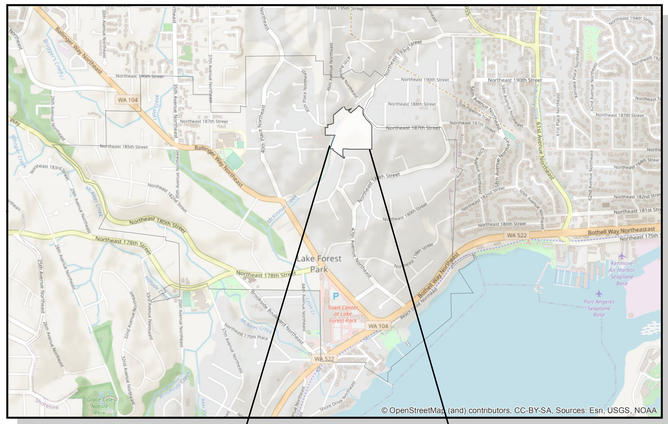
LAKE FOREST PARK WATER DISTRICT

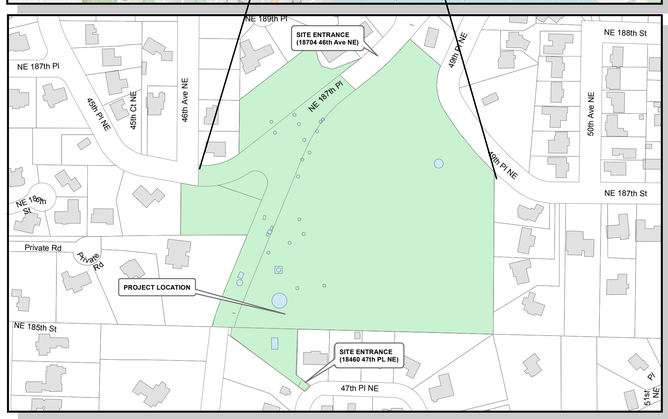
MCKINNON CREEK PUMPHOUSE - PHASE II - BUILDING

18460 47th Pl NE

GOOD WATER NATURALLY!

PROJECT LOCATION





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CONTACT INFORMATION

Contact	Company	Position	Phone
Alan Kerley	Lake Forest Park Water District	General Manager	206-365-3211
Dan Mundall	Mundall Engineering	District Engineer	360-319-1285
Calvin Killman	City of Lake Forest Park	Inspector	206-757-2815
Sandra Fernandes	Seattle City Light	Customer Relations	206-684-4975

811 Know what's below. Call before you dig.

CALL 48 HOURS BEFORE YOU DIG

REPORT ALL SPILLS
ECOLOGY 360-407-6300

DANIEL L. MUNDALL — STATE OF WASHINGTON — 032218 — REGISTERED PROFESSIONAL ENGINEER

DATE: / /

MUNDALL ENGINEERING & CONSULTING

P.O. Box 799
Sumas, Washington 98295

P.O. Box 56
Lytton, B.C. V0K 1Z0

Toll Free
1-800-313-9705

Bus. (250)-455-0085
FAX (250)-455-2276

Cellular (360)-319-1285
E-Mail Dan@Mundall.com

KEY & LEGEND

WATER

SYMBOL EXIST.	SYMBOL PROP.	DESCRIPTION
		WATER VALVE
		WATER METER
		FIRE HYDRANT
		WATER FITTING
		REDUCER/INCREASER
		COUPLER
		AIR RELEASE VALVE (ARV)
		HOSE BIB
		THRUST BLOCK
		WELL
		BLOW-OFF VALVE
		CHECK VALVE
		BUTTERFLY VALVE

SURVEY

- SPOT ELEVATION
- IRON PIPE
- SURVEY MONUMENT

OTHER UTILITIES/LANDSCAPE

- GAS VALVE
- MANHOLE
- CATCH BASIN
- MAILBOX
- UTILITY POLE
- STREET SIGN
- TREE DECIDUOUS
- TREE CONIFER
- ECOLOGY BLOCK
- UTILITY POLE ANCHOR
- HYDROEXCAVATE / HAND DIG

LINETYPES

- FIBER OPTIC
- EXIST. BUILDING
- PROPERTY LINES
- EXIST. WATER
- PROPOSED WATER
- PROPOSED COMM.
- UTILITY TO ABANDON
- SAN. SEWER
- GAS
- TELEPHONE (BURIED)
- TELEPHONE (AERIAL)
- CONTOUR MINOR
- CONTOUR MAJOR
- FENCELINE
- STORM DRAIN
- DISTRICT BOUNDARY
- POWER (AERIAL)
- POWERLINES (BURIED)
- ROADWAY
- ROAD ASPHALT PATCH
- STEEP SLOPE UNDER 20FT VERT
- STEEP SLOPE OVER 20FT VERT
- WETLAND DELINIATION
- STREAM CENTERLINE

ABBREVIATIONS

ABAND	ABANDONED
AC	ASBESTOS CEMENT
APPROX	APPROXIMATELY
AVE	AVENUE
AVG	AVERAGE
BLDG	BUILDING
BLVD	BOULEVARD
BMP	BEST MANAGEMENT PRACTICE
CATV	CABLE TV
CB	CATCH BASIN
CL	CENTERLINE
CMP	CORRUGATED METAL PIPE
CONC	CONCRETE
CONST	CONSTRUCTION
CU	CUBIC
CY	CUBIC YARD
CULV	CULVERT
DAIM	DIAMETER
DWY	DRIVEWAY
EL	ELEVATION
ELEC	ELECTRICAL
EP	EDGE OF PAVEMENT
EST	ESTIMATE
EXIST	EXISTING
F	FEMALE
FH	FIRE HYDRANT
FT	FOOT / FEET
GALV	GALVANIZED
GB	GRADE BREAK
GRD	GROUND
GV	GATE VALVE, GAS VALVE
HDPE	HIGH DENSITY POLYETHYLENE
ID	INSIDE DIAMETER
IE	INVERT ELEVATION
IPS	IRON PIPE SIZE
INV	INVERT
JB	JUNCTION BOX
LF	LINEAL FOOT
M	METER, MALE
MAX	MAXIMUM
MISC	MISCELLANEOUS
MON	MONUMENT
N	NORTH
NO	NUMBER
NRS	NON-RISING STEM
NPT	NATIONAL PIPE THREAD
OD	OUTSIDE DIAMETER
OP	OVERHEAD POWER
OT	OVERHEAD TELEPHONE
PL	PROPERTY LINE
PP	POWER POLE
PSI	POUNDS PER SQUARE INCH
PVC	POLYVINYL CHLORIDE
QTY	QUANTITY
RD	ROAD
REQ'D	REQUIRED
ROW	RIGHT-OF-WAY
R/W	RIGHT-OF-WAY
S	SOUTH
SAN	SANITARY
SCHED	SCHEDULE
SD	STORM DRAIN
SERV	SERVICE
SF	SQUARE FEET
SQ	SQUARE
SS	SANITARY SEWER
ST	STREET
STA	STATION
TEMP	TEMPORARY
THD	THREAD
TYP	TYPICAL
UG	UNDERGROUND
VAR	VARIES
VERT	VERTICAL
W	WEST, WATER
W/	WITH
WM	WATER METER, WATERMAIN
W/O	WITHOUT
WV	WATER VALVE
YDS	YARDS
&	AND

GENERAL NOTES

GENERAL NOTES:

1. THE CONTRACTOR SHALL SCHEDULE A PRE-CONSTRUCTION MEETING WITH LAKE FOREST PARK WATER DISTRICT
2. A COMPLETE SET OF PLANS SHALL BE MAINTAINED BY THE CONTRACTOR DURING CONSTRUCTION, AND SHALL REFLECT ANY VARIATION IN CONSTRUCTION FROM THE PLANS. THESE "AS-BUILT" PLANS SHALL BE PROVIDED TO THE DISTRICT AT THE COMPLETION OF CONSTRUCTION.
3. THE CONTRACTOR WILL BE FULLY RESPONSIBLE FOR THE LOCATION AND PROTECTION OF ALL EXISTING UTILITIES. THE UTILITIES SHOWN ON THE PLANS ARE APPROXIMATE AND WILL NEED FIELD VERIFICATION FOR EXACT ALIGNMENT AND DEPTH. THERE MAY BE EXISTING UTILITIES NOT SHOWN ON THE PLANS.
4. CONTRACTOR SHALL COORDINATE CONSTRUCTION WITH SEATTLE CITY POWER & LIGHT FOR UTILITY POLE STABILIZATION IF REQUIRED.
5. ALL EXCAVATION METHODS AND SHORING TECHNIQUES SHALL BE IN ACCORDANCE WITH WAC 296 TRENCH EXCAVATION SAFETY SYSTEMS.
6. THE DISTRICT SHALL AT ALL TIMES HAVE ACCESS TO THE WORK AND TO THE LOCATIONS WHERE THE WORK IS IN PREPARATION.

WATER NOTES:

1. ALL WORK, MATERIALS, CONCRETE BLOCKING AND TESTING OF WATER LINES SHALL CONFORM LAKE FOREST PARK WATER DISTRICT STANDARD DETAILS AND THE AMERICAN WATERWORKS ASSOCIATION (AWWA) SPECIFICATIONS.
2. THE WATER MAIN SHALL BE INSTALLED WITH MINIMUM OF 36 INCHES OF COVER (10-INCH PIPE AND SMALLER) AND 48 INCHES COVER (12-INCH PIPE OR LARGER), AS MEASURED FROM THE TOP OF THE PIPE TO FINISHED GRADE, UNLESS OTHERWISE APPROVED. WHERE UTILITY CONFLICTS OCCUR, THE WATER MAIN SHALL BE LOWERED TO CLEAR AS APPROVED BY THE DISTRICT. THIS INFORMATION SHALL BE REFLECTED ON THE "AS-BUILT" RECORD BY CONTRACTOR.
3. EXACT LOCATIONS AND CONFIGURATION OF WATER METERS AND VAULTS SHALL BE APPROVED BY THE DISTRICT PRIOR TO CONSTRUCTION.
4. BEDDING FOR WATER MAINS SHALL BE PROVIDED AS REQUIRED IN THE STANDARD DETAIL AND SPECIFICATIONS.
5. ALL SERVICE CONNECTIONS SHALL BE MADE IN ACCORDANCE WITH LAKE FOREST PARK WATER DISTRICT REQUIREMENTS.
6. ALL FIRE HYDRANTS SHALL BE INSTALLED, INSPECTED AND ADJUSTED IN ACCORDANCE WITH THE DISTRICT'S STANDARD DETAILS.
7. AFTER THE PIPE AND APPURTENANCES ARE IN PLACE AND THE SYSTEM HAS BEEN SATISFACTORILY PRESSURE TESTED, IT SHALL BE FLUSHED WITH WATER OF SUFFICIENT VELOCITY TO REMOVE ALL DIRT AND OTHER FOREIGN MATERIALS AND DISINFECTED/CHLORINATED IN ACCORDANCE WITH RECOMMENDED AWWA STANDARDS. THE CONTRACTOR SHALL REQUEST A BACTERIOLOGICAL SAMPLE TO BE TAKEN AT LEAST 24 HOURS AFTER FLUSHING AND DISINFECTING.
8. DUCTILE IRON PIPE SHALL CONFORM TO AWWA C-151 WITH A STANDARD THICKNESS CLASS 52. FITTINGS FOR D.I. PIPE SHALL BE DUCTILE IRON OR CLASS 250 GRAY IRON CONFORMING TO AWWA C-110.
9. PRIOR TO BACKFILLING, ALL MAINS AND APPURTENANCES SHALL BE INSPECTED AND APPROVED FOR BACKFILLING BY THE DISTRICT.
10. NO CONNECTIONS TO THE EXISTING WATER SYSTEM SHALL BE MADE WITHOUT AN APPROVED BACKFLOW PREVENTION DEVICE AND THE DISTRICT'S APPROVAL. PERMANENT CONNECTION SHALL NOT BE MADE UNTIL NEW MAINS HAVE BEEN DISINFECTED, FLUSHED AND HAVE PURITY IN ACCORDANCE WITH DISTRICT REQUIREMENTS. ANY CONNECTION TO THE EXISTING WATER SYSTEM SHALL BE WITNESSED BY THE DISTRICT INSPECTOR.
11. ALL THRUST BLOCKS SHALL BE FORMED IN PLACE. BLOCKS SHALL NOT BE BACKFILLED PRIOR TO SPECIFIC APPROVAL OF THE DISTRICT AND THE FIRST AGES OF THE CONCRETE CURING PROCESS ARE EVIDENT.
12. WATER PIPE ABANDONMENT:
    REMOVE WHERE DIRECTED AND SALVAGE TO DISTRICT
    OPEN ALL MAIN VALVES AND CAP ENDS OF PIPE
    REMOVE VALVE BOX TOPS AND RESTORE SURFACE

TEMPORARY EROSION AND STORM CONTROL (TESC):

1. CONTRACTOR SHALL HAVE EROSION CONTROL MEASURES IN PLACE BEFORE BEGINNING CONSTRUCTION – See Plans for TESC/SPPP.

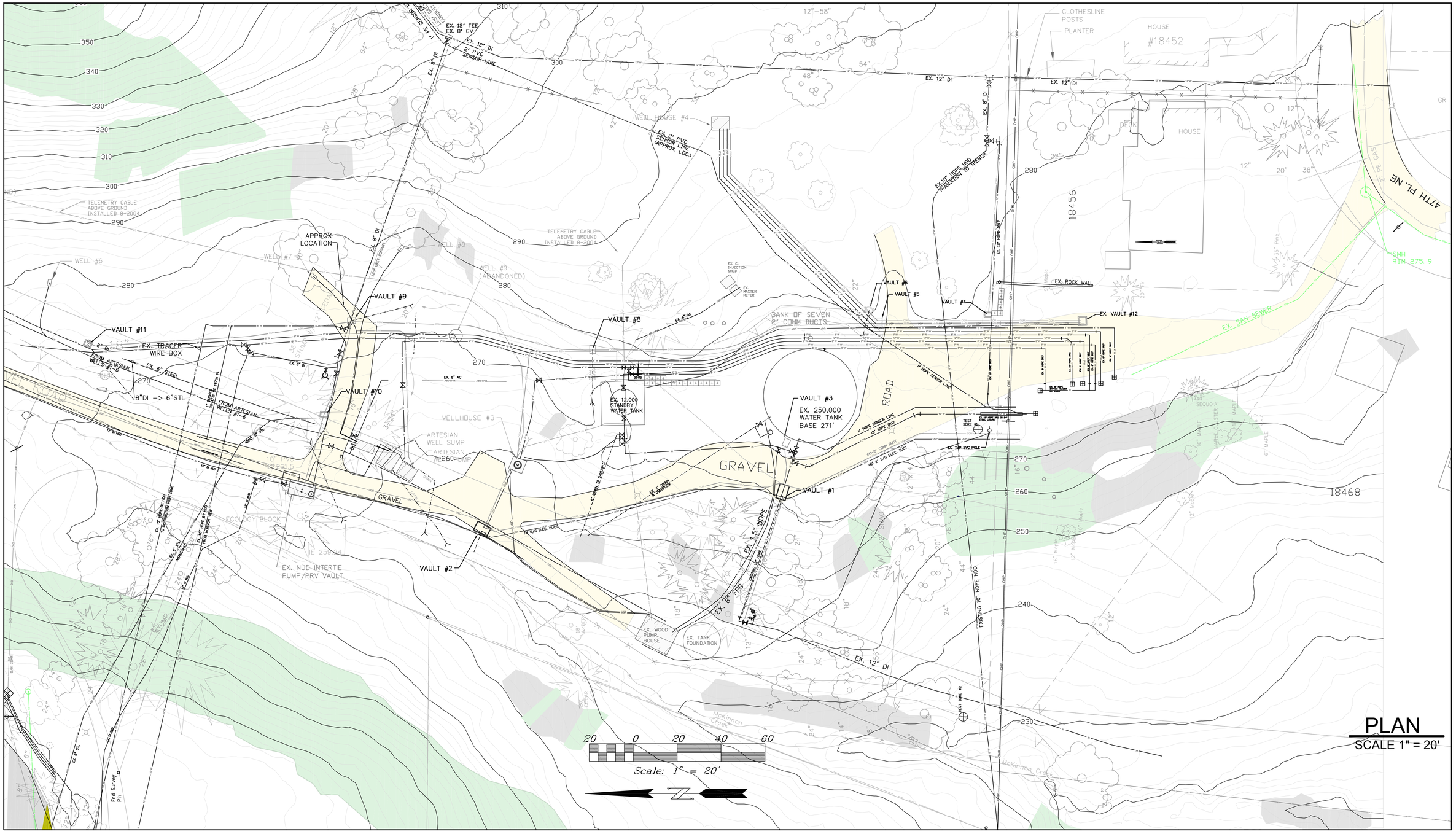
811 Know what's below. Call before you dig.

LAKE FOREST PARK WATER DISTRICT
GOOD WATER NATURALLY

MUNDALL ENGINEERING & CONSULTING
P.O. Box 799 Sumas Washington 98295
P.O. Box 56 Lytton, B.C. V0K 1Z0
Bus. (250)-455-0085 FAX (250)-455-2276
Cellular (360)-319-1285 E-Mail Engr@Mundall.com (800)-313-9705
WATER RESOURCES WASTEWATER DRIL AGRICULTURAL

DATE: / /

JOB NO.	M109-001
DRAWING NO.	PWTF-N1
SHEET	2
OF	28



PLAN

SCALE 1" = 20'

Know what's below. Call before you dig.

REVISIONS
MAY 7, 2021 - TENDER ISSUE MARCH 27, 2019 - PERMIT ISSUE 90% JUNE 23, 2016 - PERMIT ISSUE

GENERAL NOTES

DATUM: Control Data from King County Survey Control Points #127, 117 (HPGN-HARN)

VERTICAL DATUM: Elevations are NAVD88, conversion factor for data imported from NGVD29 = +3.57'

DESIGNED BY	DM
DRAWN BY	SM
CHECKED BY	DM
APPROVED BY	
DATE PRINTED	5-05-2020
SCALE	1"=20' H 1"=8' V
F.B. NO.	

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Bus. (250)-455-0285 Cellular (360)-319-1285
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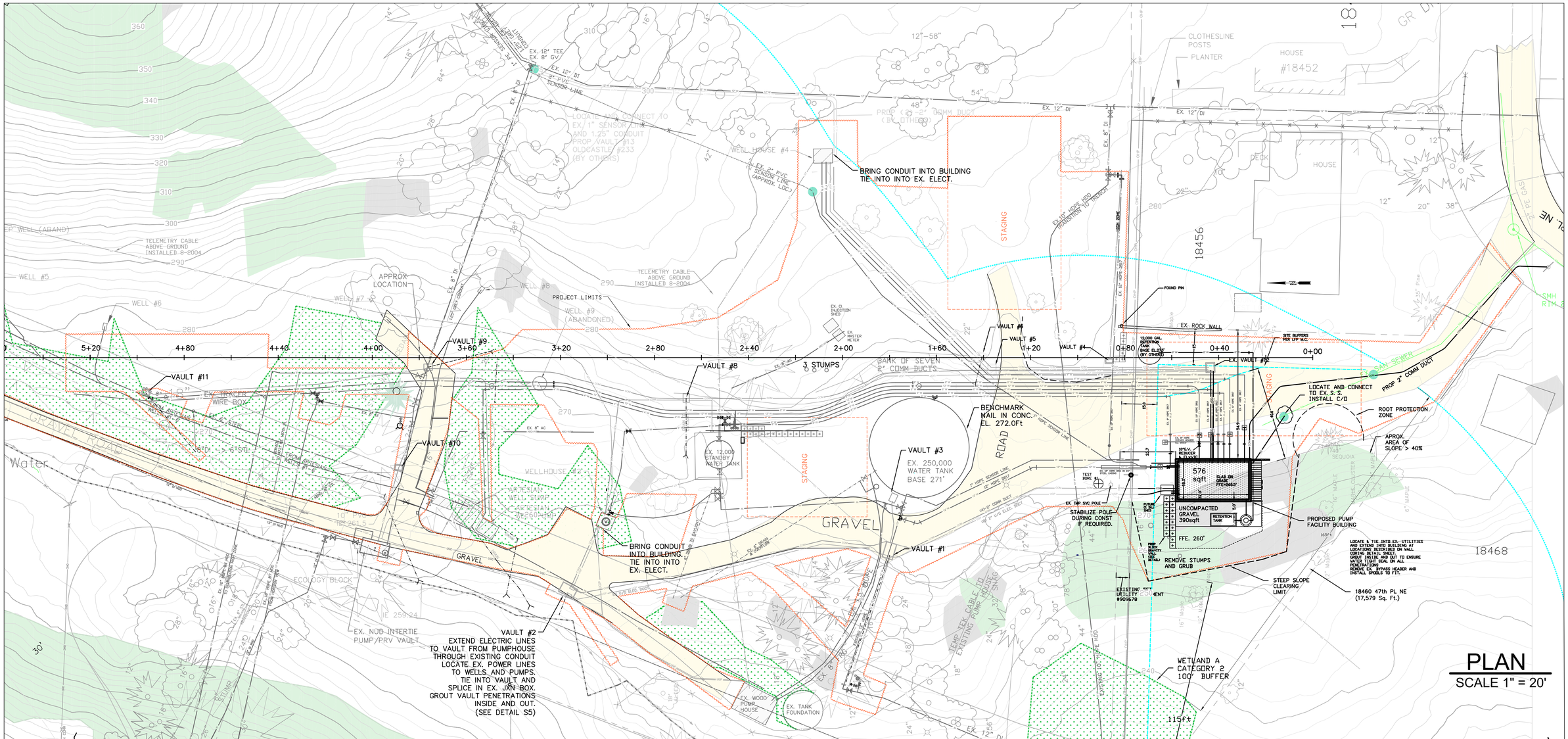
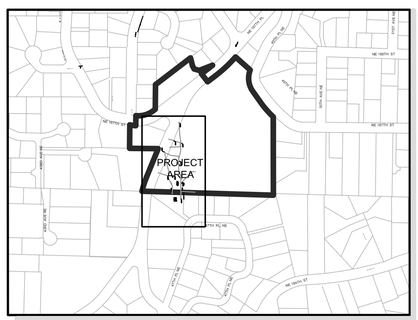
DATE: / /

LAKE FOREST PARK WATER DISTRICT
GOOD WATER NATURALLY

LAKE FOREST PARK WATER DISTRICT - PWTF 2013
McKinnon Creek Pumphouse Phase II
Existing Site Plan
18460 47th PL NE

JOB NO.	M109-001
DRAWING NO.	PWTF_S1
SHEET	3 OF 28





AREA MAP

REVISIONS	GENERAL NOTES		
MAY 12, 2021 - TENDER ISSUE JUNE 27, 2019 - TENDER ISSUE MARCH 27, 2019 - PERMIT ISSUE 90%	DATUM: Control Data from King County Survey Control Points #127, 117 (HPGN-HARN) VERTICAL DATUM: Elevations are NAVD88, conversion factor for data imported from NGVD29 = +3.57'	DESIGNED BY . DM DRAWN BY . SM CHECKED BY . DM APPROVED BY . DATE PRINTED . 5-12-2021 SCALE 1"=20' H 1"=8' V F.B. NO. .	

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DATE: / /

LAKE FOREST PARK WATER DISTRICT
GOOD WATER NATURALLY

LAKE FOREST PARK WATER DISTRICT PWTF 2013
McKinnon Creek Pumphouse - Phase II
Proposed Utilities Site Plan
18460 47th PL NE

JOB NO. M109-001
DRAWING NO. PWTF_S2
SHEET 4 OF 28

VAULT #6

VAULT #5

1+20

VAULT #4

0+80

12,000 GAL. RETENTION TANK BASE EL.273' (BY OTHERS)

EX. ROCK WALL

0+40

0+00

SITE BUFFERS PER LFP M.C.

EX. VAULT #12

EX. SAN SEWER

PROP 2" COMM DUCT

LOCATE AND CONNECT TO EX. S. S. INSTALL C/O

ROOT PROTECTION ZONE

APROX. AREA OF SLOPE > 40%

STAGING

ROAD

1" HDPE SENSOR LINE

HDPE SENSOR LINE 12" HDPE DR17

(4)-2" COMM DUCT

(8) 2" U/G ELEC. DUCT

EX. 12" HDPE DR11 IN 24" STEEL CASING

TEST BORE #1

EX. TMP SVC POLE

STABILIZE POLE DURING CONST IF REQUIRED.

EX. 8" HDPE BYPASS HEADER EL. 265.5'

10"G.V. REDUCER & FLxVIC

576 sqft

SLAB ON GRADE FFE=260.5'

FUTURE Cl INJ. SHED

UNCOMPACTED GRAVEL 390sqft

RETENTION TANK

FFE. 260'

PROP BLOCK GRAVITY WALL (SEE DETAIL)

REMOVE STUMPS AND GRUB

PROPOSED PUMP FACILITY BUILDING

40" SEQUOIA

MAPLE CLUSTER

16" MAPLE

10" MAPLE

6" MAPLE

44"

165ft

LOCATE & TIE INTO EX. UTILITIES AND EXTEND INTO BUILDING AT LOCATIONS DESCRIBED ON WALL CORING DETAIL SHEET.
GROUT INSIDE AND OUT TO ENSURE WATER TIGHT SEAL ON ALL PENETRATIONS
REMOVE EX. BYPASS HEADER AND INSTALL SPOOLS TO FIT.

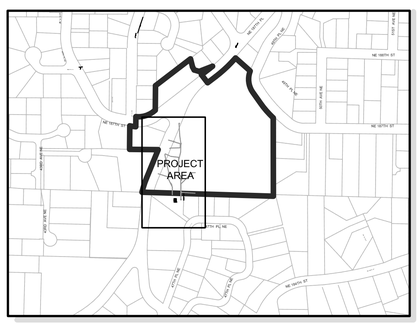
STEEP SLOPE CLEARING LIMIT

EXISTING 5FT UTILITY EASEMENT #909678

18460 47th PL NE (17,579 Sq. Ft.)

PLAN

SCALE 1" = 6'



AREA MAP

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Cellular (360)-319-1285 E-Mail: Don@Mundall.com (800)-313-9705

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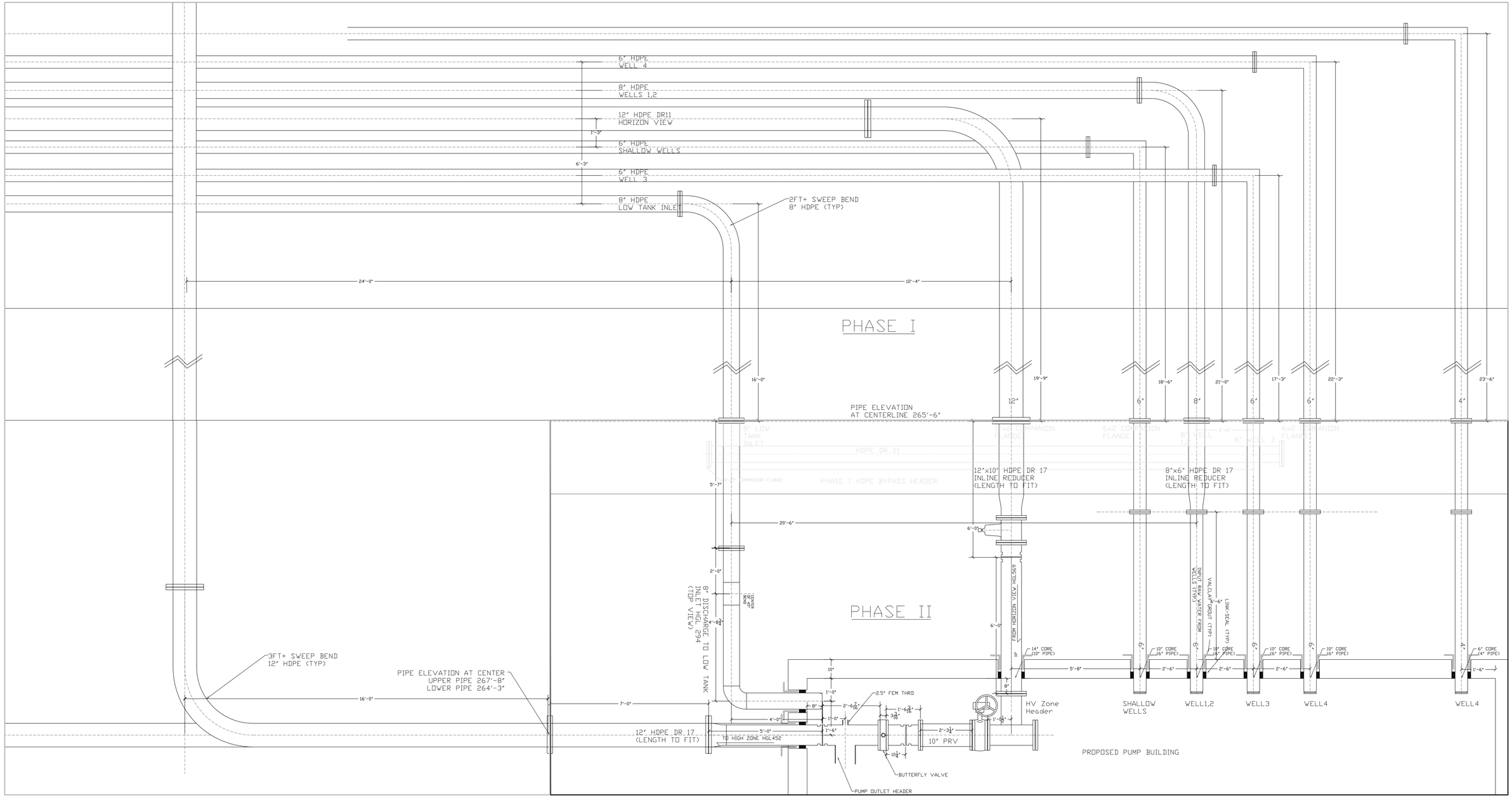
LAKE FOREST PARK WATER DISTRICT
GOOD WATER NATURALLY

LAKE FOREST PARK WATER DISTRICT PWTF 2013
McKinnon Creek Pumphouse - Phase II
Site Details 1
18460 47th PL NE

JOB NO. M109-001
DRAWING NO. PWTF_S3
SHEET 5 OF 28



NOTES:

1) ALL MATERIALS CONTACTING WATER SHALL BE NSF61 COMPLIANT.

2) COORDINATE DISINFECTION TESTING WITH DISTRICT STAFF.

3) UPON COMPLETION OF PIPING IN BUILDING, REMOVE EXISTING BYPASS HEADER AND REPLACE WITH SPOOLS TO FIT AS SHOWN

PLAN

SCALE 1" = 2'

REVISIONS	GENERAL NOTES		
MAY 12, 2021 - TENDER ISSUE	DATUM: Control Data from King County Survey Control Points #127, 117 (HPGN-HARN) VERTICAL DATUM: Elevations are NAVD88, conversion factor for data imported from NGVD29 = +3.57'	DESIGNED BY	DM
		DRAWN BY	SM
		CHECKED BY	DM
		APPROVED BY	
		DATE PRINTED	5-12-2021
		SCALE	1"=2' H 1"=2' V
		F.B. NO.	

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DATE: / /

LAKE FOREST PARK WATER DISTRICT
GOOD WATER NATURALLY

LAKE FOREST PARK WATER DISTRICT- PWTF 2013

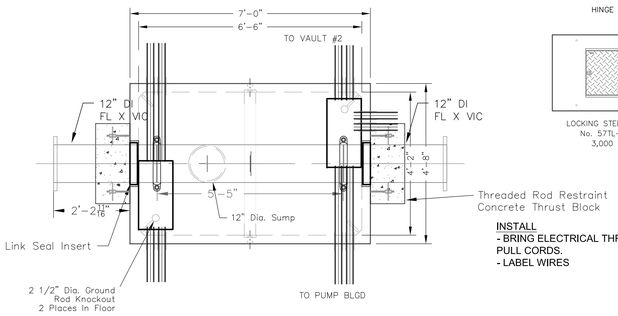
McKinnon Creek Pumphouse - Phase II

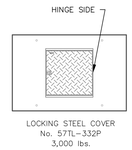
Site Details -2

JOB NO.	
M109-001	
DRAWING NO.	
PWTF_S4	
SHEET	OF
6 - 28	.

EX. VAULT #1

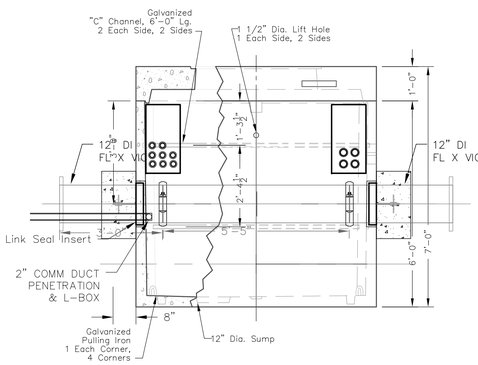
577



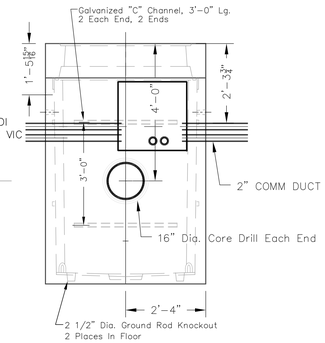


INSTALL
- BRING ELECTRICAL THROUGH VAULT #1 WITH EX. PULL CORDS.
- LABEL WIRES

PLAN VIEW



SECTION AA



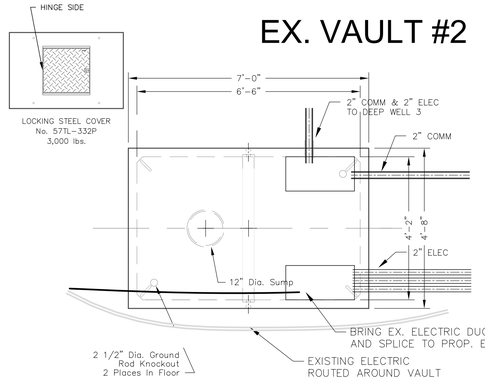
EAST END VIEW

SCALE

Oldcastle Precast® Utility Vault PO Box 588, Auburn, Washington 98071-0588 Tel: (253) 839-3500 Fax: (253) 735-4201	**577** File Name: 010-577 Issue Date: 2010 **www.uvauburn.com**	**577 - NO KNOCKOUTS** **4'-2" x 6'-6" x 6'-0"** **ELECTRIC / WATER / GAS** ©1970-2010 Oldcastle Precast, Inc.

EX. VAULT #2

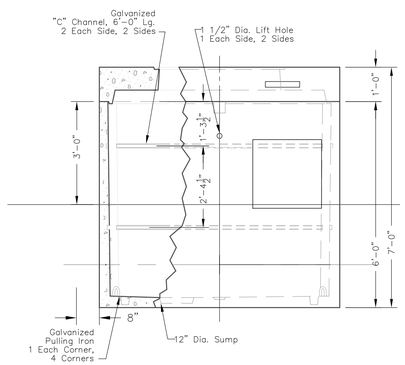
577



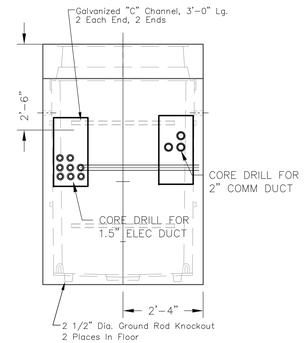
INSTALL
CUT EX. ELECTRIC, RETAINING ENOUGH LENGTH TO SPLICE TO NEW ELECTRIC
CORE-DRILL AND GROUT INSIDE AND OUT

ELECTRICAL NOTES
CONNECT TO:
-DEEP WELL 1 - 460v 3P
-DEEP WELL 2 - 460v 3P
-DEEP WELL 3 - 460v 3P
-DEEP WELL 3 - 120v 1P
-ARTESIAN PUMPS - 460v 3P
-ARTESIAN PUMP HOUSE - 120v
-NUD PUMP 1 - 460v 3P
-NUD PUMP 2 - 460v 3P
-NUD VAULT - 120v 1P
-LABEL WIRES

PLAN VIEW



SECTION AA

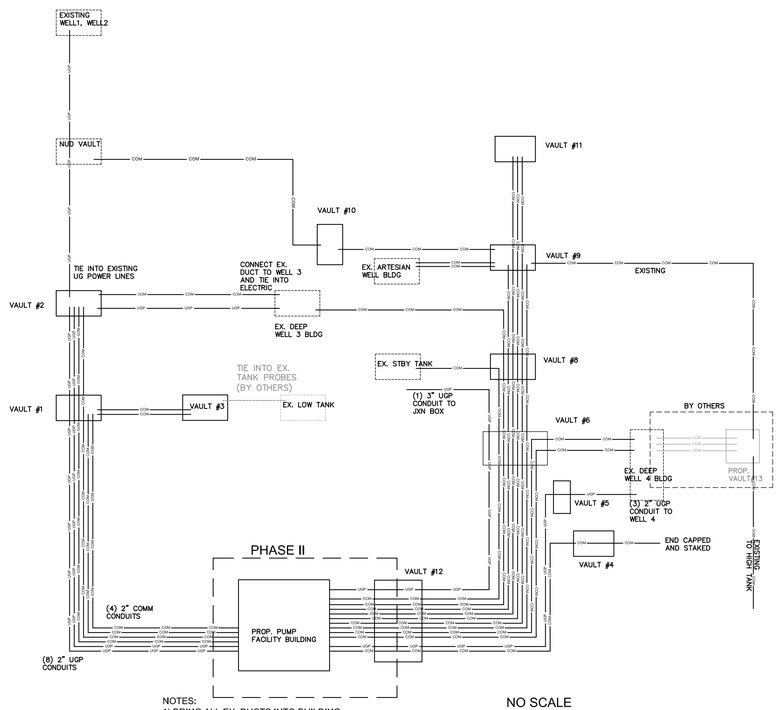


END VIEW

SCALE:

Oldcastle Precast® Utility Vault PO Box 588, Auburn, Washington 98071-0588 Tel: (253) 839-3500 Fax: (253) 735-4201	**577** File Name: 010-577 Issue Date: 2010 **www.uvauburn.com**	**577 - NO KNOCKOUTS** **4'-2" x 6'-6" x 6'-0"** **ELECTRIC / WATER / GAS** ©1970-2010 Oldcastle Precast, Inc.

VAULT LAYOUT SCHEMATIC



NOTES:
1) BRING ALL EX. DUCTS INTO BUILDING
2) GROUT ALL PENETRATIONS INSIDE AND OUT FOR WATERTIGHT SEAL
3) PULL ELECTRIC LINES THROUGH DUCTS WITH EX. PULL CORDS AND LEAVE WITH PULL CORD

NO SCALE

WEST CORRIDOR ELECTRIC & COMMUNICATION DUCTING LAYOUT	EAST CORRIDOR ELECTRIC & COMMUNICATION DUCTING LAYOUT

Know what's below. Call before you dig.

REVISIONS	GENERAL NOTES		
MAY 12, 2021 - TENDER ISSUE JUNE 27, 2019 - TENDER ISSUE MARCH 27, 2019 - PERMIT ISSUE - 90%	Datum: Control Data from King County Survey Control Points #127, 117 (HPGN-HARN)	DESIGNED BY . DM DRAWN BY . SM CHECKED BY . DM APPROVED BY . DATE PRINTED . 5-12-2021 SCALE . F.B. NO. .	

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P.O. Box 799, Sumas Washington 98295 — P.O. Box 50, Lytton, B.C. V0K 1Z0
Bus. (250)-455-0385 Cell/Mr (360)-319-1285
FAX (250)-455-2276 E-Mail mundall@spynet.com (800)-313-9705
WATER RESOURCES WASTEWATER CIVIL AGRICULTURAL

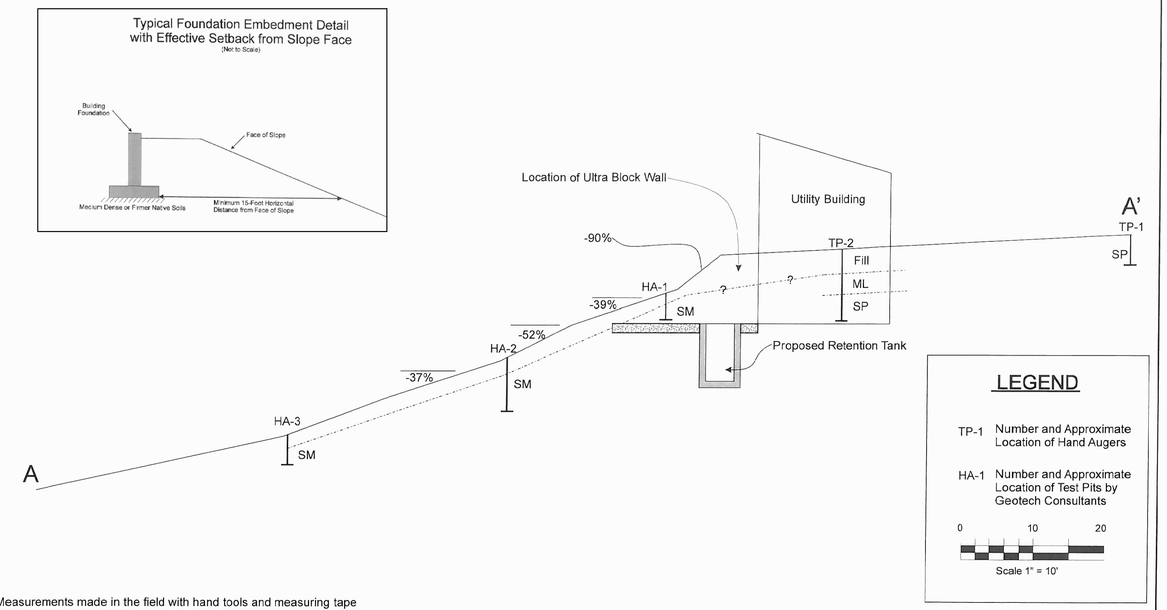
DATE: / /

LAKE FOREST PARK WATER DISTRICT
GOOD WATER NATURALLY

LAKE FOREST PARK WATER DISTRICT - PWTF 2013
McKinnon Creek Pumphouse - Phase II
Vault Details & Ducting Layout

JOB NO. M109-001
DRAWING NO. PWTF_S5
SHEET 7 OF 28

Cross Section A-A'



*Measurements made in the field with hand tools and measuring tape

ROBINSON NOBLE

PM: RBP
July 2018
2093-006A

Figure 5
Cross Section
Lake Forest Park Water District: McKinnon Creek Pumphouse

SPECIFICATIONS FOR ULTRA BLOCK RETAINING WALL

General:
1. The contractor shall have an approved set of plans and specifications on site at all times during the construction of the wall. The wall layout is the responsibility of the contractor.
2. A professional engineer or representative should observe the construction of the wall.
3. **The contractor is responsible for excavation cuts near property lines. If excavation stability is inadequate, temporary construction easements or shoring may be required. The contractor could try constructing the wall in small slot cuts to reduce the sloughing potential.**
4. Excavations made behind the planned wall, should be made with vertical cuts and flat benches.

Subgrade Preparation:
1. The ground should be prepared by removing surficial unsuitable soil, exposing dense or firmer inorganic, native soils as approved by the geotechnical engineer. Batter of the subgrade shall match the batter of the wall.
2. The excavation shall be cleaned of all excess material and protected, as necessary, from construction traffic to maintain the integrity of the subgrade.
3. A leveling pad approximately 6 inches thick of crushed rock shall be placed and compacted.

Drainage:
1. A minimum 4 inch diameter, perforated PVC pipe should be placed behind the blocks as shown on the detail.
2. The pipe should be surrounded by 6 inches of clean washed rock – 0.75 to 1.5 inches in diameter.

Ultra Blocks:
1. Ultra blocks should have a layout corresponding to the wall height as shown on this plan.
2. Base blocks should be embedded at least 1 foot into bearing, native undisturbed soils.
3. Stacked ultra blocks should be placed in a manner such that the blocks are interconnected and in accordance with the manufacturer's recommendations.
4. Ultra block layouts shown are for ultra blocks with dimensions of 2 ½ feet by 2 ½ feet by 5 feet. Half-blocks shall be used as needed.
5. The wall shall have a batter of 1H:6V in the east to west direction and wall buttress a vertical stack in the north to south direction.

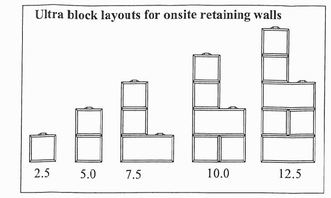
Structural Fill
1. Structural fill, consisting of granular import soils or on-site material with no greater than ¾ inch in size, would then be placed upon the subgrade. The geotechnical engineer shall approve the backfill material before placement.
2. Structural fill should have parameters equal to or better than those stated for the reinforced wall fill with less than 20% passing the number 200 sieve. The geotechnical engineer may allow a higher silt content based on review of the wall design and proposed fill parameters.
3. Soil density tests should be performed as designated by the geotechnical engineer.
4. Fill soils in the wall area shall be compacted to at least 90% of Maximum Dry Density (MDD) as determined by ASTM D-1557 Maximum Dry Density.
5. The soil shall be placed in relatively uniform horizontal lifts not exceeding 12 inches in thickness. The lift thickness shall not exceed the manufacturer's recommended depth for the compactive device used on the project.

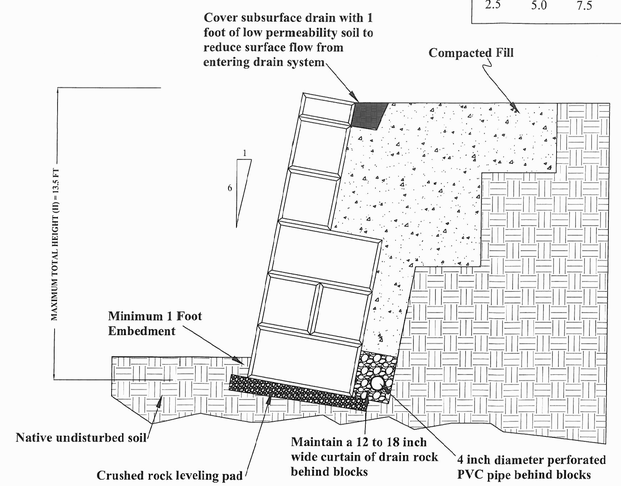
Inspection:
The construction shall be periodically observed under the direction of an engineer registered in the state of Washington with experience in the design of gravity retaining walls.

Design Parameters:
Retained Backfill: Φ = 37 deg, γ = 140 pcf, c = 0 psf
Foundation Soil: Φ = 30 deg, γ = 135 pcf, c = 0 psf

External Stability:
Minimum Factor of Safety against Base Sliding = 1.5
Minimum Factor of Safety against Overturning = 2.0
Minimum Factor of Safety against Bearing Capacity = 2.5

TYPICAL ULTRA BLOCK RETAINING WALL
(not to scale)



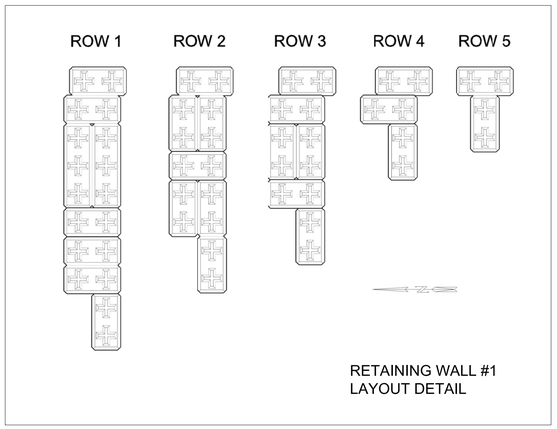


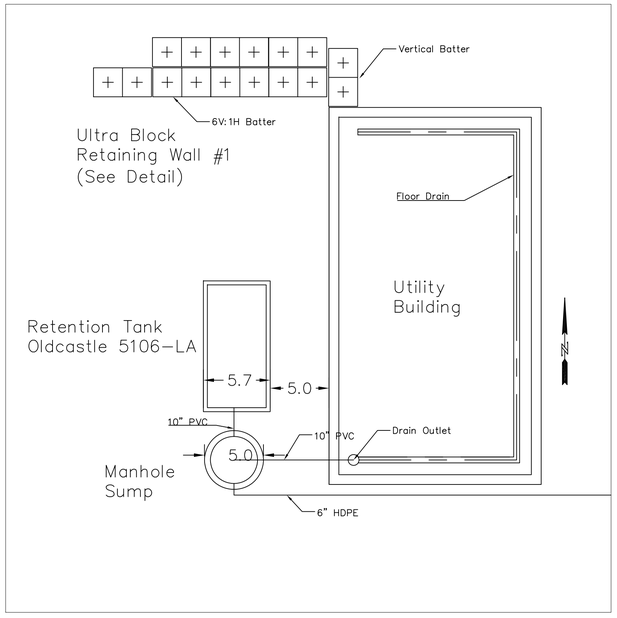
ROBINSON NOBLE

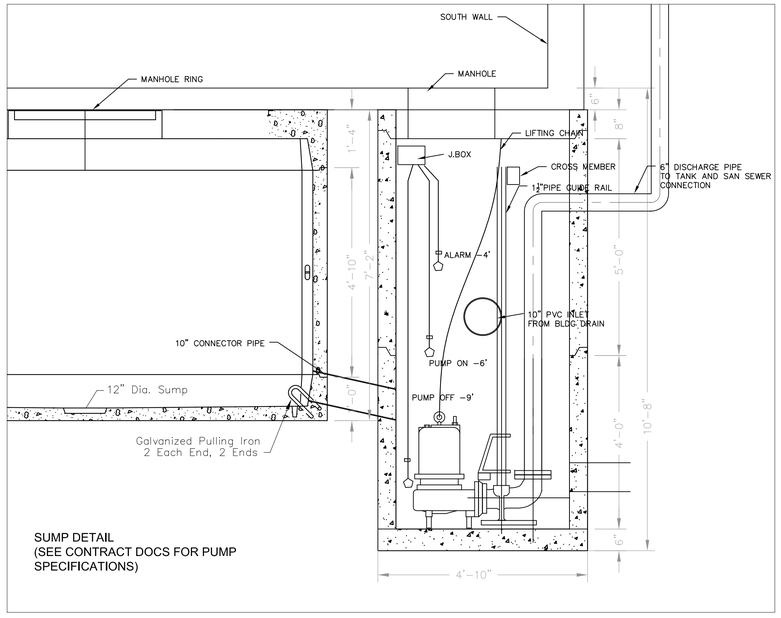
Note:

PM: RBP
July 2018
2093-006A

Figure 8
UltraBlock Wall Detail
Lake Forest Park McKinnon Creek Pumphouse







SUMP DETAIL
(SEE CONTRACT DOCS FOR PUMP SPECIFICATIONS)

REVISIONS	GENERAL NOTES		
MAY 12, 2021 - TENDER ISSUE MARCH 27, 2019 - PERMIT ISSUE - 90%	DATUM: Control Data from King County Survey Control Points #127, 117 (HPGN-HARN) VERTICAL DATUM: Elevations are NAVD88, conversion factor for data imported from NGVD29 = +3.57'	DESIGNED BY .	
		DRAWN BY .	
		CHECKED BY .	
		APPROVED BY .	
		DATE PRINTED .	5-12-21
		SCALE .	
		F.B. NO. .	

MUNDALL ENGINEERING & CONSULTING
P.O. Box 799 Sumas Washington 98295
P.O. Box 50 Lytton, B.C. V0K 1Z0
Bus. (250)-455-0085 FAX (250)-455-2276
Cellular (360)-319-1285
E-Mail Dan@Mundall.com (800)-313-9705

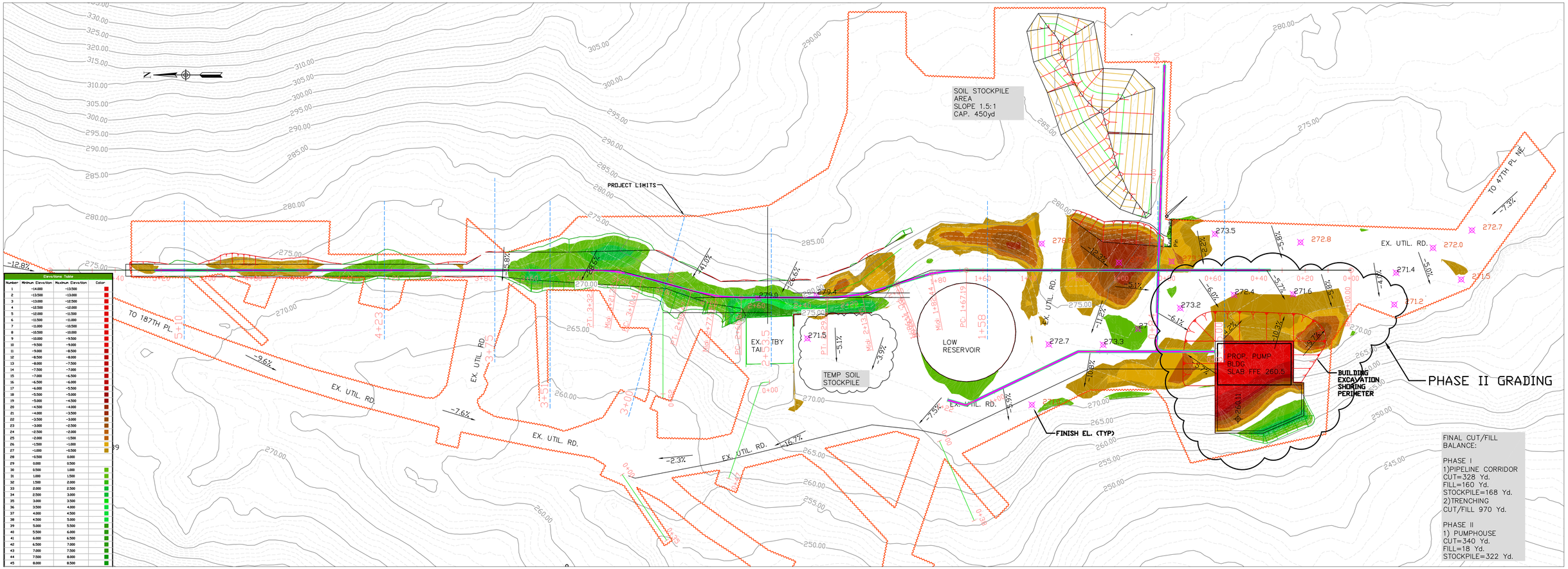
DANIEL L. MUNDALL
STATE OF WASHINGTON
REGISTERED
PROFESSIONAL ENGINEER

DATE: / /

LAKE FOREST PARK WATER DISTRICT
GOOD WATER NATURALLY

LAKE FOREST PARK WATER DISTRICT - PWTF 2013
McKinnon Creek Facility Building and Utilities
Geotech and Drainage Pump Details

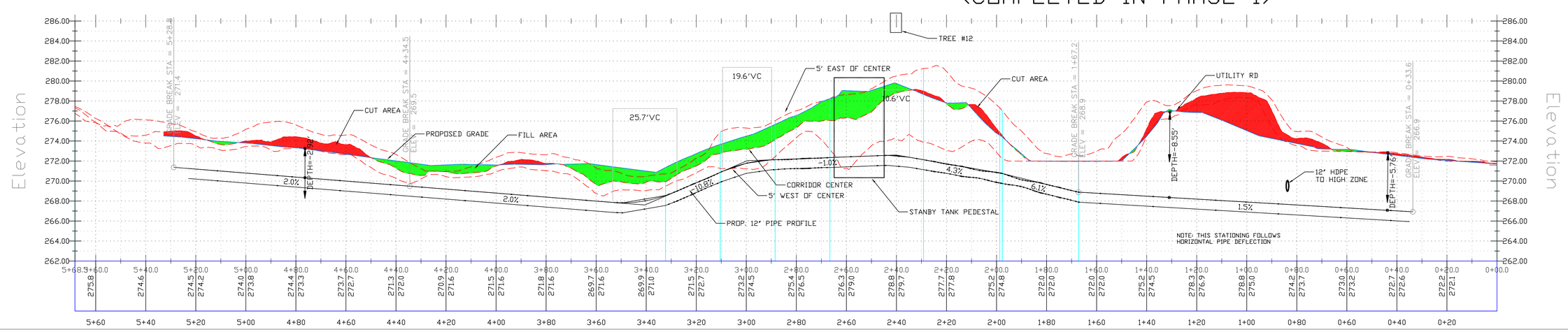
JOB NO. M109-001
DRAWING NO. PWTF-S6
SHEET 8 OF 28



Elevations Table

Number	Minimum Elevation	Maximum Elevation	Color
1	-14.000	-13.500	
2	-13.500	-13.000	
3	-13.000	-12.500	
4	-12.500	-12.000	
5	-12.000	-11.500	
6	-11.500	-11.000	
7	-11.000	-10.500	
8	-10.500	-10.000	
9	-10.000	-9.500	
10	-9.500	-9.000	
11	-9.000	-8.500	
12	-8.500	-8.000	
13	-8.000	-7.500	
14	-7.500	-7.000	
15	-7.000	-6.500	
16	-6.500	-6.000	
17	-6.000	-5.500	
18	-5.500	-5.000	
19	-5.000	-4.500	
20	-4.500	-4.000	
21	-4.000	-3.500	
22	-3.500	-3.000	
23	-3.000	-2.500	
24	-2.500	-2.000	
25	-2.000	-1.500	
26	-1.500	-1.000	
27	-1.000	-0.500	
28	-0.500	0.000	
29	0.000	0.500	
30	0.500	1.000	
31	1.000	1.500	
32	1.500	2.000	
33	2.000	2.500	
34	2.500	3.000	
35	3.000	3.500	
36	3.500	4.000	
37	4.000	4.500	
38	4.500	5.000	
39	5.000	5.500	
40	5.500	6.000	
41	6.000	6.500	
42	6.500	7.000	
43	7.000	7.500	
44	7.500	8.000	
45	8.000	8.500	

Profile - Main Corridor (COMPLETED IN PHASE I)



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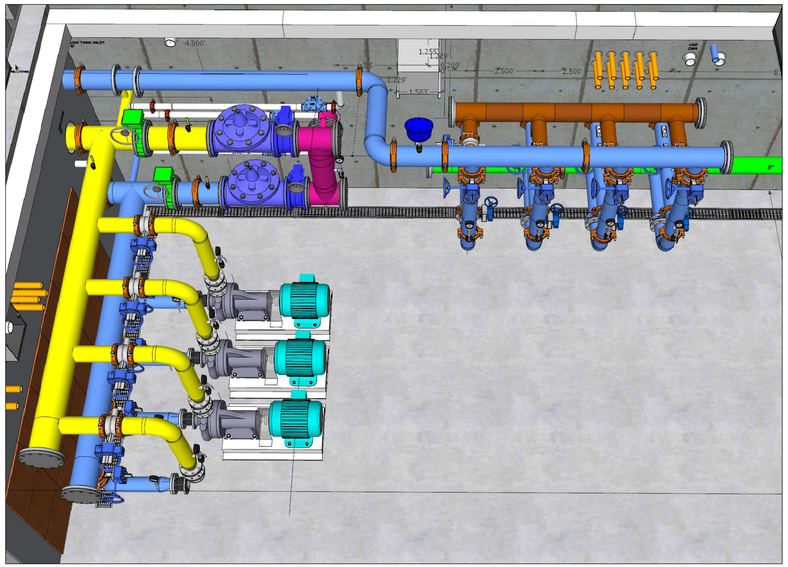
P.O. Box 50 Lytton, B.C. V0K 1Z0
Bus. (250)-455-0085 FAX (250)-455-2276
Cellular (360)-319-1285 E-Mail Darrell@Mundall.com (800)-313-9705

DATE: / /

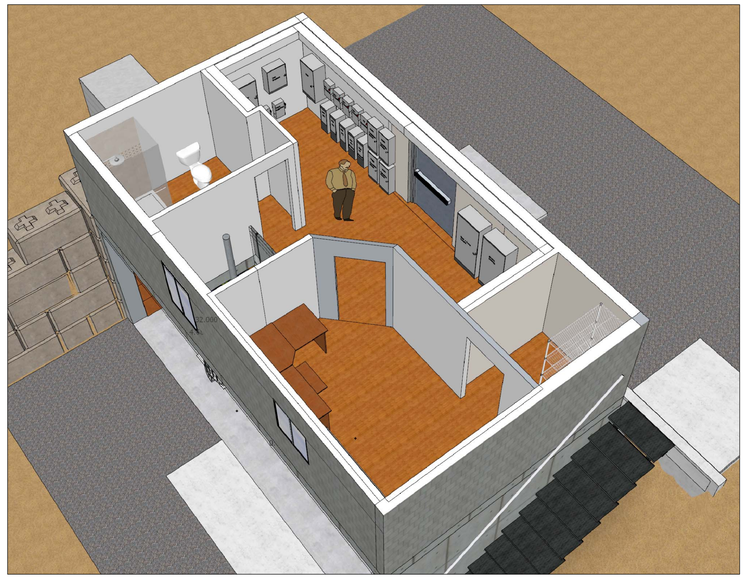
LAKE FOREST PARK WATER DISTRICT
GOOD WATER NATURALLY

LAKE FOREST PARK WATER DISTRICT - PWTF 2013
McKinnon Creek Pumphouse - Phase II
Site Grading Plan

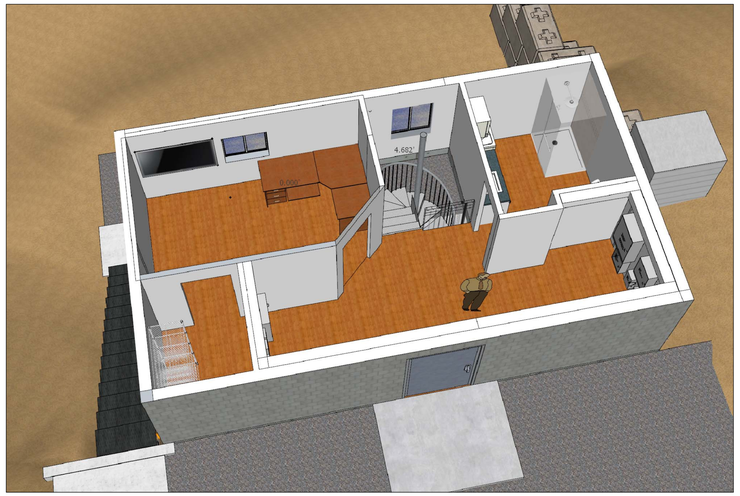
JOB NO. M109-001
DRAWING NO. PWTF_S7
SHEET 9 OF 28



BUILDING LOWER LEVEL PIPE GALLERY

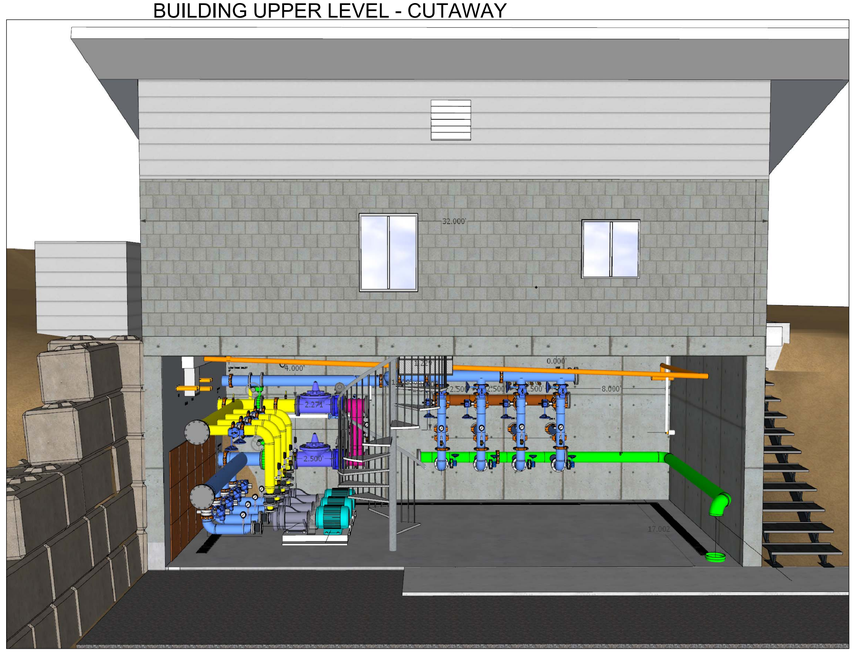


BUILDING UPPER LEVEL - CUTAWAY



BUILDING UPPER LEVEL - FACING EAST

BUILDING S.E. ASPECT



CUTAWAY LOWER LEVEL

BUILDING N.E. ASPECT - CUTAWAY LOWER LEVEL

(CONCEPTUAL ONLY - REFER TO OTHER DRAWINGS
WHERE DESCREPANCIES MAY EXIST)

REVISIONS	GENERAL NOTES		
MAY 12, 2021 - TENDER ISSUE JUNE 27, 2019 - TENDER ISSUE FEB 27, 2019 - PERMIT ISSUE - 90%	DATUM: Control Data from King County Survey Control Points #127, 117 (HPGN-HARN) VERTICAL DATUM: Elevations are NAVD88, conversion factor for data imported from NGVD29 = +3.57'	DESIGNED BY . DRAWN BY . CHECKED BY . APPROVED BY . DATE PRINTED . 5-12-21 SCALE 1"=20' H 1"=8' V F.B. NO. .	

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Bus. (250)-455-0085 FAX (250)-455-2276
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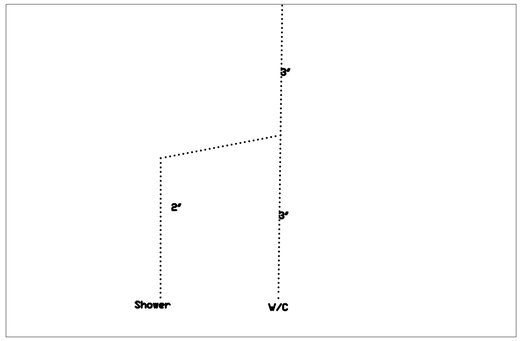
DATE: / /

LAKE FOREST PARK WATER DISTRICT
GOOD WATER NATURALLY

LAKE FOREST PARK WATER DISTRICT - PWTF 2013
McKinnon Creek Pumphouse - Phase II
Conceptual Renderings

JOB NO.	DRAWING NO.	SHEET	OF
M109-001	PWTF_B1	10	28

VENT PIPE RISER DIAGRAM
FACING NORTH WALL



PLUMBING NOTES:

A. ALL WORK SHALL COMPLY WITH THE LATEST ADOPTED STATE AND LOCAL CODES, AS WELL AS FEDERAL, STATE, AND MUNICIPAL REGULATIONS

B. THE WORK REQUIRED CONSISTS OF PERFORMING ALL LABOR AND FURNISHING ALL MATERIALS, FIXTURES AND EQUIPMENT REQUIRED TO PROVIDE A COMPLETE INSTALLATION OF ALL PLUMBING SYSTEMS AS INDICATED IN THE CONTRACT DOCUMENTS. IT SHALL FURTHER INCLUDE FURNISHING AND INSTALLING ALL ASSOCIATED ITEMS REQUIRED FOR THE PROPER OPERATION OF ALL PLUMBING SYSTEMS INCLUDING BUT NOT LIMITED TO ELECTRICAL, CONTROL AND HYRDONIC SYSTEM DEVICES.

C. DRAWINGS ARE DIAGRAMMATIC, CONTAINING INFORMATION TO A DEGREE OF DETAIL CONSISTENT WITH THEIR SCALE AND ADEQUATE TO CONVEY THE DESIGN INTENT. THE CONTRACTOR IS RESPONSIBLE FOR VERIFICATION OF ALL FIELD DIMENSIONS, LOCATIONS AND CONDITIONS PRIOR TO THE PURCHASE OF ANY MATERIALS AND COMMENCEMENT OF WORK. NOTIFY THE ARCHITECT OF ALL DISCREPANCIES THAT WILL AFFECT THE WORK FOR RESOLUTION.

D. EQUIPMENT AND MATERIAL SHOWN ON DRAWINGS ARE BASED ON MANUFACTURER'S PUBLISHED DATA, AND ARE, IN THE DESIGNER'S PROFESSIONAL OPINION, REPRESENTATIVE OF TYPICAL SIZES. ALL EQUIPMENT AND MATERIAL PROVIDED SHALL FIT WITHIN THE SPACE PROVIDED. ALL EQUIPMENT, FIXTURES, AND SERVICEABLE DEVICES SHALL BE INSTALLED WITH ACCESS AND CLEARANCE FOR MAINTENANCE. COORDINATE WITH THE GENERAL CONTRACTOR AND OTHER TRADES TO PROVIDE THIS ACCESS AND CLEARANCE. INSTALL ALL EQUIPMENT AND MATERIALS PER MANUFACTURER'S INSTRUCTIONS.

E. IF EQUIPMENT, FIXTURES, AND MATERIAL, OTHER THAN THAT SCHEDULED OR SPECIFIED, IS APPROVED AND PROVIDED, IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO COORDINATE AND PROVIDE REVISED UTILITIES AND SERVICE CONNECTIONS AND VERIFY THE SPACE ALOTTED FOR ADEQUECY AND CLEARANCE REQUIREMENTS. THIS INCLUDES BUT IS NOT LIMITED TO REVISED POWER, WATER, CONTROLS, HYDRONICS, WASTE DRAINS, FUEL FLUES AND VENT REQUIREMENTS.

F. COORDINATE ALL LOCATIONS AND SIZES OF STRUCTURAL FLOOR AND WALL PENETRATIONS WITH THE GENERAL CONTRACTOR AND PROVIDE CODE REQUIRED SEALS AT ALL FIRE RATED WALL, CEILING, ROOF AND FLOOR PENETRATIONS.

G. ACCESS DOORS AND/OR PANELS SHALL BE PROVIDED AT ALL MAINTENANCE AND SERVICE LOCATIONS FOR CONCEALED CONTROL DEVICES, VALVES AND PLUMBING EQUIPMENT/DEVICES. UNLESS A SIZE IS SPECIFICALLY NOTED, PANELS SHALL BE SIZED TO SERVICE EQUIPMENT/DEVICE. DOORS AND PANELS SHALL HAVE THE SAME FIRE RATING AS THE WALL OR CEILING IN WHICH THEY ARE INSTALLED. ACCESS DOORS AND/OR PANELS ARE NOT REQUIRED WHERE ADJUSTMENT, MAINTENANCE AND REPLACEMENT ARE POSSIBLE THROUGH LAY IN SUSPENDED CEILING.

H. INSTALL SHUT OFF VALVES AT EACH FIXTURE. INSTALL BRANCH SHUTOFF VALVES WHERE INDICATED ON PLANS. LOCATE AND ORIENT VALVE OPERATORS FOR EASE OF ACCESS AND FULL LIMITS OF OPERATION.

I. INSULATION AND VAPOR BARRIER SHALL BE PROVIDED ON ALL PIPING AND/OR EQUIPMENT SUBJECT TO HEAT LOSS, CONDENSATION, OR CONSTITUTING A POTENTIAL BURN HAZARD.

J. INSULATION SHALL NOT BE CRUSHED OR COMPRESSED THROUGH INTERFERENCE WITH SYSTEMS INSTALLED BY OTHER TRADES OR BUILDING CONSTRUCTION.

K. INSTALL PLUMBING AND PIPING HIGH POINTS AS TIGHT AS POSSIBLE TO THE BUILDING STRUCTURE TO ALLOW PROPER PITCH AND MAXIMIZE CEILING HEIGHT.

L. PROVIDE AIR VENTS AT PIPING HIGH POINTS AND DRAINS AT LOW POINTS IN MAINS.

M. ALL PIPING SHALL BE INSTALLED IN SUCH A MANNER AS TO AVOID FREEZING. ALL WATER PIPING SHALL BE INSTALLED BELOW ATTIC INSULATION AND NO PIPING SHALL BE INSTALLED WITHIN EXTERIOR WALLS. THE INSTALLATION OF PLUMBING SYSTEMS SHALL IN NO WAY CRUSH OR COMPROMISE BUILDING INSULATION AND ALL BELOWGRADE WATER PIPING SHALL BE INSTALLED NO LESS THAN 6" BELOW FROST DEPTH.

N. AT THE COMPLETION OF THE WORK AND PRIOR TO THE FINAL ACCEPTANCE, ALL PARTS OF THE WORK SHALL BE THOROUGHLY CLEANED.

O. ALL PIPING SHALL BE CONCEALED IN WALLS AND BEHIND FIXED FURNISHINGS UNLESS OTHERWISE INDICATED. EXPOSED PIPING IN FINISHED AREAS SHALL BE CHROME PLATED WITH A CHROME PLATED ESCUTCHEON AT EACH FINISHED ENTRY/EXIT.

P. ALL PIPING SHALL BE RUN PARALLEL TO BUILDING LINES AND BE SUPPORTED AND ANCHORED AS REQUIRED TO FACILITATE EXPANSION AND CONTRACTION. ALL PIPING SHALL BE CONCEALED EXCEPT IN UNFINISHED SPACES. INSTALL AS REQUIRED TO MEET ALL CONSTRUCTION CONDITIONS AND TO ALLOW FOR INSTALLATION OF OTHER WORK INCLUDING DUCTS AND ELECTRICAL CONDUIT. ALL PIPING EXPOSED TO VIEW SHALL BE ROUTED AS HIGH AS POSSIBLE AND TO THE UNDERSIDE OF STRUCTURE.

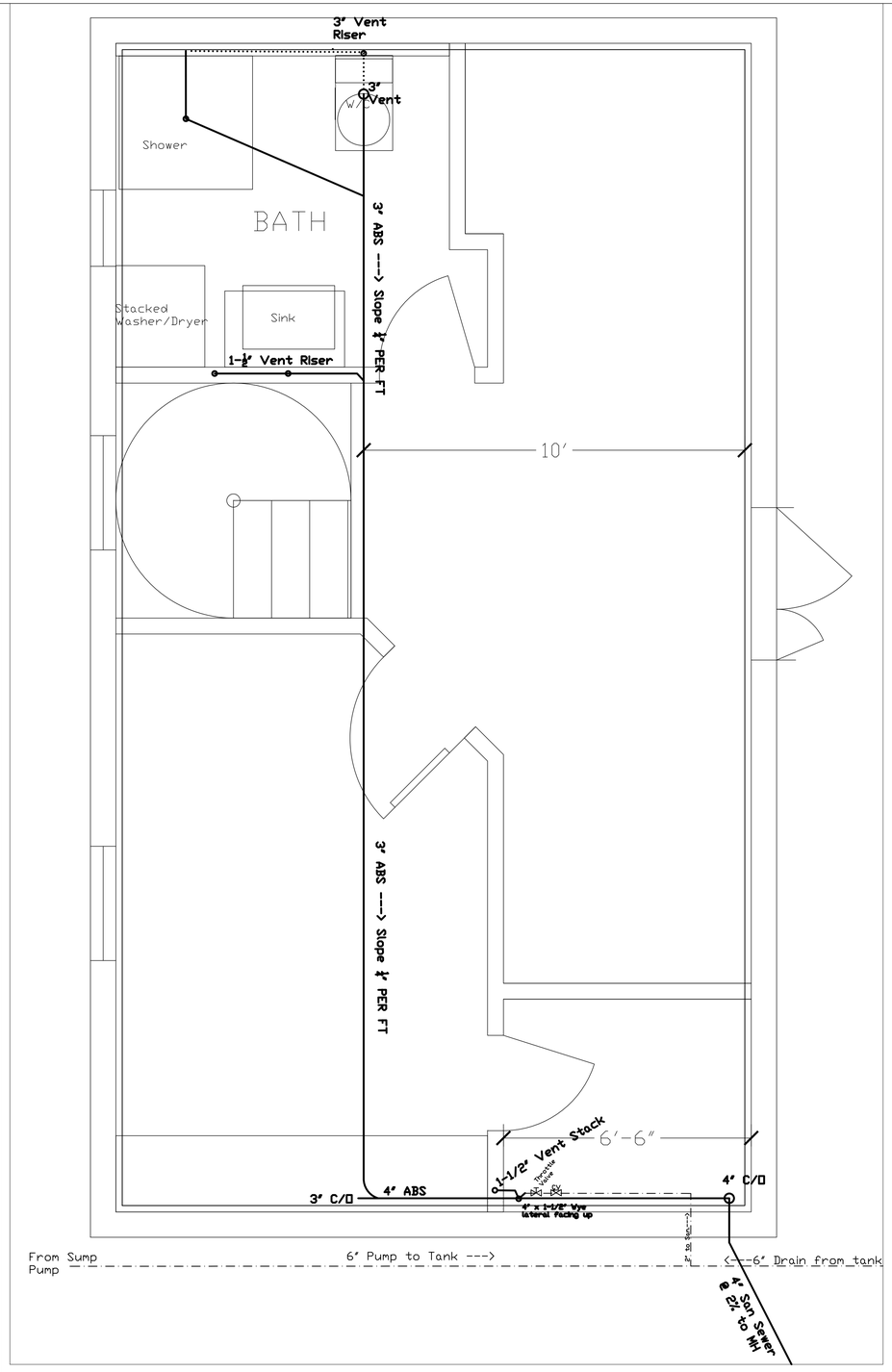
Q. ELEVATIONS LISTED FOR ALL PLUMBING SYSTEM PIPING IN THE CONTRACT DOCUMENTS ARE TO BE VERIFIED PRIOR TO CONSTRUCTION AGAINST EXISTING CONDITIONS, UTILITIES AND NEW CONSTRUCTION. ALL SLOPED PLUMBING SYSTEMS SHALL HAVE RIGHT OF WAY OVER ALL OTHER BUILDING SYSTEM COMPONENTS.

R. ALL EXISTING BUILDING AND SITE FEATURES NOT BEING ALTERED BY THIS PROJECT ARE TO BE PROTECTED FROM DAMAGE. CONTRACTOR SHALL REPAIR ALL DAMAGE OCCURRING TO EXISTING CONSTRUCTION CAUSED BY THE CONTRACTOR'S OPERATIONS AT HIS/HER EXPENSE TO THE COMPLETE SATISFACTION OF THE OWNER.

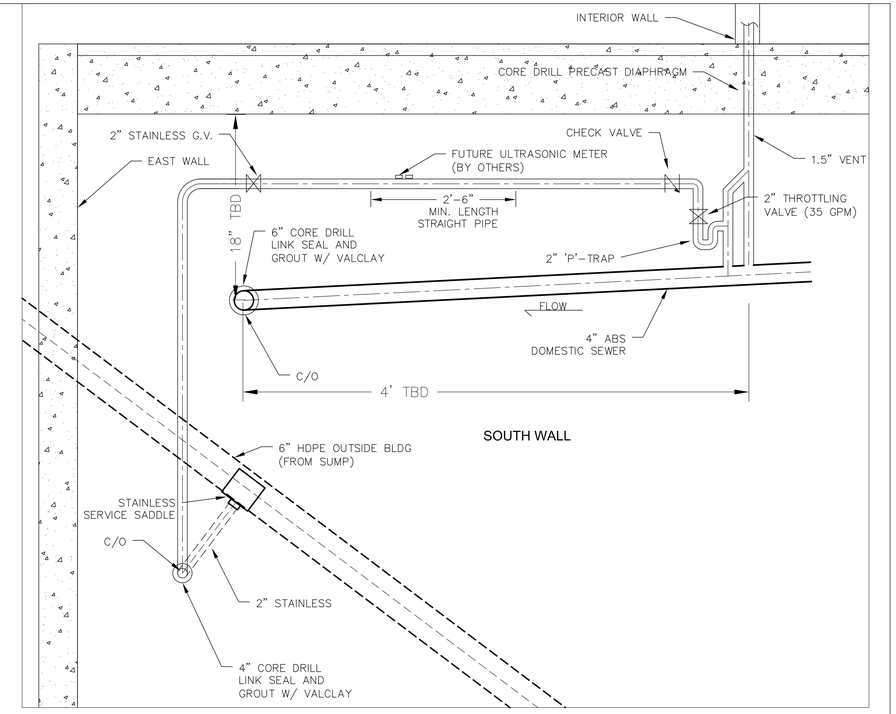
S. THE PLUMBING CONTRACTOR IS RESPONSIBLE FOR COORDINATING ALL WORK UNDER HIS/HER CONTRACT WITH ALL OTHER BUILDING TRADES. NOTIFY THE ARCHITECT OF ALL DISCREPANCIES OR QUESTIONS PERTAINING TO EXTENT OF WORK PRIOR TO BIDDING.

T. PROVIDE AND DOCUMENT CORRESPONDENCE TO THE GENERAL CONTRACTOR AND ALL TRADES, REQUIREMENTS FOR INSTALLATION, OPENINGS, CHASES AND UTILITY SERVICE CONNECTIONS. THIS INCLUDES SUPPORTING DEVICES, POINT LOADS, ACCESS OPENINGS, SLEEVES AND CUTOUTS.

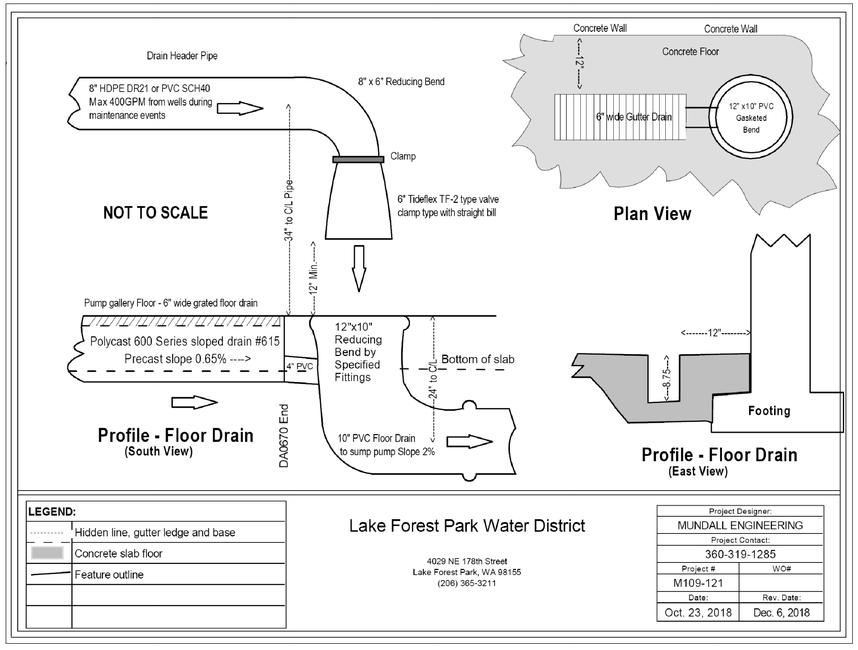
U. PROVIDE STARTERS FOR MOTORS UNLESS SPECIFICALLY IDENTIFIED AS BEING PROVIDED BY THE ELECTRICAL CONTRACTOR. PROVIDE ALL INTERNAL OVER CURRENT PROTECTION DEVICES AND INTERNAL TRANSFORMERS FOR PACKAGED EQUIPMENT.



SANITARY PLUMBING PLAN VIEW



HOLDING TANK DRAIN CONNECTION DETAIL
PROFILE VIEW FACING SOUTH WALL



LEGEND:	
	Hidden line, gutter ledge and base
	Concrete slab floor
	Feature outline

Lake Forest Park Water District

4029 NE 178th Street
Lake Forest Park, WA 98155
(206) 365-3211

Project Designer:	
MUNDALL ENGINEERING	
Project Contact:	
360-319-1285	
Project #	WO#
M109-121	
Date:	Rev. Date:
Oct. 23, 2018	Dec. 6, 2018

FLOOR DRAIN DETAILS

REVISIONS
MAY 12, 2021 - TENDER ISSUE
JUNE 27, 2019 - TENDER ISSUE
MARCH 27, 2019 - PERMIT ISSUE - 90%

GENERAL NOTES

DATUM: Control Data from King County Survey Control Points #127, 117 (HPGN-HARN)

VERTICAL DATUM: Elevations are NAVD88, conversion factor for data imported from NGVD29 = +3.57'

DESIGNED BY	.
DRAWN BY	.
CHECKED BY	.
APPROVED BY	.
DATE PRINTED	5-12-21
SCALE	1"=20' H 1"=8' V
F.B. NO.	.

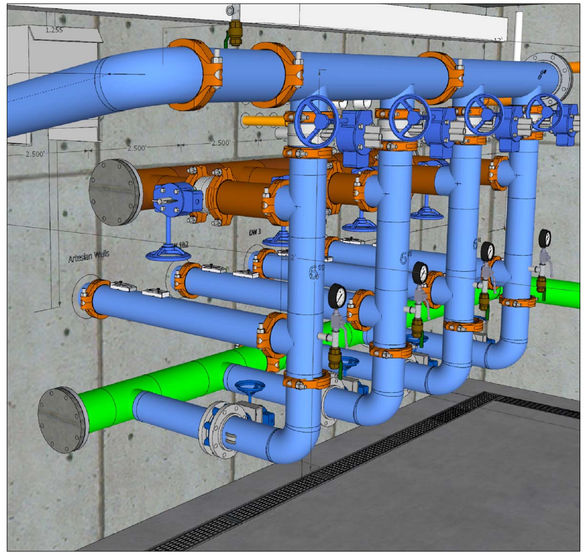
MUNDALL ENGINEERING & CONSULTING
P.O. Box 799, Sumas Washington 98295
P.O. Box 50, Lytton, B.C. V0K 1Z0
Bus. (250)-455-0085 FAX (250)-455-2276
Cellular (360)-319-1285 E-Mail Dan@Mundall.com (800)-313-9705

DATE: / /

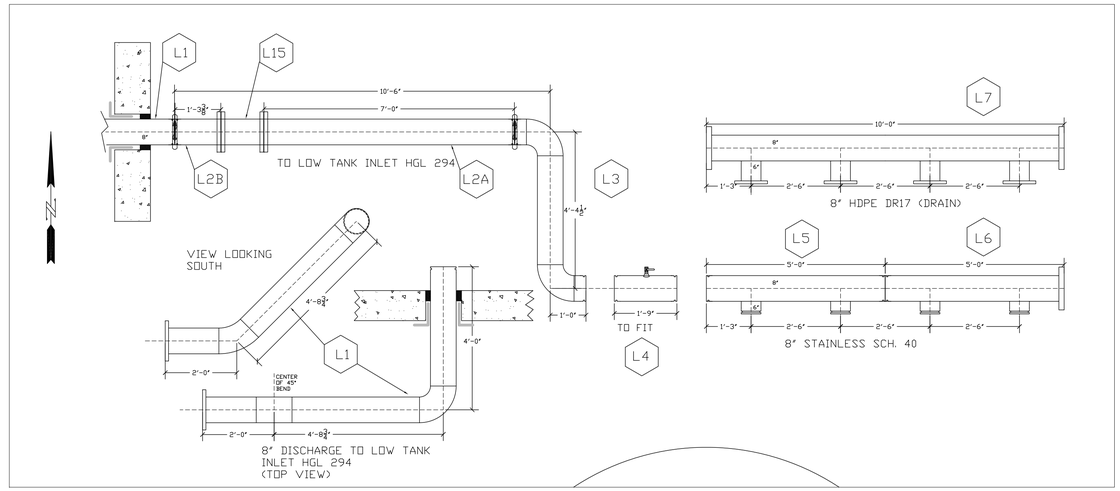
LAKE FOREST PARK WATER DISTRICT
GOOD WATER NATURALLY

LAKE FOREST PARK WATER DISTRICT - PWTF 2013
McKinnon Creek Pumphouse - Phase II
Building Plumbing Details

JOB NO.	M109-001
DRAWING NO.	PWTF_B2
SHEET	11 . OF 28 .



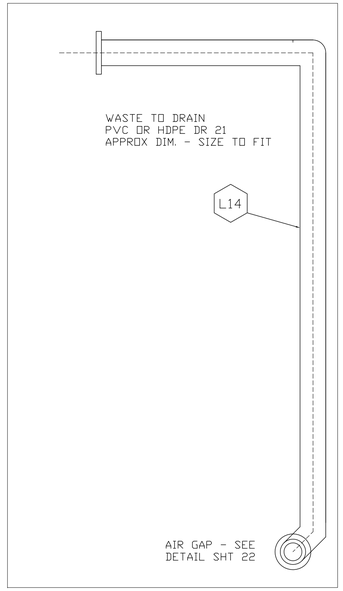
CONCEPTUAL RENDERING LOW PRESSURE HEADERS LOOKING SE
GREEN = DRAIN/FLUSH
BLUE = INPUT FROM WELLS
BROWN = TREATMENT (IRON/MN REMOVAL) FUTURE

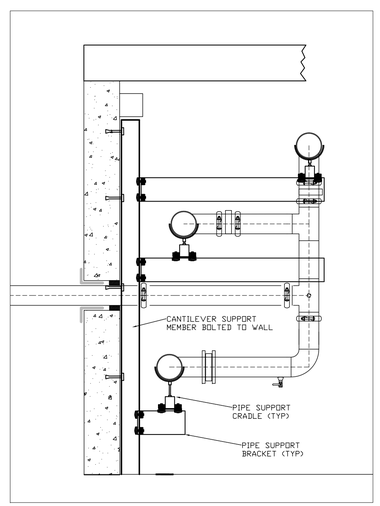


LOW PRESSURE HEADERS

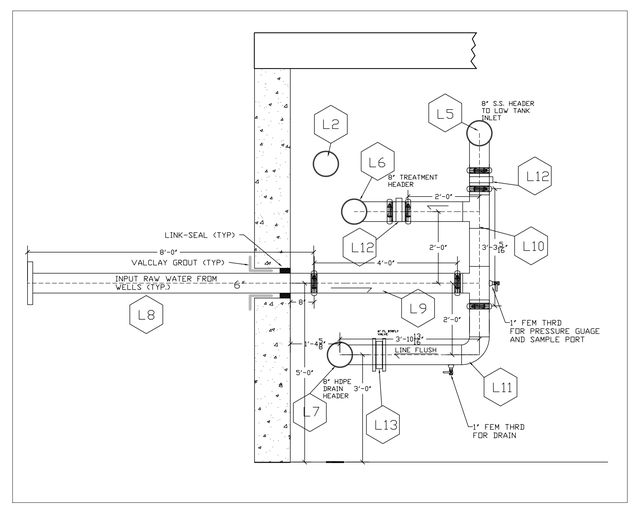
BILL OF MATERIALS

Qty to Ship	Ship Mark	# of pcs	Description	Length	Material
1	L1		*Wall Penetration to Low Tank Inlet*	See Plan	
		1	Flange 8" 150 class		S.S.
		1	Pipe 8" Std		Sched 40 S.S.
		1	Elbow 45 degree 8" Std		S.S.
		1	Pipe 8" Std		Sched 40 S.S.
		1	Elbow 90 degree 8" Std		S.S.
		1	Pipe 8" Std		Sched 40 S.S.
		1	Victaulic Groove 8"		Sched 40 S.S.
1	L2A		*Straght Pipe Section*	7'	Sched 40 S.S.
			Pipe 8" Std		Sched 40 S.S.
			Victaulic Groove 8"		Sched 40 S.S.
			Flange 8" 150 class		S.S.
1	L2B		*Straght Pipe Section*	1' 3 3/8"	
			Pipe 8" Std		Sched 40 S.S.
			Victaulic Groove 8"		Sched 40 S.S.
			Flange 8" 150 class		S.S.
1	L3		*S Curve Pipe Section*	4' 4.5"	
		2	Victaulic Groove 8"		Sched 40 S.S.
		2	Elbow 90 degree 8" Std		Sched 40 S.S.
		1	Pipe 8" Std		Sched 40 S.S.
1	L4		*Straight Pipe Section*	to fit	
		2	Victaulic Groove 8"		Sched 40 S.S.
		1	Pipe 8" Std		Sched 40 S.S.
		1	Threaded Outlet 1"		S.S.
		1	Close Nipple 1"		S.S.
		1	Ball Valve 1"		S.S.
1	L5		*Input Header*	5'	
		1	Victaulic Groove 8"		Sched 40 S.S.
		2	Tee 8"x6" Std		Sched 40 S.S.
		2	Victaulic Groove 6"		Sched 40 S.S.
			Pipe 8" Std		Sched 40 S.S.
3	L6		*Input Header*	5'	
		1	Victaulic Groove 8"		Sched 40 S.S.
		2	Tee 8"x6" Std		Sched 40 S.S.
		2	Victaulic Groove 6"		Sched 40 S.S.
			Pipe 8" Std		Sched 40 S.S.
		1	Flange 8" 150 class		Sched 40 S.S.
4	L7		*Waste Header*	10'	
		1	HDPE Pipe 8" DR 17		HDPE DR 17
		2	Flange 8" 150 class		
		4	Flange 6" 150 class		
4	L8		*Straight Pipe Section*	8'	
		1	Flange 6" 150 class		Sched 40 S.S.
		1	Pipe 6" Std	to fit	Sched 40 S.S.
		1	Victaulic Groove 6"		Sched 40 S.S.
4	L9		*Meter Section*	4'	
		2	Victaulic Grove 6"		Sched 40 S.S.
		1	Pipe 6" Std		Sched 40 S.S.
4	L10		*Well Input Header*	See Plan	
		4	Victaulic Groove 6"		Sched 40 S.S.
		2	Tee 6'x6" Std		Sched 40 S.S.
		1	Pipe 6" Std	to fit	Sched 40 S.S.
		1	Pipe 6" Std	to fit	Sched 40 S.S.
4	L11		*Waste Connection*	See Plan	
		1	Victaulic Groove 6"		Sched 40 S.S.
		1	Elbow 90 degree 8" Std		Sched 40 S.S.
		1	Pipe 6" Std	to fit	Sched 40 S.S.
		1	Pipe 6" Std	to fit	Sched 40 S.S.
		1	Flange 6" 150 class		Sched 40 S.S.
		1	Threaded Outlet 1"		S.S.
		1	Ball Valve 1"		S.S.
8	L12	1	6" Victaulic Butterfly Valve (Provided by District)		
4	L13	1	6" Lugged Butterfly Valve		
1	L14		*Waste to Drain*	See Plan	
			Pipe 8" SCHD 40 PVC	20'	PVC
		1	Flange 8"		PVC
		2	Bend 90 deg.		PVC
		1	Bend 45 deg. Sreet L		PVC
1	L15		Seametrics MagMeter 8"		
	COUP		Gruvlok Rigid Coupling 405 or Equal		
			Gruvlok Flexible Coupling 472 or Equal		
		8	4" Coupling		
		56	6" Coupling		
		4	8" Coupling		
		6	10" Coupling		





CANTILEVER SUPPORT SYSTEM TYP.
MAX SPACING 8FT O/C
8000LB MIN.



SOUTH VIEW - LOW PRESSURE HEADER

PLAN

SCALE 1" = 2'

REVISIONS	GENERAL NOTES		
MAY 12, 2021 - TENDER ISSUE JUNE 27, 2019 - TENDER ISSUE MARCH 27, 2019 - PERMIT ISSUE - 90%	DATUM: Control Data from King County Survey Control Points #127, 117 (HPGN-HARN) VERTICAL DATUM: Elevations are NAVD88, conversion factor for data imported from NGVD29 = +3.57'	DESIGNED BY . DM DRAWN BY . SM CHECKED BY . DM APPROVED BY . DATE PRINTED . 5-12-21 SCALE 1"=2' H 1"=2' V F.B. NO. .	

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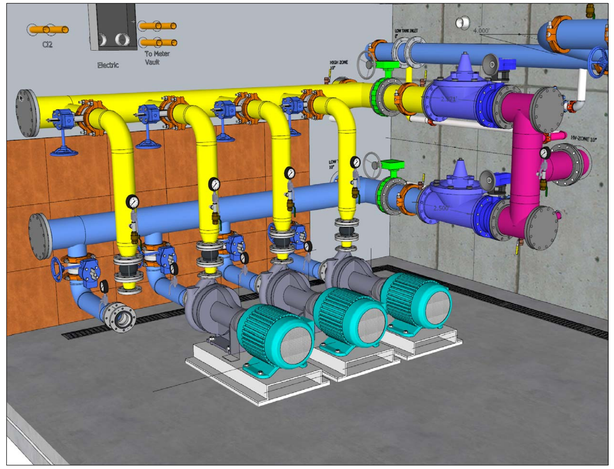
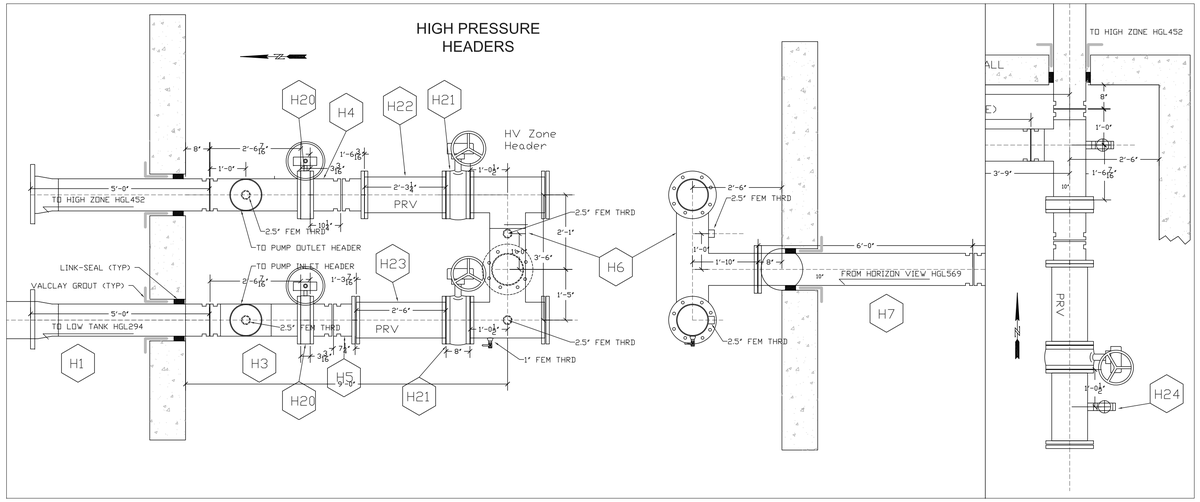
LAKE FOREST PARK WATER DISTRICT
GOOD WATER NATURALLY

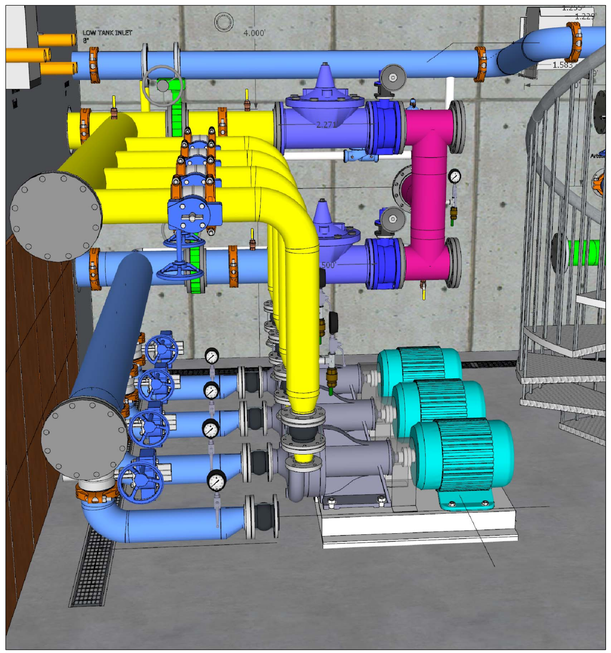
LAKE FOREST PARK WATER DISTRICT - PWTF 2013
McKinnon Creek Pump Facility Building
Pipe Headers - Low Pressure

JOB NO. M109-001
DRAWING NO. PWTF_M1
SHEET 12 OF 28

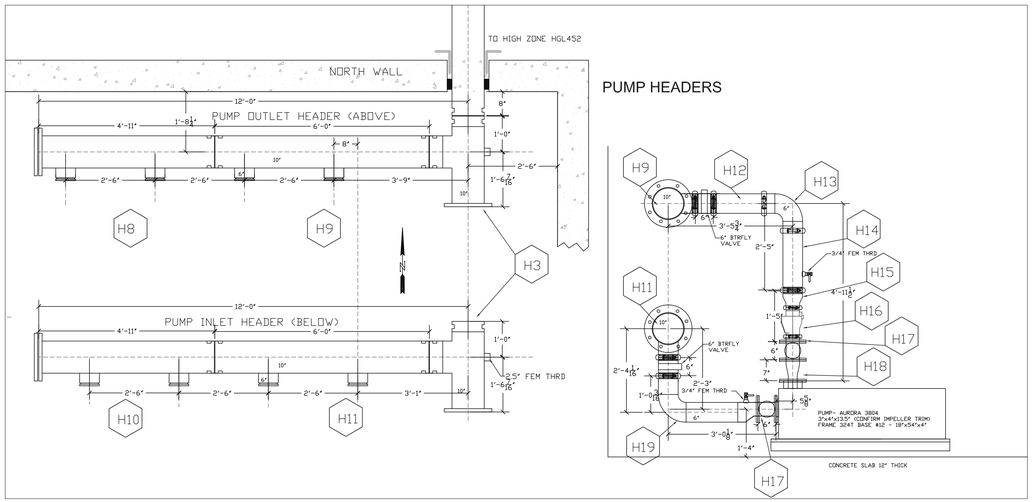


CONCEPTUAL RENDERING OF PUMPS AND HEADERS
LOOKING TO THE NORTH EAST





CONCEPTUAL RENDERING OF PUMPS AND HEADERS
LOOKING TO THE EAST



BILL OF MATERIALS

Qty to Ship	Ship Mark	# of pcs	Description	Length	Material
2	**H1**		*10" to 12" Penetration*		
		1	Flange 12" 150 Class		Sched 40 S.S.
		1	Reducer 12" x 10" Std		Sched 40 S.S.
		1	Pipe 10" Std		Sched 40 S.S.
		1	Victaulic Groove 10"		Sched 40 S.S.
2	**H3**		*Header*	2' 6-7/16"	
		2	Victaulic Groove 10"		Sched 40 S.S.
		1	Tee 10" Std		Sched 40 S.S.
		1	Pipe 10" Std		Sched 40 S.S.
		1	Flange 10" 150 class		Sched 40 S.S.
		1	Threaded Outlet 2.5"		S.S.
3	**H4**		*Flange to Victaulic Adapter*	10 1/4"	
		1	Victaulic Groove 10"		Sched 40 S.S.
		1	Flange 10" Std		Sched 40 S.S.
1	**H5**		*Flange to Victaulic Adapter*	7 1/4"	
		1	Victaulic Groove 10"		Sched 40 S.S.
		1	Pipe 10" Std		Sched 40 S.S.
		1	Flange 10" 150 class		Sched 40 S.S.
1	**H6**		*Horizon View Header*		
		5	Flange 10" 150 Class		Sched 40 S.S.
		3	Tee 10" Std		Sched 40 S.S.
		2	Threaded Outlet 2.5"		S.S.
		2	Companion Flange 10" x 2"		Painted Steel
		2	Threaded Plug 2"		Black Iron
		1	Threaded Outlet 1"		Sched 40 S.S.
		1	Threaded Reducer 1"x 3/4"		Sched 40 S.S.
		1	Ball Valve 3/4"		S.S.
		1	Thread Adapter 3/4" IP x Hose		Brass
1	**H7**		*Horizon View Penetration*		
		1	Flange 10" 150 class		Sched 40 S.S.
		1	Pipe 10" Std		Sched 40 S.S.
		1	Victaulic Groove 10"		Sched 40 S.S.
1	**H8**		*Pump Outlet Header (a)*		
		1	Blind Flange 10" 150 class		Painted Steel
		1	Flange 10" 150 class		Sched 40 S.S.
		2	Outlets 6"		Sched 40 S.S.
		2	Victaulic Groove 6"		Sched 40 S.S.
		1	Victaulic Groove 10"		Sched 40 S.S.
		2	Pipe 10" Std		Sched 40 S.S.
1	**H9**		*Pump Outlet Header (b)*		
		2	Victaulic Groove 10"		Sched 40 S.S.
		2	Outlets 6"		Sched 40 S.S.
		2	Victaulic Groove 6"		Sched 40 S.S.
		2	Pipe 10" Std		Sched 40 S.S.
1	**H10**		*Pump Inlet Header (a)*		
		1	Blind Flange 10" 150 class		Painted Steel
		1	Flange 10" 150 class		Sched 40 S.S.
		2	Outlets 6"		Sched 40 S.S.
		2	Victaulic Groove 6"		Sched 40 S.S.
		1	Victaulic Groove 10"		Sched 40 S.S.
		2	Pipe 10" Std		Sched 40 S.S.
1	**H11**		*Pump Inlet Header (b)*		
		2	Victaulic Groove 10"		Sched 40 S.S.
		2	Outlets 6"		Sched 40 S.S.
		2	Victaulic Groove 6"		Sched 40 S.S.
		2	Pipe 10" Std		Sched 40 S.S.
4	**H12**				
		2	Victaulic Groove 6"		Sched 40 S.S.
		1	Pipe 6" Std		Sched 40 S.S.
4	**H13**	1	Elbow 90 degree 6" Victaulic		Sched 40 S.S.
4	**H14**		*Straight Pipe*	To fit	
		2	Victaulic Groove 6"		Sched 40 S.S.
		1	Pipe 6" Std		Sched 40 S.S.
4	**H15**	1	4"x 6" Victaulic Reducer		Painted Steel
4	**H16**	1	Flange to Vic Adapter 4"		Painted Steel
4	**H17**	1	Metraflex Cablesphere		
			4" Flex Coupling FlxFl		
4	**H18**	1	Flanged Increaser 3"x4"	7"	
4	**H19**		*Pump Inlet Suction*		
		1	Flange 4" 150 class		Sched 40 S.S.
		1	Reducer Eccentric 6" x 4"		Sched 40 S.S.
		1	Pipe 6" Std		Sched 40 S.S.
		1	Short Radius Elbow 90 Degree		Sched 40 S.S.
		1	Pipe 6" Std		Sched 40 S.S.
		1	Victaulic Groove 6"		Sched 40 S.S.
2	**H20**		Butterfly Valve (Pratt BF or Equiv)		
2	**H21**		Flanged Butterfly (Pratt 2FII or Equiv)		
1	**H22**		10" PRV (Provided by District)		
1	**H23**		10" PRV (Provided by District)		
4	**H24**		2 1/2" Gate Valve		S.S.

NOTES:

1) ALL MATERIALS CONTACTING WATER SHALL BE NSF61 COMPLIANT.
2) COORDINATE DISINFECTION TESTING WITH DISTRICT STAFF.
3) FLOW DIRECTION INDICATORS, LABELS, AND PRESSURE GAUGES TO BE INSTALLED BY OWNER.
4) REFER TO MFG. INSTALLATION INSTRUCTIONS FOR PUMP MOUNTING.
5) STRUCTURAL CANTILEVER SUPPORTS CAP. 8,000LB.

PLAN
SCALE 1" = 2'

REVISIONS	GENERAL NOTES		
MAY 12, 2021 - TENDER ISSUE JUNE 27, 2019 - TENDER ISSUE MARCH 27, 2019 - PERMIT ISSUE - 90%	DATUM: Control Data from King County Survey Control Points #127, 117 (HPGN-HARN) VERTICAL DATUM: Elevations are NAVD88, conversion factor for data imported from NGVD29 = +3.57'	DESIGNED BY	DM
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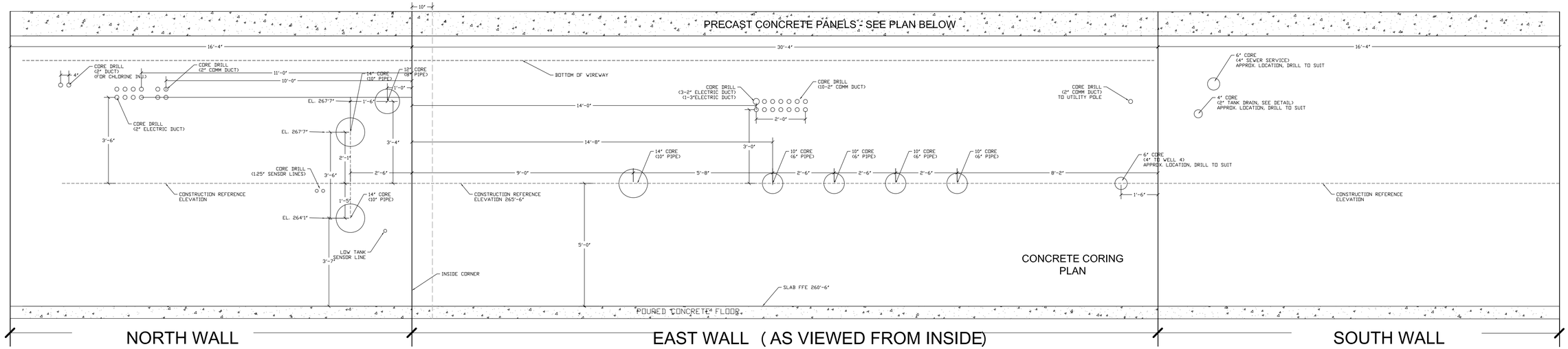
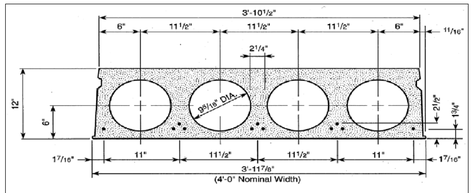
DATE: / /

LAKE FOREST PARK WATER DISTRICT
GOOD WATER NATURALLY

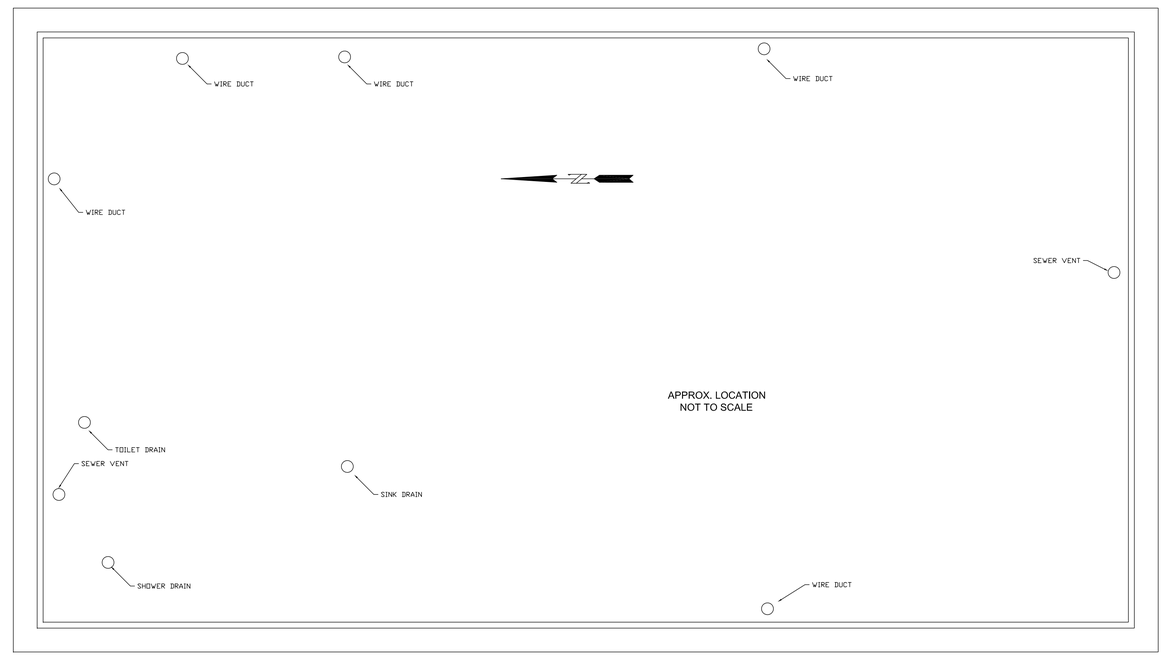
LAKE FOREST PARK WATER DISTRICT- PWTF 2013
McKinnon Creek Pump Facility Building
Pipe Headers - High Pressure

JOB NO. M109-001
DRAWING NO. PWTF_M2
SHEET 13 OF 28





12" ULTRASPAN NOT TO SCALE



DIAPHRAGM CORING PLAN DETAIL

PLAN

SCALE 1" = 2'

REVISIONS	GENERAL NOTES		
MAY 12, 2021 - TENDER ISSUE JUNE 27, 2019 - TENDER ISSUE MARCH 27, 2019 - PERMIT ISSUE - 90%	DATUM: Control Data from King County Survey Control Points #127, 117 (HPGN-HARN) VERTICAL DATUM: Elevations are NAVD88, conversion factor for data imported from NGVD29 = +3.57'	DESIGNED BY . DM DRAWN BY . SM CHECKED BY . DM APPROVED BY . DATE PRINTED . 5-12-21 SCALE 1"=2' H 1"=2' V F.B. NO. .	

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DATE: / /

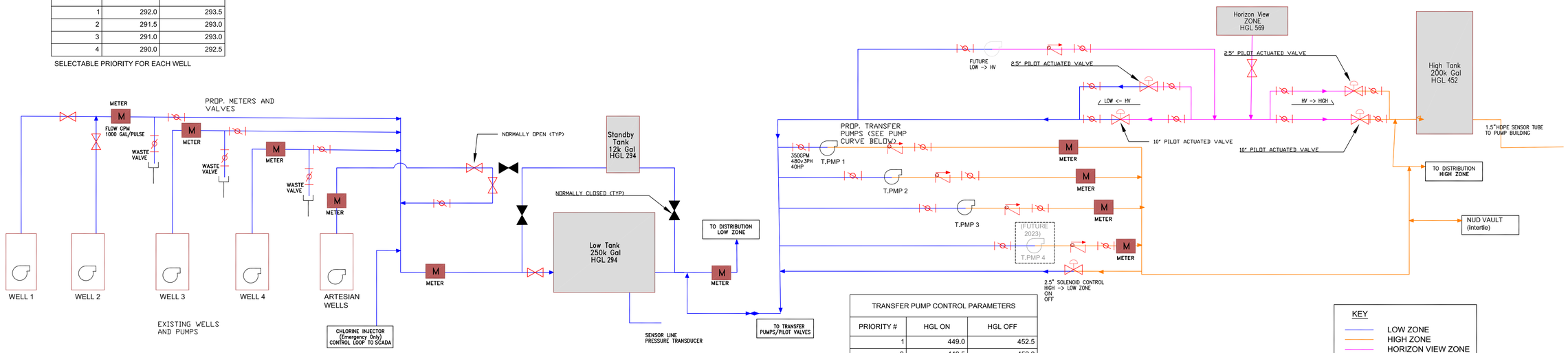
LAKE FOREST PARK WATER DISTRICT
GOOD WATER NATURALLY

LAKE FOREST PARK WATER DISTRICT - PWTF 2013
McKinnon Creek Pumphouse Phase II
PRELIMINARY CONCRETE CORING PLAN

JOB NO.	M109-001
DRAWING NO.	PWTF_M3
SHEET OF	14 .28 .

WELL PUMP CONTROL PARAMETERS		
PRIORITY #	HGL ON	HGL OFF
1	292.0	293.5
2	291.5	293.0
3	291.0	293.0
4	290.0	292.5

SELECTABLE PRIORITY FOR EACH WELL

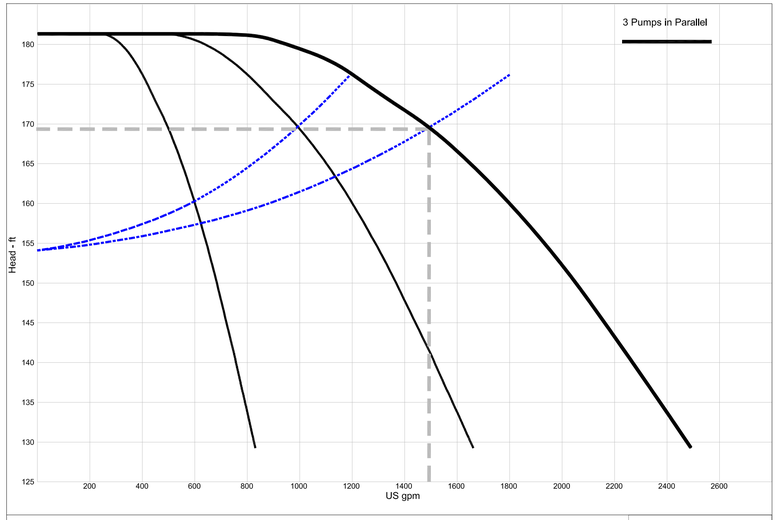


SYSTEM HYDRAULIC SCHEMATIC

TRANSFER PUMP CONTROL PARAMETERS		
PRIORITY #	HGL ON	HGL OFF
1	449.0	452.5
2	448.5	452.0
3	447.5	452.0
4	446.5	451.5

SEQUENTIAL PUMP OPERATION VIA PLC CONTROL

TRANSFER PUMP CURVE



Company: Mundall Engineering
Name: Dan Mundall, PE
5/25/2017
H2Optimize_curve_Aurora_Pentair_3800__4x5x13.5_1770.uf.

AURORA PUMPS
Catalog: Aurora Pumps 60 Hz, Vers 4.2
3800 END SUCTION - 1800

Size: 3x4x13.5
Speed: 1770 rpm
Dia: 13.125 in
Curve: PC-187613
Impeller: 444A457

SUPPLEMENTARY CONTROL DESIGN AND OPERATION NOTES

Pumphouse Control Options:

1. **Manual** (for testing or other operation requiring manual control ON/OFF)
2. **Electro-Mechanical** with level sensor control (for backup in case of PLC failure)
3. **PLC** (default mode). The PLC mode will rely on pressure/level transducers in the reservoirs and other inputs including flow. Both Electro-mechanical and PLC modes will have lead/lag configuration and the lead pump will be alternated for uniform wear on the pumps.

Transfer Pumps to High Zone:

- Up to 3 transfer Pumps will lift water from "Low Zone" HGL294 to "High Zone" HGL452.
- Transfer pumps will be fitted with VFD for soft start and to optimize performance.
- Transfer Pump #4 is for redundancy in case of pump failure. Future installation of TP#4 by District forces.
- Ultrasonic flow meters (by District forces) on each pump to monitor performance and shutoff pump via PLC if no flow/low flow condition

McKinnon Deep Well pumps

- Controlled by level in Low Zone (HGL294) reservoir
- Manual rotation of lead/lag
- Ultrasonic flow meters (by District forces) on each input to pumphouse
- Can route flow to drain sump for maintenance
- Can route flow to future water treatment loop
- Submersible level sensor and PLC shutdown in case of low well level condition
- PLC shutdown in case of no flow/low flow condition

(THE FOLLOWING FOR REFERENCE ONLY, WILL BE COMPLETED BY OTHERS, NOT IN CURRENT PROJECT BID)

Horizon Zone (HGL569) Low Zone (HGL 294) Transfer Valves

- Fire Service Cla-Val 10" modulating PRV. High flow potential (>2,000GPM) could exceed design capacity of Low Zone reservoir overflow. Dual Low Zone Reservoir level transmitters will provide input to PLC with the following over-rides to stop flow:
  - NC solenoid to close 8" valve at 46th AVE/187th Street PRV in case of overflow condition. Note: this station will require pressure adjustments all valves.
  - NC solenoid to over-ride close 10" Transfer PRV in case of over-flow condition.
- Normal Flow Cla-Val 2-1/2" ON/OFF control by solenoid in response to PLC calls or manual input. May require manual throttling setting to control maximum capacity 300GPM so SPU-Tolt Intertie is not triggered for normal transfer flow condition.

Horizon Zone (HGL569) High Zone (HGL 542) Transfer Valves

- Fire Service Cla-Val 10" modulating PRV. High flow potential (>1,400GPM) could exceed design capacity of High Zone reservoir overflow. Dual High Zone Reservoir level transmitters will provide input to PLC with the following over-rides to stop flow:
  - NC solenoid to close 8" valve at 46th AVE/187th Street PRV in case of overflow condition. Note: this station will require pressure adjustments all valves.
  - NC solenoid to over-ride close 10" Transfer PRV in case of over-flow condition.
- Normal Flow Cla-Val 2-1/2" ON/OFF control by solenoid in response to PLC calls or manual input. May require manual throttling setting to control maximum capacity 300GPM so SPU-Tolt Intertie is not triggered for normal transfer flow condition.

High Zone (HGL452) Low Zone (HGL294) Transfer Valve

- NC Solenoid with PLC or manual control to allow transfer from High Zone (HGL452 to Low Zone (HGL294).

Shallow Artesian Transfer Pumps (Sump) Low Zone (HGL294) Reservoir

- PLC shut down in case of no flow/low flow condition

NOTE:
CONTRACTOR TO ONLY SUPPLY CONTROLS NECESSARY FOR BASIC OPERATION OF DEEP WELLS AND TRANSFER PUMPS BASED ON HEAD PRESSURE FROM TANKS. OTHER INTEGRATION OF METRICS AND CONTROLS BY OTHERS.

REVISIONS	GENERAL NOTES		
MAY 20, 2021 - TENDER ISSUE JUNE 27, 2019 - TENDER ISSUE MARCH 27, 2019 - PERMIT ISSUE - 90%	DATUM: Control Data from King County Survey Control Points #127, 117 (HPGN-HARN) VERTICAL DATUM: Elevations are NAVD88, conversion factor for data imported from NGVD29 = +3.57'	DESIGNED BY	.
		DRAWN BY	. SM
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		DATE PRINTED	. 5-12-21
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		F.B. NO.	.

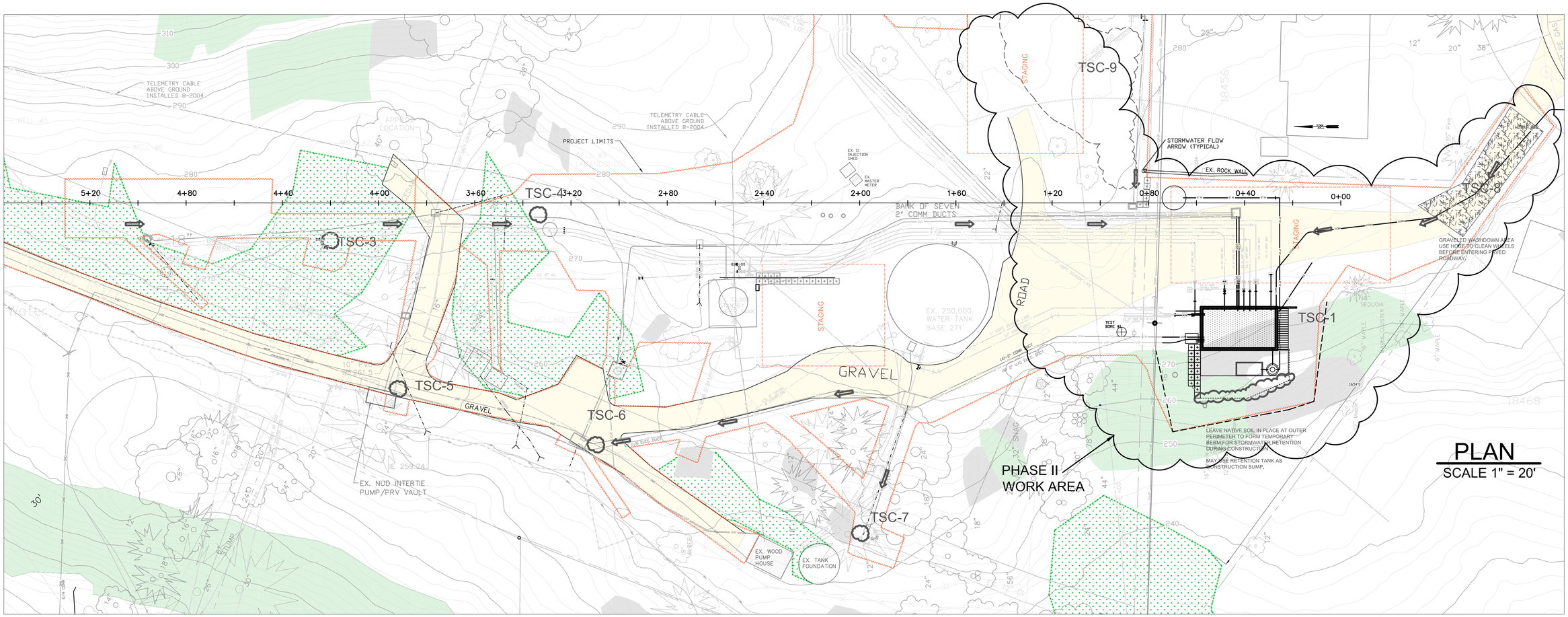
MUNDALL ENGINEERING & CONSULTING
P.O. Box 799
Sumas Washington 98295
P.O. Box 50
Lyttton, B.C. V0K 1Z0
Bus. (250)-455-0085 Cellular (360)-319-1285
FAX (250)-455-2276 E-Mail Dan@Mundall.com (800)-313-9705

DATE: / /

LAKE FOREST PARK WATER DISTRICT
GOOD WATER NATURALLY

LAKE FOREST PARK WATER DISTRICT - PWTF 2013
McKinnon Creek Pumphouse - Phase II
System Schematic & Pump Curve

JOB NO. M109-001
DRAWING NO. PWTF-M4
SHEET 15 OF 28



LFP CITY STORMWATER POLLUTION PREVENTION PLAN CHECKLIST

Rev. 11/2017

Activities requiring Major Clearing and Grading Permits require a Stormwater Pollution Prevention Plan (SWPPP) in accordance with Lake Forest Park Municipal Code (LFPMC) section 16.08.070 as well as Chapter 2 of the King County Surface Water Design Manual (KCSWDM).

The following checklist summarizes the SWPPP performance standards outlined in LFPMC 16.08.070 to help assist you in meeting those guidelines

Minimize potential impacts
- Conduct all activities so as to prevent impacts and minimize the clearing of naturally-occurring vegetation, retain existing soils, and maintain the existing natural hydrological functions of the site

Stormwater consistency of standards
- All standards shall be consistent with the latest version of the King County Surface Water Design Manual (KCSWDM)

Clearing and grading limits
- Permitted clearing and grading areas and any other areas required to preserve critical areas, buffers, native growth protection easements, or tree retention areas, shall be delineated on the site plans and the development site

Land disturbance limits
- All clearing limits, critical areas and their buffers, and significant trees that are to be preserved within the construction area shall be clearly marked both in the field and on the plans prior to land disturbance

Natural features preservation
- Land disturbance activity shall be undertaken so as to preserve and enhance natural features

Site containment
- Erosion, sediment, and other impacts resulting from any clearing and grading activity shall be contained on the site. This may require temporary erosion/sedimentation control measures during and following clearing and grading activities and include check dams, riprap, plantings, terraces, straw bales, or other devices or methods

Protection of adjacent and downstream properties and waterways
- Protect downstream properties and waterways from erosion due to temporary increases in the volume, velocity, and peak flow rate of runoff from the site.

Downstream analysis is necessary if changes in flows could impair or alter conveyance systems, stream banks, bed sediments or aquatic habitat

Install sediment controls
- Stormwater runoff from disturbed areas shall pass through a sediment pond or other appropriate sediment removal Best Management Practices (BMP) prior to entering a storm drain inlet, leaving a construction site, or discharging to an infiltration facility. Sediment removal BMPS shall be constructed as one of the first steps in grading

Construction access
- Construction vehicle access shall be, whenever feasible, limited to one route. A temporary access road shall be provided at all sites and access surfaces shall be stabilized to minimize tracking sediment onto adjacent roads

Stabilization of disturbed areas
- All exposed soil shall be stabilized by application of suitable BMPs, including but not limited to sod or other vegetation, plastic covering, mulching, or application of base course(s) on areas to be paved. From October 1 to April 30, no unworked soils shall remain exposed for more than two days. From May 1 to September 30, no unworked soils shall remain exposed for more than seven days. Soil stockpiles must be stabilized from erosion, protected with sediment trapping measures, and located away from storm drains, waterways and drainage channels.

Dust suppression
- Dust from clearing, grading, and other construction activities shall be minimized. The Administrator shall approve any dust suppressants used

Erosion and sedimentation control
- Erosion and sedimentation control BMPs shall be designed and implemented appropriate to the scale of the project and what is necessary to prevent sediment from leaving the site. Sediment removal BMPs must be installed prior to all other clearing, grading, or construction. All temporary BMPs must be removed within 30 days of final site stabilization

Native soil protection and amendment
- The duff layer and native topsoil should be retained in an undisturbed state to the maximum extent practicable

Stabilize channels and outlets
- Temporary on-site stormwater conveyance systems shall be designed, constructed, and stabilized pursuant to requirements of the KCSWDM in order to prevent erosion from leaving the site and affecting properties, streams, and wetlands downstream of clearing and grading activity

Protection of critical areas
- The function and values of all critical areas and their buffers located on or adjacent to the site shall be protected from clearing and grading activities by the use of setbacks, erosion and sediment control measures and other BMPs consistent with LFPMC Chapter 16.16

Protection of pervious area
- For projects proposing on-site stormwater management, all areas designated as permanent pervious areas or permanent infiltration areas shall be protected from compaction

Avoidance of hazards
- Land disturbance activities shall not result in off-site physical damage, nor pose a danger or hazard to life or property

Cut and fill slopes
- Cut and fill slopes shall be designed and constructed in a manner that will minimize erosion. This may require submittal of a geotechnical report pursuant to LFPMC 16.16 and compliance with Land Use Code restrictions. See 16.08.070.P for additional restrictions

Control of other pollutants
- Pollutants on-site during construction must be handled and disposed of property to avoid possible health risks and environmental contamination. Direct and indirect discharge to the drainage system, critical areas, or adjacent properties is prohibited

Dewatering devices
- Foundation, vault, and trench dewatering water with similar characteristics to stormwater runoff shall be discharged into a controlled conveyance system prior to discharge to a sediment pond. Channels must be stabilized as specified in the KCSWDM. Highly turbid or contaminated dewatering water shall be handled separately from stormwater

Stash removal
- Slash from clearing shall preferably be chipped and spread across the site within one year of project completion

Revegetation
- The site shall be revegetated and landscaped as soon as practical, in accordance with a revegetation plan approved by the Administrator

Construction phasing
- Land disturbance shall be phased to the maximum degree practicable and take into account seasonal work limitations. Land clearing schedules shall minimize the occurrence and extent of land disturbing in the wet season

Seasonality - temporary restrictions
- Wet season clearing, grading, and other land disturbing activities (October 1 through April 30) are prohibited unless a plan prepared by a professional engineer and approved by the Administrator is provided

Maintenance
- All temporary and permanent erosion and sediment control devices shall be maintained and repaired as needed. The contractor shall regularly inspect and maintain all BMPs – any damaged BMPs must be returned to normal operating conditions within 24 hours of receiving notice from the Administrator

Ponds and reservoirs
- Grading and excavation to construct ponds and reservoirs shall meet all applicable setbacks, maintain in-stream flows of natural drainage courses, and protect adjacent property from damage

Site-specific requirements
- Additional, site-specific requirements may be established after a site visit by the city

Project management
- Construction site operators shall maintain, update and implement their SWPPP. For construction projects one acre or larger that discharge stormwater to surface waters of the state, a Certified Erosion and Sediment Control Specialist shall be identified in the SWPPP and be on-site or on-call at all times

Tree retention
- Trees shall be retained as required by LFPMC Chapter 16.14

Protection during construction
- Tree protection measures shall be employed as required by LFPMC Chapter 16.14.070 D.3

Electronic versions of all forms, permits, applications, and codes are available on the Lake Forest Park website:
http://www.cityoflfp.com/

KEY AND LEGEND

STREAM

HIGH-VIS FENCE

STORM FLOW ARROW

Sub-Area	BMP Measures
TSC1	Plastic sheeting, Mulching,Temp. Det. Pond - in excavated building site
TSC2	Temp. Det. Pond
TSC3	Temp. Det. Pond, Soil Dewatering
TSC4	Temp. Det. Pond, Soil Dewatering
TSC5	Temp. Det. Pond
TSC6	Temp. Det. Pond
TSC7	Temp. Det. Pond, Mulching, Seeding
TSC8	Manual tire wash area, crushed rock surface, flow dissipation and containment to driveway **(USE EXISTING WASH AREA)**
TSC9	Plastic Cover, Erosion Control Blanket over Stockpile Area

(PHASE I COMPLETE)

Know what's below. Call before you dig.

REVISIONS
MAY 12, 2021 - TENDER ISSUE
JUNE 27, 2019 - TENDER ISSUE
MARCH 27, 2019 - PERMIT ISSUE - 90%

GENERAL NOTES

DATUM: Control Data from King County Survey Control Points #127, 117 (HPGN-HARN)

VERTICAL DATUM: Elevations are NAVD88, conversion factor for data imported from NGVD29 = +3.57'

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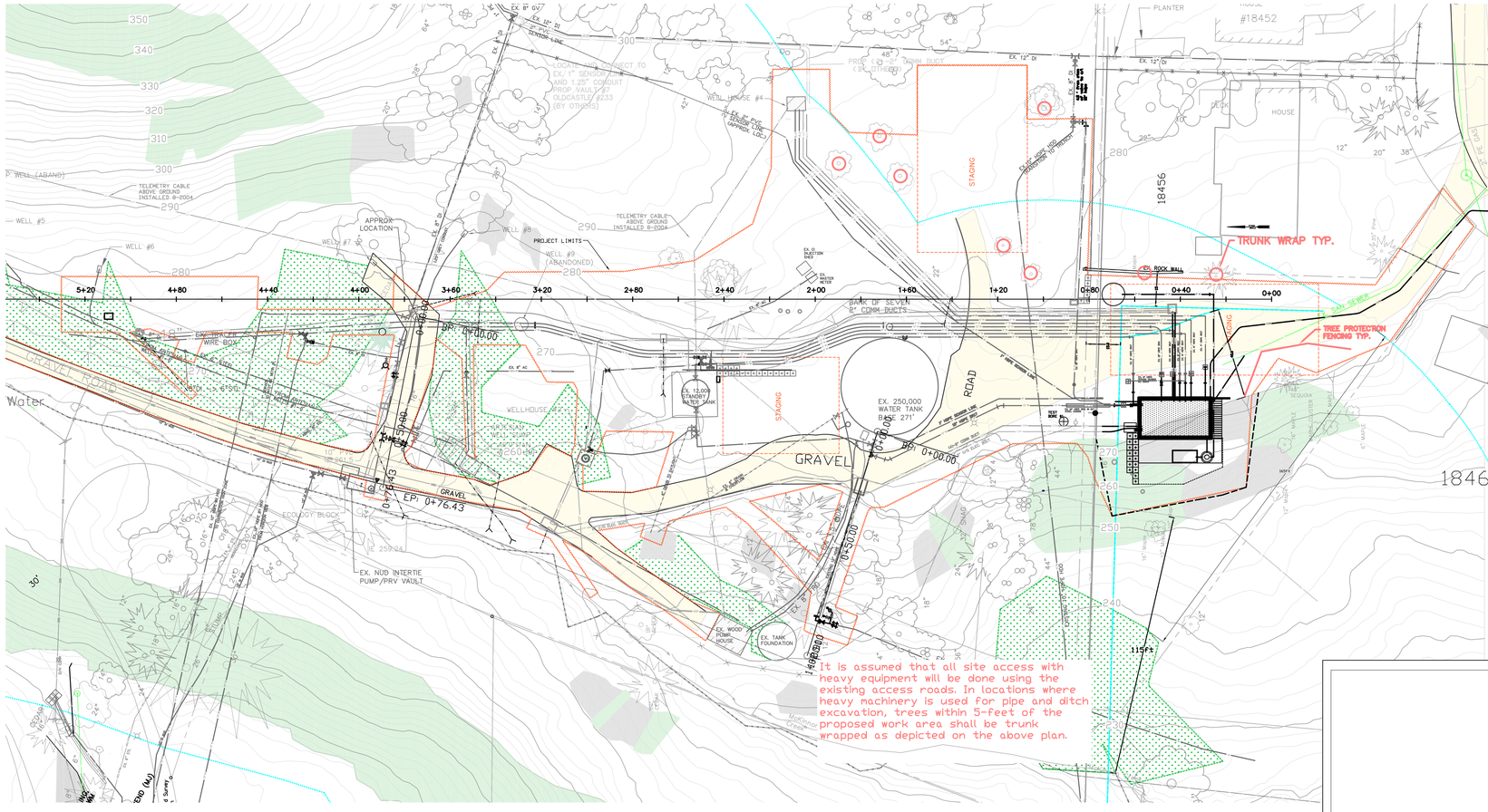
MUNDALL ENGINEERING & CONSULTING
P.O. Box 799 Sumas Washington 98295
P.O. Box 50 Lytton, B.C. V0K 1Z0
Bus. (250)-455-0065 Cellular (360)-319-1285
FAX (250)-455-2276 E-Mail Dan@Mundall.com (800)-313-9705

DATE: / /

LAKE FOREST PARK WATER DISTRICT
GOOD WATER NATURALLY

LAKE FOREST PARK WATER DISTRICT - PWTF 2013
McKinnon Creek Pumphouse - Phase II
Stormwater Pollution Prevention Plan

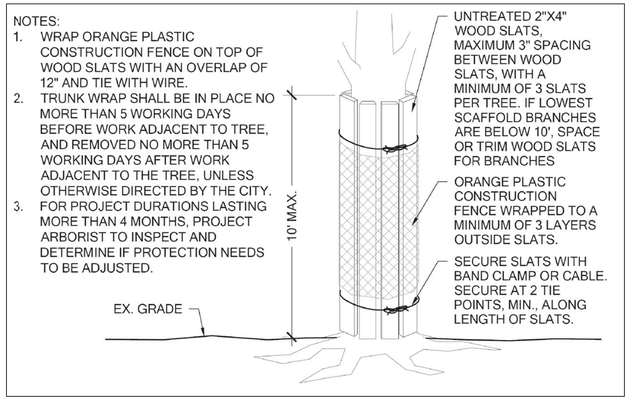
JOB NO. M109-001
DRAWING NO. PWTF_EN1
SHEET 16 OF 28



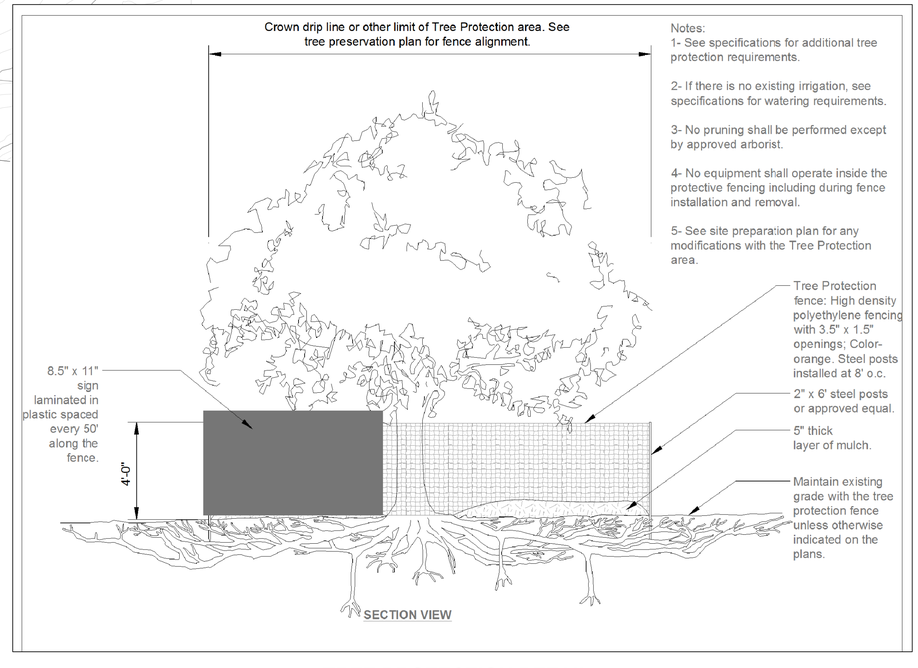
TREE PROTECTION SITE PLAN

NOTES:
This page is included in the plan set for reference, however the District is taking responsibility for tree protection.
Contractor will not be responsible for fencing and wrapping.

NOTES:
1. WRAP ORANGE PLASTIC CONSTRUCTION FENCE ON TOP OF WOOD SLATS WITH AN OVERLAP OF 12" AND TIE WITH WIRE.
2. TRUNK WRAP SHALL BE IN PLACE NO MORE THAN 5 WORKING DAYS BEFORE WORK ADJACENT TO TREE, AND REMOVED NO MORE THAN 5 WORKING DAYS AFTER WORK ADJACENT TO THE TREE, UNLESS OTHERWISE DIRECTED BY THE CITY.
3. FOR PROJECT DURATIONS LASTING MORE THAN 4 MONTHS, PROJECT ARBORIST TO INSPECT AND DETERMINE IF PROTECTION NEEDS TO BE ADJUSTED.



TEMPORARY TREE WRAP DETAIL



Notes:
1- See specifications for additional tree protection requirements.

2- If there is no existing irrigation, see specifications for watering requirements.

3- No pruning shall be performed except by approved arborist.

4- No equipment shall operate inside the protective fencing including during fence installation and removal.

5- See site preparation plan for any modifications with the Tree Protection area.

TREE PROTECTION DETAIL

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P.O. Box 50 Lytton, B.C. V0K 1Z0
Bus. (250)-455-0285 FAX (250)-459-2276
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LAKE FOREST PARK WATER DISTRICT
GOOD WATER NATURALLY

LAKE FOREST PARK WATER DISTRICT - PWTF 2013
McKinnon Creek Pumphouse - Phase II
TEMPORARY TREE PROTECTION PLAN

JOB NO.	M109-001
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