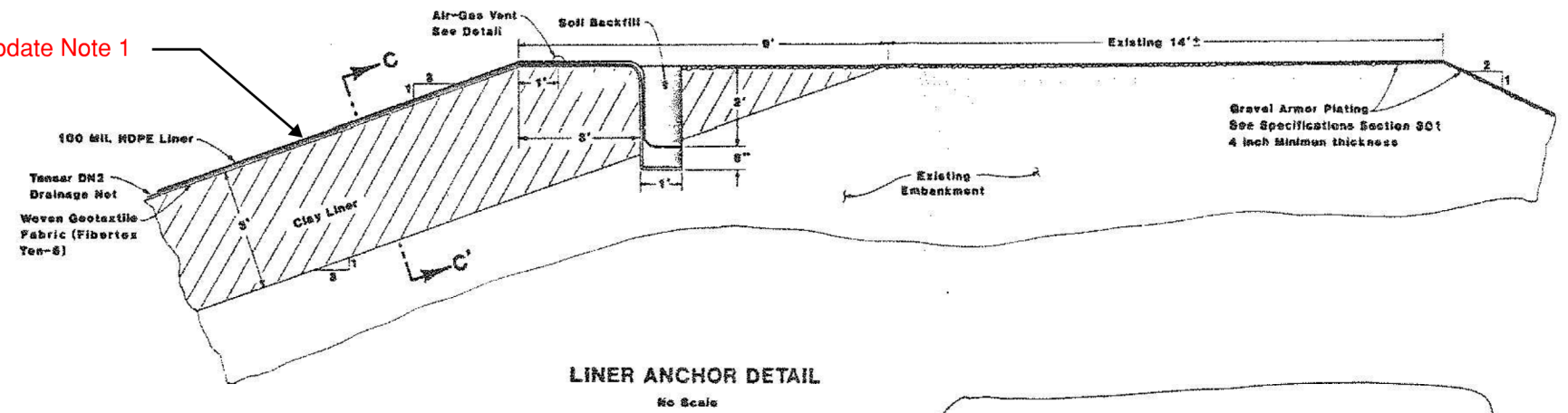


Attachment V-1 Surface
Impoundment
Drawings

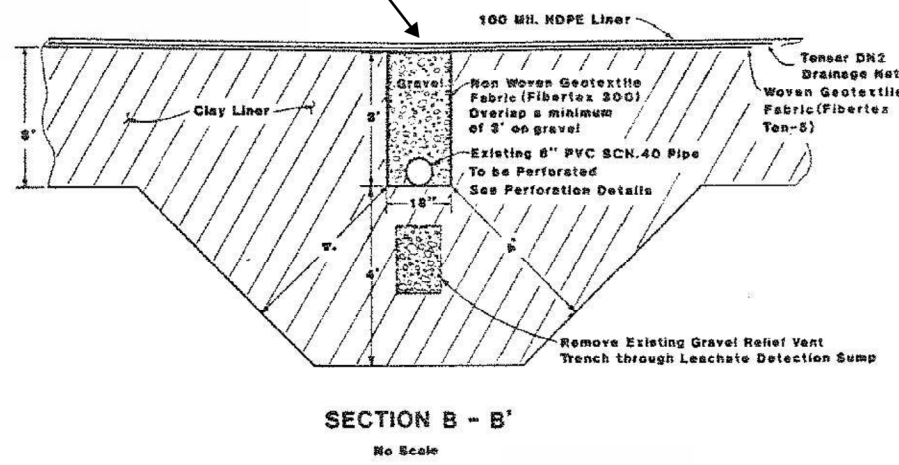
Surface Impoundment A Drawings

2023 UPDATED DRAWING

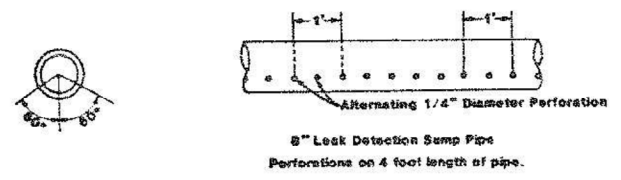
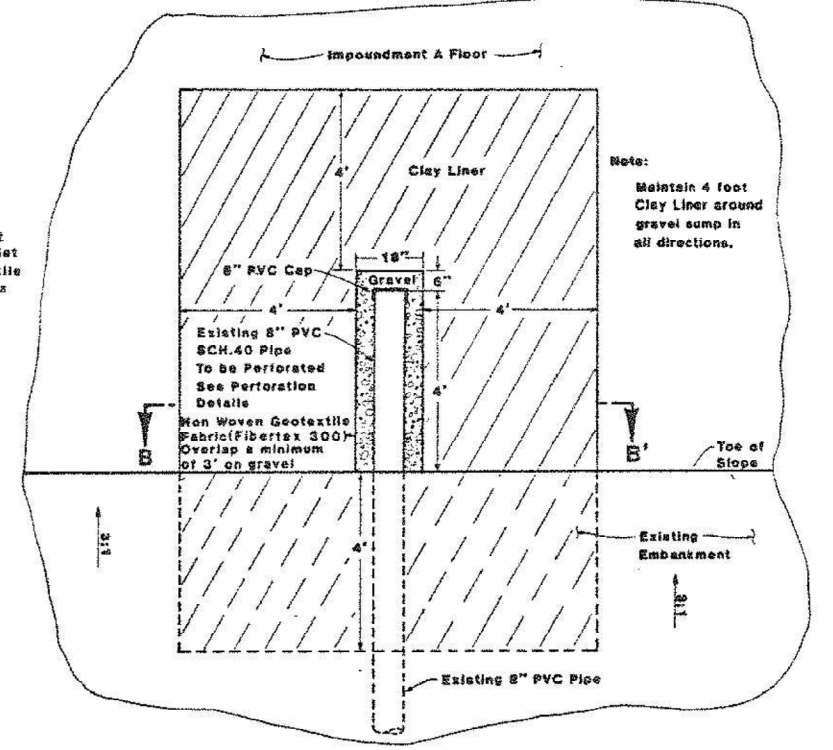
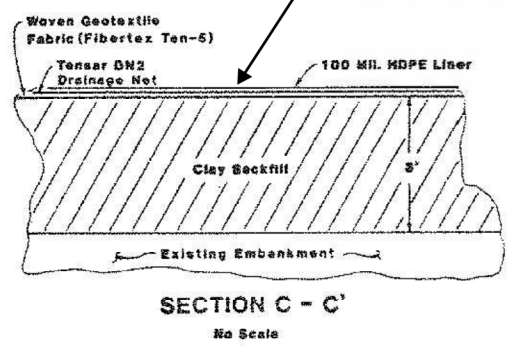
See 2023 Update Note 1



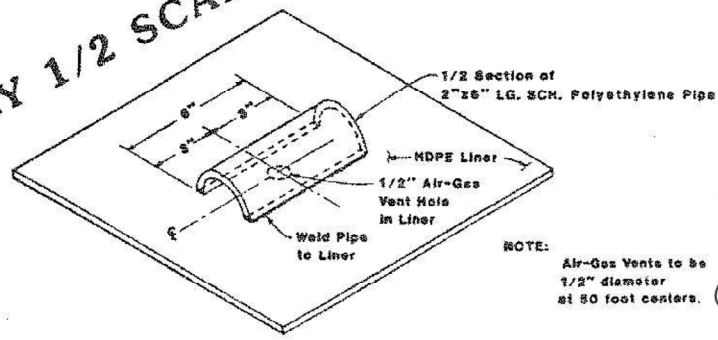
See 2023 Update Note 1



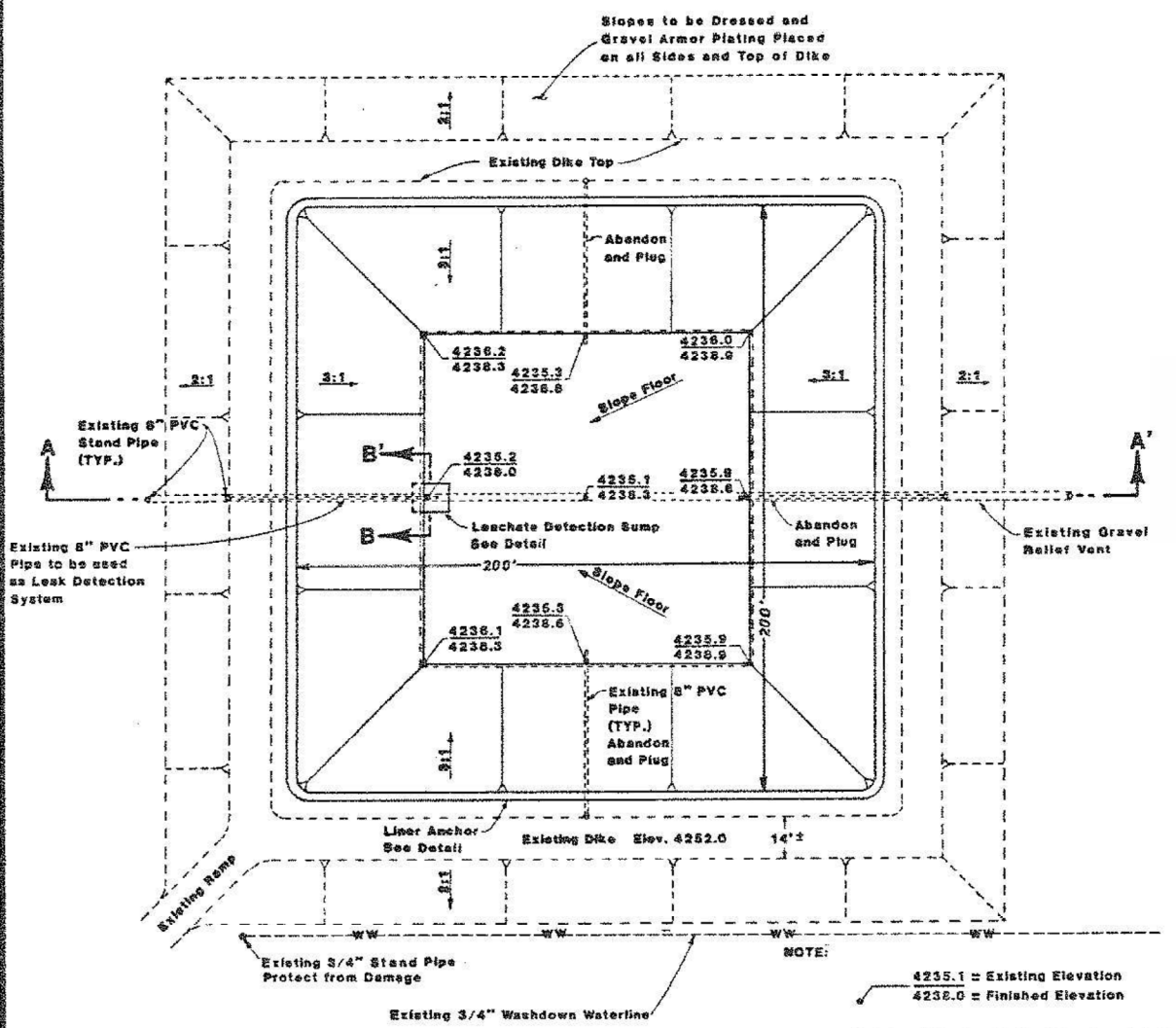
See 2023 Update Note 1



APPROXIMATELY 1/2 SCALE

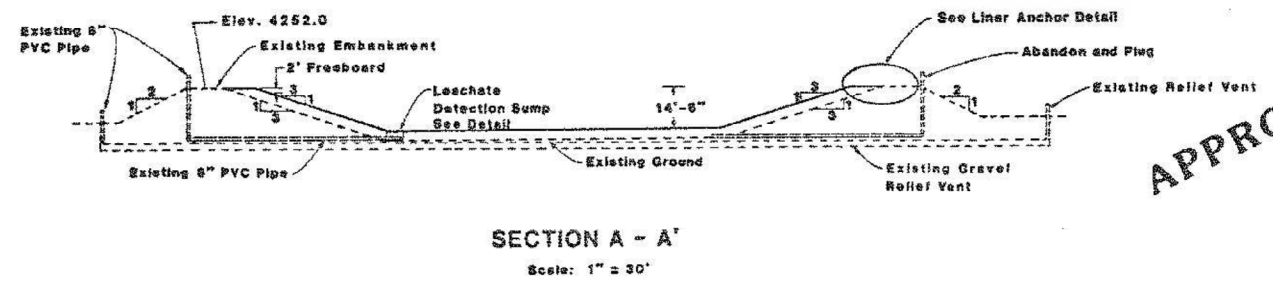


NOTE: Air-Gas Vents to be 1/2" diameter at 50 foot centers.



NOTE:
4235.1 = Existing Elevation
4236.0 = Finished Elevation
Existing PVC pipes to be Abandoned and Plugged in the following manner:
Pipe shall be excavated and removed to a point three (3) feet behind or below grade and capped with PVC cap. Excavation shall then be backfilled in accordance with section 209 with clay.

2023 Update Note 1: November 2023 repairs were made to the existing 100-mil HDPE smooth geomembrane and an additional 60-mil HDPE textured geomembrane was installed directly above the 100-mil geomembrane. A 2-foot wide by 2-foot deep anchor trench was excavated adjacent to the existing anchor trench and backfilled with native material.



LAUGHN HANSEN ASSOCIATES, INC. SALT LAKE CITY, UTAH			
TITLE USPCI GRASSY MOUNTAIN FACILITY SURFACE IMPOUNDMENT A			
REVISIONS BY DATE	ENGINEERING BY MPW	9/25/84	APPROVED BY DATE
	REVIEWED BY MEA	9/25/84	
	DRAWN BY DB	9/25/84	
SCALE As Shown		Sheet 3 of 3	

Surface Impoundment B Drawings



GRASSY MOUNTAIN FACILITY

SURFACE IMPOUNDMENT B

DRAFT PERMIT DRAWINGS

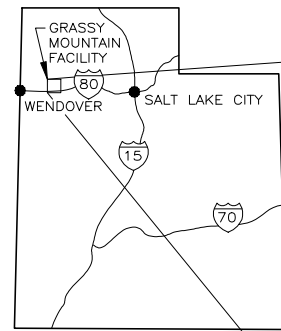
FACILITY LOCATION

KNOLLS, UTAH
Phone: (435) 884-8900

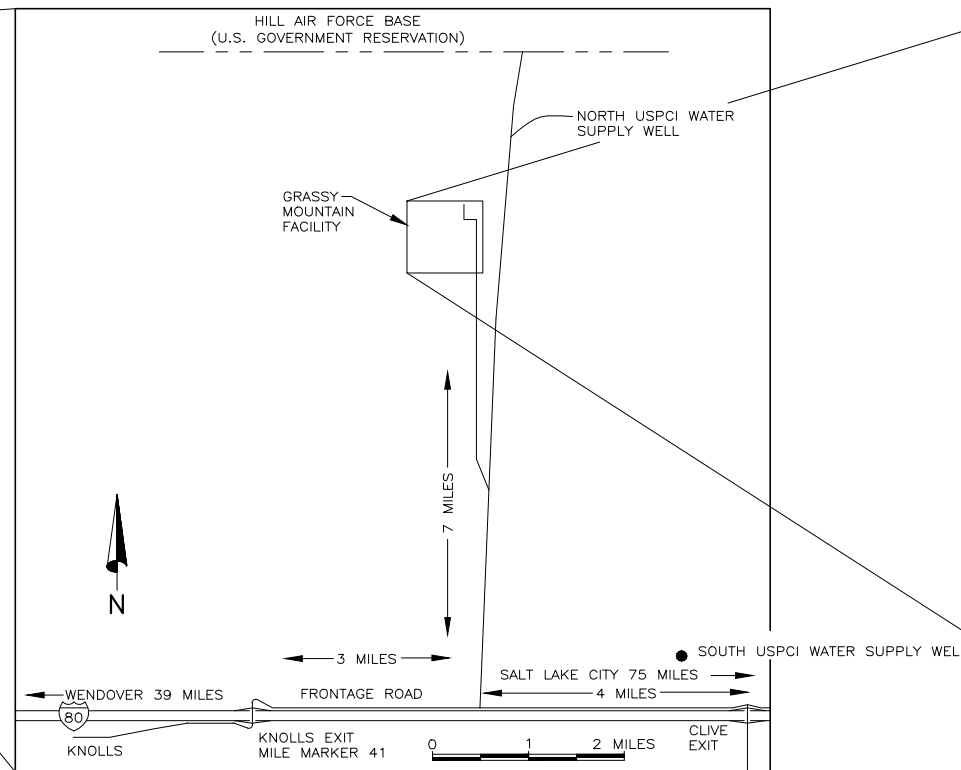
JULY 2022

REGIONAL HEADQUARTERS

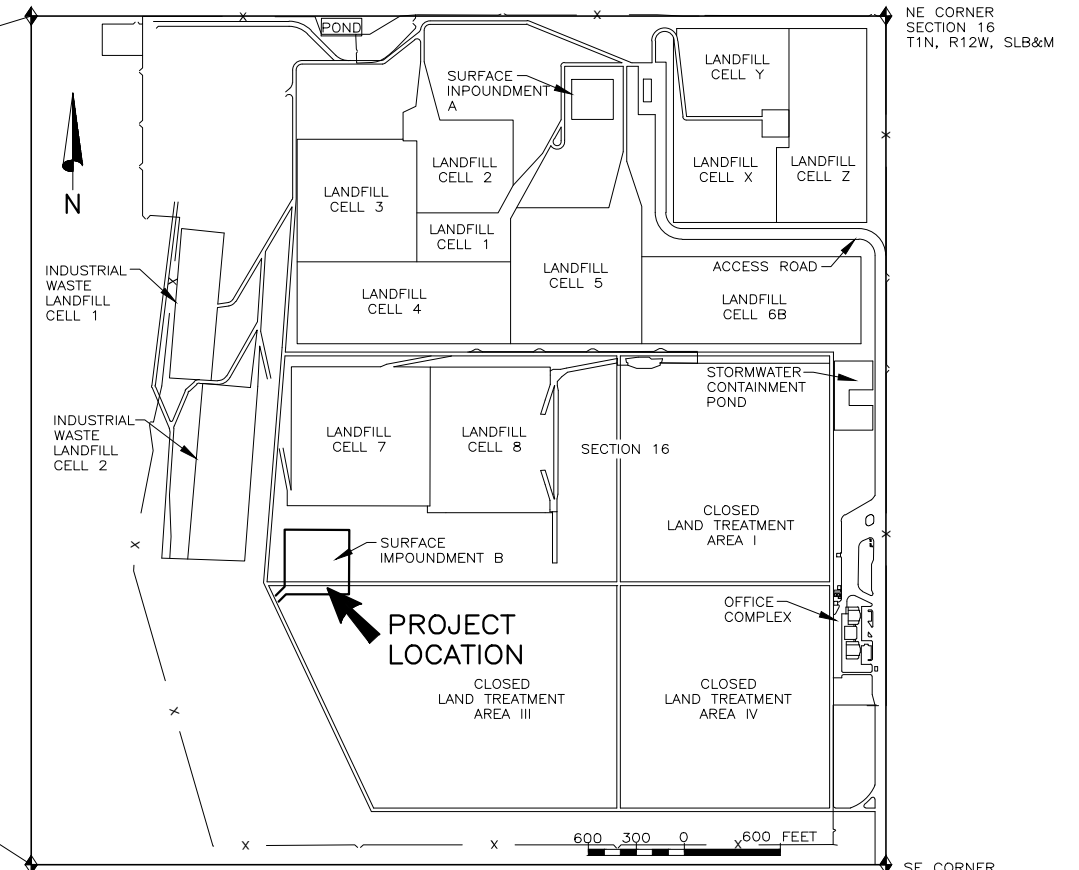
42 LONGWATER DRIVE
NORWELL, MA 02061
Phone: (781) 792-5000



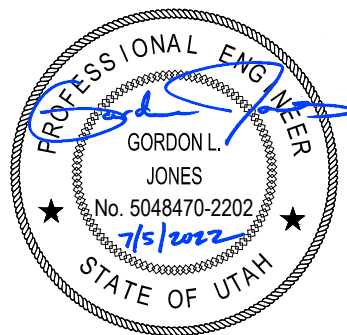
STATE OF UTAH



VICINITY MAP



PROJECT LOCATION



FILE NAME: PROJECTS\064 - CLEAN_HARBORS\85.301 - 2022 CLOSURE PLAN UPDATE\CAD\G-1 SI-B COVER.DWG
FILE DATE: 7.5.2022 14:05:02 (CAH)



CONSULTANTS
ENGINEERS
Salt Lake City
Utah

FILE NAME: PROJECTS\064 - CLEAN HARBORS\84.100 - SURFACE IMPOUNDMENT B DESIGN\CAD\DESIGN DRAWINGS\G-2 SI-B INDEX_SHEET.DWG
FILE DATE: 11.10.2017 08:02:08 (CAH)

GENERAL NOTES

- COORDINATES AND ELEVATIONS PROVIDED ARE BASED ON SITE SPECIFIC COORDINATE SYSTEM AND DATUM CONTROL.
- ALL ELEVATIONS PROVIDED ARE BASED ON ORIGINAL EMBANKMENT DESIGN AND CONSTRUCTION ELEVATIONS.

LINING SYSTEM SUBGRADES & SOIL FILL

- ALL SURFACES PROVIDING SUBGRADES FOR LINING SYSTEMS SHALL BE PROOF ROLLED FOR SOFT AND/OR YIELDING SURFACES. SOFT AND/OR YIELDING SURFACES SHALL BE COMPACTED TO PROVIDE A FIRM SUBGRADE FOR LINING SYSTEMS.
- ALL CLAY LINER MATERIALS SHALL BE COMPACTED TO 95% OF ASTM D-698 AT A MOISTURE CONTENT TYPICALLY BETWEEN MINUS 2% AND PLUS 4% OF OPTIMUM. ALL CLAY LINER SHALL MEET THE REQUIRED PERMEABILITY OF 1 X 10⁻⁷ CM/SEC.
- THE SUB-GRADE FOR THE GEOSYNTHETIC MATERIALS SHALL BE FREE OF PROTRUDING ROCKS AND DEBRIS THAT MAY POTENTIALLY CAUSE DAMAGE TO THE GEOSYNTHETIC MATERIALS. THE SUBGRADE SHALL ALSO BE ROLLED WITH A SMOOTH DRUM ROLLER TO LEAVE THE SURFACE SMOOTH.
- ALL FILL MATERIALS REQUIRING COMPACTION SHALL BE COMPACTED TO 95% OF ASTM D-698.
- PIPE BACKFILL AND ANCHOR TRENCH BACKFILL SHALL BE COMPACTED TO 90% OF ASTM D-698.

GENERAL GEOSYNTHETICS

- MANUFACTURER'S CERTIFICATIONS SHALL BE PROVIDED FOR ALL RAW AND MANUFACTURED MATERIALS. CERTIFICATIONS SHALL BE IN ACCORDANCE WITH THE MANUFACTURER'S MATERIAL SPECIFICATIONS AND PROJECT CQA PLAN CRITERIA AND SHALL INCLUDE ALL TEST DATA FOR MATERIALS DELIVERED AND AT A MINIMUM, THE TEST FREQUENCIES DESIGNATED IN THE MANUFACTURER'S QUALITY ASSURANCE MANUALS AND SPECIFICATIONS AND THE PROJECT CQA PLAN.
- ALL GEOSYNTHETIC MATERIALS SHALL BE LOADED, TRANSPORTED, OFF-LOADED, STORED, AND HANDLED IN ACCORDANCE WITH MANUFACTURER RECOMMENDATIONS.
- AT A MINIMUM, ALL GEOSYNTHETIC MATERIALS SHALL BE INSTALLED IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS AND INSTALLATION GUIDES AND IN ACCORDANCE WITH THE PROJECT SPECIFICATIONS AND CQA PLAN.

GEOMEMBRANE LINER

- NO GEOMEMBRANE MATERIALS SHALL BE DEPLOYED IN SUB-FREEZING TEMPERATURES UNLESS APPROVED BY OWNER WITH AN APPROVED COLD WEATHER DEPLOYMENT PLAN.
- NO SEAMING SHALL BE ALLOWED IN SUB-FREEZING TEMPERATURES WITHOUT OWNER APPROVAL OF AN APPROPRIATE COLD WEATHER SEAMING PLAN AND ONLY AFTER PROPER DEMONSTRATION OF PRE-QUALIFIED TEST SEAMS.
- FIELD TESTING AND QUALITY CONTROL SHALL FOLLOW, AT A MINIMUM, THE REQUIREMENTS PROVIDED IN THE MOST RECENT VERSION MANUFACTURERS INSTALLATION PROCEDURES, AND/OR THE PROJECT SPECIFICATIONS AND CQA PLAN, WHICHEVER IS MOST STRINGENT.

LEAK DETECTION SYSTEM

- GEONET SHALL HAVE A TRANSMISSIVITY OF 3X10⁻³ M²/SEC.
- GEOMEMBRANE MATERIALS SHALL BE CLEANED OF DIRT AND DEBRIS PRIOR TO DEPLOYMENT OF GEONET.
- THE GEONET SHALL BE FASTENED OR SECURED BY MANUFACTURED APPROVED METHOD.
- OVERLAPS OF SEAMS SHALL BE, AT A MINIMUM, THE DIMENSIONS RECOMMENDED BY THE MANUFACTURES.

GRAVEL ARMOR PLATING (STONE MULCH)

- STONE MULCH SHALL BE PLACED TO A MINIMUM THICKNESS OF 4 INCHES ON THE TOP SURFACE AND 3 INCHES ON ALL 3H:1V EXTERIOR SLOPES.
- MINIMUM D50 SIZE FOR STONE MULCH SHALL BE 1.0 INCH AND SHALL BE VERIFIED BY TESTING.

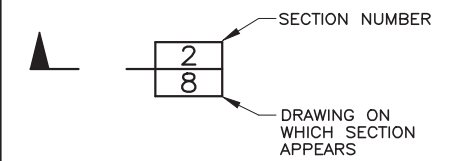
INDEX OF DRAWINGS

SHEET NO.	GENERAL
G-1	COVER SHEET
G-2	GENERAL NOTES, LEGEND & INDEX OF DRAWINGS
SURFACE IMPOUNDMENT B	
C-1	SITE PLAN
C-2	LINER SURFACE PLAN
C-3	SUMP PLANS
C-4	SUMP SECTIONS & DETAILS
C-5	TYPICAL SECTIONS & DETAILS

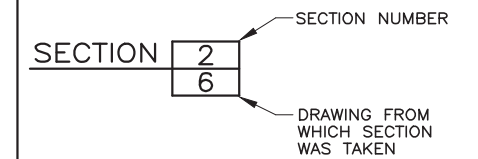
SECTION & DETAIL IDENTIFICATION

SECTION IDENTIFICATION

SECTION CUT ON DRAWING NO. 6 AND SHOWN ON DRAWING NO. 8 ON DRAWING NO. 6 THIS SECTION IS REFERENCED AS:

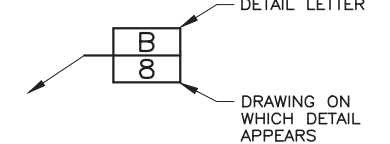


ON DRAWING NO. 8, THIS SECTION IS IDENTIFIED AS:

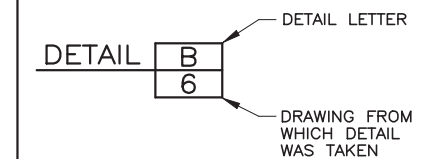


DETAIL IDENTIFICATION

DETAIL CALL-OUT ON DRAWING NO. 6 AND SHOWN ON DRAWING NO. 8 ON DRAWING NO. 6 THIS DETAIL IS REFERENCED AS:



ON DRAWING NO. 8, THIS DETAIL IS IDENTIFIED AS:

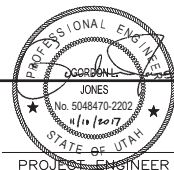


NOTES:

- IF SECTION AND DETAILS ARE SHOWN ON THE SAME DRAWING AS SECTION CUTS AND SECTION OR DETAIL CALL-OUTS DRAWING NUMBER IS REPLACED BY A LINE.
- DETAIL LETTERS "I" AND "O" NOT USED.

TABLE OF ABBREVIATIONS

● = AIR GAS VENT	MH = MANHOLE
⊙ = AT	MIN. = MINIMUM
AVG. = AVERAGE	N. = NORTH
C.C. = CENTER TO CENTER	N.T.S. = NOT TO SCALE
⊘ = CENTER LINE	O.C. = ON CENTER
CLR. = CLEARANCE	PC = POINT OF CURVE
CONT. = CONTINUOUS	PI = POINT OF INTERSECTION
CPP = CORRUGATED POLYETHYLENE PIPE	PSI = POUND PER SQUARE INCH
DIA. = DIAMETER	PT = POINT OF TANGENT
DWG = DRAWING	REINF = REINFORCEMENT
E. = EAST	SDR = STANDARD DIMENSIONAL RATIO
EF = EACH FACE	SF = SQUARE FEET
EL. = ELEVATION	SQ. = SQUARE
E.W. = EACH WAY	STA. = STATION
FL = FLOW LINE	TL = TOP OF LINER
HDPE = HIGH DENSITY POLYETHYLENE	T.O.C. = TOP OF CONCRETE
ID = INSIDE DIAMETER	TYP. = TYPICAL
MAX. = MAXIMUM	UBC = UNTREATED BASE COURSE



DESIGNED	KCS	3
DRAFTED	CAH	2
CHECKED	GLJ	1
DATE	NOVEMBER 2017	NO.
		DATE

NO.	REVISIONS	BY	APVD.

SCALE
NOT
TO
SCALE

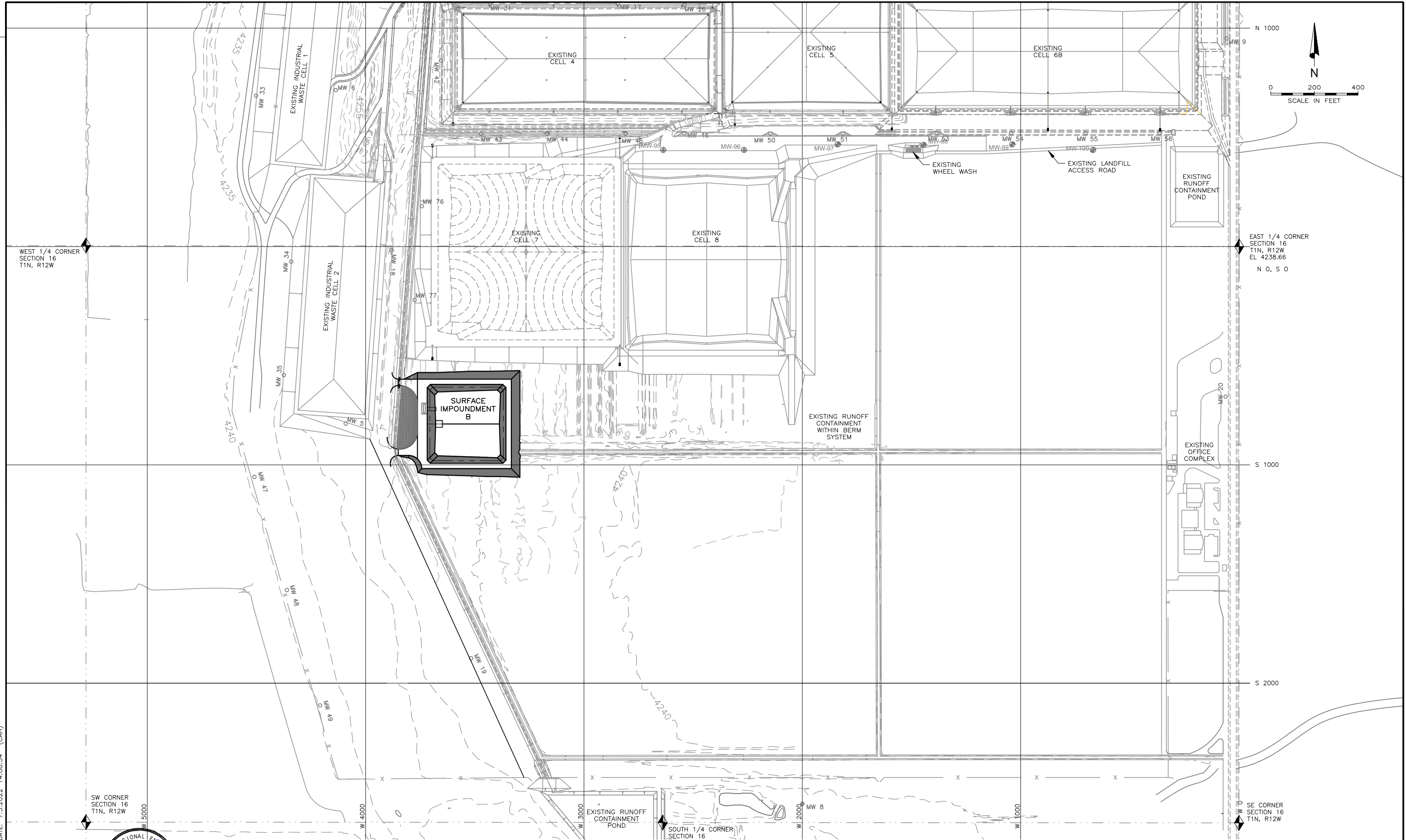


GRASSY MOUNTAIN FACILITY
GENERAL
GENERAL NOTES, LEGEND & INDEX OF DRAWINGS

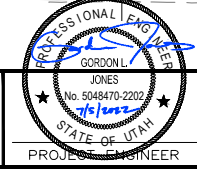
SHEET
G-2

064.84.100

FILE NAME: PROJECTS\064 - CLEAN HARBORS\85.301 - 2022 CLOSURE PLAN UPDATE\CAD\C-1 SI-B - OVERALL PLAN.DWG
 FILE DATE: 7.5.2022 14:08:54 (CAH)



10/07



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DRAFTED	CAH	2
CHECKED	GLJ	1
DATE	JULY 2022	NO.

NO.	DATE	REVISIONS	BY	APVD.

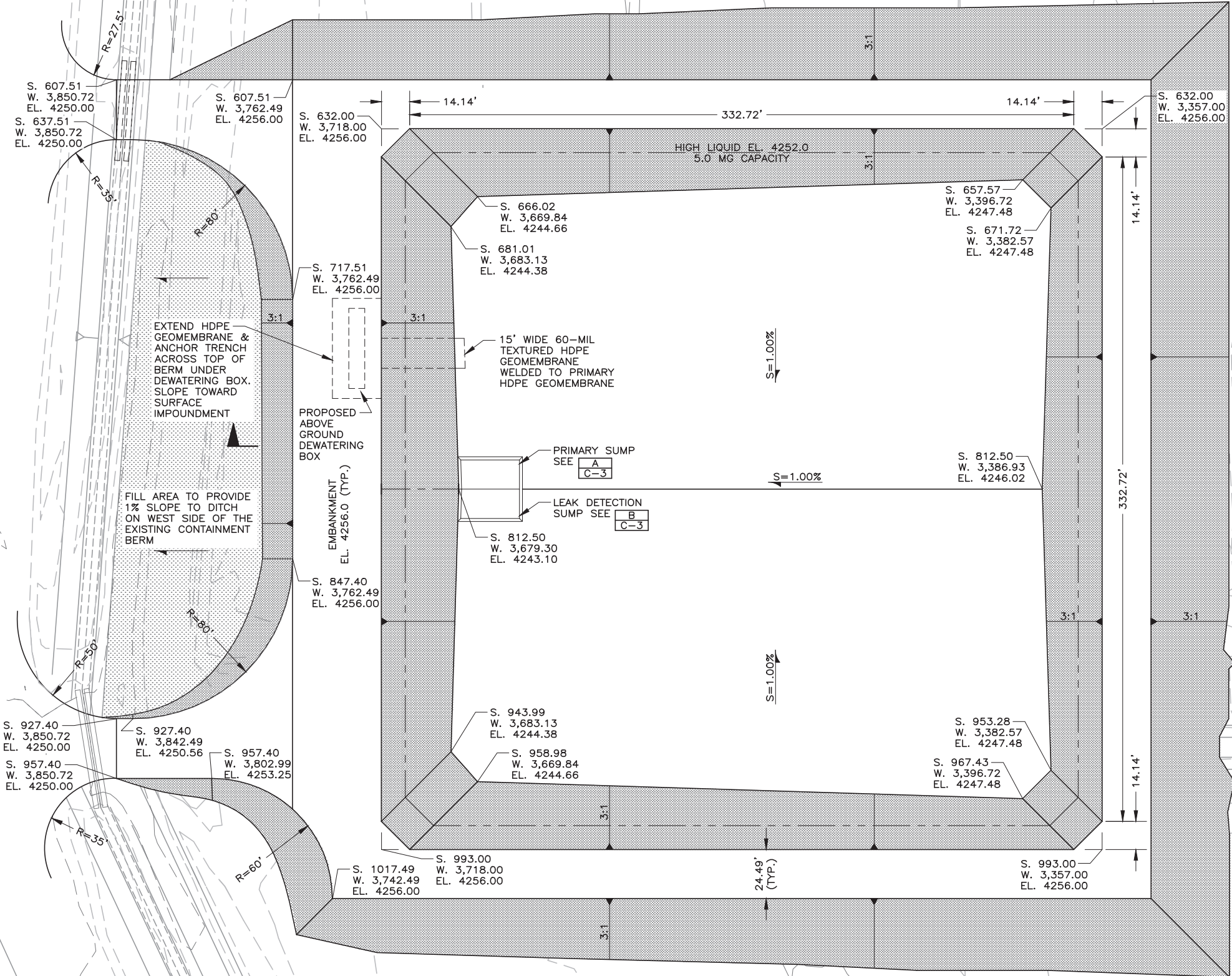
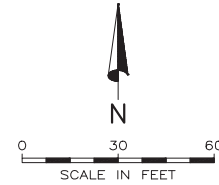
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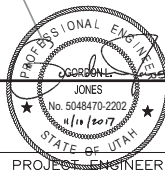
SURFACE IMPOUNDMENT B
SURFACE IMPOUNDMENT B
SITE PLAN

SHEET
C-1
064.85.301

FILE NAME: PROJECTS\064 - CLEAN HARBORS\84.100 - SURFACE IMPOUNDMENT B DESIGN\CAD\DESIGN DRAWINGS\C-2 SI-B - LINER SURFACE PLAN.DWG
 FILE DATE: 11-10-2017 08:05:17 (CAH)



- NOTES:
1. THE LOCATION OF THE PROPOSED DEWATERING BOX MAY CHANGE TO ACCOMMODATE FACILITY OPERATIONS.
 2. THE LOCATION OF THE ACCESS TO THE SURFACE IMPOUNDMENT MAY BE CHANGED TO THE NORTHWEST CORNER OR A SECOND ACCESS MAY BE PROVIDED AT THE NORTHWEST CORNER, TO ACCOMMODATE FACILITY OPERATIONS.



DESIGNED	KCS	3
DRAFTED	CAH	2
CHECKED	GLJ	1
DATE	NOVEMBER 2017	NO.
		DATE

NO.	DATE	REVISIONS	BY	APVD.

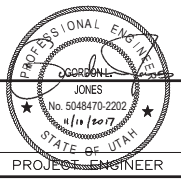
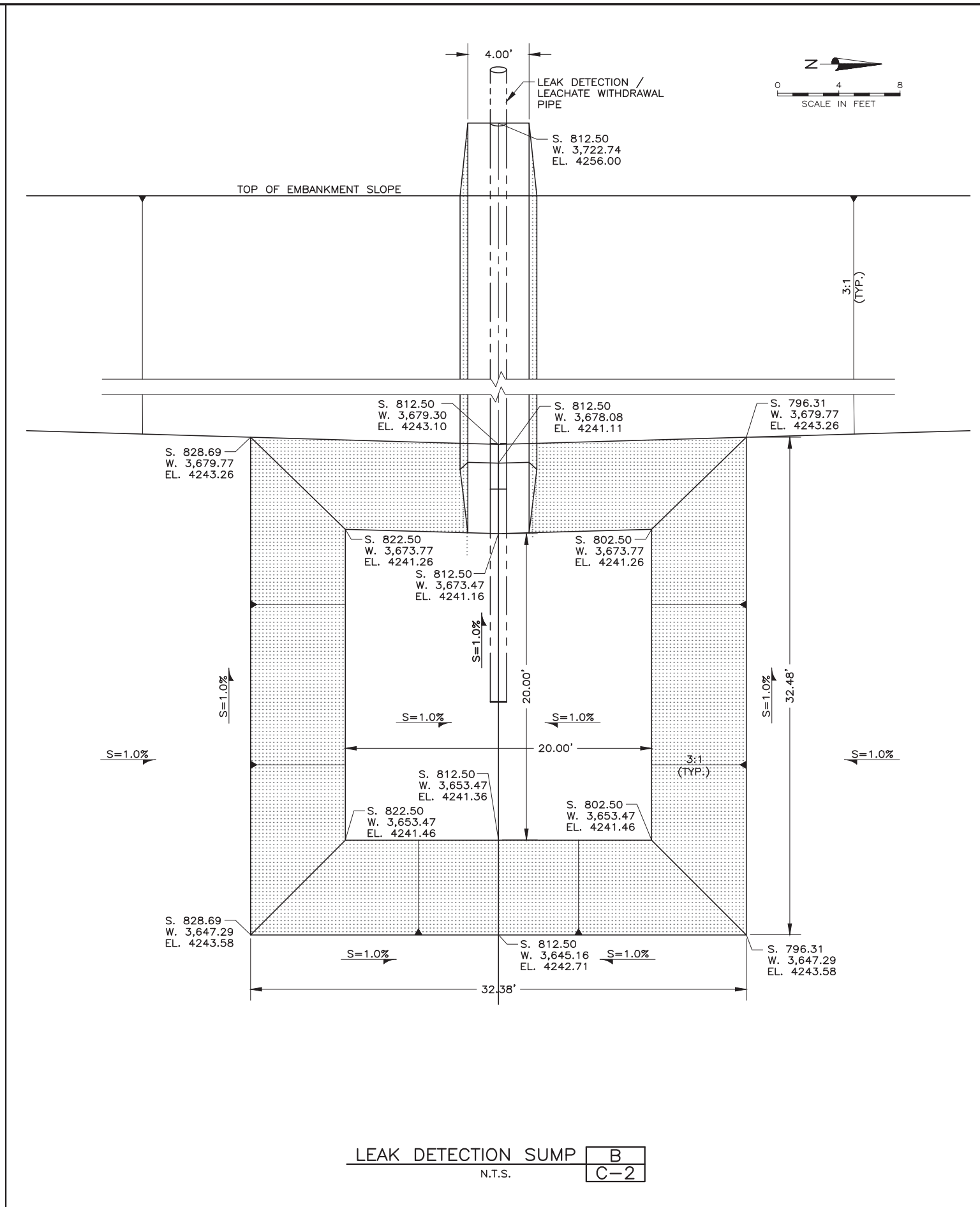
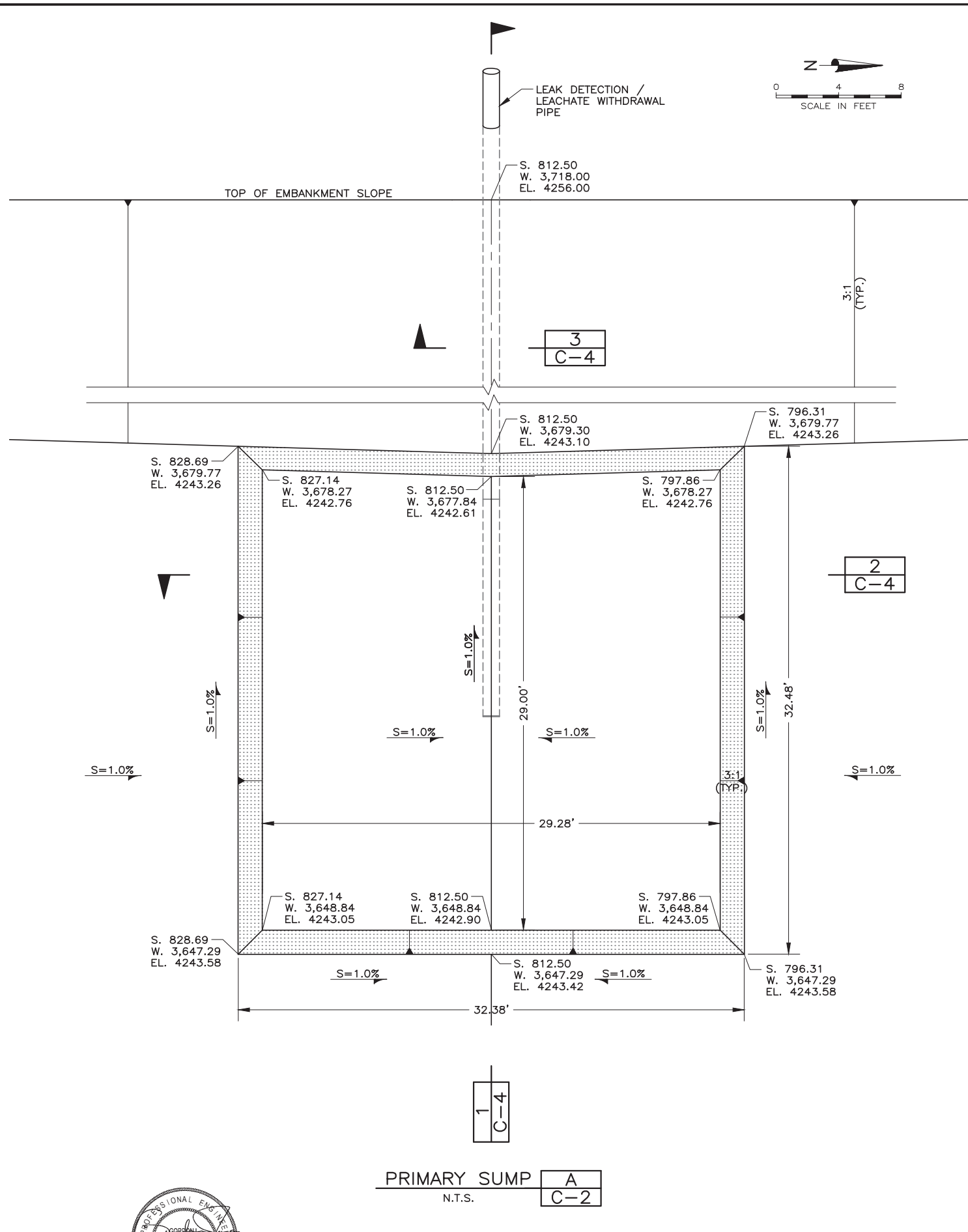
SCALE
AS SHOWN



GRASSY MOUNTAIN FACILITY
SURFACE IMPOUNDMENT B
LINER SURFACE PLAN

SHEET
C-2
064.84.100

FILE NAME: PROJECTS\064 - CLEAN HARBORS\84.100 - SURFACE IMPOUNDMENT B DESIGN\CAD\DESIGN DRAWINGS\C-3 SI-B_SUMP PLANS.DWG
 FILE DATE: 11.10.2017 08:06:25 (CAH)



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CHECKED	GLJ	1
DATE	NOVEMBER 2017	NO.

NO.	DATE	REVISIONS	BY	APVD.

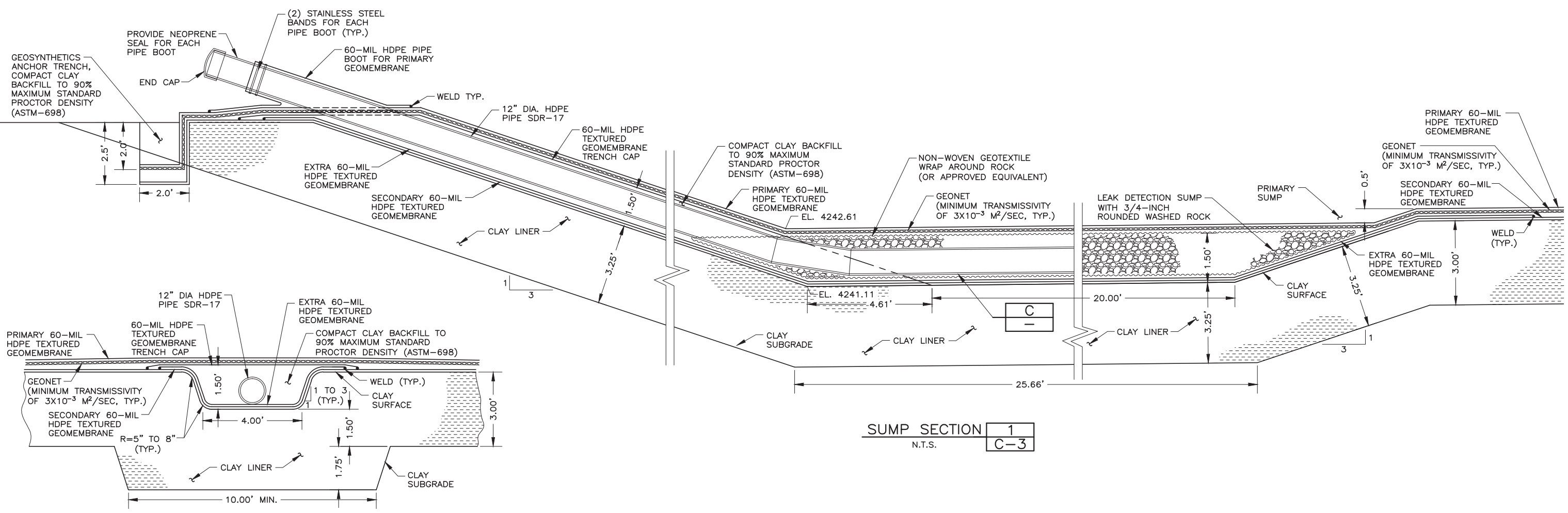
SCALE
AS SHOWN



GRASSY MOUNTAIN FACILITY
SURFACE IMPOUNDMENT B
SUMP PLANS

SHEET
C-3
064.84.100

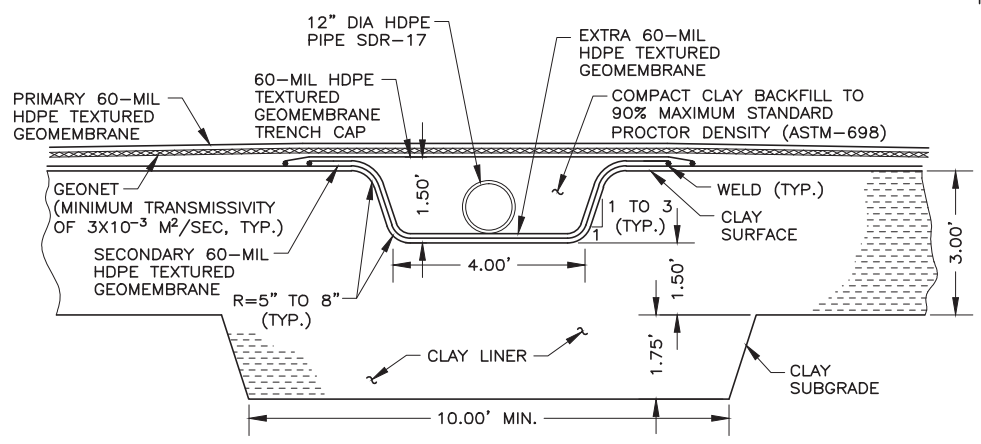
FILE NAME: PROJECTS\064 - CLEAN HARBORS\84.100 - SURFACE IMPOUNDMENT B DESIGN\CAD\DESIGN DRAWINGS\C-4 SI-B_SUMP SECTIONS AND DETAILS.DWG
 FILE DATE: 11.10.2017 08:07:39 (CAH)



SUMP SECTION

1
C-3

N.T.S.

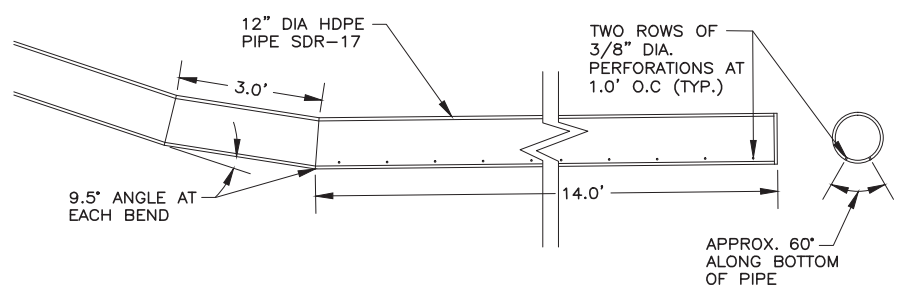


PIPE TRENCH SECTION

3
C-3

N.T.S.

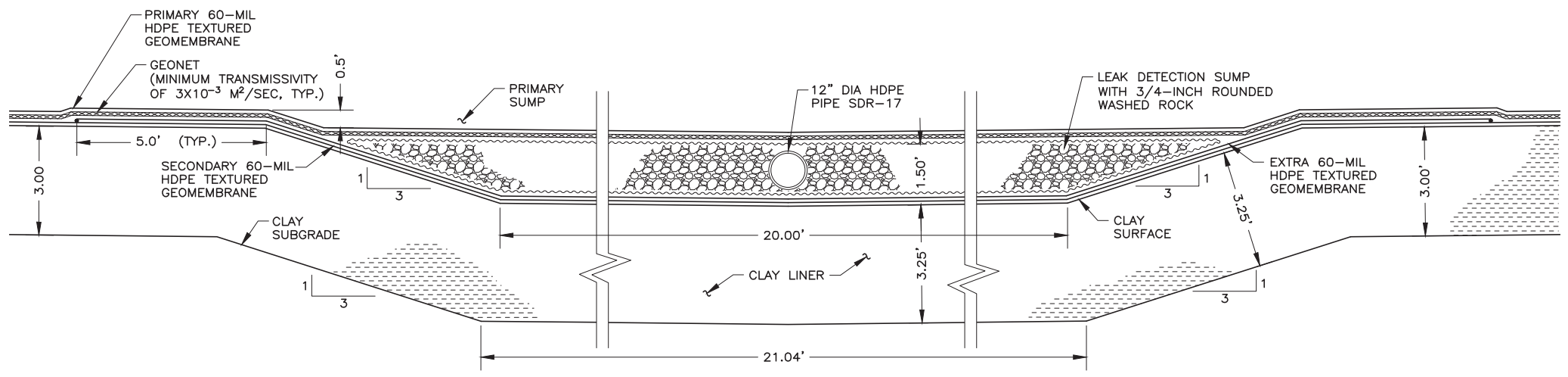
NOTE:
 DIMENSIONS AND GRADES IN THE TRENCH ON THE CLAY SURFACE MAY BE ADJUSTED BY THE ENGINEER DEPENDING ON THE DIMENSIONS AND GRADES IN THE TRENCH ON THE CLAY SUBGRADE. ADJUSTMENTS OF DIMENSIONS AND GRADES SHALL RESULT IN MINIMUM CLAY THICKNESS AS DESIGNATED ON THIS SECTION.



PIPE DETAIL

C
-

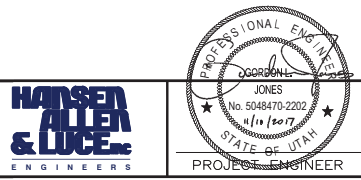
N.T.S.



SUMP SECTION

2
C-3

N.T.S.



DESIGNED	KCS	3
DRAFTED	CAH	2
CHECKED	GLJ	1
DATE	NOVEMBER 2017	NO.
		DATE

NO.	DATE	REVISIONS	BY	APVD.

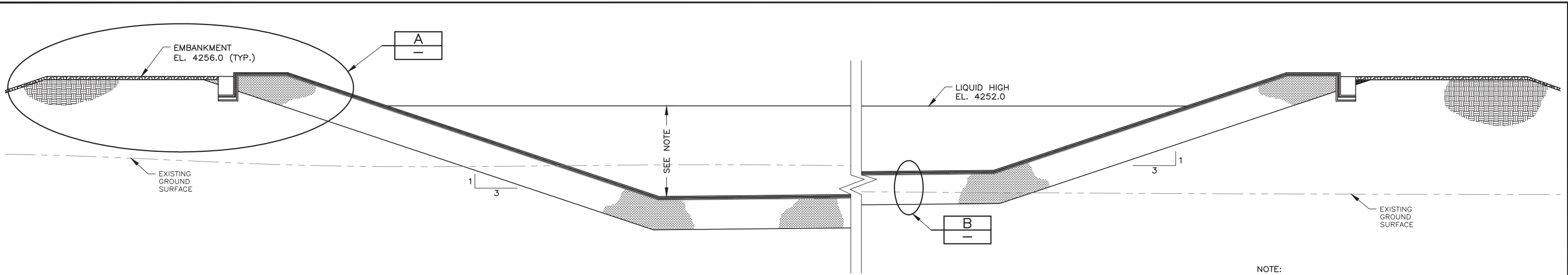
SCALE
AS SHOWN



GRASSY MOUNTAIN FACILITY
 SURFACE IMPOUNDMENT B
 SUMP SECTIONS & DETAILS

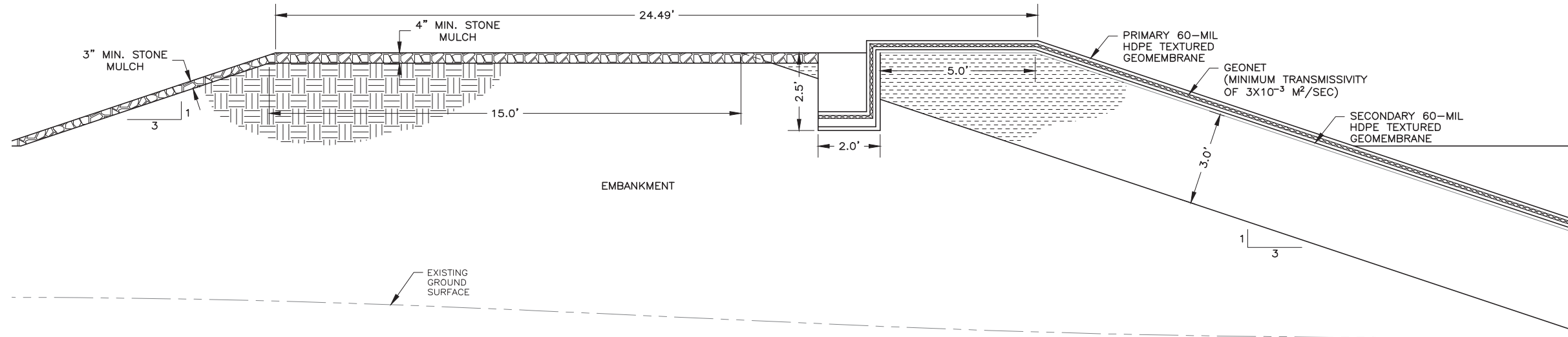
SHEET
C-4
064.84.100

FILE NAME: PROJECTS\064 - CLEAN HARBORS\84.100 - SURFACE IMPOUNDMENT B DESIGN\CAD\DESIGN DRAWINGS\C-5 SI-B_TYPICAL SECTIONS AND DETAILS.DWG
 FILE DATE: 11.10.2017 08:08:48 (CAH)

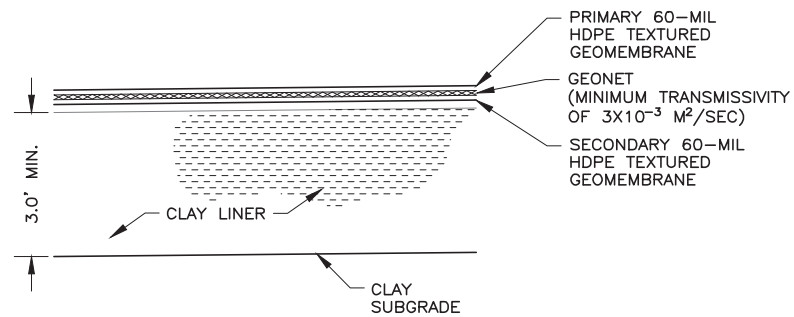


TYPICAL OVERALL SECTION 1
 N.T.S. C-5

NOTE:
 AT THE LIQUID HIGH EL., LIQUID DEPTH VARIES FROM 9.4' (LOWEST POINT ON THE FLOOR) TO 4.5' (HIGHEST POINT ON THE FLOOR) ABOVE THE PRIMARY LINER SYSTEM.

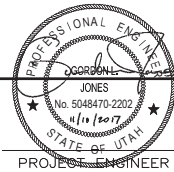


EMBANKMENT DETAIL A
 N.T.S.



LINER SYSTEM DETAIL B
 N.T.S.

10/07



DESIGNED	KCS	3
DRAFTED	CAH	2
CHECKED	GLJ	1
DATE	NOVEMBER 2017	

NO.	DATE	REVISIONS	BY	APVD.

SCALE
 AS SHOWN



GRASSY MOUNTAIN FACILITY
 SURFACE IMPOUNDMENT B
 TYPICAL SECTIONS & DETAILS

SHEET
 C-5
 064.84.100