

Project Name: Glendale Landfill North Cell Excavation Phase II
Project No.: 212261
Amendment No: One
Date:

This Amendment to that certain Standard Form Agreement dated _____ by and between the City of Glendale and Rummel Construction, Inc. (CM@Risk) for services, deliverables and work related to Project No. 212261, Project Name: Glendale Landfill North Cell Excavation Phase II, (the “Agreement”) is made and entered into effective this day of _____, 2022.

1. This Amendment #1 establishes a Guaranteed Maximum Price (“GMP”) and Construction Phase Fee for Construction Services and incorporates such terms into the Agreement, making the Agreement effective for Construction Phase Services:
 - a. The total fee for Construction Phase Services, which is included in the Guaranteed Maximum Price (GMP) as defined under the Agreement, shall be fixed at Four Hundred Twenty-Nine Thousand Six Hundred Sixty-Two and 00/100 Dollars (\$429,662.00).
 - b. The Guaranteed Maximum Price (“GMP”) for Construction Services, as defined under the Agreement, shall be Three Million Eight Hundred Seventy-Five Thousand One Hundred Ninety-Seven and 47/100 Dollars (\$3,875,197.47).
 - c. The total compensation under the Agreement, as amended by this Amendment, shall be:

	<u>Pre-Construction Phase</u>	<u>Construction Phase</u>	<u>Total</u>
Original Agreement:	\$36,358.21	\$	\$36,358.21
Previous Amendments:	\$	\$	\$
This Amendment:	\$	\$3,875,197.47	\$3,875,197.47
Total (including this Amendment):	\$36,358.21	\$3,875,197.47	\$3,911,555.68

2. DELETE the blank template “Exhibit C – Cost of the Work – Schedule of Values” from the Agreement, and ADD “Exhibit C – Rummel Construction, Inc. Cost of the Work – Schedule of Values” dated October 28, 2022 (24 Pages), attached herein.
3. ADD “Exhibit E – Construction Documents necessary to define Scope of Work and deliverables for the Construction Phase Services, including plans, designs, drawings, specifications and other required Contract Documents” dated October, 22, 2022 (156 Pages), attached herein.
4. ADD “Exhibit F - Statement of All Clarifications and Assumptions” dated October 28, 2022 (1 Pages), attached herein.
5. ADD “Exhibit G – Schedule of Major Milestones” dated October 24, 2022 (1 Pages), attached herein.
6. All other provisions, terms and conditions of the Agreement shall remain unchanged and in full effect.

(Signature on following page)

IN WITNESS WHEREOF, the Parties hereto have duly executed this Amendment, effective as of the date first written above.

OWNER
City of Glendale
5850 W. Glendale Avenue
Glendale, AZ 85301

CM@RISK
Rummel Construction, Inc.
7250 East Adobe Drive
Scottsdale, Arizona 85255

By: Its Authorized Representative:

By Its Authorized Representative:

Signature

Signature
Dodd O'Neill

Printed Name

Printed Name
Vice President

Title

Title
11-07-2022

Date

Date

ATTEST:

Julie K. Bower (SEAL)
City Clerk

APPROVED AS TO FORM:

Michael D. Bailey
City Attorney

DESIGN PROFESSIONAL
TetraTech
22601 North 19th Avenue, Suite 225
Phoenix, Arizona 85027

By Its Authorized Representative:

Signature (Reviewed in accordance with the "Agreement Between Owner and Design Professional" Section 4.8.1.14 of Exhibit A "Scope of Services for the Design Professional")

Printed Name

Title

Date

EXHIBIT C
Cost of the Work

(24 pages - final document to be included with GMP Amendment)

Glendale Municipal Landfill North Cell Excavation Phase II CMAR

Project No. 212261

October 28, 2022

Submitted by Rummel Construction Inc.

Rummel Construction Inc., serving as the Construction Manager at Risk, is providing GMP#1 for the Glendale Municipal Landfill North Cell Excavation Phase II. The scope of work for GMP#1 entails the excavation and stockpiling of material from Phase II to allow early access for landfill traffic from the scale house into the previously constructed Phase I Liner Cell. The GMP#2 will be generated in the future to complete the Phase II cell excavation.

Rummel Construction, Inc.

CONSTRUCTION MANAGER AT RISK AGREEMENT - Exhibit C - Cost of the Work
Municipal Landfill North Cell Excavation Phase II CMAR - Project No. 212261 - October 24, 2022

Exhibit C

DIRECT CONSTRUCTION COST						
Cost Code	Item of Work	GMP No. 1	GMP No. 2	GMP No. 3	GMP No. 4	Total GMP
	GENERAL CONDITIONS - PERSONNEL STAFFING	\$ 171,562.00				
	GENERAL CONDITIONS - SITE OPERATIONS	\$ 63,656.58				
	MOBILIZATION/DEMobilIZATION	\$ 100,137.00				
	PROJECT SURVEY	\$ 35,000.00				
	AZPDES/SWPPP	\$ 8,026.00				
	TRAFFIC CONTROL	\$ 5,000.00				
	EXCAVATE, HAUL & STOCKPILE TO NORTH CELL	\$ 1,025,015.00				
	EXCAVATE, HAUL & STOCKPILE TO SOUTH CELL	\$ 527,913.00				
	GENERAL FILL FOR HAUL ROADS	\$ 174,492.00				
	HAUL, PLACE & MAINTAIN AC MILLINGS	\$ 72,965.00				
	SAFETY BARRIERS	\$ 123,767.00				
	RIPRAP V-DITCH	\$ 74,826.00				
	RIPRAP SPLASH PAD	\$ 4,723.00				
	STORMWATER CROSSINGS	\$ 34,525.00				
	RELOCATE ASPHALT MILLINGS	\$ 22,096.00				
	CONTINGENCIES					
	CONTRACTOR	\$ 86,400.00				
	OWNER	\$ 583,390.00				
	SUBTOTAL DIRECT CONSTRUCTION COST (DCC)	\$ 3,113,493.58				
CONSTRUCTION PHASE FEE						
FEE	FIXED FEE, EQUAL TO 13.8% OF DCC	\$ 429,662.00				
	* Fee = 8.02% for Overhead and 5.78% for Profit					
	SUBTOTAL CONSTRUCTION PHASE FEE	\$ 429,662.00				
INDIRECT CONSTRUCTION COSTS (ICC)						
BONDS	CMR PERFORMANCE & PAYMENT BOND 1.5%	\$ 53,147.00				
INSURANCE	CMR INSURANCES (WORKER'S COMP, GENERAL LIABILITY, AUTO LIABILITY, UMBRELLA) 1.2%	\$ 42,518.00				
	BUILDER'S RISK 0.5%	\$ 17,716.00				
TAXES	5.98% OF (DCC + FEE + BOND + INSURANCE)	\$ 218,660.89				
	SUBTOTAL INDIRECT CONSTRUCTION COST (ICC)	\$ 332,041.89				
	TOTAL GMP = DCC + FEE + ICC	\$ 3,875,197.47				

Calculation for Rummel Construction Overhead & Profit (Fee Amount)

Audited Overhead (see attached)	9.22%
Deduct Insurance of 1.2% (from GMP line item)	<u>-1.20%</u>
Subtotal Overhead Cost	8.02%
Rummel Construction Profit	5.78%
Rummel Construction Overhead & Profit	13.80%

RUMMEL HOLDING GROUP, INC.

**SCHEDULE OF GENERAL AND ADMINISTRATIVE
EXPENSES FOR RUMMEL CONSTRUCTION, INC.**

Year Ended December 31, 2021

RUMMEL HOLDING GROUP, INC.
SCHEDULE OF GENERAL AND ADMINISTRATIVE
EXPENSES FOR RUMMEL CONSTRUCTION, INC.

Year Ended December 31, 2021

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4722 North 24th Street, Suite 300 ■ Phoenix, AZ 85016
Main: 602.264.6835 ■ Fax: 602.265.7631 ■ www.mhmcpa.com

INDEPENDENT AUDITORS' REPORT ON SUPPLEMENTARY INFORMATION

To the Board of Directors and Shareholders of:

RUMMEL HOLDING GROUP, INC.

We have audited the consolidated financial statements of Rummel Holding Group, Inc. (Holding) as of and for the year ended December 31, 2021 and our report thereon dated February 18, 2022, which expressed an unmodified opinion on those consolidated financial statements, is included with those consolidated financial statements and issued separate from this report. Our audit was conducted for the purpose of forming an opinion on the financial statements as a whole. The schedule of general and administrative expenses for Rummel Construction, Inc. (a wholly-owned subsidiary of Holding) on page 2 is presented for the purposes of additional analysis and is not a required part of the consolidated financial statements. Such information is the responsibility of management and was derived from and relates directly to the underlying accounting and other records used to prepare the consolidated financial statements. The information has been subjected to the auditing procedures applied in the audit of the consolidated financial statements and certain additional procedures, including comparing and reconciling such information directly to the underlying accounting and other records used to prepare the consolidated financial statements or to the consolidated financial statements themselves, and other additional procedures in accordance with auditing standards generally accepted in the United States of America. In our opinion, the information is fairly stated in all material respects in relation to the consolidated financial statements as a whole.

This report is intended solely for the information and use of management of Rummel Holding Group, Inc. and their customers for whom they perform work under construction contracts and is not intended to be and should not be used by anyone other than those specified parties.

Mayer Hoffman McCann P.C.

February 18, 2022



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RUMMEL HOLDING GROUP, INC.
CONSOLIDATED SCHEDULE OF GENERAL AND ADMINISTRATIVE
EXPENSES FOR RUMMEL CONSTRUCTION, INC.

Year Ended December 31, 2021

RUMMEL CONSTRUCTION, INC.

General and administrative expenses	\$ 14,014,939
Cost of revenues	\$ 151,986,647
General and administrative expense overhead rate	9.22%

Exhibit C Contingencies

Direct Cost Contingencies				Extended
Description of Cost	QTY	UOM	Unit Cost	Direct Cost
CONTRACTOR CONTINGENCIES				
TOPO VERIFICATION - QUANTITY ADJUSTMENTS (5% EXCAVATION)	1	LS	86,400.00	86,400.00
TOTAL CONTRACTOR CONTINGENCIES	1	LS		86,400.00
OWNER CONTINGENCIES				
GROUTING RIPRAP DITCHES	2,731	LF	20.00	54,620.00
WATER VALVE VAULTS	3	EA	10,000.00	30,000.00
AC PAVING OF NW CORNER/SWITCHBACK/CORNER	6,750	SY	36.00	243,000.00
FUEL ESCALATION	1	AL	100,000.00	100,000.00
OWNER CONTINGENCY 5% of DCC	1	LS	155,770.00	155,770.00
OWNER CONTINGENCIES				583,390.00
TOTAL CONTINGENCIES				669,790.00

Exhibit C Direct Cost Breakdown

Bid Item	Direct Cost Breakdown				Extended
	Description of Cost	QTY	UOM	Unit Cost	Direct Cost
1	MOBILIZATION/DEMOBILIZATION	1	LS	100,137.00	100,137.00
2	PROJECT SURVEY	1	LS	35,000.00	35,000.00
3	AZPDES/SWPPP	1	LS	8,026.00	8,026.00
4	TRAFFIC CONTROL (MISC SIGNS)	1	LS	5,000.00	5,000.00
5	EXCAVATE, HAUL & STOCKPILE TO NORTH CELL	353,725	CY	2.90	1,025,015.00
6	EXCAVATE, HAUL & STOCKPILE TO SOUTH CELL	74,618	CY	7.07	527,913.00
7	GENERAL FILL FOR HAUL ROADS	46,292	CY	3.77	174,492.00
8	HAUL, PLACE & MAINTAIN AC MILLINGS	189,630	SF	0.38	72,965.00
9	SAFETY BARRIERS	1,860	LF	66.54	123,767.00
10	RIPRAP V-DITCH	2,731	LF	27.40	74,826.00
11	RIPRAP SPLASH PAD	1	EA	4,723.00	4,723.00
12	STORMWATER CROSSINGS	1	EA	34,525.00	34,525.00
13	RELOCATE ASPHALT MILLINGS	9,507	CY	2.32	22,096.00
	TOTAL DIRECT COST				\$ 2,208,485.00

Exhibit C General Conditions

General Conditions Breakdown

Description of Cost	QTY	UOM	Unit Cost	Extended Direct Cost
GENERAL CONDITIONS - PERSONNEL STAFFING				
PROJECT SUPERVISION	4	MO	42,890.50	171,562.00
				171,562.00
GENERAL CONDITIONS - SITE OPERATIONS				
KLEIN TANKS/STORAGE CONTAINERS	3.5	MO	2,477.14	8,670.00
GPS EQUIPMENT	3.5	MO	6,000.00	21,000.00
SAFETY SUPPLIES/J-JOHNS/LATHE/ETC	3.5	MO	8,285.71	29,000.00
SITE SPECIFIC HEALTH & SAFETY PLAN	1	LS	2,889.45	2,889.45
ON-SITE FUEL STORAGE & CONTAINMENT	1	LS	2,097.13	2,097.13
SITE OPERATIONS				\$ 63,656.58

Rummel Construction, Inc.
 GLENDALELF2A GLENDALE LANDFILL CMAR PHASE 2A
 Dodd O'Neill

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Cost Report

Activity Resource	Desc	Quantity Pcs	Unit	Unit Cost	Perm Labor	Constr Matl/Exp	Equip Ment	Sub-Contract	Total
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BID ITEM = 100 Land Item SCHEDULE: 1 100
 Description = GENERAL CONDITIONS - PERSONNEL STAFFING Unit = LS Takeoff Quan: 1.000 Engr Quan: 1.000

140-00 Project Supervision **Quan: 80.00 S Hrs/Shft: 8.00 Cal: 508 WC: NOUSE**

<u>LA-SUP</u>	(Mod) Project Supervision		640.00 CH	Prod: 80.0000 S		Lab Pcs:	3.00	Eqp Pcs:	3.00	**Unreviewed
8TKPUPE	Project Engineer Pickup	1.00	640.00 HR	14.250			9,120		9,120	
8TKPUPM	Project Manager Pickup	0.50	320.00 HR	14.250			4,560		4,560	
8TKPUS	Superintendent Pickup	1.00	640.00 HR	14.250			9,120		9,120	
8TKPUSM	Safety Manager Pickup	0.50	320.00 HR	14.250			4,560		4,560	
ZE10	Project Engineer	1.00	640.00 MH *	62.450	39,968				39,968	
ZPM1	Project Manager	0.50	320.00 MH *	95.920	30,694				30,694	
ZS01	Superintendent	1.00	640.00 MH *	83.680	53,555				53,555	
ZSM1	Safety Manager	0.50	320.00 MH *	62.450	19,984				19,984	
\$171,561.60	24.0000 MH/S		1,920.00 MH	[1802.52]	144,202		27,360		171,562	
0.1250 Units/Hr	268.0650 \$/CrewHr		80.0000 Shifts	*	1,802.52		342.00		2,144.52	

=====> **Item Totals: 100 - GENERAL CONDITIONS - PERSONNEL STAFFING**
 \$171,561.60 1,920.0000 MH/LS 1,920.00 MH [144201.6] 144,202 27,360 **171,562**
 171,561.600 1 LS 144,201.60 27,360.00 171,561.60

BID ITEM = 200 Land Item SCHEDULE: 1 100
 Description = GENERAL CONDITIONS - SITE OPERATIONS Unit = LS Takeoff Quan: 1.000 Engr Quan: 1.000

130-00 Safety and Supplies **Quan: 1.00 LS Hrs/Shft: 10.00 Cal: 510 WC: NOUSE**

6SAFETY	Safety and Supplies	1.00	1.00 LS	29,000.000			29,000		29,000	**Unreviewed
\$29,000.00				[]			29,000		29,000	
							29,000.00		29,000.00	

130-02 H&S Plan **Quan: 1.00 LS Hrs/Shft: 10.00 Cal: 510 WC: NOUSE**

8TKPUSM	==> Safety Manager Pickup	1.00	45.00 HR	14.250			641		641	**Unreviewed
ZSM1	==> Safety Manager	1.00	45.00 MH *	49.960	2,248				2,248	
\$2,889.45	45.0000 MH/LS		45.00 MH	[2248.2]	2,248		641		2,889	
					2,248.20		641.25		2,889.45	

150-00 Misc. Equipment Costs **Quan: 70.00 S Hrs/Shft: 8.00 Cal: 508 WC: NOUSE**

<u>MIKLEI</u>	(Mod) Klein Tank / Conex		560.00 CH	Prod: 70.0000 S		Lab Pcs:	0.00	Eqp Pcs:	7.00	**Unreviewed
3METER	meter	1.00	1.00 LS	250.000		250			250	
3PIPE	Pipe	1.00	1.00 LS	1,000.000		1,000			1,000	
8YKLEIN	Klein Water Tower	2.00	1,120.00 HR	6.000			6,720		6,720	
8YSC	Storage Containers	5.00	2,800.00 HR	0.250			700		700	
\$8,670.00				[]		1,250	7,420		8,670	
0.1250 Units/Hr	13.2500 \$/CrewHr		70.0000 Shifts	*		17.86	106.00		123.86	

155-01 Fuel Storage Containment **Quan: 1.00 EA Hrs/Shft: 8.00 Cal: 508 WC: NOUSE**

<u>ECFCLN</u>	Fuel Containment Liner		4.00 CH	Prod: 4.0000 HU		Lab Pcs:	5.00	Eqp Pcs:	1.00	**Unreviewed
3PFCLNR	Fuel Containment Liner	1.00	2,100.00 SF	0.650		1,365			1,365	
8LDGT	JD210 / Case 570 Ganno	1.00	4.00 HR	38.500			154		154	
LACMN	Laborer, Common	4.00	16.00 MH *	27.385	438				438	
OPGEN	Operator, General	1.00	4.00 MH *	34.993	140				140	
\$2,097.13	20.0000 MH/EA		20.00 MH	[475]	578	1,365	154		2,097	
0.2500 Units/Hr	183.0325 \$/CrewHr		0.5000 Shifts		578.13	1,365.00	154.00		2,097.13	

Rummel Construction, Inc.
 GLENDALELF2A GLENDALE LANDFILL CMAR PHASE 2A
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Cost Report

Activity Resource	Desc	Quantity Pcs	Unit	Unit Cost	Perm Labor	Constr Material	Equip Matl/Exp	Sub-Ment Contract	Total
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BID ITEM = 200 Land Item SCHEDULE: 1 100
 Description = GENERAL CONDITIONS - SITE OPERATIONS Unit = LS Takeoff Quan: 1.000 Engr Quan: 1.000

205-10 GPS Equipment **Quan: 70.00 S Hrs/Shft: 8.00 Cal: 508 WC: NOUSE**

**Unreviewed

excavation duration + finish grade = total shifts

MIGPS	(Mod) GPS Equipmnet	560.00	CH	Prod: 70.0000 S	Lab Pcs: 0.00	Eqp Pcs: 6.00		
8SRVYBS	GPS Base Station	1.00	560.00 HR	4.000	2,240	2,240		
8SRVYMC	GPS Machine Control	3.00	1,680.00 HR	8.500	14,280	14,280		
8SRVYRV	GPS Rover	2.00	1,120.00 HR	4.000	4,480	4,480		
\$21,000.00				[]	21,000	21,000		
0.1250	Units/Hr	37.5000	\$/CrewHr	70.0000	Shifts	*	300.00	300.00

=====> Item Totals:	200	- GENERAL CONDITIONS - SITE OPERATIONS
\$63,656.58	65.0000 MH/LS	65.00 MH [2723.2] 2,826 31,615 29,215 63,657
63,656.580	1 LS	2,826.33 31,615.00 29,215.25 63,656.58

BID ITEM = 300 CLIENT# = 1 Land Item SCHEDULE: 1 100
 Description = MOBILIZATION/DEMOBILIZATION Unit = LS Takeoff Quan: 1.000 Engr Quan: 1.000

----- Mobilization Load Calculator -----

Legal Mobilization	Equipment	Qty	Trips	Total
Backhoes		1	2	2
D6 Dozer		1	2	2
308 Excavator		0	1	0
320 Excavator		2	2	4
950 Loader		1	2	2
966 Loader		0	1	0
Gannon Tractors		1	2	2
14 Motorgrader		3	2	6
140 Motorgrader		0	1	0
16 Motorgrader		0	1	0
160 Motorgrader		0	1	0
613 Scraper		0	1	0
Ag Tractor		0	1	0
Implements - Bee Gee, Discs		0	1	0
5K Waterpull		0	1	0
Water Truck - 2K		0	1	0
Water Truck - 4K		2	2	4
Hurricane Pumps		0	1	0
Klein Tank		1	2	2
Connex Boxes		2	2	4
HDPE Pipe		0	1	0
Attachments (from Heavy)		0	1	0
Misc.		6	2	12

Total Legal Loads 40

Oversize Mobilization	Equipment	Qty	Trips	Total
D8 Dozer		0	1	0
623 Scraper		2	4	8
627 Scraper		0	1	0
8K Waterpull		3	2	6
336 Excavator		0	1	0
740 / 475 Articulated Truck		0	1	0
Crusher		0	1	0
815 Compactor		0	1	0

Rummel Construction, Inc.
 GLENDALELF2A GLENDALE LANDFILL CMAR PHASE 2A
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Cost Report

Activity Resource	Desc	Quantity Pcs	Unit	Unit Cost	Perm Labor	Constr Material	Equip Matl/Exp	Sub-Contract	Total
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BID ITEM = 300 CLIENT# = 1 Land Item SCHEDULE: 1 100
 Description = MOBILIZATION/DEMOBILIZATION Unit = LS Takeoff Quan: 1.000 Engr Quan: 1.000

Total Oversize Loads 14

Oversize Heavy Mobilization

Equipment	Qty	Number of one way trips	Total
D10 Dozer	0	1	0
D9 Dozer	1	2	2
657 Scraper	0	1	0
637 Scraper	16	2	32
631 Scraper	0	1	0
988 Loader	0	1	0
349 Excavator	0	1	0
374 Excavator	0	1	0
773 Rigid Frame Truck	0	1	0

Total Oversize Heavy Loads 34

Total Equipment Prep Hours 2
 Total Equipment Prep Cost \$394
 ----- End Assembly -----

190-10-02 Mobilization - Legal Move **Quan: 40.00** **LDS Hrs/Shft: 8.00** **Cal: 508** **WC: NOUSE**

Item	Description	Quantity	Unit	Prod	HU	Lab Pcs	Eqp Pcs	Total	
MOBRUM	Mobilization Rumco	200.00	CH	5.0000		1.00	1.00	1.00	
6MBRUM	RUMCO Mob Outside Esc	1.00	EA	25.000		1,000		1,000	
8LBLB	Truck and Trailer	1.00	HR	88.365			17,673	17,673	
DRTP	Driver, Transport Low Boy	1.00	MH *	37.730	7,546			7,546	
\$26,219.02	5.0000 MH/LDS	200.00	MH	[155]	7,546	1,000	17,673	26,219	
0.2000	Units/Hr	126.0951	\$/CrewHr	25.0000	Shifts	188.65	25.00	441.83	655.48

190-10-03 Mobilization - Oversize Move **Quan: 14.00** **LDS Hrs/Shft: 8.00** **Cal: 508** **WC: NOUSE**

Item	Description	Quantity	Unit	Prod	HU	Lab Pcs	Eqp Pcs	Total	
MOBLGL	Mobilization Legal	70.00	CH	5.0000		1.00	2.00	2.00	
6MBLGL	Legal Mob Outside Esc	1.00	EA	74.000		1,036		1,036	
8LBJEEP	Jeep Trailer	1.00	HR	15.000			1,050	1,050	
8LBLB	Truck and Trailer	1.00	HR	88.365			6,186	6,186	
DRTP	Driver, Transport Low Boy	1.00	MH *	37.730	2,641			2,641	
\$10,912.66	5.0000 MH/LDS	70.00	MH	[155]	2,641	1,036	7,236	10,913	
0.2000	Units/Hr	141.0951	\$/CrewHr	8.7500	Shifts	188.65	74.00	516.83	779.48

190-10-04 Mobilization - Oversize-Heavy Move **Quan: 34.00** **LDS Hrs/Shft: 8.00** **Cal: 508** **WC: NOUSE**

Item	Description	Quantity	Unit	Prod	HU	Lab Pcs	Eqp Pcs	Total	
MOBOVS	Mobilization Oversize	204.00	CH	6.0000		3.00	5.00	5.00	
6MBOVR	Oversize Mob Outside Esc	1.00	EA	100.000		3,400		3,400	
8LBBOOS	Booster Trailer	1.00	HR	15.000			3,060	3,060	
8LBJEEP	Jeep Trailer	1.00	HR	15.000			3,060	3,060	
8LBLB	Truck and Trailer	1.00	HR	88.365			18,026	18,026	
8LBPLOT	Lowbed Pilot Car	2.00	HR	14.490			5,912	5,912	
DRPI	Driver, Pilot Car	2.00	MH *	29.210	11,918			11,918	
DRTP	Driver, Transport Low Boy	1.00	MH *	37.730	7,697			7,697	
\$53,073.16	18.0000 MH/LDS	612.00	MH	[474]	19,615	3,400	30,058	53,073	
0.1667	Units/Hr	243.4959	\$/CrewHr	25.5000	Shifts	576.91	100.00	884.07	1,560.98

190-10-07 Mobilization Equipment Setup/Takedown **Quan: 2.00** **H Hrs/Shft: 10.00** **Cal: 510** **WC: NOUSE**

Item	Description	Quantity	Unit	Prod	HU	Lab Pcs	Eqp Pcs	Total
MECH	Mech Transport Break	2.00	CH	1.0000		3.00	2.00	2.00
8LD980	Cat 980 Wheel Loader (	1.00	HR	152.795			319	319
8ZMECHTRK	Mechanics Truck	1.00	HR	23.756			48	48
MECH	Mechanic	1.00	MH *	40.165	80			80
MECHHELP	Mechanic Helper	1.00	MH *	30.795	62			62

Rummel Construction, Inc.
 GLENDALE2A GLENDALE LANDFILL CMAR PHASE 2A
 Dodd O'Neill

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Cost Report

Activity Resource	Desc	Pcs	Quantity Unit	Unit Cost	Labor	Perm Material	Constr Matl/Exp	Equip Ment	Sub-Contract	Total
BID ITEM = 300			CLIENT# = 1	Land Item	SCHEDULE: 1	100				
Description =	MOBILIZATION/DEMOBILIZATION			Unit =	LS	Takeoff Quan:	1.000	Engr Quan:		1.000
OPLDR	Operator, Loader	1.00	2.00 MH *	40.835	82					82
\$589.88		3.0000 MH/H	6.00 MH	[91.85]	224			366		590
1.0000 Units/Hr	294.9400 \$/CrewHr		0.2000 Shifts		111.80			183.15		294.94
970-61	Pothole Exploration			Quan:	1.00 S	Hrs/Shft:	8.00	Cal:	508	WC: NOUSE
4POTHOLE	Pothole / Softdig Sub	1.00	8.00 HR	300.000					2,400	2,400
\$2,400.00				[]					2,400	2,400
								2,400.00		2,400.00
151-02	Clean Up / Miscellaneous			Quan:	1.00 S	Hrs/Shft:	8.00	Cal:	508	WC: NOUSE
<u>MICU</u>	Clean Up / Miscellaneous		24.00 CH	Prod:	3.0000 S	Lab Pcs:	4.00	Eqp Pcs:		3.00
7SWEEP	Sweeping Services	1.00	8.00 HR	110.000		880				880
8LDGT	JD210 / Case 570 Ganno	1.00	24.00 HR	38.500				924		924
8TKPU	Foreman pickup	1.00	24.00 HR	14.250				342		342
8WTK4	4,000 gal Water Truck	1.00	24.00 HR	55.000				1,320		1,320
LACMN	Laborer, Common	1.00	24.00 MH *	27.385	657					657
OPGEN	Operator, General	1.00	24.00 MH *	34.992	840					840
OPWT	Operator, Water Truck	1.00	24.00 MH *	34.079	818					818
ZFM1	General Foreman	1.00	24.00 MH *	48.398	1,162					1,162
\$6,942.48		96.0000 MH/S	96.00 MH	[2826]	3,476		880	2,586		6,942
0.0417 Units/Hr	252.6033 \$/CrewHr		3.0000 Shifts *		3,476.48		880.00	2,586.00		6,942.48
====> Item Totals:	300		- MOBILIZATION/DEMOBILIZATION							
\$100,137.20	984.0000 MH/LS		984.00 MH	[27495.7]	33,502		6,316	57,919	2,400	100,137
100,137.200	1 LS				33,501.98		6,316.00	57,919.22	2,400.00	100,137.20
BID ITEM = 400			CLIENT# = 2	Land Item	SCHEDULE: 1	100				
Description =	PROJECT SURVEY			Unit =	LS	Takeoff Quan:	1.000	Engr Quan:		1.000
970-46	PROJECT SURVEY			Quan:	1.00 LS	Hrs/Shft:	10.00	Cal:	510	WC: NOUSE
7SURVEY	Survey Sub	1.00	1.00 LS	35,000.000			35,000			35,000
\$35,000.00				[]			35,000			35,000
							35,000.00			35,000.00
====> Item Totals:	400		- PROJECT SURVEY							
\$35,000.00				[]			35,000			35,000
35,000.000	1 LS						35,000.00			35,000.00
BID ITEM = 500			CLIENT# = 3	Land Item	SCHEDULE: 1	100				
Description =	AZPDES/SWPPP			Unit =	LS	Takeoff Quan:	1.000	Engr Quan:		1.000
120-00	Air Quality/Dust Control Permit			Quan:	1.00 LS	Hrs/Shft:	10.00	Cal:	510	WC: NOUSE
6DUST	Dust Control Permit	1.00	1.00 LS	3,855.000			3,855			3,855
\$3,855.00				[]			3,855			3,855
							3,855.00			3,855.00
120-02	NOI Permit			Quan:	1.00 LS	Hrs/Shft:	10.00	Cal:	510	WC: NOUSE
6NOICG	Construction General - NOI	1.00	1.00 EA	350.000			350			350
\$350.00				[]			350			350

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Cost Report

Activity Resource	Desc	Quantity Pcs	Unit	Unit Cost	Perm Labor	Constr Matl/Exp	Equip Ment	Sub-Contract	Total
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BID ITEM = 500 CLIENT# = 3 Land Item SCHEDULE: 1 100
 Description = AZPDES/SWPPP Unit = LS Takeoff Quan: 1.000 Engr Quan: 1.000
 350.00 350.00

810-12 SWPPP Plans Quan: 1.00 LS Hrs/Shft: 10.00 Cal: 510 WC: NOUSE
 8TKPUPE ==> Project Engineer Picku 1.00 40.00 HR 14.250 570 **Unreviewed
 ZE10 ==> Project Engineer 1.00 40.00 MH * 49.960 1,998 1,998
 \$2,568.40 40.0000 MH/LS 40.00 MH [1998.4] 1,998 570 2,568
 1,998.40 570.00 2,568.40

810-16 SWPPP Inspections Etc. Quan: 3.00 MOS Hrs/Shft: 10.00 Cal: 510 WC: NOUSE
 4SWPPP SWPPP Inspections 1.00 3.00 MO 417.500 1,253 1,253
 \$1,252.50 [] 1,253 1,253
 417.50 417.50

====> **Item Totals: 500 - AZPDES/SWPPP**
 \$8,025.90 40.0000 MH/LS 40.00 MH [1998.4] 1,998 4,205 570 1,253 **8,026**
 8,025.90 1 LS 1,998.40 4,205.00 570.00 1,252.50 8,025.90

BID ITEM = 600 CLIENT# = 4 Land Item SCHEDULE: 1 100
 Description = TRAFFIC CONTROL Unit = LS Takeoff Quan: 1.000 Engr Quan: 1.000

701-00 Traffic Control - Sign Allowance Quan: 1.00 LS Hrs/Shft: 10.00 Cal: 510 WC: NOUSE
 7TRAFFIC Traffic Control Sub 1.00 1.00 LS 5,000.000 5,000 5,000
 \$5,000.00 [] 5,000 5,000
 5,000.00 5,000.00 5,000.00

====> **Item Totals: 600 - TRAFFIC CONTROL**
 \$5,000.00 [] 5,000 **5,000**
 5,000.00 1 LS 5,000.00 5,000.00

BID ITEM = 700 CLIENT# = 5 Land Item SCHEDULE: 1 100
 Description = EXCAVATE, HAUL & STOCKPILE TO NORTH CELL Unit = CY Takeoff Quan: 353,725.000 Engr Quan: 353,725.000

203-00-54 Top Half of Cut Quan: 176,863.00 CY Hrs/Shft: 10.00 Cal: 510 WC: NOUSE
 **Unreviewed

FPC = 5.5
 50 / 5.5 = 9 rnds/hour
 9*21*8 scrapers = 1512 cy per hour
 8*21*8 = 1344

Item	Desc	Quantity	Unit	Unit Cost	Prod	Lab Pes	Equip Pcs	Total
EXS378	(Mod) Excavation Scraper 637-8	131.59	CH	108.500	1,344.0000 UH	17.00	17.00	17.00
8DZ06	Cat D6/D6T/D6R2 Dozer	1.00	HR	108.500		14,278	14,278	14,278
8DZ09	Cat D9T Dozer (405 hp)	1.00	HR	225.000		29,608	29,608	29,608
8MG14	Cat 14 Motorgrader	2.00	HR	110.500		29,082	29,082	29,082
8SC637	Cat 637 Scraper	8.00	HR	260.000		273,718	273,718	273,718
8WP08K	8000 GAL WATER PULL	3.00	HR	123.000		48,558	48,558	48,558
8YGATOR	UTV Gator / Kubota	2.00	HR	6.000		1,579	1,579	1,579
LAGCK	Laborer, Grade Checker	2.00	MH *	41.838	11,011			11,011
OPBLD	Operator, Finish Motorgrad	2.00	MH *	49.536	13,037			13,037
OPDZR	Operator, Dozer	2.00	MH *	42.172	11,099			11,099
OPSCR	Operator, Scraper	8.00	MH *	40.834	42,988			42,988
OPWP	Operator, Waterpull	3.00	MH *	39.495	15,592			15,592
\$490,550.30	0.0126 MH/CY	2,237.11	MH	[0.435]	93,728	396,822		490,550

Cost Report

Activity Resource	Desc	Quantity Pcs	Unit	Unit Cost	Perm Labor	Constr Material	Equip Matl/Exp	Sub-Contract	Total
BID ITEM = 700 CLIENT# = 5 Land Item SCHEDULE: 1 100									
Description = EXCAVATE, HAUL & STOCKPILE TO NORTH CELL Unit = CY Takeoff Quan: 353,725.000 Engr Quan: 353,725.000									
1,344.0459	Units/Hr	* 3,727.8691	\$/CrewHr	13.1590	Shifts	0.53	2.24		2.77
203-00-54A Bottom Half of Cut Quan: 176,862.00 CY Hrs/Shft: 10.00 Cal: 510 WC: NOUSE **Unreviewed									
FPC = 6.6 50 / 6.6 = 7.5 rnds/hour 7.5*21*8 scrapers = 1260 cy per hour									
<u>EXS378</u>	(Mod) Excavation Scraper 637-8	140.36	CH	Prod: 1,260.0006	UH	Lab Pcs: 17.00	Eqp Pcs: 17.00		
8DZ06	Cat D6/D6T/D6R2 Dozer	1.00	140.37	HR	108.500		15,230		15,230
8DZ09	Cat D9T Dozer (405 hp)	1.00	140.37	HR	225.000		31,583		31,583
8MG14	Cat 14 Motorgrader	2.00	280.73	HR	110.500		31,021		31,021
8SC637	Cat 637 Scraper	8.00	1,122.93	HR	260.000		291,962		291,962
8WP08K	8000 GAL WATER PULL	3.00	421.10	HR	123.000		51,795		51,795
8YGATOR	UTV Gator / Kubota	2.00	280.73	HR	6.000		1,684		1,684
LAGCK	Laborer, Grade Checker	2.00	280.73	MH *	41.838	11,745			11,745
OPBLD	Operator, Finish Motorgrad	2.00	280.73	MH *	49.536	13,906			13,906
OPDZR	Operator, Dozer	2.00	280.73	MH *	42.173	11,839			11,839
OPSCR	Operator, Scraper	8.00	1,122.93	MH *	40.834	45,853			45,853
OPWP	Operator, Waterpull	3.00	421.10	MH *	39.495	16,631			16,631
\$523,250.61	0.0134 MH/CY		2,386.22	MH	[0.464]	99,975	423,275		523,251
1,260.0598	Units/Hr	* 3,727.9183	\$/CrewHr	14.0360	Shifts	0.57	2.39		2.96
205-04 Finish Temporary Basins Quan: 5,554.00 SY Hrs/Shft: 10.00 Cal: 510 WC: NOUSE **Unreviewed									
<u>FIN140</u>	Finish Grade	10.00	CH	Prod: 555.4000	UH	Lab Pcs: 4.00	Eqp Pcs: 4.00		
8MG150	Cat 150 Motorgrader (I)	1.00	10.00	HR	97.000		970		970
8SC623	Cat 623 Scraper	1.00	10.00	HR	149.000		1,490		1,490
8WP08K	8000 GAL WATER PULL	1.00	10.00	HR	123.000		1,230		1,230
8YGATOR	UTV Gator / Kubota	1.00	10.00	HR	6.000		60		60
LAGCK	Laborer, Grade Checker	1.00	10.00	MH *	41.838	418			418
OPBLD	Operator, Finish Motorgrad	1.00	10.00	MH *	49.536	495			495
OPSCR	Operator, Scraper	1.00	10.00	MH *	40.834	408			408
OPWP	Operator, Waterpull	1.00	10.00	MH *	39.495	395			395
\$5,467.03	0.0072 MH/SY		40.00	MH	[0.254]	1,717	3,750		5,467
555.4000	Units/Hr	* 546.7030	\$/CrewHr	1.0000	Shifts	0.31	0.68		0.98
205-04A Finish Areas around basins Quan: 3,467.00 SY Hrs/Shft: 10.00 Cal: 510 WC: NOUSE **Unreviewed									
<u>FIN140</u>	Finish Grade	5.00	CH	Prod: 693.4000	UH	Lab Pcs: 4.00	Eqp Pcs: 4.00		
8MG150	Cat 150 Motorgrader (I)	1.00	5.00	HR	97.000		485		485
8SC623	Cat 623 Scraper	1.00	5.00	HR	149.000		745		745
8WP08K	8000 GAL WATER PULL	1.00	5.00	HR	123.000		615		615
8YGATOR	UTV Gator / Kubota	1.00	5.00	HR	6.000		30		30
LAGCK	Laborer, Grade Checker	1.00	5.00	MH *	41.838	209			209
OPBLD	Operator, Finish Motorgrad	1.00	5.00	MH *	49.536	248			248
OPSCR	Operator, Scraper	1.00	5.00	MH *	40.834	204			204
OPWP	Operator, Waterpull	1.00	5.00	MH *	39.494	197			197
\$2,733.50	0.0057 MH/SY		20.00	MH	[0.203]	859	1,875		2,734
693.4000	Units/Hr	* 546.7000	\$/CrewHr	0.5000	Shifts	0.25	0.54		0.79
205-05 Trackwalk Slopes Quan: 15,375.00 SY Hrs/Shft: 10.00 Cal: 510 WC: NOUSE **Unreviewed									
<u>FINTW</u>	Trackwalk Slopes	20.00	CH	Prod: 768.7500	UH	Lab Pcs: 1.00	Eqp Pcs: 1.00		
8DZ06	Cat D6/D6T/D6R2 Dozer	1.00	20.00	HR	108.500		2,170		2,170
OPDZR	Operator, Dozer	1.00	20.00	MH *	42.173	843			843
\$3,013.45	0.0013 MH/SY		20.00	MH	[0.045]	843	2,170		3,013
768.7500	Units/Hr	* 150.6725	\$/CrewHr	2.0000	Shifts	0.05	0.14		0.20
Item Totals: 700 - EXCAVATE, HAUL & STOCKPILE TO NORTH CELL									

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Cost Report

Activity Resource	Desc	Quantity Pcs	Unit	Unit Cost	Perm Labor	Constr Material	Equip Matl/Exp	Sub-Contract	Total
BID ITEM = 700		CLIENT# = 5	Land Item	SCHEDULE: 1	100				
Description =	EXCAVATE, HAUL & STOCKPILE TO NORTH CELL		Unit =	CY	Takeoff Quan:	353,725.000	Engr Quan:	353,725.000	
\$1,025,014.89	0.0132 MH/CY	4,703.33 MH		[0.458]	197,122		827,893		1,025,015
2.898	353725 CY				0.56		2.34		2.90

BID ITEM = 800		CLIENT# = 6	Land Item	SCHEDULE: 1	100				
Description =	EXCAVATE, HAUL & STOCKPILE TO SOUTH CELL		Unit =	CY	Takeoff Quan:	74,618.000	Engr Quan:	74,618.000	

203-00-52 Excavation Scraper 637-4 Quan: 74,618.00 CY Hrs/Shft: 10.00 Cal: 510 WC: NOUSE

**Unreviewed

FPC =12.3
 50/12.3 = 4 rnds per hour
 4x4x21 = 336

<u>EXS374</u>	(Mod) Excavation Scraper 637-4	270.00	CH	Prod: 276.3630 UH	Lab Pcs:	10.00	Eqp Pcs:	10.00
8MG14	Cat 14 Motorgrader	2.00	540.00 HR	110.500		59,670	59,670	
8SC637	Cat 637 Scraper	4.00	1,080.00 HR	260.000		280,800	280,800	
8WP08K	8000 GAL WATER PULL	2.00	540.00 HR	123.000		66,420	66,420	
8YGATOR	UTV Gator / Kubota	2.00	540.00 HR	6.000		3,240	3,240	
LAGCK	Laborer, Grade Checker	2.00	540.00 MH *	41.838	22,592		22,592	
OPBLD	Operator, Finish Motorgrad	2.00	540.00 MH *	49.536	26,749		26,749	
OPSCR	Operator, Scraper	4.00	1,080.00 MH *	40.834	44,100		44,100	
OPWP	Operator, Waterpull	2.00	540.00 MH *	39.495	21,327		21,327	
\$524,899.48	0.0361 MH/CY	2,700.00 MH		[1.264]	114,769	410,130	524,899	
276.3630	Units/Hr * 1,944.0721 \$/CrewHr	27.0000	Shifts		1.54	5.50	7.03	

205-05 Trackwalk Slopes Quan: 8,812.00 SY Hrs/Shft: 10.00 Cal: 510 WC: NOUSE

**Unreviewed

<u>FINTW</u>	Trackwalk Slopes	20.00	CH	Prod: 440.6000 UH	Lab Pcs:	1.00	Eqp Pcs:	1.00
8DZ06	Cat D6/D6T/D6R2 Dozer	1.00	20.00 HR	108.500		2,170	2,170	
OPDZR	Operator, Dozer	1.00	20.00 MH *	42.173	843		843	
\$3,013.45	0.0022 MH/SY	20.00 MH		[0.079]	843	2,170	3,013	
440.6000	Units/Hr * 150.6725 \$/CrewHr	2.0000	Shifts		0.10	0.25	0.34	

====> **Item Totals: 800 - EXCAVATE, HAUL & STOCKPILE TO SOUTH CELL**

\$527,912.93	0.0364 MH/CY	2,720.00 MH		[1.273]	115,613	412,300	527,913
7.075	74618 CY				1.55	5.53	7.07

BID ITEM = 1000		CLIENT# = 7	Land Item	SCHEDULE: 1	100				
Description =	GENERAL FILL FOR HAUL ROADS		Unit =	CY	Takeoff Quan:	46,292.000	Engr Quan:	46,292.000	

203-00-21 Excavation Scraper 623-1 Quan: 2,580.00 CY Hrs/Shft: 10.00 Cal: 510 WC: NOUSE

**Unreviewed

<u>EXS231</u>	(Mod) Excavation Scraper 623-1	30.00	CH	Prod: 86.0000 UH	Lab Pcs:	5.00	Eqp Pcs:	5.00
8DZ06	Cat D6/D6T/D6R2 Dozer	1.00	30.00 HR	108.500		3,255	3,255	
8MG150	Cat 150 Motorgrader (I)	1.00	30.00 HR	97.000		2,910	2,910	
8SC623	Cat 623 Scraper	1.00	30.00 HR	149.000		4,470	4,470	
8WP08K	8000 GAL WATER PULL	1.00	30.00 HR	123.000		3,690	3,690	
8YGATOR	UTV Gator / Kubota	1.00	30.00 HR	6.000		180	180	
LAGCK	Laborer, Grade Checker	1.00	30.00 MH *	41.838	1,255		1,255	
OPBLD	Operator, Finish Motorgrad	1.00	30.00 MH *	49.536	1,486		1,486	
OPDZR	Operator, Dozer	1.00	30.00 MH *	42.173	1,265		1,265	
OPSCR	Operator, Scraper	1.00	30.00 MH *	40.834	1,225		1,225	
OPWP	Operator, Waterpull	1.00	30.00 MH *	39.495	1,185		1,185	
\$20,921.25	0.0581 MH/CY	150.00 MH		[2.043]	6,416	14,505	20,921	
86.0000	Units/Hr * 697.3750 \$/CrewHr	3.0000	Shifts		2.49	5.62	8.11	

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Activity Resource	Desc	Pcs	Quantity Unit	Unit Cost	Perm Labor	Constr Material	Equip Matl/Exp	Sub-Contract	Total
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BID ITEM = 1000 CLIENT# = 7 Land Item SCHEDULE: 1 100
 Description = GENERAL FILL FOR HAUL ROADS Unit = CY Takeoff Quan: 46,292.000 Engr Quan: 46,292.000

203-00-52 Excavation Scraper 637-4 Quan: 43,712.00 CY Hrs/Shft: 10.00 Cal: 510 WC: NOUSE

**Unreviewed

10 rnds/hour @ 21 = 210/hour/scraper

<u>EXS374</u>	(Mod) Excavation Scraper 637-4		52.03 CH	Prod: 840.0000 UH	Lab Pcs:	13.00	Eqp Pcs:	13.00	
8DZ06	Cat D6/D6T/D6R2 Dozer	1.00	52.04 HR	108.500			5,646	5,646	
8DZ09	Cat D9T Dozer (405 hp)	1.00	52.04 HR	225.000			11,709	11,709	
8MG14	Cat 14 Motorgrader	2.00	104.08 HR	110.500			11,501	11,501	
8RCVS	Cat CS54 Vib Steel Rol	1.00	52.04 HR	47.466			2,580	2,580	
8SC637	Cat 637 Scraper	4.00	208.15 HR	260.000			54,119	54,119	
8WP08K	8000 GAL WATER PULL	2.00	104.08 HR	123.000			12,802	12,802	
8YGATOR	UTV Gator / Kubota	2.00	104.08 HR	6.000			624	624	
LAGCK	Laborer, Grade Checker	2.00	104.08 MH *	41.838	4,354			4,354	
OPBLD	Operator, Finish Motorgrad	2.00	104.08 MH *	49.536	5,156			5,156	
OPDZR	Operator, Dozer	2.00	104.08 MH *	42.172	4,389			4,389	
OPGEN	Operator, General	1.00	52.04 MH *	38.491	2,003			2,003	
OPSCR	Operator, Scraper	4.00	208.15 MH *	40.834	8,500			8,500	
OPWP	Operator, Waterpull	2.00	104.08 MH *	39.495	4,111			4,111	
\$127,494.23	0.0154 MH/CY		676.51 MH	[0.536]	28,513		98,982	127,494	
840.1307 Units/Hr	* 2,450.3984 \$/CrewHr		5.2030 Shifts		0.65		2.26	2.92	

203-30 O.G. Compaction Quan: 22,823.00 SY Hrs/Shft: 10.00 Cal: 510 WC: NOUSE

**Unreviewed

<u>GPOGC</u>	OG Compact		30.00 CH	Prod: 760.7667 UH	Lab Pcs:	2.00	Eqp Pcs:	2.00	
8MG14	Cat 14 Motorgrader	1.00	30.00 HR	110.500			3,315	3,315	
8WP08K	8000 GAL WATER PULL	1.00	30.00 HR	123.000			3,690	3,690	
OPBLD	Operator, Finish Motorgrad	1.00	30.00 MH *	49.536	1,486			1,486	
OPWP	Operator, Waterpull	1.00	30.00 MH *	39.495	1,185			1,185	
\$9,675.93	0.0026 MH/SY		60.00 MH	[0.096]	2,671		7,005	9,676	
760.7667 Units/Hr	* 322.5310 \$/CrewHr		3.0000 Shifts		0.12		0.31	0.42	

205-00 Rough Finish Quan: 23,551.00 SY Hrs/Shft: 10.00 Cal: 510 WC: NOUSE

**Unreviewed

<u>FIN140</u>	Finish Grade		30.00 CH	Prod: 785.0333 UH	Lab Pcs:	4.00	Eqp Pcs:	4.00	
8MG150	Cat 150 Motorgrader (I)	1.00	30.00 HR	97.000			2,910	2,910	
8SC623	Cat 623 Scraper	1.00	30.00 HR	149.000			4,470	4,470	
8WP08K	8000 GAL WATER PULL	1.00	30.00 HR	123.000			3,690	3,690	
8YGATOR	UTV Gator / Kubota	1.00	30.00 HR	6.000			180	180	
LAGCK	Laborer, Grade Checker	1.00	30.00 MH *	41.838	1,255			1,255	
OPBLD	Operator, Finish Motorgrad	1.00	30.00 MH *	49.536	1,486			1,486	
OPSCR	Operator, Scraper	1.00	30.00 MH *	40.834	1,225			1,225	
OPWP	Operator, Waterpull	1.00	30.00 MH *	39.495	1,185			1,185	
\$16,401.07	0.0050 MH/SY		120.00 MH	[0.18]	5,151		11,250	16,401	
785.0333 Units/Hr	* 546.7023 \$/CrewHr		3.0000 Shifts		0.22		0.48	0.70	

====> Item Totals: 1000 - GENERAL FILL FOR HAUL ROADS

\$174,492.48	0.0217 MH/CY		1,006.51 MH	[0.759]	42,751		131,742	174,492	
3.769	46292 CY				0.92		2.85	3.77	

BID ITEM = 1100 CLIENT# = 8 Land Item SCHEDULE: 1 100
 Description = HAUL, PLACE & MAINTAIN AC MILLINGS Unit = SF Takeoff Quan: 189,630.000 Engr Quan: 189,630.000

203-00-22 Place Millings Quan: 3,612.00 CY Hrs/Shft: 10.00 Cal: 510 WC: NOUSE

**Unreviewed

<u>EXS232</u>	(Mod) Excavation Scraper 623-2		20.00 CH	Prod: 180.6000 UH	Lab Pcs:	6.00	Eqp Pcs:	6.00	
8MG150	Cat 150 Motorgrader (I)	1.00	20.00 HR	97.000			1,940	1,940	

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 GLENDALE2A GLENDALE LANDFILL CMAR PHASE 2A
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Cost Report

Activity Resource	Desc	Quantity Pcs	Unit	Unit Cost	Perm Labor	Constr Material	Equip Matl/Exp	Sub-Contract	Total
BID ITEM = 1100									
Description =		HAUL, PLACE & MAINTAIN AC MILLINGS							
CLIENT# = 8									
Land Item									
SCHEDULE: 1 100									
Unit = SF									
Takeoff Quan:					189,630.000				
Engr Quan:							189,630.000		
8RCVS	Cat CS54 Vib Steel Rol	1.00	20.00 HR	47.466			992		992
8SC623	Cat 623 Scraper	2.00	40.00 HR	149.000			5,960		5,960
8WP08K	8000 GAL WATER PULL	1.00	20.00 HR	123.000			2,460		2,460
8YGATOR	UTV Gator / Kubota	1.00	20.00 HR	6.000			120		120
LAGCK	Laborer, Grade Checker	1.00	20.00 MH *	41.838	837				837
OPBLD	Operator, Finish Motorgrad	1.00	20.00 MH *	49.536	991				991
OPGEN	Operator, General	1.00	20.00 MH *	38.491	770				770
OPSCR	Operator, Scraper	2.00	40.00 MH *	40.834	1,633				1,633
OPWP	Operator, Waterpull	1.00	20.00 MH *	39.495	790				790
\$16,492.10	0.0332 MH/CY		120.00 MH	[1.142]	5,021		11,472		16,492
180.6000	Units/Hr * 824.6050 \$/CrewHr		2.0000 Shifts		1.39		3.18		4.57

303-00 Finish Subgrade **Quan: 21,070.00 SY Hrs/Shft: 10.00 Cal: 510 WC: NOUSE**

**Unreviewed									
<u>FINRS</u>	(Mod) Restore Street Subgrade		30.00 CH	Prod:	702.3330 UH	Lab Pcs:	5.00	Eqp Pcs:	4.00
8MG150	Cat 150 Motorgrader (I	1.00	30.00 HR	97.000			2,910		2,910
8RCVS	Cat CS54 Vib Steel Rol	1.00	30.00 HR	47.466			1,487		1,487
8SC623	Cat 623 Scraper	1.00	30.00 HR	149.000			4,470		4,470
8WTK4	4,000 gal Water Truck	1.00	30.00 HR	55.000			1,650		1,650
LACMN	Laborer, Common	1.00	30.00 MH *	30.123	904				904
OPBLD	Operator, Finish Motorgrad	1.00	30.00 MH *	49.536	1,486				1,486
OPGEN	Operator, General	1.00	30.00 MH *	38.491	1,155				1,155
OPSCR	Operator, Scraper	1.00	30.00 MH *	40.834	1,225				1,225
OPWT	Operator, Water Truck	1.00	30.00 MH *	37.487	1,125				1,125
\$16,411.44	0.0071 MH/SY		150.00 MH	[0.23]	5,894		10,517		16,411
702.3333	Units/Hr * 547.0480 \$/CrewHr		3.0000 Shifts		0.28		0.50		0.78

303-20 Finish ABC **Quan: 21,070.00 SY Hrs/Shft: 10.00 Cal: 510 WC: NOUSE**

**Unreviewed									
<u>FINABC</u>	(Mod) Finish Grade ABC		30.00 CH	Prod:	702.3333 UH	Lab Pcs:	7.00	Eqp Pcs:	4.00
8MG150	Cat 150 Motorgrader (I	1.00	30.00 HR	97.000			2,910		2,910
8RCVS	Cat CS54 Vib Steel Rol	1.00	30.00 HR	47.466			1,487		1,487
8SC623	Cat 623 Scraper	1.00	30.00 HR	149.000			4,470		4,470
8WTK4	4,000 gal Water Truck	1.00	30.00 HR	55.000			1,650		1,650
LACMN	Laborer, Common	2.00	60.00 MH *	30.123	1,807				1,807
LAGCK	Laborer, Grade Checker	1.00	30.00 MH *	41.838	1,255				1,255
OPBLD	Operator, Finish Motorgrad	1.00	30.00 MH *	49.536	1,486				1,486
OPGEN	Operator, General	1.00	30.00 MH *	38.491	1,155				1,155
OPSCR	Operator, Scraper	1.00	30.00 MH *	40.834	1,225				1,225
OPWT	Operator, Water Truck	1.00	30.00 MH *	37.487	1,125				1,125
\$18,570.26	0.0099 MH/SY		210.00 MH	[0.314]	8,053		10,517		18,570
702.3333	Units/Hr * 619.0087 \$/CrewHr		3.0000 Shifts		0.38		0.50		0.88

404 BITUMINOUS TREATMENTS **Quan: 21,070.00 SY Hrs/Shft: 10.00 Cal: 510 WC: NOUSE**

**Unreviewed									
4TACK	Tack Coat	1.00	21,070.00 SY	1.020				21,491	21,491
\$21,491.40				[]				21,491	21,491
							1.02		1.02

=====> Item Totals:	1100	- HAUL, PLACE & MAINTAIN AC MILLINGS							
\$72,965.20	0.0025 MH/SF		480.00 MH	[0.082]	18,968		32,506	21,491	72,965
0.385	189630 SF				0.10		0.17	0.11	0.38

BID ITEM = 1200									
Description =		SAFETY BARRIERS							
CLIENT# = 9									
Land Item									
SCHEDULE: 1 100									
Unit = LF									
Takeoff Quan:					1,860.000				
Engr Quan:							1,860.000		

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Cost Report

Activity Resource	Desc	Quantity Pcs	Unit	Unit Cost	Perm Labor	Constr Material	Equip Matl/Exp	Sub-Contract	Total
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BID ITEM = 1200 CLIENT# = 9 Land Item SCHEDULE: 1 100
 Description = SAFETY BARRIERS Unit = LF Takeoff Quan: 1,860.000 Engr Quan: 1,860.000

970-12 SAFETY BARRIERS **Quan: 1,860.00 LF Hrs/Shft: 10.00 Cal: 510 WC: NOUSE**

**Unreviewed

[[Crew Notes: ***Copied***]]

<u>LA-FAB</u>	(Mod) Filter Fabric Install	20.00	CH	Prod: 93.0000 UH	Lab Pcs: 4.00	Eqp Pcs: 1.00			
4BAR	Barricade Sub	1.00	1,860.00 LF	65.000		120,900	120,900		
8TKPU	Foreman pickup	1.00	20.00 HR	14.250		285	285		
LACMN	Laborer, Common	3.00	60.00 MH *	30.123	1,807		1,807		
ZFM1	General Foreman	1.00	20.00 MH *	38.719	774		774		
\$123,766.76		0.0430 MH/LF	80.00 MH	[1.13]	2,582	285	120,900	123,767	
93.0000 Units/Hr *	143.3380 \$/CrewHr	2.0000 Shifts			1.39	0.15	65.00	66.54	

=====> Item Totals: 1200 - SAFETY BARRIERS

\$123,766.76	0.0430 MH/LF	80.00 MH	[1.13]	2,582		285	120,900	123,767	
66.541	1860 LF			1.39		0.15	65.00	66.54	

BID ITEM = 1300 CLIENT# = 10 Land Item SCHEDULE: 1 100
 Description = RIPRAP V-DITCH Unit = LF Takeoff Quan: 2,731.000 Engr Quan: 2,731.000

913-01 Purchase Rip Rap Materials **Quan: 1,002.00 TN Hrs/Shft: 10.00 Cal: 510 WC: NOUSE**

**Unreviewed

2ARD506	Rip Rap, D50=6"	1.00	1,002.00 TN	33.850		33,918	33,918		
2GF8OZ	8 oz Non-Woven Geofabric	1.00	4,000.00 SY	1.250		5,000	5,000		
\$38,917.70				[]		38,918	38,918		
						38.84	38.84		

913-03-02 Install Loose Rip Rap 420 **Quan: 607.00 CY Hrs/Shft: 10.00 Cal: 510 WC: NOUSE**

**Unreviewed

<u>RR420</u>	(Mod) Rip Rap 420/950/Gannon	50.00	CH	Prod: 12.1400 UH	Lab Pcs: 6.00	Eqp Pcs: 3.00			
8EX325	Cat 325 Excavator (57,	1.00	50.00 HR	67.500		3,375	3,375		
8LD950	Cat 950 Wheel Loader (	1.00	50.00 HR	73.500		3,675	3,675		
8WTK4	4,000 gal Water Truck	1.00	50.00 HR	55.000		2,750	2,750		
LACMN	Laborer, Common	3.00	150.00 MH *	30.123	4,518		4,518		
OPEXC	Operator, Excavator	1.00	50.00 MH *	41.503	2,075		2,075		
OPLDR	Operator, Loader	1.00	50.00 MH *	40.834	2,042		2,042		
OPWT	Operator, Water Truck	1.00	50.00 MH *	37.487	1,874		1,874		
\$20,309.66		0.4942 MH/CY	300.00 MH	[14.226]	10,510	9,800	20,310		
12.1400 Units/Hr *	406.1932 \$/CrewHr	5.0000 Shifts			17.31	16.14	33.46		

913-05-15 Excavate Rip Rap Pocket - 320 **Quan: 1,214.00 CY Hrs/Shft: 10.00 Cal: 510 WC: NOUSE**

**Unreviewed

<u>EXE325</u>	(Mod) Excavation Excavator 325	50.00	CH	Prod: 24.2800 UH	Lab Pcs: 3.33	Eqp Pcs: 3.33			
8EX325	Cat 325 Excavator (57,	1.00	50.00 HR	67.500		3,375	3,375		
8SC623	Cat 623 Scraper	0.33	16.50 HR	149.000		2,458	2,458		
8WTK4	4,000 gal Water Truck	1.00	50.00 HR	55.000		2,750	2,750		
8YGATOR	UTV Gator / Kubota	1.00	50.00 HR	6.000		300	300		
LAGCK	Laborer, Grade Checker	1.00	50.00 MH *	41.838	2,092		2,092		
OPEXC	Operator, Excavator	1.00	50.00 MH *	41.503	2,075		2,075		
OPSCR	Operator, Scraper	0.33	16.50 MH *	40.834	674		674		
OPWT	Operator, Water Truck	1.00	50.00 MH *	37.487	1,874		1,874		
\$15,598.63		0.1371 MH/CY	166.50 MH	[4.545]	6,715	8,883	15,599		
24.2800 Units/Hr *	311.9726 \$/CrewHr	5.0000 Shifts			5.53	7.32	12.85		

=====> Item Totals: 1300 - RIPRAP V-DITCH

\$74,825.99	0.1708 MH/LF	466.50 MH	[5.182]	17,225	38,918	18,683	74,826		
27.399	2731 LF			6.31	14.25	6.84	27.40		

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Activity Resource	Desc	Quantity Pcs	Unit	Unit Cost	Perm Labor	Constr Material	Equip Matl/Exp	Sub-Contract	Total
BID ITEM = 1400 CLIENT# = 11									
Description = RIPRAP SPLASH PAD Land Item Unit = EA SCHEDULE: 1 100 Takeoff Quan: 1.000 Engr Quan: 1.000									
913-01 Purchase Rip Rap Materials Quan: 68.00 TN Hrs/Shft: 10.00 Cal: 510 WC: NOUSE									
**Unreviewed									
2ARD506	Rip Rap, D50=6"	1.00	68.00 TN	33.850		2,302			2,302
2GF8OZ	8 oz Non-Woven Geofabric	1.00	500.00 SY	1.250		625			625
\$2,926.80				[]		2,927			2,927
						43.04			43.04
913-03-02 Install Loose Rip Rap 325 Quan: 41.00 CY Hrs/Shft: 10.00 Cal: 510 WC: NOUSE									
**Unreviewed									
RR420	(Mod) Rip Rap 420/950/Gannon		2.50 CH	Prod: 16.4000 UH	Lab Pcs:	6.00	Eqp Pcs:	3.00	3.00
8EX325	Cat 325 Excavator (57,	1.00	2.50 HR	67.500			169		169
8LD950	Cat 950 Wheel Loader (	1.00	2.50 HR	73.500			184		184
8WTK4	4,000 gal Water Truck	1.00	2.50 HR	55.000			137		137
LACMN	Laborer, Common	3.00	7.50 MH *	30.124	226				226
OPEXC	Operator, Excavator	1.00	2.50 MH *	41.504	104				104
OPLDR	Operator, Loader	1.00	2.50 MH *	40.836	102				102
OPWT	Operator, Water Truck	1.00	2.50 MH *	37.488	94				94
\$1,015.48	0.3658 MH/CY		15.00 MH	[10.531]	526		490		1,015
16.4000	Units/Hr * 406.1920 \$/CrewHr		0.2500 Shifts		12.82		11.95		24.77
913-05-15 Excavate Rip Rap Pocket - 320 Quan: 41.00 CY Hrs/Shft: 10.00 Cal: 510 WC: NOUSE									
**Unreviewed									
EXE325	(Mod) Excavation Excavator 325		2.50 CH	Prod: 16.4000 UH	Lab Pcs:	3.33	Eqp Pcs:	3.33	3.33
8EX325	Cat 325 Excavator (57,	1.00	2.50 HR	67.500			169		169
8SC623	Cat 623 Scraper	0.33	0.83 HR	149.000			124		124
8WTK4	4,000 gal Water Truck	1.00	2.50 HR	55.000			137		137
8YGATOR	UTV Gator / Kubota	1.00	2.50 HR	6.000			15		15
LAGCK	Laborer, Grade Checker	1.00	2.50 MH *	41.840	105				105
OPEXC	Operator, Excavator	1.00	2.50 MH *	41.504	104				104
OPSCR	Operator, Scraper	0.33	0.83 MH *	40.843	34				34
OPWT	Operator, Water Truck	1.00	2.50 MH *	37.488	94				94
\$780.85	0.2031 MH/CY		8.33 MH	[6.733]	336		445		781
16.4000	Units/Hr * 312.3400 \$/CrewHr		0.2500 Shifts		8.19		10.85		19.05
====>	Item Totals: 1400 - RIPRAP SPLASH PAD								
\$4,723.13	23.3300 MH/EA		23.33 MH	[707.8]	861	2,927	935		4,723
4,723.130	1 EA				861.48	2,926.80	934.85		4,723.13

BID ITEM = 1500 CLIENT# = 12									
Description = STORMWATER CROSSINGS Land Item Unit = EA SCHEDULE: 1 100 Takeoff Quan: 1.000 Engr Quan: 1.000									
501-12-00 12" CMP Ex/ Place/ Backfill Quan: 170.00 LF Hrs/Shft: 10.00 Cal: 510 WC: NOUSE									
**Unreviewed									
SDSM	(Mod) Pipe - Small Diameter		30.00 CH	Prod: 5.6667 UH	Lab Pcs:	7.00	Eqp Pcs:	6.00	6.00
8EX325	Cat 325 Excavator (57,	1.00	30.00 HR	67.500			2,025		2,025
8LD950	Cat 950 Wheel Loader (	1.00	30.00 HR	73.500			2,205		2,205
8RCHR	Walk Behin Hand roller	1.00	30.00 HR	28.250			899		899
8RCMX	Ramex	1.00	30.00 HR	12.000			360		360
8WTK4	4,000 gal Water Truck	1.00	30.00 HR	55.000			1,650		1,650
8YGATOR	UTV Gator / Kubota	1.00	30.00 HR	6.000			180		180
LACMN	Laborer, Common	3.00	90.00 MH *	30.123	2,711				2,711
LAGCK	Laborer, Grade Checker	1.00	30.00 MH *	41.838	1,255				1,255
OPEXC	Operator, Excavator	1.00	30.00 MH *	41.503	1,245				1,245
OPLDR	Operator, Loader	1.00	30.00 MH *	40.834	1,225				1,225
OPWT	Operator, Water Truck	1.00	30.00 MH *	37.487	1,125				1,125

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Cost Report

Activity Resource	Desc	Pcs	Quantity Unit	Unit Cost	Labor	Perm Material	Constr Matl/Exp	Equip Ment	Sub-Contract	Total
BID ITEM = 1500 CLIENT# = 12										
Description =	STORMWATER CROSSINGS		Land Item Unit =	SCHEDULE: 1 100	EA	Takeoff Quan:	1.000	Engr Quan:		1.000
\$14,880.39	1.2352 MH/LF		210.00 MH	[36.543]	7,561			7,319		14,880
5.6667 Units/Hr *	496.0130 \$/CrewHr		3.0000 Shifts		44.48			43.06		87.53
501-12-01 12" CMP Materials Quan: 170.00 LF Hrs/Shft: 10.00 Cal: 510 WC: NOUSE										
2ABED	Bedding Material	1.00	140.60 TN		20.000		2,812			2,812
2PM124	12 in. CMP Ga. #14	1.00	170.00 LF		22.700		3,859			3,859
2PM12BANDS	12 in. CMP Bands	1.00	8.00 EA		42.510		340			340
2PM12BEND	45 deg bend	1.00	2.00 EA		66.640		133			133
\$7,144.36				[]			7,144			7,144
							42.03			42.03
970-17 Headwall Quan: 1.00 EA Hrs/Shft: 10.00 Cal: 510 WC: NOUSE										
4COS	Concrete Structure Sub	1.00	1.00 EA		12,500.000					12,500
\$12,500.00				[]						12,500
								12,500.00		12,500.00
=====> Item Totals: 1500 - STORMWATER CROSSINGS										
\$34,524.75	210.0000 MH/EA		210.00 MH	[6212.25]	7,561	7,144		7,319	12,500	34,525
34,524.750	1 EA				7,560.92	7,144.36		7,319.47	12,500.00	34,524.75

BID ITEM = 1600 CLIENT# = 13										
Description =	RELOCATE ASPHALT MILLINGS		Land Item Unit =	SCHEDULE: 1 100	CY	Takeoff Quan:	9,507.000	Engr Quan:		9,507.000
203-00-21 Excavation Scraper 623-1 Quan: 9,507.00 CY Hrs/Shft: 10.00 Cal: 510 WC: NOUSE										
EXS231	(Mod) Excavation Scraper 623-1		30.00 CH		Prod: 316.9000 UH	Lab Pcs:	5.00	Eqp Pcs:		5.00
8MG150	Cat 150 Motorgrader (I	1.00	30.00 HR		97.000		2,910			2,910
8SC623	Cat 623 Scraper	2.00	60.00 HR		149.000		8,940			8,940
8WP08K	8000 GAL WATER PULL	1.00	30.00 HR		123.000		3,690			3,690
8YGATOR	UTV Gator / Kubota	1.00	30.00 HR		6.000		180			180
LAGCK	Laborer, Grade Checker	1.00	30.00 MH *		41.838	1,255				1,255
OPBLD	Operator, Finish Motorgrad	1.00	30.00 MH *		49.536	1,486				1,486
OPSCR	Operator, Scraper	2.00	60.00 MH *		40.834	2,450				2,450
OPWP	Operator, Waterpull	1.00	30.00 MH *		39.495	1,185				1,185
\$22,096.08	0.0157 MH/CY		150.00 MH	[0.551]	6,376		15,720			22,096
316.9000 Units/Hr *	736.5360 \$/CrewHr		3.0000 Shifts		0.67		1.65			2.32
=====> Item Totals: 1600 - RELOCATE ASPHALT MILLINGS										
\$22,096.08	0.0157 MH/CY		150.00 MH	[0.551]	6,376		15,720			22,096
2.324	9507 CY				0.67		1.65			2.32

PARENT ITEM = 10000
 Description = PROJECT INDIRECT COSTS Unit = LS Takeoff Quan: 1.000 Engr Quan: 1.000

Listing of Sub-Biditems of Parent Item 10000:

BID ITEM = 10010
 Description = TIME DEPENDENT Land Item Unit = MO SCHEDULE: 1 100 Takeoff Quan: 1.000 Engr Quan: 0.000

=====> **Item Totals: 10010 - TIME DEPENDENT**
 \$0.00 []

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Cost Report

Activity Resource	Desc	Pcs	Quantity Unit	Unit Cost	Labor	Perm Material	Constr Matl/Exp	Equip Ment	Sub-Contract	Total
BID ITEM = 10010			Land Item	SCHEDULE: 1		100				
Description =	TIME DEPENDENT		Unit =	MO	Takeoff Quan:		1.000	Engr Quan:		0.000
0.000	1 MO									

BID ITEM = 10020			Land Item	SCHEDULE: 1		100				
Description =	NON TIME DEPENDENT		Unit =	LS	Takeoff Quan:		1.000	Engr Quan:		0.000

=====> **Item Totals: 10020 - NON TIME DEPENDENT**
 \$0.00 []
 0.000 1 LS

Total of Above Sub-Biditems

=====> **Item Totals: 10000 - PROJECT INDIRECT COSTS**
 \$0.00 []
 0.000 1 LS

\$2,443,703.49 * Report Totals *** 12,848.67 MH 591,587 48,989 82,136 1,562,448 158,544 2,443,703**

>>> indicates Non Additive Activity

-----Report Notes:-----

The estimate was prepared with TAKEOFF Quantities.
 This report shows TAKEOFF Quantities with the resources.

'Unreviewed' Activities are marked.

Bid Date: 10/24/22 Owner: CITYOFGLENDALE Engineering Firm: TETRATECH
 Estimator-In-Charge:

JOB NOTES

[[Attached Files: CClass A Risk Classification 1.pdf, Class A Risk Classification 2.pdf, Class B Risk Classifications.pdf]]

Labor Rates Updated 05/24/2022 Labor Burden updated 04/05/2022 Equipment Rates Updated 07/12/2022

*****Estimate created on: 10/12/2021 by User#: 52 - Chad Bryce
 Source estimate used: J:\HCSS\HEAVYBID\MSTR_LIBEST\MASTEREST18

*****Estimate created on: 10/18/2022 by User#: 103 - Mike Claflin
 Source estimate used: J:\HCSS\HEAVYBID\MSTR_LIBEST\MASTEREST22

* on units of MH indicate average labor unit cost was used rather than base rate.

[] in the Unit Cost Column = Labor Unit Cost Without Labor Burdens

In equipment resources, rent % and EOE % not = 100% are represented as XXX%YYY where XXX=Rent% and YYY=EOE%

-----Calendar Codes-----

- 410 4 X 10 HR WEEK NO OT
- 508 5 X 8 HR WEEK
- 509 5 X 9 HR WEEK
- 510 5 x 10 HR WEEK (Default Calendar)**
- 5E8 5 X 8 (Pay 9 - Work 8)
- 608 6 X 8 HR WEEK
- 610 6 X 10 HR WEEK

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Cost Report

Activity	Desc	Quantity	Unit	Unit	Perm	Constr	Equip	Sub-	Total
Resource		Pcs	Unit	Cost	Labor	Material	Matl/Exp	Ment	Contract
<hr/>									
BID ITEM	=	10020							
Description =	NON TIME DEPENDENT		Land Item	SCHEDULE:	1	100			
6E8	6 X 8 (Pay 9 - Work 8)		Unit =	LS	Takeoff Quan:	1.000	Engr Quan:		0.000

EXHIBIT E

Construction Documents necessary to define Scope of Work and Deliverables for the Construction Phase Services, including plans, designs, drawings, specifications and other required Contract Documents

(156 pages - To be Incorporated by Amendment)

CONSTRUCTION SPECIFICATIONS

CITY OF GLENDALE

GLENDALE LANDFILL

NORTH CELL PHASE 2A EXCAVATION,

HAUL, AND STOCKPILE PROJECT

GLENDALE, ARIZONA

PROJECT NO. 2023-0128-228

OCTOBER 2022



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SECTION A01010
SUMMARY OF WORK

1.0 GENERAL

1.01 BRIEF PROJECT DESCRIPTION

- A. The Glendale Landfill (Site) is located within the City of Glendale (OWNER), Arizona to the west of Phoenix. The Site address is 11480 W. Glendale Avenue, Glendale, Arizona, 85307, Maricopa County. Access to the Site is as follows: from Phoenix take I-10 west to the Loop 101, north on the Loop 101 to Glendale Avenue, and west on Glendale Avenue to the Glendale Landfill.
- B. General: Work included in the contract primarily consists of the excavation, hauling and stockpiling of soil from the Site's north cell. The CONTRACTOR will be required to stockpile the soil for future use. The Work is detailed in these Specifications and on the Contract Drawings included herein.
- C. Principal Features:
1. Mobilization and demobilization of equipment, labor, and construction of any temporary facilities that may be required;
 2. Moisture condition the area to be excavated;
 3. Excavate the soil in a systematic manner;
 4. Backfill and compact soil on all exposed North Cell slopes to the grades shown on the Contract Drawings.
 5. Haul soil to two specific stockpile locations as depicted on the Contract Drawings. All hauling of excavated material shall be confined to the site, and shall not take place on public roads; and
 6. Maintain haul roads and provide dust control.
- D. The CONTRACTOR shall replace in kind any existing improvements (drainage channels, asphalt millings roads, LFG wells & laterals, etc.) damaged during the course of construction as no cost to the OWNER.
- E. No additional and/or extra compensation will be given for all/or any increases to direct labor costs, subcontract costs, and costs of materials and equipment, which

includes all fuels. The only exception to this is a Fuel Cost Adjustment as described in subsection 1.07 of this Section.

- F. The above description of Work is for general information only, and does not limit the responsibility of the CONTRACTOR to accomplish the Work in strict accordance with the Contract Drawings and Specifications.
- G. The Work shall be performed in strict accordance with all applicable requirements of the City of Glendale, Maricopa County, State of Arizona, and other agencies having jurisdiction, and in accordance with the requirements of the General Conditions, Supplementary General Conditions, and Contract Drawings. The CONTRACTOR shall provide a Site-specific Health and Safety Plan (HASP) for OWNER approval. It shall be the CONTRACTOR'S responsibility to be fully apprised of Site conditions and to follow the approved HASP.

1.02 EXISTING SITE CONDITIONS

- A. The Site is currently an active landfill that receives residential and commercial waste on a daily basis.
- B. A limited geotechnical investigation has been conducted for this site. Boring logs and laboratory analytical results from the north cell expansion borrow source are presented in **Appendix A** of these specifications. Results of the geotechnical evaluation of the on-site material have been used to prepare two geologic cross-sections which are also presented in **Appendix A**. This information is available for review by the CONTRACTOR but does not represent a complete characterization of borrow material conditions. Some "hard dig" conditions should be expected.
- C. The base topographic mapping contours shown on the Contract Drawings were prepared from July 1, 2022 aerial photographs. Due to ongoing landfill operations and the need to excavate daily and intermediate cover, actual elevations and contours may vary at the time the CONTRACTOR is given notice to proceed.

1.03 CONTRACTOR'S USE OF PROPERTY

- A. The CONTRACTOR shall have unrestricted access and egress from the Site, as necessary, to perform the Work under this Contract. The CONTRACTOR shall obtain approval for all necessary permits (dust control, stormwater, etc.) to accomplish the Work.
- B. The CONTRACTOR shall limit use of the Site to only the Work and storage

requirements related to this Contract.

- C. The CONTRACTOR shall assume full responsibility for the protection and safekeeping of equipment and materials on or off the Site that are related to this Contract.
- D. The CONTRACTOR shall be responsible for the remediation of any fuel/petroleum spills. Fuel/petroleum spills shall be remediated as soon as they are noticed.

1.04 WORK SEQUENCE

- A. A Notice to Proceed for beginning of Work under these Contract Documents will be given after bid award.
- B. The CONTRACTOR shall be responsible for planning, scheduling, and otherwise executing the Work in a manner that meets the requirements of the Contract Drawings and Specifications for this project.

1.05 SEPARATE CONTRACTS

NOT USED

1.06 BROAD SCOPE

This article describes the project in general and provides an overview of the intent of the Work to be performed under this Contract. The CONTRACTOR shall review the entire set of Contract Documents to gain a thorough understanding of the detailed project requirements. The following describes the general sequence of work for this project.

- A. The CONTRACTOR shall perform the Work in accordance with the Contract Documents: Project Construction Drawings, Construction Specifications, referenced design reports, subsequent addenda, and approved shop drawings and submittals. The CONTRACTOR shall provide all labor, equipment, and materials for temporary utilities, roads, storage, and other facilities necessary for the completion of all Work included as part of this contract.
- B. The CONTRACTOR shall provide all labor, equipment, and materials for clearing and grubbing, subgrade preparation, excavation and engineered fill, moisture conditioning, and placing and compacting soil on the existing North Cell slopes to the lines and grades shown on the Construction Drawings.
- C. The CONTRACTOR shall provide all labor, equipment, and materials for the

construction of the Glendale Landfill west slope temporary customer access road consisting of excavation, moisture conditioning, placing and compacting general fill, and placement of road surfacing material.

- D. The CONTRACTOR shall provide all labor, equipment, and materials to excavate soil from the North Cell and haul to a stockpile. Soil shall be hauled to two separate stockpiles as shown on the Construction Drawings. The CONTRACTOR shall moisture condition the soil before excavation and shall maintain dust control on all haul roads and stockpile locations.

- F. Throughout construction, the CONTRACTOR shall maintain one set of full-size (24"x36") red-line field drawings showing as-constructed site conditions. These drawings shall remain on-site during the project for periodic review by the OWNER or ENGINEER. Upon completion of construction activities, one full-size set of ACAD drawings with revised survey data shall be submitted to the OWNER or ENGINEER for incorporation into As-built Drawings to be prepared by the ENGINEER.

1.07 WORK HOURS

- A. Unless otherwise approved by the OWNER, construction activities and material deliveries to the landfill shall be limited to the hours of 6 a.m. to 5 p.m. The CONTRACTOR shall submit a project bid which in no way assumes work outside of these hours, i.e., night work, will not be allowed on this project.

1.08 USE OF EXPLOSIVES

- A. The CONTRACTOR shall not employ the use of explosives on this project without expressed written consent from the OWNER.

1.09 SUBSTANTIAL COMPLETION

- A. Substantial Completion means the project work is complete. This shall include but is not limited to:
1. All systems in place, functional, and displayed to the OWNER or its representatives;
 2. Construction Complete;
 3. Materials and equipment installed;
 4. All systems reviewed and accepted by the OWNER.
 5. Draft record documents reviewed and accepted by the OWNER;
 6. Landscaping and site work completed;
 7. Final cleaning; and
 8. Final Acceptance (following 30 days to correct punch-list items).

1.10 PROJECT SCHEDULE

- A. The anticipated project start date is November 2022.
- B. The CONTRACTOR shall substantially complete all work and receive final acceptance by March 2, 2023.

- C. The City will consider alternative bid schedules with the exception that the Contractor will not miss the Substantial Completion deadline, March 2, 2023.

1.11 LIQUIDATED DAMAGES

- A. Liquidated damages shall be Five Thousand Dollars (\$5,000) per day that substantial completion extends beyond the date determined by the contract time as adjusted.
- B. Liquidated damages shall be Two Thousand Five Hundred Dollars (\$2,500) per day that final acceptance extends beyond the date determined by the contract time as adjusted.

2.0 PRODUCTS

NOT USED

3.0 EXECUTION

NOT USED

4.0 MEASUREMENT AND PAYMENT

- A. All costs in connection with the Work specified herein that are not specifically listed in Section A01025 will be considered incidental to the Project. The CONTRACTOR will not be compensated for Work not specifically listed in Section A01025. No payment will be made for meetings. The bid price shall include the cost that may be incurred to attend and conduct any and all meetings and provide coordination.

END OF SECTION

SECTION A01015
ABBREVIATIONS AND DEFINITIONS

1.0 GENERAL

1.01 ABBREVIATIONS

In addition to the standard abbreviations in the MAG Specification, the following abbreviations have also been used:

AASHTO	American Association of State Highway and Transportation Officials
ACI	American Concrete Institute
ADEQ	Arizona Department of Environmental Quality
ADOT	Arizona Department of Transportation
AGA	American Gas Association
AIA	American Institute of Architects
AICHE	American Institute of Chemical Engineers
AISC	American Institute of Steel Construction
AISI	American Iron and Steel Institute
ANSI	American National Standards Institute
API	American Petroleum Institute
AREA	American Railway Engineering Association
ASCE	American Society of Civil Engineers
ASHRAE	American Society of Heating, Refrigerating and Air Conditioning Engineers
ASME	American Society of Mechanical Engineers
ASQC	American Society for Quality Control
ASTM	American Society for Testing and Materials
AWS	American Welding Society
AWWA	American Water Works Association
BMP	Best Management Practices
CBM	Certified Ballast Manufacturers
CFR	Code of Federal Regulations
CGA	Compressed Gas Association
COG	City of Glendale
CQA	Construction Quality Assurance
CRSI	Concrete Reinforced Steel Institute
CY	Cubic Yard
EPA	Environmental Protection Agency
ETL	Electrical Testing Laboratories
FS	Federal Specification
IEEE	Institute of Electrical and Electronics Engineers

IES	Illuminating Engineering Society
IPCEA	Insulated Power Cable Engineer Association
ISA	Instrument Society of America
ITL	Independent Testing Laboratories
LFG	Landfill Gas
LL	Liquid Limit
MAG	Maricopa Association of Governments (Arizona)
MIL	U.S. Military Specification
NEC	National Electrical Code
NEMA	National Electrical Manufacturers Association
NETA	International Electrical Testing Association
NFPA	National Fire Protection Association
NPDES	National Pollutant Discharge Elimination System
NSF	National Sanitation Foundation
OSHA	Occupational Safety and Health Administration
PI	Plasticity Index
PPI	Plastics Pipe Institute
SHSP	Site Health and Safety Plan
SMACNA	Sheet Metal and Air Conditioning Contractor's National Association
SRP	Salt River Project
SSPC	Steel Structures Painting Council
SWMF	Solid Waste Management Facility
SWPPP	Storm Water Pollution Prevention Plan
UBC	Uniform Building Code
UL	Underwriters Laboratories
UMC	Uniform Mechanical Code
UPC	Uniform Plumbing Code
USSPWC	Uniform Standard Specifications for Public Works Construction
USBR	U.S. Bureau of Reclamation
USCS	Unified Soil Classification System
WC	Water Content
WCRSI	Western Concrete Reinforcing Steel Institute
ZAV	Zero Air Voids Curve

1.02 DEFINITION OF TERMS

REGULATORY AGENCY - Regulatory Agency, which in this context is the Arizona Department of Environmental Quality (ADEQ), is responsible for compliance with the Agency's regulations. The Occupational Safety and Health Administration (OSHA) administers regulations for the CONTRACTOR'S Site safety requirements. Maricopa County Air Quality Department (MCAQD) should be considered as an additional regulatory agency that may visit the site and review the work for dust emissions.

OWNER - OWNER refers to the City of Glendale, acting through its legally constituted officials or employees. As OWNER of the Glendale Landfill, the City of Glendale is responsible for the overall compliance with various facility permits and operations requirements, initiation, progress, and completion of this Project, and the maintenance of the completed work. The address and contact person of the OWNER shall be:

City of Glendale (OWNER)
Mr. Michael Carr
6210 W. Myrtle Avenue, Suite 111
Glendale, AZ 85301
Phone: (623) 930-2617
Fax: (623) 915-3124

OPERATOR - The City of Glendale is also the OWNER of the Site.
In this document, the OWNER and the Operator are one in the same.

ENGINEER - Also known as Designer Engineer and Construction Quality Assurance (CQA) Engineer, is an individual, a firm, or an organization who is responsible for preparation of the Contract Drawings, Specifications, and CQA Plan for the Project. The OWNER'S Project ENGINEER shall decide on all questions which may arise as to the compliance and acceptability of materials furnished, work performed, and all questions as to the fulfillment of the technical and design issues of the Contract on the part of the CONTRACTOR. The ENGINEER will make these decisions after consultation with the OWNER and, in some cases, the Design Engineer.

The ENGINEER shall be responsible for the acceptance or rejection of work based on compliance with the Contract Drawings, Specifications and design intent; the ENGINEER will recommend suspension of work for unsafe conditions, failure by the CONTRACTOR to carry out provisions of the Contract, and for unsuitable weather conditions. The ENGINEER shall also review the CONTRACTOR'S submittals, make recommendations, and review/approve the CONTRACTOR'S payment requests.

The engineering consulting company Tetra Tech BAS, Inc. (Tt-BAS) was responsible for completion of the Design. Tt-BAS was also responsible for development of the Contract Drawings and Specifications. The address and contact name for Tt-BAS is provided below:

Tetra Tech BAS, Inc.
R. Todd Livermore, P.E.
22601 N 19th Ave, Suite 225
Phoenix, AZ 85027
Phone: (602) 267-0336
Fax: (602) 267-0446

The ENGINEER shall be responsible for all CQA observation, testing, and documentation related to the north cell excavation, construction of the berms including drainage systems, perimeter roadways, and placement and compaction of all earth material backfill. The ENGINEER shall be responsible for issuing daily reports, oversight of field and laboratory testing, data evaluation, issuance of documentation reports, attendance at and recording of construction progress meetings, informing the CONTRACTOR and the OWNER regarding the construction compliance evaluation, and oversight of testing for deficiency repairs identified during construction of the berms and stockpiles.

The ENGINEER will also be responsible for addressing all concerns or questions which may arise as to the interpretation of the Contract Drawings, grading, design elements, Specifications, material evaluation, and testing. In interpreting the Contract Drawings and Specifications, the ENGINEER may make modifications to the Work, which shall not involve extra work and shall not be inconsistent with the intent of the Work. In cases where modifications are necessary to comply with Site conditions, unforeseen circumstances, changed conditions, or in emergency situations endangering life or property, the ENGINEER may, upon OWNER approval, modify the Contract Drawings and Specifications. In such cases the CONTRACTOR shall be compensated at the rate previously established by the Contract Bid.

CONSTRUCTION DOCUMENTATION REPORT - The Construction Documentation Report (also known as Documentation Report or Certification Report) is prepared by the Designer certifying that Project construction has been carried out in general compliance with the Contract Drawings and Specifications. The report shall be signed and stamped by a Registered Professional Engineer and shall contain:

- Project description;
- All CQA testing and results, including test procedures;
- Deficiencies and protocol used to repair the deficiencies;
- Photographic documentation; and,
- As-built drawings, noting deviations from the Contract Drawings.

PROJECT PLANS - The Project Plans (also known as Drawings, Project Drawings, or Standard Drawings) shall be either black-and-white or blue-line copies with the original signature and seal of a Registered Professional Engineer, prepared for the construction of this Project and attached to the bid documents. The Project Plans shall also include any modifications, which have been approved by the ENGINEER.

SPECIFICATIONS - The Specifications (also known as the Project Specifications) are the documents which provide detailed provisions and requirements for performance of the prescribed Work. The approved Specifications for the project are intended to be

interpreted in the context of the General Conditions, Special Provisions and Supplementary Conditions.

1.03 REFERENCES

Reference is made to test procedures of the American Society for Testing and Materials (ASTM). Other documents referred to include the Drawings, Specifications, Engineering Drawings, Facility Permit Documents, Safety Regulations, and U.S. EPA's "Technical Guidance Document: Quality Assurance and Quality Control for Waste Containment Facilities."

The pertinent ASTM referenced test standards are provided below:

- a) ASTM D 422 - Particle Size Analyses for Coarse Fraction of Soil Samples.
- b) ASTM D 698 (Standard Proctor)(Standard Effort - 12,400 foot-pound/foot) Test Methods for Moisture-Density Relations of Soils and Soil-Aggregate Mixture.
- c) ASTM D 1140 - Amount of Materials in Soils Finer than the No. 200 Sieve.
- d) ASTM D 1556 - Density and Unit Weight of Soil in Place by Sand-Cone Method.
- e) ASTM D 1557 (Modified Proctor) Test Methods for Moisture-Density Relations of Soils and Soil-Aggregate Mixture Using a 10-lb (4.54 kg) Rammer and 30-inch (457 mm) Drop.
- f) ASTM D 2216 - Laboratory Determination of Water Content of Soil and Rock.
- g) ASTM D 3087 - Classification of Soils for Engineering Purposes.
- h) ASTM D 3088 - Descriptions and Identification of Soils.
- i) ASTM D 2922 - Density of Soil and Aggregate In Place by Nuclear Methods (Shallow Depth).
- j) ASTM D 2937 - Density of Soil In Place by Drive - Cylinder Method.
- k) ASTM D 3017 - Moisture Content of Soil and Rock In Place by Nuclear Method (Shallow Depth).
- l) ASTM D 4220 - Preserving and Transporting Soil Samples.
- m) ASTM D 4330 - Liquid Limit, Plastic Limit, and Plasticity Index of Soils.
- n) ASTM D 4643 - Determination of Water Content of Soil by Microwave Method.
- o) ASTM D 4944 - Determination of Water Content of Soil by Calcium Carbide Gas Pressure Tester Method.
- p) ASTM D 5080 - Rapid Determination of Percent Compaction.
- q) ASTM D 5084 - Measurement of Hydraulic Conductivity of Saturated Porous Materials Using a Flexible Wall Perimeter.
- r) ASTM D 4546 - One-Dimensional Swell Potential of Remolded Soil Materials.

1.04 DEFINITIONS OF TECHNICAL TERMINOLOGY

Appurtenances:	Detailed items such as drainage facilities, and items that are necessary and related to the proper functioning of the Landfill final cover system.
Atterberg Limits:	The liquid limit and plastic limit of soil.
Caliche:	Gravel, sand, or desert debris cemented by porous calcium carbonate; also calcium carbonate itself.
Clay:	Soil material with an equivalent mean grain size smaller than 0.002 mm. Clay soils are also defined as plastic fines.
Clay Clod:	A chunk of cohesive soil or clay soils (also referred to as “clod”).
Cohesive Soils:	Soil material, which has a high plasticity index, is sticky, and tends to form clods when dry.
Compaction Curve:	Plot of dry unit weight versus molding water content, based on the data obtained from moisture-density relationship tests.
Dry Density:	The dry weight of soil material per total volume, including air space, also known as dry density. The dry weight is usually measured after drying in an oven at 212 degrees F (°F) for 30 hours or until a constant weight is achieved.
Electrical Conductivity:	Electrical conductivity, abbreviated as EC, of soil is defined as the ease at which electrical current flows through soil mass. According to Ohm’s law, EC equals the inverse of the electrical resistivity. In soils, the resistivity of the individual soil grains are high and therefore, if there is to be a passage of current through a soil mass it will be exclusively through electrolytic action due to the presence of dissolved salts and solids within the pore spaces of the soil particles. The EC of soil is indicative of the soil’s acidity or alkalinity.
Geosynthetics:	Generic term for all geosynthetic materials such as geotextiles, geomembranes, geonets, geogrids, geosynthetic clay liners, and geocomposites.
Geotextile:	A permeable geosynthetic material fabricated with only textiles, which may be woven, non-woven, or knitted.
Gravel:	Soil material, which is coarser than 4.76 mm in least dimension, or retained on a No. 4 sieve.

Hydraulic Conductivity:	Also known as permeability, refers to the capacity of a material to discharge certain fluids through a material. Discharge of fluid through a unit cross-sectional area of a porous media under a unit hydraulic gradient, and standard temperature of 68 degrees F defines this property.
Lift:	Discrete layer of soil (usually 6 to 10 inches thick) placed and compacted for construction of engineered fill.
Liquid Limit:	The minimum water content of soil at which the soil behaves like a viscous liquid. It is the arbitrary limit between the liquid and plastic state of soil.
NICET:	An acronym for the National Institute for Certification in Engineering Technologies, an organization that administers examinations for bituminous material, concrete, geosynthetics, and earthen materials for construction.
Outliers:	Data points which do not fit into the specified or required maxima or minima values.
Permittivity:	For a geotextile, the volumetric flow rate of water per unit cross-sectional area, per unit head, under laminar flow conditions, in the normal direction through the fabric.
pH of Soil:	The pH of a soil sample measures the hydrogen-ion concentration and is indicative of the soil's acidity or alkalinity.
Plasticity or Plastic Index (PI):	The range of moisture content of soil in which the soil behaves like a plastic solid. The numerical value is the difference between the liquid limit and plastic limits.
Plastic Limit (PL):	The minimum water content, above which a soil material behaves like a plastic solid.
Polymer:	A macromolecular material formed by the chemical combination of monomers having either the same or different chemical composition. Plastics, rubbers, and textile fibers are all high-molecular-weight polymers.
Polyolefin:	A family of polymeric materials that includes polypropylene and polyethylene, the former being very common in geotextiles, the latter in geomembranes. Many variations of each exist.

Seam Strength:	Strength of a seam of geotextile material measured either in shear or peel modes. Strength of seams are reported either in absolute units (pounds per inch of width), or as a percent of the strength of the geotextiles.
Unit Weight:	Weight of soil samples per total volume including air space. May include weight of water present within the pore spaces.

1.05 DELINEATION OF RESPONSIBILITIES

- A. The following are clarifications of the responsibilities and definitions of job titles to be adhered to during the period of time required to complete construction of the Project.
- B. The OWNER (also Operator) is responsible for compliance with all facility permit requirements, initiation, progress, and completion of this Project and the maintenance of the completed work.
- C. The OWNER's Project Engineer (ENGINEER) will decide on all questions which may arise as to the compliance and acceptability of materials furnished, work performed, and all questions as to the fulfillment of technical and design issues of the contract on the part of the CONTRACTOR. The ENGINEER will make these decisions after consultation with the OWNER.

The ENGINEER shall be responsible for the acceptance or rejection of work based on compliance with the Contract Drawings, Specifications, and design intent; the ENGINEER may recommend the suspension of work for unsafe conditions, failure to carry out provisions of the Contract by the CONTRACTOR, and for unsuitable weather conditions. The ENGINEER shall also review the CONTRACTOR'S submittals, make recommendations, and review/approve the CONTRACTOR'S payment requests.

- D. The ENGINEER shall be responsible for all CQA observation, testing, and documentation related to the north cell excavation, construction of the berms including drainage systems, perimeter roadways, and placement and compaction of all earth material backfill. The ENGINEER shall be responsible for issuing daily reports, oversight of field and laboratory testing, data evaluation, issuance of documentation reports, attendance at and recording of construction progress meetings, informing the CONTRACTOR and the OWNER regarding the construction compliance evaluation, and oversight of testing for deficiency repairs identified during construction of the berms and stockpiles.

The ENGINEER will also be responsible for addressing all concerns or questions which may arise as to the interpretation of the Contract Drawings, grading, design elements, specifications, material evaluation, and testing. In interpreting the Contract Drawings and Specifications, the ENGINEER may make modifications to the Work, which shall not involve extra work and shall not be inconsistent with the intent of the Work. In cases where modifications are necessary to comply with Site conditions, unforeseen circumstances, changed conditions, or in emergency situations endangering life or property, the ENGINEER may, upon OWNER approval, modify the Contract Drawings and Specifications. In such cases the CONTRACTOR shall be compensated at the rate previously established by the Contract Bid.

The ENGINEER'S representative shall issue daily reports containing field monitoring such as:

- Visual observations;
- CQA test results;
- Deficiencies encountered and retesting results;
- Summary of significant event details;
- Weather conditions; and
- Other field observations deemed necessary for completion of the Project.

- E. The CONTRACTOR is responsible for quality control (QC) on all work activities contained in the Contract Documents. The CONTRACTOR shall complete all work in accordance with the Project Plans, Specifications, CQA Plan, and Project Schedule (see Section A01010 – Project Schedule).

The CONTRACTOR has overall control over construction operations; including level of effort and site safety. The CONTRACTOR is also responsible for informing the OWNER and the ENGINEER of scheduling and occurrence of all construction activities. The CONTRACTOR is responsible for the work performed by Subcontractor(s), if any. This includes requiring Subcontractor(s) to comply with the HASP.

The CONTRACTOR is responsible for the excavation, clearing, and construction of engineered fills and soil stockpiles, including excavation, processing and moisture conditioning, transportation of soil from the excavation to the stockpile locations, drainage facilities, and perimeter roadways, as contained in the Contract Documents, or as deemed necessary and in accordance with the Specifications. The CONTRACTOR is also responsible for coordinating his/her work with the ENGINEER, OWNER, and other related parties.

1.06 QUALIFICATIONS AND TRAINING

NOT USED

2.0 PRODUCTS

NOT USED

3.0 EXECUTION

NOT USED

4.0 MEASUREMENT AND PAYMENT

- A. All costs in connection with the Work specified herein that are not specifically listed in Section A01025 will be considered incidental to the Project. The CONTRACTOR will not be compensated for Work not specifically listed in Section A01025.

END OF SECTION

SECTION A01019
MOBILIZATION AND DEMOBILIZATION

1.0 GENERAL

1.01 SECTION INCLUDES

- A. Mobilization of all construction equipment, materials, supplies, appurtenances, and the like, manned and ready for commencing and performing the Work. Mobilization will include assembly of equipment, or delivery of materials/supplies necessary for performance of the Work but which are not intended to be incorporated in the Work; preparation of the CONTRACTOR'S work area; preparation of a refueling area; personnel services preparatory to commencing actual Work (sanitary facilities, jobsite trailer, etc.); and all other preparatory Work required to permit commencement of actual Work for which payment is provided under the Contract.

- B. Subsequent removal from the Site of all construction facilities, equipment, materials, supplies, appurtenances, and the like; and cleaning and restoration of the Site upon completion of the Work to its original condition.

1.02 RELATED SECTIONS

- A. This section supplements the requirements specified in the Contract Documents. The CONTRACTOR shall obtain construction water and provide their own water storage tank in accordance with Section A01050, 3.14.

2.0 PRODUCTS

NOT USED

3.0 EXECUTION

NOT USED

4.0 MEASUREMENT AND PAYMENT

4.01 MEASUREMENT

- A. Mobilization and Demobilization: Measurement for payment for mobilization and demobilization will be by the lump sum basis.

4.02 PAYMENT

- A. Mobilization and Demobilization: Payment for mobilization and demobilization will be by the lump sum basis. This task includes any and all temporary facilities and utilities, safety plans, permits, and construction equipment required for this project. Twenty five (25) percent of the lump sum price bid will be paid with the first payment request following satisfactory evidence of mobilization of sufficient labor, equipment and material to adequately progress the work of this contract. Twenty-five (25) percent of the lump sum price bid will be paid with the second payment request. Fifty (50) percent of the lump sum price bid will be paid with the Final Payment request after final acceptance of all Work. **The bid price of this item shall not exceed three (3) percent of the original total bid or contract amount.**

END OF SECTION

SECTION A01025

MEASUREMENT AND PAYMENT

1.0 GENERAL

This section includes the items of work and the basis of payment for these items. The CONTRACTOR shall bid items 1 through 14 below separately and provide a total sum for all work items. The CONTRACTOR is responsible for supplying all materials and labor necessary for the complete construction and installation of all work as described in these specifications and as shown on the Construction Drawings. Payment for each work item will be made on either a unit price or lump sum basis, and only after that portion of the project has been completed.

Arrangements for construction water are the CONTRACTOR's responsibility. **The CONTRACTOR is specifically reminded of the need to obtain the necessary environmental permits or file the necessary environmental notices.** Copies of these permits and notices must be provided to the City's Project Manager prior to starting the permitted activity. This provision does not constitute an assumption by the OWNER of an obligation of any kind for violation of said permit or notice requirements.

Required construction water (see Section A01500 – 3.14 Construction Water) and fine grading of fill shall be considered incidental to the Work.

1.01 CONTRACT PAY ITEMS

A. Proposal Item 1 - Mobilization and Demobilization

1. Measurement

Basis of Measurement: Lump Sum (LS). The Work required for this item will be measured on the basis of satisfactory evidence of mobilization of sufficient labor, equipment and material to adequately advance the Work.

2. Payment

Basis of Payment: The Lump Sum Price for Mobilization and Demobilization shall be payment in full for, but not limited to, all labor, equipment, material and other incidentals to the site, as well as CONTRACTOR provided utilities and ongoing related expenses, considered normal for administration of the Work. Twenty-five (25) percent of the Lump Sum price bid will be paid with the first payment request following satisfactory evidence of mobilization of sufficient

labor, equipment and material to adequately progress the Work of this contract. Twenty-five (25) percent of the Lump Sum price bid will be paid with the payment request subsequent to the payment request in which the initial payment for this item is made. Fifty (50) percent of the Lump Sum price bid will be paid with the Final Payment request. **The price bid in the proposal for this item shall not exceed three (3) percent of the original total bid or contract amount.**

B. Proposal Item 2 – Project Survey

1. Measurement

Basis of Measurement: Lump Sum (LS). The Work required for this item will be measured on a lump sum basis.

2. Payment

Basis of Payment: The Lump Sum Price for Survey. The CONTRACTOR shall employ a licensed Arizona surveyor to perform the layout and as-builts of the project. Survey's documenting the amount of soil excavated shall be submitted to the OWNER and ENGINEER on a monthly basis. Full-size as-built drawings stamped by a licensed Arizona surveyor shall be provided by the CONTRACTOR. As-built data shall be provided in an AutoCAD compatible electronic format. This item shall be paid monthly based on the percentage of work completed.

C. Proposal Item 3 – AZPDES/SWPPP/Dust Control Permits and Temporary Facilities and Controls

1. Measurement

Basis of Measurement: Lump Sum (LS).

2. Payment

Basis of Payment: This item shall be paid monthly based on the percentage of work completed for obtaining and executing the provisions of AZPDES/SWPPP and Dust Control permit from Maricopa County for the construction activities relating to this Work.

A completed (typed) NOI shall be submitted to the ENGINEER at the preconstruction conference. See the Section AZPDES Compliance in the Information for Bidders.

A monthly Stormwater Pollution Prevention Plan (SWPPP) Report must be submitted with each Progress Payment. Failure to submit this report will cause rejection of the payment request.

A completed (typed) Notice of Termination (NOT) shall be submitted to the ENGINEER at final acceptance. See the Section AZPDES Compliance in the Information for Bidders.

D. Proposal Item 4 – Traffic Control

1. Measurement

Basis of Measurement: Lump Sum (LS).

2. Payment

Basis of Payment: This item shall be paid monthly based on the percentage of work completed for obtaining and executing traffic control.

E. Proposal Item 5 – Excavate, Haul, and Stockpile to North Cell

Note: The CONTRACTOR shall place excavated soil stockpiles in the following locations at the direction of the OWNER:

1. Measurement

Basis of Measurement: Cubic Yard (CY). The CONTRACTOR shall provide a base line survey for the OWNER'S review and acceptance prior to beginning excavation. Measurement of excavation will be made by comparing pre-construction base line topography with the monthly surveyed topography. Survey will establish existing grades at a maximum 100-foot grid and establish major grade breaks. Calculations will be made by AutoCAD comparison between base line topography and surveyor provided monthly topography. Required construction water and fine grading of fill shall be considered incidental to this item. No load counts will be used for payment. The CONTRACTOR shall provide all survey data used for volume calculations to the OWNER and ENGINEER.

2. Payment

Payment will be made for material excavation on a cubic yard basis. The cost shall include moisture conditioning, material processing and segregation, excavation, screening, hauling, grading/shaping, compaction, vehicles, labor, and all other items necessary to complete

the Work. The overall quantity to be excavated will be based on the difference between the current north area topography (base line) and the final elevations shown on the Contract Drawings. The CONTRACTOR must independently verify and agree to the cubic yardage quantity to be excavated prior to bid submittal. The cost per cubic yard excavated will be the sole means of payment, including moisture conditioning, material processing and segregation, excavation, hauling, grading/shaping, compaction, vehicles, labor, and all other items necessary to complete the Work.

F. Proposal Item 6 – Excavate, Haul, and Stockpile to South Cell

Note: The CONTRACTOR shall place excavated soil stockpiles in the following locations at the direction of the OWNER:

2. Measurement

Basis of Measurement: Cubic Yard (CY). The CONTRACTOR shall provide a base line survey for the OWNER'S review and acceptance prior to beginning excavation. Measurement of excavation will be made by comparing pre-construction base line topography with the monthly surveyed topography. Survey will establish existing grades at a maximum 100-foot grid and establish major grade breaks. Calculations will be made by AutoCAD comparison between base line topography and surveyor provided monthly topography. Required construction water and fine grading of fill shall be considered incidental to this item. No load counts will be used for payment. The CONTRACTOR shall provide all survey data used for volume calculations to the OWNER and ENGINEER.

2. Payment

Payment will be made for material excavation on a cubic yard basis. The cost shall include moisture conditioning, material processing and segregation, excavation, screening, hauling, grading/shaping, compaction, vehicles, labor, and all other items necessary to complete the Work. The overall quantity to be excavated will be based on the difference between the current north area topography (base line) and the final elevations shown on the Contract Drawings. The CONTRACTOR must independently verify and agree to the cubic yardage quantity to be excavated prior to bid submittal. The cost per cubic yard excavated will be the sole means of payment, including moisture conditioning, material processing and segregation, excavation, hauling, grading/shaping, compaction, vehicles, labor, and all other items necessary to complete the Work.

G. Proposal Item 7 – General Fill for Haul Roads (Excavate and Place)

1. Measurement

Basis of Measurement: In-place Cubic Yard (CY). Measurement of general fill will be made by comparing base line topography with post-construction topography when haul road construction is complete. Surveys will establish existing grades at a maximum 100-foot grid and establish major grade breaks. Calculations will be made by AutoCAD comparison between the base line topography and surveyor provided topography when haul road construction is complete. Required construction water and fine grading of haul roads shall be considered incidental to this item.

2. Payment

Basis of Payment: shall be payment in full for, but not limited to, all costs to excavate, screen and/or process, condition, control dust, load, haul, place, moisture condition, compact, fine grade and maintain as shown on the Drawings and in accordance with the Specifications.

H. Proposal Item 8 – Haul, Place and Maintain Asphalt Millings on Haul Roads

1. Measurement

Basis of Measurement: In-place Square Yard (SY) at 6-inch thickness. Measurement of asphalt millings will be made by inspection and verification of designated 6-inch depth and overall length and width of haul road to arrive at the square yardage quantity of 6-inch depth of asphalt millings in-place.

2. Payment

Basis of Payment: shall be payment in full for, but not limited to, all costs to haul, place, compact, fine grade and maintain as shown on the Drawings and in accordance with the Specifications.

I. Proposal Item 9 – Safety Barriers (Purchase and Install)

1. Measurement

Basis of Measurement: In-place Linear Foot (LF). Measurement of safety barrier will be made by inspection and verification of designated length of installed safety barrier.

2. Payment

Basis of Payment: shall be payment in full for, but not limited to, all costs to obtain, haul, and place as shown on the Drawings and in accordance with the Specifications. OWNER will retain ownership of all K-rail (safety barrier) at project completion.

J. Proposal Item 10 – Riprap V-Ditch

1. Measurement

Basis of Measurement: In-place Linear Foot (LF). Measurement of riprap v-ditch will be made by inspection and verification of designated length of installed riprap v-ditch.

2. Payment

Basis of Payment: shall be payment in full for, but not limited to, all costs to obtain materials, haul, moisture condition, place, and fine grade as shown on the Drawings and in accordance with the Specifications.

K. Proposal Item 11 – Riprap Splash Pad

1. Measurement

Basis of Measurement: Each (EA). Measurement of riprap splash pad will be made by inspection and verification installed riprap splash pad.

2. Payment

Basis of Payment: shall be payment in full for, but not limited to, all costs to obtain materials, haul, and install as shown on the Drawings and in accordance with the Specifications.

L. Proposal Item 12 –Stormwater Crossings

1. Measurement

Basis of Measurement: Each (EA). Measurement will be made by inspection and verification of installed stormwater crossings.

2. Payment

Basis of Payment: shall be payment in full for, but not limited to, all costs to obtain, and install as shown on the Drawings and in accordance with the Specifications.

M. Proposal Item 13 – Relocate Asphalt Millings

1. Measurement

Basis of Measurement: Cubic Yard (CY). Measurement of asphalt millings will be made using pre-construction topography of existing surrounding grade compared to topography of asphalt millings within the excavation boundary. Calculations will be made in AutoCAD between surrounding grade compared to the topography of the asphalt millings pile within the excavation boundary.

2. Payment

Basis of Payment: shall be payment in full for, but not limited to, all costs to haul, place, compact, fine grade and maintain as shown on the Drawings and in accordance with the Specifications.

N. Proposal Item 14 – New Waterline Valve Vaults

1. Measurement

Basis of Measurement: Each (EA). Measurement will be made by inspection and verification of installed waterline valve vaults.

2. Payment

Basis of Payment: shall be payment in full for, but not limited to, all costs to obtain, and install as shown on the Drawings and in accordance with the Specifications.

O. Proposal Item 15 – Fuel Cost Adjustment (Owners Contingency)

1. Measurement

Basis of Measurement: Lump Sum (LS). Refer to Subsection 1.07 of this Section.

2. Payment

Basis of Payment: This item shall be payment in full for, but not limited to provide a contingency fund for the OWNER. Depending upon the outcome of the Project, these funds may not be expended. Refer to Subsection 1.07 of this Section.

1.02 LOAD COUNTS AND DELIVERY TICKETS

- A. Load counts shall not be used as an acceptable means of measuring any and/or all material fills or excavation quantities for payment.

- B. Any delivery tickets, concrete tickets, scale/weight tickets and invoices shall not be used for an acceptable means of measuring any and/or all quantities for payment purposes.

1.03 NON PAY ITEMS

- A. No separate payment will be made for items not specifically set forth in the bid proposal. Include costs of such items in prices named in the bid proposal for identified items of Work. Items of Work described in the Contract Documents, but not listed in the schedule of Work items of the bid form are, in general, applicable to more than one listed Work item. No separate Work item is provided. The CONTRACTOR shall include costs of Work not listed but necessary to complete the project per the Contract Documents in the listed Work items of the bid form. The CONTRACTOR shall not use bid proposal item "Owner Allowance for Extra Work" without prior written approval of the ENGINEER.

1.04 TOTAL COST

- A. Bids for Work are intended to establish a total cost for the Work in its entirety. Should the CONTRACTOR feel that the cost for the Work has not been established by specific items in the bid form, the CONTRACTOR shall bring this to the attention of the ENGINEER or OWNER via email **no later than 10 days prior to bid opening** so that addendum and/or clarification as to whether such work is to be considered strictly as incidental or is to be included in a certain or new bid item may be issued and that his/her bid proposal reflects the total cost for completing the Work in its entirety.

1.05 QUANTITY OVERRUNS

- A. No payment will be made for quantity overruns unless the Work is expressly required by the Contract Documents and authorized in writing by the OWNER or ENGINEER prior to the performance of the Work.

1.06 PAYMENT

- A. The CONTRACTOR shall be bound by the pricing contained on and submitted with the project bid sheet.
- B. No extra monetary compensation or additional time will be authorized for claims that conditions differ from those anticipated. It is the CONTRACTOR's responsibility to make his own determination as to the actual existing conditions.
- C. No extra monetary compensations or additional time will be authorized for the removal, handling, or disposal of construction debris or waste/refuse. Cost for this work shall be included in the bid price.

- D. No additional and/or extra compensation will be given for all and/or any increases to direct labor costs, subcontract costs, and costs of materials and equipment. The only exception to this is a Fuel Cost Adjustment as described in subsection 1.07 of this Section.

1.07 FUEL COST ADJUSTMENT

A. GENERAL

- a. The ENGINEER will adjust monthly progress payments up or down as appropriate for cost fluctuations in diesel fuel as determined in accordance with these special provisions.
- b. A fuel cost adjustment will be made when fluctuations in the price of diesel fuel, in excess of 15 percent, occur throughout this contract. The ENGINEER will not provide such adjustments for fluctuations in the price of diesel fuel of 15 percent or less.
- c. No adjustments will be made for fluctuations in the price of fuels other than diesel.

B. MEASUREMENT

- a. The base index price of fuel will be determined by the ENGINEER from the selling prices of diesel fuel published by OPIS (Oil Price Information Service). The base index price to be used will be the price for Diesel fuel No. 2, Ultra Low Sulfur, PAD 5, City of Phoenix Rack. The reported average value for the Phoenix area will be used.
- b. The base index price for each month will be the arithmetic average of the selling price for diesel fuel, as specified above, shown in the last four reports received prior to the last Wednesday of the month.
- c. This price will be effective as of the last Wednesday of each month. The current price may be seen at the following website:

<https://www.azdot.gov/business/ContractsandSpecifications/PriceAdjustmentforBituminousMaterialandDieselFuel>
- d. This price will be deemed to be the "initial cost" (IC) for diesel fuel on projects for which bids are opened during the following month.
- e. The current index price for diesel fuel in subsequent months will be the base index price, determined as specified above, for the current month. For example; an adjustment for diesel fuel used in May, if applicable, will

be based on the "current price" (CP) for May as posted on the last Wednesday of May. The amount of adjustment per gallon will be the net difference between the "initial cost," adjusted by 15 percent, and the current index price. The monthly adjustment will be determined by the ENGINEER and included in the payment estimate as a fuel adjustment. For fluctuations in excess of 15 percent, fuel cost adjustments will only be made for current price index increases greater than 1.15 times the "initial cost" or for decreases less than 0.85 times the "initial cost." No calculation will be made for fluctuations in the current index price of 15 percent or less when compared to the "initial cost."

- f. If the Fuel Cost Adjustment applies according to this Section A - GENERAL, then the number of gallons of diesel fuel used per month will be considered to equal 7.5 percent of the dollar amount of work reported by the CONTRACTOR for each month. Such dollar amount will not include revenue accrued in the previous month for fuel price adjustments.
- g. A monthly adjustment, if applicable, will be made on this quantity, as shown below:

$$S = \frac{0.075(Q)}{IC} \times (CP - AC)$$

Where;

- S = Monetary amount of the adjustment (plus or minus) in dollars
- Q = Dollar amount of work completed for the month
- CP = Current index price in dollars per gallon
- AC = Adjusted "initial cost" (1.15 or 0.85 times IC) in dollars per gallon
- IC = "Initial cost" as determined above, dollars per gallon

As of today's date, the following values have been determined:

- IC for October 2022 = \$3.69/gal
 - AC is calculated to be \$3.69*1.15 = \$4.24 or \$3.69*0.85 = \$3.14/gal
- h. If adjustments are made in the contract quantities, the CONTRACTOR shall accept any fuel adjustment as full compensation for increases or decreases in the price of fuel regardless of the amounts of overrun or underrun.
 - i. The value calculated above (plus or minus) will be adjusted to include sales tax and other taxes as applicable.

- j. No additional compensation will be made for any additional charges, costs, expenses, etc., which the CONTRACTOR may have incurred since the time of bidding and which may be the result of any fluctuation in the base index price of diesel fuel.
- k. No adjustments will be made for work performed after Substantial Completion, as defined in Section A01010 Subsection 1.09, has been achieved.

C. PAYMENT

- a. Price adjustments will be shown on the monthly progress estimate, but will not be included in the total cost of work for determination of progress or for extension of contract time.

1.08 CONTRACT CONTINGENCY

- A. Contract contingency items are provided for the purpose of encumbering funds. No work shall be conducted under contract contingency without prior approval by the ENGINEER. The amount, if any, of the contingency item is determined by the ENGINEER and is not subject to individual bid pricing. All bidders shall incorporate the amount pre-entered in the bid proposal and shall reflect the same in the total amount bid for this project. This amount may or may not be used.

2.0 PRODUCTS

NOT USED

3.0 EXECUTION

NOT USED

END OF SECTION

SECTION A01030
SPECIAL INSTRUCTIONS

1.0 GENERAL

1.01 REQUIREMENTS INCLUDED

These instructions are site specific for the Glendale Landfill (GLF) site. The CONTRACTOR shall comply with, but is not limited to, all Special Instructions listed in this Section.

1.02 SMOKING POLICY

Smoking is not allowed at the GLF except in designated areas. The smoking prohibition will be strictly enforced on this project due to the explosive nature of landfill gas.

1.03 SPECIAL CLEAN-UP

Any trash generated on the project site by the CONTRACTOR, or his employees, will be cleaned up daily by the CONTRACTOR for disposal onsite (active face of the landfill). Mud and dirt tracked off-site by the CONTRACTOR, his equipment, or his employees will be cleaned up daily by the CONTRACTOR. Facility access roads and any other off-site roads will be scraped clean daily and washed down at least once per week.

1.04 LIMITING PUBLIC ACCESS

All necessary precautions including barricades and/or traffic cones will be used to prevent the public from entering the working area. The CONTRACTOR is reminded that the landfill is a hazardous area containing heavy equipment and explosive gases.

1.05 BIOHAZARDS

The CONTRACTOR may encounter waste during the course of construction. Waste may contain biohazards such as medical waste or dead animals. The CONTRACTOR's Health and Safety Plan shall address the potential for contact with biohazards and the specific measures to be taken to protect the CONTRACTOR's workers, facility staff, and the public.

1.06 MATERIALS DELIVERY

The CONTRACTOR is to have all materials delivered to his work site and/or staging area. The OWNER or ENGINEER will not accept delivery of materials.

1.07 EMERGENCIES

The CONTRACTOR shall provide the ENGINEER with the phone numbers of at least two individuals who may be contacted in an emergency on a 24-hour, 7-day per week basis, including holidays. To prepare for emergencies, the CONTRACTOR shall ensure that his employees know the location of appropriate fire and first aid equipment and emergency phone numbers. In the event of an emergency, such as damage or rupture of an existing gas pipeline, the CONTRACTOR shall immediately notify the ENGINEER and/or the Operator. Should such an emergency occur after hours, the CONTRACTOR shall notify the ENGINEER. This is in addition to the CONTRACTOR taking appropriate immediate emergency response to correct the problem.

1.08 GENERAL SAFETY

The CONTRACTOR shall be responsible for maintaining safety on the project site in accordance with the provisions of the contract and including OSHA and NFPA regulations. In addition, the CONTRACTOR shall supply all necessary safety equipment for his employees and any site visitors. Tool box safety meetings shall be performed a minimum of once per week for all site personnel.

1.09 SITE FAMILIARIZATION

A. Familiarization

- 1) Prior to implementing work, the CONTRACTOR shall become thoroughly familiar with the site, the site conditions, and all portions of the work falling within these Project Specifications and Project Drawings.

B. Inspection

- 1) If the CONTRACTOR has any concerns regarding the site, the CONTRACTOR shall notify the OWNER and ENGINEER in writing within 48 hours of the site visit. Failure to notify the OWNER or the ENGINEER prior to installation of items will be construed as CONTRACTOR's acceptance.
- 2) The CONTRACTOR shall verify as-built conditions prior to placement and/or excavation of any material.

1.09 STORM DAMAGE

The CONTRACTOR shall be responsible for the repair of any storm damage to the Work prior to the Final Acceptance by the ENGINEER and OWNER. Storm damage of engineered fill slopes and stockpiles will also be responsibility of the CONTRACTOR. Prompt repair of any storm damage shall be the responsibility of the CONTRACTOR, at no cost to the OWNER.

1.10 EQUIPMENT FUELING AND MAINTENANCE

The CONTRACTOR shall fuel and maintain equipment in designated areas of the site as directed by the ENGINEER. The CONTRACTOR shall furnish and use drip pans for the fueling of vehicles or equipment. Any fuel spills will be immediately cleaned up, and the contaminated soil removed from the site by the CONTRACTOR at the CONTRACTOR's expense. The CONTRACTOR will be allowed to place a temporary double-wall fuel tank on site, if fuel spill precautions, such as automatic fuel nozzle shutoff and visqueen barrier, are in place.

1.11 PROJECT DOCUMENT CHANGE CONTROL

A structured process for controlling project Plan and Specification changes will be implemented by the ENGINEER. "Controlled" copies of the Plans and Specifications will be issued to the CONTRACTOR and OWNER. These "controlled" copies will be updated with any project changes, revisions, or addenda. The ENGINEER will not be responsible for providing changes, revisions, or addenda to the Plans and Specifications, other than these "controlled" copies.

1.12 EXISTING ROADS

The CONTRACTOR will return all existing roads to their original condition after completion of the Work. The CONTRACTOR may be required to obtain and place asphalt millings, if the existing roads originally had a layer of millings. For the purpose of replacing asphalt millings roads to their original condition the thickness of the original millings layer is assumed to be 6". The OWNER will not compensate the CONTRACTOR for the cost of returning the existing asphalt millings roads to their original condition.

1.13 HEALTH AND SAFETY PLAN

Prior to proceeding with the construction activities, the CONTRACTOR shall submit (for the ENGINEER's approval), a site-specific Health & Safety Plan. The

CONTRACTOR shall also allow a period of two weeks for the ENGINEER's review time. During the entire construction activity, the CONTRACTOR shall maintain at least one readily available copy of the Health & Safety Plan at the site at all times. Site safety is the responsibility of the CONTRACTOR.

2.0 MEASUREMENT AND PAYMENT

All costs in connection with the Work specified herein that are not specifically listed in Section A01025 will be considered incidental to the Project. The CONTRACTOR will not be compensated for Work not specifically listed in Section A01025.

END OF SECTION

SECTION A01050
SURVEYING

1.0 GENERAL

1.01 COORDINATION

- A. Work associated with this section includes labor, materials and equipment necessary to perform new construction layout and grade staking.
- B. This section also covers required surveying for the development and maintenance of redline and ACAD as-built drawings.

1.02 RELATED WORK SPECIFIED ELSEWHERE

- A. All Work covered by the Contract Documents.

1.03 QUALITY CONTROL

- A. The CONTRACTOR shall use adequate numbers of skilled workers who are thoroughly trained and experienced in the necessary skills and who are completely familiar with the specified requirements and methods needed for proper performance of the Work described in these Specifications. The CONTRACTOR shall utilize a State of Arizona Registered Surveyor.

1.04 SUBMITTALS

- A. The CONTRACTOR shall submit the following:
 - 1. Qualifications of persons proposed to be engaged for surveying services; and
 - 2. Certification, signed by the CONTRACTOR'S retained Registered Land Surveyor that elevations and locations are in conformance or non-conformance with requirements of the Contract.

2.0 PRODUCTS

2.01 EQUIPMENT AND MATERIALS

- A. Equipment and materials necessary for proper construction surveying will be at the CONTRACTOR'S discretion.

3.0 EXECUTION

3.01 PROCEDURES

- A. Basic horizontal and vertical controls are shown on the Contract Drawings. Three survey control points have been shown on the Contract Drawings. The CONTRACTOR shall complete layout of all Work and shall be responsible for all requirements necessary for the execution of any Work in accordance with the locations, lines, and grades specified or shown on the Contract Drawings, subject to such modifications as the ENGINEER may require as work progresses. Construction staking shall be done in accordance with industry practice.
- B. The CONTRACTOR shall complete layout of the work and shall be responsible for all measurements that may be required for the preparation of the project as-built drawings to the location and limit marks prescribed in the specifications or on the Contract Drawings. These locations and limits are subject to such modifications as the ENGINEER may require to meet changed conditions or as a result of necessary modifications to the Contract Work.
- C. The CONTRACTOR shall furnish, at his own expense, such stakes, templates, platforms, equipment, tools and material, and all labor as may be required in laying out any part of the work from the survey control. It shall be the responsibility of the CONTRACTOR to maintain and preserve all stakes and other marks established until work is complete and record information is satisfactory to the ENGINEER.
- D. The ENGINEER may require Work be suspended at any time when location and limit marks established by the CONTRACTOR are not reasonably adequate to permit checking of the Work.
- E. The CONTRACTOR shall locate and protect control points before starting work on the site.
- F. The CONTRACTOR shall preserve permanent reference points during progress of the Work.
- G. The CONTRACTOR shall not change or relocate reference points for the Work without specific prior approval from the ENGINEER.
- H. The CONTRACTOR shall promptly advise the ENGINEER when a reference point is lost or destroyed or requires relocation because of other changes in the Work.
 - 1. The CONTRACTOR shall, upon direction of the ENGINEER, require the Survey Party Chief to replace reference stakes or markers.

2. The CONTRACTOR shall locate replacement stakes or markers according to the original survey control.
- I. The CONTRACTOR shall provide to the ENGINEER such surveys and volume computations as are necessary to determine the quantities of Work performed or placed during each month for which a progress payment is to be made. All original field notes, volume computations and other records for the purpose of layout and progress surveys shall be furnished promptly to the ENGINEER at the Site of the Work. A copy of the original notes, computations and records furnished to the ENGINEER shall be retained by the CONTRACTOR.
- J. The CONTRACTOR shall provide survey control during the installation of drainage structures/runoff collection channels within ± 0.1 feet.
- K. The CONTRACTOR shall provide survey control before and after placement for structural fill within ± 0.1 feet.

4.0 MEASUREMENT AND PAYMENT

- A. All costs in connection with the Work specified herein that are not specifically listed in Section A01025 will be considered incidental to the Project. The CONTRACTOR will not be compensated for Work not specifically listed in Section A01025.

END OF SECTION

SECTION A01052
LAYOUT OF WORK AND SURVEYS

1.0 GENERAL

1.01 SUMMARY

- A. Section includes requirements for survey work to be provided by the CONTRACTOR for the following:
- B. Setting offset stakes, slope stakes, and grade stakes for field layout of features for performance of the Work.
- C. Surveys for measurement of quantities for payment.
- D. Record Drawings.

1.02 DESCRIPTION

- A. **Reference Points.** The reference points provided by the OWNER include monuments and elevation bench marks in the vicinity of the Project. If displaced during the project, replacement of these reference points will be at the expense of the CONTRACTOR. All surveys for record drawings shall tie to a minimum of three of these reference points and shall use the site coordinate system previously established by the OWNER's survey and utilized in the Design Plan Drawings.
- B. The OWNER reserves the right to perform any desired checking and correction of the CONTRACTOR's layout work relative to OWNER's surveys but this does not relieve the CONTRACTOR of the responsibility for adequate performance of their Work.
- C. **Equipment and Personnel.** Provide instruments and other survey equipment that are accurate, suitable for the surveys required in accordance with recognized professional standards, and in proper condition and adjustment at all times. Perform surveys under the direct supervision of a licensed surveyor.
- D. **Field Notes and Records.** Record surveys in field notebooks.
- E. **Use by the OWNER.** The OWNER may at any time use line and grade points and markers established by the OWNER or CONTRACTOR. The CONTRACTOR's surveys

are a part of the Work and may be checked by the OWNER or representatives of the OWNER at any time.

1.03 RELATED SECTIONS

- A. Section 01025 – Measurement and Payment
- B. Section 01050 – Field Engineering

1.04 SURVEYS FOR LAYOUT AND PERFORMANCE OF WORK

- A. CONTRACTOR will perform all surveys for layout of the Work, reduce the field notes, make necessary calculations, and prepare drawings necessary to carry out such work. CONTRACTOR's layout work will include the following:
 - 1. Slope staking for excavations at 25-foot grid, and grade breaks.
 - 2. Blue top for subgrade at 25-foot grid and grade breaks.
 - 3. All as-built surveys specified in Section 01052.
 - 4. Surveys to measure completed units of work specified in Section 01025.
- B. CONTRACTOR must perform all additional slope staking, off-setting and other control staking necessary to perform the Work.

1.05 SURVEYS FOR RECORD DRAWINGS AND MEASUREMENT FOR PAYMENT

- A. When the Specifications require items of work to be measured by surveying methods, the CONTRACTOR will perform the surveys and perform necessary calculations to determine payment quantities. The ENGINEER may perform independent checks.
- B. Items requiring surveys for determining pay quantities are given in Section 01025, Measurement and Payment.
- C. The Surveyor shall prepare drawings for each layer of the lining system (subgrade, top of compacted soil, and top of protective soil layer). Points shall provide a comparison of the design elevation against the actual elevation at each point. Points shall be established on a 50-foot maximum grid. Additionally, points shall be established at major changes in grade, changes in alignment, along flow lines, and at any specific points shown in the Drawings. The difference in design versus

constructed elevation for each point shall not exceed the tolerance described in Section 01050 paragraph 1.5.

- D. Provide the OWNER with Record (As-Built) Drawings. Separate and distinct sheets shall be provided depicting existing conditions, top of subgrade/finished earth surface, top of containment system, and top of protective cover. Sheets shall include the following items:
1. Topography that depicts North Cell (NC) Earthwork grading at the start of construction and following excavation and fills. In the event the CONTRACTOR must excavate below the design subgrade as required by these specifications or to remove unsuitable material (at the direction and approval of the ENGINEER or OWNER), CONTRACTOR shall provide as-built survey of the final excavated limits and grades, the limits of fill and grades after placement of engineered fill to establish subgrade and the final grade.
 2. Staking points, grade breaks and limit lines of earthwork as shown in the Design Drawings.
 3. Staking points, grade breaks and limits of liner as shown in the Design Drawings. Where not coincident, limits shall be provided for geomembrane, GCL, and geotextile, including anchor trench alignment and temporary liner terminations (special attention to be given to specific as-built points as required in the Construction Drawings).
 4. Staking points, grade breaks and limits of operations layer as shown in the Design Drawings.
 5. Limits and Grades of earthwork in the perimeter berm. Include staking points, grade breaks, and points of change in surface material.
 6. Miscellaneous Items - CONTRACTOR'S Surveyor shall include the following as-built information on one of the sheets identified above (as appropriate) or shall provide additional sheets, as needed. The specific sheet for each element shall be as approved by the OWNER.
 - a. Location and alignment of buried utilities and buried culverts.
 - b. Initial and finish grades for storm water control features.
 - c. Limits of temporary or permanent access roads.

- d. Subgrade and finished grade of temporary or permanent access roads.
 - e. Stockpile limits and grades (pre- and post-construction).
 - f. Final site as-builts showing contours and any other miscellaneous constructions including fence, wells, probes, electrical, etc.
 - g. OWNER-provided reference points shall be shown on all applicable as-built drawing sheets.
- E. Surveyor shall provide a Text/ASCII file containing all collected as-built locations. As-built drawings shall depict all collected locations with an associated point reference number such that points in the provided Text/ASCII file can be referenced on the drawings.
- F. Surveyor shall submit certified top of subgrade as-built point drawings within 2 days of completion of the subgrade. Where applicable, Surveyor shall provide certified top of compacted soil as-built point drawings within 2 days of completion of this layer. These submittals must be approved by the OWNER before installation of the next liner component begins. In order to avoid project delays, the Surveyor may provide submittals for portions of each completed surface for approval; however, a final consolidated drawing of each surface shall be provided at the completion of each surface.
- G. All final as-built topographic survey drawings are due within 10 days after Substantial Completion date.
- H. Provide sealed as-built survey drawings on a 22" x 34" bond print at same horizontal and vertical scale, same coordinate system, same stationing, and same orientation for each element as shown on the design drawings. Provide as-built survey information and associated point data on the same datum and coordinate basis as design drawings. All point data must have clear, easy to understand descriptions. Provide all point data in Text/ASCII format, printed and on compact disk (CD) or DVD along with list of descriptor abbreviations. All information provided must be accompanied with a letter explaining what is being submitted and a list of what information is given in each CD/DVD. Submit all survey information of any layer to the OWNER before that layer is covered.
- I. Surveyor shall provide all drawings in electronic format. Provide information in AutoCAD 2018 or higher format in accordance with OWNER'S drafting standards. Surveyor shall also provide documents in Adobe .pdf format.

- J. Submit survey information for items listed above to the OWNER before the items are covered.
- K. Provide surveys to measure the following items:
1. Volume of Excavation;
 2. Volume of Engineered Fill;
 3. Volume of Unsuitable Material removed from the NC area below the design subgrade and replaced with Engineered Fill;
 4. Volume of General Fill;
 5. Volume of Screen Berm Fill;
 6. Area of Liner Subgrade Preparation;
 7. Volume of Operations Layer placement;
 8. Length of Anchor Trench (each type);
 9. Length of Liner Termination (each type);
 10. Area of GCL, HDPE Liner, and geotextile placement. Area will be to the hinge point/limit of waste as shown on the drawings only and will not include the material in the run-out or anchor trench itself;
 11. Area of LCRS Gravel placement; and
 12. Length of HDPE Leachate Collection Drain and Risers, for each diameter and material (perforated or solid).

2.0 PRODUCTS

Not Used.

3.0 EXECUTION

Not Used.

END OF SECTION

SECTION A01106
COORDINATION AND MEETINGS

1.0 GENERAL

This section provides information on coordination, pre-construction meeting, progress meetings, and resolution meetings during construction.

1.01 COORDINATION

- A. The CONTRACTOR shall coordinate his work schedule, submittals, and various works to ensure an efficient sequence of the Work and material.
- B. The CONTRACTOR shall coordinate with the OWNER, ENGINEER, and other involved parties with regard to the Work, safety, and utilization of the Site. The project will require open and continuous communication.

1.02 PRE-CONSTRUCTION MEETING

- A. A pre-construction meeting will be held at the project Site, which will be scheduled by the ENGINEER in consultation with the OWNER, and the CONTRACTOR.
- B. The meeting will be attended by the ENGINEER, the OWNER, and the CONTRACTOR. The ENGINEER shall conduct the meeting and will take minutes of the meeting.

1.03 PROGRESS MEETINGS

- A. Upon the request of the ENGINEER, progress meetings shall be held at the Site. These meetings shall occur every other week.
- B. The progress meetings will be attended by the ENGINEER, the OWNER, the CONTRACTOR, and if necessary, other affected parties.
- C. The agenda of the meetings and meeting minutes will be provided by the ENGINEER.

1.04 RESOLUTION MEETING(S)

- A. To resolve conflicts, discrepancies, and differences of opinion, the ENGINEER shall convene Resolution meetings.

- B. Resolution meetings shall be attended by the affected parties.
- C. The agenda of Resolution meetings shall depend on circumstances.

1.05 DISPUTE RESOLUTION

All claims, disputes and other matters in question between the OWNER and the CONTRACTOR arising out of, or relating to the Contract Documents, or the breach thereof will be decided by binding, unappealable arbitration, if the claim for compensation, costs and expenses or damages is equal or less than \$50,000. The CONTRACTORS sole legal remedy in relation to claims of \$50,000 or less shall be binding, unappealable arbitration.

All arbitration of claims shall be conducted in Glendale, Arizona, in accordance with the Uniform Rules of Procedure for Arbitration adopted by the Arizona Supreme Court (Court Rules) except for any rules therein allowing or concerning appeal. Where necessary to allow arbitration to proceed, the OWNER and CONTRACTOR shall execute an Agreement of Reference consistent with the provisions of this paragraph and the Uniform Rules as modified by this paragraph.

If any provision of the Agreement is held by a court of competent jurisdiction to be invalid, void or unenforceable, the remaining provisions shall nevertheless continue in full force without being impaired or invalidated in any way.

Should either party to the Agreement begin an action to enforce any provision of the Agreement, the prevailing party shall be entitled to recover reasonable attorney's fees and costs in connection therewith. Except as otherwise specifically provided in the Contract Documents, no action or failure to act by the OWNER, ENGINEER, Designer, or CONTRACTOR shall constitute a waiver of any right or duty afforded any of them under the Contract Documents nor shall any such action or failure to act constitute an approval of or acquiescence in any breach thereof.

No payment will be made for meetings. The bid price shall include the cost that may be incurred to attend and conduct any and all meetings and provide coordination.

2.0 MEASUREMENT AND PAYMENT

- A. All costs in connection with the Work specified herein that are not specifically listed in Section A01025 will be considered incidental to the Project. The CONTRACTOR will not be compensated for Work not specifically listed in Section A01025. No payment will be made for meetings. The bid price shall include the cost that may be incurred to attend and conduct any and all meetings and provide coordination.

END OF SECTION

SECTION A01310
CONSTRUCTION WORK PLAN AND SCHEDULE

1.0 GENERAL

1.01 PRELIMINARY WORK PLAN AND SCHEDULE

- A. The CONTRACTOR shall prepare and submit at the pre-construction meeting, a Work Plan and construction schedule.
- B. The ENGINEER will review the preliminary Work Plan and construction schedule prior to the commencement of construction activities.
- C. The CONTRACTOR may be interviewed by the ENGINEER to determine the CONTRACTOR'S understanding of the project, and ability to complete the work in a timely and efficient manner.
- D. The CONTRACTOR shall submit copy of Arizona Pollutant Discharge Elimination System (AZPDES) and earthmoving permit at Pre-construction meeting.

1.02 CONTRACTOR'S WORK PLAN CONTENTS

- A. The CONTRACTOR shall include with Work Plan a drawing detailing various work areas, CONTRACTOR'S utilities, phasing of work, excavation, testing, and any other information related to proposed operations.
- B. The CONTRACTOR shall describe personnel, equipment, and procedures required to accomplish specific items of work, including:
 - 1. Method of coordinating Subcontractors, if any, and maintaining project schedule.
 - 2. Methods and routes for moving and stockpiling materials on site. Include detailed drawings showing haul routes and logistics.
 - 3. Methods for reducing or increasing the moisture content of wet or dry soils prior to using them for constructing engineered fills during construction.
 - 4. Methods and equipment for excavating, hauling, and placing materials.
 - 5. Dewatering methods, equipment and schedules.
 - 6. Site drainage during construction.

7. Methods and equipment for site clearing.
8. Methods for erosion prevention and sediment control.
9. Plans for maintaining as-built information.
10. Health and Safety Plan.
11. Project Schedule.
12. List of Personnel and equipment.
13. List of Subcontractors and Subconsultants.
14. List and organizational chart of project personnel responsibility.
15. Other information required in technical specifications.
16. Emergency action plan and contacts' telephone numbers.
17. Spill Prevention Control and Countermeasures (SPCC) Plan, if required based on quantity of petroleum products stored.
18. Stormwater Pollution Prevention Plan (SWPPP).

1.03 CONTRACTOR'S CONSTRUCTION SCHEDULE

- A. The CONTRACTOR shall prepare a schedule as described in Section 2.01 and meeting overall project scheduling listed Section A01010 1.10 – Project Schedule.
- B. The CONTRACTOR shall coordinate schedule with the ENGINEER for the CONTRACTOR supplied materials.
- C. All Work, including demobilization, shall be complete by February 28, 2023.

1.04 PROJECT MEETINGS

- A. Construction Meetings:
 1. The ENGINEER will conduct construction meetings involving:
 - a. CONTRACTOR's Project Manager.
 - b. CONTRACTOR's Project Superintendent.
 - c. OWNER's designated representative(s).
 - d. ENGINEER's designated representative(s).

- e. CONTRACTOR's subcontractors as appropriate to the work in progress.
 - f. OWNER's Construction Quality Control Consultant.
- 2. The ENGINEER shall conduct progress meetings every other week.
 - 3. The ENGINEER will take meeting minutes and submit copies of meeting minutes to participants and designated recipients identified at the Preconstruction Conference.
 - a. Corrections, additions, or deletions to the minutes shall be noted and addressed at the following meeting.
 - 4. The ENGINEER will schedule meetings for most convenient time frame.
 - 5. The ENGINEER will have available at each meeting full chronological files of all previous meeting minutes.
 - 6. The CONTRACTOR shall have available at each meeting up-to-date record drawings.

1.05 VIDEO RECORDING

- A. The CONTRACTOR shall provide full access to OWNER or OWNER's authorized representative to perform video recording of construction activities, training sessions, start-up, trouble shooting, etc.

1.06 CORRESPONDENCE

- A. The CONTRACTOR will provide a correspondence matrix identifying requirements for submitting and sharing correspondence among the parties involved in the Project.

1.07 SPECIAL CONSIDERATIONS

- A. The CONTRACTOR shall be responsible for negotiations of any waivers or alternate arrangements required to enable transportation of materials to the site.
- B. Maintain conditions of access road to site such that access is not hindered as the result of construction-related deterioration.

1.08 FINAL WORK PLAN

- A. The CONTRACTOR shall resubmit the Work Plan to incorporate the information discussed during the pre-construction meeting.
- B. Work Plan and Schedule Revisions.
 - 1. The CONTRACTOR shall revise Work Plan as necessary to reflect changes in scope of work, but no less than once per month.
 - 2. The CONTRACTOR shall show changes occurring since previous submittal.
 - a. Major changes in scope.
 - b. Activities modified since previous submittal.
 - c. Other identifiable changes.
 - 3. The CONTRACTOR shall submit to the ENGINEER.

2.0 PRODUCTS

2.01 CONSTRUCTION PROGRESS SCHEDULES

- A. The CONTRACTOR shall submit initial critical path method (CPM) schedule in duplicate at the Pre-construction meeting after date of execution of Agreement. The critical path construction tasks shall be clearly identified.
- B. Construction operations will be scheduled to allow uninterrupted operation of existing adjacent facilities.
 - 1. The CONTRACTOR shall coordinate connections with existing work to ensure timely completion of interfaced items.
- C. At no time shall CONTRACTOR or his employees modify operation of the existing facilities or start construction modifications without approval of the OWNER except in emergency to prevent or minimize damage.
- D. Within 10 days prior to construction startup, CONTRACTOR shall submit for approval a CPM schedule with the critical path tasks clearly identified.
 - 1. Schedule shall include any information discussed in preconstruction meeting.
 - 2. The schedule shall account for schedule of Subcontracts.

- a. The schedule shall include proper sequence of construction, various crafts, purchasing time, Shop Drawing approval, material delivery, equipment fabrication, startup, demonstration, and similar time consuming factors.
 3. The schedule shall show as a minimum, earliest starting, earliest completion, latest starting, latest finish, and free and total float for each task or item.
- E. The CONTRACTOR shall evaluate schedule as necessary to reflect changes in Scope of Work, but no less than bi-weekly.
1. Show changes since previous submittal including major scope changes, activities modified since previous submittal and other identifiable changes.
 2. The CONTRACTOR shall update, correct, and rerun schedule and submit to ENGINEER in triplicate with pay application to show rescheduling necessary to reflect true job conditions.
 3. When shortening of various time intervals is necessary to correct for behind schedule conditions, the CONTRACTOR shall indicate actions to be implemented in order to accomplish the work in a shorter duration.
 4. Information shall be submitted to ENGINEER in writing with revised schedule.
 - a. Progress schedules shall be reviewed during progress meetings.
 - b. The CONTRACTOR shall submit a computer-generated graphic type schedule with separate line for each item of Work or operation identifying first work day of each week.
 - c. The schedule shall show complete sequence of construction by activity, identifying Work of separate stages and other logically grouped activities.
 - 1) The schedule shall indicate the early and late start, early and late finish, float dates, and duration, and critical items.
 - d. The schedule shall indicate estimated percentage of completion for each item of Work at each submission.
 - e. The schedule shall indicate submittal dates and review periods required for Shop Drawings, product data, samples, and product delivery dates, including those furnished by the OWNER.

- f. The CONTRACTOR shall coordinate schedule with ENGINEER for Engineer supplied information.
 - g. The CONTRACTOR shall coordinate schedule with Work Plan.
- F. If CONTRACTOR does not take necessary action to accomplish work according to schedule, CONTRACTOR may be ordered by OWNER in writing to take necessary and timely action to improve work progress at CONTRACTOR's expense.
 - 1. OWNER may require increased work forces, extra equipment, extra shifts or other action as necessary at CONTRACTOR's expense.
 - 2. Should CONTRACTOR refuse or neglect to take such action authorized, under provisions of this contract, OWNER may take necessary actions including, but not necessarily limited to, withholding of payment and termination of Contract.
- G. The CONTRACTOR shall indicate submittal dates and review periods required for shop drawings, product data, samples, and product delivery dates, including those furnished by the OWNER.
- H. The schedule shall indicate surveys for layout, as-builts, and measurement for payment.

3.0 EXECUTION

NOT USED

4.0 MEASUREMENT AND PAYMENT

- A. All costs in connection with the Work specified herein that are not specifically listed in Section A01025 will be considered incidental to the Project. The CONTRACTOR will not be compensated for Work not specifically listed in Section A01025.

B.

END OF SECTION

SECTION A01400
QUALITY CONTROL

1.0 GENERAL

1.01 SUMMARY DESCRIPTION

- A. This section specifies quality control descriptions and procedures and shall be applicable to all office, field, and shop work in the Contract Documents.

1.02 RELATED WORK SPECIFIED ELSEWHERE

- A. Section A - General Requirements
- B. Section B - Sitework

1.03 QUALITY CONTROL

- A. Quality control (QC) refers to the sampling, testing and measuring of all materials used at the Site and the verification checking of Contract Drawings and Specifications by the CONTRACTOR to ensure that the Work conforms to the requirements of the Contract Drawings and Specifications. QC testing will comply with all pertinent codes, regulations and standards referenced within the Contract Documents.
- B. Unless specifically authorized in writing, no construction shall be started until the CONTRACTOR'S QC plan is approved.
- C. The CONTRACTOR shall establish and continuously provide a quality control system to perform sufficient inspection and testing of all items of Work, including that of subcontractors, to ensure conformance to applicable specifications and drawings with respect to the materials, workmanship, construction, finish, functional performance, and identification. This control shall be established for all construction, except where the Technical Provisions of the contract provide for specific control inspections, tests or other means to be performed by the ENGINEER. The CONTRACTOR'S control system shall specifically include the surveillance and testing required in the Contract Specifications.
- D. The CONTRACTOR'S quality control system is the means by which he assures himself that his construction complies with the requirements of the Contract plans and specifications. The controls shall be adequate to cover all construction operations and shall be keyed to the proposed construction sequence.

- E. The CONTRACTOR'S job supervisory staff may be used for quality control, supplemented as necessary by additional personnel for surveillance, special technicians, or testing facilities to provide capability for controls required by the Technical Provisions of the specifications. Prior approval is required for facilities, equipment, and personnel used by the CONTRACTOR in performing the specified testing.

1.04 SUBMITTALS

- A. The CONTRACTOR shall submit to the OWNER and ENGINEER for approval a Quality Control Plan which shall include the procedures, instructions, and reports.

1.05 NOTICES

- A. Additional inspection and testing required due to defective work or ill-timed notices may be initiated by the ENGINEER and shall be at the CONTRACTOR'S expense.

1.06 PROJECT COOPERATION

- A. The CONTRACTOR shall provide representatives of the OWNER and ENGINEER access to the Work at all times and at all locations where Work is in progress.
- B. The CONTRACTOR shall allow the ENGINEER, OWNER, or their representatives access and time to conduct Quality Assurance sampling or testing. Frequencies, time, and locations will be at the ENGINEER'S discretion.

1.07 TESTING FREQUENCY

A. SUBGRADE

1. The CQA ENGINEER will perform testing on subgrade surfaces at frequencies as shown in the table below:

TESTS AND OBSERVATIONS ON SUBGRADE PREPARATION

Parameter	Test Method	Minimum Testing Frequency
Percent Compaction (Note 1)	ASTM D 2922	1 per acre (Note 2)
Compaction Curve	ASTM D 1557	1 per 5 acres, 1 minimum
Preparation of Previously Compacted Lift	Observation	Part Time

- a. Percent compaction is defined as the dry density of the compacted soil divided by the maximum dry density measured in the laboratory with a specified method of compaction. The test methods listed are for measurement of the dry density of the compacted soil. Compaction shall be a minimum of 90 percent of modified proctor in accordance with ASTM D1557.
- b. At a minimum, at least one test should be performed each day the construction personnel prepare subgrade by compaction.

B. GENERAL FILL (HAUL ROADS)

1. General fill is required for the construction of temporary structures such as haul roads, ramps and other fills that will be removed in the future. Testing of general fill shall not be required. These general fills may be constructed over the existing waste footprint.
2. Compaction of general fill shall be, at a minimum, 85 percent of Modified Proctor in accordance with ASTM D1557. The ENGINEER may perform spot

testing of the fill to determine the actual percent compaction being achieved by the CONTRACTOR.

3. The CONTRACTOR is responsible for the safety and maintenance of general fill structures until the completion of the Work. After completion of the project general fill structures will be the responsibility of the Glendale Landfill staff.

C. ENGINEERED FILL (PERMENANT SLOPES, ALL OTHER FILLS)

1. Field Test Methods During Construction

- a. Testing frequency of structural fill during construction shall be as shown in the table below;

ENGINEERED FILL

Parameter	Test Method	Minimum Testing Frequency
Water Content	ASTM D 3017	1/acre/lift and at least 1 per 1000 yd ³
Density	ASTM D 2922	1/acre/lift and at least 1 per 1000 yd ³
Compaction Curve	ASTM D 1557	1/5 acres/lift and at least 1 per 5000 yd ³
Construction Oversight	Observation	Part-Time

- b. Every tenth sample tested with ASTM D3017 should be tested by ASTM D4643;
 - c. For Engineered Fill, compaction shall be a minimum of 90 percent of modified proctor in accordance with ASTM D1557;
 - d. Moisture content shall be in a range of ±2% of the optimum moisture content as determined by ASTM D 1557; and
 - e. The maximum un-compacted lift thickness shall be 10".
2. The CQA ENGINEER will review all CONTRACTOR submittals for construction plans, and laboratory results.
 3. The CQA ENGINEER will verify that the subgrade has been constructed to

the thickness and final elevation as shown on the Drawings and specified herein.

- 4 The CQA ENGINEER will observe the installation of the structural fill to the lines and grades indicated on the drawings on a part time basis.

D. SOIL STOCKPILES

1. Testing of the fill during construction of the soil stockpile(s) will not be required. These stockpiles may be constructed over the existing waste footprint.
2. The daily and intermediate cover stockpile(s) shall be at a nominal 85 percent of Modified Proctor in accordance with ASTM D1557.

1.08 DEFICIENCIES

- A. When deficiencies (items that do not meet specified values) are discovered, the ENGINEER shall immediately determine the nature and extent of the problem, notify the CONTRACTOR, and complete required documentation. In all cases, the ENGINEER will notify the CONTRACTOR within 1 hour of discovering the deficiency. If the deficiency will cause construction delays of more than 1 hour or will necessitate substantial rework, the CQA ENGINEER shall also notify the OWNER.
- B. The CONTRACTOR shall correct the deficiency to the satisfaction of the ENGINEER or OWNER. If the CONTRACTOR is unable to correct the problem, the ENGINEER will develop and present to the OWNER suggested solutions for approval. The corrected deficiency shall be retested before additional work is performed by the CONTRACTOR. All retests and the steps taken to correct the problem shall be documented by the ENGINEER.

2.0 PRODUCTS

NOT USED

3.0 EXECUTION

NOT USED

4.0 MEASUREMENT AND PAYMENT

- A. All costs in connection with the Work specified herein that are not specifically listed in Section A01025 will be considered incidental to the Project. The CONTRACTOR will not be compensated for Work not specifically listed in Section A01025.

END OF SECTION

SECTION A01500
TEMPORARY FACILITIES AND CONTROLS

1.0 GENERAL

1.01 REQUIREMENTS

- A. The CONTRACTOR shall furnish, install and maintain required construction aids and barriers as required to prevent public entry, and to protect the Work, existing facilities, trees and plants from construction operations and other temporary facilities required to complete the Work.
- B. The CONTRACTOR shall provide and maintain methods, equipment, and temporary construction, as necessary to provide controls over environmental conditions at the construction site and related areas under the CONTRACTOR's control.
- C. The CONTRACTOR shall remove all temporary facilities at completion of the Work or when no longer necessary.
- D. The CONTRACTOR shall not interfere with the normal business traffic and the operations of the Glendale Landfill including not using customer traffic circulation roads.
- E. In addition to any other remedy available by law or equity to the OWNER, the parties expressly agree that the CONTRACTOR shall be liable for and shall pay to the OWNER the sum of five thousand dollars (\$5,000.00) for each notice of violation and/or citation of a federal, state, county, city, agency, or administrative law, rule, regulation, ordinance or court order resulting from the CONTRACTOR's acts, errors, or omissions on the Project. This sum will be taken out of the CONTRACTOR's Contract with the OWNER. This sum is in addition to any penalty, fine, or fee imposed by a court of law or administrative agency related to the notice of violation and/or citation, and in addition to the CONTRACTOR's acts, errors, or omissions on the Project. The parties expressly agree that the sum fixed above is reasonable and approximates the actual anticipated loss to the OWNER at the time and making of this agreement in the event that a notice of violation and/or citation is levied on the Project. The parties expressly acknowledge and agree to the fixed sum set forth above because of the difficulty of proving the OWNER's actual damages in the event that a notice of violation and/or citation is levied on the Project.

1.02 DUST CONTROL

- A. Dust control is absolutely critical on this Project. Due to residences and institutions in close proximity to this landfill, its operations are under public scrutiny at all times. Under Maricopa County's requirements for an Earthmoving Permit, the CONTRACTOR must place a sign for public viewing, with a telephone number that can be used by the public to make complaints to the Maricopa County Air Quality Department. Such a call will result in a visit to the site by County Dust Enforcement personnel and may result in a Notice of Violation (NOV). Notices of violation are issued to the holder of the Earthmoving Permit (the CONTRACTOR), but they reflect unfavorably on the City of Glendale.

The CONTRACTOR shall be prepared to spend as much time as required to keep dust controlled in accordance with regulatory requirements. The air contaminant emission at the Work area shall not exceed 20-percent opacity during the Contract period. Local regulatory requirements may be more stringent than the maximum allowable stated above. The CONTRACTOR is responsible for identifying and complying with all applicable regulatory levels. Whenever any dust emissions that can be seen by the naked eye, rising from the operation, and/or fugitive emissions obstructing the view of the operations, the CONTRACTOR is in violation of these Specifications. If the CONTRACTOR fails to provide the necessary dust control, to the ENGINEER'S satisfaction, the Project will be shut down, at the CONTRACTOR's expense, until the CONTRACTOR presents satisfactory evidence to the ENGINEER that he can continue Work and prevent dust as required.

- B. The CONTRACTOR shall provide continuous positive methods and apply dust control measures to prevent rising dust from construction operations, and provide positive means to prevent airborne dust from dispersing into the atmosphere. Chemical dust suppressants must be approved by the ENGINEER prior to use.
- C. The CONTRACTOR shall control dust by preventing blowing and movement of dust from exposed soil surfaces and access roads to reduce on- and off-site damage and health hazards. Control may be achieved by irrigation in which the site shall be sprinkled with water until the surface is moist. The process shall be repeated as needed.

1.03 NOISE CONTROL

- A. The CONTRACTOR's vehicles and equipment shall be such as to minimize noise to the greatest degree practicable. Noise levels shall conform to the latest OSHA standards and in no case will noise levels be permitted which interfere with the Work of the OWNER or others.

1.04 PEST AND RODENT CONTROL

- A. Provide rodent and pest control as necessary to prevent infestation of construction or storage areas.
 - 1. Employ methods and use materials that will not adversely affect conditions at the site or on adjoining properties.

1.05 SURFACE WATER CONTROL

- A. The CONTRACTOR shall provide methods to control surface water to prevent damage to the Project, the site, or adjoining properties. The CONTRACTOR shall control fill, grading and ditching to direct surface drainage away from excavations, pits, tunnels and other construction areas; and to direct drainage to proper run-off.
- B. The CONTRACTOR shall provide, operate, and maintain equipment of adequate capacity to control surface erosion.
- C. The CONTRACTOR shall dispose of drainage water in a manner to prevent flooding, erosion, or other damage to any portion of the site or to adjoining areas.

1.06 DEBRIS CONTROL

- A. All areas under the CONTRACTOR's control shall be maintained free of extraneous debris.
- B. The CONTRACTOR shall initiate and maintain a specific program to prevent accumulation of debris at the Project site, storage and parking areas, or along access roads and haul routes.
 - 1. The CONTRACTOR shall utilize only City of Glendale Solid Waste Collection Services containers and/or vehicles for any and all debris control measures.
 - 2. The CONTRACTOR shall prohibit overloading of trucks to prevent spillage on access and haul routes. Traffic areas shall be periodically inspected to enforce requirements.
- C. The CONTRACTOR shall schedule periodic collection and disposal of debris. Additional collections and disposal of debris shall be provided whenever the periodic schedule is inadequate to prevent accumulation.

1.07 POLLUTION CONTROL

- A. The CONTRACTOR shall provide methods, means and facilities required to prevent contamination of soil, water or atmosphere by the discharge of noxious substances from construction operations. If such contamination should occur, the CONTRACTOR shall immediately notify the OWNER and ENGINEER.
- B. The CONTRACTOR shall provide equipment and personnel to perform emergency measures required to contain any spillage and to remove contaminated soils or liquids; and, shall excavate and dispose of any soil contaminated by the construction operations off-site in accordance with all Federal, state, and local regulations and replace with suitable compacted fill, topsoil and/or vegetation as directed by the ENGINEER.
- C. The CONTRACTOR shall take special measures to prevent harmful substances from entering public waters; and, shall prevent disposal of wastes, effluents, chemicals, sediments, or other such substances adjacent to streams, or in sanitary or storm sewers.
- D. The CONTRACTOR shall provide systems for control of atmospheric pollutants and shall:
 - 1. Prevent toxic concentrations of chemicals and
 - 2. Prevent harmful dispersal of pollutants into the atmosphere.
- E. The CONTRACTOR shall provide adequate secondary containment structures for any above ground petroleum storage tanks and/or drums. If required based on the quantity of petroleum products stored, the CONTRACTOR shall prepare and implement a Spill Prevention, Control, and Countermeasures (SPCC) Plan, pursuant to and complying with the requirements of 40 Code of Federal Regulations, Part 112. The SPCC Plan shall be sealed by a Professional Engineer registered in the State of Arizona.
- F. The CONTRACTOR shall obtain a construction AZPDES permit and develop a Storm Water Pollution Prevention Plan (SWPPP) for the construction phase of the Project.

1.08 EROSION CONTROL

- A. General: The construction procedures outlined herein shall be implemented to assure minimum damage to the environment during construction. The CONTRACTOR shall take any and all additional measures required to conform to the requirements of applicable codes and regulations.

1. Whenever possible, access and temporary roads shall be located and constructed to avoid environmental damage. Provisions shall be made to regulate drainage, avoid erosion, and minimize damage to vegetation.
 2. Where areas must be cleared for storage of materials or temporary structures, provisions shall be made for regulating drainage and controlling erosion, subject to the ENGINEER's approval.
 3. Remove only those shrubs and grasses that must be removed for construction. Protect the remainder to preserve their erosion-control value.
- B. Control Measures: Measures shall be applied to control erosion and to minimize the siltation of the existing waterways, and natural ponding areas. Such measures shall include, but are not limited to, the use of berms, baled straw silt barriers, gravel or crushed stone, mulch, slope drains, and other methods.
1. Install erosion and sediment control practices where shown and according to applicable standards, codes, and Specifications. The practices shall be maintained in effective working condition during construction and until the drainage area has been permanently stabilized.
 2. Temporary measures shall be coordinated with the construction of permanent drainage facilities and other Work to the extent practicable to assure economical, effective, and continuous erosion and siltation control.
 3. The CONTRACTOR shall provide special care in areas with steep slopes. Disturbance of vegetation shall be kept to a minimum to maintain stability.
 4. After stabilization, remove all straw bale dikes, debris, etc., from the site.
- C. Failure to Comply: In the event the CONTRACTOR repeatedly fails to satisfactorily control erosion and siltation, the OWNER reserves the right to employ outside assistance or to use its own forces to provide the corrective measures indicated. The cost of such Work, plus engineering costs, will be deducted from monies due the CONTRACTOR.
- D. The CONTRACTOR shall plan and execute construction and earthwork by methods to control surface drainage from cuts and fills, and from borrow and waste disposal areas, to prevent erosion and sedimentation.
1. Hold the areas of bare soil exposed at one time to a minimum.

- 2. Provide temporary control measures such as berms, dikes, and drains.
- E. The CONTRACTOR shall construct fills and waste areas by selective placement to eliminate surface silts or clays, which will erode.
- F. The CONTRACTOR shall periodically inspect earthwork to detect any evidence of the start of erosion and apply corrective measures as required to control erosion.

2.0 PRODUCTS

2.01 MATERIALS, GENERAL

- A. Materials shall be new and suitable for the intended purpose, but must not violate requirements of applicable codes and standards.

2.02 CONSTRUCTION AIDS

- A. The CONTRACTOR shall provide any and all construction aids, equipment and materials required to facilitate execution of the Work, including but not limited to: scaffolds, staging, ladders, stairs, signs, ramps, runways, platforms, railings, hoists, cranes, chutes and other such facilities and equipment.

3.0 EXECUTION

3.01 PREPARATION

- A. The CONTRACTOR shall consult with the ENGINEER and review site conditions and factors which affect construction procedures and construction aids, including adjacent properties and public facilities which may be affected by execution of the Work.

3.02 GENERAL

- A. Installation of facilities shall be of a neat and reasonable uniform appearance, structurally adequate for required purposes.
- B. The CONTRACTOR shall maintain barriers during entire construction period.
- C. The CONTRACTOR shall relocate barriers as required by progress of construction.

3.03 TREE AND PLANT PROTECTION

- A. The CONTRACTOR shall preserve and protect existing trees and plants at the site and those adjacent to the site.

- B. The CONTRACTOR shall consult with the ENGINEER and remove agreed-upon roots and branches which interfere with construction. The CONTRACTOR shall employ a qualified tree surgeon to remove roots and branches, and to treat cuts.
- C. The CONTRACTOR shall provide temporary barriers to a height of six feet around each tree or plant or around each group of trees or plants which are in the area of the Work.
- D. The CONTRACTOR shall protect root zones of trees and plants and shall perform the following in areas of protected trees and plants:
 - 1. Not allow vehicular traffic or parking;
 - 2. Not store materials or products;
 - 3. Prevent dumping of refuse or chemically injurious materials or liquids; and
 - 4. Prevent puddling or continuous running water.
- E. The CONTRACTOR shall carefully supervise excavating, grading and filling, and subsequent construction operations, to prevent damage to existing vegetation, utilities, or monitoring devices.
- F. The CONTRACTOR shall replace, or suitably repair, trees and plants, and irrigation systems which have been damaged or destroyed due to construction operations at the CONTRACTOR's expense.
- G. Land Protection:
 - 1. Except for any Work or storage area and access routes specifically assigned for the use of the CONTRACTOR, the land areas outside the limits of construction shall be preserved in their present condition. The CONTRACTOR shall confine his construction activities to areas defined for Work within the Specifications and the Contract Documents.
 - 2. The CONTRACTOR shall manage and control all stockpile/borrow areas, Work or storage areas, access routes and embankments to prevent sediment from entering nearby water or land adjacent to the Project site.
 - 3. The CONTRACTOR shall restore all disturbed areas including stockpile/borrow and haul areas and establish permanent type of locally adaptable vegetative cover.
 - 4. Unless earthwork is immediately paved or surfaced, the CONTRACTOR shall protect all side slopes and backslopes immediately upon completion of final grading.

5. The CONTRACTOR shall plan and execute earthwork in a manner to minimize duration of exposure of unprotected soils.
6. The CONTRACTOR shall construct fills by selective placement to eliminate surface soils that are susceptible to erosion.
7. The CONTRACTOR shall periodically inspect earthwork to detect any evidence of the start of erosion, and apply corrective measures as required to control erosion.
8. Except for areas designated by the Drawings, Specifications and the Contract Documents to be cleared and grubbed, the CONTRACTOR shall not deface, injure, or destroy trees and vegetation, nor remove, cut, or disturb them without approval of the ENGINEER. Any damage caused by the CONTRACTOR's equipment or operations shall be restored as nearly as possible to its original condition at the CONTRACTOR's expense.

3.04 REMOVAL

- A. The CONTRACTOR shall completely remove temporary barriers, materials, equipment, and services:
 1. When construction needs can be met by use of permanent construction; or
 2. At completion of Project.
- B. The CONTRACTOR shall clean and repair damage caused by installation or by use of temporary facilities including:
 1. Removal of foundations and underground installations for construction aids;
 2. Grading areas of site affected by temporary installations to required elevations and slopes; and
 3. Cleaning of the area.
- C. The CONTRACTOR shall restore existing facilities used for temporary purposes to specified or original condition.
- D. The CONTRACTOR shall restore permanent facilities, if any, used for temporary purposes to condition existing prior to construction.

3.05 HISTORICAL AND ARCHAEOLOGICAL

- A. If, during the course of construction, evidence of deposits of historical or archaeological interest is found, the CONTRACTOR shall cease operations affecting the find and shall notify OWNER.

1. No further disturbance of the deposits shall ensue until the CONTRACTOR has been notified by the OWNER that the CONTRACTOR may proceed.
2. OWNER will issue a notice to proceed after appropriate authorities have surveyed the find and made a determination to the OWNER.
3. The site has been previously investigated and has no known history of historical or archaeological finds.

3.06 TEMPORARY SANITARY FACILITIES

- A. Toilet Facilities: The OWNER will not provide on-site toilet facilities for the CONTRACTOR's use. The CONTRACTOR shall be responsible for providing on-site toilet facilities for his/her employees. All toilet facilities shall be maintained in a neat and clean manner and shall not cause an eyesore. All toilet facilities shall follow all applicable regulations, laws, and ordinances. If the CONTRACTOR abuses the toilet facilities, the OWNER has the right to revoke all on-site toilet access, and the CONTRACTOR will have to provide his or her own toilet facilities, further away from the job site.
- B. The CONTRACTOR shall provide temporary sanitary toilet facilities conforming to state and local health and sanitation regulations, in sufficient number for use by the OWNER's designated Project Representatives, CONTRACTOR's and Subcontractor's employees.
- C. The CONTRACTOR shall maintain in sanitary condition and properly supply with toilet paper.
- D. No sanitary sewer pipe is located at the Project site.
 1. The CONTRACTOR shall arrange for portable toilet units and holding tanks.
 2. The CONTRACTOR shall pipe all wastes from trailer offices to a holding tank.
- E. The CONTRACTOR shall arrange for routine vacuuming, cleaning, and maintenance services.
- F. Proper sanitary, vector, and odor control shall be required and maintained at all times.

3.07 TEMPORARY ELECTRICITY, TELEPHONE, AND DOMESTIC WATER

- A. Electrical power for the CONTRACTOR'S use will not be provided by the OWNER.

- B. The CONTRACTOR shall provide power for all construction operations until final completion of Project.
- C. The CONTRACTOR shall provide temporary lighting as required during construction.
- D. The CONTRACTOR shall provide illumination Levels: In accordance with OSHA requirements for construction lighting.
- E. Equipment and materials need not be new.
- F. Temporary wiring shall be sized and fused in accordance with NEC requirements.
- G. Relamp fixtures during construction period to meet requirements of the CONTRACTOR and Subcontractors, to satisfy applicable safety requirements, and as directed by the OWNER.
- H. The CONTRACTOR shall provide ventilated enclosed areas to achieve curing of materials, to dissipate humidity, and to prevent accumulation of dust, fumes, vapors, or gases.
- I. The CONTRACTOR shall provide and pay for suitable quality water service as needed to maintain specified conditions for construction operations (see Section A01050 – 3.14 – Construction Water).
- J. Telephone and fax machines for the CONTRACTOR’s use will not be provided by the OWNER.
- K. Domestic water for human consumption shall be obtained by the CONTRACTOR.
- L. Obtain written approval from the OWNER a minimum of 72 hours prior to disconnection or shutting off any service or utility.

3.08 TEMPORARY FIRE PROTECTION

- A. The CONTRACTOR shall:
 - 1. Provide and maintain in working order a minimum of one fire extinguisher in each trailer or as required by codes;
 - 2. Be required to contact local fire department and meet all necessary fire codes at the Project site;
 - 3. Make arrangements for fire department audits, 30 days after Notice to Proceed; and
 - 4. Make roadways accessible to fire trucks.

3.09 TEMPORARY SITE AND OTHER ROADS

- A. The CONTRACTOR shall construct and maintain temporary site roadways in drivable condition necessary to carry out construction operations.
- B. The CONTRACTOR shall maintain the OWNER's existing roads and public roads used during construction free from accumulations of dirt, mud, and construction debris resulting from construction operations. Roads shall be considered "maintained" when material has been removed by a mechanical sweeper.
- C. Paved roads damaged during routine and normal construction shall be repaired at the CONTRACTOR's expense per the City of Glendale paving requirements.
- D. The CONTRACTOR shall provide photographs of road conditions before start of the Project.
- E. Security will not be provided by the OWNER.
- F. The CONTRACTOR shall be responsible for loss or injury to persons or property where Work is involved, and shall provide security and take precautionary measures to protect the CONTRACTOR's and OWNER's interests.
- G. The CONTRACTOR shall provide insurance against loss of materials, contents of trailer(s), equipment, and other property at the Project site and Project trailer.

3.10 TEMPORARY PARKING

- A. Temporary parking areas shall be provided by the CONTRACTOR at no additional cost to the OWNER.
 - 1. The OWNER and ENGINEER will require on-site parking for at least five vehicles.
- B. The CONTRACTOR shall maintain designated parking areas with 1-inch decomposed granite or other suitable material.
- C. No heavy machinery shall be allowed on the OWNER's parking area.

3.11 TEMPORARY FENCING

- A. If for any reason, the existing perimeter landfill fencing is altered or removed by the CONTRACTOR, the CONTRACTOR shall provide temporary fencing sufficient to prevent trespassing.
 - 1. The CONTRACTOR shall provide fencing that is sufficiently secure against trespass of children and stray animals.

- B. Materials shall be sufficiently durable to be effective for duration of construction period.
- C. The CONTRACTOR shall coordinate with the OWNER for the removal any and all temporary fencing around the Project site to be replaced with new permanent site fencing following construction.

3.12 PROGRESS CLEANING AND WASTE REMOVAL

- A. The CONTRACTOR shall maintain areas free of waste materials, debris, and rubbish.
 - 1. Maintain site in a clean and orderly condition.
- B. The CONTRACTOR shall remove debris and rubbish from pipe manholes, and other closed or remote spaces, prior to enclosing the space.
- C. The CONTRACTOR shall broom and vacuum clean interior areas prior to start of surface finishing, and continue cleaning to eliminate dust.
- D. The CONTRACTOR shall collect and remove waste materials, debris, and rubbish from site work area weekly and dispose of it at the active working face on-site. If the material is HazMat, the CONTRACTOR shall dispose of the HazMat material off-site.
- E. Open free-fall chutes are not permitted.
 - 1. The CONTRACTOR shall terminate closed chutes into appropriate containers with lids.

3.13 BARRIERS

- A. The CONTRACTOR shall provide barriers to prevent unauthorized entry to construction areas to allow for the OWNER's use of site and to protect existing facilities and adjacent properties from damage from construction operations and demolition.
- B. The CONTRACTOR shall provide barricades and covered walkways required by governing authorities for public rights-of-way.
- C. The CONTRACTOR shall protect non-owned vehicular traffic, stored materials, site and structures from damage.

3.14 CONSTRUCTION WATER

- A. The CONTRACTOR is responsible for transporting water per the Drawings and Specifications.
- B. The CONTRACTOR shall not use any water from the OWNER's two existing Site water stands, unless approved by the OWNER.
- C. The CONTRACTOR is responsible for obtaining construction water. There is no potable water main on-site. There is a potable water main adjacent to the Glendale Landfill's north cell along the South side of Northern Avenue. The CONTRACTOR shall contact the City of Glendale Water Department to make necessary arrangements to provide water services during construction. The CONTRACTOR is responsible for paying for all connection and usage fees associated with the water services and for providing his own water storage tank.

3.15 CONTRACTOR'S WATER USAGE LOG

- A. The CONTRACTOR shall submit a monthly log of water used for dust control to the ENGINEER with each pay application. The log shall be updated every month.
 - 1. The water usage log shall include the following:
 - a. Date water was used;
 - b. How many hours each day the water was used;
 - c. Number of loads per day;
 - d. Number of water trucks/pulls used per day;
 - e. Loads of water per hour per day;
 - f. Subcontractor gallons of water used on any date the CONTRACTOR used water;
 - g. Pre-wet water usage, gallons per day;
 - h. Identify size of water trucks/pulls used and how many gallons each piece of equipment placed per day; and
 - i. Cumulative total per day and total gallons of water used per month.

4.0 MEASUREMENT AND PAYMENT

- A. All costs in connection with the Work specified herein that are not specifically listed in Section A01025 will be considered incidental to the Project. The CONTRACTOR will not be compensated for Work not specifically listed in Section A01025.

END OF SECTION

SECTION A01510
TRAFFIC CONTROL

1.0 GENERAL

1.01 TRAFFIC REGULATIONS

- A. The following shall be considered major streets: Glendale Avenue and Northern Avenue.
- B. All traffic and/or traffic control devices on this Project shall be provided, maintained and/or controlled as specified in the City of Glendale *Traffic Barricade Manual*, latest revision.
- C. Permission to restrict major streets, sidewalks, and alleys shall be requested through the City of Glendale and/or Maricopa County Department of Transportation (MCDOT).
- D. Unless otherwise provided for the following “Special Traffic Regulations”, all traffic on this Project shall be regulated as specified in Section IV of the *Traffic Barricade Manual*.
- E. No deviation to the “Special Traffic Regulations” will be allowed or implemented unless submitted to the ENGINEER for review and approval (2) weeks prior to proposed Work.

1.02 LOCAL ACCESS REQUIREMENTS

- A. The CONTRACTOR shall maintain local access to all site haul roads, access roads, and driveways at all times. The CONTRACTOR shall restore the access as soon as possible. If the primary access cannot be restored in a timely manner, the CONTRACTOR shall provide an alternative which shall be pre-determined with the OWNER. Any local street restrictions imposed shall be such that local area traffic circulation is maintained.

1.03 SPECIAL SIGN REQUIREMENTS

- A. The CONTRACTOR shall provide, erect, and maintain advance notification, informational and directional access signs that may be required by the ENGINEER. The cost of signage is incidental to traffic control cost.

1.04 TRAFFIC CONTROL PLAN

- A. The CONTRACTOR shall submit a traffic control plan for approval, showing placement of all traffic control devices, including all conflicting signs to be covered/removed or relocated, or other features that may conflict with the placement of temporary signage. Included in the plan shall be designated routes for the CONTRACTOR’s equipment during construction. The CONTRACTOR shall not deviate from designated routes, unless otherwise approved by the ENGINEER, and shall not interfere with the traffic and operations of other Contractors, landfill haulers or the OWNER. This plan shall be professionally drawn on 24"x36" reproducible medium, and shall be submitted to the ENGINEER at the Pre-Construction meeting.

- B. The CONTRACTOR is responsible for furnishing all traffic control-related materials and personnel, including but not limited to flagmen, barricades, signs and barriers. The cost is incidental to the traffic control cost.

2.0 PRODUCTS

NOT USED

3.0 EXECUTION

NOT USED

4.0 MEASUREMENT AND PAYMENT

- A. All costs in connection with the Work specified herein that are not specifically listed in Section A01025 will be considered incidental to the Project. The CONTRACTOR will not be compensated for Work not specifically listed in Section A01025.

END OF SECTION

SECTION A01810
DRAWINGS

1.0 GENERAL

1.01 DESCRIPTION

The Drawings, showing the scope, extent and character of the Work to be furnished and performed by the CONTRACTOR are provided under separate cover and are included as part of the Specifications and Contract Documents. The Drawings are listed as follows:

INDEX OF DRAWINGS

- C-1 Title Sheet
- C-2 Plan View
- C-3 Excavation Plans
- C-4 Excavation Plans
- C-5 Stockpiling Plans
- C-6 Stockpiling Plans
- C-7 Details

2.0 PRODUCTS

NOT USED

3.0 EXECUTION

NOT USED

4.0 MEASUREMENT AND PAYMENT

- A. All costs in connection with the Work specified herein that are not specifically listed in Section A01025 will be considered incidental to the Project. The CONTRACTOR will not be compensated for Work not specifically listed in Section A01025.

END OF SECTION

SECTION B02200
EARTHWORK

1.0 GENERAL

1.01 DESCRIPTION OF WORK

- A. The CONTRACTOR shall furnish all labor, materials, tools, supervision, transportation, and installation equipment necessary to perform all related Work as specified herein, as shown on the Contract Drawings.
- B. The Work of this Section shall include, but not necessarily be limited to: excavating, separating, hauling, stockpiling, backfilling, compacting, and grading of soils. The Work of this Section may pertain in whole or in part to construction of the following: the landfill's north cell, excavation, filling, haul road development, stockpiling for soils, and hauling soil to stockpile locations. The Work of this Section also includes protection of Work partially completed.
- C. The CONTRACTOR shall conform to the dimensions, lines, and grades specified on the Drawings.
- D. No extra monetary compensation or additional time will be authorized for claims that soil conditions differ from those anticipated. It is the CONTRACTOR's responsibility to make his own determination as to the actual existing conditions.

1.02 SUBMITTALS AND QUALIFICATIONS

- A. The CONTRACTOR shall submit 7 days prior to commencement of work to the OWNER and the ENGINEER for review a work plan describing the proposed methods of construction, including stripping, dewatering, excavation, filling, compaction, stockpiling, and backfilling for the various portions of the work. The review shall be for method only. The CONTRACTOR shall remain responsible for the adequacy and safety of the methods.
- B. The CONTRACTOR shall notify the OWNER Representative in writing at least 7 days in advance of intention to perform the work of this Section.
- C. If work is interrupted for reasons other than inclement weather, the CONTRACTOR shall notify the OWNER and the ENGINEER a minimum of 24 hours prior to the resumption of work.

1.03 PROTECTION

- A. The CONTRACTOR shall contact utility companies and locate, mark and protect all existing utilities before commencement of construction activities. Mounding of soil to construct an equipment crossing may be required for any natural gas lines, water sewer, or drainage culverts. The CONTRACTOR shall provide design by an engineer registered in the State of Arizona for any pipeline crossing. The CONTRACTOR shall not cross a gas line with heavy equipment until obtaining clearance from the utility companies and from the OWNER.
- B. The CONTRACTOR shall protect trees, shrubs, lawns, sprinkler/irrigation systems, rock outcroppings and other features remaining as part of final landscaping unless otherwise noted.
- C. The CONTRACTOR shall protect benchmarks, survey markers, fences, roads, sidewalks, paving, curbs and other existing structures from damage due to the CONTRACTOR'S activities unless otherwise noted.
- D. The CONTRACTOR shall repair damage caused by the construction operations at the CONTRACTOR'S expense.
- E. Erosion control must be maintained. Erosion control measures shall be as noted on the Grading Plan or as directed by the ENGINEER.

2.0 PRODUCTS

2.01 GENERAL FILL MATERIAL

- A. The General Fill for ramps, haul roads, etc. shall consist of on-site soil materials and shall be free of debris, foreign objects, roots, organic and other materials considered deleterious by the ENGINEER.

2.02 ENGINEERED FILL MATERIAL

- A. The Engineered Fill material shall be on-site soil materials, or other materials, as approved by the OWNER or ENGINEER. The Engineered Fill shall be free of rock greater than 6 inches in diameter retained on a 6-inch mechanical screen. The location of all screening and crushing equipment shall be approved by the OWNER and ENGINEER prior to the production of the Engineered Fill materials. The Engineered Fill Material shall be free of debris, foreign objects, roots, and organic and other materials considered deleterious by the ENGINEER. The Engineered Fill material shall be composed of cohesive materials.

2.03 PIPE BEDDING MATERIAL

- A. The Pipe Bedding aggregate shall be washed ASTM C33 Coarse Aggregate Size Number 57 with the following gradation. Alternate particle sizes will be considered by the OWNER or ENGINEER.

Sieve Designation	Percent Passing
1 1/2"	100
1"	95-100
1/2"	25-60
#4	0-10
#8	0-5

- B. Native soil backfill may be used for backfill for the temporary culverts.

2.04 ACCESS ROAD SEGMENT SURFACING

- A. Access roads shall be surfaced with Asphalt Surface Millings and oil mixture (millings). The millings are reclaimed asphalt pavement (AP) material meeting the requirements of MAG Section 709.1. The millings shall be free of detrimental quantities of organic, non-granular soils and deleterious materials. The millings shall be stored in such a manner as to permit ready inspection and shall be protected from contamination. Any portion of the stockpile that has been consolidated so that the uniformity is affected will require reprocessing prior to use. Reclaimed asphalt millings are available on site and are to be used along with the specified emulsion mixture.

3.0 EXECUTION

3.01 PREPARATION

- A. The CONTRACTOR shall establish and identify required lines and levels.
- B. The CONTRACTOR shall maintain benchmarks, monuments, and other reference points and re-establish if disturbed or destroyed, at no additional cost to the OWNER.
- C. Before start of the Work, the CONTRACTOR shall locate utilities in the Work areas. The CONTRACTOR shall notify utilities to remove and relocate lines that

are in the way of construction and are not to be relocated as a part of the Work covered by these Specifications.

- D. The CONTRACTOR shall maintain, protect, reroute, or extend as required existing utilities to remain which pass through the Work area.
- E. The CONTRACTOR shall develop access to the construction area in accordance with the requirements of the Drawings and Specifications.
- F. The CONTRACTOR shall install barriers and other devices to protect areas adjacent to construction.
- G. The CONTRACTOR shall install silt fences or other means to control surface erosion in accordance with the Construction AZPDES Permit.

3.02 STOCKPILING

- A. Excavated material classified as General Fill material and/or Engineered Fill material shall be segregated from other materials and stockpiled in the manner shown on the Drawings or as specified by the OWNER or ENGINEER.
- B. Excavated materials classified as oversize material (defined as rock materials larger than 6 inches in any direction), rejects from any screening or crushing operation, and the Crushed Rock material shall be stockpiled in designated areas separate from General Fill material and/or Engineered Fill material and from incompatible soil, clearing debris, or other objectionable materials. Stockpile areas will be shown on the Drawings or designated by the OWNER or ENGINEER.
- C. Stockpiles of Engineered Fill material and General Fill material shall be no steeper than 2:1 (horizontal: vertical) or their respective angle of repose, whichever is flatter, without approval of the ENGINEER, graded to drain, sealed by track walk with a Dozer parallel to the slope or other means approved by the ENGINEER, and graded uniformly daily during periods when fill is taken from the stockpile. Upon completion of a stockpile the CONTRACTOR shall soak the surface and shall form a ¼ inch thick crust on all surfaces. After creation of the crust, no further vehicle traffic will be allowed. Any screening berms will be sealed by tracking parallel to the slope with a Dozer or other means approved by the ENGINEER and graded to remove loose materials and provide a smooth even surface.
- D. The CONTRACTOR shall perform watering as necessary to control dust.
- E. Soil from the cell excavation shall be stockpiled within the area specified on the Construction Drawings. Stockpile sideslopes shall be no greater than 2:1, unless otherwise approved by the ENGINEER.

3.03 EXCAVATION – GENERAL

- A. Excavation shall be performed, at a minimum, to the lines and grades indicated on the Drawings. Additional excavation shall be performed to achieve a stable working base or filled to bridge over weak subgrade materials. The limits of additional excavation shall be determined by the ENGINEER.
- B. All excavation shall be open cut unless otherwise shown on Plans or approved by the OWNER or ENGINEER.
- C. Excavated materials shall be transported to stockpile locations, as indicated on the Drawings or as directed by the ENGINEER.
- D. The tolerances from the dimensions and elevations shown on the Drawings for excavation activities only shall be:

1.	Trenches:	Line	±0.1 foot
		Grade	±0.1 foot
2.	Cell Floor and Slope to be lined ⁽¹⁾ :	Line	±0.5 foot
		Grade	±0.1 foot
3.	Unlined Cell Slopes:	Line	±0.5 foot
		Grade	± 0.2 foot
4.	Road Excavations:	Line	±0.5 foot
		Grade	±0.2 foot

⁽¹⁾ – These areas to be left 1 foot “fat” from depicted grades as indicated on the Drawings.

3.04 SHEETING, SHORING, AND BRACING

- A. When necessary, the CONTRACTOR shall furnish, put in place, and maintain such sheeting, bracing, etc., as may be required to support the sides of the excavation and to prevent movement.
- B. Care shall be taken to prevent voids outside the sheeting.
- C. If voids are formed, they shall be immediately filled and compacted.
- D. Unless adjacent facilities will be damaged, the CONTRACTOR shall remove all sheeting, shoring, and bracing after backfill has been placed to a depth of 18 inches over the pipeline.

- E. Shoring shall be completely removed prior to closure of the trench.
- F. The CONTRACTOR shall be responsible for performance and safety on all sheeting, shoring, and bracing.

3.05 UNAUTHORIZED EXCAVATION

- A. All excavation outside or below the proposed lines and grades shown on the Drawings shall be considered unauthorized excavation.
- B. The CONTRACTOR shall backfill areas of unauthorized excavation with Engineered Fill in accordance with this Section at no additional cost to the OWNER, to insure the stability of the structure or construction involved.

3.06 OBSTRUCTIONS

- A. Obstructions shown on the Drawings are for information only and do not guarantee their exact locations nor exclude the presence of other obstructions.
- B. The CONTRACTOR shall exercise due care in excavating adjacent to existing obstructions and shall not disturb them.
- C. In the event obstructions are disturbed, the CONTRACTOR shall repair or replace them as quickly as possible to the condition existing prior to their disturbance. This repair or replacement will be at the CONTRACTOR's expense.
- D. If desired by the utility or the OWNER, the CONTRACTOR shall pay for the repair or replacement Work performed by the forces of the utility, the OWNER or other appropriate party.
- E. If replacement or repair of disturbed obstructions is not performed after a reasonable period of time, the OWNER may have the necessary Work done and deduct the cost of same from payments to the CONTRACTOR.

3.07 PUMPING AND DRAINAGE

- A. At all times during construction, the CONTRACTOR shall provide, maintain and operate equipment and facilities to remove all water entering excavations and keep such excavations dry so as to obtain a satisfactory subgrade to allow the construction of the Work.
- B. Drainage shall be disposed of only in an area approved by the OWNER and the ENGINEER.

3.08 SURVEY CONTROL

- A. The CONTRACTOR shall survey the location and elevation of the excavations. He or she shall also Survey the location and elevation of the top of subgrade shown on the Drawings. Surveying shall be performed in accordance with Specifications Section 01050.
- B. The CONTRACTOR shall provide As-built Drawings of the location and elevation of the excavations and the top of subgrade, in accordance with the requirements of Specifications Section 01050. The CONTRACTOR shall submit this As-built Drawing to the OWNER or ENGINEER at least 48 hours prior to the start of fill placement. The CONTRACTOR may submit a partial As-built Drawing to obtain approval for a portion of Work. The OWNER or ENGINEER will define the minimum requirements for a partial Submittal.

3.09 PIPE BEDDING PLACEMENT

- A. Place pipe bedding only when trench subgrade has been prepared and approved by the ENGINEER.
- B. Compact pipe bedding according to Part 2.04 of this Section.
- C. Place pipe in pipe bedding to lines and grades indicated on Drawings.
- D. Place additional pipe bedding to springline of pipe, then compact.
- E. Do not damage pipe.
- F. Place and compact additional pipe bedding to lines, grades and cross-sectional dimensions shown on the Drawings and Specifications, then compact.
- G. Install pipe bedding to the thickness and elevations shown on the Drawings to a tolerance of minus zero to plus 0.10 feet.

3.10 SUBGRADE PREPARATION AND COMPACTION

- A. General: The CONTRACTOR may be required to reconstruct the subgrade in areas where over-excavations are determined necessary by the OWNER or ENGINEER at the CONTRACTOR's expense.
- B. Prior to placing any fill material over undisturbed subsoil or upon completion of excavation to subgrade, the subgrade shall be proof-rolled with loaded dump truck or similar pneumatic tired vehicle under the observation of the ENGINEER. Should subgrade soils pump, yield or fail to achieve density required, the CONTRACTOR shall disc, blade, scarify and allow to dry or add moisture to aid the compaction process. The CONTRACTOR shall then recompact the soil in

layers as specified in this Section under the observation of the ENGINEER. This procedure shall be repeated as necessary as the weather permits, to facilitate the drying and recompaction of the soil. After recompaction, the subgrade shall be fine graded within tolerance specified in this Section and rolled to form a smooth surface using a steel-drum vibratory roller under the observation of the ENGINEER.

- C. The CONTRACTOR shall grade the subgrade. Uneven areas and low spots shall be eliminated. Debris, roots, branches, stones, etc., in excess of 6 inches in size shall be removed. Remove subsurface soils that have been contaminated with petroleum products. Rocks/stones in excess of 12 inches in size shall be relocated to the rock stockpile.
- D. Prior to placing the Engineered Fill materials, the existing ground surface shall be scarified to a minimum depth of 8 inches, moisture-conditioned to within ± 2 percent of the optimum moisture content and compacted to 90 percent of the maximum dry density as determined by ASTM D1557.
- E. Should efforts to achieve required density be unsuccessful, the CONTRACTOR shall excavate the material and replace with Engineered Fill material as specified in this Section. Undercutting shall not be permitted except at the direction of the ENGINEER.

3.11 GENERAL FILL

- A. The General Fill materials shall be placed in a single uniform lift thickness of 24 inches and/or as specified on the Drawings.

3.12 ENGINEERED FILL PLACEMENT

- A. Engineered Fill material shall be compacted to 90 percent of the maximum dry density as determined by ASTM D1557. Moisture content shall be uniform throughout a compacted lift and shall be within a moisture content range of ± 2 percent of optimum moisture content.
- B. Engineered Fill material shall be placed in 8 inch (maximum) uniform lift thickness and compacted to a uniform density.

3.13 ACCESS ROAD SURFACING

- A. The subgrade shall be moisture-conditioned and prepared as necessary to meet the final surface performance specified under paragraph D of this Subsection.

- B. Placement shall be by methods that will minimize segregation. Any damage to underlying or surrounding material or structures during placement of the millings shall be repaired before proceeding with Work.
- C. Millings shall be placed to fill layer thickness in one operation in such a manner as to minimize segregation and avoid damage to underlying materials.
- D. Millings shall be with an emulsion/rejuvenator application rate of 0.2 GAL/SY x 2 with SS-1H. The millings will have a total moisture content of 6% by weight and be compacted to 95% Standard Proctor Density. Prior to acceptance, the surface of the placed millings shall be proof-rolled and shall be smooth, firm, and unyielding. At the completion of this activity no wheel ruts or other irregularities shall exist on the surface. Place millings to the lines, grades, cross-sections, and dimensions shown on the Drawings.
- E. Millings shall be compacted by a smooth drum vibratory compactor, as approved by the ENGINEER, which shall make a minimum of three passes in each direction over the millings.
- F. After asphalt millings are compacted, a final coat of emulsion/rejuvenator will be applied at an application rate of 0.25 GAL/SY.

3.14 FIELD QUALITY ASSURANCE

- A. The minimum frequency and details of quality assurance testing are provided in Specifications Section 01400. The CONTRACTOR shall be aware of all field quality assurance activities, as these may affect the schedule.
- B. All perforations resulting from testing the backfill material shall be filled with soil and compacted to the satisfaction of the ENGINEER.
- C. If a defective area is discovered in the earthwork, the ENGINEER shall immediately determine the extent and nature of the defect by additional tests, observations, a review of records, or other means that the ENGINEER deems appropriate.
- D. After determining the extent and nature of a defect, the CONTRACTOR shall correct the deficiency at the CONTRACTOR's expense.
- E. Additional testing shall be performed by the ENGINEER to verify that the defects have been corrected before any additional Work is performed by the CONTRACTOR in the area of the deficiency.

3.15 PRODUCT PROTECTION

- A. The CONTRACTOR shall use all means necessary to protect all prior Work, including all materials and completed Work of other Sections.
- B. In the event of damage, the CONTRACTOR shall immediately make all repairs and replacements necessary, to the approval of the ENGINEER at no additional cost to the OWNER.
- C. At the end of each day, the CONTRACTOR shall verify that the entire Work area was left in a state that promotes surface drainage off and away from the area and from finished Work. If threatening weather conditions are forecast, compacted surfaces shall be seal-rolled to protect finished Work.

4.0 MEASUREMENT AND PAYMENT

- A. All costs in connection with the Work specified herein that are not specifically listed in Section A01025 will be considered incidental to the Project. The CONTRACTOR will not be compensated for Work not specifically listed in Section A01025.

END OF SECTION

SECTION B02211
GRADING

1.0 GENERAL

1.01 SUMMARY DESCRIPTION

- A. Work consists of general grading (filling and excavation) required to establish a final Site grade as designated on the Contract Drawings. The excavation shall be rough graded to the tolerances indicated in Section B02200. Grades in the area of the future installation of the Module 2A liner (Not in this Contract) shall be left 1 foot “fat” of the depicted contours as indicated on the Drawings. These slopes will be trimmed back by others before the landfill liner is installed.
- B. The CONTRACTOR shall perform rough grading of the north cell excavation (fine grading will be done by others).
- C. The CONTRACTOR shall perform rough grading of soil stockpiles.
- D. The CONTRACTOR shall grade, cut, fill, and contour adjacent areas or washes in the immediate vicinity the work zone as required to slope to drain.

1.02 RELATED WORK SPECIFIED ELSEWHERE

- A. Section B02222 – Excavation
- B. Section B02223 – Backfilling

1.03 PROTECTION

- A. The CONTRACTOR shall protect bench marks, any existing structures, fences and roads.
- B. The CONTRACTOR shall protect above or below grade utilities and wells which are to remain.
- C. The CONTRACTOR shall repair all damage to any appurtenances disturbed as directed by the OWNER.

2.0 PRODUCTS

NOT USED

3.0 EXECUTION

3.01 PREPARATION

- A. The CONTRACTOR shall identify required lines, levels, contours, and datum.
- B. The CONTRACTOR shall identify known below-grade utilities and stake and flag locations.
- C. The CONTRACTOR shall identify and flag above grade utilities.
- D. The CONTRACTOR shall maintain and protect remaining existing utilities which pass through the Work area.
- E. The CONTRACTOR shall notify appropriate utility agencies to remove and relocate utilities.
- F. The CONTRACTOR shall upon discovery of unknown utilities or concealed conditions, discontinue affected work and notify the ENGINEER.

3.02 BOULDER EXCAVATION

- A. The CONTRACTOR shall excavate boulders (average diameter more than 12 inches) from areas to be graded and stockpile in area(s) designated by the OWNER in accordance with Section B02222.
- B. The CONTRACTOR shall pothole with backhoe equipment as necessary to remove boulders protruding beyond the final grade and elevation.

3.03 GRADING

- A. The CONTRACTOR shall cut and fill areas to contours or elevations as shown on the Contract Drawings.
- B. The CONTRACTOR shall place and compact materials in continuous layers in conformance with Section B02223.
- C. The CONTRACTOR shall maintain the optimum moisture content of fill materials to attain required compaction densities.
- D. The CONTRACTOR shall make grade changes gradual and blend slopes into level areas.
- E. The CONTRACTOR shall remove excess soil, unsuitable material, and boulders from the Work area during rough and final grading and stockpile on-site at a stockpile area designated by the ENGINEER.

3.04 TOLERANCES

- A. The CONTRACTOR shall rough grade the surface of excavation subgrade to plus or minus 0.1 feet.
- B. The CONTRACTOR shall fine grade screening berm surfaces to plus or minus 0.1 feet.
- C. The CONTRACTOR shall perform general rough grading of all slopes such that they will not create a safety hazard.

3.05 FIELD QUALITY CONTROL

- A. CQA field inspection and testing will be performed under provisions of Section A01400.
- B. The CONTRACTOR's tests and analyses of fill material shall be performed in accordance with ASTM D1557.
- C. The CONTRACTOR shall be responsible for quality control measures and corrective actions in accordance with Section A01400 and the results of CQA testing.
- D. If tests indicate Work does not meet specified requirements the CONTRACTOR shall Re-Work or remove Work prior to replacing and retesting Work at no cost to the OWNER.

4.0 MEASUREMENT AND PAYMENT

- A. Separate measurements or payment will not be made for work required under this Section. All costs in connection with the work specified herein will be considered incidental to the Project.

END OF SECTION

SECTION B02222

EXCAVATION

1.0 GENERAL

1.01 LOCAL BORROW

- A. The north cell excavation is located between the active landfill and Northern Avenue. The excavation was previously mined for aggregate, and the existing cut slopes are near vertical. The OWNER has completed a limited geotechnical investigation consisting of exploratory test borings, soil sampling. This information is included in Appendix A.
- B. It is estimated that approximately 50% of the material to be excavated will be fine grained (fines sands, silts and clays) and will be acceptable for construction of Engineered Fill. The ENGINEER will determine in the field during excavation which materials are classified as fine grained to be used as Engineered Fill. The CONTRACTOR will be required to screen Engineered Fill materials containing rocks greater than 6-inches in diameter as part of this Contract.
- C. The CONTRACTOR shall haul coarse grained materials (gravel) to the stockpiles or for the Landfill's use as daily cover.

2.0 PRODUCTS

NOT USED

3.0 EXECUTION

3.01 OVER EXCAVATION

The CONTRACTOR shall take care not to excavate below the depth indicated on the Contract Drawings. Unauthorized excavation below specified grade lines shall be refilled at the CONTRACTOR'S expense with clean soil material per Section B02223. The CONTRACTOR will not be paid for amount of material over excavated or for backfilling over excavated areas.

3.02 EXCAVATION

- A. The CONTRACTOR shall, during excavation, uniformly moisture condition and remove materials in an orderly manner. Material with excessive or inadequate moisture content shall not be considered suitable for proper compaction. The CONTRACTOR, at his own expense, shall remove or add moisture to material being excavated to bring it within a range of ± 2 percent of the optimum moisture content. Where tests indicate that moisture content of the material being excavated is below the Project requirements, the moisture content of the material shall be adjusted by the CONTRACTOR and retested. No material will be excavated and hauled to stockpile locations until it meets the moisture content requirements of these Specifications to the satisfaction of the ENGINEER.
- B. Where work is interrupted by heavy rains, fill operations shall not be resumed until observations and field tests by the ENGINEER indicate the moisture content of the materials being excavated are within the limits previously specified. This requirement does not preclude the CONTRACTOR from disking or aerating excessively wet areas to enhance drying.
- C. Throughout construction, all excavation areas shall be graded to provide positive drainage to appropriate detention basins or drainage structures to prevent ponding of water. Surface water shall be controlled to avoid damage to adjoining properties or to finished work on the Site. The CONTRACTOR shall assume all responsibility for surface water damage to completed work or adjoining properties arising from the CONTRACTOR'S work.
- D. The CONTRACTOR shall inspect the condition of all existing slopes prior to bid to determine the extent of remedial work necessary to construct the slopes shown on the Contract Drawings. The submission of a bid will be considered proof that the bidder has examined the Site and understands the conditions to be encountered in performing the Work. The CONTRACTOR shall use material from the north area excavation to complete the required remedial slope fills. The CONTRACTOR will be responsible for the stability and safety of the existing slopes during remedial slope filling.
- E. The CONTRACTOR shall not haul any material excavated from the north area excavation to locations other than General or Engineered Fill areas shown on the Drawings or the stockpile locations shown on the Contract Drawings, unless otherwise directed by the ENGINEER.

4.0 MEASUREMENT AND PAYMENT

- A. All costs in connection with the Work specified herein that are not specifically listed in Section A01025 will be considered incidental to the Project. The CONTRACTOR will not be compensated for Work not specifically listed in Section A01025.

END OF SECTION

SECTION B02223

BACKFILLING

1.0 GENERAL

1.01 SUMMARY DESCRIPTION

- A. This Section describes the general requirements for subgrade preparation, backfill placement, and structural fill.

1.02 RELATED WORK SPECIFIED ELSEWHERE

- A. Section B02211 – Grading
- B. Section B02222 – Excavation

1.03 REFERENCES

- A. American Society for Testing and Materials (ASTM):
 1. D 422 Method for Particle-Size Analysis for Soils
 2. D 854 Test Method for Specific Gravity of Soils
 3. D 1556 Test Method for Density of Soil in Place by the Sand-Cone Method
 4. D 1557 Test Methods for Moisture-Density Relations of Soils and Soil-Aggregate Mixture Using 10-lb (4.54 kg) Rammer and 30-in. (457 mm) Drop
 5. D 3034 Standard Test Method for Permeability of Granular Soils (Constant Head)
 6. D 2850 Test Methods for Unconsolidated, Undrained Compressive Strength of Cohesive Soils in Triaxial Compression
 7. D 3087 Classifications of Soils for Engineering Purposes
 8. D 2922 Test Methods for Density of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth)
 9. D 2937 Test Methods for Density of Soil in Place by the Drive-Cylinder Method

10. D 3017 Test Methods for Moisture Content of Soil and Soil-Aggregate Mixtures.
11. D 4330 Test Method for Liquid Limit, Plastic Limit, and Plasticity Index of Soils
12. D 4643 Test Method for Determination of Water (Moisture) Content of Soil by the Microwave Oven Method

B. United States Environmental Protection Agency (USEPA):

1. USEPA Test Method 9100

1.04 GENERAL REQUIREMENTS

- A. The CONTRACTOR shall be solely responsible for the safety of temporary cuts and fills.
- B. The CONTRACTOR shall, except as otherwise required by Engineer or Specifications, maintain the finished surface or subgrade adjacent to or forming the foundation for backfill within normal industry tolerance for the specific Work.
- C. The CONTRACTOR shall use equipment, tools, and machines to perform the Work in accordance with requirements covered by the Specifications. The CONTRACTOR shall maintain equipment, tool and machines in satisfactory working condition. Compaction equipment shall be suitable for the soils to be compacted so as to consistently produce the required strengths throughout the compacted soil mass as required by the Specifications.
- D. The CONTRACTOR shall exclusively use excavated materials for structural fill.
- E. The CONTRACTOR shall grade and restore areas disturbed in any manner not required for completion of the Work during construction and restore disturbed areas to their original grade and profile.
- F. The CONTRACTOR shall conduct work to reduce erosion/sedimentation to as little as possible and shall provide temporary erosion control as required.
- G. The CONTRACTOR is responsible for quality control measures for conducting the Work and corrective actions required by CQA testing and inspection.

1.05 PERFORMANCE REQUIREMENTS

- A. The daily and intermediate cover stockpiles shall at a nominal 85% of Modified Proctor in accordance with ASTM D1557.

1.06 QUALITY CONTROL

- A. General
 - 1. CQA observation, sampling and testing will be performed by the ENGINEER to confirm that materials and construction are in compliance with the requirements of the Contract Documents in accordance with Section 01400.
 - 2. The CONTRACTOR shall implement the necessary quality control measures for earthwork preparation, excavation, backfill, and compaction of the Work.
- B. Laboratory Test Methods
 - 1. It shall be the responsibility of the CQA Engineer to perform any laboratory tests on the soils being excavated by the CONTRACTOR. The CONTRACTOR shall perform laboratory Quality Control testing in accordance with the approved Quality Control Plan.
- C. Field Test Methods
 - 1. It shall be the responsibility of the CQA Engineer to perform Construction Quality Assurance field testing. The CONTRACTOR shall perform field Quality Control testing in accordance with the approved Quality Control Plan.

1.07 SUBMITTALS

- A. The CONTRACTOR shall submit for the ENGINEER's review, specifications of the equipment proposed for the excavation, hauling and compaction and its application at least 15 days before commencing each application.
- B. Verification shall also be made after the first month of operation that the equipment proposed is of sufficient size and quantity to accomplish the

work within the term of the Contract.

1.08 ENGINEERED FILL AREAS

- A. Areas of Engineered Fill shall be remedial slope fills, and any other areas so designated by the ENGINEER.

1.09 STRUCTURES

- A. Structures shall be defined as improvements such as soil stockpiles, drainage ditches, piping, and culverts.

2.0 PRODUCTS

2.01 RIPRAP

- A. Riprap shall be obtained from off-site sources selected by the CONTRACTOR and shall be approved by the ENGINEER. The riprap shall be hard, durable, angular to sub-rounded in shape; resistant to weathering and to water action; free from overburden, spoil, and organic material; and shall meet the gradation requirements for the size specified. Rounded shaped stone such as “river rock” shall not be acceptable for use as riprap material. Neither the width nor thickness of a single stone should be less than one-third its length. Not more than 25 percent of the stone reasonably distributed throughout the gradation shall have a length of more than 2.5 times the width or thickness. The minimum unit weight of the stone shall be 157 pounds per cubic foot.
- B. The gradation requirements for 6-inch riprap are as follows:

TABLE B02223-1 RIPRAP GRADATION	
Stone Size for 6-in riprap (in inches)	Percent Total Weight Smaller (<u>than the Given Size</u>)
12	100-90
9	85-70
6	50-30
4	15-5
2	5-0

3.0 EXECUTION

3.01 PREPARATION FOR FILL PLACEMENT

- A. Before placing fill materials, the CONTRACTOR shall prepare the Work area by clearing existing obstructions, vegetation, and debris. Unsuitable material shall be removed where directed.
- B. The CONTRACTOR shall maintain proper and adequate surface drainage to the satisfaction of the ENGINEER in order to keep the Site dry and in such condition that placement and compaction of fill may proceed unhindered by saturation of the Work area.
- C. The CONTRACTOR shall proof roll existing surfaces in the presence of the ENGINEER prior to fill placement. Proof rolling shall be performed with available heavy construction equipment of not less than 10-ton wheel load. Soft or unstable areas shall be removed and replaced with suitable materials as directed by the ENGINEER and recompacted. Rock subgrades exposed during grading shall be observed by the ENGINEER and repaired for voids, cracks or other weaknesses as directed by the ENGINEER.
- D. Except as noted on the Contract Drawings or as required by the ENGINEER, sloped ground surfaces steeper than one vertical to 5 horizontal, on structural fill on which structures are constructed, shall be cut to form benches as the Work is brought up in layers.

3.02 MATERIAL PROCESSING

- A. All soil materials to be utilized for construction of the remedial slope fills shall be processed in the excavation area before transporting the material to the fill locations except for minor adjustments to be made in moisture content specified in the construction method. The processing of the soil materials shall involve the following tasks:
- Water content adjustment;
 - Removal of oversized material (boulders averaging more than 6" in diameter);
 - Reduction or pulverization of clay clods; and
 - Mixing of soil.

The ENGINEER may observe, periodically test, and document processing of the material. The ENGINEER shall perform visual classification of soils by utilizing field tests such as dry strength, fines content, toughness tests (ASTM D2488) and perform fines content (ASTM D1140), moisture content with calcium carbide (ASTM D4944) or nuclear gauge (ASTM D3017) or microwave method (ASTM D4643).

- B. Due to the climatic conditions in Glendale, Arizona, it will be necessary for the CONTRACTOR to process the material before placement so that the moisture content remains at the target or within the specified range, the consistency of the soil is uniform, and the amount of clods are minimal.

3.03 GENERAL REQUIREMENTS FOR BACKFILLS

- A. The CONTRACTOR shall obtain fill materials from the required excavation. Materials shall be free of objectionable material, with no stone dimension greater than as specified by material type.
- B. The CONTRACTOR shall not operate heavy equipment over pipes and buried structures until at least 1.5 feet of fill material has been placed and compacted over the top in conformance with the requirements specified herein, or as directed by the ENGINEER. The CONTRACTOR shall select and operate compaction equipment so that structures are not damaged nor over stressed during compaction operations. The CONTRACTOR shall use hand-operated mechanical tampers for compaction of fill material adjacent to structures where rolling equipment is impractical for use in compaction.
- C. The CONTRACTOR shall place fill materials in horizontal layers not exceeding the allowable lift thickness and which, after compaction, meet

or exceed established compaction requirements. The CONTRACTOR shall place material containing stones in a manner to prevent segregation of the material and to prevent the formation of rock nests and voids in the fill.

- D. The CONTRACTOR shall place and compact fill materials while at their required water content.
- E. The CONTRACTOR shall provide general fill to lines, grades, and elevations as shown on the Contract Drawings or as required in writing by the OWNER or ENGINEER.
- F. The CONTRACTOR shall place material in continuous layers not exceeding the required loose condition depth unless otherwise directed or approved. The cross fall of each layer shall not exceed one foot in 20 feet.
- G. The CONTRACTOR shall backfill systematically, as early as possible, to allow maximum time for natural settlement. The CONTRACTOR shall not backfill over porous, wet, or spongy subgrade surfaces.
- H. The CONTRACTOR shall make changes in grade gradual and blend slopes into level areas.
- I. The CONTRACTOR shall compact each layer with a sufficient number of passes of the soil compactor. The number of passes shall be determined such that in the opinion of ENGINEER, sufficient compaction has been obtained.
- J. Soils which cannot be placed and compacted to the criteria indicated in the Specifications due to excessive moisture content should be air dried for a sufficient amount of time such that they may be placed and compacted to meet the criteria or removed and replaced.
- K. In the event of a failing test, supplemental testing shall be performed prior to placing additional fill in order to define the area that has been inadequately compacted. The area shall be reworked and/or removed and replaced, then retested prior to subsequent material being placed over the area.

3.04 REMEDIAL SLOPE FILLS

- A. The CONTRACTOR shall provide Engineered Fill to lines, grades and elevations as shown on the Contract Drawings and as approved by the ENGINEER.
- B. The CONTRACTOR shall place the processed soil materials in approximately ten-inch loose lifts to produce a compacted lift thickness of approximately eight inches. The CONTRACTOR shall compact each lift to meet the

requirements specified herein.

- C. Compaction shall be performed with appropriate equipment capable of providing compactive forces commensurate with the densities required.
- D. Engineered fill materials are to be compacted to at least 90 percent compaction as specified by ASTM D 1557 unless otherwise specified or approved by the ENGINEER.
- E. Moisture content shall be maintained uniform throughout and within the limits of ± 2 percent of optimum moisture content.
- F. The maximum compacted lift thickness shall be 8".
- G. The CONTRACTOR shall separate/segregate fine grained and course grained materials as directed by the ENGINEER. Fine grained materials will be used for remedial slope fills.
- H. Where work is interrupted by rains, fill operations shall not be resumed until observations and field tests by the ENGINEER indicate that the moisture content and density of the in-place fills are within specified limits.
- I. Unless otherwise specified by the ENGINEER, no permanent cut slopes shall be excavated steeper than allowed by the ENGINEER, the OWNER or the Regulator.

3.05 UNSUITABLE MATERIALS

- A. Unsuitable material encountered below the natural ground surface in fill areas or below the grading plane in excavation areas shall be excavated and disposed of as directed by the ENGINEER. Unsuitable material is defined as material the ENGINEER determines to be one of the following:
 - 1. Of such unstable nature as to be incapable of being compacted to specified density using ordinary methods at optimum moisture content;
 - 2. Too wet to be properly compacted and circumstances prevent suitable in-place drying prior to incorporation into the Work; or
 - 3. Otherwise unsuitable for the planned use.

The presence of excessive moisture in a material is not, by itself, sufficient cause for determining that the material is unsuitable.

- B. When unsuitable material is removed and disposed of, the resulting space shall be filled with material suitable for the planned use. Such suitable

material shall be placed and compacted in layers as herein specified

- C. The CONTRACTOR shall dispose of foreign materials, rubble, abandoned construction waste, and material that is unacceptable to the ENGINEER for fill in accordance with local regulations.
- D. The CONTRACTOR shall grade temporary waste holding areas to maintain a natural appearing variable percentage slope and to prevent slope failures.

3.06 TEMPORARY DRAINAGE

- A. The CONTRACTOR shall be responsible for constructing, operating and maintaining temporary drainage systems while construction occurs prior to the permanent drainage system being constructed and operational. Temporary drainage systems shall be required to handle existing drainage and the revised drainage patterns as they occur during construction. Temporary drainage systems shall not impact the ability to construct permanent drainage systems. The CONTRACTOR shall be solely responsible for repairing/replacing appurtenances and/or Work damaged due to inadequate stormwater management during construction at no cost to the OWNER.

4.0 MEASUREMENT AND PAYMENT

- A. All costs in connection with the Work specified herein that are not specifically listed in Section A01025 will be considered incidental to the Project. The CONTRACTOR will not be compensated for Work not specifically listed in Section A01025.

END OF SECTION

SECTION B02720
DRAINAGE FACILITIES

1.0 GENERAL

1.01 DESCRIPTION OF WORK

- A. The CONTRACTOR shall furnish all labor, materials, tools, supervision, transportation, and installation equipment necessary for installation of all storm drain materials and appurtenances as specified herein, as shown on the Contract Drawings.

1.02 SUBMITTALS

- A. The CONTRACTOR shall submit to the ENGINEER for approval within 14 days after signing of the Contract and at least 28 days before the start of work, complete, detailed shop drawings of all storm drain materials, a list of materials to be furnished, names of the suppliers and the proposed dates of delivery of the materials to the site.
- B. The CONTRACTOR shall submit to the ENGINEER the manufacturer's certification of compliance with this Section for all materials delivered to the site, and shall comply with the manufacturer's recommendations for handling, storing, and installing of all storm drain materials.

2.0 PRODUCTS

2.01 CORRUGATED HIGH DENSITY POLYETHYLENE (CHDPE) PIPE

- A. The CHDPE pipe shall be a smooth-walled interior, corrugated exterior pipe (ADS N-12 or approved equivalent).
- B. The CHDPE pipe shall be in accordance with the requirements of AASHTO M-294 and have a minimum cell classification of PE 335420C.
- C. CHDPE pipe shall be supplied in standard laying lengths.
- D. The 12-inch CHDPE pipe material shall comply with the notched constant ligament-stress (NCLS) test as specified in Sections 9.5 and 5.1 of AASHTO M294 and ASTM 2306 respectively.

2.02 CORRUGATED METAL PIPE (CMP)

- A. Corrugated metal 12-inch pipe shall be plain galvanized metal pipe conforming to the requirements of AASHTO M-36 with a minimum wall thickness of 2.8 mm.
- B. Field joints shall provide circumferential and longitudinal strength to maintain alignment, prevent separation of the pipe, prevent infiltration of side fill material, and prevent leakage of water into the surrounding soil.
- C. The external coating and internal lining of the pipe shall be in accordance with AASHTO M-190.

3.0 EXECUTION

3.01 HANDLING AND PLACEMENT

- A. The CONTRACTOR shall exercise care when transporting, handling and placing CHDPE and CMP pipe and fittings, such that they will not be cut, kinked, twisted, or otherwise damaged.
- B. Pipe or fittings shall not be dropped onto rocky or unprepared ground. Under no circumstances shall pipe or fittings be dropped into trenches, or dragged over sharp and or abrasive objects.
- C. CHDPE and CMP pipe shall be stored on clean level ground, preferably turf or sand, free of sharp objects that could damage the pipe.
- D. Bedding and backfill material for storm drain structures shall be the same as the final cover fill and placed in accordance with Section 02200 and the drawings.

3.02 INSTALLATION

- A. General:
 - 1. All storm drain materials shall be installed in accordance with the manufacturer's instructions and MAG Specifications.
 - 2. The CONTRACTOR shall carefully examine all structures for damage or defects before installation. Defective materials shall be immediately removed from the site and replaced at no additional cost to the OWNER.
 - 3. The interior of all pipe and fittings shall be inspected, and any foreign material shall be completely removed from the pipe interior before it is moved into final position.

4. All structures and pipes shall be laid or placed to the lines and grades shown on the Drawings with bedding and backfill material shown on the Drawings and as specified in this Section.
5. Field-cutting of pipes, where required, shall be made with a machine. No structures or pipes shall be laid until the OWNER or the ENGINEER has approved the bedding conditions.
6. No pipes shall be brought into position until the preceding length has been bedded and secured in its final position.

3.03 JOINTS AND CONNECTIONS

- A. Assembly of the gasketed joints shall be in accordance with the pipe manufacturer's recommendations. All joints shall be water tight.

3.04 PRODUCT PROTECTION

- A. The CONTRACTOR shall use all means necessary to protect all prior work and materials and completed work of other Sections.
- B. In the event of damage to any structure or pipe during construction activities, the CONTRACTOR shall immediately make all repairs, recoating as necessary, and replacements necessary, to the approval of the OWNER or the ENGINEER and at no additional cost to the OWNER.

4.0 MEASUREMENT AND PAYMENT

- A. All costs in connection with the Work specified herein that are not specifically listed in Section A01025 will be considered incidental to the Project. The CONTRACTOR will not be compensated for Work not specifically listed in Section A01025.

END OF SECTION

APPENDIX A

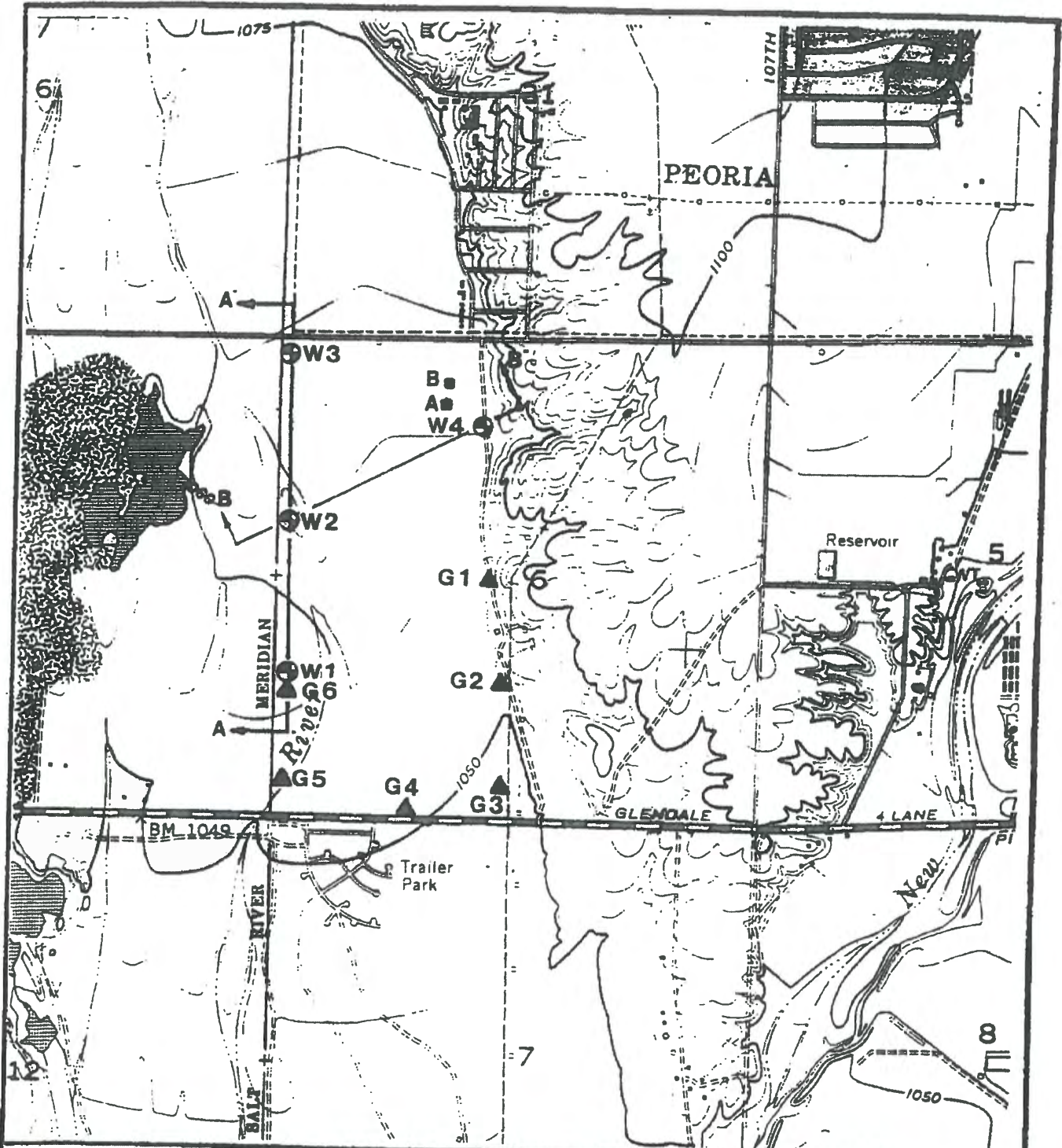
NORTH CELL GEOTECHNICAL INFORMATION



CITY OF GLENDALE – GLENDALE LANDFILL

NORTH CELL PHASE 2A EXCAVATION, HAUL, AND STOCKPILE PROJECT





LEGEND

- ⊙ Monitoring well (approx.)
- ▲ Gas probe (approx.)
- Hand sample
- ↕ Location of cross section

Copied from 1957/1982 USGS topographic quadrangle map "El Mirage, Arizona"



FIGURE 1. Location Plan
Monitoring Wells, Gas Probes, and Hand Samples, Glendale Landfill

Project No. 89-0081

THOMAS HARTIG & ASSOCIATES, INC.

1989

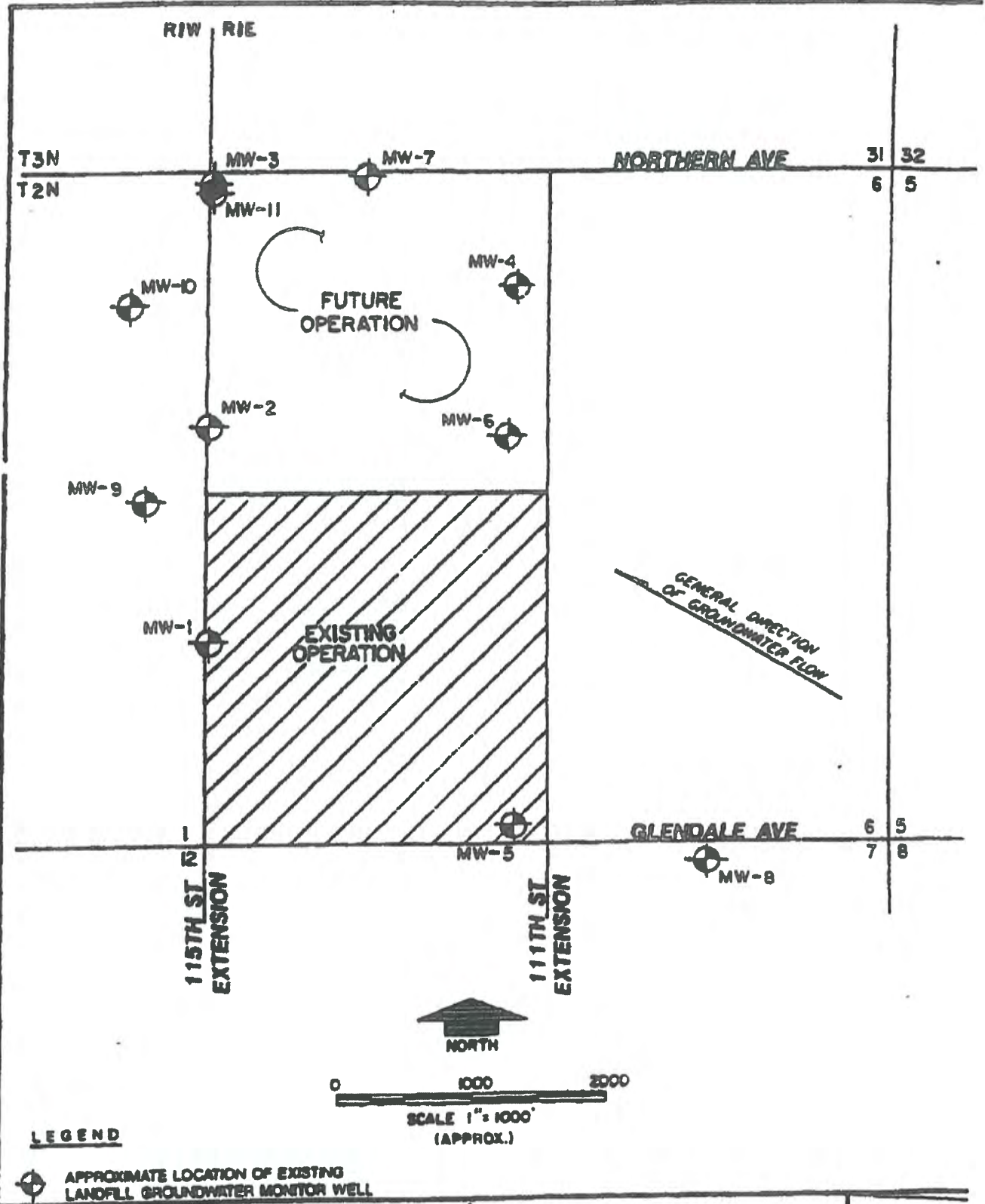


FIGURE 1
LOCATION OF GLENDALE LANDFILL
GROUNDWATER MONITOR WELLS

INTERPRETATION OF GEOPHYSICAL LOGS

A letter with comments and a plot of the four logs on one sheet have been provided by Wellenco Geophysics, the geophysical subconsultant. These are included in this Appendix.

Gamma ray logs indicate naturally occurring gamma emissions from the formation surrounding the borehole. The most significant naturally occurring elements are potassium 40, uranium 238, uranium 235, and thorium 232. Potassium 40 is the most abundant and is found in all potassium bearing minerals such as potassium, feldspars, biotite, and orthoclase. Clay minerals often contain potassium, making them detectable by the gamma log. In addition, granitic sands and silts often contain potassium, making them detectable by the gamma log. In the classic interpretation, high gamma readings indicate high clay content. However, in alluvial basins with granitic sands and silts, high gamma readings may also indicate sands and silts.

Neutron logs indicate reflected radioactivity in the formation brought on by bombardment from a neutron source in the probe. Neutrons are slowed most effectively by collisions with hydrogen because the nucleus of a hydrogen atom has approximately the same mass as a neutron. Therefore, neutron logs generally measure moisture content above the water table and porosity below the water table. Below the water table, a higher neutron reading indicates lower porosity because there is less water and thus more reflected radioactivity.



GEOPHYSICS

RECEIVED 11 11 1989

March 30, 1989

Mr. Roger Brewer
Thomas-Hartig & Associates, Inc.
7031 West Oakland St.
Chandler, AZ 85226

Dear Roger,

We have looked at the lithologic logs along with the Gamma Ray-Neutron logs of the four wells at the Glendale Landfill many times during the past two weeks and have reached the following conclusions:

1. The lithologic columns and the logs do not agree in very many places. At some levels the Gamma ray seems to agree more, at others the Neutron looks better.
2. The radioactive content of the formations does not respond in the classic way. That is to say, the clays do not always exhibit more radioactivity than the sands.
3. The enclosed plot of all four logs (corrected for elevations) has some correlation lines drawn in that are our best guess for correlation. Formations dip slightly from north to south.

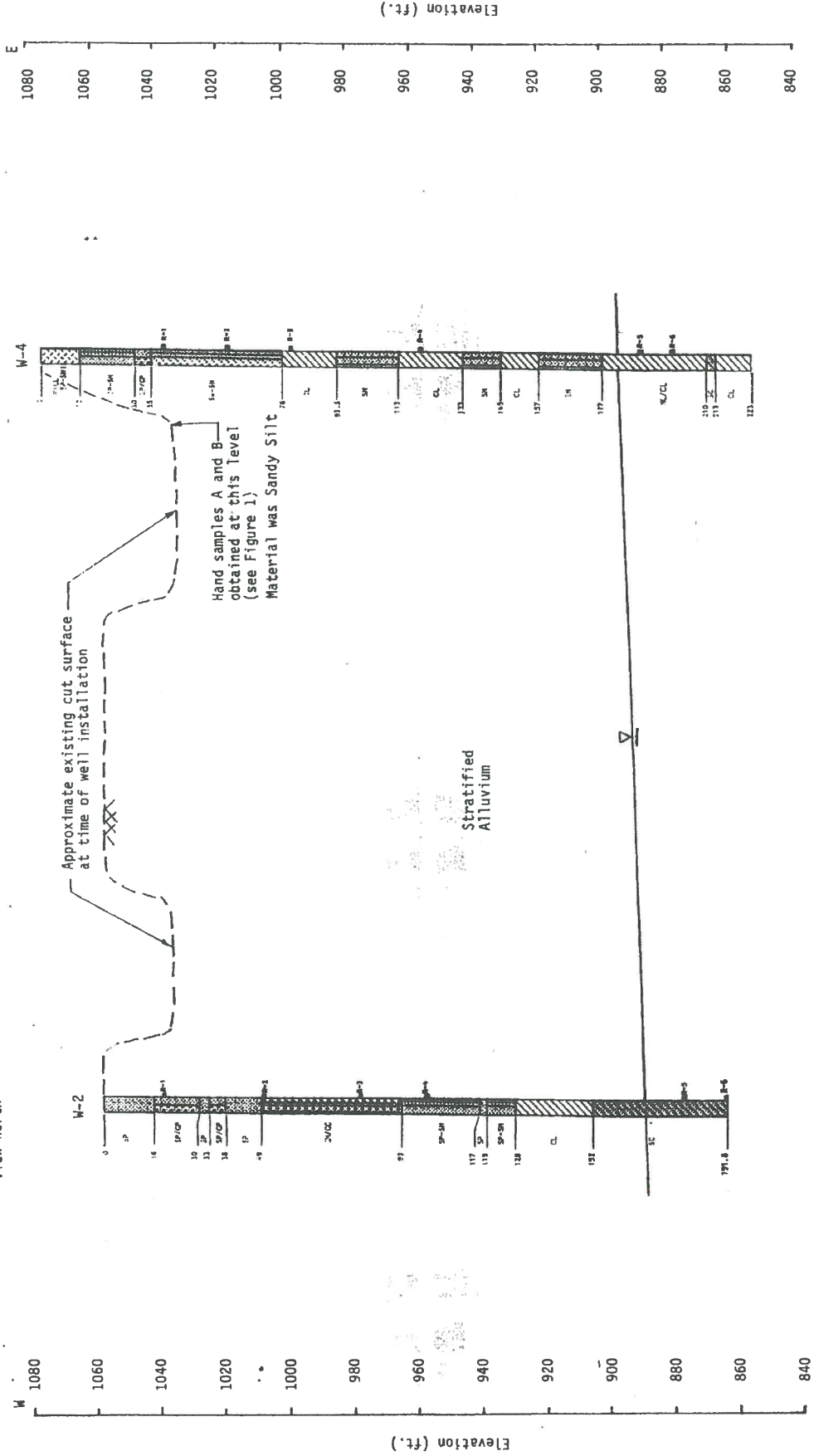
We hope this brief interpretation will be of some value to you.

Sincerely,

Joseph L. Newman
President

Enclosure:

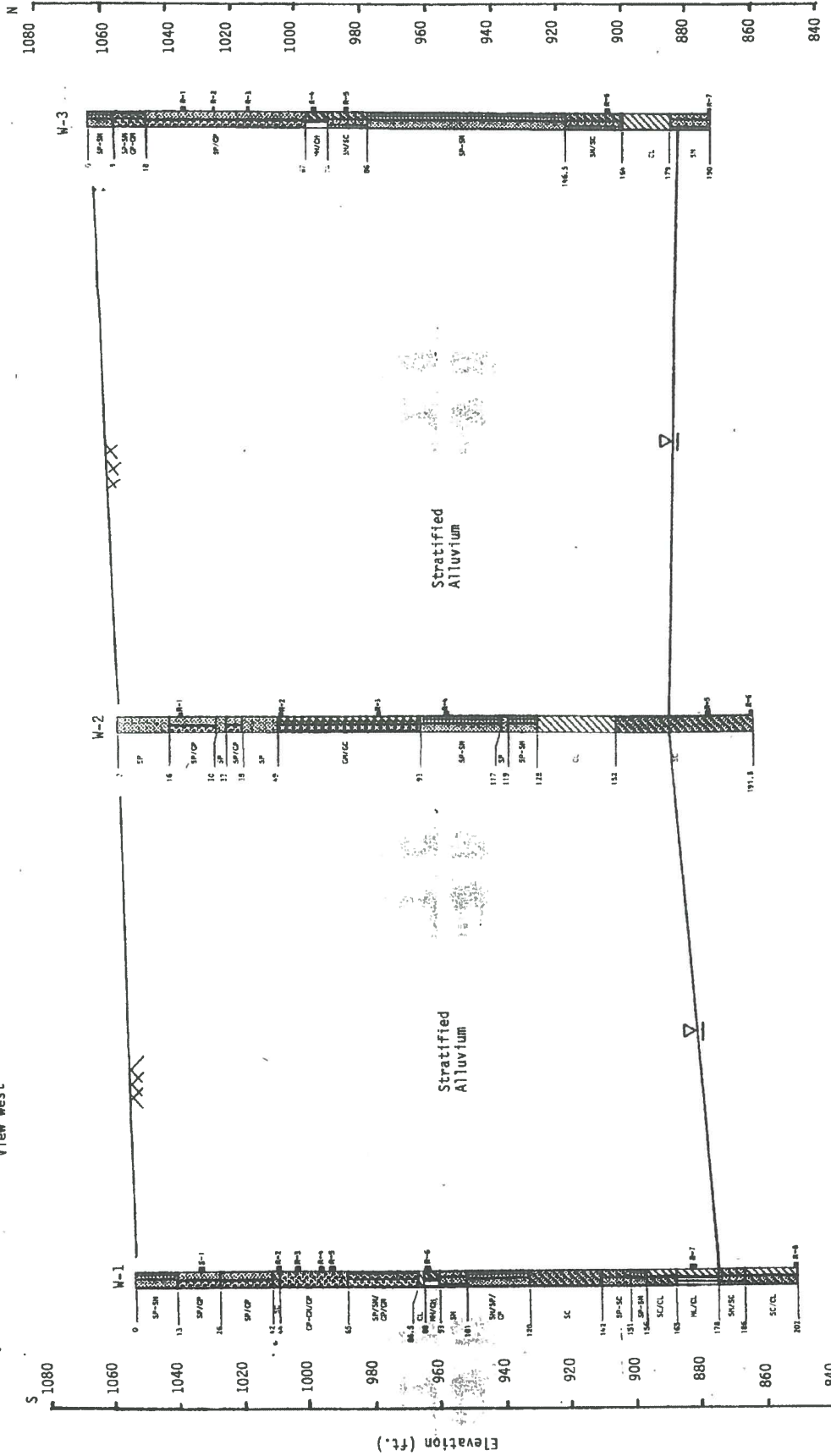
SECTION B-B
View north



THOMAS-HARTIG & ASSOCIATES, INC.
Project No. 89-0081

Scale:
Horizontal = 1 in. = 300 ft.
Vertical = 1 in. = 30 ft.

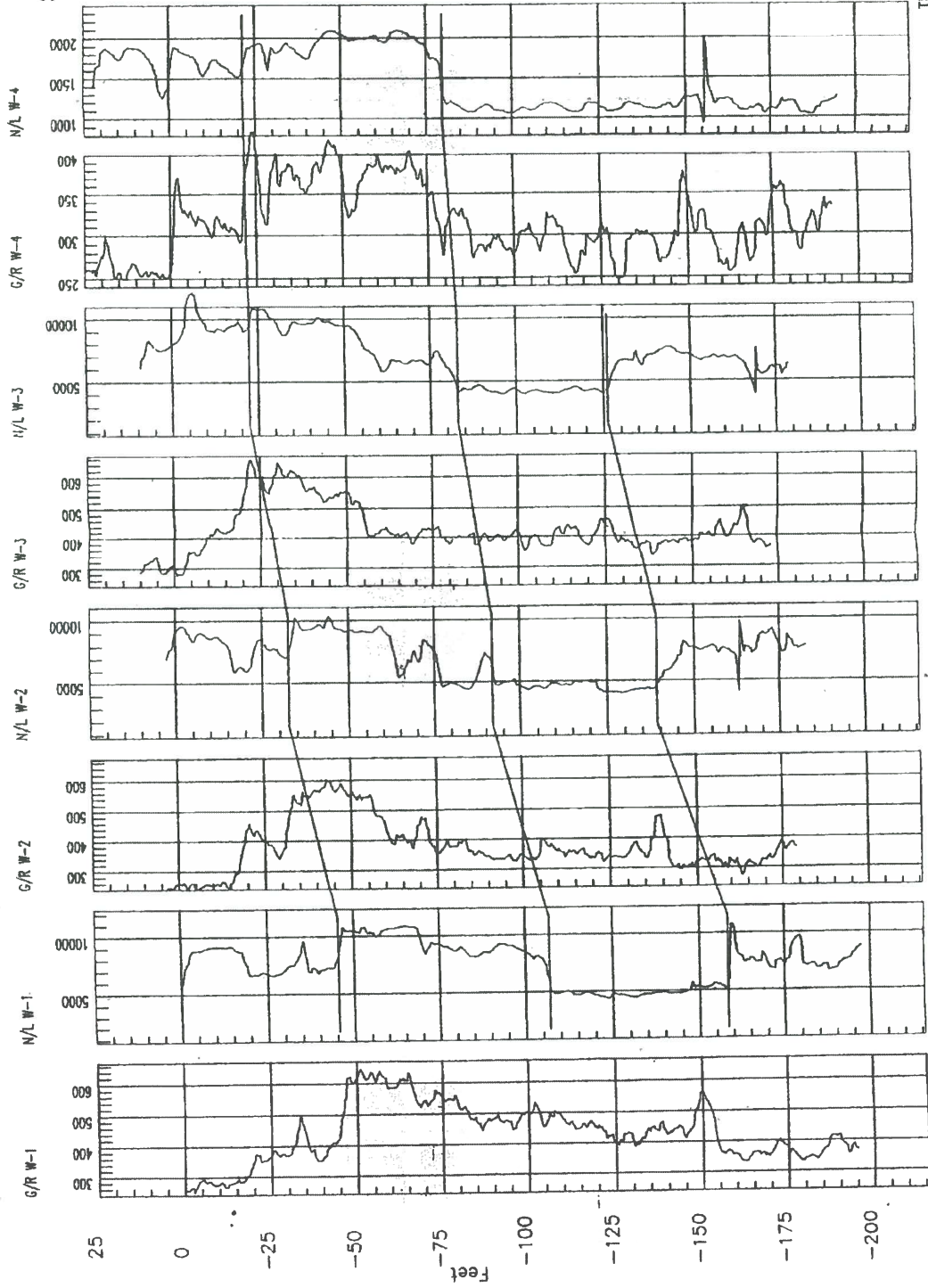
SECTION A-A
View west

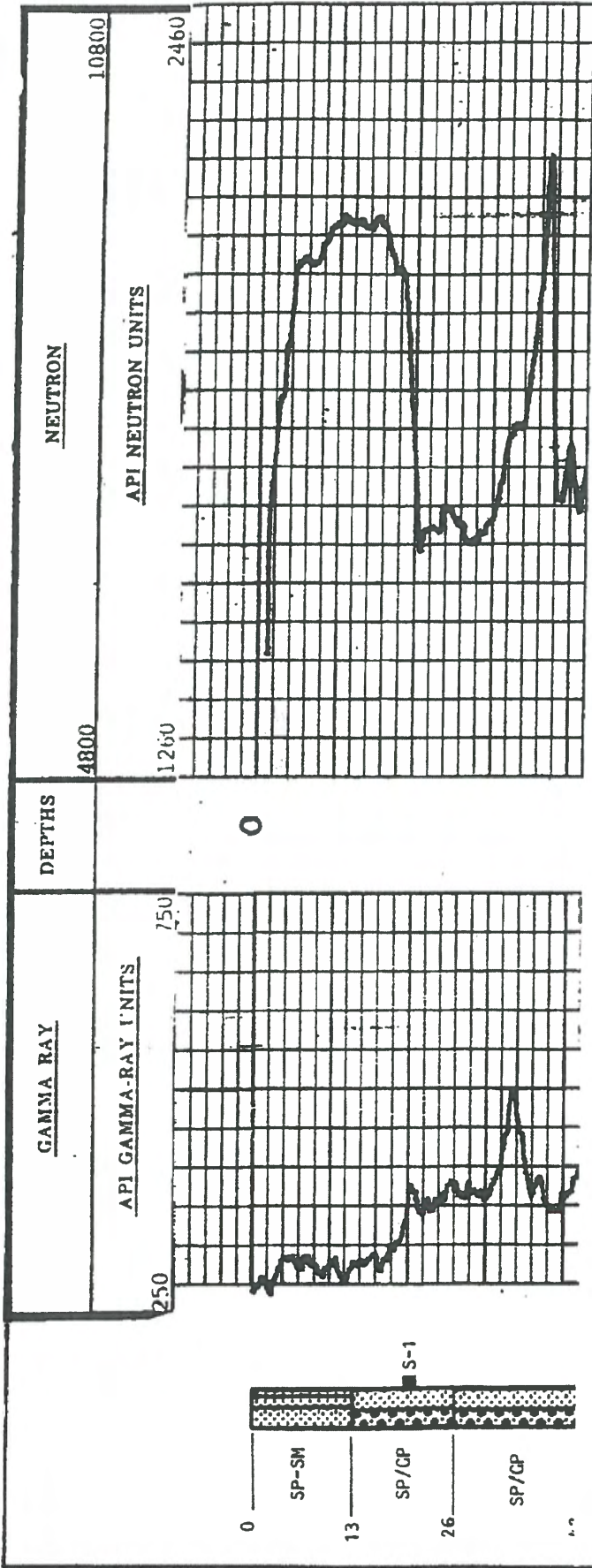


THOMAS-HARTIG & ASSOCIATES, INC.
Project No. 89-0081

Scale:
Horizontal = 1 in. = 300 ft.
Vertical = 1 in. = 30 ft.

Wellname
 Filename GLENDALE
 Location
 Elevation 0 Reference Ground Surface





Gamma Ray		Neutron	
Run No.	001	Run No.	001
Tool Joint No.	111/16	Tool Joint No.	111/16
Serial No.	SCINT	Serial No.	SCINT
Length	13'	Length	13'
Division to H. Source	1'	Division to H. Source	1'
Model Trans. No.		Model Trans. No.	
Instrument Trans. No.		Instrument Trans. No.	
Tool Joint No.		Tool Joint No.	

Gamma Ray		Neutron	
Run No.	001	Run No.	001
Tool Joint No.	111/16	Tool Joint No.	111/16
Serial No.	SCINT	Serial No.	SCINT
Length	13'	Length	13'
Division to H. Source	1'	Division to H. Source	1'
Model Trans. No.		Model Trans. No.	
Instrument Trans. No.		Instrument Trans. No.	
Tool Joint No.		Tool Joint No.	

Gamma Ray		Neutron	
Run No.	001	Run No.	001
Tool Joint No.	111/16	Tool Joint No.	111/16
Serial No.	SCINT	Serial No.	SCINT
Length	13'	Length	13'
Division to H. Source	1'	Division to H. Source	1'
Model Trans. No.		Model Trans. No.	
Instrument Trans. No.		Instrument Trans. No.	
Tool Joint No.		Tool Joint No.	

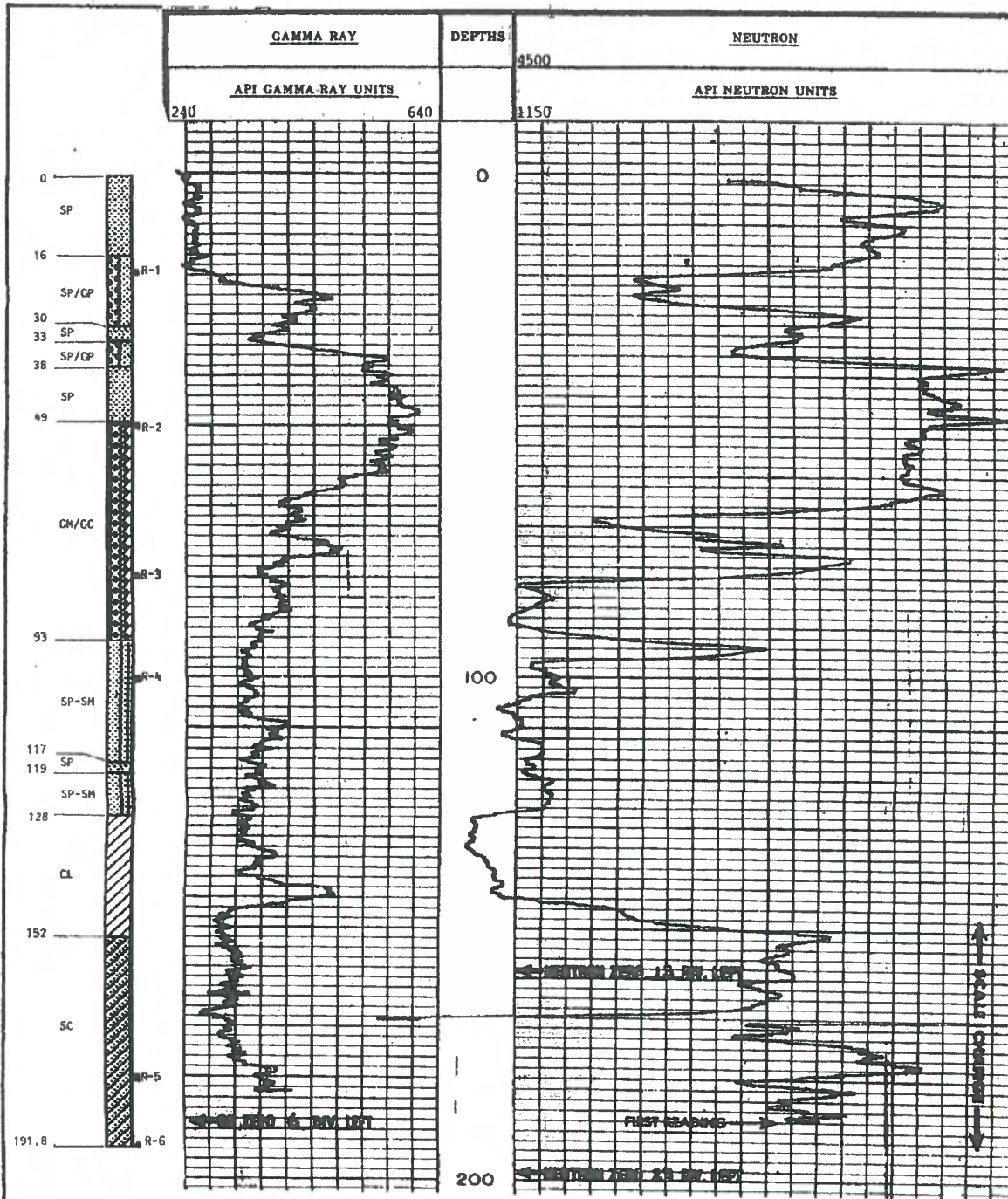
Gamma Ray		Neutron	
Run No.	001	Run No.	001
Tool Joint No.	111/16	Tool Joint No.	111/16
Serial No.	SCINT	Serial No.	SCINT
Length	13'	Length	13'
Division to H. Source	1'	Division to H. Source	1'
Model Trans. No.		Model Trans. No.	
Instrument Trans. No.		Instrument Trans. No.	
Tool Joint No.		Tool Joint No.	

W - 1



THOMAS-HARTIG & ASSOCIATES, INC.

PROJECT NO. 89-0081



EQUIPMENT DATA											
Run No.						Location					
Run No.	DATE	Run No.	DATE	Run No.	DATE	Run No.	DATE	Run No.	DATE	Run No.	DATE
Tool Model No.	11116	Tool Model No.	11116	Tool Model No.	11116	Tool Model No.	11116	Tool Model No.	11116	Tool Model No.	11116
Operator Model No.		Operator Model No.		Operator Model No.		Operator Model No.		Operator Model No.		Operator Model No.	
Type	SP-107	Type	SP-107	Type	SP-107	Type	SP-107	Type	SP-107	Type	SP-107
Calibration		Calibration		Calibration		Calibration		Calibration		Calibration	
Reference to H. Series		Reference to H. Series		Reference to H. Series		Reference to H. Series		Reference to H. Series		Reference to H. Series	
Count		Count		Count		Count		Count		Count	
Units Used		Units Used		Units Used		Units Used		Units Used		Units Used	
Manufacturer Model No.		Manufacturer Model No.		Manufacturer Model No.		Manufacturer Model No.		Manufacturer Model No.		Manufacturer Model No.	
Year Model No.		Year Model No.		Year Model No.		Year Model No.		Year Model No.		Year Model No.	

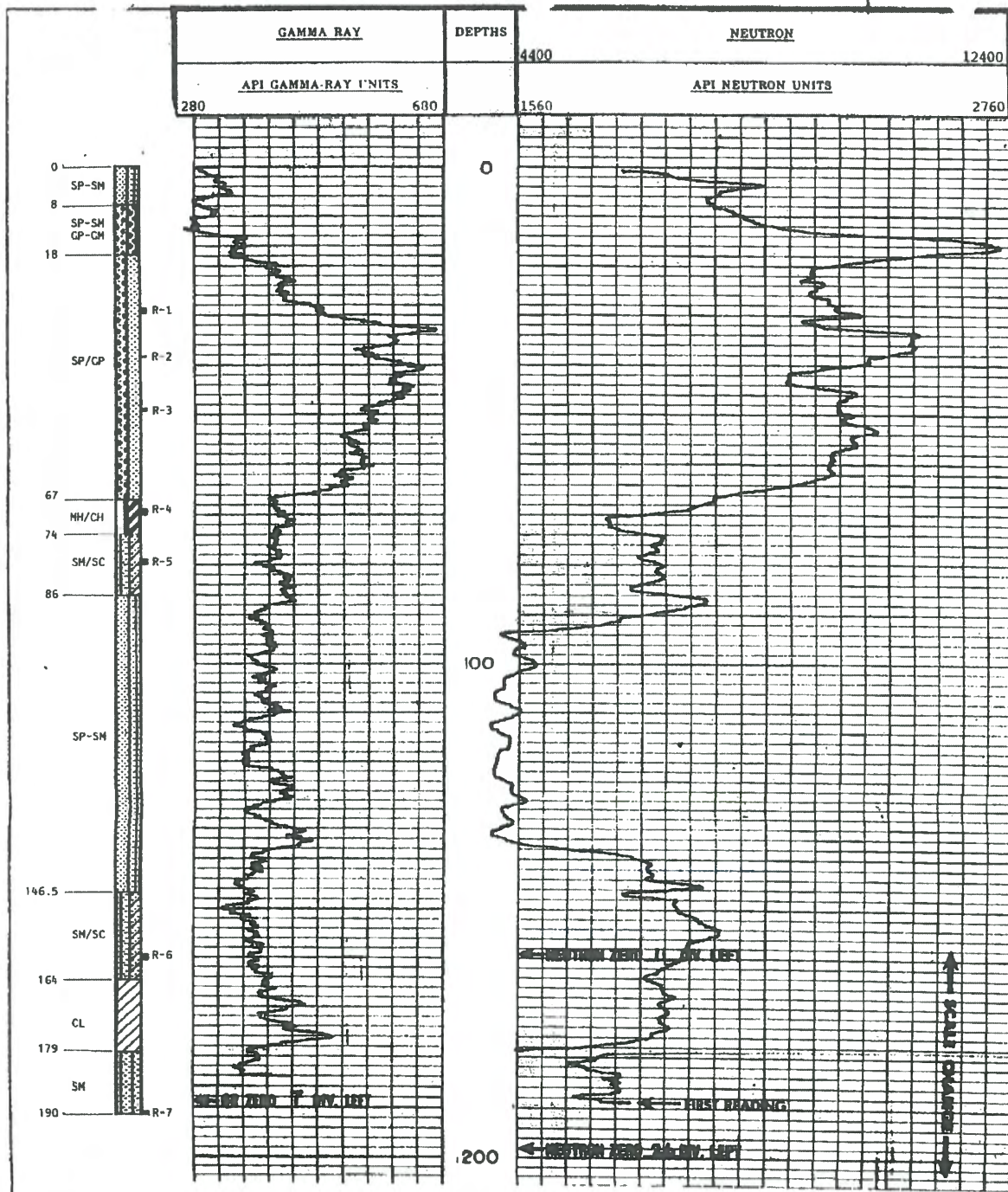
LOGGING DATA											
Run No.						Location					
Run No.	DATE	Run No.	DATE	Run No.	DATE	Run No.	DATE	Run No.	DATE	Run No.	DATE
API G.S. Units	240	API G.S. Units	240	API G.S. Units	240	API G.S. Units	240	API G.S. Units	240	API G.S. Units	240
Neutron	1150	Neutron	1150	Neutron	1150	Neutron	1150	Neutron	1150	Neutron	1150
4th H. Units		4th H. Units		4th H. Units		4th H. Units		4th H. Units		4th H. Units	

W - 2

Company		Job No.	
THOMAS-HARTIG & ASSOCIATES, INC.		W-2	
City		State	
CITY OF OKLAHOMA		OKLAHOMA	
Well Name		Well No.	
ARLITA		11116	
Log No.		Date	
Log Date		Log Time	
Log Location		Log Depth	
Log Operator		Log Recorder	
Log Supervisor		Log Checker	
Log Engineer		Log Analyst	



THOMAS-HARTIG & ASSOCIATES, INC.



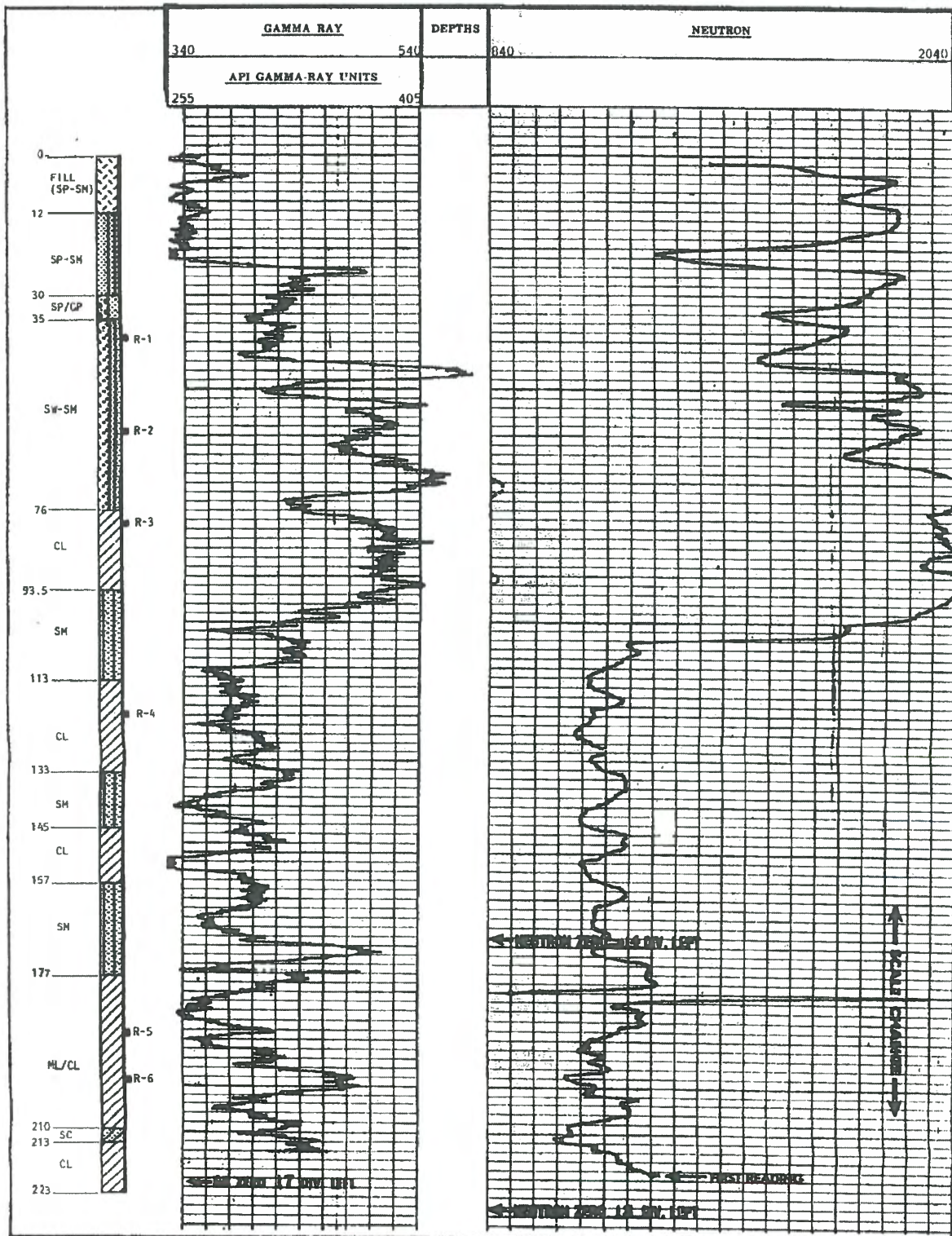
LOGGING DATA									
General					Logging Data				
Well No.	Depth	API Gamma-Ray Units	API Neutron Units	Gamma-Ray Index	Well No.	Depth	API Gamma-Ray Units	API Neutron Units	Gamma-Ray Index
1	181'	173	20	1.00/0.85	1	181'	173	20	1.00/0.85
1	179'	171	20	1.00/0.85	1	179'	171	20	1.00/0.85

W - 3

THOMAS-HARTIG & ASSOCIATES, INC.	
Client	Project
Client: CITY OF CHANDLER, ARIZONA	Project: CHANDLER
Address: 1000 N. GILBERT AVENUE, CHANDLER, AZ 85224	Phone: (480) 948-1000
Well No.: W-3	Well Name: W-3
Well Depth: 190'	Well Type: SP-SH
Well Status: Open	Well Age: 1970
Well Owner: City of Chandler	Well Operator: Thomas-Hartig & Associates, Inc.
Well Log No.: TH-1000	Well Log Date: 1/1/77



THOMAS-HARTIG & ASSOCIATES, INC.



EQUIPMENT DATA										
Date	Operator	Run No.	Core	Section	Run No.	Core	Section	Run No.	Core	Section
11/1/82	11/1/82	11/1/82	11/1/82	11/1/82	11/1/82	11/1/82	11/1/82	11/1/82	11/1/82	11/1/82

LOGGING DATA										
Run No.	Depth	API G.R.	Neutron	Gamma	Gamma	Gamma	Gamma	Gamma	Gamma	Gamma
1	210	100/100	110	100/100	110	100/100	110	100/100	110	100/100
1	213	100/100	110	100/100	110	100/100	110	100/100	110	100/100

W - 4

THOMAS HARTIG & ASSOCIATES, INC.			
Client	Project	Date	Scale
CITY OF CLEVELAND LANDFILL			
MILWAUKEE			

Item	Description	Quantity	Unit
1	LOGGING	1	DAY
2	REPORT	1	COPY



THOMAS-HARTIG & ASSOCIATES, INC.



THOMAS-HARTIG & ASSOCIATES, INC.

TOM W. THOMAS, P.E. • HARRY E. HARTIG, P.E.
Geotechnical, Materials Testing, and Environmental Consultants
7031 West Oakland Street • Chandler, Arizona 85226

James R. Morrow
John P. Boyd, PE.
Charles H. Atkinson, PE.
Donald J. Spadola, PE.

Glen K. Copeland, PE.
James M. Willson, PE.
Frank M. Guerra, PE.

Roger A. Brewer, PE.
Steven A. Haire, PE.
Chet L. Pearson, PE.
Kenneth L. Ricker, PE.

Field Operations Center
City of Glendale
6210 West Myrtle Avenue
Glendale, Arizona 85301

21 April 1989

Attention: Michael W. Hoyt
Field Operations Director

Project: Glendale Landfill Monitoring Wells,
Gas Probes, and Other Geotechnical
Work (Glendale Project 878099)

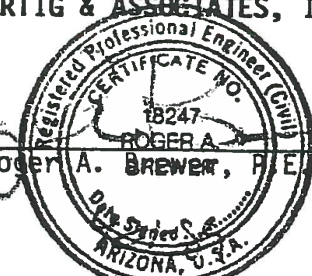
Project No. 89-0081



In accordance with our contract agreement dated 27 December 1988, Thomas-Hartig & Associates, Inc. is pleased to provide this submittal for the subject project. A location plan is shown on Figure 1. Included are our final boring logs (Appendix A), the first round results of the water analyses and gas probe readings (Appendix B), the results of the geotechnical laboratory tests (Appendix C), well construction diagrams (Appendix D), well development forms (Appendix E), the field permeability results, data, and analyses (Appendix F), the gamma and neutron logs (Appendix G), two cross sections (Appendix H), and Arizona Department of Water Resources (ADWR) Well Registration Forms (Appendix I). On review of the ADWR forms, we noticed the wells and corresponding locations were recorded incorrectly. We notified Layne Environmental Services, the drilling subcontractor, and they indicated they would have them corrected. We can provide corrected copies when available.

We appreciate the opportunity to provide these services and look forward to a continued relationship in the future. If there are any questions or if we may be of additional service, please do not hesitate to call.

Respectfully submitted,

THOMAS-HARTIG & ASSOCIATES, INC.

By:  
Roger A. Brewer, P.E.

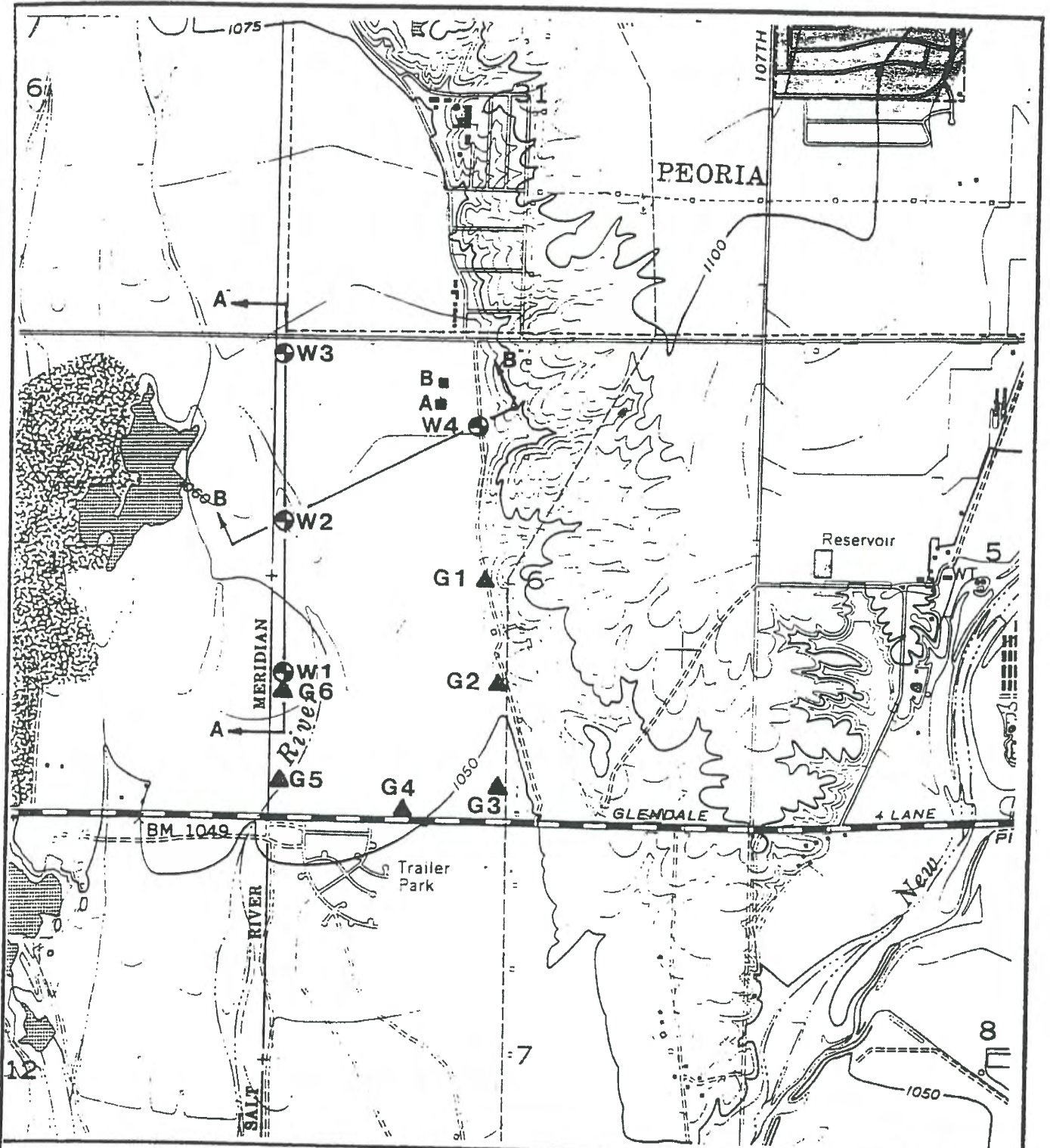
Reviewed by:  
Kenneth L. Ricker, P.E.

/cb

Copies to: Doname & Associates, Inc./James W. Garvin (2)

SUMMARY OF APPENDICES

<u>Appendix</u>	<u>Item</u>
A	Boring logs
B	First round results of water analyses and gas probe readings
C	Results of geotechnical laboratory tests
D	Well construction diagrams
E	Well development forms
F	Field permeability results, data and analyses
G	Gamma and neutron logs
H	Geologic cross sections
I	Well registration forms



LEGEND

- Monitoring well (approx.)
- ▲ Gas probe (approx.)
- Hand sample
- ↕ Location of cross section

Copied from 1957/1982 USGS topographic quadrangle map "El Mirage, Arizona"



FIGURE 1. Location Plan
Monitoring Wells, Gas Probes, and Hand Samples, Glendale Landfill

Project No. 89-0081

THOMAS-HARTIG & ASSOCIATES, INC.

LEGEND

SOIL CLASSIFICATION

COARSE-GRAINED SOIL

More than 50% larger than 200 sieve size

SYMBOL	LETTER	DESCRIPTION	MAJOR DIVISIONS
	GW	WELL-GRADED GRAVELS OR GRAVEL-SAND MIXTURES, LESS THAN 5% - #200 FINES	GRAVELS More than half of coarse fraction is larger than No. 4 sieve size
	GP	POORLY-GRADED GRAVELS OR GRAVEL-SAND MIXTURES, LESS THAN 5% - #200 FINES	
	GM	SILTY GRAVELS, GRAVEL-SAND-SILT MIXTURES, MORE THAN 12% - #200 FINES	
	GC	CLAYEY GRAVELS, GRAVEL-SAND-CLAY MIXTURES, MORE THAN 12% - #200 FINES	
	SW	WELL-GRADED SANDS OR GRAVELLY SANDS, LESS THAN 5% - #200 FINES	SANDS More than half of coarse fraction is smaller than No. 4 sieve size
	SP	POORLY-GRADED SANDS OR GRAVELLY SANDS, LESS THAN 5% - #200 FINES	
	SM	SILTY SANDS, SAND-SILT MIXTURES MORE THAN 12% - #200 FINES	
	SC	CLAYEY SANDS, SAND-CLAY MIXTURES MORE THAN 12% - #200 FINES	

FINE-GRAINED SOIL

More than 50% smaller than 200 sieve size

SYMBOL	LETTER	DESCRIPTION	MAJOR DIVISIONS
	ML	INORGANIC SILTS, ROCK FLOUR, AND FINE SANDY OR CLAYEY SILTS OF LOW TO MEDIUM PLASTICITY	SILTS AND CLAYS Liquid limit less than 50
	CL	INORGANIC CLAYS, GRAVELLY CLAYS, SANDY CLAYS, SILTY CLAYS, AND LEAN CLAYS OF LOW TO MEDIUM PLASTICITY	
	OL	ORGANIC SILTS AND ORGANIC SILT-CLAY MIXTURES OF LOW TO MEDIUM PLASTICITY	
	MH	INORGANIC SILTS, MICACEOUS OR DIATOMACEOUS, AND FINE SANDY OR CLAYEY SILTS OF HIGH PLASTICITY	SILTS AND CLAYS Liquid limit greater than 50
	CH	INORGANIC CLAYS, FAT CLAYS, AND SILTY CLAYS OF HIGH PLASTICITY	
	OH	ORGANIC CLAYS AND ORGANIC SILTS OF MEDIUM TO HIGH PLASTICITY	
	PT	PEAT AND OTHER HIGHLY ORGANIC SOILS	

LEGEND FOR LOG OF BORING

Penetration Resistance - Blows per foot using 'A' rod and 140 lb. hammer with 30 inch free fall unless otherwise noted.

N Standard Penetration Resistance (ASTM: D1586), 2.0 inch O.D. split barrel sampler.

C Continuous Penetration Resistance, 2.0 inch O.D. Bull Nose.

R Penetration Resistance, 2.42 inch I.D. Ring Sampler.

Sample Type

R - Ring T - Shelby Tube S - Standard Split Barrel B - Bulk
G - Grab C - Cutting V - Vertical Face Cut

REC - Percent recovered from core run

RQD - Rock Quality Determination

RUN - Core Run Number

NR - No recovery

GRAIN SIZES								
SILTS & CLAYS DISTINGUISHED ON BASIS OF PLASTICITY	U.S. STANDARD SERIES SIEVE			CLEAR SQUARE SIEVE OPENINGS			COBBLES	BOULDERS
	200	40	10	4	3/4"	3"			12"
	SAND			GRAVEL				
	FINE	MEDIUM	COARSE	FINE	COARSE			
MOISTURE CONDITION (INCREASING MOISTURE →)								
	SLIGHTLY DAMP SD		DAMP D (Plastic Limit)	MOIST M	VERY MOIST VM	WET (SATURATED) W (Liquid Limit)		

PROJECT Glendale Landfill LOCATION See plan DRILLED BY Layne BORING NO. W-1
 DATE STARTED 1-24-89 INCLINATION Vert. LOGGED BY Pearson/Brewer GROUND EL. 1053.9'
 DATE COMPLETED 1-25-89 BEARING -- CHECKED BY K. Ricker TOTAL DEPTH 202.0'

EL ft.	DEPTH ft.	SAMPLE				REMARKS ON ADVANCE OF BORING	GRAPHIC LOG	SOIL AND ROCK DESCRIPTIONS
		TYPE - NO.	BLOWS PER 6"	PEN in	REC in.			
	0							FINE TO MEDIUM SAND (SP-SM); gray brown; approximately 5 to 10 percent non-plastic fines. Some coarse sand and gravel.
	5							
	10							
	13'							
	15							SAND AND GRAVEL (SP/GP); gray brown; stratified fine to coarse sand and gravel with approximately 5 percent non-plastic fines.
	20	S-1	3 6 12	18	0	Piece of gravel in shoe		
	25							
	26'							
	30							SAND, GRAVEL AND COBBLES (SP/GP); gray brown; stratified; clean to slightly silty.
	35							

LEGEND
 BLOWS PER 6" - 140lb hammer falling 30" to drive a split spoon sampler
 PEN - Penetration length of sampler
 REC - Length of sample recovered
 ∇ - Groundwater
 S - Split spoon sample
 R = Ring sample

NOTE: The data presented on the boring logs represents subsurface conditions only at the specific locations and at the time designated. This data may not represent conditions at other locations and/or times. This boring data was compiled primarily for design purposes, and should not be construed as part of the plans governing construction or defining construction techniques. Bidders are fully responsible for interpretations or conclusions they draw from the boring log.

DATE 1-24-89 PROJECT NO. 89-0081
 PAGE 1 OF 6 BORING NO. W-1

PROJECT Glendale Landfill LOCATION See plan DRILLED BY Layne BORING NO. W-1
 DATE STARTED 1-24-89 INCLINATION Vert. LOGGED BY Pearson/Brewer GROUND EL. 1053.9'
 DATE COMPLETED 1-25-89 BEARING -- CHECKED BY K. Ricker TOTAL DEPTH 202.0'

EL ft.	DEPTH ft.	SAMPLE				REMARKS ON ADVANCE OF BORING	GRAPHIC LOG	SOIL AND ROCK DESCRIPTIONS
		TYPE - NO.	BLOWS PER 6"	PEN in	REC in.			
	35							SAND, GRAVEL AND COBBLES (SP/GP); gray brown; stratified; clean to slightly silty.
	40							42'
	45	R-2	9 24	12	11			CLAYEY SAND (SC); brown; fine to medium; 44' cemented.
	50	R-3	7 10 14	18	14			SLIGHTLY SILTY GRAVEL (GP-GM/GP); gray brown to brown; stratified; intermittent cementation; occasional heavily cemented clayey sand (SC) layers.
	55							
	60	R-4	6 11 13	18	12			
	65	R-5	6 13 21/4"	16	14			
	70							65'
								SAND AND GRAVEL (SP/SM/GP/GM); brown to light brown; stratified.

LEGEND
 BLOWS PER 6" - 140 lb. hammer falling 30" to drive a split spoon sampler
 PEN - Penetration length of sampler
 REC - Length of sample recovered
 ▽ - Groundwater
 S - Split spoon sample
 R = Ring sample

NOTE: The data presented on the boring logs represents subsurface conditions only at the specific locations and at the time designated. This data may not represent conditions at other locations and/or times. This boring data was compiled primarily for design purposes, and should not be construed as part of the plans governing construction or defining construction techniques. Bidders are fully responsible for interpretations or conclusions they draw from the boring logs.

DATE 1-24-89 PROJECT NO. 89-0081
 PAGE 2 OF 6 BORING NO. W-1

PROJECT Glendale Landfill LOCATION See plan DRILLED BY Layne BORING NO. W-1
 DATE STARTED 1-24-89 INCLINATION Vert. LOGGED BY Pearson/Brewer GROUND EL. 1053.9'
 DATE COMPLETED 1-25-89 BEARING -- CHECKED BY K. Ricker TOTAL DEPTH 202.0'

EL ft.	DEPTH ft.	SAMPLE				REMARKS ON ADVANCE OF BORING	GRAPHIC LOG	SOIL AND ROCK DESCRIPTIONS
		TYPE - NO.	BLOWS PER 6"	PEN in	REC in.			
	70							
	75							
	80							
	85							
	86.5'							
	88'							SANDY CLAY (CL); light brown; medium plasticity; mod. to heavy cementation.
	89'	R-6	7 14 11	18	18			SANDY SILT AND CLAY (MH/CH); brown; high plasticity; intermittent light cementation.
	90'							
	93'							
	95'							SILTY SAND (SM); brown; fine to medium sand with approximately 10 to 30 percent non-plastic to low plasticity fines. Intermittent light cementation; occasional sandy silt (ML) and sandy clay (CL) layers.
	100'							
	101'							
	105'							SAND AND GRAVEL (SM/SP/GP); gray brown; stratified layers of sand (SM) and sandy gravel (SP/GP); some cobbles; intermittent cementation.

LEGEND
 BLOWS PER 6" - 140lb. hammer falling 30" to drive a split spoon sampler
 PEN - Penetration length of sampler
 REC - Length of sample recovered
 * - Groundwater
 * - Split spoon sample
 R = Ring sample

NOTE: The data presented on the boring logs represents subsurface conditions only at the specific locations and at the time designated. This data may not represent conditions at other locations and/or times. This boring data was compiled primarily for design purposes, and should not be construed as part of the plans governing construction or defining construction techniques. Bidders are fully responsible for interpretations or conclusions they draw from the boring log.

DATE 1-24-89 PROJECT NO. 89-0081
 PAGE 3 OF 6 BORING NO. W-1

PROJECT Glendale Landfill LOCATION See plan DRILLED BY Layne BORING NO. W-1
 DATE STARTED 1-24-89 INCLINATION Vert. LOGGED BY Pearson/Brewer GROUND EL. 1053.9'
 DATE COMPLETED 1-25-89 BEARING -- CHECKED BY K. Ricker TOTAL DEPTH 202.0'

EL ft.	DEPTH ft.	SAMPLE				REMARKS ON ADVANCE OF BORING	GRAPHIC LOG	SOIL AND ROCK DESCRIPTIONS
		TYPE - NO.	BLOWS PER 6"	PEN in	REC in.			
105								
110								
115								
120					Add water to aid in drilling		120' - CLAYEY SAND (SC); brown; fine to medium sand with approximately 20 to 40 percent low plasticity fines; intermittent light to heavy cementation; stratified with occasional gravel lenses.	
125								
130								
135							Some Sandy Clay (CL) layers below 135 feet.	
140								

LEGEND
 BLOWS PER 6" - 140 lb. hammer falling 30" to drive
 a split spoon sampler
 PEN - Penetration length of sampler
 REC - Length of sample recovered
 4 - Groundwater
 5 - Split spoon sample
 R = Ring sample

NOTE: The data presented on the boring logs represents subsurface conditions only at the specific locations and at the time designated. This data may not represent conditions at other locations and/or times. This boring data was compiled primarily for design purposes, and should not be construed as part of the plans governing construction or defining construction techniques. Bidders are fully responsible for interpretations or conclusions they draw from the boring log.

DATE 1-24-89 PROJECT NO. 89-0081
 PAGE 4 OF 6 BORING NO. W-1

PROJECT Glendale Landfill LOCATION See plan DRILLED BY Layne BORING NO. W-1
 DATE STARTED 1-24-89 INCLINATION Vert. LOGGED BY Pearson/Brewer GROUND EL. 1053.9'
 DATE COMPLETED 1-25-89 BEARING -- CHECKED BY K. Ricker TOTAL DEPTH 202.0'

EL ft.	DEPTH ft.	SAMPLE				REMARKS ON ADVANCE OF BORING	GRAPHIC LOG	SOIL AND ROCK DESCRIPTIONS
		TYPE NO.	BLOWS PER 6"	PEN in	REC in.			
	140							142'
	145							FINE TO MEDIUM SAND (SP-SC); light brown and gray; approximately 10 to 15 percent low plasticity fines; variable light to heavy cementation.
	150							151'
	155							FINE TO MEDIUM SAND (SP-SM); brown; approximately 10 to 15 percent non-plastic fines; trace gravel.
	160							156'
	165							CLAYEY FINE SAND/SANDY CLAY (SC/CL); brown; fine sand with approximately 40 to 60 percent low plasticity fines; variable light to heavy cementation.
	170	R-7	6 11 14	18	12			165'
	175							SANDY SILT/SANDY CLAY (ML/CL); brown; variable light to heavy cementation.

LEGEND
 BLOWS PER 6" - 140lb hammer falling 30" to drive a split spoon sampler
 PEN - Penetration length of sampler
 REC - Length of sample recovered
 W - Groundwater
 S - Split spoon sample
 R = Ring sample

NOTE: The data presented on the boring logs represents subsurface conditions only at the specific locations and at the time designated. This data may not represent conditions at other locations and/or times. This boring data was compiled primarily for design purposes, and should not be construed as part of the plans governing construction or defining construction techniques. Bidders are fully responsible for interpretations or conclusions they draw from the boring log.

DATE 1-24-89 PROJECT NO. 89-0081
 PAGE 5 OF 6 BORING NO. W-1

PROJECT Glendale Landfill LOCATION See plan DRILLED BY Layne BORING NO. W-1
 DATE STARTED 1-24-89 INCLINATION Vert. LOGGED BY Pearson/Brewer GROUND EL. 1053.9'
 DATE COMPLETED 1-25-89 BEARING -- CHECKED BY K. Ricker TOTAL DEPTH 202.0'

EL ft.	DEPTH ft.	SAMPLE				REMARKS ON ADVANCE OF BORING	GRAPHIC LOG	SOIL AND ROCK DESCRIPTIONS
		TYPE - NO.	BLOWS PER 6"	PEN in	REC in.			
	175							
	180							178' SILTY TO CLAYEY FINE SAND (SM/SC); brown to light brown; moderately to heavily cemented.
	185							186' CLAYEY FINE SAND/SANDY CLAY (SC/CL); brown to light brown; uniform fine sand with approximately 40 to 60 percent low plasticity fines; variably cemented.
	190							
	195							
	200	R-8	6 46	12	12			
	205							Bottom of W-1 at 202.0' Installed W-1 1-25-89 (refer to Well Diagram for details)
	210							

LEGEND
 BLOWS PER 6" - 140 lb hammer falling 30" to drive a split spoon sampler
 PEN - Penetration length of sampler
 REC - Length of sample recovered
 * - Groundwater
 S - Split spoon sample
 R = Ring sample

NOTE: The data presented on the boring logs represents subsurface conditions only at the specific locations and at the time designated. This data may not represent conditions at other locations and/or times. This boring data was compiled primarily for design purposes, and should not be construed as part of the plans governing construction or defining construction techniques. Bidders are fully responsible for interpretations or conclusions they draw from the boring logs.

DATE 1-24-89 PROJECT NO. 89-0081
 PAGE 6 OF 6 BORING NO. W-1

PROJECT Glendale Landfill LOCATION See plan DRILLED BY Layne BORING NO. W-2
 DATE STARTED 1-26-89 INCLINATION Vert. LOGGED BY R. Brewer GROUND EL. 1057.0'
 DATE COMPLETED 1-26-89 BEARING -- CHECKED BY K. Ricker TOTAL DEPTH 191.8'

EL ft.	DEPTH ft.	SAMPLE				REMARKS ON ADVANCE OF BORING	GRAPHIC LOG	SOIL AND ROCK DESCRIPTIONS
		TYPE - NO.	BLOWS PER 6"	PEN in	REC In.			
	0							FINE TO MEDIUM SAND (SP); gray brown; stratified; approximately 5 percent non-plastic fines; some coarse sand and fine gravel; occasional cobbles to 3 inches.
	5							
	10							
	15							
	16'							
	20	R-1	14 20 50/0"	12	3	Broken cobble in shoe		SAND AND GRAVEL (SP/GP); gray brown; stratified fine to coarse sand and gravel with approximately 5 percent non-plastic fines; occasional cobbles.
	25							
	30							
	30'							
	33'							FINE TO MEDIUM SAND (SP); brown; narrowly graded; clean.
	35							SAND, GRAVEL AND COBBLES (SP/GP); gray brown; stratified; clean to slightly silty.

LEGEND
 BLOWS PER 6" - 140lb. hammer falling 30" to drive a split spoon sampler
 PEN - Penetration length of sampler
 REC - Length of sample recovered
 ∇ - Groundwater
 S - Split spoon sample
 R = Ring sample

NOTE: The data presented on the boring logs represents subsurface conditions only at the specific locations and at the time designated. This data may not represent conditions at other locations and/or times. This boring data was compiled primarily for design purposes, and should not be construed as part of the plans governing construction or defining construction techniques. Bidders are fully responsible for interpretations or conclusions they draw from the boring log.

DATE 1-26-89 PROJECT NO. 89-0081
 PAGE 1 OF 6 BORING NO. W-2

PROJECT Glendale Landfill LOCATION See plan DRILLED BY Layne BORING NO. W-2
 DATE STARTED 1-26-89 INCLINATION Vert. LOGGED BY R. Brewer GROUND EL. 1057.0'
 DATE COMPLETED 1-26-89 BEARING -- CHECKED BY K. Ricker TOTAL DEPTH 191.8'

EL ft.	DEPTH ft.	SAMPLE				REMARKS ON ADVANCE OF BORING	GRAPHIC LOG	SOIL AND ROCK DESCRIPTIONS
		TYPE - NO.	BLOWS PER 6"	PEN in	REC in.			
	35							
	40							38' FINE TO MEDIUM SAND (SP); light brown; narrowly graded; clean. Stratified with occasional fine gravel lenses below approximately 42 feet.
	45							
	50	R-2	75/4"	4	4			49' SAND, GRAVEL AND COBBLES (GM/GC); gray brown; stratified; widely graded; approx- imately 10 to 20 percent low to medium plasticity fines.
	55					Hard drilling		
	60							
	65							
	70							

LEGEND
 BLOWS PER 6" - 140lb hammer falling 30" to drive a split spoon sampler
 PEN - Penetration length of sampler
 REC - Length of sample recovered
 √ - Groundwater
 S - Split spoon sample
 R = Ring sample

NOTE: The data presented on the boring logs represents subsurface conditions only at the specific locations and at the time designated. This data may not represent conditions at other locations and/or times. This boring data was compiled primarily for design purposes, and should not be construed as part of the plans governing construction or defining construction techniques. Bidders are fully responsible for interpretations or conclusions they draw from the boring log.

DATE 1-26-89 PROJECT NO. 89-0081
 PAGE 2 OF 6 BORING NO. W-2

PROJECT Glendale Landfill LOCATION See plan DRILLED BY Layne BORING NO. W-2
 DATE STARTED 1-26-89 INCLINATION Vert. LOGGED BY R. Brewer GROUND EL. 1057.0'
 DATE COMPLETED 1-26-89 BEARING -- CHECKED BY K. Ricker TOTAL DEPTH 191.8'

EL ft.	DEPTH ft.	SAMPLE				REMARKS ON ADVANCE OF BORING	GRAPHIC LOG	SOIL AND ROCK DESCRIPTIONS
		TYPE - NO.	BLOWS PER 6"	PEN in	REC in.			
	70							SAND, GRAVEL AND COBBLES (GM/GC); gray brown; stratified; widely graded; approximately 10 to 20 percent low to medium plasticity fines.
	75							
	80	R-3	75/6"	6	6	Cobble in shoe Drillers inject water at 82'		
	85							
	90							
	93'							MEDIUM SAND (SP-SM); brown to light brown; narrowly graded; slightly silty.
	95							
	100	R-4	22 31 49	18	18			
	105							

LEGEND
 BLOWS PER 6" - 140lb hammer falling 30" to drive a split spoon sampler
 PEN - Penetration length of sampler
 REC - Length of sample recovered
 √ - Groundwater
 S - Split spoon sample
 R = Ring sample

NOTE: The data presented on the boring logs represents subsurface conditions only at the specific locations and at the time designated. This data may not represent conditions at other locations and/or times. This boring data was compiled primarily for design purposes, and should not be construed as part of the plans governing construction or defining construction techniques. Bidders are fully responsible for interpretations or conclusions they draw from the boring log.

DATE 1-26-89 PROJECT NO. 89-0081
 PAGE 3 OF 6 BORING NO. W-2

PROJECT Glendale Landfill LOCATION See plan DRILLED BY Layne BORING NO. W-2
 DATE STARTED 1-26-89 INCLINATION Vert. LOGGED BY R. Brewer GROUND EL. 1057.0'
 DATE COMPLETED 1-26-89 BEARING -- CHECKED BY K. Ricker TOTAL DEPTH 191.8'

EL ft.	DEPTH ft.	SAMPLE				REMARKS ON ADVANCE OF BORING	GRAPHIC LOG	SOIL AND ROCK DESCRIPTIONS
		TYPE - NO.	BLOWS PER 6"	PEN in	REC In.			
	105							MEDIUM SAND (SP-SM); brown to light brown; narrowly graded, slightly silty.
	110							
	115							
								117'
								CEMENTED SAND (SP); brown (sandstone). 119'
	120							MEDIUM SAND (SP-SM); light brown; narrowly graded; clean to slightly silty.
	125							
								128'
	130							SANDY CLAY (CL); light brown to brown; medium plasticity; approximately 30 to 40 percent fine sand; stratified with occasional clayey sand (SC) layers.
	135					Easy drilling		
	140							

LEGEND	BLOWS PER 6" - 140 lb. hammer falling 30" to drive a split spoon sampler	NOTE: The data presented on the boring logs represents subsurface conditions only at the specific locations and at the time designated. This data may not represent conditions at other locations and/or times. This boring data was compiled primarily for design purposes, and should not be construed as part of the plans governing construction or defining construction techniques. Bidders are fully responsible for interpretations or conclusions they draw from the boring log.	DATE <u>1-26-89</u>	PROJECT NO. <u>89-0081</u>
	PEN - Penetration length of sampler		PAGE <u>4</u> OF <u>6</u>	BORING NO. <u>W-2</u>
	REC - Length of sample recovered			
G - Groundwater S - Split spoon sample R = Ring sample				

PROJECT Glendale Landfill LOCATION See plan DRILLED BY Layne BORING NO. W-2
 DATE STARTED 1-26-89 INCLINATION Vert. LOGGED BY R. Brewer GROUND EL. 1057.0'
 DATE COMPLETED 1-26-89 BEARING -- CHECKED BY K. Ricker TOTAL DEPTH 191.8'

EL ft.	DEPTH ft.	SAMPLE				REMARKS ON ADVANCE OF BORING	GRAPHIC LOG	SOIL AND ROCK DESCRIPTIONS
		TYPE - NO.	BLOWS PER 6"	PEN in	REC in.			
	140						<p>SANDY CLAY (CL); light brown to brown; medium plasticity; approximately 30 to 40 percent fine sand; stratified with occasional clayey sand (SC) layers.</p> <p>Occasional cemented zones between approximately 145' and 152'.</p>	
	145							
	150						152'	
	155						<p>CLAYEY SAND (SC); brown; stratified fine to medium sand with approximately 20 to 40 percent low plasticity fines. Occasional sandy clay (CL) layers.</p> <p>Occasional cemented zones below approximately 160 feet.</p>	
	160							
	165							
	170						<p>Water level measured in drill pipe at 0720 on 1-27-89 after leaving overnight (drill pipe at 190 feet).</p>	
	175							

LEGEND
 BLOWS PER 6" - 140 lb. hammer falling 30" to drive a soil spoon sampler
 PEN - Penetration length of sampler
 REC - Length of sample recovered
 ∇ - Groundwater
 S - Split spoon sample
 R = Ring sample

NOTE: The data presented on the boring logs represents subsurface conditions only at the specific locations and at the time designated. This data may not represent conditions at other locations and/or times. This boring data was compiled primarily for design purposes, and should not be construed as part of the plans governing construction or defining construction techniques. Bidders are fully responsible for interpretations or conclusions they draw from the boring log.

DATE 1-26-89 PROJECT NO. 89-0081
 PAGE 5 OF 6 BORING NO. W-2

PROJECT Glendale Landfill LOCATION See plan DRILLED BY Layne BORING NO. W-2
 DATE STARTED 1-26-89 INCLINATION Vert. LOGGED BY R. Brewer GROUND EL. 1057.0'
 DATE COMPLETED 1-26-89 BEARING -- CHECKED BY K. Ricker TOTAL DEPTH 191.8'

EL ft.	DEPTH ft.	SAMPLE				REMARKS ON ADVANCE OF BORING	GRAPHIC LOG	SOIL AND ROCK DESCRIPTIONS
		TYPE - NO.	BLOWS PER 6"	PEN in	REC in.			
	175						CLAYEY SAND (SC); brown; variably cemented; stratified fine to coarse sand with occasional gravel and approximately 15 to 30 percent non-plastic to low plasticity fines.	
	180	R-5	50	12	12			
	185						Water level at end of day on 1-27-89 after blowing water out of hole.	
	190	R-6	50/4"	4	4			
	195						(GM)	
	200						Bottom of W-2 at 191.8' Installed W-2 1-26-89 and 1-27-89 (refer to Well Diagram for details)	
	205							
	210							

LEGEND
 BLOWS PER 6" - 140 lb. hammer falling 30" to drive a split spoon sampler
 PEN - Penetration length of sampler
 REC - Length of sample recovered
 ∇ - Groundwater
 S - Split spoon sample
 R = Ring sample

NOTE: The data presented on the boring logs represents subsurface conditions only at the specific locations and at the time designated. This data may not represent conditions at other locations and/or times. This boring data was compiled primarily for design purposes, and should not be construed as part of the plans governing construction or defining construction techniques. Bidders are fully responsible for interpretations or conclusions they draw from the boring log.

DATE 1-26-89 PROJECT NO. 89-0081
 PAGE 6 OF 6 BORING NO. W-2

PROJECT GRADUATE LANDFILL LOCATION SEE PLAN DRILLED BY AZ CUSTOM DR. BORING NO. G-1
 DATE STARTED 1-26-89 INCLINATION Vert. LOGGED BY Thompson/Brewer GROUND EL. 1070.73'
 DATE COMPLETED 1-26-89 BEARING -- CHECKED BY K. Ricker TOTAL DEPTH 20.0'

EL ft.	DEPTH ft.	SAMPLE				REMARKS ON ADVANCE OF BORING	GRAPHIC LOG	SOIL AND ROCK DESCRIPTIONS
		TYPE - NO.	BLOWS PER 6"	PEN in	REC in.			
	0							FILL; Gravelly Sand (SP); brown.
	5	S-1	50/4"	4	4			SANDY CLAY (CL); brown to light brown; variable medium to heavy cementation; low to medium plasticity.
	6'							
	9'							SILTY FINE SAND (SM); brown; occasional coarse sand; weakly cemented.
	10	S-2	10 10 9	18	6			SAND AND GRAVEL (SP/GP); gray brown; clean, stratified fine to coarse sand and gravel to 2".
	15	S-3	12 22 28	18	12			Occasional cobbles below approximately 15'.
	20	S-4	50/3"	3	3			Bottom of G-1 at 20.0' Installed G-1 1-26-89 (refer to Gas Probe Diagram for details)
	25							
	30							
	35							

LEGEND	BLOWS PER 6" - 140lb. hammer falling 30" to drive a split spoon sampler	NOTE: The data presented on the boring logs represents subsurface conditions only at the specific locations and at the time designated. This data may not represent conditions at other locations and/or times. This boring data was compiled primarily for design purposes, and should not be construed as part of the plans governing construction or defining construction techniques. Bidders are fully responsible for interpretations or conclusions they draw from the boring log.	DATE <u>1-26-89</u>	PROJECT NO. <u>89-0081</u>
	PEN - Penetration length of sampler REC - Length of sample recovered ▽ - Groundwater S - Split spoon sample		PAGE <u>1</u> OF <u>1</u>	BORING NO. <u>G-1</u>

PROJECT STENOGRAPHIC LIGHTHOUSE LOCATION SEE PLAN DRILLED BY AZ CUSCUM DT BORING NO. G-2
 DATE STARTED 1-26-89 INCLINATION Vert. LOGGED BY Thompson/Brewer GROUND EL. 1057.66'
 DATE COMPLETED 1-26-89 BEARING -- CHECKED BY K. Ricker TOTAL DEPTH 20.0'

EL ft.	DEPTH ft.	SAMPLE				REMARKS ON ADVANCE OF BORING	GRAPHIC LOG	SOIL AND ROCK DESCRIPTIONS
		TYPE - NO.	BLOWS PER 6"	PEN in	REC in.			
	0							SAND AND GRAVEL (SP-SM/GP-GM); gray brown; stratified; fine to coarse sand and gravel; clean to slightly silty; occasional cobbles.
	5	S-1	15 23 42	18	12			
	10	S-2	10 19 25	18	14			
	15	S-3	50/4"	4	4			
	20	S-4	25/0"	0	0			
	25						Bottom of G-2 at 20.0' Installed G-2 1-26-89 (refer to Gas Probe Diagram for details)	
	30							
	35							

LEGEND	BLOWS PER 6" - 14 O.D. hammer falling 30" to drive a split spoon sampler	NOTE: The data presented on the boring logs represents subsurface conditions only at the specific locations and at the time designated. This data may not represent conditions at other locations and/or times. This boring data was compiled primarily for design purposes, and should not be construed as part of the plans governing construction or defining construction techniques. Bidders are fully responsible for interpretations or conclusions they draw from the boring log.	DATE <u>1-26-89</u>	PROJECT NO. <u>89-0081</u>
	PEN - Penetration length of sampler REC - Length of sample recovered G - Groundwater S - Split spoon sample		PAGE <u>1</u> OF <u>1</u>	BORING NO. <u>G-2</u>

PROJECT Glendale Landfill LOCATION See plan DRILLED BY Layne BORING NO. W-3
 DATE STARTED 1-28-89 INCLINATION Vert. LOGGED BY M. Dennis GROUND EL. 1064.0'
 DATE COMPLETED 1-29-89 BEARING -- CHECKED BY K. Ricker TOTAL DEPTH 190.0'

EL ft.	DEPTH ft.	SAMPLE				REMARKS ON ADVANCE OF BORING	GRAPHIC LOG	SOIL AND ROCK DESCRIPTIONS
		TYPE - NO.	BLOWS PER 6"	PEN in	REC in.			
	0							FINE TO MEDIUM SAND (SP-SM); brown; approximately 5 to 15 percent non-plastic fines.
	5							
	8'							
	10							SAND AND GRAVEL (SP-SM/GP-GM); brown; stratified fine to coarse sand and gravel with approximately 5 to 15 percent non-plastic fines; occasional cobbles.
	15							
	16'							Boulder at 16'
	18'							
	20							SAND, GRAVEL AND COBBLES (SP/GP); gray brown; stratified; clean to slightly silty.
	25							
	30	R-1	21 15	12	0			
	32'							Clean sand lense 32' to 34'
	35							

LEGEND
 BLOWS PER 6" - 140 lb. hammer falling 30" to drive a split spoon sampler
 PEN - Penetration length of sampler
 REC - Length of sample recovered
 W - Groundwater
 S - Spill spoon sample
 R = Ring sample

NOTE: The data presented on the boring logs represents subsurface conditions only at the specific locations and at the time designated. This data may not represent conditions at other locations and/or times. This boring data was compiled primarily for design purposes, and should not be construed as part of the plans governing construction or defining construction techniques. Bidders are fully responsible for interpretations or conclusions they draw from the boring log.

DATE 1-28-89 PROJECT NO. 89-0081
 PAGE 1 OF 6 BORING NO. W-3

PROJECT Glendale Landfill LOCATION See plan DRILLED BY Layne BORING NO. W-3
 DATE STARTED 1-28-89 INCLINATION Vert. LOGGED BY M. Dennis GROUND EL. 1064.0'
 DATE COMPLETED 1-29-89 BEARING -- CHECKED BY K. Ricker TOTAL DEPTH 190.0'

EL ft.	DEPTH ft.	SAMPLE				REMARKS ON ADVANCE OF BORING	GRAPHIC LOG	SOIL AND ROCK DESCRIPTIONS
		TYPE - NO.	BLOWS PER 6"	PEN in	REC in.			
	35							SAND, GRAVEL AND COBBLES (SP/GP); gray brown; stratified; clean to slightly silty; some boulders.
	40	R-2	50/0"	0	0	Cobble piece in shoe		
	45							
	50	R-3	50/5"	5	0			Becomes slightly clayey below 50'
	55							Becomes moderately to heavily cemented below 55'
	60							
	65							
	67'							
	70	R-4	16 24	12	12	Plug in casing		CLAYEY SILT/SILTY CLAY (MH/CH); brown.

LEGEND
 BLOWS PER 6" - 140 lb. hammer falling 30" to drive a split spoon sampler
 PEN - Penetration length of sampler
 REC - Length of sample recovered
 ▽ - Groundwater
 S - Split spoon sample
 R = Ring sample

NOTE: The data presented on the boring logs represents subsurface conditions only at the specific locations and at the time designated. This data may not represent conditions at other locations and/or times. This boring data was compiled primarily for design purposes, and should not be construed as part of the plans governing construction or defining construction techniques. Bidders are fully responsible for interpretations or conclusions they draw from the boring log.

DATE 1-28-89 PROJECT NO. 89-0081
 PAGE 2 OF 6 BORING NO. W-3

PROJECT Glendale Landfill LOCATION See plan DRILLED BY Layne BORING NO. W-3
 DATE STARTED 1-28-89 INCLINATION Vert. LOGGED BY M. Dennis GROUND EL. 1064.0'
 DATE COMPLETED 1-29-89 BEARING -- CHECKED BY K. Ricker TOTAL DEPTH 190.0'

EL ft.	DEPTH ft.	SAMPLE				REMARKS ON ADVANCE OF BORING	GRAPHIC LOG	SOIL AND ROCK DESCRIPTIONS
		TYPE - NO.	BLOWS PER 6"	PEN in	REC in.			
	70							
	75							
	80	R-5	13 12	12	12			74' SILTY TO CLAYEY SAND (SM/SC); brown; fine to medium sand with approximately 20 to 30 percent low plasticity fines.
	85							86' FINE SAND (SP-SM); brown; approximately 5 to 15 percent non-plasticity fines; some medium sand.
	90							Siltier, with trace of clay
	95							Less silt, no clay
	100							
	105							Becomes variably cemented below approximately 105'

LEGEND
 BLOWS PER 6" - 140lb hammer falling 30" to drive a split spoon sampler
 PEN - Penetration length of sampler
 REC - Length of sample recovered
 G - Groundwater
 S - Split spoon sample
 R = Ring sample

NOTE: The data presented on the boring logs represents subsurface conditions only at the specific locations and at the time designated. This data may not represent conditions at other locations and/or times. This boring data was compiled primarily for design purposes, and should not be construed as part of the plans governing construction or defining construction techniques. Bidders are fully responsible for interpretations or conclusions they draw from the boring log.

DATE 1-28-89 PROJECT NO. 89-0081
 PAGE 3 OF 6 BORING NO. W-3

PROJECT Glendie Landfill LOCATION See plan DRILLED BY Layne BORING NO. W-3
 DATE STARTED 1-28-89 INCLINATION Vert. LOGGED BY M. Dennis GROUND EL. 1064.0'
 DATE COMPLETED 1-29-89 BEARING -- CHECKED BY K. Ricker TOTAL DEPTH 190.0'

EL ft.	DEPTH ft.	SAMPLE				REMARKS ON ADVANCE OF BORING	GRAPHIC LOG	SOIL AND ROCK DESCRIPTIONS
		TYPE - NO.	BLOWS PER 6"	PEN in	REC in.			
	105							FINE SAND (SP-SM); brown; approximately 5 to 15 percent non-plastic fines; variably cemented; occasional heavily cemented zones.
	110							
	115							Siltier, trace of clay
	120							Less silt, no clay
	125							
	130							
	135							Hard cemented zones
	140							

LEGEND	BLOWS PER 6" - 140 lb. hammer falling 30" to drive a split spoon sampler	NOTE: The data presented on the boring logs represents subsurface conditions only at the specific locations and at the time designated. This data may not represent conditions at other locations and/or times. This boring data was compiled primarily for design purposes, and should not be construed as part of the plans governing construction or defining construction techniques. Bidders are fully responsible for interpretations or conclusions they draw from the boring log.	DATE <u>1-28-89</u>	PROJECT NO. <u>89-0081</u>
	PEN - Penetration length of sampler REC - Length of sample recovered G - Groundwater S - Split spoon sample R = Ring sample		PAGE <u>4</u> OF <u>6</u>	BORING NO. <u>W-3</u>

PROJECT Glendale Landfill LOCATION See plan DRILLED BY Layne BORING NO. W-3
 DATE STARTED 1-28-89 INCLINATION Vert. LOGGED BY M. Dennis GROUND EL. 1064.0'
 DATE COMPLETED 1-29-89 BEARING -- CHECKED BY K. Ricker TOTAL DEPTH 190.0'

EL ft.	DEPTH ft.	SAMPLE				REMARKS ON ADVANCE OF BORING	GRAPHIC LOG	SOIL AND ROCK DESCRIPTIONS
		TYPE - NO.	BLOWS PER 6"	PEN in	REC in.			
	140							FINE SAND (SP-SM); brown; variably cemented.
	145							Very hard cemented 145' to 146.5' 146.5'
	150							SILTY TO CLAYEY SAND (SM/SC); brown; stratified fine to coarse sand with some gravel and approximately 20 to 30 percent low to medium plasticity fines.
	155							
	160	R-6	32 50	12	10			164'
	165							SANDY CLAY (CL); brown; low to medium plasticity; moderately to heavily cemented.
	170							
	175							

LEGEND
 BLOWS PER 6" - 140 lb. hammer falling 30" to drive a split spoon sampler
 PEN - Penetration length of sampler
 REC - Length of sample recovered
 ∇ - Groundwater
 S - Split spoon sample
 R = Ring sample

NOTE: The data presented on the boring logs represents subsurface conditions only at the specific locations and at the time designated. This data may not represent conditions at other locations and/or times. This boring data was compiled primarily for design purposes, and should not be construed as part of the plans governing construction or defining construction techniques. Bidders are fully responsible for interpretations or conclusions they draw from the boring log.

DATE 1-28-89 PROJECT NO. 89-0081
 PAGE 5 OF 6 BORING NO. W-3

PROJECT Glendale Landfill LOCATION See plan DRILLED BY Layne BORING NO. W-3
 DATE STARTED 1-28-89 INCLINATION Vert. LOGGED BY M. Dennis GROUND EL. 1064.0'
 DATE COMPLETED 1-29-89 BEARING -- CHECKED BY K. Ricker TOTAL DEPTH 190.0'

EL ft.	DEPTH ft.	SAMPLE				REMARKS ON ADVANCE OF BORING	GRAPHIC LOG	SOIL AND ROCK DESCRIPTIONS
		TYPE - NO.	BLOWS PER 6"	PEN in	REC in.			
	175							
	180							179'
	185							<u>SILTY SAND (SM)</u> ; brown; occasional clay (CL) layers; variably cemented.
	190	R-7	27 50/3"	9	7			Bottom of W-3 at 190.0' Installed W-3 1-29-89 (refer to Well Diagram for details)
	195							
	200							
	205							
	210							

LEGEND
 BLOWS PER 6" - 140lb. hammer falling 30" to drive a split spoon sampler
 PEN - Penetration length of sampler
 REC - Length of sample recovered
 ▽ - Groundwater
 S - Split spoon sample
 R = Ring sample

NOTE: The data presented on the boring logs represents subsurface conditions only at the specific locations and at the time designated. This data may not represent conditions at other locations and/or times. This boring data was compiled primarily for design purposes, and should not be construed as part of the plans governing construction or defining construction techniques. Bidders are fully responsible for interpretations or

DATE 1-28-89 PROJECT NO. 89-0081
 6 of 6 BORING NO. W-3

PROJECT Glendale Landfill LOCATION See plan DRILLED BY Layne BORING NO. W-4
 DATE STARTED 1-30-89 INCLINATION Vert. LOGGED BY C. Pearson GROUND EL. 1076.4'
 DATE COMPLETED 1-31-89 BEARING -- CHECKED BY K. Ricker TOTAL DEPTH 223.0'

EL ft.	DEPTH ft.	SAMPLE				REMARKS ON ADVANCE OF BORING	GRAPHIC LOG	SOIL AND ROCK DESCRIPTIONS
		TYPE - NO.	BLOWS PER 6"	PEN in	REC in.			
	0							FILL; Gravelly Sand (SP-SM); gray brown; medium dense.
	5							
	10							
	12'							
	15							GRAVELLY SAND (SP-SM); gray brown; stratified; approximately 5 to 15 percent non-plastic fines; some cobbles.
	20							
	25							
	30							
	30'							
	35							SAND AND GRAVEL (SP/GP); gray brown; stratified fine to coarse sand and gravel with approximately 5 percent non-plastic fines.

LEGEND
 BLOWS PER 6" - 140lb. hammer falling 30" to drive a split spoon sampler
 PEN - Penetration length of sampler
 REC - Length of sample recovered
 G - Groundwater
 S - Split spoon sample
 R = ring sample

NOTE: The data presented on the boring logs represents subsurface conditions only at the specific locations and at the time designated. This data may not represent conditions at other locations and/or times. This boring data was compiled primarily for design purposes, and should not be construed as part of the plans governing construction or defining construction techniques. Bidders are fully responsible for interpretations or conclusions they draw from the boring log.

DATE 1-30-89 PROJECT NO. 89-0081
 PAGE 1 OF 6 BORING NO. W-4

PROJECT Glendale Landfill LOCATION See plan DRILLED BY Layne BORING NO. W-4
 DATE STARTED 1-30-89 INCLINATION Vert. LOGGED BY C. Pearson GROUND EL. 1076.4'
 DATE COMPLETED 1-31-89 BEARING -- CHECKED BY K. Ricker TOTAL DEPTH 223.0'

EL ft.	DEPTH ft.	SAMPLE				REMARKS ON ADVANCE OF BORING	GRAPHIC LOG	SOIL AND ROCK DESCRIPTIONS
		TYPE - NO.	BLOWS PER 6"	PEN in	REC in.			
	35							SILTY SAND (SW-SM); brown; stratified fine to medium sand with approximately 10 to 15 percent non-plastic to low plasticity fines; occasional gravels. Some cemented layers
	40	R-1	15 22	12	12			
	45							Slightly clayey below 48'
	50							
	55							
	60	R-2	8 25	12	10			
	65							
	70							

LEGEND
 BLOWS PER 6" - 140 lb. hammer falling 30" to drive a split spoon sampler
 PEN - Penetration length of sampler
 REC - Length of sample recovered
 G - Groundwater
 S - Split spoon sample
 R = ring sample

NOTE: The data presented on the boring logs represents subsurface conditions only at the specific locations and at the time designated. This data may not represent conditions at other locations and/or times. This boring data was compiled primarily for design purposes, and should not be construed as part of the plans governing construction or defining construction techniques. Bidders are fully responsible for interpretations or conclusions they draw from the boring log.

DATE 1-30-89 PROJECT NO. 89-0081
 PAGE 2 OF 6 BORING NO. W-4

PROJECT Glendale Landfill LOCATION See plan DRILLED BY Layne BORING NO. W-4
 DATE STARTED 1-30-89 INCLINATION Vert. LOGGED BY C. Pearson GROUND EL. 1076.4'
 DATE COMPLETED 1-31-89 BEARING -- CHECKED BY K. Ricker TOTAL DEPTH 223.0'

EL ft.	DEPTH ft.	SAMPLE				REMARKS ON ADVANCE OF BORING	GRAPHIC LOG	SOIL AND ROCK DESCRIPTIONS
		TYPE - NO.	BLOWS PER 6"	PEN in	REC in.			
	70							SILTY SAND (SW-SM); brown; stratified fine to medium sand with approximately 10 to 15 percent non-plastic to low plasticity fines; occasional gravels.
	75							76'
	80	R-3	11 16	12	8			SANDY CLAY (CL); brown; low to medium plasticity; stratified layers of moderate to heavy cementation.
	85							
	90							
	95							Layer of cemented sand and gravel at 93' 93.5'
	100							SILTY SAND (SM); brown; stratified fine to coarse sand with approximately 10 to 30 percent non-plastic to low plasticity fines; intermittent cementation; some gravel.
	105							Stratified with layers of clayey sand (SC) and sandy clay (CL) below 100'

LEGEND
 BLOWS PER 6" - 140lb hammer falling 30" to drive a split spoon sampler
 PEN - Penetration length of sampler
 REC - Length of sample recovered
 - Groundwater
 - Split spoon sample
 R = ring sample

NOTE: The data presented on the boring logs represents subsurface conditions only at the specific locations and at the time designated. This data may not represent conditions at other locations and/or times. This boring data was compiled primarily for design purposes, and should not be construed as part of the plans governing construction or defining construction techniques. Bidders are fully responsible for interpretations or conclusions they draw from the boring log.

DATE 1-30-89 PROJECT NO. 89-0081
 PAGE 3 OF 6 BORING NO. W-4

PROJECT <u>Glendale Landfill</u>	LOCATION <u>See plan</u>	DRILLED BY <u>Layne</u>	BORING NO. <u>W-4</u>
DATE STARTED <u>1-30-89</u>	INCLINATION <u>Vert.</u>	LOGGED BY <u>C. Pearson</u>	GROUND EL. <u>1076.4'</u>
DATE COMPLETED <u>1-31-89</u>	BEARING <u>--</u>	CHECKED BY <u>K. Ricker</u>	TOTAL DEPTH <u>223.0'</u>

EL ft.	DEPTH ft.	SAMPLE				REMARKS ON ADVANCE OF BORING	GRAPHIC LOG	SOIL AND ROCK DESCRIPTIONS
		TYPE - NO.	BLOWS PER 6"	PEN in	REC in.			
	105							Hit cobble or boulder at 106'. No cuttings.
	110							Still pushing cobble or boulder. Some gravel chips or cuttings.
								113' (transition difficult to tell)
	115							SILTY TO SANDY CLAY (CL); brown; low plasticity; stratified layers of light to heavy cementation.
	120	R-4	*	*	10			
	125							
	130							
								133'
	135							SILTY SAND (SM); brown; predominantly fine to medium sand with approximately 15 to 30 percent non-plastic fines; occasional gravel.
	140							Moderate to heavy cementation, and whitish in color, from 138' to 144'

LEGEND	BLOWS PER 6" - 140lb. hammer falling 30" to drive a split spoon sampler	NOTE: The data presented on the boring logs represents subsurface conditions only at the specific locations and at the time designated. This data may not represent conditions at other locations and/or times. This boring data was compiled primarily for design purposes, and should not be construed as part of the plans governing construction or defining construction techniques. Bidders are fully responsible for interpretations or conclusions they draw from the boring log.	*Portion of cobble in drill pipe. Had to lift pipe and push rock aside with sampler. Blows and penetration not recorded.
	PEN - Penetration length of sampler		DATE <u>1-30-89</u> PROJECT NO. <u>89-0081</u>
	REC - Length of sample recovered		PAGE <u>4</u> OF <u>6</u> BORING NO. <u>W-4</u>

GW - Groundwater
 S - Spill spoon sample
 R = ring sample

PROJECT Glendale Landfill LOCATION See plan DRILLED BY Layne BORING NO. W-4
 DATE STARTED 1-30-89 INCLINATION Vert. LOGGED BY C. Pearson GROUND EL. 1076.4'
 DATE COMPLETED 1-31-89 BEARING -- CHECKED BY K. Ricker TOTAL DEPTH 223.0'

EL ft.	DEPTH ft.	SAMPLE				REMARKS ON ADVANCE OF BORING	GRAPHIC LOG	SOIL AND ROCK DESCRIPTIONS
		TYPE - NO.	BLOWS PER 6"	PEN in	REC in.			
	140							
	145							145'
	150							SILTY TO SANDY CLAY (CL); brown; low plasticity; intermittent cementation; stratified with occasional layers of clayey sand.
	155							157'
	160							SILTY SAND (SM); brown; fine to medium sand with approximately 15 to 30 percent low plasticity fines; intermittent cementation.
	165							Moderately to heavily cemented below 167'
	170							
	175							

LEGEND
 BLOWS PER 6" - 140lb hammer falling 30" to drive a soil spoon sampler
 PEN - Penetration length of sampler
 REC - Length of sample recovered
 - Groundwater
 - Soil spoon sample
 R = ring sample

NOTE: The data presented on the boring logs represents subsurface conditions only at the specific locations and at the time designated. This data may not represent conditions at other locations and/or times. This boring data was compiled primarily for design purposes, and should not be construed as part of the plans governing construction or defining construction techniques. Bidders are fully responsible for interpretations or conclusions they draw from the boring logs.

DATE 1-30-89 PROJECT NO. 89-0081
 PAGE 5 OF 6 BORING NO. W-4

PROJECT Glendale Landfill LOCATION See plan DRILLED BY Layne BORING NO. W-4
 DATE STARTED 1-30-89 INCLINATION Vert. LOGGED BY C. Pearson GROUND EL. 1076.4'
 DATE COMPLETED 1-31-89 BEARING -- CHECKED BY K. Ricker TOTAL DEPTH 223.0'

EL ft.	DEPTH ft.	SAMPLE				REMARKS ON ADVANCE OF BORING	GRAPHIC LOG	SOIL AND ROCK DESCRIPTIONS
		TYPE - NO.	BLOWS PER 6"	PEN in	REC in.			
	175							
	180							
	185							
	190	R-5	10 35/4"	10	10			177' SILTY TO SANDY CLAY (CL); brown; low plasticity; light to moderate cementation.
	195							
	200							
	205							
	210							

LEGEND
 BLOWS PER 6" - 140lb. hammer falling 30" to drive a split spoon sampler
 PEN - Penetration length of sampler
 REC - Length of sample recovered
 * - Groundwater
 * - Split spoon sample
 R = ring sample

NOTE: The data presented on the boring logs represents subsurface conditions only at the specific locations and at the time designated. This data may not represent conditions at other locations and/or times. This boring data was compiled primarily for design purposes, and should not be construed as part of the plans governing construction or defining construction techniques. Bidders are fully responsible for interpretations or conclusions they draw from the boring logs.

DATE 1-30-89 PROJECT NO. 89-0081
 PAGE 6 OF 6 BORING NO. W-4

PROJECT WATERGATE EXPANSION LOCATION SEE PLAN DRILLED BY Layne BORING NO. W-4
 DATE STARTED 1-30-89 INCLINATION Vert. LOGGED BY C. Pearson GROUND EL. 1076.4'
 DATE COMPLETED 1-31-89 BEARING -- CHECKED BY K. Ricker TOTAL DEPTH 223.0'

EL ft.	DEPTH ft.	SAMPLE				REMARKS ON ADVANCE OF BORING	GRAPHIC LOG	SOIL AND ROCK DESCRIPTIONS
		TYPE - NO.	BLOWS PER 6"	PEN in	REC in.			
	210						210'	
	210						CLAYEY SAND (SC); brown; low plasticity fines.	
	213						213'	
	215						SANDY SILT/SANDY CLAY (ML/CL); light brown; low plasticity; variable light to heavy cementation.	
	220	R-6	12 21/5"	11	10			
	225						Bottom of W-4 at 223.0' Installed W-1 1-31-89 and 2-1-89 (refer to Well Diagram for details)	
	230							
	235							
	240							
	245							

LEGEND	BLOWS PER 6" - 140lb hammer falling 30" to drive a split spoon sampler	NOTE: The data presented on the boring logs represents subsurface conditions only at the specific locations and at the time designated. This data may not represent conditions at other locations and/or times. This boring data was compiled primarily for design purposes, and should not be construed as part of the plans governing construction or defining construction techniques. Bidders are fully responsible for interpretations or conclusions they draw from the boring log.	DATE <u>1-30-89</u>	PROJECT NO. <u>89-0081</u>
	PEN - Penetration length of sampler REC - Length of sample recovered W - Groundwater S - Split spoon sample R = ring sample		PAGE <u>7</u> OF <u>6</u>	BORING NO. <u>W-4</u>

DATE STARTED 1-26-89 INCLINATION Vert. LOGGED BY Thompson/Brewer BORING NO.
 DATE COMPLETED 1-26-89 BEARING -- CHECKED BY K. Ricker GROUND EL. 1049.67'
 TOTAL DEPTH 20.0'

EL ft.	DEPTH ft.	SAMPLE				REMARKS ON ADVANCE OF BORING	GRAPHIC LOG	SOIL AND ROCK DESCRIPTIONS
		TYPE - NO.	BLOWS PER 6"	PEN in	REC in.			
	0							SILTY FINE SAND/SANDY SILT (SM/ML); brown; uniform. 2'
	5	S-1	10 11 12	18	16			MEDIUM SAND (SP); brown; clean; trace 4' gravel.
	10	S-2	10 15 14	18	18			SAND AND GRAVEL (SP-SM/GP-GM); gray brown; stratified fine to coarse sand and gravel; clean to slightly silty; occasional clean sand (SP) lenses.
	15	S-3	17 20 22	18	12			Stratified with cobbles below 14'.
	20	S-4	45 50/4"	10	10			Bottom of G-3 at 20.0' Installed G-3 1-26-89 (refer to Gas Probe Diagram for details)
	25							
	30							
	35							

LEGEND	BLOWS PER 6" - 140lb. hammer falling 30" to drive a split spoon sampler	NOTE: The data presented on the boring logs represents subsurface conditions only at the specific locations and at the time designated. This data may not represent conditions at other locations and/or times. This boring data was compiled primarily for design purposes, and should not be construed as part of the plans governing construction or defining construction techniques. Bidders are fully responsible for interpretations or conclusions they draw from the boring log.	DATE <u>1-26-89</u>	PROJECT NO. <u>89-0081</u>
	PEN - Penetration length of sampler REC - Length of sample recovered ∇ - Groundwater S - Split spoon sample		PAGE <u>1</u> OF <u>1</u>	BORING NO. <u>G-3</u>

PROJECT Glendale Landfill LOCATION See plan DRILLED BY AZ Custom Dr. BORING NO. G-4
 DATE STARTED 1-26-89 INCLINATION Vert. LOGGED BY Thompson/Brewer GROUND EL. 1050.39'
 DATE COMPLETED 1-26-89 BEARING -- CHECKED BY K. Ricker TOTAL DEPTH 19.0'

EL ft.	DEPTH ft.	SAMPLE				REMARKS ON ADVANCE OF BORING	GRAPHIC LOG	SOIL AND ROCK DESCRIPTIONS
		TYPE - NO.	BLOWS PER 6"	PEN in	REC in.			
	0							<u>SILTY FINE SAND/SANDY SILT (SM/ML); light brown; approximately 50 percent non-plastic fines.</u> 4'
	5	S-1	4 5 11	18	14			<u>FINE TO MEDIUM SAND (SP); gray brown; clean; trace coarse sand.</u> 9'
	10	S-2	12 12 8	18	12			<u>GRAVELLY SAND (SP-SM); slightly silty fine to coarse sand with approximately 30 percent gravel to 1 inch.</u> 13'
	15	S-3	50/4"	4	4			<u>SANDY GRAVEL (GP-GM); gray brown; slightly silty gravel to 1" with approximately 40 percent sand; occasional cobbles.</u>
		S-4	25/0"	0	0			
	20							Bottom of G-4 at 19.0' Installed G-4 1-26-89 (refer to Gas Probe Diagram for details)
	25							
	30							
	35							

LEGEND	BLOWS PER 6" - 140 lb. hammer falling 30" to drive a split spoon sampler	NOTE: The data presented on the boring logs represents subsurface conditions only at the specific locations and at the time designated. This data may not represent conditions at other locations and/or times. This boring data was compiled primarily for design purposes, and should not be construed as part of the plans governing construction or defining construction techniques. Bidders are fully responsible for interpretations or conclusions they draw from the boring log.	DATE <u>1-26-89</u>	PROJECT NO. <u>89-0081</u>
	PEN - Penetration length of sampler		PAGE <u>1</u> OF <u>1</u>	BORING NO. <u>G-4</u>
	REC - Length of sample recovered			
	GW - Groundwater			
	SS - Split spoon sample			

PROJECT Glendale Landfill LOCATION See plan DRILLED BY AZ Custom Dr. BORING NO. G-5
 DATE STARTED 1-24-89 INCLINATION Vert. LOGGED BY Thomp./Pearson GROUND EL. 1049.91'
 DATE COMPLETED 1-24-89 BEARING -- CHECKED BY K. Ricker TOTAL DEPTH 19.8'

EL ft.	DEPTH ft.	SAMPLE				REMARKS ON ADVANCE OF BORING	GRAPHIC LOG	SOIL AND ROCK DESCRIPTIONS
		TYPE - NO.	BLOWS PER 6"	PEN in	REC in.			
	0							<p><u>SILTY SAND (SM)</u>; brown; stratified fine to medium sand with approximately 10 to 20 percent non-plastic fines to approximately 4' depth; stratified fine to coarse sand with occasional fine gravel and approximately 10 to 20 percent non-plastic fines below approximately 4' depth.</p>
	5	S-1	7 8 7	18	18			
	10	S-2	13 18 16	18	18			
	15	S-3	40 40 30	18	18			
	19.8	S-4	36 50/4"	10	10			<p><u>SAND AND GRAVEL (SP-SM/GP-GM)</u>; gray brown; stratified; clean to slightly silty; occasional cobbles.</p>
	20							<p>Bottom of G-5 at 19.8' Installed G-5 1-24-89 (refer to Well Diagram for details)</p>
	25							
	30							
	35							

LEGEND	BLOWS PER 6" - 140lb. hammer falling 30" to drive a split spoon sampler	NOTE: The data presented on the boring logs represents subsurface conditions only at the specific locations and at the time designated. This data may not represent conditions at other locations and/or times. This boring data was compiled primarily for design purposes, and should not be construed as part of the plans governing construction or defining construction techniques. Bidders are fully responsible for interpretations or conclusions they draw from the boring log.	DATE <u>1-24-89</u>	PROJECT NO. <u>89-0081</u>
	PEN - Penetration length of sampler		PAGE <u>1</u> OF <u>1</u>	BORING NO. <u>G-5</u>
	REC - Length of sample recovered			
	GW - Groundwater			
	SS - Split spoon sampler			

PROJECT: _____ LOCATION: SEC 11 DRILLED BY: AL CUSUMBI DT. BORING NO. G-6
 DATE STARTED 1-24-89 INCLINATION Vert. LOGGED BY: Thomp./Pearson GROUND EL. 1054.07'
 DATE COMPLETED 1-24-89 BEARING -- CHECKED BY: K. Ricker TOTAL DEPTH 20.5'

EL ft.	DEPTH ft.	SAMPLE				REMARKS ON ADVANCE OF BORING	GRAPHIC LOG	SOIL AND ROCK DESCRIPTIONS
		TYPE - NO.	BLOWS PER 6"	PEN in	REC in.			
0								FINE TO MEDIUM SAND (SP-SM); gray brown; approximately 5 to 10 percent non-plastic fines; some coarse sand and gravel.
	5	S-1	8 12 15	18	18			
	10	S-2	16 12 11	18	12			11.5'
	15	S-3	10 9 12	18	12			SAND AND GRAVEL (SP-SM/GP-GM); gray brown; stratified fine to coarse sand and gravel with approximately 5 to 12 percent non-plastic fines.
	20	S-4	35 31 17	18	18			
	25							Bottom of G-6 at 20.5' Installed G-6 1-24-89 (refer to Gas Probe Diagram for details)
	30							
	35							

LEGEND
 BLOWS PER 6" - 140lb. hammer falling 30" to drive a split spoon sampler
 PEN - Penetration length of sampler
 REC - Length of sample recovered
 ∇ - Groundwater
 S - Split spoon sample

NOTE: The data presented on the boring logs represents subsurface conditions only at the specific locations and at the time designated. This data may not represent conditions at other locations and/or times. This boring data was compiled primarily for design purposes, and should not be construed as part of the plans governing construction or defining construction techniques. Bidders are fully responsible for interpretations or conclusions they draw from the boring log.

DATE 1-24-89 PROJECT NO. 89-0081
 PAGE 1 OF 1 BORING NO. G-6

CITY OF GLENDALE

GLENDALE, ARIZONA



GLENDALE LANDFILL NORTH CELL EXCAVATION PHASE 2A OCTOBER 2022

CITY ENGINEER _____ DATE _____

PUBLIC WORKS DIRECTOR _____ DATE _____

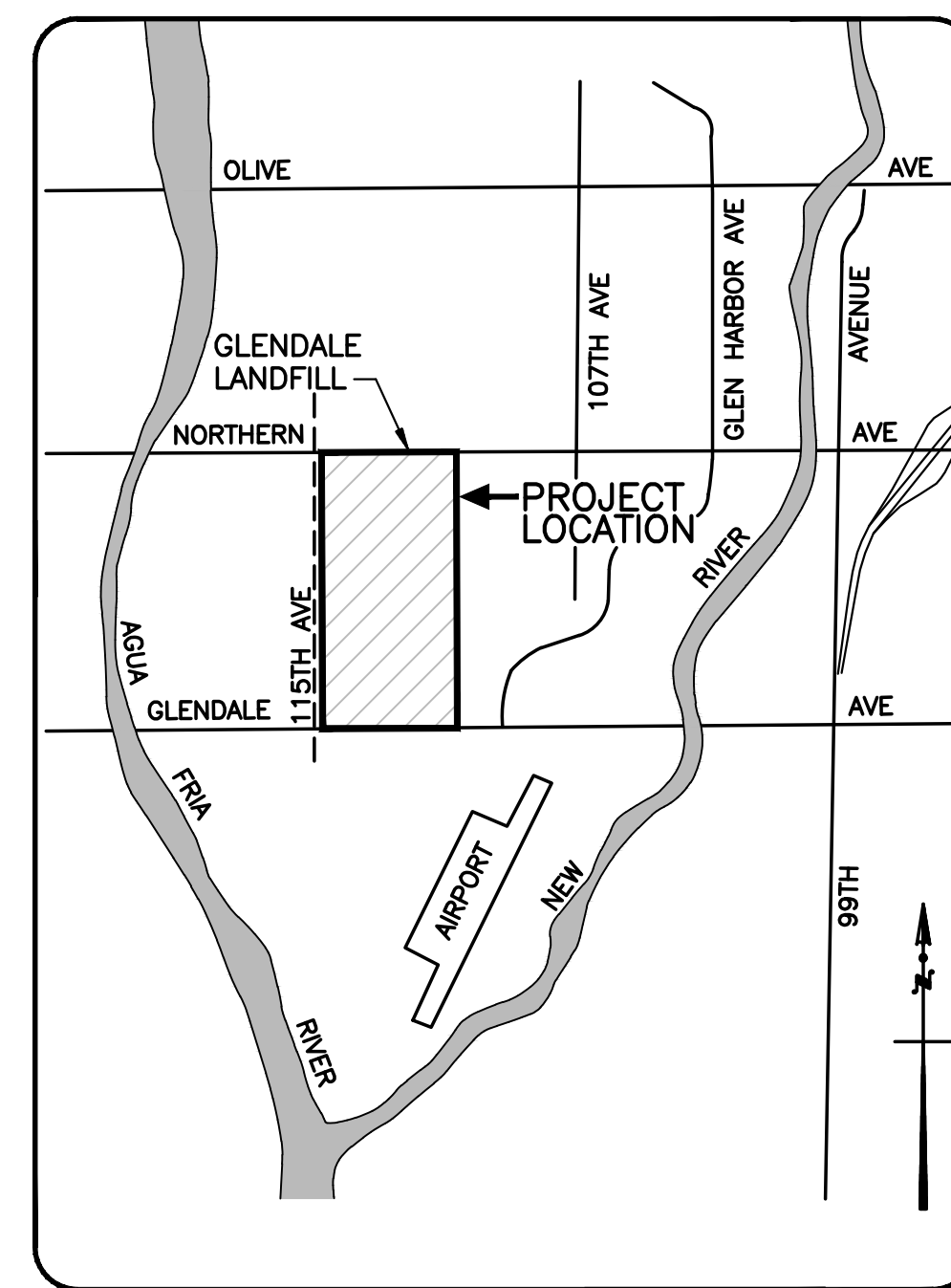
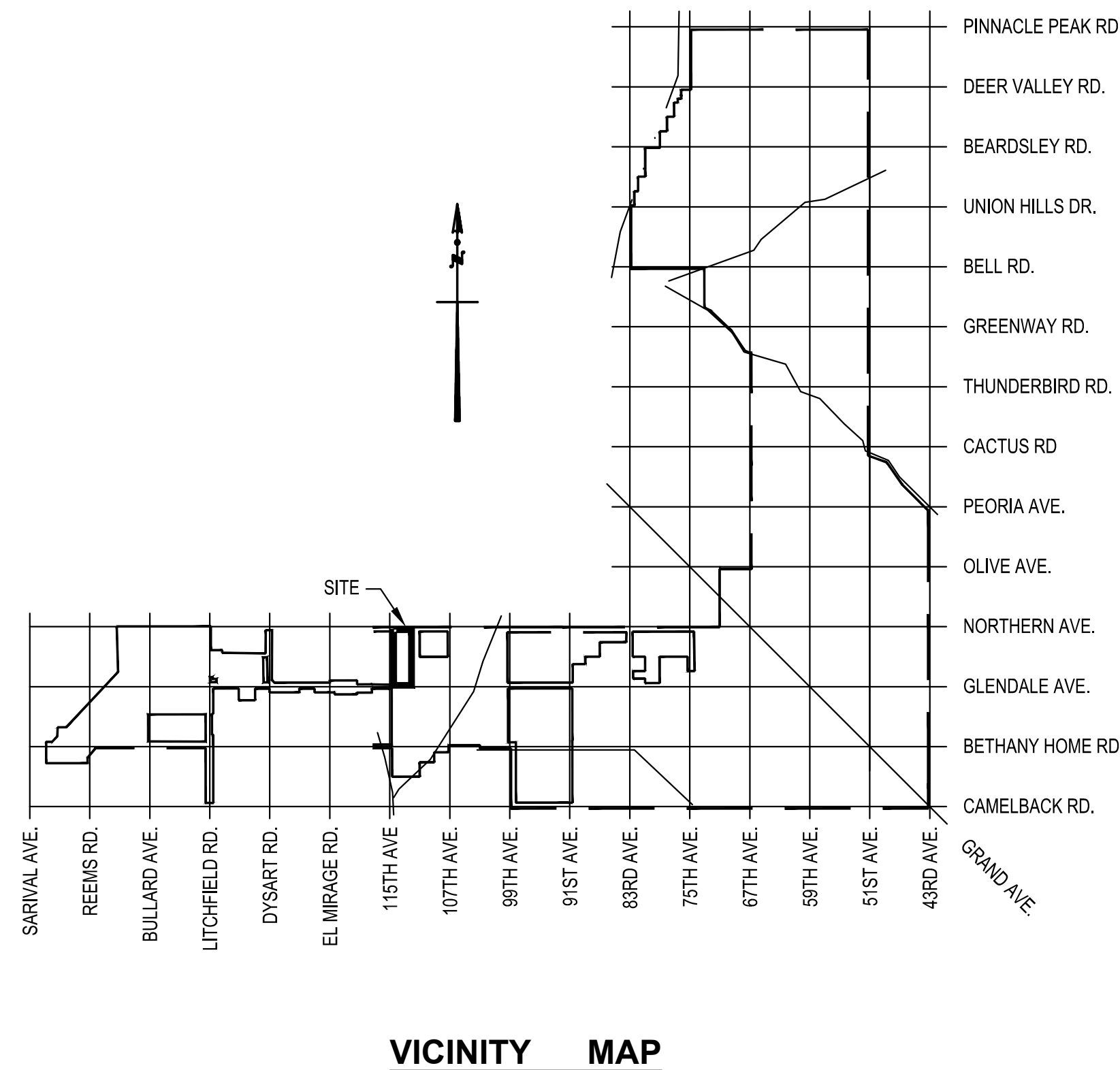
MAYOR
JERRY P. WEIERS

CITY COUNCIL
JAMIE ALDAMA
JOYCE V. CLARK
IAN HUGH
RAY MALNAR
LAUREN TOLMACHOFF
BART TURNER

CITY MANAGER
KEVIN R. PHELPS

CITY CLERK
JULIE K. BOWER

CITY ATTORNEY
MICHAEL D. BAILEY



SHEET INDEX

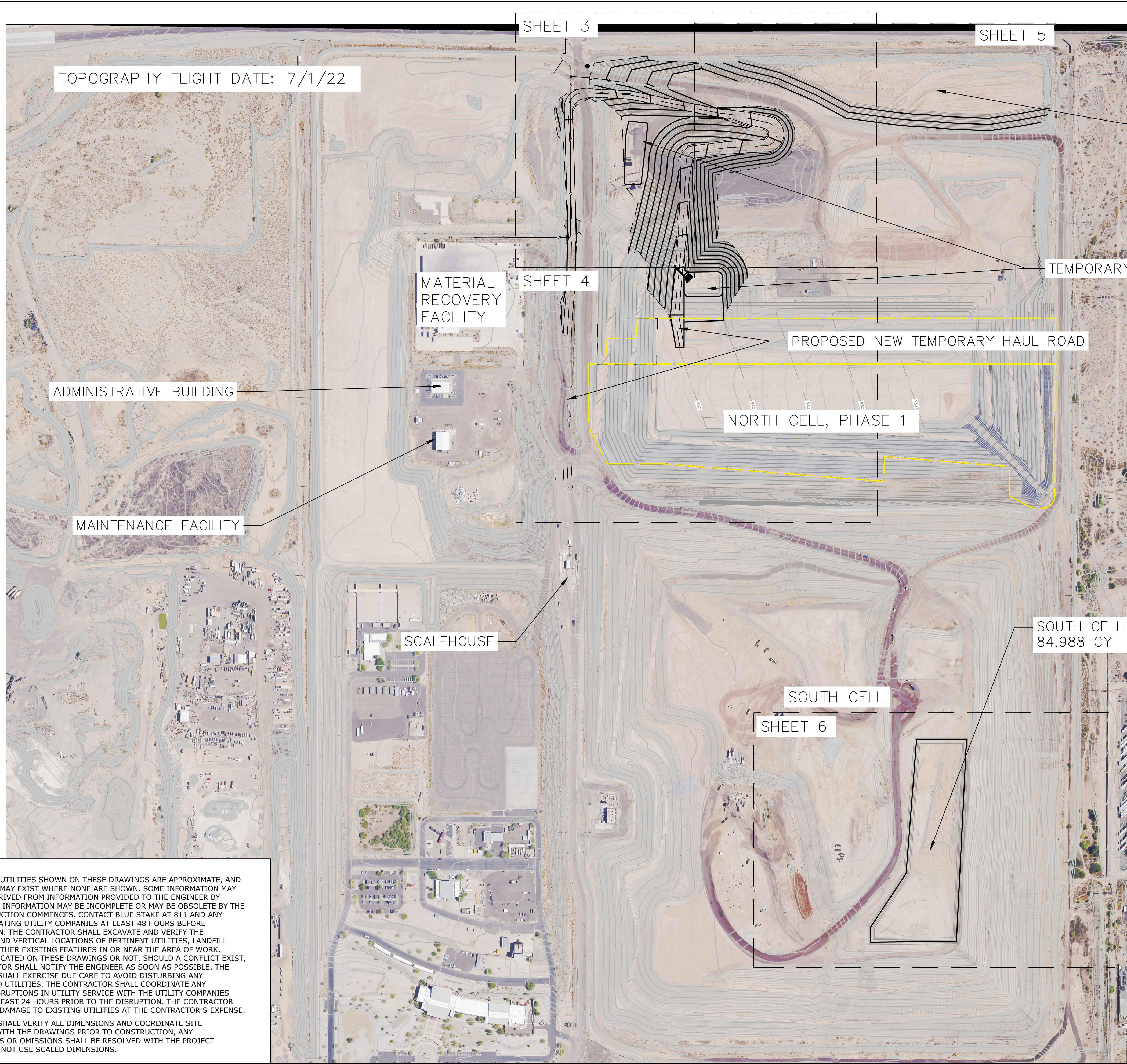
SHEET NO.	DESCRIPTION
1	TITLE SHEET
2	PLAN VIEW
3	EXCAVATION PLANS
4	EXCAVATION PLANS
5	STOCKPILING PLANS
6	STOCKPILING PLANS
7	DETAILS

BENCHMARK DATUMS & POINTS
 HORIZONTAL DATUM: NAD 83
 VERTICAL DATUM: NAVD 88
 CONTROL POINT #1: N 928199.38 E 583693.57 ELEV 1082.60
 CONTROL POINT #2: N 928207.398 E 580355.01 ELEV 1064.723
 CONTROL POINT #3: N 925551.414 E 583695.891 ELEV 1072.763

CIVIL SHEET NO. 1 OF 7	REVISIONS TO DRAWINGS	NO.	DESCRIPTION	REV. BY	DATE
REV. NO. 0	CITY PROJECT NO.: TBD	DATE: OCTOBER 2022		PROJECT NO.: 2023-012B-22B PLOT DATE: 10-24-2022 DRAWN BY: M.C.L. DESIGNED BY: R.T.L. CHECKED BY: R.T.L.	
				CITY OF GLENDALE, ARIZONA PUBLIC WORKS/ENGINEERING 5850 W. GLENDALE AVENUE GLENDALE, ARIZONA 85301 (602) 930-3630	

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TOPOGRAPHY FLIGHT DATE: 7/1/22

ADMINISTRATIVE BUILDING

MAINTENANCE FACILITY

SCALEHOUSE

MATERIAL RECOVERY FACILITY

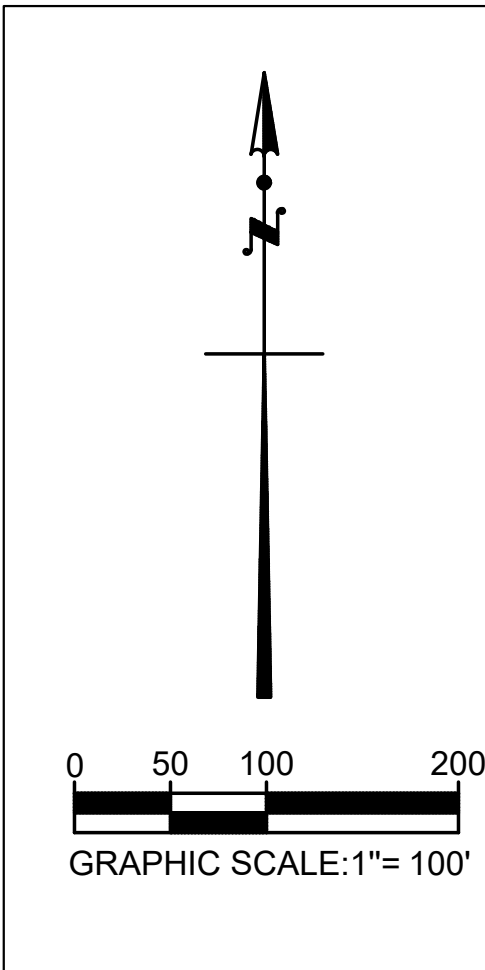
NORTH CELL, PHASE 1

PROPOSED NEW TEMPORARY HAUL ROAD

TEMPORARY STORMWATER RETENTION BASINS

NORTH CELL STOCKPILE
353,725 CY

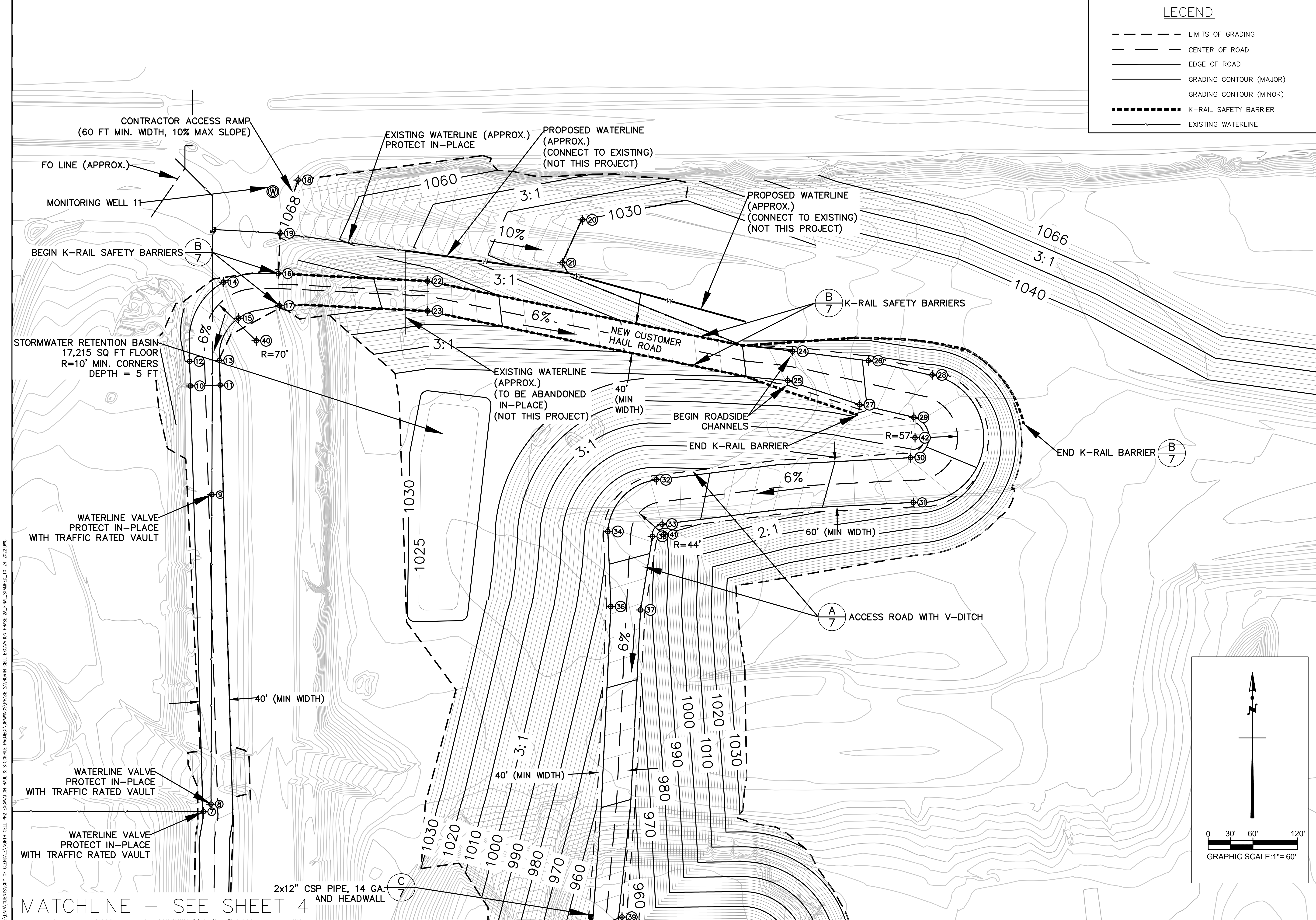
SOUTH CELL STOCKPILE
84,988 CY



NOTES:

1. THE EXISTING UTILITIES SHOWN ON THESE DRAWINGS ARE APPROXIMATE, AND UTILITY LINES MAY EXIST WHERE NONE ARE SHOWN. SOME INFORMATION MAY HAVE BEEN DERIVED FROM INFORMATION PROVIDED TO THE ENGINEER BY OTHERS. SUCH INFORMATION MAY BE INCOMPLETE OR MAY BE OBSOLETE BY THE TIME CONSTRUCTION COMMENCES. CONTACT BLUE STAKE AT 811 AND ANY NON-PARTICIPATING UTILITY COMPANIES AT LEAST 48 HOURS BEFORE CONSTRUCTION. THE CONTRACTOR SHALL EXCAVATE AND VERIFY THE HORIZONTAL AND VERTICAL LOCATIONS OF PERTINENT UTILITIES, LANDFILL LINERS, AND OTHER EXISTING FEATURES IN OR NEAR THE AREA OF WORK, WHETHER INDICATED ON THESE DRAWINGS OR NOT. SHOULD A CONFLICT EXIST, THE CONTRACTOR SHALL NOTIFY THE ENGINEER AS SOON AS POSSIBLE. THE CONTRACTOR SHALL EXERCISE DUE CARE TO AVOID DISTURBING ANY UNDERGROUND UTILITIES. THE CONTRACTOR SHALL COORDINATE ANY POTENTIAL DISRUPTIONS IN UTILITY SERVICE WITH THE UTILITY COMPANIES AFFECTED AT LEAST 24 HOURS PRIOR TO THE DISRUPTION. THE CONTRACTOR SHALL REPAIR DAMAGE TO EXISTING UTILITIES AT THE CONTRACTOR'S EXPENSE.
2. CONTRACTOR SHALL VERIFY ALL DIMENSIONS AND COORDINATE SITE CONDITIONS WITH THE DRAWINGS PRIOR TO CONSTRUCTION. ANY DISCREPANCIES OR OMISSIONS SHALL BE RESOLVED WITH THE PROJECT ENGINEER. DO NOT USE SCALED DIMENSIONS.

CIVIL SHEET NO. 2 OF 7	REV. NO. 0	GLENDALE LANDFILL		CITY OF GLENDALE, ARIZONA		PROJECT NO. 2023-012B-22B	DATE: 10-24-2022	DRAWN BY: M.C.L.	DESIGNED BY: R.T.L.	CHECKED BY: R.T.L.			REVISIONS TO DRAWINGS		
		NORTH CELL EXCAVATION PHASE 2A		PUBLIC WORKS/ENGINEERING									NO.	DESCRIPTION	REV. BY (D.G.)	DATE
PLAN VIEW CITY PROJECT NO.: TBD DATE: OCTOBER 2022												5850 W. GLENDALE AVENUE GLENDALE, ARIZONA 85301 (623) 930-3630		2400 WEST WASHINGTON AVENUE, SUITE 225 PHOENIX, ARIZONA 85027 (602) 287-0336	



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LEGEND	
---	LIMITS OF GRADING
- - -	CENTER OF ROAD
---	EDGE OF ROAD
---	GRADING CONTOUR (MAJOR)
---	GRADING CONTOUR (MINOR)
---	K-RAIL SAFETY BARRIER
---	EXISTING WATERLINE

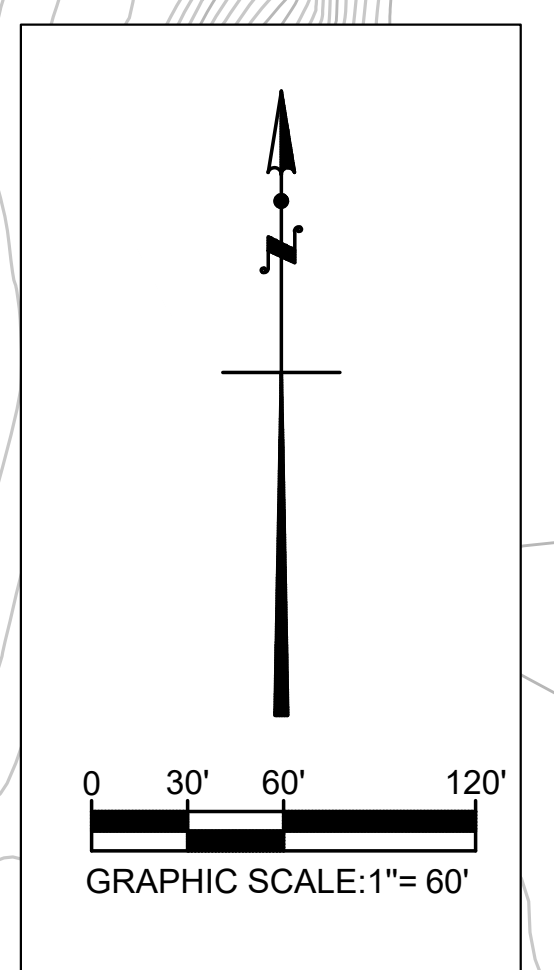
REVISIONS TO DRAWINGS			
NO.	DESCRIPTION	REV. BY	DATE

PROJECT NO.	2023-012B-22B
CITY OF	GLENDALE, ARIZONA
DESIGNED BY	R.T.L.
CHECKED BY	R.T.L.
DRAWN BY	M.C.L.
DATE	10-24-2022
PROJECT NAME	NORTH CELL EXCAVATION PHASE 2A
DATE	10-24-2022
PROJECT ADDRESS	5850 W. GLENDALE AVENUE, SUITE 225 GLENDALE, ARIZONA 85301 (623) 930-3630

PROJECT NO.	2023-012B-22B
CITY OF	GLENDALE, ARIZONA
DESIGNED BY	R.T.L.
CHECKED BY	R.T.L.
DRAWN BY	M.C.L.
DATE	10-24-2022
PROJECT NAME	NORTH CELL EXCAVATION PHASE 2A
DATE	10-24-2022
PROJECT ADDRESS	5850 W. GLENDALE AVENUE, SUITE 225 GLENDALE, ARIZONA 85301 (623) 930-3630

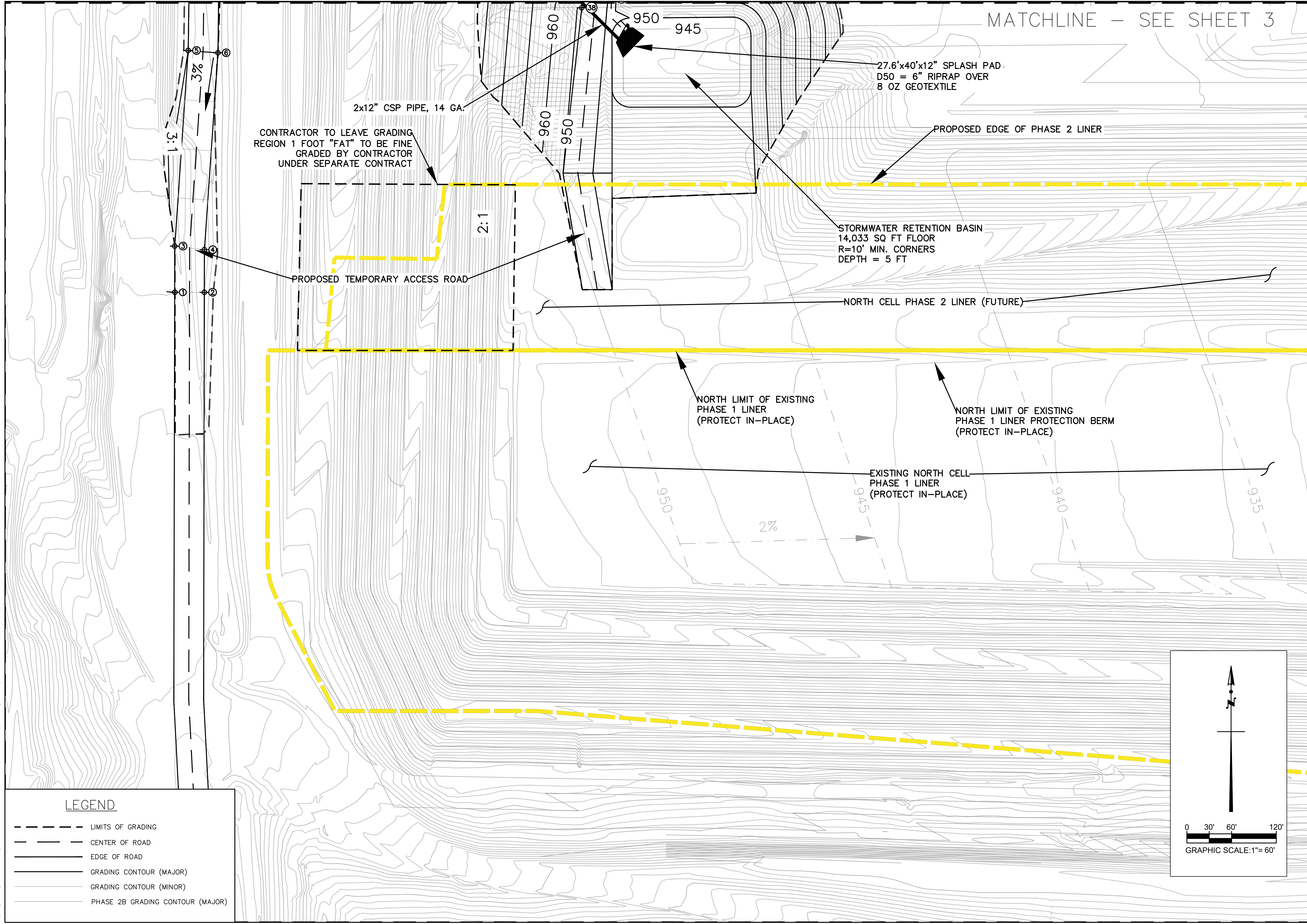
CIVIL SHEET	3 OF 7
NO.	3
REV. NO.	0

TETRA TECH BAS, INC.
 CONSULTING CIVIL & ENVIRONMENTAL ENGINEERS
 2300 NORTH CENTRAL AVENUE, SUITE 225
 PHOENIX, ARIZONA 85022
 (602) 287-0336



MATCHLINE - SEE SHEET 4

F:\DATA\CITY OF GLENDALE\NORTH CELL PHASE 2A\PROJECT DRAWINGS\PHASE 2A\NORTH CELL EXCAVATION PHASE 2A_FINAL STAMPED_10-24-2022.DWG



MATCHLINE - SEE SHEET 3

CONTRACTOR TO LEAVE GRADING REGION 1 FOOT "FAT" TO BE FINE GRADED BY CONTRACTOR UNDER SEPARATE CONTRACT

2x12" CSP PIPE, 14 GA.

27.6'x40'x12" SPLASH PAD
D50 = 6" RIPRAP OVER
8 OZ GEOTEXTILE

PROPOSED EDGE OF PHASE 2 LINER

STORMWATER RETENTION BASIN
14,033 SQ FT FLOOR
R=10' MIN. CORNERS
DEPTH = 5 FT

PROPOSED TEMPORARY ACCESS ROAD

NORTH CELL PHASE 2 LINER (FUTURE)

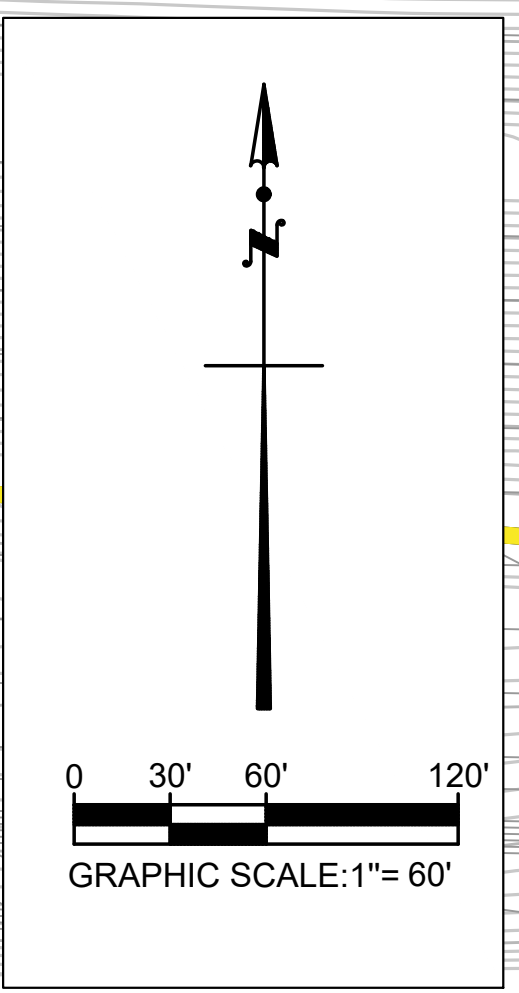
NORTH LIMIT OF EXISTING PHASE 1 LINER (PROTECT IN-PLACE)

NORTH LIMIT OF EXISTING PHASE 1 LINER PROTECTION BERM (PROTECT IN-PLACE)

EXISTING NORTH CELL PHASE 1 LINER (PROTECT IN-PLACE)

LEGEND

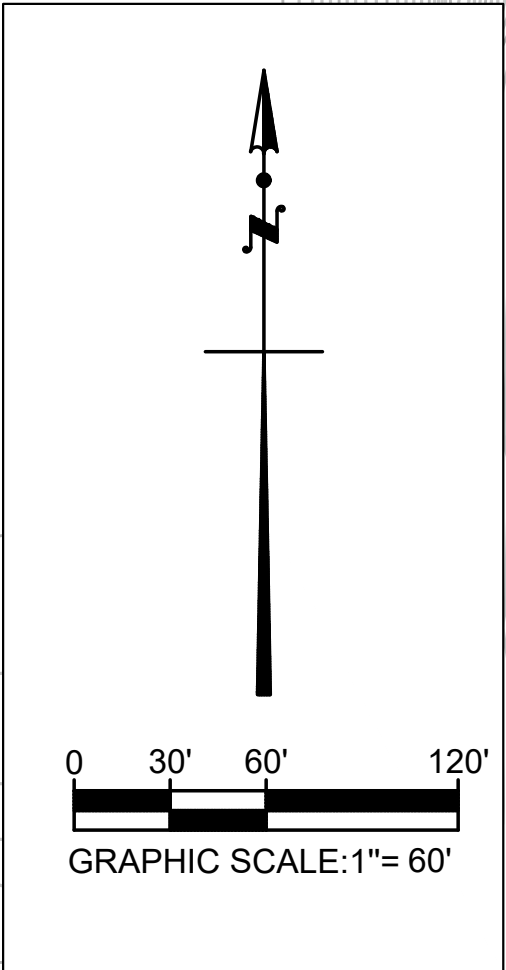
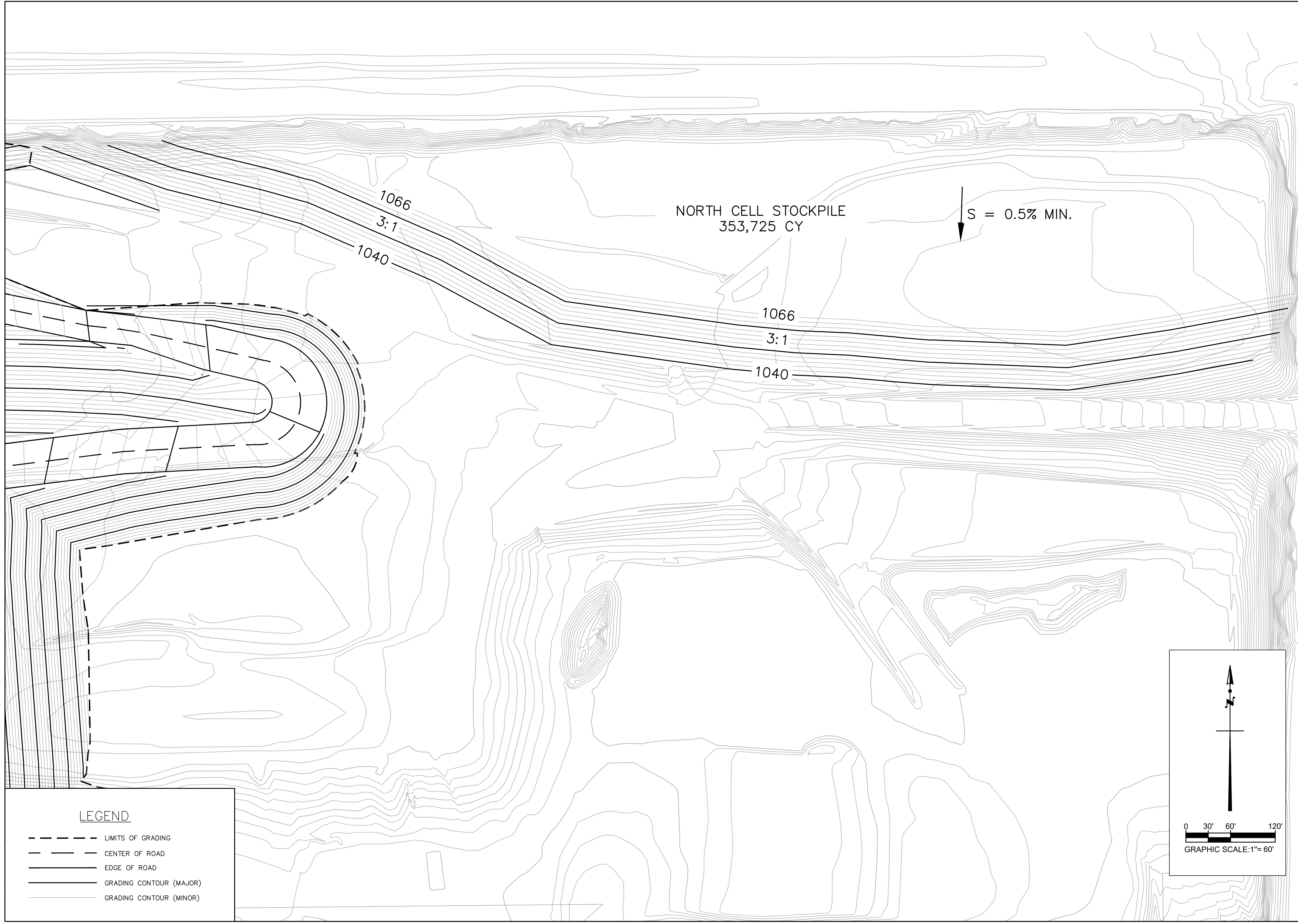
- LIMITS OF GRADING
- - - CENTER OF ROAD
- EDGE OF ROAD
- GRADING CONTOUR (MAJOR)
- GRADING CONTOUR (MINOR)
- PHASE 2B GRADING CONTOUR (MAJOR)





REVISIONS TO DRAWINGS		REV. BY	DATE
NO.	DESCRIPTION		

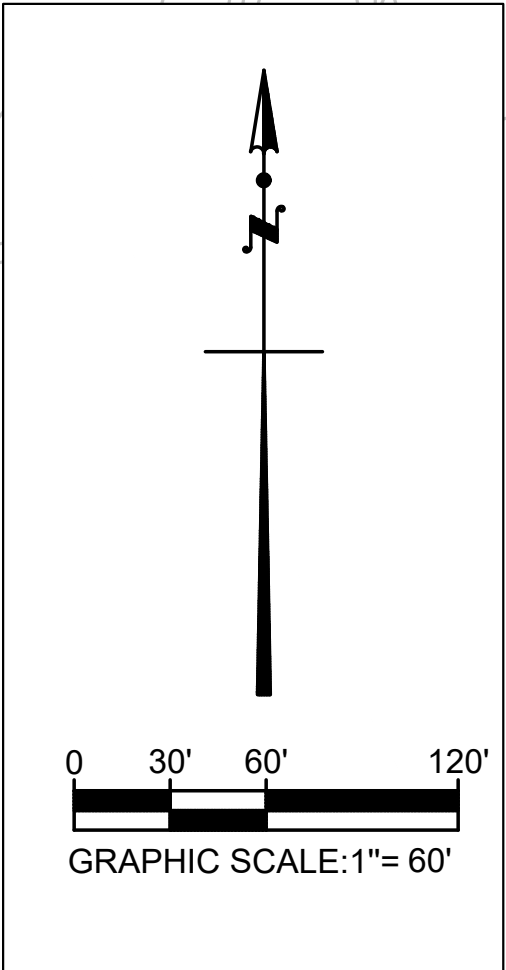
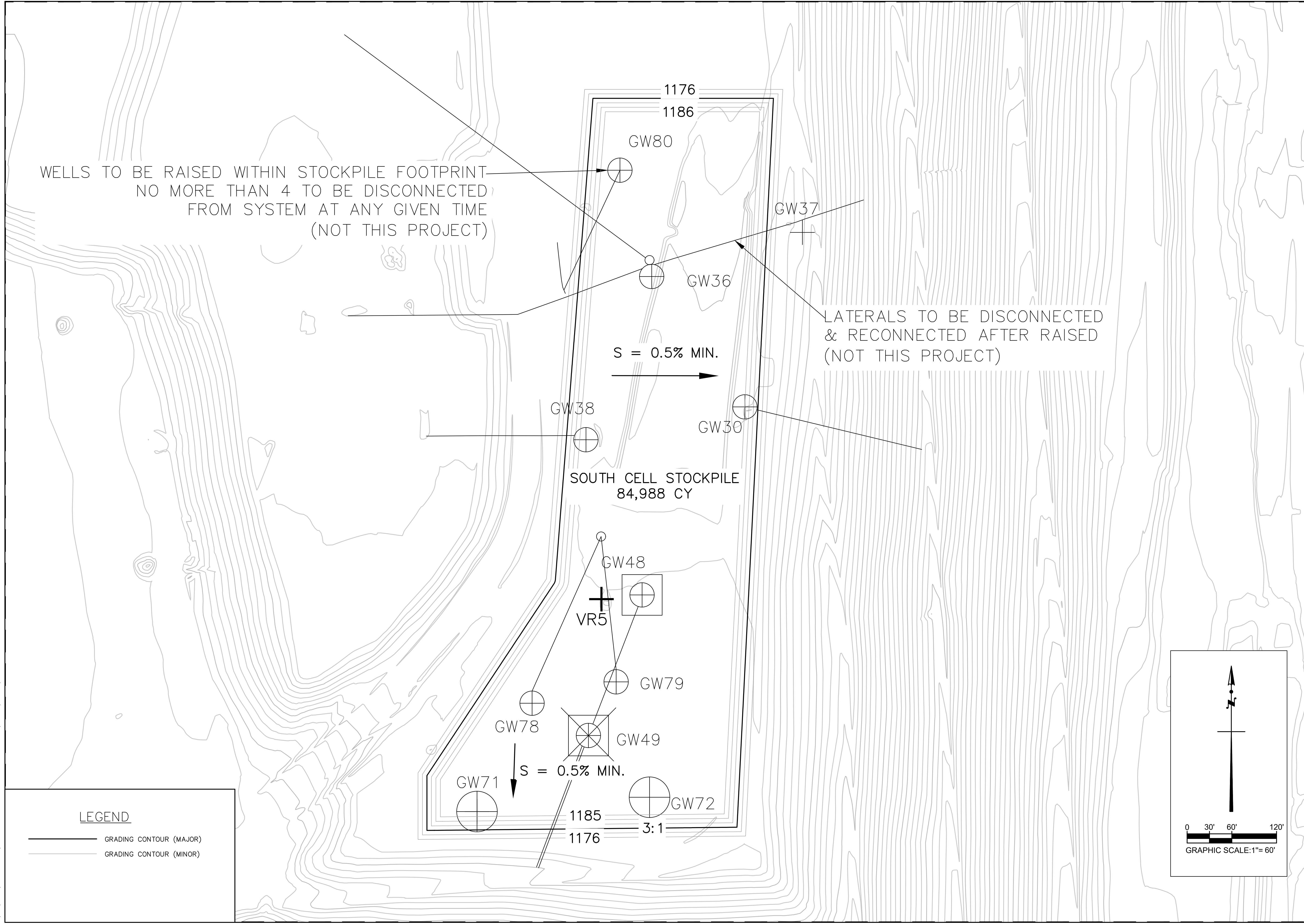
CITY OF GLENDALE, ARIZONA PUBLIC WORKS/ENGINEERING		PROJECT NO: 2023-012B-22B	DATE: 10-24-2022
5850 W. GLENDALE AVENUE GLENDALE, ARIZONA 85301 (623) 930-3630		DESIGNED BY: R.T.L.	CHECKED BY: R.T.L.
GLENDALE LANDFILL NORTH CELL EXCAVATION PHASE 2A CONSTRUCTION PLANS		DATE: OCTOBER 2022	
CIVIL SHEET NO. 4 OF 7			
REV. NO. 0	CITY PROJECT NO: TBD		

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CIVIL SHEET NO. 5 OF 7 REV. NO. 0	GLENDALE LANDFILL NORTH CELL EXCAVATION PHASE 2A STOCKPILE PLANS		CITY PROJECT NO.: TBD DATE: OCTOBER 2022		CITY OF GLENDALE, ARIZONA PUBLIC WORKS/ENGINEERING 5850 W. GLENDALE AVENUE GLENDALE, ARIZONA 85301 (623) 930-3630		PROJECT NO. 2023-012B-22B DATE OF PLOTTING 10-24-2022 DRAWN BY: M.C.L. DESIGNED BY: R.T.L. CHECKED BY: R.T.L.	TEIRA TECH BAS	REVISIONS TO DRAWINGS	
	NO.	DESCRIPTION						REV. BY	DATE	

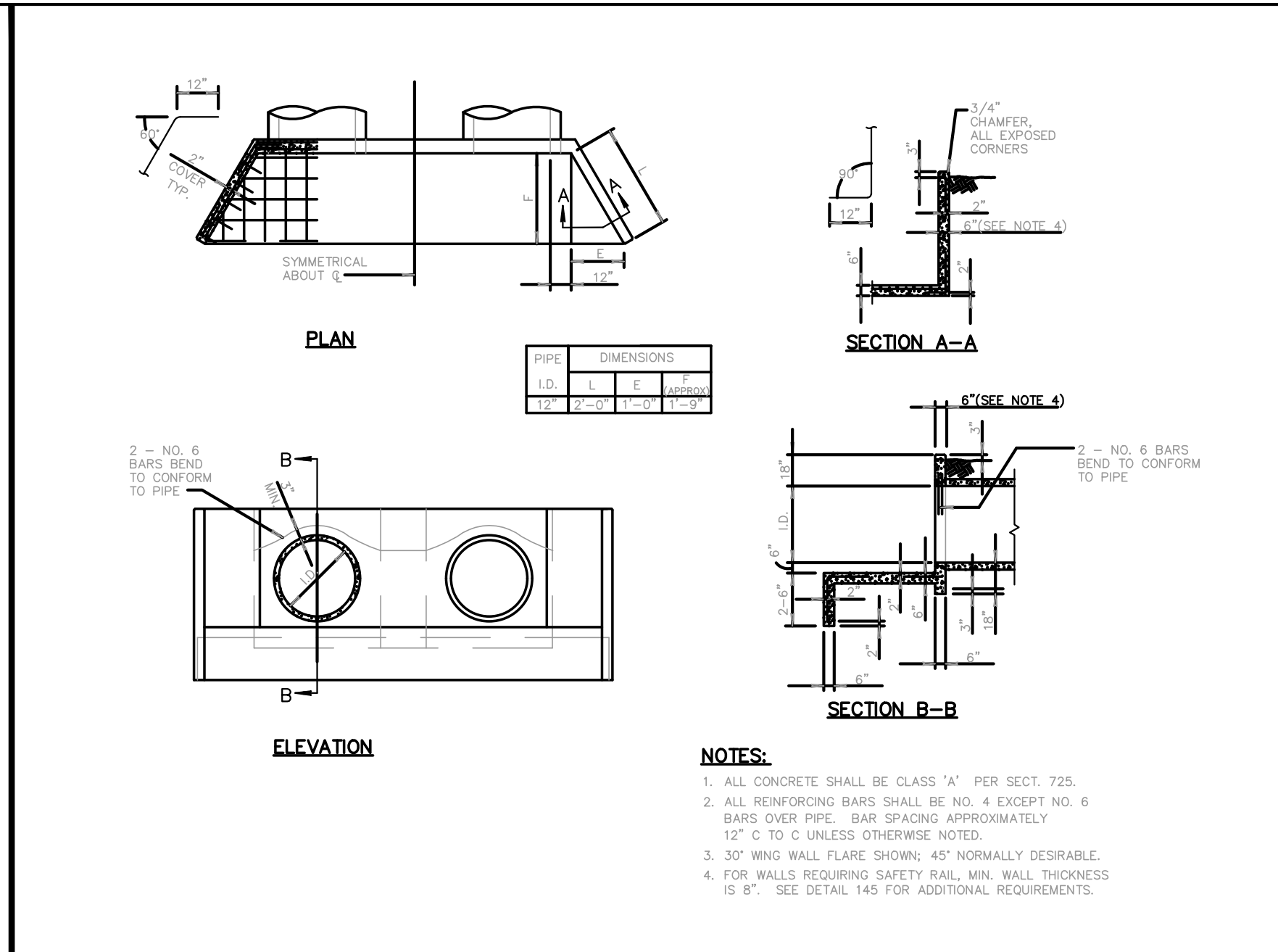
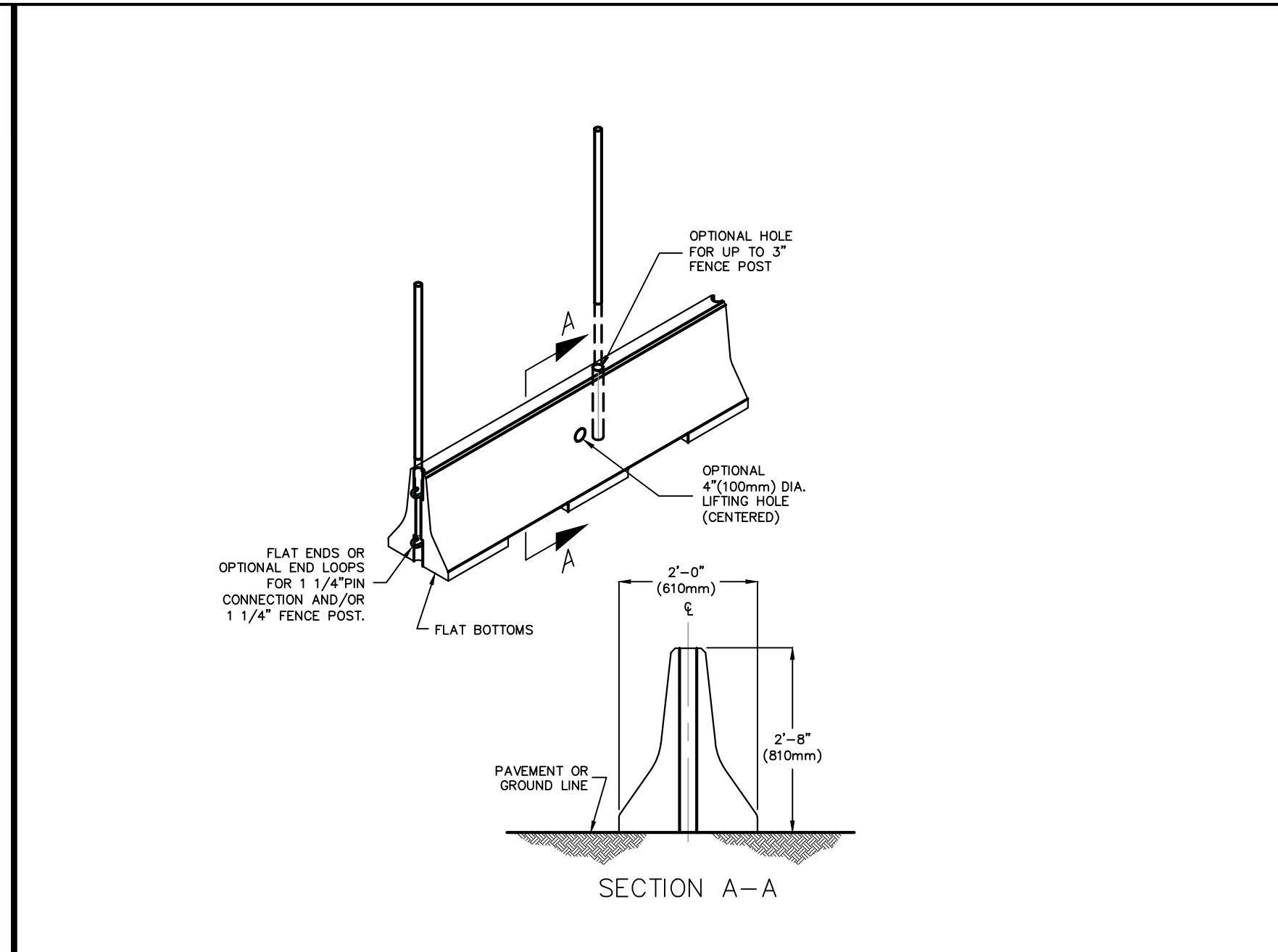
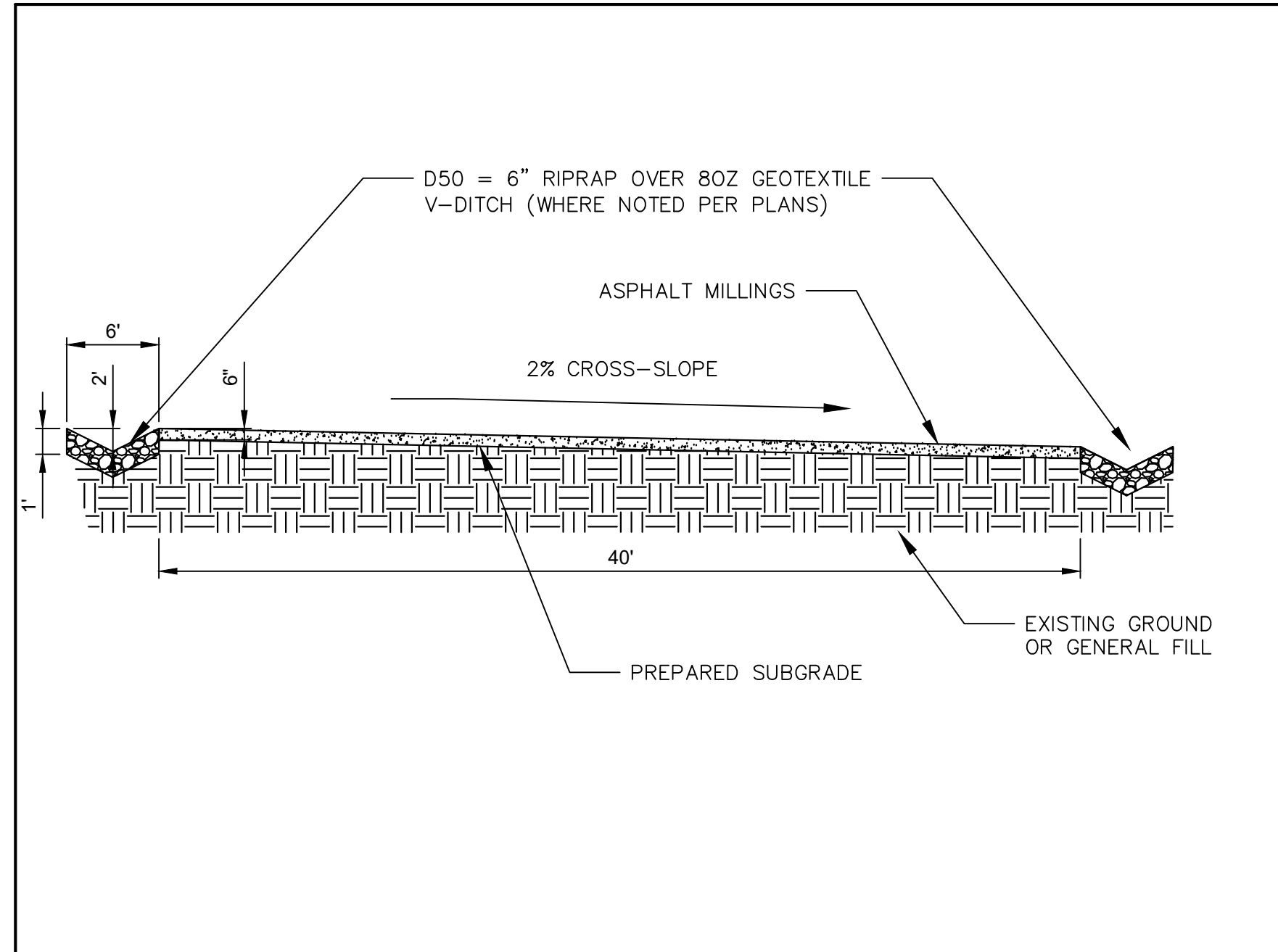
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LEGEND	
	GRADING CONTOUR (MAJOR)
	GRADING CONTOUR (MINOR)

CIVIL SHEET NO. 6 OF 7	REV. NO. 0	DATE: OCTOBER 2022	CITY PROJECT NO.: TBD		CITY OF GLENDALE, ARIZONA PUBLIC WORKS/ENGINEERING 5850 W. GLENDALE AVENUE GLENDALE, ARIZONA 85301 (623) 930-3630	PROJECT NO: 2023-012B-226 DATE: 10-24-2022 DRAWN BY: M.C.L. DESIGNED BY: R.T.L. CHECKED BY: R.T.L.			REVISIONS TO DRAWINGS
									NO.

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A ASPHALT MILLINGS ROADWAY
 NTS REFERENCE SHEET 3 & 4

B JENSEN PRECAST 10' K-RAIL
 NTS REFERENCE SHEET 3

C MAG STANDARD 501-5 HEADWALL (MOD.)
 NTS REFERENCE SHEET 3

Point Table				
Point #	Elevation	Northing	Easting	Description
1	1054.00	926648.48	581032.79	V GRADEBREAK
2	1054.00	926648.41	581072.29	V GRADEBREAK
3	1052.00	926710.47	581032.60	H GRADEBREAK
4	1052.00	926705.62	581072.39	H GRADEBREAK
5	1060.00	926972.98	581050.63	GRADEBREAK
6	1060.00	926969.97	581090.54	GRADEBREAK
7	1056.00	927184.85	581057.83	VALVE
8	1056.00	927194.93	581067.95	VALVE
9	1057.25	927609.62	581069.18	VALVE
10	1060.00	927755.21	581040.37	GRADEBREAK
11	1060.00	927756.38	581080.35	GRADEBREAK
12	1062.00	927788.22	581039.44	GRADEBREAK
13	1062.00	927789.38	581079.25	GRADEBREAK
14	1068.00	927894.29	581084.71	GRADEBREAK
15	1068.00	927846.06	581105.09	GRADEBREAK
16	1068.00	927905.74	581158.25	GRADEBREAK
17	1060.00	927862.68	581159.89	GRADEBREAK
18	1066.00	928031.11	581184.77	GRADEBREAK
19	1066.00	927959.75	581160.43	GRADEBREAK
20	1030.00	927977.71	581565.53	GRADEBREAK
21	1030.00	927920.21	581538.52	GRADEBREAK

Point Table				
Point #	Elevation	Northing	Easting	Description
22	1054.00	927895.74	581358.25	GRADEBREAK
23	1054.00	927855.56	581358.25	GRADEBREAK
24	1025.94	927801.68	581847.38	40' TO 60' TRANSITION
25	1026.66	927762.40	581840.73	40' TO 60' TRANSITION
26	1019.48	927788.95	581948.88	40' TO 60' TRANSITION
27	1030.00	927730.11	581937.18	40' TO 60' TRANSITION
28	1016.00	927769.97	582034.19	CURVE
29	1013.74	927713.31	582009.74	CURVE
30	1008.50	927659.09	582005.38	CURVE
31	1005.50	927599.18	582008.91	CURVE
32	986.50	927629.47	581664.51	CURVE
33	986.00	927570.01	581672.44	CURVE
34	981.80	927560.20	581599.78	CURVE
35	982.95	927553.71	581659.60	CURVE
36	976.50	927459.68	581603.76	40' TO 60' TRANSITION
37	975.50	927455.10	581643.60	40' TO 60' TRANSITION
38	950.00	927030.39	581578.84	GRADEBREAK
39	950.02	927043.69	581618.80	GRADEBREAK
40	0.00	927815.74	581128.63	CURVE CP
41	0.00	927556.11	581674.66	CURVE CP
42	0.00	927685.84	582011.39	CURVE CP

CIVIL SHEET	NO. OF	7 OF 7	REVISIONS TO DRAWINGS	REV. BY	DATE
				NO.	
GLENDALE LANDFILL NORTH CELL EXCAVATION PHASE 2A			TETRA TECH BAS		
DETAILS					
CITY PROJECT NO.: TBD			PROJECT NO.: 2023-012B-22B PLOT DATE: 10-24-2022 DRAWN BY: M.C.L. DESIGNED BY: R.T.L. CHECKED BY: R.T.L.		
CITY OF GLENDALE, ARIZONA PUBLIC WORKS/ENGINEERING 5850 W. GLENDALE AVENUE GLENDALE, ARIZONA 85301 (623) 930-3630			CITY OF GLENDALE, ARIZONA PUBLIC WORKS/ENGINEERING 5850 W. GLENDALE AVENUE GLENDALE, ARIZONA 85301 (623) 930-3630		
OCTOBER 2022					

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EXHIBIT F
Statement of All Clarifications and Assumptions (if any)

(1 pages - To be Incorporated by Amendment)

Date: 10-28-2022

Exhibit F

Municipal Landfill North Cell Excavation Phase II CMAR – Project 212261

Qualifications:

1. GMP is based on the following documents:
 - a. Revised Specifications dated 10/24/2022
 - b. Revised Plans (sheets 1-7) signed 10/24/2022 and revised per CAD file received 10/19/2022
 - c. Order of Precedence
 - i. RFIs
 - ii. Plans
 - iii. Specifications
2. GMP is based on the following comments/clarifications
 - a. No end treatments shown for stormwater crossing in basin nor provided.
 - b. Any landfill gas well or line adjustments to be done for south stockpile to be done under existing landfill maintenance contract. Those costs are not accounted for in the GMP
 - c. City of Glendale to provide construction water at no cost. Extension of waterline will be done under the existing landfill maintenance contract.
 - d. All embankments are general fill and do not require QC testing
 - e. Plans do not indicate date of existing topography. We will perform a pre-topo to verify and use the contractor's contingency for any adjustments.

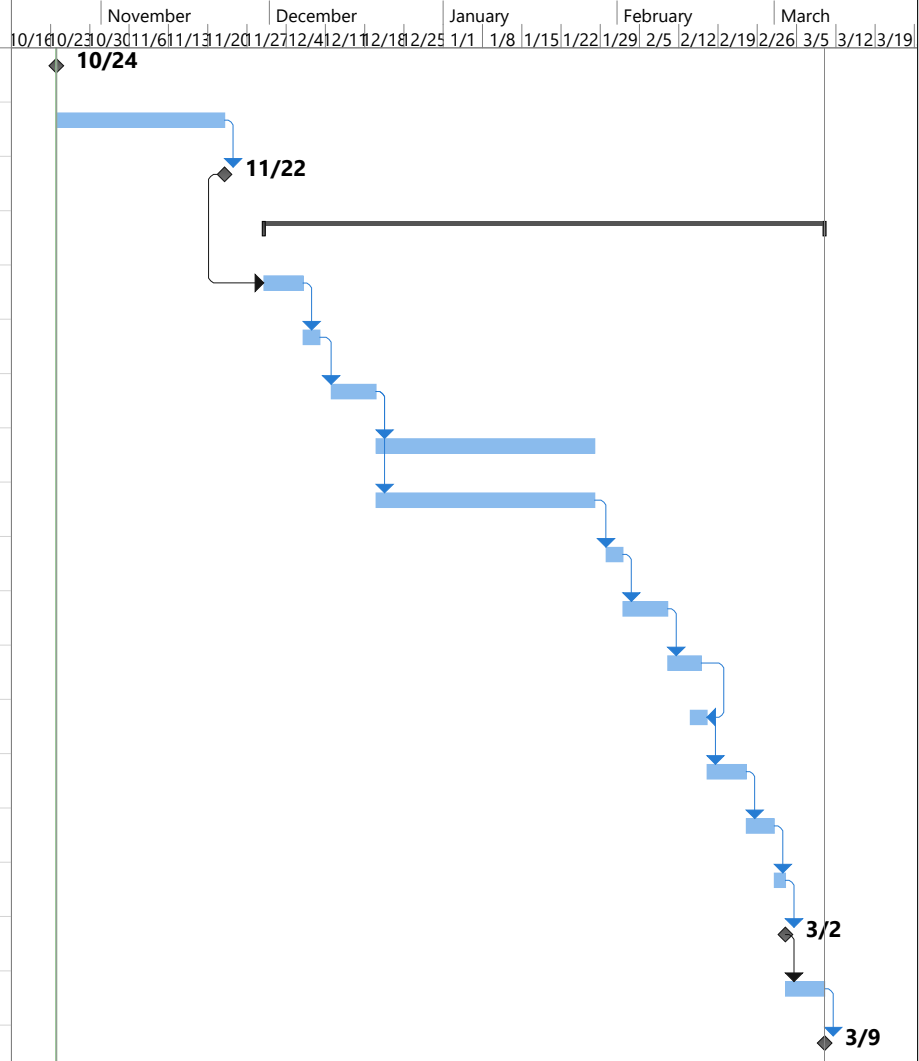
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EXHIBIT G
Schedule of Major Milestones

(1 pages - To be Incorporated by Amendment)

Rummel Construction, Inc.
 CONSTRUCTION MANAGER AT RISK AGREEMENT - Exhibit G - Preliminary Project Schedule
 Municipal Landfill North Cell Excavation Phase II CMAR - Project No. 212261 - October 24, 2022

ID	Task Name	Duration	Start	Finish
1	Submittal of GMP1	0 days	Mon 10/24/22	Mon 10/24/22
2	City Review	22 days	Mon 10/24/22	Tue 11/22/22
3	Council Approval	0 days	Tue 11/22/22	Tue 11/22/22
4	Construct North Cell Phase 2A	70 days	Wed 11/30/22	Thu 3/9/23
5	Mobilization	5 days	Wed 11/30/22	Tue 12/6/22
6	Relocate AC Millings	3 days	Wed 12/7/22	Fri 12/9/22
7	General Fill for Haul Roads	6 days	Mon 12/12/22	Mon 12/19/22
8	Excavate to North Stockpile	27 days	Tue 12/20/22	Fri 1/27/23
9	Excavate To South Stockpile	27 days	Tue 12/20/22	Fri 1/27/23
10	Rough Grade Haul Road	3 days	Mon 1/30/23	Wed 2/1/23
11	Excavate Ditch and Place Riprap	6 days	Thu 2/2/23	Thu 2/9/23
12	Install Stormwater crossing & riprap	4 days	Fri 2/10/23	Wed 2/15/23
13	Finegrade for AC Millings	3 days	Tue 2/14/23	Thu 2/16/23
14	Place & Finish AC Millings	5 days	Fri 2/17/23	Thu 2/23/23
15	Apply Fog Coat	3 days	Fri 2/24/23	Tue 2/28/23
16	Install Safety Barriers	2 days	Wed 3/1/23	Thu 3/2/23
17	Substantial Completion	0 days	Thu 3/2/23	Thu 3/2/23
18	Punch list & Debmobilization	5 days	Fri 3/3/23	Thu 3/9/23
19	Final Completion	0 days	Thu 3/9/23	Thu 3/9/23



Project: Preliminary Schedule Date: Mon 10/24/22	Task	Inactive Task	Manual Summary Rollup	External Milestone	Milestone
	Split	Inactive Milestone	Manual Summary	Deadline	Progress
	Milestone	Inactive Summary	Start-only	Progress	Manual Progress
	Summary	Manual Task	Finish-only	Manual Progress	
	Project Summary	Duration-only	External Tasks		

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EXHIBIT H
Dispute Resolution Procedures

1. Disputes.

- 1.1 Each Dispute arising out of or related to this Agreement (including Disputes regarding any alleged breaches of this Agreement) shall be initiated and decided under the provisions of this Exhibit.
- 1.2 CMAR and City shall each designate in writing to the other party, from time to time, a member of senior management who shall be authorized to attempt to expeditiously resolve any Dispute relating to the subject matter of this Agreement in an equitable manner.
- 1.3 A party shall initiate a Dispute by delivery of written notice to the members of management designated by the respective parties under Section 1.2 of this Exhibit.
- 1.4 The parties must:
 - (A) Attempt to resolve all Disputes promptly, equitably and in a good faith manner; and
 - (B) Provide each other with reasonable access during normal business hours to any and all non-privileged records, information and data pertaining to any such Dispute.
- 1.5 With respect to matters concerning modification of the GMP or any schedule, CMAR must first follow the provisions of any Claim procedure established by the Design-Build Agreement before seeking relief under these Procedures.

2. Emergency Arbitration.

- 2.1 If the parties are unable to accomplish resolution of a Dispute, the expedited resolution of which either party considers necessary to prevent or mitigate a material delay to the critical path of the Services (a "Time Sensitive Dispute") within two days after the Time Sensitive Dispute has been initiated by a party, either party may thereafter seek emergency relief before an emergency arbitrator (the "Emergency Arbitrator") appointed as follows:
 - (A) The parties will exercise best efforts to pre-select an Emergency Arbitrator within 20 days after entering into this Agreement;
 - (B) If the Emergency Arbitrator has not been selected at the time a party delivers Notice of a Time Sensitive Dispute, the parties will each select a representative within one day after the Notice is delivered and the two representatives will then select the Emergency Arbitrator by the third day following delivery of the Notice.
 - (C) The Emergency Arbitrator shall be an attorney with at least ten (10) years' experience with commercial construction legal matters in Maricopa County, Arizona, be independent, impartial, and not have engaged in any business for or adverse to either party for at least ten (10) years.
- 2.2 The Emergency Arbitrator will conduct a hearing and render a written determination on the Dispute to both parties within five business days of the matter being referred to him or her, all in accordance with Rules O-1 to O-8 of the

American Arbitration Association ("AAA") Commercial Rules-Optional Rules for Emergency Protection Commercial Rules ("AAA Emergency Rules").

- 2.3 Although the hearing will be conducted using AAA rules, unless both parties agree otherwise, this dispute process will not be administered by the AAA but will be conducted by the parties in accordance with these procedures.
- 2.4 If, however, an Emergency Arbitrator has not selected within three days after delivery of the Notice, either party may upon three days additional notice, thereafter seek emergency relief before the AAA, in accordance with the AAA Emergency Rules, provided that the Emergency Arbitrator meets the qualifications set forth above.
- 2.5 All proceedings to arbitrate Time Sensitive Disputes shall be conducted in Glendale, Arizona.
- 2.6 Presentation, request for determination (i.e., a party's prayer), and the Emergency Arbitrators decision will adhere to the procedures required in Section 3.6 of this Exhibit.
- 2.7 The finding of the Emergency Arbitrator with respect to any Time Sensitive Dispute will be binding upon the parties on an interim basis during progress of the Services, subject to review de novo by arbitration after the Project Substantial Completion Date.
- 2.8 The time and extent of discovery will be as determined by the Emergency Arbitrator.
 - (A) Discovery orders of the Emergency Arbitrator will consider the time sensitivity of the matter and the parties desire to resolve the issue in the most time and costs efficient manner;
 - (B) The parties are obligated to cooperate fully and completely in the provision of documents and other information, including joint interviews of individuals with knowledge such that the matter moves toward resolution in the most time and costs efficient manner and the Emergency Arbitrator is empowered to fashion any equitable penalty against a party that fail to meet this obligation.

3. Non-Emergency Arbitration.

- 3.1 Except as provided in Section 5 of this Exhibit, any Dispute that is either a non-emergency Dispute that has not been resolved by negotiation, or a de novo review of an AAA emergency arbitration will be decided by binding arbitration by a panel of three arbitrators in accordance with, but not necessarily administered by, the Construction Industry Rules of the AAA.
 - (A) The parties shall each select an arbitrator within 15 days after notice that a party desires to resolve a dispute by arbitration.
 - (B) The two arbitrators shall then each select a third arbitrator. If an arbitrator is not selected within any such 15 day period, then the arbitrator shall be appointed by the AAA.
- 3.2 The arbitrator(s) shall meet the qualifications of Emergency Arbitrators as provided in Section 2 of this Exhibit.

- 3.3** The arbitrators do not have the authority to consider or award punitive damages as part of the arbitrators' award.
- 3.4** In connection with such arbitration, each party shall be entitled to conduct up to five depositions, and, no less than 90 days prior to the date of the arbitration hearing, each party shall deliver to the other party copies of all documents in the delivering party's possession that are relevant to the dispute.
- 3.5** The arbitration hearing shall be held within 150 days of the appointment of the arbitrators.
- 3.6** At the arbitration hearing, each party will argue its position to the arbitrators in support of one proposed resolution to the dispute (a "Proposed Resolution").
- (A) Each party's Proposed Resolution must be fully dispositive of the dispute.
 - (B) The arbitrators must select one Proposed Resolution by majority consent and are not free to fashion any alternative resolutions.
 - (C) The parties must submit their proposed resolution of the matter to the arbitrators and the other party 15 days prior to the date set for commencement of the arbitration proceeding.
 - (D) The decision of the arbitrators will be forwarded to the parties within 15 days after the conclusion of the arbitration hearing.
 - (E) The decision of the arbitration panel is final and binding on the parties and may be entered in any court of competent jurisdiction for the purpose of securing an enforceable judgment.
 - (F) All costs and expenses associated with the arbitration, including the reasonable legal fees and costs incurred by the prevailing party, must be paid by the party whose position was not selected by the arbitrators.
- 4. Continuing Work.** Unless otherwise agreed to in writing, CMAR must continue to perform and maintain progress of the Work during any Dispute Resolution or arbitration proceedings, and City will continue to make payment to CMAR in accordance with the Agreement.
- 5. Exceptions.**
- 5.1** Neither City nor CMAR are required to arbitrate any third-party claim, cross-claim, counter claim, or other claim or defenses in any action that is commenced by a third-party who is not obligated by contract to arbitrate disputes with City and CMAR.
- 5.2** City or CMAR may commence and prosecute a civil action to contest a lien or stop notice, or enforce any lien or stop notice (but only to the extent the lien or stop notice the party seeks to enforce is enforceable under Arizona law), including, without limitation, an action under A.R.S. § 33-420, without the necessity of initiating or exhausting the procedures of this Exhibit.
- 5.3** This Exhibit does not apply to, and may not be construed to require arbitration of, any claims, actions or other process undertaken, filed, or issued by the City of Glendale Building Safety Department, Code Compliance Department, Police Department, Fire Department, or any other agency of City acting in its

governmental permitting, for the benefit of public health, safety, and welfare, or other regulatory capacity.

- 5.4** In connection with any arbitration, the arbitrators do not have the authority to, and may not enforce, any provision of the Federal or Arizona Rules of Civil Procedure.