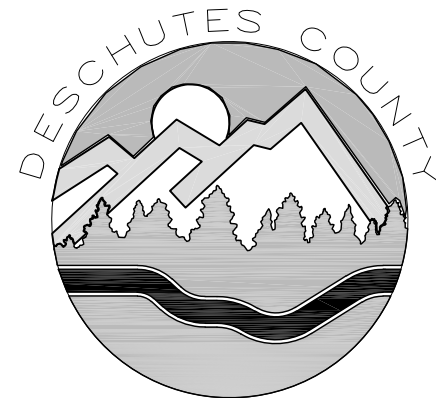
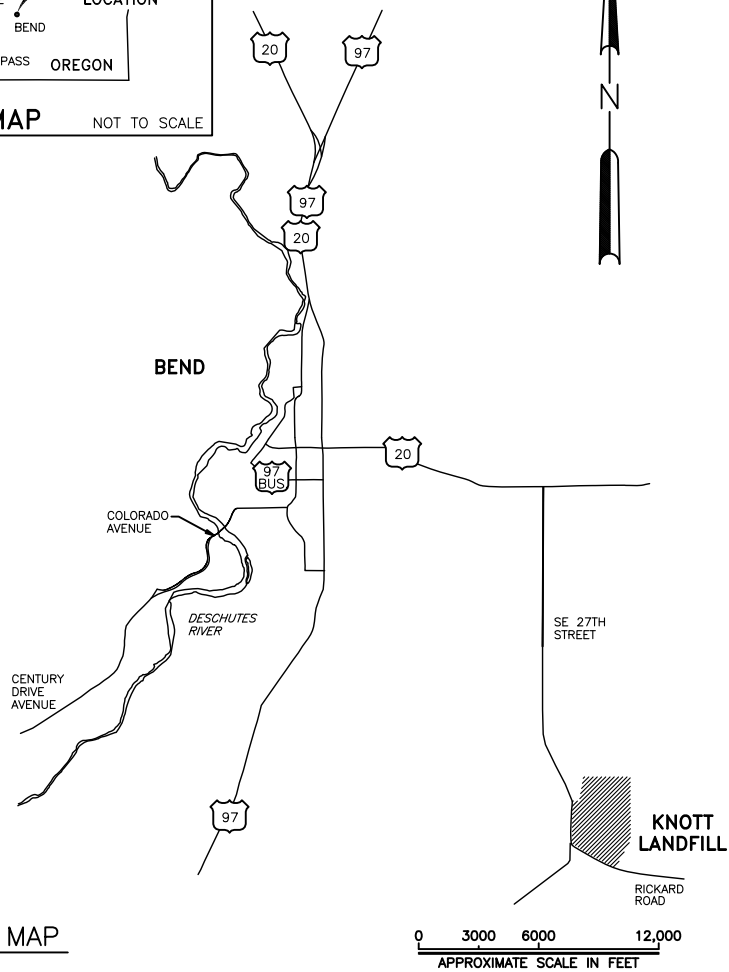
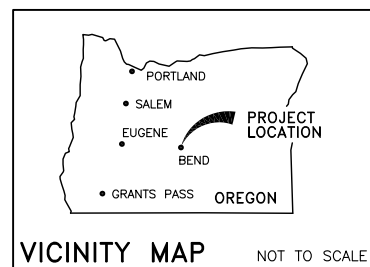


# Contract Drawings for the Construction of

# Knott Landfill

◆

# Cell 8 Construction Project



DEPARTMENT OF SOLID WASTE  
61050 SE 27th Street  
Bend, Oregon 97702

### County Commissioners

Philip Henderson  
Patti Adair  
Anthony DeBone

### Director of Solid Waste

Timm Schimke

**October, 2019**

## Project Directory

### Owner

Deschutes County  
Department of Solid Waste  
61050 SE 27th Street  
Bend, Oregon 97702  
Phone: 541-317-3163  
Director: Timm Schimke  
Operations Managers:  
Chad Centola  
Todd Sween

### Project Engineer

Gerry Friesen PE  
G. Friesen Associates, Inc.  
4088 Orchard Drive  
Lake Oswego, Oregon 97035  
Phone: 503-635-1233

### Geotechnical Engineer

Andy Siemens PE  
Siemens & Associates  
19134 River Woods Drive  
Bend, Oregon 97702  
Phone: 541-385-6500

### Mechanical Engineer

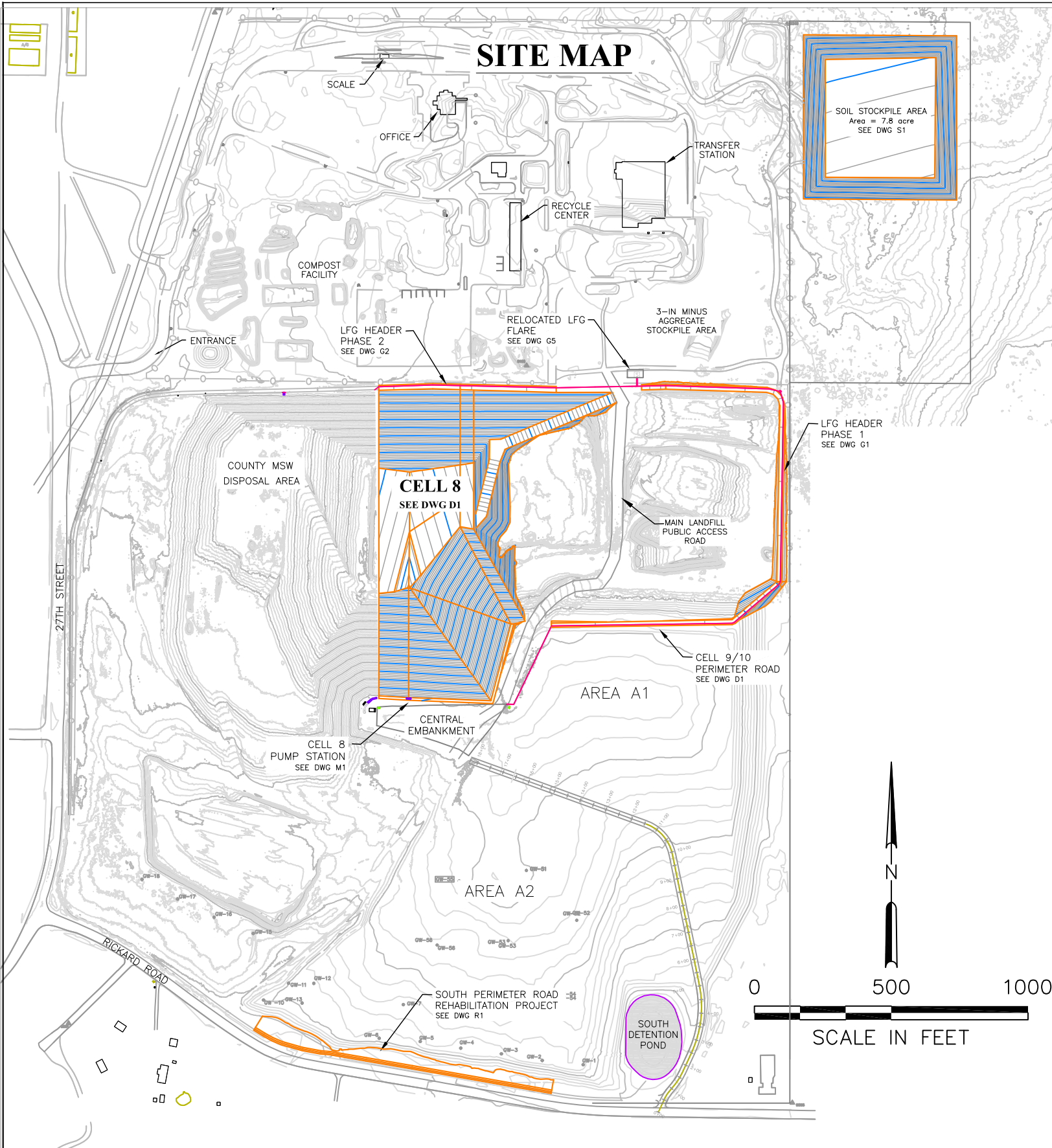
Benny Benson PE  
Cassidy Fisher  
ENERGYneering Solutions, Inc.  
15820 Barclay Drive  
Sisters, Oregon 97759  
Phone: 541-549-8766

### Surveying

John Thompson PLS  
John Thompson & Associates, Inc.  
PO Box 683  
Bend, Oregon 97709  
Phone: 541-312-9421

### Geosynthetic CQA

John Stein  
Peak Geosolutions  
5060 SW Philomath Blvd. #303  
Corvallis, Oregon 97339  
Phone: 541-231-0779



## Drawing Index

### Cover Sheet

A1 Site Map and Drawing Index

### Cell 8

D1 Existing Site Plan  
 D2 Subgrade Plan  
 D3 Subgrade Plan - Cut and Fill Depths  
 D4 Liner Sections and Details  
 D5 Liner Sections and Details  
 D6 Liner Sections and Details  
 D7 Trench and Pipe Details  
 D8 Sump Sections

### Landfill Gas System

G1 GCCS Work Phase I  
 G2 GCCS Work Phase II  
 G3 Perimeter LFG Pipe Profile I  
 G4 Perimeter LFG Pipe Profile II  
 G5 New Flare Site Plan  
 G6 LFG System Details I  
 G7 LFG System Details II  
 G8 LFG System Details III  
 G9 LFG System Details IV  
 G10 Flare Station Details I  
 G11 Flare Station Fence Details  
 G12 Compressed Air System Details

### Cell 8 Pump Station

M1 Pump Station Layout  
 M2 Pump Station Details I  
 M3 Pump Station Details II  
 M4 Leachate Riser Details

### Electrical System Modifications

E1 Electrical Legend/Notes  
 E2 Electrical Flare Site  
 E3 Flare Skid Electrical Single Line  
 E4 Electrical Details I  
 E5 Electrical Details II  
 E6 Electrical Single Line Drawing I  
 E7 Electrical Single Line Drawing II

### South Perimeter Road Rehabilitation

R1 Existing Topography  
 R2 Final Grading Plan  
 R3 Cut and Fill Depths  
 R4 Road and Wall Sections

### Soil Stockpile Area

S1 Existing Site Plan  
 S2 Final Grading Plan  
 S3 Soil Fill Depths



				JOB No. 00180	DESIGNED: GF	PROJ. ENGINEER: GF
				SCALE: AS SHOWN	DRAWN BY: GF	APPROVED BY: CC
					CHECKED BY: GF	DATE: 10/22/2019
A	10/22/19	GF	ISSUED FOR BIDDING			
No.	DATE	BY	REVISION			

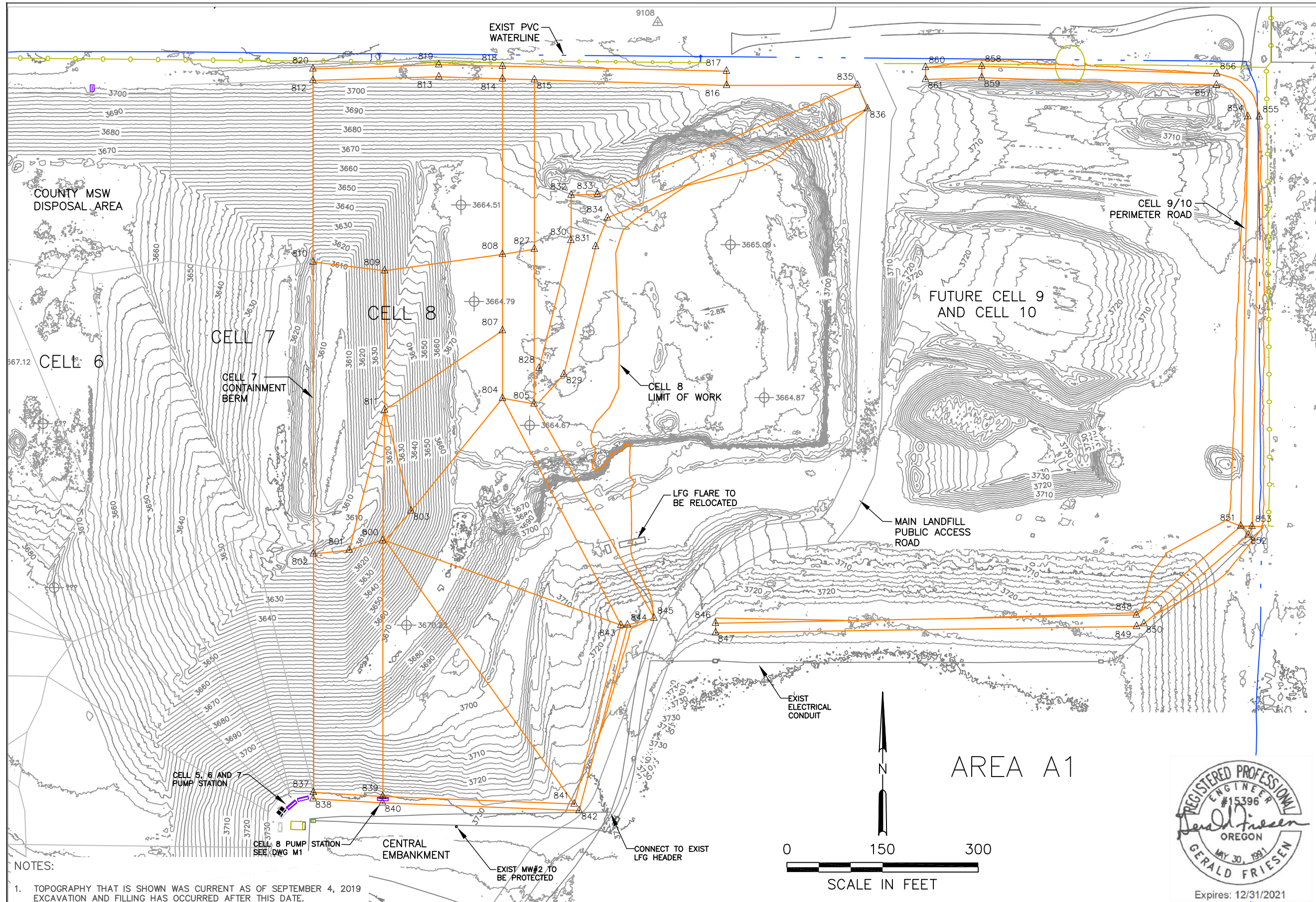


G. Friesen Associates, Inc.  
 4088 Orchard Drive  
 Lake Oswego, Oregon 97035  
 Tel: (503) 635-1233  
 Fax: (866) 533-5543

**KNOTT LANDFILL  
 CELL 8 CONSTRUCTION  
 PROJECT**  
 DESCHUTES COUNTY, OREGON

**CELL 8  
 SITE MAP AND DRAWING INDEX**

DRAWING NUMBER: A1	
CAD FILE NUMBER: A01	
SHEET: 2 OF 40	REV. A



Point Table

Point #	Northing	Easting	Elevation
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811	369556.02	3307694.81	3602.95
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813	370078.63	3307779.80	3707.42
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829	369611.91	3307975.78	3620.00
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839	368949.73	3307691.90	3730.46
840	368939.74	3307691.51	3730.26
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842	368927.67	3307999.70	3728.61
843	369218.58	3308065.23	3727.43
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851	369373.88	3309037.10	3709.70
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853	369373.37	3309054.74	3709.70
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NOTES:  
 1. TOPOGRAPHY THAT IS SHOWN WAS CURRENT AS OF SEPTEMBER 4, 2019  
 EXCAVATION AND FILLING HAS OCCURRED AFTER THIS DATE.

No.	DATE	BY	REVISION
A	10/22/19	GF	ISSUED FOR BIDDING

JOB No. 00180	DESIGNED: GF	PROJ. ENGINEER: GF
SCALE: AS SHOWN	DRAWN BY: GF	APPROVED BY: CC
	CHECKED BY: GF	DATE: 10/22/19



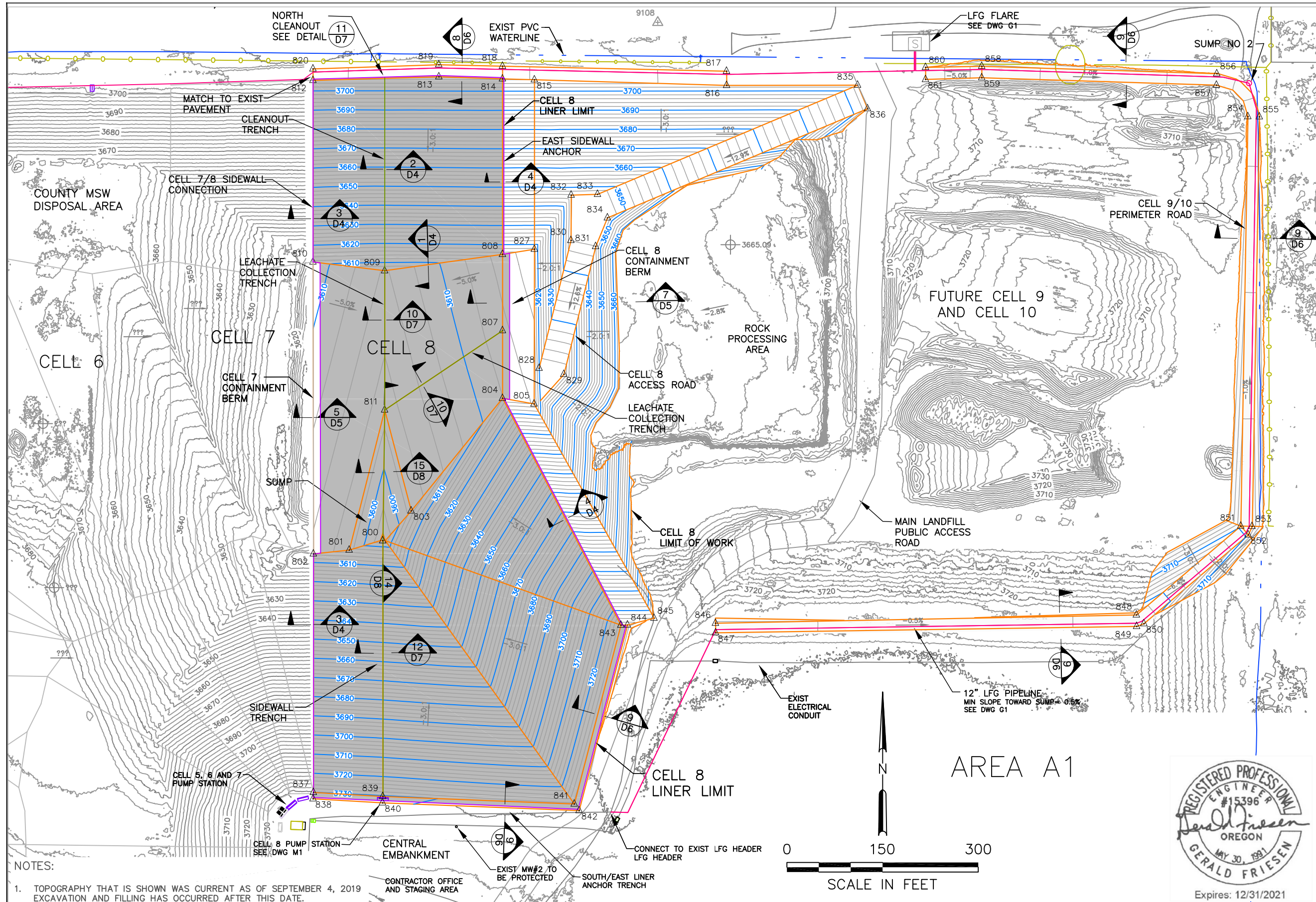
G. Friesen Associates, Inc.  
 4088 Orchard Drive  
 Lake Oswego, Oregon 97035  
 Tel: (503) 635-1233  
 Fax: (866) 533-5543

**KNOTT LANDFILL  
 CELL 8 CONSTRUCTION  
 PROJECT  
 DESCHUTES COUNTY, OREGON**



**CELL 8  
 EXISTING SITE PLAN**

DRAWING NUMBER: D1	
CAD FILE NUMBER: DO1	
SHEET: 3 of 40	REV. A



Point Table

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842	368927.67	3307999.70	3728.61
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NOTES:  
 1. TOPOGRAPHY THAT IS SHOWN WAS CURRENT AS OF SEPTEMBER 4, 2019 EXCAVATION AND FILLING HAS OCCURRED AFTER THIS DATE.

No.	DATE	BY	REVISION
A	10/22/19	GF	ISSUED FOR BIDDING

JOB No. 00180	DESIGNED: GF	PROJ. ENGINEER: GF
SCALE: AS SHOWN	DRAWN BY: GF	APPROVED BY: CC
	CHECKED BY: GF	DATE: 10/22/19

CONTRACTOR OFFICE AND STAGING AREA	EXIST MW#2 TO BE PROTECTED	SOUTH/EAST LINER ANCHOR TRENCH	CONNECT TO EXIST LFG HEADER
------------------------------------	----------------------------	--------------------------------	-----------------------------



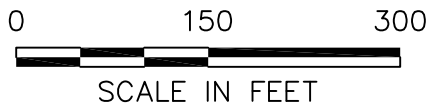
G. Friesen Associates, Inc.  
 4088 Orchard Drive  
 Lake Oswego, Oregon 97035  
 Tel: (503) 655-1233  
 Fax: (866) 533-5543

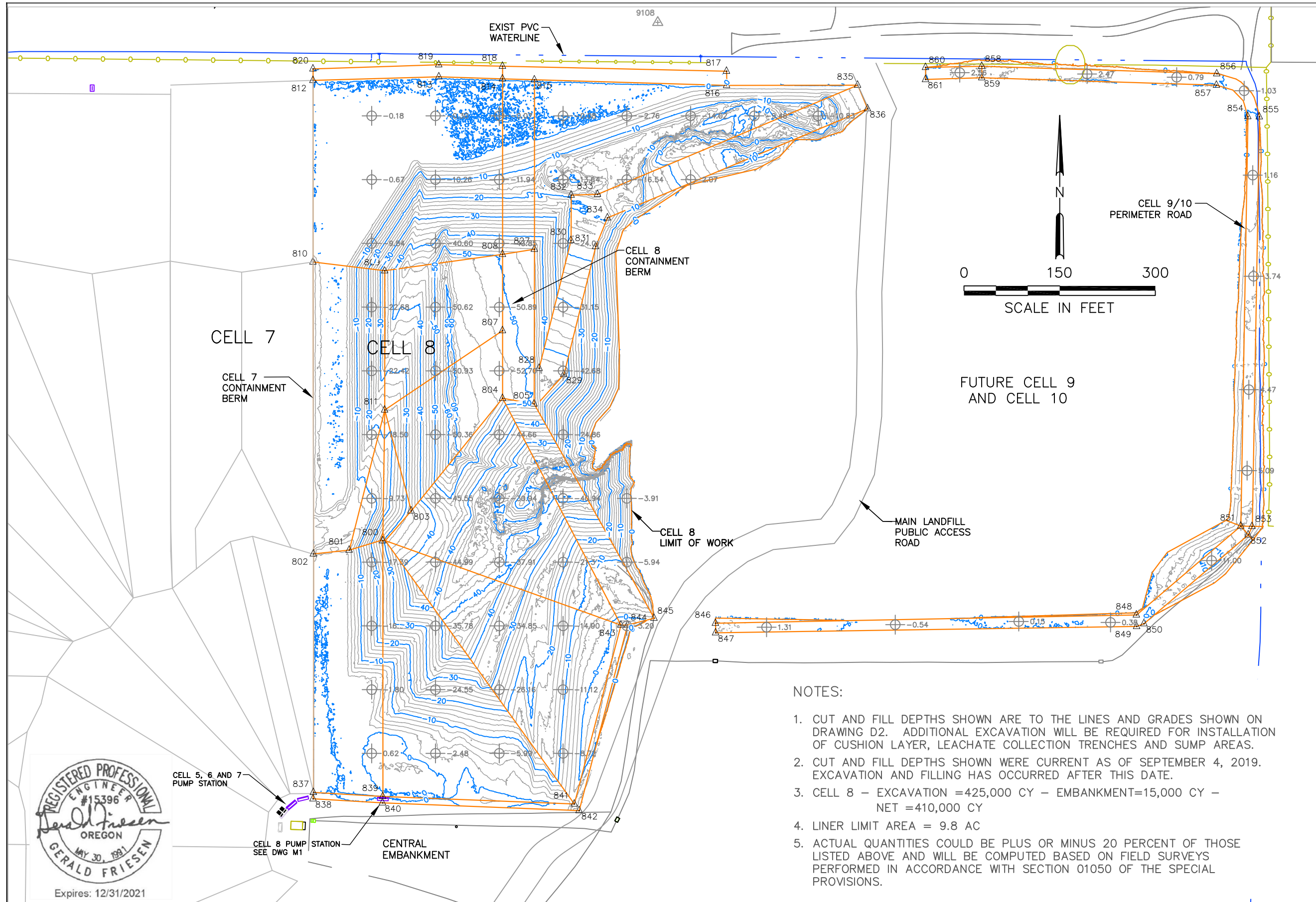
**KNOTT LANDFILL  
 CELL 8 CONSTRUCTION  
 PROJECT  
 DESCHUTES COUNTY, OREGON**



**CELL 8  
 SUBGRADE PLAN**

DRAWING NUMBER: <b>D2</b>	
CAD FILE NUMBER: <b>DO2</b>	
SHEET: 4 of 40	REV. A





Point Table

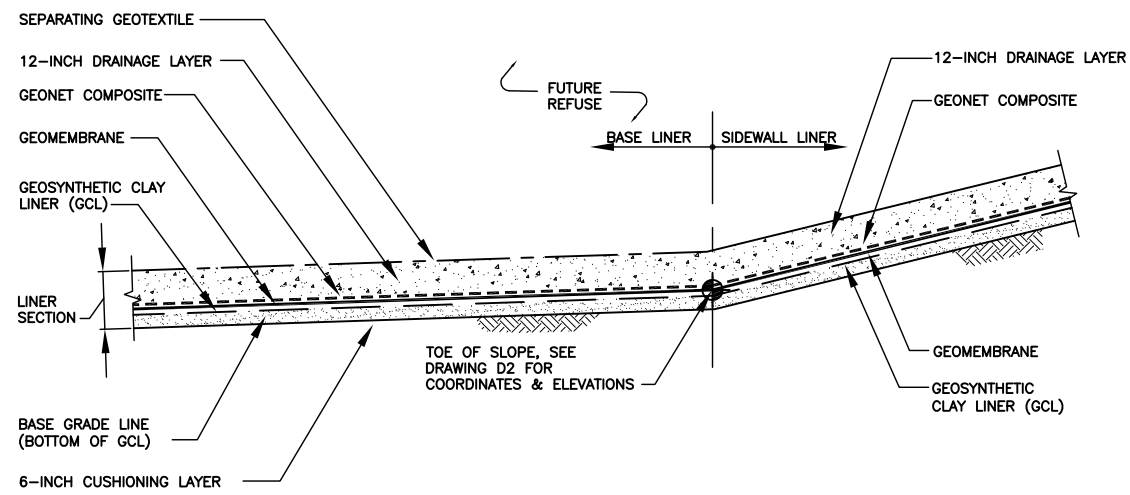
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NOTES:

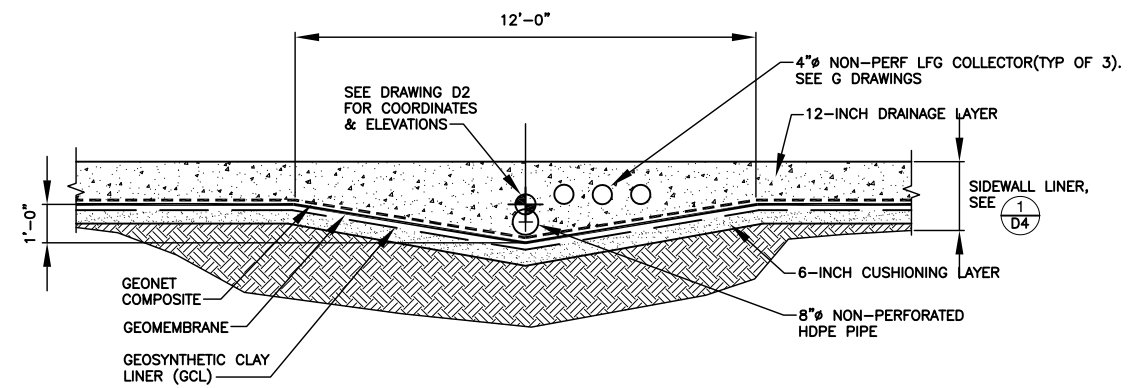
- CUT AND FILL DEPTHS SHOWN ARE TO THE LINES AND GRADES SHOWN ON DRAWING D2. ADDITIONAL EXCAVATION WILL BE REQUIRED FOR INSTALLATION OF CUSHION LAYER, LEACHATE COLLECTION TRENCHES AND SUMP AREAS.
- CUT AND FILL DEPTHS SHOWN WERE CURRENT AS OF SEPTEMBER 4, 2019. EXCAVATION AND FILLING HAS OCCURRED AFTER THIS DATE.
- CELL 8 - EXCAVATION = 425,000 CY - EMBANKMENT = 15,000 CY - NET = 410,000 CY
- LINER LIMIT AREA = 9.8 AC
- ACTUAL QUANTITIES COULD BE PLUS OR MINUS 20 PERCENT OF THOSE LISTED ABOVE AND WILL BE COMPUTED BASED ON FIELD SURVEYS PERFORMED IN ACCORDANCE WITH SECTION 01050 OF THE SPECIAL PROVISIONS.



A		10/22/19	GF	ISSUED FOR BIDDING									
No.	DATE	BY	REVISION										
<table border="1"> <tr> <td>JOB No. 00180</td> <td>DESIGNED: GF</td> <td>PROJ. ENGINEER: GF</td> </tr> <tr> <td>SCALE: AS SHOWN</td> <td>DRAWN BY: GF</td> <td>APPROVED BY: CC</td> </tr> <tr> <td></td> <td>CHECKED BY: GF</td> <td>DATE: 10/22/19</td> </tr> </table>					JOB No. 00180	DESIGNED: GF	PROJ. ENGINEER: GF	SCALE: AS SHOWN	DRAWN BY: GF	APPROVED BY: CC		CHECKED BY: GF	DATE: 10/22/19
JOB No. 00180	DESIGNED: GF	PROJ. ENGINEER: GF											
SCALE: AS SHOWN	DRAWN BY: GF	APPROVED BY: CC											
	CHECKED BY: GF	DATE: 10/22/19											
		G. Friesen Associates, Inc. 4088 Orchard Drive Lake Oswego, Oregon 97035 Tel: (503) 635-1233 Fax: (866) 533-5543											
KNOTT LANDFILL <b>CELL 8 CONSTRUCTION PROJECT</b> DESCHUTES COUNTY, OREGON		CELL 8 <b>SUBGRADE PLAN - CUT AND FILL DEPTHS</b>											
DRAWING NUMBER: <b>D3</b>		CAD FILE NUMBER: <b>DO3</b>											
SHEET: 5 of 40		REV. <b>A</b>											



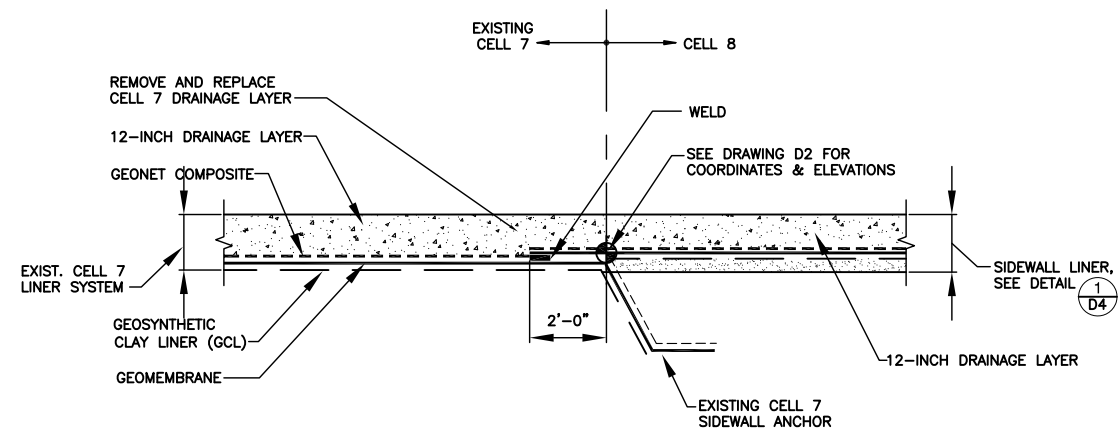
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N.T.S. 1



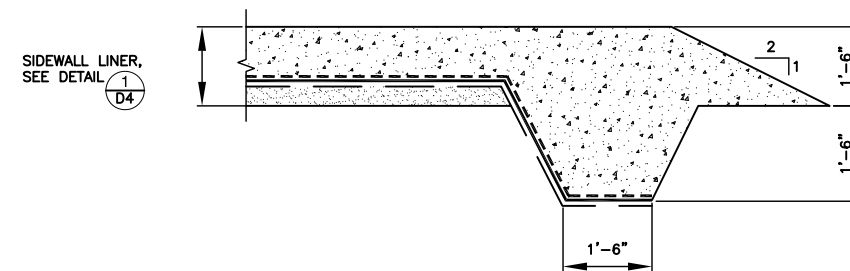
**CLEANOUT TRENCH**  
N.T.S. 2

**LEGEND**

- GEOMEMBRANE
- - - - - CUSHIONING GEOTEXTILE
- GEOSYNTHETIC CLAY LINER (GCL)
- - - - - GEONET COMPOSITE
- - - - - SEPARATING GEOTEXTILE



**CELL 7 SIDEWALL CONNECTION**  
N.T.S. 3



**SIDEWALL ANCHOR**  
N.T.S. 4



				JOB No. 00180	DESIGNED: GF	PROJ. ENGINEER: GF
				SCALE: N.T.S.	DRAWN BY: GF	APPROVED BY: CC
					CHECKED BY: GF	DATE: 10/22/19
A	10/22/19	GF	ISSUED FOR BIDDING			
No.	DATE	BY	REVISION			



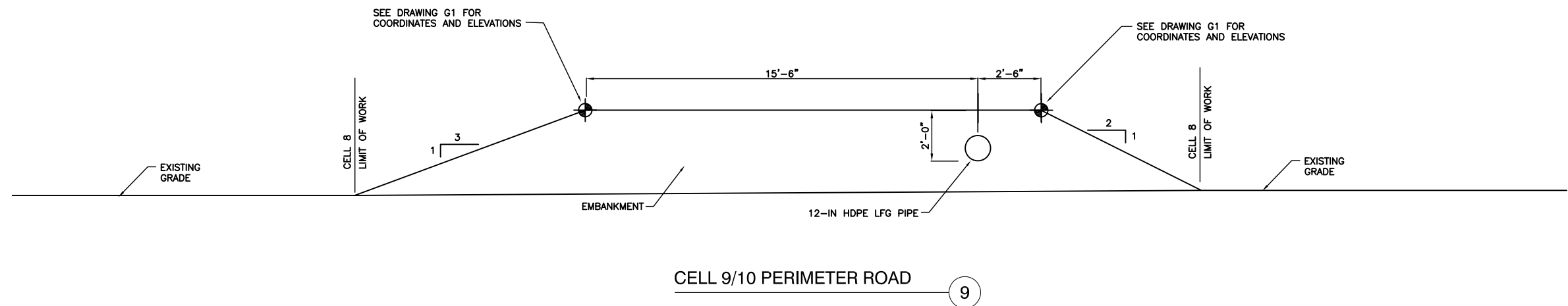
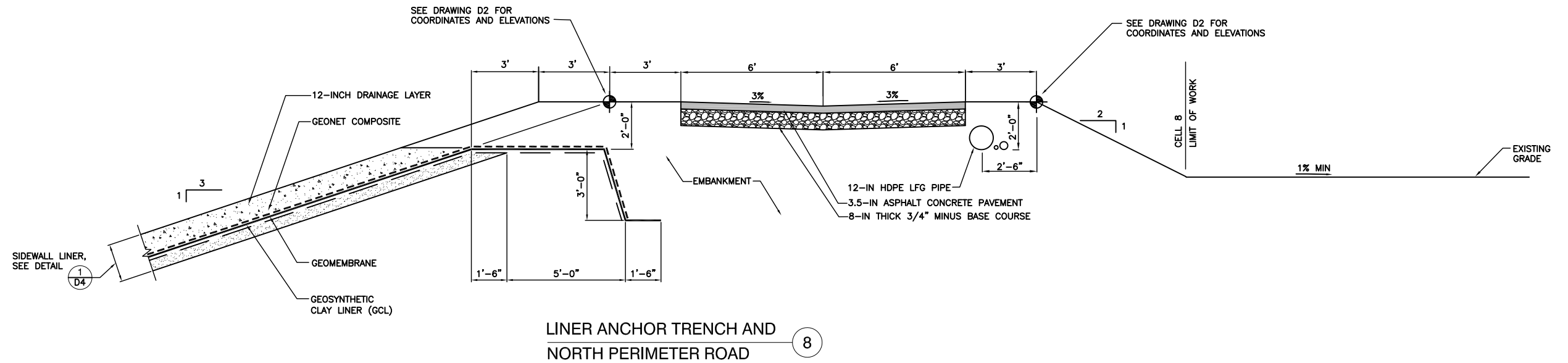
G. Friesen Associates, Inc.  
4088 Orchard Drive  
Lake Oswego, Oregon 97035  
Tel: (503) 635-1233  
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**KNOTT LANDFILL  
CELL 8 CONSTRUCTION  
PROJECT  
DESCHUTES COUNTY, OREGON**

**CELL 8  
LINER SECTIONS AND DETAILS**

DRAWING NUMBER: <b>D4</b>	
CAD FILE NUMBER: <b>D04</b>	
SHEET: 6 OF 40	REV. <b>A</b>





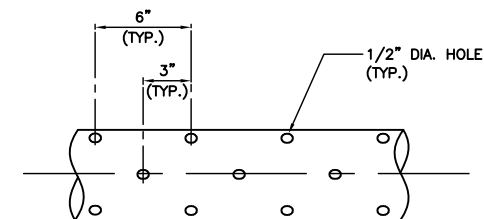
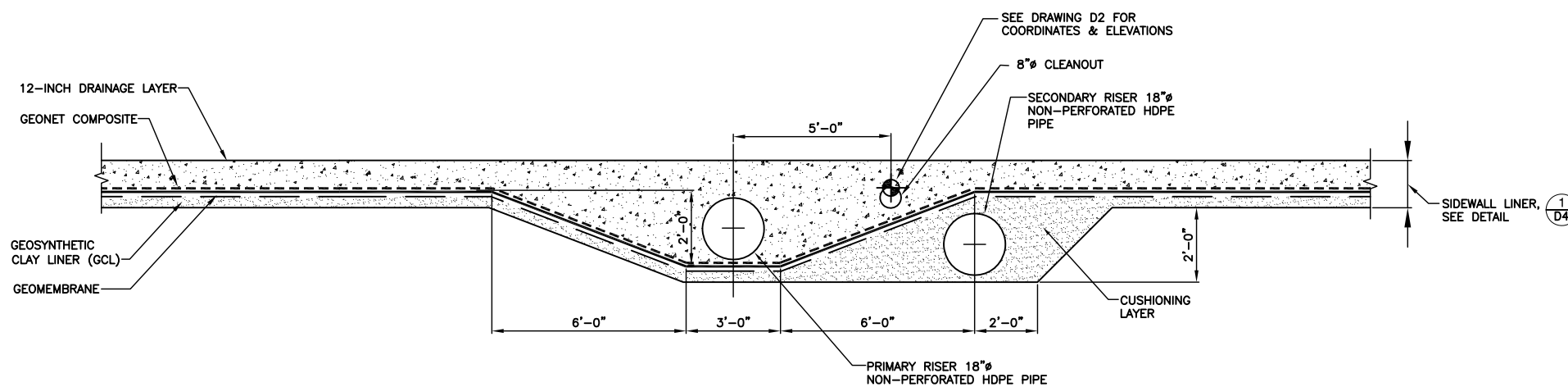
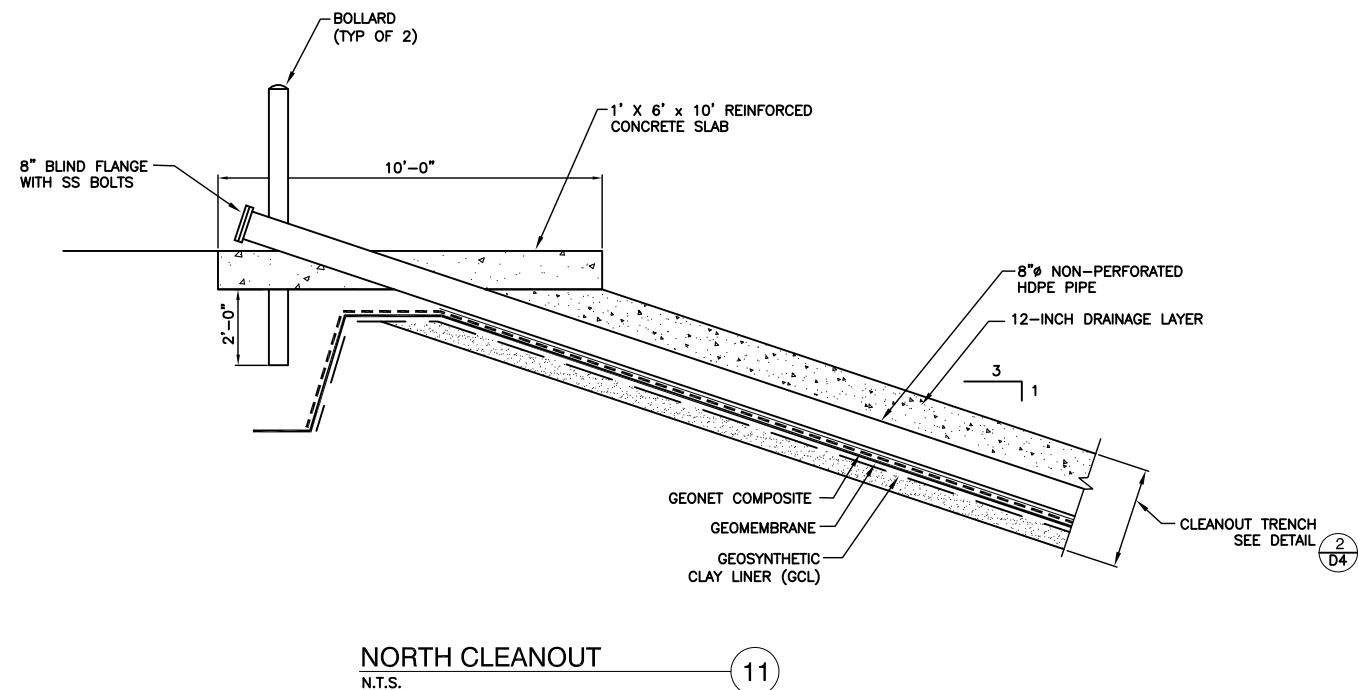
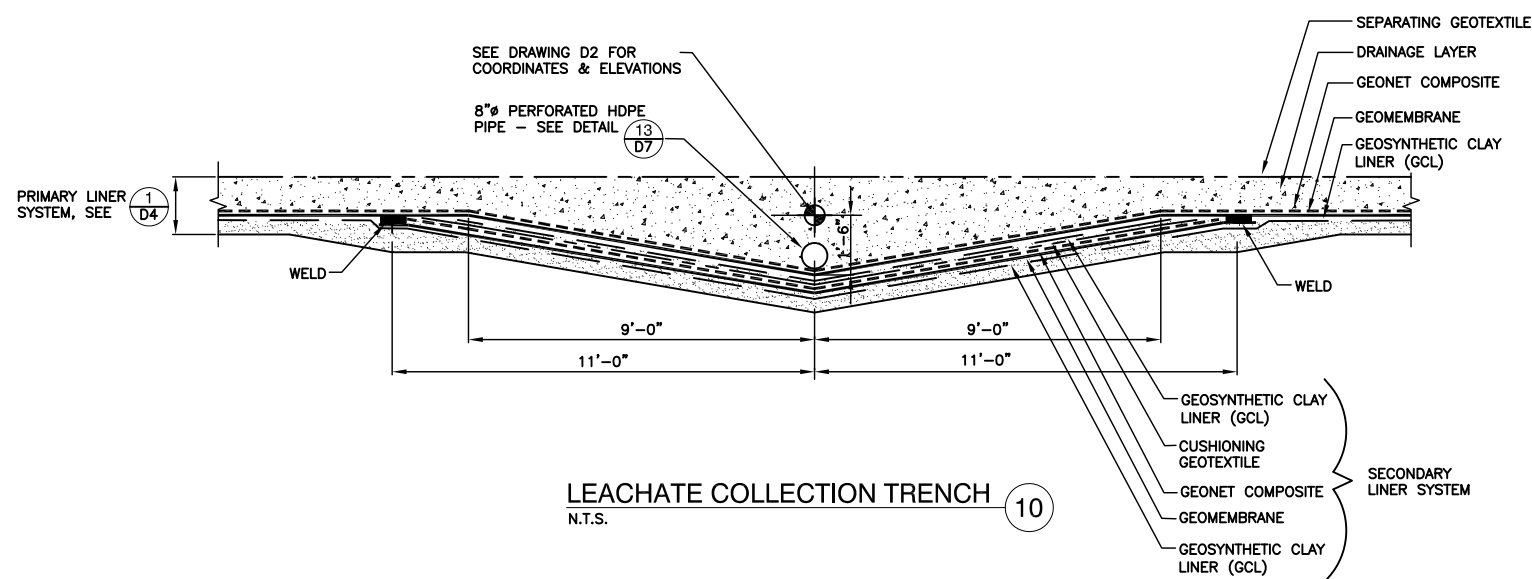
**LEGEND**

- GEOMEMBRANE
- - - - CUSHIONING GEOTEXTILE
- GEOSYNTHETIC CLAY LINER (GCL)
- - - - GEONET COMPOSITE
- - - - SEPARATING GEOTEXTILE



				JOB No. 00180	DESIGNED: GF	PROJ. ENGINEER: GF			 <p>G. Friesen Associates, Inc. 4088 Orchard Drive Lake Oswego, Oregon 97075 Tel: (503) 635-1233 Fax: (866) 533-5543</p>	<p><b>KNOTT LANDFILL CELL 8 CONSTRUCTION PROJECT DESCHUTES COUNTY, OREGON</b></p>	<p><b>CELL 8 LINER SECTIONS AND DETAILS</b></p>	D6	
				SCALE: N.T.S.	DRAWN BY: GF	APPROVED BY: CC						CAD FILE NUMBER: D06	
					CHECKED BY: GF	DATE: 10/22/19						SHEET: 8 OF 40	REV. A
A	10/22/19	GF	ISSUED FOR BIDDING										
No.	DATE	BY	REVISION										





- NOTES:
- HOLES SHALL BE DRILLED AT 90° AROUND PIPE CIRCUMFERENCE. SUCCESSIVE ROWS SHALL BE SEPERATED BY 2" AND STAGGERED 45°
  - REMOVE INTERIOR WELD BEADS AND ALL CUTTINGS INSIDE AND OUT BEFORE PIPE IS INSTALLED.

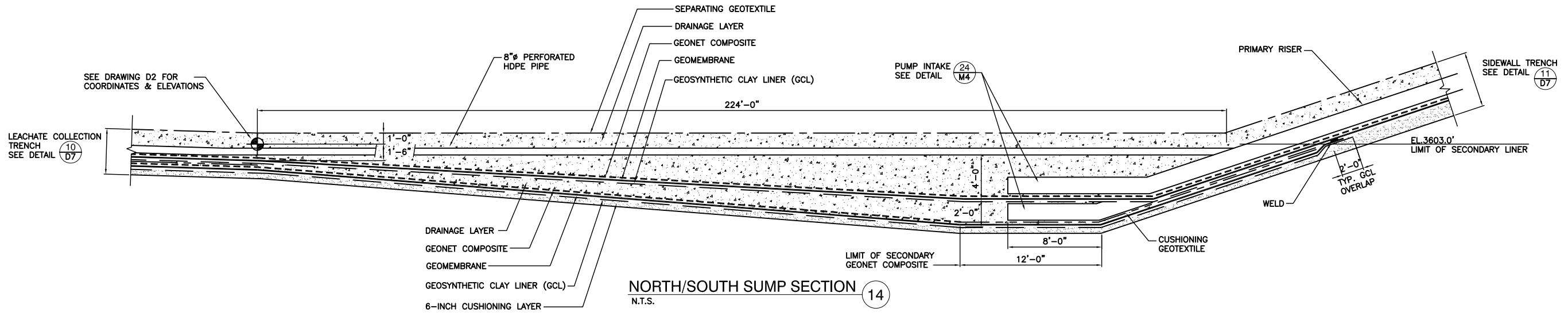
PERFORATED HDPE PIPE 13 N.T.S.

LEGEND

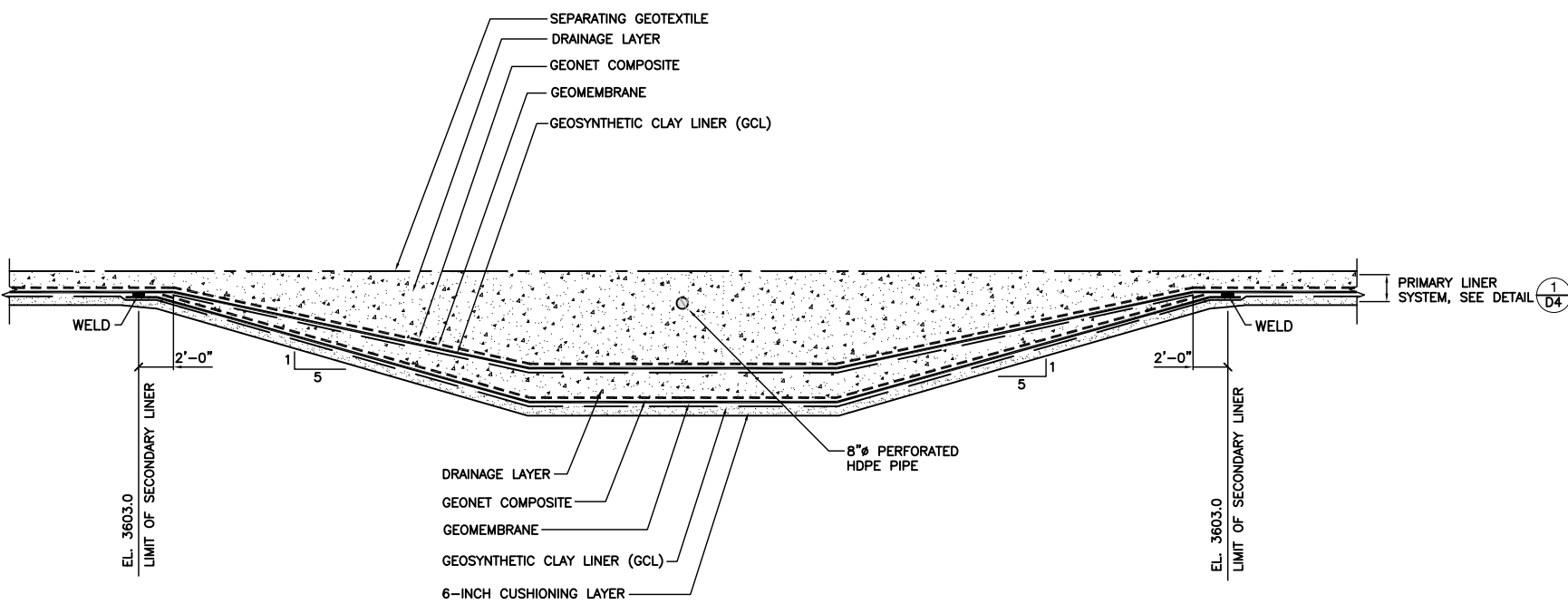
- GEOMEMBRANE
- - - - - CUSHIONING GEOTEXTILE
- GEOSYNTHETIC CLAY LINER (GCL)
- - - - - GEONET COMPOSITE
- SEPARATING GEOTEXTILE



				JOB No. 00180	DESIGNED: GF	PROJ. ENGINEER: GF			<p>G. Friesen Associates, Inc. 4088 Orchard Drive Lake Oswego, Oregon 97075 Tel: (503) 635-1233 Fax: (866) 5543</p>	<p>KNOTT LANDFILL CELL 8 CONSTRUCTION PROJECT DESCHUTES COUNTY, OREGON</p>	DRAWING NUMBER: D7	
				SCALE: N.T.S.	DRAWN BY: GF	APPROVED BY: CC					CAD FILE NUMBER: D07	
					CHECKED BY: GF	DATE: 10/22/19					SHEET: 9 of 40	REV. A
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No.	DATE	BY	REVISION									



**NORTH/SOUTH SUMP SECTION 14**  
N.T.S.



**EAST/WEST SUMP SECTION 15**  
N.T.S.

**LEGEND**

—————	GEOMEMBRANE
- - - - -	CUSHIONING GEOTEXTILE
—————	GEOSYNTHETIC CLAY LINER (GCL)
- - - - -	GEONET COMPOSITE
- - - - -	SEPARATING GEOTEXTILE



No.	DATE	BY	REVISION
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JOB No.	DESIGNED:	PROJ. ENGINEER:
00180	GF	GF
SCALE:	DRAWN BY:	APPROVED BY:
N.T.S.	GF	CC
	CHECKED BY:	DATE:
	GF	10/22/19



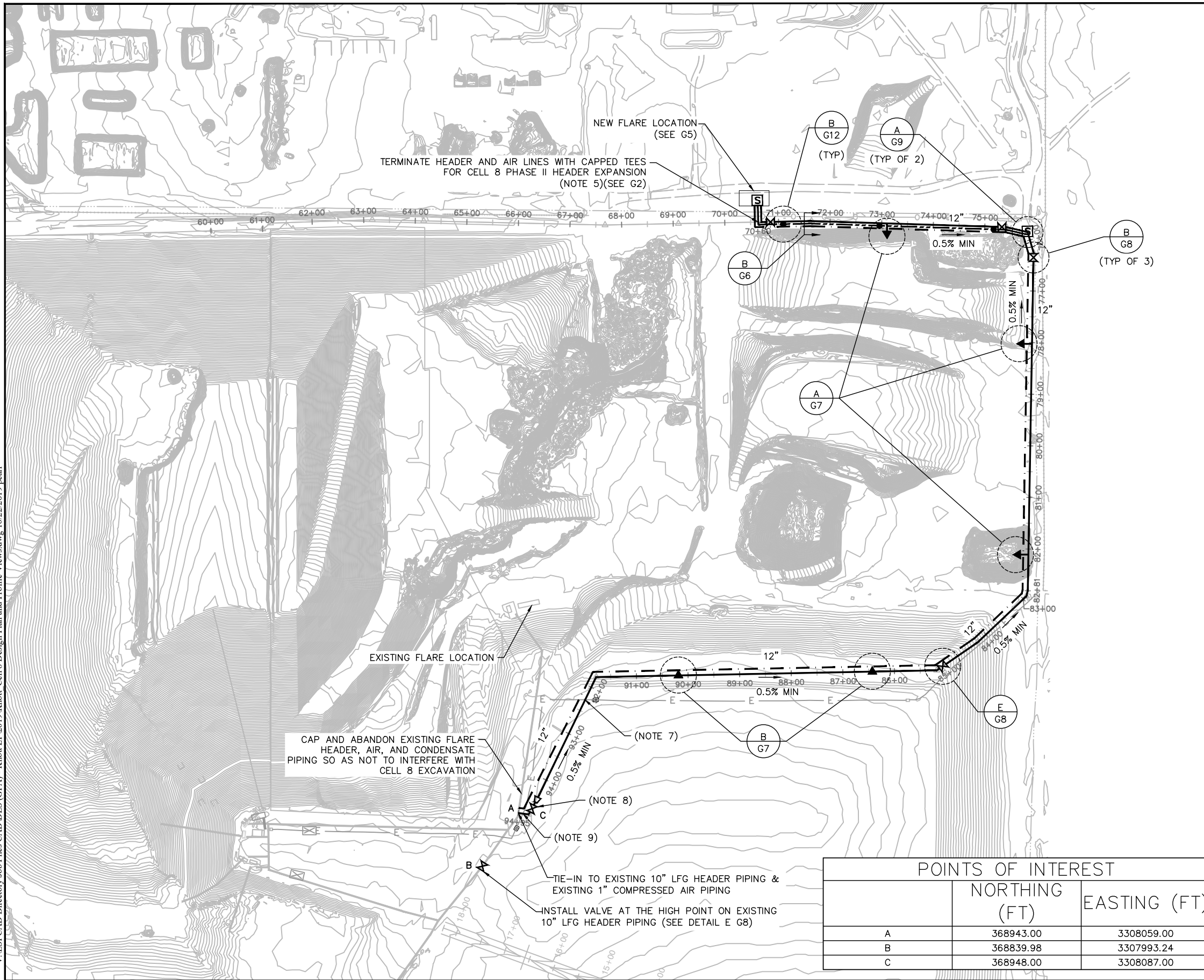
G. Friesen Associates, Inc.  
4088 Orchard Drive  
Lake Oswego, Oregon 97075  
Tel: (503) 635-1233  
Fax: (866) 533-5543

**KNOTT LANDFILL  
CELL 8 CONSTRUCTION  
PROJECT  
DESCHUTES COUNTY, OREGON**

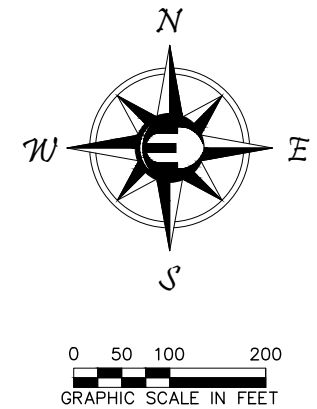
**CELL 8  
SUMP SECTIONS**

DRAWING NUMBER: <b>D8</b>	
CAD FILE NUMBER: <b>D08</b>	
SHEET: 10 of 40	REV. <b>A</b>

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- LEGEND**
- 10" LFG PIPE AND SIZE
  - CONDENSATE PIPE (2" HDPE SDR11)
  - COMPRESSED AIR PIPE (1" HDPE SDR11)
  - 0.5% LFG PIPE SLOPE
  - 8" (EXISTING) LFG PIPE AND SIZE
  - (EXISTING) CONDENSATE PIPE
  - (EXISTING) COMPRESSED AIR PIPE
  - (EXISTING) ELECTRICAL LINE
  - S CONDENSATE SUMP
  - X ISOLATION VALVE
  - ▲ LFG STUB-UP/OUT
  - CONDENSATE PIPING CLEANOUT



- NOTES:**
1. PHASE 1 MUST BE COMPLETED BEFORE EXCAVATING CELL 8.
  2. ALL PIPING TO BE SDR 17 HDPE UNLESS OTHERWISE STATED.
  3. EXISTING FLARE AND BLOWER SKID TO BE RELOCATED DURING PHASE I OF CELL 8 CONSTRUCTION. LFG HEADER PIPING & PERIMETER ROAD WILL BE COMPLETED AT THE SAME TIME TO REDIRECT LFG TO THE NEW FLARE LOCATION.
  4. REFER TO G3 FOR PROFILE VIEW OF LFG HEADER.
  5. TERMINATE CONDENSATE PIPING WITH CAPPED WYE FITTING.
  6. CONDENSATE PIPING TO DRAIN TO TEMPORARY STORAGE TANK NEAR NEW FLARE LOCATION UNTIL PHASE II PIPING IS COMPLETE AND CONDENSATE CAN DRAIN TO CELL 8 GCCS PIPING. CONTRACTOR HAS FLEXIBILITY WITH PHASE I CONDENSATE PIPING DRAINAGE, TO BE APPROVED BY OWNER OR ENGINEER.
  7. USE CAUTION WHEN EXCAVATING DURING HEADER INSTALLATION. MAINTAIN 12" SPACING OF CEC ELECTRICAL LINE. LFG PIPE MAY CROSS OVER CEC ELECTRICAL LINE IF NECESSARY.
  8. VALVE AND REDUCER SHOULD BE INSTALLED EAST OF THE ELECTRICAL CROSSING (SEE DETAIL E G8 FOR VALVE).
  9. AT TIE-IN TO EXISTING 10"Ø HEADER AT CENTRAL EMBANKMENT, INSTALL NEW HEADER PIPING WITH ADEQUATE FALL TO MAINTAIN 12" OF SPACING BELOW THE NEARBY ELECTRICAL CONDUIT AT POINT OF CROSSING.

POINTS OF INTEREST		
	NORTHING (FT)	EASTING (FT)
A	368943.00	3308059.00
B	368839.98	3307993.24
C	368948.00	3308087.00



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JOB No. 018.502	DESIGNED: TB	PROJ. ENGINEER: TB
SCALE: AS SHOWN	DRAWN BY: PC	APPROVED BY: CF
	CHECKED BY: CF	DATE: 10/21/19

**ENERGYNEERING SOLUTIONS INC**  
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 FAX: (541) 549-1901

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**KNOTT LANDFILL  
 CELL 8 CONSTRUCTION  
 PROJECT  
 DESCHUTES COUNTY, OREGON**

**CELL 8  
 GCCS WORK PHASE I**

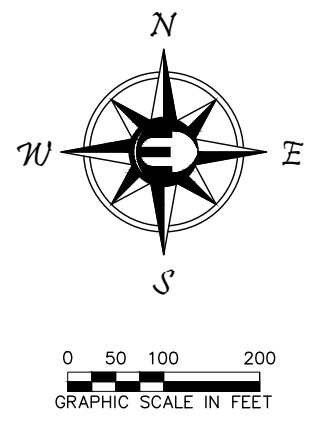
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CAD FILE NUMBER: ESI 1	
SHEET: 11 OF 40	REV. A

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**LEGEND**

	10" LFG PIPE AND SIZE
	CONDENSATE PIPE (2" HDPE SDR11)
	COMPRESSED AIR PIPE (1" HDPE SDR11)
	0.5% LFG PIPE SLOPE
	(EXISTING) LFG PIPE AND SIZE
	(EXISTING) CONDENSATE PIPE
	(EXISTING) COMPRESSED AIR PIPE
	(EXISTING) ELECTRICAL LINE
	CONDENSATE SUMP
	ISOLATION VALVE
	LFG STUB-UP/OUT
	CONDENSATE PIPING CLEANOUT



**NOTES:**

1. PHASE 2 WILL BEGIN WHEN PHASE 1 WORK IS COMPLETED, FLARE IS OPERATIONAL AND CELL 8 LINER INSTALLED. VARIATIONS FROM THIS SCHEDULE TO BE APPROVED BY OWNER.
2. ALL PIPING TO BE SDR 17 HDPE UNLESS OTHERWISE STATED.
3. REFER TO G4 FOR PROFILE VIEW.
4. NEW 12"Ø HEADER TO CROSS BENEATH ROAD FOLLOWING TIE-IN TO CELL 7 10"Ø HEADER. CONTRACTOR TO ROUTE PIPE AS NECESSARY TO MAINTAIN FALL.



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SCALE: AS SHOWN	DRAWN BY: PC	APPROVED BY: CF
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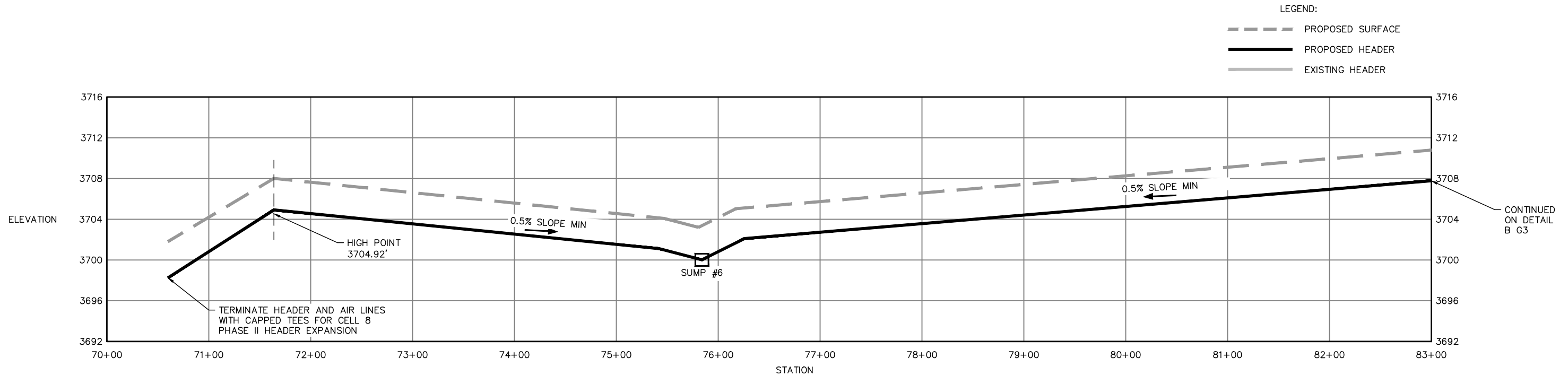
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**KNOTT LANDFILL  
 CELL 8 CONSTRUCTION  
 PROJECT  
 DESCHUTES COUNTY, OREGON**

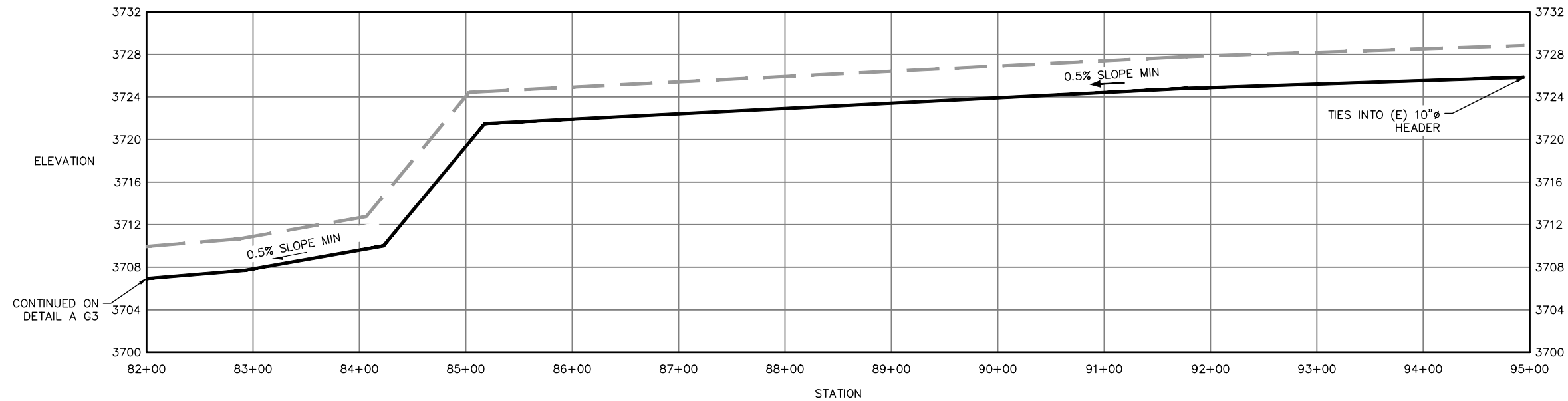
**CELL 8  
 GCCS WORK PHASE II**

DRAWING NUMBER: G2	
CAD FILE NUMBER: ESI 1	
SHEET: 12 OF 40	REV. A

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(A) PHASE 1 ALIGNMENT - PROFILE 1  
G3



(B) PHASE 1 ALIGNMENT - PROFILE 2  
G3

**NOTES:**  
 1. ALL ELEVATIONS ARE APPROXIMATED. CONTRACTOR TO VERIFY AT TIME OF CONSTRUCTION.



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	CHECKED BY: CF	DATE: 10/21/19

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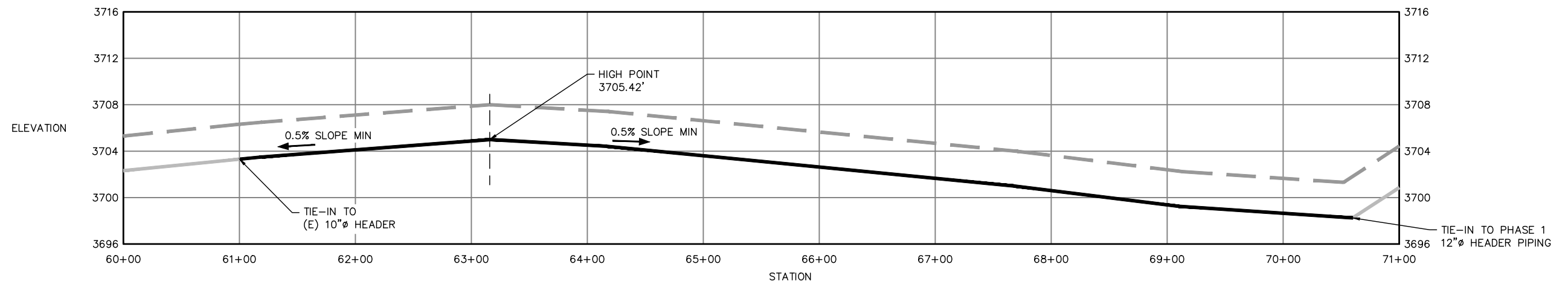
**KNOTT LANDFILL  
 CELL 8 CONSTRUCTION  
 PROJECT  
 DESCHUTES COUNTY, OREGON**

**CELL 8  
 PERIMETER LFG PIPE PROFILE I**

DRAWING NUMBER: G3	
CAD FILE NUMBER: ESI 1	
SHEET: 13 OF 40	REV. A

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LEGEND:  
 - - - - - PROPOSED SURFACE  
 ——— PROPOSED HEADER  
 ——— EXISTING HEADER



A  
G4

## PHASE 2 ALIGNMENT PROFILE

NOTES:

1. ALL ELEVATIONS ARE APPROXIMATED. CONTRACTOR TO VERIFY AT TIME OF CONSTRUCTION.



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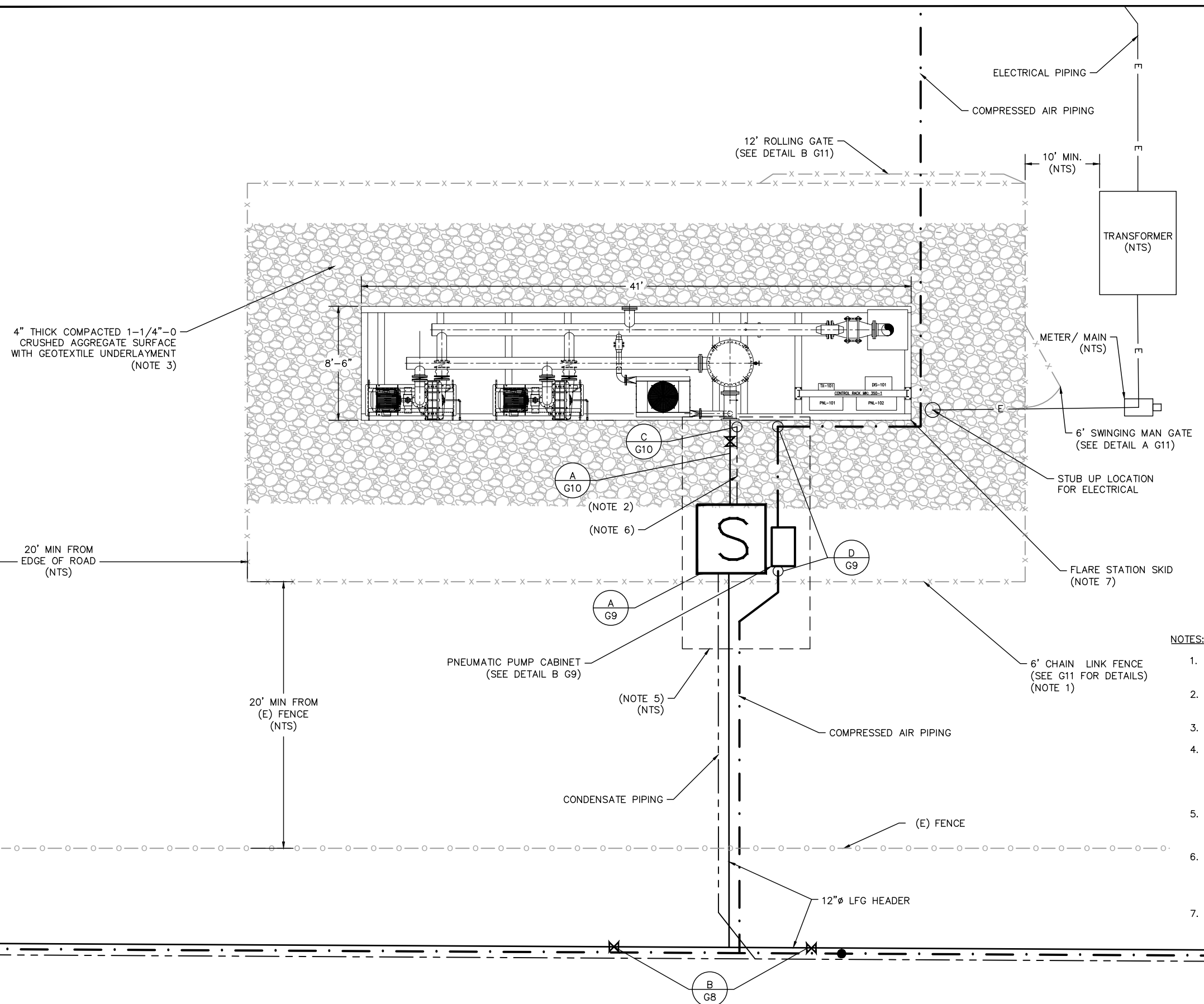
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**KNOTT LANDFILL  
 CELL 8 CONSTRUCTION  
 PROJECT  
 DESCHUTES COUNTY, OREGON**

**CELL 8  
 PERIMETER LFG PIPE PROFILE II**

DRAWING NUMBER: G4	
CAD FILE NUMBER: ESI 1	
SHEET: 14 OF 40	REV. A

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- LEGEND**
- LFG HEADER PIPING
  - CONDENSATE PIPING
  - - - COMPRESSED AIR PIPING
  - [S] CONDENSATE SUMP
  - E - ELECTRICAL CONDUIT
  - - - EXISTING FENCE
  - - - EXISTING ROADWAY
  - (NTS) NOT TO SCALE
  - CONDENSATE PIPING CLEANOUT
  - X ISOLATION VALVE

- NOTES:**
1. FENCE LOCATION DEPICTED IS APPROXIMATE. FIELD FIT TO ENSURE AN 8' PERIMETER IS MAINTAINED BETWEEN THE FENCE AND THE SKID.
  2. REUSE EXISTING PIPE SUPPORT STRUCTURES FROM PREVIOUS FLARE LOCATION AS NECESSARY. APPROVED ALTERNATIVE IS DETAILED ON DRAWING G10 DETAIL D.
  3. CRUSHED AGGREGATE SURFACING TO BE EXTENDED 5' PAST THE SIDES OF THE SKID BASE.
  4. THE FLARE SKID AND ATTACHED ELECTRICAL EQUIPMENT ARE TO BE RELOCATED FROM THEIR EXISTING LOCATION ON THE LANDFILL SITE. THE CANOPY ATTACHED TO THE SKID SHALL BE RELOCATED OR REBUILT IN KIND AT THE NEW LOCATION. THE SKID HAS TWO FORKLIFT POCKETS LOCATED ON THE LONG SIDE OF THE SKID.
  5. CONTRACTOR HAS FLEXIBILITY WITH THE ROUTING AND ARRANGEMENT OF SHOWN SERVICE LINES AND SUMP. ANY CHANGES MADE TO BE APPROVED BY ENGINEER PRIOR TO INSTALLATION.
  6. TIE IN LOCATION OF CONDENSATE RETURN LINE TO LFG HEADER OR SUMP TO BE FIELD FIT BY THE CONTRACTOR WITH APPROVAL BY THE ENGINEER. USE ELECTROFUSION COUPLING BRANCH SADDLE OR APPROVED ALTERNATIVE (IE. SIDEWINDER FUSION BRANCH SADDLE).
  7. SKID LOCATION PROVIDED AND STAKED BY OWNER.



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JOB No. 018.502	DESIGNED: JH	PROJ. ENGINEER: JH
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	CHECKED BY: CF	DATE: 10/21/19

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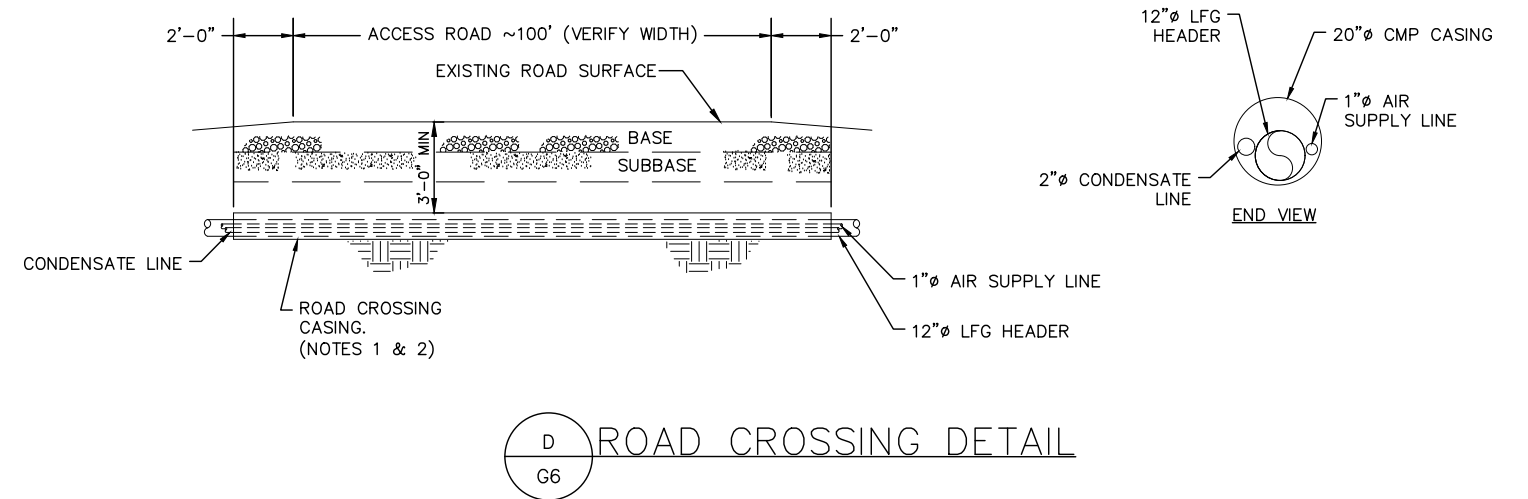
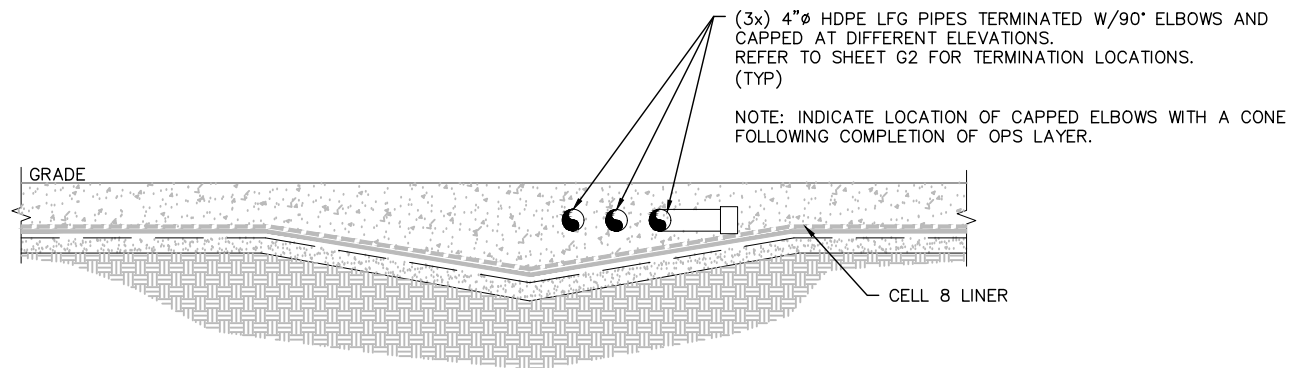
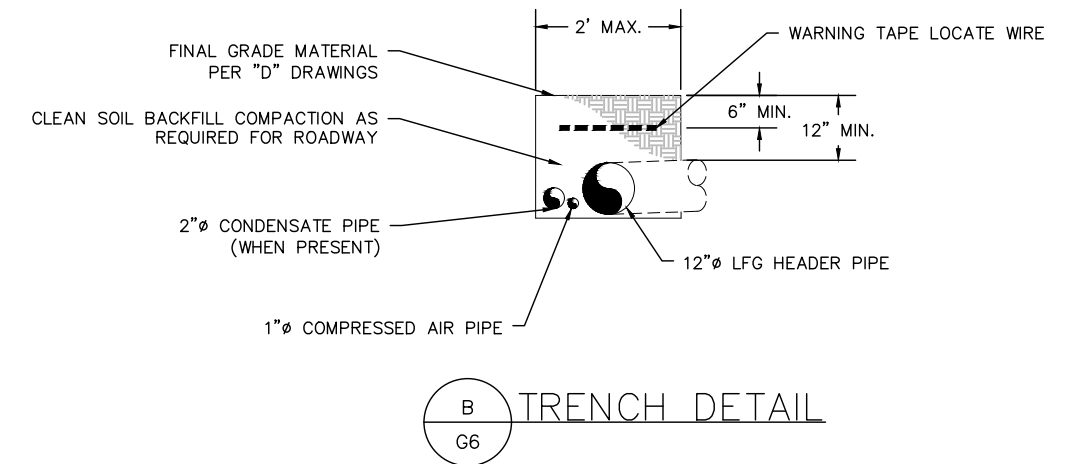
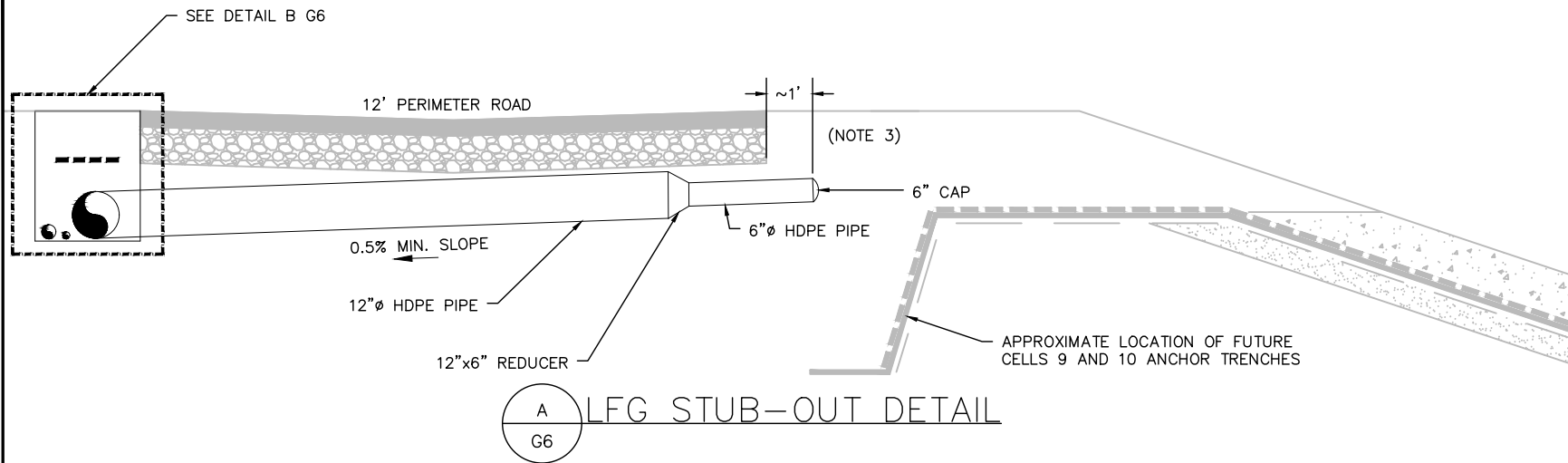
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**KNOTT LANDFILL  
 CELL 8 CONSTRUCTION  
 PROJECT  
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**CELL 8  
 NEW FLARE SITE PLAN**

DRAWING NUMBER: G5	
CAD FILE NUMBER: ESI 1	
SHEET: 15 OF 40	REV. A

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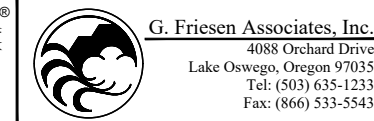
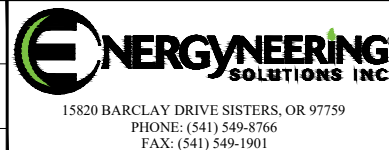
**NOTES:**

1. CMP CASING A MINIMUM OF 5" GREATER THAN THE CUMULATIVE DIAMETER OF THE PIPES ENCASED
2. THE AIR AND CONDENSATE LINES MAY BE INSTALLED IN A SEPARATE CASING IF PREFERRED BY THE CONTRACTOR, WITH APPROVAL FROM THE OWNER.
3. STUB-OUT 6"  $\phi$  LFG PIPING WITH ADEQUATE LENGTH TO PREVENT EXCAVATION OF ROAD ASPHALT FOR PIPE JOINING DURING CELLS 9 AND 10 FUTURE ANCHOR TRENCH CONSTRUCTIONS.



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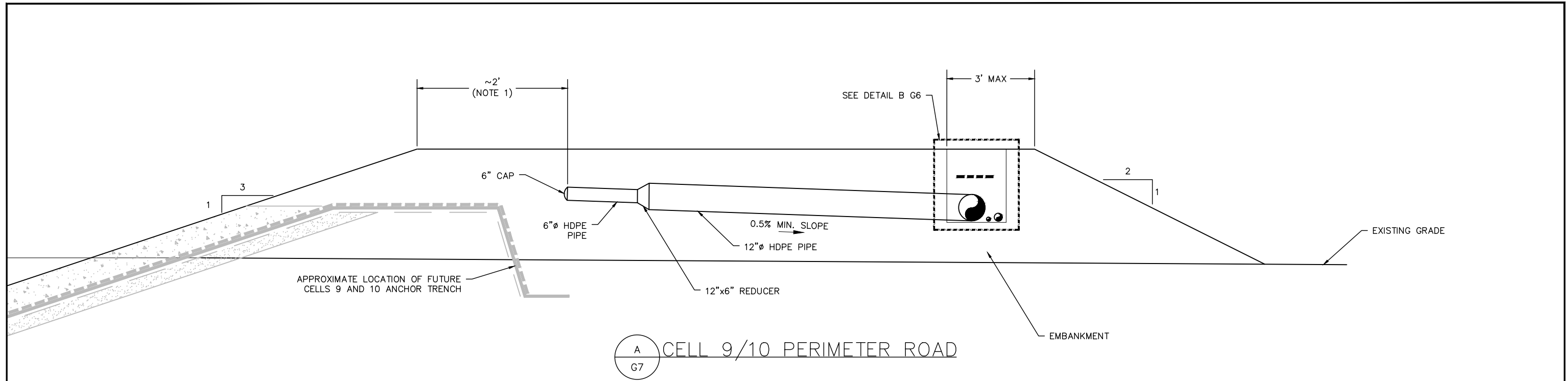
**KNOTT LANDFILL  
CELL 8 CONSTRUCTION  
PROJECT  
DESCHUTES COUNTY, OREGON**

**CELL 8  
LFG SYSTEM DETAILS I**

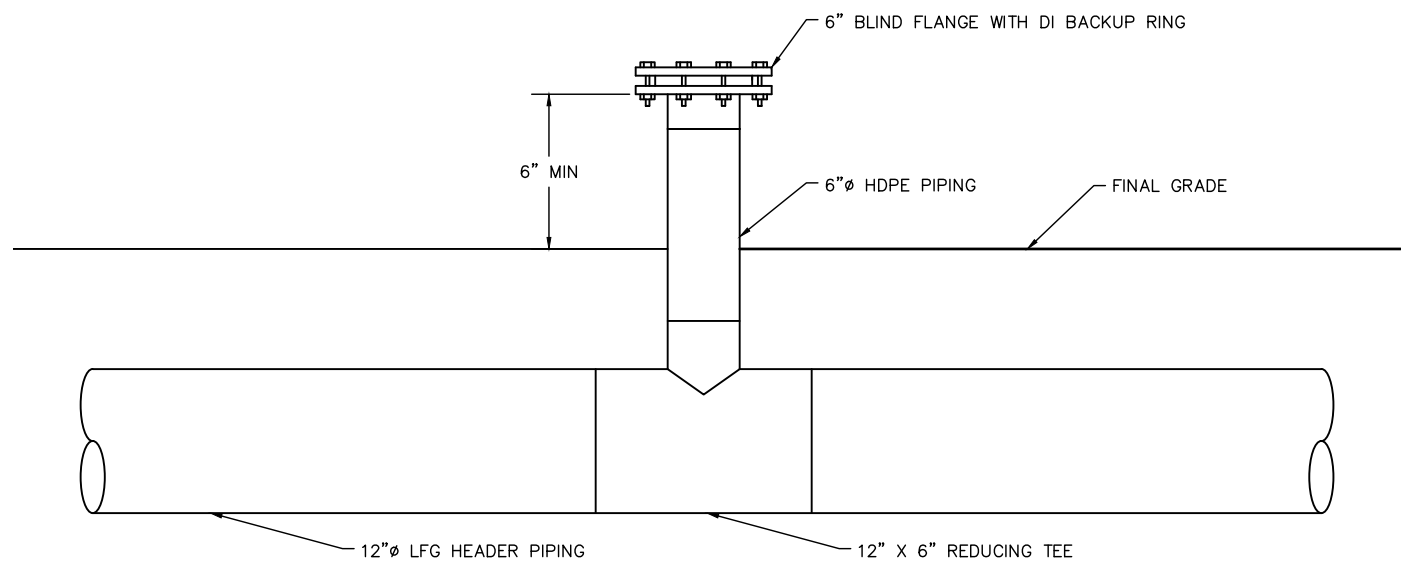
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SHEET: 16 OF 40	REV. A



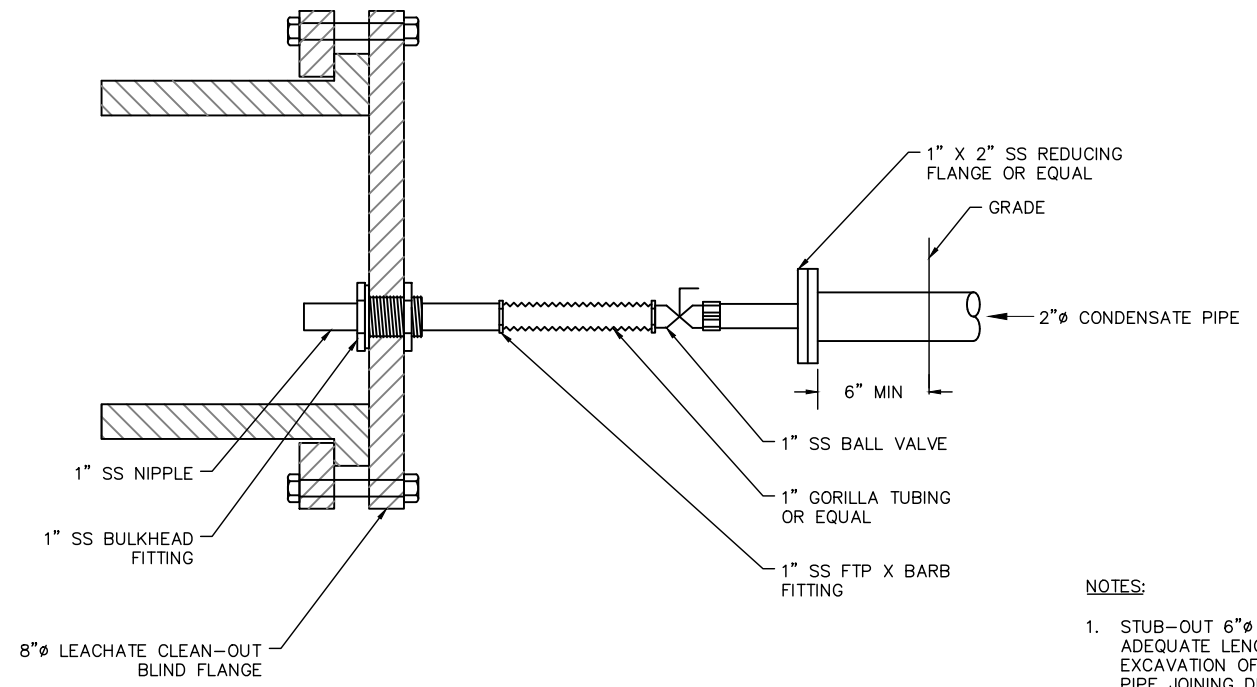
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A  
G7  
CELL 9/10 PERIMETER ROAD



B  
G7  
STUB UP DETAIL



C  
G7  
CLEAN-OUT FLANGE MODIFICATION DETAIL

- NOTES:**
1. STUB-OUT 6" LFG PIPING WITH ADEQUATE LENGTH TO PREVENT EXCAVATION OF ROAD ASPHALT FOR PIPE JOINING DURING CELLS 9 AND 10 FUTURE ANCHOR TRENCH CONSTRUCTIONS.



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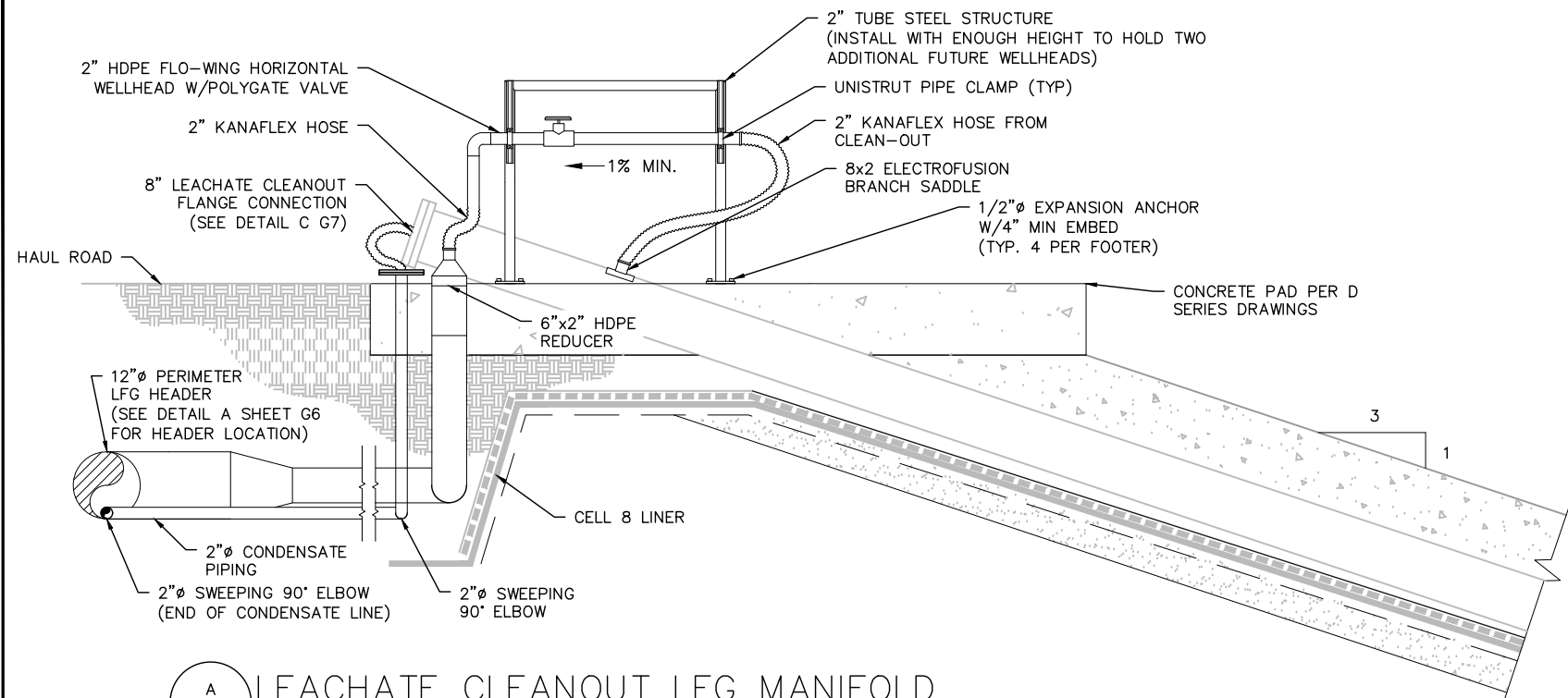
**G. Friesen Associates, Inc.**  
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**KNOTT LANDFILL  
CELL 8 CONSTRUCTION  
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DESCHUTES COUNTY, OREGON**

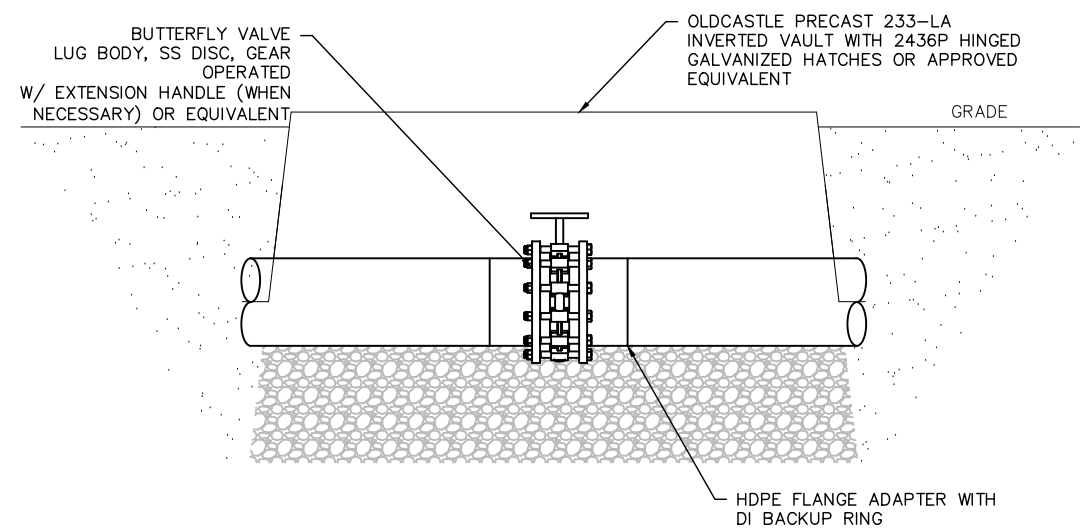
**CELL 8  
LFG SYSTEM DETAILS II**

DRAWING NUMBER: G7	
CAD FILE NUMBER: ESI 2	
SHEET: 17 OF 40	REV. A

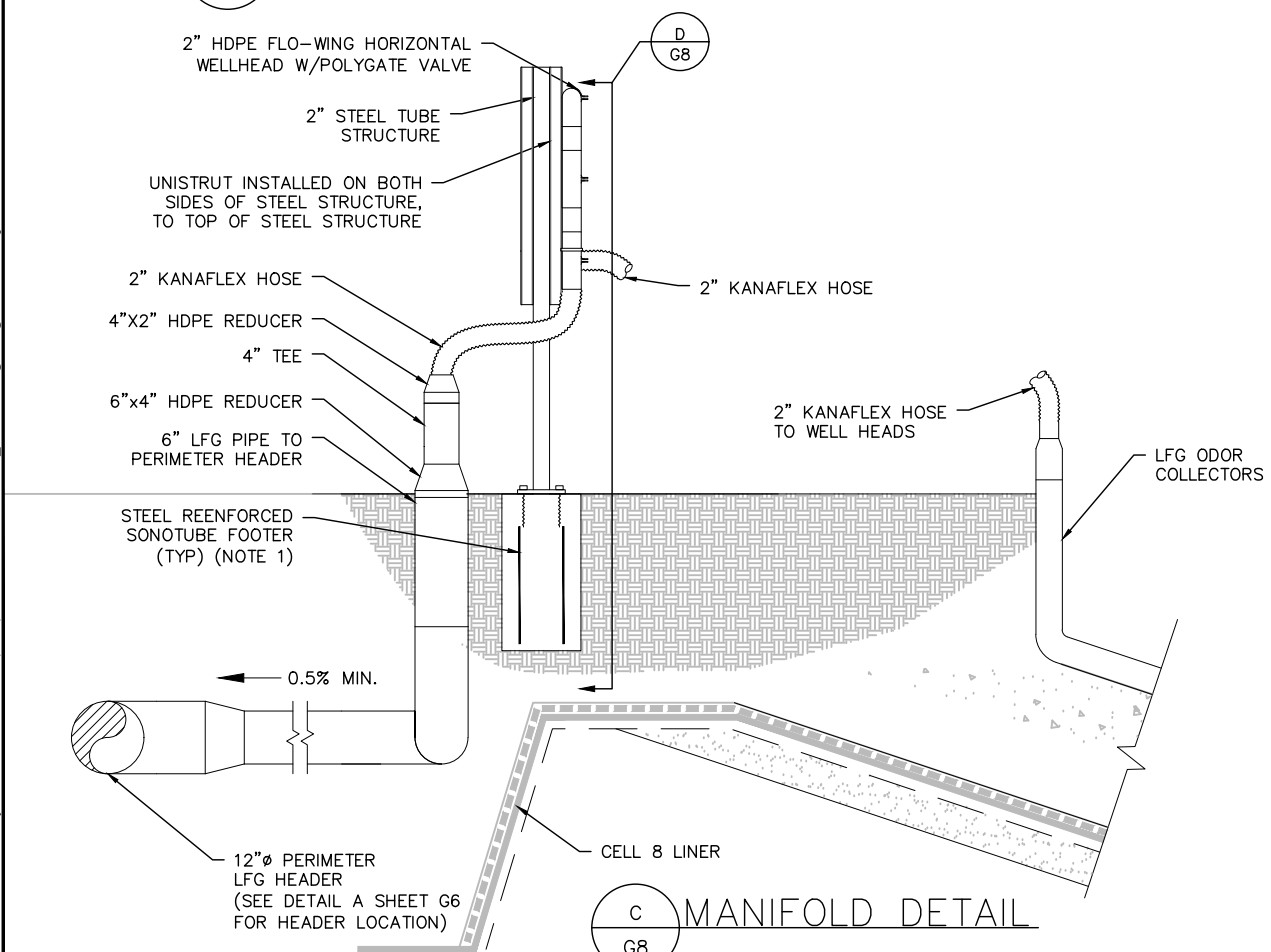
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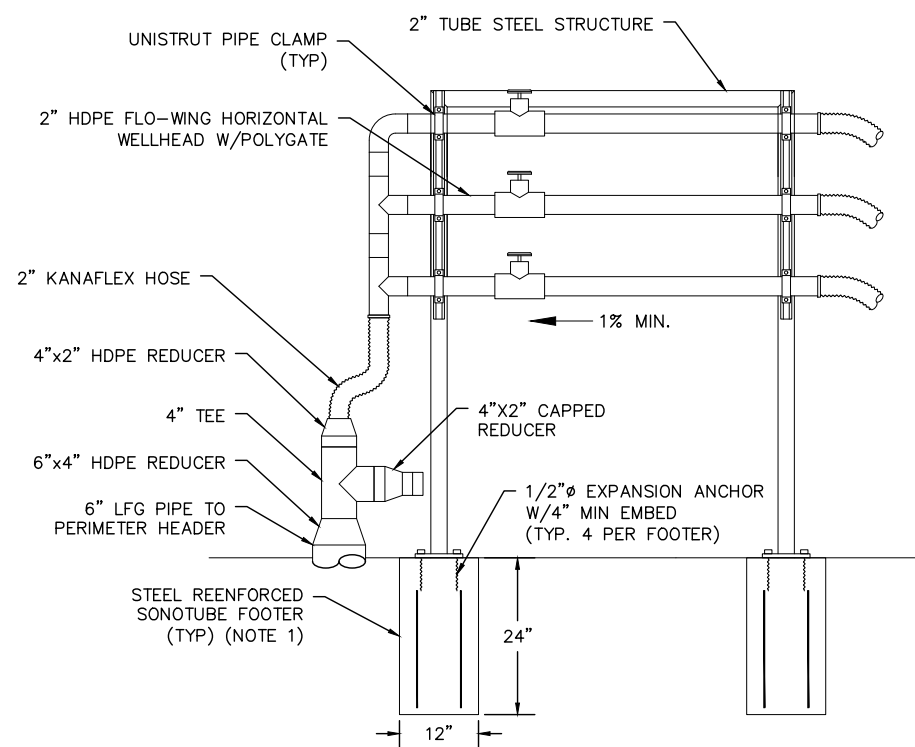
**A** LEACHATE CLEANOUT LFG MANIFOLD  
G8



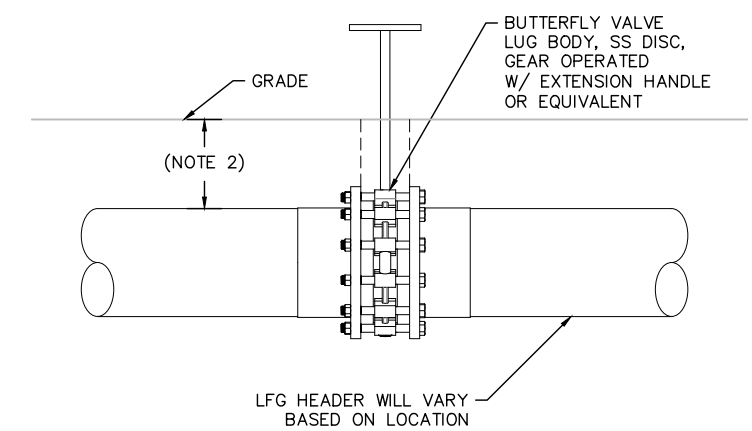
**B** VALVE VAULT  
G8



**C** MANIFOLD DETAIL  
G8



**D** MANIFOLD DETAIL  
G8



**E** BELOW GRADE VALVE DETAIL  
G8

**NOTES**

- CONTRACTOR TO VERIFY DEPTH TO BASE OF EXISTING GEOMEMBRANE ANCHOR TRENCH AND USE EXTREME CAUTION TO AVOID DAMAGING LINER AND HEADER INFRASTRUCTURE WHEN INSTALLING SONOTUBE FOOTERS.
- EXTENSION HANDLE LENGTH WILL BE BASED ON LOCATION OF VALVES



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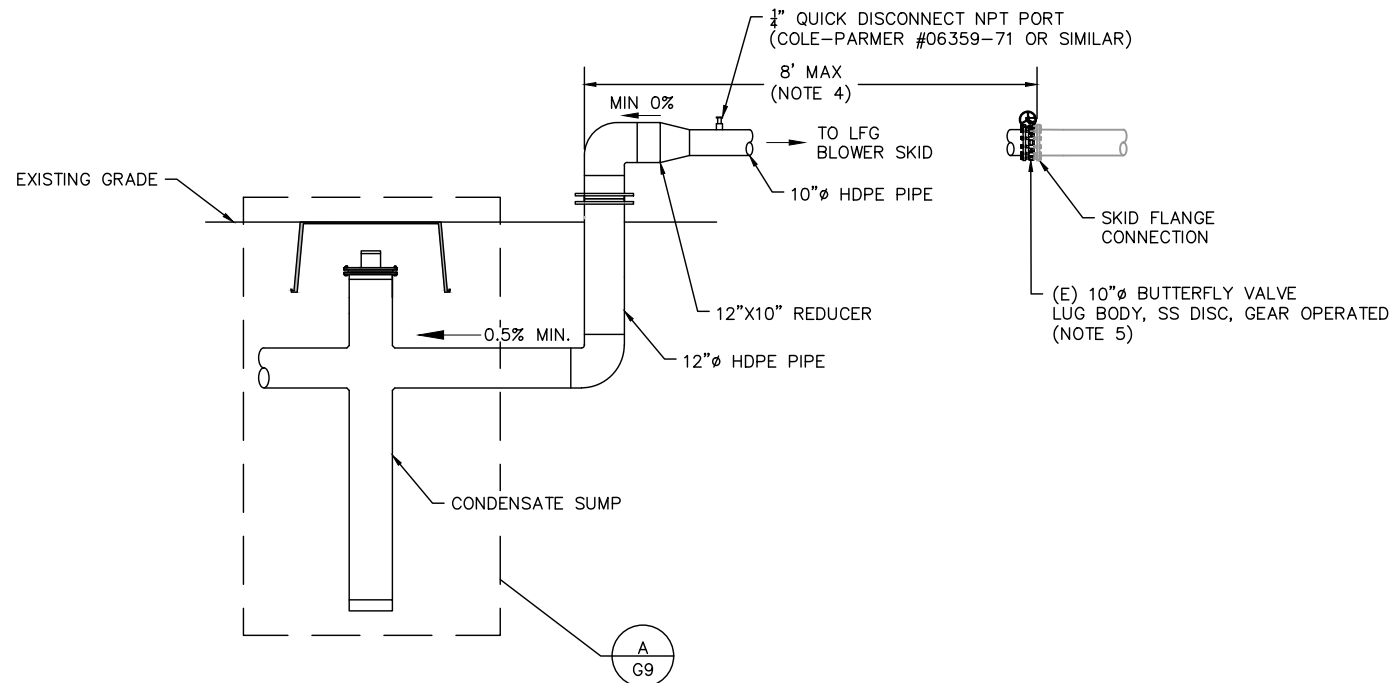
**KNOTT LANDFILL  
 CELL 8 CONSTRUCTION  
 PROJECT  
 DESCHUTES COUNTY, OREGON**

**CELL 8  
 LFG SYSTEM DETAILS III**

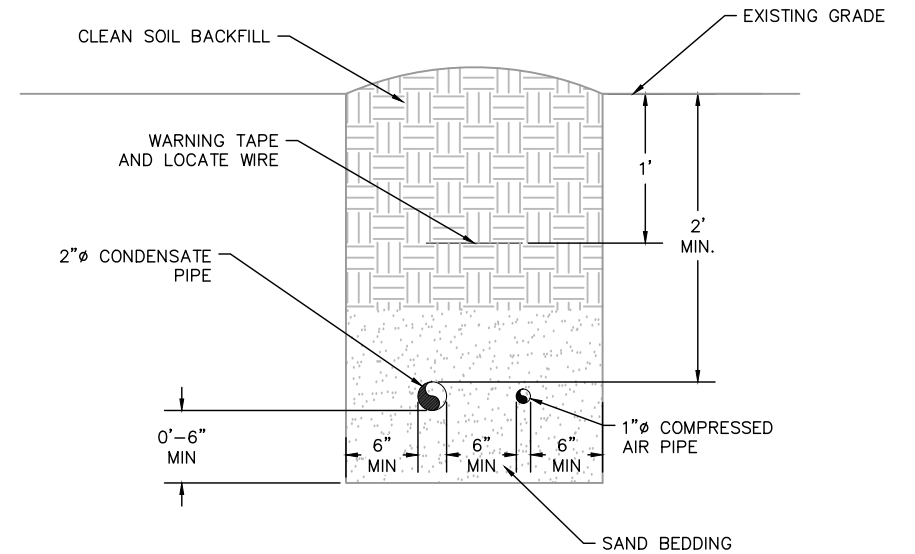
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SHEET: 18 OF 40	REV. A



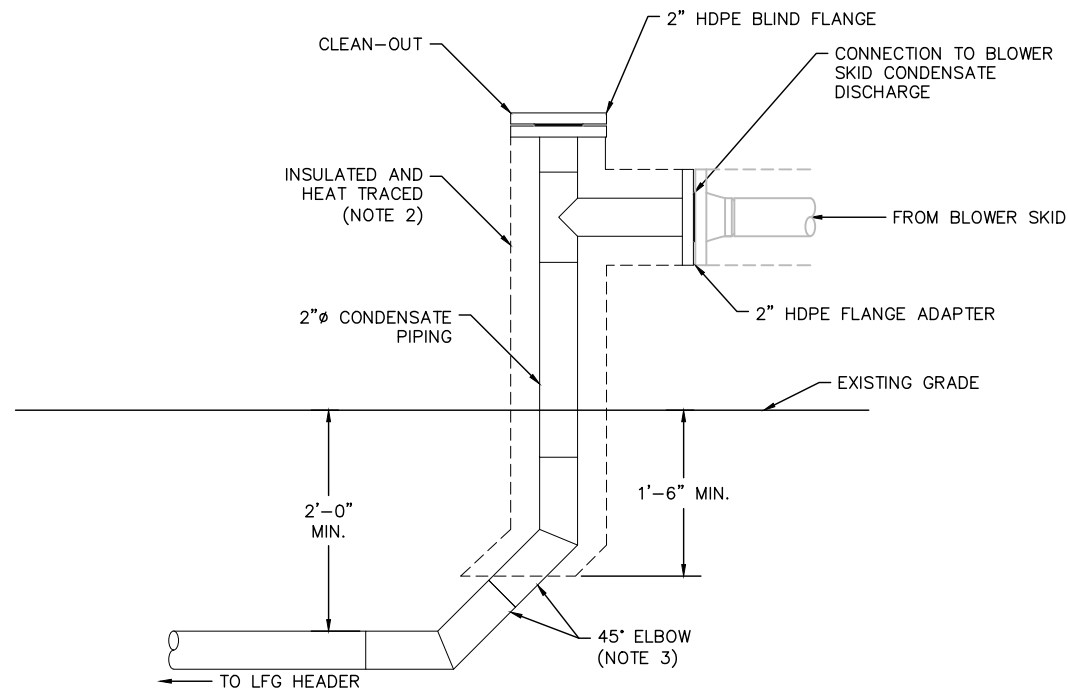
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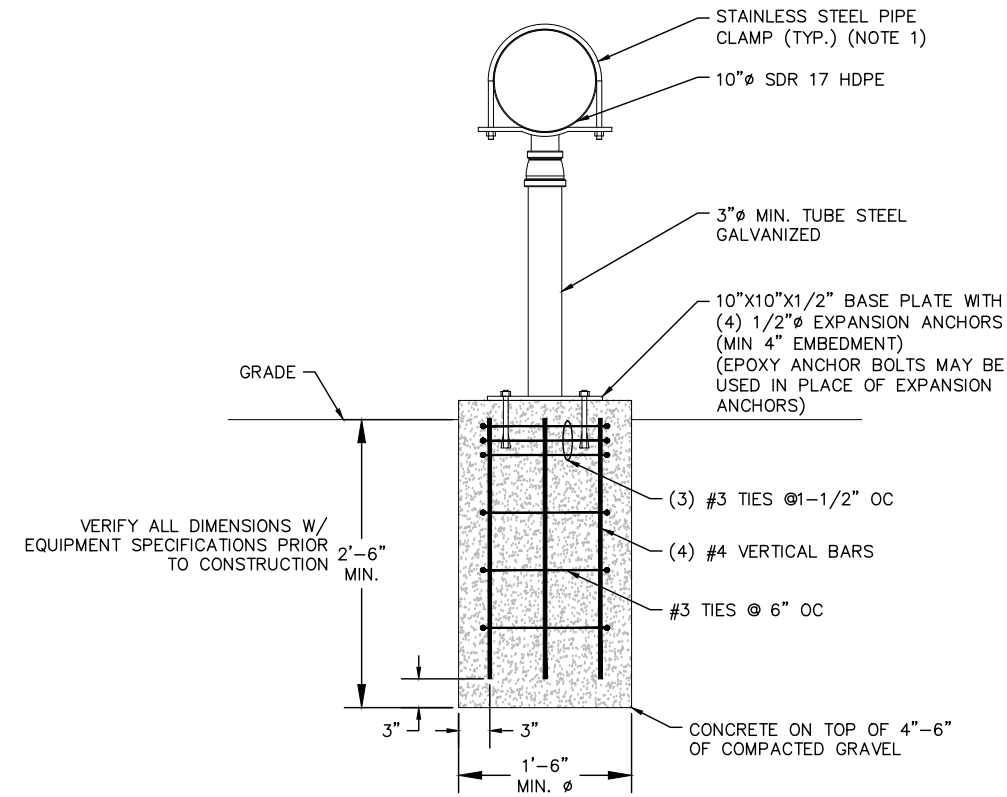
**A**  
G10 LFG STUB UP FROM SUMP



**B**  
G10 CONDENSATE DRAIN TRENCH DETAIL



**C**  
G10 CONDENSATE SKID CONNECTION DETAIL



**D**  
G10 PIPE SUPPORT DETAIL

**NOTES:**

1. STAINLESS STEEL PIPE CLAMP TO REMAIN LOOSE TO ALLOW AXIAL PIPE MOVEMENT.
2. HEAT TRACING TO BE A SPIRAL WOUND CONTINUATION OF THE WIRE PROVIDED BY SKID MANUFACTURER. INSULATION TO BE 1" THICK FOAMGLASS WITH METAL WEATHER BARRIER INSTALLED IN A NEAT AND ATTRACTIVE MANNER WITH BAND SEALS AND UV RATED CAULK TO PREVENT MOISTURE INGRESS.
3. DEBEAD HDPE WELDS WHERE POSSIBLE.
4. IN THE CASE OF THE PIPE LENGTH BEING LONGER THAN 8', PIPE SUPPORTS SHOULD BE INSTALLED ENSURING NO LENGTHS OF PIPE RUN LONGER THAN 8' WITHOUT SUPPORT.
5. THE EXISTING 10"Ø BUTTERFLY VALVE ON THE ABOVE GRADE LFG HEADER AT THE EXISTING FLARE STATION TO BE MOVED AND INSTALLED AT THE LFG HEADER TO SKID CONNECTION AT THE NEW LOCATION.



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SCALE: AS SHOWN	DRAWN BY: PC	APPROVED BY: CF
	CHECKED BY: CF	DATE: 10/21/19

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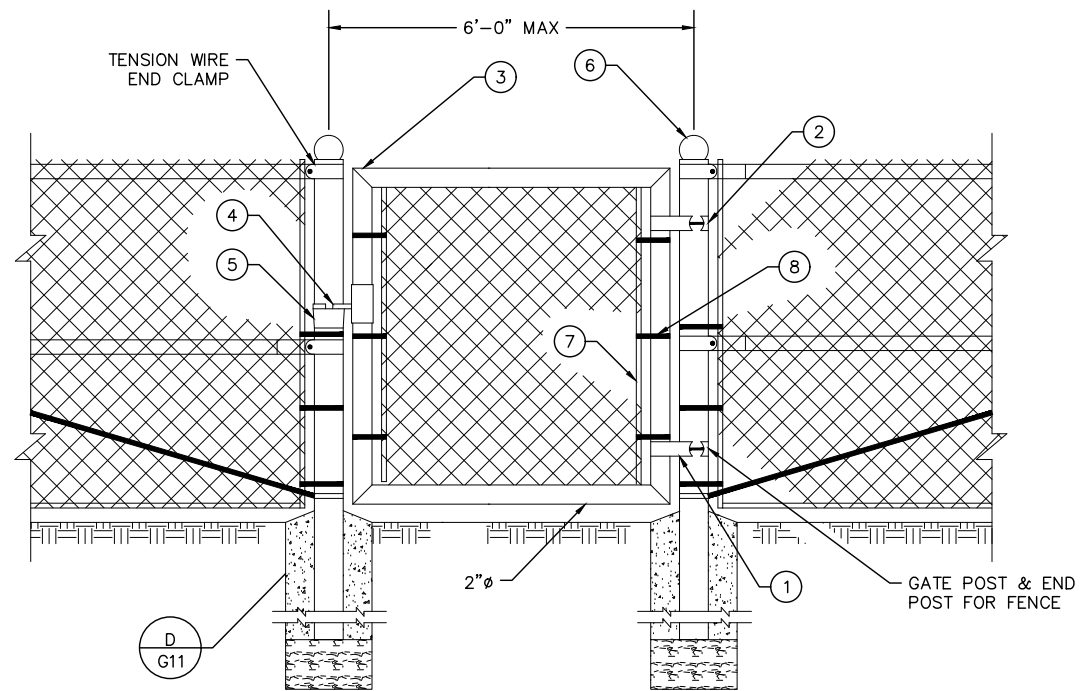
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4088 Orchard Drive  
Lake Oswego, Oregon 97035  
Tel: (503) 635-1233  
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**KNOTT LANDFILL  
CELL 8 CONSTRUCTION  
PROJECT  
DESCHUTES COUNTY, OREGON**

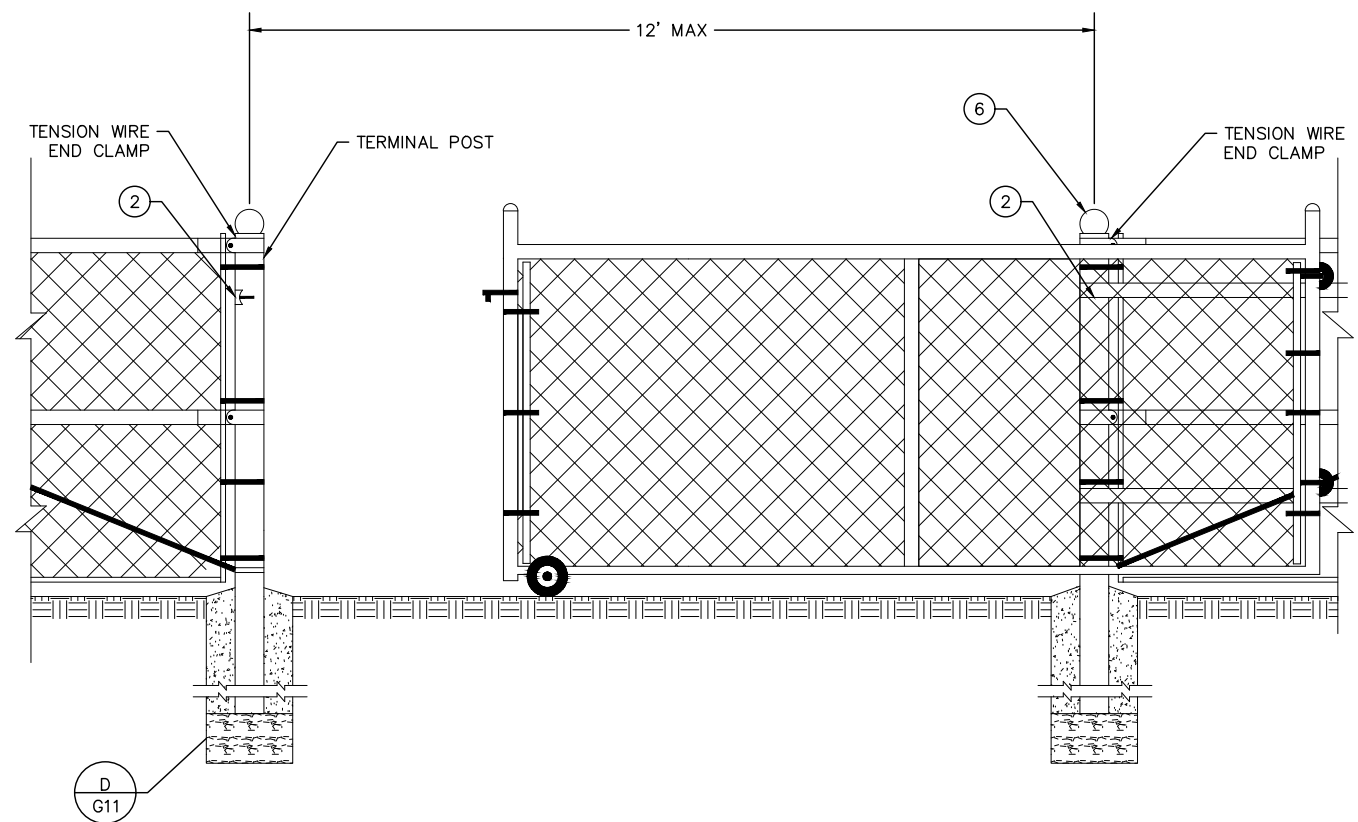
**CELL 8  
FLARE STATION DETAILS I**

DRAWING NUMBER: <b>G10</b>	
CAD FILE NUMBER: <b>ESI 2</b>	
SHEET: 20 OF 40	REV. <b>A</b>

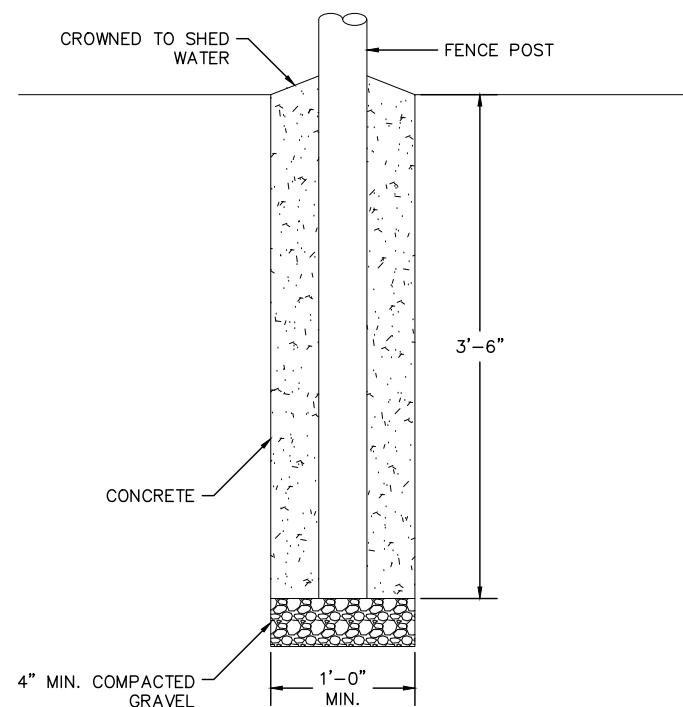
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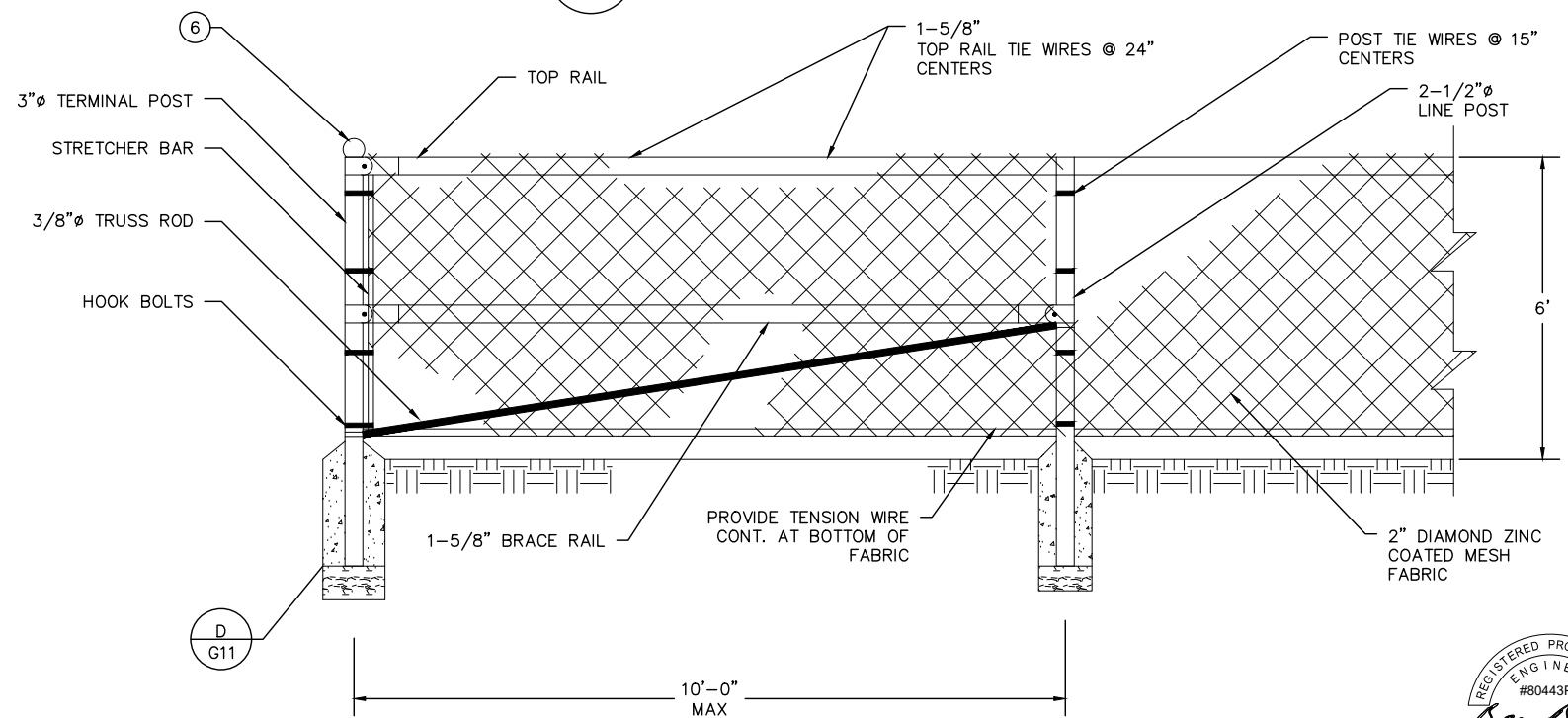
**A** MAN GATE FENCE DETAIL  
G11



**B** ROLLING GATE FENCE DETAIL  
G11



**D** FENCE POST FOOTER  
G11



**C** TYPICAL FENCE DETAIL  
G11

LEGEND	
PART NO.	DESCRIPTION
1	BOTTOM HINGE
2	TOP HINGE
3	WELDED JOINT WITH ZINC COATING (TYP)
4	PAD LOCKABLE LATCH FORK
5	FORK CATCH
6	ORNAMENTAL TOPS
7	STRETCHER BAR
8	FABRIC BANDS (15" MAX SPACING)
9	PLUNGER ROD
10	LOCK KEEPER GUIDE
11	LOCK KEEPER



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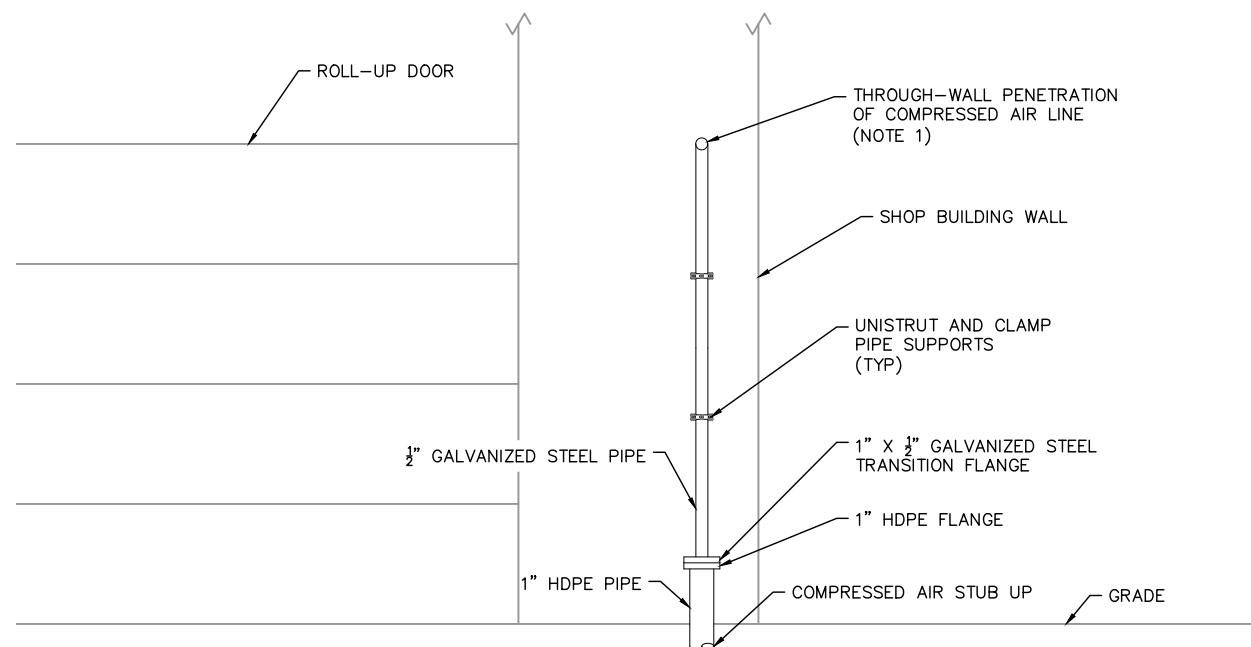
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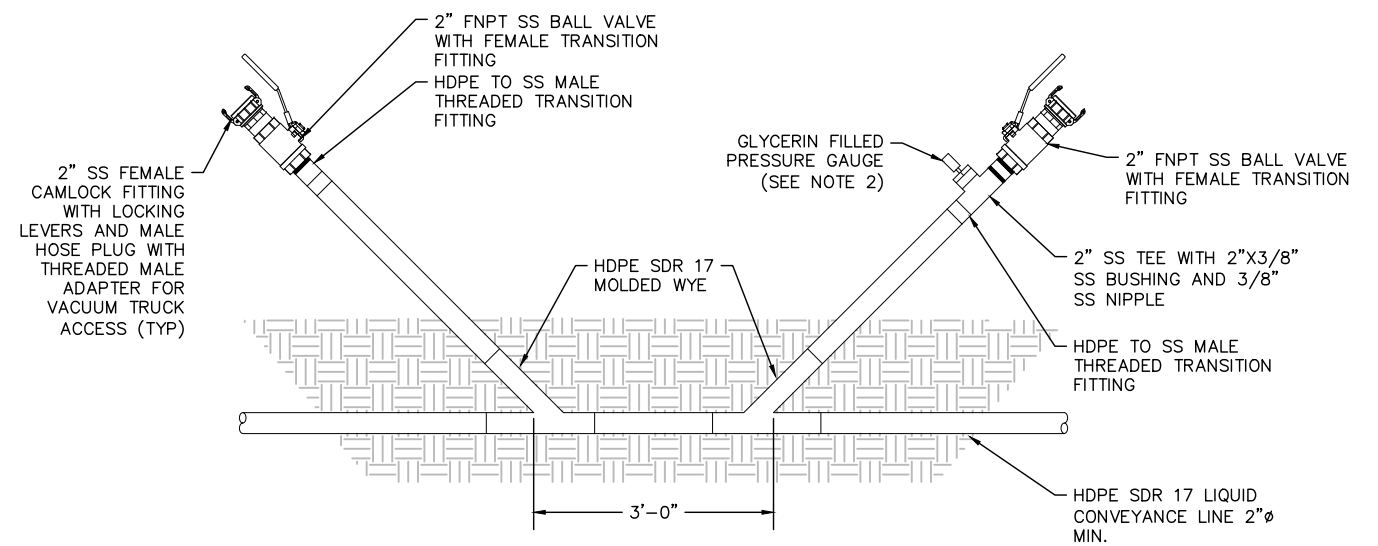
**CELL 8  
FLARE STATION FENCE DETAILS**

DRAWING NUMBER: <b>G11</b>	
CAD FILE NUMBER: <b>ESI 2</b>	
SHEET: 21 OF 40	REV. <b>A</b>

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**A** SHOP BUILDING COMPRESSED AIR DETAIL  
G12



**B** CONDENSATE PIPING CLEANOUT  
G12

**NOTES:**

1. CONTRACTOR TO FIELD FIT NEW LINE TO THE COMPRESSED AIR PIPING INSIDE THE BUILDING. ENSURE AN ISOLATION BALL VALVE IS INSTALLED ON THE NEW LINE IN THE INTERIOR OF THE BUILDING. SUPPORT ALL PIPING WITH UNISTRUT AND CLAMP STYLE SUPPORT.
2. 3/8" SS BALL VALVE AND GLYCERIN FILLED PRESSURE GAUGE (0-200 PSI RANGE).



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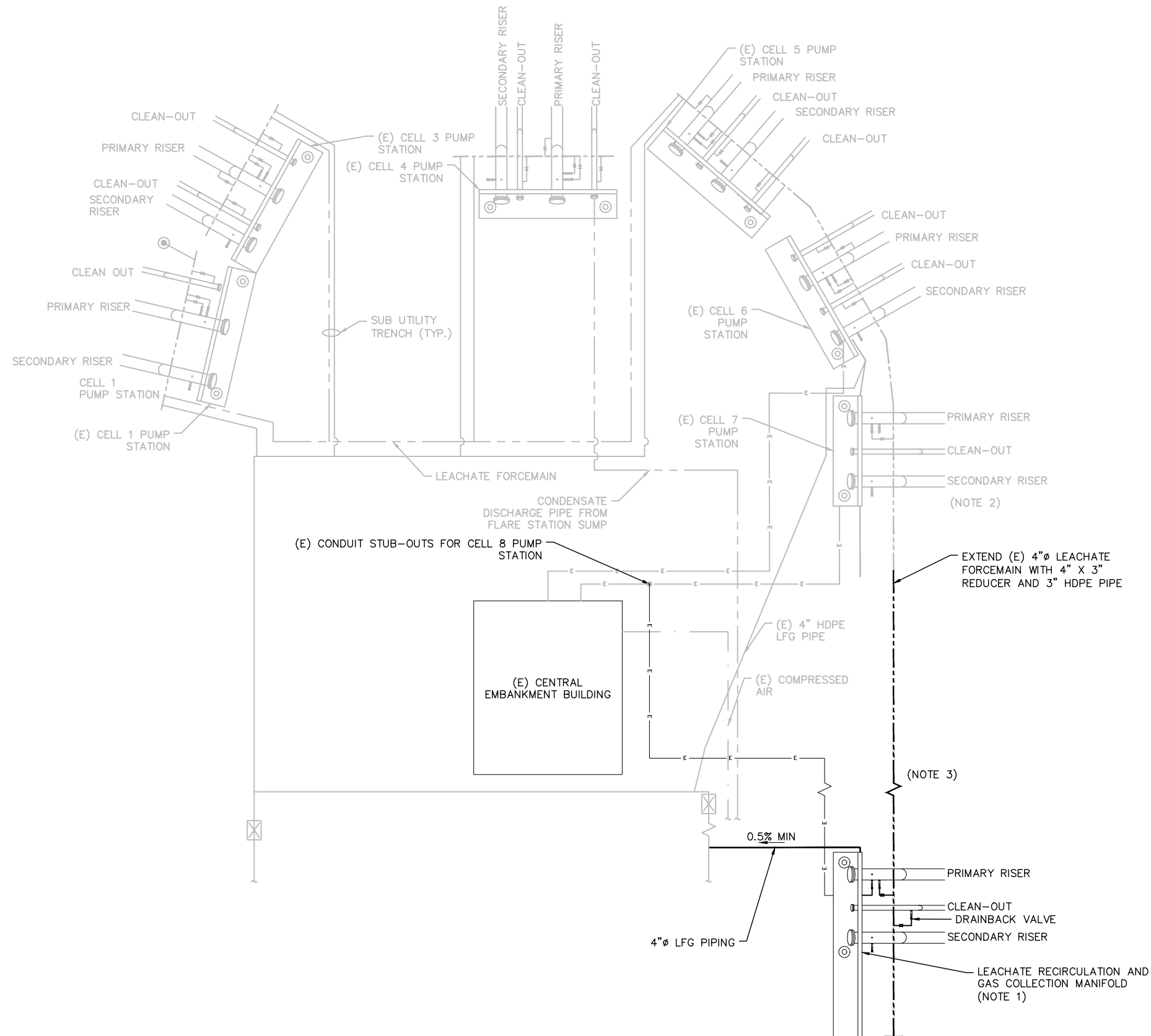
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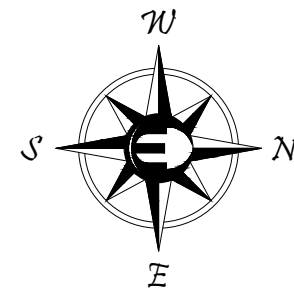
**CELL 8  
COMPRESSED AIR AND CONDENSATE DETAILS**

DRAWING NUMBER: G12
CAD FILE NUMBER: ESI 2
SHEET: 22 OF 40
REV. A

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- LEGEND**
- (E) LFG PIPING
  - (E) ELECTRICAL CONDUIT
  - - - (E) LEACHATE PIPING
  - - - (E) COMPRESSED AIR PIPING
  - LFG PIPING
  - E — ELECTRICAL CONDUIT
  - - - LEACHATE PIPING
  - ⊗ ISOLATION VALVE
  - 0.5% LFG PIPE SLOPE



**NOTES:**

1. REFER TO SHEETS M2-4 FOR DETAILS.
2. CONTRACTOR TO VERIFY POWER AND CONTROL REQUIREMENTS FOR THE PUMPS.
3. CELL 8 PUMP STATION LOCATED APPROXIMATELY 105' FROM CELL 7 PUMP STATION ALONG SOUTH EDGE OF CELL 8.
4. MAINTAIN 1' MIN OF SOIL COVERAGE FOR ALL BELOW GRADE PIPING.
5. MAINTAIN 12" OF SPACING OF ELECTRICAL LINE. LFG PIPE MAY CROSS OVER CEC ELECTRICAL LINE IF NECESSARY.



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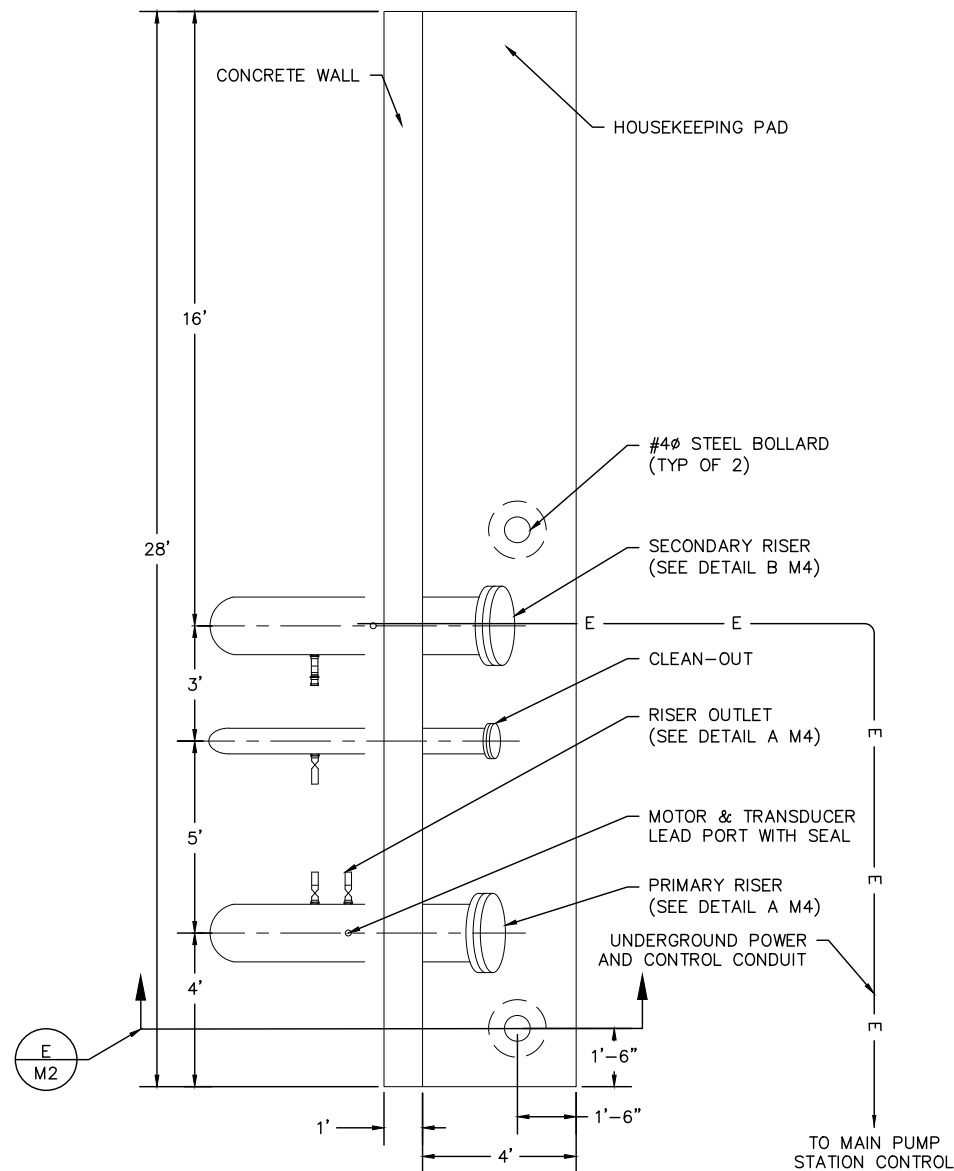
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**KNOTT LANDFILL  
 CELL 8 CONSTRUCTION  
 PROJECT  
 DESCHUTES COUNTY, OREGON**

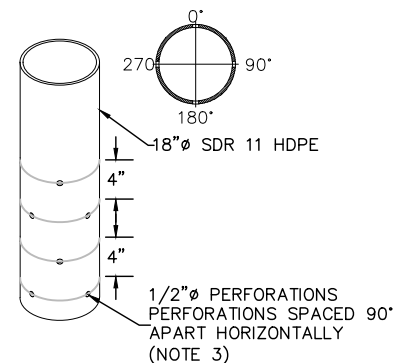
**CELL 8  
 PUMP STATION LAYOUT**

DRAWING NUMBER: <b>M1</b>	
CAD FILE NUMBER: <b>ESI 2</b>	
SHEET: 23 OF 40	REV. <b>A</b>

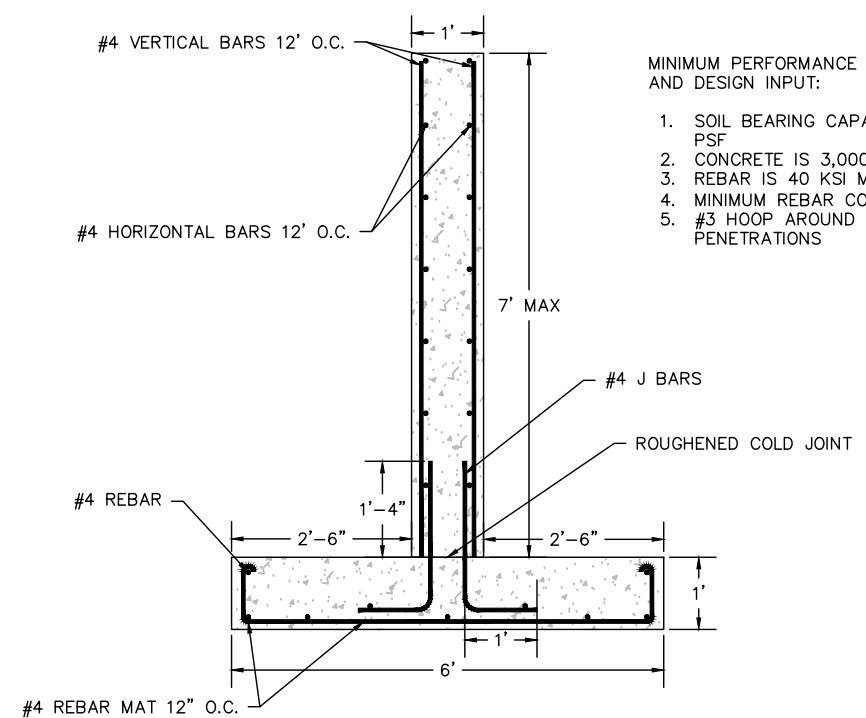
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**A** PUMP STATION PLAN  
M2

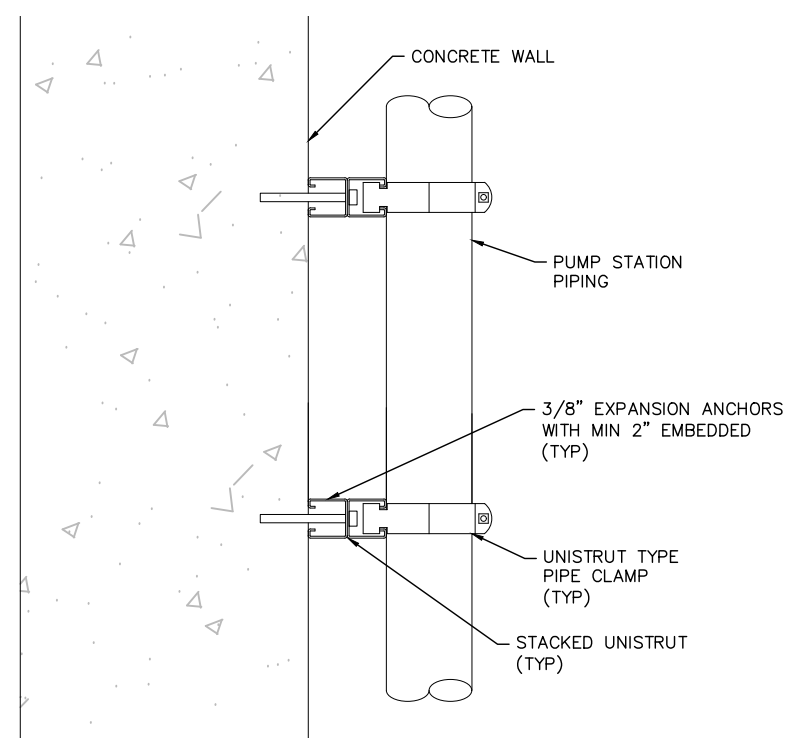


**D** PERFORATIONS DETAIL  
M2



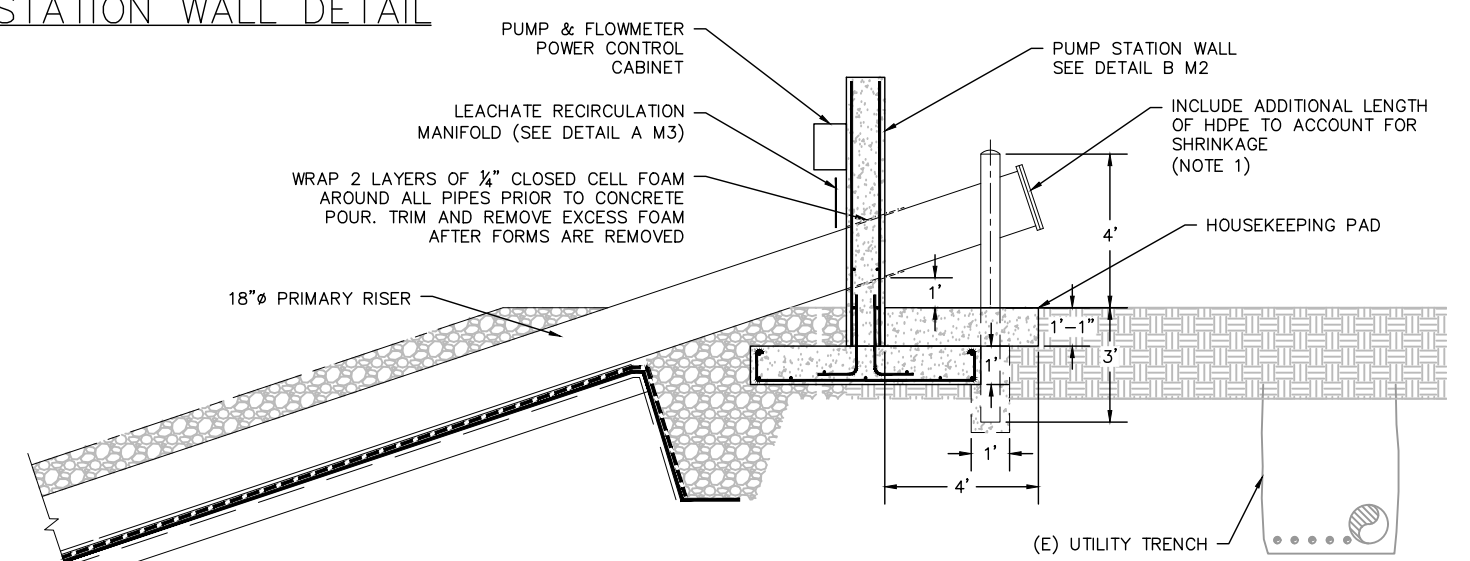
**B** PUMP STATION WALL DETAIL  
M2

- MINIMUM PERFORMANCE STANDARDS AND DESIGN INPUT:
1. SOIL BEARING CAPACITY IS 2,000 PSF
  2. CONCRETE IS 3,000 PSF MINIMUM
  3. REBAR IS 40 KSI MINIMUM
  4. MINIMUM REBAR COVER IS 2"
  5. #3 HOOP AROUND WALL PENETRATIONS



**C** TYPICAL UNISTRUT PIPE SUPPORT  
M2 (NOTE 2)

- LEGEND
- GEOMEMBRANE
  - - - - CUSHIONING GEOTEXTILE
  - GEOSYNTHETIC CLAY LINER (GCL)
  - GEONET COMPOSITE
  - - - - SEPARATING GEOTEXTILE



**E** PUMP STATION DETAIL  
M2

- NOTES:
1. ON HDPE RISERS, LEAVE EXTERNAL WELD BEADS AS ADDITIONAL MEANS OF RESISTING DOWNSLOPE SLIPPAGE.
  2. INSTALL AT MINIMUM TWO UNISTRUT STACKED ANCHOR-PIPE CLAMP ASSEMBLIES PER UPRIGHT SECTION OF PUMP STATION PIPING.
  3. ALTERNATE PERFORATION DETAILS MAY BE SUBMITTED IF THE CONTRACTOR HAS PREFERRED FABRICATION OR AVAILABILITY. ALTERNATES TO BE APPROVED BY THE DESIGN ENGINEER.



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**KNOTT LANDFILL  
CELL 8 CONSTRUCTION  
PROJECT  
DESCHUTES COUNTY, OREGON**

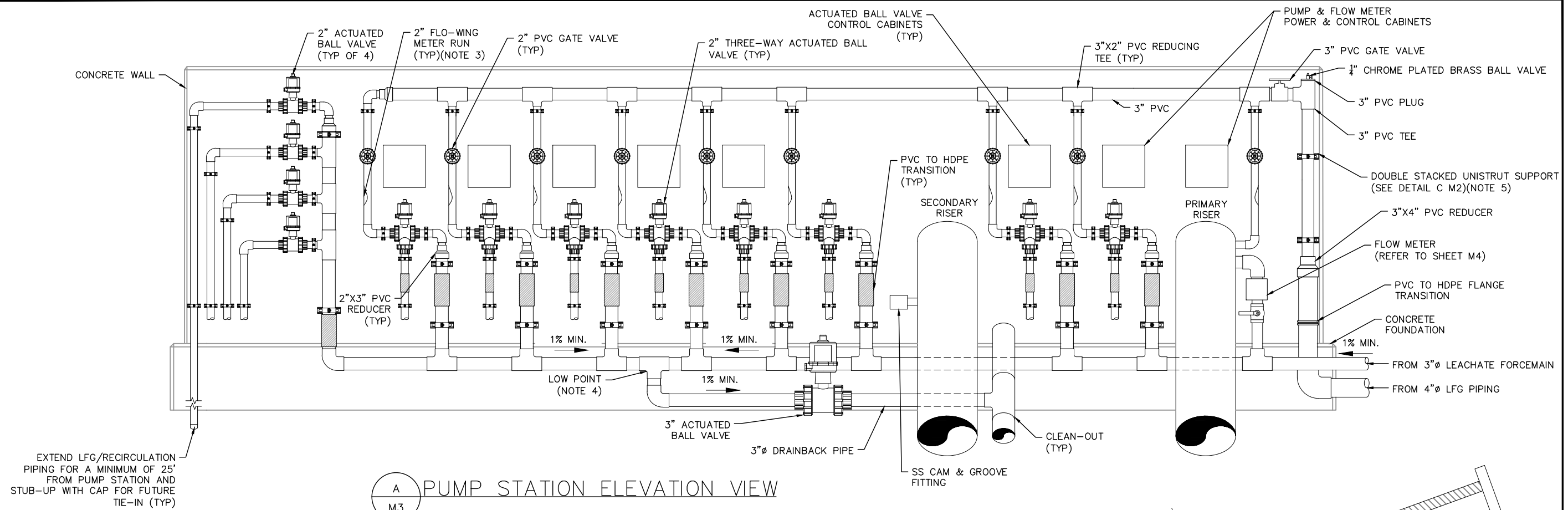
**CELL 8  
PUMP STATION DETAILS I**

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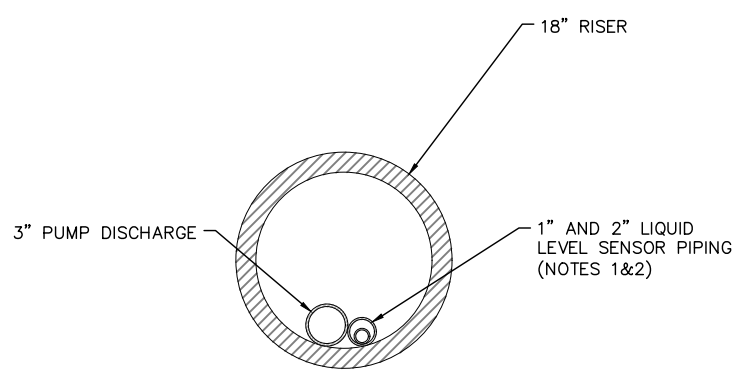
DRAWING NUMBER:	M2
CAD FILE NUMBER:	ESI 2
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REV.	A



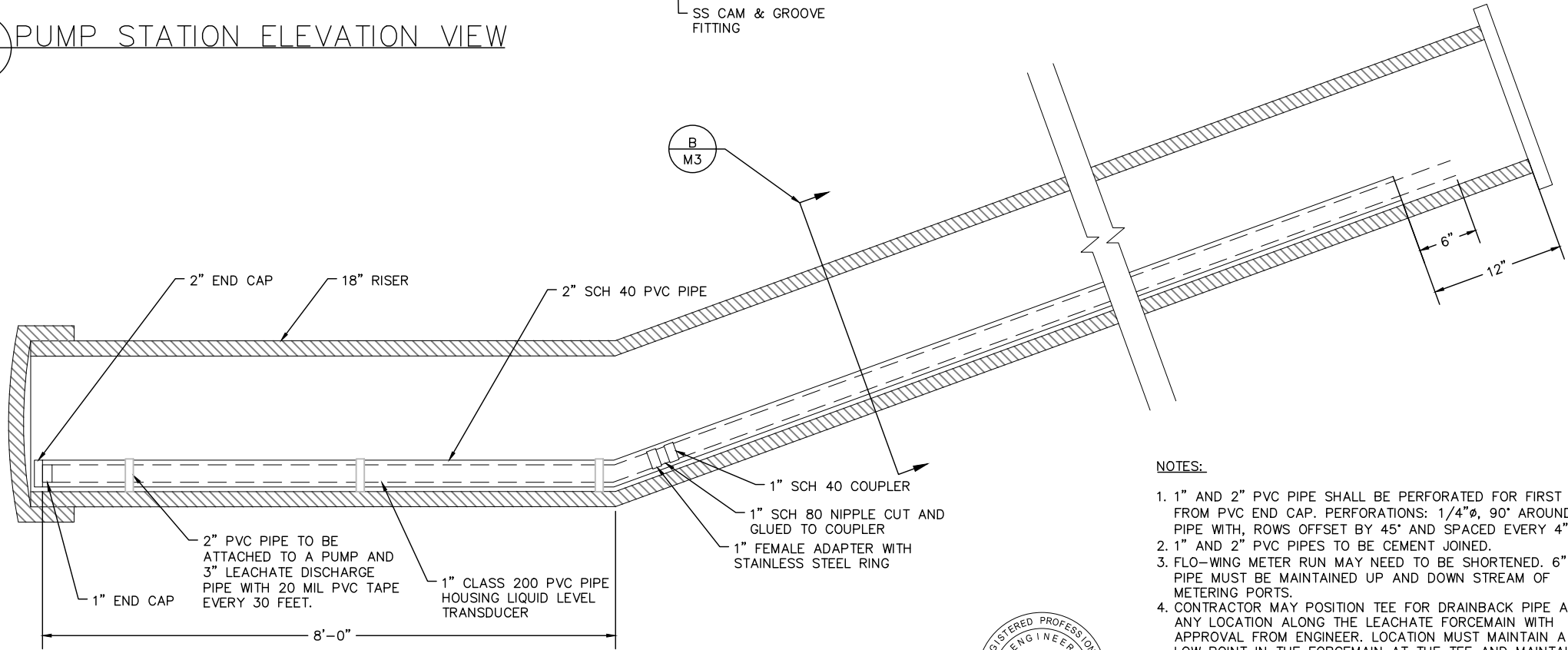
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**A**  
M3  
PUMP STATION ELEVATION VIEW



**B**  
M3  
RISER CROSS SECTION



**C**  
M3  
RISER PROFILE

- NOTES:**
- 1" AND 2" PVC PIPE SHALL BE PERFORATED FOR FIRST 10' FROM PVC END CAP. PERFORATIONS: 1/4"Ø, 90° AROUND PIPE WITH, ROWS OFFSET BY 45° AND SPACED EVERY 4".
  - 1" AND 2" PVC PIPES TO BE CEMENT JOINED.
  - FLO-WING METER RUN MAY NEED TO BE SHORTENED. 6" OF PIPE MUST BE MAINTAINED UP AND DOWN STREAM OF METERING PORTS.
  - CONTRACTOR MAY POSITION TEE FOR DRAINBACK PIPE AT ANY LOCATION ALONG THE LEACHATE FORCEMAIN WITH APPROVAL FROM ENGINEER. LOCATION MUST MAINTAIN A LOW POINT IN THE FORCEMAIN AT THE TEE AND MAINTAIN FALL TOWARDS THE CLEANOUT.
  - PLACEMENT OF VALVES AND PIPING ON THE PUMP STATION WALL MAY BE FIELD FIT TO BEST UTILIZE WALL SPACE WITHOUT INTERFERING WITH DIMENSIONS ON DETAIL A M2. USE EXISTING PIPE STATIONS AS REFERENCE.



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**KNOTT LANDFILL  
CELL 8 CONSTRUCTION  
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DESCHUTES COUNTY, OREGON**

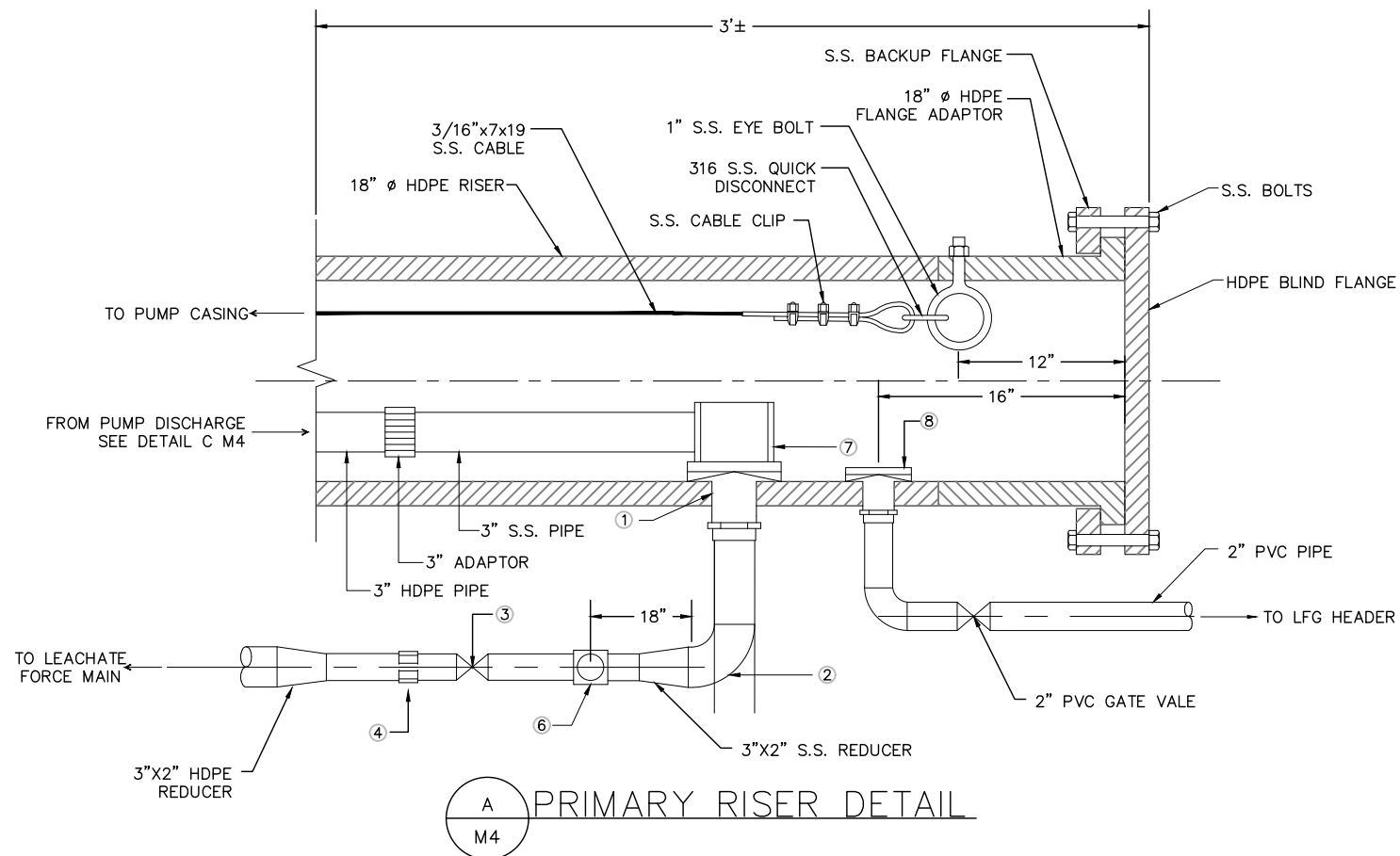
**CELL 8  
PUMP STATION DETAILS II**

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CAD FILE NUMBER: <b>ESI 2</b>	
SHEET: 25 OF 40	REV. <b>A</b>

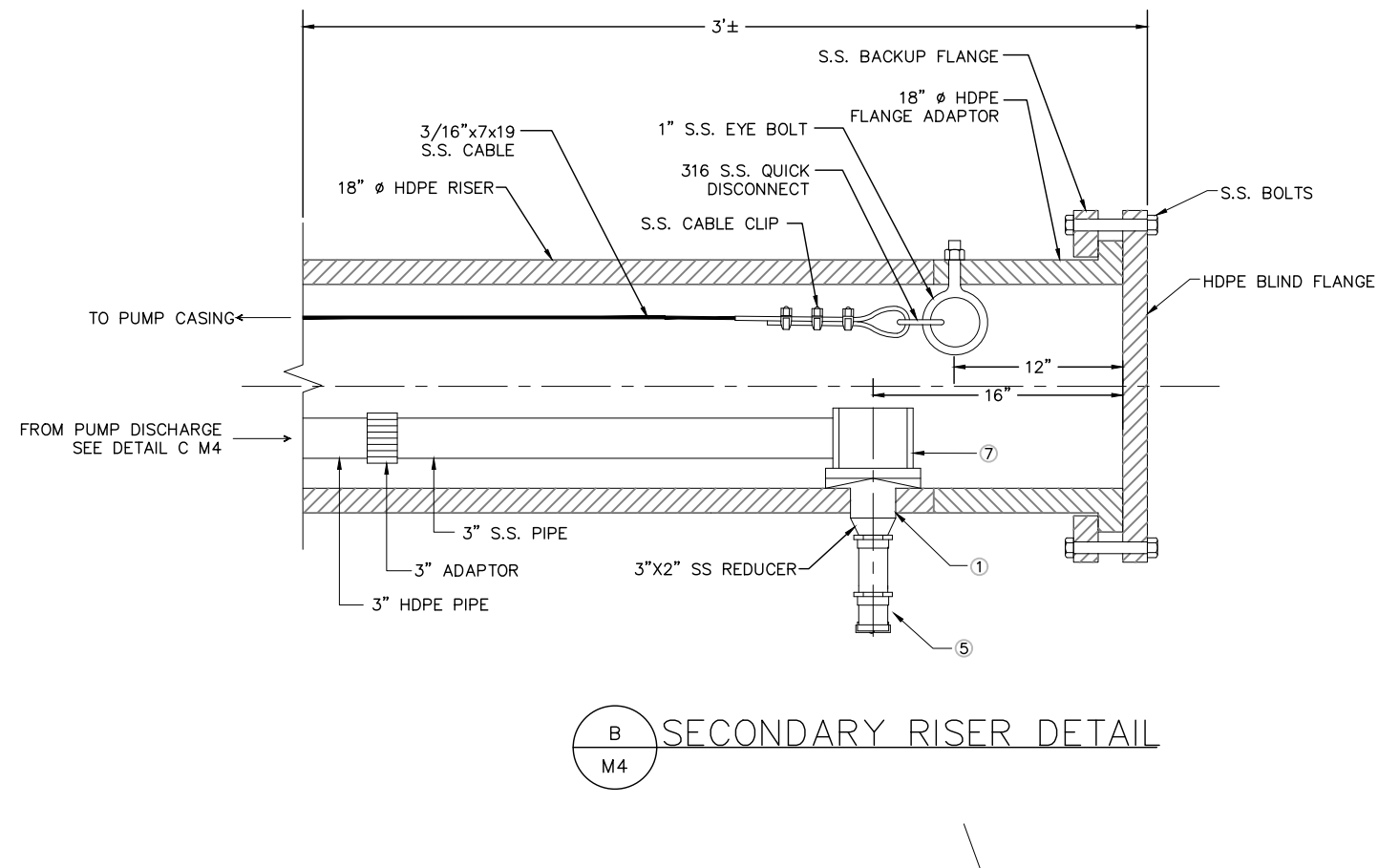
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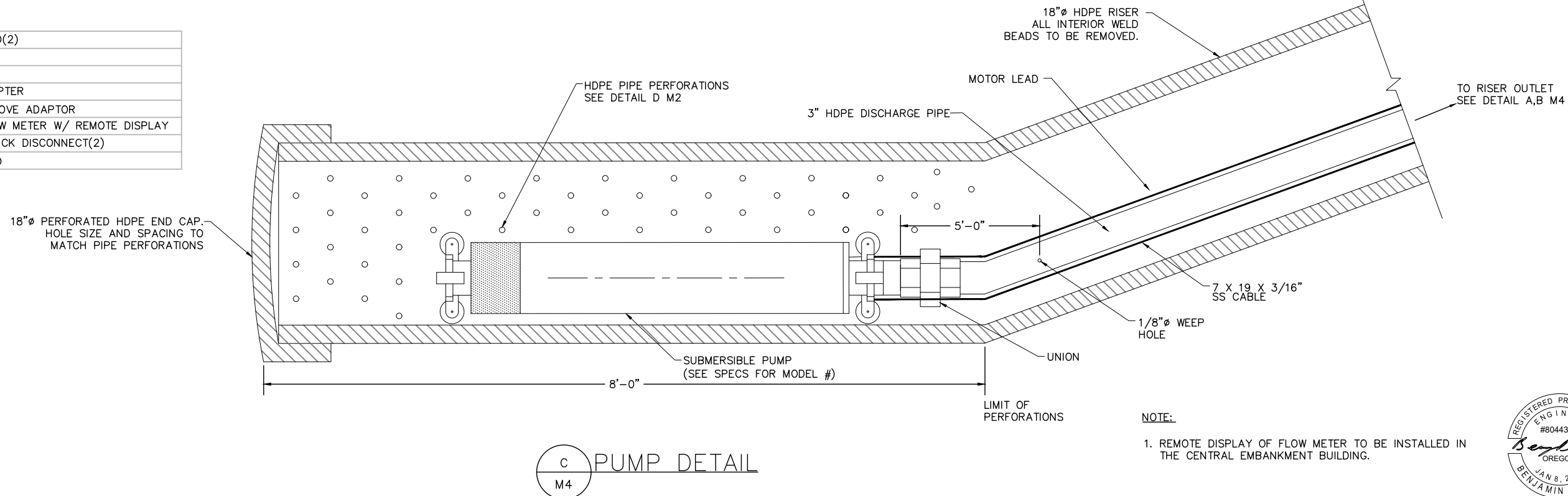
**A** PRIMARY RISER DETAIL  
M4



**B** SECONDARY RISER DETAIL  
M4

**MATERIAL LIST**

1	3" S.S. BULKHEAD(2)
2	3" S.S. ELBOW
3	2" BALL VALVE
4	2" SS/HDPE ADAPTER
5	2" SS CAM & GROVE ADAPTOR
6	2" MAGNETIC FLOW METER W/ REMOTE DISPLAY
7	3" 90° ELBOW QUICK DISCONNECT(2)
8	2" S.S. BULKHEAD



**C** PUMP DETAIL  
M4

**NOTE:**  
1. REMOTE DISPLAY OF FLOW METER TO BE INSTALLED IN THE CENTRAL EMBANKMENT BUILDING.



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**CELL 8  
LEACHATE RISER DETAILS**

DRAWING NUMBER: <b>M4</b>
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### ELECTRICAL ABBREVIATIONS

(E)	EXISTING TO REMAIN
(ED)	EXISTING TO BE DEMOLISHED
(ER)	EXISTING TO BE RELOCATED
(N)	NEW
(RL)	EXISTING SHOWN RELOCATED
A	AMP, AMPERES
AF	AMPERE FRAME
AFB	ABOVE FINISHED FLOOR
AFG	ABOVE FINISHED GRADE
AIC	AMPERES INTERRUPTING CAPACITY
AT	AMPERES TRIP
C	CONDUIT
CAB	CABINET
CB, C/B	CIRCUIT BREAKER
CKT	CIRCUIT
CLG	CEILING
CP	CONTROL PANEL
CT	CURRENT TRANSFORMER
DEG	DEGREE
DTT	DIRECT TRANSFER TRIP
DWG	DRAWING
EC	ELECTRICAL CONTRACTOR
EF	EXHAUST FAN
ELEC	ELECTRICAL
EMERG	EMERGENCY
EMT	ELECTRICAL METALLIC TUBING
EPC	ENGINEER PROCURE CONSTRUCT
EPO	EMERGENCY POWER OFF
EPR	ETHYLENE-PROPYLENE RUBBER
EQ	EQUAL
FA	FIRE ALARM
FDR	FEEDER
FIXT	FIXTURE
FU	FUSE
FNVR	FULL VOLTAGE NON-REVERSING STARTER
G, GND	GROUND
GEN	GENERATOR
GFCI	GROUND FAULT CIRCUIT INTERRUPTER
GFI	GROUND FAULT INTERRUPTER (5MA)
GFP	GROUND FAULT PROTECTOR (30MA)
HH	HAND HOLE
HOA	HAND OFF AUTOMATIC
HP	HORSE POWER
HZ	HERTZ
JB	JUNCTION BOX
K	KILO, THOUSAND
KV	KILOVOLT
KVA	KILO VOLT-AMPERE
KW	KILOWATT
LA	LIGHTNING ARRESTER
LFG	LANDFILL GAS
LSIG	LONG, SHORT, INSTANTANEOUS AND GROUND FAULT TRIP FUNCTIONS
LTG	LIGHTING
LTNG	LIGHTNING
M	MEGA, MILLION
MAX	MAXIMUM
MCB	MAIN CIRCUIT BREAKER
MCC	MOTOR CONTROL CENTER
MDP	MAIN DISTRIBUTION PANEL
MDSB	MAIN DISTRIBUTION SWITCHBOARD
MDSW	MAIN DISTRIBUTION SWITCHGEAR
MIN	MINIMUM
MLO	MAIN LUGS ONLY
MST	MOTOR STARTER
MVA	MEGA VOLT-AMPERE
MW	MEGAWATT
N	NEUTRAL
NC	NORMALLY CLOSED
NEC	NATIONAL ELECTRICAL CODE
NFPA	NATIONAL FIRE PROTECTION CODE
NGR	NEUTRAL GROUNDING RESISTER
NIC	NOT IN CONTRACT
NL	NIGHT LIGHT
NO	NORMALLY OPEN
NTS	NOT TO SCALE
OL	OVERLOAD RELAY
P	POLE(S)
PH	PHASE(S)
PNL	PANEL, PANELBOARD
PP	POWER PANEL
PRI	PRIMARY
PT	POWER TRANSFORMER
PVC	POLYVINYL CHLORIDE
REC	RECESSED
RECPT	RECPT, RECEPTACLE
RGS	RIGID GALVANIZED STEEL

### ELECTRICAL ABBREVIATIONS

RM	ROOM
RP	RECEPTACLE PANEL
SA	SURGE ARRESTER
SC	SURGE CAPACITOR
S/N	SOLID NEUTRAL
SEC	SECONDARY
SPEC	SPECIFICATION
STP	SHIELDED TWISTED PAIR
STT	SHIELDED TWISTED TRIPLET
SW	SWITCH
SWBD	SWITCHBOARD
SWGR	SWITCHGEAR
T/M	THERMAL/MAGNETIC
TDR	TIME DELAY RELAY
THWN	THERMOPLASTIC, HEAT & WATER RESISTANT, NYLON COATED TYPICAL
UON	UNLESS OTHERWISE NOTED
UPS	UNINTERRUPTIBLE POWER SOURCE
V	VOLTS
VA	VOLTS-AMPERE
VFD	VARIABLE FREQUENCY DRIVE
W	WATT(S), WIRE(S)
W/	WITH
W/O	WITHOUT
WP	WATER PROOF
XFMR	TRANSFORMER
XP	EXPLOSION PROOF

### OUTLETS & DEVICES

	DUPLEX RECEPTACLE OUTLET
	QUADRUPLEX RECEPTACLE OUTLET
	DEDICATED DUPLEX RECEPTACLE OUTLET
	DEDICATED QUADRUPLEX RECEPTACLE OUTLET
	QUADRUPLEX RECEPTACLE OUTLET FLOOR MOUNTED
	DUPLEX RECEPTACLE OUTLET WITH GROUND FAULT INTERRUPTER
	SPECIAL PURPOSE RECEPTACLE OUTLET NEMA CONFIGURATION AS INDICATED ON DRAWING
	TELEPHONE OUTLET
	DATA OUTLET

### SWITCHES

	SINGLE POLE SWITCH: LOWER CASE LETTER INDICATES DEVICE CONTROLLED
	THREE WAY SWITCH
	FOUR WAY SWITCH
	MANUAL MOTOR STARTER W/THERMAL OVERLOAD
	KEY OPERATED SWITCH
	SWITCH WITH PILOT LIGHT
	SINGLE POLE SWITCH ON EMERGENCY CIRCUIT (RED BODY)
	PUSH BUTTON
	STOP/START PUSH BUTTON

### SINGLE LINE DIAGRAM

	TRANSFORMER
	CIRCUIT BREAKER 100 AF - INDICATES AMPERE FRAME 100 AT - INDICATES AMPERE TRIP
	CURRENT LIMITING CIRCUIT BREAKER
	THERMAL OVERLOAD
	DISCONNECT DEVICE FOR DRAWOUT EQUIPMENT
	NON-FUSED SWITCH
	FUSE
	FUSED SWITCH
	FUSED DISCONNECT
	LIGHTNING ARRESTER
	CURRENT TRANSFORMER
	POTENTIAL TRANSFORMER
	POTENTIAL TRANSFORMER WITH FUSE
	NORMALLY CLOSED MOMENTARY BUTTON
	NORMALLY OPEN MOMENTARY BUTTON
	GROUND CONNECTION
	BATTERY
	RELAY
	NORMALLY OPEN CONTACT
	NORMALLY CLOSED CONTACT
	METER
	GENERATOR/ MOTOR
	TRANSFER SWITCH
	AMMETER
	AMMETER SWITCH
	VOLTMETER
	VOLTMETER SWITCH
	KIRK KEY INTERLOCK
	WATT HOUR METER
	C/B WITH SHUNT TRIP
	DELTA CONNECTION
	GROUNDDED WYE CONNECTION
	OPEN WYE
	GROUNDDED OPEN WYE
	CONTACTOR
	POWER FACTOR CORRECTION CAPACITOR
	TRANSIENT VOLTAGE SURGE SUPPRESSION
	INDICATING LAMP
	ELECTRIC POLE
	POINT OF CONNECTION TO EXISTING EQUIPMENT.
	POINT OF DISCONNECTION TO EXISTING EQUIPMENT.
	SURGE ARRESTER
	SURGE CAPACITOR
	METAL OXIDE VARISTOR

### LIGHTING

	CEILING SUSPENDED EMERGENCY LUMINAIRE TYPE AS INDICATED
	CEILING SUSPENDED MOUNT LUMINAIRE TYPE AS INDICATED
	SURFACE MOUNT REMOTE EMERGENCY LIGHT. TYPE AS INDICATED.
	SURFACE MOUNT EMERGENCY LIGHT PACK. TYPE AS INDICATED.
	CEILING MOUNT LUMINAIRE. TYPE AS INDICATED
	SURFACE MOUNT LUMINAIRE. TYPE AS INDICATED
	SURFACE MOUNT EXIT LIGHT. TYPE AS INDICATED
	CEILING MOUNT EXIT LIGHT. TYPE AS INDICATED
	WALL MOUNTED LIGHT
	POLE MOUNTED LIGHT
	TIME CLOCK
	PHOTOCELL

### LINE TYPES

	INDICATES DEMOLISHED OR UNDERGROUND CONDUIT
	INDICATES EXISTING
	INDICATES NEW WORK

### POWER DISTRIBUTION

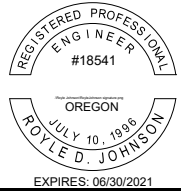
	208/120 VOLT PANEL BOARD
	480/277 VOLT PANEL BOARD
	TRANSFORMER
	JUNCTION BOX
	NON-FUSED DISCONNECT SWITCH
	ENCLOSED CIRCUIT BREAKER
	FUSED DISCONNECT SWITCH
	SELECTOR SWITCH HOA = HAND-OFF-AUTO
	MAGNETIC MOTOR STARTER
	COMBINATION MAGNETIC MOTOR STARTER AND DISCONNECT SWITCH
	MOTOR HORSEPOWER AS INDICATED
	EMERGENCY POWER OFF STATION
	HOMERUN TO PANEL ARROWS INDICATE NUMBER OF CIRCUITS
	CONCEALED WIRING IN WALL OR CEILING
	CONCEALED WIRING IN OR UNDER FLOOR SLAB OR ACCESS FLOOR
	CONDUIT SEAL
	EXPOSED WIRING

### FIRE ALARM & SAFETY

	MANUAL PULL STATION
	ALARM (STROBE)
	ALARM (HORN/BELL)
	ALARM (HORN/STROBE)
	SMOKE DETECTOR
	HEAT DETECTOR
	HYDROGEN SENSOR
	METHANE SENSOR
	METHANE TRANSMITTER
	FLAME SENSOR FIRE
	FIRE ALARM RELAY
	WARNING LIGHTS
	E-STOP PUSH BUTTON
	WALL MOUNTED FIRE EXTINGUISHER CABINET

NOTES:

- ENTIRE INSTALLATION, INCLUDING MATERIALS, EQUIPMENT AND WORKMANSHIP, SHALL CONFORM WITH THE CURRENT NATIONAL ELECTRICAL CODE (N.E.C.) AND WITH ALL APPLICABLE LAWS, CODES AND REGULATIONS AND REGULATORY BODIES HAVING JURISDICTION OVER THIS WORK.
- ELECTRICAL CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING DELIVERIES, RECEIVING, RIGGING, BOLTING TO PADS (TYPICAL FOR ALL STUB-UPS AND EQUIPMENT ON ALL CONCRETE PADS) AND APPURTENANCES REQUIRED FOR INSTALLATION PER MANUFACTURER'S REQUIREMENTS AND THE CONTRACT DOCUMENTS.
- ALL NEW ELECTRICAL MATERIAL AND EQUIPMENT SHALL BE LISTED BY THE UNDERWRITERS' LABORATORIES, INC. (UL) AND BEAR THE UL LABEL. WHERE EQUIPMENT AND CONDUITS PENETRATE FIRE AND SMOKE BARRIERS INCLUDING WALLS, PARTITIONS, FLOORS AND CEILINGS, INSTALL FIRE STOPPING AT PENETRATIONS AFTER CABLES ARE INSTALLED.
- THE DRAWINGS ARE DIAGRAMMATIC AND ALL SPECIALTIES AND APPURTENANCES ARE NOT SHOWN, HOWEVER ELECTRICAL CONTRACTOR SHALL BE REQUIRED TO PROVIDE A COMPLETE INSTALLATION, IN A NEAT WORKMANLIKE MANNER.
- UNLESS OTHERWISE NOTED, ALL INDOOR ELECTRICAL EQUIPMENT SHALL BE PROVIDED WITH AND HOUSED IN A NEMA 1 ENCLOSURE. ALL OUTDOOR ELECTRICAL EQUIPMENT SHALL BE INSTALLED IN NEMA 4X STAINLESS ENCLOSURES UNLESS OTHERWISE NOTED.
- THE CONTRACTOR SHALL VERIFY ALL DIMENSIONS AND CONDITIONS AT THE SITE BEFORE PROCEEDING WITH THE WORK.
- THE CONTRACTOR SHALL ASSUME THAT THERE WILL BE MINOR MODIFICATIONS MADE DURING CONSTRUCTION, CHANGE ORDERS FOR THESE MODIFICATIONS WILL NOT BE ACCEPTED.
- WORK REQUIRING A SHUTDOWN OF EQUIPMENT SHALL BE AT SUCH TIME AND IN SUCH MANNER AS DIRECTED BY THE OWNER. PROVIDE A MINIMUM ONE (1) WEEK PRIOR WRITTEN NOTICE.
- IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO VERIFY FIELD CONDITIONS AT THE SITE AND NOTIFY THE ENGINEER OF ANY DISCREPANCIES PRIOR TO COMMENCING WITH THE WORK.
- EFFECTIVELY PROTECT ALL MATERIALS AND EQUIPMENT FROM ENVIRONMENTAL AND PHYSICAL DAMAGE UNTIL FINAL ACCEPTANCE. CLOSE AND PROTECT ALL OPENINGS DURING CONSTRUCTION. PROVIDE NEW MATERIALS AND EQUIPMENT TO REPLACE ITEMS DAMAGED. EXISTING ELECTRICAL EQUIPMENT THAT INTERFERES WITH NEW ARRANGEMENT SHALL BE REMOVED, REINSTALLED, RELOCATED, REROUTED, EXTENDED OR ABANDONED AS REQUIRED, TO SUIT THE NEW ARRANGEMENT.
- THE ELECTRICAL CONTRACTOR IS RESPONSIBLE FOR REVIEWING AND COORDINATING WITH THE DOCUMENTS OF ALL TRADES.
- DURING CONSTRUCTION, THE CONTRACTOR SHALL MAINTAIN A RECORD SET OF INSTALLATION PRINTS. HE SHALL NEATLY AND CLEARLY RECORD ON THESE PRINTS ALL DEVIATIONS FROM THE CONTRACT DRAWINGS IN SIZES, LOCATIONS AND DETAILS. AT THE COMPLETION OF THE WORK, THE CONTRACTOR SHALL RETURN THE MARKED PRINTS WITH ALL INFORMATION OBTAINED DURING THE CONSTRUCTION PROCESS TO THE ENGINEER FOR SUBMISSION TO OWNER.
- CONTACT SITE UTILITY LOCATOR AT LEAST 48 HRS PRIOR TO EXCAVATING.
- FOR LOCATIONS OF ALL MECHANICAL EQUIPMENT REFER TO MECHANICAL PLANS.
- ENERGYNEERING SOLUTIONS, INC. INCORPORATES COMMERCIALY MANUFACTURED ITEM(S) OR COMPONENT(S) IN THE PREPARATION OF THIS PLAN, AND RELIES UPON THE MANUFACTURER'S STATED OR IDENTIFIED SPECIFICATIONS AND PROPERTIES IN THE PREPARATION OF THIS PLAN. ENERGYNEERING SOLUTIONS, INC. HAS NOT UNDERTAKEN ANY INDEPENDENT EXAMINATION, TESTING OR ANALYSIS TO VERIFY THE MANUFACTURERS' SPECIFICATIONS OR PROPERTIES FOR ANY ITEM OR COMPONENT. (ENERGYNEERING SOLUTIONS INC. MAKES NO REPRESENTATIONS OR WARRANTIES AS TO THE ACCURACY OF THE SPECIFICATIONS OR PROPERTIES ASSOCIATED WITH ANY ITEM OR COMPONENT UTILIZED IN THIS PLAN.)
- ENERGYNEERING SOLUTIONS, INC. HAS RELIED UPON INFORMATION PROVIDED TO IT BY OTHERS IN PREPARATION OF THESE PLANS. THIS INFORMATION HAS BEEN USED IN THE DEVELOPMENT OF THESE PLANS. ENERGYNEERING SOLUTIONS INC. SHALL NOT BE HELD RESPONSIBLE FOR THE ACCURACY OF THIS INFORMATION; NOR FIELD CHANGES DURING INSTALLATION AND CONSTRUCTION.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR LABELING ALL CONDUCTORS AND CONDUITS TO ALLOW FUTURE IDENTIFICATION.
- ABBREVIATIONS AND SYMBOLS ON THIS SHEET ARE GENERIC AND MAY NOT ALL BE USED IN THIS DRAWING SET.



No.	DATE	BY	REVISION
A	10/22/19	RJ	ISSUED FOR BIDDING

JOB No.	DESIGNED:	PROJ. ENGINEER:
018.502	RJ	RJ
SCALE:	DRAWN BY:	APPROVED BY:
AS SHOWN	PD	CF
	CHECKED BY:	DATE:
	CF	10/21/19

**ENERGYNEERING SOLUTIONS INC**  
 15820 BARCLAY DRIVE SISTERS, OR 97759  
 PHONE: (541) 549-8766  
 FAX: (541) 549-1901

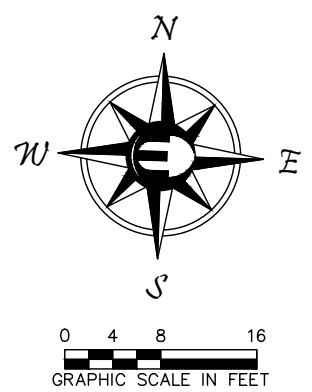
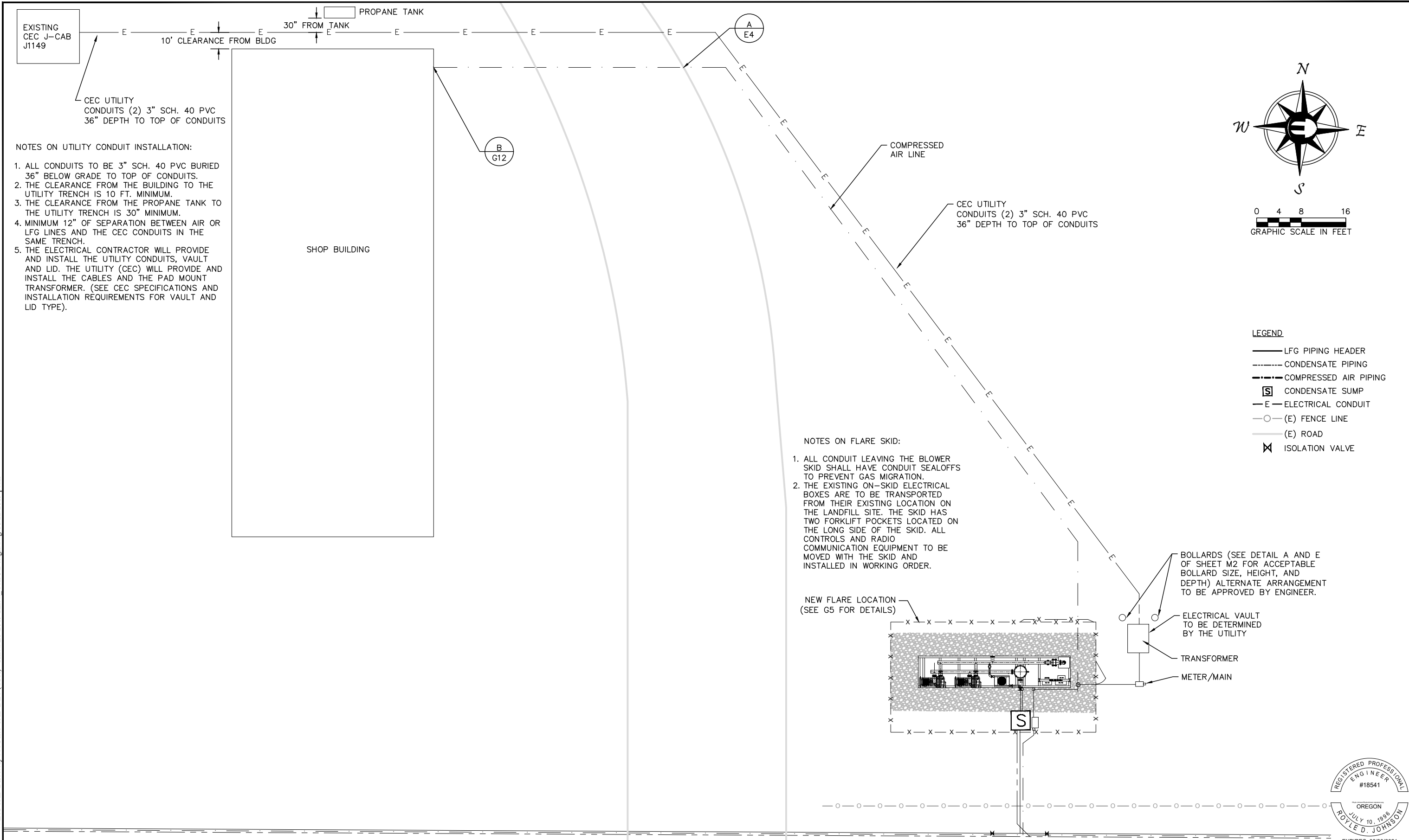
**G. Friesen Associates, Inc.**  
 4088 Orchard Drive  
 Lake Oswego, Oregon 97035  
 Tel: (503) 635-1233  
 Fax: (866) 533-5543

**KNOTT LANDFILL  
 CELL 8 CONSTRUCTION  
 PROJECT  
 DESCHUTES COUNTY, OREGON**

**CELL 8  
 ELECTRICAL LEGEND/NOTES**

DRAWING NUMBER:	E1
CAD FILE NUMBER:	ESI 3
SHEET:	REV.
27 OF 40	A

V:\ESI CAD Directory\Job Files CAD\DES (GFA) - Knott LF.2019\Knott Cell 8 Design.dwg 10/22/2019 pcar



NOTES ON UTILITY CONDUIT INSTALLATION:

1. ALL CONDUITS TO BE 3" SCH. 40 PVC BURIED 36" BELOW GRADE TO TOP OF CONDUITS.
2. THE CLEARANCE FROM THE BUILDING TO THE UTILITY TRENCH IS 10 FT. MINIMUM.
3. THE CLEARANCE FROM THE PROPANE TANK TO THE UTILITY TRENCH IS 30" MINIMUM.
4. MINIMUM 12" OF SEPARATION BETWEEN AIR OR LFG LINES AND THE CEC CONDUITS IN THE SAME TRENCH.
5. THE ELECTRICAL CONTRACTOR WILL PROVIDE AND INSTALL THE UTILITY CONDUITS, VAULT AND LID. THE UTILITY (CEC) WILL PROVIDE AND INSTALL THE CABLES AND THE PAD MOUNT TRANSFORMER. (SEE CEC SPECIFICATIONS AND INSTALLATION REQUIREMENTS FOR VAULT AND LID TYPE).

NOTES ON FLARE SKID:

1. ALL CONDUIT LEAVING THE BLOWER SKID SHALL HAVE CONDUIT SEALOFFS TO PREVENT GAS MIGRATION.
2. THE EXISTING ON-SKID ELECTRICAL BOXES ARE TO BE TRANSPORTED FROM THEIR EXISTING LOCATION ON THE LANDFILL SITE. THE SKID HAS TWO FORKLIFT POCKETS LOCATED ON THE LONG SIDE OF THE SKID. ALL CONTROLS AND RADIO COMMUNICATION EQUIPMENT TO BE MOVED WITH THE SKID AND INSTALLED IN WORKING ORDER.

**LEGEND**

- LFG PIPING HEADER
- CONDENSATE PIPING
- - - COMPRESSED AIR PIPING
- ⊠ CONDENSATE SUMP
- E- ELECTRICAL CONDUIT
- (E) FENCE LINE
- (E) ROAD
- ⊗ ISOLATION VALVE

No.	DATE	BY	REVISION
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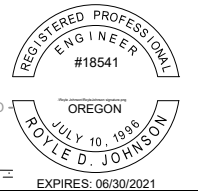
JOB No. 018.502	DESIGNED: RJ	PROJ. ENGINEER: RJ
SCALE: AS SHOWN	DRAWN BY: PD	APPROVED BY: CF
	CHECKED BY: CF	DATE: 10/21/19

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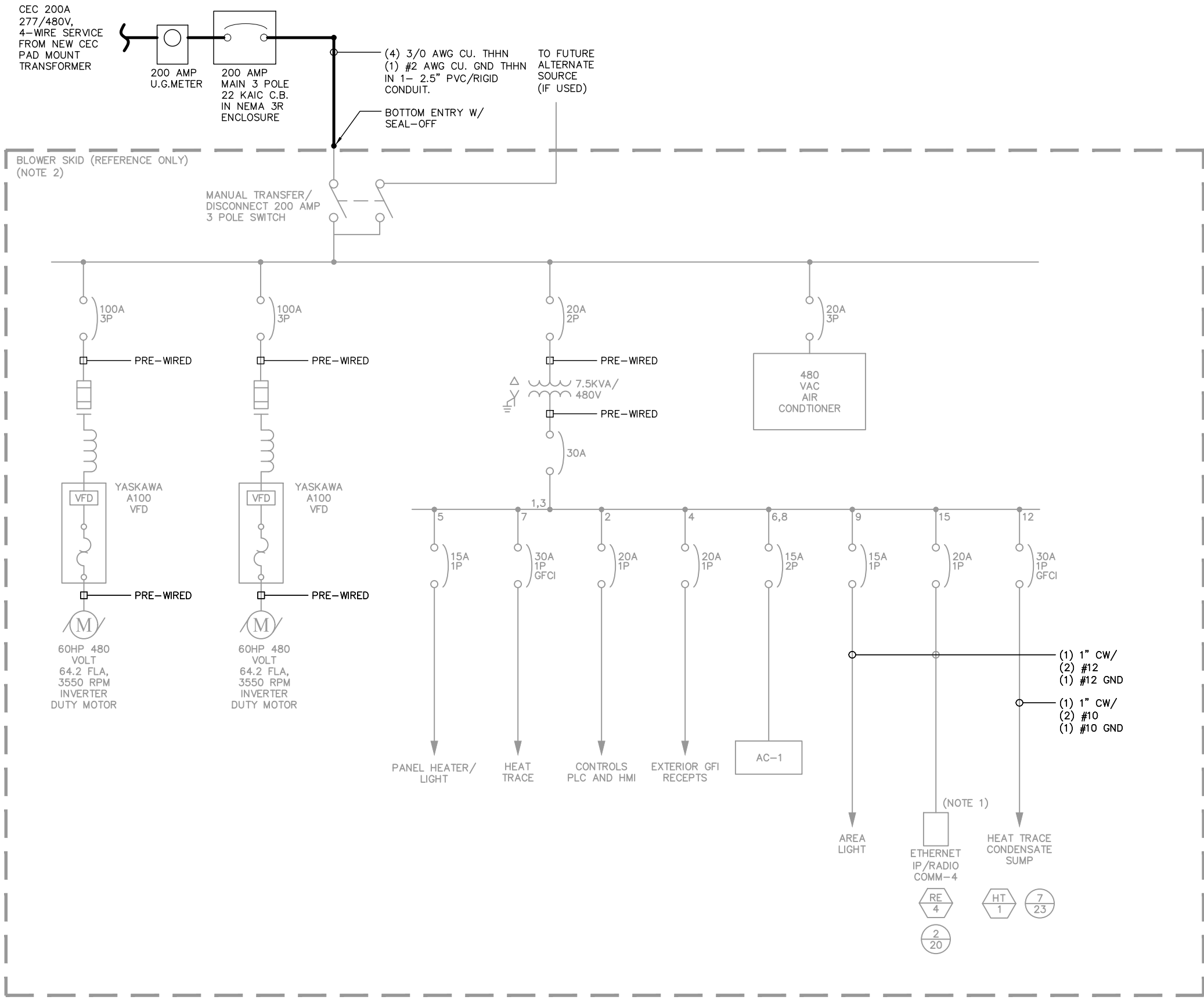
**G. Friesen Associates, Inc.**  
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**KNOTT LANDFILL  
 CELL 8 CONSTRUCTION  
 PROJECT  
 DESCHUTES COUNTY, OREGON**

**CELL 8  
 ELECTRICAL FLARE SITE**



DRAWING NUMBER: E2	
CAD FILE NUMBER: ESI 3	
SHEET: 28 OF 40	REV. A

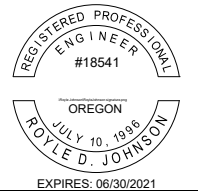


**LOAD SUMMARY:**

(1) 60 HP BLOWER	-64 KVA
(1) 60 HP BLOWER @ 125%	-80 KVA
AUXILLARY LOADS	-10 KVA
	<u>154 KVA</u>

154 KVA @ 480 V 3 PHASE = 185 AMPS  
200 AMP METER AND MAIN SERVICE RATED  
CIRCUIT BREAKER SUPPLIES THIS EQUIPMENT

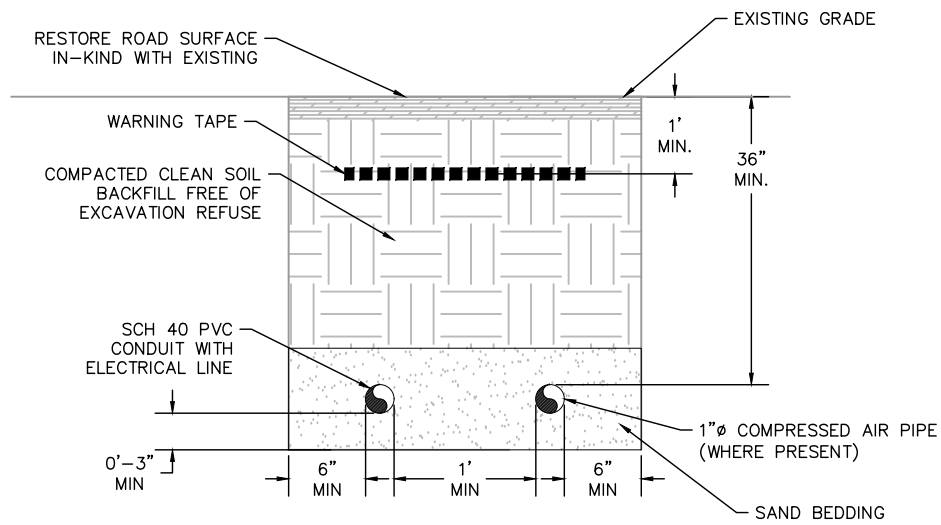
- NOTES:**
- RADIO WILL BE POWER OVER ETHERNET. A STANDARD DUPLEX RECEPTACLE TO BE PROVIDED INSIDE NEMA 3R ENCLOSURE BY BLOWER SKID MANUFACTURER.
  - COMPONENTS WITHIN THE BLOWER SKID MANUFACTURER'S SCOPE OF WORK WILL VARY PER THE MANUFACTURER'S DESIGN. THIS CONTENT IS PROVIDED FOR REFERENCE ONLY.



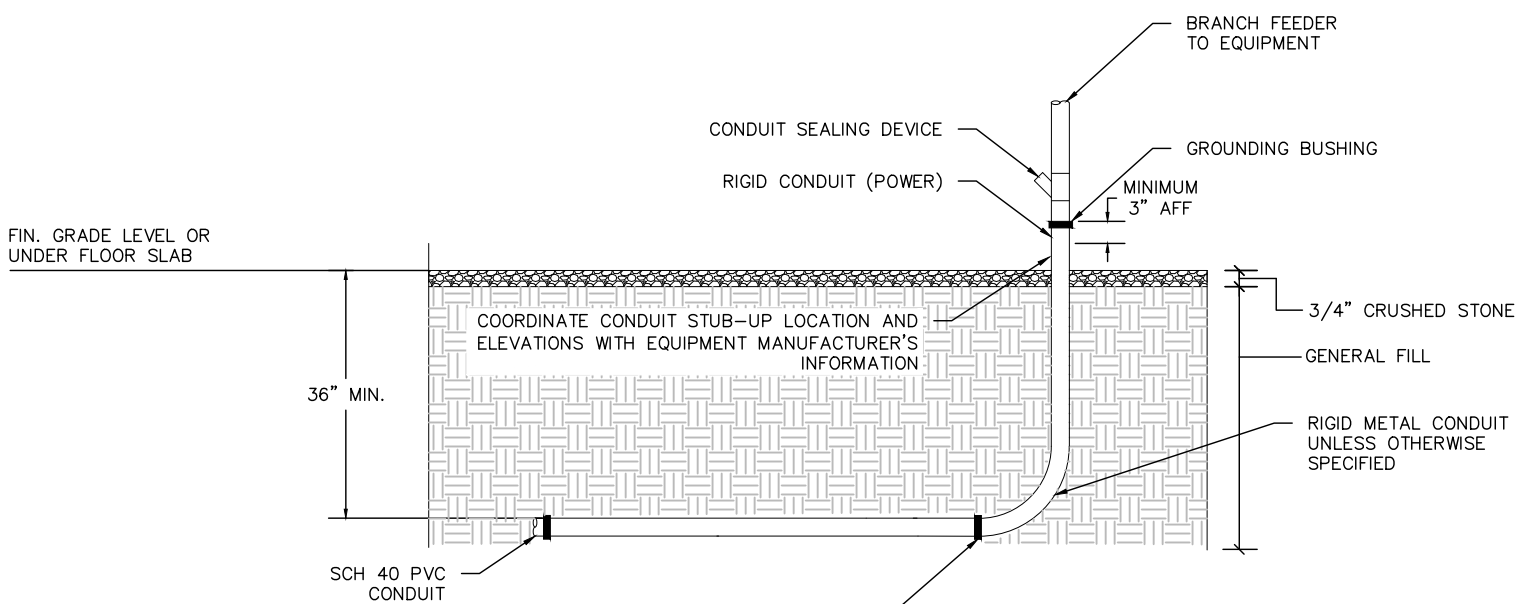
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<table border="1"> <tr> <td>No.</td> <td>DATE</td> <td>BY</td> <td>REVISION</td> </tr> <tr> <td>A</td> <td>10/22/19</td> <td>RJ</td> <td>ISSUED FOR BIDDING</td> </tr> </table>			No.	DATE	BY	REVISION	A	10/22/19	RJ	ISSUED FOR BIDDING	JOB No. 018.502  SCALE: AS SHOWN	DESIGNED: RJ  DRAWN BY: PD  CHECKED BY: CF	PROJ. ENGINEER: RJ  APPROVED BY: CF  DATE: 10/21/19	<p>15820 BARCLAY DRIVE SISTERS, OR 97759 PHONE: (541) 549-8766 FAX: (541) 549-1901</p>	<p>G. Friesen Associates, Inc. 4088 Orchard Drive Lake Oswego, Oregon 97035 Tel: (503) 635-1233 Fax: (866) 533-5543</p>	<p><b>KNOTT LANDFILL CELL 8 CONSTRUCTION PROJECT DESCHUTES COUNTY, OREGON</b></p>	<p><b>CELL 8 FLARE SKID ELECTRICAL SINGLE LINE</b></p>	DRAWING NUMBER: E3  CAD FILE NUMBER: ESI 3  SHEET: 29 OF 40  REV. A
No.	DATE	BY	REVISION															
A	10/22/19	RJ	ISSUED FOR BIDDING															

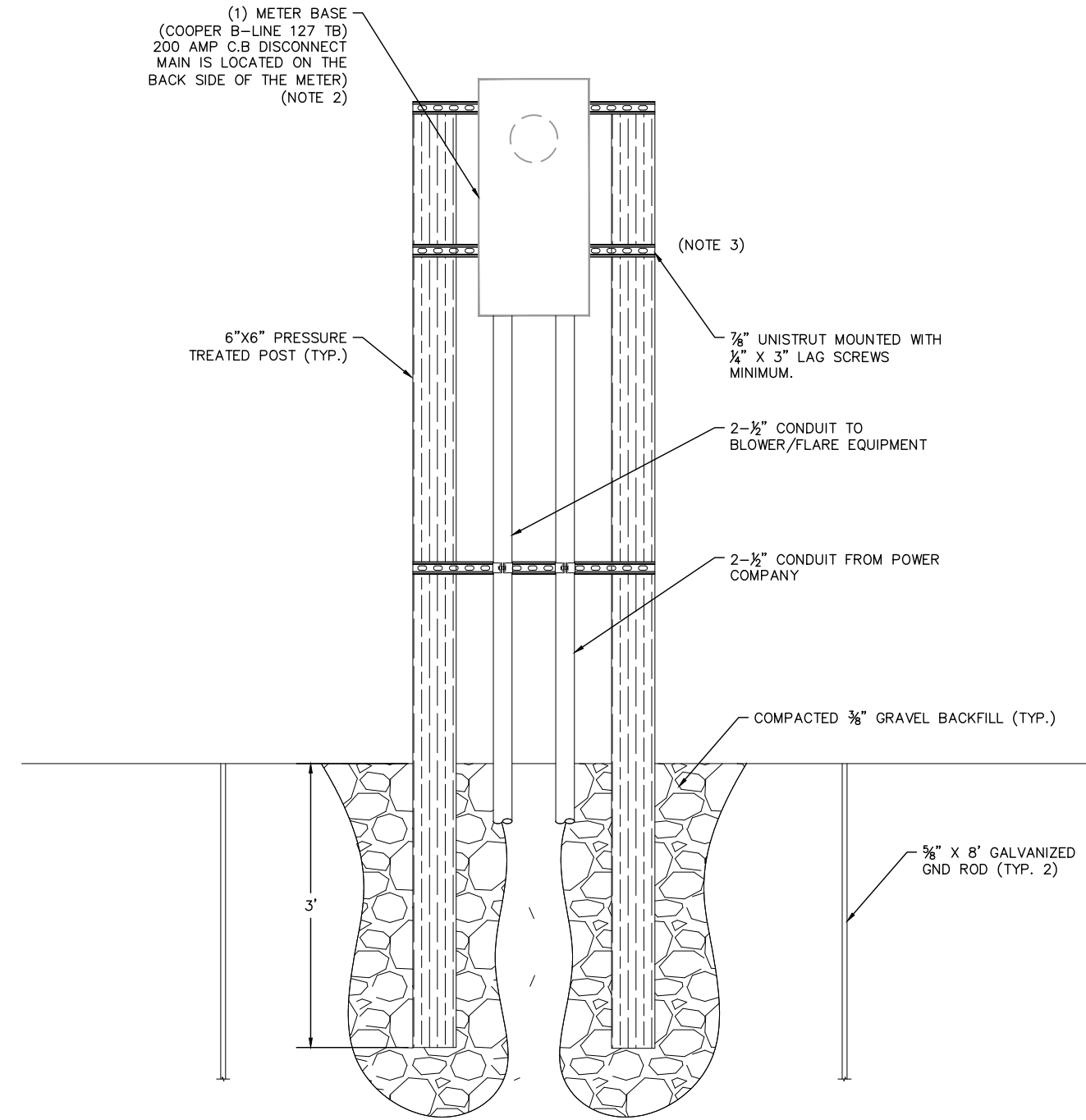
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**A**  
E4 CONDUIT TRENCH DETAIL



**C**  
E4 CONDUIT STUB-UP DETAIL



**B**  
E4 MAIN SERVICE ELEVATION VIEW

- NOTES:**
- COORDINATE INSTALLATION AND EQUIPMENT SELECTION WITH THE ELECTRIC UTILITY.
  - METER BASE SHALL BE COOPER B-LINE 127 TB OR APPROVED EQUAL.
  - ROUTE CONDUITS FOR BOTTOM ENTRY. FINAL ROUTING TO BE DETERMINED BY E.C. IN FIELD.



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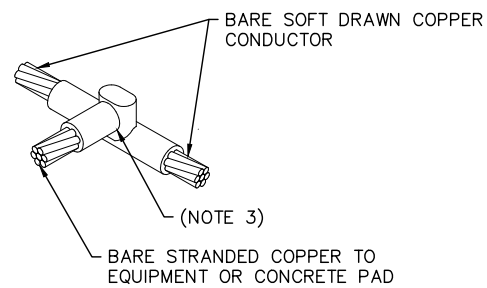
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**KNOTT LANDFILL  
CELL 8 CONSTRUCTION  
PROJECT  
DESCHUTES COUNTY, OREGON**

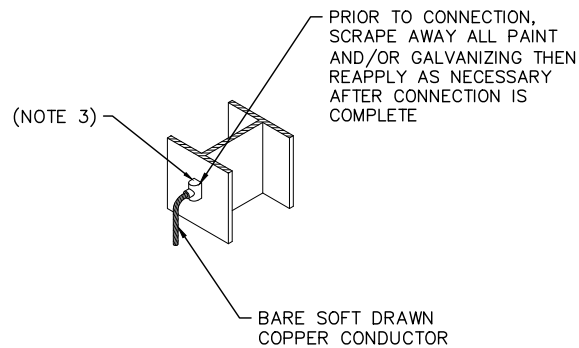
**CELL 8  
ELECTRICAL DETAILS I**

DRAWING NUMBER: <b>E4</b>	
CAD FILE NUMBER: <b>ESI 3</b>	
SHEET: 30 OF 40	REV. <b>A</b>

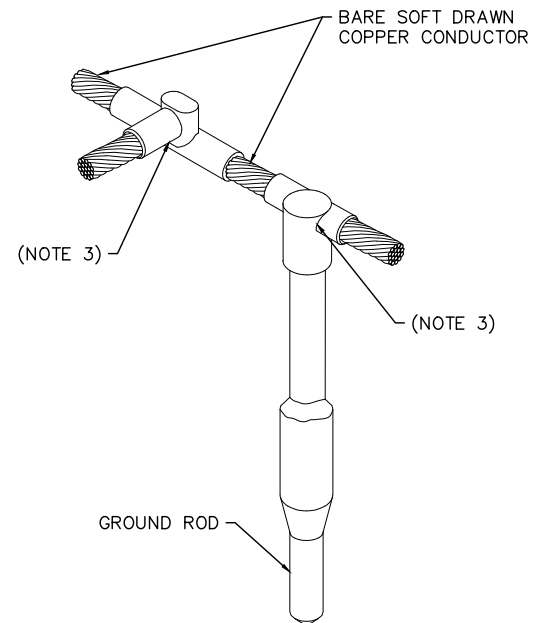
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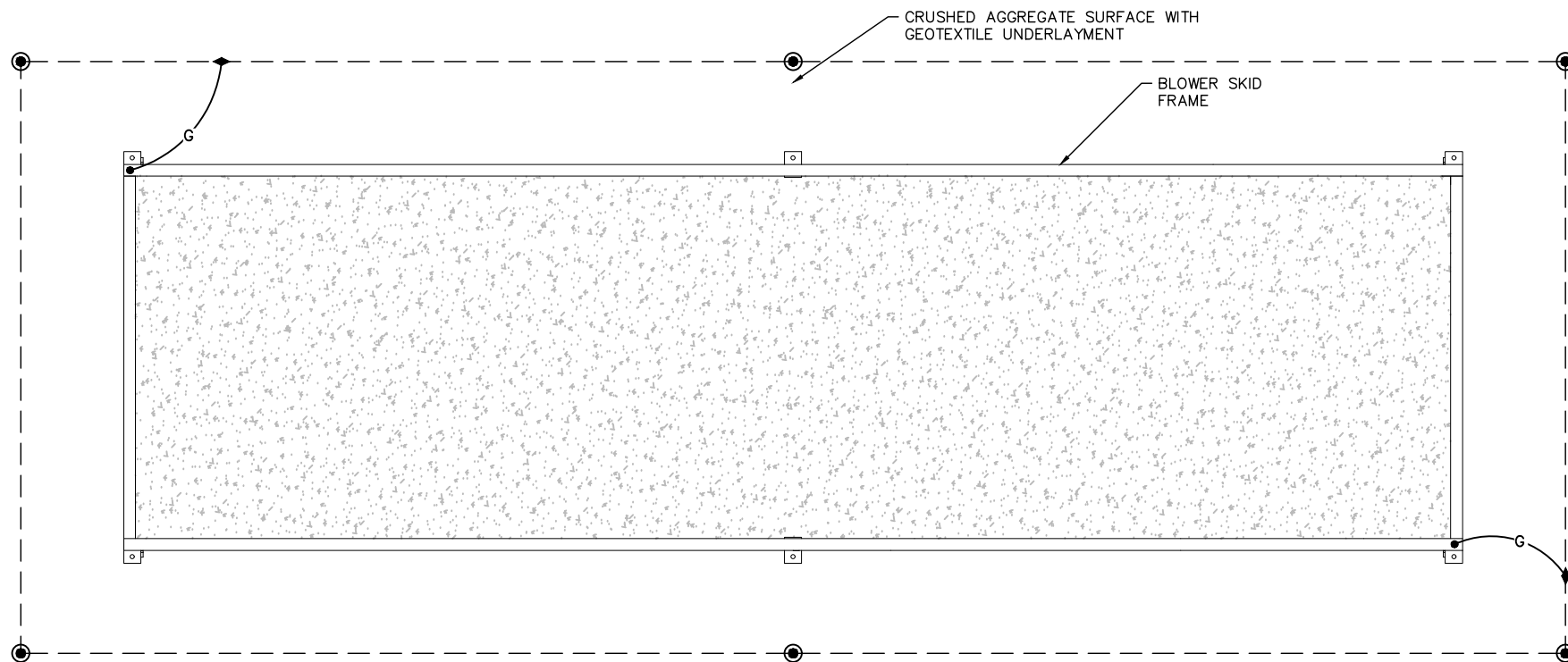
**A**  
E5 EXOTHERMIC WELD CONNECTION DETAIL



**B**  
E5 EXOTHERMIC TO STEEL CONNECTION



**C**  
E5 GROUND ROD DETAIL



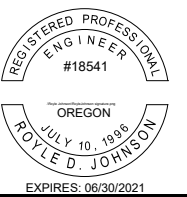
**D**  
E5 SKID FRAME GROUNDING DETAIL

**LEGEND:**

- G — #2 BARE COPPER BONDING CONDUCTOR FOR THE CONNECTION OF EQUIPMENT
- - - #2 AWG BARE COPPER CONDUCTOR
- ◆ BONDING LOCATION
- GROUND ROD COPPER COATED STEEL, 5/8" MIN. DIA DRIVEN TO A DEPTH OF NOT LESS THEN 8"

**NOTES:**

1. GROUND RING ELECTRODE IS #2 AWG BARE COPPER CONDUCTOR WITH 6" MINIMUM CLEAN SOIL COMPACTED SOIL SURROUNDING THE CONDUCTOR ON ALL SIDES. OTHER GROUND CONDUCTORS AND DEVICES ARE TO BE BONDED AS SHOWN IN THE DETAILS.
2. REBAR TO BE BONDED TO GROUND RING ELECTRODE.
3. USE EXOTHERMIC WELD CONNECTIONS AS PER THE DETAILS SHOWN ABOVE. AS AN OPTION, U.L. LISTED COMPRESSION CONNECTIONS ARE PERMITTED. USE BURNDY-HYGRID, HYTAIL, GRIDLOCK AND HYTAP CONNECTORS WITH APPROVED COMPRESSION TOOL.



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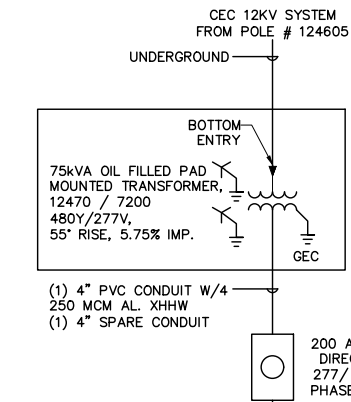
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**KNOTT LANDFILL  
CELL 8 CONSTRUCTION  
PROJECT  
DESCHUTES COUNTY, OREGON**

**CELL 8  
ELECTRICAL DETAILS II**

DRAWING NUMBER: E5	
CAD FILE NUMBER: ESI 3	
SHEET: 31 OF 40	REV. A

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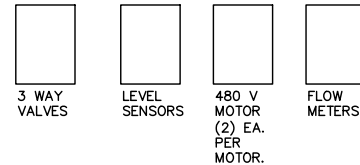


- NOTES:
- ① SCHNEIDER GV2ME14 MOTOR STARTER AND PROTECTOR WITH AMP SETTING 6-10 AMPS. SET @ 4.8 AND 8 AMPS.
  - ② (1)-1" STEEL FLEX WITH (2)-#6 CU. THHN AND (1) #5 CU. E.G.C.
  - ③ (1)-1.5" STEEL FLEX WITH (1)-#1 CU. THHN AND (1) #5 CU. E.G.C.
  - ④ (1)-3/4" EMT WITH (3)-#10 CU. THHN AND (1) #10 CU. E.G.C.
  - ⑤ 15 KVA TRANSFORMER G.E. CAT # 9T83B2670 480 TO 120-240 V 1 PHASE 7.9% Z.
  - ⑥ G.E. LOADCENTER WITH TYPE THQL CIRCUIT BREAKERS. 10,000 AIC
  - ⑦ OVERSIZED CONDUCTORS FOR VOLTAGE DROP REDUCTION. RUN TO REMOTE CABINET LOCATION.
  - ⑧ LOADCENTER PANEL L CIRCUIT SCHEDULE: CIRCUIT #1(20/1) - CONTROL RM RECPT. CIRCUIT #2 (20/1) - STORAGE RM. RECPTS. CIRCUIT #3 (20/1) - CONTROL CIRCUIT POWER CIRCUIT #4 (20/1) - STORAGE RM LIGHTS CIRCUIT #5 (20/1) - O.S RECPT. CIRCUIT #6-8 (20/2) STORAGE RM HEATER CIRCUIT #7-9 (30/2)-HVAC UNIT CIRCUITS #10,12,14 (20/1) - HEAT TAPES CIRCUIT #16 (20/1) - PARNEL COMM. UNIT
  - ⑨ PLC PROCESSOR - PRODUCTIVITY P3-550 CPU. HMI - AUTOMATION DIRECT EA7-T15C+10429B012. SEE POWERS OF AUTOMATION PLC CONTROL PANEL DRAWINGS FOR THE SCHEMATICS ON THE PLC CONTROL DEVICES AND COMPONENTS.
  - ⑩ G.V. INTERNATIONAL # D1014D 2 CHANNEL REPEATER POWER SUPPLY. SEE SHEET 8,9,10 OF CONTROL DWGS. POWER FOR SUBMERSIBLE LEVEL SENSORS 0-5 PSI. (6) TOTAL - TWO FOR EACH CELL. (12) TOTAL
  - ⑪ G.V. INTERNATIONAL # D1060S ISOLATION BARRIER. SEE SHEET 12-14 OF CONTROL DWGS. TURBINE FLOW METER 0-100 GPM. (6) TOTAL - ONE FOR EACH CELL. 4-20 MA OUTPUT FROM THE G.V. #D1060S TO THE PLC ANALOG INPUT CARD - (6) TOTAL ONE PER UNIT.
  - ⑫ ROSEMOUNT 8712E FLOW METERS #8712ESR1A14. (6) TOTAL ONE FROM EACH UNIT. FLOW METER DEVICE OUTSIDE HAS A TWO-WIRE COIL AND TWO-WIRE SENSOR. THEY CONNECT TO THE INDOOR ROSEMOUNT 8712E UNIT, THE ROSEMOUNT IS POWERED BY 120 VAC AND HAS A 4-20 ANALOG INPUT CIRCUIT TO THE PLC ANALOG INPUT CARD (6) TOTAL.

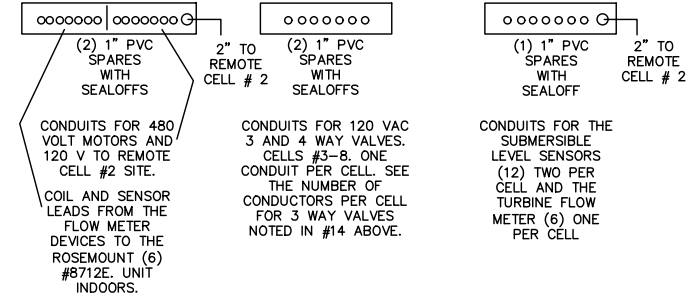
- ⑬ AS OF 9/10/2019. SPARE COMPONENTS IN CONTROL PANEL CONSIST OF : (12) SPARE RELAY OUTPUTS; (12) DIGITAL INPUT SPARES; (2) ANALOG INPUT SPARE CHANNELS. SEE ZIP LINK TERMINATION DEVICES. SEE SITE FOR SPARES PER 9/10/2019. CONTRACTOR TO PROVIDE (1) GMI D1014S DUAL CHANNEL ISOLATION BARRIER.

- ⑭ CELL #1 HAS NO VALVES. CELL #2 IS REMOTE. CELLS #3,4 HAVE (3) VALVES. CELLS #5,6 HAVE (4) VALVES. EACH 3 WAY VALVE HAS (8) WIRES = TOTAL OF 3X8=24 WIRES OR 4X8=32 WIRES. ALL #14 THHN CU. CONFIRM PER CONTROL DWGS.

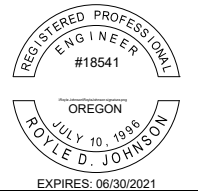
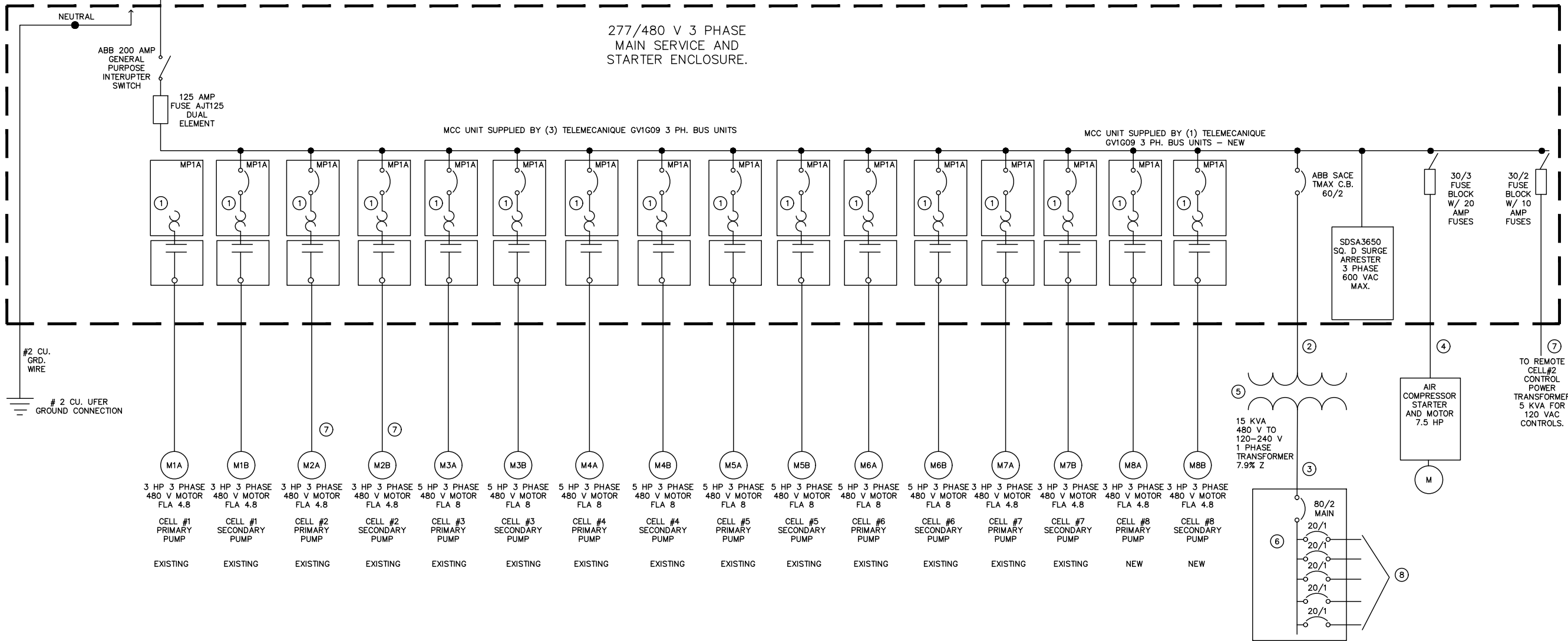
TYPICAL CELL SITE ENCLOSURE CONTROL LAYOUT



- ⑮ OUTDOOR DISTRIBUTION NEMA 3R GUTTERS HAVE THE FOLLOWING USED AND SPARE CONDUITS - (9/10/2019)



- ⑰ ELECTRICAL CONTRACTOR TO PROVIDE THE SAME WIRING METHODS, CABLE AND CONDUIT TYPES THAT HAVE BEEN USED IN EACH OF THE PRECEDING CELL EXPANSION PROJECTS.



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**KNOTT LANDFILL  
CELL 8 CONSTRUCTION  
PROJECT  
DESCHUTES COUNTY, OREGON**

**CELL 8  
ELECTRICAL SINGLE LINE DRAWING I**

DRAWING NUMBER: E6	
CAD FILE NUMBER: ESI 3	
SHEET: 32 OF 40	REV. A

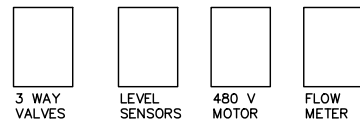


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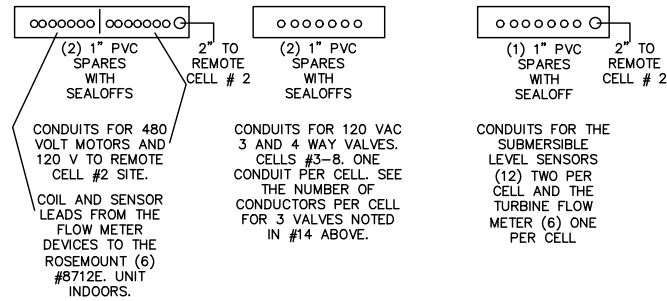
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- ② (1)-1" STEEL FLEX WITH (2)-#6 CU. THHN AND (1) #8 CU. E.G.C.
- ③ (1)-1.5" STEEL FLEX WITH (1)-# 1 CU. THHN AND (1) #8 CU. E.G.C.
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- ⑤ 15 KVA TRANSFORMER G.E. CAT # 9T83B2670 480 TO 120-240 V 1 PHASE 7.9% Z.
- ⑥ G.E. LOADCENTER WITH TYPE THQL CIRCUIT BREAKERS. 10,000 AIC
- ⑦ OVERSIZED CONDUCTORS FOR VOLTAGE DROP REDUCTION. RUN TO REMOTE CABINET LOCATION.
- ⑧ **LOADCENTER PANEL 1 CIRCUIT SCHEDULE:** CIRCUIT #1(20/1) - CONTROL RM RECPT. CIRCUIT #2 (20/1) - STORAGE RM. RECPTS. CIRCUIT #3 (20/1) - CONTROL CIRCUIT POWER CIRCUIT #4 (20/1) - STORAGE RM LIGHTS CIRCUIT #5 (20/1) - O.S RECPT. CIRCUIT #6-8 (20/2) STORAGE RM HEATER CIRCUIT #7-9 (30/2)-HVAC UNIT CIRCUITS #10,12,14 (20/1) - HEAT TAPES CIRCUIT #16 (20/1) - PARNEL COMM. UNIT
- ⑨ PLC PROCESSOR - PRODUCTIVITY P3-550 CPU. HMI - AUTOMATION DIRECT EA7-T15C+10429B012. SEE **POWERS OF AUTOMATION** PLC CONTROL PANEL DRAWINGS FOR THE SCHEMATICS ON THE PLC CONTROL DEVICES AND COMPONENTS.
- ⑩ G.V. INTERNATIONAL # D1014D 2 CHANNEL REPEATER POWER SUPPLY. SEE SHEET 8,9,10 OF CONTROL DWGS. POWER FOR SUBMERSIBLE LEVEL SENSORS 0-5 PSI. (6) TOTAL UNITS - TWO CIRCUITS FOR EACH CELL. (12) TOTAL.
- ⑪ G.V. INTERNATIONAL # D1060S ISOLATION BARRIER. SEE SHEET 12-14 OF CONTROL DWGS. TURBINE FLOW METER 0-100 GPM. (6) TOTAL - ONE FOR EACH CELL. 4-20 MA OUTPUT FROM THE G.V. #D1060S TO THE PLC ANALOG INPUT CARD - (6) TOTAL ONE PER UNIT.
- ⑫ ROSEMOUNT 8712E FLOW METERS #8712ESR1A14. (6) TOTAL ONE FROM EACH UNIT. FLOW METER DEVICE OUTSIDE HAS A TWO-WIRE COIL AND TWO-WIRE SENSOR. THEY CONNECT TO THE INDOOR ROSEMOUNT 8712E UNIT, THE ROSEMOUNT IS POWERED BY 120 VAC AND HAS A 4-20 ANALOG INPUT CIRCUIT TO THE PLC ANALOG INPUT CARD (6) TOTAL.
- ⑬ AS OF 9/10/2019. SPARE COMPONENTS IN CONTROL PANEL CONSIST OF : (12) SPARE RELAY OUTPUTS; (12) DIGITAL INPUT SPARES; (2) ANALOG INPUT SPARE CHANNELS. SEE ZIP LINK TERMINATION DEVICES. SEE SITE FOR SPARES PER 9/10/2019. CONTRACTOR TO PROVIDE (1) GMI D1014S DUAL CHANNEL ISOLATION BARRIER.

- ⑭ CELL #1 HAS NO VALVES. CELL #2 IS REMOTE. CELLS #3,4 HAVE (3) VALVES. CELLS #5,6 HAVE (4) VALVES. EACH VALVE HAS (8) WIRES = TOTAL OF 3X8=24 WIRES OR 4X8=32 WIRES. ALL #14 THHN CU. CONFIRM PER CONTROL DWGS.

CELL SITE ENCLOSURE CONTROL LAYOUT



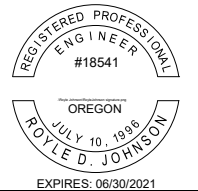
- ⑮ OUTDOOR DISTRIBUTION NEMA 3R GUTTERS HAVE THE FOLLOWING USED AND SPARE CONDUITS - (9/10/2019)



- ⑯ REMOTE CELL #2 IS SUPPLIED BY (2) 2" CONDUITS AND (1) 1" CONDUIT VIA A CONCRETE VAULT ON THE SOUTH SIDE OF THE ELECTRICAL BLDG.
- ⑰ ELECTRICAL CONTRACTOR TO PROVIDE THE SAME WIRING METHODS, CABLE AND CONDUIT TYPES THAT HAVE BEEN USED IN EACH OF THE PRECEDING CELL EXPANSION PROJECTS.



V:\ESI CAD Directory\Job Files CAD\DES (GFA) - Knott LF\2019\Knott Cell 8 Design.dwg 10/22/2019 pear



No.	DATE	BY	REVISION
A	10/22/19	RJ	ISSUED FOR BIDDING

JOB No.	DESIGNED:	PROJ. ENGINEER:
018.502	RJ	RJ
SCALE:	DRAWN BY:	APPROVED BY:
AS SHOWN	PD	CF
	CHECKED BY:	DATE:
	CF	10/21/19

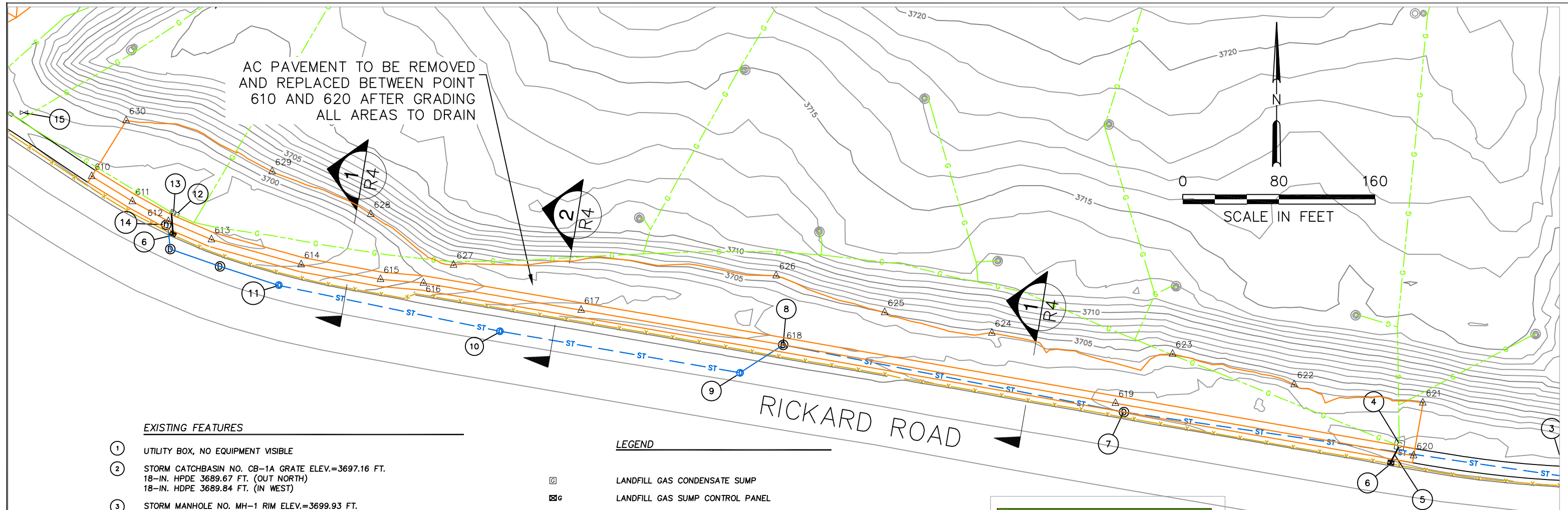
**ENERGYNEERING SOLUTIONS INC**  
 15820 BARCLAY DRIVE SISTERS, OR 97759  
 PHONE: (541) 549-8766  
 FAX: (541) 549-1901

**G. Friesen Associates, Inc.**  
 4088 Orchard Drive  
 Lake Oswego, Oregon 97035  
 Tel: (503) 635-1233  
 Fax: (866) 533-5543

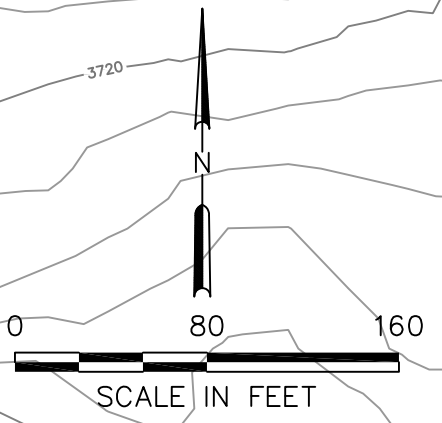
**KNOTT LANDFILL  
 CELL 8 CONSTRUCTION  
 PROJECT  
 DESCHUTES COUNTY, OREGON**

**CELL 8  
 ELECTRICAL SINGLE LINE DRAWING II**

DRAWING NUMBER: E7	
CAD FILE NUMBER: ESI 3	
SHEET: 33 OF 40	REV. A



AC PAVEMENT TO BE REMOVED AND REPLACED BETWEEN POINT 610 AND 620 AFTER GRADING ALL AREAS TO DRAIN



**EXISTING FEATURES**

- ① UTILITY BOX, NO EQUIPMENT VISIBLE
- ② STORM CATCHBASIN NO. CB-1A GRATE ELEV.=3697.16 FT.  
18-IN. HPDE 3689.67 FT. (OUT NORTH)  
18-IN. HPDE 3689.84 FT. (IN WEST)
- ③ STORM MANHOLE NO. MH-1 RIM ELEV.=3699.93 FT.  
18-IN. HPDE 3690.35 FT. (OUT EAST)  
18-IN. HPDE 3690.44 FT. (IN WEST)
- ④ LANDFILL GAS CONDENSATE VAULT, SUMP NO. 1, LID ELEVATION=3700.86 FT.
- ⑤ LANDFILL GAS CONDENSATE SUMP CONTROL WIRING (SEE NOTE 5)
- ⑥ LANDFILL GAS CONDENSATE SUMP CONTROL PANEL FENCE MOUNTED
- ⑦ STORM MANHOLE NO. MH-2 RIM ELEV.=3701.97 FT.  
18-IN. HPDE 3691.18 FT. (OUT EAST)  
18-IN. HPDE 3691.47 FT. (IN WEST)
- ⑧ STORM MANHOLE MH-3 RIM ELEV.=3703.23 FT.  
18-IN. HPDE 3691.86 FT. (OUT EAST)  
18-IN. HPDE 3691.99 FT. (IN SOUTHWEST)
- ⑨ STORM MANHOLE MH-4 RIM ELEV.=3697.64 FT.  
18-IN. HPDE 3692.16 FT. (OUT NORTHEAST)  
18-IN. HPDE 3692.41 FT. (IN WEST)
- ⑩ STORM MANHOLE MH-5 RIM ELEV.=3696.74 FT.  
18-IN. HPDE 3692.86 FT. (OUT EAST)  
18-IN. HPDE 3692.85 FT. (IN WEST)
- ⑪ STORM MANHOLE MH-6 RIM ELEV.=3695.42 FT.  
18-IN. HPDE 3693.03 FT. (OUT EAST)  
18-IN. HPDE 3693.12 FT. (IN WEST)
- ⑫ LANDFILL GAS VALVE VAULT LID ELEVATION=3697.56 FT.
- ⑬ LANDFILL GAS CONDENSATE VAULT, SUMP NO. 2, LID ELEVATION=3697.59 FT.
- ⑭ STORM CATCHBASIN NO. CB-2 GRATE ELEV.=3697.31 FT.  
18-IN. HPDE 3694.09 FT. (OUT SOUTHEAST)
- ⑮ LANDFILL GAS VALVE IN PLASTIC UTILITY BOX
- ⑯ LANDFILL GAS VALVE VAULT LID ELEVATION=3698.29 FT.

**LEGEND**

- LANDFILL GAS CONDENSATE SUMP
  - LANDFILL GAS SUMP CONTROL PANEL
  - STORM MANHOLE
  - UTILITY BOX, TYPE UNKNOWN
- 
- EXISTING CHAINLINK FENCE, HT.=6.0 FT.
  - EXISTING TEMPORARY TRASH FENCE
  - EXISTING LANDFILL GAS LINE (SEE NOTE 5)
  - EXISTING STORM LINE (18-IN. HPDE)

**LEGEND**

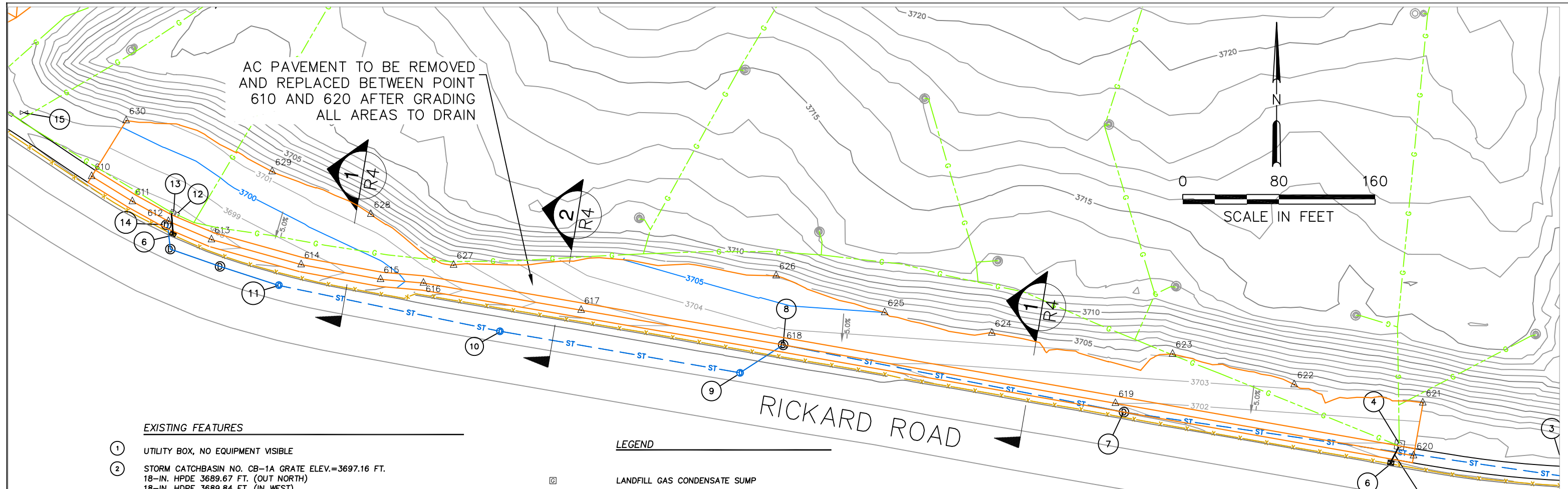
**NOTES**

1. THE COORDINATES SHOWN ARE BASED ON THE CENTRAL OREGON COORDINATE SYSTEM. ELEVATIONS ARE BASED ON THE VERTICAL DATUM NGVD29 AND WERE DERIVED FROM PUBLISHED CENTRAL OREGON COORDINATE SYSTEM MONUMENTS  
LINEAR UNITS: INTERNATIONAL FEET  
HORIZONTAL DATUM: NAD(83-91)  
VERTICAL DATUM: NGVD29
2. NO UNDERGROUND UTILITY FIELD LOCATION REQUEST WAS MADE FOR THIS SURVEY. VERIFY LOCATIONS PRIOR TO CONSTRUCTION.
3. CONTOUR INTERVAL IS 1-FOOT.
4. EXISTING GROUND SURFACE MODEL CREATED 10-25-2018.
5. LANDFILL GAS PIPING, STRUCTURES AND CONTROL WIRING LOCATIONS ARE TAKEN FROM RECORD DESIGN DRAWINGS ONLY UNLESS OTHERWISE NOTED. THEY ARE NOT BASED FIELD TIE DATA OR AS-BUILT DRAWING LOCATIONS. VERIFY LOCATIONS PRIOR TO CONSTRUCTION.

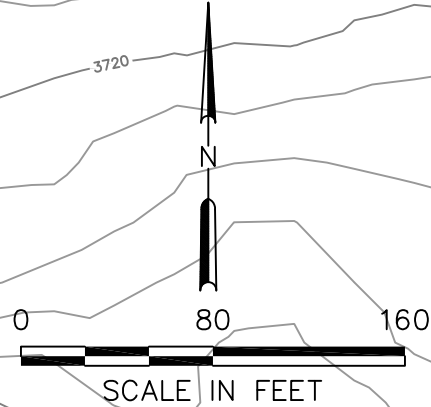
Point Table			
Point #	Northing	Easting	Elevation
610	367738.41	3307128.74	3697.72
611	367717.48	3307162.64	3697.52
612	367700.89	3307192.66	3697.35
613	367685.72	3307228.45	3697.74
614	367664.91	3307303.01	3698.52
615	367652.64	3307369.10	3699.19
616	367649.56	3307404.79	3700.25
617	367626.99	3307535.90	3702.62
618	367598.03	3307704.18	3703.47
619	367549.46	3307980.31	3702.00
620	367505.84	3308228.26	3700.85
621	367549.84	3308236.00	3702.79
622	367565.06	3308128.95	3703.18
623	367590.47	3308027.83	3704.10
624	367607.89	3307877.48	3704.45
625	367625.06	3307788.38	3705.00
626	367655.62	3307698.12	3706.06
627	367664.51	3307429.82	3701.65
628	367706.83	3307360.98	3701.63
629	367742.30	3307278.87	3701.36
630	367784.81	3307157.40	3700.33



A		10/22/19	GF	ISSUED FOR BIDDING	JOB No. 00180	DESIGNED: GF	PROJ. ENGINEER: GF	<p>G. Friesen Associates, Inc. 4088 Orchard Drive Lake Oswego, Oregon 97035 Tel: (503) 655-1233 Fax: (866) 533-5543</p>	<p><b>KNOTT LANDFILL CELL 8 CONSTRUCTION PROJECT</b></p> <p>DESCHUTES COUNTY, OREGON</p>	<p><b>SOUTH PERIMETER ROAD REHABILITATION</b></p> <p>EXISTING TOPOGRAPHY- CURRENT AS OF 10/25/18</p>	DRAWING NUMBER: R1	
No.		DATE	BY	REVISION	SCALE: AS SHOWN	DRAWN BY: GF	APPROVED BY: CC				CAD FILE NUMBER: R01	
					CHECKED BY: GF	DATE: 10/22/19	SHEET: 34 of 40				REV. A	



AC PAVEMENT TO BE REMOVED AND REPLACED BETWEEN POINT 610 AND 620 AFTER GRADING ALL AREAS TO DRAIN



**EXISTING FEATURES**

- ① UTILITY BOX, NO EQUIPMENT VISIBLE
- ② STORM CATCHBASIN NO. CB-1A GRATE ELEV.=3697.16 FT.  
18-IN. HPDE 3689.67 FT. (OUT NORTH)  
18-IN. HPDE 3689.84 FT. (IN WEST)
- ③ STORM MANHOLE NO. MH-1 RIM ELEV.=3699.93 FT.  
18-IN. HPDE 3690.35 FT. (OUT EAST)  
18-IN. HPDE 3690.44 FT. (IN WEST)
- ④ LANDFILL GAS CONDENSATE VAULT, SUMP NO. 1, LID ELEVATION=3700.86 FT.
- ⑤ LANDFILL GAS CONDENSATE SUMP CONTROL WIRING (SEE NOTE 5)
- ⑥ LANDFILL GAS CONDENSATE SUMP CONTROL PANEL FENCE MOUNTED
- ⑦ STORM MANHOLE NO. MH-2 RIM ELEV.=3701.97 FT.  
18-IN. HPDE 3691.18 FT. (OUT EAST)  
18-IN. HPDE 3691.47 FT. (IN WEST)
- ⑧ STORM MANHOLE MH-3 RIM ELEV.=3703.23 FT.  
18-IN. HPDE 3691.86 FT. (OUT EAST)  
18-IN. HPDE 3691.99 FT. (IN SOUTHWEST)
- ⑨ STORM MANHOLE MH-4 RIM ELEV.=3697.64 FT.  
18-IN. HPDE 3692.16 FT. (OUT NORTHEAST)  
18-IN. HPDE 3692.41 FT. (IN WEST)
- ⑩ STORM MANHOLE MH-5 RIM ELEV.=3696.74 FT.  
18-IN. HPDE 3692.86 FT. (OUT EAST)  
18-IN. HPDE 3692.85 FT. (IN WEST)
- ⑪ STORM MANHOLE MH-6 RIM ELEV.=3695.42 FT.  
18-IN. HPDE 3693.03 FT. (OUT EAST)  
18-IN. HPDE 3693.12 FT. (IN WEST)
- ⑫ LANDFILL GAS VALVE VAULT LID ELEVATION=3697.56 FT.
- ⑬ LANDFILL GAS CONDENSATE VAULT, SUMP NO. 2, LID ELEVATION=3697.59 FT.
- ⑭ STORM CATCHBASIN NO. CB-2 GRATE ELEV.=3697.31 FT.  
18-IN. HPDE 3694.09 FT. (OUT SOUTHEAST)
- ⑮ LANDFILL GAS VALVE IN PLASTIC UTILITY BOX
- ⑯ LANDFILL GAS VALVE VAULT LID ELEVATION=3698.29 FT.

**LEGEND**

- LANDFILL GAS CONDENSATE SUMP
- LANDFILL GAS SUMP CONTROL PANEL
- STORM MANHOLE
- UTILITY BOX, TYPE UNKNOWN
- EXISTING CHAINLINK FENCE, HT.=6.0 FT.
- EXISTING TEMPORARY TRASH FENCE
- EXISTING LANDFILL GAS LINE (SEE NOTE 5)
- EXISTING STORM LINE (18-IN. HPDE)

**LEGEND**

- EXISTING CHAINLINK FENCE, HT.=6.0 FT.
- EXISTING TEMPORARY TRASH FENCE
- EXISTING LANDFILL GAS LINE (SEE NOTE 5)
- EXISTING STORM LINE (18-IN. HPDE)

**NOTES**

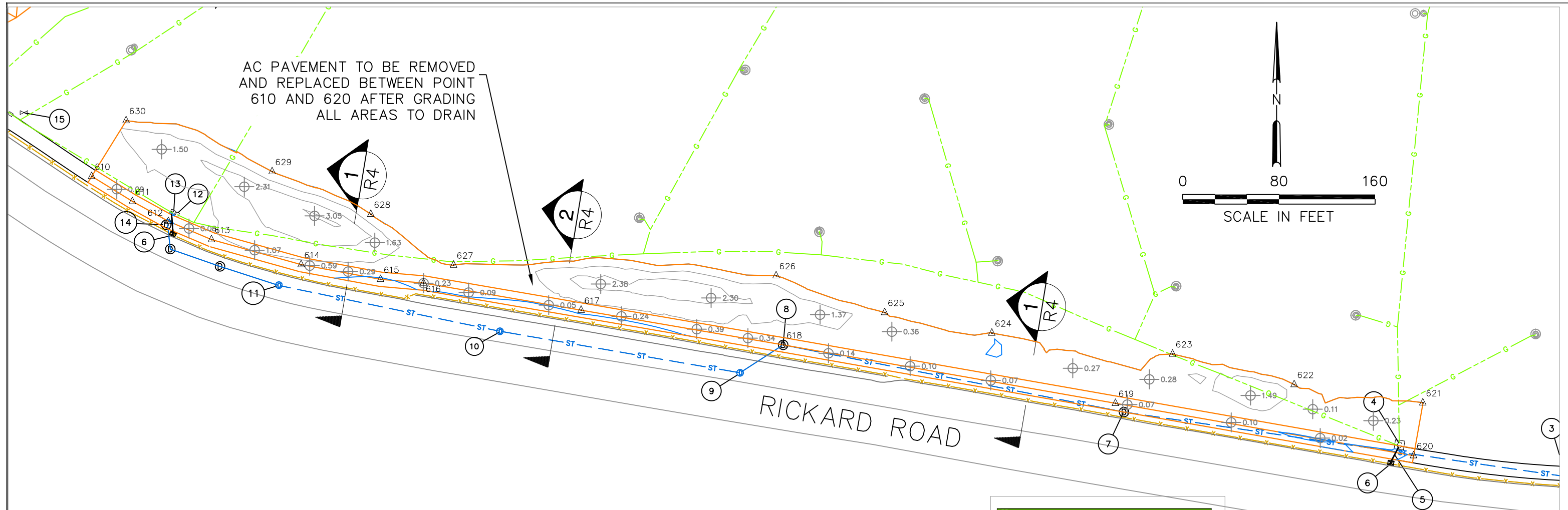
1. THE COORDINATES SHOWN ARE BASED ON THE CENTRAL OREGON COORDINATE SYSTEM. ELEVATIONS ARE BASED ON THE VERTICAL DATUM NGVD29 AND WERE DERIVED FROM PUBLISHED CENTRAL OREGON COORDINATE SYSTEM MONUMENTS  
LINEAR UNITS: INTERNATIONAL FEET  
HORIZONTAL DATUM: NAD(83-91)  
VERTICAL DATUM: NGVD29
2. NO UNDERGROUND UTILITY FIELD LOCATION REQUEST WAS MADE FOR THIS SURVEY. VERIFY LOCATIONS PRIOR TO CONSTRUCTION.
3. CONTOUR INTERVAL IS 1-FOOT.
4. EXISTING GROUND SURFACE MODEL CREATED 10-25-2018.
5. LANDFILL GAS PIPING, STRUCTURES AND CONTROL WIRING LOCATIONS ARE TAKEN FROM RECORD DESIGN DRAWINGS ONLY UNLESS OTHERWISE NOTED. THEY ARE NOT BASED FIELD TIE DATA OR AS-BUILT DRAWING LOCATIONS. VERIFY LOCATIONS PRIOR TO CONSTRUCTION.

**Point Table**

Point #	Northing	Easting	Elevation
610	367738.41	3307128.74	3697.72
611	367717.48	3307162.64	3697.52
612	367700.89	3307192.66	3697.35
613	367685.72	3307228.45	3697.74
614	367664.91	3307303.01	3698.52
615	367652.64	3307369.10	3699.19
616	367649.56	3307404.79	3700.25
617	367626.99	3307535.90	3702.62
618	367598.03	3307704.18	3703.47
619	367549.46	3307980.31	3702.00
620	367505.84	3308228.26	3700.85
621	367549.84	3308236.00	3702.79
622	367565.06	3308128.95	3703.18
623	367590.47	3308027.83	3704.10
624	367607.89	3307877.48	3704.45
625	367625.06	3307788.38	3705.00
626	367655.62	3307698.12	3706.06
627	367664.51	3307429.82	3701.65
628	367706.83	3307360.98	3701.63
629	367742.30	3307278.87	3701.36
630	367784.81	3307157.40	3700.33



A	10/22/19	GF	ISSUED FOR BIDDING	JOB No. 00180	DESIGNED: GF	PROJ. ENGINEER: GF	G. Friesen Associates, Inc. 4088 Orchard Drive Lake Oswego, Oregon 97035 Tel: (503) 635-1233 Fax: (866) 533-5543	<b>KNOTT LANDFILL CELL 8 CONSTRUCTION PROJECT</b> DESCHUTES COUNTY, OREGON	<b>SOUTH PERIMETER ROAD REHABILITATION FINAL GRADING PLAN</b>	DRAWING NUMBER: R2	
	No.	DATE	BY	REVISION	SCALE: AS SHOWN	DRAWN BY: GF				APPROVED BY: CC	CAD FILE NUMBER: R02
				CHECKED BY: GF	DATE: 10/22/19					SHEET: 35 of 40	REV. A



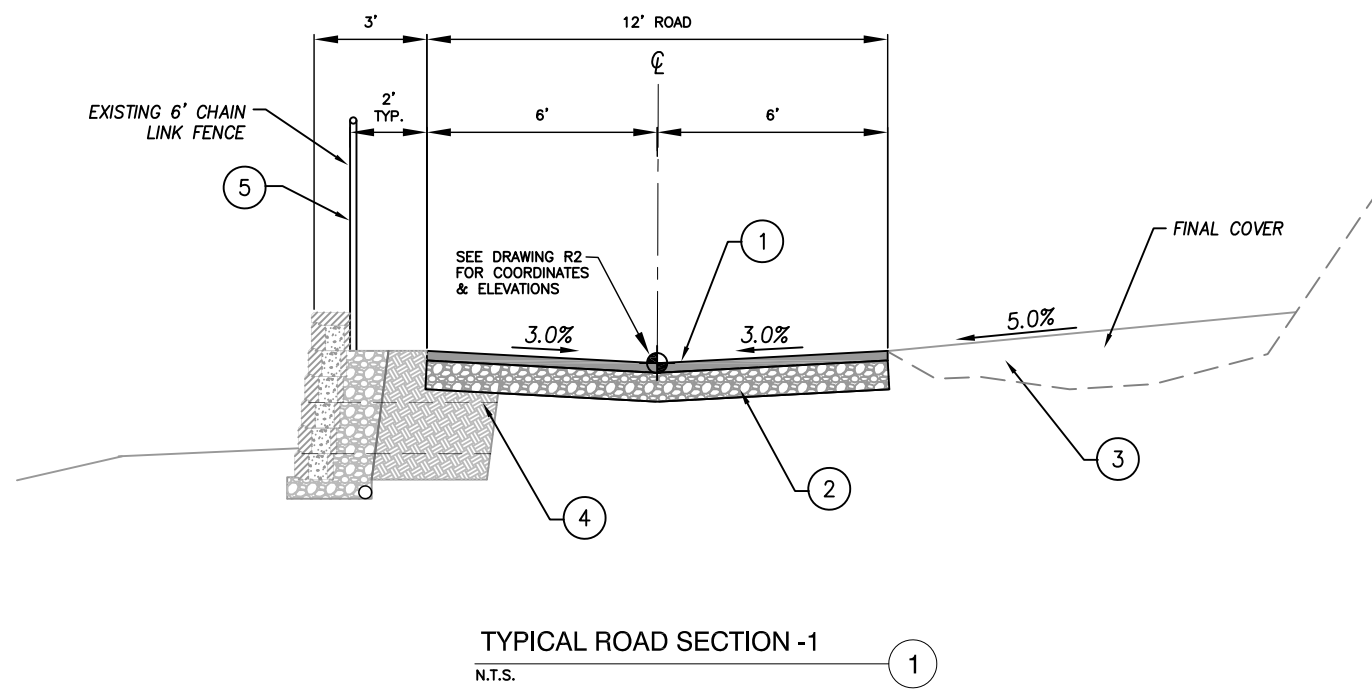
**NOTES:**

- CUT AND FILL DEPTHS SHOWN ARE TO THE LINES AND GRADES SHOWN ON DRAWING R2.
- CUT AND FILL DEPTHS SHOWN WERE CURRENT AS OF OCTOBER 25, 2018. SETTLEMENT HAS OCCURRED AFTER THIS DATE. A TOPOGRAPHIC SURVEY WILL BE PERFORMED JUST PRIOR TO THE START OF CONSTRUCTION.
- EXISTING ASPHALT CONCRETE PAVEMENT TO BE REMOVED BETWEEN POINT 610 AND 620 AND SHALL BE PAID FOR AS EXCAVATION. THE QUANTITY OF EXCAVATION THAT WILL BE REQUIRED IS APPROXIMATELY 150 CY.
- AREA A FINAL COVER IS APPROXIMATELY 1,700 CY.
- 3/4-INCH MINUS CRUSHED BASE COURSE VOLUME IS APPROXIMATELY 250 CY.
- LOW PERMEABILITY HOT MIXED ASPHALT CONCRETE PAVEMENT VOLUME IS APPROXIMATELY 150 CY.
- ACTUAL QUANTITIES COULD BE PLUS OR MINUS 20 PERCENT OF THOSE LISTED ABOVE AND WILL BE COMPUTED BASED ON FIELD SURVEYS PERFORMED IN ACCORDANCE WITH SECTION 01050 OF THE SPECIAL PROVISIONS.

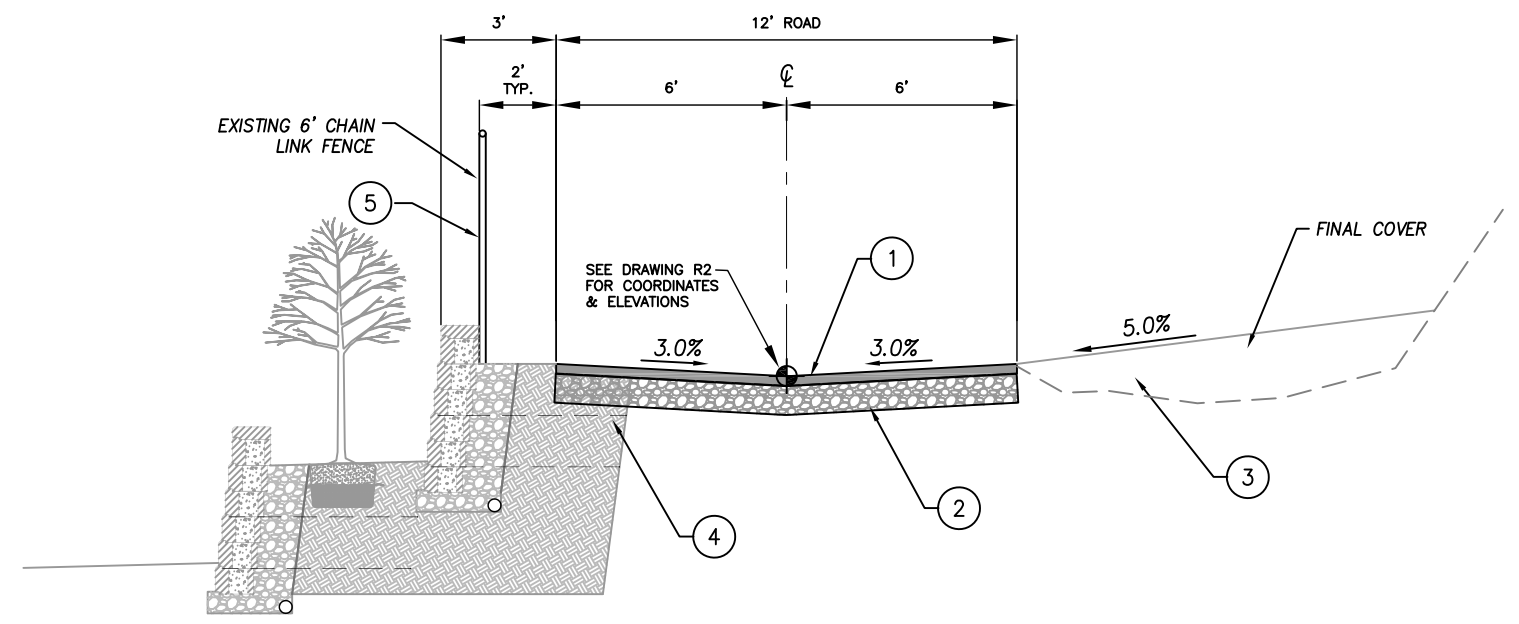
Point Table			
Point #	Northing	Easting	Elevation
610	367738.41	3307128.74	3697.72
611	367717.48	3307162.64	3697.52
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613	367685.72	3307228.45	3697.74
614	367664.91	3307303.01	3698.52
615	367652.64	3307369.10	3699.19
616	367649.56	3307404.79	3700.25
617	367626.99	3307535.90	3702.62
618	367598.03	3307704.18	3703.47
619	367549.46	3307980.31	3702.00
620	367505.84	3308228.26	3700.85
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626	367655.62	3307698.12	3706.06
627	367664.51	3307429.82	3701.65
628	367706.83	3307360.98	3701.63
629	367742.30	3307278.87	3701.36
630	367784.81	3307157.40	3700.33



JOB No. 00180		DESIGNED: GF	PROJ. ENGINEER: GF	<p>G. Friesen Associates, Inc. 4088 Orchard Drive Lake Oswego, Oregon 97035 Tel: (503) 635-1233 Fax: (866) 533-5543</p>	<p><b>KNOTT LANDFILL CELL 8 CONSTRUCTION PROJECT</b></p> <p>DESCHUTES COUNTY, OREGON</p>	<p><b>SOUTH PERIMETER ROAD REHABILITATION CUT AND FILL DEPTHS</b></p>	DRAWING NUMBER: <b>R3</b>
SCALE: AS SHOWN		DRAWN BY: GF	APPROVED BY: CC				CAD FILE NUMBER: <b>R03</b>
A 10/22/19 GF ISSUED FOR BIDDING		CHECKED BY: GF	DATE: 10/22/19				SHEET: 36 of 40
No.	DATE	BY	REVISION				



TYPICAL ROAD SECTION -1  
N.T.S. 1



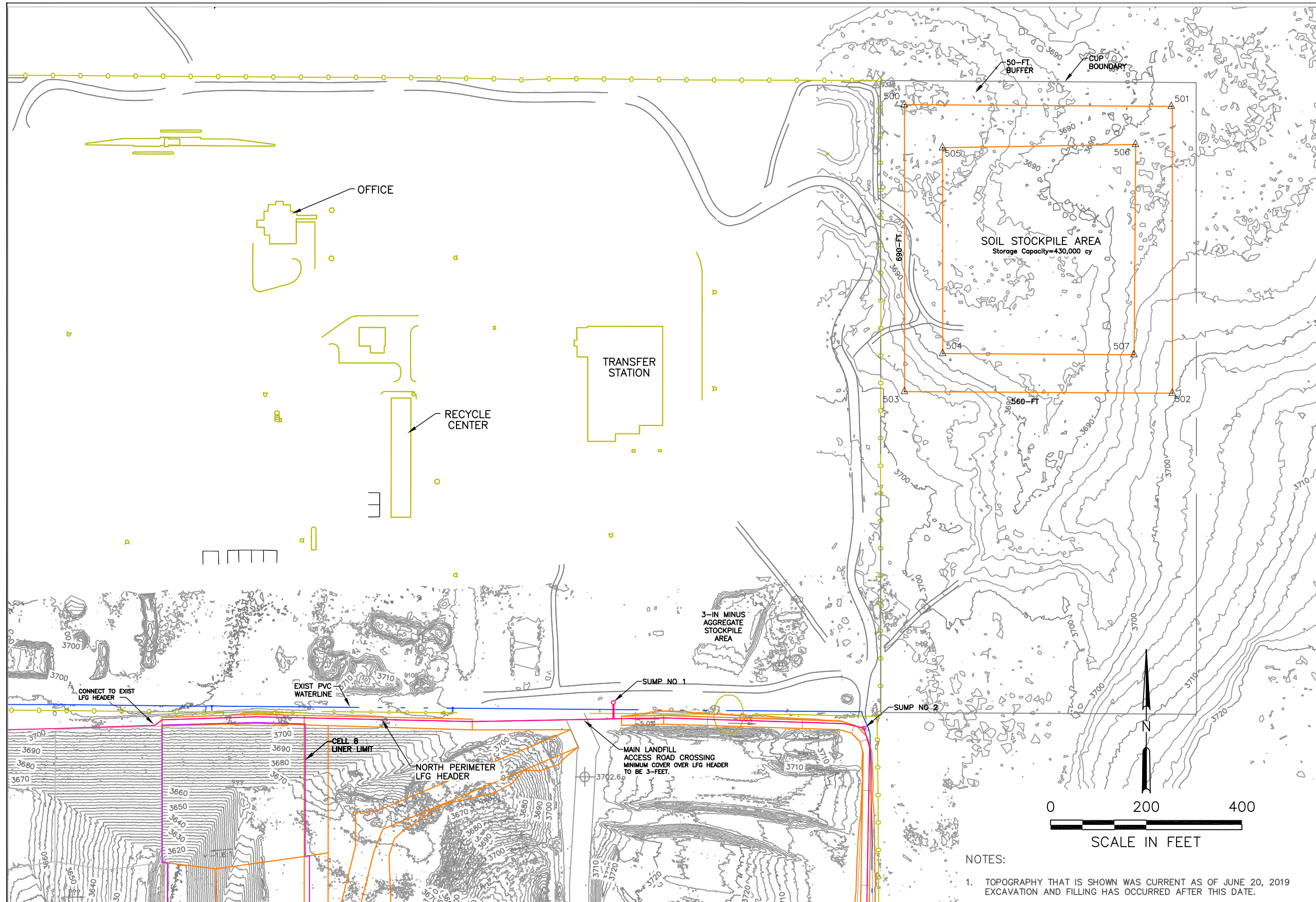
TYPICAL ROAD SECTION -2  
N.T.S. 2

CONSTRUCTION NOTES:

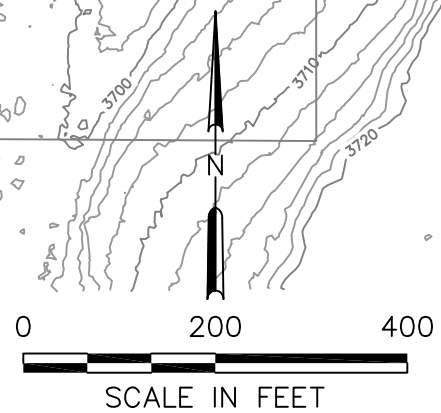
- 1 EXISTING 3.5-INCH LOW PERMEABILITY HOT MIXED ASPHALT CONCRETE PAVEMENT TO BE EXCAVATED AND PAID FOR IN ACCORDANCE WITH SECTION 02200 OF THE SPECIAL PROVISIONS. NEW 3.5-INCH LOW PERMEABILITY HOT MIXED ASPHALT CONCRETE PAVEMENT TO BE IN ACCORDANCE WITH SECTION 02306 OF THE SPECIAL PROVISIONS.
- 2 3/4-INCH MINUS CRUSHED BASE COURSE TO HAVE A MINIMUM THICKNESS OF 8-INCHES AND BE FURNISHED, INSTALLED, COMPACTED AND GRADED TO ENABLE ALL AREAS TO DRAIN TOWARD THE EXISTING CATCH BASINS.
- 3 FINAL COVER MATERIAL TO BE IN ACCORDANCE WITH SECTION 02310 OF THE SPECIAL PROVISIONS AND SHALL BE INSTALLED AND GRADED TO ENABLE ALL AREAS TO DRAIN TOWARD THE PERIMETER ROAD AT A MINIMUM SLOPE OF 5.0 PERCENT.
- 4 EXISTING MSE WALL & GEOSYNTHETIC REINFORCEMENT. CONTRACTOR SHALL REPAIR ANY MSE WALL OR GEOSYNTHETIC REINFORCEMENT THAT IS DAMAGED BY CONSTRUCTION ACTIVITIES.
- 5 EXISTING CHAIN LINK FENCE. CONTRACTOR SHALL REPAIR ANY CHAIN LINK FENCE THAT IS DAMAGED BY CONSTRUCTION ACTIVITIES.



				JOB No. 00180	DESIGNED: GF	PROJ. ENGINEER: GF			DRAWING NUMBER: R4		
				SCALE: N.T.S.	DRAWN BY: GF	APPROVED BY: CC			CAD FILE NUMBER: R04		
					CHECKED BY: GF	DATE: 10/22/19			SHEET: 37 of 40		
									REV. A		
A	10/22/19	GF	ISSUED FOR BIDDING					KNOTT LANDFILL CELL 8 CONSTRUCTION PROJECT DESCHUTES COUNTY, OREGON		SOUTH PERIMETER ROAD REHABILITATION ROAD AND WALL SECTIONS	
No.	DATE	BY	REVISION					G. Friesen Associates, Inc. 4088 Orchard Drive Lake Oswego, Oregon 97035 Tel: (503) 635-1233 Fax: (866) 533-5543			



Point Table			
Point #	Northing	Easting	Elevation
500	371372.67	3309134.23	3683.00
501	371369.07	3309692.41	3689.99
502	370769.07	3309694.55	3699.00
503	370772.65	3309134.56	3697.00
504	370852.14	3309214.52	3736.22
505	371282.63	3309214.03	3728.44
506	371289.35	3309617.73	3730.10
507	370849.58	3309614.50	3738.25



NOTES:  
 1. TOPOGRAPHY THAT IS SHOWN WAS CURRENT AS OF JUNE 20, 2019 EXCAVATION AND FILLING HAS OCCURRED AFTER THIS DATE.



No.	DATE	BY	REVISION
A	10/22/19	GF	ISSUED FOR BIDDING

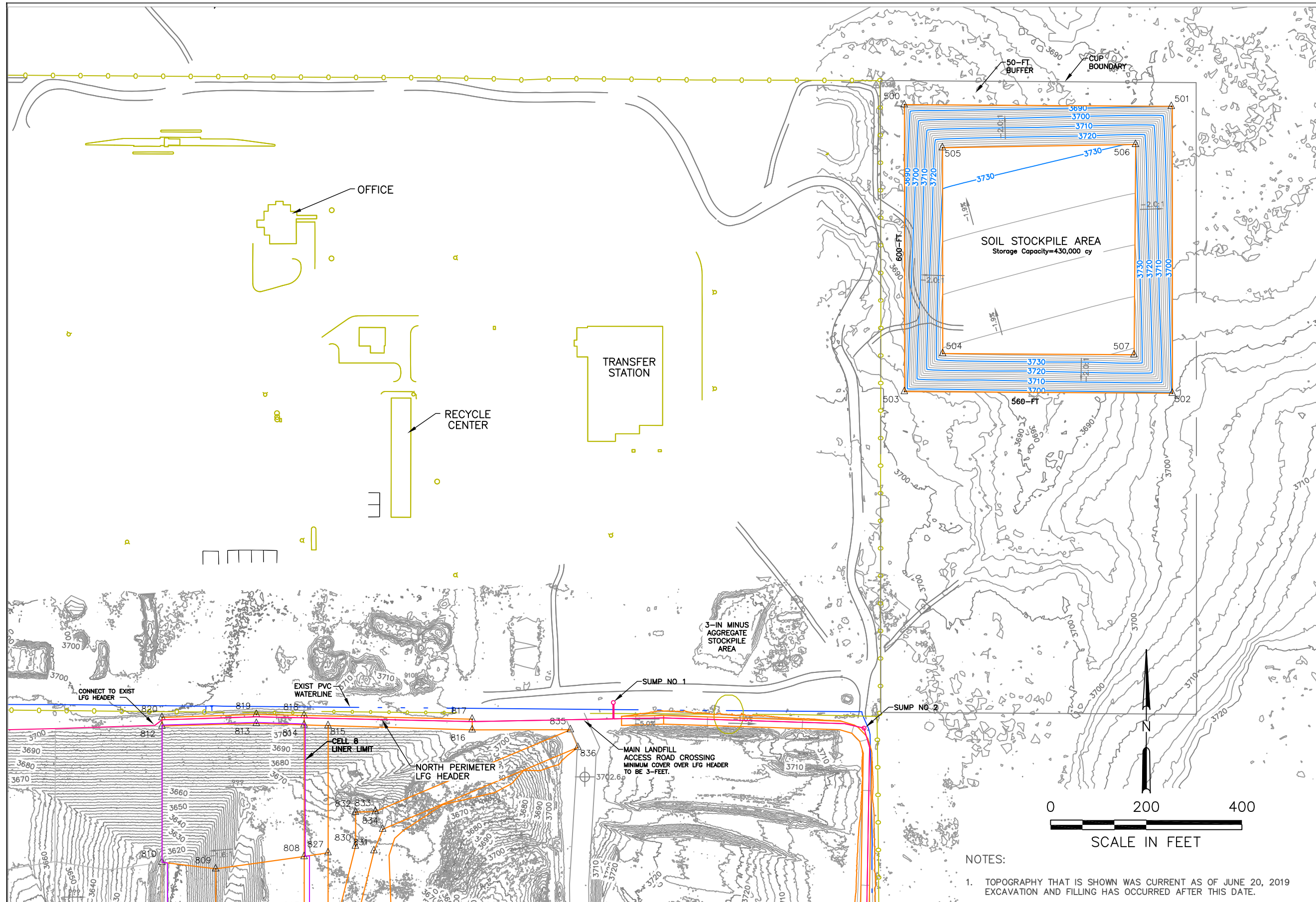
JOB No.	DESIGNED:	PROJ. ENGINEER:
00180	GF	GF
SCALE:	DRAWN BY:	APPROVED BY:
AS SHOWN	GF	CC
	CHECKED BY:	DATE:
	GF	10/22/19

G. Friesen Associates, Inc.  
 4088 Orchard Drive  
 Lake Oswego, Oregon 97035  
 Tel: (503) 635-1233  
 Fax: (866) 533-5543

**KNOTT LANDFILL**  
**CELL 8 CONSTRUCTION**  
**PROJECT**  
 DESCHUTES COUNTY, OREGON

**CELL 8 - SOIL STOCKPILE AREA**  
**EXISTING SITE PLAN**

DRAWING NUMBER:	S1
CAD FILE NUMBER:	S01
SHEET:	38 of 40
REV.	A



Point Table			
Point #	Northing	Easting	Elevation
500	371372.67	3309134.23	3683.00
501	371369.07	3309692.41	3689.99
502	370769.07	3309694.55	3699.00
503	370772.65	3309134.56	3697.00
504	370852.14	3309214.52	3736.22
505	371282.63	3309214.03	3728.44
506	371289.35	3309617.73	3730.10
507	370849.58	3309614.50	3738.25

NOTES:  
 1. TOPOGRAPHY THAT IS SHOWN WAS CURRENT AS OF JUNE 20, 2019 EXCAVATION AND FILLING HAS OCCURRED AFTER THIS DATE.



No.	DATE	BY	REVISION
A	10/22/19	GF	ISSUED FOR BIDDING

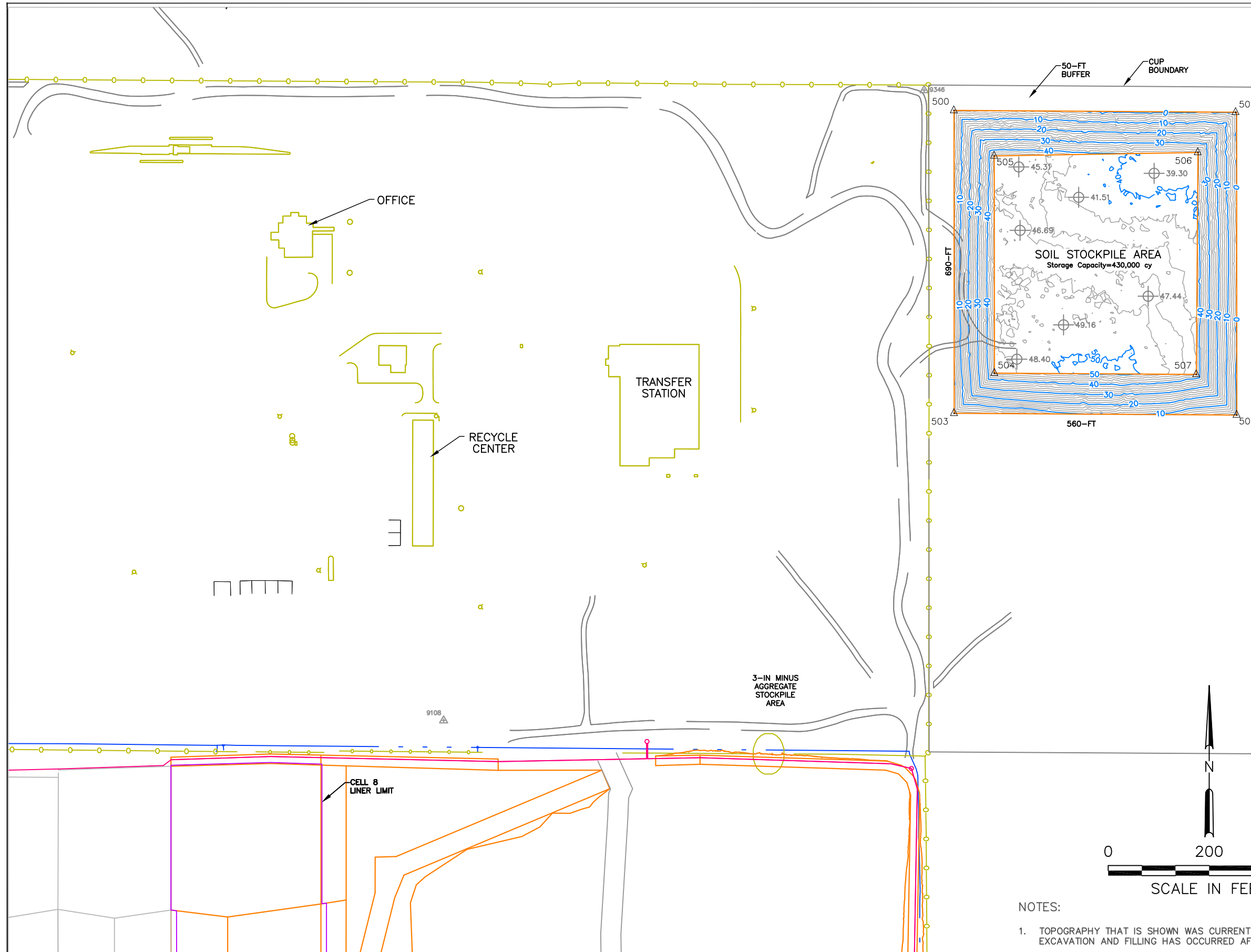
JOB No. 00180	DESIGNED: GF	PROJ. ENGINEER: GF
SCALE: AS SHOWN	DRAWN BY: GF	APPROVED BY: CC
	CHECKED BY: GF	DATE: 10/22/19

G. Friesen Associates, Inc.  
 4088 Orchard Drive  
 Lake Oswego, Oregon 97035  
 Tel: (503) 635-1233  
 Fax: (866) 533-5543

**KNOTT LANDFILL**  
**CELL 8 CONSTRUCTION**  
**PROJECT**  
 DESCHUTES COUNTY, OREGON

**CELL 8 - SOIL STOCKPILE AREA**  
**FINAL GRADING PLAN**

DRAWING NUMBER: S2	
CAD FILE NUMBER: S02	
SHEET: 39 of 40	REV. A




Point Table			
Point #	Northing	Easting	Elevation
500	371372.67	3309134.23	3683.00
501	371369.07	3309692.41	3689.99
502	370769.07	3309694.55	3699.00
503	370772.65	3309134.56	3697.00
504	370852.14	3309214.52	3736.22
505	371282.63	3309214.03	3728.44
506	371289.35	3309617.73	3730.10
507	370849.58	3309614.50	3738.25

NOTES:  
 1. TOPOGRAPHY THAT IS SHOWN WAS CURRENT AS OF JUNE 20, 2019  
 EXCAVATION AND FILLING HAS OCCURRED AFTER THIS DATE.



			JOB No. 00180	DESIGNED: GF	PROJ. ENGINEER: GF
			SCALE: AS SHOWN	DRAWN BY: GF	APPROVED BY: CC
				CHECKED BY: GF	DATE: 10/22/19
A	10/22/19	GF	ISSUED FOR BIDDING		
No.	DATE	BY	REVISION		

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**KNOTT LANDFILL  
 CELL 8 CONSTRUCTION  
 PROJECT  
 DESCHUTES COUNTY, OREGON**

**CELL 8 - SOIL STOCKPILE AREA  
 SOIL FILL DEPTHS**

DRAWING NUMBER: <b>S3</b>	
CAD FILE NUMBER: <b>S03</b>	
SHEET: 40 of 40	REV. <b>A</b>