REG	STATE	PROJECT	SHEET NO.	TOTAL SHEETS
IMR	CO	PRA MEVE 10(9) MESA VERDE NP	B4	B18

GRADING SUMMARY

Column A	Column B	Column C	Column D	Column F	Column G	Column H	Column K	Column L	Column M	Column N	Column S	Column T	Column U	Column W	Column X	Column Y	Column Z	Column AA	Column BB
	Roadway Excavation			Adjustments To Excavation					Roadway Embankment		Adjustments to Embankment			20420-0000			62407-0000	20420-0000 Notes 6 & 7	20441-000 Notes 6 & 7
Pay Item																			
Station to Station	Roadway Prism	Approach Roads	Roadway Excavation	(-) Pavement Removal in Cuts	(-) Topsoil Stripping In Cuts	(+) Excavation From Roadway Obliteration	Average Shrink/ Swell Factor[4]	Total Excavation Available for Fills	Roadway Prism	Approach Roads	(+) Backfill for Pavement Removal Under Fill	(+) Topsoil Replacement Under Fill	(+) Embankment For Roadway Obliteration	Embankment	Excavation - Embankment	Mass Ordinate	Placing Conserved Topsoil	Millings Embankment Construction	WASTE
Definition	(BCY)	(BCY)	(BCY)	(BCY)	(BCY)	(BCY)		(CCY)	(CCY)	(CCY)	(CCY)	(CCY)	(CCY)	(CCY)	(CCY)	(CCY)	(CUYD)	(CCY)	(CCY)
10+75.00 to 29+13.76	3032	0	3032	594	229	0	0.90	1988	2019	0	0	508	0	2527	-539	-539	737	1852	
Contractor Stockpile Area	1315	0	1315	0	210	0	0.90	995	4793	0	0	395	0	5188	-4193	-4,732	605	2600	
Future Cultural Center Site	7184	0	7184	0	535	0	0.90	5984	34	0	0	66	0	100	5884	1,152	601		1152
Totals	**11531**	**0**	**11531**	**594**	**974**	**0**		**8967**	**6846**	**0**	**0**	**969**	**0**	**7815**			**1943**	**4452**	**5570**

NOTES:

1. BCY = Bank Cubic Yard = One cubic yard of material as it lies in natural bank state.
2. CCY = Compacted Cubic Yard = One cubic yard of material after it has been compacted to specification density.
3. The quantities shown herein are approximations. Payment will be made for the actual quantities of work performed and accepted.
4. The average shrink/swell factor shown is computed by taking an average of values over the specified station range.
5. The Total Embankment Quantity as shown on the Bid Summaries is equal to the sum of columns W and AA.
6. A 10% swell factor has been applied to the millings volume as calculated from the milling and pavement removal areas. It is assumed that 2" of pavement will be removed from those areas as shown in the typical sections. The pavement removed in other areas of the Main Entrance Road may be used in the Culutural Center Access Road or the Contractor Stockpile Site embankments in accordance with Section 204 of the Special Contract Requirements and as approved by the CO.
7. The additional millings from the Main Entrance Road will be salvaged and placed at the Morefield Salvage Area or as determined by Mesa Verde National Park in consultation with the CO. The cost of salvaging the additional millings will be paid under item no. 20441-0000. The total of Column BB is equal to the waste material from the Future Cultural Center Site and the remaining millings that are not used in the construction of the Cultural Center Access Road and the Contractor Stockpile Area.
8. The existing topsoil thickness used in calculating the earthwork quantities was assumed to be 2 inches.
9. The quantities shown were calculated based on digital terrain models that are provided per Section 152 of the Special Contract Requirements.

2/27/2009 7:41:17 AM N:\CO\meve10(9)\Roadway\sheets\B-Summ\EW_Summary.dgn

GRADING SUMMARY

DWG. NO. 307/41933 NPS PMIS NO.: 127018

```
*****************************************************************
**                                                             **
** TIN to TIN Volume Report -- Fri Feb 27 07:31:16 2009
**                                                             **
** From TIN <n:\CO\meve10(9)\Roadway\geopak\Cultural Center Subgrade_02-12-09.tin>
to TIN <n:\CO\meve10(9)\Roadway\geopak\Cultural Center_Subgrade&Top of Millings_02-12-09.tin>
**                                                             **
** Prismoidal Volume
**                                                             **
**                                                             **
*****************************************************************
**                                                             **
**  Total Cut =          1.294 Cubic Yards
**  Total Fill =         1851.931 Cubic Yards
**  Area =               9721.812 Sq Yards
**  Balance =            -1850.637 Cubic Yards
**                                                             **
** Boundary Polygon Used
*****************************************************************
```

```
*****************************************************************
**                                                             **
** TIN to TIN Volume Report -- Wed Feb 25 13:39:47 2009
**                                                             **
** From TIN <n:\CO\meve10(9)\Roadway\geopak\Existing Ground_02-12-09.tin>
to TIN <n:\CO\meve10(9)\Roadway\geopak\Bottom of Existing Main Entrance Road Pavement Surface_02-12-09.tin>
**                                                             **
** Prismoidal Volume
**                                                             **
**                                                             **
*****************************************************************
**                                                             **
**  Total Cut =          593.622 Cubic Yards
**  Total Fill =         0.000 Cubic Yards
**  Area =               3568.439 Sq Yards
**  Balance =            593.622 Cubic Yards
**                                                             **
** Boundary Polygon Used
*****************************************************************
```

```
*****************************************************************
**                                                             **
** TIN to TIN Volume Report -- Fri Feb 27 07:28:57 2009
**                                                             **
** From TIN <n:\CO\meve10(9)\Roadway\geopak\Existing Ground_02-12-09.tin>
to TIN <n:\CO\meve10(9)\Roadway\geopak\Cultural Center_Subgrade&Top of Millings_02-12-09.tin>
**                                                             **
** Prismoidal Volume
**                                                             **
**                                                             **
*****************************************************************
**                                                             **
**  Total Cut =          1369.965 Cubic Yards
**  Total Fill =         200.786 Cubic Yards
**  Area =               7068.271 Sq Yards
**  Balance =            1169.179 Cubic Yards
**                                                             **
** Boundary Polygon Used
*****************************************************************
```

```
*****************************************************************
**                                                             **
** TIN to TIN Volume Report -- Wed Feb 25 06:47:44 2009
**                                                             **
** From TIN <n:\CO\meve10(9)\Roadway\geopak\Existing Ground_02-12-09.tin>
to TIN <n:\CO\meve10(9)\Roadway\geopak\Future Cultural Center Pad Finished Ground_02-12-09.tin>
**                                                             **
** Prismoidal Volume
**                                                             **
**                                                             **
*****************************************************************
**                                                             **
**  Total Cut =          7183.866 Cubic Yards
**  Total Fill =         33.777 Cubic Yards
**  Area =               10788.081 Sq Yards
**  Balance =            7150.088 Cubic Yards
**                                                             **
*****************************************************************
```

```
*****************************************************************
**                                                             **
** TIN to TIN Volume Report -- Fri Feb 27 07:30:24 2009
**                                                             **
** From TIN <n:\CO\meve10(9)\Roadway\geopak\Existing Ground_02-12-09.tin>
to TIN <n:\CO\meve10(9)\Roadway\geopak\Cultural Center Subgrade_02-12-09.tin>
**                                                             **
** Prismoidal Volume
**                                                             **
**                                                             **
*****************************************************************
**                                                             **
**  Total Cut =          1662.173 Cubic Yards
**  Total Fill =         1817.702 Cubic Yards
**  Area =               9730.663 Sq Yards
**  Balance =            -155.529 Cubic Yards
**                                                             **
** Boundary Polygon Used
*****************************************************************
```

```
*****************************************************************
**                                                             **
** TIN to TIN Volume Report -- Wed Feb 25 13:33:33 2009
**                                                             **
** From TIN <n:\CO\meve10(9)\Roadway\geopak\Existing Ground_Without_2In_Topsoil_Layer_02-12-09.tin>
to TIN <n:\CO\meve10(9)\Roadway\geopak\Contractor Stockpile Area_11-5-08.tin>
**                                                             **
** Prismoidal Volume
**                                                             **
**                                                             **
*****************************************************************
**                                                             **
**  Total Cut =          1105.099 Cubic Yards
**  Total Fill =         5187.998 Cubic Yards
**  Area =               10865.052 Sq Yards
**  Balance =            -4082.899 Cubic Yards
**                                                             **
*****************************************************************
```

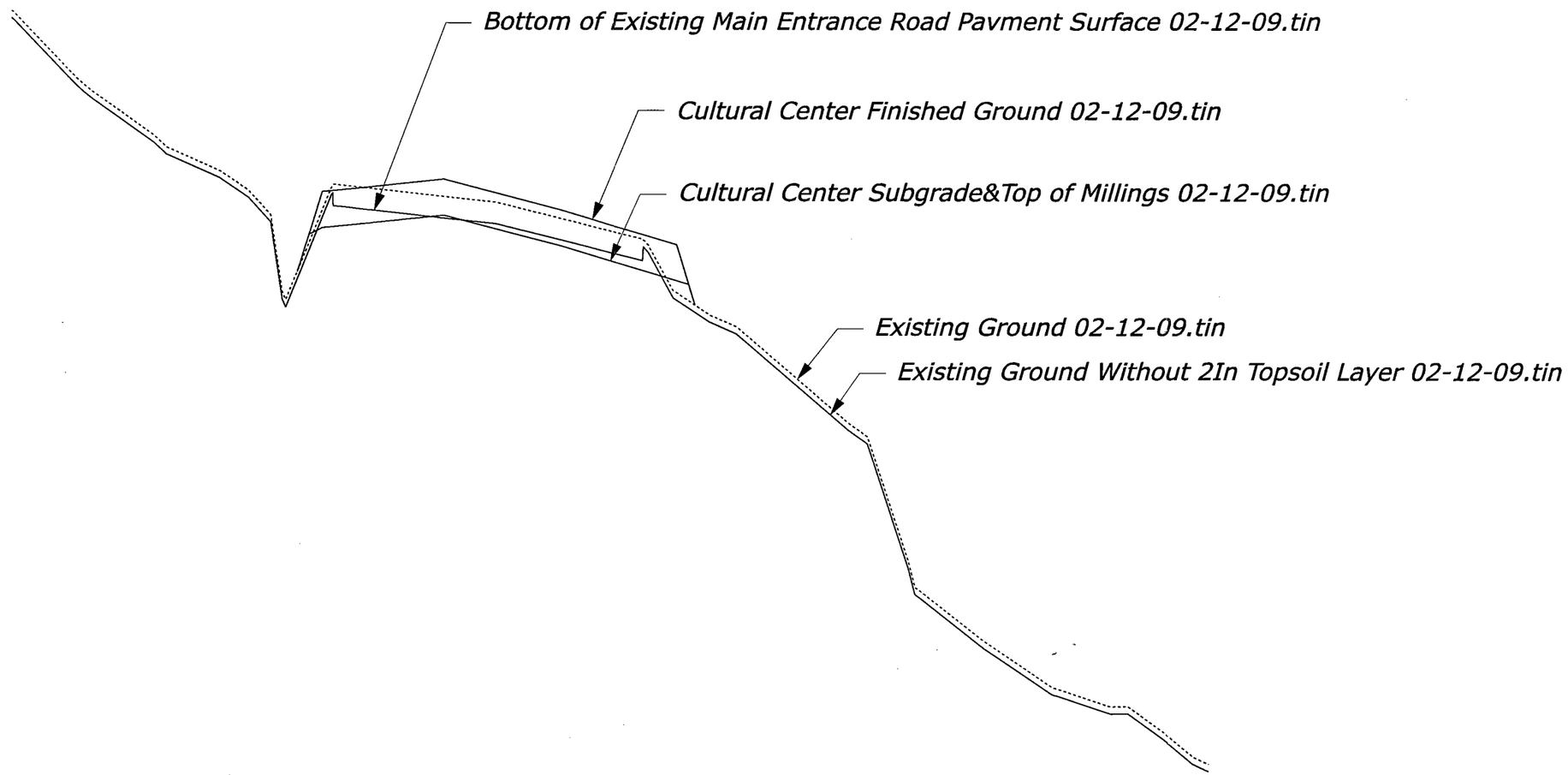
```
*****************************************************************
**                                                             **
** TIN to TIN Volume Report -- Wed Feb 25 13:31:22 2009
**                                                             **
** From TIN <n:\CO\meve10(9)\Roadway\geopak\Existing Ground_Without_2In_Topsoil_Layer_02-12-09.tin>
to TIN <n:\CO\meve10(9)\Roadway\geopak\Future Cultural Center Pad Finished Ground_02-12-09.tin>
**                                                             **
** Prismoidal Volume
**                                                             **
**                                                             **
*****************************************************************
**                                                             **
**  Total Cut =          6649.305 Cubic Yards
**  Total Fill =         99.753 Cubic Yards
**  Area =               10788.081 Sq Yards
**  Balance =            6549.552 Cubic Yards
**                                                             **
*****************************************************************
```

```
*****************************************************************
**                                                             **
** TIN to TIN Volume Report -- Wed Feb 25 13:28:56 2009
**                                                             **
** From TIN <n:\CO\meve10(9)\Roadway\geopak\Existing Ground_Without_2In_Topsoil_Layer_02-12-09.tin> to TIN
<n:\CO\meve10(9)\Roadway\geopak\Cultural Center_Subgrade&Top of Millings_02-12-09.tin>
**                                                             **
** Prismoidal Volume
**                                                             **
**                                                             **
*****************************************************************
**                                                             **
**  Total Cut =          1595.291 Cubic Yards
**  Total Fill =         3762.316 Cubic Yards
**  Area =               16791.321 Sq Yards
**  Balance =            -2167.025 Cubic Yards
**                                                             **
*****************************************************************
```

```
*****************************************************************
**                                                             **
** TIN to TIN Volume Report -- Wed Feb 25 06:51:26 2009
**                                                             **
** From TIN <n:\CO\meve10(9)\Roadway\geopak\Existing Ground_02-12-09.tin>
to TIN <n:\CO\meve10(9)\Roadway\geopak\Cultural Center_Subgrade&Top of Millings_02-12-09.tin>
**                                                             **
** Prismoidal Volume
**                                                             **
**                                                             **
*****************************************************************
**                                                             **
**  Total Cut =          2417.362 Cubic Yards
**  Total Fill =         3254.503 Cubic Yards
**  Area =               16791.321 Sq Yards
**  Balance =            -837.140 Cubic Yards
**                                                             **
*****************************************************************
```

```
*****************************************************************
**                                                             **
** TIN to TIN Volume Report -- Wed Feb 25 06:46:51 2009
**                                                             **
** From TIN <n:\CO\meve10(9)\Roadway\geopak\Existing Ground_02-12-09.tin>
to TIN <n:\CO\meve10(9)\Roadway\geopak\Contractor Stockpile Area_11-5-08.tin>
**                                                             **
** Prismoidal Volume
**                                                             **
**                                                             **
*****************************************************************
**                                                             **
**  Total Cut =          1314.910 Cubic Yards
**  Total Fill =         4792.988 Cubic Yards
**  Area =               10865.052 Sq Yards
**  Balance =            -3478.078 Cubic Yards
**                                                             **
*****************************************************************
```

REG	STATE	PROJECT	SHEET NO.	TOTAL SHEETS
IMR	CO	PRA MEVE 10(9) MESA VERDE NP	1	7



CULTURAL CENTER ACCESS ROAD
SURFACE REPRESENTATION TYPICAL SECTION
STATION 12+00

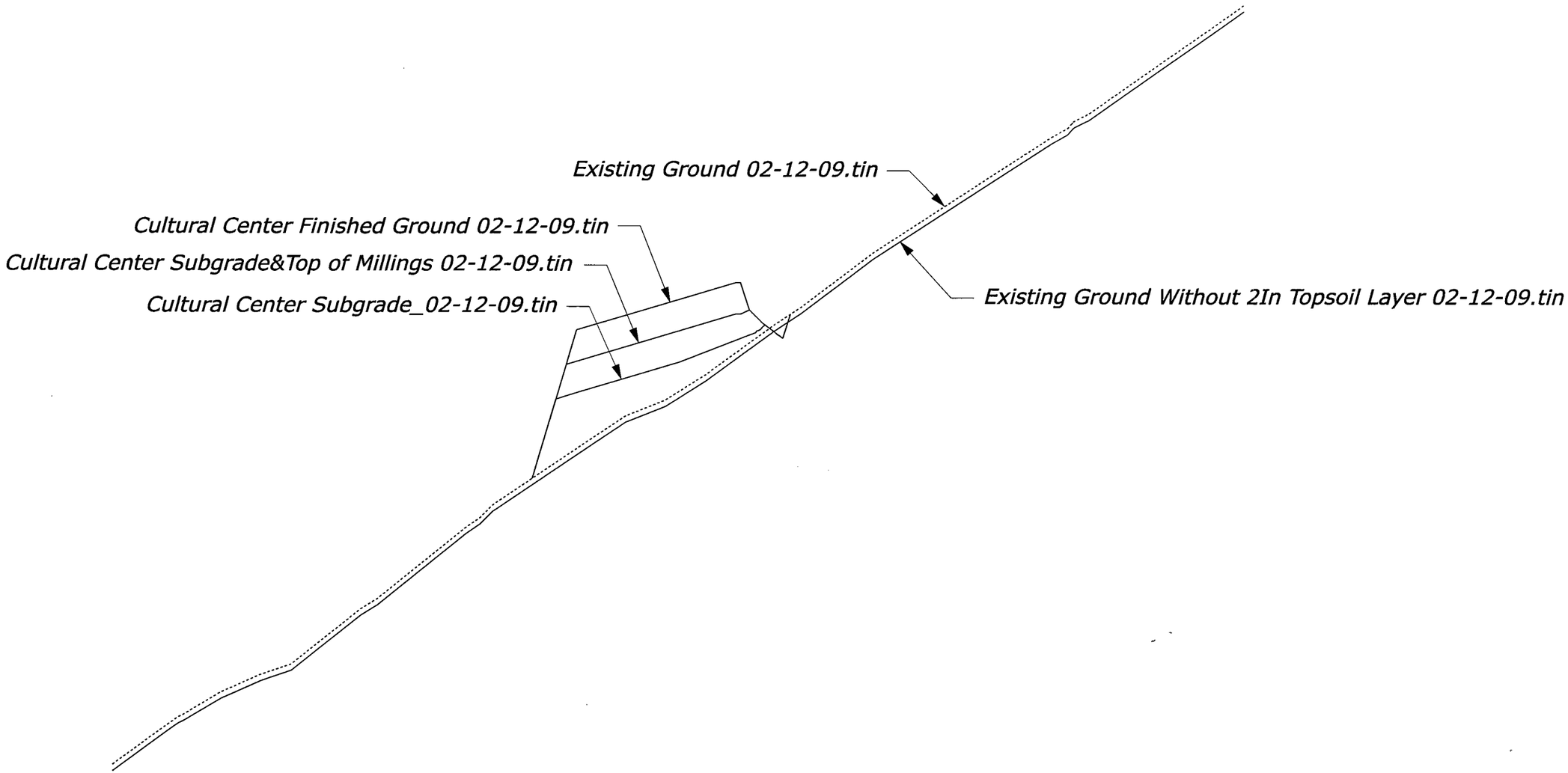
No Scale

3D SURFACE TEMPLATE DRAWINGS

2/25/2009 3:07:37 PM N:\CO\meve10(9)\Roadway\geopak\SITE\SURFACE_CALCULATIONS.dgn

DWG. NO. 307/41933 NPS PMIS NO.: 127018

REG	STATE	PROJECT	SHEET NO.	TOTAL SHEETS
IMR	CO	PRA MEVE 10(9) MESA VERDE NP	2	7



CULTURAL CENTER ACCESS ROAD
SURFACE REPRESENTATION TYPICAL SECTION
STATION 14+50

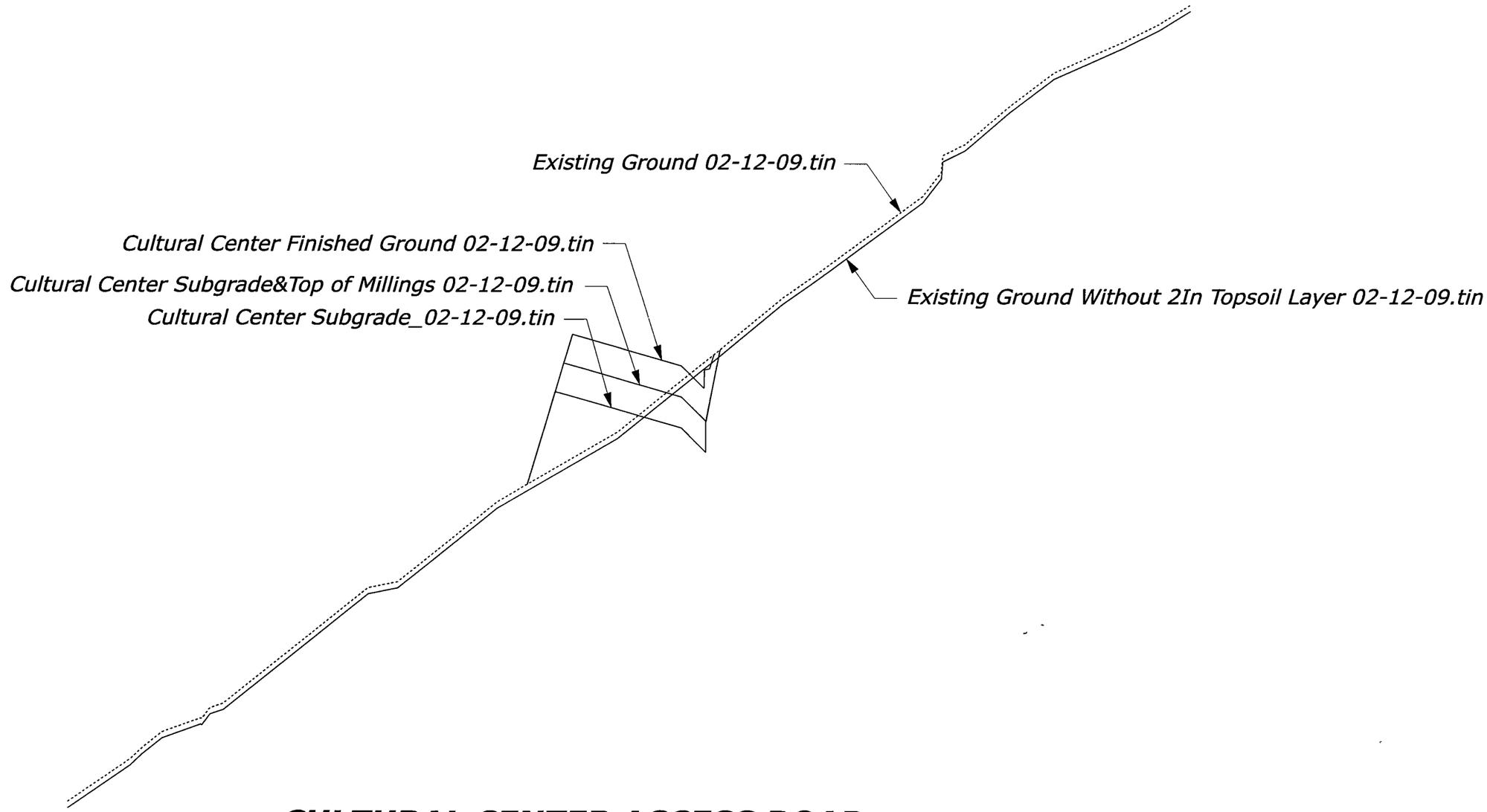
No Scale

3D SURFACE TEMPLATE DRAWINGS

2/25/2009 2:45:24 PM N:\CO\meve10(9)\Roadway\geopak\SITE\SURFACE_CALCULATIONS.dgn

DWG. NO. 307/41933 NPS PMIS NO.: 127018

REG	STATE	PROJECT	SHEET NO.	TOTAL SHEETS
IMR	CO	PRA MEVE 10(9) MESA VERDE NP	3	7



CULTURAL CENTER ACCESS ROAD
SURFACE REPRESENTATION TYPICAL SECTION
STATION 18+00

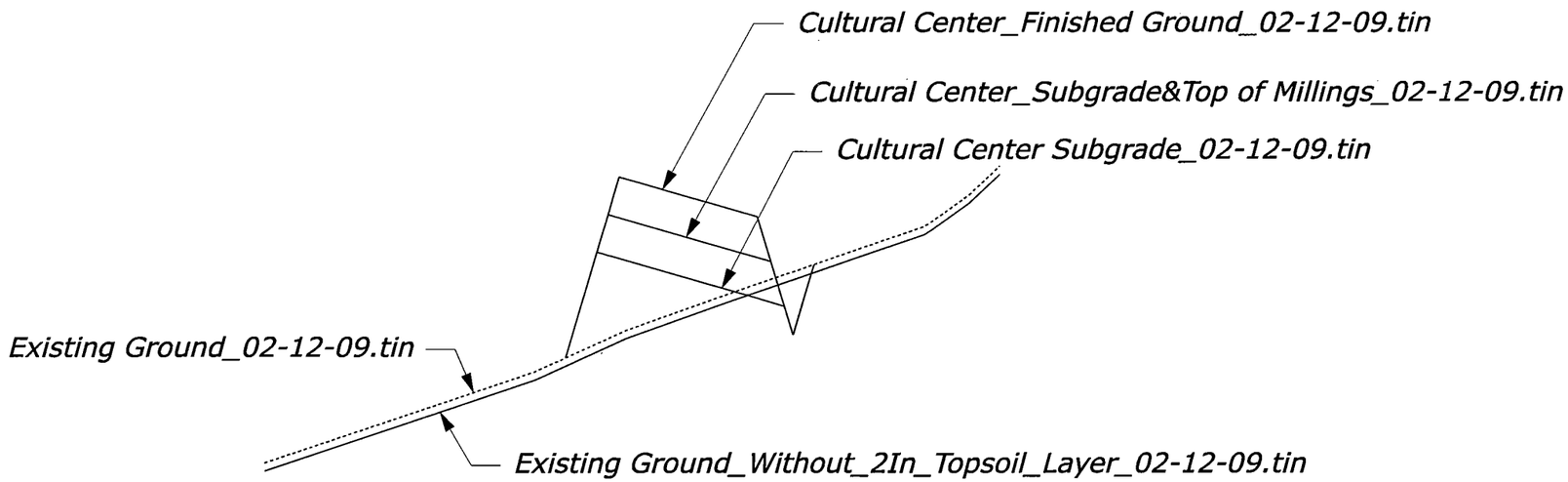
No Scale

3D SURFACE TEMPLATE DRAWINGS

2/25/2009 2:45:24 PM N:\CO\meve10(9)\Roadway\geopak\SITE\SURFACE_CALCULATIONS.dgn

DWG. NO. 307/41933 NPS PMIS NO.: 127018

REG	STATE	PROJECT	SHEET NO.	TOTAL SHEETS
IMR	CO	PRA MEVE 10(9) MESA VERDE NP	4	7



CULTURAL CENTER ACCESS ROAD
SURFACE REPRESENTATION TYPICAL SECTION
STATION 25+00

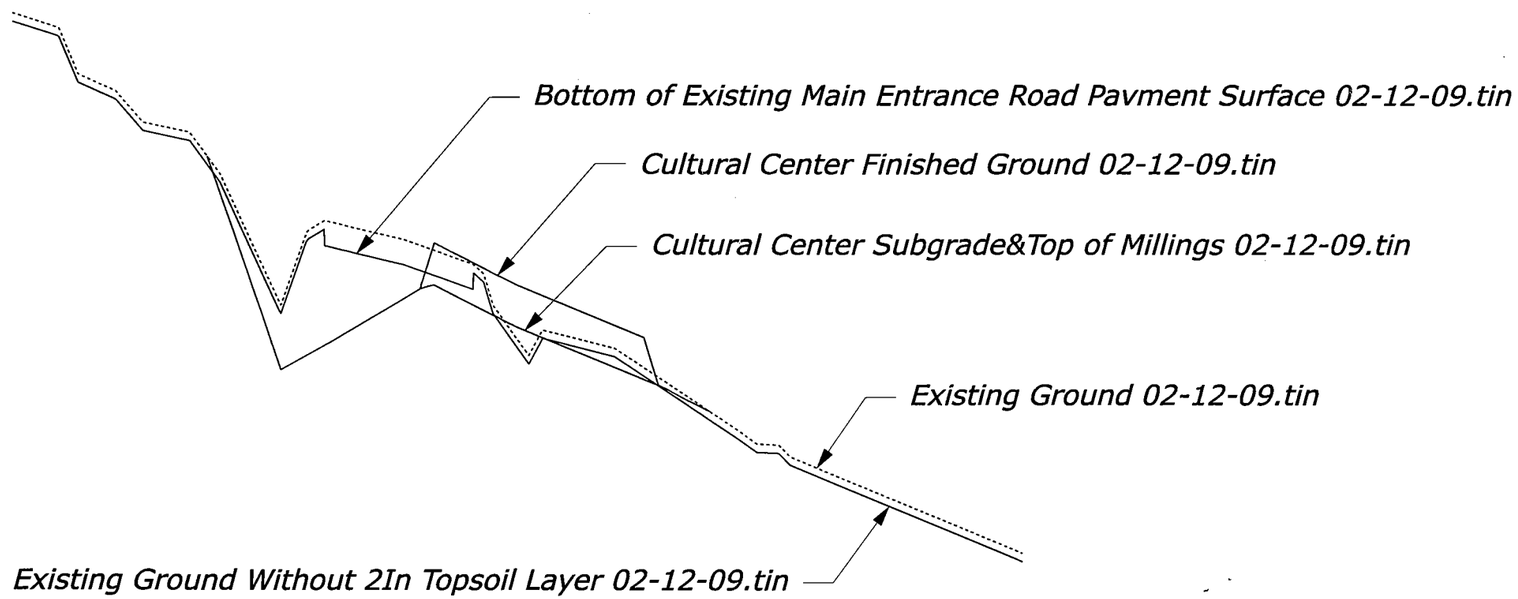
No Scale

3D SURFACE TEMPLATE DRAWINGS

2/25/2009 2:45:23 PM N:\CO\meve10(9)\Roadway\geopak\SITE\SURFACE_CALCULATIONS.dgn

DWG. NO. 307/41933 NPS PMIS NO.: 127018

REG	STATE	PROJECT	SHEET NO.	TOTAL SHEETS
IMR	CO	PRA MEVE 10(9) MESA VERDE NP	5	7



MAIN ENTRANCE ROAD RE-ALIGNMENT SURFACE REPRESENTATION TYPICAL SECTION STATION 21+50

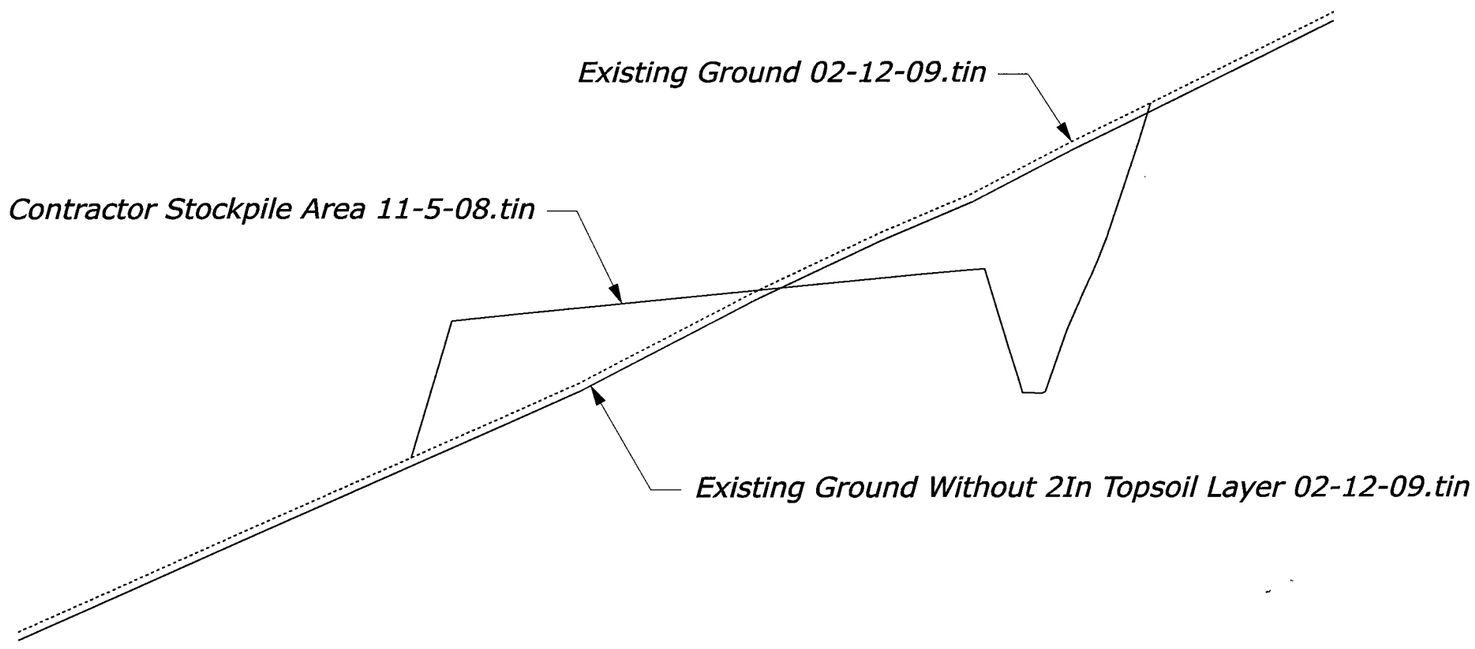
No Scale

3D SURFACE TEMPLATE DRAWINGS

2/25/2009 2:47:07 PM N:\CO\meve10(9)\Roadway\geopak\SITE\SURFACE_CALCULATIONS.dgn

DWG. NO. 307/41933 NPS PMIS NO.: 127018

REG	STATE	PROJECT	SHEET NO.	TOTAL SHEETS
IMR	CO	PRA MEVE 10(9) MESA VERDE NP	6	7



CONTRACTOR STOCKPILE AREA ALIGNMENT B SURFACE REPRESENTATION TYPICAL SECTION STATION 203+00

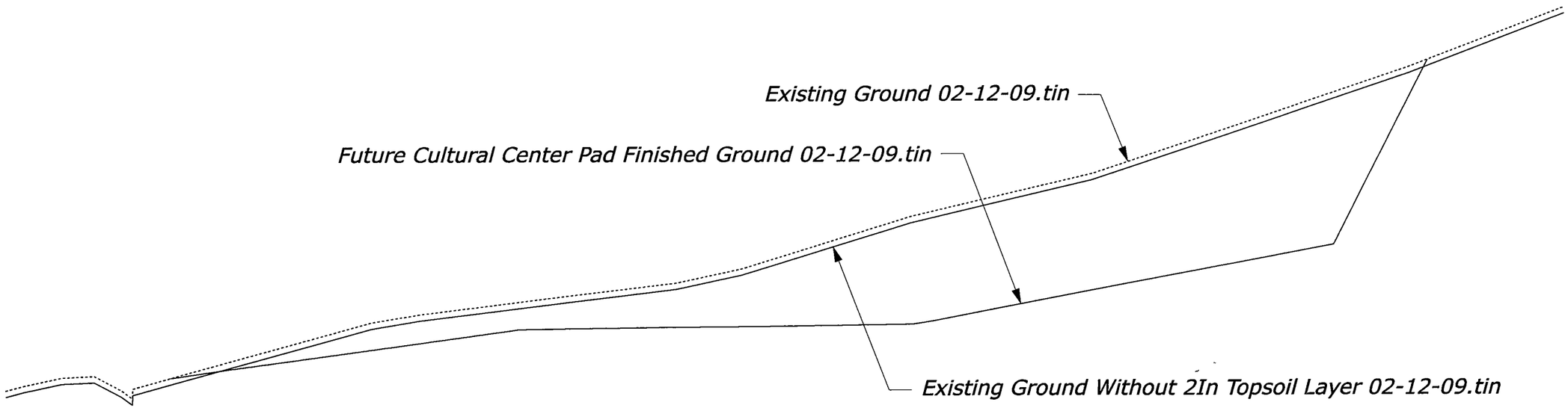
No Scale

3D SURFACE TEMPLATE DRAWINGS

2/26/2009 6:23:56 AM N:\CO\meve10(9)\Roadway\geopak\SITE\SURFACE_CALCULATIONS.dgn

DWG. NO. 307/41933 NPS PMIS NO.: 127018

REG	STATE	PROJECT	SHEET NO.	TOTAL SHEETS
IMR	CO	PRA MEVE 10(9) MESA VERDE NP	7	7



FUTURE CULTURAL CENTER PAD SURFACE REPRESENTATION TYPICAL SECTION

No Scale

3D SURFACE TEMPLATE DRAWINGS

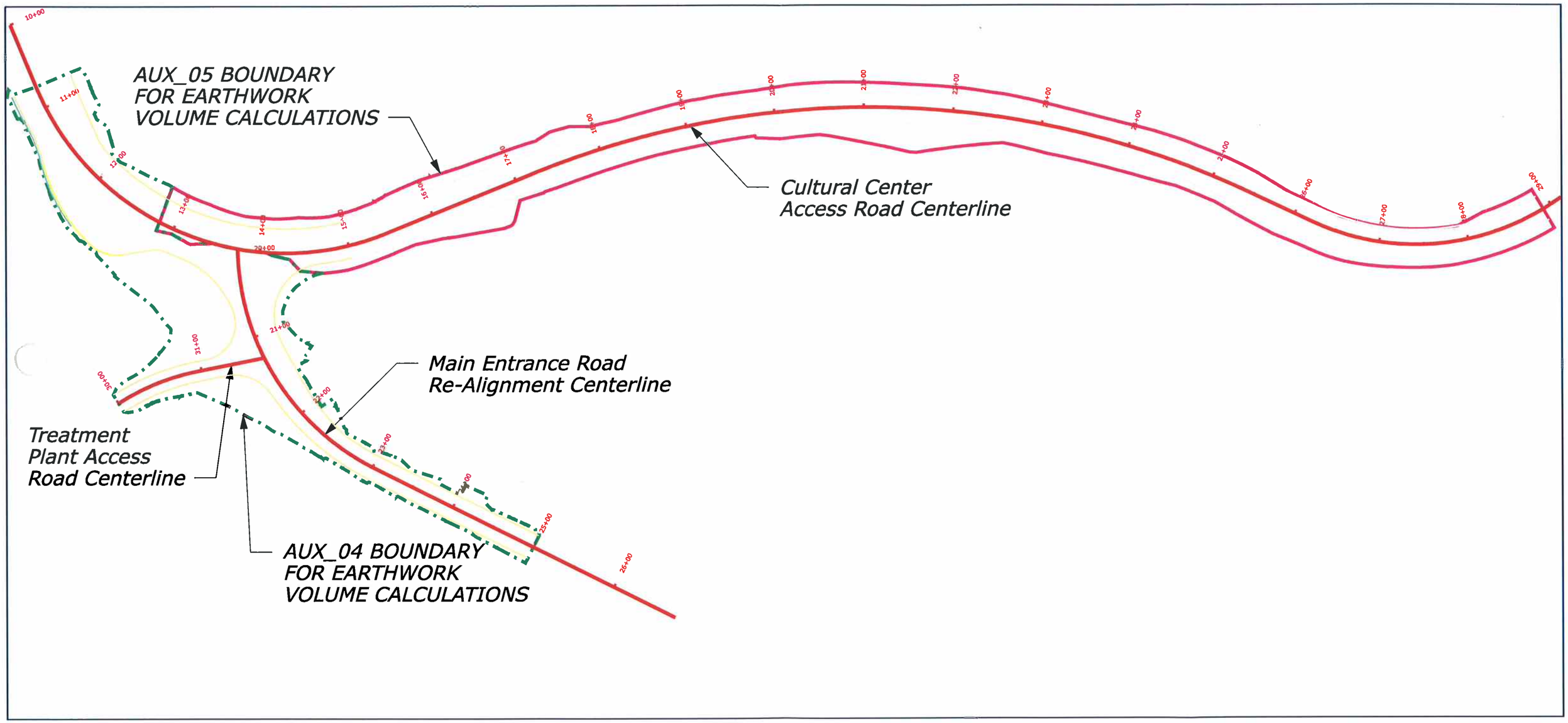
2/25/2009 2:45:26 PM N:\CO\meve10(9)\Roadway\geopak\SITE\SURFACE_CALCULATIONS.dgn

DWG. NO. 307/41933 NPS PMIS NO.: 127018

ID	Boundary Level (SURFACE_CALCULATIONS.dgn)	From Surface (.TIN)	To Surface (.TIN)	Cut (CUYD)	Fill (CUYD)	Net (CUYD)	Comments	Millings Embankment Construction (CUYD)
1	AUX_05	Cultural Center Subgrade 02-12-09	Cultural Center Subgrade&Top of Millings 02-12-09	1.3	1851.9	-1850.6	Millings Embankment Quantity in the Cultural Center Access Road	2600
2	None	Existing Ground 02-12-09	Cultural Center Subgrade&Top of Millings 02-12-09	2417.4	3254.5	-837.1	Earthwork from Exist. Ground to Subgrade/Top of Millings	
3	None	Existing Ground Without 2In Topsoil Layer 02-12-09	Cultural Center Subgrade&Top of Millings 02-12-09	1595.3	3762.3	-2167	Earthwork from Topsoil Layer to Subgrade/Top of Millings	
4	AUX_04	Existing Ground 02-12-09	Bottom of Existing Main Entrance Road Pavement Surface_02-12-09.tin	593.6	0	593.6	Total Pavement Removal Quantity. See Note 2.	
				228.5	507.8		Topsoil in Cut & Fill from ID 2 & 3 for Cult. Cen. Access Road	
5	None	Existing Ground 02-12-09	Future Cultural Center Pad Finished Ground_02-12-09	7183.9	33.8	7150.1	Earthwork from Exist. Ground to build Fut. Cult. Cen. Pad Site	
6	None	Existing Ground Without 2In Topsoil Layer 02-12-09	Future Cultural Center Pad Finished Ground_02-12-10	6649.3	99.8	6549.5	Earthwork from Topsoil Layer to build Fut. Cult. Cen. Pad Site	
				534.6	66		Topsoil in Cut & Fill from ID 5 & 6 for the Fut. Cult. Cen. Pad Site	
8	None	Existing Ground 02-12-09	Contractor Stockpile Area_11-5-08	1314.9	4793	-3478.1	Earthwork from Exist. Ground to build Contractor Stockpile Area	
9	None	Existing Ground Without 2In Topsoil Layer 02-12-09	Contractor Stockpile Area_11-5-08	1105.1	5188	-4082.9	Earthwork from Topsoil Layer to build Contractor Stockpile Area	
				209.8	395		Topsoil in Cut & Fill from ID 8 & 9 for the Contractor Stockpile Site	
11	None	Existing Ground 02-12-09	Cultural Center Subgrade&Top of Millings 02-12-09	2417.4	3254.5	-837.1	Earthwork from Exist. Ground to build Cultural Center Access Road, including the millings embankment quantity	
12	AUX_04	Existing Ground 02-12-09	Cultural Center Subgrade&Top of Millings 02-12-09	1370	200.8	1169.2	Earthwork from Exist. Ground to subgrade to build Cult. Center Road EXCLUDING the area where millings are being placed. See Note 1.	
13	AUX_05	Existing Ground 02-12-09	Cultural Center Subgrade 02-12-09	1662.2	1817.7	-155.5	Earthwork from Exist. Ground to subgrade to build Cult. Center Road INCLUDING the areas where millings are being placed. See Note 1.	

Millings Area (SQFT) (from element area in PKNGPLN.dgn drawing of Stockpile site subgrade area)	70624
Millings Area (ACRE)	1.62
Millings Sch. D depth (FT)	0.99
Millings Sch. D depth (IN)	11.88

Notes: 1. The sum of **ID 12** and **ID 13** equals the total amount of earthwork to build Cultural Center Access Road to subgrade in both areas where millings are placed and where no millings are placed. This includes the Main Entrance Road Re-Alignment and the Treatment Plant Access Road. Millings are placed from approximate station 12+80 through 29+13 on the Cultural Center Access Road.


AUX_05 BOUNDARY
FOR EARTHWORK
VOLUME CALCULATIONS
Cultural Center
Access Road Centerline
Main Entrance Road
Re-Alignment Centerline
Treatment
Plant Access
Road Centerline
AUX_04 BOUNDARY
FOR EARTHWORK
VOLUME CALCULATIONS
10+00
11+00
12+00
13+00
14+00
15+00
16+00
17+00
18+00
19+00
20+00
21+00
22+00
23+00
24+00
25+00
26+00
27+00
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29+00
30+00
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