



PUBLIC WORKS DEPARTMENT, ENGINEERING DIVISION

FUNDED IN PART BY THE



GRANT #: WQC-2021-BELLPW-00018

# DONALD AVENUE WATER QUALITY RETROFIT

CITY OF BELLINGHAM PROJECT #: EV-0171

**PROJECT REPRESENTATIVES**

CITY PROJECT ENGINEER:  
JESSICA BENNETT, P.E.

CIVIL ENGINEER & LAND SURVEYOR:



Pacific Surveying & Engineering

**GEOTECHNICAL ENGINEER**



ELEMENT solutions

CITY OFFICIALS  
MAYOR - KIM LUND  
PW DIRECTOR - ERIC JOHNSTON

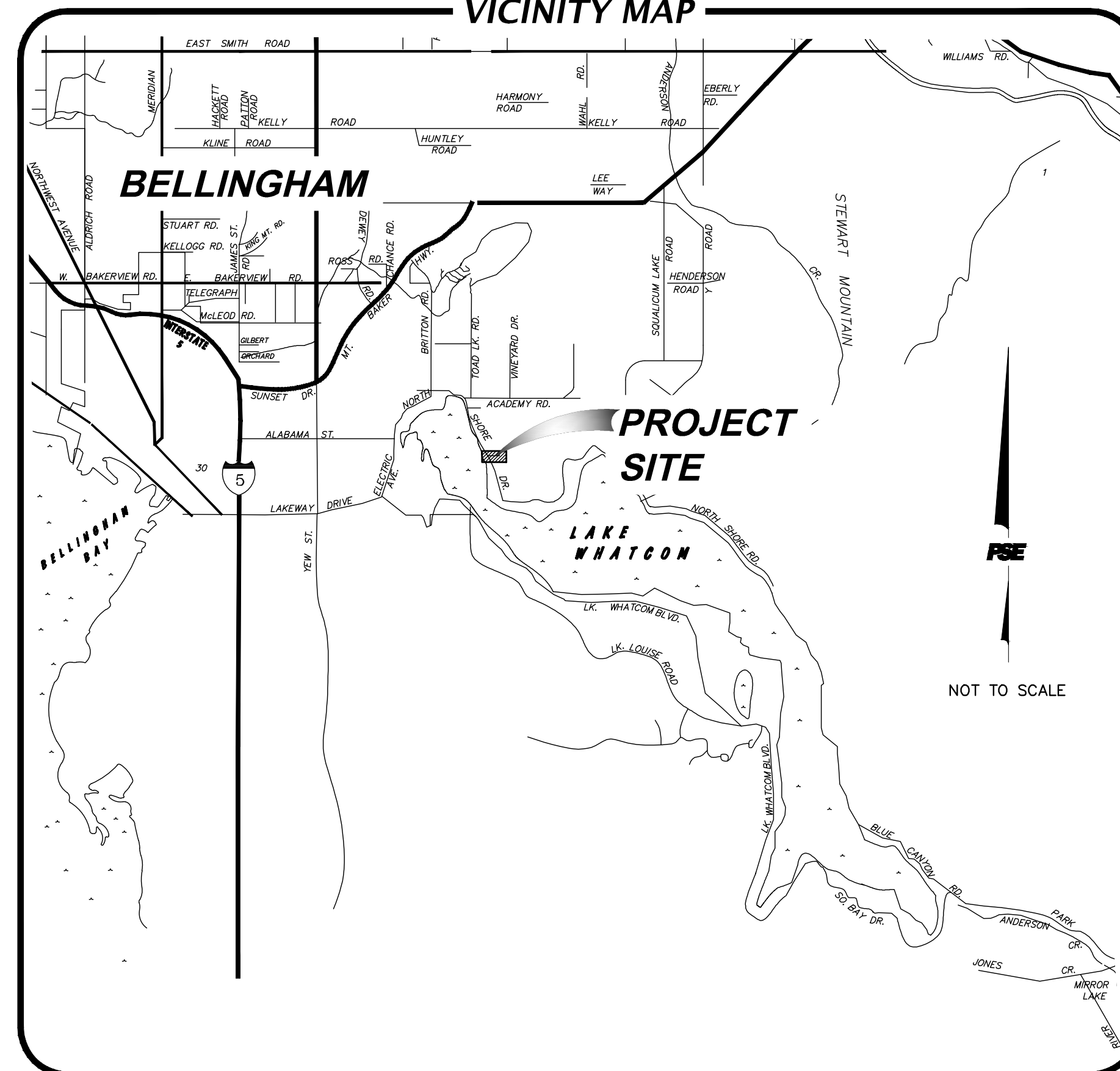
CITY COUNCIL  
HANNAH STONE  
HOLLIE HUTHMAN  
DANIEL HAMMILL  
EDWIN WILLIAMS  
LISA ANDERSON  
MICHAEL LILLIQUIST  
JACE COTTON

CERTIFYING ENGINEER



IAN HINTON, P.E.  
PACIFIC SURVEYING & ENGINEERING  
360.671.7387

**VICINITY MAP**



**NOTES**

1. THE CITY OF BELLINGHAM'S TARGET ELEVATION FOR THE LAKE WHATCOM MAXIMUM WATER SURFACE ELEVATION IS CONSIDERED TO BE 314.50' (CITY DATUM) WHICH TRANSLATES TO 312.79' (NAVD88). WHATCOM COUNTY DECREE=314.94', CITY OF BELLINGHAM DECREE=313.23'.  
314.94' - 313.23' = 1.71', 314.50' - 1.71' = 312.79'.

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WASHINGTON STATE DEPARTMENT  
OF ECOLOGY

Date	No	Revision	By
6/12/24	6	Revisions per DOE Comments	
6/5/24	5	Bid Set	
4/25/24	4	90% Design	
10/13/23	3	Ecology Review Response	
6/12/23	2	60% Design	

PROJECT ENGINEER I.D.H.  
DESIGNED/DRAWN I.D.H.  
INSPECTOR --

DIRECTOR PUBLIC WORKS E.C.J.  
CITY ENGINEER J.J.B.  
ASSISTANT DIRECTOR M.L.W.

CITY OF BELLINGHAM, WASHINGTON  
PUBLIC WORKS DEPARTMENT  
ENGINEERING DIVISION

SCALE  
Horiz. N/A  
Vert. N/A

DATUM  
NAD 83/98  
NAVD 88

Job. No. EV-0171  
Date 10/13/2023  
Field Bk. 1062 SERIES

DONALD AVE. WATER QUALITY RETROFIT  
COVER

SHEET  
01 OF  
17

**EXISTING LINE AND SYMBOL LEGEND**

---	= EXISTING ROADWAY CENTERLINE
---	= EXISTING EDGE OF ASPHALT
---	= EXISTING EDGE OF CONCRETE
---	= EXISTING CONCRETE PAD
.....	= EXISTING BUTTON STRIPE
.....	= EXISTING WHITE STRIPE
=====	= EXISTING STORM CULVERT
SD	= EXISTING STORM DRAIN LINE
[SD]	= RECORD STORM DRAIN LINE
SS	= EXISTING SANITARY SEWER GRAVITY LINE
[SS]	= RECORD SANITARY SEWER LINE
W	= EXISTING WATER LINE
[W]	= RECORD WATER LINE
OHE	= EXISTING OVERHEAD ELECTRIC LINES
[OHE]	= RECORD OVERHEAD ELECTRIC LINES
OHE/OCM	= EXISTING OVERHEAD ELECTRIC & COMMUNICATION LINES
[OHE/OCM]	= RECORD OVERHEAD ELECTRIC & COMMUNICATION LINES
UTV	= EXISTING UNDERGROUND TV CABLE LINE
[UTV]	= RECORD UNDERGROUND TV CABLE LINE
UCM	= EXISTING UNDERGROUND COMMUNICATIONS LINE
[UCM]	= RECORD UNDERGROUND COMMUNICATIONS LINE
OPH	= EXISTING OVERHEAD TELEPHONE LINE
[OPH]	= RECORD OVERHEAD TELEPHONE LINE
GUY	= EXISTING OVERHEAD GUY WIRE LINE
G	= EXISTING UNDERGROUND GAS LINE
[G]	= RECORD UNDERGROUND GAS LINE
TOP	= EXISTING TOP OF SLOPE LINE
TOE	= EXISTING TOE OF SLOPE LINE
-120	= EXISTING GRADE INDEX CONTOUR
-118	= EXISTING GRADE INTERVAL CONTOUR
->>	= EXISTING FLOW LINE
OHW	= EXISTING ORDINARY HIGH WATER LINE
~~~~~	= EXISTING EDGE OF BRUSH
~~~~~	= EXISTING EDGE OF TREES
○	= EXISTING CHAINLINK FENCE
x	= EXISTING BARBED WIRE FENCE
□	= EXISTING WOOD FENCE
○-○-○-○	= EXISTING ROCK FENCE
●	= EXISTING MONUMENT
▲	= EXISTING REBAR AND CAP PLS#...
⊕	= SET REBAR & ORANGE PLASTIC CAP
⊙	= EXISTING STORM DRAIN MANHOLE
⊕	= EXISTING STORM DRAIN CLEANOUT
⊙	= EXISTING CATCH BASIN
⊙	= EXISTING SANITARY SEWER MANHOLE
⊕	= EXISTING WATER METER
⊕	= EXISTING IRRIGATION BOX
⊕	= EXISTING POST
⊕	= EXISTING STOP SIGN
⊕	= EXISTING STREET SIGN
⊕	= EXISTING MAILBOX
⊕	= EXISTING POWER POLE
⊕-drp	= EXISTING POWER POLE W/DROP
⊕	= EXISTING GROUND GUY
⊕	= EXISTING FIBER-OPTIC/COMM. HANDHOLD
⊕	= EXISTING FIBER-OPTIC/COMM. PEDESTAL/RISER
⊕	= EXISTING ELECTRIC HANDHOLD
⊕	= EXISTING TELEPHONE PEDESTAL/RISER
⊕	= EXISTING CONIFEROUS TREE (GENERIC)
⊕	= EXISTING DECIDUOUS TREE (GENERIC)
⊕	= EXISTING BIRCH TREE
⊕	= EXISTING COTTONWOOD TREE
⊕	= EXISTING ASPEN/POPLAR TREE
⊕	= EXISTING WILLOW TREE
⊕	= EXISTING PINE/SPRUCE TREE
⊕	= EXISTING FIR TREE
⊕	= EXISTING LANDSCAPE TREE/UNKNOWN SPECIES TREE
⊕	= EXISTING FRUIT TREE
⊕	= EXISTING CEDAR TREE
⊕	= EXISTING ALDER TREE
⊕	= EXISTING MADRONA TREE
⊕	= EXISTING MAPLE TREE
⊕	= EXISTING HEMLOCK TREE
⊕	= EXISTING OAK TREE
⊕	= EXISTING BUSH
⊕	= EXISTING SHRUB
⊕	= EXISTING STUMP
15'φ	= DIAMETER OF EXISTING TREE
123.45	= SPOT ELEVATION ON EXISTING GROUND
▨	= EXISTING ASPHALT SURFACING
▩	= EXISTING CONCRETE SURFACING
▧	= EXISTING GRAVEL SURFACING

**PROPOSED LINE AND SYMBOL LEGEND**

---	= PROPOSED EDGE OF ASPHALT
---	= PROPOSED EDGE OF GRAVEL ROAD
---	= PROPOSED SAWCUT LIMITS
==>	= PROPOSED DITCH LINE
SD	= PROPOSED STORM DRAIN LINE
TOP	= PROPOSED TOP OF SLOPE LINE
TOE	= PROPOSED TOE OF SLOPE LINE
(125)	= PROPOSED FINISHED GRADE INDEX CONTOUR
(124)	= PROPOSED FINISHED GRADE INTERVAL CONTOUR
□	= PROPOSED WOOD FENCE
⊕	= PROPOSED STORM DRAIN MANHOLE
⊕	= PROPOSED STORM DRAIN CLEANOUT
⊕	= PROPOSED CATCH BASIN
⊕	= PROPOSED STOP SIGN
⊕	= PROPOSED STREET SIGN
⊕	= PROPOSED BOLLARD
▨	= PROPOSED ASPHALT SURFACING
▩	= PROPOSED TOPSOIL & SOD
1	= CONSTRUCTION KEY NOTE
123.45	= PROPOSED FINISHED GRADE ELEVATION
X	= PROPOSED TREE REMOVAL

**ABBREVIATIONS**

A.D.	ALGEBRAIC DIFFERENCE	K	RATE OF VERTICAL CURVATURE
A.F.#	AUDITOR'S FILE NUMBER	LF	LINEAR FEET
ACP	ASPHALT CONCRETE PAVING	LT	LEFT
ADA	AMERICAN DISABILITIES ACT	MAX.	MAXIMUM
APPROX.	APPROXIMATE	MIN.	MINIMUM
APWA	AMERICAN PUBLIC WORKS ASSOCIATION	N.I.C.	NOT IN CONTRACT
B/C	BACK OF CURB	NVPA	NATIVE VEGETATION PROTECTION AREA
BMP	BEST MANAGEMENT PRACTICE	O.C.	ON CENTER
BVCE	BEGINNING VERTICAL CURVE ELEVATION	OHWM	ORDINARY HIGH WATER MARK
BVCS	BEGINNING VERTICAL CURVE STATION	PC	POINT OF CURVATURE
BW	BOTTOM OF WALL	PPC	PORTLAND CEMENT CONCRETE
C&G	CURB & GUTTER	PERF.	PERFORATED
CB	CATCH BASIN	PROP.	PROPOSED
CL	CENTERLINE	PT	POINT OF TANGENCY
CMP	CORRUGATED METAL PIPE	PVC	POLYVINYL CHLORIDE
CMU	CONCRETE MASONRY UNIT	PVI	POINT OF VERTICAL INFLECTION
CONC.	CONCRETE	R&C	RING & COVER
CPSSP	CORRUGATED POLYETHYLENE STORM SEWER PIPE	R/W	RIGHT OF WAY
CSTC	CRUSHED SURFACING TOP COURSE	R=	CURVE RADIUS
D.I.	DUCTILE IRON	RT	RIGHT
DIA.	DIAMETER	S.S.	STAINLESS STEEL
EG	EXISTING GRADE	S/W	SIDEWALK
EL	ELEVATION	SD	STORM DRAIN
EOP	EDGE OF PAVEMENT	SDCB	STORM DRAIN CATCH BASIN
EVCE	ENDING VERTICAL CURVE ELEVATION	SDMH	STORM DRAIN MANHOLE
EVCS	ENDING VERTICAL CURVE STATION	SDR	STANDARD DIAMETER RATIO
EX.	EXISTING	SF	SQUARE FOOT
F&G	FRAME AND GRATE	SPEC.	SPECIFICATION
F.HYD.	FIRE HYDRANT	SSCO	SANITARY SEWER CLEAN-OUT
F/C	FACE OF CURB	SSMH	SANITARY SEWER MANHOLE
FF	FINISH FLOOR	STA	STATION
FG	FINISH GRADE	STD	STANDARD
FL	FLOWLINE	SVC	SERVICE
FS	FINISH SURFACE	T/W	TOP OF WALL
GA.	GAUGE	TBOC	TOP BACK OF CURB
GALV.	GALVANIZED	TC	TOP OF CURB
H.C.	HANDICAP	TF	TOP OF FOOTING
I.E.	INVERT ELEVATION	TP	TOP OF PIPE
INV.	INVERT	TYP.	TYPICAL
		VC	VERTICAL CURVE LENGTH
		W/	WITH
		WM	WATER METER
		WSDOE	WASHINGTON STATE DEPT. OF ECOLOGY
		WSDOT	WASHINGTON STATE DEPT. OF TRANSPORTATION

**LEGAL DESCRIPTION**

(PER CHICAGO TITLE SUBDIVISION GUARANTEE ORDER NO. 245421032)

ALL THAT PORTION OF GOVERNMENT LOT 5, SECTION 22, TOWNSHIP 37 NORTH, RANGE 4 EAST OF W.M., LYING SOUTHWESTERLY OF LAKE WHATCOM BOULEVARD.

ALSO ALL THAT PART OF THE NORTHWEST QUARTER OF THE NORTHWEST QUARTER OF SECTION 27, TOWNSHIP 37 NORTH, RANGE 4 EAST OF W.M., LYING SOUTHWESTERLY OF LAKE WHATCOM BOULEVARD.

ALSO THE SOUTHWEST QUARTER OF THE NORTHWEST QUARTER; THE EAST HALF OF THE NORTHWEST QUARTER, EXCEPT THAT PART CONVEYED TO W A LESLIE BY DEED RECORDED IN VOLUME 237 OF DEEDS, PAGE 332, AND EXCEPT THAT PART LYING NORTHEASTERLY OF LAKE WHATCOM BOULEVARD, IN SECTION 27, TOWNSHIP 37 NORTH, RANGE 4 EAST OF THE WILLAMETTE MERIDIAN.

EXCEPT THAT PORTION CONVEYED TO WHATCOM COUNTY FOR COUNTY ROAD, AS DESCRIBED UNDER WHATCOM COUNTY AUDITOR'S FILE NO. 926898.

LESS ROADS.

SITUATE IN WHATCOM COUNTY, WASHINGTON.

**NOTE**

1. CONTRACTOR SHALL TAKE NECESSARY PRECAUTIONS TO LOCATE AND PROTECT ALL EXISTING SURVEY MONUMENTS, WHICH INCLUDES PROPERTY CORNERS, DURING CONSTRUCTION. ALL SURVEY MONUMENTS THAT MAY BE DISTURBED BY CONSTRUCTION SHALL BE IDENTIFIED AND REPLACED IN ACCORDANCE WITH RECOGNIZED SURVEYING PRACTICES BY A WASHINGTON STATE LICENSED LAND SURVEYOR PROVIDED BY THE CONTRACTOR.

2. PROTECTION OF THE ENVIRONMENT: NO CONSTRUCTION RELATED ACTIVITY SHALL CONTRIBUTE TO THE DEGRADATION OF THE ENVIRONMENT, ALLOW MATERIAL TO ENTER SURFACE OR GROUND WATERS, OR ALLOW PARTICULATE EMISSIONS TO THE ATMOSPHERE, WHICH EXCEED STATE OR FEDERAL STANDARDS. ANY ACTIONS THAT POTENTIALLY ALLOW A DISCHARGE TO STATE WATERS MUST HAVE PRIOR APPROVAL OF THE WASHINGTON STATE DEPARTMENT OF ECOLOGY.



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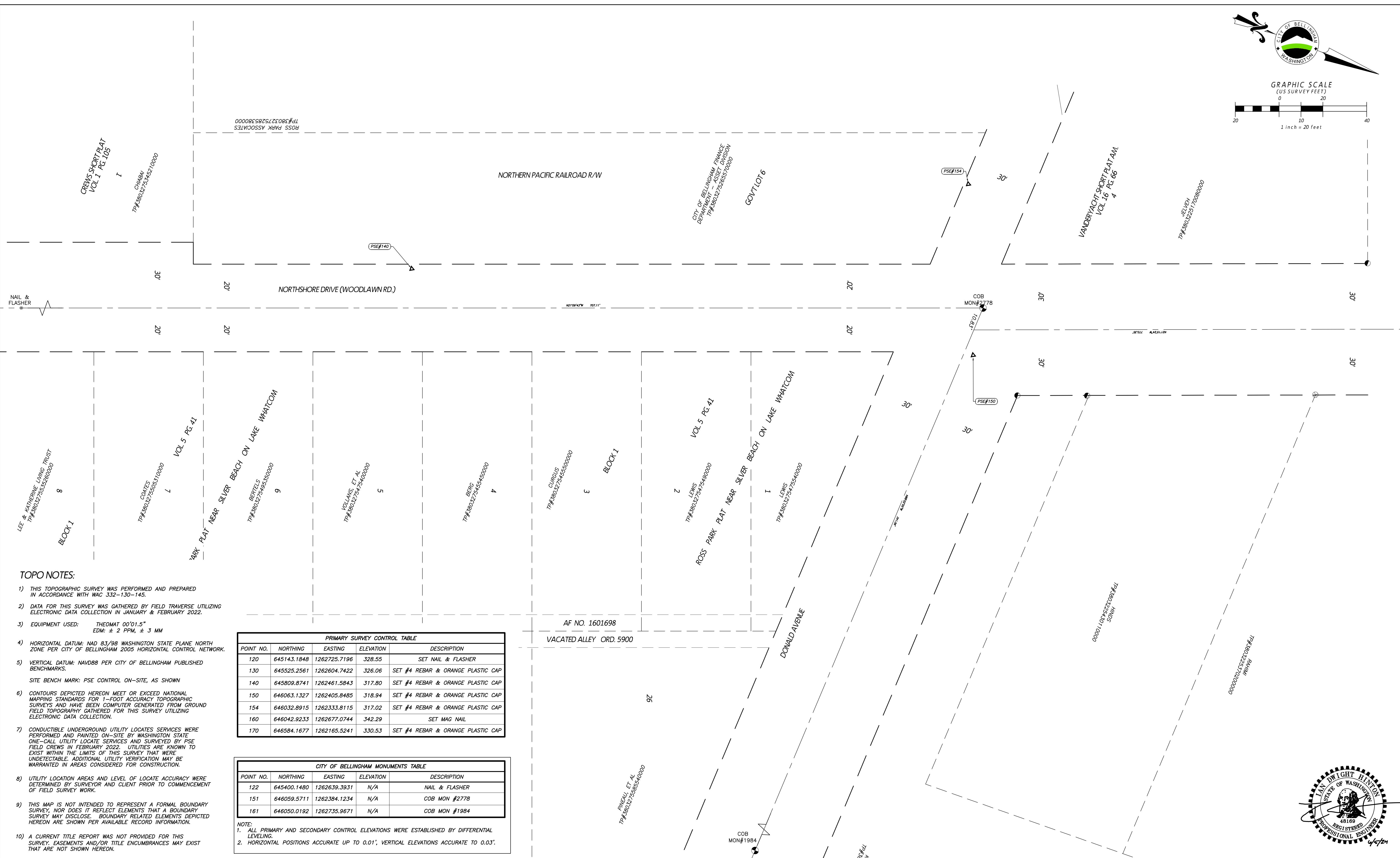
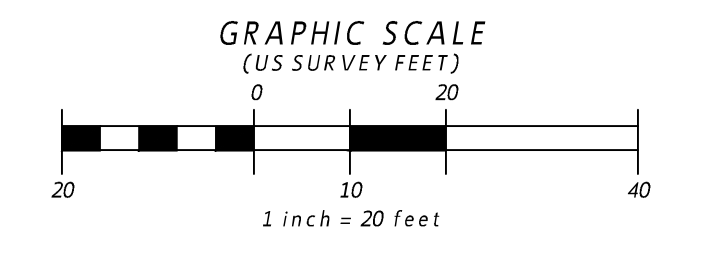
SCALE  
 Horiz. N/A  
 Vert. N/A

DATUM  
 NAD 83/98  
 NAVD 88

Job. No. EV-0171  
 Date 10/13/2023  
 Field Bk. 1062 SERIES

**DONALD AVE. WATER QUALITY RETROFIT**  
 LEGEND & ABBREVIATIONS

SHEET 02 OF 17



**TOPO NOTES:**

- 1) THIS TOPOGRAPHIC SURVEY WAS PERFORMED AND PREPARED IN ACCORDANCE WITH WAC 332-130-145.
- 2) DATA FOR THIS SURVEY WAS GATHERED BY FIELD TRAVERSE UTILIZING ELECTRONIC DATA COLLECTION IN JANUARY & FEBRUARY 2022.
- 3) EQUIPMENT USED: THEOMAT 00'D1.5" EDM: ± 2 PPM, ± 3 MM
- 4) HORIZONTAL DATUM: NAD 83/98 WASHINGTON STATE PLANE NORTH ZONE PER CITY OF BELLINGHAM 2005 HORIZONTAL CONTROL NETWORK.
- 5) VERTICAL DATUM: NAVD88 PER CITY OF BELLINGHAM PUBLISHED BENCHMARKS.  
SITE BENCH MARK: PSE CONTROL ON-SITE, AS SHOWN
- 6) CONTOURS DEPICTED HEREON MEET OR EXCEED NATIONAL MAPPING STANDARDS FOR 1-FOOT ACCURACY TOPOGRAPHIC SURVEYS AND HAVE BEEN COMPUTER GENERATED FROM GROUND FIELD TOPOGRAPHY GATHERED FOR THIS SURVEY UTILIZING ELECTRONIC DATA COLLECTION.
- 7) CONDUCTIBLE UNDERGROUND UTILITY LOCATES SERVICES WERE PERFORMED AND PAINTED ON-SITE BY WASHINGTON STATE ONE-CALL UTILITY LOCATE SERVICES AND SURVEYED BY PSE FIELD CREWS IN FEBRUARY 2022. UTILITIES ARE KNOWN TO EXIST WITHIN THE LIMITS OF THIS SURVEY THAT WERE UNDETECTABLE. ADDITIONAL UTILITY VERIFICATION MAY BE WARRANTED IN AREAS CONSIDERED FOR CONSTRUCTION.
- 8) UTILITY LOCATION AREAS AND LEVEL OF LOCATE ACCURACY WERE DETERMINED BY SURVEYOR AND CLIENT PRIOR TO COMMENCEMENT OF FIELD SURVEY WORK.
- 9) THIS MAP IS NOT INTENDED TO REPRESENT A FORMAL BOUNDARY SURVEY, NOR DOES IT REFLECT ELEMENTS THAT A BOUNDARY SURVEY MAY DISCLOSE. BOUNDARY RELATED ELEMENTS DEPICTED HEREON ARE SHOWN PER AVAILABLE RECORD INFORMATION.
- 10) A CURRENT TITLE REPORT WAS NOT PROVIDED FOR THIS SURVEY. EASEMENTS AND/OR TITLE ENCUMBRANCES MAY EXIST THAT ARE NOT SHOWN HEREON.

PRIMARY SURVEY CONTROL TABLE				
POINT NO.	NORTHING	EASTING	ELEVATION	DESCRIPTION
120	645143.1848	1262725.7196	328.55	SET NAIL & FLASHER
130	645525.2561	1262604.7422	326.06	SET #4 REBAR & ORANGE PLASTIC CAP
140	645809.8741	1262461.5843	317.80	SET #4 REBAR & ORANGE PLASTIC CAP
150	646063.1327	1262405.8485	318.94	SET #4 REBAR & ORANGE PLASTIC CAP
154	646032.8915	1262333.8115	317.02	SET #4 REBAR & ORANGE PLASTIC CAP
160	646042.9233	1262677.0744	342.29	SET MAG NAIL
170	646584.1677	1262165.5241	330.53	SET #4 REBAR & ORANGE PLASTIC CAP

CITY OF BELLINGHAM MONUMENTS TABLE				
POINT NO.	NORTHING	EASTING	ELEVATION	DESCRIPTION
122	645400.1480	1262639.3931	N/A	NAIL & FLASHER
151	646059.5711	1262384.1234	N/A	COB MON #2778
161	646050.0192	1262735.9671	N/A	COB MON #1984

NOTE:  
 1. ALL PRIMARY AND SECONDARY CONTROL ELEVATIONS WERE ESTABLISHED BY DIFFERENTIAL LEVELINGS.  
 2. HORIZONTAL POSITIONS ACCURATE UP TO 0.01'; VERTICAL ELEVATIONS ACCURATE TO 0.03'.

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 DESIGNED/DRAWN I.D.H.  
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**CITY OF BELLINGHAM, WASHINGTON**  
**PUBLIC WORKS DEPARTMENT**  
 ENGINEERING DIVISION

SCALE  
 Horiz. 1"=20'  
 Vert. N/A

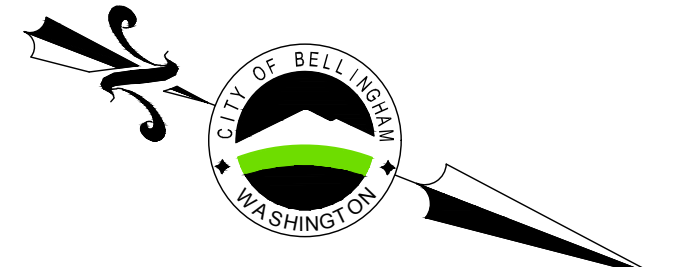
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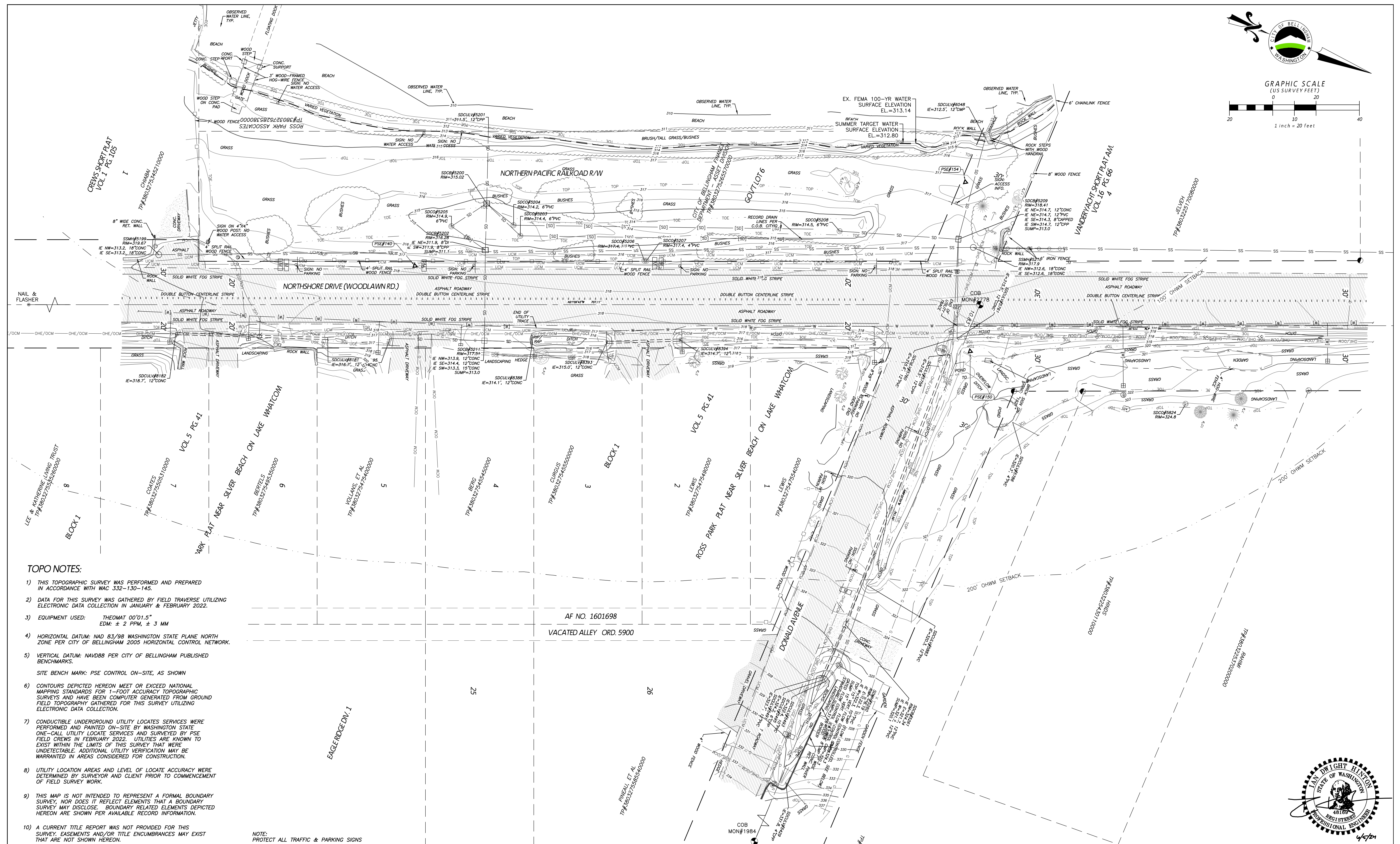
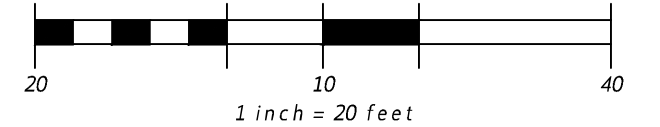
**DONALD AVE. WATER QUALITY RETROFIT**  
 SURVEY CONTROL

SHEET 03 OF 17





GRAPHIC SCALE  
(US SURVEY FEET)



**TOPO NOTES:**

- 1) THIS TOPOGRAPHIC SURVEY WAS PERFORMED AND PREPARED IN ACCORDANCE WITH WAC 332-130-145.
- 2) DATA FOR THIS SURVEY WAS GATHERED BY FIELD TRAVERSE UTILIZING ELECTRONIC DATA COLLECTION IN JANUARY & FEBRUARY 2022.
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NOTE:  
PROTECT ALL TRAFFIC & PARKING SIGNS

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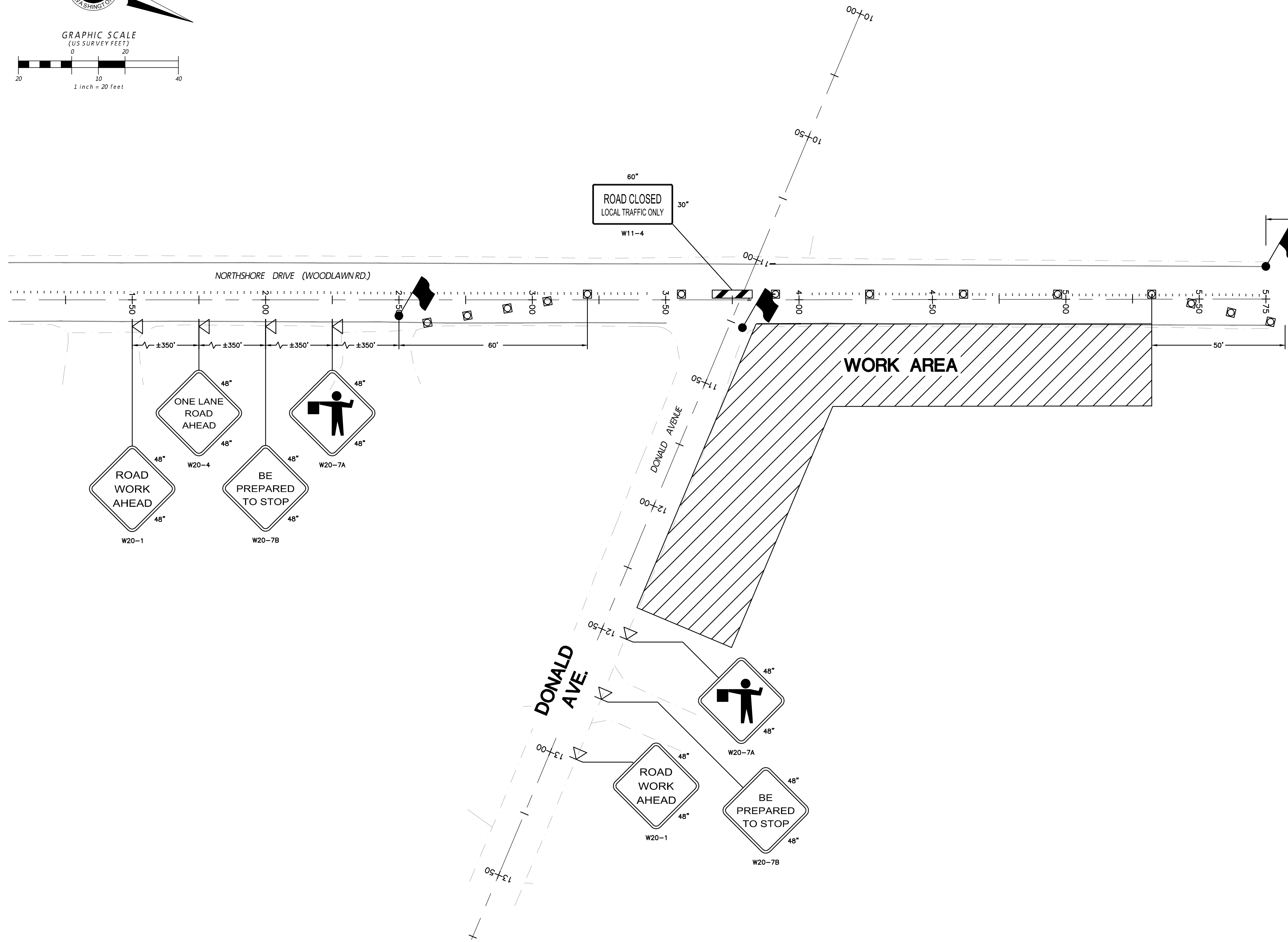
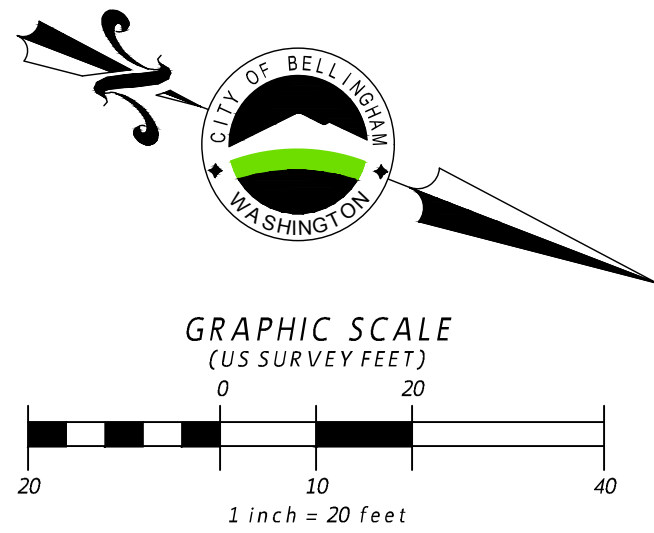
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**DONALD AVE. WATER QUALITY RETROFIT**  
 EXISTING CONDITIONS

SHEET 04 OF 17





LEGEND

- FLAGGING STATION
- TEMPORARY SIGN LOCATION
- CHANNELIZING DEVICES
- TYPE 3 BARRICADE

CHANNELIZATION DEVICE SPACING (feet)		
MPH	TAPER	TANGENT
35/40	30	60
25/30	20	40

- NOTE:
- NOTIFY AFFECTED BUSINESSES & RESIDENTS A MINIMUM OF 48 HOURS IN ADVANCE OF PROPOSED TRAFFIC CONTROL OR ACCESS INTERRUPTIONS.
  - ALL SPACING MAY BE ADJUSTED TO ACCOMMODATE INTERSECTIONS & DRIVEWAYS.
  - THIS SPACING MAY BE REDUCED IN URBAN AREAS TO FIT ROADWAY CONDITIONS.
  - ALL SIDEWALKS, DRIVEWAYS, EXITS & EGRESSSES SHALL BE COMPLETELY CLEAR UNLESS OTHERWISE INDICATED.
  - ALL SIGNS SHALL BE BLACK ON ORANGE UNLESS OTHERWISE SPECIFIED.
  - ALL SIGNS SHOWN SHALL BE CLASS B CONSTRUCTION SIGNS UNLESS OTHERWISE SPECIFIED.
  - TEMPORARY TRAFFIC CONTROL DEVICES SHALL BE EXTENDED TO A POINT WHERE THEY ARE VISIBLE TO APPROACHING TRAFFIC.
  - ARTERIAL WORKING HOURS: WORK HOURS 9:00AM TO 4:00PM WHEN FLAGGING ON NORTHSHORE DR.



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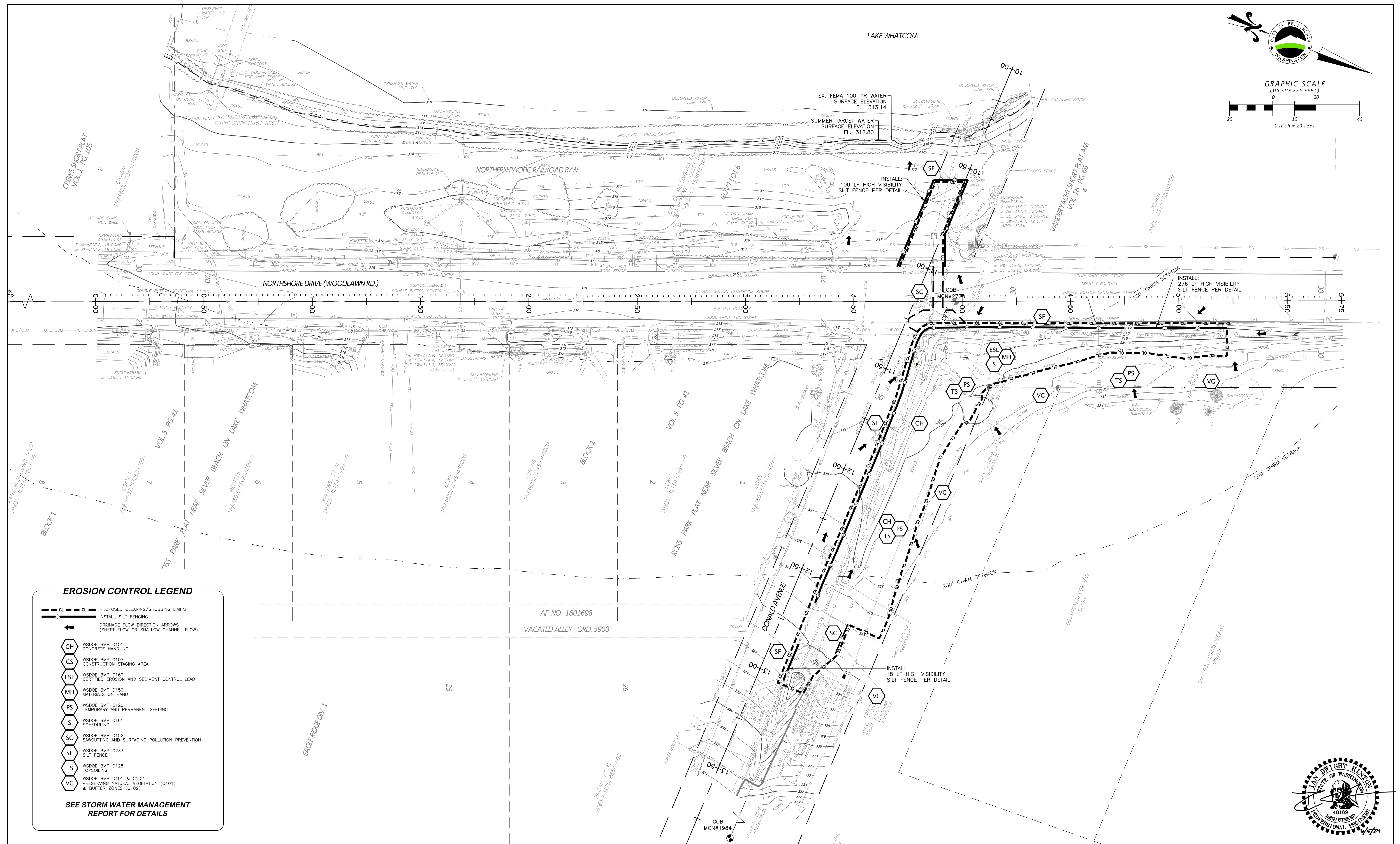
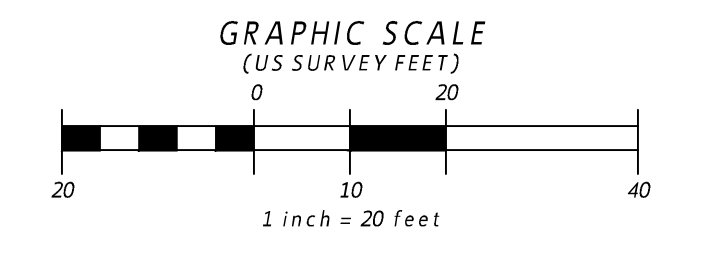
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**DONALD AVE. WATER QUALITY RETROFIT  
 TRAFFIC CONTROL PLAN**

SHEET 05 OF 17



**EROSION CONTROL LEGEND**

- PROPOSED CLEARING/GRUBBING LIMITS
- INSTALL SILT FENCING
- DRAINAGE FLOW DIRECTION ARROWS (SHEET FLOW OR SHALLOW CHANNEL FLOW)
- WSDOE BMP C151 CONCRETE HANDLING
- WSDOE BMP C107 CONSTRUCTION STAGING AREA
- WSDOE BMP C160 CERTIFIED EROSION AND SEDIMENT CONTROL LEAD
- WSDOE BMP C150 MATERIALS ON HAND
- WSDOE BMP C120 TEMPORARY AND PERMANENT SEEDING
- WSDOE BMP C161 SCHEDULING
- WSDOE BMP C152 SAWCUTTING AND SURFACING POLLUTION PREVENTION
- WSDOE BMP C233 SILT FENCE
- WSDOE BMP C125 TOPSOILING
- WSDOE BMP C101 & C102 PRESERVING NATURAL VEGETATION (C101) & BUFFER ZONES (C102)

SEE STORM WATER MANAGEMENT REPORT FOR DETAILS

Date	No	Revision	By
6/12/24	6	Revisions per DOE Comments	
6/5/24	5	Bid Set	
4/25/24	4	90% Design	
10/13/23	3	Ecology Review Response	
6/12/23	2	60% Design	

PROJECT ENGINEER I.D.H.  
 DESIGNED/DRAWN I.D.H.  
 INSPECTOR ---

DIRECTOR PUBLIC WORKS E.C.J.  
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 ASSISTANT DIRECTOR M.L.W.

**CITY OF BELLINGHAM, WASHINGTON**  
 PUBLIC WORKS DEPARTMENT  
 ENGINEERING DIVISION

SCALE  
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 Vert. N/A

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 NAD 83/98  
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Job No. EV-0171  
 Date 10/13/2023  
 Field Bk. 1062 SERIES

**DONALD AVE. WATER QUALITY RETROFIT**  
 TESC PLAN

SHEET 06 OF 17



**STORMWATER POLLUTION PREVENTION PLAN - 13 ELEMENTS**

**ELEMENT #1: - PRESERVE VEGETATION / MARK CLEARING LIMITS:**

PRIOR TO BEGINNING LAND DISTURBING ACTIVITIES, INCLUDING CLEARING & GRADING, ALL CLEARING LIMITS, SENSITIVE AREAS & THEIR BUFFERS, & TREES THAT ARE TO BE PRESERVED WITHIN THE CONSTRUCTION AREA SHOULD BE CLEARLY MARKED, BOTH IN THE FIELD & ON THE PLANS, TO PREVENT DAMAGE & OFFSITE IMPACTS. PLASTIC, METAL, OR STAKE WIRE FENCE MAY BE USED TO MARK THE CLEARING LIMITS.

**ELEMENT #2: - ESTABLISH CONSTRUCTION ACCESS:**

- (A) CONSTRUCTION VEHICLE ACCESS & EXIT SHALL BE LIMITED TO ONE ROUTE IF POSSIBLE.
- (B) ACCESS POINTS SHALL BE STABILIZED WITH QUARRY SPALL OR CRUSHED ROCK TO MINIMIZE THE TRACKING OF SEDIMENT ONTO PUBLIC ROADS.
- (C) WHEEL WASH OR TIRE BATHS SHOULD BE LOCATED ON SITE, IF APPLICABLE.
- (D) PUBLIC ROADS SHALL AT A MINIMUM BE CLEANED THOROUGHLY AT THE END OF EACH DAY. SEDIMENT SHALL BE REMOVED FROM ROADS BY SHOVELING OR PICKUP SWEEPING & SHALL BE TRANSPORTED TO A CONTROLLED SEDIMENT DISPOSAL AREA. STREET WASHING WILL BE ALLOWED ONLY AFTER SEDIMENT IS REMOVED IN THIS MANNER.
- (E) STREET WASH WASTEWATER SHALL BE CONTROLLED BY PUMPING BACK ON-SITE, OR OTHERWISE BE PREVENTED FROM DISCHARGING INTO SYSTEMS TRIBUTARY TO STATE SURFACE WATERS.

**ELEMENT #3: - CONTROL FLOW RATES:**

- (A) PROPERTIES & WATERWAYS DOWNSTREAM FROM DEVELOPMENT SITES SHALL BE PROTECTED FROM EROSION DUE TO INCREASES IN THE VOLUME, VELOCITY, & PEAK FLOW RATE OF STORMWATER RUNOFF FROM THE PROJECT SITE. PROPERTIES SUBJECT TO MINIMUM REQUIREMENT #5 AND/OR #7 SHALL IMPLEMENT CONTROLS AS EARLY IN THE DEVELOPMENT AS IS PRACTICABLE TO MITIGATE FOR FLOW RATES.
- (B) DOWNSTREAM ANALYSIS IS NECESSARY IF CHANGES IN FLOWS COULD IMPAIR OR ALTER CONVEYANCE SYSTEMS, STREAM BANKS, BED SEDIMENT OR AQUATIC HABITAT. SEE THE ECOLOGY MANUAL FOR OFFSITE ANALYSIS GUIDANCE.
- (C) WHERE NECESSARY TO COMPLY WITH MINIMUM REQUIREMENT #7, STORMWATER RETENTION/DETENTION FACILITIES SHALL BE CONSTRUCTED AS ONE OF THE FIRST STEPS IN GRADING. DETENTION FACILITIES SHALL BE FUNCTIONAL PRIOR TO CONSTRUCTION OF SITE IMPROVEMENTS (E.G. IMPERVIOUS SURFACES).
- (D) IF PERMANENT INFILTRATION PONDS ARE USED FOR FLOW CONTROL DURING CONSTRUCTION, THESE FACILITIES SHOULD BE PROTECTED FROM SILTATION DURING THE CONSTRUCTION PHASE.

**ELEMENT #4: - INSTALL SEDIMENT CONTROLS**

- (A) THE DUFF LAYER, NATIVE TOPSOIL, & NATURAL VEGETATION SHALL BE RETAINED IN AN UNDISTURBED STATE TO THE MAXIMUM EXTENT PRACTICABLE.
- (B) PRIOR TO LEAVING A CONSTRUCTION SITE, OR PRIOR TO DISCHARGE TO AN INFILTRATION FACILITY, STORMWATER RUNOFF FROM DISTURBED AREAS SHALL PASS THROUGH A SEDIMENT POND OR OTHER APPROPRIATE SEDIMENT REMOVAL BMP. RUNOFF FROM FULLY STABILIZED AREAS MAY BE DISCHARGED WITHOUT A SEDIMENT REMOVAL BMP, BUT MUST MEET THE FLOW CONTROL PERFORMANCE STANDARD OF ELEMENT 3. FULL STABILIZATION MEANS CONCRETE OR ASPHALT PAVING, QUARRY SPALLS USED AS DITCH LINING, OR THE USE OF ROLLED EROSION PRODUCTS, A BONDED FIBER MATRIX PRODUCT, OR VEGETATIVE COVER IN A MANNER THAT WILL FULLY PREVENT SOIL EROSION. SEDIMENT PONDS, VEGETATED BUFFER STRIPS, SEDIMENT BARRIERS OR FILTERS, DIKES, & OTHER BMPS INTENDED TO TRAP SEDIMENT ON-SITE SHALL BE CONSTRUCTED AS ONE OF THE FIRST STEPS IN GRADING. THESE BMPS SHALL BE FUNCTIONAL BEFORE OTHER LAND DISTURBING ACTIVITIES TAKE PLACE.
- (C) EARTHEN STRUCTURES SUCH AS DAMS, DIKES, & DIVERSIONS SHALL BE SEEDED & MULCHED ACCORDING TO THE TIMING INDICATED IN ELEMENT 5 BELOW.

**ELEMENT #5 - STABILIZE SOILS**

- (A) ALL EXPOSED & UNWORKED SOILS SHALL BE STABILIZED BY APPLICATION OF EFFECTIVE BMPS THAT PROTECT THE SOIL FROM THE EROSION FORCES OF RAINDROP IMPACT & FLOWING WATER, & WIND EROSION.
- (B) FROM OCTOBER 1 THROUGH APRIL 30 OF EACH YEAR, NO SOILS SHALL REMAIN EXPOSED & UNWORKED FOR MORE THAN 2 DAYS. FROM MAY 1 TO SEPTEMBER 30 OF EACH YEAR, NO SOILS SHALL REMAIN EXPOSED & UNWORKED FOR MORE THAN 7 DAYS. THIS CONDITION APPLIES TO ALL SOILS ON SITE, WHETHER AT FINAL GRADE OR NOT.
- (C) APPLICABLE PRACTICES INCLUDE, BUT ARE NOT LIMITED TO, TEMPORARY & PERMANENT SEEDING, SODDING, MULCHING, PLASTIC COVERING, SOIL APPLICATION OF POLYACRYLAMIDE (PAM), EARLY APPLICATION OF GRAVEL BASE ON AREAS TO BE PAVED, & DUST CONTROL.
- (D) SOIL STABILIZATION MEASURES SELECTED SHOULD BE APPROPRIATE FOR THE TIME OF YEAR, SITE CONDITIONS, ESTIMATED DURATION OF USE, & POTENTIAL WATER QUALITY IMPACTS THAT STABILIZATION AGENTS MAY HAVE ON DOWNSTREAM WATERS OR GROUND WATER.
- (E) SOIL STOCKPILES MUST BE STABILIZED & PROTECTED WITH SEDIMENT TRAPPING MEASURES.
- (F) WORK ON LINEAR CONSTRUCTION SITES & ACTIVITIES, INCLUDING RIGHT-OF-WAY & EASEMENT CLEARINGS, ROADWAY DEVELOPMENT, PIPELINES, & TRENCHING FOR UTILITIES, SHALL NOT EXCEED THE CAPABILITY OF THE INDIVIDUAL CONTRACTOR FOR HIS PORTION OF THE PROJECT TO INSTALL THE BEDDING MATERIALS, ROADBEDS, STRUCTURES, PIPELINES, AND/OR UTILITIES, & TO RE-STABILIZE THE DISTURBED SOILS, MEETING THE TIMING CONDITIONS LISTED ABOVE.
- (G) IN ADDITION, AT THE DISCRETION OF THE PUBLIC WORKS DIRECTOR, THOSE SITES UNABLE TO MAINTAIN THE QUALITY OF THEIR STORMWATER DISCHARGE MAY BE REQUIRED TO PROVIDE SOIL STABILIZATION TO ALL EXPOSED SOIL AREAS REGARDLESS OF THE WORKING STATUS OF THE AREA. UPON WRITTEN NOTIFICATION, THE PROPERTY OWNER SHALL PROVIDE FULL STABILIZATION OF ALL EXPOSED SOIL AREAS WITHIN 24 HOURS.
- (H) ALL LAND DISTURBING ACTIVITIES SHALL BE ACCOMPLISHED BETWEEN JUNE 1 & SEPTEMBER 30. LAND DISTURBING ACTIVITIES OUTSIDE OF THESE DATES IS NOT ALLOWED.

**ELEMENT #6 - PROTECT SLOPES**

- (A) CUT & FILL SLOPES SHALL BE DESIGNED & CONSTRUCTED IN A MANNER THAT WILL MINIMIZE EROSION.
- (B) CONSIDER SOIL TYPE & ITS POTENTIAL FOR EROSION.
- (C) REDUCE SLOPE RUNOFF VELOCITIES BY REDUCING THE CONTINUOUS LENGTH OF SLOPE WITH TERRACING & DIVERSIONS, REDUCE SLOPE STEEPNESS, & ROUGHEN SLOPE SURFACE.
- (D) DIVERT UPSLOPE DRAINAGE & RUN-ON WATERS FROM OFF-SITE WITH INTERCEPTORS AT TOP OF SLOPE. OFF-SITE STORMWATER SHOULD BE HANDLED SEPARATELY FROM STORMWATER GENERATED ON THE SITE. DIVERSION OF OFF-SITE STORMWATER AROUND THE SITE MAY BE A VIABLE OPTION. DIVERTED FLOWS SHALL BE REDIRECTED TO THE NATURAL DRAINAGE LOCATION AT OR BEFORE THE PROPERTY BOUNDARY.
- (E) CONTAIN DOWN SLOPE COLLECTED FLOWS IN PIPES, SLOPE DRAINS, OR PROTECTED CHANNELS.
- (F) PROVIDE DRAINAGE TO REMOVE GROUND WATER INTERSECTING THE SLOPE SURFACE OF EXPOSED SOIL AREAS.
- (G) EXCAVATED MATERIAL SHALL BE PLACED ON THE UPHILL SIDE OF TRENCHES, CONSISTENT WITH SAFETY & SPACE CONSIDERATIONS.
- (H) CHECK DAMS SHALL BE PLACED AT REGULAR INTERVALS WITHIN TRENCHES THAT ARE CUT DOWN A SLOPE.
- (I) STABILIZE SOILS ON SLOPES, AS SPECIFIED IN ELEMENT #5.

**ELEMENT #7 - PROTECT DRAIN INLETS**

- (A) ALL STORM DRAIN INLETS MADE OPERABLE DURING CONSTRUCTION SHALL BE PROTECTED SO THAT STORMWATER RUNOFF SHALL NOT ENTER THE CONVEYANCE SYSTEM WITHOUT FIRST BEING FILTERED OR TREATED TO REMOVE SEDIMENT.
- (B) ALL APPROACH ROADS SHALL BE KEPT CLEAN, & STREET WASH WATER SHALL NOT BE ALLOWED TO ENTER STORM DRAINS WITHOUT PRIOR & ADEQUATE TREATMENT UNLESS TREATMENT IS PROVIDED BEFORE THE STORM DRAIN DISCHARGES TO WATERS OF THE STATE.

**ELEMENT #8 - STABILIZE CHANNELS AND OUTLETS**

- (A) ALL TEMPORARY ON-SITE CONVEYANCE CHANNELS SHALL BE DESIGNED, CONSTRUCTED & STABILIZED TO PREVENT EROSION FROM THE EXPECTED VELOCITY OF FLOW FROM A 2 YEAR, 24-HOUR FREQUENCY STORM FOR THE DEVELOPED CONDITION.
- (B) STABILIZATION, INCLUDING ARMORING MATERIAL, ADEQUATE TO PREVENT EROSION OF OUTLETS, ADJACENT STREAM BANKS, SLOPES & DOWNSTREAM REACHES SHALL BE PROVIDED AT THE OUTLETS OF ALL CONVEYANCE SYSTEMS.

**ELEMENT #10 - CONTROL DEWATERING**

- (A) ALL FOUNDATION, VAULT, & TRENCH DEWATERING WATER, WHICH HAS SIMILAR CHARACTERISTICS TO STORMWATER RUNOFF AT THE SITE, SHALL BE DISCHARGED INTO A CONTROLLED CONVEYANCE SYSTEM, PRIOR TO DISCHARGE TO A SEDIMENT TRAP OR SEDIMENT POND. CHANNELS MUST BE STABILIZED, AS SPECIFIED IN ELEMENT #8.
- (B) CLEAN, NON-TURBID DEWATERING WATER, SUCH AS WELL-POINT GROUND WATER, CAN BE DISCHARGED TO SYSTEMS TRIBUTARY TO STATE SURFACE WATERS, AS SPECIFIED IN ELEMENT #8; PROVIDED THE DEWATERING FLOW DOES NOT CAUSE EROSION OR FLOODING OF THE RECEIVING WATERS. THESE CLEAN WATERS SHOULD NOT BE ROUTED THROUGH SEDIMENT PONDS WITH STORMWATER.
- (C) HIGHLY TURBID OR OTHERWISE CONTAMINATED DEWATERING WATER, SUCH AS FROM CONSTRUCTION EQUIPMENT OPERATION, CLAMSHELL DIGGING, CONCRETE TREMIE POUR, OR WORK INSIDE A COFFERDAM, SHALL BE HANDLED SEPARATELY FROM STORMWATER AT THE SITE.
- (D) OTHER DISPOSAL OPTIONS, DEPENDING ON SITE CONSTRAINTS, MAY INCLUDE, BY WAY OF EXAMPLE: 1) INFILTRATION, 2) TRANSPORT OFF-SITE IN VEHICLE, SUCH AS A VACUUM FLUSH TRUCK, FOR LEGAL DISPOSAL IN A MANNER THAT DOES NOT POLLUTE STATE WATERS, 3) ON-SITE TREATMENT USING CHEMICAL TREATMENT OR OTHER SUITABLE TREATMENT TECHNOLOGIES.

**ELEMENT #11 - MAINTAIN BMPS**

- (A) ALL TEMPORARY & PERMANENT EROSION & SEDIMENT CONTROL BMPS SHALL BE MAINTAINED & REPAIRED AS NEEDED TO ASSURE CONTINUED PERFORMANCE OF THEIR INTENDED FUNCTION. ALL MAINTENANCE & REPAIR SHALL BE CONDUCTED IN ACCORDANCE WITH BMPS.
- (B) SEDIMENT CONTROL BMPS SHALL BE INSPECTED WEEKLY OR AFTER A RUNOFF-PRODUCING STORM EVENT DURING THE DRY SEASON & DAILY DURING THE WET SEASON. ALL PROJECTS THAT DISTURB AN AREA GREATER THAN ONE ACRE SHALL HAVE A CERTIFIED EROSION CONTROL LEAD AVAILABLE TO THE SITE. THIS EROSION CONTROL LEAD SHALL BE RESPONSIBLE TO PROVIDE OVERVIEW OF ONGOING DAY TO DAY EROSION CONTROL REQUIREMENTS. THE EROSION CONTROL LEAD SHALL (WITHIN 24 HOURS) REPORT TO THE CITY & DEPARTMENT OF ECOLOGY ANY SITE DISCHARGES THAT EXCEED STATE WATER QUALITY STANDARDS THAT HAVE OR ARE LIKELY TO HAVE ENTERED WATERS OF THE STATE.
- (C) ALL TEMPORARY EROSION & SEDIMENT CONTROL BMPS SHALL BE REMOVED WITHIN 30 DAYS AFTER FINAL SITE STABILIZATION IS ACHIEVED OR AFTER THE TEMPORARY BMPS ARE NO LONGER NEEDED. TRAPPED SEDIMENT SHALL BE REMOVED OR STABILIZED ON SITE. DISTURBED SOIL AREAS RESULTING FROM REMOVAL OF BMPS OR VEGETATION SHALL BE PERMANENTLY STABILIZED.

**ELEMENT #12 - MANAGE THE PROJECT**

- (A) PHASING OF CONSTRUCTION - DEVELOPMENT PROJECTS SHALL BE PHASED WHERE FEASIBLE IN ORDER TO PREVENT, TO THE MAXIMUM EXTENT PRACTICABLE, THE TRANSPORT OF SEDIMENT FROM THE DEVELOPMENT SITE DURING CONSTRUCTION. REVEGETATION OF EXPOSED AREAS & MAINTENANCE OF THAT VEGETATION SHALL BE AN INTEGRAL PART OF THE CLEARING ACTIVITIES FOR ANY PHASE.
- (B) WHEN ESTABLISHING THESE PERMITTED CLEARING & GRADING AREAS, CONSIDERATION SHOULD BE GIVEN TO MINIMIZING REMOVAL OF EXISTING TREES & MINIMIZING DISTURBANCE/COMPACTION OF NATIVE SOILS EXCEPT AS NEEDED FOR BUILDING PURPOSES. PERMITTED CLEARING & GRADING AREAS & ANY OTHER AREAS REQUIRED TO PRESERVE CRITICAL OR SENSITIVE AREAS, BUFFERS, NATIVE GROWTH PROTECTION EASEMENTS, OR TREE RETENTION AREAS, SHALL BE DELINEATED ON THE SITE PLANS & THE DEVELOPMENT SITE.
- (C) COORDINATION WITH UTILITIES & OTHER CONTRACTORS - THE PRIMARY PROJECT PROPONENT SHALL EVALUATE, WITH INPUT FROM UTILITIES & OTHER CONTRACTORS, THE STORMWATER MANAGEMENT REQUIREMENTS FOR THE ENTIRE PROJECT, INCLUDING THE UTILITIES, WHEN PREPARING THE CONSTRUCTION SWPPP.
- (D) INSPECTION & MONITORING - ALL BMPS SHALL BE INSPECTED, MAINTAINED, & REPAIRED AS NEEDED TO ASSURE CONTINUED PERFORMANCE OF THEIR INTENDED FUNCTION.
- (E) FOR ANY PROJECT DISTURBING MORE THAN ONE ACRE, A CERTIFIED PROFESSIONAL IN EROSION & SEDIMENT CONTROL SHALL BE IDENTIFIED IN THE CONSTRUCTION SWPPP & SHALL BE ON-SITE OR ON-CALL AT ALL TIMES. CERTIFICATION MAY BE THROUGH THE WASHINGTON STATE DEPARTMENT OF TRANSPORTATION/ASSOCIATED GENERAL CONTRACTORS (WSDOT/AGC) CONSTRUCTION SITE EROSION & SEDIMENT CONTROL CERTIFICATION PROGRAM OR ANY EQUIVALENT LOCAL OR NATIONAL CERTIFICATION AND/OR TRAINING PROGRAM, IN THE CITY'S DISCRETION.
- (F) WHENEVER INSPECTION AND/OR MONITORING REVEALS THAT THE BMPS IDENTIFIED IN THE CONSTRUCTION SWPPP ARE INADEQUATE, DUE TO THE ACTUAL DISCHARGE OF OR POTENTIAL TO DISCHARGE A SIGNIFICANT AMOUNT OF ANY POLLUTANT, THE SWPPP SHALL BE MODIFIED, AS APPROPRIATE, IN A TIMELY MANNER.
- (G) MAINTENANCE OF THE CONSTRUCTION SWPPP - THE CONSTRUCTION SWPPP SHALL BE RETAINED ON-SITE. THE CONSTRUCTION SWPPP SHALL BE MODIFIED WHENEVER THERE IS A SIGNIFICANT CHANGE IN THE DESIGN, CONSTRUCTION, OPERATION, OR MAINTENANCE OF ANY BMP.

**ELEMENT #13 - PROTECT LOW IMPACT DEVELOPMENT BMPS**

- (A) PROTECT ALL BIORETENTION BMPS FROM SEDIMENTATION THROUGH INSTALLATION & MAINTENANCE OF EROSION & SEDIMENT CONTROL BMPS ON PORTIONS OF THE SITE THAT DRAIN INTO THE BIORETENTION AND/OR RAIN GARDEN BMPS. RESTORE THE BMPS TO THEIR FULLY FUNCTIONING CONDITION IF THEY ACCUMULATE SEDIMENT DURING CONSTRUCTION. RESTORING THE BMP MUST INCLUDE REMOVAL OF SEDIMENT & ANY SEDIMENT-LADEN BIORETENTION SOILS, & REPLACING THE REMOVED SOILS WITH SOILS MEETING THE DESIGN SPECIFICATION.
- (B) PREVENT COMPACTING BIORETENTION BMPS BY EXCLUDING CONSTRUCTION EQUIPMENT & FOOT TRAFFIC. PROTECT COMPLETED LAWN & LANDSCAPING AREAS FROM COMPACTION DUE TO CONSTRUCTION EQUIPMENT.
- (C) KEEP ALL HEAVY EQUIPMENT OFF EXISTING SOILS UNDER LID FACILITIES THAT HAVE BEEN EXCAVATED TO FINAL GRADE TO RETAIN INFILTRATION RATES OF THE SOILS.

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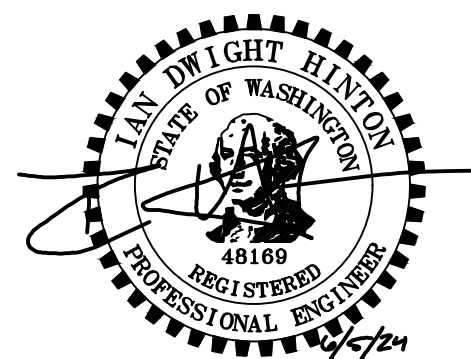
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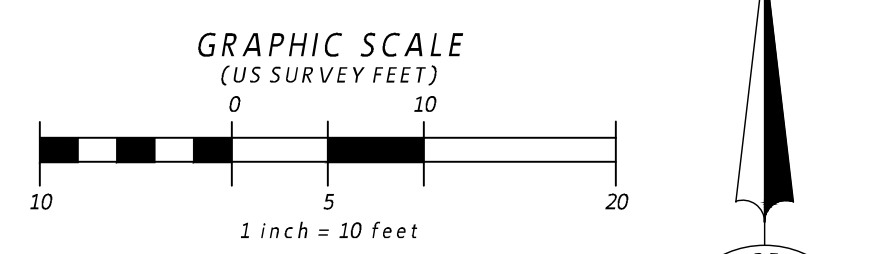
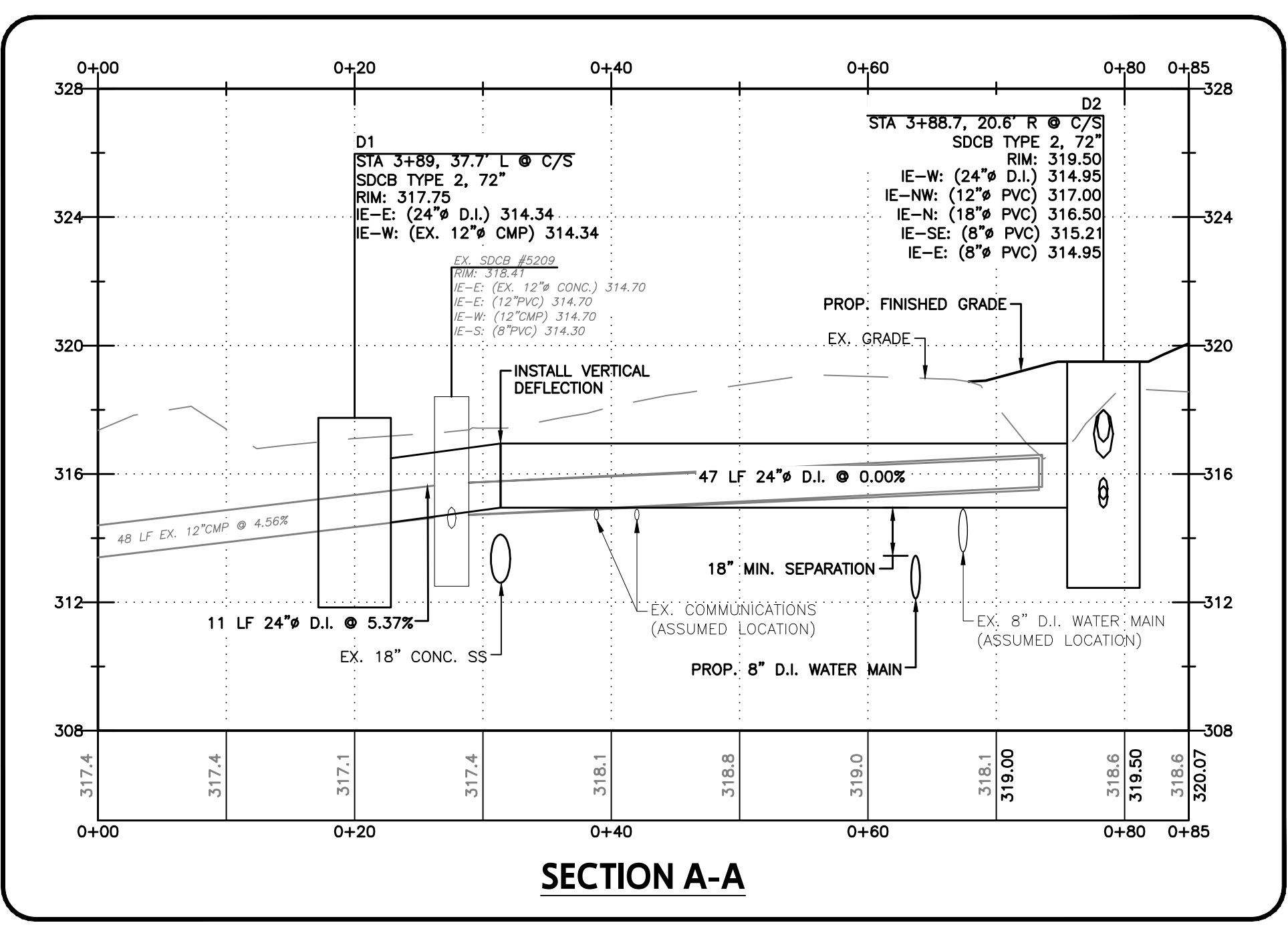
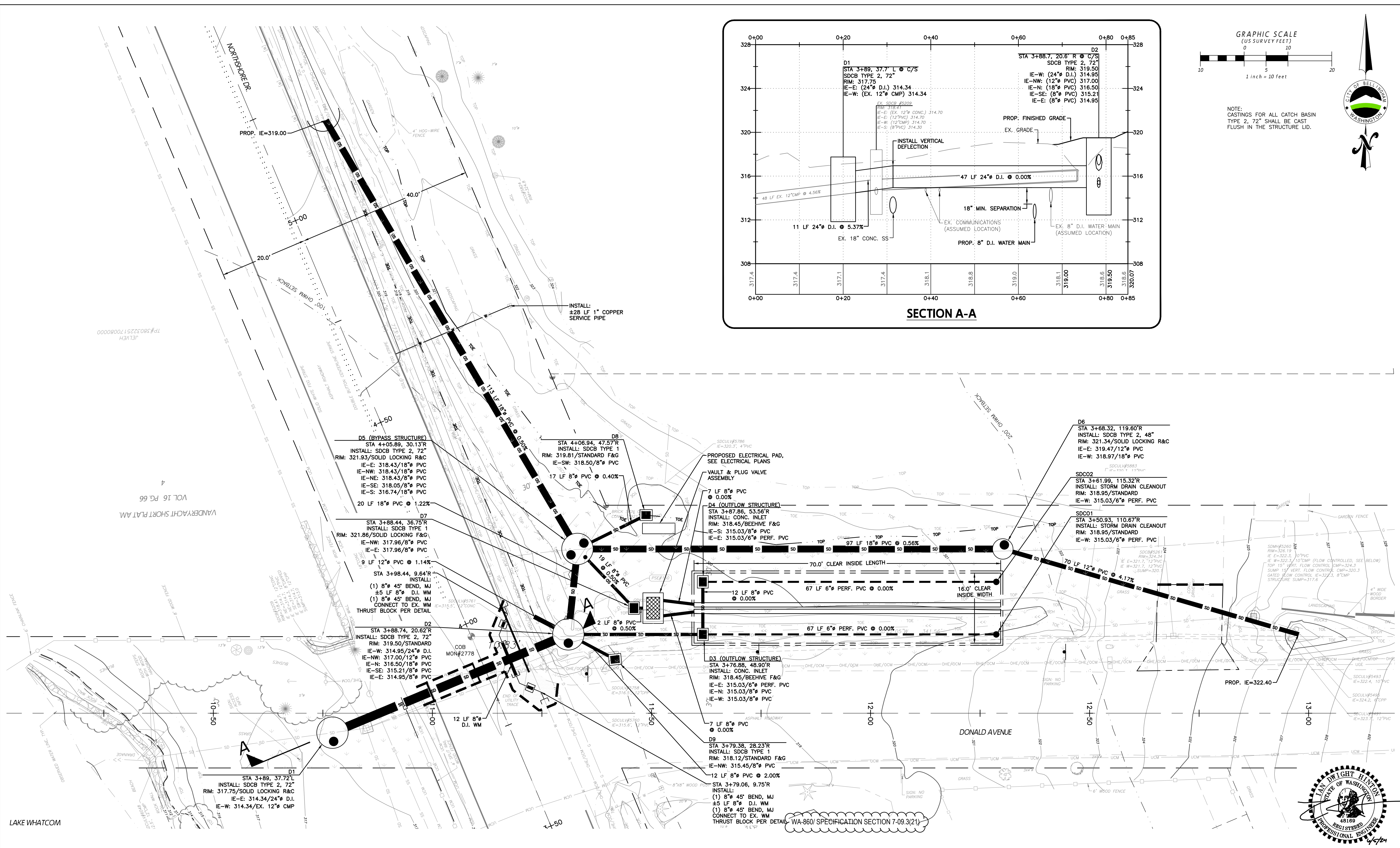
**DONALD AVE. WATER QUALITY RETROFIT**  
**SWPPP**

SHEET 07 OF 17









NOTE: CASTINGS FOR ALL CATCH BASIN TYPE 2, 72" SHALL BE CAST FLUSH IN THE STRUCTURE LID.



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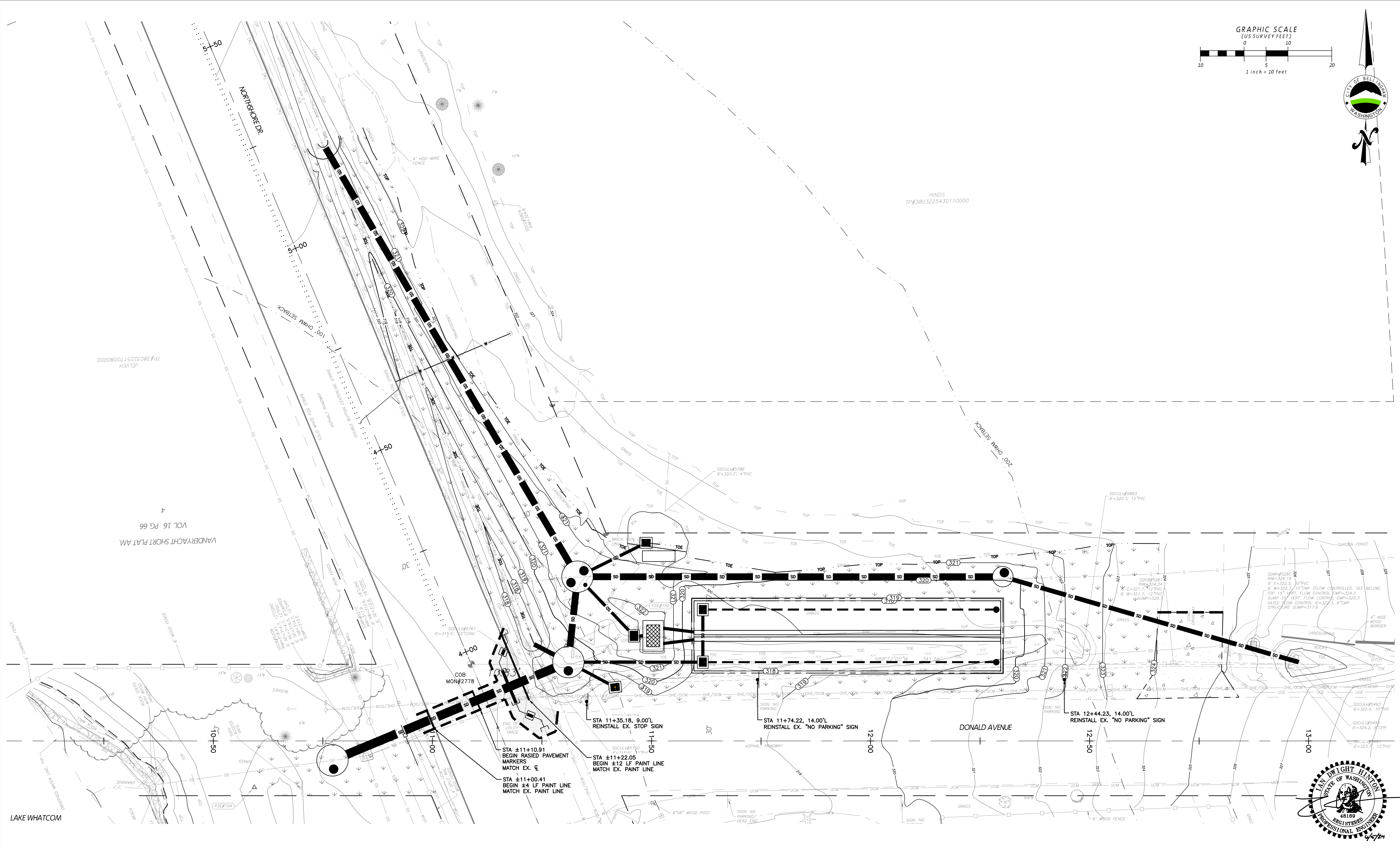
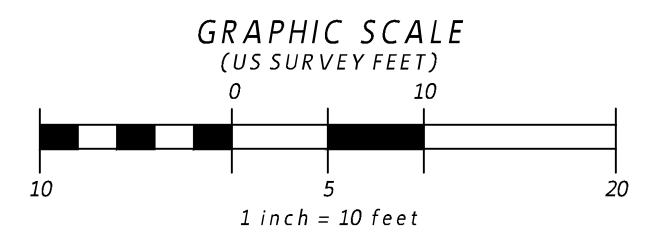
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**DONALD AVE. WATER QUALITY RETROFIT  
 STORMWATER IMPROVEMENTS**

SHEET 09 OF 17





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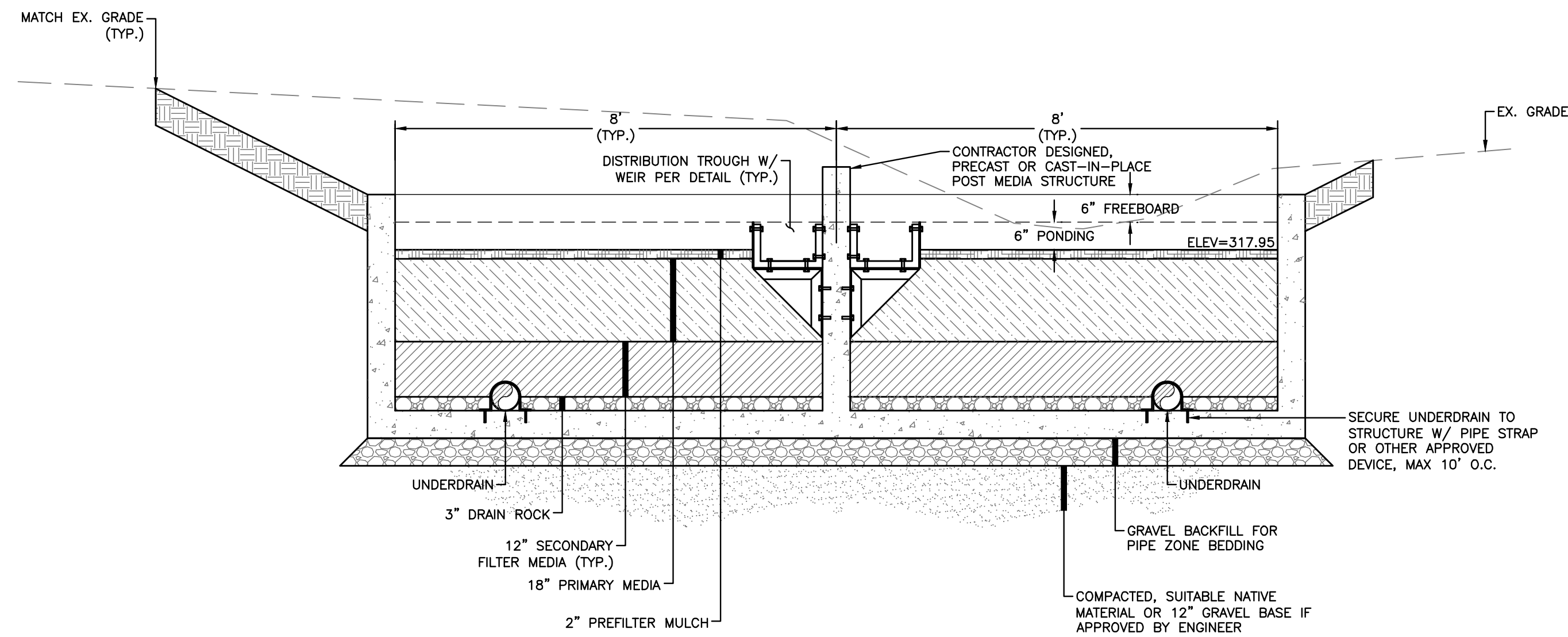
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**DONALD AVE. WATER QUALITY RETROFIT**  
 GRADING & RESTORATION

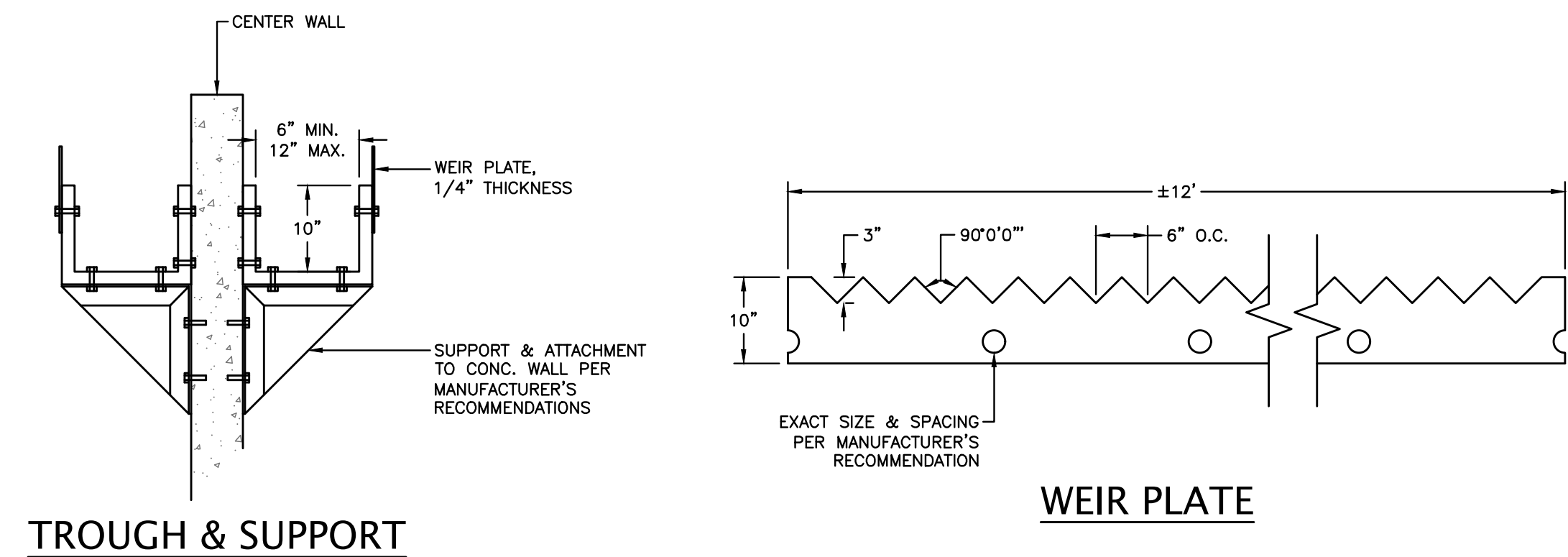
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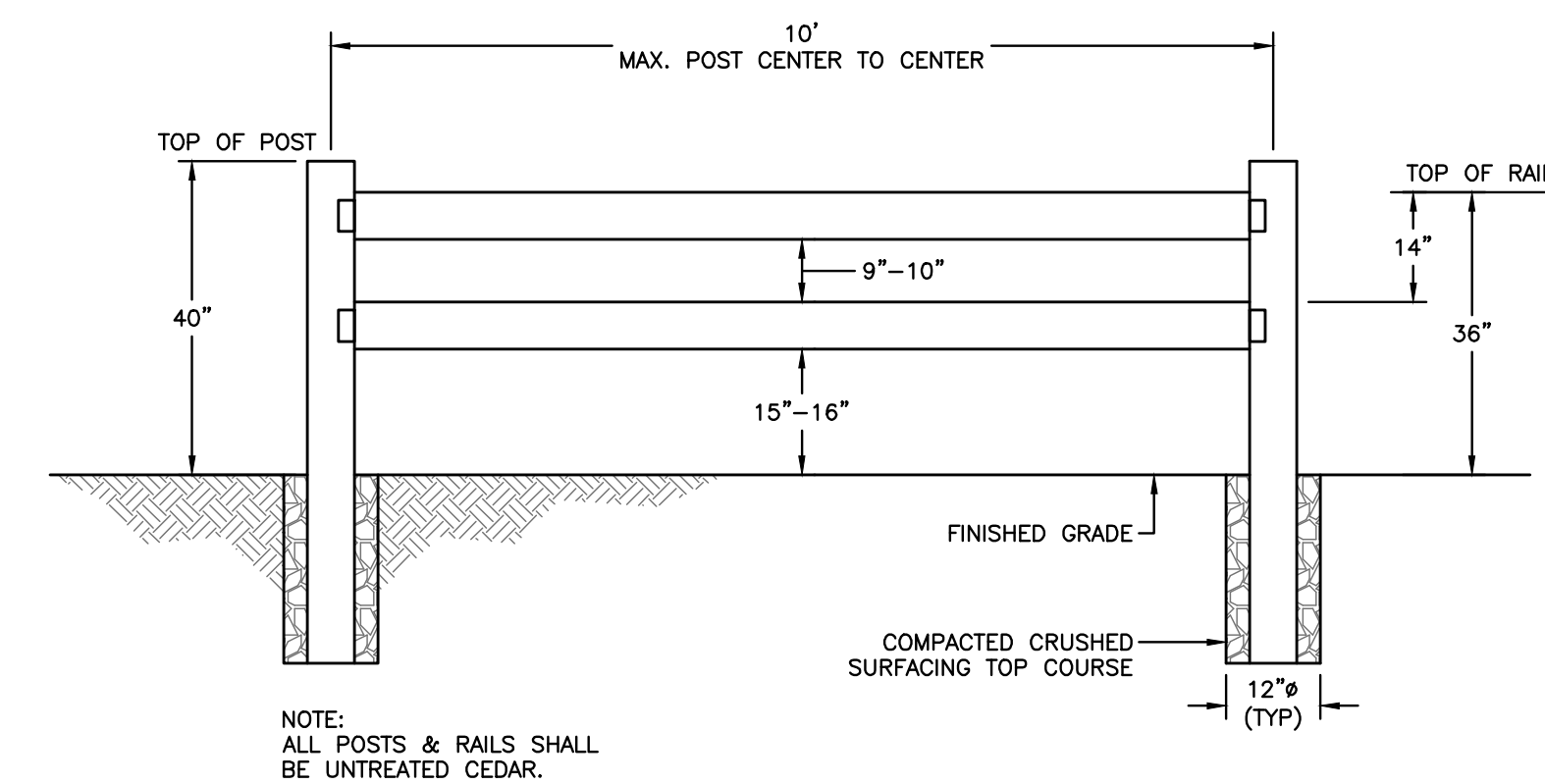
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## WOODEN SPLIT RAIL FENCE

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DONALD AVE. WATER QUALITY RETROFIT  
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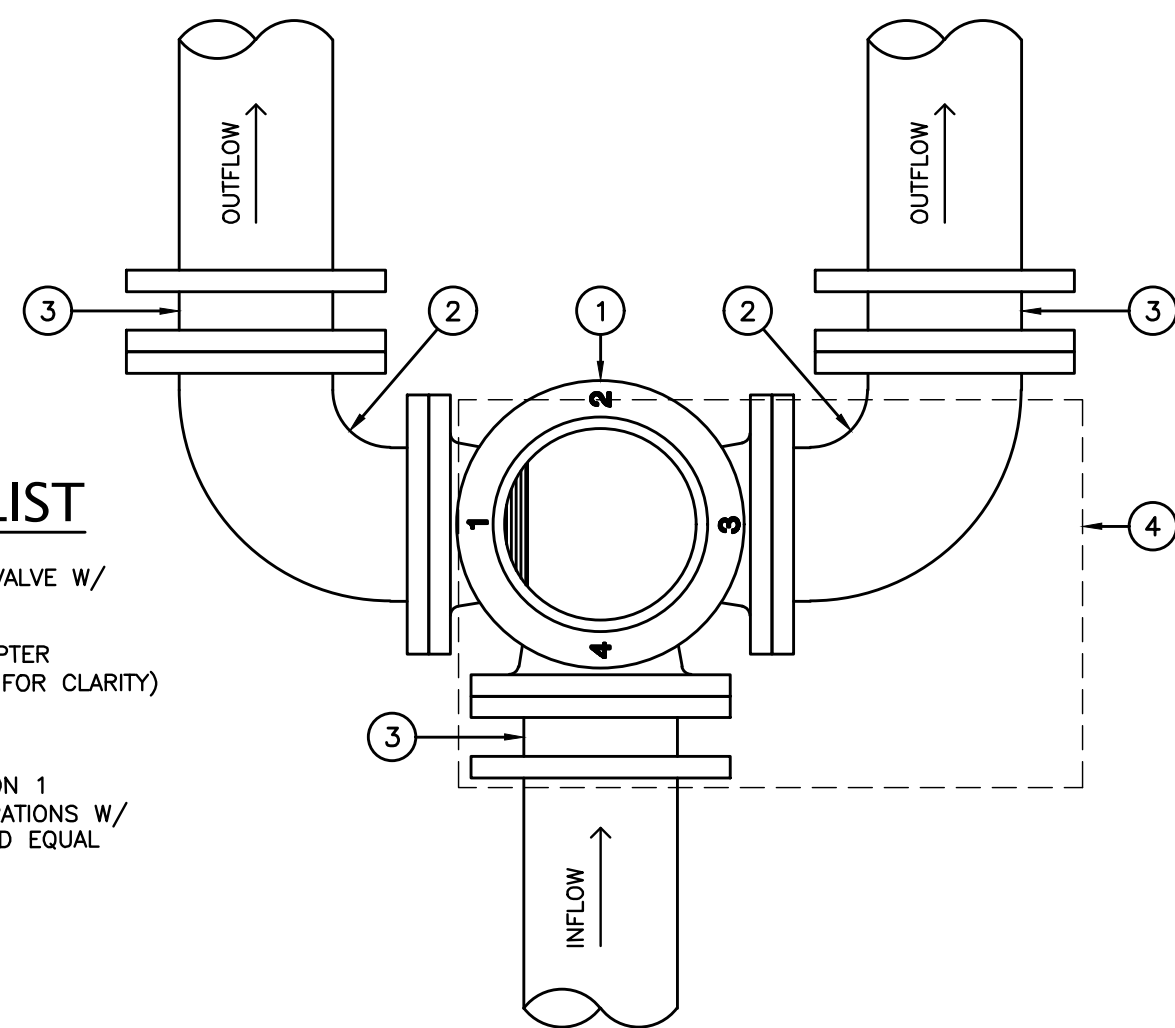
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**EQUIPMENT LIST**

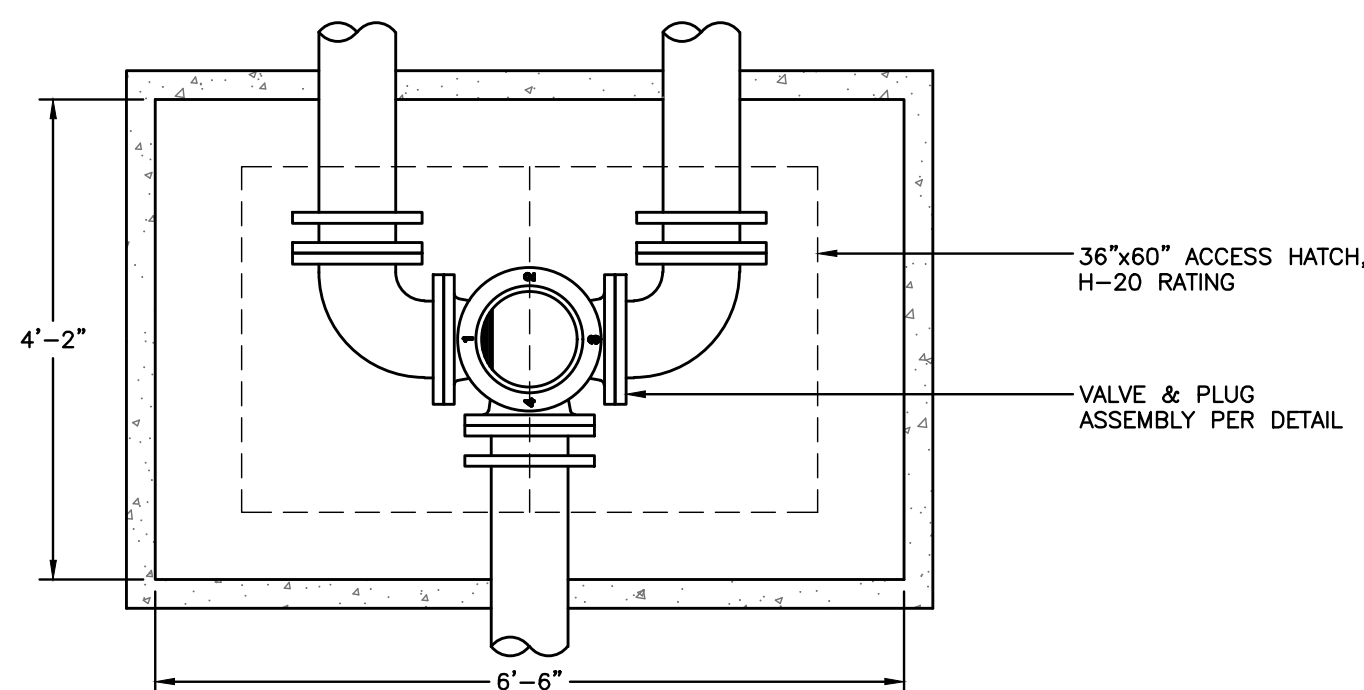
1. 3-WAY TAPERED PLUG VALVE W/ WORM GEAR ACTUATOR
2. 90° BEND
3. FLANGED COUPLING ADAPTER
4. ACTUATOR (NOT DRAWN FOR CLARITY)

NOTE:  
 • PLUG SHOWN IN POSITION 1  
 • SEAL ALL VAULT PENETRATIONS W/ LINK-SEAL OR APPROVED EQUAL

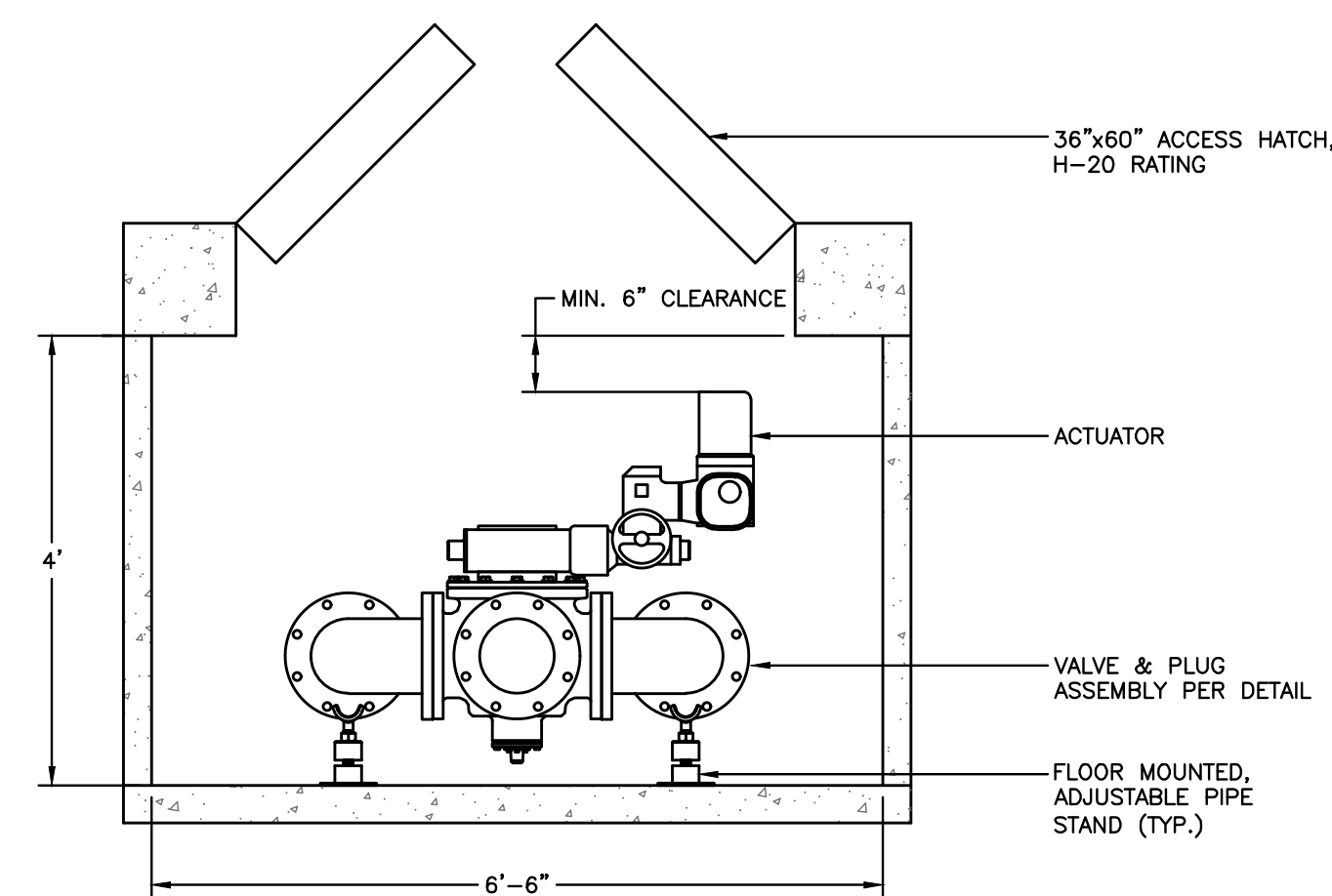


**PLUG VALVE ASSEMBLY**

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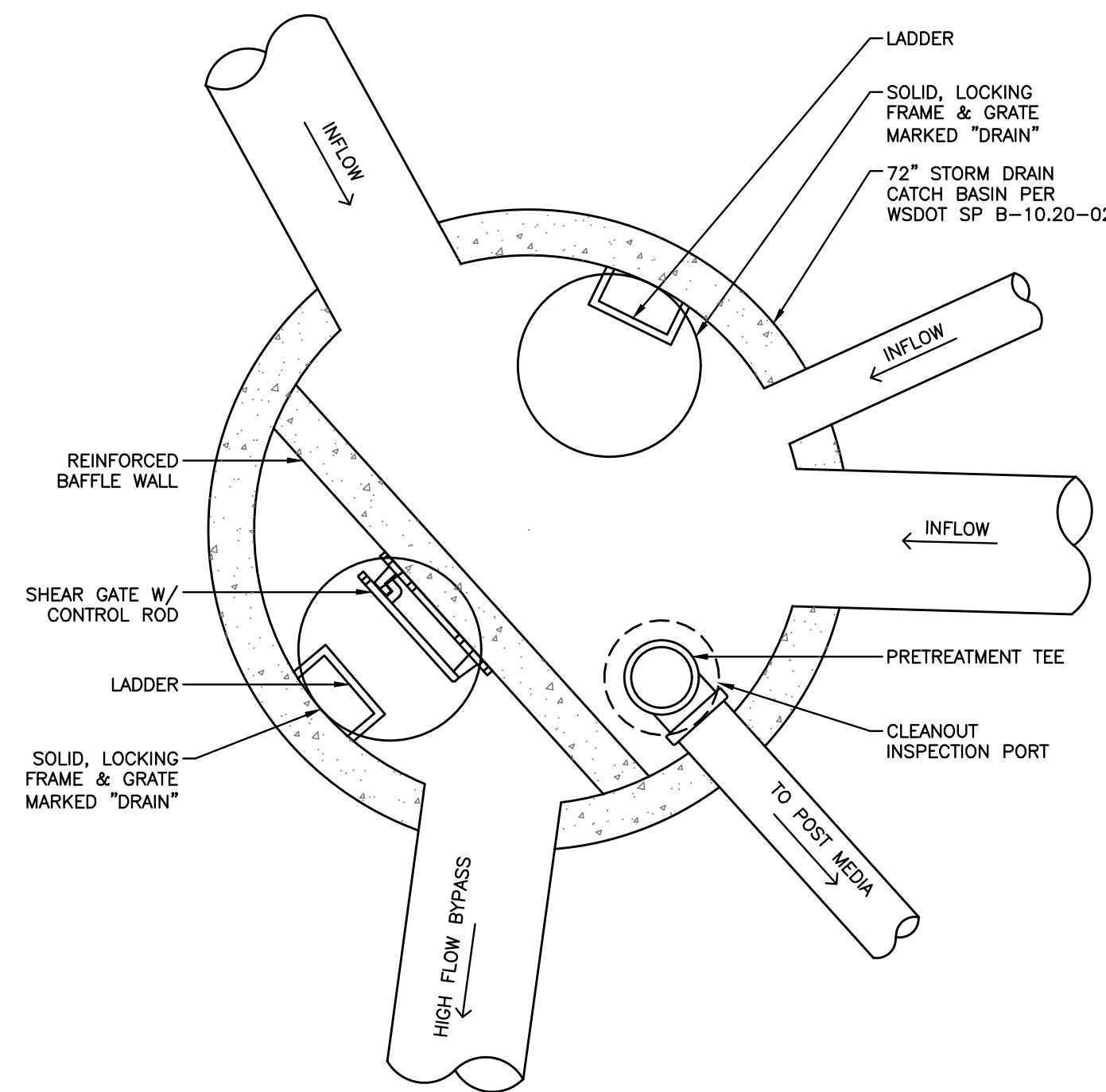
**PLAN VIEW**



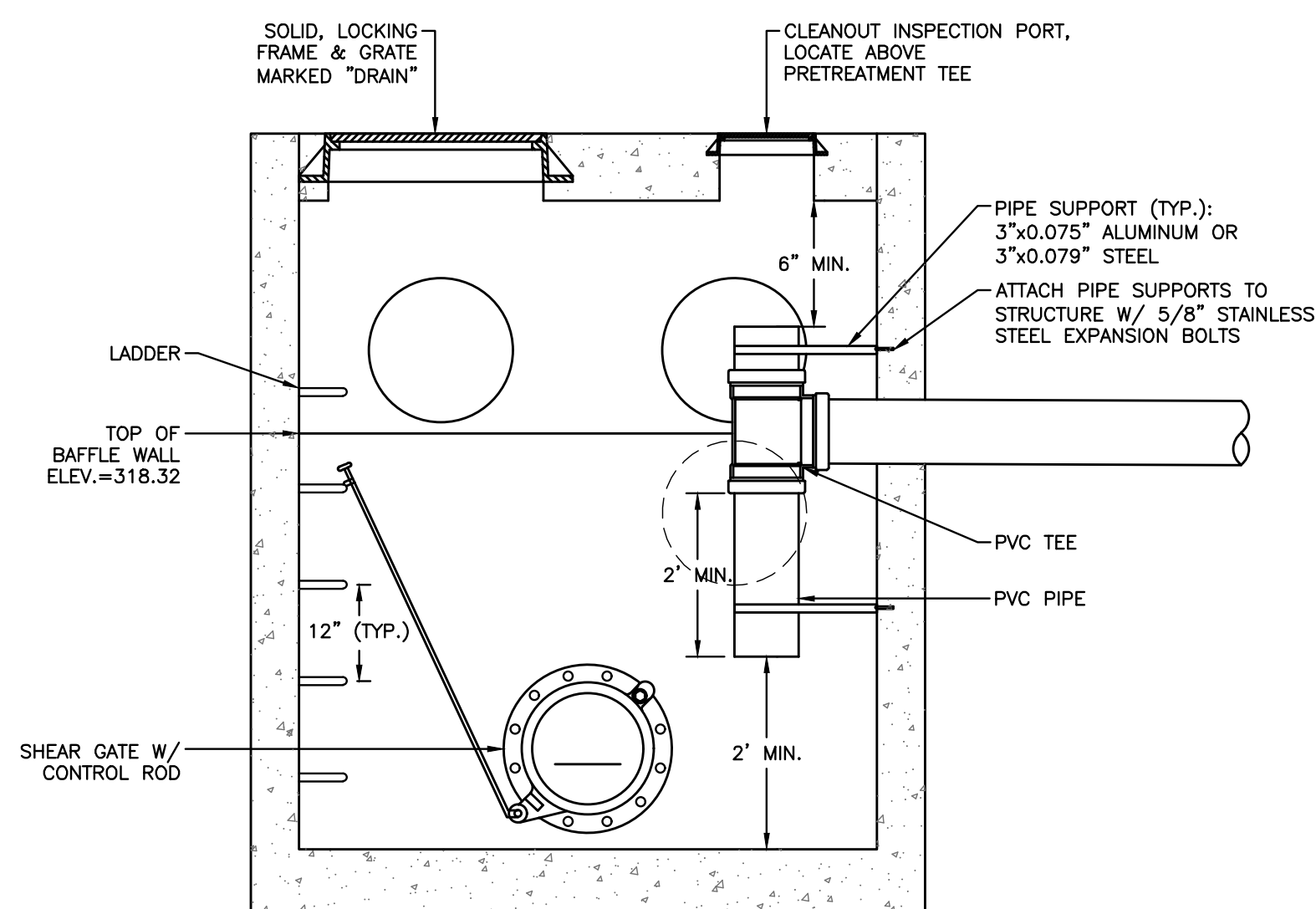
**SECTION VIEW**

**PLUG VALVE VAULT**

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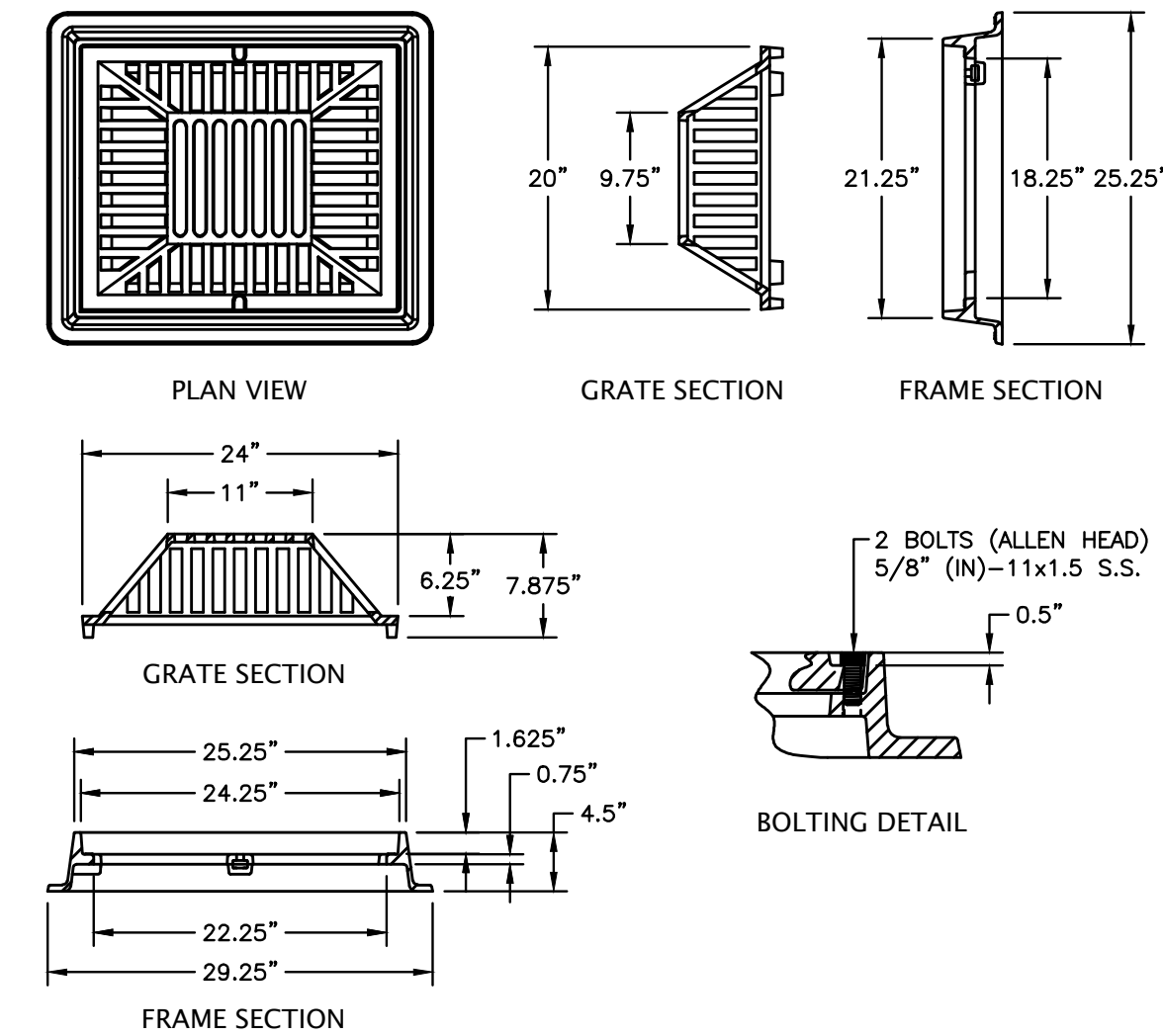
**PLAN VIEW**



**SECTION VIEW**

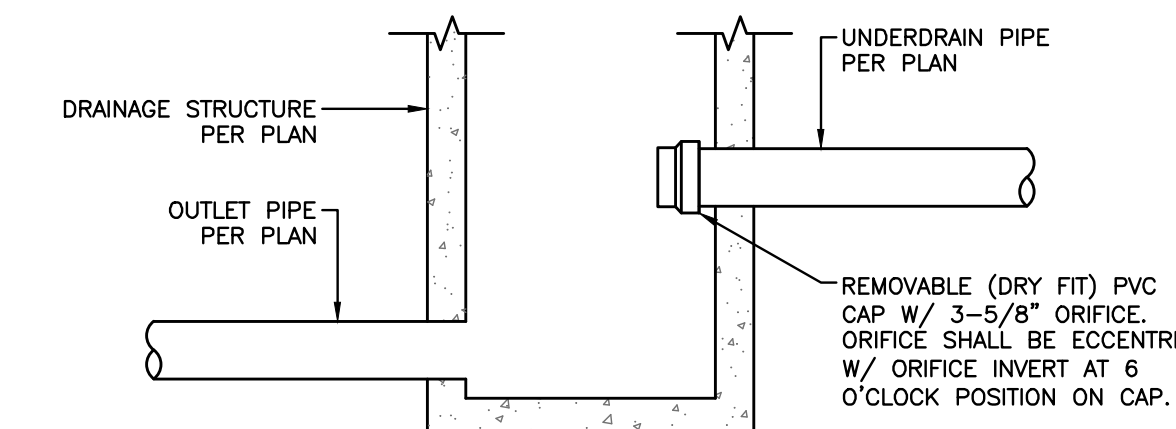
**BYPASS STRUCTURE**

NTS



**BEEHIVE FRAME & GRATE**

NTS



**OUTFLOW STRUCTURE**

NTS

Date	No	Revision	By
6/12/24	6	Revisions per DOE Comments	
6/5/24	5	Bid Set	
4/25/24	4	90% Design	
10/13/23	3	Ecology Review Response	
6/12/23	2	60% Design	

PROJECT ENGINEER I.D.H.  
 DESIGNED/DRAWN I.D.H.  
 INSPECTOR --

DIRECTOR PUBLIC WORKS E.C.J.  
 CITY ENGINEER J.J.B.  
 ASSISTANT DIRECTOR M.L.W.

**CITY OF BELLINGHAM, WASHINGTON**  
 PUBLIC WORKS DEPARTMENT  
 ENGINEERING DIVISION

SCALE  
 Horiz. N/A  
 Vert. N/A

DATUM  
 NAD 83/98  
 NAVD 88

Job No. EV-0171  
 Date 10/13/2023  
 Field Bk. 1062 SERIES

**DONALD AVE. WATER QUALITY RETROFIT**  
 DETAILS

SHEET 12 OF 17



### BEDDING SPECIFICATIONS FOR PVC PIPE

THE FOLLOWING SUPPLEMENTAL SPECIFICATIONS ARE TO BE USED IN CONJUNCTION WITH THE STANDARD SPECIFICATIONS FOR ROAD, BRIDGE AND MUNICIPAL CONSTRUCTION, CURRENT EDITION:

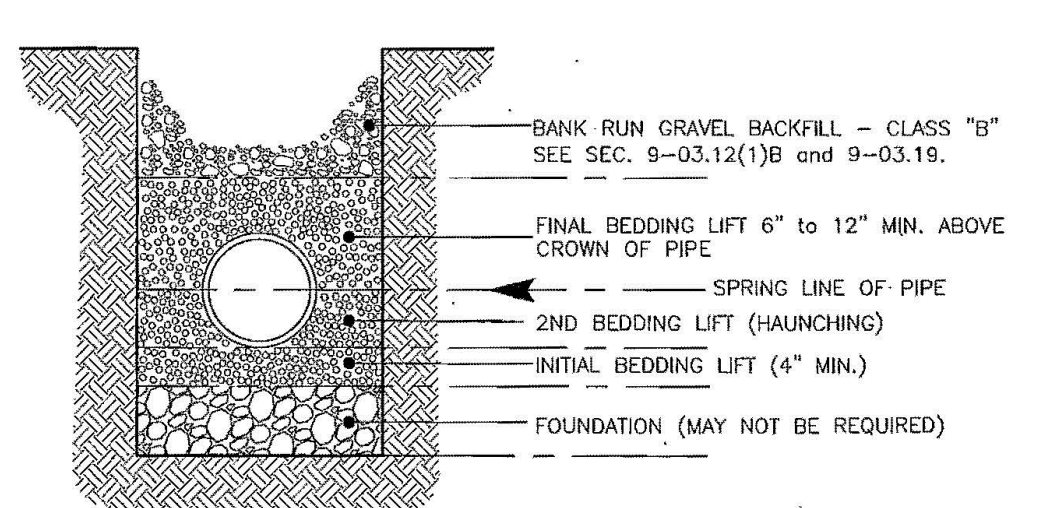
**BEDDING FOR SEWERS, DRAINS AND CULVERTS FOR PVC PIPE-**

BEDDING MATERIAL FOR PVC PIPE SHALL BE PEA GRAVEL CONFORMING TO THE FOLLOWING SPECIFICATIONS.

PEA GRAVEL - PEA GRAVEL BEDDING SHALL BE A CLEAN MIXTURE FREE FROM ORGANIC MATTER AND CONFORMING TO THE FOLLOWING GRADATION WHEN TESTED IN ACCORDANCE WITH ASTM D422:

U.S. STANDARD SIEVE SIZE	PERCENT PASSING, BY WT.
1/2"	100
3/8"	95-100
#8	0-10
#200	0-3

BACKFILL - WHEREVER A TRENCH IS EXCAVATED IN THE EXISTING OR PROPOSED ROADWAY, SIDEWALK OR OTHER AREAS WHERE SETTLEMENT WOULD BE DETRIMENTAL, THE ENTIRE TRENCH SHALL BE BACKFILLED WITH IMPORTED GRAVEL AND COMPACTED TO 95% OF MAXIMUM DENSITY.



APPROVED: *[Signature]*  
City Engineer

Date: 11/15/07

CITY OF BELLINGHAM  
PVC PIPE BEDDING  
DETAILS

DRAWING  
DR-538

### BEDDING SPECIFICATIONS FOR PVC PIPE

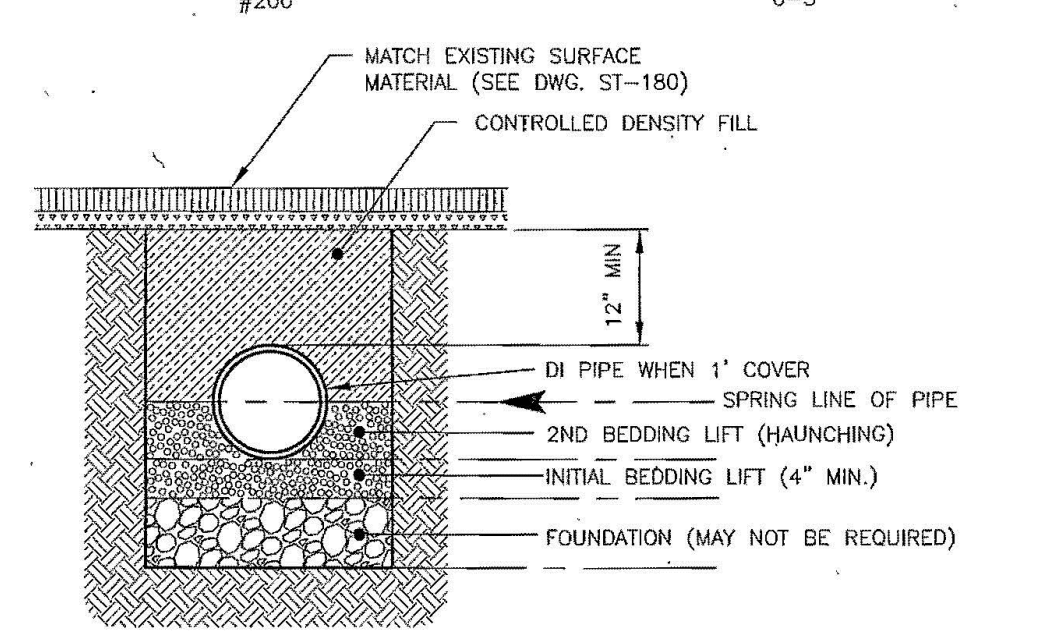
THE FOLLOWING SUPPLEMENTAL SPECIFICATIONS ARE TO BE USED IN CONJUNCTION WITH THE STANDARD SPECIFICATIONS FOR ROAD, BRIDGE AND MUNICIPAL CONSTRUCTION, CURRENT EDITION:

**BEDDING FOR SEWERS, DRAINS AND CULVERTS FOR PVC PIPE-**

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U.S. STANDARD SIEVE SIZE	PERCENT PASSING, BY WT.
1/2"	100
3/8"	95-100
#8	0-10
#200	0-3

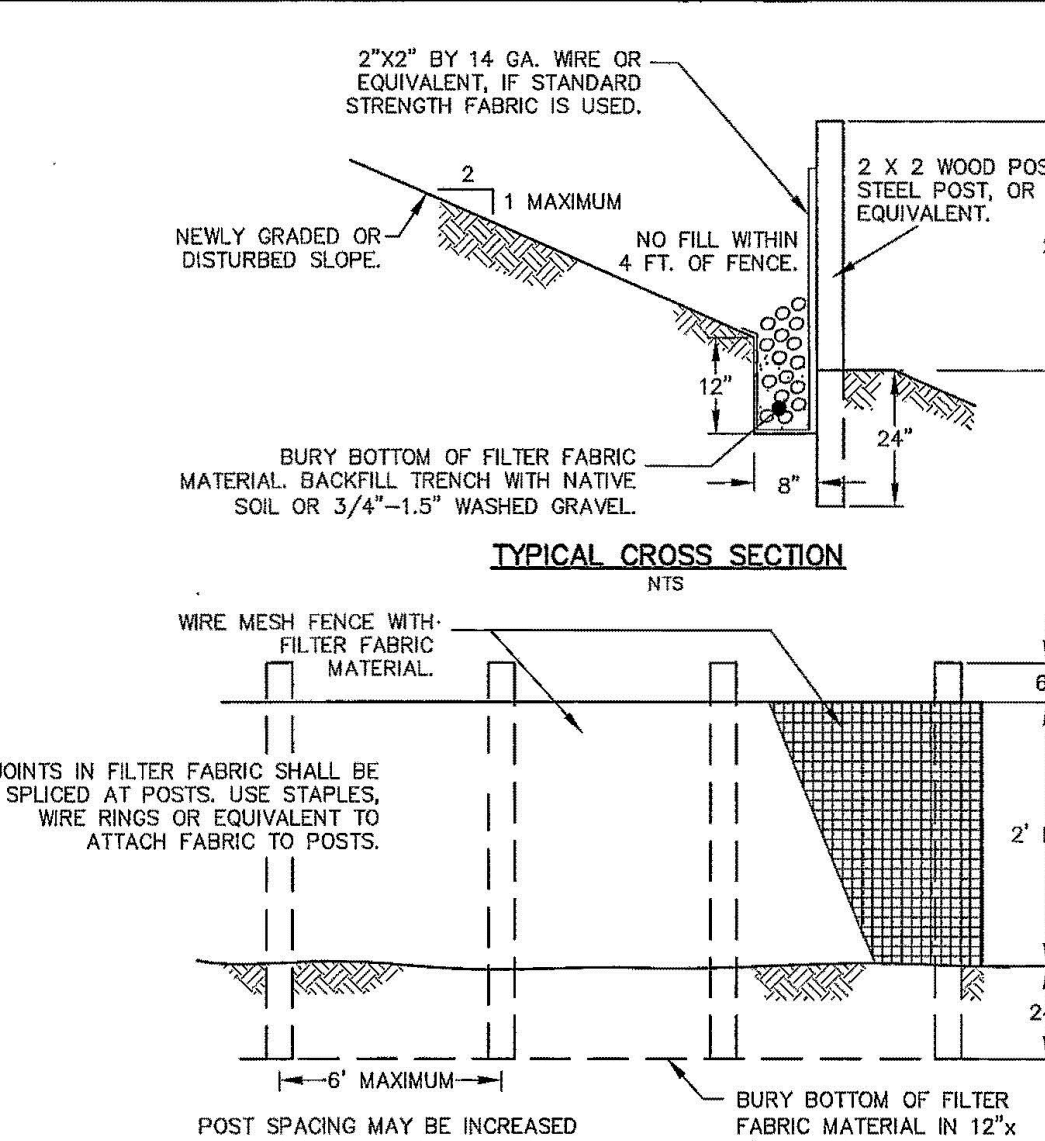


APPROVED: *[Signature]*  
City Engineer

Date: 11/15/07

CITY OF BELLINGHAM  
PIPE BEDDING DETAILS FOR  
2' OR LESS OF COVER

DRAWING  
DR-539



**TYPICAL CROSS SECTION**

**ELEVATION**

**NOTES:**

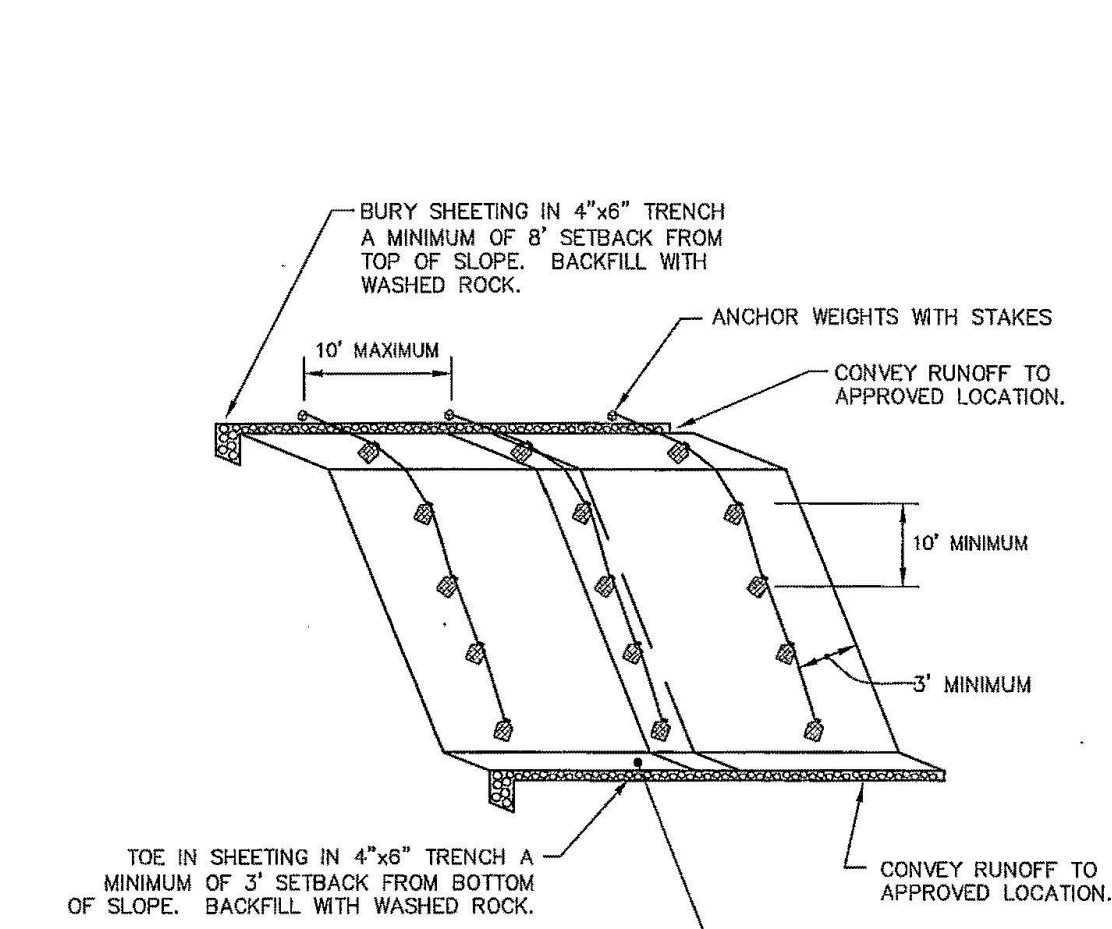
- FENCE SHALL NOT BE INSTALLED ON SLOPES STEEPER THAN 2:1.
- JOINTS IN FILTER FABRIC SHALL BE OVERLAPPED 6 INCHES AT POST.
- USE STAPLES, WIRE RINGS, OR EQUIVALENT, TO ATTACH FABRIC TO WIRE FENCE.
- REMOVE SEDIMENT WHEN IT REACHES 1/3 FENCE HEIGHT.

APPROVED: *[Signature]*  
City Engineer

Date: 11/29/04

CITY OF BELLINGHAM  
REINFORCED SILT FENCE

DRAWING  
EC-615



**NOTES:**

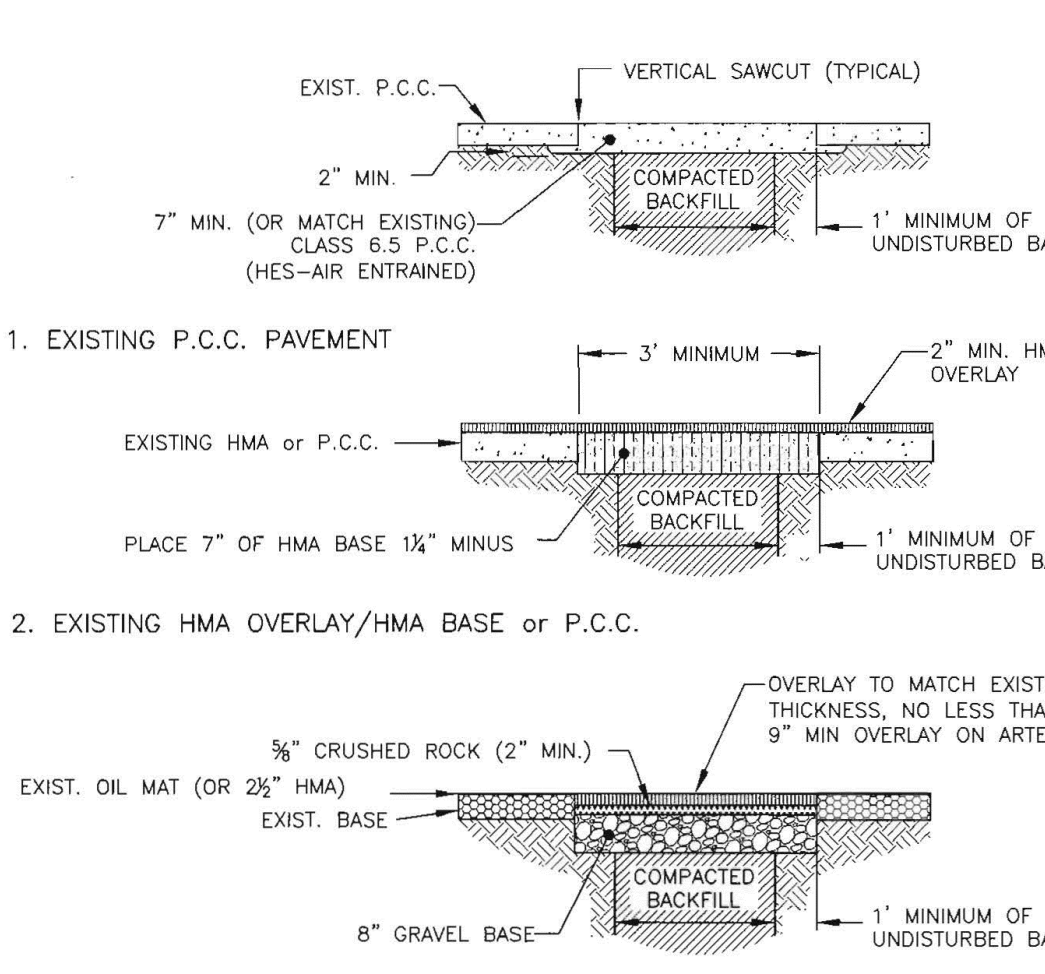
- TIRES, SANDBAGS, OR EQUIVALENT MAY BE USED TO WEIGH DOWN PLASTIC SHEETING.
- SEAMS BETWEEN SHEETS MUST OVERLAP A MINIMUM OF 12" AND BE WEIGHTED OR TAPED.
- PLASTIC SHEETING SHALL HAVE A MINIMUM THICKNESS OF 6 MIL.
- DUE TO RAPID RUNOFF CAUSED BY PLASTIC SHEETING, THIS METHOD SHALL NOT BE USED UPSLOPE OF AREAS THAT MIGHT BE ADVERSELY IMPACTED BY CONCENTRATED RUNOFF.
- CONSTRUCT BERM OR SWALE AT TOP OF SLOPE AS DIRECTED BY THE CLEARING AND GRADING INSPECTOR.
- CONSTRUCT DITCH AT BASE OF SLOPE AS REQUIRED BY CITY, AND DISCHARGE TO APPROVED LOCATION.

APPROVED: *[Signature]*  
City Engineer

Date: 11/29/04

CITY OF BELLINGHAM  
PLASTIC COVERING FOR  
SLOPES AND STOCKPILES

DRAWING  
EC-650



**NOTES:**

ALL WORK SHALL BE DONE IN ACCORDANCE WITH THE CITY OF BELLINGHAM'S STANDARD SPECIFICATIONS FOR UTILITY CUTS IN STREET AREA.

PAVEMENT OVERLAYS No. 2 AND 3, TACK ALL EDGES AND HMA BASE SURFACE BEFORE PLACING HMA PAVEMENT. SEAL ALL JOINTS WITH HOT ASPHALT (AR-4000W) BETWEEN EXISTING AND NEW HMA PAVEMENT IMMEDIATELY AFTER FINISH ROLLING.

CONTRACTOR SHALL MATCH EXISTING SURFACES THAT ARE COLORED, TEXTURED, STAMPED OR INLAID WITH BRICK.

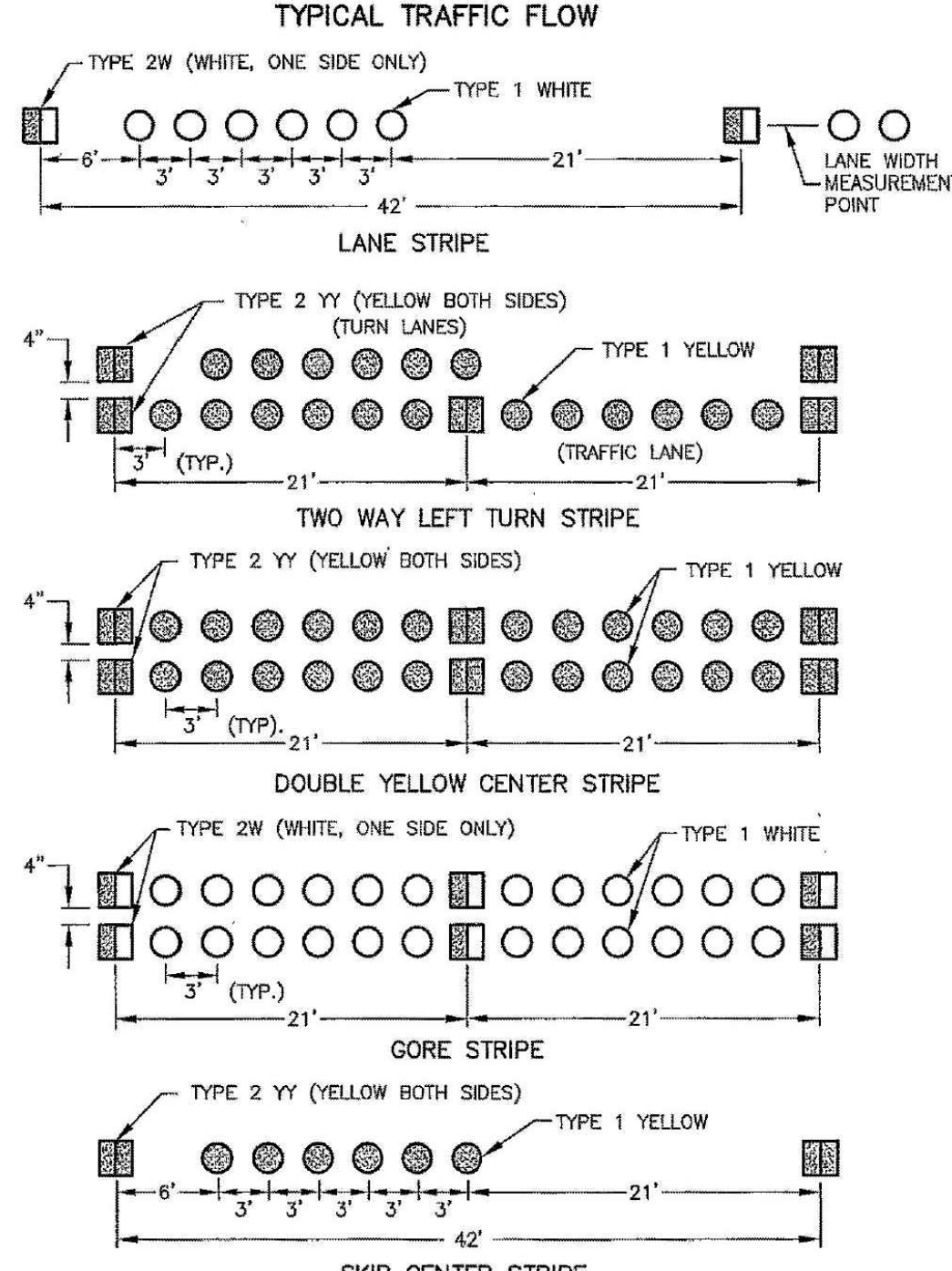
APPROVED: *[Signature]*  
City Engineer

Date: 12/16/09

CITY OF BELLINGHAM  
HORIZONTAL PAVEMENT REPAIR  
(STREET CROSSINGS)

DRAWING  
ST-180

### TYPICAL TRAFFIC FLOW



APPROVED: *[Signature]*  
City Engineer

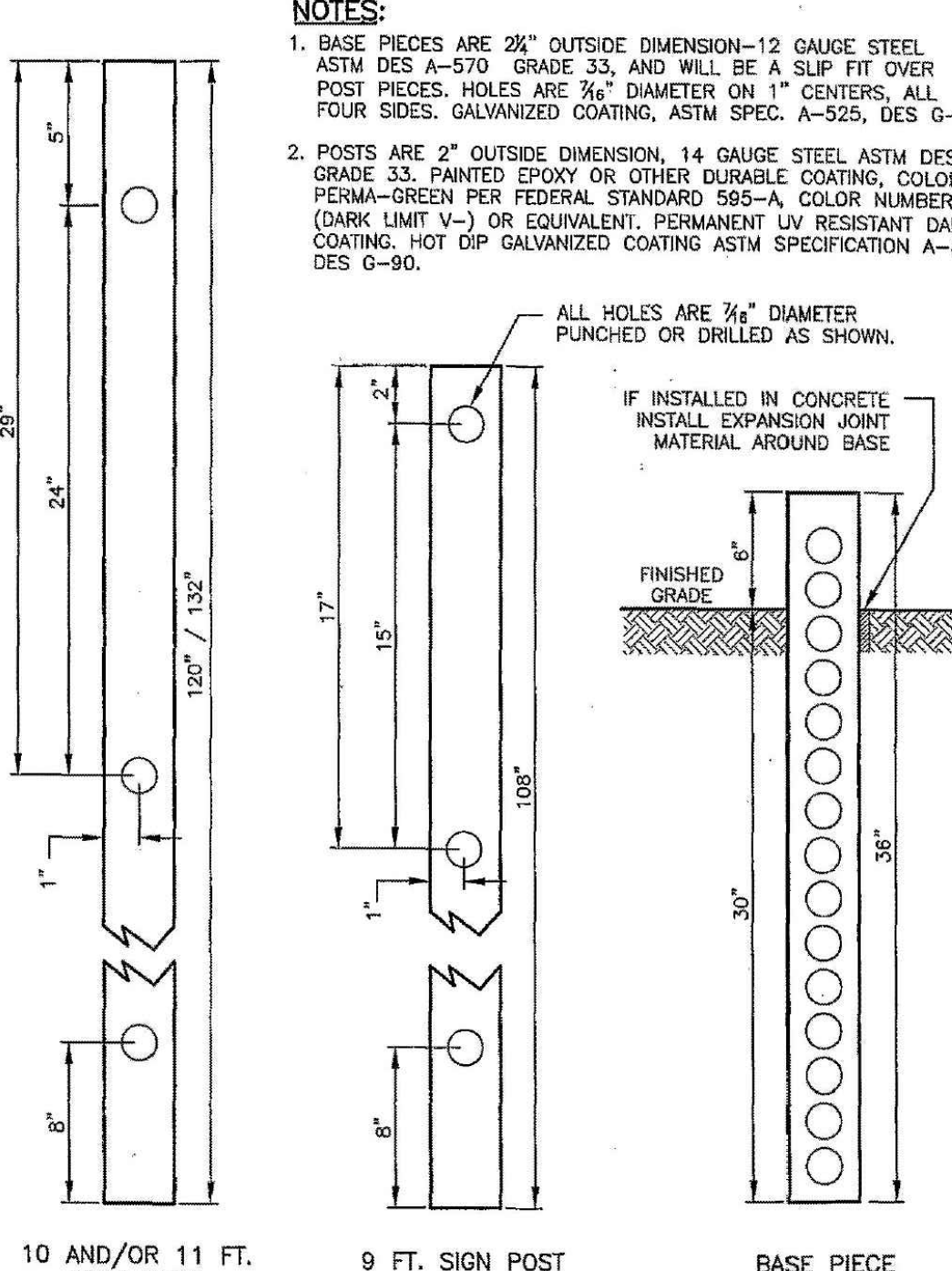
Date: 11/29/04

CITY OF BELLINGHAM  
PAVEMENT MARKING DETAILS

DRAWING  
TC-305

**NOTES:**

- BASE PIECES ARE 2 1/2" OUTSIDE DIMENSION-12 GAUGE STEEL ASTM DES A-570 GRADE 33, AND WILL BE A SLIP FIT OVER POST PIECES. HOLES ARE 3/8" DIAMETER ON 1" CENTERS, ALL FOUR SIDES. GALVANIZED COATING, ASTM SPEC. A-525, DES G-90.
- POSTS ARE 2" OUTSIDE DIMENSION, 14 GAUGE STEEL ASTM DES A-570 GRADE 33. PAINTED EPOXY OR OTHER DURABLE COATING, COLOR IS PERMA-GREEN PER FEDERAL STANDARD 595-A, COLOR NUMBER 14109 (DARK LIMIT V-) OR EQUIVALENT. PERMANENT UV RESISTANT DARK GREEN COATING. HOT DIP GALVANIZED COATING ASTM SPECIFICATION A-525, DES G-90.



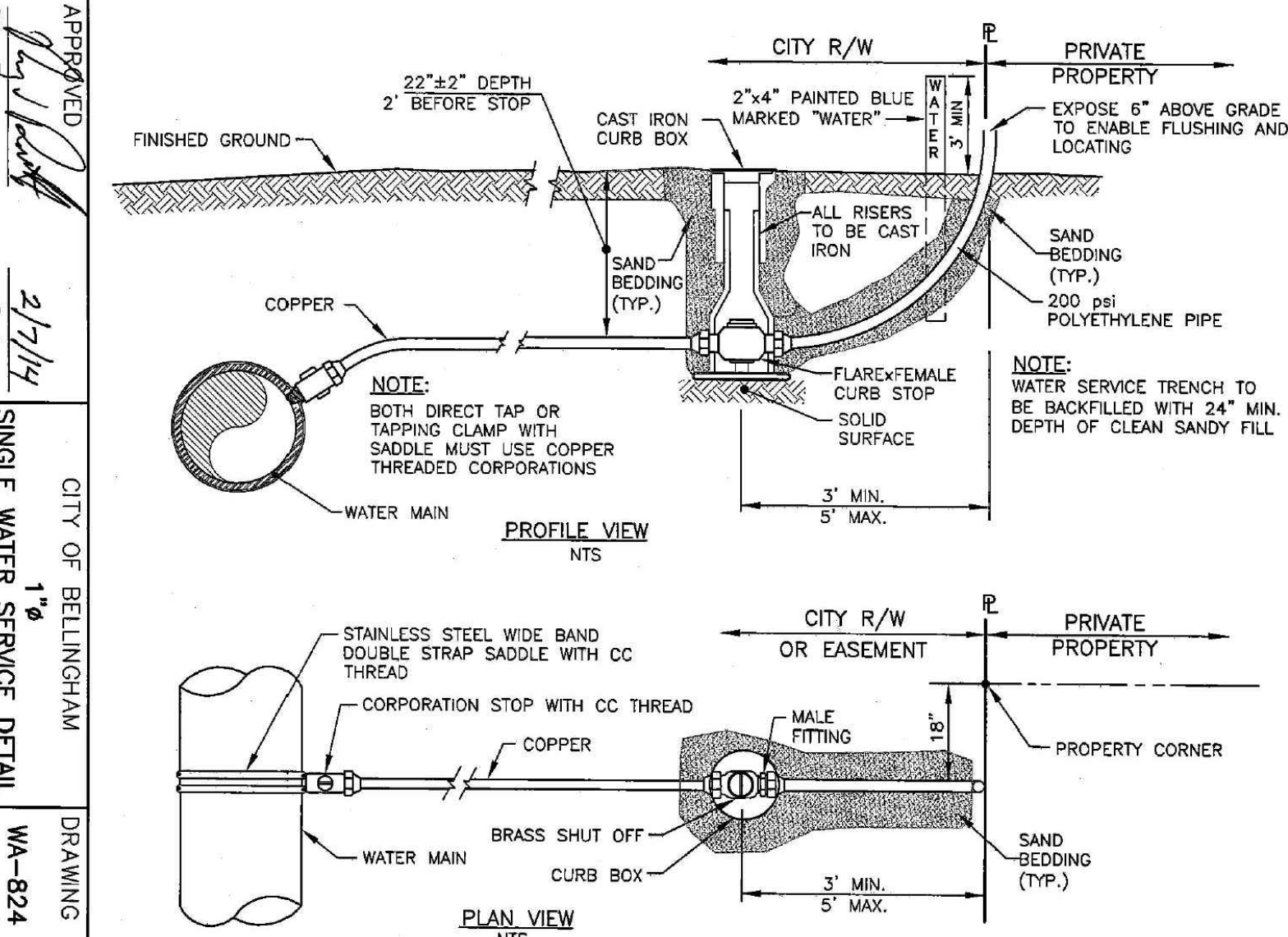
APPROVED: *[Signature]*  
City Engineer

Date: 11-9-05

CITY OF BELLINGHAM  
STREET SIGN POST DETAIL

DRAWING  
TC-320

### CITY OF BELLINGHAM SINGLE WATER SERVICE DETAIL



**NOTE:** BOTH DIRECT TAP OR TAPPING CLAMP WITH SADDLE MUST USE COPPER THREADED CORPORATIONS

**NOTE:** WATER SERVICE TRENCH TO BE BACKFILLED WITH 24" MIN. DEPTH OF CLEAN SANDY FILL

APPROVED: *[Signature]*  
City Engineer

Date: 2/7/14

CITY OF BELLINGHAM  
SINGLE WATER SERVICE DETAIL

DRAWING  
WA-824

Date	No	Revision	By
6/12/24	6	Revisions per DOE Comments	
6/5/24	5	Bid Set	
4/25/24	4	90% Design	
10/13/23	3	Ecology Review Response	
6/12/23	2	60% Design	

PROJECT ENGINEER I.D.H.  
 DESIGNED/DRAWN I.D.H.  
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 ASSISTANT DIRECTOR M.L.W.

**CITY OF BELLINGHAM, WASHINGTON**  
**PUBLIC WORKS DEPARTMENT**  
 ENGINEERING DIVISION

SCALE  
 Horiz. N/A  
 Vert. N/A

DATUM  
 NAD 83/98  
 NAVD 88

Job. No. EV-0171  
 Date 10/13/2023  
 Field Bk. 1062 SERIES

**DONALD AVE. WATER QUALITY RETROFIT**  
**CITY OF BELLINGHAM STANDARD DETAILS**

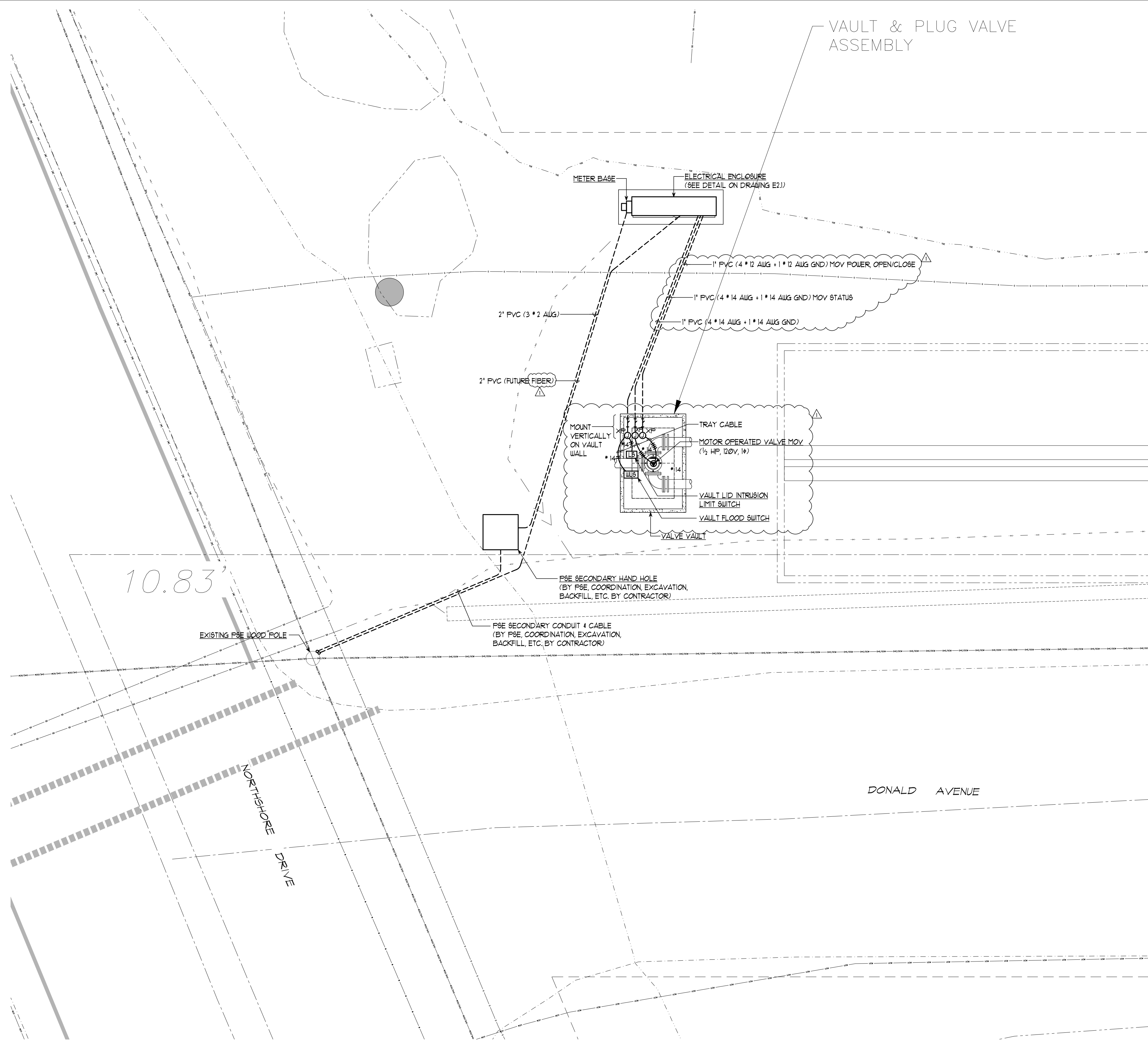
SHEET  
 13 OF  
 17

**NOTES (APPLICABLE TO ALL ELECTRICAL DRAWINGS):**

- ALL EQUIPMENT, CONDUITS, BOXES, CABLES, ETC. SHOWN &/OR INDICATED ON THE ELECTRICAL DRAWINGS ARE NEW UNLESS SPECIFICALLY NOTED OTHERWISE.
- ALL WIRING SHALL BE ENCLOSED WITHIN THE RACEWAY SYSTEM, EXCEPT MULTI-CONDUCTOR TYPE SO CABLE OR SIMILAR WITHIN WET WELL.
- PLAN DRAWINGS ARE DIAGRAMMATIC IN FORM AND DO NOT ATTEMPT TO SHOW COMPLETE DETAILS OR LIST EVERY ITEM OF THE ELECTRICAL SYSTEM, EQUIPMENT, OR BUILDING CONSTRUCTION; HOWEVER, THE ROUTING OF RACEWAYS AND CIRCUITS, THE LOCATIONS OF EQUIPMENT, DEVICES AND FIXTURES REPRESENT THE DESIRED FINISHED ARRANGEMENT.
- OBTAIN APPROVAL FROM ENGINEER PRIOR TO PROCEEDING WITH ALTERNATE CONDUIT ROUTES.
- DETAIL DRAWINGS SHALL BE CONSIDERED APPLICABLE TO ALL PLAN DRAWINGS AND SIMILAR CONDITIONS EVEN IF THE DETAILS ARE NOT SPECIFICALLY REFERENCED.
- RACEWAYS SHALL BE RUN AS NEATLY & UNOBTRUSIVELY AS POSSIBLE, SUPPORTED AS REQUIRED, PARALLEL OR AT RIGHT ANGLES TO CEILINGS, WALLS & STRUCTURAL MEMBERS.
- RACEWAYS SHALL BE AS FOLLOWS, UNLESS NOTED OTHERWISE:
  - INTERIOR, EXPOSED INSIDE ELECTRICAL ENCLOSURE - ELECTRICAL METALLIC TUBING (EMT).
  - EXTERIOR ABOVE GRADE - GALVANIZED RIGID STEEL CONDUIT (GRS).
  - EXTERIOR BELOW GRADE - BELOW GRADE CONDUIT SHALL BE SCHEDULE 40 PVC, DIRECT BURIED A MINIMUM OF 24" BELOW GRADE, EXCEPT MINIMUM LAST 10' OF UNDERGROUND CONDUIT RUN BEFORE EMERGENCE INTO HAZARDOUS (CLASSIFIED) AREAS SHALL BE PVC COATED GALVANIZED RIGID STEEL.
  - CONDUIT WITHIN VALVE VAULT SHALL BE PVC COATED GALVANIZED RIGID STEEL, EXCEPT LIQUIDTIGHT FLEX SUITABLE FOR THE CLASSIFICATION SHALL BE USED FOR FINAL CONNECTIONS TO VIBRATING EQUIPMENT.
- RACEWAYS SHALL BE SIZED SO THAT THE CABLE FILL DOES NOT EXCEED 40%, EXCEPT, MINIMUM CONDUIT SIZES SHALL BE AS FOLLOWS, UNLESS NOTED OTHERWISE:
  - 3/4" - BRANCH CIRCUITS AND SYSTEM RACEWAYS, EXCEPT AS NOTED BELOW.
  - 1" - UNDERGROUND CONDUITS.
- DEVICE BOX SIZES SHALL BE SIZED IN ACCORDANCE WITH NEC FOR BOX FILL.
  - POWER & LIGHTING - 4" x 4" x 1 1/2"
- TELECOMMUNICATIONS & FIBER OPTIC CONDUITS SHALL BE PROVIDED WITH PULL ROPES BELOW GRADE AND PULL STRINGS ABOVE GRADE.
- BELOW GRADE SERVICE & FEEDER CABLE SHALL BE 1/C COPPER (UNLESS SPECIFICALLY NOTED OTHERWISE) WITH 800V TYPE USE/RHW/RHH OR XHHW INSULATION.
- BRANCH CIRCUIT CABLES, EQUIPMENT GROUND CABLES AND ABOVE GRADE FEEDER CABLES SHALL BE 1/C COPPER, #12 AWG UNLESS NOTED OTHERWISE, WITH 800V TYPE XHHW OR THHN/THWN INSULATION.
- MOTOR, CONTROL & BRANCH CIRCUIT CABLES, EQUIPMENT GROUND CABLES & ABOVE GRADE FEEDER CABLES SHALL BE 1/C COPPER, #12 AWG UNLESS NOTED OTHERWISE, WITH 800V TYPE USE/RHW/RHH, XHHW OR THHN/THWN INSULATION, EXCEPT MULTI-CONDUCTOR TYPE SO CABLE OR SIMILAR WITHIN WET WELL.
- IN ADDITION TO THE CIRCUIT CONDUCTORS INDICATED, CONTRACTOR SHALL PROVIDE AN EQUIPMENT GROUND CABLE (SIZED THE SAME AS THE LARGEST CIRCUIT CONDUCTOR UNLESS SPECIFICALLY NOTED OTHERWISE) WITHIN EACH RACEWAY WITH THE CIRCUIT CONDUCTORS.
- LABELING & NAMEPLATES:
  - REFER TO SPECIFICATIONS FOR PANELS, DISCONNECT SWITCHES, STARTERS, ETC. NAMEPLATES AND LABELING.
- VERIFY ALL EQUIPMENT, DEVICE, ETC. LOCATIONS WITH THE OWNER & ENGINEER PRIOR TO ROUGH-IN.
- POWER INTERRUPTIONS (WHETHER TO THE ENTIRE SYSTEM OR TO INDIVIDUAL PANELS, EQUIPMENT, DEVICES, ETC.) SHALL BE KEPT TO AN ABSOLUTE MINIMUM, AND SHALL NOT BE DONE WITHOUT PRIOR APPROVAL & SCHEDULING WITH THE OWNER.

**HAZARDOUS (CLASSIFIED) LOCATIONS**

- WET WELL - CLASS 1, DIVISION 1, GROUP D
- ELECTRICAL VAULT ADJACENT TO VALVE VAULT & CONNECTING CHASES - CLASS 1, DIVISION 1, GROUP D
- VALVE VAULT - CLASS 1, DIVISION 2, GROUP D

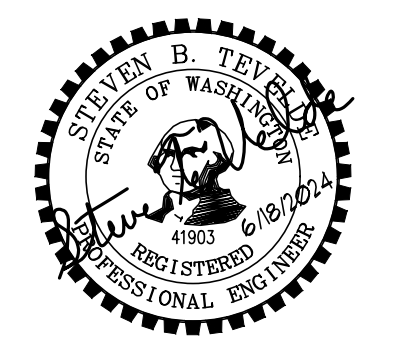
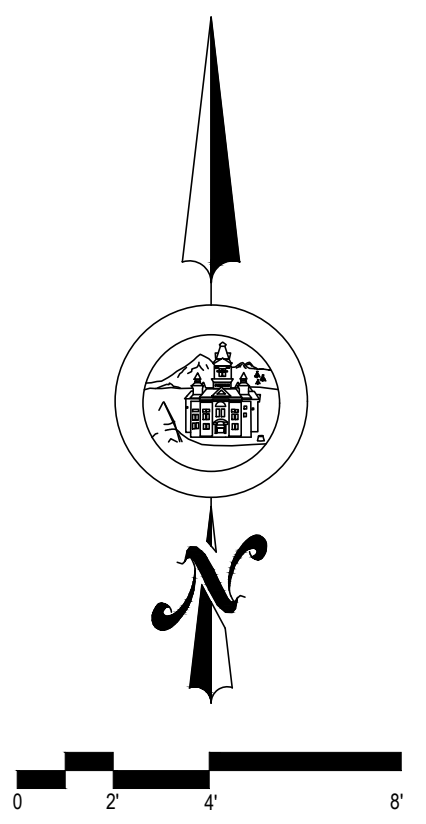


**ELECTRICAL LEGEND**

- ◻ LED POLE LIGHT
- BELOW GRADE CONDUIT, NEW OR NEW CABLE
- BELOW GRADE CONDUIT, EXISTING
- || BRANCH CIRCUIT, ABOVE GRADE, EXPOSED (SLASHES = NO. OF CIRCUIT CONDUCTORS)
- HOMERUN TO LOCATION INDICATED, (TYPICAL)
- GROUND CABLE
- ⊕ DUPLEX OUTLET
- JUNCTION BOX
- THERMOSTAT
- ⊗ SOLENOID VALVE
- LS LIMIT SWITCH
- WS WATER LEVEL SWITCH
- EXPLOSION PROOF SEAL
- XP EXPLOSION PROOF
- EX EXISTING
- WP WEATHER PROOF
- GFI GROUND FAULT CIRCUIT INTERRUPTER

**DEMOLITION**

- (DASHED LINES INDICATE EXISTING TO BE REMOVED)
- BRANCH CIRCUIT CONDUIT, SURFACE MTD.
  - ⊗ WALL MOUNTED FIXTURE
  - ⊞ PANELBOARD
  - ⊞ DISCONNECT SWITCH
  - ⊞ JUNCTION BOX



**ELECTRICAL - SITE PLAN**  
SCALE: 1/4" = 1'-0"

**K ENGINEERS INC.**  
208 Third Street  
Lynden, WA 98264  
Bus (360) 354-4757  
FAX (360) 354-6794

6/18/2024	6	Addendum 1		
6/4/2024	5	Bid Set		
4/25/2024	4	90% Design		
10/13/23	3	Ecology Review Response		
Date	No	Revision	By	

PROJECT ENGINEER STV  
DESIGNED/DRAWN KL  
INSPECTOR --

DIRECTOR PUBLIC WORKS E.C.J.  
CITY ENGINEER J.J.B.  
ASSISTANT DIRECTOR M.A.O.

**CITY OF BELLINGHAM, WASHINGTON**  
**PUBLIC WORKS DEPARTMENT**  
ENGINEERING DIVISION

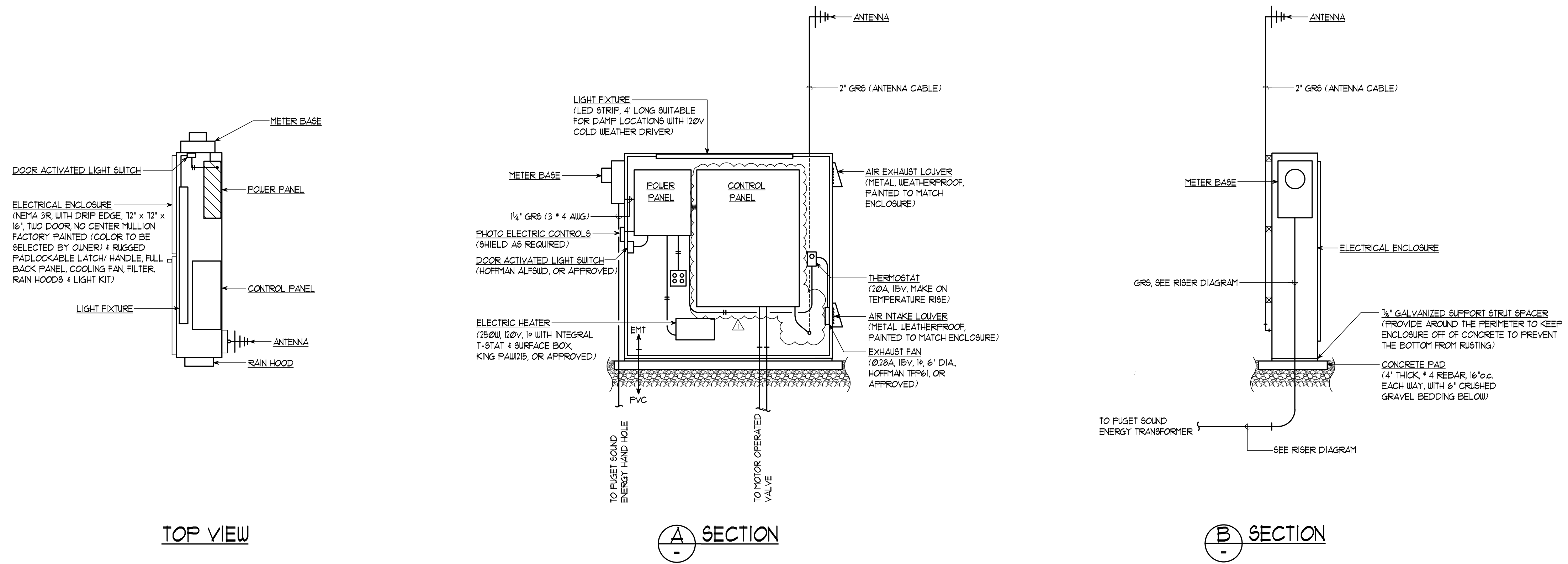
SCALE  
Horiz. \_\_\_\_\_  
Vert. \_\_\_\_\_

DATUM  
NAD 83/98  
NAVD 88

Job No. 2348  
Date 6/4/2024  
Field Bk. 1062 SERIES

**DONALD AVE. WATER QUALITY RETROFIT**  
**ELECTRICAL - SITE PLAN**

SHEET E1.1R1 OF



**ELECTRICAL ENCLOSURE**  
SCALE: 1/2" = 1'-0"



**K ENGINEERS INC.**  
208 Third Street  
Lynden, WA 98264  
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6/18/2024	6	Addendum 1	
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Date	No	Revision	By

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ASSISTANT DIRECTOR M.A.O.

**CITY OF BELLINGHAM, WASHINGTON**  
PUBLIC WORKS DEPARTMENT  
ENGINEERING DIVISION

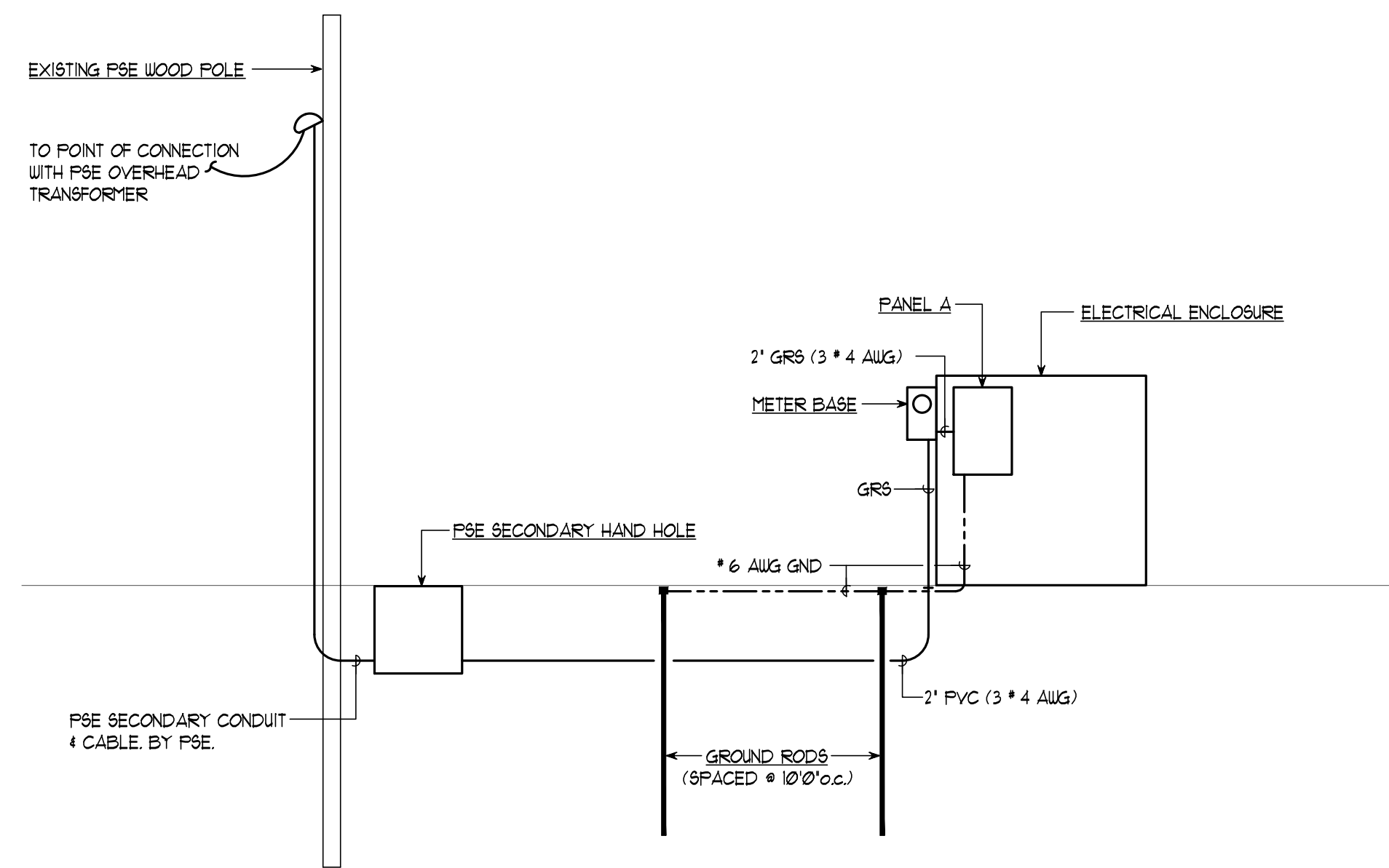
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Horiz. \_\_\_\_\_  
Vert. \_\_\_\_\_

DATUM  
NAD 83/98  
NAVD 88

Job. No. 2348  
Date 6/4/2024  
Field Bk. 1062 SERIES

**DONALD AVE. WATER QUALITY RETROFIT**  
ELECTRICAL - DETAILS

SHEET  
E2.1R1 OF



**ELECTRICAL - POWER SYSTEM RISER DIAGRAM**  
SCALE: NONE

METER BASE		ELECTRICAL ENCLOSURE					
VOLTAGE: 120/240V, 1 PH, 3 W		ELECTRICAL LOAD CALCULATION		CONN. LOAD (VA)	DEMAND FACTOR	DEMAND LOAD (VA)	
ENCLOSURE: NEMA 3R	MOUNTING: SURFACE	Lighting	0.0	30.0	30.0	1.25	37.5
CONTINUOUS RATING: 100 A	PER PUGET SOUND ENERGY REQUIREMENTS	Gen. Purpose Outlets (First 10 KVA)	0.0	360.0	360.0	1.00	360.0
SUITABLE FOR USE AS SERVICE ENTRANCE EQUIPMENT		Gen. Purpose Outlets (Remainder)	0.0	0.0	0.0	0.50	0.0
		Special Purpose Outlets	0.0	0.0	0.0	1.00	0.0
		Mechanical Equipment	0.0	1332.2	1332.2	1.00	1332.2
		Kitchen Equipment & Appliances	0.0	0.0	0.0	1.00	0.0
		Miscellaneous	0.0	1127.0	1127.0	1.00	1127.0
		25% Largest Motor					281.8
		<b>TOTAL LOAD</b>	0.0	2849.2	2849.2		3138.5
		<b>TOTAL AMPS</b>	0.0	11.9	11.9		13.1

PANEL A		INSIDE ELECTRICAL ENCLOSURE						
VOLTAGE: 120/240V, 1 PH, 3 W		FEEDER/BRANCH CIRCUIT DEVICES:		ELECTRICAL LOAD CALCULATION		CONN. LOAD (VA)	DEMAND FACTOR	DEMAND LOAD (VA)
TYPE: PANELBOARD	ENCLOSURE: NEMA 1	BOLT-ON CIRCUIT BREAKERS	Lighting	0.0	30.0	30.0	1.25	37.5
MOUNTING: SURFACE	CONTINUOUS RATING: 100 A	FULL AIC RATING: 10,000 A	Gen. Purpose Outlets (First 10 KVA)	0.0	360.0	360.0	1.00	360.0
BUSSING: MANUFACTURER'S STANDARD	FULL AIC RATING: 10,000 A	SERIES AIC RATING: NONE	Gen. Purpose Outlets (Remainder)	0.0	0.0	0.0	0.50	0.0
CONTINUOUS RATING: 100 A	SERIES AIC RATING: NONE	SPECIAL PROVISIONS:	Special Purpose Outlets	0.0	0.0	0.0	1.00	0.0
MAIN: CIRCUIT BREAKER	LOCATION: BOTTOM	MASTER NAMEPLATE	Mechanical Equipment	0.0	1332.2	1332.2	1.00	1332.2
CONTINUOUS RATING: 70 A		GROUND BAR	Kitchen Equipment & Appliances	0.0	0.0	0.0	1.00	0.0
FULL AIC RATING: 10,000 A		SUITABLE FOR USE AS SERVICE ENTRANCE EQUIPMENT	Miscellaneous	0.0	1127.0	1127.0	1.00	1127.0
SERIES AIC RATING: NONE			25% Largest Motor					281.8
			<b>TOTAL LOAD</b>	0.0	2849.2	2849.2		3138.5
			<b>TOTAL AMPS</b>	0.0	11.9	11.9		13.1

CONN. LOAD (VA)	FEEDER/BRANCH CIRCUIT DESCRIPTION	NOTE	BKR AMP/P	CKT NO	BUS (PHASE)	CKT NO	BKR AMP/P	FEEDER/BRANCH CIRCUIT DESCRIPTION	NOTE	CONN. LOAD (VA)
390.0	LTG & OUTLETS - ELECTRICAL ENCLOSURE		20/1	1	A	2	20/1	CONTROL PANEL		800.0
32.2	EXHAUST FAN - ELECTRICAL ENCLOSURE		20/1	3	B	4	20/1	MOTOR OPERATED VALVE		1127.0
500.0	HEATER - ELECTRICAL ENCLOSURE		20/1	5	A	6	20/1	SPARE		0.0
0.0	SPARE		20/1	7	B	8	20/1	SPARE		0.0
0.0	SPARE		20/1	9	A	10	20/1	SPARE		0.0
0.0	SPARE		20/1	11	B	12	20/1	SPARE		0.0
0.0	SPACE		SPACE	13	A	14	SPACE			0.0
0.0	SPACE		SPACE	15	B	16	SPACE			0.0
0.0	SPACE		SPACE	17	A	18	SPACE			0.0
0.0	SPACE		SPACE	19	B	20	SPACE			0.0
0.0	SPACE		SPACE	21	A	22	SPACE			0.0
0.0	SPACE		SPACE	23	B	24	SPACE			0.0
0.0	SPACE		SPACE	25	A	26	SPACE			0.0
0.0	SURGE ARRESTOR		30/2	27	B	28	SPACE			0.0
0.0				29	A	30	SPACE			0.0
								MAIN CIRCUIT BREAKER		



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6/4/2024	5	Bid Set		
Date	No	Revision	By	

PROJECT ENGINEER STV  
DESIGNED/DRAWN KL  
INSPECTOR --

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CITY ENGINEER J.J.B.  
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**CITY OF BELLINGHAM, WASHINGTON**  
PUBLIC WORKS DEPARTMENT  
ENGINEERING DIVISION

SCALE  
Horiz. \_\_\_\_\_  
Vert. \_\_\_\_\_

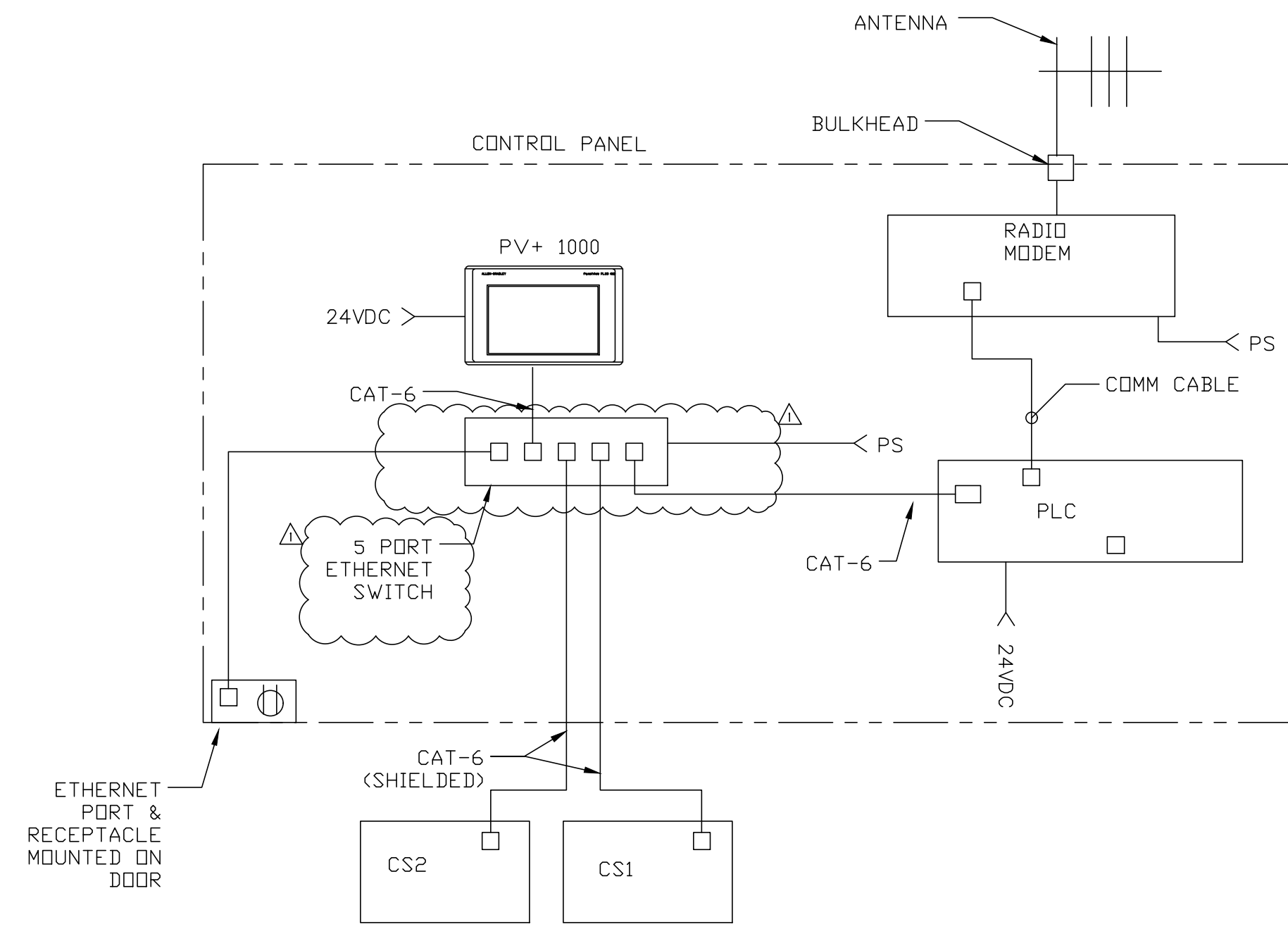
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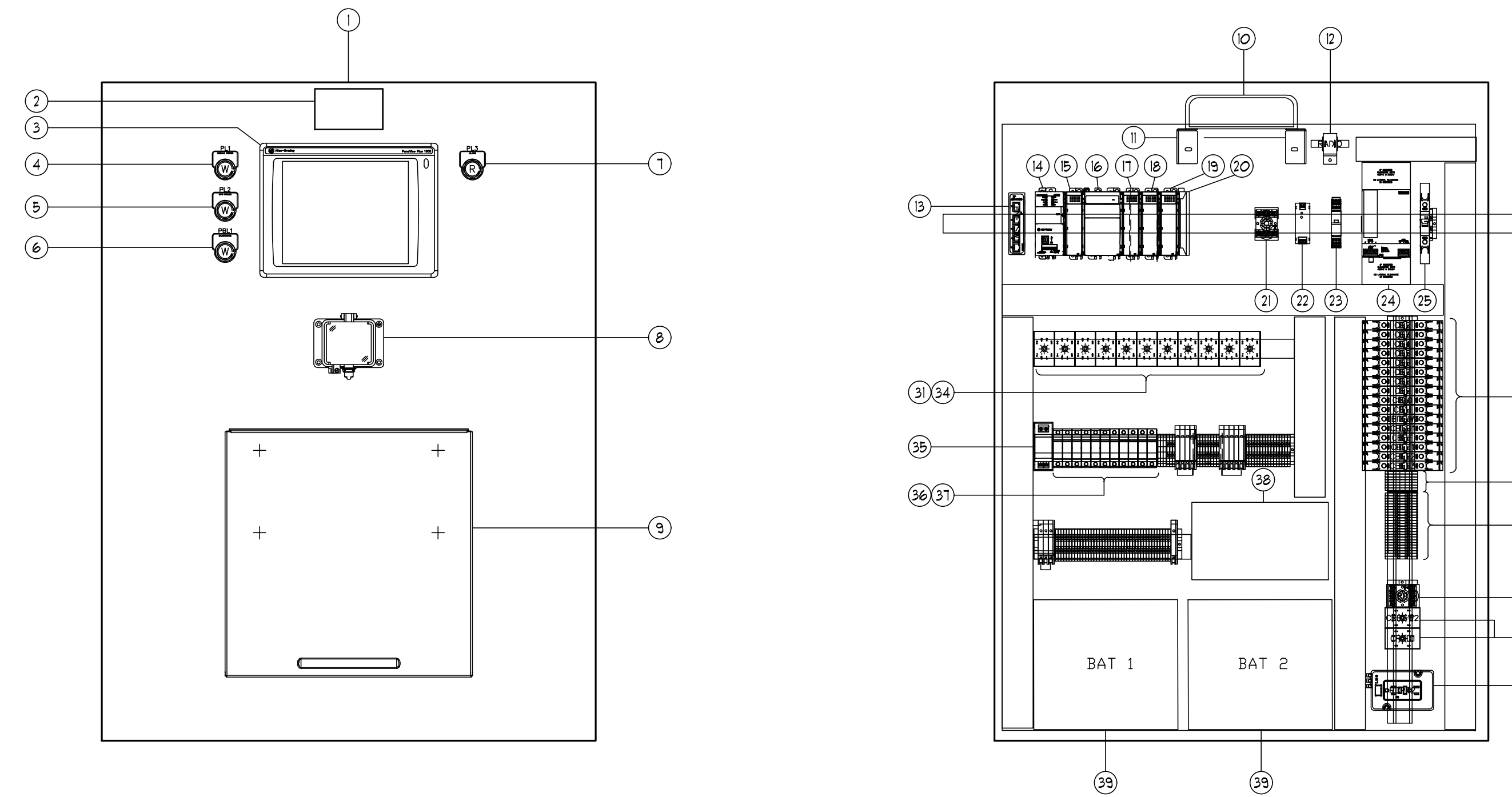
**DONALD AVE. WATER QUALITY RETROFIT**  
ELECTRICAL - RISER DIAGRAM & SCHEDULES

SHEET  
E6.1 OF





**ELECTRICAL - NETWORK DIAGRAM**  
SCALE: 1" = 1"



**DETAIL - CONTROL PANEL**  
SCALE: 1/2" = 1'-0"

ITEM #	DESCRIPTION	MANUFACTURER	PART NUMBER
1	ENCLOSURE (36"W x 48"H x 12"D), NEMA 12	SUBMIT	SUBMIT
2	PHENOLIC NAMEPLATE	SUBMIT	SUBMIT
3	PANELVIEW PLUS 7, PERFORMANCE 1000, 24VDCM ETHERNET	ALLEN-BRADELY	2711P-T10CSSD9P
4	PILOT LIGHT, WHITE, 12-130V AC/DC PUSH TO TEST "120VAC POWER"	ALLEN-BRADELY	800HC QRTH2W
5	PILOT LIGHT, WHITE, 12-130V AC/DC PUSH TO TEST "UPS POWER"	ALLEN-BRADELY	800HC QRTH2W
6	PUSH BUTTON LED, WHITE, EXGENDE HEAD W/O GUARD, 12-130V AC/DC. 1NO/1NC "DEACTIVA"	ALLEN-BRADELY	800HC QRBH2W
7	PILOT LIGHT, RED, 12-130V AC/DC PUSH TO TES "ALARM"	ALLEN-BRADELY	800HC QRTH2R
8	GRACEPORT, ETHERNET CATSPORT, NEMA 4. GFCI OUTLET, 3A CB	GRACE ENGINEERING	P-R2-K3RF3
9	SHELF, FOLDING, 18"WX18"D, STEEL, GRAY	HOFFMAN	AA615HLF1818
10	WIRELESS TRANSCIEVER RADIO	ESTEEM	210C
11	RADIO BRACKET, 3" STAINLESS	HOFFMAN	CT33WB
12	LIGHTNING ARRESTOR	ESTEEM	AA161
13	STRATIX 2000 UNMANAGED ETHERNET SWITCH, 5 COPPER PORTS	ALLEN-BRADELY	1783-US5T
14	COMPACTLOGIX L3 PROCESSOR, 2MB, DUAL ENET, 16 EXPAN MOD & 32 ENET NODE CAPACITY	ALLEN-BRADELY	1769-L33ER
15	COMPACT I/O 4 CHANNEL ISOLATED ANALOG INPUT MODULE	ALLEN-BRADELY	1769-IF41
16	COMPACTLOGIX POWER SUPPLY 24 VDC INPUT 4A @ 5VDC, 2A @ 24VDC	ALLEN-BRADELY	1769-PB4

ITEM #	DESCRIPTION	MANUFACTURER	PART NUMBER
17	2 CHANNEL RS232/RS485/RS422 ASCII MODULE	PROSOFT	MV169-MCM
18	COMPACT I/O 16 POINT 24 VDC SINKING /SOURCING INUT MODULE	ALLEN-BRADELY	1769-IQ16
19	COMPACT I/O 16 POINT 24 VDC SOURCING OUTPUT MODULE	ALLEN-BRADELY	1769-OB16
20	COMPACT I/O RIGHT END CAP /TERMINATOR	ALLEN-BRADELY	1769-ECR
21	VOLTAGE SENSING RELAY, SOLID STATE, 24VDC	MACROMATIC	VAKP024D
22	POWER SUPPLY, 120VAC, 12VDC, 2A @ 12VDC	RHINO	PSP12-DC24-2
23	SURGE PROTECTOR, PLT-SEC-T3-120-FM-UT, 120VAC/DC	PHONIX CONTACT	2907918
24	POWER SUPPLY, SITOP, 24VDC, 20A	SIEMENS	6EP1336-3BA10
25	CIRCUIT BREAKER, MINIATURE, 20A, 1-POLE, 120VAC	ALLEN-BRADELY	1489-M1C200
26	CIRCUIT BREAKER, MINIATURE, xA, 1-POLE, 120VAC (SIZE AS REQUIRED)	ALLEN-BRADELY	1489-M1Cx00
27	GROUND TERMINALS, SINGLE TIER, GREEN/YELLOW (QTY. AS REQUIRED)	ALLEN-BRADELY	1492-JG3
28	TERMINALS, IEC, FEED THROUGH, 600V AC/DC, 20A (QTY. AS REQUIRED)	ALLEN-BRADELY	1492-J3
29	RELAY BASE, 8-PIN, OCTAL	MACROMATIC	70169-D
30	VOLTAGE SENSING RELAY, 120V COIL, 10A	MACROMATIC	VAKP120A
31	SCREW TERMINAL, TUBE BASE SOCKETS, 8-PIN (QUANTITY AS REQUIRED)	ALLEN-BRADELY	700-HN100
32	DPDT RELAY, TUBE BASE, 120VAC COIL	ALLEN-BRADELY	700-HA32A1

ITEM #	DESCRIPTION	MANUFACTURER	PART NUMBER
33	DUPLEX 15 AMP GFCI DIN-RAIL RECEPTACLE	WEIDMULLER	6720005422
34	DPDT CONTROL RELAY, 24VDC COIL, 10A (QUANTITY AS REQUIRED)	ALLEN-BRADELY	700-HA32Z24
35	DC VOLTAGE TRANSDUCER, 0-50VDC INPUT, 4-20mA OUTPUT	ACUAMP	VDCT050-42-24
36	FUSE HOLDER, CLASS CC, 1-POLE, 30A, DC, WITH INDICATOR (QTY. AS REQUIRED)	BUSSMAN	CHCC1D1-48U
37	FUSE Xa, CLASS CC, DUAL ELEMENT, TIME DELAY (SIZE AND QTY. AS REQUIRED)	BUSSMAN	LP-CC-x
38	BATTERY CHARGER, 120VAC INPUT, 24VDC/21A OUTPUT	MEAN WELL	HEP-600C-24
39	SEALED LEAD-ACID BATTERY, 140 Ah, 12V	POWERSONIC	PS-121400 FR
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**K ENGINEERS INC.**  
208 Third Street  
Lynden, WA 98264  
Bus (360) 354-4757  
FAX (360) 354-6794

6/18/2024	6	Addendum 1
6/4/2024	5	Bid Set
4/25/2024	4	90% Design
10/13/23	3	Ecology Review Response
Date	No	Revision

PROJECT ENGINEER STV  
DESIGNED/DRAWN KL  
INSPECTOR --

DIRECTOR PUBLIC WORKS E.C.J.  
CITY ENGINEER J.J.B.  
ASSISTANT DIRECTOR M.A.O.

**CITY OF BELLINGHAM, WASHINGTON**  
PUBLIC WORKS DEPARTMENT  
ENGINEERING DIVISION

SCALE  
Horiz. \_\_\_\_\_  
Vert. \_\_\_\_\_

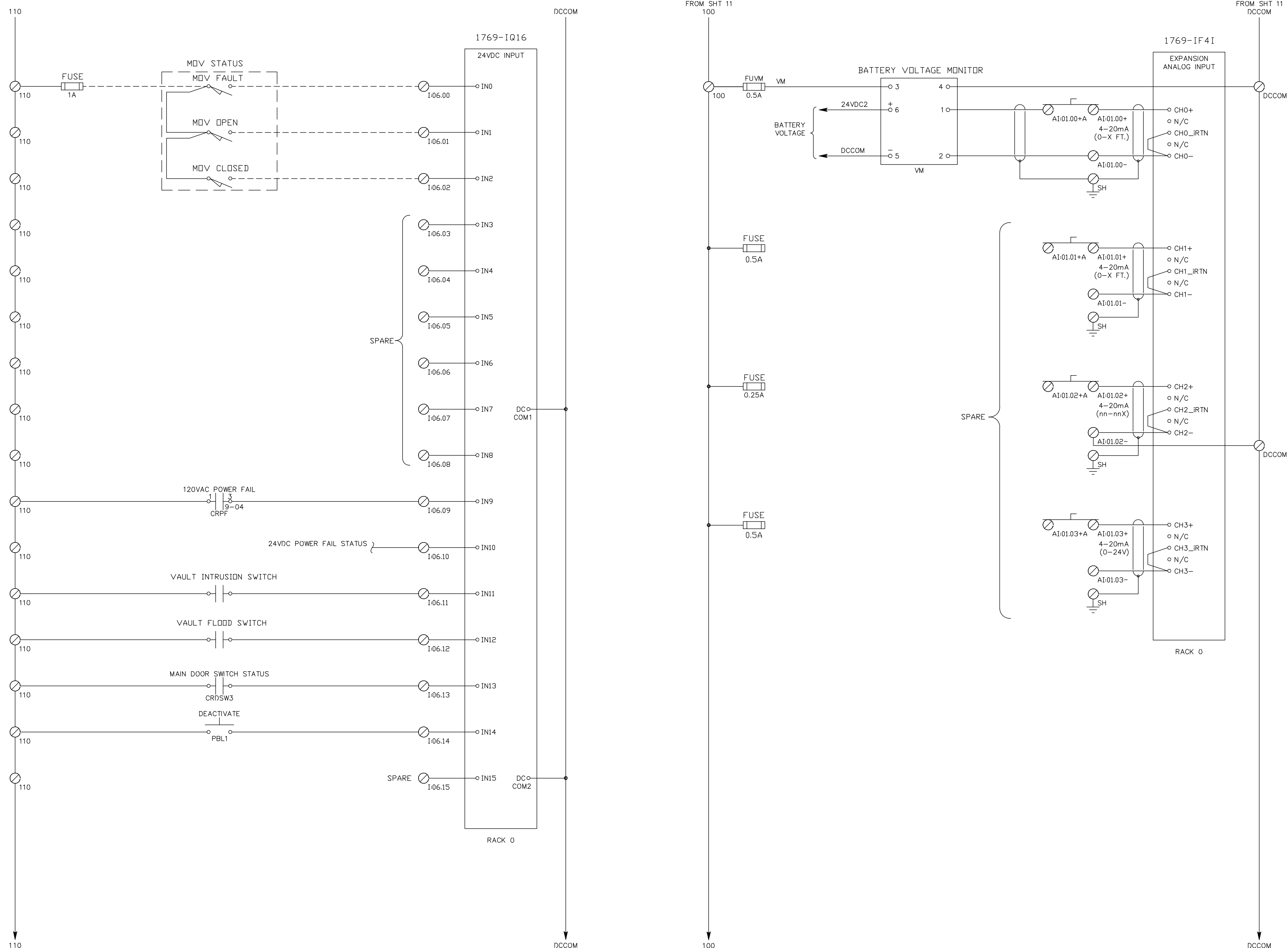
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NAD 83/98  
NAVD 88

Job. No. 2348  
Date 6/4/2024  
Field Bk. 1062 SERIES

**DONALD AVE. WATER QUALITY RETROFIT**  
ELECTRICAL - CONTROLS

SHEET  
E7.1R1 OF





**ELECTRICAL - CONTROL SCHEMATICS**  
SCALE: NONE



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Date	No	Revision	By
6/18/2024	0	Addendum 1	

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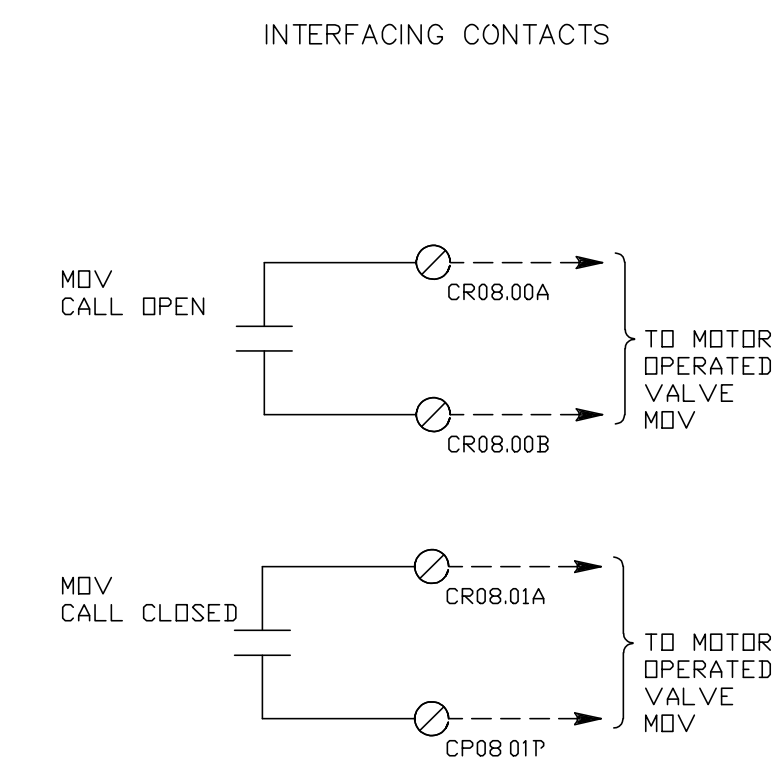
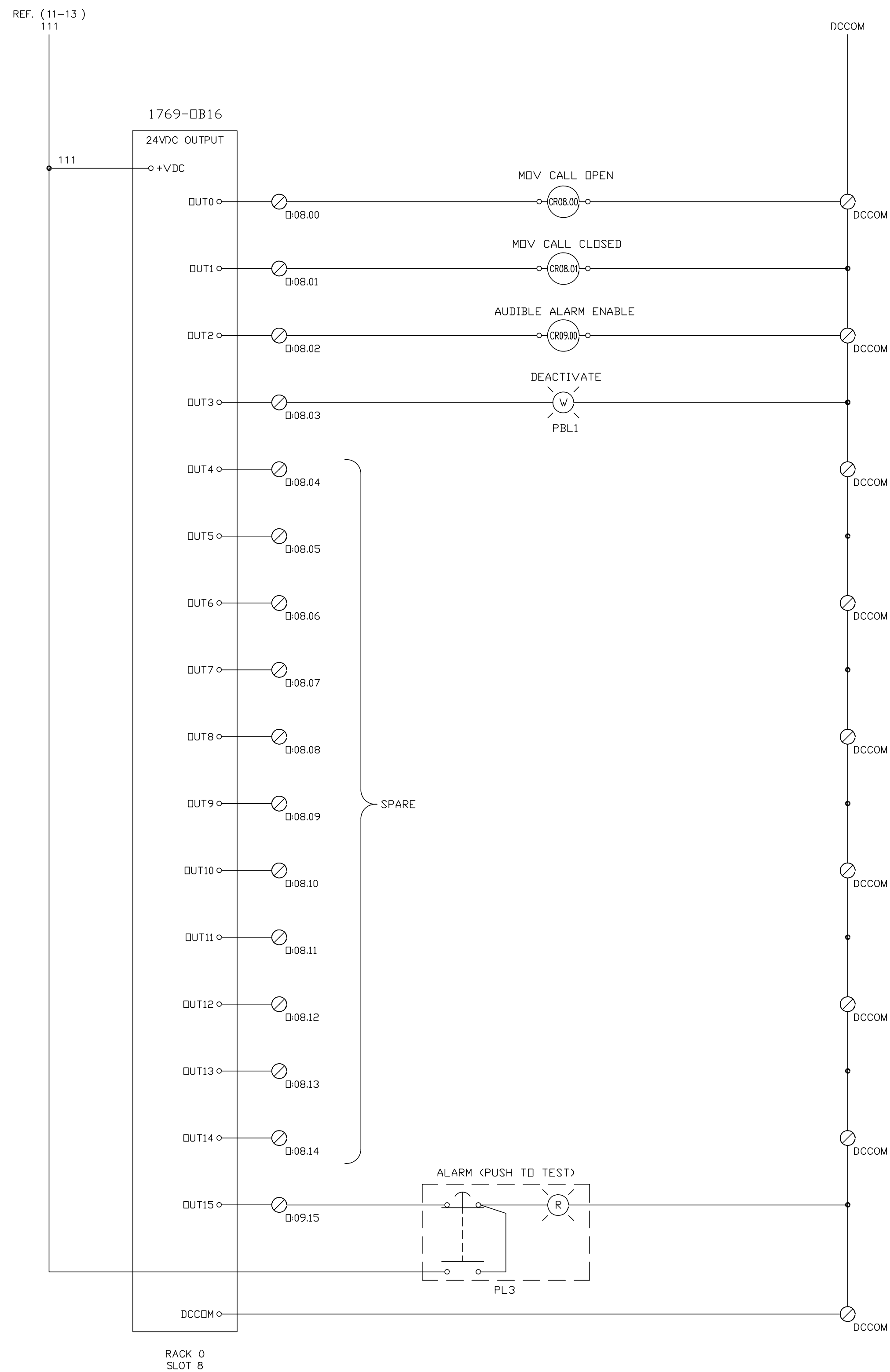
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**DONALD AVE. WATER QUALITY RETROFIT**  
ELECTRICAL - CONTROL SCHEMATICS

SHEET E7.3 OF OF



**ELECTRICAL - CONTROL SCHEMATICS**  
SCALE: NONE



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6/18/2024	0	Addendum 1		
Date	No	Revision	By	

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SCALE  
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**DONALD AVE. WATER QUALITY RETROFIT**  
ELECTRICAL - CONTROL SCHEMATICS

SHEET  
E7.4 OF