PROJECT NAME: ARGHANDAB TO DAYCHOPAN ROAD GRAVELING

LENGTH = 12 KM.

NUMBER OF CULVERTS = 21.

ROAD GRAVELING OF DISTRICT ROAD

CULVERT CONSTRUCTION

VILLAGE: MORE THAN 10 VILLAGES ARE ALIGNED

DISTRICTS: ARGHANDAB - DAYCHOPAN

PROVINCE: ZABUL, AFGHANISTAN

DATE: MAY - 2022

ZABUL-AFGHANISTAN
# SHEET INDEX

## ARGHANDAB TO DAYCHOPAN ROAD GRAVELING PROJECT

<table>
<thead>
<tr>
<th>SHEET No.</th>
<th>DRAWING TITLES</th>
<th>SHEET NAME</th>
<th>REMARKS</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>SHEET INDEX</td>
<td>GN-01/10</td>
<td>SHEET INDEX</td>
</tr>
<tr>
<td>2</td>
<td>LEGEND AND ASBBREVIATION</td>
<td>SP-02/10</td>
<td>GENERAL INFORMATION</td>
</tr>
<tr>
<td>3</td>
<td>GIS MAP, SITE PLAN</td>
<td>SN-03/10</td>
<td>GIS MAP SITE PLAN ROAD ALIGNMENT</td>
</tr>
<tr>
<td>4</td>
<td>GIS MAP, CULVERTS LOCATIONS</td>
<td>SP-04/10</td>
<td>GIS MAP SITE PLAN ROAD ALIGNMENT</td>
</tr>
<tr>
<td>5</td>
<td>CULVERT PLAN</td>
<td>LS-05/10</td>
<td>STRUCTURE DRAWINGS</td>
</tr>
<tr>
<td>6</td>
<td>CULVERT CROSS SECTION</td>
<td>PP-06/10</td>
<td>STRUCTURE DRAWINGS</td>
</tr>
<tr>
<td>7</td>
<td>CULVERT LONG SECTION</td>
<td>PP-07/17</td>
<td>STRUCTURE DRAWINGS</td>
</tr>
<tr>
<td>8</td>
<td>CULVERT STEEL BARS TABLE</td>
<td>ST-08/10</td>
<td>CATCHMENTS AREA</td>
</tr>
<tr>
<td>9</td>
<td>ROAD TYPICAL SECTION</td>
<td>SP-09/10</td>
<td>STRUCTURE DRAWINGS</td>
</tr>
<tr>
<td>10</td>
<td>SITE PICTURES</td>
<td>SP-10/10</td>
<td>SITE PICTURES</td>
</tr>
</tbody>
</table>
NOTES:
1. ALL DIMENSION ARE BY METER.
2. EXISTING SURFACE IS SEEN SOIL, SAND WITH SMALL LARGE SIZE AGGREGATE.
3. START AND END POINTS ARE SHOWN IN GIS MAP.
4. 21 CULVERT ARE ALONG THE 14 KM ALIGNMENT, THAT ARE ACCORDING SITE
CONDITION AND IT WILL ADJUST DURING PROJECT IMPLEMENTATION.

GENERAL INFO:
1. TOTAL LENGTH OF ROAD GRAVELING IS 12 KM.
2. START AND END POINTS ARE SHOWN IN GIS MAP.
3. TOTAL NUMBER OF CULVERT ARE 21
4. THE PART OF ROAD GRAVELING CONNECT TWO DISTRICTS OF ZABUL PROVINCE
ARGHANDAB ADN DAYCHOPAN
5. ELEVATIONS SHOULD ADJUST AND MARK DURING PROJECT LAYOUT ACCORDING
SITE CONDITIONS.
6. THE MAIN GOAL OF THIS PROJECT'S CONNECT LOCATION VILLAGES AND
DISTRICTS
7. LOCAL RESIDENT OF 2 DISTRICTS WILL BENEFITED FROM THIS PROJECT.

DAM ALIGNMENT POINTS

<table>
<thead>
<tr>
<th>Point #</th>
<th>Elevation</th>
<th>Lat</th>
<th>Long</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>01</td>
<td>1500</td>
<td>32.40043</td>
<td>66.79564</td>
<td>Start of Road</td>
</tr>
<tr>
<td>02</td>
<td>1750</td>
<td>32.48214</td>
<td>66.85729</td>
<td>End of Road</td>
</tr>
</tbody>
</table>

CULVERT LISTS

<table>
<thead>
<tr>
<th>CULVERT NO</th>
<th>Latitude</th>
<th>Longitude</th>
<th>NO</th>
<th>Latitude</th>
<th>Longitude</th>
</tr>
</thead>
<tbody>
<tr>
<td>01</td>
<td>32.403628</td>
<td>66.797177</td>
<td>12</td>
<td>32.439758</td>
<td>66.860050</td>
</tr>
<tr>
<td>02</td>
<td>32.407072</td>
<td>66.801057</td>
<td>13</td>
<td>32.442027</td>
<td>66.862617</td>
</tr>
<tr>
<td>03</td>
<td>32.411241</td>
<td>66.812987</td>
<td>14</td>
<td>32.442540</td>
<td>66.863650</td>
</tr>
<tr>
<td>04</td>
<td>32.420111</td>
<td>66.829689</td>
<td>15</td>
<td>32.442540</td>
<td>66.864962</td>
</tr>
<tr>
<td>05</td>
<td>32.422841</td>
<td>66.836928</td>
<td>16</td>
<td>32.445784</td>
<td>66.866452</td>
</tr>
<tr>
<td>06</td>
<td>32.428820</td>
<td>66.840154</td>
<td>17</td>
<td>32.446896</td>
<td>66.869464</td>
</tr>
<tr>
<td>07</td>
<td>32.429372</td>
<td>66.841857</td>
<td>18</td>
<td>32.451373</td>
<td>66.870099</td>
</tr>
<tr>
<td>08</td>
<td>32.430916</td>
<td>66.844773</td>
<td>19</td>
<td>32.462454</td>
<td>66.860974</td>
</tr>
<tr>
<td>09</td>
<td>32.432065</td>
<td>66.846978</td>
<td>20</td>
<td>32.474275</td>
<td>66.858280</td>
</tr>
<tr>
<td>10</td>
<td>32.43325</td>
<td>66.848949</td>
<td>21</td>
<td>32.479740</td>
<td>66.858356</td>
</tr>
<tr>
<td>11</td>
<td>32.435751</td>
<td>66.853728</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
2 A-A SECTION

SCALE NTS

CLEAR COVER OF STEELS
(a) For faces of members in contact with water (insides) = C = 30mm.
(b) For faces of members in contact with soil (out side) = C = 30mm.

STEELS DETAILS 1m Span Culvert

1. Ø16mm @ 200mm C/C
2. Ø10mm @ 200mm C/C
3. Ø10mm @ 250mm C/C
4. Ø10mm @ 250mm C/C
5. 10 Ø10mm
6. 2 Legged Ring Ø 6mm @ 200mm C/C
7. 2 Legged Ring Ø 6mm @ 200mm C/C
8. Spacers Ø10mm @ 1000mm C/C
9. 2 Legged Ring Ø10mm @ 200mm C/C
10. Ø10mm

STEEL BARS OVERLAP
Steel bars overlap for all vertical and horizontal elements is 60d
"d" is considered steel bar diameter
Development length of bar is 58d

AFGHANISTAN
United Nation Development Program

DRAWN BY: MK JAHANGIRI MAERIA AFZALI
CHECKED BY: MK JAHANGIRI MAERIA AFZALI
APPROVED BY: MK JAHANGIRI MAERIA AFZALI

PROJECT NAME: GANDAMAK BAHSAH ODRA ROAD CROWNING

DATE: 13 MAY 2022
Parapet Wall
PCC, 10cm
Cut-off Wall

PCC, 10 cm
Dry Stone Patching, 20 cm
Natural / Compacted Soil

Abutment Foundation line
Dry Stone patching line

1.5
0.3
4.00
0.3
1.50
0.20

O.G.L

3.050
0.7
0.8
0.3
0.9
0.8

3
B-B SECTION
SCALE
NTS

O.G.L

0.5
0.7
1.5
6.60
4.6
7.8
1.5
0.5
0.7
STEEL BARS CUTTING DETAILS

STEEL BARS CHART

<table>
<thead>
<tr>
<th>Bar Nomination Number (f)</th>
<th>Bar Location</th>
<th>Bar Dia. (mm)</th>
<th>Bar len. (mm)</th>
<th>Total Weight (kg)</th>
<th>Total Weight + 5% (kg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bottom of Slab</td>
<td>15</td>
<td>1.70</td>
<td>43.8</td>
<td>1.08</td>
<td>94.48</td>
</tr>
<tr>
<td>Top of Slab</td>
<td>16</td>
<td>1.70</td>
<td>43.8</td>
<td>1.08</td>
<td>94.48</td>
</tr>
<tr>
<td>Top of Slab</td>
<td>17</td>
<td>1.70</td>
<td>34.0</td>
<td>0.83</td>
<td>21.08</td>
</tr>
<tr>
<td>Bottom of Slab</td>
<td>19</td>
<td>1.70</td>
<td>43.8</td>
<td>1.08</td>
<td>94.48</td>
</tr>
<tr>
<td>L-beams</td>
<td>20</td>
<td>1.70</td>
<td>43.8</td>
<td>1.08</td>
<td>94.48</td>
</tr>
<tr>
<td>Top of Slab</td>
<td>21</td>
<td>1.70</td>
<td>34.0</td>
<td>0.83</td>
<td>21.08</td>
</tr>
<tr>
<td>Top of Slab</td>
<td>22</td>
<td>1.70</td>
<td>34.0</td>
<td>0.83</td>
<td>21.08</td>
</tr>
<tr>
<td>Steel grade</td>
<td>23</td>
<td>1.70</td>
<td>34.0</td>
<td>0.83</td>
<td>21.08</td>
</tr>
<tr>
<td>Steel grade</td>
<td>24</td>
<td>1.70</td>
<td>34.0</td>
<td>0.83</td>
<td>21.08</td>
</tr>
<tr>
<td>Total Weight of 18mm(Kg)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>88</td>
</tr>
<tr>
<td>Total Weight of 12mm(Kg)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>88</td>
</tr>
<tr>
<td>Total Weight of 10mm(Kg)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>114</td>
</tr>
<tr>
<td>Total Weight of 8mm(Kg)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>33</td>
</tr>
<tr>
<td>Total Weight of Culvert Reinforcement(Kg)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>303</td>
</tr>
</tbody>
</table>

GENERAL NOTE AND TECHNICAL SPECIFICATIONS

1. All dimensions are in mm for steel bars, and by meters for structure drawings.
2. Should not be use River bed stone, smooth stone, chemical material stone, poor quality stone and small size stone.
3. Should be use hard, and large size stone.
4. All masonry work should be pointed (out side faces).
5. Skew angle height, length and slope of wing walls should be adjusted by the responsible engineer as per site conditions.
6. Refer to the bars schedule for the length and shape of reinforcement.
7. Concrete mix shall be proportioned by volume with a water/cement ratio of not more than 0.45.
8. Slope of culvert bed during implementation from up-stream to down-stream (2 - 4%).
9. Should be use clean and without organic material water.
10. The center of culvert span should be consider 4mm/m span upper across support during shuttering for controlling of deflection.
11. Minimum duration of removal of shuttering 16 days for (1 - 2m Span) and 28 days for 3m or more than 3m span culverts or bridges.
12. Duration of curing of RCC and PCC work not be less than 28 days.
13. Consider manhole (10" x 10") or 4" PVC Pipes for back water drainage in abutment and wing walls if needed.
14. Mark of RCC concrete not be less than 200 kg/cm2 (1:1.5:3).
15. Mark of PCC concrete not be less than 150 kg/cm2 (1:2:4).
16. Mark of steel bars (Grade 63, 60000 psi or Fe-415).
17. Portion of mortar in stone masonry (1:4).
18. Portion of mortar in pointing should be (1:3).
19. Depth of Abutments and wing walls are not constant, it, is belongs to site condition and Bearing Capacity of soil.
20. Consider Expansion joints between L Beams and end of RCC slab (25mm) in the two sides and filled by elastic materials.
21. Should be use plastic sheet between L beams (bed blocks) and deck slab in supports for separating slab and L beams (free condition).
22. Consider PVC pipe for culvert surface drainage.
23. For separating of bottom and top layers of steels mesh, should not consider spacers in props spacing.
24. The following data considered in design of this structure (Slab, Abutments and Wing Walls), so if you see any differences in data at the proposed structure site, the structure should be re-design based on actual data of site.
   A- Mark of concrete is 250, B- Grade of steel is 60,  C- Safe B/C of soil is 250 K/Nm2 (compacted Gravel), D- Unit weight of back fill material is 17 K/Nm3, E- Unit weight of stone masonry is 24 K/Nm3, F- Angle of Repose is 35 degree, G- Friction coefficient is 0.6.
25. The steel bars should not be cut in one time but after cutting of sample bars and corrected fixing of that in template.
4 ROAD TYPICAL SECTION

TYPICAL SECTION FOR 12000 METERS LENGTH

300 mm Gravel Surface with 98% Compaction

Existing sub grade to be scarified at 20cm, reshaped and compacted 93% of MDD
Before, placing the top layer

DETAIL A

300 mm Gravel Surface Road.
Existing sub grade to be scarified at 200mm, reshaped and compacted 95% of MDD
Before, placing the top layer

Side ditch to be excavated

hilly area

1. TOTAL LENGTH OF THE ROAD IS 12000 METERS.
2. THE ROAD ALIGNMENT IS ACCORDING TO SITE.
3. THE SIDE DITCH IS NEEDED FOR ONE SIDE LEFT SIDE OF THE MOUNTAIN SIDE OF THE ROAD.
4. THERE ARE 21 SLAB CULVERT BASED ON SITE CONDITIONS.
5. THE APPROXIMATE LENGTH OF SIDE DITCH IS 10000 OR 1KM TO BE EXCAVATED AND CONNECTED TO NEARBY CULVERT TO TRANSFER STREAM WATER.