGS AT A PEAK HOURLY FLOW RATE OF 292 GPM / 420,000 GPD.

FINAL BID SET

APPROVED FOR CONSTRUCTION

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CE-13867
2018-3-9
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DESIGN CRITERIA, PROCESS FLOW DIAGRAM & HYDRAULIC PROFILE

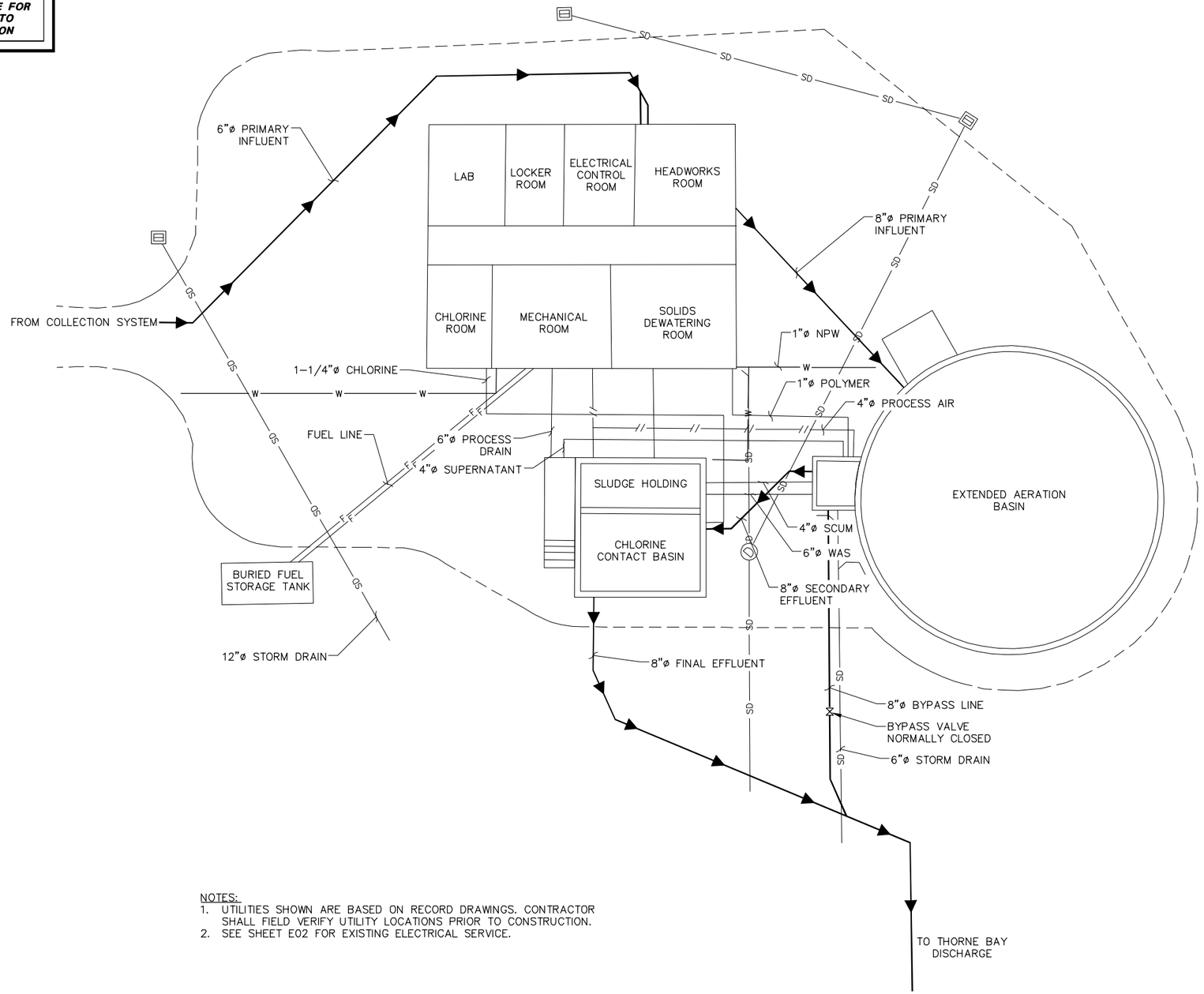
REVISION	BY	DATE

Project No. 1529.50093.01
Date 2018-03-09
Designed PY
Drawn DW
Approved CN

Sheet No. G02

SHEET 2 OF 23

CAUTION ! ! !
EXISTING UTILITIES IN AREA
CONTRACTOR RESPONSIBLE FOR UTILITY LOCATES PRIOR TO AND DURING CONSTRUCTION



NOTES:
1. UTILITIES SHOWN ARE BASED ON RECORD DRAWINGS. CONTRACTOR SHALL FIELD VERIFY UTILITY LOCATIONS PRIOR TO CONSTRUCTION.
2. SEE SHEET E02 FOR EXISTING ELECTRICAL SERVICE.

N

10 0 10 20
SCALE IN FEET

FINAL BID SET
APPROVED FOR CONSTRUCTION

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VILLAGE SAFE WATER

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49TH
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REGISTERED
Orsea A. Nelson
CE-13867
2018-3-3

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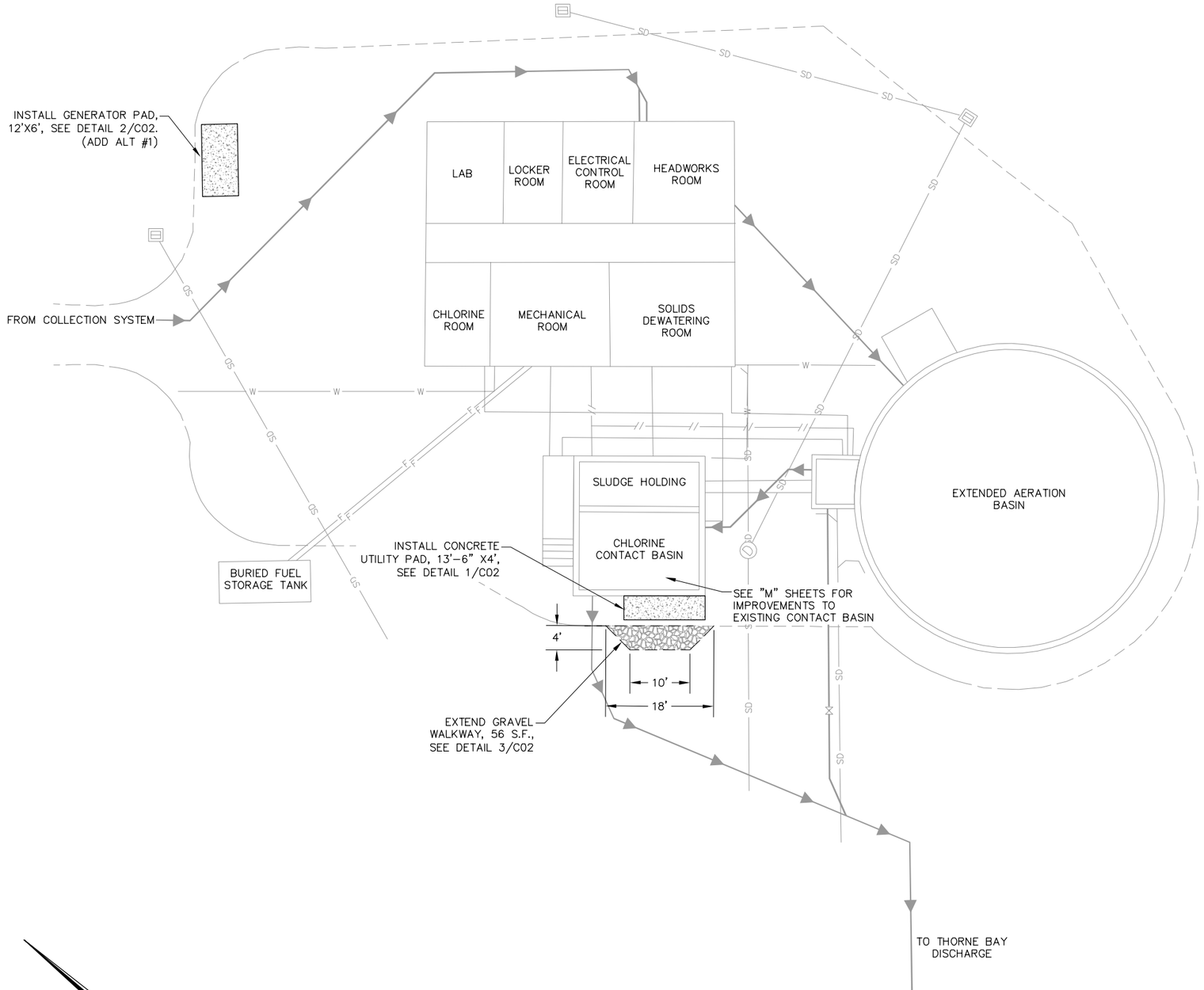
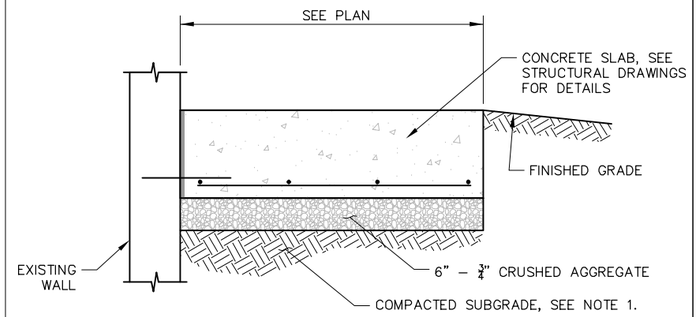
OVERALL TREATMENT SITE
EXISTING SITE PLAN

BY	DATE	REVISION

Project No. 1529.500933.01
Date 2018-03-09
Designed PY
Drawn DW
Approved CN

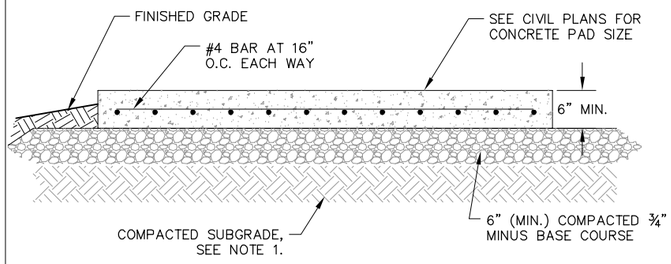
Sheet No. C01
SHEET 3 OF 23





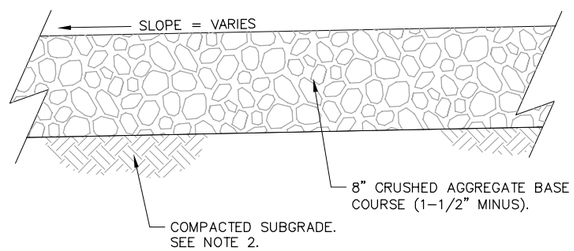
NOTES:
1. COMPACT SUBGRADE OR BASE COURSE TO 95% OF MAXIMUM DRY DENSITY, ±2% OF OPTIMUM MOISTURE CONTENT, PER ASTM D698.
2. CONTRACTION JOINTS SHALL BE PLACED AT 10' INTERVALS AND SHALL HAVE A MINIMUM DEPTH OF 3/4" AND MINIMUM WIDTH OF 1/8".

1 / C02 TYPICAL CONCRETE UTILITY PAD
NTS



NOTES:
1. COMPACT SUBGRADE OR BASE COURSE TO 95% OF MAXIMUM DRY DENSITY, ±2% OF OPTIMUM MOISTURE CONTENT, PER ASTM D698.

2 / C02 TYPICAL GENERATOR PAD
NTS



NOTE:
1. PRIOR TO PLACEMENT OF AGGREGATE BASE COURSE, ALL TOPSOIL AND DELETERIOUS MATERIAL SHALL BE REMOVED.
2. COMPACT SUBGRADE OR BASE COURSE TO 95% OF MAXIMUM DRY DENSITY, ±2% OF OPTIMUM MOISTURE CONTENT, PER ASTM D698.

3 / C02 TYPICAL GRAVEL SECTION
NTS

FINAL BID SET
APPROVED FOR CONSTRUCTION

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VILLAGE SAFE WATER

STATE OF ALASKA 49TH — REGISTERED PROFESSIONAL ENGINEER — Drew A. Nelson — CE-13867 — 2018-3-3

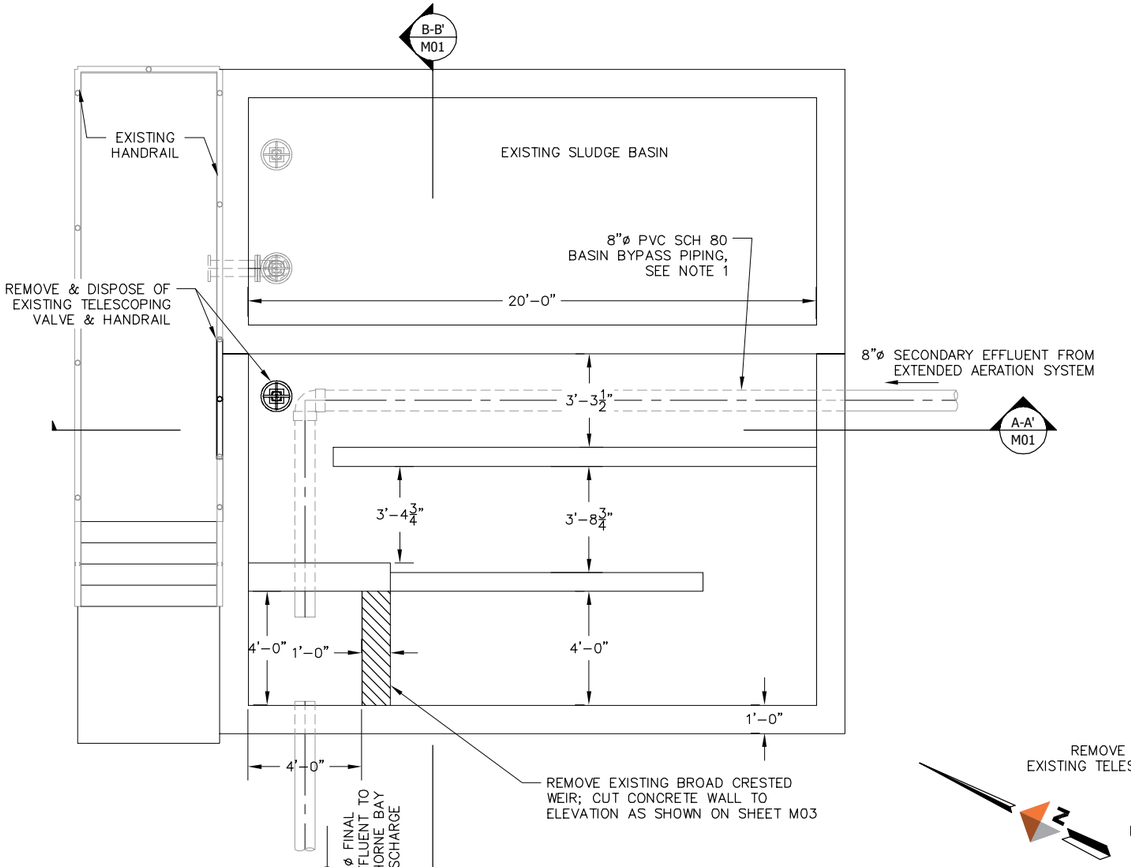
DOWL — AECL646 — www.dowl.com — 3535 College Road, #100 Fairbanks, Alaska 99709 907-474-0275

OVERALL TREATMENT SITE CIVIL SITE IMPROVEMENTS PLAN

REVISION	BY	DATE

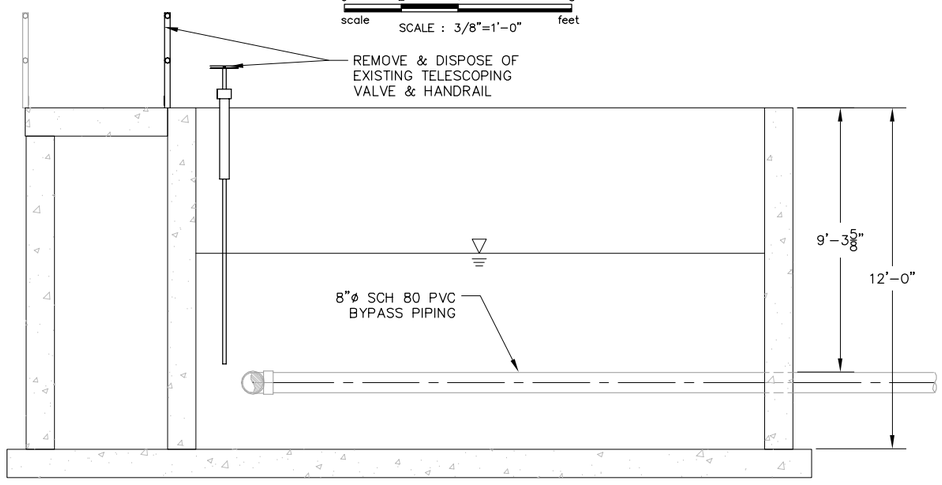
Project No. 1529.50093.01
Date 2018-03-09
Designed PY
Drawn DW
Approved CN

Sheet No. C02
SHEET 4 OF 23

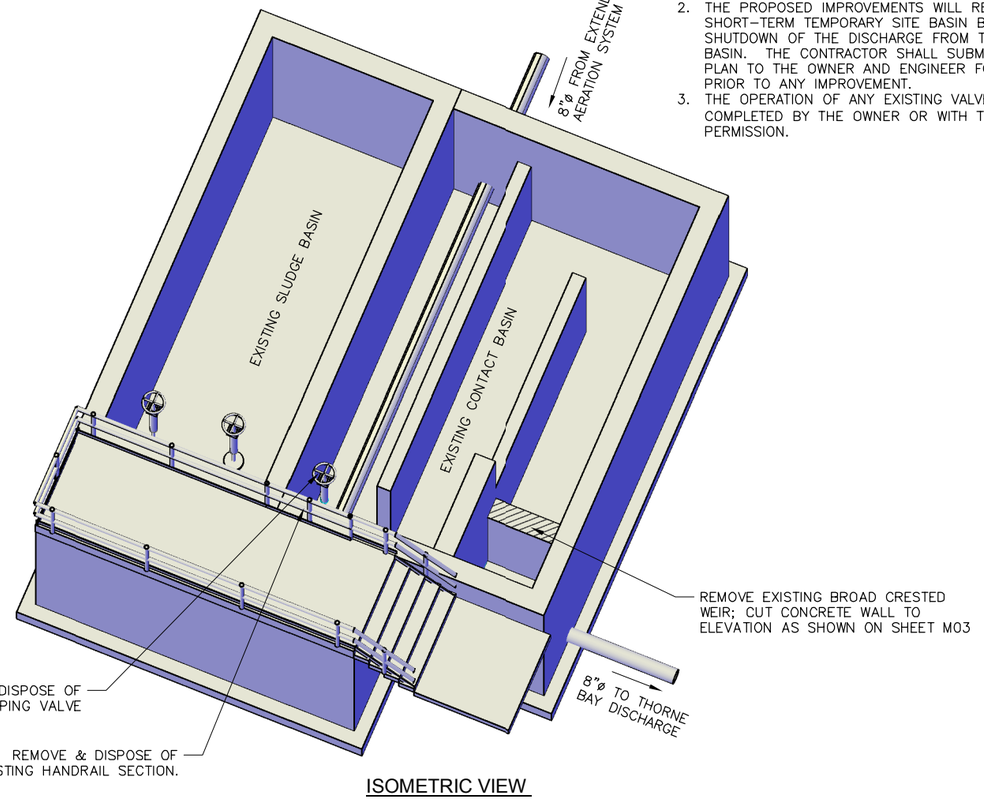


EXISTING CHLORINE CONTACT BASIN - PLAN VIEW

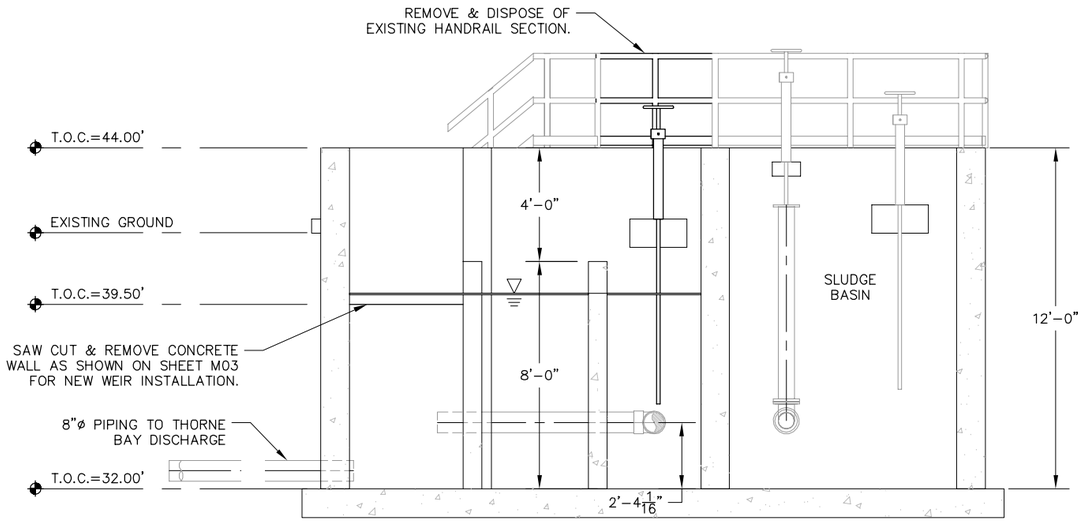
scale 0 2 4 8 feet
SCALE : 3/8"=1'-0"



A-A' M01 SECTION
scale 0 2 4 8 feet
SCALE : 3/8"=1'-0"



ISOMETRIC VIEW



B-B' M01 SECTION
scale 0 2 4 8 feet
SCALE : 3/8"=1'-0"

NOTES:
1. THE EXISTING CONTACT BASIN IS CURRENTLY OUT OF SERVICE WITH EFFLUENT FLOW UTILIZING THE BYPASS PIPING WITHIN THE CONTACT BASIN.
2. THE PROPOSED IMPROVEMENTS WILL REQUIRE A SHORT-TERM TEMPORARY SITE BASIN BYPASS OR SHUTDOWN OF THE DISCHARGE FROM THE TREATMENT BASIN. THE CONTRACTOR SHALL SUBMIT A BYPASS PLAN TO THE OWNER AND ENGINEER FOR APPROVAL PRIOR TO ANY IMPROVEMENT.
3. THE OPERATION OF ANY EXISTING VALVES SHALL BE COMPLETED BY THE OWNER OR WITH THE OWNER'S PERMISSION.

FINAL BID SET
APPROVED FOR CONSTRUCTION

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VILLAGE SAFE WATER

STATE OF ALASKA 49TH
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Chase A. Nelson
CE-13867
2018-3-9

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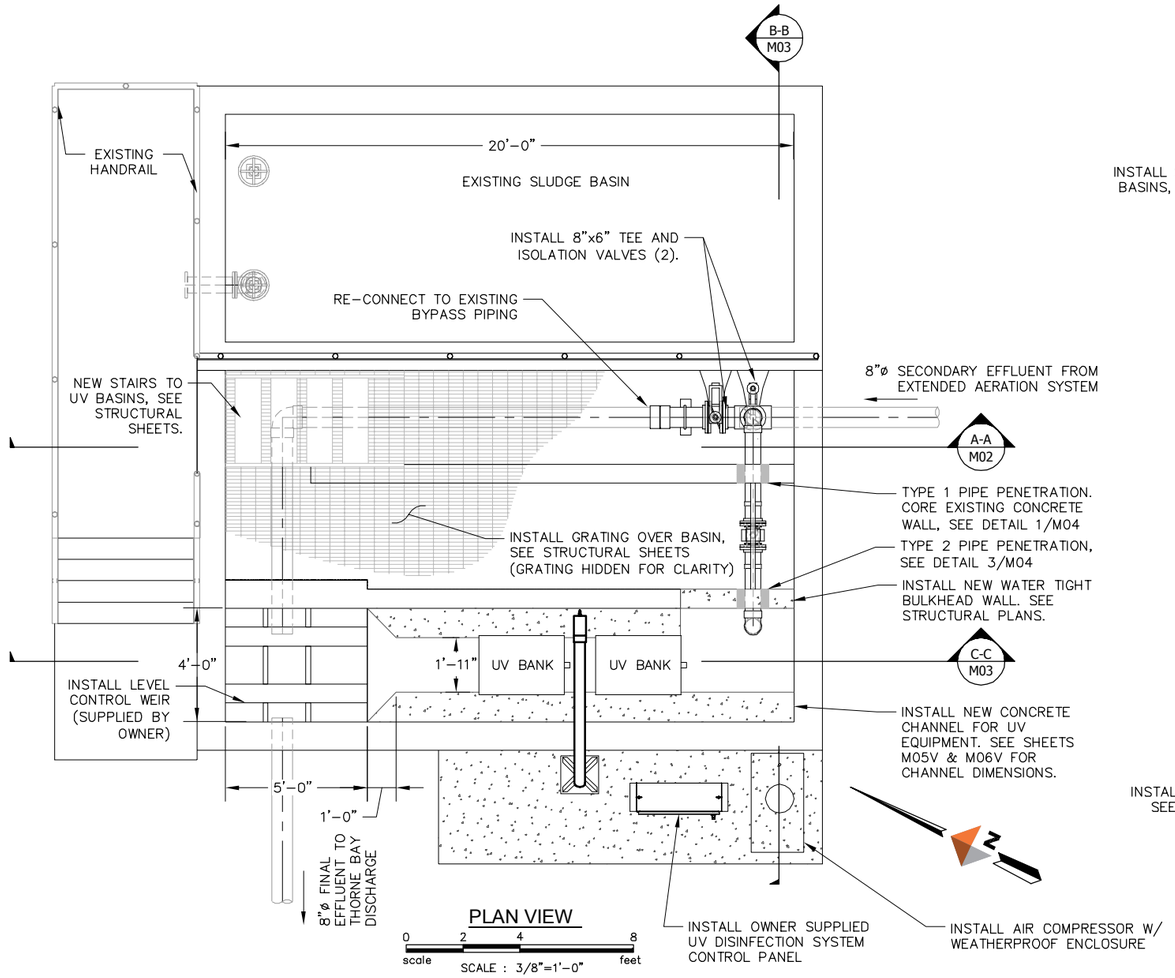
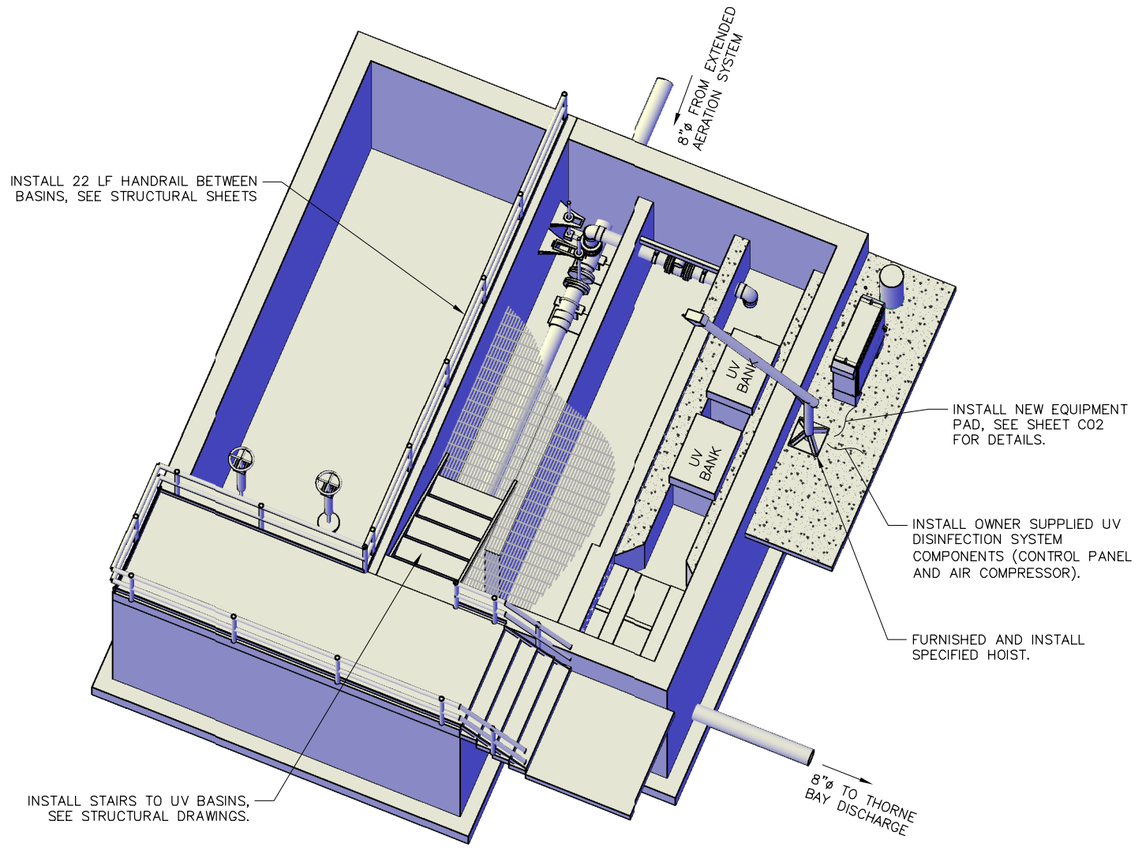
EXISTING CHLORINE CONTACT BASIN DEMO PLAN & SECTIONS

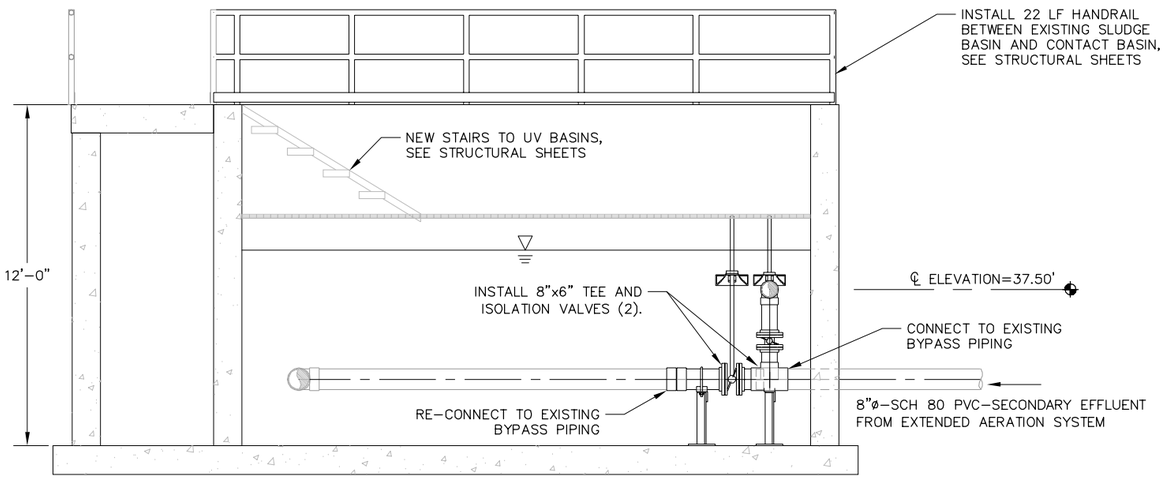
REVISION	BY	DATE

Project No. 1529.50093.01
Date 2018-03-09
Designed PY
Drawn DW
Approved CN

Sheet No. M01
SHEET 5 OF 23







NOTES:
1. UV DISINFECTION SYSTEM TO BE SUPPLIED BY THE OWNER & INSTALLED BY CONTRACTOR. SEE APPENDIX A OF CONTRACT DOCUMENTS FOR SCOPE OF SUPPLIES AND VENDOR DRAWING SHEETS M05V, M06V & M07V FOR DETAILS.
2. ALL PIPING, FITTING & VALVE CONNECTIONS SHALL BE WATER TIGHT. VISUAL INSPECTION FOR LEAKS SHALL BE VERIFIED BY THE OWNER & ENGINEER.
3. CONTRACTOR IS RESPONSIBLE FOR ALL CONDUIT & PIPING TO CONNECT UV BANKS TO CONTROLS & AIR COMPRESSOR.

FINAL BID SET

APPROVED FOR CONSTRUCTION

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CE-13867
2018-3-9

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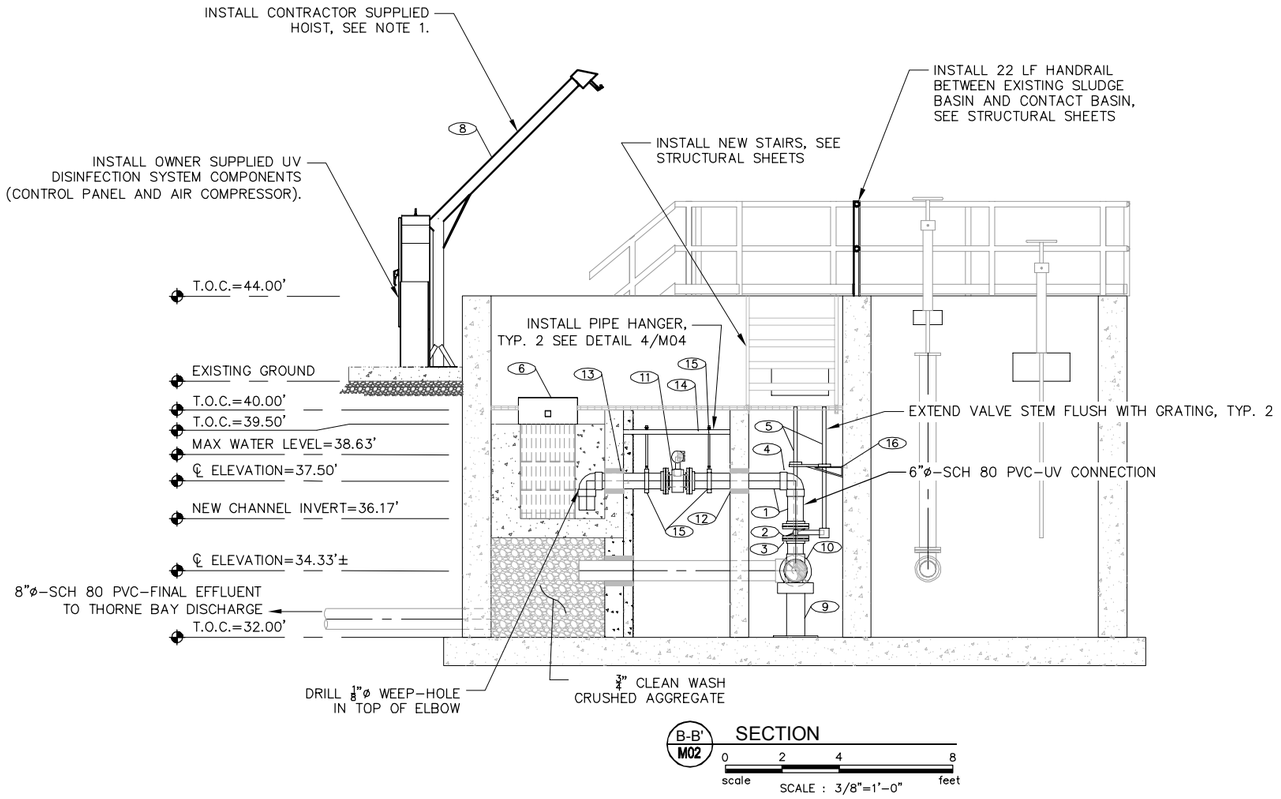
UV DISINFECTION SYSTEM IMPROVEMENTS PLAN & SECTIONS

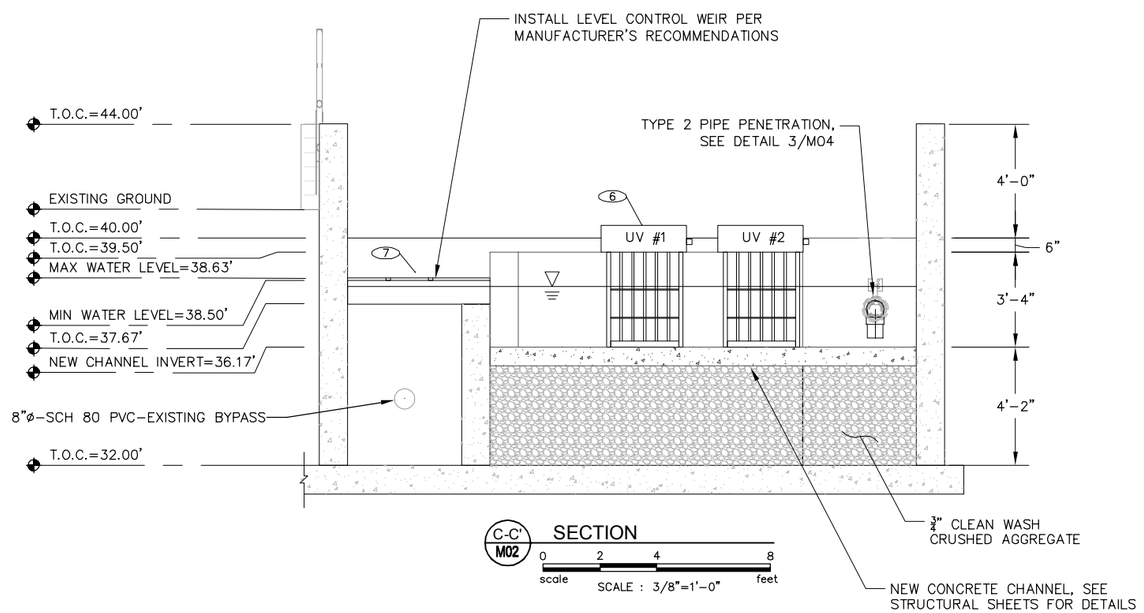
REVISION	BY	DATE

Project No. 1529.50093.01
Date 2018-03-09
Designed PY
Drawn DW
Approved CN

Sheet No. M02

SHEET 6 OF 23





EQUIPMENT & FITTING SCHEDULE

ID	QTY	DESCRIPTION	SUPPLIED BY
1	9 LF	6"ø PVC PIPE (SCH 80)	CONTRACTOR
2	2	6"ø BUTTERFLY VALVE, FLxFL	CONTRACTOR
3	4	6"ø PUSH-ON FLANGE (SCH 80)	CONTRACTOR
4	2	6"ø 90 DEGREE BEND (SCH 80)	CONTRACTOR
5	2	VALVE STEM EXTENDER	CONTRACTOR
6	2	UV MODULE	OWNER
7	1	LEVEL CONTROL WEIR	OWNER
8	1	HOIST	CONTRACTOR
9	2	PIPE SUPPORT	CONTRACTOR
10	1	8"X6" REDUCING TEE (SCH 80)	CONTRACTOR
11	1	6"ø FLOW METER	CONTRACTOR
12	1	TYPE 1 PIPE PENETRATION	CONTRACTOR
13	1	TYPE 2 PIPE PENETRATION	CONTRACTOR
14	1	STRUCTURAL BEAM, C6X8.2	CONTRACTOR
15	2	PIPE HANGER	CONTRACTOR
16	2	VALVE STEM GUIDE	CONTRACTOR

NOTE: QUANTITIES SHOWN FOR REFERENCE ONLY. CONTRACTOR IS RESPONSIBLE FOR FINAL QUANTITIES.

NOTES:
1. CONTRACTOR TO PROVIDE AND INSTALL EQUIPMENT HOIST, CAPTAIN SERIES 571 OR APPROVED EQUAL, SEE PROJECT SPECIFICATIONS.
2. CONTRACTOR TO PROVIDE 36" VALVE KEY OPERATOR.

CITY OF THORNE BAY
P.O. BOX 19110
THORNE BAY, ALASKA 99919
(907) 828 3380
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www.thornebay-ak.gov

VILLAGE SAFE WATER

STATE OF ALASKA 49TH
REGISTERED PROFESSIONAL ENGINEER
Chase A. Nelson
CE-13867
2018-3-9

DOWL AECL646
www.dowl.com
3535 College Road, #100
Fairbanks, Alaska 99709
907-374-0275

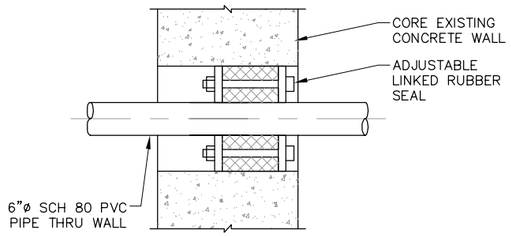
UV DISINFECTION SYSTEM IMPROVEMENTS SECTIONS

REVISION	BY	DATE

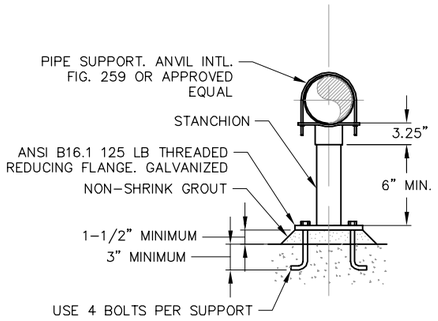
Project No. 1529.50093.01
Date 2018-03-09
Designed PY
Drawn DW
Approved CN

Sheet No. M03
SHEET 7 OF 23

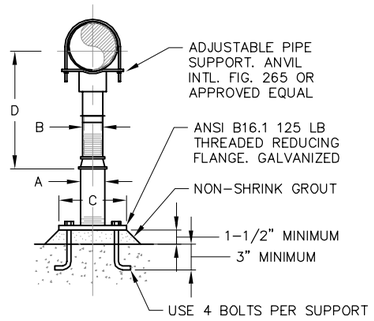
FINAL BID SET
APPROVED FOR CONSTRUCTION



1 M04 TYPE 1 - PIPE PENETRATION (FOR EXISTING WALL)
NTS



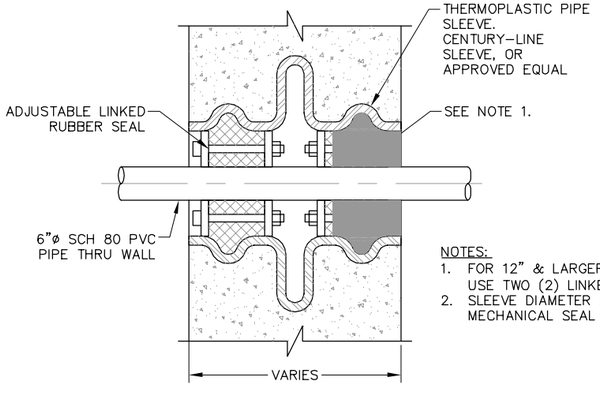
FIXED PIPE SADDLE SUPPORT



ADJUSTABLE PIPE SADDLE SUPPORT

ADJUSTABLE PIPE SUPPORT DIMENSIONS						
PIPE SIZE	A	B	C	D MIN.	D MAX.	ANCHOR BOLT DIA.
4	4"	3"	9"	9-1/2"	14"	5/8"
6	4"	3"	9"	10-3/4"	15-1/4"	5/8"
8	4"	3"	9"	12-1/4"	16-3/4"	5/8"

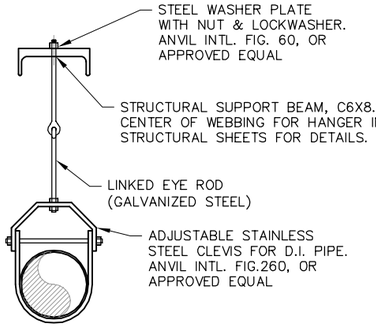
2 M04 TYPICAL PIPE SADDLE SUPPORT
NTS



NOTES:
1. FOR 12" & LARGER DIAMETER PIPES, USE TWO (2) LINKED SEALS
2. SLEEVE DIAMETER AS RECOMMENDED B MECHANICAL SEAL MANUFACTURER

NOTES:
1. INSTALL LINK-SEAL CONNECTION PER MANUFACTURER RECOMMENDATIONS. GROUT IN PLACE IF NECESSARY TO PROVIDE A WATER TIGHT SEAL

3 M04 TYPE 2 - PIPE PENETRATION (CAST-IN-PLACE)
NTS



NOTES:
1. GALVANIZE ALL PARTS AFTER FABRICATION. SEE PROJECT SPECIFICATIONS.

4 M04 TYPICAL PIPE HANGER
NTS

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CITY OF THORNE BAY
P.O. BOX 19110
THORNE BAY, ALASKA 99919
(907) 828 3380
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VILLAGE SAFE WATER

STATE OF ALASKA
Chase A. Nelson
CE-13345
2018-3-9
REGISTERED PROFESSIONAL ENGINEER

DOWL
AECL#46
3536 College Road, #100
Fairbanks, Alaska 99709
907-374-4275

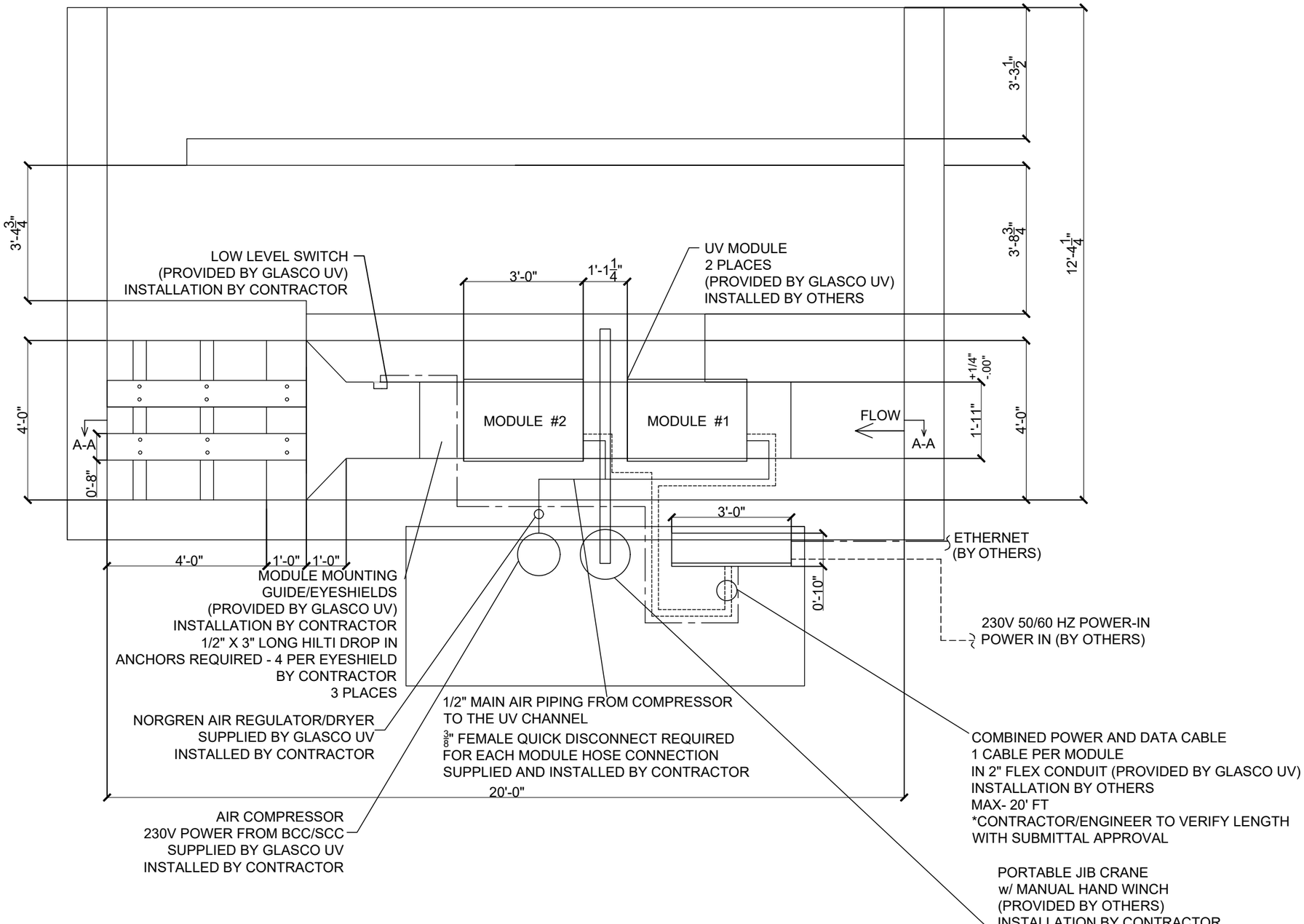
UV DISINFECTION SYSTEM IMPROVEMENTS
STANDARD DETAILS

REVISION	BY	DATE

Project No. 1529.50093.01
Date 2018-03-09
Designed PY
Drawn DW
Approved CN

Sheet No. M04
SHEET 8 OF 23

REV	DESCRIPTION	DATE	APPROVED



Sheet No. M05V

SHEET 9 OF 23

FINAL BID SET

APPROVED FOR CONSTRUCTION

Glasco UV
126 Christie Avenue. Mahwah, NJ 07430
PH: 201-934-3348 FX: 201-934-3388
WWW.GLASCOUV.COM

PROJECT: THORNE BAY, AK

FINISH:

MATERIAL:

TOLERANCES UNLESS OTHERWISE SPECIFIED
X = ± .030
XX = ± .015
XXX = ± .005
ANG = ± -

DO NOT SCALE DRAWING

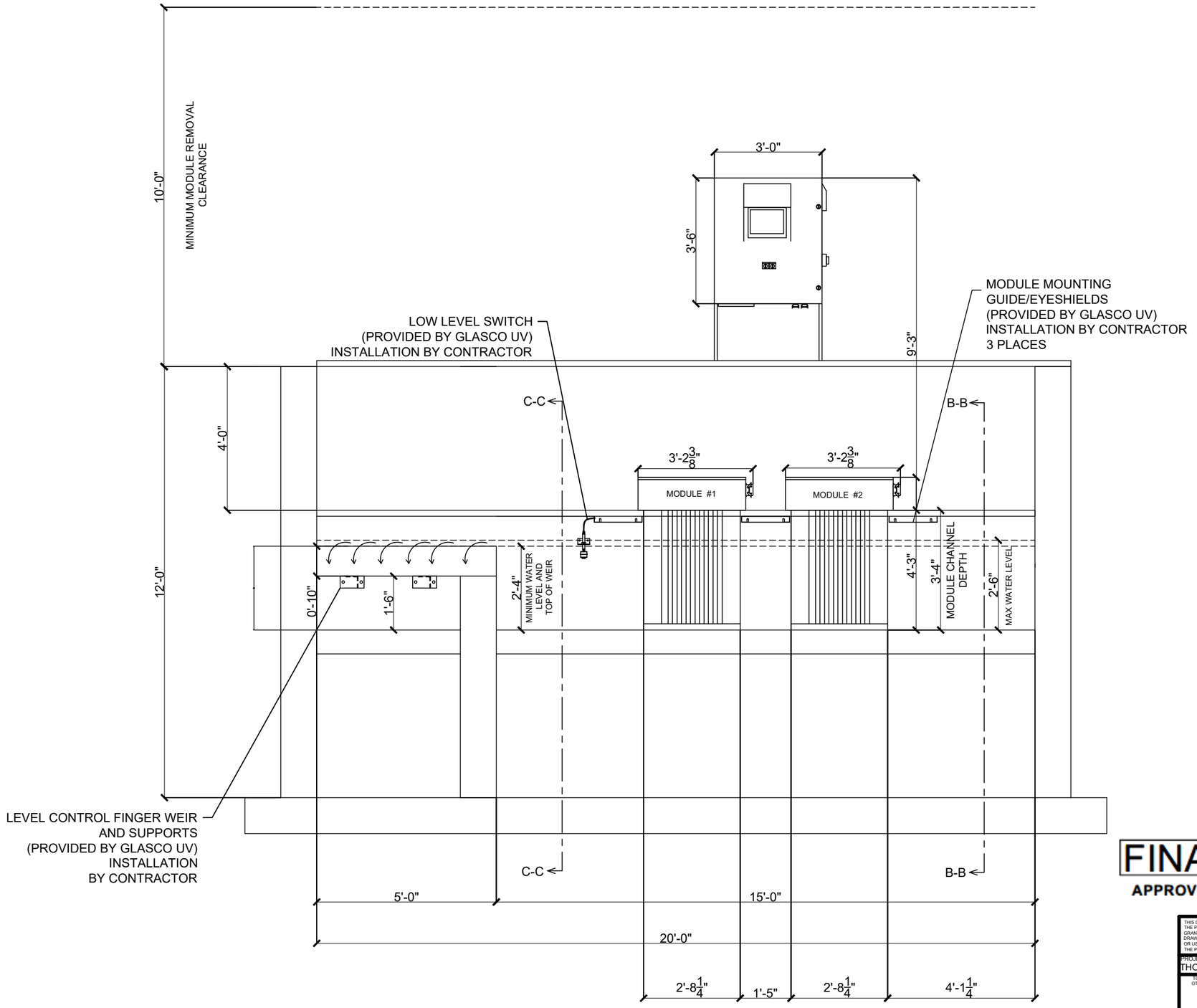
DWN	ES	11/2/17
APVD	RV	11/2/17

TITLE: UV EQUIPMENT LAYOUT TOP VIEW

SIZE: D | DWG. NO.: GLOW-VCS-40HO-LB (X2) | REV: -

SCALE: N/A | SHEET 1 OF 3

REV	DESCRIPTION	DATE	APPROVED



FINAL BID SET

APPROVED FOR CONSTRUCTION

Sheet No. M06V

SHEET 10 OF 23

Glasco UV
126 Christie Avenue. Mahwah, NJ 07430
PH: 201-934-3348 FX: 201-934-3388
WWW.GLASCOUV.COM

PROJECT: THORNE BAY, AK

FINISH:

MATERIAL:

TOLERANCES UNLESS OTHERWISE SPECIFIED
X = ± .030
XX = ± .015
XXX = ± .005
ANG = ± °
DO NOT SCALE DRAWING

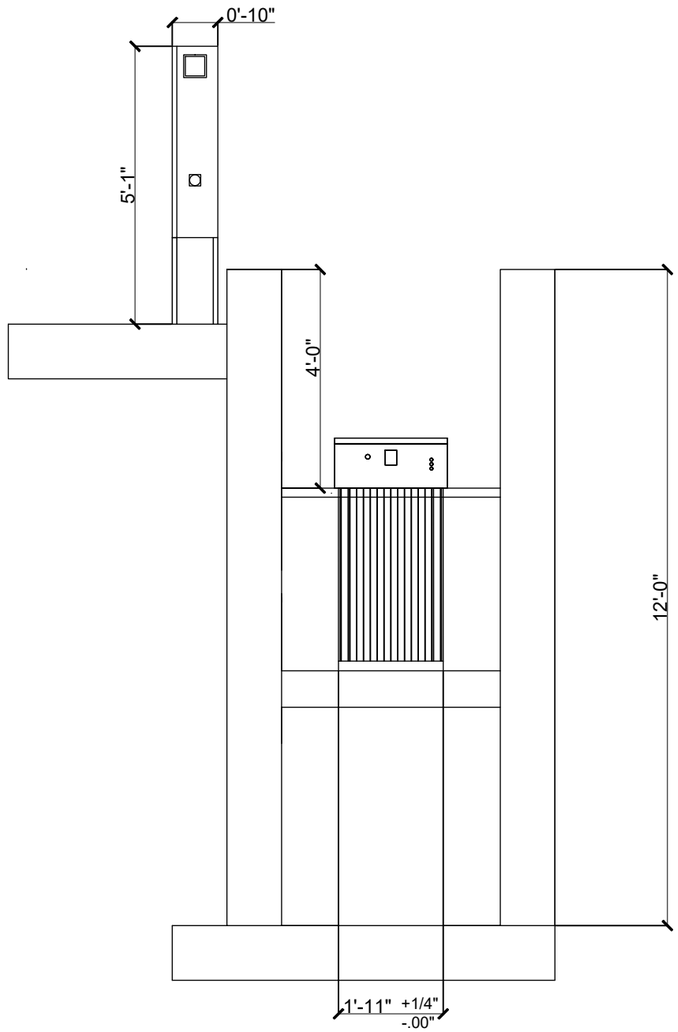
DWN	ES	11/2/17
APVD	RV	11/2/17

TITLE: UV EQUIPMENT LAYOUT SIDE VIEW

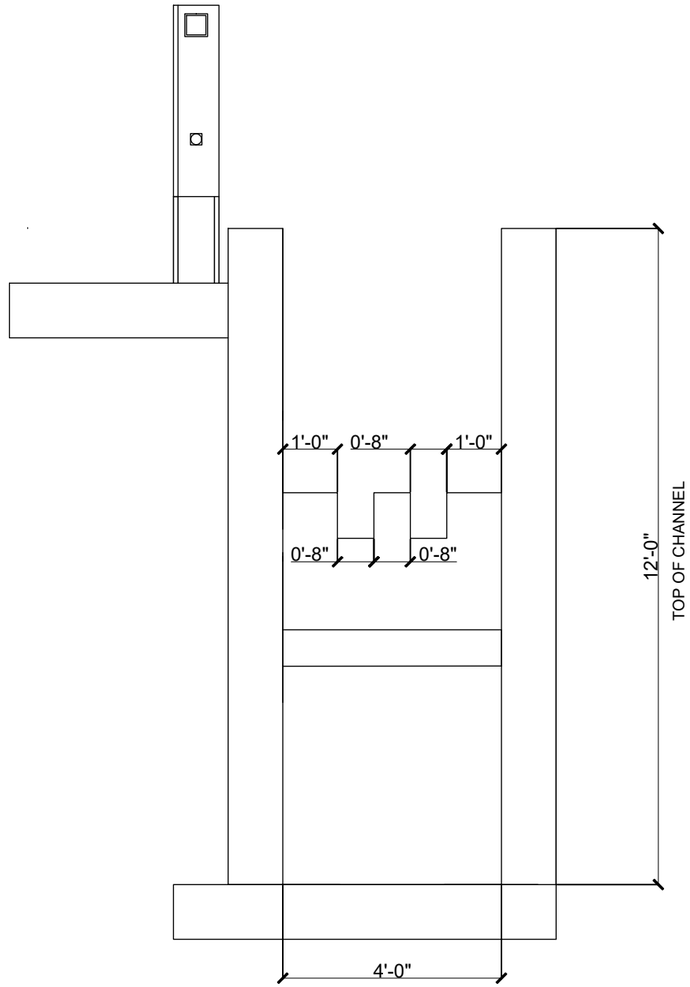
SIZE: D | DWG. NO.: GLOW-VCS-40HO-LB (X2) | REV: -

SCALE: N/A | SHEET 2 OF 3

REV	DESCRIPTION	DATE	APPROVED



UV MODULE CHANNEL AREA



WEIR FINGER NOT SHOWN FOR CLARITY
CONCRETE DIMENSIONS REQUIRED AS SHOWN

Sheet No. M07V

SHEET 11 OF 23

FINAL BID SET

APPROVED FOR CONSTRUCTION

Glasco UV
126 Christie Avenue, Mahwah, NJ 07430
PH: 201-934-3348 FX: 201-934-3388
WWW.GLASCOUV.COM

PROJECT: THORNE BAY, AK

FINISH:

TOLERANCES UNLESS OTHERWISE SPECIFIED
X = ± .030
XX = ± .015
XXX = ± .005
ANG = ± -
DO NOT SCALE DRAWING

MATERIAL:

DWN	ES	11/2/17
APVD	RV	11/2/17

TITLE: UV EQUIPMENT LAYOUT CUT VIEW

SIZE: D | DWG. NO.: GLOW-VCS-40HO-LB (X2) | REV: -

SCALE: N/A | SHEET 3 OF 3

STRUCTURAL GENERAL NOTES:

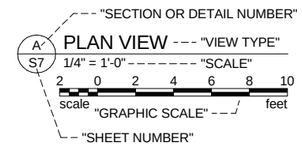
1. APPLICABLE SPECIFICATIONS AND CODES:
   a. CONSTRUCTION AND DESIGN SHALL BE IN ACCORDANCE WITH THE AMERICAN CONCRETE INSTITUTE SPECIFICATIONS AND THE REQUIREMENTS NOTED AS FOLLOWS.
2. DESIGN LOADS:
   a. DEAD LOAD - - - - - - - - - - SELF-WEIGHT OF INDIVIDUAL ELEMENTS, COMPONENTS AND EQUIPMENT.
   b. LIVE LOADS
      i. CATWALKS AND STEEL PEDESTRIAN WALKWAYS - - - 40 PSF OR 300 LBS CONCENTRATED LOAD.
      ii. FALL PROTECTION CLIPS - - - - - - - - - - - 300 LBS
      iii. HANDRAILS - - - - - - - 50 PEF OR 200 LBS CONCENTRATED LOAD.
3. CONSTRUCTION LOADS:
   PROVIDE TEMPORARY BRACING, SHORING OR OTHER SUPPLEMENTAL SUPPORT DURING CONSTRUCTION AS NECESSARY TO PROTECT THE STRUCTURES FROM EXCESSIVE CONSTRUCTION LOADS.
4. CONCRETE:
   a. CONCRETE CONSTRUCTION SHALL CONFORM TO THE AMERICAN CONCRETE INSTITUTE BUILDING CODE REQUIREMENTS FOR REINFORCED CONCRETE (ACI 318).
   b. DETAILING, FABRICATION AND PLACEMENT OF REINFORCEMENT SHALL CONFORM TO DETAILS AND DETAILING OF CONCRETE REINFORCEMENT (ACI 315).
   c. MATERIALS
      i. STRUCTURAL CAST-IN-PLACE - f'c = 4,000 PSI MINIMUM.
      ii. REINFORCING BARS - - - - - - - - ASTM A615, GRADE 60
   d. ALL BENT REINFORCING BARS SHALL BE SHOP FABRICATED ONLY. REBENDING OR WELDING OF REINFORCEMENT WILL NOT BE PERMITTED UNLESS AUTHORIZED BY ENGINEER.
   e. END HOOKS IN REINFORCING BARS & LAP SPLICES SHOWN ON THE DRAWINGS BUT NOT DIMENSIONED SHALL CONFORM TO ACI 318.
   f. CONCRETE COVER OVER REINFORCEMENT SHALL BE 2" CLEAR, EXCEPT CONCRETE PLACED AGAINST AND PERMANENTLY IN CONTACT WITH EARTH SHALL BE 3" CLEAR.
   g. REINFORCEMENT SPLICES ARE NOT PERMITTED EXCEPT AS DETAILED OR AUTHORIZED BY ENGINEER. LAP REINFORCING BARS THE FOLLOWING MINIMUMS AT ALL SPLICES, CORNERS AND INTERSECTIONS, UNLESS OTHERWISE INDICATED. TOP BARS ARE HORIZONTAL BARS WITH MORE THAN 12" OF CONCRETE CAST BELOW THE BAR.

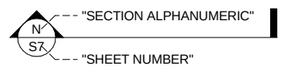
BAR SIZE	REG. BARS	TOP BARS
#3	1'-3"	1'-7"
#4	1'-7"	2'-1"
#5	2'-0"	2'-7"
#6	2'-5"	3'-1"
#7	3'-6"	4'-6"
#8	4'-0"	5'-2"
#9	4'-6"	5'-10"
#10	5'-1"	6'-7"

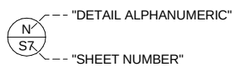
   h. STAGGER ADJACENT REINFORCEMENT LAP SPLICES IN WALLS 18" MINIMUM.
   i. PROVIDE BAR SUPPORTS TO PROPERLY SECURE AND SUPPORT REINFORCING BARS AT POSITIONS SHOWN ON THE DRAWINGS. IN ADDITION TO NORMAL ACCESSORIES PROVIDE #5 STANDEES AT 36" O.C. TO SUPPORT TOP REINFORCEMENT IN BASE SLABS, AND #3 U OR Z SHAPE SPACERS AT 72" O.C. EACH WAY IN WALLS WITH TWO CURTAINS OF REINFORCEMENT.
   j. DOWELS, PIPES AND OTHER INSTALLED MATERIALS AND ACCESSORIES SHALL BE HELD SECURELY IN POSITION DURING CONCRETE PLACEMENT.
   k. REINFORCING BARS AND ACCESSORIES SHALL NOT BE IN CONTACT WITH ANY PIPE, PIPE FLANGE OR METAL PART EMBEDDED IN CONCRETE. PROVIDE 2" CLEARANCE IN ALL CASES UNLESS OTHERWISE INDICATED. NO EMBEDDED ITEM SHALL BE SUSPENDED FROM, SUPPORTED BY, OR BRACED IN PLACE FROM THE STRUCTURAL REINFORCEMENT.
   l. LOCATE CONSTRUCTION JOINTS AS SHOWN ON THE DRAWINGS OR AS AUTHORIZED BY ENGINEER.
   m. THOROUGHLY CLEAN BY MECHANICAL SCARIFICATION ALL BONDED CONSTRUCTION JOINTS PRIOR TO PLACING CONCRETE IN ADJACENT POUR.
   n. BEGIN SPACING OF BARS THAT PARALLEL CONSTRUCTION AND EXPANSION JOINTS 2" CLEAR FROM EACH SIDE OF JOINT.
   o. CHAMFER ALL EXPOSED CONCRETE EDGES 3/4", UNLESS OTHERWISE DICATED.
   p. ALL NEW CONCRETE IS CAST-IN-PLACE UNLESS OTHERWISE NOTED.
   q. SCHEDULE AN ENGINEERING INSPECTION OF THE REINFORCEMENT PRIOR TO PLACING OF ANY CONRETE.
5. STRUCTURAL STEEL
   a. STRUCTURAL STEEL CONSTRUCTION SHALL CONFORM TO THE AMERICAN INSTITUTE OF STEEL CONSTRUCTION SPECIFICATION FOR THE DESIGN, FABRICATION AND ERECTION OF STRUCTURAL STEEL FOR BUILDINGS.
   b. MATERIAL
      i. STRUCTURAL PLATE - - - - - - - - - - - - ASTM A572, GRADE 50
      ii. SHAPES - ASTM A36 OR A992
      iii. HANDRAIL POSTS AND RAILS - - - - - - ASTM A53 GRADE B
      iv. BAR GRATING - - - - - - - - - - - - - - - - - - ASTM A36
   c. ALL WELDING SHALL CONFORM TO AMERICAN WELDING SOCIETY STRUCTURAL WELDING CODE-STEEL (AWS D1.1), AND SHALL BE PERFORMED BY WELDERS QUALIFIED BY THE APPROPRIATE AWS TEST FOR THE WELDING PERFORMED.
   d. ALL STEEL METALWORK FOR THE PROJECT SHALL BE HOT-DIP GALVANIZED AFTER FABRICATION, OTHER THAN STAINLESS STEEL OR STEEL SPECIFICALLY INDICATED TO BE PAINTED.
   e. ADHESIVE ANCHORS SHALL BE HILTI HIT RE 500 V3 ADHESIVE WITH ASTM F1554 GRADE 36 ANCHOR RODS OR APPROVED EQUAL. ANCHORS SHALL BE HOT-DIP ZINC COATED IN ACCORDANCE WITH ASTM A153.

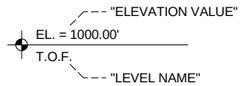
5. STRUCTURAL STEEL (CONTINUED)
   f. BAR GRATING DESIGN AND FASTENERS BASED ON PRODUCTS MANUFACTURERED BY THE MCNICHOLS COMPANY. INDIVIDUAL BAR GRATING SECTIONS TO BE SIZED TO RESULT IN A GROSS SECTION WEIGHT OF 50 TO 60 LBS.
   g. BAR GRATING TO BE CONNECTED TO SUPPORTING STEEL BEAMS AT 12" O.C. MAXIMUM WITH GRATING MANUFACTURER'S STANDARD CLIPS AND FASTENERS. ACCEPTABLE PRODUCTS INCLUDE MCNICHOLS TYPE GFSS-1, SSGC, GN OR APPROVED EQUAL. SEE DETAILS FOR CONNECTING BAR GRATING TO CONCRETE.
6. EXISTING CONSTRUCTION
   a. DIMENSIONS, ELEVATIONS AND DETAILS OF EXISTING CONSTRUCTION WERE OBTAINED FROM FIELD INVESTIGATIONS. THE CONTRACTOR SHALL VERIFY ALL EXISTING CONDITIONS NECESSARY TO PROPERLY COORDINATE NEW CONSTRUCTION AND NOTIFY THE ENGINEER OF ALL VARIATIONS IN THE DETAILS, DIMENSIONS AND ELEVATIONS OF EXISTING CONSTRUCTION FROM THOSE SHOWN ON THE DRAWINGS.
   b. CLEAN AND PREPARE ALL EXISTING SURFACES THAT WILL BE IN CONTACT WITH NEW CONSTRUCTION AS INDICATED AND AS ACCEPTABLE TO ENGINEER IMMEDIATELY PRIOR TO PLACING NEW CONCRETE. APPLY BONDING COMPOUND TO ALL EXISTING CONCRETE SURFACES THAT WILL BE IN CONTACT WITH NEW CONCRETE.
   c. PROTECT EXISTING MATERIALS FROM DAMAGE DURING CONSTRUCTION.
   d. FURNISH AND INSTALL TEMPORARY SHORING OR BRACING AS NECESSARY TO PROVIDE SUPPORT AND STABILITY FOR EXISTING WALLS AND FRAMING DURING DEMOLITION AND CONSTRUCTION.
   e. UPON COMPLETION OF DEMOLITION ACTIVITIES, SCHEDULE AN ENGINEERING INSPECTION PRIOR TO CONSTRUCTING NEW FEATURES.

SHEET SYMBOL IDENTIFICATION







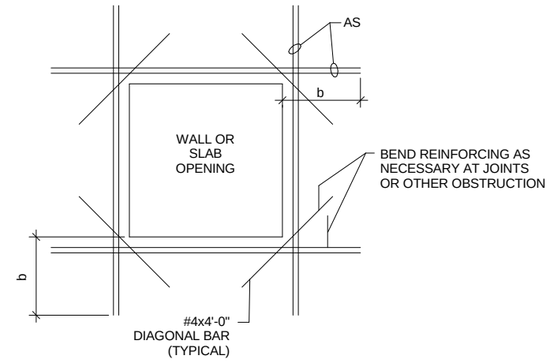


ABBREVIATIONS

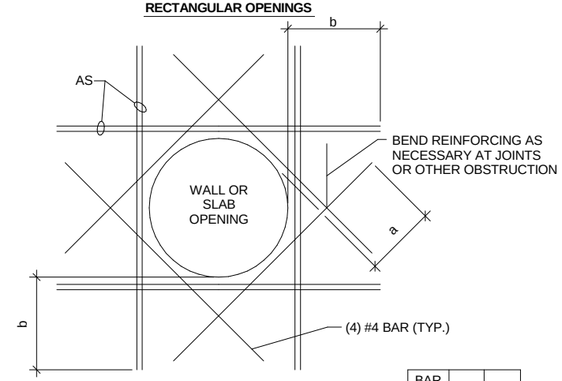
ASD	Alternate Stress Design
ACI	American Concrete Institute
AISC	American Institute of Steel Construction
AISI	American Iron and Steel Institute
ASTM	American Society for Testing and Materials
AWS	American Welding Society
AB	Anchor Bolt
B	Bottom
BM	Beam
BRG	Bearing
BLK	Block
BOF	Bottom of Foundation
BOT	Bottom
BRKT	Bracket
CIP	Cast-In-Place
CLR	Clear
COL	Column
CONC	Concrete
CMU	Concrete Masonry Unit
CRSI	Concrete Reinforcing Steel Institute
CJ	Construction Joint, Control Joint
CONT	Continuous
DEPR	Depression
DET	Detail
DL	Development Length
DIA	Diameter
DIM	Dimension
DIR	Direction
DWLS	Dowels
EA	Each
EE	Each End
EF	Each Face
EJ	Expansion Joint
ES	Each Side
EQ	Equal
EW	Each Way
EXP	Bolt Expansion Bolt
EXP JT	Expansion Joint
FF	Finished Floor
FL	Floor
FT	Foot or Feet
FND	Foundation
FS	Far Side
GALV	Galvanized
GA	Gauge
GR	Grade
GB	Grade Beam
GP	Gusset Plate
HT	Height
HP	High Point
HS	High Strength
HEF	Horizontal Each Face
HIF	Horizontal Inside Face
HOF	Horizontal Outside Face
HOR	Horizontal
IN	Inch
ID	Inside Diameter
ICBO	International Conference of Building Officials
INV	Invert
JT	Joint
JST	Joist
K	Kip (1000 Pounds)
LW	Light Weight
LWC	Light Weight Concrete
LRFD	Load and Resistance Factor Design
LLV	Long Leg Vertical LP Low Point
MAS	Masonry
MTL	Metal
NF	Near Face
NWC	Normal Weight Concrete
NIC	Not in Contract
NS	Near Side
OC	On Center
OD	Outside Diameter
OPNG	Opening
PC	Pile Cap
PL	Plate
PT	Point
PVC	Polyvinyl Chloride
PSF	Pounds per Square Foot
PSI	Pounds per Square Inch
R	Radius
REINF	Reinforced
RETG	Retaining
RET	Return
RE	Right End
SECT	Section
SC	Shear Connector
SHT	Sheet
SLV	Short Leg Vertical
SIM	Similar
SOG	Slab on Grade
SL	Splice Length
SQ	Square
STD	Standard

ABBREVIATIONS CONT.

STL	Steel
SDI	Steel Deck Institute
SF	Step Footing or Square Foot
STIFF	Stiffener
STR	Structural
SUP	Support
SYM	Symmetrical
THK	Thick or Thickness
THRD	Threaded
T&B	Top and Bottom
T	Top
TO	Top of
TOC	Top of Concrete
TOF	Top of Foundation or Floor
TOS	Top of Steel
TOW	Top of Wall
TYP	Typical
UNO	Unless Noted Otherwise
US	Underside
VEF	Vertical Each Face
VIF	Vertical Inside Face or Verify in Field
VOF	Vertical Outside Face
WWF	Welded Wire Fabric
W/	With
WP	Working Point

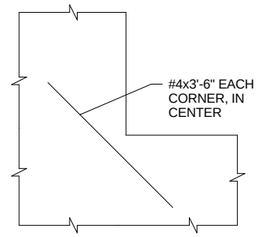


RECTANGULAR OPENINGS



BAR SIZE	a	b
#4	18"	24"
#5	24"	30"
#6	30"	36"
#7	42"	54"
#8	48"	62"
#9	54"	70"
#10	61"	79"

CIRCULAR OPENINGS



ISOLATED RE-ENTRANT CORNERS

1. 'AS' = ADDITIONAL BARS EQUAL IN TOTAL NUMBER TO REGULAR REINFORCEMENT CUT BY THE OPENING. PLACE ONE-HALF TOTAL BARS TO EACH SIDE OF OPENING & IN THE SAME TRANSVERSE POSITION AS THE REGULAR REINFORCEMENT.
2. 'AS' BAR SIZE TO BE SAME AS REGULAR REINFORCEMENT IN EACH DIRECTION.
3. THIS DETAIL APPLIES UNLESS ADDITIONAL REINFORCEMENT SPECIFICALLY INDICATED AT OPENINGS ON DRAWINGS.
4. ADDITIONAL BARS TO PLACED AT OF WALL OR SLAB WHERE ONE LAYER OF REINFORCING IS PROVIDED AND AT EACH FACE WHERE TWO LAYERS OF REINFORCING ARE PROVIDED.
5. ADDITIONAL HORIZONTAL AND VERTICAL BARS ARE NOT NECESSARY FOR HOLES 8 TO 11 INCHES. USE ONLY THE DIAGONAL BARS. FOR HOLES SMALLER THAN 8 INCHES DO NOT CUT BARS, SPREAD NORMAL REINFORCING AROUND HOLE (NO DIAGONALS NEEDED).

1 / GS01 DETAIL
TYPICAL ADDITIONAL REINFORCEMENT AT OPENINGS

FINAL BID SET

APPROVED FOR CONSTRUCTION

CITY OF THORNE BAY
P.O. BOX 19110
THORNE BAY, ALASKA 99919
(907) 828-3380
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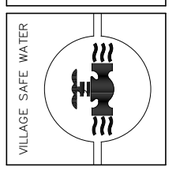
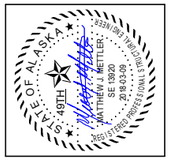
VILLAGE SAFE WATER





DOWL
www.dowl.com
3535 College Road, #100
Fairbanks, Alaska 99709
907-374-0275
AECL848

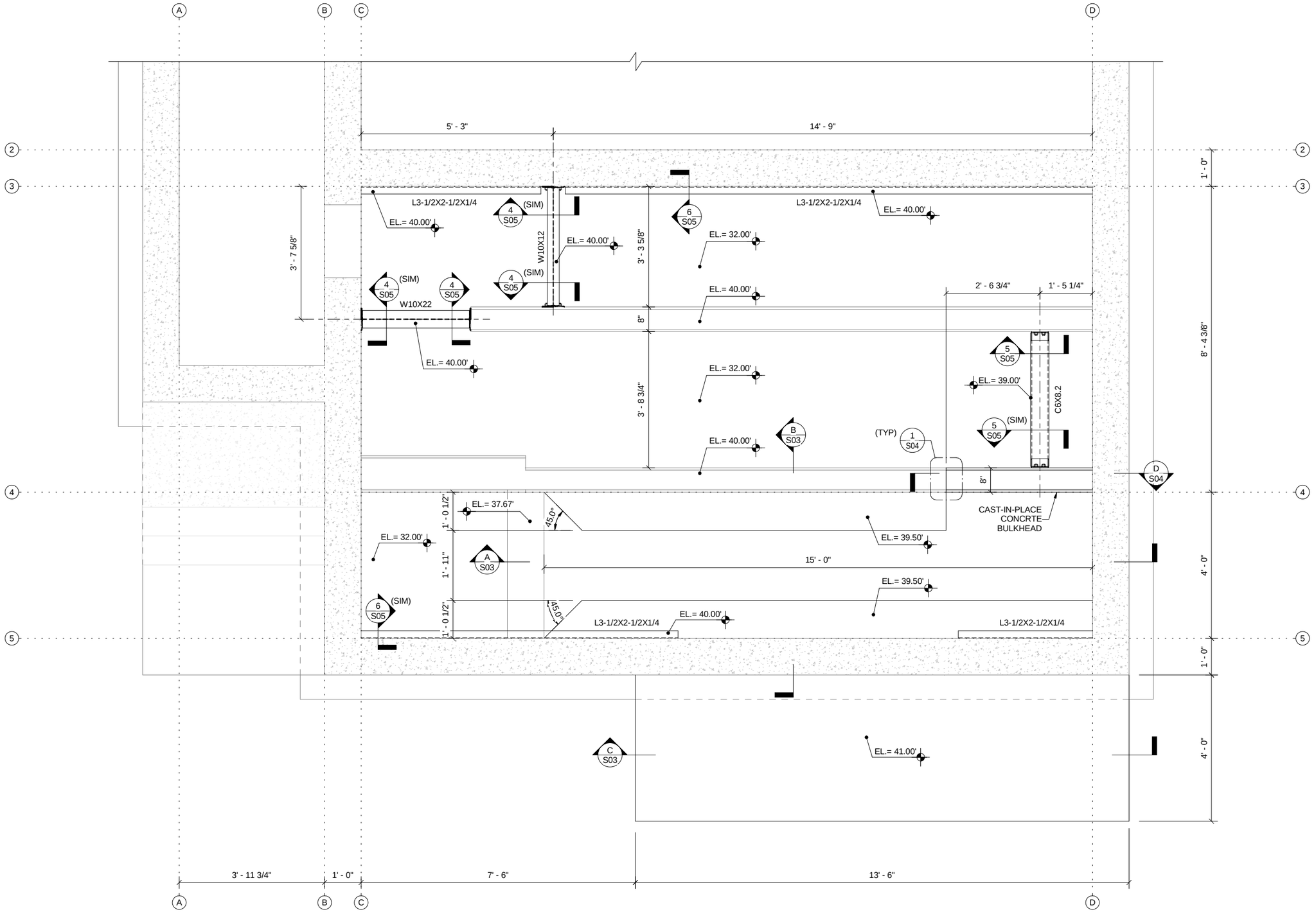
GENERAL STRUCTURAL NOTES & DETAILS

BY	DATE
REVISION	

Project No. 1529.50093.01
Date 2018-03-09
Designed MM
Drawn NC
Approved CN

Sheet No. GS01
SHEET 12 OF 23

\\BZN-FS1\zn-projects\29\50093-01\65CAD\Structural\MR-ST-DT-50093-01-WWTP.rvt



1 S01 PLAN VIEW
T.O. LEVEL 8

scale 1 0 1 2 3 feet

FINAL BID SET

APPROVED FOR CONSTRUCTION

CITY OF THORNE BAY
P.O. BOX 19110
THORNE BAY, ALASKA 99919
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FAX (907) 828-3374
www.thornebay-ak.gov

VILLAGE SAFE WATER

STATE OF ALASKA 49TH
MATTHEW J. METTLER
SE 13920
2018.03.09

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www.dowl.com
3535 College Road, #100
Fairbanks, Alaska 99709
907-374-0275
AECL848

UV DISINFECTION
STRUCTURAL PLAN
VIEW

REVISION	BY	DATE

Project No. 1529.50093.01
Date 2018-03-09
Designed MM
Drawn NC
Approved CN

Sheet No. S01
SHEET 13 OF 23

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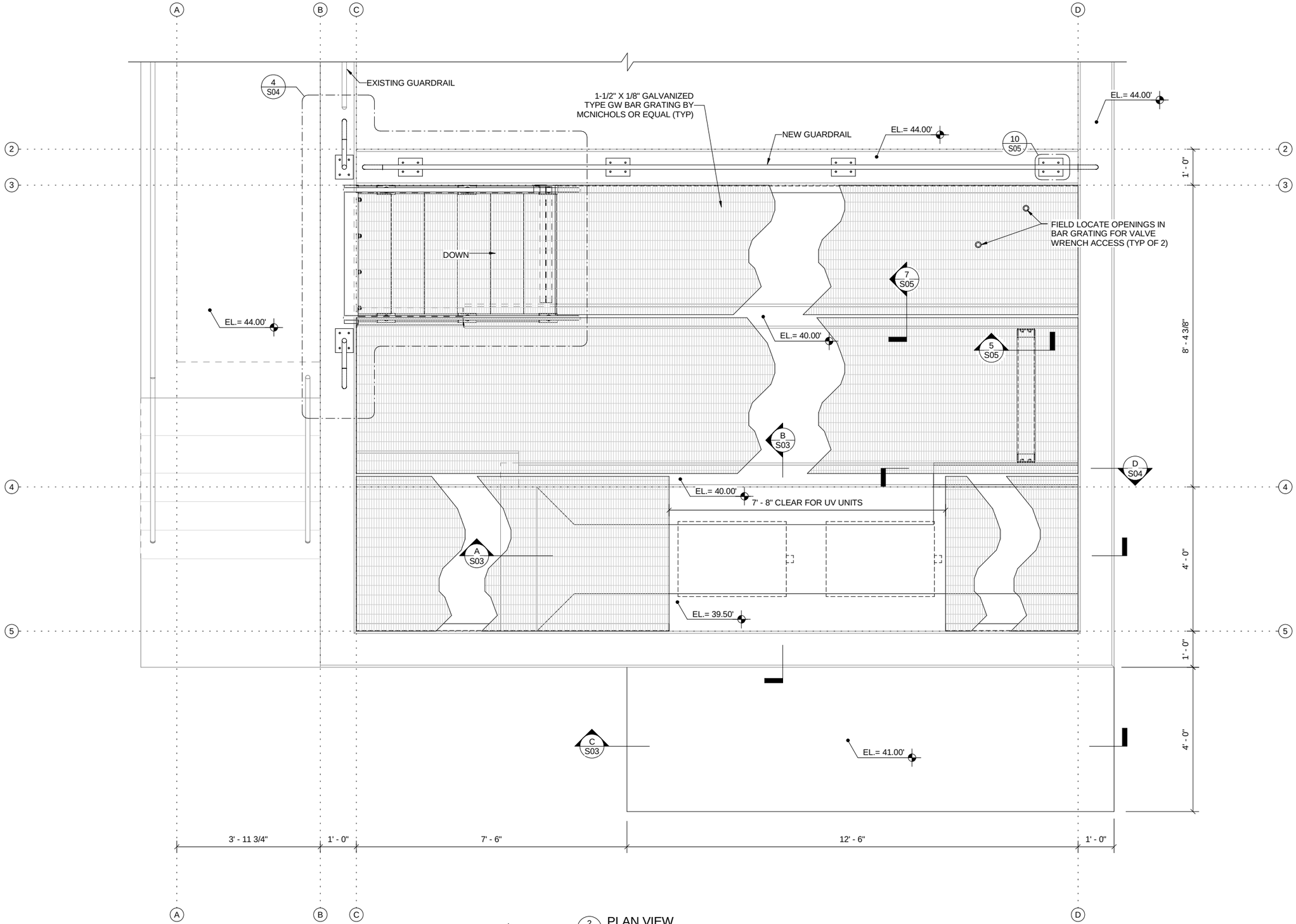

2 S02 PLAN VIEW
UV DISINFECTION

scale 1 0 1 2 3 feet

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UV DISINFECTION
STRUCTURAL PLAN
VIEW

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Drawn NC
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Sheet No. S02
SHEET 14 OF 23

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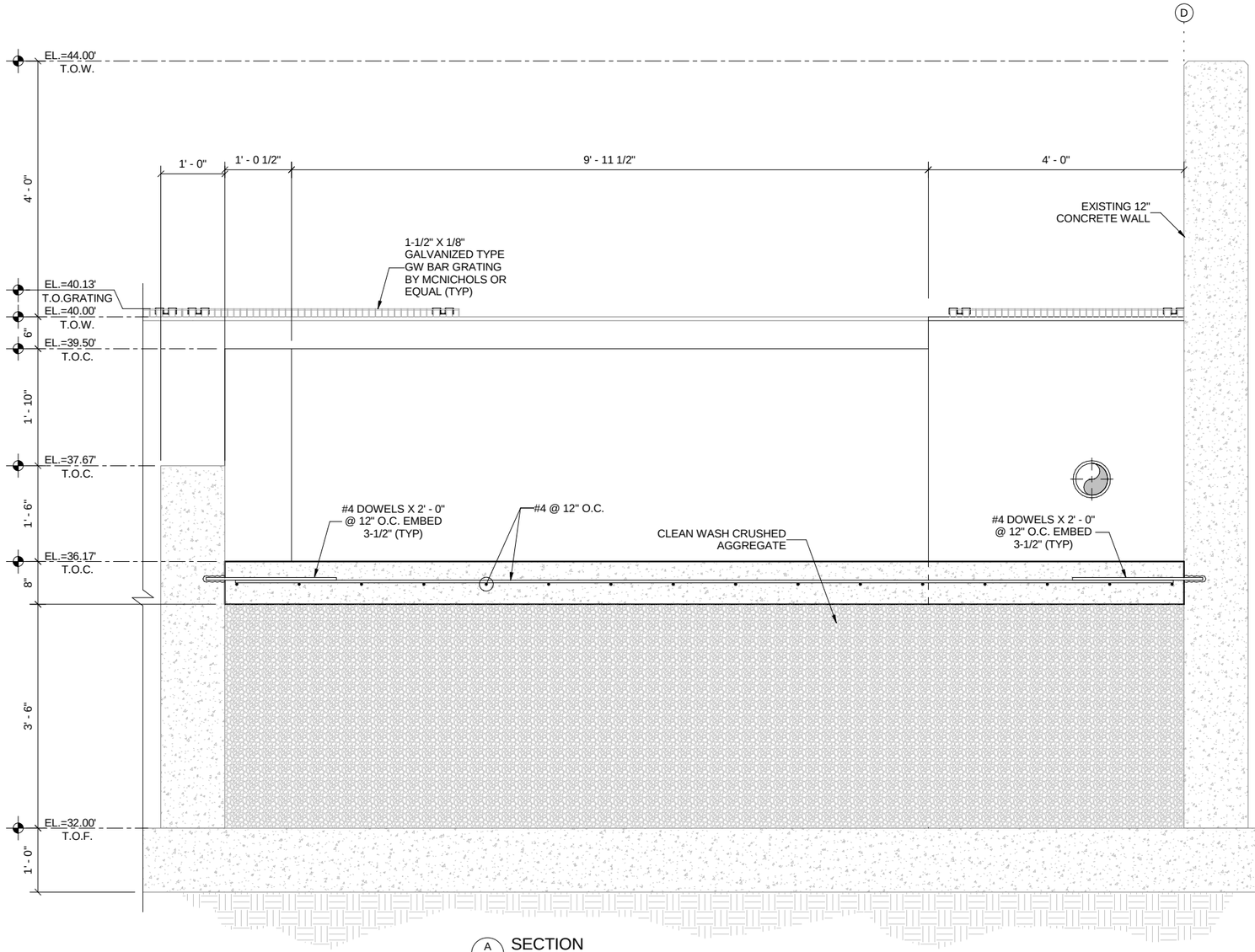
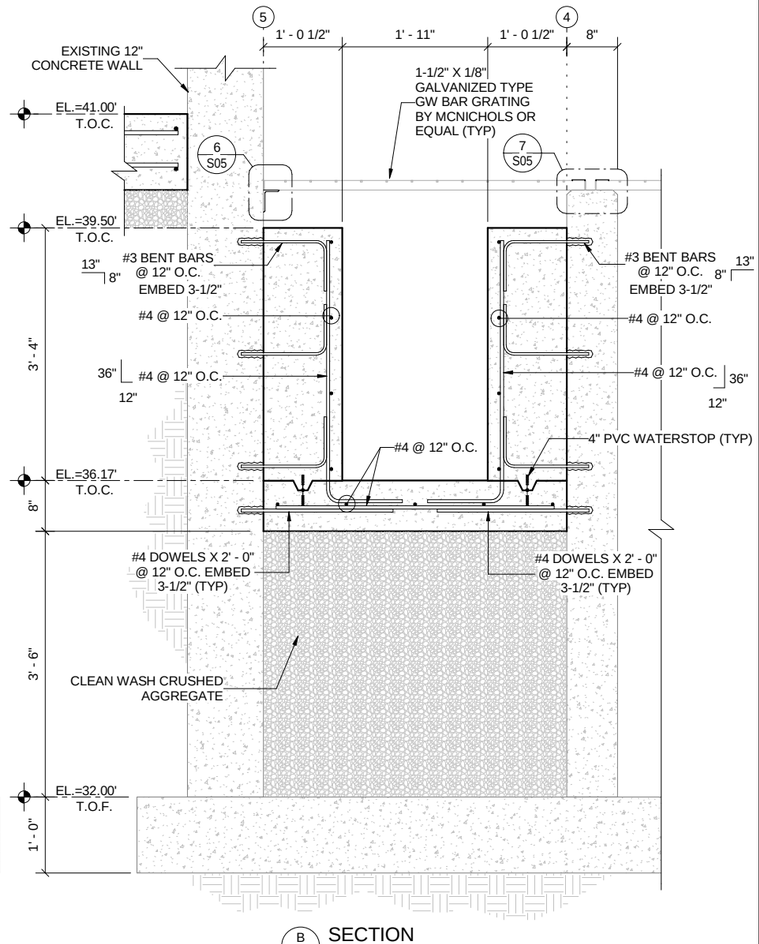
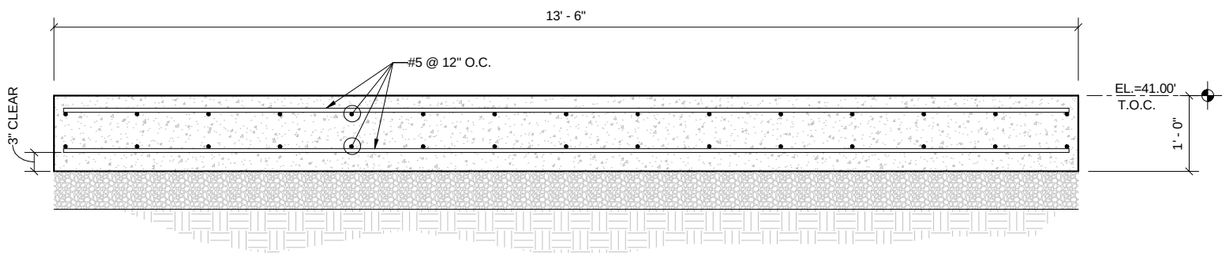


A S03 SECTION
UV CHANNEL REINFORCEMENT
1 0 1 2
scale feet



B S03 SECTION
UV CHANNEL REINFORCEMENT
1 0 1 2
scale feet



C S03 SECTION
EQUIPMENT PAD REINFORCEMENT
1 0 1 2
scale feet

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UV DISINFECTION
STRUCTURAL
SECTIONS

REVISION	BY	DATE

Project No. 1529.50093.01
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Drawn NC
Approved CN

Sheet No. S03
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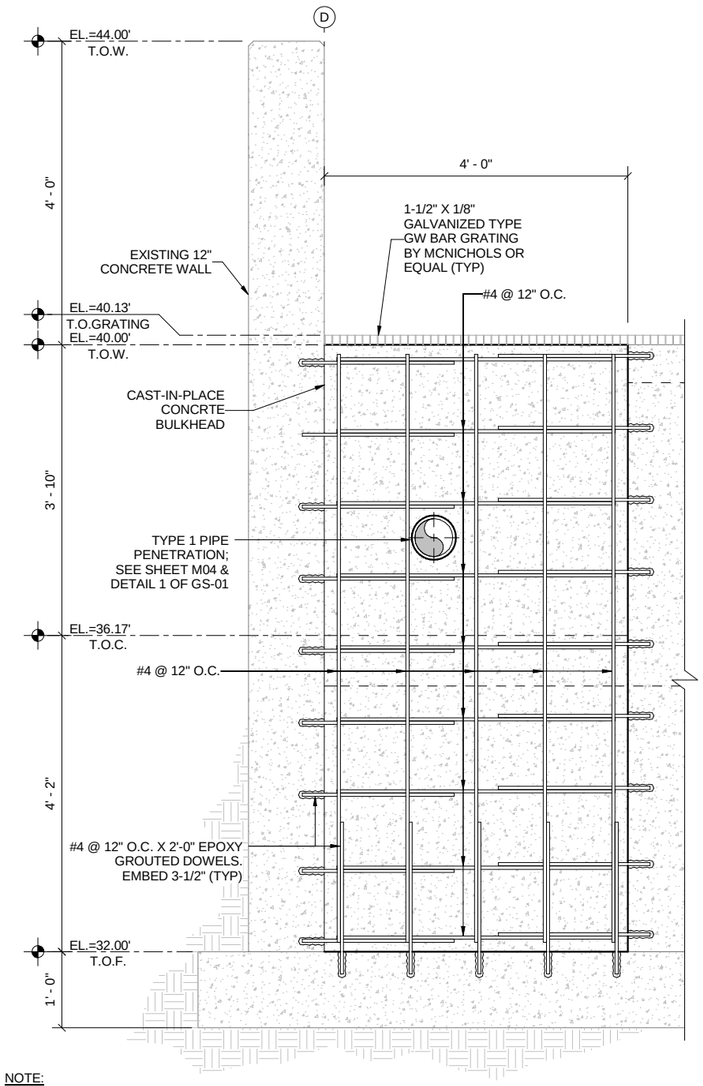
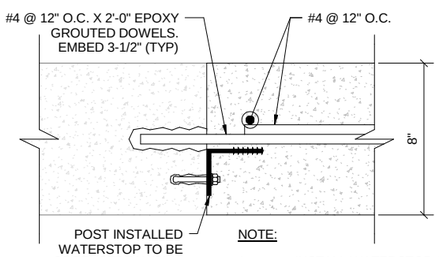


NOTE:

1. POST INSTALLED WATERSTOP TO BE GREENSTREAK/SIKA TYPE 655 OR EQUAL.

D S04 SECTION
BULKHEAD REINFORCEMENT

scale 1 0 1 2 feet

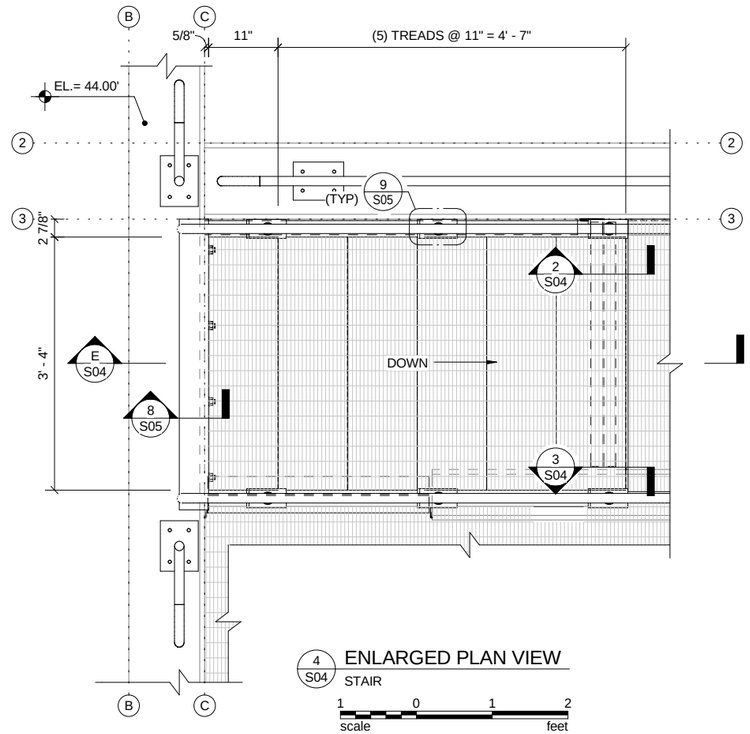


NOTE:

1. INSTALL WATERSTOP ON BOTTOM & BOTH SIDES OF NEW BULKHEAD.

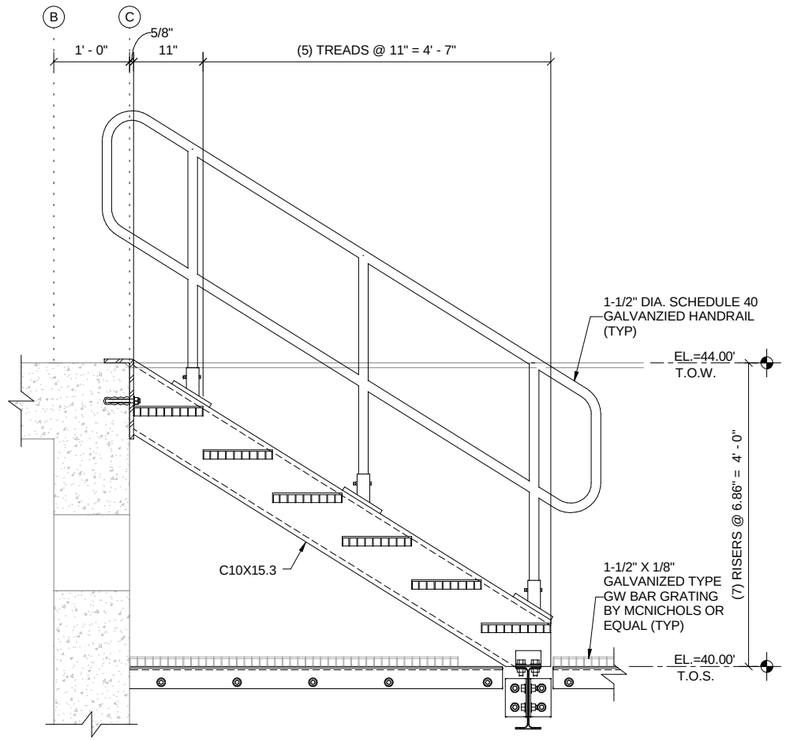
1 S04 DETAIL
BULK HEAD REINFORCEMENT

scale 0 1 feet



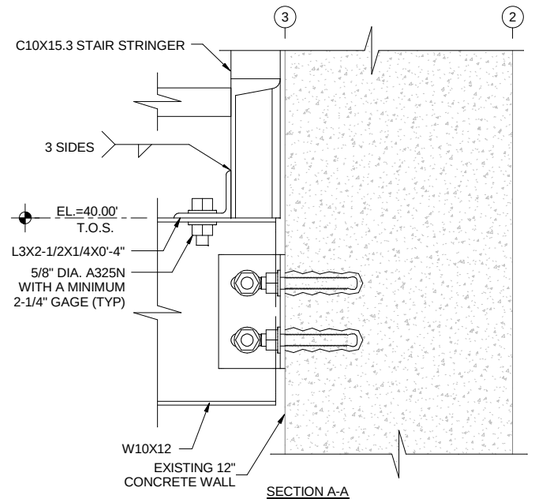
4 S04 ENLARGED PLAN VIEW
STAIR

scale 1 0 1 2 feet

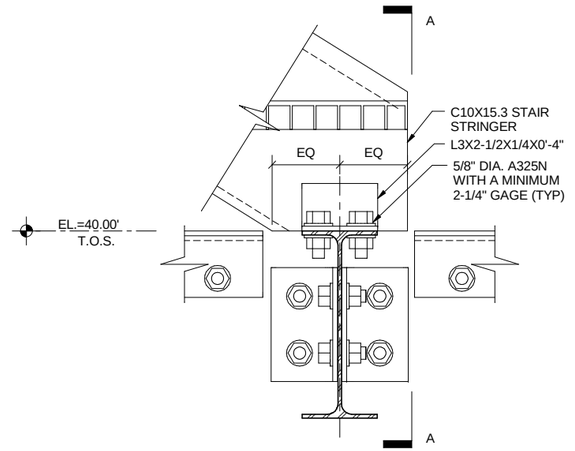


E S04 SECTION
STAIR

scale 1 0 1 2 feet

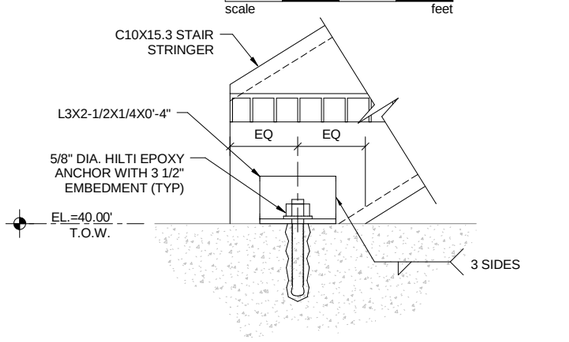


SECTION A-A



2 S04 DETAIL
STRINGER TO WIDE FLANGE BEAM CONNECTION

scale 0 1 feet



3 S04 DETAIL
STRINGER TO WIDE FLANGE BEAM CONNECTION

scale 0 1 feet

FINAL BID SET

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VILLAGE SAFE WATER

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49TH
MATTHEW J. METTLER
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UV DISINFECTION
STRUCTURAL
SECTIONS

REVISION	BY	DATE

Project No. 1529.50093.01
Date 2018-03-09
Designed MM
Drawn NC
Approved CN

Sheet No. S04
SHEET 16 OF 23

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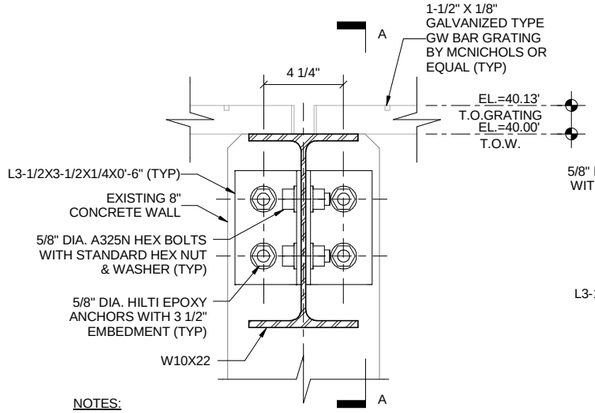
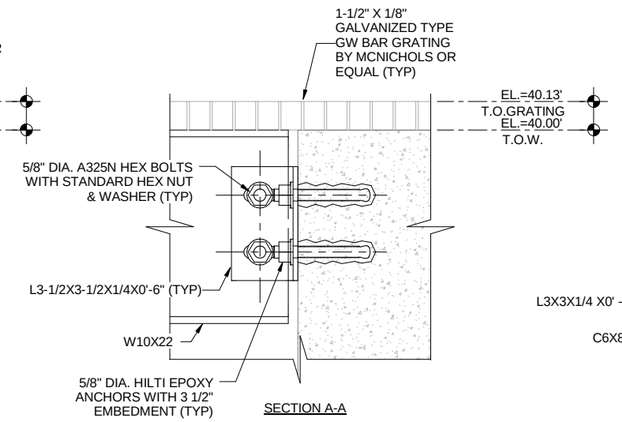


NOTES:

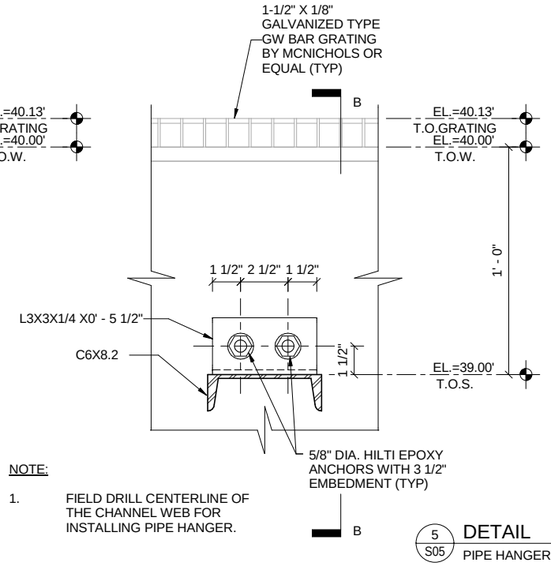
1. BEAM CONNECTIONS TO FLAT WALL SURFACES SIMILAR.
2. PROVIDE SHORT-SLOTTED HORIZONTAL HOLES FOR CONNECTION TO STEEL BEAM.

4 S05 DETAIL
W10x12 CONNECTION

scale 1 0 1 feet

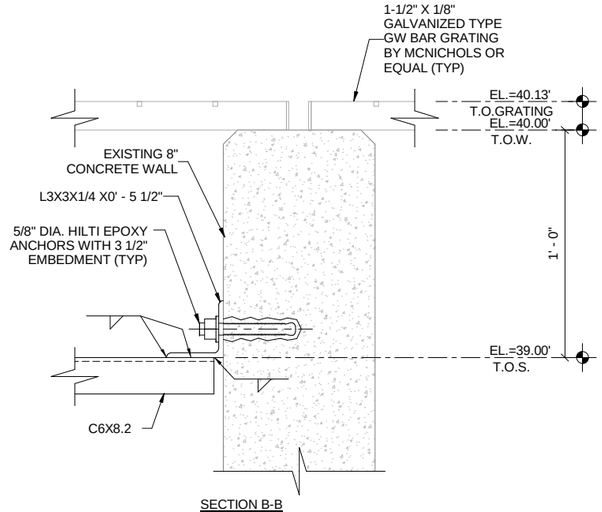


SECTION A-A



NOTE:

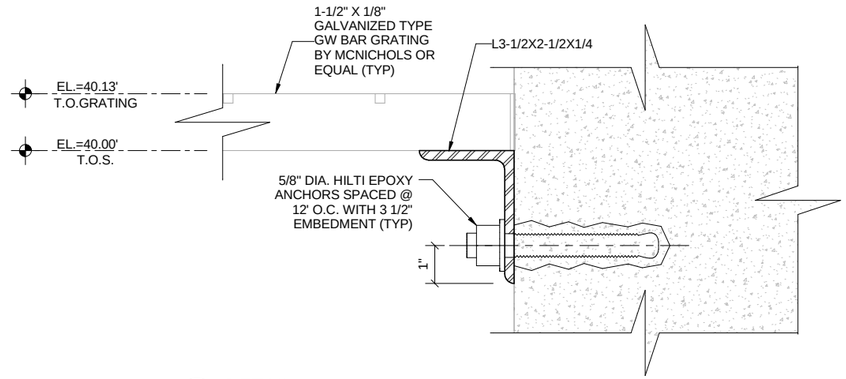
1. FIELD DRILL CENTERLINE OF THE CHANNEL WEB FOR INSTALLING PIPE HANGER.



SECTION B-B

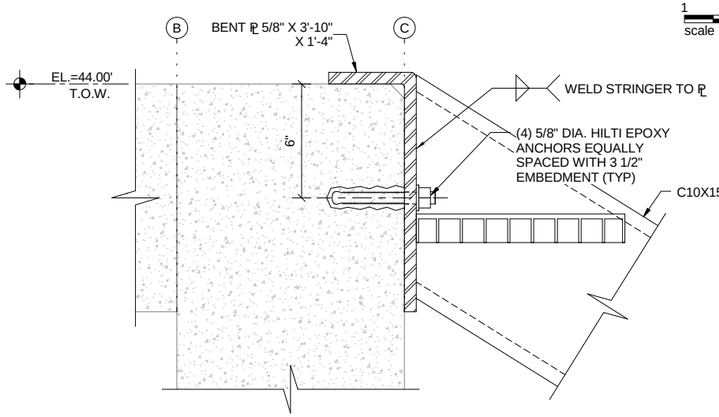
5 S05 DETAIL
PIPE HANGER SUPPORT CONNECTION

scale 1 0 1 feet



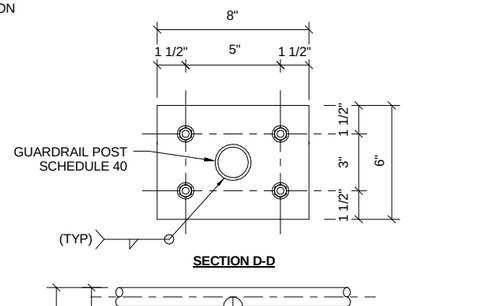
6 S05 DETAIL
GRATING SUPPORT ANGLE CONNECTION

scale 0 1 feet

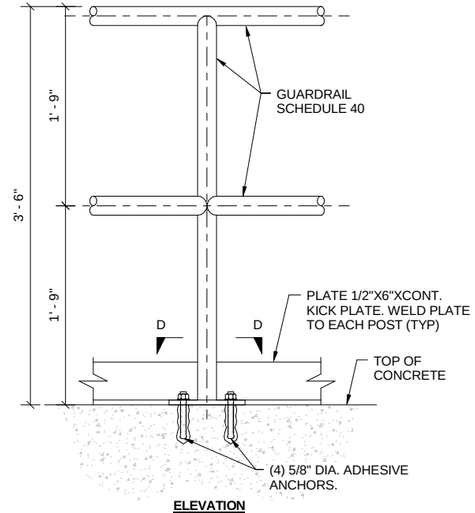


8 S05 DETAIL
STAIR STRINGER TO EXISTING CONCRETE CONNECTION

scale 1 0 1 feet



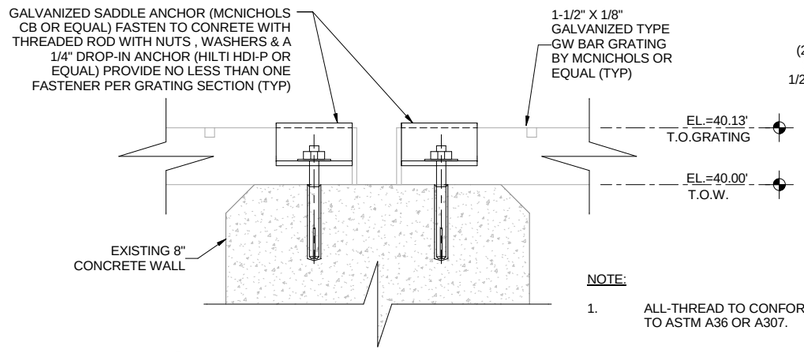
SECTION D-D



ELEVATION

10 S05 DETAIL
TYPICAL GUARDRAIL - STEEL TO CONCRETE

scale 1 0 1 feet

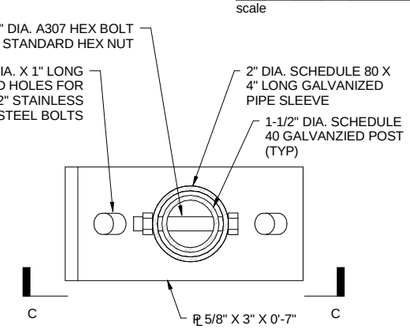


NOTE:

1. ALL-THREAD TO CONFORM TO ASTM A36 OR A307.

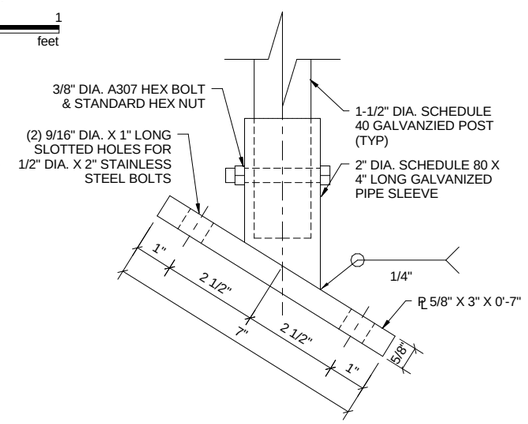
7 S05 DETAIL
BAR GRATING TO CONCRETE CONNECTION

scale 0 1 feet



9 S05 DETAIL
HANDRAIL POST MOUNT CONNECTION

scale 0 1 feet



SECTION C-C

FINAL BID SET

APPROVED FOR CONSTRUCTION

CITY OF THORNE BAY
P.O. BOX 19110
THORNE BAY, ALASKA 99919
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UV DISINFECTION STRUCTURAL DETAILS

REVISION	BY	DATE

Project No. 1529.50093.01
Date 2018-03-09
Designed MM
Drawn NC
Approved CN

Sheet No. S05
SHEET 17 OF 23

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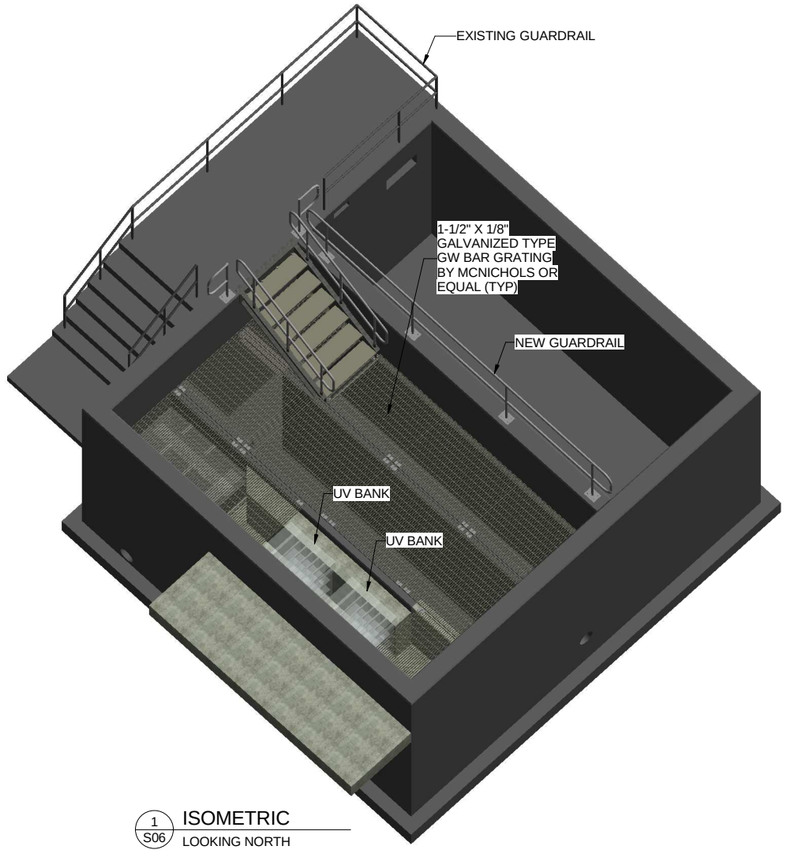
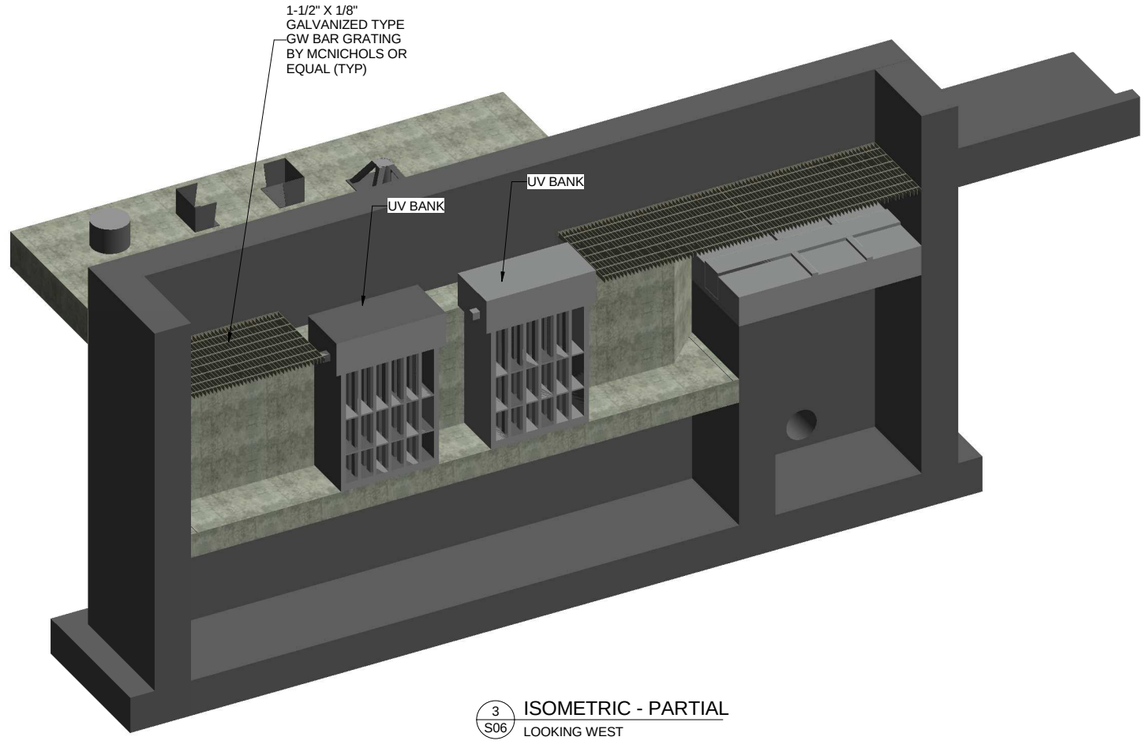
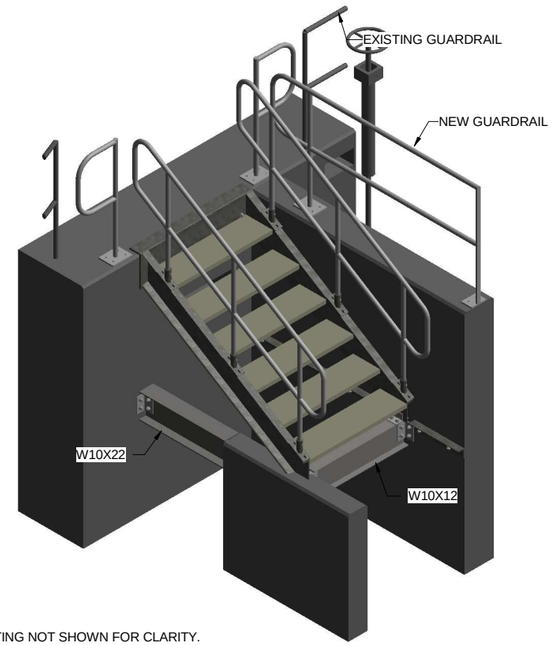


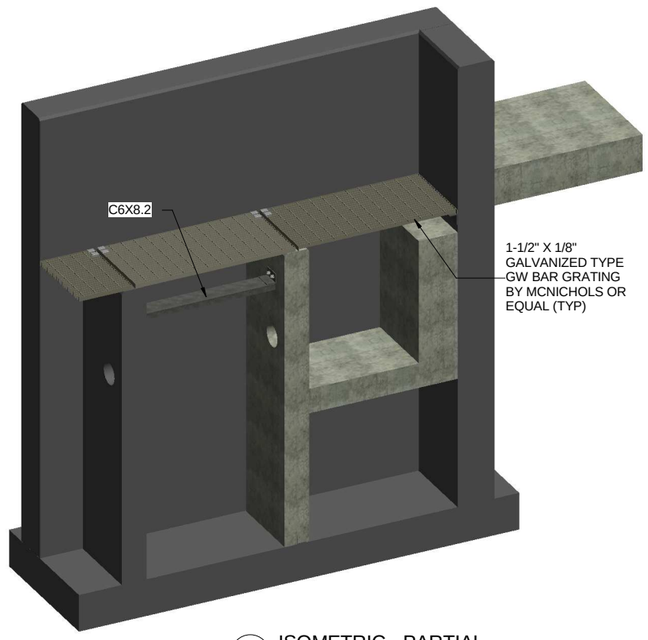
1 S06 ISOMETRIC
LOOKING NORTH



3 S06 ISOMETRIC - PARTIAL
LOOKING WEST



2 S06 ISOMETRIC - PARTIAL
LOOKING NORTH 2



4 S06 ISOMETRIC - PARTIAL
LOOKING SOUTH

NOTE:

1. GRATING NOT SHOWN FOR CLARITY.

FINAL BID SET

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VILLAGE SAFE WATER

STATE OF ALASKA 49TH
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UV DISINFECTION
STRUCTURAL
ISOMETRICS

REVISION	BY	DATE

Project No. 1529.50093.01
Date 2018-03-09
Designed MM
Drawn NC
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Sheet No. S06
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ELECTRICAL LEGEND

SYMBOL	DESCRIPTION
———	CONDUIT, EXPOSED
- - - -	CONDUIT, UNDERGROUND OR IN CONCRETE
	3/4" X 10' COPPER CLAD STEEL GROUND ROD
	CONDUIT RUN – CHANGE IN ELEVATION
	LIQUID–TIGHT FLEXIBLE METALLIC CONDUIT
	HOME RUN
	PANELBOARD
	CONTROL PANEL OR CONTROLLER
	MOLDED CASE CIRCUIT BREAKER, X = AMPERE RATING, Y = NO. OF POLES
	THREE–PHASE MOTOR
	SINGLE–PHASE MOTOR
S_T	MOTOR STARTER–MANUAL
	DISCONNECT SWITCH
J	JUNCTION BOX OR FITTING
	120V QUADRUPLEX RECEPTACLE, NEMA 5–20R
	120V DUPLEX RECEPTACLE, NEMA 5–20R
	120V DUPLEX GFCI RECEPTACLE, NEMA 5–20R
	SPECIALTY RECEPTACLE, TYPE AS NOTED
	TELECOM – DATA OUTLET
	TELECOM – PHONE/DATA OUTLET
OTHER SYMBOLS AS DEFINED BY NOTE	

ELECTRICAL ABBREVIATIONS

A	AMPERE, ANALOG SIGNAL
AFF	ABOVE FINISH FLOOR
AFG	ABOVE FINISH GRADE
AI	ANALOG INPUT
AO	ANALOG OUTPUT
BCU	BARE COPPER
BLDG	BUILDING
C	CONDUIT
CB	CIRCUIT BREAKER
CP	CONTROL PANEL
CT	CURRENT TRANSFORMER
CU	COPPER
D	DIGITAL SIGNAL
DEG	DEGREES
DI	DIGITAL INPUT
DO	DIGITAL OUTPUT
E	EMERGENCY
(E)	EXISTING
FLA	FULL LOAD AMPERES
FVNR	FULL VOLTAGE NON–REVERSING MOTOR CONTROLLER
FVR	FULL VOLTAGE REVERSING MOTOR CONTROLLER
G	GROUND CONDUCTOR
GES	GROUNDING ELECTRODE SYSTEM
GFI	GROUND FAULT INTERRUPTING
GRC	GALVANIZED RIGID (STEEL) CONDUIT
GRD	GROUND
HDPE	HIGH DENSITY POLYETHYLENE CONDUIT
HIM	HUMAN INTERFACE MODULE
HOA	HAND–OFF–AUTO
HP	HORSEPOWER
KVA	KILO–VOLT–AMPERES
LTF	LIQUID TIGHT FLEXIBLE CONDUIT (METALLIC)
MCC	MOTOR CONTROL CENTER
MCP	MOTOR CIRCUIT PROTECTOR
MLO	MAIN LUG ONLY
(N)	NEW
N.I.C.	NOT IN CONTRACT
NC	NORMALLY CLOSED
NO	NORMALLY OPEN, NUMBER
PH	PHASE
PLC	PROGRAMMABLE LOGIC CONTROLLER
POE	POWER OVER ETHERNET
PR	PAIR
PS	POWER SUPPLY
SIG	SIGNAL
SLC	SIGNALING LINE CIRCUIT
TWSH	TWISTED WIRE SHIELDED
TYP	TYPICAL
UON	UNLESS OTHERWISE NOTED
UPS	UNINTERRUPTIBLE POWER SUPPLY
UTP	UNSHIELDED TWISTED PAIR
UV	ULTRAVIOLET
V	VOLTS
VFD	VARIABLE FREQUENCY DRIVE MOTOR CONTROLLER
W	WATTS
WP	WEATHERPROOF
XFMR	TRANSFORMER
ZS	LIMIT SWITCH

GENERAL NOTES

1. ALL ELECTRICAL WORK SHALL BE INSTALLED IN ACCORDANCE WITH ALL REQUIREMENTS OF THE LATEST ADOPTED EDITION OF THE NATIONAL ELECTRICAL CODE, AND THE CONTRACT SPECIFICATIONS.
2. MATERIALS AND EQUIPMENT SHALL BE IN ACCORDANCE WITH THE SPECIFICATIONS, AND SHALL BE ACCEPTABLE TO THE AUTHORITY HAVING JURISDICTION AS SUITABLE FOR THE USE INTENDED. ALL ELECTRICAL EQUIPMENT SHALL INCLUDE THE SEAL OF A NATIONALLY RECOGNIZED TESTING LABORATORY FOR THE PURPOSE FOR WHICH IT IS INSTALLED. SIMILAR ITEMS SHALL BE SUPPLIED BY THE SAME MANUFACTURER THROUGHOUT THE PROJECT.
3. COORDINATE AND PROVIDE EQUIPMENT WITH THE SHORT CIRCUIT CURRENT RATING (SCCR) FOR THE AVAILABLE FAULT CURRENT AT THE POINT OF THE SYSTEM WHERE INSTALLED. PROVIDE ARC FLASH HAZARD WARNING LABELS ON ALL SWITCHBOARDS, PANELBOARDS, INDUSTRIAL CONTROL PANELS, METER SOCKET ENCLOSURES, MOTOR CONTROL CENTERS AND SIMILAR EQUIPMENT PER NEC ARTICLE 110.16 AND NFPA 70E.
4. DIMENSIONS OF EQUIPMENT ARE APPROXIMATE. INSTALLATION SHALL BE VERIFIED BASED ON ACTUAL MANUFACTURER'S DATA AND SHOP DRAWINGS.
5. ALL SITE WORK AND UTILITIES ARE SHOWN IN APPROXIMATE LOCATIONS. VERIFY ALL INSTALLATIONS PRIOR TO COMMENCEMENT OF WORK. COORDINATE ALL WORK WITH UTILITIES AS REQUIRED.
6. ALL SINGLE–PHASE BRANCH CIRCUITS SHALL BE 3/4"C, 3#12, AND ALL THREE–PHASE BRANCH CIRCUITS SHALL BE 3/4"C, 4#12, UNLESS OTHERWISE NOTED. ALL CIRCUITS SHALL HAVE AND EQUIPMENT GROUNDING CONDUCTOR SIZED IN ACCORDANCE WITH THE NEC.
7. CONTRACTOR SHALL SUBMIT REQUEST FOR SUBSTITUTION IN WRITING TO THE ENGINEER.
8. PROVIDE SEISMIC SUPPORT AND DESIGN PER IBC REQUIREMENTS.
9. WHERE EXISTING UNDERGROUND UTILITIES ARE SHOWN ON THE PLANS, MULTIPLE PARALLEL LINES MAY BE ENCOUNTERED IN THE SAME TRENCH OR GENERAL AREA. SINGLE LINES WERE SHOWN FOR CLARITY.
10. CALL BEFORE YOU DIG. ALL UTILITIES MAY NOT BE SHOWN IN THE PLANS. THE CONTRACTOR SHALL FIELD LOCATE ALL UTILITIES WITHIN WORK AREA PRIOR TO COMMENCEMENT OF WORK. THE CONTRACTOR SHALL NOTIFY THE ENGINEER OF ANY UTILITY CONFLICTS BETWEEN PROPOSED STRUCTURES & UTILITIES. ADJUSTMENTS OF ALL STRUCTURES MAY BE NECESSARY TO AVOID UTILITY CONFLICTS. ADJUSTMENTS SHALL BE APPROVED BY THE ENGINEER PRIOR TO CONSTRUCTION. HAND DIG WITHIN 36" OF ALL UTILITIES.
11. THIS FACILITY IS REQUIRED TO BE OPERATED CONTINUOUSLY THROUGHOUT THE CONSTRUCTION PERIOD. FACILITY OPERATORS WILL NEED ACCESS AROUND THE DESIGNATED WORK AREAS FOR GENERAL OPERATION PROCEDURES. THE CONTRACTOR SHALL COORDINATE WITH THE OWNER DURING THE CONSTRUCTION PERIOD SO AS TO NOT INTERFERE WITH DAILY PROCEDURES.
12. COORDINATE WITH OWNER BEFORE DISCONNECTION OF EQUIPMENT. DO NOT DISCONNECT EQUIPMENT UNTIL NOTIFICATION TO OWNER HAS BEEN MADE AND APPROVED.
13. COORDINATE WITH OWNER PRIOR TO ANY INTENDED POWER OUTAGES. DO NOT DISCONNECT POWER TO ANY EQUIPMENT UNTIL NOTIFICATION TO OWNER HAS BEEN MADE AN APPROVED.

CIRCUIT AND DEVICE LEGEND

A1,a — GROUP OR EQUIPMENT IDENTIFICATION.
"A" DENOTES PANEL NAME
"1" DENOTES CIRCUIT NUMBER
"a" DENOTES SWITCH LEG AS INDICATED.

$\$_{3,a}$ — SWITCH IDENTIFICATION.
"3" DENOTES SWITCH CONFIGURATION
"a" DENOTES SWITCH LEG AS INDICATED.

SERVICE LOAD CALCULATION

(1) EXISTING DEMAND LOAD

EXISTING 12 MONTH MAXIMUM DEMAND LOAD	=	21.2 KVA *
NEC FACTOR 0.25%	=	5.3 KVA
SUBTOTAL	=	26.5 KVA

(2) ADDITIONAL DEMAND LOAD

ITEM	DESCRIPTION		
1	UV SYSTEM	=	10.6 KVA
2	AIR COMPRESSOR	=	1.8 KVA
3	GENERATOR HEATERS, BATTERY CHARGER	=	1.9 KVA
4	AUTODIALER	=	0.1 KVA
	SUBTOTAL	=	14.4 KVA

TOTAL NEW SERVICE DEMAND LOAD

LOAD 1 + LOAD 2 = **40.9 KVA**

51.4 AMPS @460V

* REPORTED BY AP&T

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VILLAGE SAFE WATER

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213 W. FIREWEED LANE
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(907) 276-7933
LICENSE NO. AECC705

UV DISINFECTION SYSTEM

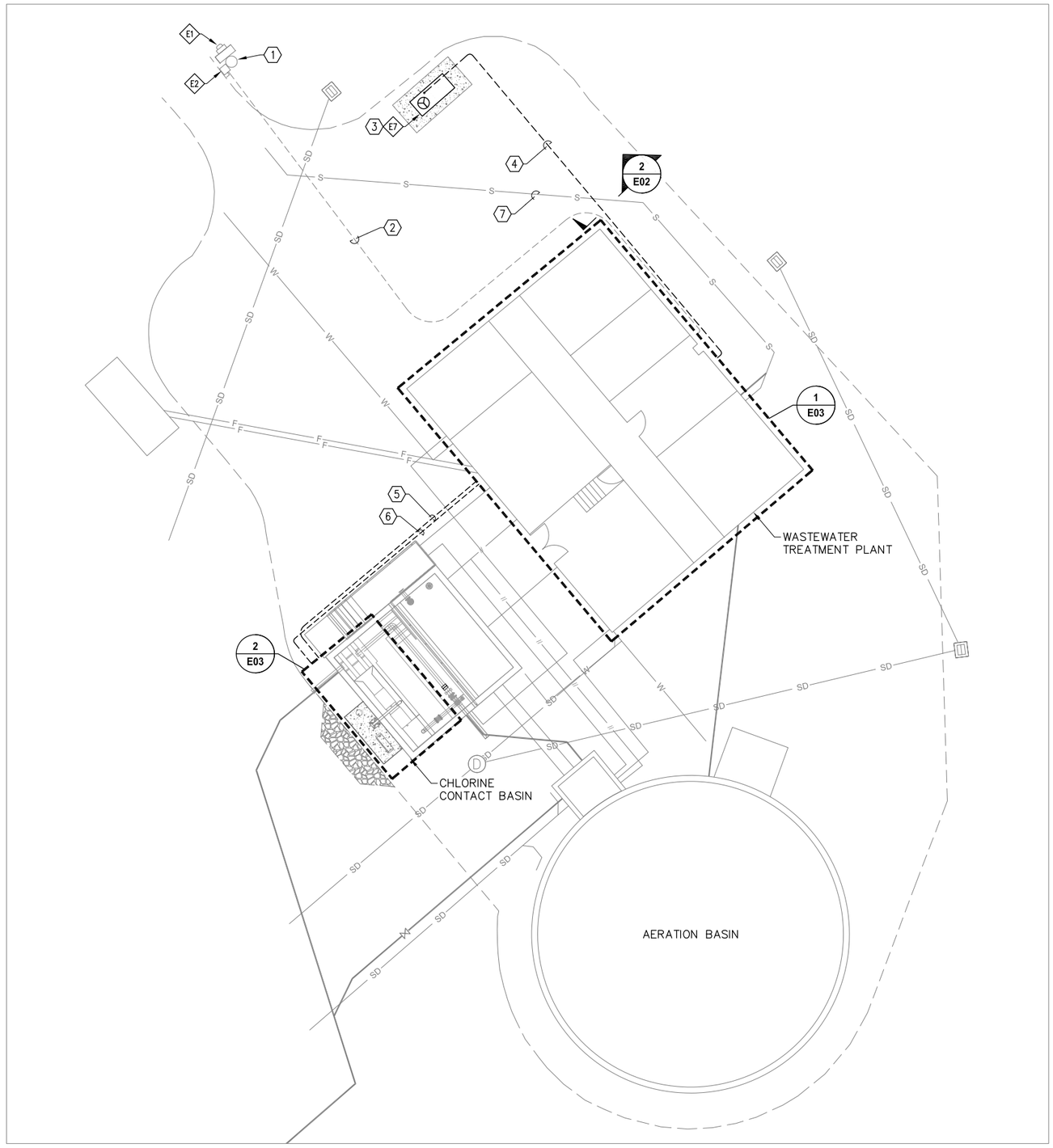
ELECTRICAL LEGEND AND ABBREVIATIONS

BY	DATE

REVISION

Project No. 1529.50093.01
Date 2018-03-09
Designed JF
Drawn OM
Approved JF

Sheet No.
SHEET E01 OF 23



1 E02 **ELECTRICAL SITE PLAN**
SCALE: 1"=10'-0"

0 10' 20'

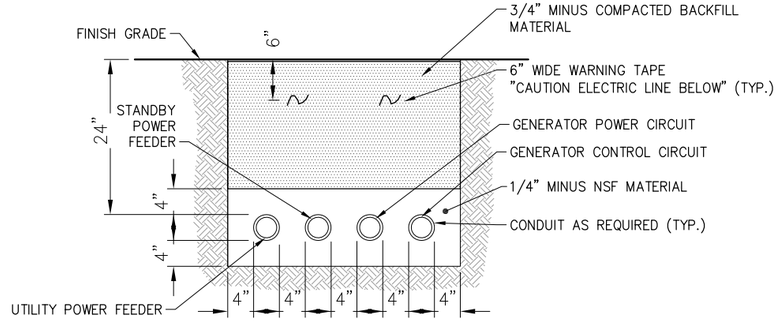
SHEET NOTES

1. EXISTING ELECTRICAL UTILITY POLE WITH CT ENCLOSURE, METER AND MAIN DISCONNECT SWITCH.
2. EXISTING WWTP UTILITY FEEDER. ROUTING SHOWN IS BASED ON RECORD DRAWINGS. FIELD VERIFY EXACT LOCATION. PULL IN NEW GROUNDING CONDUCTOR. SEE SHEET E04, NOTE 7 FOR DETAILS.

ADD. ALT. #1
3. STANDBY GENERATOR ON EQUIPMENT PAD. SEE DETAIL 2 ON SHEET C02 FOR PAD DETAILS.
4. STANDBY POWER FEEDER AND GENERATOR ENCLOSURE POWER AND CONTROL CIRCUITS.

5. UV EQUIPMENT AND AIR COMPRESSOR BRANCH CIRCUITS.
6. UV SYSTEM ALARM CIRCUIT CONDUCTORS.
7. EXISTING SEWER LINE. SEE CIVIL FOR DETAILS.

E# SEE SHEET E04 FOR EQUIPMENT SCHEDULE



2 E02 **TRENCH DETAIL (TYP.) - ADD. ALT. #1**
SCALE: NTS

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VILLAGE SAFE WATER

STATE OF ALASKA * 11749TH * REGISTERED PROFESSIONAL ENGINEER * Jared H. Fraction EE 8286 3/9/18

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UV DISINFECTION SYSTEM

ELECTRICAL SITE PLAN

REVISION	BY	DATE

Project No. 1529.50093.01
Date 2018-03-09
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Sheet No.
SHEET E02 OF 23

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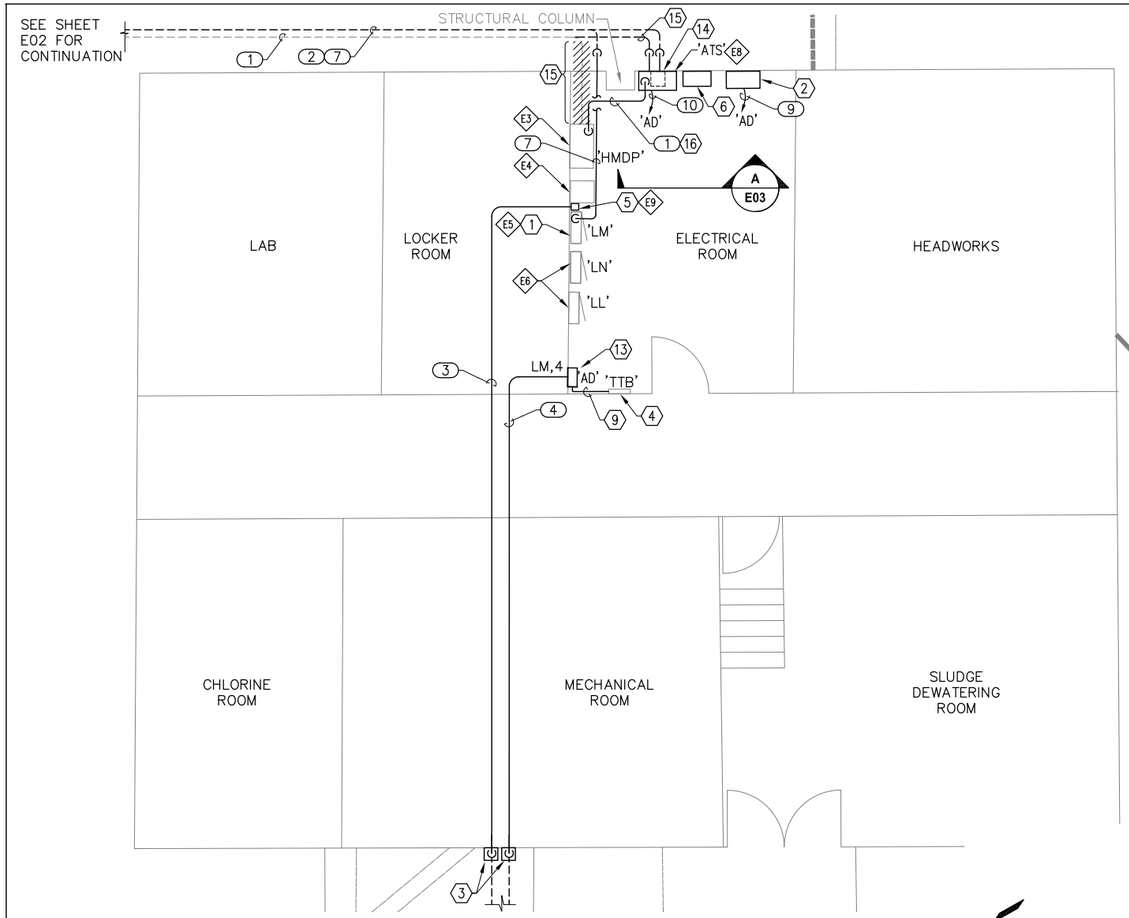
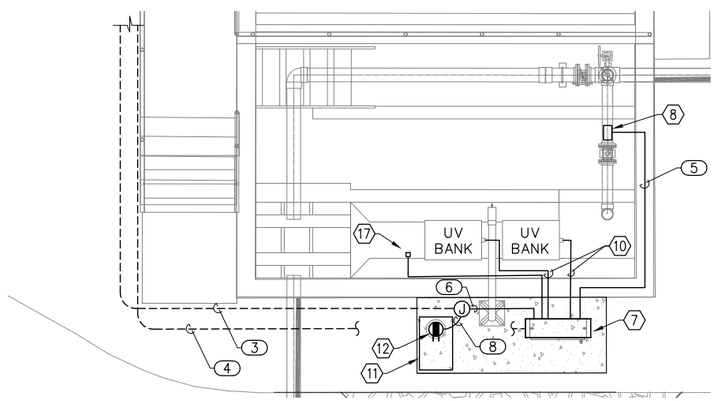
PLOT DATE 2018-3-2 13:04 SAVED DATE 2018-03-02 12:49



1 E03 **WWTP ELECTRICAL PLAN**
SCALE: 1/4" = 1'-0"
0 4' 8'



2 E03 **CHLORINE CONTACT BASIN ELECTRICAL PLAN**
SCALE: 1/4" = 1'-0"
0 4' 8'

CIRCUIT SCHEDULE

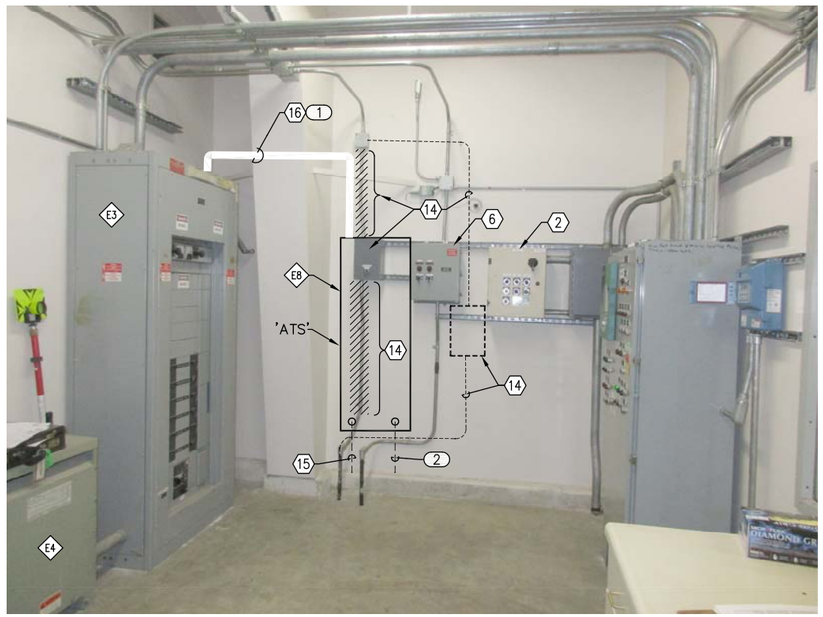
	TAG	DESCRIPTION
	1	EXISTING 3"C, 3#4/0 (3H), 1#4 (N) & NEW 1#6 (G)
ADD. ALT. #1	2	2"C, 4#6 (3H,N) & 1#8 (G) 1"C 6PR SHIELDED CONTROL CABLE
	3	1"C, 2#8 (2H), 2#10 (H,N) & 1#8 (G)
	4	3/4"C, 6PR SHIELDED CONTROL CABLE
	5	3/4"C, 1PR#18 TWISH & 3#14 (+24V,–24V,G).
	6	3/4"C, 2#8 (2H) & 1#8 (G)
ADD. ALT. #1	7	1"C, 4#12 (2H,2N) & 1#12 (6)
	8	3/4"C, 2#10 (H,N) & 1#10 (G)
	9	3/4"C, 3#14 (2SIG,G)
ADD. ALT. #1	10	3/4"C, 5#14 (4SIG,G)

SHEET NOTES

1. (E) PANELBOARD 'LM'. PROVIDE NEW CIRCUITS. SEE SHEET E04 FOR DETAILS.
2. (E) ROTOR AND AIR LIFT VALVE CONTROL PANEL. PROVIDE (N) AUXILIARY, N.O. RUN CONTACT ON (E) ROTOR CONTACTOR (SIEMENS CAT# 3TF46).
3. NEMA 4X, STAINLESS STEEL JUNCTION BOX FOR PULL POINT. LOCATE WITH TOP 48" AFG.
4. (E) TELEPHONE TERMINAL BLOCK, 'TTB'.
5. BUCK–BOOST TRANSFORMER. MOUNT ADJACENT TO PANEL 'LM'.
6. (E) HEAT TRACE CONTROL PANEL TO REMAIN.
7. UV SYSTEM CONTROL PANEL.
8. FLOW METER.
9. 1/2"C, CAT 6 CABLE. CONNECT TO ACTIVE TELEPHONE LINE AT TTB.
10. 2" LTF WITH POWER/DATA CABLE. OWNER FURNISHED, CONTRACTOR TO INSTALL.
11. AIR COMPRESSOR IN WEATHER PROOF ENCLOSURE.
12. MOUNT THE DUPLEX GFCI RECEPTACLE IN THE AIR COMPRESSOR ENCLOSURE. PROVIDE WITH METALLIC WHILE–IN–USE WEATHER PROOF COVER.
13. AUTODIALER, SENSAPHONE MODEL #FGD–6700. OWNER FURNISHED, CONTRACTOR TO INSTALL. SEE SHEET E05 FOR SCHEMATIC.

ADD. ALT. #1
14. RE–LOCATE (E) OUTSIDE LIGHTING CONTROL PANEL AND ASSOCIATED CIRCUITS AS NECESSARY TO ACCOMMODATE (N) 'ATS'.
15. RE–ROUTE SERVICE ENTRANCE CONDUCTORS INTO THE (N) ATS.
16. ROUTE (N) FEEDER FROM 'ATS' TO THE 'HDMP'.
17. FLOAT SWITCH AND CABLE. OWNER FURNISHED CONTRACTOR TO INSTALL.

E# SEE SHEET E04 FOR ELECTRICAL EQUIPMENT SCHEDULE.



3 E03 **ELEVATION 'A'**
SCALE: NTS

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UV DISINFECTION SYSTEM
ELECTRICAL PLANS

REVISION	BY	DATE

Project No. 1529.50093.01
Date 2018–03–09
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SHEET E03 OF 23

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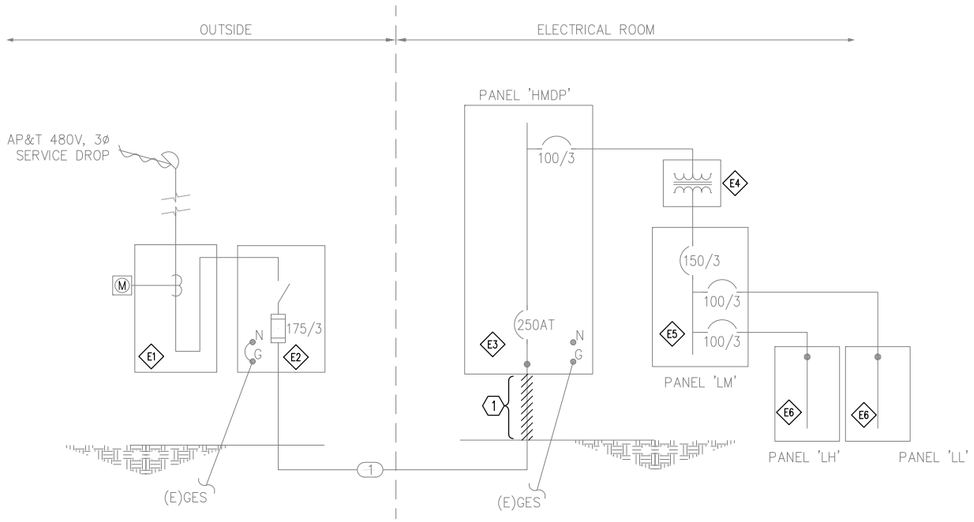


1 E04 ELECTRICAL POWER ONE-LINE - EXISTING

SCALE: NTS

ELECTRICAL EQUIPMENT SCHEDULE

ITEM NO.	DESCRIPTION	MANUFACTURER/MODEL (OR EQUAL)
E1	(E) CT ENCLOSURE AND METER	CIRCLE AW
E2	(E) 480/277V, 200A, 3–POLE MAIN DISCONNECT SWITCH	CUTLER HAMMER
E3	(E) 480/277V, 400A, 3ø, MAIN DISTRIBUTION PANEL	GE AV SWITCHBOARD STYLE 2D
E4	(E) 45kVA, 480V: 208Y120V, 3ø TRANSFORMER	GE MODEL #9T23B3873
E5	(E) 208/120V, 225A, 42–SPACE PANELBOARD	GE CAT #AQF3422ATX
E6	(E) 208/120V, 100A, 3ø, 42–SPACE, PANELBOARD	GE CAT #AQF3421MTX
ADD. ALT. #1 E7	40KW, 480/277V, 3ø, 4W STANDBY GENERATOR	CUMMINS OR EQUAL
ADD. ALT. #1 E8	480V, 200A, 3–POLE, 4W, 10,000 AIC, AUTOMATIC TRANSFER SWITCH	ASCO OR EQUAL
E9	208:240V, BUCK–BOOST TRANSFORMER, 40A @ 240V	SQUARE D CAT# 1.5S46F

SHEET NOTES

ADD. ALT. #1 (1) DISCONNECT SERVICE ENTRANCE CONDUCTORS AT THE HMDP AND RE–TERMINATE AT THE (N) ATS. SEE POWER ONE–LINE–NEW WORK.

(2) (E) SPARE CIRCUIT TO BE USED AS SHOWN.

(3) PROVIDE (N) 40A, 2–POLE CIRCUIT BREAKER IN (E) PANEL FOR CIRCUIT AS SHOWN.

(4) PROVIDE (N) TYPED PANEL SCHEDULE.

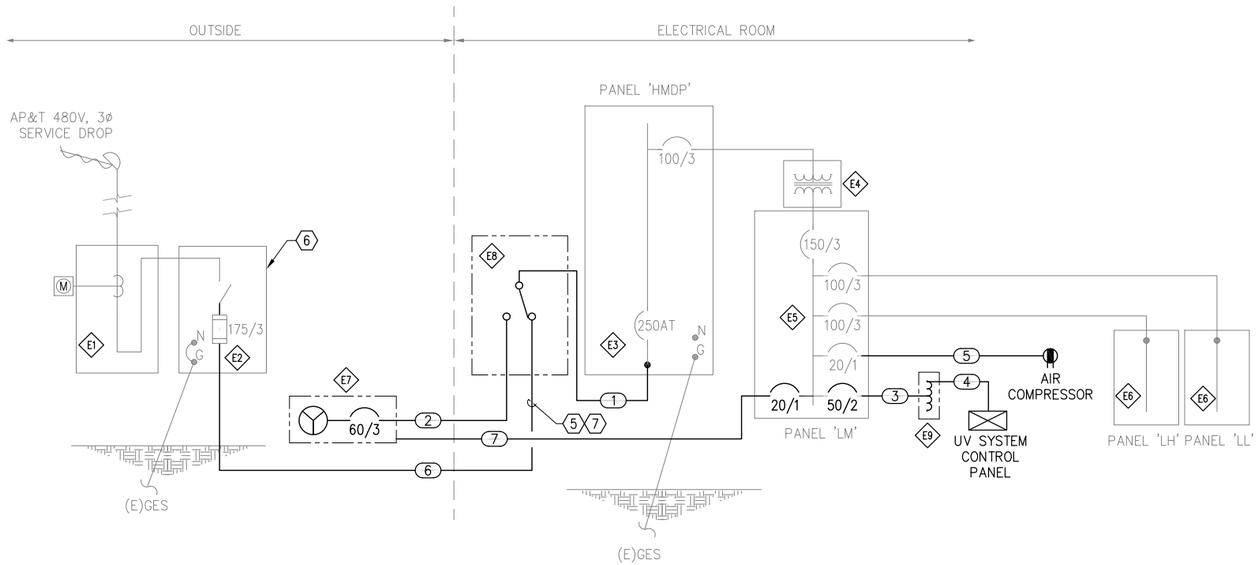
ADD. ALT. #1 (5) RECONNECT (E) FEEDER TO NORMAL SIDE OF ATS.

ADD. ALT. #1 (6) PROVIDE PLACARDS AT MAIN DISCONNECT PER NEC ARTICLES 702.7 (A) & (B).

(7) INSTALL (N) #6 EQUIPMENT GROUNDING CONDUCTOR WITH (E) FEEDER CONDUCTORS BETWEEN THE MAIN DISCONNECT SWITCH AND THE ATS.

CIRCUIT SCHEDULE

	TAG	DESCRIPTION
	(1)	3"C, 3#4/0 (3H) & 1#4 (N)
ADD. ALT. #1	(2)	2"C, 4#6 & 1#8 (G) AND 1"C 6PR SHIELDED CONTROL CABLE
	(3)	3/4"C, 2#8 (2H) & 1#10(G).
	(4)	2#8(2H) & 1#10(G) *
	(5)	2#10(H,N) & 1#10(G) *
	(6)	EXISTING 3"C, 3#4/0 (3H), 1#4 (N) & NEW 1#6 (G). SEE SHEET NOTES 5&7.
ADD. ALT. #1	(7)	1"C, 4#12 (2H,2N) & 1#12 (G)
	* ROUTE CIRCUITS IN SAME 1"C BETWEEN ELECTRICAL ROOM AND UV EQUIPMENT PAD.	



2 E04 ELECTRICAL POWER ONE-LINE - NEW WORK

SCALE: NTS

PANEL SCHEDULE 'LM' (4)

VOLTAGE: 208/120 PHASE: 3 WIRE: 4 BUS: 225A MAIN: 150A LOCATION: ELECTRICAL ROOM MIN. A.I.C. RATING: 10,000 ENCLOSURE: NEMA 1 MOUNTING: SURFACE

CKT	AMP TRIP	LOAD DESCRIPTION	KVA	LOAD	A	B	C	LOAD	KVA	LOAD DESCRIPTION	AMP TRIP	CKT	
1	20/1	MAIN CONTROL PANEL			1.8				1.8	AIR COMPRESSOR	20/1	2	(2)
3	20/1	DE-WATER PUMP CONTROL				0.1			0.1	SENSAPHONE AUTODIALER	20/1	4	
5	20/1	POLYMAX					1.5		1.5	GEN. HTRS/BATT CHARGER	20/1	6	
7					3.3				3.3	UV SYSTEM	40/2	8	(3)
9						3.3			3.3			10	
11							0.0					12	
13					0.0							14	
15						0.0						16	
17							0.0					18	
19					0.0							20	
21						0.0						22	
23							0.0					24	
25					0.0							26	
27	100/3	PANEL 'LL'				0.0						28	
29							0.0					30	
31					0.0							32	
33						0.0			PANEL 'LH'		100/3	34	
35							0.0					36	
37					0.0							38	
39						0.0						40	
41							0.0					42	
*					5.1	3.4	1.5						

TOTAL KVA: 10.0
AMPS: 27.8

SUMMARY BY LOAD TYPE		CONNECTED KVA PH A	PH B	PH C	FEED	TOTAL KVA	NEC%	NEC TOTAL	NOTES:
L	LIGHTING	0.0	0.0	0.0		0.0	1.25	0.0	
R	RECEPTACLES	0.0	0.0	0.0		0.0	10K+50%	0.0	
M	MOTORS	0.0	0.0	0.0		0.0	1.00	0.0	
LM	LARGEST MOTOR	0.0	0.0	0.0		0.0	1.25	0.0	
C	CONTINUOUS	0.0	0.0	0.0		0.0	1.25	0.0	
N	NON-CONTINUOUS	0.0	0.0	0.0		0.0	1.00	0.0	
S	SPARE	0.0	0.0	0.0		0.0	1.00	0.0	
X	NON-COINCIDENT	0.0	0.0	0.0		0.0	0.00	0.0	
O	OTHER	0.0	0.0	0.0		0.0	1.00	0.0	
F	FEEDER	0.0	0.0	0.0		0.0	1.00	0.0	
TOTAL KVA (PHASE)		0.0	0.0	0.0		0.0		0.0	
TOTAL AMPERES		0.0	0.0	0.0		0.0		0.0	
PHASE BALANCE, ABC		A-B	B-C	C-A					
PERCENT									

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UV DISINFECTION SYSTEM

POWER ONE-LINE DIAGRAM AND PANEL SCHEDULE

DATE	BY	REVISION

Project No. 1529.50093.01
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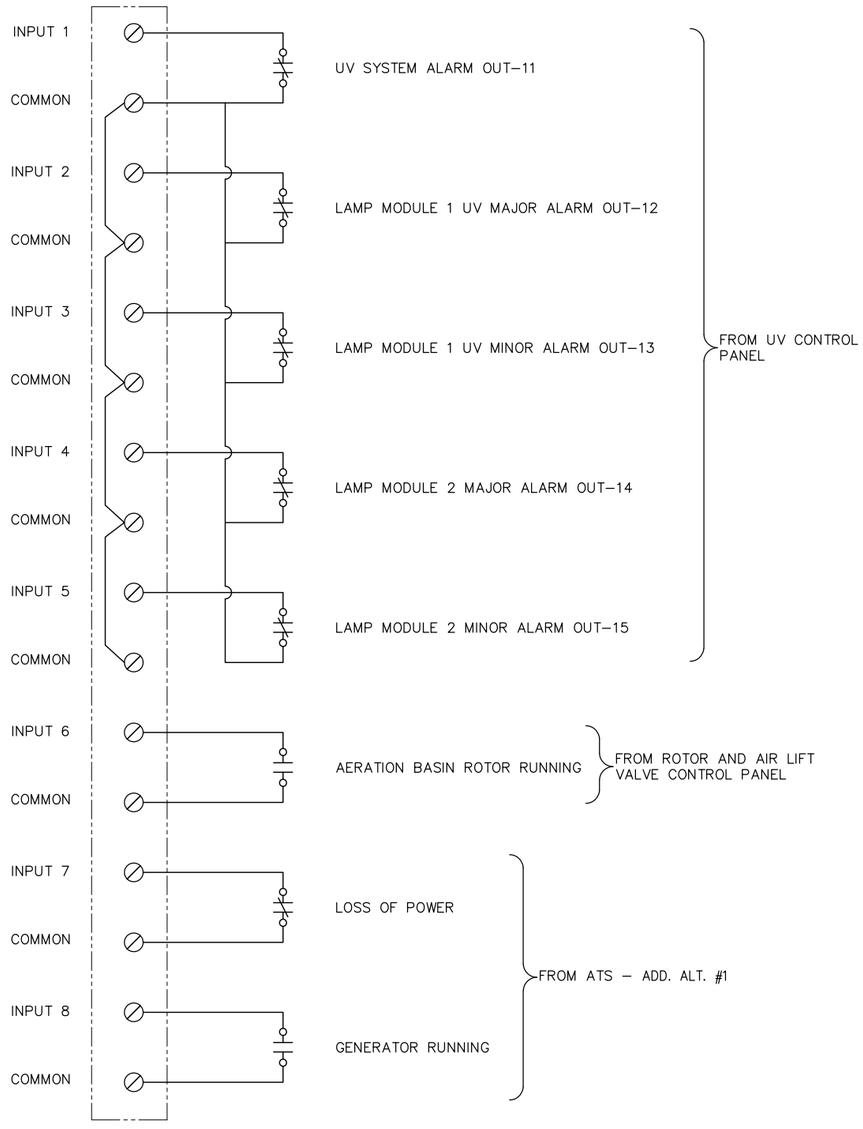
Sheet No. E04 SHEET OF 23



1 / E05 AUTODIALER INPUTS SCHEMATIC
SCALE: NTS

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AUTODIALER INPUTS SCHEMATIC

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