NORTHSHORE UTILITY DISTRICT

King County, Washington

CONTRACT 2020-01

LAKE FOREST PARK RESERVOIR AND BOOSTER STATION UPGRADES

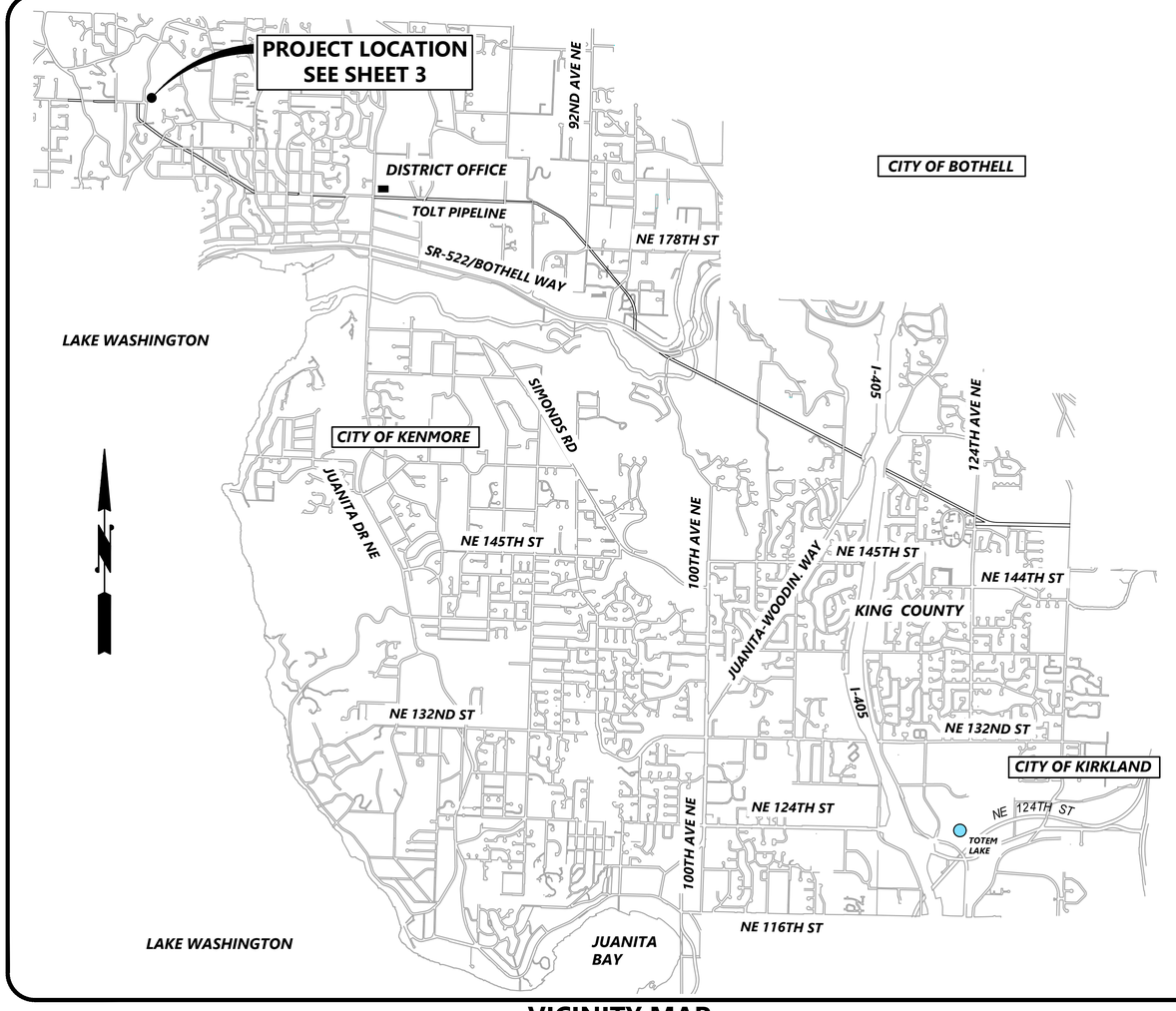
OCTOBER 2020

BID SET

Gray & Osborne, Inc.
CONSULTING ENGINEERS

THOMAS D. MORTIMER	President of the Board
MATT BREYSSE	Secretary of the Board
TRUDY C. ROLLA	Commissioner
D. BRUCE GARDINER	Commissioner
DONALD A. ELLIS	Commissioner
ALAN G. NELSON	General Manager

SHEET INDEX



VICINITY MAP

NOT TO SCALE

C1502

SHEET 1 OF 28

M:\Nshore\19670_Lake_Forest_Park_Reservoir_and_Booster_Station\01_Design\Planset\General\Cover.dwg

LEGEND

EXISTING	PROPOSED	DESCRIPTION
		PROPERTY LINE
		RIGHT OF WAY LINE
- - FL - -		DITCH CENTERLINE
		SIDE SLOPE
8" DI W		WATER LINE
8" PVC SS		SANITARY SEWER LINE
SD SD		STORM DRAIN LINE
12" CONCRETE SD		STORM DRAIN CULVERT
FL FL		SWALE OR DITCH
G		GAS LINE
UGP		UNDERGROUND POWER LINE
OHP		OVERHEAD POWER LINE
T		TELEPHONE LINE
C		CABLE LINE
FO		FIBER OPTIC LINE
		CHAIN LINK FENCE
		WATER METER
		FIRE HYDRANT
		WATER VALVE
		AIR RELIEF VALVE
		CLEAN OUT
		SANITARY MANHOLE
		STORM DRAIN MANHOLE
		STORM DRAIN CATCH BASIN
		GAS VALVE
		POWER POLE
		GUY ANCHOR
		LIGHT POLE
		SIGNAL POLE
P		ELECTRICAL VAULT
		ELECTRICAL HANDHOLE
		COMMUNICATIONS VAULT
		TELEPHONE HANDHOLE
		SIGN
		MONUMENT
		ROCKERY
		ROCK WALL
		MAIL BOX(ES)
		CONIFER TREE
		DECORATIVE TREE
		DECIDUOUS TREE
		SHRUB
		RETAINING WALL
		CEMENT CONCRETE PAVEMENT
		CEMENT CONCRETE CURB, GUTTER
		ASPHALT CONCRETE PAVEMENT
		GRAVEL
		GRASS
		FILTER FABRIC FENCE
		CATCHBASIN INLET PROTECTION
		PROPERTY ADDRESS

GENERAL NOTES:

1. ALL CONSTRUCTION AND MATERIALS SHALL BE IN ACCORDANCE WITH THE REQUIREMENTS SPECIFIED IN THE CURRENT NORTHSHORE UTILITY DISTRICT STANDARD SPECIFICATIONS AND STANDARD DETAILS.
2. THE APPROXIMATE LOCATIONS OF EXISTING UTILITIES ARE SHOWN ON THE PLANS FOR CONVENIENCE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFICATION OF UTILITY LOCATIONS SHOWN, FOR THE PROTECTION AND REPAIR OF DAMAGED UTILITIES AND FOR THE DISCOVERY OF POSSIBLE ADDITIONAL UTILITIES NOT SHOWN ON THE PLANS. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO HAVE LOCATED, BY THE APPROPRIATE UTILITY DISTRICTS OR COMPANIES, ALL UNDERGROUND UTILITIES PRIOR TO BEGINNING CONSTRUCTION. FOR UTILITY LOCATES IN KING COUNTY, CALL 1-800-424-5555 PRIOR TO DIGGING.
3. A PRE-CONSTRUCTION CONFERENCE WILL BE HELD AT THE DISTRICT OFFICE PRIOR TO START OF CONSTRUCTION.
4. THE CONTRACTOR SHALL NOTIFY NORTHSHORE UTILITY DISTRICT A MINIMUM OF FIVE (5) DAYS IN ADVANCE OF BEGINNING CONSTRUCTION. CONSTRUCTION SHALL NOT BEGIN WITHOUT PRIOR WRITTEN NOTICE TO PROCEED BY THE DISTRICT.
5. THE CONTRACTOR SHALL NOT OPERATE ANY VALVES OR MAKE ANY CONNECTIONS TO THE EXISTING WATER SYSTEM WITHOUT PRIOR APPROVAL FROM THE DISTRICT.

SURVEY CONTROL DATA

HORIZONTAL DATUM:
WASHINGTON STATE COORDINATE SYSTEM, NORTH ZONE NAD83(91), US FEET UTILIZING RTK GPS FIELD PROCEDURES

VERTICAL DATUM: NAVD88, US FEET AS PRESCRIBED BY NORTHSHORE UTILITY DISTRICT.

TOPOGRAPHIC MAPPING:
THE MAP SHOWN HEREON IS THE RESULT OF A TOPOGRAPHIC SURVEY BY DUANE HARTMAN & ASSOCIATES, INC. (DHA) COMPLETED IN JUNE 2020. DHA ASSUMES NO LIABILITY, BEYOND SAID DATE, FOR ANY FUTURE SURFACE FEATURE MODIFICATIONS OR CONSTRUCTION ACTIVITIES THAT MAY OCCUR WITHIN OR ADJOINING THE PERIMETER OF THIS SURVEY. CONTACT DHA (425) 483-5355 FOR SITE UPDATES AND VERIFICATIONS.

CONTOUR INTERVAL: ONE FOOT (1') CONTOURS

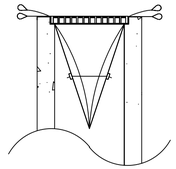
BENCHMARKS:

POINT TABLE

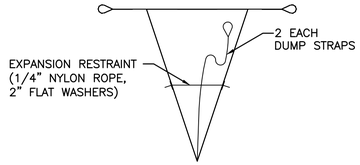
POINT #	DESCRIPTION	ELEVATION	NORTHING	EASTING
554	R-CAP	527.21	284423.20	1285201.28
555	MON	513.46	284179.64	1285212.58
560	DHA560	525.26	284395.01	1285298.97
561	DHA561	512.74	284381.18	1285381.04
562	DHA562	482.52	284307.63	1285426.68
563	DHA563	582.88	284139.51	1285457.57
564	DHA564	492.51	284069.64	1285426.13
565	DHA565	506.38	284065.87	1285318.22
566	DHA 566 NCC	535.35	284631.59	1285236.69
2065	MON	531.72	284525.54	1285231.55
2227	MON	536.31	284564.78	1285289.06

TEMPORARY EROSION AND SEDIMENTATION CONTROL NOTES

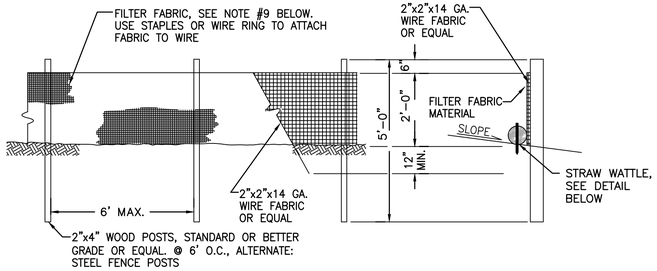
1. THE TEMPORARY EROSION AND SEDIMENTATION CONTROL (TESC) FACILITIES SHALL BE IMPLEMENTED PRIOR TO THE START OF ANY CONSTRUCTION ACTIVITIES, AND IN SUCH A MANNER AS TO ENSURE THAT SEDIMENT WATER DOES NOT ENTER THE DRAINAGE SYSTEM OR VIOLATE APPLICABLE WATER STANDARDS. MAINTENANCE, REPLACEMENT, AND UPGRADING OF THESE TESC FACILITIES IS THE RESPONSIBILITY OF THE CONTRACTOR UNTIL ALL CONSTRUCTION IS APPROVED.
2. THE STORM DRAIN INLET PROTECTION DEVICE SHALL BE SILT SACK OR EQUAL. ALL CATCH BASINS WITHIN THE VICINITY OF THE CONSTRUCTION SHALL HAVE INLET PROTECTION MEASURES.
3. CONTRACTOR SHALL MAINTAIN ALL EXISTING DRAINAGE CHANNELS, CULVERTS, SWALES AND STRUCTURES. WHENEVER EXISTING DRAINAGE FACILITIES ARE DISTURBED, THE CONTRACTOR SHALL PROVIDE SUITABLE MEANS FOR DIVERTING AND MAINTAINING ALL FLOWS DURING CONSTRUCTION IN THAT AREA AT ITS EXPENSE. AFTER CONSTRUCTION HAS BEEN COMPLETED, ALL DRAINAGE CHANNELS, CULVERTS, SWALES AND STRUCTURES DISTURBED SHALL BE RETURNED TO THEIR ORIGINAL CONDITIONS.
4. THE TESC FACILITIES SHOWN ON THIS PLAN ARE THE MINIMUM REQUIREMENTS FOR ANTICIPATED SITE CONDITIONS. DURING THE CONSTRUCTION PERIOD, TESC FACILITIES SHALL BE MAINTAINED AND UPGRADED AS NECESSARY BY THE CONTRACTOR.
5. CONTRACTOR SHALL INSPECT THE TESC FACILITIES AT THE END OF EACH WORKING DAY TO ASSURE ITSELF THAT THEY ARE IN GOOD CONDITIONS. IF TESC FACILITIES REQUIRE REPAIR/MAINTENANCE, IT SHALL BE PERFORMED PRIOR TO THE END OF THE WORKING DAY. ALL DISTURBED AREAS SHALL BE PROMPTLY AND THOROUGHLY STABILIZED AGAINST EROSION DURING PERIODS OF WET WEATHER WHEN WORK IS NOT BEING PERFORMED AT THE SITE.
6. ALL UNSUITABLE OR SURPLUS EXCAVATED OR CLEARED MATERIAL SHALL BE REMOVED FROM THE SITE AND DISPOSED OF IN AN APPROVED, LEGAL FILL SITE. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO LOCATE ACCEPTABLE DISPOSAL SITES AND ASSURE THAT ALL SURPLUS MATERIAL IS DISPOSED OF IN SAME.
7. CONTRACTOR SHALL BE RESPONSIBLE FOR IMPLEMENTING ALL APPROPRIATE MEASURES NEEDED (STREET SWEEPERS, WATER TRUCKS, ETC.) TO KEEP STREETS AND ROADS USED AS HAUL ROUTES FOR EXPORT OR IMPORT OF MATERIAL CLEAN AND FREE FROM DEBRIS, MUD, ETC.. ADDITIONAL MEASURES MAY BE REQUIRED TO ENSURE THAT ALL PAVED AREAS ARE KEPT CLEAN FOR THE DURATION OF THE PROJECT.



INSTALLATION DETAIL



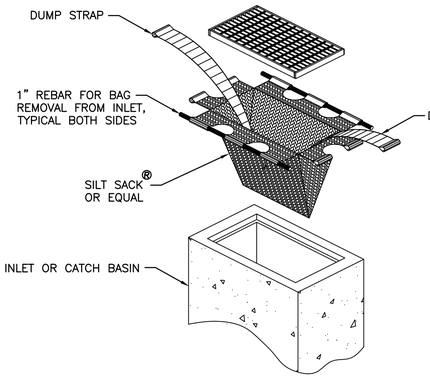
BAG DETAIL



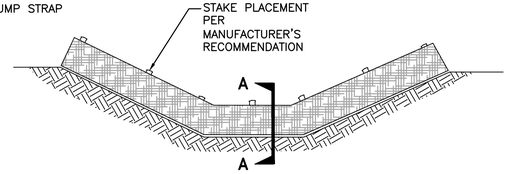
NOTES

1. THE FILTER FABRIC SHALL BE PURCHASED IN A CONTINUOUS ROLL CUT TO THE LENGTH OF THE BARRIER TO AVOID USE OF JOINTS. WHEN JOINTS ARE NECESSARY, FILTER CLOTH SHALL BE SPLICED TOGETHER ONLY AT A SUPPORT POST, WITH A MINIMUM 6-INCH OVERLAP AND BOTH ENDS SECURELY FASTENED TO THE POST.
2. THE FILTER FABRIC FENCE SHALL BE INSTALLED TO FOLLOW THE CONTOURS (WHERE FEASIBLE). THE FENCE POSTS SHALL BE SPACED A MAXIMUM OF 6 FEET APART AND DRIVEN SECURELY INTO THE GROUND (MINIMUM OF 30 INCHES).
3. WHEN STANDARD STRENGTH FILTER FABRIC IS USED, A WIRE MESH SUPPORT FENCE SHALL BE FASTENED SECURELY TO THE UPSLOPE SIDE OF THE POSTS USING HEAVY-DUTY WIRE STAPLES AT LEAST 1 INCH LONG, TIE WIRE OR HOG RINGS.
4. THE STANDARD STRENGTH FILTER FABRIC SHALL BE STAPLED OR WIRED TO THE FENCE, AND 20 INCHES OF THE FABRIC SHALL BE EXTENDED ACROSS THE GROUND, UPSLOPE AND ADJACENT TO THE WOOD POST. THE FABRIC SHALL NOT EXTEND MORE THAN 30 INCHES ABOVE THE ORIGINAL GROUND SURFACE. FILTER FABRIC SHALL NOT BE STAPLED TO EXISTING TREES.
5. WHEN EXTRA FILTER FABRIC AND CLOSER POST SPACING ARE USED, THE WIRE MESH SUPPORT FENCE MAY BE ELIMINATED. IN SUCH A CASE, THE FILTER FABRIC IS STAPLED OR WIRED DIRECTLY TO THE POSTS WITH ALL OTHER PROVISIONS OF STANDARD NOTE 3 APPLYING.
6. FABRIC SHALL BE SECURED AT THE BASE BY PEA-ROCK FILLED SANDBAGS OR STRAW WATTLES PLACED END TO END.
7. FILTER FABRIC FENCES SHALL BE REMOVED WHEN THEY HAVE SERVED THEIR USEFUL PURPOSE, BUT NOT BEFORE THE UPSLOPE AREA HAS BEEN PERMANENTLY STABILIZED.
8. FILTER FABRIC FENCES SHALL BE INSPECTED IMMEDIATELY AFTER EACH RAINFALL AND AT LEAST DAILY DURING PROLONGED RAINFALL. ANY REQUIRED REPAIRS SHALL BE MADE IMMEDIATELY.
9. FILTER FABRIC SHALL BE PER CURRENT GEOTEXTILE FABRIC STANDARDS FOR SILT FENCE IN THE DEPARTMENT OF ECOLOGY STORMWATER MANAGEMENT MANUAL FOR WESTERN WASHINGTON.

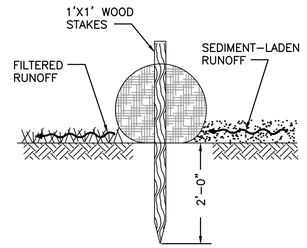
2 – HIGH VISIBILITY FILTER FABRIC FENCE
NOT TO SCALE



1 – STORM DRAIN INLET PROTECTION
NOT TO SCALE



PLACEMENT OF STRAW WATTLE



CROSS SECTION A-A

3 – STRAW WATTLE DAM
NOT TO SCALE

ERIC B. DELBEL
STATE OF WASHINGTON
40195
REGISTERED
PROFESSIONAL ENGINEER
10/14/2020

NO	BY	APPD	REVISION	DATE

BID SET

WARNING
0 ½ 1
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO SCALE

Gray & Osborne, Inc
CONSULTING ENGINEERS

DESIGNED BY	MTM
DRAWN BY	BS
CHECKED BY	MTM
APPROVAL	EBD
DATE	OCT 2020

NORTHSHORE UTILITY DISTRICT
6830 NE 185th St.
Kenmore, WA 98028-2684
P.O. Box 82489
Kenmore, WA 98028-2684
Ph: (425) 398-4400 | Fax: (425) 398-4430 | www.nud.net

CONTRACT 2020-01
LAKE FOREST PARK RESERVOIR AND BOOSTER STATION UPGRADES

TESC DETAILS AND NOTES

BASE MAP A2
C1502
SHEET
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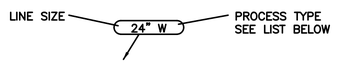
ABBREVIATIONS

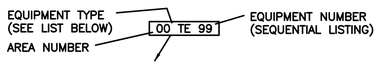
AVE	AVENUE
AC	ASBESTOS CEMENT PIPE
ADJ	ADJUST
ALT	ALTERNATE
ALUM	ALUMINUM
ANSI	AMERICAN NATIONAL STANDARDS INSTITUTE
AP	ANGLE POINT
ASPH	ASPHALT
ASTM	AMERICAN SOCIETY OF TESTING AND MATERIALS
ASSY	ASSEMBLY
BF	BLIND FLANGE
BLDG	BUILDING
BLK	BLOCK
BO	BLOW OFF
BOP	BEGINNING OF PROJECT
BVCE	BEGIN VERTICAL CURVE ELEVATION
BVCS	BEGIN VERTICAL CURVE STATION
CTR	CENTER
CAP	CORRUGATED ALUMINUM PIPE
CB	CATCH BASIN
CI	CAST IRON
℄	CENTER LINE
CLR	CLEARANCE
CMP	CORRUGATED METAL PIPE
CO	CLEANOUT
CONC	CONCRETE
C	CONDUIT
CONN	CONNECTION
CONT	CONTINUOUS
CPEP	CORRUGATED POLYETHYLENE PIPE
CPLG	COUPLING
CY	CUBIC YARD
CONT	CONTINUED
CL	CLASS
CF	CUBIC FEET
CFS	CUBIC FEET PER SECOND
DC	DEGREE OF CURVATURE
DI	DUCTILE IRON
DIA	DIAMETER
DOT	DEPARTMENT OF TRANSPORTATION
DIM	DIMENSION
DWGS	DRAWING(S)
D	DRAIN
E	EAST
EA	EACH
EL	ELEVATION
ELEC	ELECTRICAL
EOA	EDGE OF ASPHALT
EOP	END OF PROJECT
EVCE	END VERTICAL CURVE ELEVATION
EVCS	END VERTICAL CURVE STATION
EXIST	EXISTING
FIG	FIGURE
FIN	FINISHED
FL	FLANGE
FT	FEET
GA	GAUGE
GALV	GALVANIZED
GI	GALVANIZED IRON
GV	GATE VALVE
HDPE	HIGH DENSITY POLYETHYLENE PIPE
ID	INSIDE DIAMETER
IE	INVERT ELEVATION
INV	INVERT
IN	INCH
L	LENGTH
LB	POUND
LF	LINEAR FEET
MAX	MAXIMUM
MFR	MANUFACTURER
MH	MANHOLE
MIN	MINIMUM
MJ	MECHANICAL JOINT
MISC	MISCELLANEOUS
N	NORTH
NO	NUMBER
NTS	NOT TO SCALE
OC	ON CENTER
OD	OUTSIDE DIAMETER
PI	POINT OF INTERSECTION
PP	POWER POLE
PVI	POINT OF VERTICAL INTERSECTION
PE	PLAIN END
PERF	PERFORATED
PVC	POLYVINYL CHLORIDE
PVMT	PAVEMENT
PVT	POINT OF VERTICAL TANGENT
PC	POINT OF CURVATURE
PT	POINT OF TANGENCY
QTY	QUANTITY
RET	RETAINING
RR	RAILROAD
R	RADIUS
RED	REDUCER
REINF	REINFORCE
REQD	REQUIRED
R/W	RIGHT-OF-WAY
SL	SLOPE
S	SOUTH
SCH	SCHEDULE
SF	SQUARE FEET
SHT	SHEET
SPECS	SPECIFICATIONS
SQ	SQUARE
STA	STATION
STD	STANDARD
TB	THRUST BLOCK
TC	TOP OF CURB
TEL	TELEPHONE
TESC	TEMPORARY EROSION AND SEDIMENT CONTROL
THRD	THREADED
THRU	THROUGH
TYP	TYPICAL
UNO	UNLESS NOTED OTHERWISE
VERT	VERTICAL
W	WEST
WSDOT	WASHINGTON STATE DEPARTMENT OF TRANSPORTATION
W/	WITH
W/O	WITHOUT

PROCESS PIPING / EQUIPMENT IDENTIFICATIONS

PROCESS PIPING



EQUIPMENT



ABBREVIATIONS

PROCESS PIPING		EQUIPMENT	
DIE	DIESEL FUEL	EF	EFFLUENT FAN
EXH	EXHAUST	GEN	GENERATOR
FOR	FUEL OIL RETURN	LVR	LOUVER
FOS	FUEL OIL SUPPLY	RFS	REMOTE FUEL STATION
V	VENT		

KEY MAP
SCALE: 1"=50'

ERIC B. DELFEL
STATE OF WASHINGTON
40195
REGISTERED
PROFESSIONAL ENGINEER
10/14/2020

NO	BY	APPD	REVISION	DATE

BID SET

WARNING
0 ½ 1
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CONTRACT 2020-01
LAKE FOREST PARK RESERVOIR AND BOOSTER STATION UPGRADES

ABBREVIATIONS & KEY MAP

BASE MAP A2
C1502
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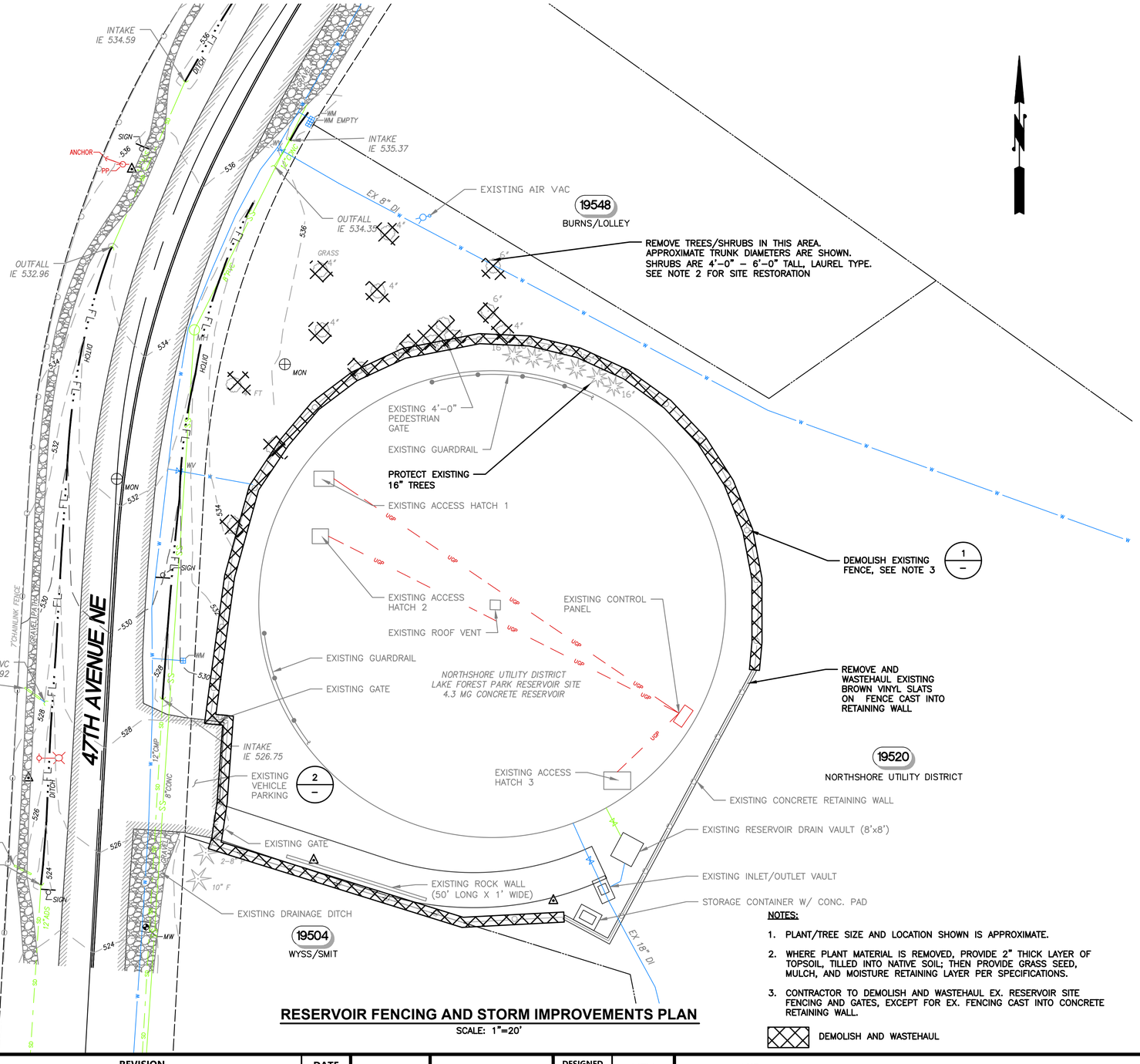

RESERVOIR FENCING AND STORM IMPROVEMENTS PLAN
SCALE: 1"=20'

NOTES:

1. PLANT/TREE SIZE AND LOCATION SHOWN IS APPROXIMATE.
2. WHERE PLANT MATERIAL IS REMOVED, PROVIDE 2" THICK LAYER OF TOPSOIL, TILLED INTO NATIVE SOIL; THEN PROVIDE GRASS SEED, MULCH, AND MOISTURE RETAINING LAYER PER SPECIFICATIONS.
3. CONTRACTOR TO DEMOLISH AND WASTEHAUL EX. RESERVOIR SITE FENCING AND GATES, EXCEPT FOR EX. FENCING CAST INTO CONCRETE RETAINING WALL.

DEMOLISH AND WASTEHAUL

1 – **EXISTING SITE FENCING**
NOT TO SCALE

2 – **EXISTING VEHICLE PARKING**
NOT TO SCALE

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EXISTING RESERVOIR SITE TESC AND DEMO PLAN

BASE MAP A2
C1502
SHEET
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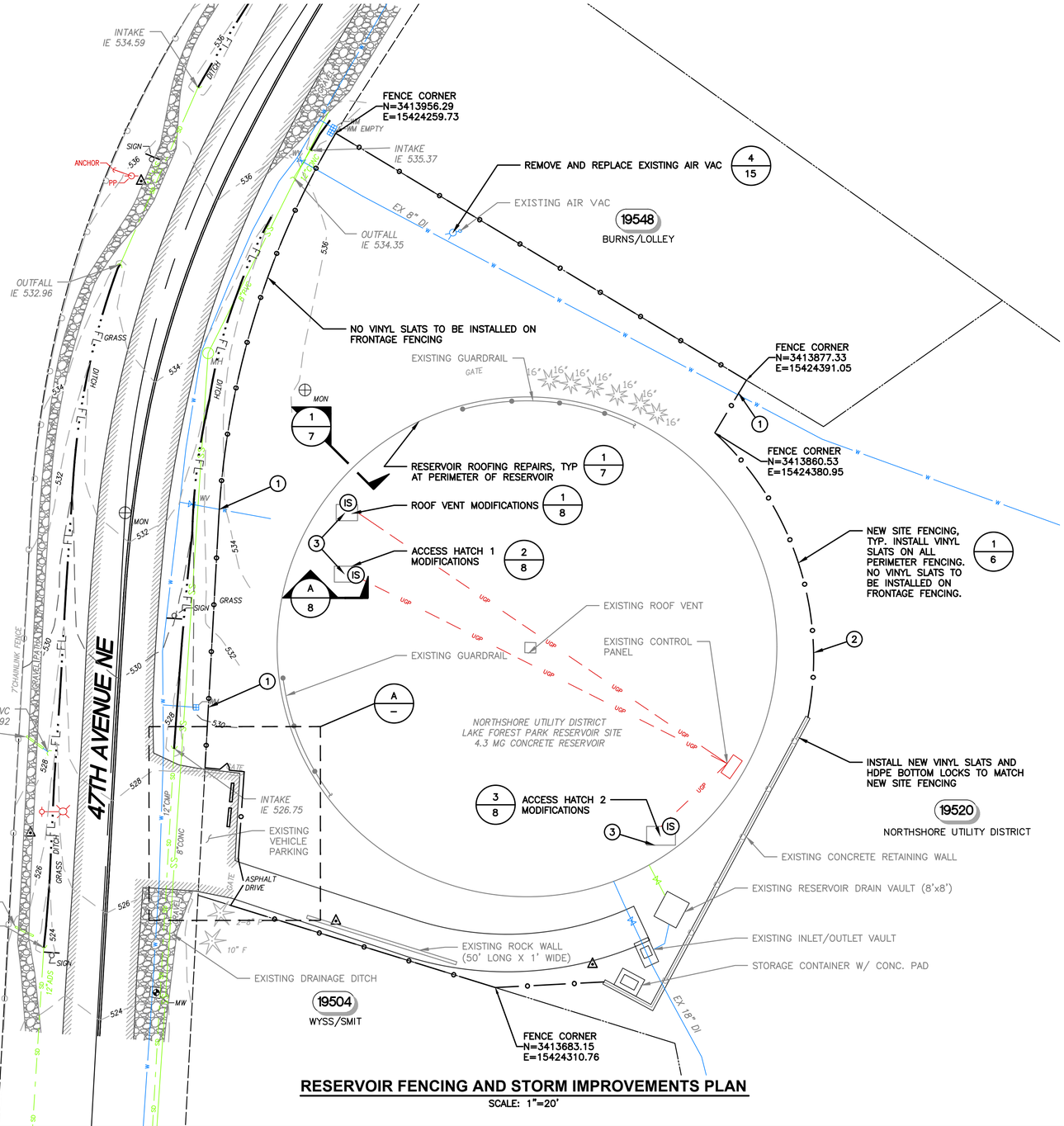


RESERVOIR FENCING AND STORM IMPROVEMENTS PLAN

SCALE: 1"=20'

GENERAL NOTES

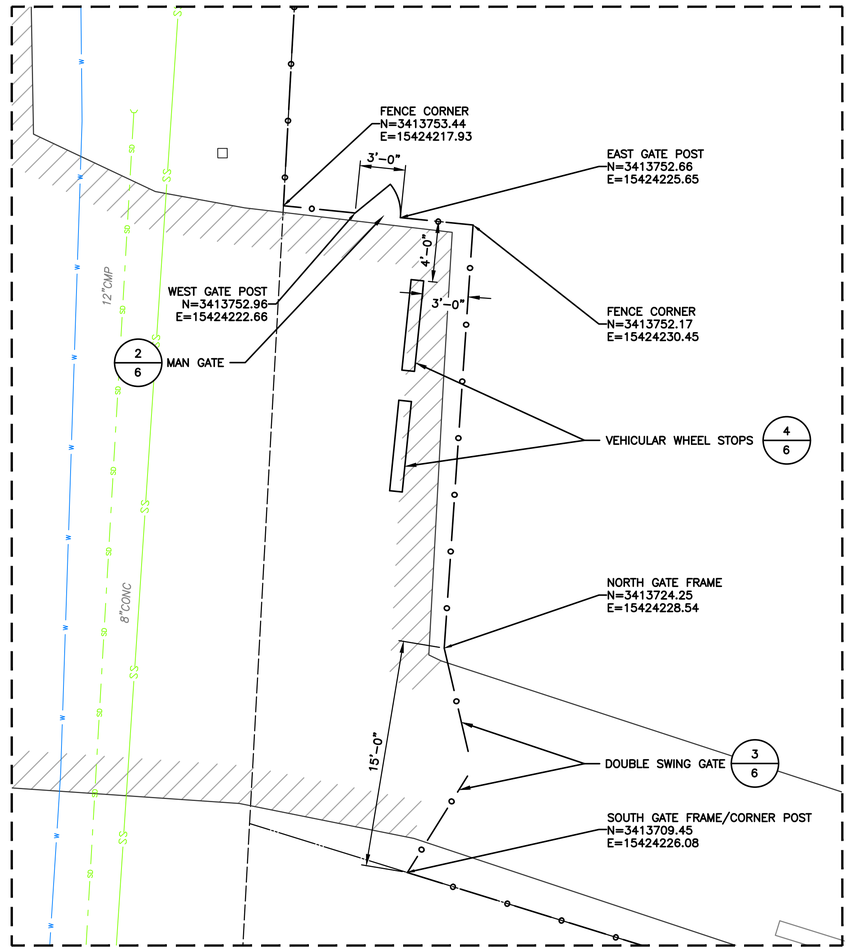
1. SEE SHEET 2 FOR GENERAL NOTES, LEGEND, AND SURVEY CONTROL INFORMATION.
2. DISTRICT WILL DRAIN RESERVOIR PRIOR TO RESERVOIR IMPROVEMENTS. CONTRACTOR TO PROVIDE 14 DAYS NOTICE PRIOR TO WORK ON RESERVOIR. CONTRACTOR IS RESPONSIBLE FOR REMOVING ANY CONSTRUCTION DEBRIS FROM RESERVOIR. AFTER RESERVOIR WORK IS COMPLETE AND ALL CONSTRUCTION DEBRIS IS REMOVED, CONTRACTOR WILL DISINFECT AND PUT RESERVOIR BACK IN SERVICE.

CONSTRUCTION NOTES

① POTENTIAL UTILITY CONFLICT. CONTRACTOR SHALL POTHOLE AND FIELD VERIFY EXACT LOCATION AND DEPTH OF EXISTING UTILITY PRIOR TO STARTING WORK. ANY DISCREPANCIES FOUND IN THE FIELD FROM THOSE SHOWN HERE SHALL BE REPORTED TO THE OWNER PRIOR TO STARTING WORK

② CONTRACTOR TO STAGE FENCE WORK IN ORDER TO MAINTAIN SITE SECURITY AT ALL TIMES. TEMPORARY FENCING SHALL BE ERECTED AT END OF WORK DAY IN ORDER TO MAINTAIN SITE SECURITY.

③ INSTALL NEW INTRUSION SWITCHES, MODEL 802M, AS MANUFACTURED BY ALLEN BRADLEY ON NEW HATCHES AND NEW ROOF VENT. PULL NEW WIRE THROUGH EX. CONDUITS TO RESERVOIR CONTROL PANEL.



A — PARKING AREA DETAIL

SCALE: 1"=5'-0"

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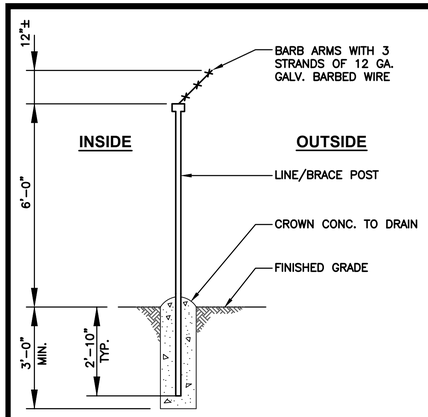
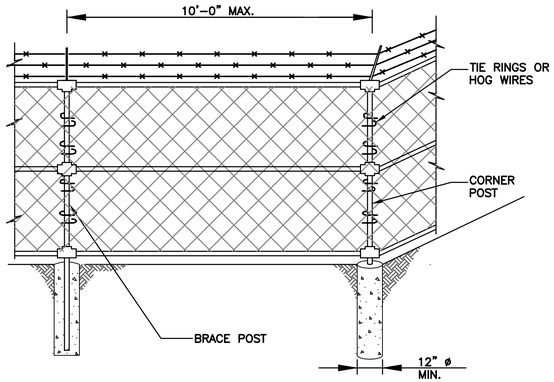
RESERVOIR SITE PLAN

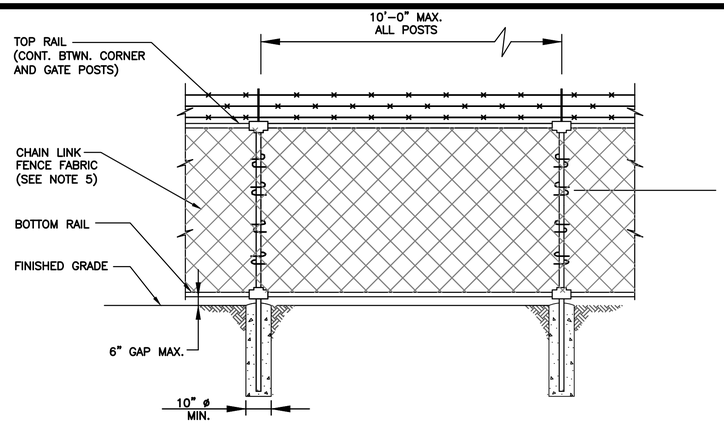
BASE MAP A2
C1502
SHEET 5 OF 28



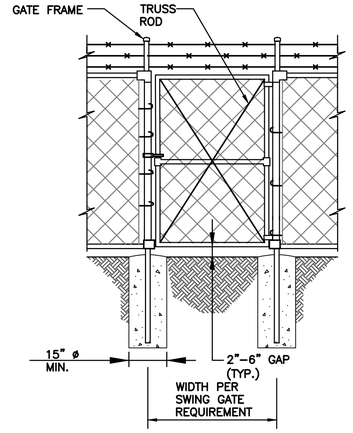
SECTION



CORNER POST



ELEVATION

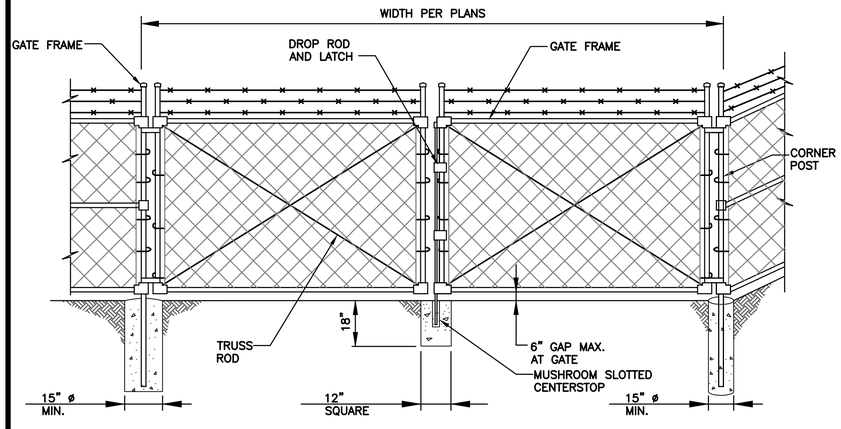


NOTES:

1. SEE SPECIFICATIONS FOR TYPICAL MATERIAL AND INSTALLATION REQUIREMENTS.
2. INSTALL CORNER POSTS WHERE ALIGNMENT CHANGES 30-DEG. OR MORE.
3. PROVIDE GALVANIZED FINISH ON POSTS, RAILS AND FITTINGS.
4. ANGLE BARBED WIRE ARM OUTWARD ON ALL LINE, BRACE AND CORNER POSTS, UNLESS OTHERWISE NOTED.
5. 1-3/32" GREEN VINYL SLATS AND HDPE BOTTOM LOCKS SHALL BE INSTALLED ON ALL SITE FENCING EXCLUDING FRONTAGE.
6. TOP AND BOTTOM MESH TIES SHALL BE KNUCKLE STYLE.
7. NEW CHAIN LINK MESH SHALL BE 2" OPEN x 9 GAUGE GALVANIZED STYLE.

1 – **CHAIN LINK SECURITY FENCE**
NOT TO SCALE

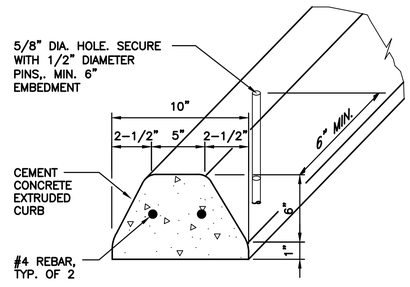
2 – **MAN GATE DETAIL**
NOT TO SCALE



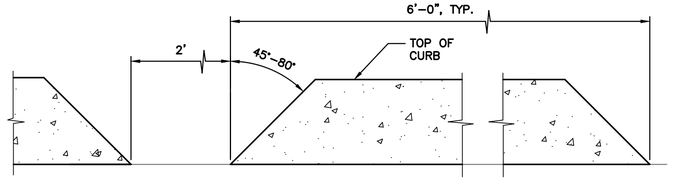
NOTES:

1. SEE SPECIFICATIONS FOR TYPICAL MATERIAL AND INSTALLATION REQUIREMENTS.
2. PROVIDE GALVANIZED FINISH ON POSTS, RAILS AND FITTINGS.
3. PROVIDE GALV IRON, MUSHROOM TYPE, SLOTTED CENTERSTOP FOR DOUBLE GATE DROP ROD.
4. ANGLE BARBED WIRE ARM OUTWARD ON ALL LINE, BRACE AND CORNER POSTS, UNLESS OTHERWISE NOTED.
5. 1-3/32" GREEN VINYL SLATS AND HDPE BOTTOM LOCKS SHALL BE INSTALLED ON ALL SITE FENCING EXCLUDING FRONTAGE.
6. TOP AND BOTTOM MESH TIES SHALL BE KNUCKLE STYLE.
7. NEW CHAIN LINK MESH SHALL BE 2" OPEN x 9 GAUGE GALVANIZED STYLE.

3 – **DOUBLE SWING GATE DETAIL**
NOT TO SCALE



SECTION



PROFILE

GAP DETAIL

NOTE:

1. GAPS SHALL BE CONSTRUCTED IN THE CURBS TO PROVIDE FOR SURFACE DRAINAGE AT LOCATIONS AS DIRECTED BY THE ENGINEER.
2. COORDINATE FINAL LOCATION W/ DISTRICT BASED ON AVAILABLE SPACING AND VEHICLE DIMENSIONS

4 – **VEHICULAR WHEEL STOP**
NOT TO SCALE

ERIC B. DELBEL — STATE OF WASHINGTON — 40195 — REGISTERED PROFESSIONAL ENGINEER
10/14/2020

NO	BY	APPD	REVISION	DATE
BID SET				

WARNING
0 ½ 1
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Gray & Osborne, Inc
CONSULTING ENGINEERS

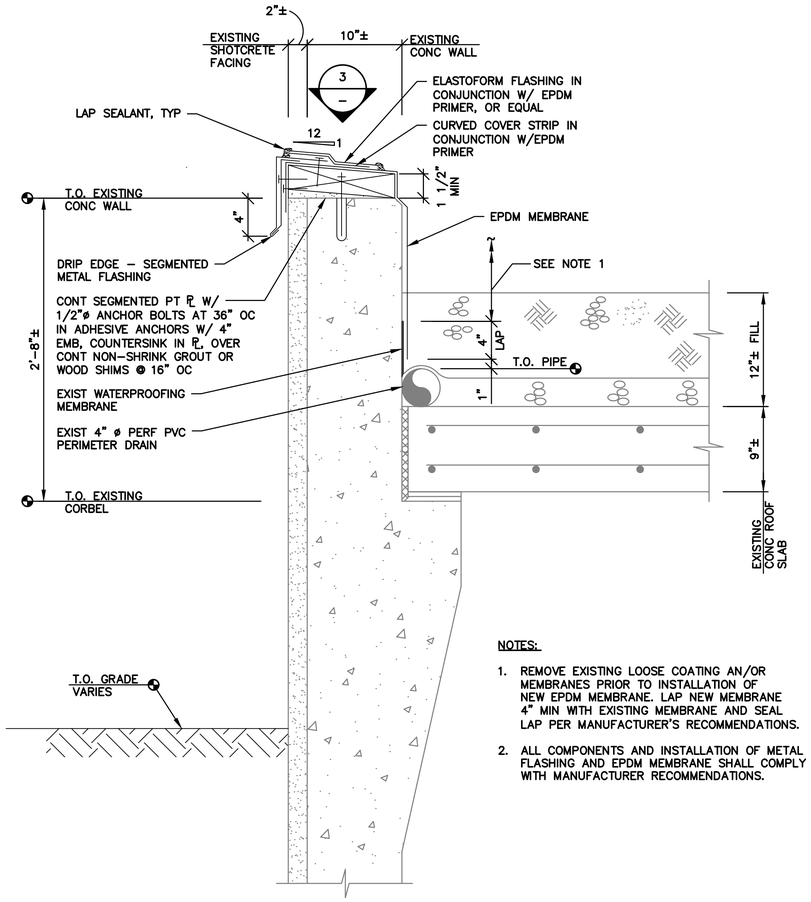
DESIGNED BY	MTM
DRAWN BY	BS
CHECKED BY	MTM
APPROVAL	EBD
DATE	OCT 2020

NORTHSHORE UTILITY DISTRICT
6830 NE 185th St.
Kenmore, WA 98028-2684
P.O. Box 82489
Kenmore, WA 98028-2684
Ph: (425) 398-4400 | Fax: (425) 398-4430 | www.nud.net

CONTRACT 2020-01
LAKE FOREST PARK RESERVOIR AND BOOSTER STATION UPGRADES

RESERVOIR DETAILS

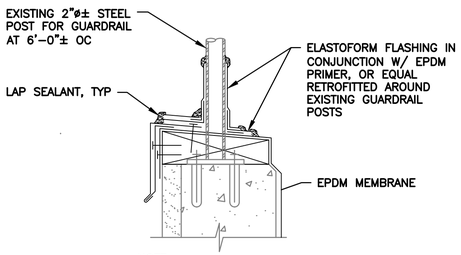
BASE MAP A2
C1502
SHEET 6 *OF* 28



NOTES:

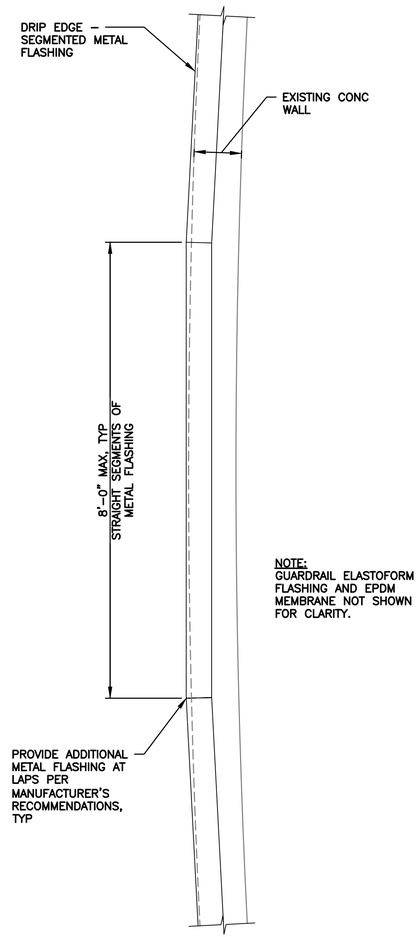
1. REMOVE EXISTING LOOSE COATING AN/OR MEMBRANES PRIOR TO INSTALLATION OF NEW EPDM MEMBRANE. LAP NEW MEMBRANE 4" MIN WITH EXISTING MEMBRANE AND SEAL LAP PER MANUFACTURER'S RECOMMENDATIONS.
2. ALL COMPONENTS AND INSTALLATION OF METAL FLASHING AND EPDM MEMBRANE SHALL COMPLY WITH MANUFACTURER RECOMMENDATIONS.

1/3 TYPICAL WATERPROOFING REPAIR SECTION
SCALE: 1 1/2"=1'–0"



NOTE:
1. SEE 1/– FOR BALANCE OF INFO.

2/– TYPICAL WATERPROOFING AT GUARDRAIL POST
SCALE: 1 1/2"=1'–0"



NOTE:
GUARDRAIL ELASTOFORM FLASHING AND EPDM MEMBRANE NOT SHOWN FOR CLARITY.

3/– TYPICAL WATERPROOFING PLAN DETAIL
SCALE: 3/4"=1'–0"

MYRON J. BASDEN
STATE OF WASHINGTON
46334
STRUCTURAL ENGINEER
PROFESSIONAL ENGINEERS
10/14/2020

NO	BY	APPD	REVISION	DATE

BID SET

WARNING
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Gray & Osborne, Inc
CONSULTING ENGINEERS

DESIGNED BY	MJB
DRAWN BY	RAH
CHECKED BY	MJB
APPROVAL	MJB
DATE	OCT 2020

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6830 NE 185th St.
Kenmore, WA 98028-2684
P.O. Box 82489
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CONTRACT 2020-01
LAKE FOREST PARK RESERVOIR AND BOOSTER STATION UPGRADES

RESERVOIR DETAILS

BASE MAP A2
C1502
SHEET
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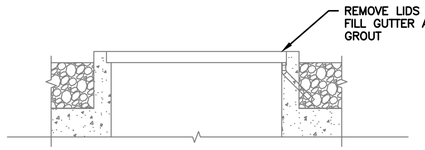
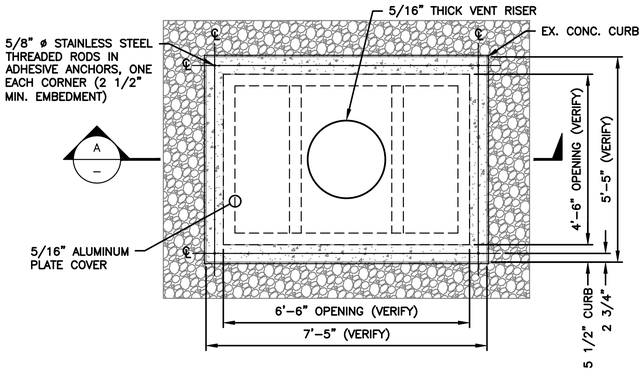
A – **EXISTING HATCH SECTION**
SCALE: 1/2"=1'–0"

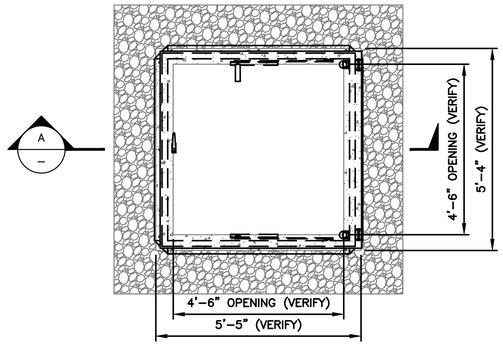


A – **EXISTING HATCH 1 SECTION**
SCALE: 1/2"=1'–0"

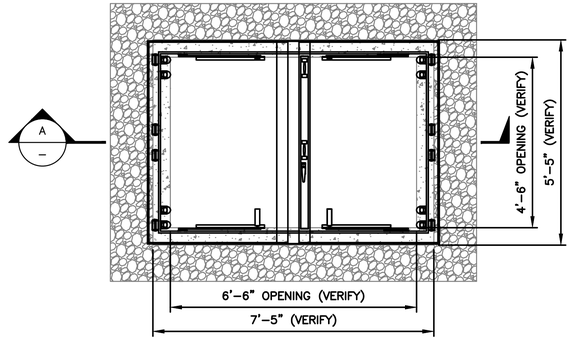
A – **EXISTING HATCH 2 SECTION**
SCALE: 1/2"=1'–0"



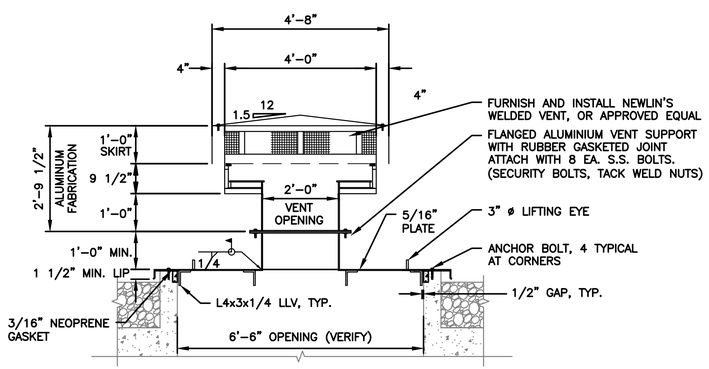
ROOF VENT PLAN
SCALE: 1/2"=1'–0"



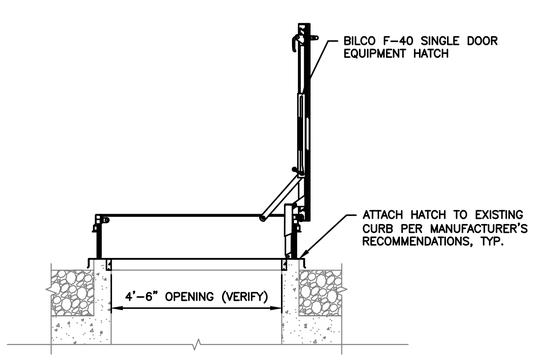
HATCH 1 PLAN
SCALE: 1/2"=1'–0"



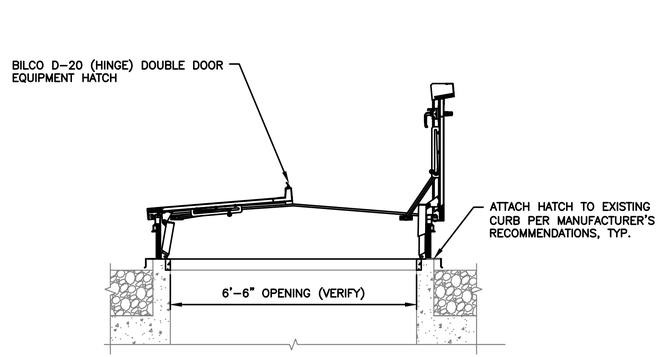
HATCH 2 PLAN
SCALE: 1/2"=1'–0"



A – **ROOF VENT SECTION**
SCALE: 1/2"=1'–0"



A – **HATCH 1 SECTION**
SCALE: 1/2"=1'–0"



A – **HATCH 2 SECTION**
SCALE: 1/2"=1'–0"

NOTES:
1.
2. VERIFY ALL EX. CONDITIONS AND DIMENSIONS BEFORE FABRICATING ROOF VENT COVER PLATE.
3. ALL ITEMS ARE TYPE 6061 ALUMINUM, UNO.
4. ALUMINUM WELDING ELECTRODES OR WIRE: AWS D1.2 AND A5.3. ALL WELDS SHALL BE 3/16" MIN AND SEAL WELDED.
5. ADHESIVE ANCHORS: HILTI HIT–150 OR APPROVED EQUAL. INSTALL PER MANUFACTURERS RECOMMENDATIONS.
6. STAINLESS STEEL THREADED RODS: ASTM A193 GRADE B8.

1 – **ROOF VENT**
SCALE: 1/2"=1'–0"

2 – **HATCH 1**
SCALE: 1/2"=1'–0"

3 – **HATCH 2**
SCALE: 1/2"=1'–0"

ERIC B. DELFEL — STATE OF WASHINGTON — 40195 — REGISTERED PROFESSIONAL ENGINEER
10/14/2020

NO	BY	APPD	REVISION	DATE

BID SET

WARNING
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Gray & Osborne, Inc
CONSULTING ENGINEERS

DESIGNED BY	MJB
DRAWN BY	RAH
CHECKED BY	MJB
APPROVAL	MJB
DATE	OCT 2020

NORTHSHORE UTILITY DISTRICT
6830 NE 185th St.
Kenmore, WA 98028-2684
P.O. Box 82489
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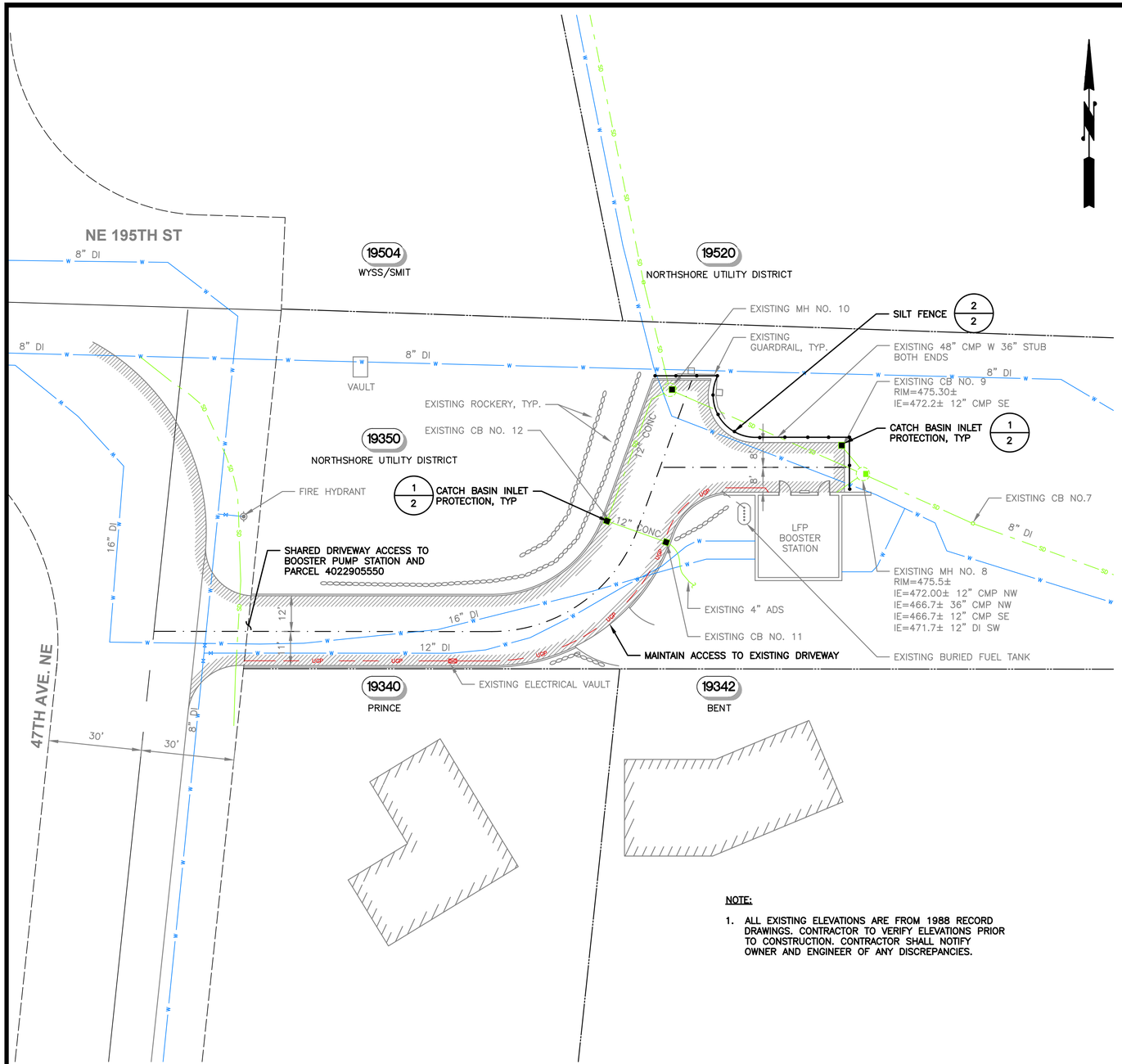
CONTRACT 2020-01
LAKE FOREST PARK RESERVOIR AND BOOSTER STATION UPGRADES

RESERVOIR DETAILS

BASE MAP A2
C1502
SHEET
8 *OF* 28



NOTE:

1. ALL EXISTING ELEVATIONS ARE FROM 1988 RECORD DRAWINGS. CONTRACTOR TO VERIFY ELEVATIONS PRIOR TO CONSTRUCTION. CONTRACTOR SHALL NOTIFY OWNER AND ENGINEER OF ANY DISCREPANCIES.

EXISTING SITE AND TESC PLAN

SCALE: 1"=20'

NOTE:

1. PHOTO IS TAKEN LOOKING SOUTHEAST

1/– SITE PHOTO DETAIL NO. 1
NOT TO SCALE

NOTE:

1. PHOTO IS TAKEN LOOKING EAST

2/– SITE PHOTO DETAIL NO. 2
NOT TO SCALE

AARON M. PEARCE STATE OF WASHINGTON 40276 REGISTERED PROFESSIONAL ENGINEER 10/14/20

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CONSULTING ENGINEERS

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CHECKED BY	AMP
APPROVAL	EBD
DATE	OCT 2020

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6830 NE 185th St.
Kenmore, WA 98028-2684
P.O. Box 82489
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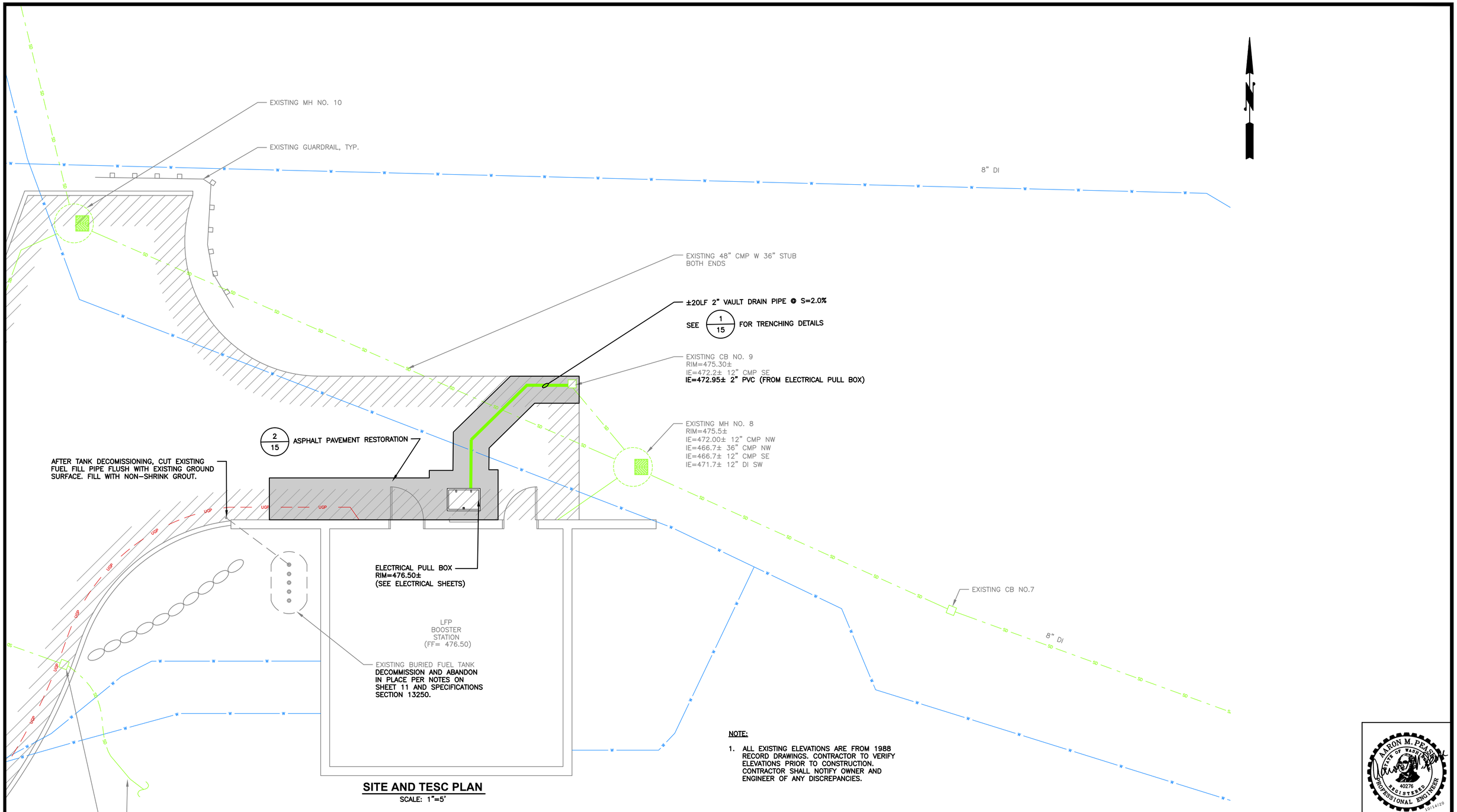
CONTRACT 2020-01
LAKE FOREST PARK RESERVOIR AND BOOSTER STATION UPGRADES

EXISTING BOOSTER STATION SITE & TESC PLAN

BASE MAP A2
C1502
SHEET 9 OF 28



SITE AND TESC PLAN

SCALE: 1"=5'

NOTE:

1. ALL EXISTING ELEVATIONS ARE FROM 1988 RECORD DRAWINGS. CONTRACTOR TO VERIFY ELEVATIONS PRIOR TO CONSTRUCTION. CONTRACTOR SHALL NOTIFY OWNER AND ENGINEER OF ANY DISCREPANCIES.

AARON M. PEASE — STATE OF WASHINGTON — 40276 — REGISTERED PROFESSIONAL ENGINEER — 10/14/20

NO	BY	APPD	REVISION	DATE

BID SET

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Gray & Osborne, Inc
CONSULTING ENGINEERS

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DRAWN BY	MTM
CHECKED BY	AMP
APPROVAL	EBD
DATE	OCT 2020

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Kenmore, WA 98028-2684

P.O. Box 82489
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CONTRACT 2020-01

LAKE FOREST PARK RESERVOIR AND BOOSTER STATION UPGRADES

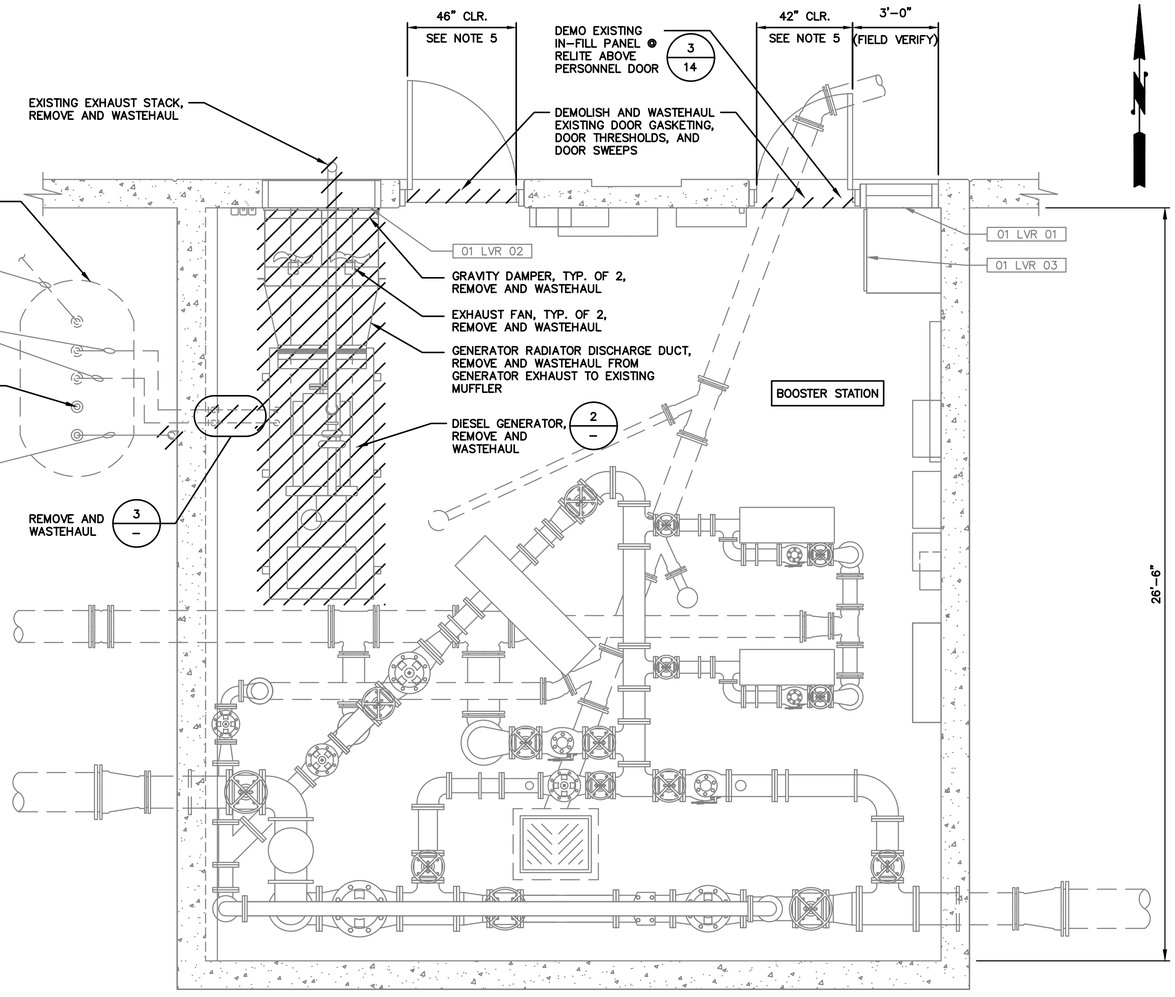
BOOSTER STATION SITE & RESTORATION PLAN

BASE MAP A2

C1502

SHEET

10 *OF* 28



NOTES:

1. FUEL TANK IS BURIED EXTERIOR TO BOOSTER STATION. TANK CONTAINS DIESEL FUEL. TANK CAPACITY IS APPROXIMATELY 300 GALLONS. TANK TO BE DECOMMISSIONED AND ABANDONED IN PLACE WITH CONTROLLED DENSITY FILL (CDF) IN ACCORDANCE WITH ALL FEDERAL, STATE, AND LOCAL REGULATIONS AND SPECIFICATION SECTION 13250. CONTRACTOR TO COMPLETE AND SUBMIT ALL REQUIRED NOTICES, CHECKLISTS, AND APPLICATIONS IN ACCORDANCE WITH WAC 173-360A AND KING COUNTY FIRE PROTECTION DISTRICT NO. 16.
2. DECOMISSIONING AND PERMANENT CLOSURE ACTIVITIES SHALL BE CONDUCTED BY AN UNDERGROUND STORAGE TANK DECOMMISSIONER AND SITE ASSESSOR AS CERTIFIED BY THE INTERNATIONAL CODE COUNCIL. EMPTY AND CLEAN TANK AND PIPING OF ALL LIQUID AND ACCUMULATED SLUDGE. TANK TO BE INERTED OF FLAMMABLE VAPORS, AS DIRECTED BY CODE. PIPING, EXCEPT ANY VENT LINES, SHALL BE DRAINED AND CAPPED. REMOVE AND WASTEHAUL VENT LINE MUST REMAIN CONNECTED UNTIL THE TANK IS PURGED OR INERTED OF FLAMMABLE VAPORS. REMOVE AND WASTEHAUL VENT AND PIPING ONCE COMPLETE. ANY DISTURBED AREA SHALL BE RESTORED TO EXISTING CONDITIONS.
3. SEE ELECTRICAL SHEETS FOR ADDITIONAL DEMOLITION WORK.
4. EXHAUST FAN & LOUVER HAVE GRAVITY DAMPER SYSTEM. REMOVE AND WASTEHAUL WITH FANS.
5. APPROXIMATE CLEAR WIDTH WITH DOOR REMOVED. CONTRACTOR TO FIELD VERIFY.

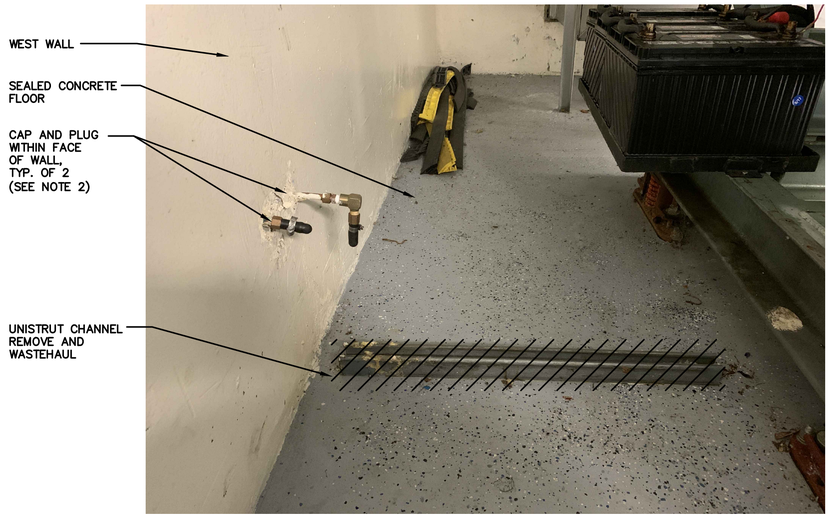
1/– **EXISTING BUILDING AND DEMOLITION PLAN**
SCALE: 3/8"=1'-0"

SEE ELECTRICAL SHEETS FOR ADDITIONAL INFORMATION. ELECTRICAL SHEETS GOVERN FOR DEMOLITION WORK.

NOTES:

1. PHOTO IS TAKEN WITHIN THE LAKE FOREST PARK BOOSTER STATION LOOKING NORTHWEST.
2. REMOVE AND WASTEHAUL EXISTING GENERATOR, SKID, ISOLATION PADS, FLEX CONDUIT, EXHAUST SYSTEM, DUCTWORK, FANS, AND SUPPORTS. GENERATOR WEIGHS APPROXIMATELY 2,200 POUNDS. SKID WEIGHS APPROXIMATELY 1,000 POUNDS.

2/– **GENERATOR DEMOLITION PHOTO DETAIL**
NOT TO SCALE



NOTES:

1. PHOTO IS TAKEN WITHIN THE LAKE FOREST PARK BOOSTER STATION LOOKING NORTH.
2. SAWCUT AND REMOVE EXISTING CONCRETE TO 1-INCHES DEEP APPROXIMATELY 3 TO 4-INCHES CLEAR AROUND EXISTING FUEL LINES. CUT AND PLUG EXISTING FUEL LINES WITHIN EXISTING WALL FACE. PATCH WALL WITH NON-SHRINK GROUT AND PAINT.

3/– **FUEL LINE DEMOLITION AND MODIFICATION PHOTO DETAIL**
NOT TO SCALE

AARON M. PEASE — STATE OF WASHINGTON — 40276 — REGISTERED PROFESSIONAL ENGINEER — 10/14/20

NO	BY	APPD	REVISION	DATE

BID SET

WARNING
0 ½ 1
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Gray & Osborne, Inc
CONSULTING ENGINEERS

DESIGNED BY	MTM
DRAWN BY	MTM
CHECKED BY	AMP
APPROVAL	EBD
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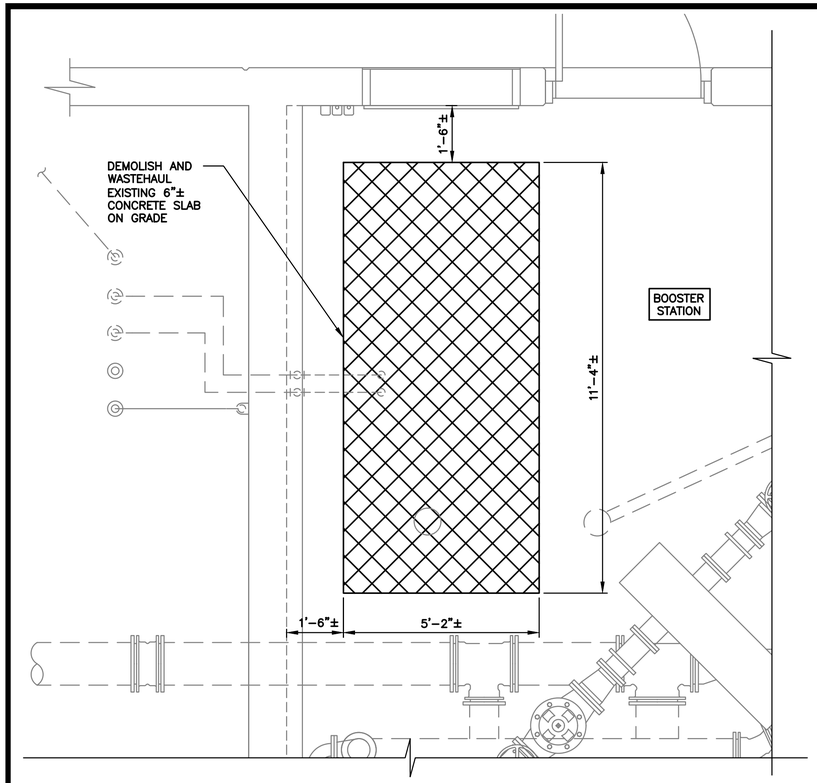
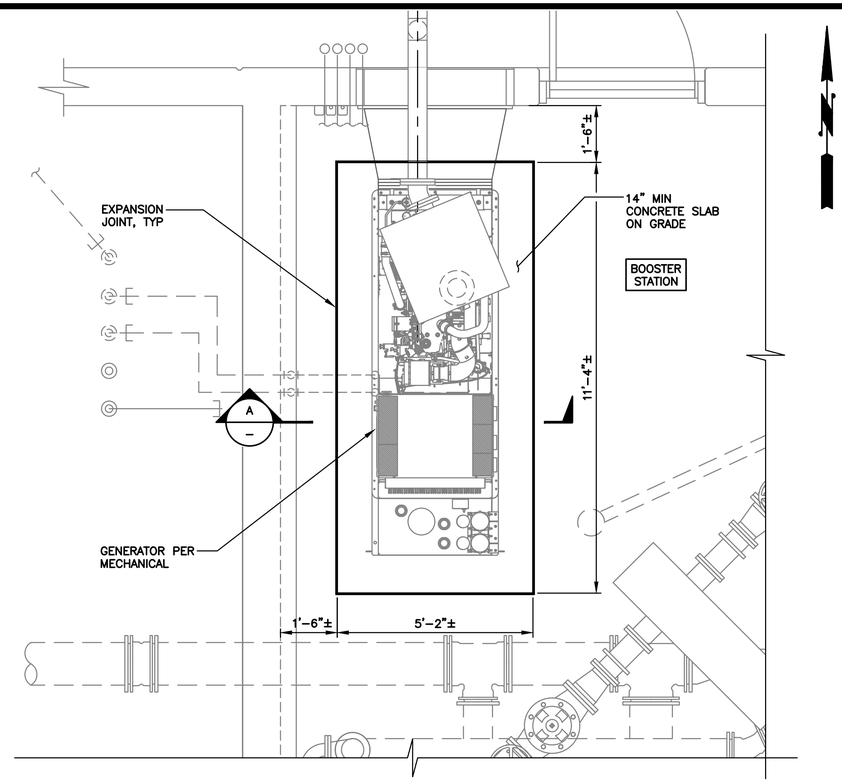
CONTRACT 2020-01
LAKE FOREST PARK RESERVOIR AND BOOSTER STATION UPGRADES

BOOSTER STATION DEMOLITION PLAN AND DETAILS

BASE MAP A2
C1502
SHEET 11 *OF* 28



DEMOLITION PLAN
SCALE: 1/2"=1'-0"



PROPOSED PLAN
SCALE: 1/2"=1'-0"

GENERAL
THE GENERAL CONTRACTOR SHALL VERIFY ALL DIMENSIONS AND SITE CONDITIONS BEFORE STARTING WORK. THE ENGINEER SHALL BE NOTIFIED OF ANY DISCREPANCY. USE DETAIL MARKED "TYPICAL" WHEREVER APPLICABLE. CHANGES, OMISSIONS OR SUBSTITUTIONS ARE NOT PERMITTED WITHOUT WRITTEN APPROVAL OF THE ENGINEER. REFER TO THE SPECIFICATIONS FOR FURTHER REQUIREMENTS. DO NOT SCALE THE DRAWINGS.

ALL MATERIALS AND WORKMANSHIP SHALL CONFORM TO THE 2015 EDITION OF THE INTERNATIONAL BUILDING CODE.

THE DESIGN, ADEQUACY AND SAFETY OF ERECTION BRACING, SHORING, TEMPORARY SUPPORTS, ETC., IS THE SOLE RESPONSIBILITY OF THE CONTRACTOR, AND HAS NOT BEEN CONSIDERED BY THE ENGINEER OF RECORD. THE CONTRACTOR IS RESPONSIBLE FOR THE STABILITY OF THE STRUCTURE PRIOR TO ITS COMPLETION. THE CONTRACTOR SHALL PROVIDE THE NECESSARY BRACING TO PROVIDE STABILITY PRIOR TO THE COMPLETION OF THE STRUCTURE.

THE GENERAL NOTES APPLY TO ALL STRUCTURES UNLESS NOTED OTHERWISE (U.N.O.). LOCATION AND SIZE OF ANCHOR BOLTS FOR SPECIFIC EQUIPMENT SHALL BE SPECIFIED BY THE VENDOR. CONTRACTOR SHALL COORDINATE LOCATIONS OF STRUCTURAL OPENINGS, PENETRATIONS AND EMBEDDED ITEMS WITH THE MECHANICAL, ARCHITECTURAL, ELECTRICAL, PLUMBING AND VENTILATION SECTIONS OF THE DRAWINGS AND WITH SUPPLIERS AND SUBCONTRACTORS AS MAY BE REQUIRED.

SHOP DRAWINGS
SHOP DRAWINGS, WHERE REQUIRED, SHALL BE CHECKED AND APPROVED BY THE GENERAL CONTRACTOR PRIOR TO SUBMITTING FOR ENGINEER REVIEW. SHOP DRAWINGS SHALL BE SUBMITTED TO THE ENGINEER FOR REVIEW OF DESIGN INTENT, PRIOR TO FABRICATION. GENERAL CONTRACTOR IS RESPONSIBLE FOR VERIFICATION AND COORDINATION OF DIMENSIONS AND DETAILS FOR EACH SUBCONTRACTOR.

CAST-IN-PLACE CONCRETE
CONCRETE SHALL HAVE THE FOLLOWING PROPERTIES:
28-DAY STRENGTH f'c=3,500 PSI
AIR ENTRAINMENT: 5%-7%
MAXIMUM SLUMP: 3" FOR SLABS FOOTINGS. CONSTRUCTION TO BE IN ACCORDANCE WITH ACI 318.

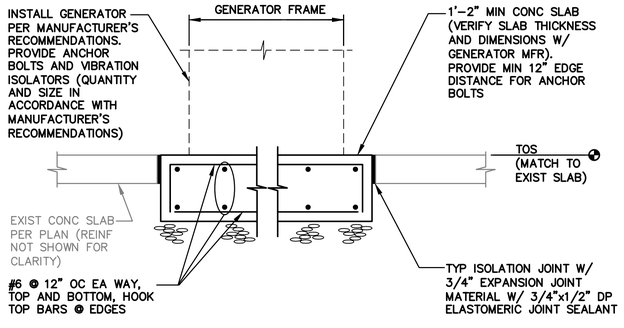
SUBMIT MIX DESIGN FOR REVIEW AND PROVIDE NOT LESS THAN 6 SACKS OF CEMENT PER CUBIC YARD FOR ALL CONCRETE WITH MAXIMUM W/C=0.45.

REINFORCING STEEL
WELDED WIRE FABRIC (W.W.F.): ASTM A82 AND A185
DEFORMED BARS: ASTM A615, GRADE 60 (GRADE 40 FOR #3).
UNLESS OTHERWISE NOTED ON THESE DRAWINGS, MINIMUM CONCRETE COVER FOR REINFORCING BARS SHALL BE AS FOLLOWS:
- CONCRETE CAST AGAINST SOIL=3".
- FORMED CONCRETE AGAINST SOIL=2".
- WALLS, COLUMNS AND BEAMS EXPOSED TO WATER, SEWAGE & WEATHER=2".
- WALLS, COLUMNS AND BEAMS DRY CONDITION=1 1/2".

PROVIDE 2-#5 MIN. U.N.O. TRIM BARS AROUND ALL OPENINGS IN CONCRETE WALLS OR SLAB EXTENDING 2'-6" PAST CORNERS, TYP. AT TIME OF CONCRETE PLACEMENT, REINFORCING SHALL BE FREE OF MUD, OIL, OR OTHER NONMETALLIC COATINGS THAT MAY DECREASE BOND.

WELDING OF REINFORCING BARS SHALL CONFORM TO ANSI/AWS D1.4.
WHERE PERMITTED, LOW HYDROGEN WELDING RODS SHALL BE USED FOR ALL WELDING OF REINFORCING BARS. SPECIAL INSPECTION IS REQUIRED FOR ALL FIELD WELDING.

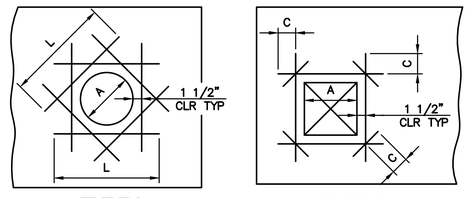
SUBMIT SHOP DRAWINGS OF REINFORCING STEEL FOR REVIEW BY THE ENGINEER PRIOR TO FABRICATION. REINFORCING SHALL BE DETAILED IN ACCORDANCE WITH ACI 315 AND 318 (LATEST EDITION).



A / – **SECTION**
NOT TO SCALE

REINF	LAP
#4	2'-4"
#5	3'-0"
#6	3'-6"
#7	4'-3"
#8	4'-10"
#9	5'-3"
#10	6'-6"
#11	8'-0"

1 / TYP **TYP LAP SCHEDULE**
NOT TO SCALE



TYPE I **TYPE II**

	TYPE I		TYPE II	
OPENING SIZE (A)	MINIMUM BAR LENGTH (L)	BAR SIZE	(C)	BAR SIZE
0" – 12"	3' – 9"	#5	1' – 0"	MATCH VERTICAL BARS OR LARGEST BAR IN SLABS OR WALKWAYS
13" – 18"	4' – 9"	#6	1' – 3"	
19" – 24"	6' – 9"	MATCH VERTICAL BARS OR LARGEST BAR IN SLABS OR WALKWAYS	2' – 6"	
25" – 36"	7' – 9"		2' – 6"	
36" ———	8' – 9"		2' – 6"	

NOTE:
ALL BARS, EACH FACE. USE THESE BAR SIZES UNLESS OTHERWISE NOTED.

2 / TYP **TYP PENETRATION REINFORCING DETAIL**
NOT TO SCALE

AYRON J. BASDEN — STATE OF WASHINGTON — 46334 — STRUCTURAL ENGINEER — PROFESSIONAL ENGINEER
10/14/2020

NO	BY	APPD	REVISION	DATE

BID SET

WARNING
0 ½ 1
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Gray & Osborne, Inc
CONSULTING ENGINEERS

DESIGNED BY	MJB
DRAWN BY	RAH
CHECKED BY	MJB
APPROVAL	MJB
DATE	OCT 2020

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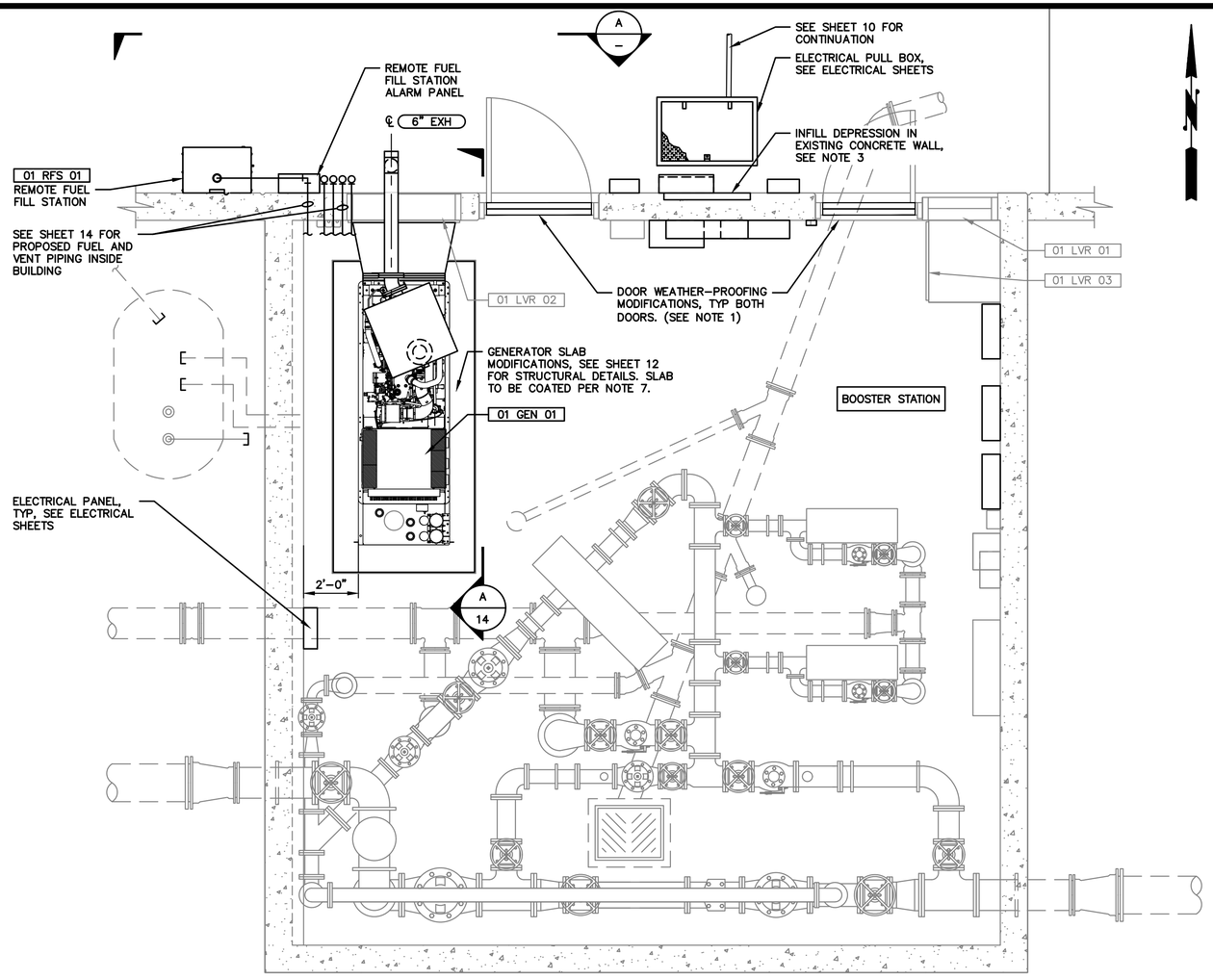
6830 NE 185th St. Kenmore, WA 98028-2684
P.O. Box 82489 Kenmore, WA 98028-2684
Ph: (425) 398-4400 | Fax: (425) 398-4430 | www.nud.net

CONTRACT 2020-01
LAKE FOREST PARK RESERVOIR AND BOOSTER STATION UPGRADES

CONCRETE SLAB DEMOLITION & PROPOSED PLANS AND DETAILS

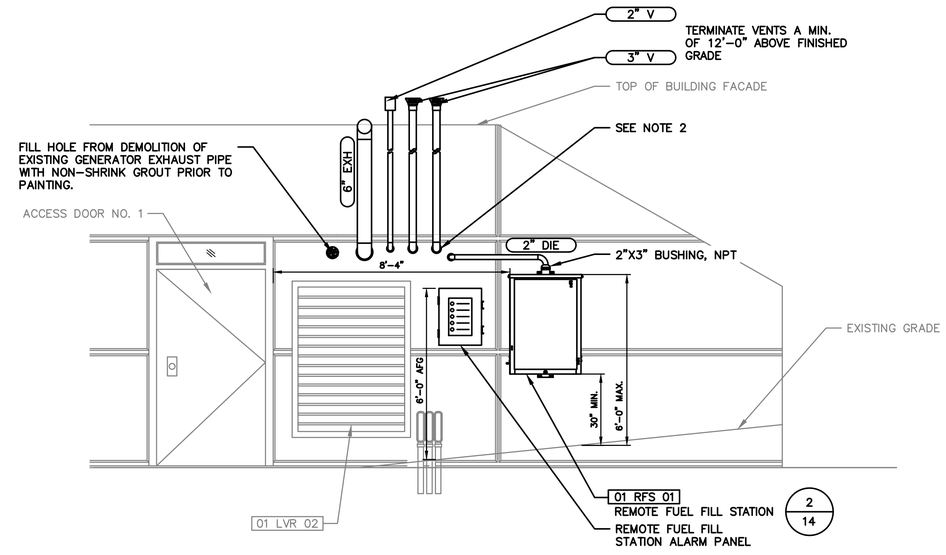
BASE MAP A2
C1502
SHEET 12 *OF* 28



1 – **PROPOSED BUILDING PLAN**
SCALE: 3/8"=1'–0"

NOTES:

1. DOOR WEATHER PROOFING MODIFICATIONS SHALL INCLUDE NEW THRESHOLDS, NEW DOOR SWEEP BOTTOMS, AND NEW DOOR GASKETING AS LISTED BELOW:
   a. THRESHOLDS – PEMKO #2715A, OR EQUAL
   b. DOOR SWEEPS – PEMKO #210APK, OR EQUAL
   c. DOOR GASKETING – PEMKO #290AS AND #2891AS, OR EQUAL
   d. FINISH – ALUMINUM MILL FINISH
2. PROVIDE 2–4" CORE DRILLS FOR 2 – (3" V) . PROVIDE 2–3" CORE DRILLS FOR (2" V) AND (2" DIE). SEAL WITH NON–SHRINK GROUT.
3. APPLY EPOXY BONDING AGENT TO EXISTING SURFACES AND FILL DEPRESSION WITH QUIKRETE CRACK RESISTANT 4000 PSI CONCRETE OR EQUAL. INSTALL PER MANUFACTURER RECOMMENDATIONS. FINISHED SURFACE OF INFILL SHALL MATCH FINISH OF SURROUNDING EXISTING CONCRETE SURFACES. PRIOR TO INSTALLATION PREPARE EXISTING SURFACES BY REMOVING EXISTING PAINT AND LAITANCE.
4. PAINT ALL EXPOSED SURFACES OF EXTERIOR WALL PER SPECIFICATIONS. APPROXIMATE SURFACE AREA = 540 SF. CONTRACTOR SHALL BE RESPONSIBLE FOR REMOVING ALL EXISTING PAINT THAT IS NOT TIGHTLY ADHERED PRIOR TO SURFACE PREP AND APPLICATION OF NEW COATINGS
5. BOTH DOORS AND FRAMES SHALL BE REPAINTED PER SPECIFICATIONS PRIOR TO THE WEATHER–PROOFING MODIFICATIONS.
6. TOUCH UP INTERIOR PAINT AS REQUIRED FOR PIPE PENETRATIONS. MATCH EXISTING INTERIOR PAINT COLOR.
7. COAT NEW GENERATOR SLAB PER MANUFACTURER RECOMMENDATIONS. COATING SHALL BE THE EPOXYSHIELD SEMI–GLOSS PROFESSIONAL FLOOR COATING KIT IN SILVER GRAY AS MANUFACTURED BY RUST–OLEUM .



A – **SECTION**
SCALE: 3/8"=1'–0"

AARON M. PEASE
STATE OF WASHINGTON
40276
REGISTERED
PROFESSIONAL ENGINEER
10/14/20

NO	BY	APPD	REVISION	DATE

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CONSULTING ENGINEERS

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CHECKED BY	AMP
APPROVAL	EBD
DATE	OCT 2020

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6830 NE 185th St.
Kenmore, WA 98028-2684
P.O. Box 82489
Kenmore, WA 98028-2684
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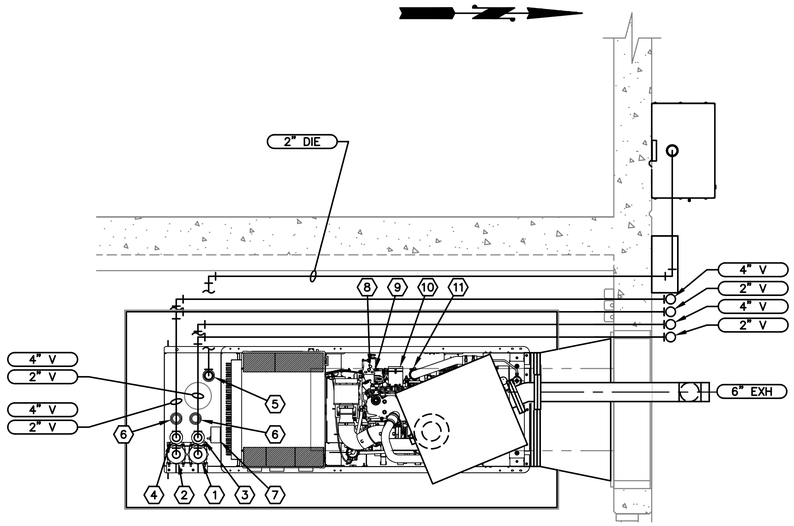
CONTRACT 2020-01
LAKE FOREST PARK RESERVOIR AND BOOSTER STATION UPGRADES

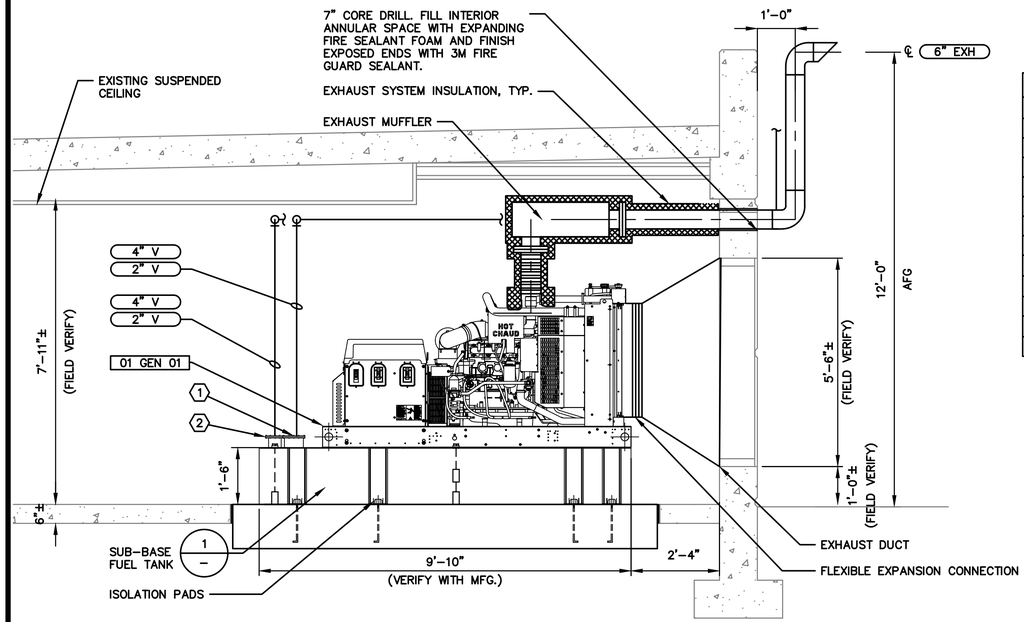
BOOSTER STATION MODIFICATIONS PLAN AND SECTION

BASE MAP A2
C1502
SHEET
13 *OF* 28



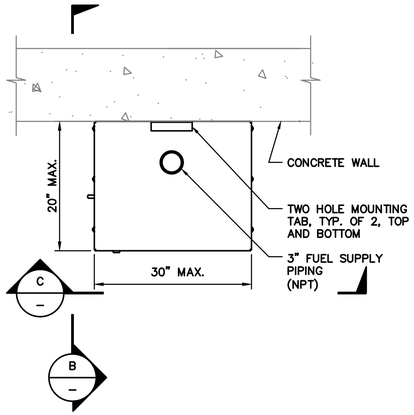
NOTE:
1. PROVIDE PIPE SUPPORTS PER SPECIFICATIONS SECTION 15066.

1/– SUB-BASE TANK CONNECTION DETAIL
SCALE: 1/2"=1'-0"

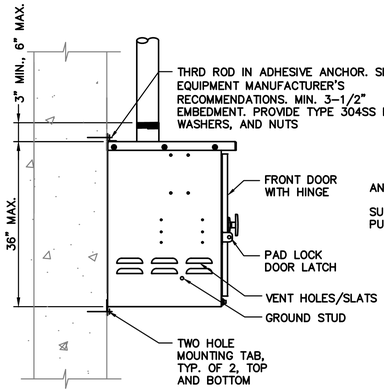


A/13 SECTION
SCALE: 1/2"=1'-0"

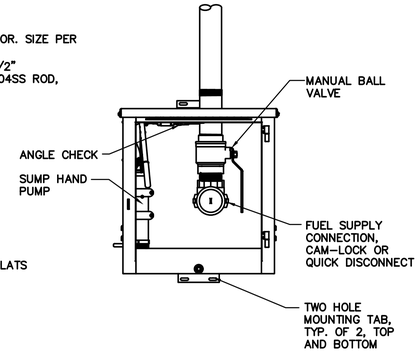
LEGEND	
NO.	DESCRIPTION
1	4" NPT, PRIMARY EMERGENCY TANK VENT
2	4" NPT, SECONDARY EMERGENCY TANK VENT
3	2" NPT, PRIMARY NORMAL TANK VENT
4	2" NPT, SECONDARY NORMAL TANK VENT
5	2" NPT, FUEL FILL INLET
6	2" NPT, SPARE
7	1" NPT, FUEL LEVEL ALARM PANEL
8	1/4" NPT, ENGINE SUPPLY
9	1/4" NPT, ENGINE RETURN
10	1" NPT, LOW FUEL SWITCH
11	1-1/2" NPT, FUEL GAUGE
12	1" NPT, SECONDARY LEAK DETECTION



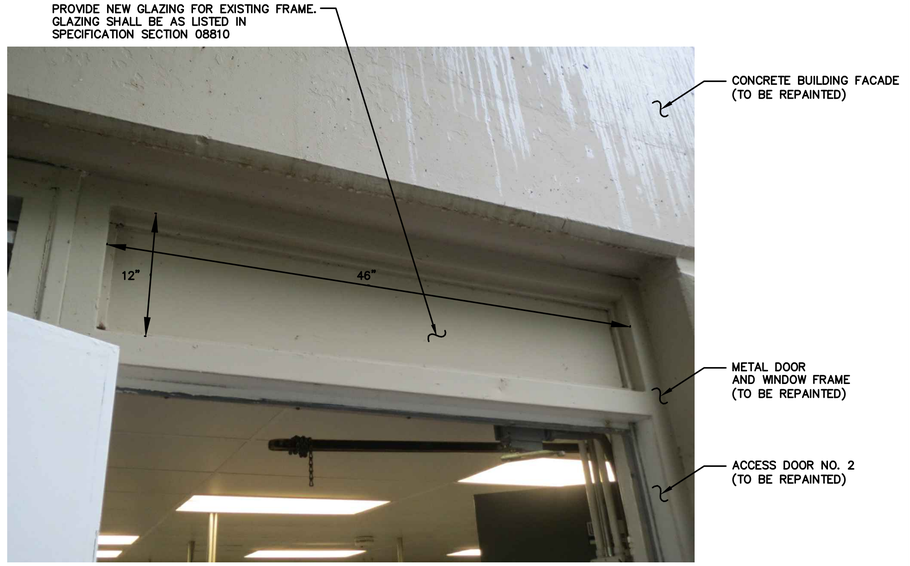
2/– REMOTE FUEL FILL STATION
NOT TO SCALE



B/– SIDE VIEW
NOT TO SCALE



C/– FRONT VIEW (FRONT DOOR REMOVED)
NOT TO SCALE



3/11 GLAZING PHOTO DETAIL
NOT TO SCALE

AARON M. PEASE — STATE OF WASHINGTON — 40276 — REGISTERED PROFESSIONAL ENGINEER — 10/14/20

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BID SET				

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6830 NE 185th St. Kenmore, WA 98028-2684
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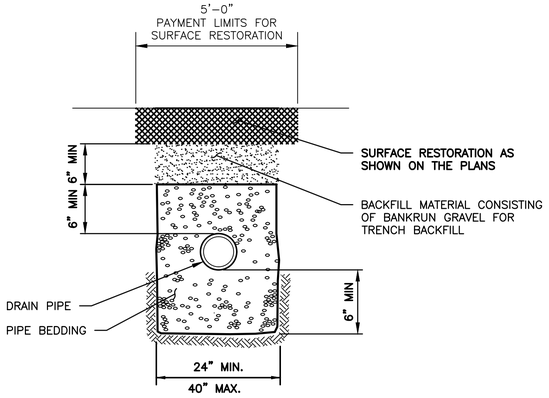
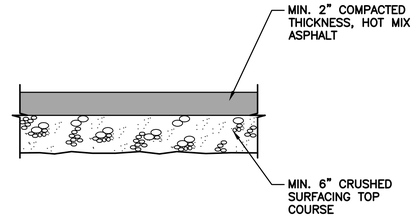
CONTRACT 2020-01
LAKE FOREST PARK RESERVOIR AND BOOSTER STATION UPGRADES

BOOSTER PUMP STATION MODIFICATIONS SECTIONS AND DETAILS

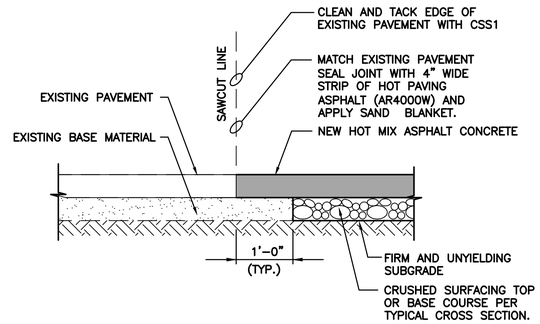
BASE MAP A2
C1502
SHEET 14 *OF* 28



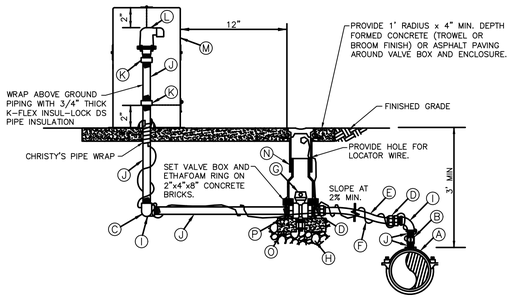
1/10 **TYPICAL TRENCH SECTION AND PAYMENT LIMITS**
NOT TO SCALE



2/10 **ASPHALT PAVING DETAIL**
NOT TO SCALE



3/10 **ASPHALT PAVING BUTT JOINT DETAIL**
NOT TO SCALE



MATERIAL LIST:

ITEM	QTY.	DESCRIPTION
Ⓐ	1	SADDLE: ALL SADDLES SHALL BE DUCTILE IRON CASTING WITH IP THREADS. FOR ALL PIPE MATERIAL OTHER THAN PVC PIPE, SADDLES SHALL BE SINGLE STRAP TYPE EQUAL TO FORD FC101, ROMAC 101NS, MUELLER DR1S, OR DISTRICT APPROVED EQUAL. FOR PVC PIPE, SADDLES SHALL BE DOUBLE STRAP TYPE EQUAL TO MUELLER DR2S, FORD FCD202, OR ROMAC 202NS.
Ⓑ	1	2" BALL VALVE FIPxFIP, FORD #B11-777-NL OR EQUAL.
Ⓒ	1	2" 90° BRASS ELBOW, FIPxFIP.
Ⓓ	2	2" ADAPTER, MIPxPACK JOINT, FORD #C86-44-NL WITH STIFFENER, FORD INSERT-75, A.Y. MCDONALD 6136-2", OR MUELLER 529117, OR EQUAL FOR SIDR 7, 250 PSI PIPE.
Ⓔ	1	2" POLYETHYTLENE PIPE PER THE SPECIFICATIONS. SIDR 7, 250 PSI RATING, LENGTH TO FIT. ALL POLYETHYLENE PIPE INSTALLED BY OPEN-CUT CONSTRUCTION SHALL BE BEDDED IN SAND, 4" OVER AND UNDER. IF THE DISTANCE BETWEEN BALL VALVES IS LESS THAN 5', A BRASS NIPPLE, LENGTH TO FIT, WITH BRASS FITTINGS, AS REQUIRED, WILL BE ALLOWED.
Ⓕ	1	TRACER WIRE PER THE SPECIFICATIONS. BLUE 14 GAUGE POLYETHYLENE INSULATED COPPER. CONTINUOUS FROM MAINLINE.
Ⓖ	1	2" BALL VALVE, FIPxFIP, CAMBRIDGE BRASS #203NL-F7F7W WITH 2" OPERATING NUT, FORD #QT-67.
Ⓗ		WASHED GRAVEL, PASSING 1 1/2" AND RETAINED ON 1/4" MESH.
Ⓘ	2	STREET ELBOW, FIPxMIP.
Ⓙ	5	2" BRASS NIPPLE, LENGTH TO FIT.
Ⓚ	1	2" BRASS COUPLING, FIPxFIP.
Ⓛ	1	AIR/VACUUM RELIEF VALVE, A.R.I. #D-040-C-2".
Ⓜ	1	INSULATED FIBERGLASS ENCLOSURE. HUBBELL POWER SYSTEMS HOT BOX® VENT GUARD #AVG1824 GREEN.
Ⓝ	1	TWO-PIECE, CAST IRON VALVE BOX AND ETHAFOAM RING PER THE SPECIFICATIONS AND STANDARD WATER DETAIL #11.
Ⓞ	2	4"x8"x16" CONCRETE BLOCK.
Ⓟ	2	2"x4"x8" CONCRETE BRICK, ONE ON EITHER SIDE OF THE BALL VALVE TO SUPPORT ETHAFOAM RING.

NOTES:

1. THE LOCATION OF THE ASSEMBLY AS SHOWN ON THE PLANS IS APPROXIMATE ONLY. THE FINAL LOCATION SHALL BE AT THE LOCAL HIGH POINT OF THE WATER MAIN AS DIRECTED BY THE DISTRICT IN THE FIELD DURING CONSTRUCTION.
2. 2" BALL VALVE SHALL BE INSTALLED PER THE DIRECTIONAL ARROW STAMPED ON VALVE BODY. THE DRAIN PORT IS TO DISCHARGE INTO THE WASHED ROCK.
3. ALL POLYETHYLENE PIPE TO PACK JOINT CONNECTIONS REQUIRE A PIPE STIFFENER.

4/5 **2-INCH AIR VAC DETAIL**
NOT TO SCALE

ERIC B. DELFEL
STATE OF WASHINGTON
40195
REGISTERED
PROFESSIONAL ENGINEER
10/14/2020

NO	BY	APPD	REVISION	DATE

BID SET

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CHECKED BY	MTM
APPROVAL	EBD
DATE	OCT 2020

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P.O. Box 82489 Kenmore, WA 98028-2684
Ph: (425) 398-4400 | **Fax:** (425) 398-4430 | **www.nud.net**

CONTRACT 2020-01
LAKE FOREST PARK RESERVOIR AND BOOSTER STATION UPGRADES

DETAILS

BASE MAP A2
C1502
SHEET
15 *OF* 28

ABBREVIATIONS

A	AMPERE (AMP)
AC	ALTERNATING CURRENT
AF	BREAKER FRAME SIZE (IN AMPS)
AI	ANALOG INPUT
AL	ALUMINUM
AM	AMMETER
AO	ANALOG OUTPUT
AT	BREAKER TRIP (SETTING IN AMPS)
ATS	AUTOMATIC TRANSFER SWITCH
AWG	AMERICAN WIRE GAUGE
BATT	BATTERY
BKR	BREAKER
CP	CONTROL PANEL
CPT	CONTROL POWER TRANSFORMER
CST	CONTROL STATION
CT	CURRENT TRANSFORMER
CU	COPPER
DC	DIRECT CURRENT
DI	DISCRETE INPUT
DIST	DISTRIBUTION
DO	DISCRETE OUTPUT
DTWV	DISCHARGE–TO–WASTE VALVE
EIOM	EXTENDED I/O MODULE
ETC	ELAPSED TIME/COUNTER METER
ETM	ELAPSED TIME METER
ENCL	ENCLOSURE
EXIST	EXISTING
FDR	FEEDER
FLA	FULL LOAD AMPS
FU	FUSE
FVNR	FULL VOLTAGE NON REVERSING
FVR	FULL VOLTAGE REVERSING
FY	FLOW COMPUTATION
G	GROUND CONDUCTOR
GEC	GROUNDING ELECTRODE CONDUCTOR
GFCI	GROUND FAULT CIRCUIT INTERRUPTER
GND	GROUND
H	HORN
HA	HAND–AUTO
HIM	HUMAN INTERFACE MODULE
HMI	HUMAN MACHINE INTERFACE
HOA	HAND–OFF–AUTO
HOR	HAND–OFF–REMOTE
HP	HORSEPOWER
IC	INTERRUPTING CAPACITY
JCXXX	JUNCTION BOX, CONTROL
JPXXX	JUNCTION BOX, POWER
JSXXX	JUNCTION BOX, SIGNAL
kA	KILOAMPERES
kAIC	KILOAMPERES–INTERRUPTING CAPACITY
KCM	THOUSAND CIRCULAR MILLS
kV	KILOVOLT
kVA	KILOVOLT–AMPERE
kVAh	KILOVOLT–AMPERE HOUR
kVAR	KILOVAR (REACTIVE KILOVOLT–AMPERE)
KVARh	KILOVAR–HOUR
kW	KILOWATT
kWh	KILOWATT–HOUR
LA	LIGHTNING ARRESTOR
LAN	LOCAL AREA NETWORK
LFMC	LIQUIDTIGHT FLEXIBLE METAL CONDUIT
LINE	POWER LINE/POWER BLOCK
LV	LOW VOLTAGE
M	MAGNETIC CONTACTOR
mA	MILLIAMPERES
MCC	MOTOR CONTROL CENTER
MCM	THOUSAND CIRCULAR MILLS
MCP	MOTOR CIRCUIT PROTECTOR
MOV	METAL OXIDE VARISTOR
MS	MOTOR STARTER
MSDS	MOTOR SAFETY DISCONNECT SWITCH
MTS	MANUAL TRANSFER SWITCH
MTU	MASTER TELEMETRY UNIT
mV	MILLIVOLT
MW	MEGAWATT
N	NEUTRAL CONDUCTOR
NEC	NATIONAL ELECTRICAL CODE
NEMA	NATIONAL ELECTRIC MANUFACTURERS ASSOC.
NESC	NATIONAL ELECTRICAL SAFETY CODE
NFPA	NATIONAL FIRE PROTECTION AGENCY
OCPD	OVERCURRENT PROTECTION DEVICE
OE	OVERHEAD ELECTRIC
OIU	OPERATOR INTERFACE UNIT
OL	OVERLOAD, THERMAL
OLR	OVERLOAD RELAY
P	POLE
PF	POWER FACTOR
PH	PHASE
PLC	PROGRAMMABLE LOGIC CONTROL
PMR	PHASE MONITOR RELAY
PMU	POWER MONITOR UNIT
POT	POTENTIOMETER
PVC	POLYVINYL CHLORIDE CONDUIT
RGS	RIGID GALVANIZED STEEL CONDUIT
RVSS	REDUCED–VOLTAGE SOFT START
RMC	RIGID METALLIC CONDUIT
RNC	RIGID NONMETALLIC CONDUIT
RTU	REMOTE TELEMETRY UNIT
s	SECOND
SHD	SHIELDED
SPD	SURGE PROTECTION DEVICE
SS	STAINLESS STEEL
SUSE	SUITABLE FOR USE AS A SERVICE ENTRANCE
TB	TERMINAL BLOCK
TDAD	TIME DELAY AFTER DE–ENERGIZATION
TDAE	TIME DELAY AFTER ENERGIZATION
TQS	TORQUE SWITCH
TP/TSP	TWISTED PAIR/TWISTED SHIELDED PAIR
TST/TT	TWISTED SHIELDED TRIAD/TWISTED TRIAD
T/M	THERMAL MAGNETIC
UPS	UNINTERRUPTIBLE POWER SUPPLY
V	VOLT
VA	VOLT–AMPERE
VFD	VARIABLE FREQUENCY DRIVE
VMR	VOLTAGE MONITORING RELAY
W	WATT
WAN	WIDE AREA NETWORK
Wh	WATT–HOUR
WP	WEATHER PROOF
XFMR	POWER TRANSFORMER

SYMBOL LEGEND

ONE LINE SYMBOLS

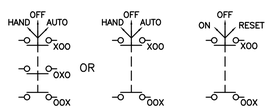
- CAPACITOR
- REACTOR/CHOKE
- M — CIRCUIT BREAKER, MAGNETIC ONLY
- T/M — CIRCUIT BREAKER, THERMAL–MAGNETIC
- CONNECTION POINT
- CONTACTOR
- CURRENT TRANSFORMER
- FUSE
- FUSIBLE DISCONNECT
- AM — ANALOG AMMETER
- THERMAL OVERLOAD RELAY
- GROUND EQUIPMENT/CHASSIS
- S/N — SOLID NEUTRAL
- TRANSFORMER

PLAN SYMBOLS

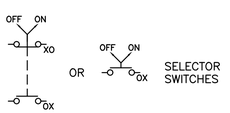
- CONDUIT DOWN
- CONDUIT UP
- CONDUIT STUB UP/END CAP
- DISCONNECT SWITCH
- F — FUSED DISCONNECT SWITCH
- COMMUNICATION OUTLET
- TELEPHONE OUTLET
- SPECIAL OUTLET
- SIMPLEX RECEPTACLE
- DUPLEX RECEPTACLE
- DUPLEX RECEPTACLE (HIDDEN)
- QUAD RECEPTACLE
- QUAD RECEPTACLE (HIDDEN)
- FLOOR MOUNTED RECEPTACLE
- OR — SINGLE / DUAL — LED LIGHT POLES
- #12 AWG GROUND CONDUCTOR
- #12 AWG NEUTRAL CONDUCTOR
- #12 AWG BRANCH CONDUCTOR
- CROSSMARKS INDICATE QUANTITY AND USE OF CONDUCTORS
- S x — LIGHT SWITCH; X = 3 = 3–WAY, 4 = 4–WAY, K = KEY, M = MOTION
- SEAL OFF
- X — MOTOR X = HORSE POWER
- XX — XX= CV CHECK VALVE; FE FLOW ELEMENT; FI FLOW INDICATOR; FIT FLOW INDICATOR/TRANSMITTER; FS FLOW SWITCH; FT FLOW TRANSMITTER; HD HEAT DETECTOR; IS INTRUSION SWITCH; J JUNCTION BOX; L LIMIT SWITCH; LE LEVEL ELEMENT; LI LEVEL INDICATOR; LIT LEVEL INDICATOR/TRANSMITTER; LS LEVEL SWITCH/FLOAT; LT LEVEL TRANSDUCER; MDT MOTION DETECTOR; MFM MAGNETIC FLOW METER; MOV MOTOR OPERATOR VALVE; PC PHOTO CELL; PE PRESSURE ELEMENT; PI PRESSURE INDICATOR; PIT PRESSURE INDICATOR TRANSMITTER; PS PRESSURE SWITCH; PT PRESSURE TRANSMITTER; SD SMOKE DETECTOR; SV SOLENOID VALVE; T THERMOSTAT

ELEMENTARY WIRING DIAGRAM SYMBOLS

- CONNECTION POINT
- TERMINAL POINT
- SCREW TERMINAL
- MOUNTED ON OUTER DOOR
- MOUNTED ON INNER DOOR
- LOCKABLE DEVICE
- NC CONTACT
- NC CONTACTOR
- NO CONTACT
- NO CONTACTOR
- SSR — SOLID STATE CONTACTOR
- ALT — ALTERNATING RELAY
- CR — CONTROL RELAY
- C — CONTACTOR
- C BP — "BYPASS" CONTACTOR
- C IC — "ISOLATION" CONTACTOR
- C SS — SOLID STATE CONTACT RELAY
- M — MOTOR RELAY
- TR — TIME DELAY RELAY (TDAE)
- TR — TIME DELAY RELAY (TDAD)
- X — LIGHT FIXTURE; X = REFERENCE LIGHTING SCHEDULE IF APPLICABLE
- L X — "PUSH TO TEST" LED PILOT LIGHT; A = AMBER, B = BLUE, G = GREEN, R = RED, W = WHITE
- FUSE
- FUSED SWITCH W/ LED
- TDAE, N.O., TIME DELAY CLOSE, INSTANTANEOUS RE–OPEN
- TDAE, N.C., TIME DELAY OPEN, INSTANTANEOUS RE–CLOSE
- TDAD, N.O., INSTANTANEOUS CLOSE, TIME DELAY RE–OPEN
- TDAD, N.C., INSTANTANEOUS OPEN, TIME DELAY RE–CLOSE
- N.O. TOGGLE SPST SWITCH
- N.C. TOGGLE SPST SWITCH
- N.O. TEMPERATURE SWITCH
- N.C. TEMPERATURE SWITCH
- N.O. PRESSURE SWITCH
- N.C. PRESSURE SWITCH
- N.O. LIMIT SWITCH
- N.C. LIMIT SWITCH
- N.O. FLOW SWITCH
- N.C. FLOW SWITCH
- N.O. FLOAT SWITCH
- N.C. FLOAT SWITCH
- N.O. DIFFERENTIAL PRESSURE SWITCH
- N.C. DIFFERENTIAL PRESSURE SWITCH
- N.O. PUSHBUTTON
- N.C. PUSHBUTTON
- N.O. MUSHROOM PUSHBUTTON
- N.C. MUSHROOM PUSHBUTTON



HAND–OFF–AUTO SWITCHES — ON–OFF–RESET SWITCH



SELECTOR SWITCHES

- GROUND EQUIPMENT/CHASSIS
- GROUND, ISOLATED
- RESISTOR
- POTENTIOMETER
- SOLENOID VALVE COIL
- METAL OXIDE VARISTOR (MOV)
- TRANSFORMER WINDING/REACTOR/CHOKE
- LIGHT EMITTING DIODE
- OR — DIODE
- GFCI DUPLEX OUTLET
- DUPLEX OUTLET

GENERAL SYMBOLS

- XXXXX — CONDUIT
- XX XXXX XX — TAG LABEL
- GFCI — GFCI PANELBOARD CIRCUIT
- X — AREA ID TAG
- DEMOLITION (DEMO)
- INTRINSICALLY SAFE AREA
- CLEARANCE AREA

LINETYPES

- EXPOSED CONDUIT
- UNDERGROUND (BURIED) CONDUIT
- GROUNDING ELECTRODE CONDUCTORS
- EMBEDDED CONDUIT (WALLS, CONCRETE, ETC.)

NOTE: UNLESS NOTED OTHERWISE.

NOTE:
THIS IS A GENERAL LEDGER SHEET. ALL SYMBOLS MAY NOT APPLY.

GENERAL ELECTRICAL NOTES:

SITE AND BUILDING PLANS:

1. CONDUIT ROUTING IS SHOWN SCHEMATICALLY. ACTUAL ROUTING MAY BE MORE DIRECT AND IS LEFT TO THE CONTRACTOR FOLLOWING SPECIFICATIONS 16130. NON–ELECTRICAL BURIED PIPING HAS ROUTING PRIORITY OVER ELECTRICAL BURIALS.
2. ALL TRENCHING SHALL BE PER ELECTRICAL TRENCHING DETAIL (1/28).
3. THE CONTRACTOR SHALL PROTECT EXISTING UTILITIES.
4. THROUGHOUT THIS DOCUMENT, THE TERMS "DEMO", "DEMOLISH", AND "REMOVE" MEAN TO REMOVE, THEN WASTEHAUL OR RETURN TO THE OWNER, PER THE OWNER'S DIRECTION.

GENERAL CONTROL PANEL NOTES:

1. UNLESS SPECIFICALLY NOTED OTHERWISE ON THE CONTROL PANEL DETAILS, THE FOLLOWING NOTES APPLY.
   - 1.1 ALL ENCLOSURES SHALL BE PROVIDED WITH AN ENGRAVED PHENOLIC NAMEPLATE, RED WITH WHITE LETTERING CORRESPONDING TO THE ASSOCIATED TAG ID NUMBER AND TAG DESCRIPTION.

TAG DESCRIPTION ← 1/4" TEXT
[TAG NUMBER] ← 3/16" TEXT

INDOOR INSTALLATIONS:

1. ALL EXPOSED PORTIONS OF CONDUITS FROM UNDERGROUND SHALL BE RGS. ALL OVERHEAD CONDUITS SHALL BE IMC.
2. PANELS MOUNTED ON INTERIOR WALLS SHALL BE SUPPORTED TO THE WALL WITH 1/2–INCH (MINIMUM) GALVANIZED UNISTRUT.

PULLBOX/VAULT/OUTDOOR INSTALLATIONS:

1. ALL MOUNTING FASTENERS (NUTS, BOLTS SCREWS, WASHERS, ETC.) SHALL BE 316 STAINLESS STEEL.
2. ALL MOUNTING BRACKETS AND BRACING SHALL BE 316L STAINLESS STEEL.
3. ALL EXPOSED PORTIONS OF CONDUITS SHALL BE PVC–COATED RGS UNLESS SPECIFICALLY NOTED OTHERWISE.
4. ALL CONNECTIONS INTO ENCLOSURES SHALL BE WATERTIGHT, MADE INTO THE BOTTOM OF THE PANELS, USING MYERS–TYPE HUBS. REFERENCE SPECIFICATION 16130.
5. PANELS MOUNTED ON VERTICAL WALLS SHALL BE SUPPORTED TO THE WALL WITH 1/2–INCH (MINIMUM) 316L STAINLESS STEEL UNISTRUT.
6. ENCLOSURE SHALL INCLUDE WELDED MOUNTING TABS. HOLES SHALL NOT BE DRILLED THROUGH ENCLOSURE SURFACES FOR MOUNTING PURPOSE.

CABLE AND CONDUIT NOTES:

1. REFERENCE SPECIFICATION 16120 FOR CONDUCTORS, INSTRUMENTATION, COMMUNICATION, AND OTHER SPECIAL CABLES AND CONDUCTORS.
2. REFERENCE SPECIFICATION 16130 FOR RACEWAYS, BOXES, AND JUNCTION BOX TYPES, AND HANDHOLE, PULLBOX, AND VAULT CONDUIT INSTALLATION METHODS.
3. CONDUIT NUMBERS ARE FORMATTED AS:

   TAANN(S) WHERE: T = TYPE (P=POWER; C=CONTROL; S=SIGNAL/INSTRUMENTATION)
   AA= AREA NUMBER (01–99)
   NN= CONDUIT NUMBER WITHIN THE AREA (01–99)
   S = SPARE CONDUIT (~ "TILDE") (IF APPLICABLE)

   P0319~ = AREA 03 POWER CONDUIT NO. 19, SPARE
   C0112 = AREA 01 CONTROL CONDUIT NO. 12
   S0521~ = AREA 05 INSTRUMENTATION CONDUIT NO. 21, SPARE
4. CABLE AND CONDUIT SCHEDULES:
   - 4.1. THE CABLE AND CONDUIT SCHEDULE PROVIDES CONDUIT NUMBER, SOURCE, DESTINATION, AND SIZE AS WELL AS CONDUCTOR AND CABLE REQUIREMENTS. REFERENCE SPECIFICATION 16130 FOR CONDUIT COMPOSITION AND COATING.
   - 4.2. CONDUITS MARKED WITH "* N" (WHERE N = 1, 2, OR 3) SHALL BE 100% CONTINUOUS PER SPECIFICATION 16130.

     SPECIFICALLY, CONDUITS MARKED WITH:

     "* 1" NOT USED.

     "* 2" NOT USED.

     "* 3" DENOTE INSTRUMENTATION CIRCUITS THAT ARE NOT INTRINSICALLY SAFE. IF THESE CONDUITS ENTER A PULLBOX, THEN THEY MUST CONNECT TO A "TYPE 3" J–BOX INSIDE THE PULLBOX.
5. REGARDLESS OF THE TYPE OF CONDUIT BEING ROUTED TO A MOTOR, THE LAST 18 INCHES OF THE CONDUIT CONNECTING TO THE MOTOR SHALL BE LFMC.

READING ELECTRICAL SHEETS:

ELEMENTARY DIAGRAMS:

1. ELEMENTARY DIAGRAMS ARE SHOWN IN LADDER LOGIC FORM WITH LINE NUMBERS FORMATTED AS:

   SS.LL WHERE SS = SHEET NUMBER AND LL = LINE NUMBER
2. RELAY COIL "TYPES" ARE INDICATED INSIDE THE COIL SYMBOL AS PER THE SYMBOL SCHEDULE ON THIS SHEET. THE COIL NUMBER IS OF THE FORMAT:

   TTSS.LL.AA WHERE TT = RELAY TYPE (PER SYMBOL SCHEDULE); SS.LL = AS DESCRIBED ABOVE; AA = ASSOCIATION WITH A DRIVE, CONTROLLER, CONTROL PANEL, ETC.
3. RELAY CONTACTS ARE NUMBERED IN ASSOCIATION WITH THEIR COILS FOLLOWED BY "–X" WHERE X IS THE CONTACT POLE NUMBER.

   EXAMPLE: RELAY CONTACTS FOR A DPDT RELAY

POLE NUMBER	N.O. CONTACT REFERENCE	N.C. CONTACT REFERENCE
1:	12.40	NA\
2:	13.04	13.05\

   (\ = LINE NUMBER / SHEET NUMBER)

   N.O. = NORMALLY OPEN CONTACT
   N.C. = NORMALLY CLOSED CONTACT.
4. CONTACTS AND ANALOG SIGNALS CONNECTED TO PLC I/O ARE FORMATTED AS:

   *RR:SS:CC WHERE * DENOTES A PLC I/O CONNECTION; RR = PLC RACK NUMBER; SS = RACK SLOT NUMBER; CC = SLOT CHANNEL NUMBER

   *TT:CC WHERE * DENOTES A PLC I/O CONNECTION; TT = I/O TYPE: AI = ANALOG INPUT, AO = ANALOG OUTPUT, DI = DIGITAL INPUT, DO = DIGITAL OUTPUT; CC = EMBEDDED CHANNEL NUMBER

SHEET INDEX

JASON R. NEWQUIST — STATE OF WASHINGTON — 45311 — REGISTERED PROFESSIONAL ENGINEER — 10/14/20

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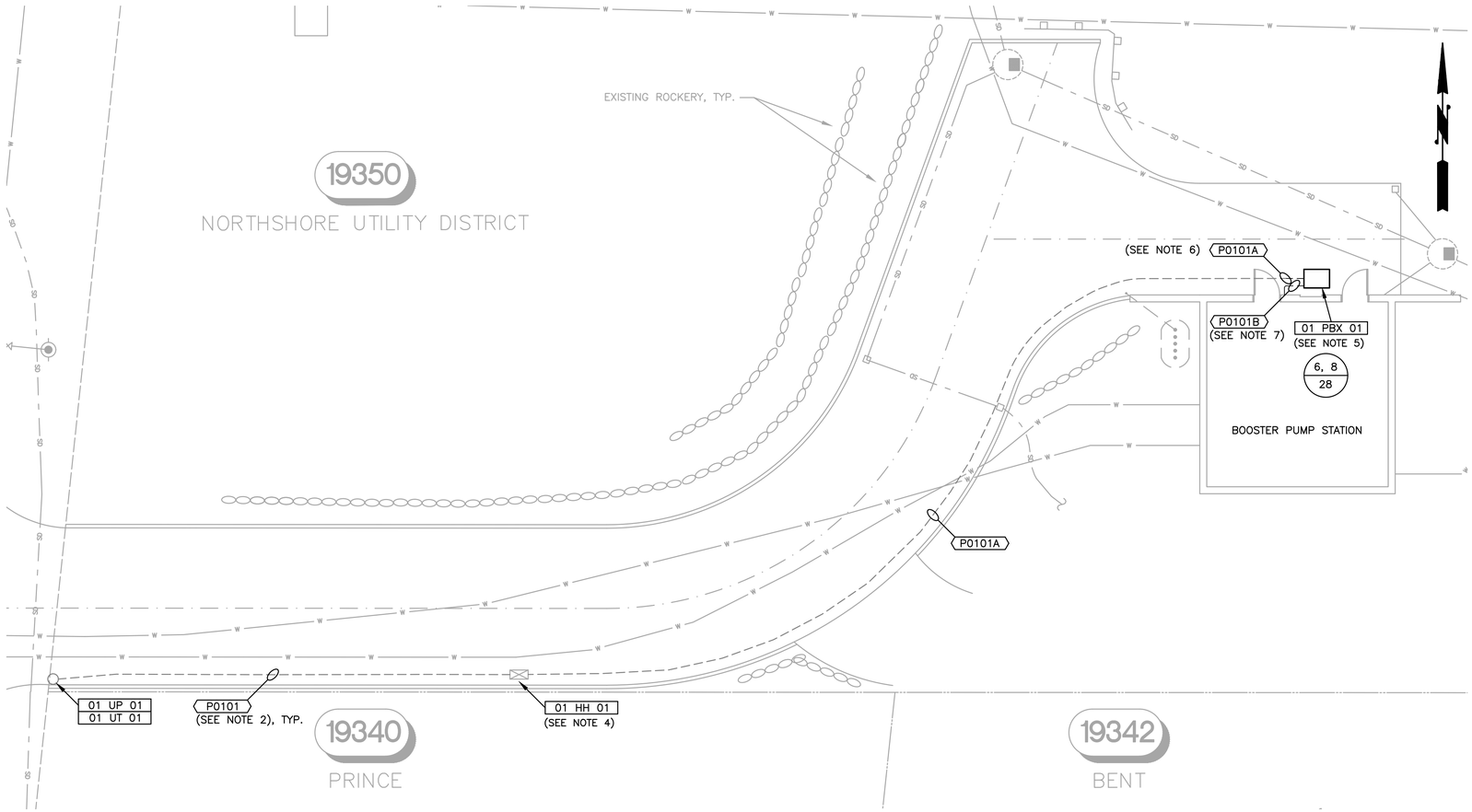
6830 NE 185th St. Kenmore, WA 98028-2684
P.O. Box 82489 Kenmore, WA 98028-2684
Ph: (425) 398-4400 | Fax: (425) 398-4430 | www.nud.net

CONTRACT 2020-01
LAKE FOREST PARK RESERVOIR AND BOOSTER STATION UPGRADES

ELECTRICAL SYMBOLS, ABBREVIATIONS, AND GENERAL NOTES

BASE MAP A2
C1502
SHEET 16 *OF* 28



NOTES:

1. SEE NOTES ON (–/16).
2. EXISTING CONDUIT ROUTING IS APPROXIMATE. VERIFY ROUTING AS NEEDED.
3. ALL POWER OUTAGES SHALL BE COORDINATED WITH THE OWNER.
4. SPLICE NEW SECONDARY CONDUCTORS FROM [01 PBX 01] TO THE EXISTING SECONDARY CONDUCTORS FROM [01 UT 01] IN [01 HH 01]. THE EXISTING SPLICE LUGS MAY BE REUSED. SPLICES SHALL BE PER NEC AND SEATTLE CITY LIGHT SPECIFICATIONS. COORDINATE THE INSTALLATION OF THE NEW SECONDARY CONDUCTORS WITH SCL AND THE OWNER.
5. [01 PBX 01] SHALL BE OLDCASTLE 233–LA MINIMUM WITH H–20 RATED LID. [01 PBX 01] IS USED TO LET WATER DRAIN OUT OF CONDUIT P0101A. CONDUIT P0101A SHALL PENETRATE [01 PBX 01] SIX INCHES BELOW CONDUIT P0101B.
6. INTERCEPT EXISTING CONDUIT BEFORE IT ENTERS THE BOOSTER PUMP BUILDING AND EXTEND TO [01 PBX 01]. DEMOLISH EXISTING CONDUCTORS TO [01 HH 01].
7. INCLUDE #6 AWG BARE COPPER GROUNDING ELECTRODE CONDUCTOR AND CONNECT TO THE SITE GROUNDING ELECTRODE SYSTEM. CONTRACTOR SHALL ENGAGE AN INDEPENDENT ELECTRICAL TESTING ORGANIZATION TO PERFORM A 3–POINT FALL–OF–POTENTIAL GROUND TEST, REFERENCE SPECIFICATION 16060.
8. TWO ACCESS HATCHES AND ONE VENT WILL BE REPLACED ON THE ROOF OF THE EXISTING RESERVOIR THAT IS LOCATED APPROXIMATELY 300 FEET NORTH OF THE BOOSTER PUMP STATION. THERE ARE EXISTING INTRUSION SWITCHES INSTALLED ON THE HATCHES AND VENT AND EXISTING CONDUITS BETWEEN THEM AND THE EXISTING CONTROL PANEL THAT IS LOCATED ON THE RESERVOIR ROOF. CONTRACTOR SHALL DOCUMENT THE EXISTING INTRUSION SWITCH TERMINATIONS IN THE EXISTING CONTROL PANEL AND THE NUMBER AND TYPE OF CONDUCTORS IN EACH CONDUIT. CONTRACTOR SHALL PROVIDE AND INSTALL NEW INTRUSION SWITCHES MATCHING THE EXISTING INSTALLATION AND PROVIDE AND INSTALL NEW CONDUCTORS OF THE SAME NUMBER AND TYPE AS THE EXISTING, BETWEEN THE NEW INTRUSION SWITCHES AND THE EXISTING CONTROL PANEL AND TERMINATE CONDUCTORS TO MATCH THE EXISTING INSTALLATION.

(–/5)

(1/–) **SITE ELECTRICAL PLAN**
SCALE: 1"=10'–0"

AREA 01 - DEVICE TAG LIST

TAG ID#	TAG DESCRIPTION	VINTAGE	PROVIDED BY
01 ATS 01	AUTOMATIC TRANSFER SWITCH	NEW	INTEGRATOR
01 CP 01	CONTROL PANEL	EXISTING	NA
01 GAPR 01	ANCILLARY POWER RECEPTACLES, STANDBY GENERATOR	NEW	CONTRACTOR
01 GCB 01	CIRCUIT BREAKER, STANDBY GENERATOR	NEW	CONTRACTOR
01 GCB 02	CIRCUIT BREAKER, STANDBY GENERATOR	NEW	CONTRACTOR
01 GCP 01	CONTROL PANEL, STANDBY GENERATOR	NEW	CONTRACTOR
01 GDCB 01	CIRCUIT BREAKER, GENERATOR DISCONNECT	NEW	CONTRACTOR
01 GEN 01	GENERATOR, STANDBY	NEW	CONTRACTOR
01 GREC 01	RECEPTACLE, GENERATOR	NEW	CONTRACTOR
01 HH 01	HAND HOLE	EXISTING	NA
01 MB 01	METER BASE	NEW	CONTRACTOR
01 MS 01	MOTOR STARTER, BOOSTER PUMP NO. 1 MOTOR	NEW	INTEGRATOR
01 MS 02	MOTOR STARTER, BOOSTER PUMP NO. 2 MOTOR	NEW	INTEGRATOR
01 MS 03	MOTOR STARTER, HIGH FLOW PUMP MOTOR	NEW	INTEGRATOR
01 MTR 01	MOTOR, BOOSTER PUMP NO. 1	EXISTING	NA
01 MTR 02	MOTOR, BOOSTER PUMP NO. 2	EXISTING	NA
01 MTR 03	MOTOR, HIGH FLOW PUMP	EXISTING	NA
01 MTS 01	MANUAL TRANSFER SWITCH	NEW	INTEGRATOR
01 OIT 01	OPERATOR IN TROUBLE STATION	NEW	INTEGRATOR
01 PB 01	PANELBOARD 240/120V	EXISTING	NA
01 PBX 01	PULLBOX	NEW	CONTRACTOR
01 PDBP 01	POWER DISTRIBUTION BLOCK PANEL	NEW	CONTRACTOR
01 RFSA 01	REMOTE FILL STATION ALARM PANEL	NEW	CONTRACTOR
01 RFSL 01	REMOTE FILL STATION DIESEL FUEL LEVEL SWITCHES	NEW	CONTRACTOR
01 SDF 01	SERVICE DISCONNECT FUSES	EXISTING	NA
01 SDS 01	SAFETY DISCONNECT SWITCH, TRANSFORMER, 15 KVA, 480–240/120V	EXISTING	NA
01 SPD 01	SURGE PROTECTIVE DEVICE NO. 1	NEW	INTEGRATOR
01 SPD 02	SURGE PROTECTIVE DEVICE NO. 2	NEW	INTEGRATOR
01 UP 01	ELECTRICAL UTILITY POWER POLE	EXISTING	NA
01 UT 01	ELECTRICAL UTILITY TRANSFORMERS	EXISTING	NA
01 XFMR 01	TRANSFORMER, 15 KVA, 480–240/120V	EXISTING	NA

ELECTRICAL WORK SUMMARY:

THIS SUMMARY OF ELECTRICAL WORK IS INCLUDED AS A COURTESY AND IS INTENDED TO PROVIDE A GENERAL UNDERSTANDING OF ELECTRICAL DESIGN INTENT AND MAJOR ELECTRICAL CONSTRUCTION TASKS. IT IS NOT PROVIDED AS A COMPLETE LIST OF WORK AND SHALL NOT BE USED FOR BIDDING PURPOSES. REFER TO ALL PLANS AND SPECIFICATIONS.

1. REPLACE EXISTING UTILITY POWER METER AND CT ENCLOSURE WITH NEW METER BASE AND UTILITY POWER METER.
2. REPLACE EXISTING GENERATOR AND ATS WITH NEW GENERATOR AND ATS.
3. REPLACE EXISTING 75HP TWO STAGE TRANSFORMER STARTER WITH NEW 75HP RVSS STARTER WITH START RATED BYPASS CONTACTOR.
4. REPLACE EXISTING 25HP VFDS (TWO TOTAL) WITH NEW 25HP VFDS.
5. ADD NEW MTS, GENERATOR CIRCUIT BREAKER, AND GENERATOR RECEPTACLE.
6. THE INTEGRATOR WILL BE QUALITY CONTROL CORPORATION.

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APPROVAL	JRN
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6830 NE 185th St.
Kenmore, WA 98028-2684
P.O. Box 82489
Kenmore, WA 98028-2684
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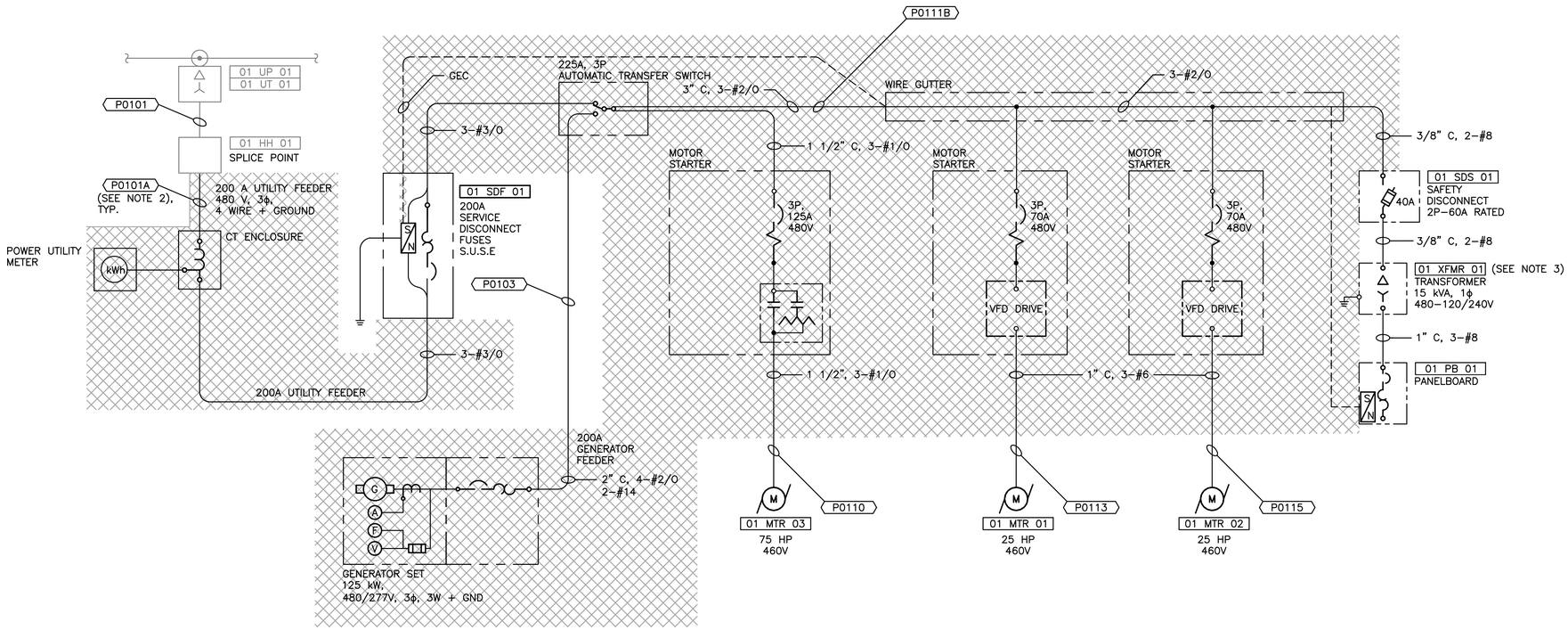
CONTRACT 2020-01
LAKE FOREST PARK RESERVOIR AND BOOSTER STATION UPGRADES

SITE ELECTRICAL PLAN, TAG LIST AND WORK SUMMARY

BASE MAP A2
C1502
SHEET
17 *OF* 28

NOTES:

1. SEE NOTES ON (1/16).
2. TAGGED CONDUIT WILL BE REUSED AND/OR EXTENDED.
3. REMOVE NEUTRAL–GROUND BOND IN [01 XFMR 01].



1 / – EXISTING ONE LINE DIAGRAM
NOT TO SCALE

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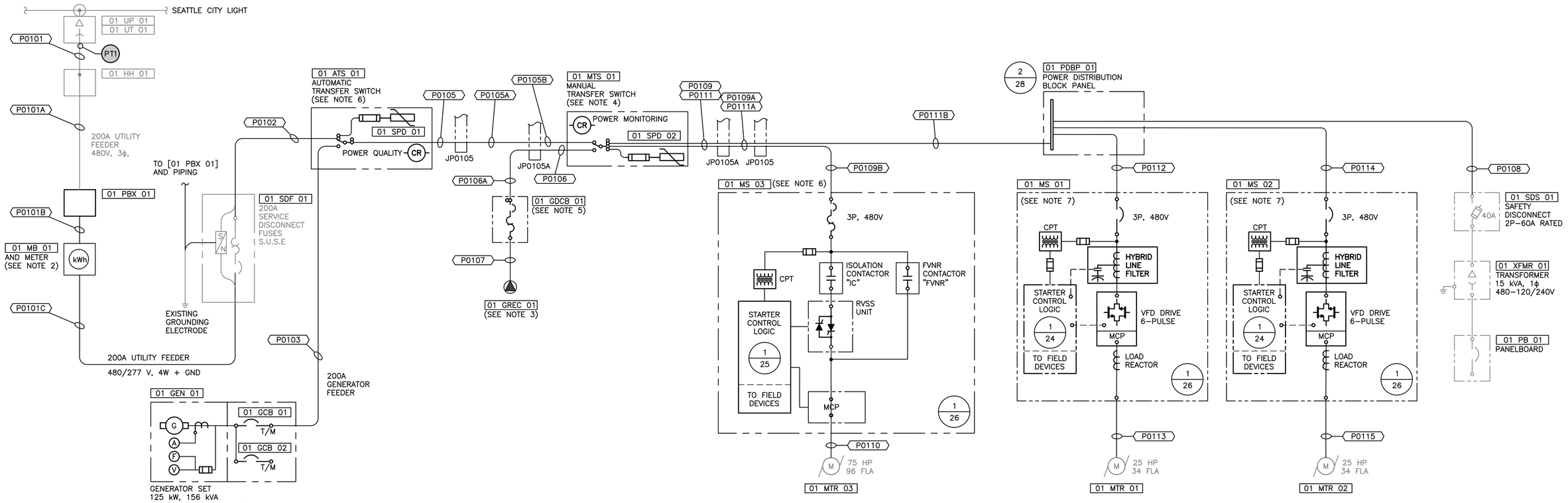
LAKE FOREST PARK RESERVOIR AND BOOSTER STATION UPGRADES

EXISTING ONE LINE DIAGRAM

BASE MAP A2
C1502
SHEET 18 OF 28



NOTES:

1. SEE NOTES ON (–/16).
2. THE REVENUE METER IS PROVIDED BY THE POWER UTILITY COMPANY. THE METER BASE SHALL BE PROVIDED BY THE CONTRACTOR PER THE POWER UTILITY'S SPECIFICATION.
3. GENERATOR RECEPTACLE [01 GREC 01] SHALL BE 400 A, 600V, 4 WIRE, 4 PIN, REVERSE SERVICE, WITH STYLE 1 (SHELL ONLY) GROUNDING WITH 1.25 DIAMETER WIRE RECESS. CROUSE-HINDS PART NUMBER AREX40412104 ASSEMBLY WITH AR40412 RECEPTACLE.
4. [01 MTS 01] SHALL HAVE LOAD SIDE LUGS FOR THE CONDUCTORS FOR [01 MS 03], [01 PDBP 01], [01 SPD 02], AND THE POWER MONITORING RELAY.
5. [01 GDCB 01] SHALL INCLUDE LUGS FOR THE POWER MONITORING RELAY.
6. AUTOMATIC TRANSFER SWITCH [01 ATS 01], MANUAL TRANSFER SWITCH [01 MTS 01], MOTOR STARTERS [01 MS 01, 02, 03], AND SURGE PROTECTIVE DEVICES [01 SPD 01, 02] ARE PROVIDED BY THE INTEGRATOR AND INSTALLED BY THE CONTRACTOR. ELECTRICAL CONNECTION DOCUMENTS WILL BE PROVIDED BY THE INTEGRATOR.
7. MOTOR STARTER MANUFACTURER SHALL SIZE MOTOR STARTER BREAKERS AND OVERLOAD PROTECTION CIRCUITS BASED ON NEC AND MOTOR MANUFACTURER'S REQUIREMENTS.
8. EACH DRIVE SHALL BE PROVIDED WITH INDIVIDUAL CONTROL TRANSFORMERS. SIZE THE DRIVE CONTROL TRANSFORMERS TO HANDLE ALL DRIVE/STARTER CONTROL DEVICES AS PER REFERENCED ELEMENTARY WIRING DIAGRAMS PLUS 25%.
9. THREE PHASE SHORT CIRCUIT BOLTED FAULT CALCULATIONS ARE BASED ON INFINITE UTILITY CONTRIBUTION, +10% VARIANCE IN UTILITY VOLTAGE, –10% VARIANCE IN TRANSFORMER IMPEDANCE, AND A 150 KVA TRANSFORMER WITH 1.7% ASSUMED IMPEDANCE. FAULT CALCULATIONS ALSO INCLUDE 1,927 AIC MOTOR REGENERATIVE CONTRIBUTION FROM THE 2x 25 HP MOTORS PLUS 1x 75 HP MOTOR ADDED TO EACH FAULT POINT. ALL CALCULATIONS ARE BASED ON 460 V.

BOLTED FAULT TABLE

FAULT POINT	3PH SHORT CIRCUIT VALUES
PT1	15,600 AIC

(SEE NOTE 9)

POWER DEVICE SIZING

TAG NUMBER	RATED VOLTAGE	OPERATING VOLTAGE	POLES/ PHASES	AMPACITY	MIN. INTERRUPT AND WITHSTAND RATING	ENCLOSURE TYPE
* 01 ATS 01	480 V	480 V	3	225 A	22 kAIC	NEMA 1
01 GCB 01	600 V	480 V	3	200 AT/225 AF	22 kAIC	IN [01 GEN 01]
01 GCB 02	600 V	480 V	3	200 AT/225 AF	22 kAIC	IN [01 GEN 01]
01 GDCB 01	600 V	480 V	3	200 AT/225 AF	22 kAIC	NEMA 3R
* 01 MS 01	600 V	480 V	3	MANUFACTURER	22 kAIC	NEMA 1
* 01 MS 02	600 V	480 V	3	MANUFACTURER	22 kAIC	NEMA 1
* 01 MS 03	600 V	480 V	3	MANUFACTURER	22 kAIC	NEMA 1
* 01 MTS 01	600 V	480 V	3	200 A	22 kAIC	NEMA 3R
01 PDBP 01	600 V	480 V	3	200 A	22 kAIC	NEMA 1

* = SEE NOTE 6

1/– **MODIFIED ONE LINE DIAGRAM**
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6830 NE 185th St. Kenmore, WA 98028-2684
P.O. Box 82489 Kenmore, WA 98028-2684
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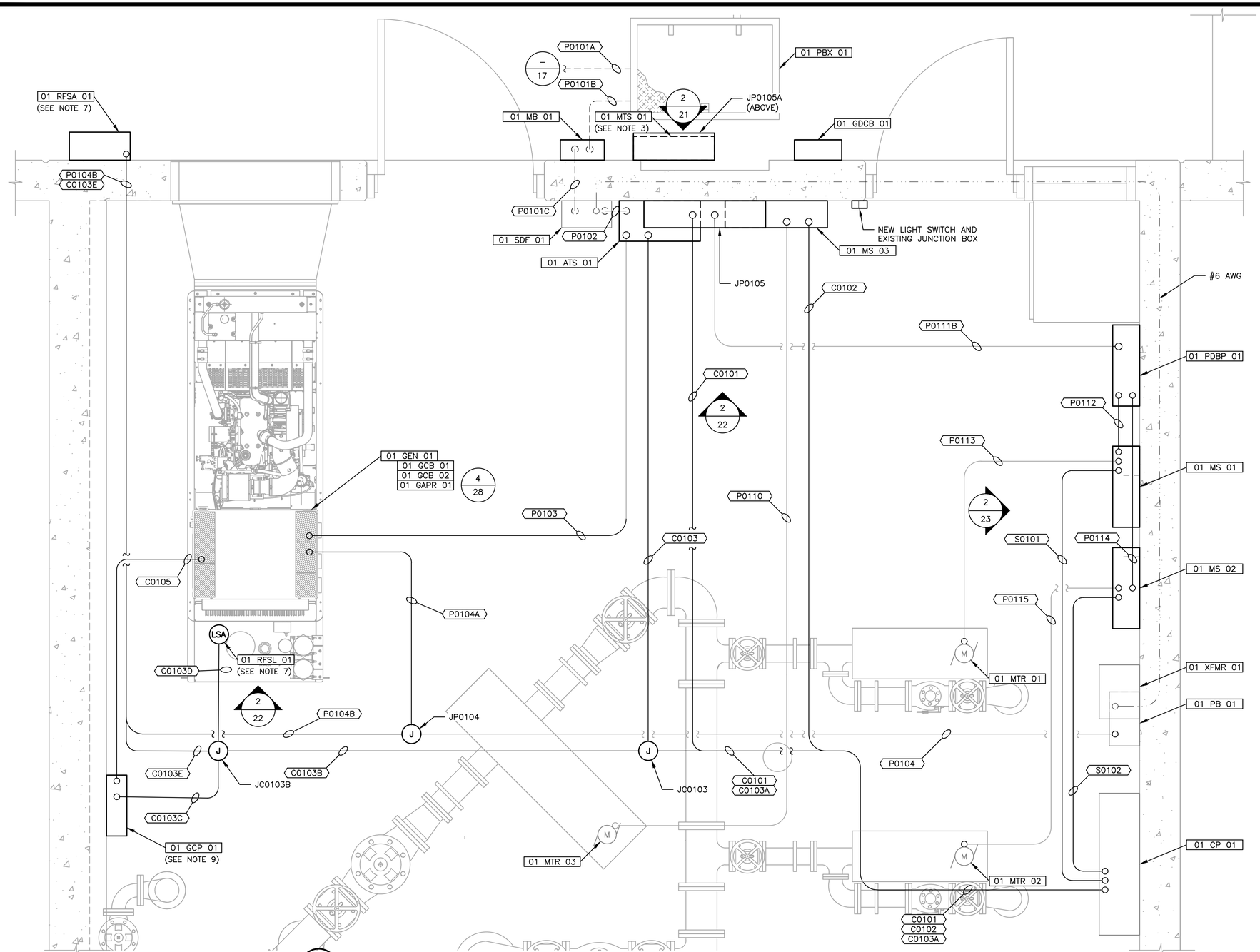
ONE LINE DIAGRAM

BASE MAP A2
C1502
SHEET 19 *OF* 28



1 – MODIFIED BUILDING POWER, CONTROL AND INSTRUMENTATION PLAN

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

NOTES:

1. SEE NOTES ON (– / 16).
2. MECHANICAL PIPING AND EQUIPMENT IS NOT SHOWN ON THIS DRAWING.
3. NOT ALL ELECTRICAL EQUIPMENT AND CONDUITS ARE SHOWN ON THIS DRAWING.
4. EXISTING CONDUIT, SHOWN AS FADED, MAY BE REUSED. NEW INDOOR CONDUIT AND EXTENSIONS OF EXISTING CONDUIT SHALL BE IMC AND LFMC
5. ROUTE NEW CONDUIT THAT IS INSIDE OF THE BUILDING BETWEEN THE SUSPENDED CEILING AND THE CEILING FURRING. EXISTING CONDUIT ABOVE THE SUSPENDED CEILING MAY BE REUSED.
6. EXISTING CONDUITS FROM ABOVE THE SUSPENDED CEILING TO THE MOTORS MAY BE REUSED.
7. CONNECT PER MANUFACTURER'S DOCUMENTATION.
8. REMOVE AND REINSTALL SUSPENDED CEILING AS NEEDED FOR CONDUIT INSTALLATION.
9. CONNECT [01 GCP 01] TO [01 GEN 01] PER MANUFACTURER'S DOCUMENTATION.

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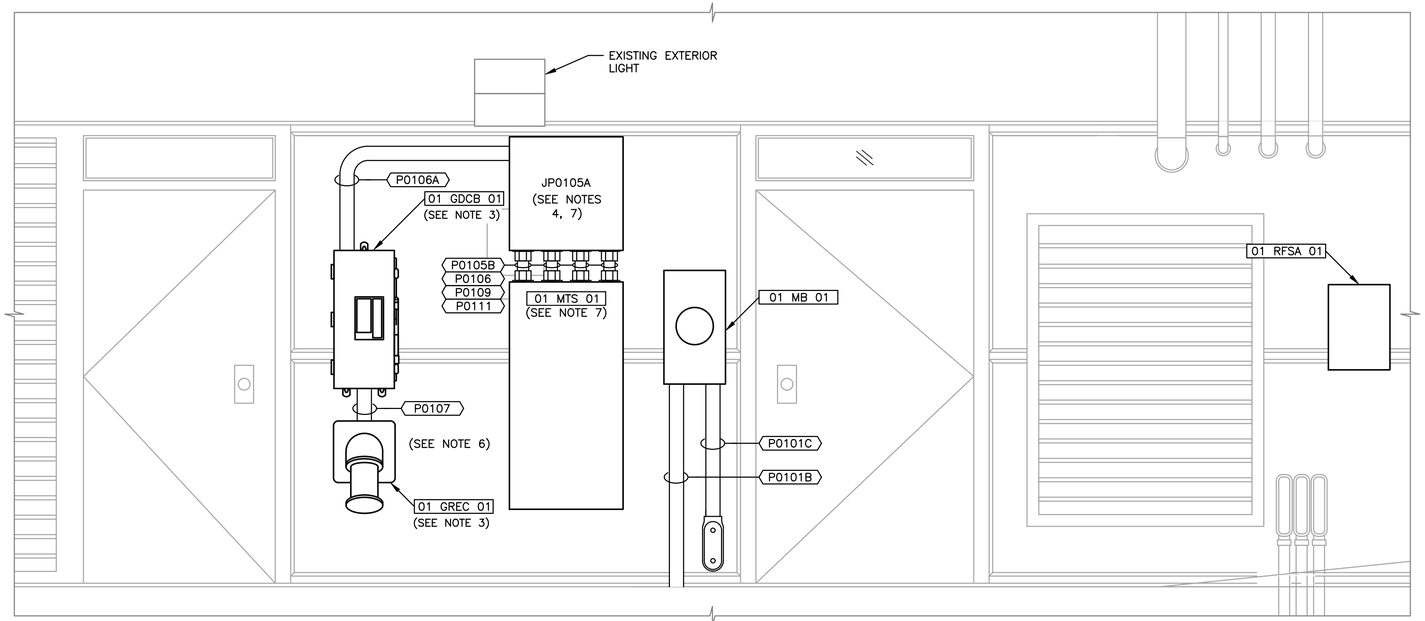
CONTRACT 2020-01
LAKE FOREST PARK RESERVOIR AND BOOSTER STATION UPGRADES

ELECTRICAL BUILDING PLAN

BASE MAP A2
C1502
SHEET 20 *OF* 28

1 / – **EXTERIOR NORTH WALL ELECTRICAL DEMOLITION**
SCALE: 3/4"=1'-0"



2 / – **MODIFIED EXTERIOR NORTH WALL ELEVATION**
SCALE: 3/4"=1'-0"

NOTES:

1. SEE NOTES ON – / 16 .
2. ALL OUTDOOR CONNECTIONS TO EQUIPMENT SHALL BE MADE USING MEYERS HUBS.
3. THE TOP OF [01 GDCB 01] SHALL BE MOUNTED NO MORE THAN 6'-6" ABOVE GRADE. MOUNT RECEPTACLE [01 GREC 01] AS HIGH ABOVE GRADE AS POSSIBLE TO FACILITATE CONNECTION.
4. JUNCTION BOX JP0105A SHALL BE 24" X 24" X 8" MINIMUM NEMA 4X 304 STAINLESS STEEL.
5. CONDUITS BETWEEN JUNCTION BOXES JP0105 AND JP0105A ARE NOT SHOWN
6. SEE CABLE AND CONDUIT SCHEDULE – / 27 AND DETAIL 3 / 28 .
7. [01 MTS 01], [01 SPD 02], AND JP0105A WILL BE INSTALLED OVER EXISTING UTILITY METER INDENTATION IN THE CONCRETE WALL, PROVIDE AND INSTALL UNI-STRUT AS A NEEDED TO SPAN INDENTATION.
8. ELECTRICAL EQUIPMENT MOUNTED TO EXTERIOR USING 304 STAINLESS STEEL UNI-STRUT. ALL EXTERIOR MOUNTING HARDWARE SHALL BE 316 STAINLESS STEEL.

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NORTHSHORE UTILITY DISTRICT
6830 NE 185th St. Kenmore, WA 98028-2684
P.O. Box 82489 Kenmore, WA 98028-2684
Ph: (425) 398-4400 | **Fax:** (425) 398-4430 | **www.nud.net**

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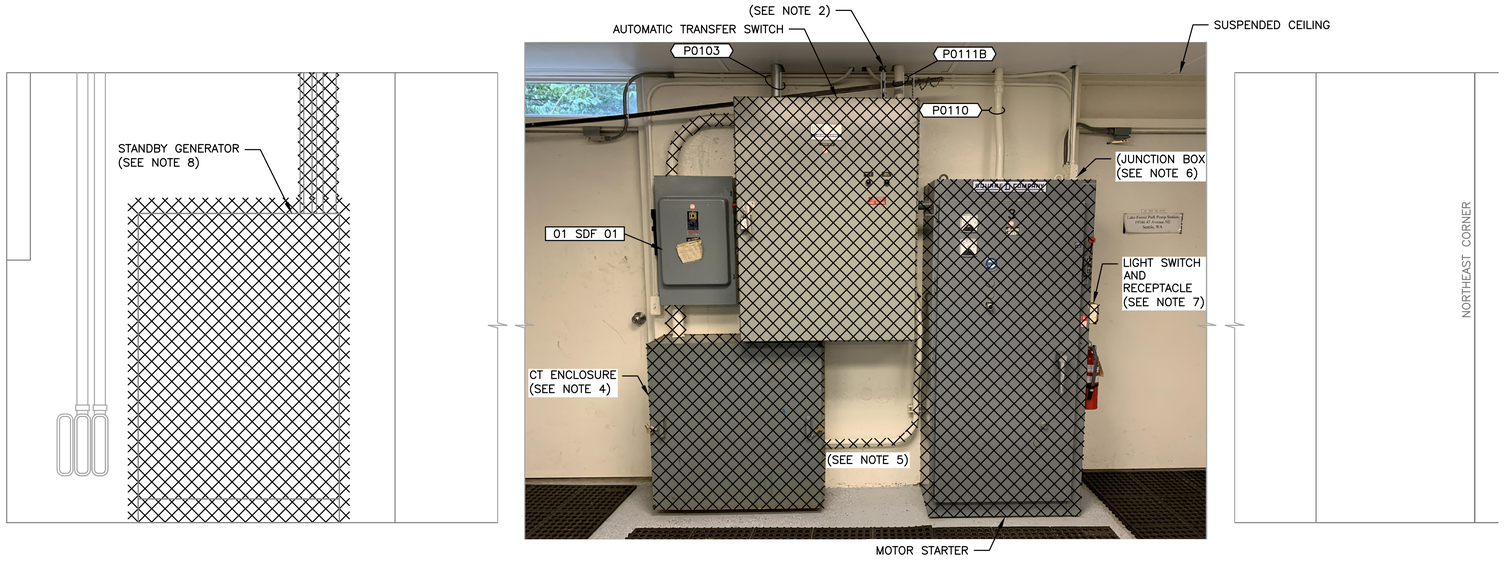
LAKE FOREST PARK RESERVOIR AND BOOSTER STATION UPGRADES
EXTERIOR NORTH WALL ELECTRICAL DEMOLITION AND MODIFIED ELECTRICAL ELEVATION

BASE MAP A2
C1502
SHEET 21 *OF* 28

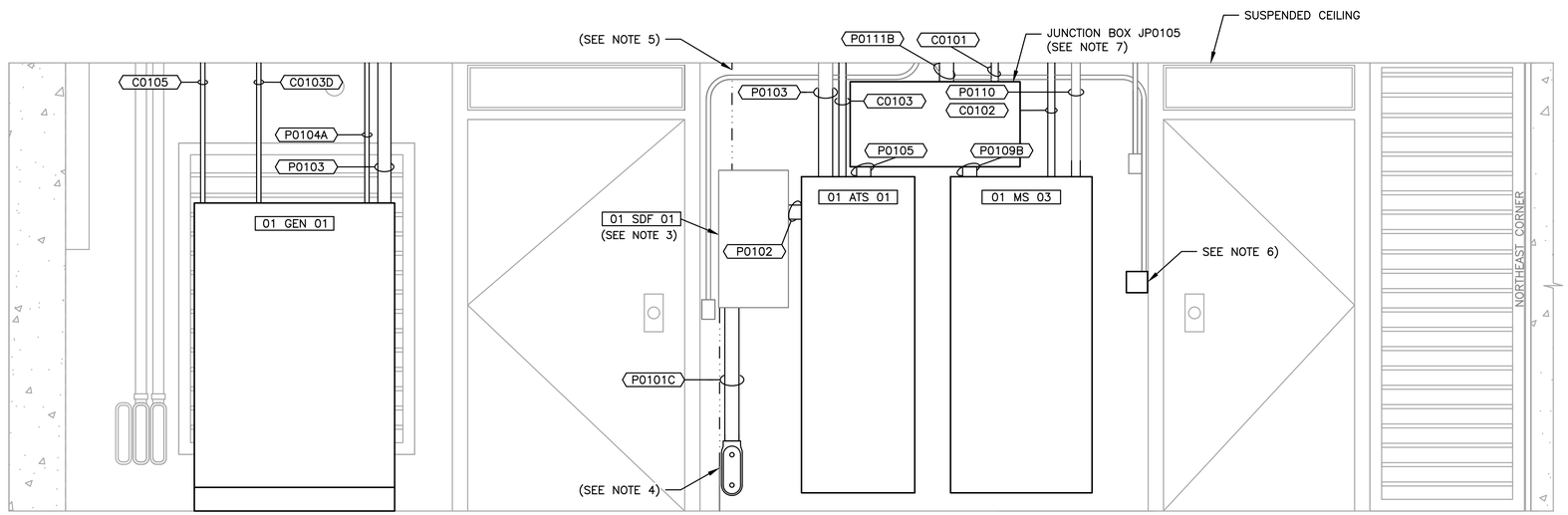


1/– EXISTING INTERIOR NORTH WALL ELEVATION

SCALE: 3/4"=1'–0"

NOTES:

1. SEE NOTES ON (–/16).
2. DEMOLISH CONDUIT AND CONDUCTORS TO THE EXISTING WIREWAY.
3. FOR ALL DEMOLISHED ELECTRICAL EQUIPMENT DEMOLISH CONDUIT AS SHOWN AND CONDUCTORS IN THEIR ENTIRETY.
4. DELIVER CURRENT TRANSFORMERS TO SEATTLE CITY LIGHT. PROTECT EXISTING GROUNDING ELECTRODE CONDUCTOR.
5. CONDUIT TO UTILITY BILLING METER. EXISTING METER AND ENCLOSURE ARE MOUNTED ON OUTSIDE WALL. DEMOLISH ENCLOSURE AND DELIVER METER TO SEATTLE CITY LIGHT. SEE SHEET 21, DETAIL 1.
6. REMOVE CONDUIT BETWEEN JUNCTION BOX AND THE EXISTING MOTOR STARTER. DEMOLISH STATUS/RUN REQUEST CONDUCTORS TO [01 CP 01]. COVER/CAP CONDUIT PENETRATION AND PROVIDE JUNCTION BOX SUPPORT TO WALL.
7. DEMOLISH RECEPTACLE AND REMOVE CONDUCTORS TO NEAREST SPLICE POINT. PROTECT INDOOR AND OUTDOOR LIGHTING CIRCUIT CONDUCTORS.
8. DEMOLISH CONDUIT TO THE EXISTING GENERATOR TO ABOVE THE SUSPENDED CEILING AND CONDUCTORS IN THEIR ENTIRETY.



2/– MODIFIED INTERIOR NORTH WALL ELEVATION

SCALE: 3/4"=1'–0"

NOTES:

1. SEE NOTES ON (–/16).
2. NOT ALL CONDUITS ARE SHOWN ON THIS ELEVATION.
3. PROVIDE COVER/PLUG FOR DEMOLISHED CONDUIT PENETRATION.
4. SPLICE NEW #4 AWG BARE STRANDED GROUNDING ELECTRODE CONDUCTOR TO EXISTING GROUNDING ELECTRODE CONDUCTOR AND TERMINATE ON [01 SDF 01] GROUND–NEUTRAL BUS.
5. #6 AWG BARE STRANDED GROUNDING ELECTRODE CONDUCTOR TERMINATE ON [01 SDF 01] GROUND–NEUTRAL BUS AND [01 PB 01] GROUND–NEUTRAL BUS.
6. INSTALL CAST BOX AT 42" ABOVE FLOOR. SHORTEN CONDUIT AND CONDUCTORS AS NEEDED. CONNECT NEW INDOOR LIGHTING SWITCH AND OUTDOOR LIGHTING ON–OFF–AUTO SWITCH THE SAME AS THE EXISTING SWITCHES ARE.
7. JUNCTION BOX JP0105 SHALL BE 36" X 18" X 8" NEMA 1.
8. CONDUITS BETWEEN JUNCTION BOXES JP0105 AND JPO105A ARE NOT SHOWN SEE CABLE AND CONDUIT SCHEDULE (–/27) AND DETAIL (3/28).

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CHECKED BY	PAM
APPROVAL	JRN
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6830 NE 185th St.
Kenmore, WA 98028-2684

P.O. Box 82489
Kenmore, WA 98028-2684

Ph: (425) 398-4400 | Fax: (425) 398-4430 | www.nud.net

CONTRACT 2020-01
LAKE FOREST PARK RESERVOIR AND BOOSTER STATION UPGRADES

DEMO/MODIFIED INTERIOR NORTH WALL ELEVATIONS

BASE MAP A2

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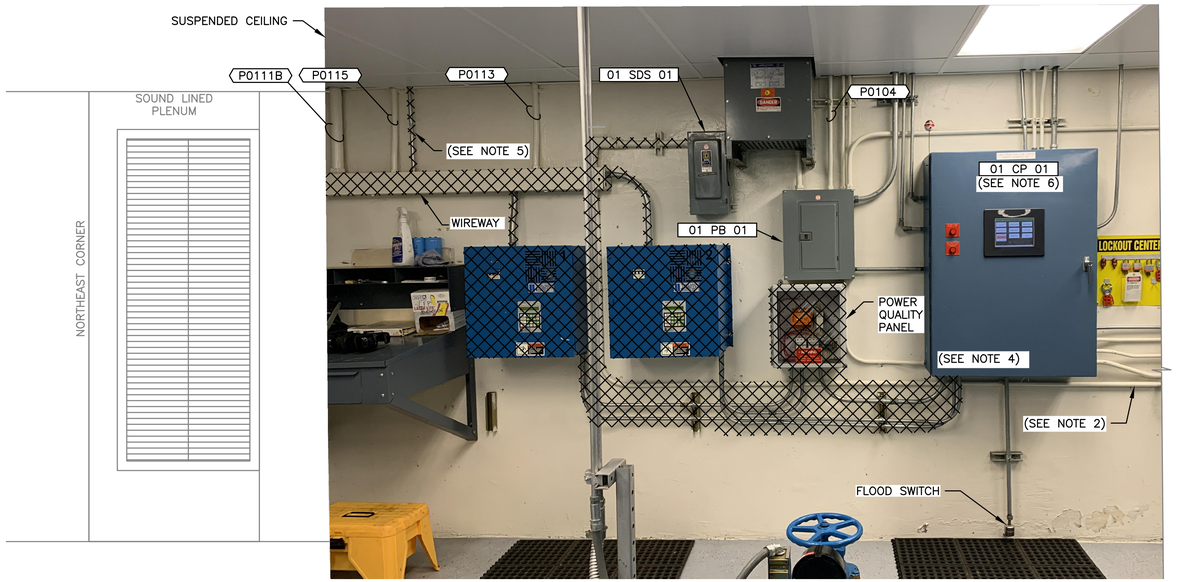
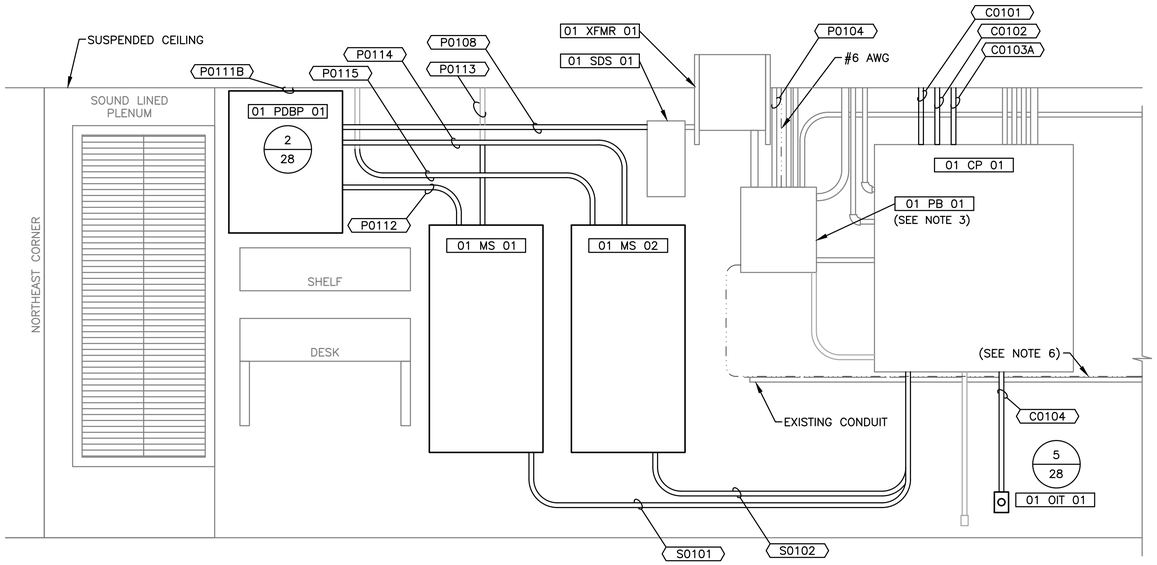


1 / – **EXISTING INTERIOR EAST WALL ELEVATION**
SCALE: 3/4"=1'-0"

NOTES:

1. SEE NOTES ON – / 16 .
2. EXISTING CONDUIT TO PIPING GROUNDING LOCATION, APPROXIMATELY 20'. DEMO EXISTING INSULATED GROUND CONDUCTOR.
3. FOR ALL DEMOLISHED ELECTRICAL EQUIPMENT DEMOLISH CONDUIT AS SHOWN AND CONDUCTORS FROM THE EQUIPMENT TO THEIR DESTINATION.
4. PLUG/CAP ALL UNUSED CONDUIT PENETRATIONS.
5. DEMOLISH CONDUIT AND CONDUCTORS TO EXISTING ATS.
6. DEMOLISH GENERATOR STATUS CONDUIT FROM THE GENERATOR TO ABOVE THE SUSPENDED CEILING. DEMOLISH THE STATUS CONDUCTORS IN THEIR ENTIRETY



2 / – **MODIFIED INTERIOR EAST WALL ELEVATION**
SCALE: 3/4"=1'-0"

NOTES:

1. SEE NOTES ON – / 16 .
2. NOT ALL CONDUIT IS SHOWN ON THIS DRAWING.
3. REPLACE EXISTING 2-POLE, 20A, 240/120V GENERATOR BLOCK HEATER CIRCUIT BREAKER WITH TWO 1-POLE, 20A, 120V GENERATOR COOLANT HEATER AND BATTERY CHARGER CIRCUIT BREAKERS AND UPDATE PANELBOARD SCHEDULE.
4. SPLICE NEW #6 AWG BARE STRANDED GROUNDING ELECTRODE CONDUCTOR TO EXISTING GROUNDING ELECTRODE CONDUCTOR AND TERMINATE ON [01 SDCB 01] GROUND-NEUTRAL BUS.
5. #6 AWG BARE STRANDED GROUNDING ELECTRODE CONDUCTOR TERMINATE ON [01 SDCB 01] GROUND-NEUTRAL BUS AND [01 PB 01] GROUND-NEUTRAL BUS.
6. PROVIDE AND INSTALL #6 AWG BARE STRANDED GROUNDING ELECTRODE CONDUCTOR FROM [01 PB 01] TO PIPING GROUNDING LOCATION.

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CHECKED BY	PAM
APPROVAL	JRN
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NORTHSHORE UTILITY DISTRICT
6830 NE 185th St. Kenmore, WA 98028-2684
P.O. Box 82489 Kenmore, WA 98028-2684
Ph: (425) 398-4400 | Fax: (425) 398-4430 | www.nud.net

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LAKE FOREST PARK RESERVOIR AND BOOSTER STATION UPGRADES

DEMO/MODIFIED INTERIOR EAST WALL ELEVATIONS

BASE MAP A2
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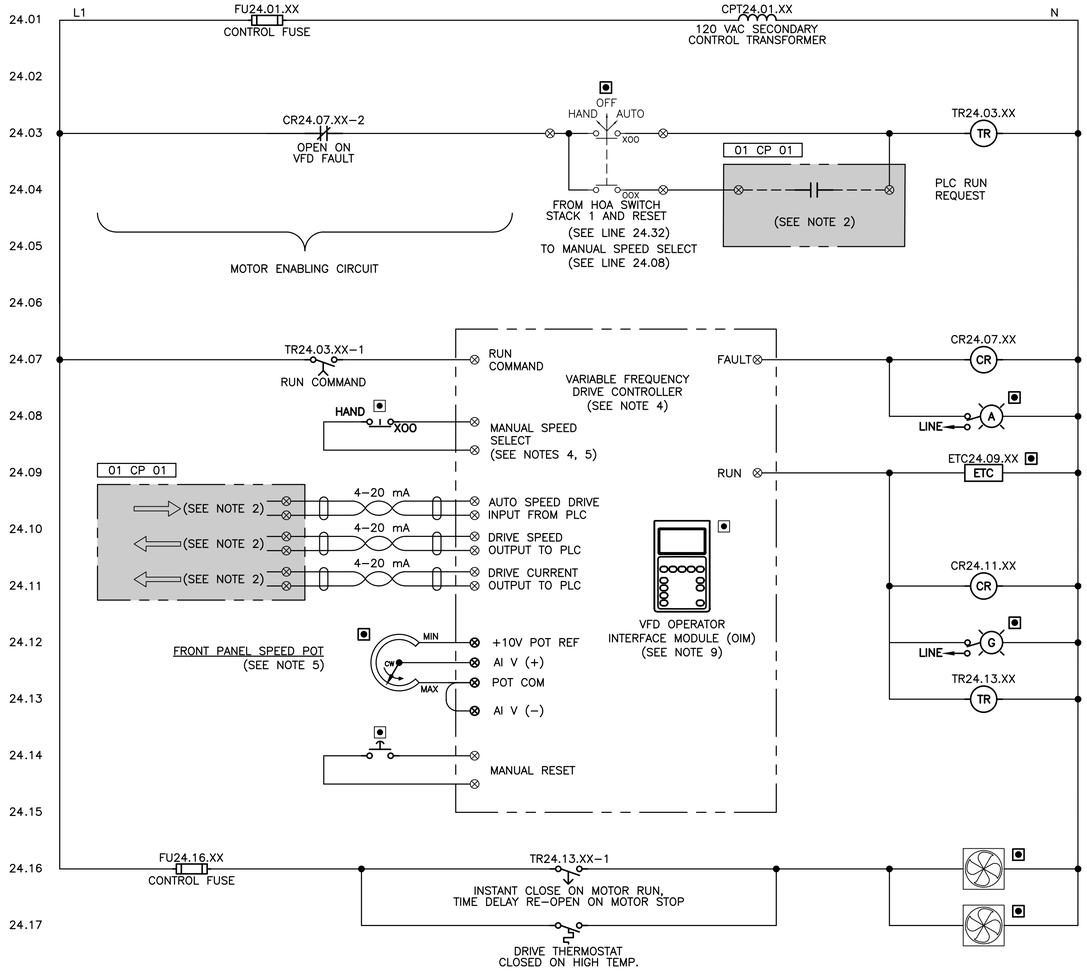


RELAY CONTACT ASSIGNMENTS

1: 24.07 NA\
2: NA NA\
MOTOR RUN COMMAND TIMER
ENERGIZED ON RUN COMMAND
(SEE TIMER TABLE, SEE NOTE 3)

SPEED SETTINGS:

AUTO: SPEED SET BY 4-20 mA FROM PLC.
MANUAL: SPEED SET BY SPEED POT.

1: 24.34 NA\
2: NA 24.03\
DRIVE FAULT RELAY
ENERGIZED ON DRIVE FAULT

"DRIVE FAULT" STATUS INDICATOR
(SEE NOTE 8)

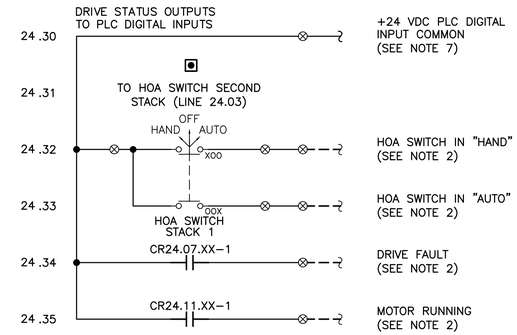
MOTOR START COUNTER AND
ELAPSED TIME METER

1: 24.35 NA\
2: NA NA\
DRIVE RUN RELAY
ENERGIZED ON MOTOR RUNNING

"MOTOR RUNNING" STATUS
INDICATOR
(SEE NOTE 8)

1: 24.16 NA\
2: NA NA\
DRIVE FAN CONTROL TIMER
ENERGIZED ON MOTOR RUNNING
(SEE TIMER TABLE, NOTE 6)

DRIVE COOLING FANS (TYP.)
(SEE NOTE 6)



TIMER TABLE					
TIMER	FUNCTION	TYPE	AKA	MINIMUM RANGE	INITIAL SETTING
TR24.03.01	POWER-UP DELAY	TDAE	ON DELAY	0-100 SECONDS	1 SECOND
TR24.03.02	POWER-UP DELAY	TDAE	ON DELAY	0-100 SECONDS	3 SECONDS
TR24.13.XX	STARTER ENCLOSURE FAN DELAY	TDAD	OFF DELAY	0-60 MINUTES	2 MINUTES MIN.

NOTES:

1. METAL OXIDE VARISTORS SHALL PARALLEL EACH CONTROL RELAY AND TIMER.
2. THE INTEGRATOR WILL PROVIDE TERMINATION POINTS IN [01 CP 01].
3. TIMER TR24.03.XX PREVENTS MORE THAN ONE MOTOR OF THE SAME TYPE STARTING AT THE SAME TIME FOLLOWING RE-APPLICATION OF POWER.
4. VFD PROGRAMMING REQUIREMENTS:
   A. PROGRAM FOR AUTO RESET AND DOOR MOUNTED RESET.
   B. PROGRAM FOR VFD DOOR MOUNTED SPEED POT WHEN HAND IS SELECTED.
   C. SET 4-20 mA OUTPUT FOR 4 mA = 0% SPEED, 20 mA = 100% SPEED.
   D. PROGRAM TO OPERATE AT MINIMUM OPERABLE SPEED WHEN MANUAL SPEED IS ZERO.
   E. PROGRAM FOR BUMPLESS TRANSFER BETWEEN AUTO AND MANUAL MODES.
5. MANUAL SPEED IS SELECTED WHEN THE ASSOCIATED HOA SWITCH IS IN THE "HAND" POSITION.
6. DRIVE MANUFACTURER SHALL SIZE AND PROVIDE DRIVE COOLING FANS, THERMOSTAT AND ASSOCIATED CONTROL LOGIC AS SHOWN. THERMOSTAT SHALL BE FACTORY SET BY THE MANUFACTURER.
7. THE STARTER CONTRACTOR SHALL PROVIDE INDEPENDENT DRY CONTACTS CONNECTED TO A "CONTROL OUTPUT" TERMINAL STRIP FOR THE FUNCTIONS SHOWN ON THIS SHEET. HOA POSITIONS TO THIS TERMINAL STRIP SHALL BE FROM A SECOND (REAR) HOA STACK. MANUFACTURER SHALL JUMPER ALL CONTACTS TOGETHER ON ONE COMMON SIDE AS SHOWN.
8. ALL PILOT LIGHTS SHALL BE PUSH-TO-TEST LED STYLE.
9. VFD OPERATOR'S INTERFACE MODULE SHALL BE MOUNTED ON THE STARTER DOOR. PROVIDE ALL CABLING, HARDWARE, AND CONNECTORS FOR DOOR MOUNT AS PER SPECIFICATION 16420.

MOTOR STARTER REFERENCE TABLE		
XX	TAG	DESCRIPTION
01	[01 MS 01]	BOOSTER PUMP NO. 1 MOTOR STARTER
02	[01 MS 02]	BOOSTER PUMP NO. 2 MOTOR STARTER

1 — MOTOR STARTER ELEMENTARY WIRING DIAGRAM
NOT TO SCALE

SHADED DEVICES ON MOTOR STARTER ELEMENTARY WIRING DIAGRAMS ARE REMOTE FROM THE STARTER.

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P.O. Box 82489
Kenmore, WA 98028-2684
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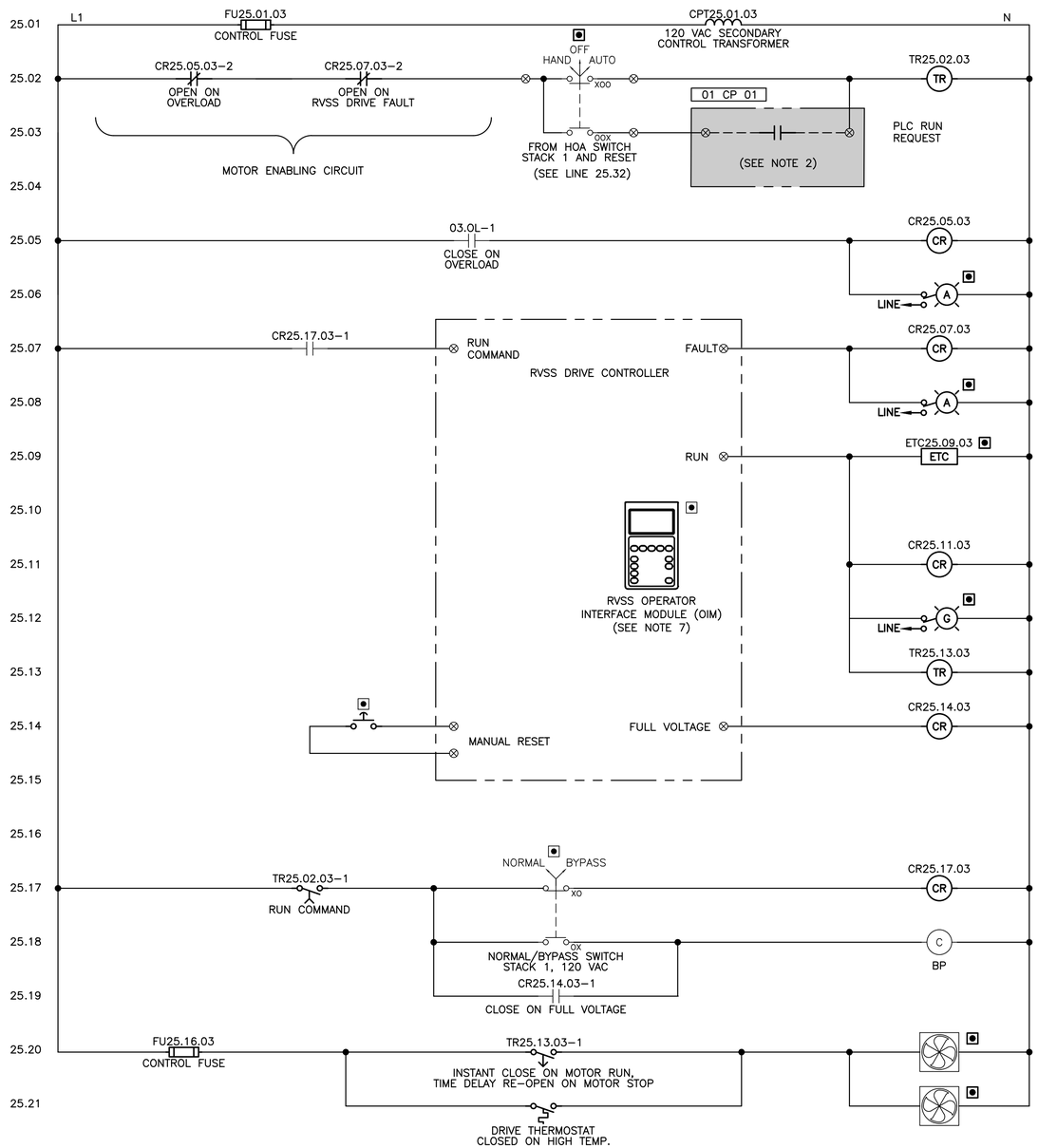
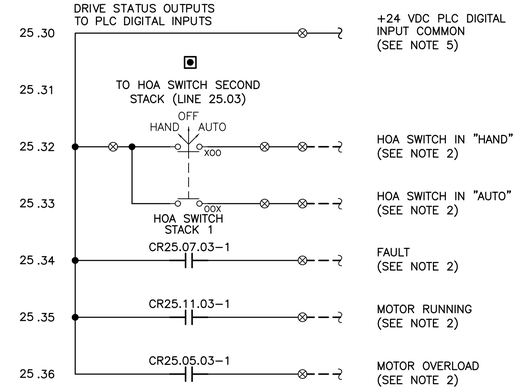
MOTOR STARTER ELEMENTARY WIRING DIAGRAM

BASE MAP A2
C1502
SHEET 24 OF 28



RELAY CONTACT ASSIGNMENTS

1: 25.17 NA\ 2: NA NA\	MOTOR RUN COMMAND TIMER ENERGIZED ON RUN COMMAND (SEE TIMER TABLE, SEE NOTE 3)	
1: 25.36 NA\ 2: NA 25.02\	MOTOR OVERLOAD RELAY ENERGIZED ON MOTOR OVERLOAD	
	"MOTOR OVERLOAD" STATUS INDICATOR (SEE NOTE 6)	
1: 25.36 NA\ 2: NA 25.02\	DRIVE FAULT RELAY ENERGIZED ON DRIVE FAULT	
	"DRIVE FAULT" STATUS INDICATOR (SEE NOTE 6)	
	MOTOR START COUNTER AND ELAPSED TIME METER	
1: 25.35 NA\ 2: NA NA\	DRIVE RUN RELAY ENERGIZED ON MOTOR RUNNING	
	"MOTOR RUNNING" STATUS INDICATOR (SEE NOTE 6)	
1: 25.16 NA\ 2: NA NA\	DRIVE FAN CONTROL TIMER ENERGIZED ON MOTOR RUNNING (SEE TIMER TABLE, NOTE 4)	
1: 25.19 NA\ 2: NA NA\	FULL VOLTAGE RELAY	
1: 25.07 NA\ 2: NA NA\	DRIVE RUN RELAY	
	BYPASS CONTACTOR	
	DRIVE FAN CONTROL TIMER ENERGIZED ON MOTOR RUNNING (SEE TIMER TABLE, NOTE 4)	



TIMER TABLE

TIMER	FUNCTION	TYPE	AKA	MINIMUM RANGE	INITIAL SETTING
TR25.03.03	POWER–UP DELAY	TDAE	ON DELAY	0–100 SECONDS	1 SECOND
TR25.13.03	STARTER ENCLOSURE FAN DELAY	TDAD	OFF DELAY	0–60 MINUTES	2 MINUTES MIN.

NOTES:

1. METAL OXIDE VARISTORS SHALL PARALLEL EACH CONTROL RELAY AND TIMER.
2. THE INTEGRATOR WILL PROVIDE TERMINATION POINTS IN [01 CP 01].
3. TIMER TR25.03.03 PREVENTS MORE THAN ONE MOTOR OF THE SAME TYPE STARTING AT THE SAME TIME FOLLOWING RE–APPLICATION OF POWER.
4. DRIVE MANUFACTURER SHALL SIZE AND PROVIDE DRIVE COOLING FANS, THERMOSTAT AND ASSOCIATED CONTROL LOGIC AS SHOWN. THERMOSTAT SHALL BE FACTORY SET BY THE MANUFACTURER.
5. THE STARTER CONTRACTOR SHALL PROVIDE INDEPENDENT DRY CONTACTS CONNECTED TO A "CONTROL OUTPUT" TERMINAL STRIP FOR THE FUNCTIONS SHOWN ON THIS SHEET. HOA POSITIONS TO THIS TERMINAL STRIP SHALL BE FROM A SECOND (REAR) HOA STACK. MANUFACTURER SHALL JUMPER ALL CONTACTS TOGETHER ON ONE COMMON SIDE AS SHOWN.
6. ALL PILOT LIGHTS SHALL BE PUSH–TO–TEST LED STYLE.
7. RVSS OPERATOR'S INTERFACE MODULE SHALL BE MOUNTED ON THE STARTER DOOR. PROVIDE ALL CABLING, HARDWARE, AND CONNECTORS FOR DOOR MOUNT AS PER SPECIFICATION 16420.
8. ISOLATION CONTACTOR IS NOT SHOWN. ISOLATION CONTACTOR CIRCUIT MAY VARY BETWEEN MANUFACTURERS. PROVIDE AS REQUIRED. ALL OTHER PHYSICAL RELAYS AND TIMERS SHALL BE PROVIDED AS SHOWN.

SHADED DEVICES ON MOTOR STARTER ELEMENTARY WIRING DIAGRAMS ARE REMOTE FROM THE STARTER.

TAG	DESCRIPTION
[01 MS 03]	HIGH FLOW PUMP MOTOR STARTER

1 — MOTOR STARTER ELEMENTARY WIRING DIAGRAM
NOT TO SCALE

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6830 NE 185th St.
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P.O. Box 82489
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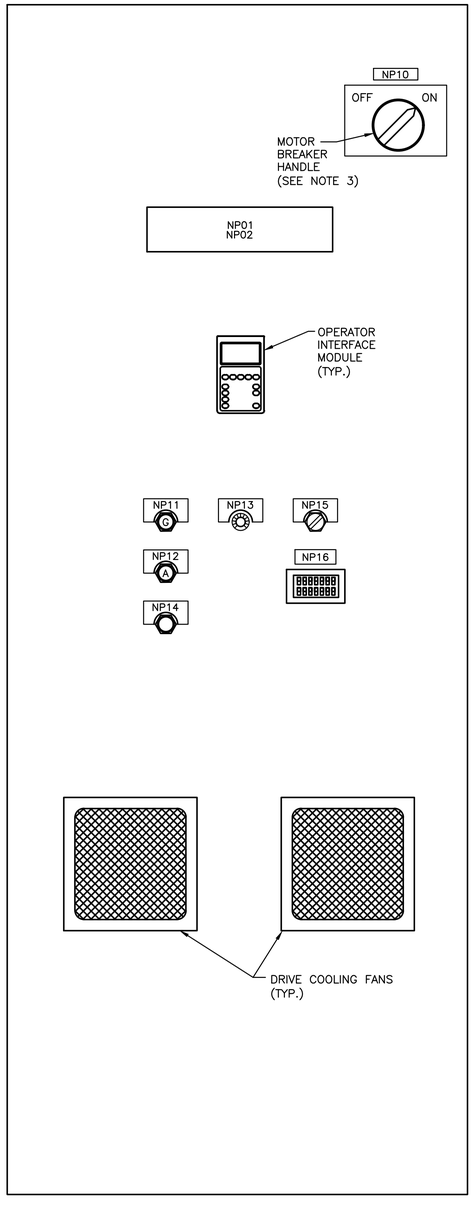
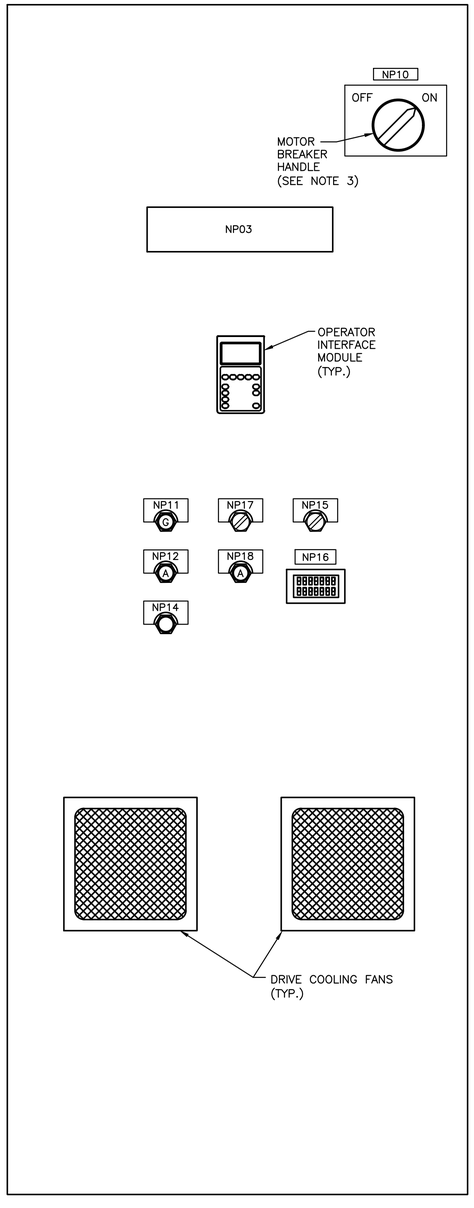
MOTOR STARTER ELEMENTARY WIRING DIAGRAM

BASE MAP A2
C1502
SHEET
25 OF 28



EXTERIOR [01 MS 01, 02]



EXTERIOR [01 MS 03]

1 – **MOTOR STARTER ELEVATIONS**
NOT TO SCALE

PANEL DOOR NAMEPLATE SCHEDULE	
ITEM NUMBER	**NAMEPLATE ENGRAVING**
NP01	BOOSTER PUMP NO. 1 MOTOR STARTER [01 MS 01]
NP02	BOOSTER PUMP NO. 2 MOTOR STARTER [01 MS 02]
NP03	HIGH FLOW PUMP NO. 3 MOTOR STARTER [01 MS 03]
NP10	STARTER BREAKER
NP11	MOTOR RUNNING (PILOT, GREEN)
NP12	MOTOR FAULT (PILOT, AMBER)
NP13	"HAND SPEED" POT
NP14	MANUAL RESET
NP15	HAND – OFF – AUTO
NP16	ELAPSED TIME/COUNTER METER
NP17	NORMAL – BYPASS
NP18	MOTOR OVERLOAD

NOTES:

1. MOTOR STARTERS [01 MS 01] AND [01 MS 02] ARE COMPLETE VFD COMBINATION STARTERS WITH INPUT FILTERS AND LOAD REACTORS.
2. MOTOR STARTER [01 MS 03] IS A COMPLETE RVSS COMBINATION STARTER WITH ISOLATION CONTACTOR AND FVNR START RATED BYPASS CONTACTOR.
3. MOTOR STARTER BREAKERS SHALL BE LOCKABLE IN THE OPEN POSITION WITH THE DOOR LATCHING MECHANISM.

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6830 NE 185th St. Kenmore, WA 98028-2684
P.O. Box 82489 Kenmore, WA 98028-2684
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MOTOR STARTER ELEVATIONS

BASE MAP A2
C1502
SHEET 26 *OF* 28

POWER CABLE AND CONDUIT SCHEDULE

NUMBER	SOURCE	DESTINATION	SIZE	CONDUCTORS	NOTES
P0101	[01 UT 01], ELECTRICAL UTILITY TRANSFORMERS	[01 HH 01], HAND HOLE	2"	EXISTING CONDUIT AND CONDUCTORS	CONDUIT IDENTIFIED FOR COMPLETENESS, NO MODIFICATIONS
P0101A	[01 HH 01], HAND HOLE	[01 PBX 01], PULLBOX	2"	3X #3/0 AWG XHHW-2; 1X #2 AWG XHHW-2 N	EXTEND EXISTING CONDUIT TO [01 PBX 01]. CONDUCTORS ARE NEW.
P0101B	[01 PBX 01], PULLBOX	[01 MB 01], METER BASE	2"	3X #3/0 AWG XHHW-2; 1X #2 AWG XHHW-2 N	
P0101C	[01 MB 01], METER BASE	[01 SDF 01], SERVICE DISCONNECT FUSES	2"	3X #3/0 AWG XHHW-2; 1X #1/0 AWG XHHW-2 N; 1X #6 AWG XHHW-2 G	
P0102	[01 SDF 01], SERVICE DISCONNECT FUSES	[01 ATS 01], AUTOMATIC TRANSFER SWITCH	2"	3X #3/0 AWG XHHW-2; 1X #1/0 AWG XHHW-2 N; 1X #6 AWG XHHW-2 G	
P0103	[01 ATS 01], AUTOMATIC TRANSFER SWITCH	[01 GCB 01], CIRCUIT BREAKER, STANDBY GENERATOR	2"	3X #3/0 AWG XHHW-2; 1X #1/0 AWG XHHW-2 N; 1X #6 AWG XHHW-2 G	
P0104	[01 PB 01], PANELBOARD 240/120V	JUNCTION BOX JP0104	3/4"	2X #12 AWG XHHW-2; 2X #12 AWG XHHW-2 N; 1X #12 AWG XHHW-2 G	[01 GAPR 01] (COOLANT HEATER, BATTERY CHARGER, ETC.) AND [01 RFSA 01]
P0104A	JUNCTION BOX JP0104	[01 GAPR 01], ANCILLARY POWER RECEPTACLES, STANDBY GENERATOR	3/4"	2X #12 AWG XHHW-2; 2X #12 AWG XHHW-2 N; 1X #12 AWG XHHW-2 G	
P0104B	JUNCTION BOX JP0104	[01 RFSA 01], REMOTE FILL STATION ALARM PANEL	3/4"	1X #12 AWG XHHW-2; 1X #12 AWG XHHW-2 N; 1X #12 AWG XHHW-2 G	SPLICE IN JP0104
P0105	[01 ATS 01], AUTOMATIC TRANSFER SWITCH	JUNCTION BOX JP0105	2"	3X #3/0 AWG XHHW-2; 1X #1/0 AWG XHHW-2 N; 1X #6 AWG XHHW-2 G	
P0105A	JUNCTION BOX JP0105	JUNCTION BOX JP0105A	2"	3X #3/0 AWG XHHW-2; 1X #1/0 AWG XHHW-2 N; 1X #6 AWG XHHW-2 G; 4X #14 AWG	4X #14 FOR [01 SPD 02] STATUS AND POWER MONITORING STATUS
P0105B	JUNCTION BOX JP0105A	[01 MTS 01], MANUAL TRANSFER SWITCH	2"	3X #3/0 AWG XHHW-2; 1X #1/0 AWG XHHW-2 N; 1X #6 AWG XHHW-2 G; 4X #14 AWG	4X #14 FOR [01 SPD 02] STATUS AND POWER MONITORING STATUS
P0106	[01 MTS 01], MANUAL TRANSFER SWITCH	JUNCTION BOX JP0105A	2"	3X #3/0 AWG XHHW-2; 1X #1/0 AWG XHHW-2 N; 1X #6 AWG XHHW-2 G	
P0106A	JUNCTION BOX JP0105A	[01 GDCB 01], CIRCUIT BREAKER, GENERATOR DISCONNECT	2"	3X #3/0 AWG XHHW-2; 1X #1/0 AWG XHHW-2 N; 1X #6 AWG XHHW-2 G	
P0107	[01 GDCB 01], CIRCUIT BREAKER, GENERATOR DISCONNECT	[01 GREC 01], RECEPTACLE, GENERATOR	2"	3X #3/0 AWG XHHW-2; 1X #1/0 AWG XHHW-2 N; 1X #6 AWG XHHW-2 G	
P0108	[01 PDBP 01], POWER DISTRIBUTION BLOCK PANEL	[01 SDS 01], SAFETY DISCONNECT SWITCH, TRANSFORMER, 15 KVA, 480-240/120V	1"	2X #4 AWG XHHW-2; 1X #8 AWG XHHW-2 G	
P0109	[01 MTS 01], MANUAL TRANSFER SWITCH	JUNCTION BOX JP0105A	2"	3X #3/0 AWG XHHW-2; 1X #6 AWG XHHW-2 G	CONDUCTORS SIZED FOR TAP
P0109A	JUNCTION BOX JP0105A	JUNCTION BOX JP0105	2"	3X #3/0 AWG XHHW-2; 1X #6 AWG XHHW-2 G	CONDUCTORS SIZED FOR TAP
P0109B	JUNCTION BOX JP0105	[01 MS 03], MOTOR STARTER, HIGH FLOW PUMP MOTOR	2"	3X #3/0 AWG XHHW-2; 1X #6 AWG XHHW-2 G	CONDUCTORS SIZED FOR TAP
P0110	[01 MS 03], MOTOR STARTER, HIGH FLOW PUMP MOTOR	[01 MTR 03], MOTOR, HIGH FLOW PUMP	1-1/2"	3X #1 AWG XHHW-2; 1X #6 AWG XHHW-2 G	EXTEND EXISTING CONDUIT TO [01 MS 03].
P0111	[01 MTS 01], MANUAL TRANSFER SWITCH	JUNCTION BOX JP0105A	2"	3X #3/0 AWG XHHW-2; 1X #6 AWG XHHW-2 G	
P0111A	JUNCTION BOX JP0105A	JUNCTION BOX JP0105	2"	3X #3/0 AWG XHHW-2; 1X #6 AWG XHHW-2 G	
P0111B	JUNCTION BOX JP0105	[01 PDBP 01], POWER DISTRIBUTION BLOCK PANEL	2"	3X #3/0 AWG XHHW-2; 1X #6 AWG XHHW-2 G	EXTEND EXISTING CONDUIT TO JUNCTION BOX JP0105.
P0112	[01 PDBP 01], POWER DISTRIBUTION BLOCK PANEL	[01 MS 01], MOTOR STARTER, BOOSTER PUMP NO. 1 MOTOR	1"	3X #4 AWG XHHW-2; 1X #6 AWG XHHW-2 G	CONDUCTORS SIZED FOR TAP
P0113	[01 MS 01], MOTOR STARTER, BOOSTER PUMP NO. 1 MOTOR	[01 MTR 01], MOTOR, BOOSTER PUMP NO. 1	1"	3X #6 AWG XHHW-2; 1X #6 AWG XHHW-2 G	EXTEND EXISTING CONDUIT TO [01 MS 01]
P0114	[01 PDBP 01], POWER DISTRIBUTION BLOCK PANEL	[01 MS 02], MOTOR STARTER, BOOSTER PUMP NO. 2 MOTOR	1"	3X #4 AWG XHHW-2; 1X #6 AWG XHHW-2 G	CONDUCTORS SIZED FOR TAP
P0115	[01 MS 02], MOTOR STARTER, BOOSTER PUMP NO. 2 MOTOR	[01 MTR 02], MOTOR, BOOSTER PUMP NO. 2	1"	3X #6 AWG XHHW-2; 1X #6 AWG XHHW-2 G	EXTEND EXISTING CONDUIT TO [01 MS 02]

CONTROL CABLE AND CONDUIT SCHEDULE

NUMBER	SOURCE	DESTINATION	SIZE	CONDUCTORS	NOTES
C0101	[01 CP 01], CONTROL PANEL	JUNCTION BOX JP0105	1/2"	4X #14 AWG XHHW-2	4X #14 FOR [01 SPD 02] STATUS AND POWER MONITORING STATUS
C0102	[01 MS 03], MOTOR STARTER, HIGH FLOW PUMP MOTOR	[01 CP 01], CONTROL PANEL	3/4"	11X #14 AWG XHHW-2	MOTOR STATUS AND RUN COMMAND, 3X #14 ARE SPARE
C0103	[01 ATS 01], AUTOMATIC TRANSFER SWITCH	JUNCTION BOX JC0103	3/4"	9X #14 AWG XHHW-2; 1X #12 AWG XHHW-2 G	5X #14 [01 ATS 01] STATUS AND GENERATOR RUN REQUEST, 2X #14 [01 SPD 01] STATUS, AND 2X #14 POWER QUALITY STATUS
C0103A	JUNCTION BOX JC0103	[01 CP 01], CONTROL PANEL	1"	15X #14 AWG XHHW-2	8X #14 [01 GEN 01] STATUS, 3X #14 [01 ATS 01] STATUS , 2X #14 [01 SPD 01] STATUS, 2X #14 POWER QUALITY STATUS
C0103B	JUNCTION BOX JC0103	JUNCTION BOX JC0103B	3/4"	10X #14 AWG XHHW-2; 1X #12 AWG XHHW-2 G	8X #14 [01 GEN 01] STATUS AND 2X #14 RUN REQUEST FROM [01 ATS 01]
C0103C	JUNCTION BOX, JC0103	[01 GCP 01], CONTROL PANEL, STANDBY GENERATOR	3/4"	10X #14 AWG XHHW-2	8X #14 [01 GEN 01] STATUS AND 2X #14 RUN REQUEST FROM [01 ATS 01]
C0103D	JUNCTION BOX, JC0103	[01 RFSL 01], REMOTE FILL STATION DIESEL FUEL LEVEL SWITCHES	3/4"	5X #14 AWG XHHW-2; 1X #12 AWG XHHW-2 G	
C0103E	[01 RFSA 01], REMOTE FILL STATION ALARM PANEL	[01 RFSA 01], REMOTE FILL STATION ALARM PANEL	3/4"	5X #14 AWG XHHW-2; 1X #12 AWG XHHW-2 G	
C0104	[01 CP 01], CONTROL PANEL	[01 OIT 01], OPERATOR IN TROUBLE STATION	1/2"	2X #14 AWG XHHW-2; 1X #12 AWG XHHW-2 G	
C0105	[01 GEN 01], GENERATOR, STANDBY	[01 GCP 01], CONTROL PANEL, STANDBY GENERATOR	1"	8x #12 AWG XHHW-2; 1x 8-C, 4-TP, #23 AWG, CAT6; 1x #12 AWG XHHW-2 G	

INSTRUMENTATION CABLE AND CONDUIT SCHEDULE

NUMBER	SOURCE	DESTINATION	SIZE	CONDUCTORS	NOTES
S0101	[01 CP 01], CONTROL PANEL	[01 MS 01], MOTOR STARTER, BOOSTER PUMP NO. 1 MOTOR	1"	10X #14 AWG XHHW-2; 3X 2-C, 1-TP, #18 AWG, OS	* 3, MOTOR STATUS, RUN COMMAND, AND SPEED REFERENCE, 3X #14 ARE SPARE
S0102	[01 CP 01], CONTROL PANEL	[01 MS 02], MOTOR STARTER, BOOSTER PUMP NO. 2 MOTOR	1"	10X #14 AWG XHHW-2; 3X 2-C, 1-TP, #18 AWG, OS	* 3, MOTOR STATUS, RUN COMMAND, AND SPEED REFERENCE, 3X #14 ARE SPARE

NOTES:

1. SEE NOTES ON (-/16).

JASON R. NEWQUIST, STATE OF WASHINGTON, 45331, REGISTERED PROFESSIONAL ENGINEER
10/14/20

NO	BY	APPD	REVISION	DATE

BID SET

WARNING
0 ½ 1
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO SCALE

Gray & Osborne, Inc
CONSULTING ENGINEERS

DESIGNED BY	PAM
DRAWN BY	PEB
CHECKED BY	PAM
APPROVAL	JRN
DATE	OCT 2020

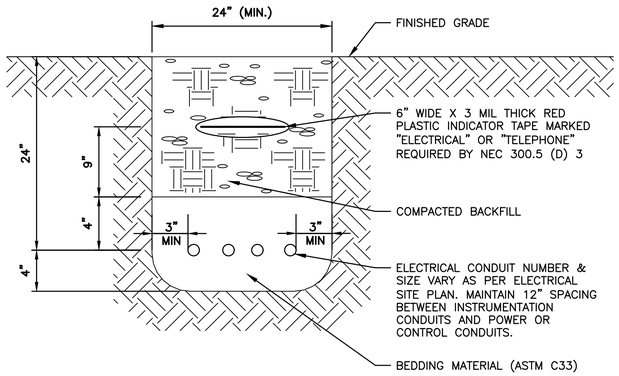
NORTHSHORE UTILITY DISTRICT
WATER SEWER

NORTHSHORE UTILITY DISTRICT
6830 NE 185th St.
Kenmore, WA 98028-2684
P.O. Box 82489
Kenmore, WA 98028-2684
Ph: (425) 398-4400 | Fax: (425) 398-4430 | www.nud.net

CONTRACT 2020-01
LAKE FOREST PARK RESERVOIR AND BOOSTER STATION UPGRADES

CABLE AND CONDUIT SCHEDULES

BASE MAP A2
C1502
SHEET
27 OF 28

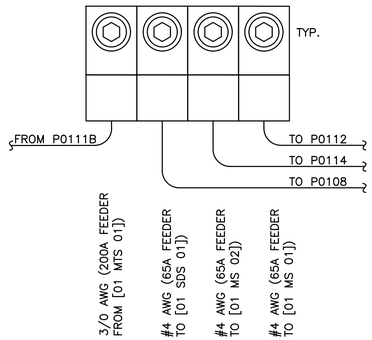


NOTE:

1. SPACING BETWEEN CONDUITS AND OTHER UTILITIES SHALL BE IN COMPLIANCE WITH THE UTILITIES OR 24 INCHES MINIMUM, WHICHEVER IS THE GREATER.
2. SEE CIVIL SHEETS FOR SURFACING RESTORATION.

1 / TYP — ELECTRICAL TRENCHING DETAIL
NOT TO SCALE

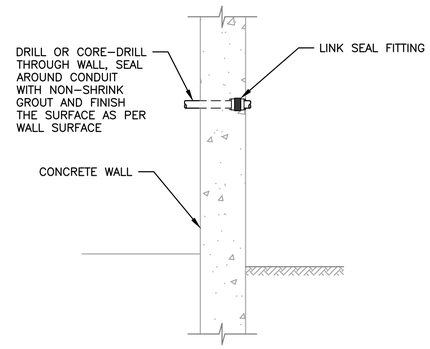
6–POINT TERMINAL BLOCK, SINGLE–SIDED TERMINAL TYPE, 250 KCM TO 10 AWG SOLID, BLACK; PENNUNION #IPBBNA2506D OR EQUAL. ONE BLOCK PER PHASE, ONE BLOCK FOR NEUTRAL, ONE BLOCK FOR GROUND



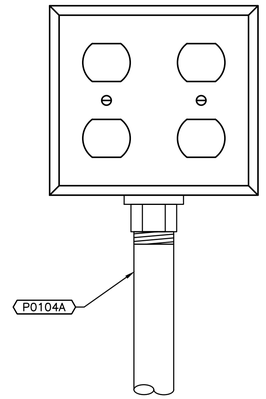
NOTES:

1. ENCLOSURE SHALL BE NEMA 1, WITH MINIMUM DIMENSIONS OF 30"x24"x 8".
2. TERMINAL BLOCKS SHALL BE COVERED WITH A PLEXIGLASS SHIELD.

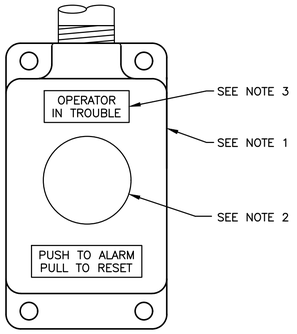
2 / TYP — [01 PDBP 01] TERMINAL BLOCKS
NOT TO SCALE



3 / TYP — INDOOR TO OUTDOOR TRANSITION
NOT TO SCALE



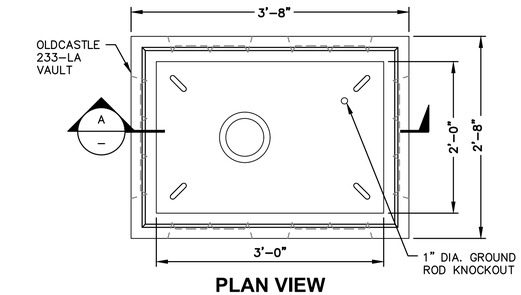
4 / 20 — GENERATOR ANCILLARY POWER RECEPTACLES [01 GAPR 01]
NOT TO SCALE



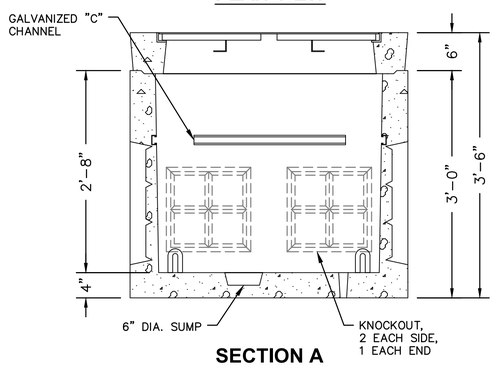
NOTES:

1. BOX SHALL BE TWO–GANG CAST ALUMINUM OR CAST IRON WITH MATCHING COVER (REFERENCE SPECIFICATION 16130).
2. OPERATOR IN TROUBLE PUSHBUTTONS SHALL BE RED, MUSHROOM HEAD CONTACT, PUSH TO ALARM, PULL TO RESET. MOUNT 12" ABOVE THE FLOOR.
3. PROVIDE WITH NAMEPLATE = "OPERATOR IN TROUBLE".

5 / 23 — OPERATOR -IN-TROUBLE CONTROL DEVICE BOX DETAIL
NOT TO SCALE

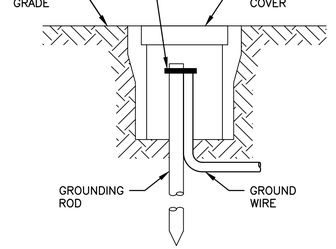


PLAN VIEW



SECTION A

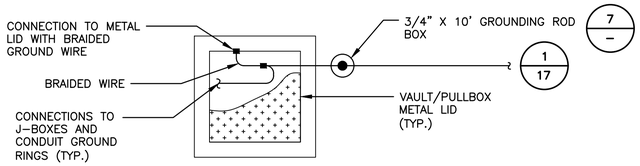
6 / 17 — PULLBOX DETAILS
SCALE: 1" = 1'–0"



NOTES:

1. GROUND ROD BOX SHALL BE FOGTITE GROUND ROD BOX WITH ROAD RATING EQUAL TO THE DEVICE OR STRUCTURE IT SUPPORTS (H20 MINIMUM).

7 / 28 — GROUND ROD BOX DETAIL
NOT TO SCALE



NOTES:

1. GROUND CONDUCTOR SHALL BE BARE COPPER STRANDED #6 AWG.
2. GROUND ALL METAL COMPONENTS AS PER "VAULT AND PULLBOX GROUNDING" IN SPECIFICATION 16060.
3. ALL GROUND CONDUCTORS SHALL BE STRANDED WITH THE EXCEPTION OF THE FLEXIBLE BRAIDED GROUND CONDUCTOR TO THE METAL HATCH LIDS.

8 / 17 — METAL LID GROUNDING DETAIL
NOT TO SCALE

JASON R. NEWQUIST — STATE OF WASHINGTON — 45311 — REGISTERED PROFESSIONAL ENGINEER
10/14/20

NO	BY	APPD	REVISION	DATE

BID SET

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CONTRACT 2020-01
LAKE FOREST PARK RESERVOIR AND BOOSTER STATION UPGRADES

ELECTRICAL DETAILS

BASE MAP A2
C1502
SHEET 28 *OF* 28