Punjab Cities Program

Detailed Design of Infrastructure Sub-Projects, Sectoral Planning & Resident Supervision in 16 Cities of Punjab

MM Pakistan (Pvt) Ltd.
Associates in Development (AID) Pvt. Ltd.
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Ref: MMP/PMDFC/1076/COM/341 /2022
Date: 06 December 2022

Mr. Syed Zahid Aziz
Managing Director, PD PCP
Punjab Municipal Development Fund Company (PMDFC)
House No. 184, Scotch Corner, Upper Mall,
Lahore, Pakistan

Subject: **Updated Draft PC-I for Improvement, Widening and Raising of Road from Tank Chowk to Akbar Chowk along Canal Okara City - Package-V**

Dear Sir,

Please refer to observation raised by the MC Okara received through WhatsApp. They have sent observations on the Draft PC-I submitted to PMDFC costing PKR 100.53 Million vide our letter No. MMP/PMDFC/1076/283/2022 dated 15 November 2022.
Para wise comments appended below: -

1. Removal of Tack coat.
2. Formatting of BOQ.
3. Earth work rates updated from MRS 2nd Bi-Annual.
4. Update Non Schedule item of Electrical work to Schedule item.

After incorporating a/m observations, kindly find enclosed the copy of the **Updated Draft PC-I Costing PKR 98.33 Million for the project "Widening and Raising of Road from Tank Chowk to Akbar Chowk along Canal Okara City"** under PCP Package-V.
This deliverable is submitted under **Consultancy Agreement Clause Appendix A, V, Serial No.2 c of Package-V** for your review and further necessary action, please.
Assuring you of our best technical services and cooperation at all times.

Yours faithfully,

Received by MC OKARA S/E 06/12/22

Brig Pervez Hayat Niazi (R)
Team Leader Package-V
MMP – PCP

Cc:

- Iftikhar Rasool, Deputy Project Director, PMDFC
- Muhammad Ashiq Chuadhry, Senior Program Officer, PMFDC
- Malik Ahsan Gulzar, Manager Projects, Associates in Development (Pvt.) Ltd.
- Dr. Javed Iqbal, Project Director, PCP – MMP
- Syed Aslam Sabzwari, W&W Head, PCP – MMP
- Tanvir Masud, Contract Specialist, PCP – MMP
- The Chief Officer, Municipal Committee Khanewal
- Muhammad Abdullah, Senior Engineer Transportation, PCP – MMP
- Zubair Qadir, Field Coordinator, PCP – MMP
- Master File MMP- PCP

Encl:

i. **Draft PC-I for Improvement, Widening and Raising of Road from Tank Chowk to Akbar Chowk along Canal Okara City - Package-V (01 Hard Copy and 01 Soft Copy)**

Diary No. ..... 07 DEC 2022 PUNJAB MUNICIPAL DEVELOPMENT FUND COMPANY Government of the Punjab

OFFICE COPY

DRAFT

Local Government & Community Development Department

Punjab Cities Program
PC-I Form
For
Improvement, Widening and Raising of Road from Tank Chowk to Akbar Chowk along Canal Road

Estimated Cost 98.33 Million PKR

December 2022

Municipal Committee Okara

Punjab Cities Program
PC-I Form Widening / Raising and Improvement of Existing Roads Including Installation of Street Lights in Okara City
Table of contents

PC-I FORM
for
Widening / Raising and Improvement of Existing Roads Including Installation of Street Lights in Okara City

Project Serial Number
Sector : Local Government & Community Development Department
Sub Sector : Social

<table>
<tr><td>1. Name of the project</td><td>Punjab Cities Program
1. Improvement, Widening and Raising of Road from Tank Chowk to Akbar Chowk along Canal Road</td></tr>
<tr><td>2.Location</td><td>Okara is 127 Km south west of Lahore. The city coordinates are 30-8138’ North latitude, and 73-4534' East longitude. Location map of the city is attached in Annexure-A</td></tr>
<tr><td colspan="2">3. Authorities responsible for</td></tr>
<tr><td>I- Sponsoring</td><td>Government of the Punjab (through World Bank funding)</td></tr>
<tr><td>ii- Execution</td><td>District Council Unit Okara</td></tr>
<tr><td>iii- Operation and Maintenance</td><td>District Council Unit Okara</td></tr>
<tr><td>iv-Concerned Provincial Department</td><td>Local Government and Community Development Department Punjab</td></tr>
<tr><td>4a.Plan Provision</td><td></td></tr>
<tr><td>i. If the project is included in medium term/five year plan, specify actual allocation</td><td>Punjab Cities Program (PCP) is a World Bank funded Program with a total cost of 236.00 million USD and comprises of below mentioned components.

<table>
<tr><td>Total loan from World Bank</td><td>200.00 million USD</td></tr>
<tr><td>Component-1 Infrastructure development (PforR)</td><td>180.00 million USD</td></tr>
<tr><td>Component-2 Technical Assistance</td><td>20.00 million USD</td></tr>
<tr><td>MCs share (20% of PforR component) equivalent to:</td><td>36.00 million USD</td></tr>
<tr><td>Total Program cost</td><td>236.00 million USD</td></tr>
</table>
Component-2 i-e Technical Assistance component of Program costing 20.00 million USD is meant for management cost of the Program and capacity building of MCs & Government</td></tr>
</table>

		Departments and is included in the medium term/ five year plan and has been funded now in ADP 2022-23 - under General Serial No-1769 with allocation of PKR 100 million as foreign component.
ii- If not included in the current plan, what warrants its inclusion and how it is now proposed to be accommodated		Not applicable
iii If the project is proposed to be financed out of block provision indicate.		The Project is being financed by World Bank as Donor along with 20% co-financing from the Program Units and is not proposed to be financed out of Block Allocation.
4b- Provision in the current year PSDP/ADP		Rs.100.00 million under ADP 2022-23 General Serial No 1769 for Component-2 of the Program i-e Technical Assistance as described above.
5. Project objectives and its relationship with sector objectives		**Sector Objectives** The sector objectives include: 1. Provision of efficient and effective municipality services to the masses. 2. Community development through improving basic infrastructure. 3. Clean and green environment for better living standards. 4. Ease in mobility and communication. 5. Capacity building of Local Governments. **Objectives of the Project** The Main objective of project is to improve the quality of roads / streets leading to enhance quality of life of residents of the area and safety for pedestrians and traffic. The Project has the following objectives; 1. Improvement of service delivery level of the municipal services in the sector of communication. 2. Better travelling facilities for the commuters. 3. Reduction in road accidents. 4. Saving in travelling and repair cost of the vehicles. 5. Reduction in annual maintenance charges of roads and parks 6. Improvement in environments of the city making them livable. 7. Improvement in local and province economy.

		8. Improvement in the economic growth potential of the city. Hence, the objectives of the project are in line with the sector objectives mentioned at Sr. No-1, 2, 3 and 4 above and the project forms integral part of the concerned sector.
6. Description, justification, technical parameters and technology transfer aspects		
i)Description ii)Justification iii)Technical Parameters		Improvement and widening of existing Roads with allied drainage Works at Okara district. There are a lot of areas of Okara District where Roads have been constructed in past years. Due to various activities for installation of utilities in these areas the condition of the areas highlighted by district council, Okara has been deteriorated and needed immediate attention to improve the vehicles/ Pedestrian traffic to ease out the public at large in the area. The same shall also enhance the quality of life and improve area environment also. Presently the roads taken in the project are in miserable condition and show problems regarding surface riding quality, surface drainage and aesthetics. The reconnaissance and detailed surveys were done to identify the condition of existing infrastructure quality and suggest remedial measures to improve the condition of roads pointed out by the client. About 04 Nos of roads were surveyed and the detailed x-sections were developed for different width of road and pavement design. Providing technical parameters and discuss technology aspect of the project • Sub – Grade compaction to act as levelling layer. • Sub – Base 6 to 8 inches compacted. • Base course 6 inches compacted • Pre-mixed Wearing course with binding coats • Kerb stone is provided as protection of the edges • 7000 Psi Tuff Pavers of approved quality 80mm thick with Sand bedding 2” to 3”.
iv) Detail of civil works, equipment & machinery and other physical facilities		Location of Okara city area highlighted by the client. The detail of roads to be improved, rehabilitated or constructed in the city, is attached in **Annexure-B**

<table>
<tr><td>v) Indicate governess issues of the sector relevant to the project and strategy to resolve them</td><td>

• The smooth sailing of the Punjab Cities Program can only be assured when the required staff for maintenance is available with Okara Unit.
• The Repair and maintenance of the municipal services seem to be not up to the mark in the Unit. Trainings will be imparted by PMDFC to the officers as well as the field staff under the Program but practicing the interventions and method/procedures learnt in these trainings is the actual requirement in which Units are lacking at present. The same are to be given due considerate for improving the delivery level.

</td></tr>
<tr><td>7- Capital Cost of Project</td><td>

The summary of the works included in the project is given below;

<table>
<tr><th>S. No</th><th>Description</th><th colspan="2">Total Cost (PKR)</th></tr>
<tr><td colspan="4">Road Works</td></tr>
<tr><td>1</td><td>Improvement, Widening and Raising of Road from Tank Chowk to Akbar Chowk along Canal Road</td><td>Rs</td><td>67,349,609</td></tr>
<tr><td colspan="4">Installation of Street Lights</td></tr>
<tr><td>2</td><td>Improvement, Widening and Raising of Road from Tank Chowk to Akbar Chowk along Canal Road</td><td>Rs</td><td>23,298,395</td></tr>
<tr><td>3</td><td>Total cost</td><td>Rs</td><td>90,648,004</td></tr>
<tr><td></td><td>Contingencies @2%</td><td>Rs</td><td>1,812,960</td></tr>
<tr><td></td><td>Punjab Sales Tax & 5%</td><td>Rs</td><td>4,532,400</td></tr>
<tr><td></td><td>Environment Impact Assessment Cost</td><td>Rs</td><td>1,333,000</td></tr>
<tr><td></td><td>GRAND TOTAL (RS)</td><td>Rs</td><td>98,326,364</td></tr>
<tr><td colspan="2">Say Rs (Million)</td><td>Rs</td><td>98.33</td></tr>
<tr><td colspan="4">See Annexure-B for details</td></tr>
</table>

Rs

</td></tr>
<tr><td>i- Indicate date of estimation of the project cost</td><td>The project estimates have been framed during the month of December, 2022</td></tr>
<tr><td>ii- Basis of determining the</td><td>The cost estimates have been framed on the basis of bill of quantities actually measured at site and unit rates from the Market</td></tr>
</table>

estimates be provided.

Rate System (MRS) issued by the Government of Punjab (District Okara 2nd biannual of year 2022).
For items not available in the MRS, the same have been analyzed as per prevailing market rates.

iii- Provide year wise estimation of physical activities

The physical and financial requirements, year wise are included in the following table:

S. #	Name of road	Year 2022-23
1	Widening and Improvement of Roads	100%
2	Drainage Works	100%
3	Contingencies, taxes and other items	100%

iv- Phasing of capital cost on the basis of each item of work.

The phasing of capital cost of the project is included in the following table: (All figures are in million rupees)

S. No	Description	Total Cost (PKR)	
Road Works			
1	Improvement, Widening and Raising of Road from Tank Chowk to Akbar Chowk along Canal Road	Rs	67,349,609
Installation of Street Lights			
2	Improvement, Widening and Raising of Road from Tank Chowk to Akbar Chowk along Canal Road	Rs	23,298,395
	Total cost	**Rs**	**90,648,004**
	Contingencies @2%	**Rs**	**1,812,960**
	Punjab Sales Tax & 5%	**Rs**	**4,532,400**
	Environment Impact Assessment Cost	**Rs**	**1,333,000**
	GRAND TOTAL (RS)	**Rs**	**98,326,364**
Say Rs (Million)		**Rs**	**98.33**
See **Annexure-B** for details			

8-**Annual recurrent cost after completion of the project and source of financing**	The roads are already being repaired and maintained by the District Council Unit Okara out of its own financial resources. No additional cost will be required after completion of the improvement and upgradation of the roads, rather the repair cost will be reduced for the initial years. However, the efficiency of the infrastructure and service delivery level will be improved after completion of the project.
9- **Demand & Supply Analysis** i- Existing Capacity of services	**B. Existing supply level** The roads are in much deteriorated condition which are hampering the mobility of residents.
ii- Projected Demand for 10 years	1. Improvement, Widening and Raising of Road from Tank Chowk to Akbar Chowk along Canal Road
iii- Capacity of other similar projects being implemented in public/private sector	No other project of similar nature is being executed in city at present.
iv- Supply and Demand gaps	The roads are old and condition is deteriorated due to a number of maintenance and construction operation for different utility departments. The construction/ rehabilitation is needed to bring the area to a good condition of roads by strengthening the existing structure using sub – base , base and wearing courses has been conceived by the client also for this purpose. This PC-1 is prepared keeping into consideration, above requirement.
v-Designed capacity and output of the project	Roads having total Length of 6152 ft. shall be designed for about ten year's life with minimum O&M cost.
10. Financial Plan Sources of financing <u>Debt</u> a) Indicate the local and foreign debt Loan	Below given loan for the Punjab Cities Program has been funded by World Bank for 16 PCP cities in Punjab.

Total loan to Government of Pakistan/Punjab	200 million USD
Component-1 for Infrastructure Development	180 million USD
Component-2 for Investment Project Financing For capacity building of MCs & three Govt. organization and program management.	20 million USD

<table>
<tr><td></td><td></td><td>
<table>
<tr><td>20% share of Municipalities is equivalent to</td><td>36 million USD</td></tr>
<tr><td>Total funds available for Infrastructure Development</td><td>216 million USD</td></tr>
<tr><td colspan="2">This project will be funded under this financing.</td></tr>
</table>
</td></tr>
<tr><td>b) Equity</td><td></td><td>
A. Loan/grant to MC
The amount of loan converted to grant to Okara Unit will be Rs 98.33 (cost of the PC-I). The financing of the project will be as given below:
<table>
<tr><td>Grant to Unit for the year 2021-22 (80% of cost of PC-I) worked out</td><td>PKR 78.66 million</td></tr>
<tr><td>20% Co-finance by MC (20% of the cost of PC-I) worked out</td><td>PKR 19.66 million</td></tr>
<tr><td>Total available funds (Total cost of PC-I) worked out</td><td>PKR 98.33 million</td></tr>
</table>
B. Project Cost 98.33 Million PKR

*The loan is from World Bank to Government of Pakistan/Punjab which will trickle down to Okara Unit as grant.
</td></tr>
<tr><td>c) Grants</td><td></td><td>No grant is being given by Government of Punjab out of ADP funds. The World Bank loan to Government of Pakistan/Punjab will trickle down as grant to MC from Government of Punjab.</td></tr>
<tr><td>d) Weighted cost of capital</td><td></td><td>Nil</td></tr>
<tr><td colspan="3">11-Project benefits and analysis</td></tr>
<tr><td>i. Financial:
Income to the project with assumption</td><td></td><td>(Attached Economic Analysis, Cost benefit ratio and Sensitivity Analysis as Annexure-C)</td></tr>
<tr><td>ii. Social benefits to the target group</td><td></td><td>(Attached at Annexure-E)</td></tr>
<tr><td>iii. Environmental Impact negative/positive</td><td></td><td>(Attached at Annexure-E)</td></tr>
<tr><td>iv. Quantifiable project outputs</td><td></td><td>(Attached at Annexure-C)</td></tr>
<tr><td>v. Unit cost analysis</td><td></td><td>Unit cost of construction shall be Rs. 15,982.83 per Rft (98,326,364/ 6152 ft)</td></tr>
</table>

vi. Employment generation (direct and indirect)		**<u>Employment Analysis</u>** **Direct Employment** ***a) Planning and Design of projects*** The planning and design of the project has been entrusted to local consultants who have appointed staff and experts in road and related disciplines along with their support staff. The consultants will also appoint their staff for resident supervision of the project to verify and certify the items of works to be executed under this PC-I. **b) Execution of the Project** ***a) PMDFC*** PMDFC has the project monitoring and supervisory role and the company has enough experts and staff to complete this assignment. PMDFC has already deployed under mentioned staff for these projects: • Civil Engineers • Accounts, administration and audit personnel • Urban planners • GIS experts • Support staff like computer operators, vehicle drivers, office boys and guards. • Procurement experts • Communication experts • Environmental and social experts • Contract management experts ***b) Consultants*** PMDFC has employed consultants for detailed design and resident supervision of the projects who will deploy their staff for execution of the project. ***c) Municipality*** Okara Unit has regular staff like engineers, sub engineers and other administrative & accounts keeping staff which will be responsible for execution of the project and contract management. No additional staff will be needed for execution of this project ***d) Contractor*** The contractor responsible for execution of the sub project will employ skilled and un-skilled labor on this work.

		Indirect Employment Indirect employment for production of material such as cement, steel, stone metal, bitumen, bricks etc. will be generated.
vii. Impacts of delays on project cost and viability		The impact of delay in project implementation will; • Result in increased project cost due to escalation in cost of material and labor. • Delay the benefits to the target group • Result in further deterioration of the infrastructure and the service delivery level.
12-Implementation Schedule		
a) Indicate starting and completion date of the project		The project is anticipated to commence by December 2022 and to be completed by the end of financial year 2022-2023 i.e. May,2023
b) Item wise/year wise schedule in line chart		The chart is attached as **Annexure – D**
13- Management Structure and manpower requirements		
i. Administrative arrangements for the implementation of the project		**i. Planning & design of the project** The project has been designed by the consultants employed by PMDFC and will also carry out the resident supervision of the project. **ii. Preparation of cost estimation** The cost estimates have been prepared by the MM Pakistan (PVT) Ltd. The execution of the items of works included in these estimates /PC-I will be certified by these consultants. **iii. Execution of the project** • The project will be executed by District Council Unit Okara and supervised by the Consultants appointed by PMDFC in resident supervision mode. The technical staff & experts in PMDFC will oversee, co-ordinate and collaborate in the project planning, design and implementation through their experts in head office located in Lahore and regional offices. The reporting of progress to LG & CDD & World bank and troubleshooting will also be responsibility of PMDFC.

- MO (I&S) of the Unit has been designated as Project Manager /Engineer in Charge of the project. The supervision of the works will also be carried out by these municipal officers along with their support engineering staff. All supervisory staff is available with MC.
- The procurement of works and goods will be done by Procurement Committee of Okara Unit as per PPRA Rules.

iv. Verification of quantities included in PC-Is and Resident Supervision of the works by consultants

The works will be supervised by Supervision Consultants in resident supervision mode by assuring the quantity and quality of works. The consultants will verify the items of work and their quantities contained in the PC-Is and cost estimates initially and then the quantities and quality of works included in the contractor claims at the stage of payments. Payments will be made by the Unit after these contractor claims have been entered in the measurement books by the Resident Engineer in Charge and pre audited as per LG Works Rules.

ii- The manpower requirements by skills during execution and operation of the project and;
The job description, qualification, experience, age and salary of each post

a) PMDFC experts and staff

For rendering assistance in implementation of infrastructure projects in 16 MCs, PMDFC has the experts and staff in the required fields. In order to facilitate the Program Units, three regional offices have been established by PMDFC at Gujranwala, Faisalabad and Multan/Okara.

b) Resident Supervision Consultants

The project will be supervised by consultants. The tentative staff to be employed/deployed by the consultants for the certification of quantities of works and resident supervision of the project is given below.

S #	Personnel	Nos	Qualification
1	Chief Resident Engineer/Team Leader	01	BSc;/BE in Civil engineering with minimum 20 years' professional experience or MSC; Civil Engineering/Public Health Engineering/Environmental Engineering with Bachelor in Civil Engineering and minimum 15 years, experience, with 5 years on similar assignments in both cases
~~2~~	Senior Engineer	01	BSc/BE Civil engineering with minimum 08 years' relevant design experience or MSc engineering, with 5 years on similar assignments in both cases

3	Resident Engineer	01	BSc; /BE Civil engineering with minimum 10 years' experience in site supervision and execution for projects of similar nature.	
4	Assistant Resident Engineer	01	Bachelor Degree in Civil engineering with minimum 8 years' experience in site supervision and execution for projects of similar nature	
5	Site Inspectors	01	DAE in Civil with minimum 10 years' experience in site supervision for projects of similar nature	
6	Quantity Surveyor	01	DAE in Civil Technology with minimum 10 years' experience in estimation & costing of projects of similar nature. The person having public sector projects will be preferred.	
7	AutoCAD Operator	01	DAE in Civil Technology with minimum 5 years' experience in preparation of drawings for projects of similar nature. (situated at Lahore office)	

c) Contractor's Technical staff, skilled & non skilled labor

The contractors will employ the supervisory technical staff and skilled & non skilled labor for execution of works. The works will be supervised by experienced Engineers and sub engineers and the number of slots for engineers and skilled and non-skilled will depend upon the type and quantity of work and its period of completion.

d) Repair & maintenance of the project

MC has its own regular staff which has been deployed for Repair and maintenance of the municipal services infrastructure. However, it has been observed that the existing staff is not adequate to repair and maintain the services in a manner which can give good service delivery. Hence it is proposed to;

- Fill up the presently vacant slots
- Recruit additional staff as per need of the infrastructure after obtaining the sanctions from the competent authorities.

15-Certificate	Certified that the project proposal has been prepared on the basis of guidelines provided by the Planning Commission for the preparation of PC-I for Local Government and community development Department.

Prepared by	MM Pakistan (Pvt) Ltd		Stamp & Signatures	
Checked by	Municipal officer (Infrastructure) District Council Unit Okara		Stamp & Signatures	
	Chief Officer District Council Unit Okara		Stamp & Signatures	
Forwarded by	Administrator District Council Okara		Stamp & Signatures	

ANNEXURES

ANNEXURE – A

Location Map

Okara City Road Projects

Sr.No.	Project Title
1	Improvement, Widening and Raising from Tank Chowk to Akbar Chowk along Canal Road

Canal Road

Legend

NAME

- Proposed Canal Road
- Canal
- Existing Primary Roads
- Existing Secondary Roads
- Railway Line
- MC Boundary PLGA 2019

PUNJAB MUNICIPAL DEVELOPEMENT FUND COMPANY

PROJECT:

PUNJAB CITIES PROGRAM (PCP)

DETAILED DESIGN OF INFRASTRUCTURE SUB-PROJECTS, SECTORAL PLANNING & RESIDENT SUPERVISION IN16 CITIES OF PUNJAB(PACKAGE-5)

Map Code
0830 02 1022

Map Version
1.0

DISCLAIMER:

INFORMATION IS PROVIDED BY MC, PHED & OTHER SOURCES.

Scale:
1:26,000
0 0.5 1 2 Kilometers

Date
September 2022

Drawing No.
MMP-1076P05-OKR-RD-LP-001

MMP
MM Pakistan (Pvt) Ltd.

ANNEXURE – B

Cost Estimates

Detail Design of Infrastructure Sub - Projects Sectoral Planning & Resident Supervision in 16 Cities of Punjab

Improvement, Widening and Raising of Road from Tank Chowk to Akbar Chowk along Canal Road, Okara

TOTAL LENGTH = 1.875 KM

SUMMARY OF COST

ITEM	DECRIPTION	AMOUNT	
A -	**ROAD WORKS**		
1	Improvement, Widening and Raising of Road from Tank Chowk to Akbar Chowk along Canal Road	Rs	67,349,609
B -	**STREET LIGHTING NETWORK**		
2	Improvement, Widening and Raising of Road from Tank Chowk to Akbar Chowk along Canal Road	Rs	23,298,395
	TOTAL (RS) :	**Rs**	**90,648,004**
	ADD 2% CONTINGENCY	Rs	1,812,960
	ADD 5% PST	Rs	4,532,400
	Environment Impact Assessment Cost	Rs	1,333,000
	GRAND TOTAL (RS)	**Rs**	**98,326,364**
	COST IN (MILLIONS)	**Rs**	**98.33**

Detail Design of Infrastructure Sub - Projects Sectoral Planning & Resident Supervision in 16 Cities of Punjab

Improvement, Widening and Raising of Road from Tank Chowk to Akbar Chowk along Canal Road

Calculation of Quantities

NOTE: Description of all items shall be considered same as of referred MRS item number.

NOTE: Market Rate System (MRS) issued by the Government of Punjab (District Okara 2nd biannual of year 2022).

Sr. No	MRS 02-2022		Detail of Item	Nos	Measurments			Quantity	Unit	Rate	Unit	Amount
	Chap	Item			Length	Width	Height					
			A) ROAD WORKS									
1	4	11	Dismantling dry brick masonry / existing road edging.									
			STA : 0+000 to 6+152	2	6,152.00	0.25	0.75	2,307.00				
			Total Qty					**2,307.00**	**Cft**	**863.50**	**100**	**Rs. 19,921**
2	4	45	Dismantling and removing road metalling									
			STA : 0+000 to 6+152	1	89,854.00	-	0.17	15,275.18	Cft			
			Total Qty of Item No - 12					**15,275.18**	**Cft**	**2,031.75**	**100**	**Rs. 310,353**
3	4	11	Dismantling Tuff pavers									
			STA : 4+690 to 4+885 SOLING	1	195.00	14.50		2,827.50				
			Total Qty					**2,827.50**	**Sft**	**863.50**	**100**	**24,415**
4	3	17	Transportation of earth all types when the total distance, including the lead covered in the item of work, is more than 1000 ft. (300 m)									
			Tuff Pavers (Broken) As above		2,827.50	0.26	50%	371.06				
			Total Qty					**371.06**	**Cft**	**6,002.40**	**1000**	**2,227**
5	3	6	Regular excavation dressed.									
			Widened Portion									
			STA : 0+000 to 2+000 24 15.50	1	2,000.00	24.00	1.00	48,000.00				
			STA : 2+000 to 4+690 24 14.00	1	2,690.00	24.00	1.00	64,560.00				
			STA : 4+690 to 4+825 24 14.50	1	135.00	24.00	1.00	3,240.00				
			STA : 4+825 to 6+152 24 14.50	1	1,327.00	24.00	1.00	31,848.00				
			Total Qty					**147,648.00**	**Cft**	**5,241.45**	**1000**	**Rs. 773,890**
6	3	5 - i	Earthowrk in ordinary soil for embankments lead upto 100 ft. (30 m), including ploughing and mixing with blade gradeor disc harrow or other suitable equipment, and compaction by mechanical means at optimum moisture content and dressing to designed section, complete in all respects:-									
			Excavated Material to be used									
			Old Carriage way					24,619.50				
			Expnded Carriage way					16,146.33				
			STA : 0+000 to 2+000 24 15.50	1	2,000.00	24.00	0.75	36,000.00				
			STA : 2+000 to 4+690 24 14.00	1	2,690.00	24.00	0.75	48,420.00				
			STA : 4+690 to 4+825 24 14.50	1	135.00	24.00	0.75	2,430.00				
			STA : 4+825 to 6+152 24 14.50	1	1,327.00	24.00	0.75	23,886.00				
			for Shoulders					1,659.00				
			Edging	1	6,152.00	2.34	1.17	16,842.95				
			Total Qty					**170,003.78**	**Cft**	**9,527.90**	**1000**	**Rs. 1,619,779**

Detail Design of Infrastructure Sub - Projects Sectoral Planning & Resident Supervision in 16 Cities of Punjab

Improvement, Widening and Raising of Road from Tank Chowk to Akbar Chowk along Canal Road

Calculation of Quantities

NOTE: Description of all items shall be considered same as of referred MRS item number.

NOTE: Market Rate System (MRS) issued by the Government of Punjab (District Okara 2nd biannual of year 2022).

Sr. No	MRS 02-2022		Detail of Item	Nos	Measurments			Quantity	Unit	Rate	Unit	Amount
	Chap	Item			Length	Width	Height					
7	3	7 - i	**Earthwork excavation in open cutting**									
			Earthwork excavation in open cutting upto 5'-0" (1.5 m) depth for storm water channels, drains, sullage drains in open areas, roads, streets, lanes, including under pinning walls and shoring to protect existing works, shuttering and timbering the trenches, dressed to designed level and dimensions, trimming, removal of surface water from trenches, back filling and surplus excavated material disposed of and dressed within 50 ft. (15 m) lead:-									
			i) Ordinary Soil									
			Old Carriage way					2,501.65				
			Expnded Carriage way									
			STA : 0+000 to 2+000 24 15.50	1	2,000.00	8.50	0.75	12,750.00				
			STA : 2+000 to 4+690 24 14.00	1	2,690.00	10.00	0.75	20,175.00				
			STA : 4+690 to 4+825 24 14.50	1	135.00	9.50	0.75	961.88				
			STA : 4+825 to 6+152 24 14.50	1	1,327.00	9.50	0.75	9,454.88				
			In addition to 0.58 depth					1,567.53				
			for Shoulders					12,409.21				
			Total Qty					**59,820.14**	**Cft**	**9,016.70**	**1000**	**Rs. 539,380**
8	4	45	Dismantling and removing road metalling									
			ii) Hard soil (WBM)									
			Old Carriage way	1								
			STA 0+000 to 2+000 = 15.50 Width	1	2,000.00	15.50	0.58	17,980.00				
			STA : 2+000 to 4+690 = 14.00 Width	1	2,690.00	14.00	0.58	21,842.80				
			STA : 4+690 to 4+825 = 14.50 Width	1	135.00	14.50	0.58	1,135.35				
			STA : 4+825 to 6+152 = 14.50 Width	1	1,327.00	14.50	0.58	11,160.07				
			Existing Footpath	1	1,700.00	3.00	0.67	3,417.00				
			Total Qty					**55,535.22**	**Cft**	**2,031.75**	**100**	**Rs. 1,128,337**
9	3	17	Transportation of earth all types when the total distance, including the lead covered in the item of work, is more than 1000 ft. (300 m)									
			Filling required To be brought in					170,003.78				
			Less Ordinary soil can be used					(59,820.14)				
			Hard soil To be carried away		52,118.22		30%	15,635.47				
			Total Qty					**125,819.10**	**Cft**	**6,002.40**	**1000**	**Rs. 755,217**

Detail Design of Infrastructure Sub - Projects Sectoral Planning & Resident Supervision in 16 Cities of Punjab

Improvement, Widening and Raising of Road from Tank Chowk to Akbar Chowk along Canal Road

Calculation of Quantities

NOTE: Description of all items shall be considered same as of referred MRS item number.

NOTE: Market Rate System (MRS) issued by the Government of Punjab (District Okara 2nd biannual of year 2022).

Sr. No	MRS 02-2022		Detail of Item	Nos	Measurments			Quantity	Unit	Rate	Unit	Amount
	Chap	Item			Length	Width	Height					
10	10	3	Relaying, watering and ramming dismantled road brick edging as sub base making brick ballast 1½" to 2"(40 mm to 50 mm) gauge mixed with 25% sand,									
			In Shoulders (Labour rate only)									
			Take 90% Quantity of Item No - 1			2307 x 0.9		2,076.30				
			WBM	1 x	52,118.22	0.9		46,906.40				
			Total Qty					**48,982.70**	**Cft**	**4,064.40**	**100**	**Rs. 1,990,853**
11	18	3 - a - ii	Providing and laying sub-base course of stone product of approved quality and grade, including placing, mixing, spreading and compaction of sub-base material to required depth, camber, grade to achieve 100%maximum modified AASHO dry density, including carriage of all material to site of work except gravel and. aggregate.									
			Raising & Widening Portion									
			STA : 0+000 to 2+000	1	2,000.00	24.00	0.50	24,000.00				
			STA : 2+000 to 4+690	1	2,690.00	24.00	0.50	32,280.00				
			STA : 4+690 to 4+825	1	135.00	24.00	0.50	1,620.00				
			STA : 4+825 to 6+152	1	1,327.00	24.00	0.50	15,924.00				
			Shoulders					-				
			STA : 0+000 to 6+152 3 3	1	6,152.00	6.00	0.50					
			Deduction Quantity item no - 6					(48,982.70)				
			Total Qty		**6,152.00**			**24,841.30**	**Cft**	**20,976.48**	**100**	**Rs. 5,210,831**
12	18	4 - a	Providing and laying base course of crushed stone aggregate of approved quality and grade, and supply and spreading of stone screening, including placing, mixing, spreading and compaction of base course material to required depth, camber and grade to achieve 100%maximum modified AASHO dry density, including carriage of all materials to site of work except gravel and. aggregate.									
			Raising & Widening Portion									
			STA : 0+000 to 2+000	1	2,000.00	24.00	0.50	24,000.00				
			STA : 2+000 to 4+690	1	2,690.00	24.00	0.50	32,280.00				
			STA : 4+690 to 4+825	1	135.00	24.00	0.50	1,620.00				
			STA : 4+825 to 6+152	1	1,327.00	24.00	0.50	15,924.00				
			Total Qty		**6,152.00**			**73,824.00**	**Cft**	**26,254.94**	**100**	**Rs. 19,382,445**
13	18	6	Providing and laying bituminous priming coat, using 10 lbs. kerosene oil and 10 lbs. binder per 100 Sft. or 0.5 Kg kerosene and 0.5 Kg binder per square metre.									
			Raising & Widening Portion									
			STA : 0+000 to 2+000	1	2,000.00	24.00	-	48,000.00				
			STA : 2+000 to 4+690	1	2,690.00	24.00	-	64,560.00				
			STA : 4+690 to 4+825	1	135.00	24.00	-	3,240.00				
			STA : 4+825 to 6+152	1	1,327.00	24.00	-	31,848.00				
			Total Qty					**147,648.00**	**Sft**	**2,294.80**	**100**	**Rs. 3,388,226**

Detail Design of Infrastructure Sub - Projects Sectoral Planning & Resident Supervision in 16 Cities of Punjab

Improvement, Widening and Raising of Road from Tank Chowk to Akbar Chowk along Canal Road

Calculation of Quantities

NOTE: Description of all items shall be considered same as of referred MRS item number.

NOTE: Market Rate System (MRS) issued by the Government of Punjab (District Okara 2nd biannual of year 2022).

Sr. No	MRS 02-2022		Detail of Item	Nos	Measurments			Quantity	Unit	Rate	Unit	Amount
	Chap	Item			Length	Width	Height					
14	18	10a	Providing and laying plant premixed bituminous 2" thick carpet, including compaction and finishing to required camber, grade and density.									
			iv) 4.5% Bitumen									
			STA : 0+000 to 2+000	1	2,000.00	24.00	-	48,000.00				
			STA : 2+000 to 4+690	1	2,690.00	24.00	-	64,560.00				
			STA : 4+690 to 4+825	1	135.00	24.00	-	3,240.00				
			STA : 4+825 to 6+152	1	1,327.00	24.00	-	31,848.00				
			Total Qty					**147,648.00**	**Sft**	**16,462.51**	**100**	**Rs. 24,306,561**
15	13	36 - b	Painting Traffic Lane Marking of specified width (1.5mm thick), with Thermoplastic (TP) Paint including Glass Beads, complete in all respect, as approved and directed by Engineer incharge. 6" wide									
			STA : 0+000 to 6+152	2	6,152.00	-	-	12,304.00				
				1	2,051.00	-	-	2,051.00				
			Total Qty of Item No - 14					**14,355.00**	**Rft**	**56.20**	**1**	**Rs. 806,751**
16	6	52 -b- i	Providing and fixing precast Edge Kerb Stone (4"to6" thick), of 3500PSI Compressive Strength, embeded in PCC1:2:4 over lean concrete1:4:8 etc complete in all respect.									
			STA : 0+000 to 6+152	2	6,152.00	-	-	12,304.00				
			Total Qty					**12,304.00**	**Rft**	**516.90**	**1**	**Rs. 6,359,938**
17	18	25a	Providing, fabrication and fixing pole mounted Direction Board/road delineator of any shape and size, with specified Sheet and thickness, supported with G.IChannel, (excluding the cost of vertical post and painting) etc complete in all respect									
			If 3 mm thick Aluminium sheet is used, increase composite rate by Rs 627/- Psft or Rs 6747/- Per Sq.Mtr									
			(a) G. I. Sheet 14 SWG									
			i) CIRCULAR/TRIANGULAR									
			3 ft size									
				4			3.00	12.00	Sft			
			Total Qty					**12.00**	**Sft**	**948.15**	**1**	**Rs. 11,378**
18	18	27b	Providing, fabrication and fixing Vertical Post comprising of medium quality G.I Pipe of specified diameter, including the cost of clamping arrangements, top cover, hold fasts embeded in PCC1:2:4 etc complete in all respect.									
			(b) 3 inch diameter									
				4			10.17	40.68	Rft			
			Total Qty					**40.68**	**Rft**	**1,259.95**	**1**	**Rs. 51,255**

Detail Design of Infrastructure Sub - Projects Sectoral Planning & Resident Supervision in 16 Cities of Punjab

Improvement, Widening and Raising of Road from Tank Chowk to Akbar Chowk along Canal Road

Calculation of Quantities

NOTE: Description of all items shall be considered same as of referred MRS item number.

NOTE: Market Rate System (MRS) issued by the Government of Punjab (District Okara 2nd biannual of year 2022).

Sr. No	MRS 02-2022		Detail of Item	Nos	Measurments			Quantity	Unit	Rate	Unit	Amount
	Chap	Item			Length	Width	Height					
19	18	28	Providing & fixing Cat Eyes of size 4"x4"x3/4" duly casted with specified material having plastic strip containing mini retro-reflective glass beads of color white/red/yellow having specifid reflections, quality & shape i/c the cost of self builtin 12mm dia x 120mm long steel zinc plated nail, fixing to road with epoxy/ hammering with separate nail complete b) Aluminium Alloy (B) Uni-Directional (ii) 43 Glass beads a side @ 30' c/c	3	206			618.00 - **618.00**	**Each**	**543.80**	**1**	**Rs. 336,068**
			Total of Road Work									**Rs. 67,017,825**
20			**B) ROAD DRAINAGE WORKS** Raising of Man Holes (As per attached **Total Qty**	1	28.00			28.00 **28.00**	**No.**	**11,849.43**	**1**	**Rs. 331,784**
			Total of Drainage Works									**Rs. 331,784**
			Total of Road + Drainage Works									**Rs. 67,349,609**

Detail Design of Infrastructure Sub - Projects Sectoral Planning & Resident Supervision in 16 Cities of Punjab

Improvement, Widening and Raising of Road from Tank Chowk to Akbar Chowk along Canal Road

Calculation of Quantities

NOTE: Description of all items shall be considered same as of referred MRS item number.

NOTE: Market Rate System (MRS) issued by the Government of Punjab (District Okara 2nd biannual of year 2022).

Sr. No	MRS 02-2022		Detail of Item	Nos	Measurments			Quantity	Unit	Rate	Unit	Amount
	Chap	Item			Length	Width	Height					
			C) CIVIL WORKS FOR ELECTRICAL WORKS									
21	3	7-i	Earthwork excavation in open cutting upto 5'-0" (1.5 m) depth for storm water channels, drains, sullage drains in open areas, roads, streets, lanes, including under pinning of walls and shoring to protect existing works, shuttering and timbering the trenches, dressed to designed level anddi mensi ons, trimming, removal of surface water from trenches, back filling and surplus excavated material disposed of and dressed within 50 ft. (15 m) lead i) Ordinary For 1 Foundation = 3' x 3' x 4.25' = 38.25 Cft For 16 Foundations = 13 x 38.25 = 555.75 Cft	53	3.00	3.00	4.25	2,027.25				
			Total Qty					**2,027.25**	**Cft**	**9,016.70**	**1000**	**Rs. 18,279**
22	3	17	Transportation of earth all types when the total distance, including the lead covered in the item of work, is more than 1000 ft. (300 m) **Ordinary soil**					2,027.25				
			Total Qty					**2,027.25**	**Cft**	**6,002.40**	**1000**	**Rs. 12,168**
23	6	*5-i*	Cement concrete plain including placing, compacting, finishing and curing complete (including screening and washi ng of stone aggregate): **i) 1:4:8**	53	3.00	3.00	0.25	119.25				
								119.25	**Cft**	**38,504.48**	**100**	**Rs. 45,917**
24	6	*6-a-iii-3*	Providing and laying reinforced cement concrete (including prestressed concrete), using coarse sand and screened graded and washed aggregate, in required shape and design, including forms, moulds, shuttering, lifting, compacting, curing, rendering and finishing exposed surface, complete (but excluding the cost of steel reinforcement, its fabrication and placing in position, etc.) (a)(iii) Reinforced cement concrete in slab of rafts / strip foundation, base slab of column and retaining walls; etc and footing beams, other structural members other than those mentioned in 6(a) (i)&(ii) above not requiring form work (i.e. horizontal shuttering) complete in all respects: **(3) Type C (nominal mix 1: 2: 4)**	53	2.00	2.00	6.00	1,272.00	Cft			
								1,272.00	**Cft**	**644.88**	**1**	**Rs. 820,284**
25	6	*12-c*	Fabrication of mild steel reinforcement for cement concrete, including cutting, bending, laying in position, making joints and fastenings, including cost of binding wire and labour charges for binding of steel reinforcement (also includes removal of rust from bars):- **('c) Deformed bars (Grade-60)** **@ 5lbs/Cft**					**2,885.66**	**Kg**	**31,781.75**	**100**	**Rs. 917,114**

Detail Design of Infrastructure Sub - Projects Sectoral Planning & Resident Supervision in 16 Cities of Punjab

Improvement, Widening and Raising of Road from Tank Chowk to Akbar Chowk along Canal Road

Calculation of Quantities

NOTE: Description of all items shall be considered same as of referred MRS item number.

NOTE: Market Rate System (MRS) issued by the Government of Punjab (District Okara 2nd biannual of year 2022).

Sr. No	MRS 02-2022		Detail of Item	Nos	Measurments			Quantity	Unit	Rate	Unit	Amount
	Chap	Item			Length	Width	Height					
26	24	*6-ii*	Supply and erection PVC pipe for recessed wiring (main and sub-main) purpose, including bends, specials, etc. in floor, wall or trenches:- **iii) 80mm** **(7 Rft/Foundation)**									
				53	7.00			371.00	Rft			
								371.00	**Rft**	**233.75**	**1**	**Rs. 86,721**
27	7	*30*	Supplying and filling sand under floor; or plugging in wells.									
				53	3.00	3.00	3.75	1,788.75				
			Less foundation	-53	2.00	2.00	3.75	(795.00)				
								993.75	**Cft**	**2,943.30**	**100**	**Rs. 29,249**
28	25	9	Small iron work, such as gusset plates, knees, bends,stirrups, straps, rings, etc. including cutting, drilling, riveting, handling, assembling and fixing; but excluding erection in position. (Supply & Installation of 470x470x20 mm Base plate for 10 meter Single & Double Arms Poles.)									
				53	0.47	0.47	0.02	1,838.11	Kg			
								1,838.11	**Kg**	**41,131.85**	**100**	**Rs. 756,048**
			Sub Head 2: laying of Underground Cables									
29		*3/7/i*	Earthwork excavation in open cutting upto 5'-0" (1.5 m) depth for storm water channels, drains, sullage drains in open areas, roads, streets, lanes, including under pinning of walls and shoring to protect existing works, shuttering and timbering the trenches, dressed to designed level anddi mensi ons, trimming, removal of surface water from trenches, back filling and surplus excavated material disposed of and dressed within 50 ft. (15 m) lead **i) Ordinary**									
				1	6,123.72	1.50	3.00	27,556.74	Cft			
								27,556.74	**Cft**	**9,016.70**	**1000**	**Rs. 248,471**
30	24	*6-iii*	Supply and erection PVC pipe for recessed wiring (main and sub-main) purpose, including bends, specials, etc. in floor, wall or trenches:- **iii) 100 mm i/d (4 inch)**									
				0	6,123.72			-	Rft			
								-	**Rft**	**290.75**	**1**	**Rs. 000**
			Total Civil Works for Electrical Works									**Rs. 2,934,252**

Detail Design of Infrastructure Sub - Projects Sectoral Planning & Resident Supervision in 16 Cities of Punjab
Improvement, Widening and Raising of Road from Tank Chowk to Akbar Chowk along Canal Road, Okara
STREET LIGHTING NETWORK TANK CHOWK TO AKBAR ROAD VIA CANAL DISTRICT OKARA
ENGINEERING COST ESTIMATE (ELECTRICAL WORKS)

ITEM NO.	Okara 2022 2nd MRS Ref.	DESCRIPTION	UNIT	QTY	RATE (Rs.)	AMOUNT (Rs.)
Sub Head 1: Street Light Poles						
1	***24/68***	Supplying, installation testing and commissioning of Octagonal shape electric street light pole, made of hot dipped 4.5 mm thick (7 SWG) galvanized steel ,tapered from 225 mm at bottom to 100 mm at top, with 1500 mmx60 mm dia. arm for luminaire installation, duly G.I.welded with 470x470x20 mm base plate with the help of 4 no triangular stiffeners 100x350x20 mm of GI sheet, with built in junction box with shutter, I/c the cost of nuts & J-rag bolts, duly fixed in prelaid concrete foundation, foundation will be paid additionally as approved and directed by the Engineer Incharge.				
a	***i)***	Single Arm 10 Meter	Each	53	106,236.55	5,630,537.15
2	***NS***	Supply, installation, testing and commissioning of Pole Base Connection Plates complete comprising of four number (4 Nos.) line up terminal for 35 mm square cables connection for incoming and outgoing, nut & bolts, end covers and stoppers and covers etc. with Main 6 Amp Single Pole MCB at outgoing. make Legrand or equivalent				
		Single Arm 10 Meter	Each	53	3,540.68	187,656.09
Sub Head 2: Cables						
3	***24/13/d/iv/v***	Supply and erection of copper conductor cables for service connection, in prelaid pipe/G.I. wire/trenches, etc d) PVC insulated, PVC sheathed 4 Core, 600/1000 volt armoured cable:-				
	v	25 mm^2 4-Core Cable.	Rft	30	1,340.70	40,221.00
	iv	16 mm^2 4-Core Cable.	Rft	10882	816.10	8,880,800.20
4	***24/13/a/iii***	Supply and erection of copper conductor cables for service connection, in prelaid pipe/G.I. wire/trenches, etc a) PVC insulated, PVC sheathed twin core, 250/440 volts. iii) 2.5mmsq [7/0.74 mm (7/0.029")]	Rft	2198	86.55	190,229.11
Sub Head 3: Conduits						
5	***24/6/iii***	Supply and erection PVC pipe for recessed wiring (main and sub-main) purpose, including bends, specials, etc. in floor, wall or trenches:- **iii) 100 mm i/d (4 inch)**	Rft	6736	290.75	1,958,512.35
Sub Head 4: Street Light Control Panel (SLCP)						
	24/90/a/i	P/F wall mounted DB (Distribution Board) made with 16SWG Sheet (Recessed/Surface mounted Type), Powder coated Paint, i/c the cost of Lock, Indication lights, Thimble, Copper Comb, Wiring, Netural & Earth Bar, Door Earthing, Digital Voltmeter,Digital Ammeter,Volt Selector Switch,Ammeter selector switch,Current Transformers and Controles Complete in all respect as approved and directed by the Engineer Incharge **a) 6" Deep** **i) 20~60A**	Each	1	18,634.45	18,634.45
		Incoming				
	24/87/a/ii	Supplying ,Installation and commissioning of MCCB (Moulded Case Circuit Breaker) of specified rat i ng made of LEGRAND FRA NCE/ GE U.S.A / SCHNEIDER GERMANY / TERASAKI JAPAN/SIEMEN/ABB SWITZERLAND (with fixed Thermal-Magnetic Trip) in prelaid DBs and Panels i / c the cost of screws, necessary wire complete in all respect as approved and directed by the Engineer Incharge. a) Tripple Pole (ii) 40 Amp (10 KA)	Each	1	11,433.00	11,433.00

Detail Design of Infrastructure Sub - Projects Sectoral Planning & Resident Supervision in 16 Cities of Punjab
Improvement, Widening and Raising of Road from Tank Chowk to Akbar Chowk along Canal Road, Okara
STREET LIGHTING NETWORK TANK CHOWK TO AKBAR ROAD VIA CANAL DISTRICT OKARA
ENGINEERING COST ESTIMATE (ELECTRICAL WORKS)

ITEM NO.	Okara 2022 2nd MRS Ref.	DESCRIPTION	UNIT	QTY	RATE (Rs.)	AMOUNT (Rs.)
6	24/94/xv/b	Providing and fixing DB/Panel accessories of required rating and size i/c copper screws of approved brand Complete in all respect as approved and directed by the Engineer Incharge. (xv) Magnetic Contactor (b) 40 A (AC 3) for 25 KVAR	Each	1	20,193.00	20,193.00
	24/94/viii	Providing and fixing DB/Panel accessories of required rating and size i/c copper screws of approved brand Complete in all respect as approved and directed by the Engineer Incharge (viii) Control MCB S/P 6A (Make: Schneider/ Terasaki/ABB)	Each	1	1,173.00	1,173.00
	24/94/x	Providing and fixing DB/Panel accessories of required rating and size i/c copper screws of approved brand Complete in all respect as approved and directed by the Engineer Incharge (x) Auto/Manual Switch 3-Steps (Make: GGT/Camsco)	Each	1	1,833.00	1,833.00
	NS	Photo Electric Switch Type (10 Amp)	Each	1	16,252.50	16,252.50
	24/21/i	Supply and erection of bus bars, for 500 volts 3 phase A.C.supply with four copper bars, including glazed porcelain bridges, on angle iron board, fixed with rag bolts and M.S.sheet box 1.5 mm thick, etc. complete:- i)60 Amp. with 4 copper bars size 1½"x1/8" (40 x 3 mm)	Each	1	4,924.60	4,924.60
	24/94/vi	Providing and fixing DB/Panel accessories of required rating and size i/c copper screws of approved brand Complete in all respect as approved and directed by the Engineer Incharge (vi) Push Button ON/OFF (Make: Schneider/Himal/Eqv.)	Each	1	447.50	447.50
		Outgoing				
	24/86/c/ii	Suppling,Installation and comissioning of MCB (Miniature Circuit Breaker) of specified rating made of LEGRAND FRANCE/ GE U.S.A / SCHNEIDER GERMANY /SIEMEN GERMAN/TERASAKI JAPAN/ ABB SWITZERLAND in prelaid DBs and Panels i/c the cost of screwes,necessary wire complete in all respect as approved and directed by the Engineer Incharge. **c) Tripple Pole** ii) 20 Amps TP 6 KA MCB	Each	3	6,753.00	20,259.00
		c) Tripple Pole ii) 16 Amps TP 6 KA MCB	Each	2	6,753.00	13,506.00
		16 Amps TP 6 KA MCB as spare	Each	2	6,753.00	13,506.00
Sub Head 5: LED Street Light						
7	***24/69/a/v***	Supplying, installation and commissioning of LED Cobra-head Luminaries of specified wattage and lumens conformimg to IP 65, Philips/Osram/Thorn with corrosion resistant die casted aluminum housing, silicon gas kit, thermally hardened glass complete with LED drivers, surge protection i/c the cost of all accessories/components required for proper operation , fully flexible for future upgradation and easy replacements for maintenance purposes,bucket elevator charges as approved and directed by the Engineer Incharge **a) 140 Lm/Watt.** **(v) 120 Watt with 16800 Lumens** *The LEDs shall be in compliance with latest NEECA/PEECA standards. Along with the minimum of 5 year Manufacturer's warrenty*	Each	53	53,301.85	2,824,998.05
Sub Head 5: Replacement LEDs						

Detail Design of Infrastructure Sub - Projects Sectoral Planning & Resident Supervision in 16 Cities of Punjab
Improvement, Widening and Raising of Road from Tank Chowk to Akbar Chowk along Canal Road, Okara
STREET LIGHTING NETWORK TANK CHOWK TO AKBAR ROAD VIA CANAL DISTRICT OKARA
ENGINEERING COST ESTIMATE (ELECTRICAL WORKS)

ITEM NO.	Okara 2022 2nd MRS Ref.	DESCRIPTION	UNIT	QTY	RATE (Rs.)	AMOUNT (Rs.)
8	***24/69/a/v***	Supplying, installation and commissioning of LED Cobra-head Luminaries of specified wattage and lumens conformimg to IP 65, Philips/Osram/Thorn with corrosion resistant die casted aluminum housing, silicon gas kit, thermally hardened glass complete with LED drivers, surge protection i/c the cost of all accessories/components required for proper operation , fully flexible for future upgradation and easy replacements for maintenance purposes,bucket elevator charges as approved and directed by the Engineer Incharge a) 140 Lm/Watt. (v) 50 Watt with 7000 Lumens *The LEDs shall be in compliance with latest NEECA/PEECA standards. Along with the minimum of 5 year Manufacturer's warrenty*	Each	2	50,172.95	100,345.90

Detail Design of Infrastructure Sub - Projects Sectoral Planning & Resident Supervision in 16 Cities of Punjab
Improvement, Widening and Raising of Road from Tank Chowk to Akbar Chowk along Canal Road, Okara
STREET LIGHTING NETWORK TANK CHOWK TO AKBAR ROAD VIA CANAL DISTRICT OKARA
ENGINEERING COST ESTIMATE (ELECTRICAL WORKS)

ITEM NO.	Okara 2022 2nd MRS Ref.	DESCRIPTION	UNIT	QTY	RATE (Rs.)	AMOUNT (Rs.)
Sub Head 5: Transformer & Energy Meter						
9	***24/105/iii***	Supply, installation, commissioning and testing of oil cooled type, Step down Power Transformer of specified rating,11/0.415 kV, i/c the cost of lifting hooks, thermometers, LT & HT bushing 5-steps, tap changer, imported double float buchholz relay, 2 earthing terminals, roller wheels, connecting terminals for cables M .S box on transformer i n order to cover complete L.T side, all necessary materials required for connections on H.T & L.T side,rated voltage 11000/415/240 V impedance 6.25% or as specified by WAPDA/IEC system earth: Delta / Star, neutral solidly earthed, i/c Wapda test i ng charges,complete in all respects made of PEL , Siemens, as approved and directed by the Engineer Incharge **iii) 25KVA**	Each	1	329,487.70	329,487.70
10	***24/77/b/ii***	Supply and erection of electric energy meter, including meter testing fee, etc. b)Three phase, 4 wires: ii) 3x50 Amp, 400 volts	Each	1	14,659.25	14,659.25
Sub Head 6: Earthing						
11	***24/70***	Earthing of iron clad/aluminum switches, etc. with G.I. wire No. 8 SWG in G.I. pipe 15 mm (½") dia, recessed or on surface of wall and floor, complete with 1.5 metre long G.I. pipe, 50 mm (2") dia with reducing socket 4 to 5 metre below ground level, and 2 metre away from building plinth.	Job	1	9,592.65	9,592.65
12	***24/71-i***	Earthing of Metallic cases, etc. with G.I. wire No. 8 SWG, in 15 mm (½") dia G.I. pipe, best quality:- i) on surface, including clamps, etc.	Each	530	141.40	74,942.00
TOTAL (Rs.)						**20,364,143.51**
TOTAL (Rs. In Million)						**20.364**

Detail Design of Infrastructure Sub - Projects Sectoral Planning & Resident Supervision in 16 Cities of Punjab
Improvement, Widening and Raising of Road from Tank Chowk to Akbar Chowk along Canal Road, Okara
STREET LIGHTING NETWORK TANK CHOWK TO AKBAR ROAD VIA CANAL DISTRICT OKARA
RATE ANALYSIS OF NON- SCHEDULE ITEMS OF ELECTRICAL WORKS

BOQ Item#	DESCRIPTION	Qty	Unit	Unit Price	Cost	Contractor Profit %		Amount in lieu of Tax		Total Material Cost	Freight Charges		Labour / Installation (With		Income Tax		Total Services Cost	Total Cost /unit	Total Cost
		a	b	c	d	e	f	g	h	m	n	o	p	q	x	y	z	cc	dd
					a x c		d x e		d x g	d + f + h		d x n		d x p		(o + q) * x	o + q + y	dd / a	m + z
					Pkr	%	Amount	%	Amount	Pkr	%	Amount	%	Amount	%	Amount	Pkr	Pkr	Pkr
							Pkr		Pkr			Pkr		Pkr					
2	Single Arm Pole Connection Plate 10 Meter	55	Each	2,396	131,802	20%	26,360	17%	22,406	180,569	5%	6,590	5%	6,590	7.5%	989	14,169	**3,541**	194,737
5	Photo Electric Switch Type (10 Amp)	1	Each	11,000	11,000	20%	2,200	17%	1,870	15,070	5%	550	5%	550	7.5%	83	1,183	**16,253**	16,253
11	Earthing (Bore Type)	1	Job	62,770	62,770	20%	12,554	17%	10,671	85,995	5%	3,139	5%	3,139	7.5%	471	6,748	**92,743**	92,743
12	Earthing (Rod Type)	55	Each	20,240	1,113,200	20%	222,640	17%	189,244	1,525,084	5%	55,660	5%	55,660	7.5%	8,349	119,669	**29,905**	1,644,753

Detail Design of Infrastructure Sub - Projects Sectoral Planning & Resident Supervision in 16 Cities of Punjab

Improvement, Widening and Raising of Road from Tank Chowk to Akbar Chowk along Canal Road, Okara

Sub - Head B **Rate Analysis of Raising of Man hole chambers**

MEASUEMENT SHEET & ESTIMATE

MRS, 2nd BI-ANNUAL-2022 (01.07.2022 to 31.12.2022) DISTRICT OKARA

Sr No.	Desription of Item	Quantity	Rate	Unit	Amount
	(Ch.4 item No.19.c)				
1	Dismantling cement concrete 1:2:4 plain.				
	1 x 3.142 x 2.58 x 0.75 x 0.50 = 3.0 Cft				
	Total = 3.0 Cft =	3.04 Cft	11174.60	100	Rs. 340
	(Ch.7 item No.7i)				
2	Pacca brick work other than building upto 10ft. (3 m) height in cement sand mortar ratio 1:3.				
	1 x 3.142 x 2.58 x 0.75 x 0.50 = 3.0 Cft				
	Total = 3.0 Cft =	3.04 Cft	33606.10	100	Rs. 1,022
	(Ch.6 item No.5f)				
3	Cement concrete plain including placing, compacting, finishing and curing complete (including screening and washing of stone aggregate):(f) Ratio 1: 2: 4.				
	Arround Manhole Cover				
	1 x 3.142 x 2.58 x 0.75 x 0.50 = 3.04				
	Total = 3.040 =	3.04 Cft	47016.25	100	Rs. 1,429
	(Ch. 11 item No.8b)				
4	Cement plaster 1:3 upto 20' (6.00 m) height:-½" (13 mm)				
	2 x 3.142 x 3.33 x 0.75 = 15.69 Sft =				
	2 x 3.142 x 3.33 x 0.50 = 10.46 Sft =				
	2 x 3.142 x 3.33 x 0.25 = 5.23 Sft =				
	2 x 3.142 x 3.33 x 0.50 = 10.46 Sft =				
	Total = 41.85 Sft =	41.85 Sft	3424.50	100	Rs. 1,433
5	NON MRS RPC Manhole Cover Manufactured with 100% Reinforced Plastic Composite Material, 650 mm dia with clear opening size 600 mm (24" dia) and RPC manhole frame having dia meter 790 mm (Complete) (Certified under ISO 9001-2015				
	MRS INPUT PRICE = 7,000.00 Installation 2,000.00 Sub-Total = 9,000.00 Contractor's Overheads and Profit 20% = 1,800.00 Total price for 1 Manhole cover = 10,800.00 =	1 No.	10800.00	1	Rs. 10,800
	(Ch. 4 item No.20)				
6	Dismantling cement concrete reinforced,separating reinforcement from concrete, cleaning and straightening the same.				
	Dismantling RCC of Existing Man Holes = 1 x 1.60 = 1.60 Cft =	1.60 Cft	18285.70	100	Rs. 292.57
		TOTAL (A) =			**Rs. 15,316**

	DEDUCT																	
7	Deduct Cost of old material available from Manhole covers with 80% depriciated weight &10% missing Covers i/c dismantling of RCC and seprating the steel bars.																	
	Old material																	
	i) C.I frame	=	1.0	x	0.90	x	37.324	x	0.80	=	26.9 Kg	=	26.87	Kg	60.00	1	Rs. 1,612
	RCC cover																	
	ii) M.S L-iron frame 2.5"x2.50"x.25" (22" dia)																	
	Length (each)	=	3.142	x	26-0.25/12	x	1.00	=	6.742	Rft								
	Weight (each)	=	6.742	x	2.5+2.5-0.25	x	0.25x480	=	12.11	Kg								
					12		12x12											
	wgt.for 1000	=	1.0	x	12.11	x				=	12.11 Kg							
	iii)1/2" M.S bars (Straight bars)																	
			No,s		Length		Weight/Rft		Total Wgt.									
	(Straight bars)	=	1.0	x	2.125	x	0.299	=	0.636	Kg								
		=	2.0	x	2.021	x	0.299	x	1.210	Kg								
		=	4.0	x	1.656	x	0.299	x	1.984	Kg								
					2.125+0.166+													
	(Bent up bars)	=	1.0	x	0.166	x	0.299	=	0.736	Kg								
					2.021+0.166+													
		=	2.0	x	0.166	x	0.299	x	1.472	Kg								
					2.125+0.138+													
		=	4.0	x	0.140	x	0.299	x	2.876	Kg								
	Upper Dit.Rong	=	3.142	x	1.50	x	0.299	x	1.411	Kg								
	Lower Dit.Rong	=	3.142	x	1.25	x	0.299	x	1.176	Kg								
	Over lap Dit.Ring	=	2.000	x	0.50	x	0.299	x	0.299	Kg								
							Total		11.800	Kg								
	wgt.for 811	=	1.0	x	0.90	x	11.80	x	0.800	=	8.50 Kg							
							Total (ii)+(iii)			=	21 Kg	=	20.61	Kg	90.00	1	Rs. 1,854
	Total cost of old material														**TOTAL (B) =**		**Rs. 3,467**	
															TOTAL (A-B) =		**Rs. 11,849**	

Detail Design of Infrastructure Sub - Projects Sectoral Planning & Resident Supervision in 16 Cities of Punjab

Improvement, Widening and Raising of Road from Tank Chowk to Akbar Chowk along Canal Road, Okara

MRS, 2nd BI-ANNUAL-2022 (01.07.2022 to 31.12.2022) DISTRICT OKARA **UNIT** **100 CFT**

Sr.No	Detail of Item	Unit			Rate	Amount
	RATE ANALYSIS FOR SUB - BASE **Chapter,18 - Item ,3a,ii,b - Page ,115**					
1	Providing and laying sub-base course of stone product of approved quality and grade, including placing, mixing, spreading and compaction of sub-base material to required depth, camber, grade to achieve 100%maximum modified AASHO dry density, including carriage of all material to site of work except gravel and. aggregate.					
ii)	Crushed stone aggregate.	100	Cft		8,925	8,925.00
	Chapter,1 - Item ,1 - Page ,3					
2	Carriage of 100 Cft. (2.83 cu.m) of all materials like stone aggregate, spawl, kankar lime (unslaked), surkhi, etc. or 150 Cft. (4.25 cu.m) of timber, by truck or by any other means owned by the contractor.					
	Carriage from Kirana Hills Quarry Okara to Pull 11 + Pull 11 to Kirana hills 165 + 1.4 = **166.5 Kms**					
	1st Km		Km	1.200	299.40	359.28
	2nd Km		Km	1.200	145.25	174.30
	3rd Km		Km	1.200	116.85	140.22
	4th Km		Km	1.200	85.30	102.36
	5th Km		Km	1.200	80.20	96.24
	6th Km		Km	1.200	79.00	94.80
	7th Km		Km	1.200	74.25	89.10
	8th Km		Km	1.200	73.50	88.20
	9th Km		Km	1.200	69.55	83.46
	10th Km		Km	1.200	65.70	78.84
	10th Kms to 166.4Kms = 156.4Kms 156.4		Km	1.200	57.25	10,744.68
	Total Carriage					**12,051.48**
	Total Rate for 100 Cft					**20,976.48**
	Rate Per Cft					**209.76**

Detail Design of Infrastructure Sub - Projects Sectoral Planning & Resident Supervision in 16 Cities of Punjab

Improvement, Widening and Raising of Road from Tank Chowk to Akbar Chowk along Canal Road, Okara

MRS, 2nd BI-ANNUAL-2022 (01.07.2022 to 31.12.2022) DISTRICT OKARA **UNIT** **100 CFT**

Sr.No	Detail of Item	Unit			Rate	Amount
	RATE ANALYSIS FOR BASE COURSE **Chapter,18 - Item ,4 (a) page ,116**					
1	Providing and laying base course of crushed stone aggregate of approved quality and grade, and supply and spreading of stone screening, including placing, mixing, spreading and compaction of base course material to required depth, camber and grade to achieve 100%maximum modified AASHO dry density, including carriage of all materials to site of work except gravel and. aggregate.					
ii)	Crushed stone aggregate.	100	Cft		14,002.60	14,002.60
	Chapter,1 - Item ,1 - Page ,3					
2	Carriage of 100 Cft. (2.83 cu.m) of all materials like stone aggregate, spawl, kankar lime (unslaked), surkhi, etc. or 150 Cft. (4.25 cu.m) of timber, by truck or by any other means owned by the contractor.					
	Carriage from Kirana Hills Quarry Okara to Pull 11 + Pull 11 to Kirana hills 165 + 1.4 = **166.5 Kms**					
	1st Km		Km	1.220	299.40	365.27
	2nd Km		Km	1.220	145.25	177.21
	3rd Km		Km	1.220	116.85	142.56
	4th Km		Km	1.220	85.30	104.07
	5th Km		Km	1.220	80.20	97.84
	6th Km		Km	1.220	79.00	96.38
	7th Km		Km	1.220	74.25	90.59
	8th Km		Km	1.220	73.50	89.67
	9th Km		Km	1.220	69.55	84.85
	10th Km		Km	1.220	65.70	80.15
	10th Kms to 166.4Kms = 156.4Kms 156.4		Km	1.220	57.25	10,923.76
	Total Carriage					**12,252.34**
	Total Rate for 100 Cft					**26,254.94**
	Rate Per Cft					**262.55**

Detail Design of Infrastructure Sub - Projects Sectoral Planning & Resident Supervision in 16 Cities of Punjab

Improvement, Widening and Raising of Road from Tank Chowk to Akbar Chowk along Canal Road, Okara

MRS, 2nd BI-ANNUAL-2022 (01.07.2022 to 31.12.2022) DISTRICT OKARA **UNIT** **100 CFT**

Sr.No	Detail of Item	Unit			Rate	Amount
	RATE ANALYSIS FOR PCC 1:4:8					
	Chapter,6 - Item ,5 (i)					
1	Cement concrete plain including placing, compacting, finishing and curing complete (including screening and washing of stone aggregate					
	(i) Ratio 1: 4: 8					
ii)	Crushed stone aggregate.	100	Cft		28,986.90	28,986.90
	Chapter,1 - Item ,1 - Page ,3					
2	Carriage of 100 Cft. (2.83 cu.m) of all materials like stone aggregate, spawl, kankar lime (unslaked), surkhi, etc. or 150 Cft. (4.25 cu.m) of timber, by truck or by any other means owned by the contractor.					
	Carriage from Kirana Hills Quarry					
	Okara to Pull 11 + Pull 11 to Kirana hills					
	165 + 1.4 = **166.5 Kms**					
	Consumption Factor = 1.54 x 8 / 13					
	1st Km		Km	0.948	299.40	283.74
	2nd Km		Km	0.948	145.25	137.65
	3rd Km		Km	0.948	116.85	110.74
	4th Km		Km	0.948	85.30	80.84
	5th Km		Km	0.948	80.20	76.00
	6th Km		Km	0.948	79.00	74.87
	7th Km		Km	0.948	74.25	70.37
	8th Km		Km	0.948	73.50	69.66
	9th Km		Km	0.948	69.55	65.91
	10th Km		Km	0.948	65.70	62.26
	10th Kms to 166.4Kms = 156.4Kms 156.4		Km	0.948	57.25	8,485.54
	Total Carriage					**9,517.58**
	Total Rate for 100 Cft					**38,504.48**
	Rate Per Cft					**385.04**

Detail Design of Infrastructure Sub - Projects Sectoral Planning & Resident Supervision in 16 Cities of Punjab

Improvement, Widening and Raising of Road from Tank Chowk to Akbar Chowk along Canal Road, Okara

MRS, 2nd BI-ANNUAL-2022 (01.07.2022 to 31.12.2022) DISTRICT OKARA **UNIT** **100 CFT**

Sr.No	Detail of Item	Unit			Rate	Amount
	RATE ANALYSIS FOR PCC 1:2:4					
	Chapter,6 - Item ,5 (f)					
1	Cement concrete plain including placing, compacting, finishing and curing complete (including screening and washing of stone aggregate (f) Ratio 1: 2: 4					
ii)	Crushed stone aggregate.	100	Cft		38,178.50	38,178.50
	Chapter,1 - Item ,1 - Page ,3					
2	Carriage of 100 Cft. (2.83 cu.m) of all materials like stone aggregate, spawl, kankar lime (unslaked), surkhi, etc. or 150 Cft. (4.25 cu.m) of timber, by truck or by any other means owned by the contractor.					
	Carriage from Kirana Hills Quarry					
	Okara to Pull 11 + Pull 11 to Kirana hills					
	165 + 1.4 = **166.5 Kms**					
	Consumption Factor = 1.54 x 4 / 7					
	1st Km		Km	0.880	299.40	263.47
	2nd Km		Km	0.880	145.25	127.82
	3rd Km		Km	0.880	116.85	102.83
	4th Km		Km	0.880	85.30	75.06
	5th Km		Km	0.880	80.20	70.58
	6th Km		Km	0.880	79.00	69.52
	7th Km		Km	0.880	74.25	65.34
	8th Km		Km	0.880	73.50	64.68
	9th Km		Km	0.880	69.55	61.20
	10th Km		Km	0.880	65.70	57.82
	10th Kms to 166.4Kms = 156.4Kms 156.4		Km	0.880	57.25	7,879.43
	Total Carriage					**8,837.75**
	Total Rate for 100 Cft					**47,016.25**
	Rate Per Cft					**470.16**

Detail Design of Infrastructure Sub - Projects Sectoral Planning & Resident Supervision in 16 Cities of Punjab

Improvement, Widening and Raising of Road from Tank Chowk to Akbar Chowk along Canal Road, Okara

MRS, 2nd BI-ANNUAL-2022 (01.07.2022 to 31.12.2022) DISTRICT OKARA — **UNIT** **100 CFT**

Sr.No	Detail of Item	Unit			Rate	Amount
	RATE ANALYSIS FOR RCC 1:2:4					
	Chapter,6 - Item ,6-a-i-3					
1	Providing and laying reinforced cement concrete (including prestressed a) (i) Reinforced cement concrete in roof slab, beams,columns lintels, girders and other structural members laid in situ or precast laid in position, or prestressed members cast in situ, complete in all respects:-					
	(3) Type C (nominal mix 1: 2: 4)					
ii)	Crushed stone aggregate.	100	Cft	100.000	556.50	55,650.00
	Chapter,1 - Item ,1 - Page ,3					
2	Carriage of 100 Cft. (2.83 cu.m) of all materials like stone aggregate, spawl, kankar lime (unslaked), surkhi, etc. or 150 Cft. (4.25 cu.m) of timber, by truck or by any other means owned by the contractor.					
	Carriage from Kirana Hills Quarry					
	Okara to Pull 11 + Pull 11 to Kirana hills					
	165 + 1.4 = **166.5 Kms**					
	Consumption Factor = 1.54 x 4 / 7					
	1st Km		Km	0.880	299.40	263.47
	2nd Km		Km	0.880	145.25	127.82
	3rd Km		Km	0.880	116.85	102.83
	4th Km		Km	0.880	85.30	75.06
	5th Km		Km	0.880	80.20	70.58
	6th Km		Km	0.880	79.00	69.52
	7th Km		Km	0.880	74.25	65.34
	8th Km		Km	0.880	73.50	64.68
	9th Km		Km	0.880	69.55	61.20
	10th Km		Km	0.880	65.70	57.82
	10th Kms to 166.4Kms = 156.4Kms 156.4		Km	0.880	57.25	7,879.43
	Total Carriage					**8,837.75**
	Total Rate for 100 Cft					**64,487.75**
	Rate Per Cft					**644.88**

Detail Design of Infrastructure Sub - Projects Sectoral Planning & Resident Supervision in 16 Cities of Punjab

Improvement, Widening and Raising of Road from Tank Chowk to Akbar Chowk along Canal Road, Okara

MRS, 2nd BI-ANNUAL-2022 (01.07.2022 to 31.12.2022) DISTRICT OKARA — **UNIT** **100 CFT**

Sr.No	Detail of Item	Unit			Rate	Amount
	RATE ANALYSIS FOR RCC 1:1:2					
	Chapter,6 - Item ,6-a-i-3					
1	Providing and laying reinforced cement concrete (including prestressed a) (i) Reinforced cement concrete in roof slab, beams,columns lintels, girders and other structural members laid in situ or precast laid in position, or prestressed members cast in situ, complete in all respects:-					
	1) Type A (nominal mix 1:1:2)					
ii)	Crushed stone aggregate.	100	Cft	100.000	716.30	71,630.00
	Chapter,1 - Item ,1 - Page ,3					
2	Carriage of 100 Cft. (2.83 cu.m) of all materials like stone aggregate, spawl, kankar lime (unslaked), surkhi, etc. or 150 Cft. (4.25 cu.m) of timber, by truck or by any other means owned by the contractor.					
	Carriage from Kirana Hills Quarry					
	Okara to Pull 11 + Pull 11 to Kirana hills					
	165 + 1.4 = **166.5 Kms**					
	Consumption Factor = 1.54 x 2 / 4					
	1st Km		Km	0.770	299.40	230.54
	2nd Km		Km	0.770	145.25	111.84
	3rd Km		Km	0.770	116.85	89.97
	4th Km		Km	0.770	85.30	65.68
	5th Km		Km	0.770	80.20	61.75
	6th Km		Km	0.770	79.00	60.83
	7th Km		Km	0.770	74.25	57.17
	8th Km		Km	0.770	73.50	56.60
	9th Km		Km	0.770	69.55	53.55
	10th Km		Km	0.770	65.70	50.59
	10th Kms to 166.4Kms = 156.4Kms 156.4		Km	0.770	57.25	6,894.50
	Total Carriage					**7,733.03**
	Total Rate for 100 Cft					**79,363.03**
	Rate Per Cft					**793.63**

Detail Design of Infrastructure Sub - Projects Sectoral Planning & Resident Supervision in 16 Cities of Punjab

Improvement, Widening and Raising of Road from Tank Chowk to Akbar Chowk along Canal Road, Okara

MRS, 2nd BI-ANNUAL-2022 (01.07.2022 to 31.12.2022) DISTRICT OKARA — **UNIT** **100 CFT**

Sr.No	Detail of Item	Unit			Rate	Amount
	RATE ANALYSIS FOR PLANT MIX BITUMEN 2" THICK					
	Chapter,18 - Item ,10a					
1 iv)	Providing and laying plant premixed bituminous 2" thick iv) 4.5% Bitumen	100	Sft	100	15,056.50	15,056.50
	Chapter,1 - Item ,1 - Page ,3					
2	Carriage of 100 Cft. (2.83 cu.m) of all materials like stone					
	Carriage from Kirana Hills Quarry					
	Okara to Pull 11 + Pull 11 to Kirana hills					
	165 + 1.4 = **166.5 Kms**					
	Consumption Factor = 1.54 x 2 / 4					
	1st Km		Km	0.1400	299.40	41.92
	2nd Km		Km	0.1400	145.25	20.34
	3rd Km		Km	0.1400	116.85	16.36
	4th Km		Km	0.1400	85.30	11.94
	5th Km		Km	0.1400	80.20	11.23
	6th Km		Km	0.1400	79.00	11.06
	7th Km		Km	0.1400	74.25	10.40
	8th Km		Km	0.1400	73.50	10.29
	9th Km		Km	0.1400	69.55	9.74
	10th Km		Km	0.1400	65.70	9.20
	10th Kms to 166.4Kms = 156.4Kms	156	Km	0.1400	57.25	1,253.55
	Total Carriage					**1,406.01**
	Total Rate for 100 Cft					**16,462.51**
	Rate Per Cft					**164.63**

Detail Design of Infrastructure Sub - Projects Sectoral Planning & Resident Supervision in 16 Cities of Punjab

Improvement, Widening and Raising of Road from Tank Chowk to Akbar Chowk along Canal Road, Okara

MRS, 2nd BI-ANNUAL-2022 (01.07.2022 to 31.12.2022) DISTRICT OKARA

Sr.No	Mrs Chap	Mrs Item	Detail of Item	Unit	Rate (Rs)	Amount (Rs)
			A) EXCAVATION FOR PITS			
	3	7 - i	Earthwork excavation in open cutting upto 5'-0" (1.5 m) depth for storm water			
			i) Ordinary Soil	1000 cft	9,016.70	9016.7
			B) EXTRA FOR TRANSPORTATION UPTO 3 KM			
	3	17	Transportation of earth all types when the total distance, including the lead covered in the item of work, is more than 1000 ft. (300 m)			
			2) This rate will be paid inaddition to the rate of earthwork, without deducting the			
			a) upto ¼ mile (400 m).	1000 Cft	4248.00	4248.00
			b) for every 330 ft. (100 m) additional lead or part thereof,beyond ¼ mile (400 m) upto one mile. (1.6 Km.)			
			1600 - 400 = 1200 ÷ 100 = 12 x 47.5 = 570			
			Total 570			570.00
			c) for every ¼ mile (400 m) additional lead or part thereof,beyond one mile (1.6 Km.) upto 5 mile (8 Km).			
			3000 - 1600 = 1400 ÷ 400 = 3.5 x 338 = 1184			
			Total 1184			1184.40
			S - TOTAL (B)			**6,002.40**
			TOTAL (A+B)	1000 Cft		**15,019.10**
		A)	**A) COST OF SWEET SOIL REQUIRED FOR TREE PITS**			
	N/S		Expected cost taken for estimation	1000 cft	3,500.00	3,500.00
			B) EXCAVATION FOR PITS			
	3	7 - i	Earthwork excavation in open cutting upto 5'-0" (1.5 m) depth for storm water			
			i) Ordinary Soil	1000 cft	9,016.70	9,016.70
			C) EXTRA FOR TRANSPORTATION UPTO 3 KM			
	3	17	Transportation of earth all types when the total distance, including the lead			
			2) This rate will be paid inaddition to the rate of earthwork, without deducting the			
			a) upto ¼ mile (400 m).	1000 Cft	4248.00	4248.00
			b) for every 330 ft. (100 m) additional lead or part thereof,beyond ¼ mile (400 m) upto one mile. (1.6 Km.)			
			1600 - 400 = 1200 ÷ 100 = 12 x 47.5 = 570			
			Total 570			570.00
			c) for every ¼ mile (400 m) additional lead or part thereof,beyond one mile (1.6 Km.) upto 5 mile (8 Km).			
			3000 - 1600 = 1400 ÷ 400 = 3.5 x 338 = 1184			
			Total 1184			1184.40
			S - TOTAL (B)			**6,002.40**
			TOTAL (A+B+C)	1000 Cft		**18,519.10**

		A)	**A) FERTILIZER**			
	N/S		cow manure fertilizer			
			Cost of Fertilizer	100 Bag	10.00	1,000.00
			B) MIXING WITH SWEET SOIL			-
	N/S		Mixing with sweet soil	100 Bag	2.00	200.00
			Total			-
			S - TOTAL (B)			**1,200.00**
			TOTAL (A+B+C)	1 Bags		**12.00**

Detail Design of Infrastructure Sub - Projects Sectoral Planning & Resident Supervision in 16 Cities of Punjab

Improvement, Widening and Raising of Road from Tank Chowk to Akbar Chowk along Canal Road, Okara

MRS, 2nd BI-ANNUAL-2022 (01.07.2022 to 31.12.2022) DISTRICT OKARA

Sr.No	Mrs		Detail of Item	Unit	Rate (Rs)	Amount (Rs)
	Chap	Item				
		A)	**A) TREES**			
	N/S		Terminalia Tree			
			Cost of Terminalia Tree	20 Eac	3,000.00	60,000.00
			B) TRANSPORTATION			
	N/S		Transportation to site and Plantation (Small Pick-up to be used)	1 Trip	1,000.00	1,000.00
			Total			
			S - TOTAL (B)			**61,000.00**
			TOTAL (A+B+C)	1 Bags		**3,050.00**

Detail Design of Infrastructure Sub - Projects Sectoral Planning &
Resident Supervision in 16 Cities of Punjab
Improvement, Widening and Raising of Road from Tank Chowk to Akbar Chowk along Canal Road, Okara
Calculation of Quantites

3-7-i

Basic Data									Excavation in Ordinary Soil		
	RD	Depth Reqired	Depth available	Depth available after removing old road	Further depth required	Width of New Carriage Way Rft	Width of Old Carriage Way Rft	Width of Expanded Carriage Way Rft	Excavation under AdditionalCarriage Way Area = Sft	Further depth required Rft	Quantity of Excavation Cft
	50	1.167	0.42	1.17	(0.00)	24.00	15.5	8.50	425.00		-
	100	1.167	0.62	1.37	(0.20)	24.00	15.5	8.50	425.00		-
	150	1.167	0.58	1.33	(0.16)	24.00	15.5	8.50	425.00		-
	200	1.167	0.49	1.24	(0.07)	24.00	15.5	8.50	425.00		-
	250	1.167	0.46	1.21	(0.04)	24.00	15.5	8.50	425.00		-
	300	1.167	0.35	1.10	0.07	24.00	15.5	8.50	425.00	0.07	28.48
	350	1.167	0.30	1.05	0.12	24.00	15.5	8.50	425.00	0.12	49.73
	400	1.167	0.21	0.96	0.21	24.00	15.5	8.50	425.00	0.21	87.98
	450	1.167	0.34	1.09	0.08	24.00	15.5	8.50	425.00	0.08	32.73
	500	1.167	0.52	1.27	(0.10)	24.00	15.5	8.50	425.00		-
	550	1.167	0.74	1.49	(0.32)	24.00	15.5	8.50	425.00		-
	600	1.167	0.79	1.54	(0.37)	24.00	15.5	8.50	425.00		-
	650	1.167	0.84	1.59	(0.42)	24.00	15.5	8.50	425.00		-
	700	1.167	0.89	1.64	(0.47)	24.00	15.5	8.50	425.00		-
	750	1.167	0.93	1.68	(0.51)	24.00	15.5	8.50	425.00		-
	800	1.167	0.88	1.63	(0.46)	24.00	15.5	8.50	425.00		-
	850	1.167	0.82	1.57	(0.40)	24.00	15.5	8.50	425.00		-
	900	1.167	0.94	1.69	(0.52)	24.00	15.5	8.50	425.00		-
	950	1.167	0.95	1.70	(0.53)	24.00	15.5	8.50	425.00		-
	1000	1.167	0.85	1.60	(0.43)	24.00	15.5	8.50	425.00		-
	1050	1.167	0.81	1.56	(0.39)	24.00	15.5	8.50	425.00		-
	1100	1.167	0.84	1.59	(0.42)	24.00	15.5	8.50	425.00		-
	1150	1.167	0.77	1.52	(0.35)	24.00	15.5	8.50	425.00		-
	1200	1.167	0.70	1.45	(0.28)	24.00	15.5	8.50	425.00		-
	1250	1.167	0.61	1.36	(0.19)	24.00	15.5	8.50	425.00		-
	1300	1.167	0.50	1.25	(0.08)	24.00	15.5	8.50	425.00		-
	1350	1.167	0.47	1.22	(0.05)	24.00	15.5	8.50	425.00		-
	1400	1.167	0.52	1.27	(0.10)	24.00	15.5	8.50	425.00		-
	1450	1.167	0.52	1.27	(0.10)	24.00	15.5	8.50	425.00		-
	1500	1.167	0.54	1.29	(0.12)	24.00	15.5	8.50	425.00		-
	1550	1.167	0.60	1.35	(0.18)	24.00	15.5	8.50	425.00		-
	1600	1.167	0.69	1.44	(0.27)	24.00	15.5	8.50	425.00		-
	1650	1.167	0.71	1.46	(0.29)	24.00	15.5	8.50	425.00		-
	1700	1.167	0.60	1.35	(0.18)	24.00	15.5	8.50	425.00		-
	1750	1.167	0.48	1.23	(0.06)	24.00	15.5	8.50	425.00		-
	1800	1.167	0.53	1.28	(0.11)	24.00	15.5	8.50	425.00		-
	1850	1.167	0.61	1.36	(0.19)	24.00	15.5	8.50	425.00		-
	1900	1.167	0.70	1.45	(0.28)	24.00	15.5	8.50	425.00		-
	1950	1.167	0.79	1.54	(0.37)	24.00	15.5	8.50	425.00		-
	2000	1.167	0.89	1.64	(0.47)	24.00	15.5	8.50	425.00		-
	2050	1.167	0.96	1.71	(0.54)	24.00	14	10.00	500.00		-
	2100	1.167	0.80	1.55	(0.38)	24.00	14	10.00	500.00		-
	2150	1.167	0.64	1.39	(0.22)	24.00	14	10.00	500.00		-

Detail Design of Infrastructure Sub - Projects Sectoral Planning &
Resident Supervision in 16 Cities of Punjab
Improvement, Widening and Raising of Road from Tank Chowk to Akbar Chowk along Canal Road, Okara
Calculation of Quantites

Basic Data								Excavation in Ordinary Soil		
2200	1.167	0.48	1.23	(0.06)	24.00	14	10.00	500.00		-
2250	1.167	0.48	1.23	(0.06)	24.00	14	10.00	500.00		-
2300	1.167	0.42	1.17	(0.00)	24.00	14	10.00	500.00		-
2350	1.167	0.39	1.14	0.03	24.00	14	10.00	500.00	0.03	13.50
2400	1.167	0.58	1.33	(0.16)	24.00	14	10.00	500.00		-
2450	1.167	0.77	1.52	(0.35)	24.00	14	10.00	500.00		-
2500	1.167	0.91	1.66	(0.49)	24.00	14	10.00	500.00		-
2550	1.167	0.86	1.61	(0.44)	24.00	14	10.00	500.00		-
2600	1.167	0.87	1.62	(0.45)	24.00	14	10.00	500.00		-
2650	1.167	0.91	1.66	(0.49)	24.00	14	10.00	500.00		-
2700	1.167	0.91	1.66	(0.49)	24.00	14	10.00	500.00		-
2750	1.167	0.88	1.63	(0.46)	24.00	14	10.00	500.00		-
2800	1.167	0.88	1.63	(0.46)	24.00	14	10.00	500.00		-
2850	1.167	0.90	1.65	(0.48)	24.00	14	10.00	500.00		-
2900	1.167	0.86	1.61	(0.44)	24.00	14	10.00	500.00		-
2950	1.167	0.86	1.61	(0.44)	24.00	14	10.00	500.00		-
3000	1.167	0.89	1.64	(0.47)	24.00	14	10.00	500.00		-
3050	1.167	0.80	1.55	(0.38)	24.00	14	10.00	500.00		-
3100	1.167	0.77	1.52	(0.35)	24.00	14	10.00	500.00		-
3150	1.167	0.80	1.55	(0.38)	24.00	14	10.00	500.00		-
3200	1.167	0.81	1.56	(0.39)	24.00	14	10.00	500.00		-
3250	1.167	0.79	1.54	(0.37)	24.00	14	10.00	500.00		-
3300	1.167	0.73	1.48	(0.31)	24.00	14	10.00	500.00		-
3350	1.167	0.66	1.41	(0.24)	24.00	14	10.00	500.00		-
3400	1.167	0.63	1.38	(0.21)	24.00	14	10.00	500.00		-
3450	1.167	0.66	1.41	(0.24)	24.00	14	10.00	500.00		-
3500	1.167	0.64	1.39	(0.22)	24.00	14	10.00	500.00		-
3550	1.167	0.53	1.28	(0.11)	24.00	14	10.00	500.00		-
3600	1.167	0.54	1.29	(0.12)	24.00	14	10.00	500.00		-
3650	1.167	0.59	1.34	(0.17)	24.00	14	10.00	500.00		-
3700	1.167	0.77	1.52	(0.35)	24.00	14	10.00	500.00		-
3750	1.167	0.87	1.62	(0.45)	24.00	14	10.00	500.00		-
3800	1.167	0.90	1.65	(0.48)	24.00	14	10.00	500.00		-
3850	1.167	0.88	1.63	(0.46)	24.00	14	10.00	500.00		-
3900	1.167	0.86	1.61	(0.44)	24.00	14	10.00	500.00		-
3950	1.167	0.78	1.53	(0.36)	24.00	14	10.00	500.00		-
4000	1.167	0.71	1.46	(0.29)	24.00	14	10.00	500.00		-
4050	1.167	0.67	1.42	(0.25)	24.00	14	10.00	500.00		-
4100	1.167	0.72	1.47	(0.30)	24.00	14	10.00	500.00		-
4150	1.167	0.76	1.51	(0.34)	24.00	14	10.00	500.00		-
4200	1.167	0.81	1.56	(0.39)	24.00	14	10.00	500.00		-
4250	1.167	0.82	1.57	(0.40)	24.00	14	10.00	500.00		-
4300	1.167	0.76	1.51	(0.34)	24.00	14	10.00	500.00		-
4350	1.167	0.72	1.47	(0.30)	24.00	14	10.00	500.00		-
4400	1.167	0.69	1.44	(0.27)	24.00	14	10.00	500.00		-
4450	1.167	0.63	1.38	(0.21)	24.00	14	10.00	500.00		-
4500	1.167	0.54	1.29	(0.12)	24.00	14	10.00	500.00		-
4550	1.167	0.41	1.16	0.01	24.00	14	10.00	500.00	0.01	3.50
4600	1.167	0.31	1.06	0.11	24.00	14	10.00	500.00	0.11	53.50
4650	1.167	0.39	1.14	0.03	24.00	14	10.00	500.00	0.03	13.50

Detail Design of Infrastructure Sub - Projects Sectoral Planning &
Resident Supervision in 16 Cities of Punjab
Improvement, Widening and Raising of Road from Tank Chowk to Akbar Chowk along Canal Road, Okara
Calculation of Quantites

3-7-i

Basic Data								Excavation in Ordinary Soil		
4700	1.167	0.41	1.16	0.01	24.00	14	10.00	500.00	0.01	3.50
4750	1.167	0.31	1.06	0.11	24.00	14.5	9.50	475.00	0.11	50.83
4800	1.167	0.25	1.00	0.17	24.00	14.5	9.50	475.00	0.17	79.33
4850	1.167	0.22	0.97	0.20	24.00	14.5	9.50	475.00	0.20	93.58
4900	1.167	0.24	0.99	0.18	24.00	14.5	9.50	475.00	0.18	84.08
4950	1.167	0.30	1.05	0.12	24.00	14.5	9.50	475.00	0.12	55.58
5000	1.167	0.30	1.05	0.12	24.00	14.5	9.50	475.00	0.12	55.58
5050	1.167	0.31	1.06	0.11	24.00	14.5	9.50	475.00	0.11	50.83
5100	1.167	0.39	1.14	0.03	24.00	14.5	9.50	475.00	0.03	12.83
5150	1.167	0.42	1.17	(0.00)	24.00	14.5	9.50	475.00		-
5200	1.167	0.37	1.12	0.05	24.00	14.5	9.50	475.00	0.05	22.33
5250	1.167	0.37	1.12	0.05	24.00	14.5	9.50	475.00	0.05	22.33
5300	1.167	0.37	1.12	0.05	24.00	14.5	9.50	475.00	0.05	22.33
5350	1.167	0.36	1.11	0.06	24.00	14.5	9.50	475.00	0.06	27.08
5400	1.167	0.38	1.13	0.04	24.00	14.5	9.50	475.00	0.04	17.58
5450	1.167	0.39	1.14	0.03	24.00	14.5	9.50	475.00	0.03	12.83
5500	1.167	0.23	0.98	0.19	24.00	14.5	9.50	475.00	0.19	88.83
5550	1.167	0.09	0.84	0.33	24.00	14.5	9.50	475.00	0.33	155.33
5600	1.167	0.05	0.80	0.37	24.00	14.5	9.50	475.00	0.37	174.33
5650	1.167	0.24	0.99	0.18	24.00	14.5	9.50	475.00	0.18	84.08
5700	1.167	0.42	1.17	(0.00)	24.00	14.5	9.50	475.00		-
5750	1.167	0.58	1.33	(0.16)	24.00	14.5	9.50	475.00		-
5800	1.167	0.91	1.66	(0.49)	24.00	14.5	9.50	475.00		-
5850	1.167	1.34	2.09	(0.92)	24.00	14.5	9.50	475.00		-
5900	1.167	1.77	2.52	(1.35)	24.00	14.5	9.50	475.00		-
5950	1.167	1.81	2.56	(1.39)	24.00	14.5	9.50	475.00		-
6000	1.167	1.86	2.61	(1.44)	24.00	14.5	9.50	475.00		-
6050	1.167	1.91	2.66	(1.49)	24.00	14.5	9.50	475.00		-
6100	1.167	1.44	2.19	(1.02)	24.00	14.5	9.50	475.00		-
6152	1.167	0.07	0.82	0.35	24.00	14.5	9.50	494.00	0.35	171.42
	TOTAL QUANTITY									**1,567.53**

Detail Design of Infrastructure Sub - Projects Sectoral Planning &
Resident Supervision in 16 Cities of Punjab
Improvement, Widening and Raising of Road from Tank Chowk to Akbar Chowk along
Calculation of Quantites

3-5-i

Basic Data									Filling in Carriage Way Area		
	RD	Depth Reqired	Depth available	Depth available after removing old road	Further depth required	Width of New Carriage Way Rft	Width of Old Carriage Way Rft	Width of Expanded Carriage Way Rft	Excavation under AdditionalCarriage Way Area = Sft	Filling Depth available Ft	Total Filly Quantity Cft
	50	1.167	0.42	1.17	(0.00)	24.00	15.5	8.50	425.00	0.00	1.27
	100	1.167	0.62	1.37	(0.20)	24.00	15.5	8.50	425.00	0.20	86.28
	150	1.167	0.58	1.33	(0.16)	24.00	15.5	8.50	425.00	0.16	69.28
	200	1.167	0.49	1.24	(0.07)	24.00	15.5	8.50	425.00	0.07	31.03
	250	1.167	0.46	1.21	(0.04)	24.00	15.5	8.50	425.00	0.04	18.28
	300	1.167	0.35	1.10	0.07	24.00	15.5	8.50	425.00		-
	350	1.167	0.30	1.05	0.12	24.00	15.5	8.50	425.00		-
	400	1.167	0.21	0.96	0.21	24.00	15.5	8.50	425.00		-
	450	1.167	0.34	1.09	0.08	24.00	15.5	8.50	425.00		-
	500	1.167	0.52	1.27	(0.10)	24.00	15.5	8.50	425.00	0.10	43.78
	550	1.167	0.74	1.49	(0.32)	24.00	15.5	8.50	425.00	0.32	137.28
	600	1.167	0.79	1.54	(0.37)	24.00	15.5	8.50	425.00	0.37	158.53
	650	1.167	0.84	1.59	(0.42)	24.00	15.5	8.50	425.00	0.42	179.78
	700	1.167	0.89	1.64	(0.47)	24.00	15.5	8.50	425.00	0.47	201.03
	750	1.167	0.93	1.68	(0.51)	24.00	15.5	8.50	425.00	0.51	218.03
	800	1.167	0.88	1.63	(0.46)	24.00	15.5	8.50	425.00	0.46	196.78
	850	1.167	0.82	1.57	(0.40)	24.00	15.5	8.50	425.00	0.40	171.28
	900	1.167	0.94	1.69	(0.52)	24.00	15.5	8.50	425.00	0.52	222.28
	950	1.167	0.95	1.70	(0.53)	24.00	15.5	8.50	425.00	0.53	226.53
	1000	1.167	0.85	1.60	(0.43)	24.00	15.5	8.50	425.00	0.43	184.03
	1050	1.167	0.81	1.56	(0.39)	24.00	15.5	8.50	425.00	0.39	167.03
	1100	1.167	0.84	1.59	(0.42)	24.00	15.5	8.50	425.00	0.42	179.78
	1150	1.167	0.77	1.52	(0.35)	24.00	15.5	8.50	425.00	0.35	150.03
	1200	1.167	0.70	1.45	(0.28)	24.00	15.5	8.50	425.00	0.28	120.28
	1250	1.167	0.61	1.36	(0.19)	24.00	15.5	8.50	425.00	0.19	82.02
	1300	1.167	0.50	1.25	(0.08)	24.00	15.5	8.50	425.00	0.08	35.28
	1350	1.167	0.47	1.22	(0.05)	24.00	15.5	8.50	425.00	0.05	22.53
	1400	1.167	0.52	1.27	(0.10)	24.00	15.5	8.50	425.00	0.10	43.78
	1450	1.167	0.52	1.27	(0.10)	24.00	15.5	8.50	425.00	0.10	43.78
	1500	1.167	0.54	1.29	(0.12)	24.00	15.5	8.50	425.00	0.12	52.28
	1550	1.167	0.60	1.35	(0.18)	24.00	15.5	8.50	425.00	0.18	77.78
	1600	1.167	0.69	1.44	(0.27)	24.00	15.5	8.50	425.00	0.27	116.03
	1650	1.167	0.71	1.46	(0.29)	24.00	15.5	8.50	425.00	0.29	124.53
	1700	1.167	0.60	1.35	(0.18)	24.00	15.5	8.50	425.00	0.18	77.78
	1750	1.167	0.48	1.23	(0.06)	24.00	15.5	8.50	425.00	0.06	26.78
	1800	1.167	0.53	1.28	(0.11)	24.00	15.5	8.50	425.00	0.11	48.03
	1850	1.167	0.61	1.36	(0.19)	24.00	15.5	8.50	425.00	0.19	82.02
	1900	1.167	0.70	1.45	(0.28)	24.00	15.5	8.50	425.00	0.28	120.28
	1950	1.167	0.79	1.54	(0.37)	24.00	15.5	8.50	425.00	0.37	158.53
	2000	1.167	0.89	1.64	(0.47)	24.00	15.5	8.50	425.00	0.47	201.03
	2050	1.167	0.96	1.71	(0.54)	24.00	14	10.00	500.00	0.54	271.50
	2100	1.167	0.80	1.55	(0.38)	24.00	14	10.00	500.00	0.38	191.50
	2150	1.167	0.64	1.39	(0.22)	24.00	14	10.00	500.00	0.22	111.50

Detail Design of Infrastructure Sub - Projects Sectoral Planning &
Resident Supervision in 16 Cities of Punjab
Improvement, Widening and Raising of Road from Tank Chowk to Akbar Chowk along
Calculation of Quantites

3-5-i

Basic Data								Filling in Carriage Way Area		
2200	1.167	0.48	1.23	(0.06)	24.00	14	10.00	500.00	0.06	31.50
2250	1.167	0.48	1.23	(0.06)	24.00	14	10.00	500.00	0.06	31.50
2300	1.167	0.42	1.17	(0.00)	24.00	14	10.00	500.00	0.00	1.50
2350	1.167	0.39	1.14	0.03	24.00	14	10.00	500.00		-
2400	1.167	0.58	1.33	(0.16)	24.00	14	10.00	500.00	0.16	81.50
2450	1.167	0.77	1.52	(0.35)	24.00	14	10.00	500.00	0.35	176.50
2500	1.167	0.91	1.66	(0.49)	24.00	14	10.00	500.00	0.49	246.50
2550	1.167	0.86	1.61	(0.44)	24.00	14	10.00	500.00	0.44	221.50
2600	1.167	0.87	1.62	(0.45)	24.00	14	10.00	500.00	0.45	226.50
2650	1.167	0.91	1.66	(0.49)	24.00	14	10.00	500.00	0.49	246.50
2700	1.167	0.91	1.66	(0.49)	24.00	14	10.00	500.00	0.49	246.50
2750	1.167	0.88	1.63	(0.46)	24.00	14	10.00	500.00	0.46	231.50
2800	1.167	0.88	1.63	(0.46)	24.00	14	10.00	500.00	0.46	231.50
2850	1.167	0.90	1.65	(0.48)	24.00	14	10.00	500.00	0.48	241.50
2900	1.167	0.86	1.61	(0.44)	24.00	14	10.00	500.00	0.44	221.50
2950	1.167	0.86	1.61	(0.44)	24.00	14	10.00	500.00	0.44	221.50
3000	1.167	0.89	1.64	(0.47)	24.00	14	10.00	500.00	0.47	236.50
3050	1.167	0.80	1.55	(0.38)	24.00	14	10.00	500.00	0.38	191.50
3100	1.167	0.77	1.52	(0.35)	24.00	14	10.00	500.00	0.35	176.50
3150	1.167	0.80	1.55	(0.38)	24.00	14	10.00	500.00	0.38	191.50
3200	1.167	0.81	1.56	(0.39)	24.00	14	10.00	500.00	0.39	196.50
3250	1.167	0.79	1.54	(0.37)	24.00	14	10.00	500.00	0.37	186.50
3300	1.167	0.73	1.48	(0.31)	24.00	14	10.00	500.00	0.31	156.50
3350	1.167	0.66	1.41	(0.24)	24.00	14	10.00	500.00	0.24	121.50
3400	1.167	0.63	1.38	(0.21)	24.00	14	10.00	500.00	0.21	106.50
3450	1.167	0.66	1.41	(0.24)	24.00	14	10.00	500.00	0.24	121.50
3500	1.167	0.64	1.39	(0.22)	24.00	14	10.00	500.00	0.22	111.50
3550	1.167	0.53	1.28	(0.11)	24.00	14	10.00	500.00	0.11	56.50
3600	1.167	0.54	1.29	(0.12)	24.00	14	10.00	500.00	0.12	61.50
3650	1.167	0.59	1.34	(0.17)	24.00	14	10.00	500.00	0.17	86.50
3700	1.167	0.77	1.52	(0.35)	24.00	14	10.00	500.00	0.35	176.50
3750	1.167	0.87	1.62	(0.45)	24.00	14	10.00	500.00	0.45	226.50
3800	1.167	0.90	1.65	(0.48)	24.00	14	10.00	500.00	0.48	241.50
3850	1.167	0.88	1.63	(0.46)	24.00	14	10.00	500.00	0.46	231.50
3900	1.167	0.86	1.61	(0.44)	24.00	14	10.00	500.00	0.44	221.50
3950	1.167	0.78	1.53	(0.36)	24.00	14	10.00	500.00	0.36	181.50
4000	1.167	0.71	1.46	(0.29)	24.00	14	10.00	500.00	0.29	146.50
4050	1.167	0.67	1.42	(0.25)	24.00	14	10.00	500.00	0.25	126.50
4100	1.167	0.72	1.47	(0.30)	24.00	14	10.00	500.00	0.30	151.50
4150	1.167	0.76	1.51	(0.34)	24.00	14	10.00	500.00	0.34	171.50
4200	1.167	0.81	1.56	(0.39)	24.00	14	10.00	500.00	0.39	196.50
4250	1.167	0.82	1.57	(0.40)	24.00	14	10.00	500.00	0.40	201.50
4300	1.167	0.76	1.51	(0.34)	24.00	14	10.00	500.00	0.34	171.50
4350	1.167	0.72	1.47	(0.30)	24.00	14	10.00	500.00	0.30	151.50
4400	1.167	0.69	1.44	(0.27)	24.00	14	10.00	500.00	0.27	136.50
4450	1.167	0.63	1.38	(0.21)	24.00	14	10.00	500.00	0.21	106.50
4500	1.167	0.54	1.29	(0.12)	24.00	14	10.00	500.00	0.12	61.50
4550	1.167	0.41	1.16	0.01	24.00	14	10.00	500.00		-
4600	1.167	0.31	1.06	0.11	24.00	14	10.00	500.00		-
4650	1.167	0.39	1.14	0.03	24.00	14	10.00	500.00		-

Detail Design of Infrastructure Sub - Projects Sectoral Planning &
Resident Supervision in 16 Cities of Punjab
Improvement, Widening and Raising of Road from Tank Chowk to Akbar Chowk along
Calculation of Quantites

3-5-i

Basic Data									Filling in Carriage Way Area		
	4700	1.167	0.41	1.16	0.01	24.00	14	10.00	500.00		-
	4750	1.167	0.31	1.06	0.11	24.00	14.5	9.50	475.00		-
	4800	1.167	0.25	1.00	0.17	24.00	14.5	9.50	475.00		-
	4850	1.167	0.22	0.97	0.20	24.00	14.5	9.50	475.00		-
	4900	1.167	0.24	0.99	0.18	24.00	14.5	9.50	475.00		-
	4950	1.167	0.30	1.05	0.12	24.00	14.5	9.50	475.00		-
	5000	1.167	0.30	1.05	0.12	24.00	14.5	9.50	475.00		-
	5050	1.167	0.31	1.06	0.11	24.00	14.5	9.50	475.00		-
	5100	1.167	0.39	1.14	0.03	24.00	14.5	9.50	475.00		-
	5150	1.167	0.42	1.17	(0.00)	24.00	14.5	9.50	475.00	0.00	1.42
	5200	1.167	0.37	1.12	0.05	24.00	14.5	9.50	475.00		-
	5250	1.167	0.37	1.12	0.05	24.00	14.5	9.50	475.00		-
	5300	1.167	0.37	1.12	0.05	24.00	14.5	9.50	475.00		-
	5350	1.167	0.36	1.11	0.06	24.00	14.5	9.50	475.00		-
	5400	1.167	0.38	1.13	0.04	24.00	14.5	9.50	475.00		-
	5450	1.167	0.39	1.14	0.03	24.00	14.5	9.50	475.00		-
	5500	1.167	0.23	0.98	0.19	24.00	14.5	9.50	475.00		-
	5550	1.167	0.09	0.84	0.33	24.00	14.5	9.50	475.00		-
	5600	1.167	0.05	0.80	0.37	24.00	14.5	9.50	475.00		-
	5650	1.167	0.24	0.99	0.18	24.00	14.5	9.50	475.00		-
	5700	1.167	0.42	1.17	(0.00)	24.00	14.5	9.50	475.00	0.00	1.42
	5750	1.167	0.58	1.33	(0.16)	24.00	14.5	9.50	475.00	0.16	77.43
	5800	1.167	0.91	1.66	(0.49)	24.00	14.5	9.50	475.00	0.49	234.18
	5850	1.167	1.34	2.09	(0.92)	24.00	14.5	9.50	475.00	0.92	438.43
	5900	1.167	1.77	2.52	(1.35)	24.00	14.5	9.50	475.00	1.35	642.68
	5950	1.167	1.81	2.56	(1.39)	24.00	14.5	9.50	475.00	1.39	661.68
	6000	1.167	1.86	2.61	(1.44)	24.00	14.5	9.50	475.00	1.44	685.43
	6050	1.167	1.91	2.66	(1.49)	24.00	14.5	9.50	475.00	1.49	709.18
	6100	1.167	1.44	2.19	(1.02)	24.00	14.5	9.50	475.00	1.02	485.93
	6152	1.167	0.07	0.82	0.35	24.00	14.5	9.50	494.00		-
		TOTAL QUANTITY									**16,146.33**

Detail Design of Infrastructure Sub - Projects Sectoral Planning &
Resident Supervision in 16 Cities of Punjab
Improvement, Widening and Raising of Road from Tank Chowk to Akbar Chowk along Canal Road, Okara
Calculation of Quantites

3-7-ii

Basic Data								Ecavation in Hard Soil (WBM)			
	RD	Depth Reqired	Depth available	Depth available after removing old road	Further depth required	Old Carriage Way	Rmoval of 2" thick TPT surface Sft	Removal of WBM Sft	Further depth required	Thickness of WBM Ft	Quantity Removl of WBM Cft
									~~(0.170)~~		
	50	1.17	0.42	1.17	-	15.5	775.00	775	-	-	-
	100	1.17	0.62	1.37	(0.20)	15.5	775.00	775	(0.200)		-
	150	1.17	0.58	1.33	(0.16)	15.5	775.00	775	(0.160)		-
	200	1.17	0.49	1.24	(0.07)	15.5	775.00	775	(0.070)		-
	250	1.17	0.46	1.21	(0.04)	15.5	775.00	775	(0.040)		-
	300	1.17	0.35	1.10	0.07	15.5	775.00	775	0.070	0.070	54.25
	350	1.17	0.30	1.05	0.12	15.5	775.00	775	0.120	0.120	93.00
	400	1.17	0.21	0.96	0.21	15.5	775.00	775	0.210	0.210	162.75
	450	1.17	0.34	1.09	0.08	15.5	775.00	775	0.080	0.080	62.00
	500	1.17	0.52	1.27	(0.10)	15.5	775.00	775	(0.100)		-
	550	1.17	0.74	1.49	(0.32)	15.5	775.00	775	(0.320)		-
	600	1.17	0.79	1.54	(0.37)	15.5	775.00	775	(0.370)		-
	650	1.17	0.84	1.59	(0.42)	15.5	775.00	775	(0.420)		-
	700	1.17	0.89	1.64	(0.47)	15.5	775.00	775	(0.470)		-
	750	1.17	0.93	1.68	(0.51)	15.5	775.00	775	(0.510)		-
	800	1.17	0.88	1.63	(0.46)	15.5	775.00	775	(0.460)		-
	850	1.17	0.82	1.57	(0.40)	15.5	775.00	775	(0.400)		-
	900	1.17	0.94	1.69	(0.52)	15.5	775.00	775	(0.520)		-
	950	1.17	0.95	1.70	(0.53)	15.5	775.00	775	(0.530)		-
	1000	1.17	0.85	1.60	(0.43)	15.5	775.00	775	(0.430)		-
	1050	1.17	0.81	1.56	(0.39)	15.5	775.00	775	(0.390)		-
	1100	1.17	0.84	1.59	(0.42)	15.5	775.00	775	(0.420)		-
	1150	1.17	0.77	1.52	(0.35)	15.5	775.00	775	(0.350)		-
	1200	1.17	0.70	1.45	(0.28)	15.5	775.00	775	(0.280)		-
	1250	1.17	0.61	1.36	(0.19)	15.5	775.00	775	(0.190)		-
	1300	1.17	0.50	1.25	(0.08)	15.5	775.00	775	(0.080)		-
	1350	1.17	0.47	1.22	(0.05)	15.5	775.00	775	(0.050)		-
	1400	1.17	0.52	1.27	(0.10)	15.5	775.00	775	(0.100)		-
	1450	1.17	0.52	1.27	(0.10)	15.5	775.00	775	(0.100)		-
	1500	1.17	0.54	1.29	(0.12)	15.5	775.00	775	(0.120)		-
	1550	1.17	0.60	1.35	(0.18)	15.5	775.00	775	(0.180)		-
	1600	1.17	0.69	1.44	(0.27)	15.5	775.00	775	(0.270)		-
	1650	1.17	0.71	1.46	(0.29)	15.5	775.00	775	(0.290)		-
	1700	1.17	0.60	1.35	(0.18)	15.5	775.00	775	(0.180)		-
	1750	1.17	0.48	1.23	(0.06)	15.5	775.00	775	(0.060)		-
	1800	1.17	0.53	1.28	(0.11)	15.5	775.00	775	(0.110)		-
	1850	1.17	0.61	1.36	(0.19)	15.5	775.00	775	(0.190)		-
	1900	1.17	0.70	1.45	(0.28)	15.5	775.00	775	(0.280)		-
	1950	1.17	0.79	1.54	(0.37)	15.5	775.00	775	(0.370)		-
	2000	1.17	0.89	1.64	(0.47)	15.5	775.00	775	(0.470)		-
	2050	1.17	0.96	1.71	(0.54)	14	700.00	700	(0.540)		-
	2100	1.17	0.80	1.55	(0.38)	14	700.00	700	(0.380)		-
	2150	1.17	0.64	1.39	(0.22)	14	700.00	700	(0.220)		-

Detail Design of Infrastructure Sub - Projects Sectoral Planning &
Resident Supervision in 16 Cities of Punjab
Improvement, Widening and Raising of Road from Tank Chowk to Akbar Chowk along Canal Road, Okara
Calculation of Quantites

3-7-ii

Basic Data								Ecavation in Hard Soil (WBM)			
	2200	1.17	0.48	1.23	(0.06)	14	700.00	700	(0.060)		-
	2250	1.17	0.48	1.23	(0.06)	14	700.00	700	(0.060)		-
	2300	1.17	0.42	1.17	-	14	700.00	700	-	-	-
	2350	1.17	0.39	1.14	0.03	14	700.00	700	0.030	0.030	21.00
	2400	1.17	0.58	1.33	(0.16)	14	700.00	700	(0.160)		-
	2450	1.17	0.77	1.52	(0.35)	14	700.00	700	(0.350)		-
	2500	1.17	0.91	1.66	(0.49)	14	700.00	700	(0.490)		-
	2550	1.17	0.86	1.61	(0.44)	14	700.00	700	(0.440)		-
	2600	1.17	0.87	1.62	(0.45)	14	700.00	700	(0.450)		-
	2650	1.17	0.91	1.66	(0.49)	14	700.00	700	(0.490)		-
	2700	1.17	0.91	1.66	(0.49)	14	700.00	700	(0.490)		-
	2750	1.17	0.88	1.63	(0.46)	14	700.00	700	(0.460)		-
	2800	1.17	0.88	1.63	(0.46)	14	700.00	700	(0.460)		-
	2850	1.17	0.90	1.65	(0.48)	14	700.00	700	(0.480)		-
	2900	1.17	0.86	1.61	(0.44)	14	700.00	700	(0.440)		-
	2950	1.17	0.86	1.61	(0.44)	14	700.00	700	(0.440)		-
	3000	1.17	0.89	1.64	(0.47)	14	700.00	700	(0.470)		-
	3050	1.17	0.80	1.55	(0.38)	14	700.00	700	(0.380)		-
	3100	1.17	0.77	1.52	(0.35)	14	700.00	700	(0.350)		-
	3150	1.17	0.80	1.55	(0.38)	14	700.00	700	(0.380)		-
	3200	1.17	0.81	1.56	(0.39)	14	700.00	700	(0.390)		-
	3250	1.17	0.79	1.54	(0.37)	14	700.00	700	(0.370)		-
	3300	1.17	0.73	1.48	(0.31)	14	700.00	700	(0.310)		-
	3350	1.17	0.66	1.41	(0.24)	14	700.00	700	(0.240)		-
	3400	1.17	0.63	1.38	(0.21)	14	700.00	700	(0.210)		-
	3450	1.17	0.66	1.41	(0.24)	14	700.00	700	(0.240)		-
	3500	1.17	0.64	1.39	(0.22)	14	700.00	700	(0.220)		-
	3550	1.17	0.53	1.28	(0.11)	14	700.00	700	(0.110)		-
	3600	1.17	0.54	1.29	(0.12)	14	700.00	700	(0.120)		-
	3650	1.17	0.59	1.34	(0.17)	14	700.00	700	(0.170)		-
	3700	1.17	0.77	1.52	(0.35)	14	700.00	700	(0.350)		-
	3750	1.17	0.87	1.62	(0.45)	14	700.00	700	(0.450)		-
	3800	1.17	0.90	1.65	(0.48)	14	700.00	700	(0.480)		-
	3850	1.17	0.88	1.63	(0.46)	14	700.00	700	(0.460)		-
	3900	1.17	0.86	1.61	(0.44)	14	700.00	700	(0.440)		-
	3950	1.17	0.78	1.53	(0.36)	14	700.00	700	(0.360)		-
	4000	1.17	0.71	1.46	(0.29)	14	700.00	700	(0.290)		-
	4050	1.17	0.67	1.42	(0.25)	14	700.00	700	(0.250)		-
	4100	1.17	0.72	1.47	(0.30)	14	700.00	700	(0.300)		-
	4150	1.17	0.76	1.51	(0.34)	14	700.00	700	(0.340)		-
	4200	1.17	0.81	1.56	(0.39)	14	700.00	700	(0.390)		-
	4250	1.17	0.82	1.57	(0.40)	14	700.00	700	(0.400)		-
	4300	1.17	0.76	1.51	(0.34)	14	700.00	700	(0.340)		-
	4350	1.17	0.72	1.47	(0.30)	14	700.00	700	(0.300)		-
	4400	1.17	0.69	1.44	(0.27)	14	700.00	700	(0.270)		-
	4450	1.17	0.63	1.38	(0.21)	14	700.00	700	(0.210)		-
	4500	1.17	0.54	1.29	(0.12)	14	700.00	700	(0.120)		-
	4550	1.17	0.41	1.16	0.01	14	700.00	700	0.010	0.010	7.00
	4600	1.17	0.31	1.06	0.11	14	700.00	700	0.110	0.110	77.00
	4650	1.17	0.39	1.14	0.03	14	700.00	700	0.030	0.030	21.00

Detail Design of Infrastructure Sub - Projects Sectoral Planning &
Resident Supervision in 16 Cities of Punjab
Improvement, Widening and Raising of Road from Tank Chowk to Akbar Chowk along Canal Road, Okara
Calculation of Quantites

3-7-ii

Basic Data								Ecavation in Hard Soil (WBM)			
	4700	1.17	0.41	1.16	0.01	14	700.00	700	0.010	0.010	7.00
	4750	1.17	0.31	1.06	0.11	14.5	725.00	725	0.110	0.110	79.75
	4800	1.17	0.25	1.00	0.17	14.5	725.00	725	0.170	0.170	123.25
	4850	1.17	0.22	0.97	0.20	14.5	725.00	725	0.200	0.200	145.00
	4900	1.17	0.24	0.99	0.18	14.5	725.00	725	0.180	0.180	130.50
	4950	1.17	0.30	1.05	0.12	14.5	725.00	725	0.120	0.120	87.00
	5000	1.17	0.30	1.05	0.12	14.5	725.00	725	0.120	0.120	87.00
	5050	1.17	0.31	1.06	0.11	14.5	725.00	725	0.110	0.110	79.75
	5100	1.17	0.39	1.14	0.03	14.5	725.00	725	0.030	0.030	21.75
	5150	1.17	0.42	1.17	-	14.5	725.00	725	-	-	-
	5200	1.17	0.37	1.12	0.05	14.5	725.00	725	0.050	0.050	36.25
	5250	1.17	0.37	1.12	0.05	14.5	725.00	725	0.050	0.050	36.25
	5300	1.17	0.37	1.12	0.05	14.5	725.00	725	0.050	0.050	36.25
	5350	1.17	0.36	1.11	0.06	14.5	725.00	725	0.060	0.060	43.50
	5400	1.17	0.38	1.13	0.04	14.5	725.00	725	0.040	0.040	29.00
	5450	1.17	0.39	1.14	0.03	14.5	725.00	725	0.030	0.030	21.75
	5500	1.17	0.23	0.98	0.19	14.5	725.00	725	0.190	0.190	137.75
	5550	1.17	0.09	0.84	0.33	14.5	725.00	725	0.330	0.330	239.25
	5600	1.17	0.05	0.80	0.37	14.5	725.00	725	0.370	0.370	268.25
	5650	1.17	0.24	0.99	0.18	14.5	725.00	725	0.180	0.180	130.50
	5700	1.17	0.42	1.17	-	14.5	725.00	725	-	-	-
	5750	1.17	0.58	1.33	(0.16)	14.5	725.00	725	(0.160)		-
	5800	1.17	0.91	1.66	(0.49)	14.5	725.00	725	(0.490)		-
	5850	1.17	1.34	2.09	(0.92)	14.5	725.00	725	(0.920)		-
	5900	1.17	1.77	2.52	(1.35)	14.5	725.00	725	(1.350)		-
	5950	1.17	1.81	2.56	(1.39)	14.5	725.00	725	(1.390)		-
	6000	1.17	1.86	2.61	(1.44)	14.5	725.00	725	(1.440)		-
	6050	1.17	1.91	2.66	(1.49)	14.5	725.00	725	(1.490)		-
	6100	1.17	1.44	2.19	(1.02)	14.5	725.00	725	(1.020)		-
	6152	1.17	0.07	0.82	0.35	14.5	754.00	754	0.350	0.350	263.90
									-		
									-		
		TOTAL QUANTITY					**89,854.00**				**2,501.65**

Detail Design of Infrastructure Sub - Projects Sectoral Planning &
Resident Supervision in 16 Cities of Punjab
Improvement, Widening and Raising of Road from Tank Chowk to Akbar Chow
Calculation of Quantites

3-5-i

Basic Data								Filling in Carriage Way Area		
	RD	Depth Reqired	Depth available	Depth available after removing old road	Further depth required	Old Carriage Way	Rmoval of 2" thick TPT surface Sft	Excavation under Old Carriage Way Area = Sft	Filling Depth available Ft	Total Filly Quantity Cft
	50	1.17	0.42	1.17	-	15.5	775.00	775	-	-
	100	1.17	0.62	1.37	(0.20)	15.5	775.00	775	0.20	155.00
	150	1.17	0.58	1.33	(0.16)	15.5	775.00	775	0.16	124.00
	200	1.17	0.49	1.24	(0.07)	15.5	775.00	775	0.07	54.25
	250	1.17	0.46	1.21	(0.04)	15.5	775.00	775	0.04	31.00
	300	1.17	0.35	1.10	0.07	15.5	775.00	775		-
	350	1.17	0.30	1.05	0.12	15.5	775.00	775		-
	400	1.17	0.21	0.96	0.21	15.5	775.00	775		-
	450	1.17	0.34	1.09	0.08	15.5	775.00	775		-
	500	1.17	0.52	1.27	(0.10)	15.5	775.00	775	0.10	77.50
	550	1.17	0.74	1.49	(0.32)	15.5	775.00	775	0.32	248.00
	600	1.17	0.79	1.54	(0.37)	15.5	775.00	775	0.37	286.75
	650	1.17	0.84	1.59	(0.42)	15.5	775.00	775	0.42	325.50
	700	1.17	0.89	1.64	(0.47)	15.5	775.00	775	0.47	364.25
	750	1.17	0.93	1.68	(0.51)	15.5	775.00	775	0.51	395.25
	800	1.17	0.88	1.63	(0.46)	15.5	775.00	775	0.46	356.50
	850	1.17	0.82	1.57	(0.40)	15.5	775.00	775	0.40	310.00
	900	1.17	0.94	1.69	(0.52)	15.5	775.00	775	0.52	403.00
	950	1.17	0.95	1.70	(0.53)	15.5	775.00	775	0.53	410.75
	1000	1.17	0.85	1.60	(0.43)	15.5	775.00	775	0.43	333.25
	1050	1.17	0.81	1.56	(0.39)	15.5	775.00	775	0.39	302.25
	1100	1.17	0.84	1.59	(0.42)	15.5	775.00	775	0.42	325.50
	1150	1.17	0.77	1.52	(0.35)	15.5	775.00	775	0.35	271.25
	1200	1.17	0.70	1.45	(0.28)	15.5	775.00	775	0.28	217.00
	1250	1.17	0.61	1.36	(0.19)	15.5	775.00	775	0.19	147.25
	1300	1.17	0.50	1.25	(0.08)	15.5	775.00	775	0.08	62.00
	1350	1.17	0.47	1.22	(0.05)	15.5	775.00	775	0.05	38.75
	1400	1.17	0.52	1.27	(0.10)	15.5	775.00	775	0.10	77.50
	1450	1.17	0.52	1.27	(0.10)	15.5	775.00	775	0.10	77.50
	1500	1.17	0.54	1.29	(0.12)	15.5	775.00	775	0.12	93.00
	1550	1.17	0.60	1.35	(0.18)	15.5	775.00	775	0.18	139.50
	1600	1.17	0.69	1.44	(0.27)	15.5	775.00	775	0.27	209.25
	1650	1.17	0.71	1.46	(0.29)	15.5	775.00	775	0.29	224.75
	1700	1.17	0.60	1.35	(0.18)	15.5	775.00	775	0.18	139.50
	1750	1.17	0.48	1.23	(0.06)	15.5	775.00	775	0.06	46.50
	1800	1.17	0.53	1.28	(0.11)	15.5	775.00	775	0.11	85.25
	1850	1.17	0.61	1.36	(0.19)	15.5	775.00	775	0.19	147.25
	1900	1.17	0.70	1.45	(0.28)	15.5	775.00	775	0.28	217.00
	1950	1.17	0.79	1.54	(0.37)	15.5	775.00	775	0.37	286.75
	2000	1.17	0.89	1.64	(0.47)	15.5	775.00	775	0.47	364.25
	2050	1.17	0.96	1.71	(0.54)	14	700.00	700	0.54	378.00
	2100	1.17	0.80	1.55	(0.38)	14	700.00	700	0.38	266.00
	2150	1.17	0.64	1.39	(0.22)	14	700.00	700	0.22	154.00

Detail Design of Infrastructure Sub - Projects Sectoral Planning &
Resident Supervision in 16 Cities of Punjab
Improvement, Widening and Raising of Road from Tank Chowk to Akbar Chow
Calculation of Quantites

3-5-i

Basic Data							Filling in Carriage Way Area		
2200	1.17	0.48	1.23	(0.06)	14	700.00	700	0.06	42.00
2250	1.17	0.48	1.23	(0.06)	14	700.00	700	0.06	42.00
2300	1.17	0.42	1.17	-	14	700.00	700	-	-
2350	1.17	0.39	1.14	0.03	14	700.00	700		-
2400	1.17	0.58	1.33	(0.16)	14	700.00	700	0.16	112.00
2450	1.17	0.77	1.52	(0.35)	14	700.00	700	0.35	245.00
2500	1.17	0.91	1.66	(0.49)	14	700.00	700	0.49	343.00
2550	1.17	0.86	1.61	(0.44)	14	700.00	700	0.44	308.00
2600	1.17	0.87	1.62	(0.45)	14	700.00	700	0.45	315.00
2650	1.17	0.91	1.66	(0.49)	14	700.00	700	0.49	343.00
2700	1.17	0.91	1.66	(0.49)	14	700.00	700	0.49	343.00
2750	1.17	0.88	1.63	(0.46)	14	700.00	700	0.46	322.00
2800	1.17	0.88	1.63	(0.46)	14	700.00	700	0.46	322.00
2850	1.17	0.90	1.65	(0.48)	14	700.00	700	0.48	336.00
2900	1.17	0.86	1.61	(0.44)	14	700.00	700	0.44	308.00
2950	1.17	0.86	1.61	(0.44)	14	700.00	700	0.44	308.00
3000	1.17	0.89	1.64	(0.47)	14	700.00	700	0.47	329.00
3050	1.17	0.80	1.55	(0.38)	14	700.00	700	0.38	266.00
3100	1.17	0.77	1.52	(0.35)	14	700.00	700	0.35	245.00
3150	1.17	0.80	1.55	(0.38)	14	700.00	700	0.38	266.00
3200	1.17	0.81	1.56	(0.39)	14	700.00	700	0.39	273.00
3250	1.17	0.79	1.54	(0.37)	14	700.00	700	0.37	259.00
3300	1.17	0.73	1.48	(0.31)	14	700.00	700	0.31	217.00
3350	1.17	0.66	1.41	(0.24)	14	700.00	700	0.24	168.00
3400	1.17	0.63	1.38	(0.21)	14	700.00	700	0.21	147.00
3450	1.17	0.66	1.41	(0.24)	14	700.00	700	0.24	168.00
3500	1.17	0.64	1.39	(0.22)	14	700.00	700	0.22	154.00
3550	1.17	0.53	1.28	(0.11)	14	700.00	700	0.11	77.00
3600	1.17	0.54	1.29	(0.12)	14	700.00	700	0.12	84.00
3650	1.17	0.59	1.34	(0.17)	14	700.00	700	0.17	119.00
3700	1.17	0.77	1.52	(0.35)	14	700.00	700	0.35	245.00
3750	1.17	0.87	1.62	(0.45)	14	700.00	700	0.45	315.00
3800	1.17	0.90	1.65	(0.48)	14	700.00	700	0.48	336.00
3850	1.17	0.88	1.63	(0.46)	14	700.00	700	0.46	322.00
3900	1.17	0.86	1.61	(0.44)	14	700.00	700	0.44	308.00
3950	1.17	0.78	1.53	(0.36)	14	700.00	700	0.36	252.00
4000	1.17	0.71	1.46	(0.29)	14	700.00	700	0.29	203.00
4050	1.17	0.67	1.42	(0.25)	14	700.00	700	0.25	175.00
4100	1.17	0.72	1.47	(0.30)	14	700.00	700	0.30	210.00
4150	1.17	0.76	1.51	(0.34)	14	700.00	700	0.34	238.00
4200	1.17	0.81	1.56	(0.39)	14	700.00	700	0.39	273.00
4250	1.17	0.82	1.57	(0.40)	14	700.00	700	0.40	280.00
4300	1.17	0.76	1.51	(0.34)	14	700.00	700	0.34	238.00
4350	1.17	0.72	1.47	(0.30)	14	700.00	700	0.30	210.00
4400	1.17	0.69	1.44	(0.27)	14	700.00	700	0.27	189.00
4450	1.17	0.63	1.38	(0.21)	14	700.00	700	0.21	147.00
4500	1.17	0.54	1.29	(0.12)	14	700.00	700	0.12	84.00
4550	1.17	0.41	1.16	0.01	14	700.00	700		-
4600	1.17	0.31	1.06	0.11	14	700.00	700		-
4650	1.17	0.39	1.14	0.03	14	700.00	700		-

Detail Design of Infrastructure Sub - Projects Sectoral Planning &
Resident Supervision in 16 Cities of Punjab
Improvement, Widening and Raising of Road from Tank Chowk to Akbar Chow
Calculation of Quantites

3-5-i

	Basic Data								Filling in Carriage Way Area		
	4700	1.17	0.41	1.16	0.01	14	700.00		700		-
	4750	1.17	0.31	1.06	0.11	14.5	725.00		725		-
	4800	1.17	0.25	1.00	0.17	14.5	725.00		725		-
	4850	1.17	0.22	0.97	0.20	14.5	725.00		725		-
	4900	1.17	0.24	0.99	0.18	14.5	725.00		725		-
	4950	1.17	0.30	1.05	0.12	14.5	725.00		725		-
	5000	1.17	0.30	1.05	0.12	14.5	725.00		725		-
	5050	1.17	0.31	1.06	0.11	14.5	725.00		725		-
	5100	1.17	0.39	1.14	0.03	14.5	725.00		725		-
	5150	1.17	0.42	1.17	-	14.5	725.00		725	-	-
	5200	1.17	0.37	1.12	0.05	14.5	725.00		725		-
	5250	1.17	0.37	1.12	0.05	14.5	725.00		725		-
	5300	1.17	0.37	1.12	0.05	14.5	725.00		725		-
	5350	1.17	0.36	1.11	0.06	14.5	725.00		725		-
	5400	1.17	0.38	1.13	0.04	14.5	725.00		725		-
	5450	1.17	0.39	1.14	0.03	14.5	725.00		725		-
	5500	1.17	0.23	0.98	0.19	14.5	725.00		725		-
	5550	1.17	0.09	0.84	0.33	14.5	725.00		725		-
	5600	1.17	0.05	0.80	0.37	14.5	725.00		725		-
	5650	1.17	0.24	0.99	0.18	14.5	725.00		725		-
	5700	1.17	0.42	1.17	-	14.5	725.00		725	-	-
	5750	1.17	0.58	1.33	(0.16)	14.5	725.00		725	0.16	116.00
	5800	1.17	0.91	1.66	(0.49)	14.5	725.00		725	0.49	355.25
	5850	1.17	1.34	2.09	(0.92)	14.5	725.00		725	0.92	667.00
	5900	1.17	1.77	2.52	(1.35)	14.5	725.00		725	1.35	978.75
	5950	1.17	1.81	2.56	(1.39)	14.5	725.00		725	1.39	1,007.75
	6000	1.17	1.86	2.61	(1.44)	14.5	725.00		725	1.44	1,044.00
	6050	1.17	1.91	2.66	(1.49)	14.5	725.00		725	1.49	1,080.25
	6100	1.17	1.44	2.19	(1.02)	14.5	725.00		725	1.02	739.50
	6152	1.17	0.07	0.82	0.35	14.5	754.00		754		-
		TOTAL QUANTITY					**89,854.00**				**24,619.50**

Detail Design of Infrastructure Sub - Projects Sectoral Planning &
Resident Supervision in 16 Cities of Punjab
Improvement, Widening and Raising of Road from Tank Chowk to Akbar Chowk along Canal Road, Okara
Calculation of Earth Work Quantites

3-7-i

Basic Data								Excavation in Ordinary Soil		
	RD	Depth Reqired	Depth available	Further depth required	No of Shoulders Ft	Width of Shoulders Ft	Total Width of Shoulders Ft	Excavation under Shoulders Area = Sft	Further depth required Rft	Quantity of Excavation Cft
	50	0.917	0.42	0.50	2.00	3.5	7.00	350.00	0.50	173.95
	100	0.917	0.62	0.30	2.00	3.5	7.00	350.00	0.30	103.95
	150	0.917	0.58	0.34	2.00	3.5	7.00	350.00	0.34	117.95
	200	0.917	0.49	0.43	2.00	3.5	7.00	350.00	0.43	149.45
	250	0.917	0.46	0.46	2.00	3.5	7.00	350.00	0.46	159.95
	300	0.917	0.35	0.57	2.00	3.5	7.00	350.00	0.57	198.45
	350	0.917	0.30	0.62	2.00	3.5	7.00	350.00	0.62	215.95
	400	0.917	0.21	0.71	2.00	3.5	7.00	350.00	0.71	247.45
	450	0.917	0.34	0.58	2.00	3.5	7.00	350.00	0.58	201.95
	500	0.917	0.52	0.40	2.00	3.5	7.00	350.00	0.40	138.95
	550	0.917	0.74	0.18	2.00	3.5	7.00	350.00	0.18	61.95
	600	0.917	0.79	0.13	2.00	3.5	7.00	350.00	0.13	44.45
	650	0.917	0.84	0.08	2.00	3.5	7.00	350.00	0.08	26.95
	700	0.917	0.89	0.03	2.00	3.5	7.00	350.00	0.03	9.45
	750	0.917	0.93	(0.01)	2.00	3.5	7.00	350.00		-
	800	0.917	0.88	0.04	2.00	3.5	7.00	350.00	0.04	12.95
	850	0.917	0.82	0.10	2.00	3.5	7.00	350.00	0.10	33.95
	900	0.917	0.94	(0.02)	2.00	3.5	7.00	350.00		-
	950	0.917	0.95	(0.03)	2.00	3.5	7.00	350.00		-
	1000	0.917	0.85	0.07	2.00	3.5	7.00	350.00	0.07	23.45
	1050	0.917	0.81	0.11	2.00	3.5	7.00	350.00	0.11	37.45
	1100	0.917	0.84	0.08	2.00	3.5	7.00	350.00	0.08	26.95
	1150	0.917	0.77	0.15	2.00	3.5	7.00	350.00	0.15	51.45
	1200	0.917	0.70	0.22	2.00	3.5	7.00	350.00	0.22	75.95
	1250	0.917	0.61	0.31	2.00	3.5	7.00	350.00	0.31	107.45
	1300	0.917	0.50	0.42	2.00	3.5	7.00	350.00	0.42	145.95
	1350	0.917	0.47	0.45	2.00	3.5	7.00	350.00	0.45	156.45
	1400	0.917	0.52	0.40	2.00	3.5	7.00	350.00	0.40	138.95
	1450	0.917	0.52	0.40	2.00	3.5	7.00	350.00	0.40	138.95
	1500	0.917	0.54	0.38	2.00	3.5	7.00	350.00	0.38	131.95
	1550	0.917	0.60	0.32	2.00	3.5	7.00	350.00	0.32	110.95
	1600	0.917	0.69	0.23	2.00	3.5	7.00	350.00	0.23	79.45
	1650	0.917	0.71	0.21	2.00	3.5	7.00	350.00	0.21	72.45
	1700	0.917	0.60	0.32	2.00	3.5	7.00	350.00	0.32	110.95
	1750	0.917	0.48	0.44	2.00	3.5	7.00	350.00	0.44	152.95
	1800	0.917	0.53	0.39	2.00	3.5	7.00	350.00	0.39	135.45
	1850	0.917	0.61	0.31	2.00	3.5	7.00	350.00	0.31	107.45
	1900	0.917	0.70	0.22	2.00	3.5	7.00	350.00	0.22	75.95
	1950	0.917	0.79	0.13	2.00	3.5	7.00	350.00	0.13	44.45
	2000	0.917	0.89	0.03	2.00	3.5	7.00	350.00	0.03	9.45
	2050	0.917	0.96	(0.04)	2.00	3.5	7.00	350.00		-
	2100	0.917	0.80	0.12	2.00	3.5	7.00	350.00	0.12	40.95
	2150	0.917	0.64	0.28	2.00	3.5	7.00	350.00	0.28	96.95

Detail Design of Infrastructure Sub - Projects Sectoral Planning &
Resident Supervision in 16 Cities of Punjab
Improvement, Widening and Raising of Road from Tank Chowk to Akbar Chowk along Canal Road, Okara
Calculation of Earth Work Quantites

3-7-i

Basic Data							Excavation in Ordinary Soil		
2200	0.917	0.48	0.44	2.00	3.5	7.00	350.00	0.44	152.95
2250	0.917	0.48	0.44	2.00	3.5	7.00	350.00	0.44	152.95
2300	0.917	0.42	0.50	2.00	3.5	7.00	350.00	0.50	173.95
2350	0.917	0.39	0.53	2.00	3.5	7.00	350.00	0.53	184.45
2400	0.917	0.58	0.34	2.00	3.5	7.00	350.00	0.34	117.95
2450	0.917	0.77	0.15	2.00	3.5	7.00	350.00	0.15	51.45
2500	0.917	0.91	0.01	2.00	3.5	7.00	350.00	0.01	2.45
2550	0.917	0.86	0.06	2.00	3.5	7.00	350.00	0.06	19.95
2600	0.917	0.87	0.05	2.00	3.5	7.00	350.00	0.05	16.45
2650	0.917	0.91	0.01	2.00	3.5	7.00	350.00	0.01	2.45
2700	0.917	0.91	0.01	2.00	3.5	7.00	350.00	0.01	2.45
2750	0.917	0.88	0.04	2.00	3.5	7.00	350.00	0.04	12.95
2800	0.917	0.88	0.04	2.00	3.5	7.00	350.00	0.04	12.95
2850	0.917	0.90	0.02	2.00	3.5	7.00	350.00	0.02	5.95
2900	0.917	0.86	0.06	2.00	3.5	7.00	350.00	0.06	19.95
2950	0.917	0.86	0.06	2.00	3.5	7.00	350.00	0.06	19.95
3000	0.917	0.89	0.03	2.00	3.5	7.00	350.00	0.03	9.45
3050	0.917	0.80	0.12	2.00	3.5	7.00	350.00	0.12	40.95
3100	0.917	0.77	0.15	2.00	3.5	7.00	350.00	0.15	51.45
3150	0.917	0.80	0.12	2.00	3.5	7.00	350.00	0.12	40.95
3200	0.917	0.81	0.11	2.00	3.5	7.00	350.00	0.11	37.45
3250	0.917	0.79	0.13	2.00	3.5	7.00	350.00	0.13	44.45
3300	0.917	0.73	0.19	2.00	3.5	7.00	350.00	0.19	65.45
3350	0.917	0.66	0.26	2.00	3.5	7.00	350.00	0.26	89.95
3400	0.917	0.63	0.29	2.00	3.5	7.00	350.00	0.29	100.45
3450	0.917	0.66	0.26	2.00	3.5	7.00	350.00	0.26	89.95
3500	0.917	0.64	0.28	2.00	3.5	7.00	350.00	0.28	96.95
3550	0.917	0.53	0.39	2.00	3.5	7.00	350.00	0.39	135.45
3600	0.917	0.54	0.38	2.00	3.5	7.00	350.00	0.38	131.95
3650	0.917	0.59	0.33	2.00	3.5	7.00	350.00	0.33	114.45
3700	0.917	0.77	0.15	2.00	3.5	7.00	350.00	0.15	51.45
3750	0.917	0.87	0.05	2.00	3.5	7.00	350.00	0.05	16.45
3800	0.917	0.90	0.02	2.00	3.5	7.00	350.00	0.02	5.95
3850	0.917	0.88	0.04	2.00	3.5	7.00	350.00	0.04	12.95
3900	0.917	0.86	0.06	2.00	3.5	7.00	350.00	0.06	19.95
3950	0.917	0.78	0.14	2.00	3.5	7.00	350.00	0.14	47.95
4000	0.917	0.71	0.21	2.00	3.5	7.00	350.00	0.21	72.45
4050	0.917	0.67	0.25	2.00	3.5	7.00	350.00	0.25	86.45
4100	0.917	0.72	0.20	2.00	3.5	7.00	350.00	0.20	68.95
4150	0.917	0.76	0.16	2.00	3.5	7.00	350.00	0.16	54.95
4200	0.917	0.81	0.11	2.00	3.5	7.00	350.00	0.11	37.45
4250	0.917	0.82	0.10	2.00	3.5	7.00	350.00	0.10	33.95
4300	0.917	0.76	0.16	2.00	3.5	7.00	350.00	0.16	54.95
4350	0.917	0.72	0.20	2.00	3.5	7.00	350.00	0.20	68.95
4400	0.917	0.69	0.23	2.00	3.5	7.00	350.00	0.23	79.45
4450	0.917	0.63	0.29	2.00	3.5	7.00	350.00	0.29	100.45
4500	0.917	0.54	0.38	2.00	3.5	7.00	350.00	0.38	131.95
4550	0.917	0.41	0.51	2.00	3.5	7.00	350.00	0.51	177.45
4600	0.917	0.31	0.61	2.00	3.5	7.00	350.00	0.61	212.45
4650	0.917	0.39	0.53	2.00	3.5	7.00	350.00	0.53	184.45

Detail Design of Infrastructure Sub - Projects Sectoral Planning &
Resident Supervision in 16 Cities of Punjab
Improvement, Widening and Raising of Road from Tank Chowk to Akbar Chowk along Canal Road, Okara
Calculation of Earth Work Quantites

3-7-i

Basic Data								Excavation in Ordinary Soil		
	4700	0.917	0.41	0.51	2.00	3.5	7.00	350.00	0.51	177.45
	4750	0.917	0.31	0.61	2.00	3.5	7.00	350.00	0.61	212.45
	4800	0.917	0.25	0.67	2.00	3.5	7.00	350.00	0.67	233.45
	4850	0.917	0.22	0.70	2.00	3.5	7.00	350.00	0.70	243.95
	4900	0.917	0.24	0.68	2.00	3.5	7.00	350.00	0.68	236.95
	4950	0.917	0.30	0.62	2.00	3.5	7.00	350.00	0.62	215.95
	5000	0.917	0.30	0.62	2.00	3.5	7.00	350.00	0.62	215.95
	5050	0.917	0.31	0.61	2.00	3.5	7.00	350.00	0.61	212.45
	5100	0.917	0.39	0.53	2.00	3.5	7.00	350.00	0.53	184.45
	5150	0.917	0.42	0.50	2.00	3.5	7.00	350.00	0.50	173.95
	5200	0.917	0.37	0.55	2.00	3.5	7.00	350.00	0.55	191.45
	5250	0.917	0.37	0.55	2.00	3.5	7.00	350.00	0.55	191.45
	5300	0.917	0.37	0.55	2.00	3.5	7.00	350.00	0.55	191.45
	5350	0.917	0.36	0.56	2.00	3.5	7.00	350.00	0.56	194.95
	5400	0.917	0.38	0.54	2.00	3.5	7.00	350.00	0.54	187.95
	5450	0.917	0.39	0.53	2.00	3.5	7.00	350.00	0.53	184.45
	5500	0.917	0.23	0.69	2.00	3.5	7.00	350.00	0.69	240.45
	5550	0.917	0.09	0.83	2.00	3.5	7.00	350.00	0.83	289.45
	5600	0.917	0.05	0.87	2.00	3.5	7.00	350.00	0.87	303.45
	5650	0.917	0.24	0.68	2.00	3.5	7.00	350.00	0.68	236.95
	5700	0.917	0.42	0.50	2.00	3.5	7.00	350.00	0.50	173.95
	5750	0.917	0.58	0.34	2.00	3.5	7.00	350.00	0.34	117.95
	5800	0.917	0.91	0.01	2.00	3.5	7.00	350.00	0.01	2.45
	5850	0.917	1.34		2.00	3.5	7.00	350.00		-
	5900	0.917	1.77		2.00	3.5	7.00	350.00		-
	5950	0.917	1.81		2.00	3.5	7.00	350.00		-
	6000	0.917	1.86		2.00	3.5	7.00	350.00		-
	6050	0.917	1.91		2.00	3.5	7.00	350.00		-
	6100	0.917	1.44		2.00	3.5	7.00	350.00		-
	6152	0.917	0.07	0.85	2.00	3.5	7.00	364.00	0.85	308.31
		TOTAL QUANTITY						**43,064.00**		**12,409.21**

Detail Design of Infrastructure Sub - Projects Sectoral Planning &
Resident Supervision in 16 Cities of Punjab
Improvement, Widening and Raising of Road from Tank Chowk to Akbar Chowl
Calculation of Earth Work Quantites

3-5-i

Basic Data								Filling in Carriage Way Area		
	RD	Depth Reqired	Depth available	Further depth required	No of Shoulders Ft	Width of Shoulders Ft	Total Width of Shoulders Ft	Excavation under Old Carriage Way Area = Sft	Filling Depth available Ft	Total Filly Quantity Cft
	50	0.917	0.42	0.50	2.00	3.5	7.00	350.00		-
	100	0.917	0.62	0.30	2.00	3.5	7.00	350.00		-
	150	0.917	0.58	0.34	2.00	3.5	7.00	350.00		-
	200	0.917	0.49	0.43	2.00	3.5	7.00	350.00		-
	250	0.917	0.46	0.46	2.00	3.5	7.00	350.00		-
	300	0.917	0.35	0.57	2.00	3.5	7.00	350.00		-
	350	0.917	0.30	0.62	2.00	3.5	7.00	350.00		-
	400	0.917	0.21	0.71	2.00	3.5	7.00	350.00		-
	450	0.917	0.34	0.58	2.00	3.5	7.00	350.00		-
	500	0.917	0.52	0.40	2.00	3.5	7.00	350.00		-
	550	0.917	0.74	0.18	2.00	3.5	7.00	350.00		-
	600	0.917	0.79	0.13	2.00	3.5	7.00	350.00		-
	650	0.917	0.84	0.08	2.00	3.5	7.00	350.00		-
	700	0.917	0.89	0.03	2.00	3.5	7.00	350.00		-
	750	0.917	0.93	(0.01)	2.00	3.5	7.00	350.00	0.01	4.55
	800	0.917	0.88	0.04	2.00	3.5	7.00	350.00		-
	850	0.917	0.82	0.10	2.00	3.5	7.00	350.00		-
	900	0.917	0.94	(0.02)	2.00	3.5	7.00	350.00	0.02	8.05
	950	0.917	0.95	(0.03)	2.00	3.5	7.00	350.00	0.03	11.55
	1000	0.917	0.85	0.07	2.00	3.5	7.00	350.00		-
	1050	0.917	0.81	0.11	2.00	3.5	7.00	350.00		-
	1100	0.917	0.84	0.08	2.00	3.5	7.00	350.00		-
	1150	0.917	0.77	0.15	2.00	3.5	7.00	350.00		-
	1200	0.917	0.70	0.22	2.00	3.5	7.00	350.00		-
	1250	0.917	0.61	0.31	2.00	3.5	7.00	350.00		-
	1300	0.917	0.50	0.42	2.00	3.5	7.00	350.00		-
	1350	0.917	0.47	0.45	2.00	3.5	7.00	350.00		-
	1400	0.917	0.52	0.40	2.00	3.5	7.00	350.00		-
	1450	0.917	0.52	0.40	2.00	3.5	7.00	350.00		-
	1500	0.917	0.54	0.38	2.00	3.5	7.00	350.00		-
	1550	0.917	0.60	0.32	2.00	3.5	7.00	350.00		-
	1600	0.917	0.69	0.23	2.00	3.5	7.00	350.00		-
	1650	0.917	0.71	0.21	2.00	3.5	7.00	350.00		-
	1700	0.917	0.60	0.32	2.00	3.5	7.00	350.00		-
	1750	0.917	0.48	0.44	2.00	3.5	7.00	350.00		-
	1800	0.917	0.53	0.39	2.00	3.5	7.00	350.00		-
	1850	0.917	0.61	0.31	2.00	3.5	7.00	350.00		-
	1900	0.917	0.70	0.22	2.00	3.5	7.00	350.00		-
	1950	0.917	0.79	0.13	2.00	3.5	7.00	350.00		-
	2000	0.917	0.89	0.03	2.00	3.5	7.00	350.00		-
	2050	0.917	0.96	(0.04)	2.00	3.5	7.00	350.00	0.04	15.05
	2100	0.917	0.80	0.12	2.00	3.5	7.00	350.00		-
	2150	0.917	0.64	0.28	2.00	3.5	7.00	350.00		-

Detail Design of Infrastructure Sub - Projects Sectoral Planning &
Resident Supervision in 16 Cities of Punjab
Improvement, Widening and Raising of Road from Tank Chowk to Akbar Chowl
Calculation of Earth Work Quantites

3-5-i

Basic Data								Filling in Carriage Way Area		
	2200	0.917	0.48	0.44	2.00	3.5	7.00	350.00		-
	2250	0.917	0.48	0.44	2.00	3.5	7.00	350.00		-
	2300	0.917	0.42	0.50	2.00	3.5	7.00	350.00		-
	2350	0.917	0.39	0.53	2.00	3.5	7.00	350.00		-
	2400	0.917	0.58	0.34	2.00	3.5	7.00	350.00		-
	2450	0.917	0.77	0.15	2.00	3.5	7.00	350.00		-
	2500	0.917	0.91	0.01	2.00	3.5	7.00	350.00		-
	2550	0.917	0.86	0.06	2.00	3.5	7.00	350.00		-
	2600	0.917	0.87	0.05	2.00	3.5	7.00	350.00		-
	2650	0.917	0.91	0.01	2.00	3.5	7.00	350.00		-
	2700	0.917	0.91	0.01	2.00	3.5	7.00	350.00		-
	2750	0.917	0.88	0.04	2.00	3.5	7.00	350.00		-
	2800	0.917	0.88	0.04	2.00	3.5	7.00	350.00		-
	2850	0.917	0.90	0.02	2.00	3.5	7.00	350.00		-
	2900	0.917	0.86	0.06	2.00	3.5	7.00	350.00		-
	2950	0.917	0.86	0.06	2.00	3.5	7.00	350.00		-
	3000	0.917	0.89	0.03	2.00	3.5	7.00	350.00		-
	3050	0.917	0.80	0.12	2.00	3.5	7.00	350.00		-
	3100	0.917	0.77	0.15	2.00	3.5	7.00	350.00		-
	3150	0.917	0.80	0.12	2.00	3.5	7.00	350.00		-
	3200	0.917	0.81	0.11	2.00	3.5	7.00	350.00		-
	3250	0.917	0.79	0.13	2.00	3.5	7.00	350.00		-
	3300	0.917	0.73	0.19	2.00	3.5	7.00	350.00		-
	3350	0.917	0.66	0.26	2.00	3.5	7.00	350.00		-
	3400	0.917	0.63	0.29	2.00	3.5	7.00	350.00		-
	3450	0.917	0.66	0.26	2.00	3.5	7.00	350.00		-
	3500	0.917	0.64	0.28	2.00	3.5	7.00	350.00		-
	3550	0.917	0.53	0.39	2.00	3.5	7.00	350.00		-
	3600	0.917	0.54	0.38	2.00	3.5	7.00	350.00		-
	3650	0.917	0.59	0.33	2.00	3.5	7.00	350.00		-
	3700	0.917	0.77	0.15	2.00	3.5	7.00	350.00		-
	3750	0.917	0.87	0.05	2.00	3.5	7.00	350.00		-
	3800	0.917	0.90	0.02	2.00	3.5	7.00	350.00		-
	3850	0.917	0.88	0.04	2.00	3.5	7.00	350.00		-
	3900	0.917	0.86	0.06	2.00	3.5	7.00	350.00		-
	3950	0.917	0.78	0.14	2.00	3.5	7.00	350.00		-
	4000	0.917	0.71	0.21	2.00	3.5	7.00	350.00		-
	4050	0.917	0.67	0.25	2.00	3.5	7.00	350.00		-
	4100	0.917	0.72	0.20	2.00	3.5	7.00	350.00		-
	4150	0.917	0.76	0.16	2.00	3.5	7.00	350.00		-
	4200	0.917	0.81	0.11	2.00	3.5	7.00	350.00		-
	4250	0.917	0.82	0.10	2.00	3.5	7.00	350.00		-
	4300	0.917	0.76	0.16	2.00	3.5	7.00	350.00		-
	4350	0.917	0.72	0.20	2.00	3.5	7.00	350.00		-
	4400	0.917	0.69	0.23	2.00	3.5	7.00	350.00		-
	4450	0.917	0.63	0.29	2.00	3.5	7.00	350.00		-
	4500	0.917	0.54	0.38	2.00	3.5	7.00	350.00		-
	4550	0.917	0.41	0.51	2.00	3.5	7.00	350.00		-
	4600	0.917	0.31	0.61	2.00	3.5	7.00	350.00		-
	4650	0.917	0.39	0.53	2.00	3.5	7.00	350.00		-

Detail Design of Infrastructure Sub - Projects Sectoral Planning &
Resident Supervision in 16 Cities of Punjab
Improvement, Widening and Raising of Road from Tank Chowk to Akbar Chowl
Calculation of Earth Work Quantites

3-5-i

	Basic Data								**Filling in Carriage Way Area**		
	4700	0.917	0.41	0.51	2.00	3.5	7.00		350.00		-
	4750	0.917	0.31	0.61	2.00	3.5	7.00		350.00		-
	4800	0.917	0.25	0.67	2.00	3.5	7.00		350.00		-
	4850	0.917	0.22	0.70	2.00	3.5	7.00		350.00		-
	4900	0.917	0.24	0.68	2.00	3.5	7.00		350.00		-
	4950	0.917	0.30	0.62	2.00	3.5	7.00		350.00		-
	5000	0.917	0.30	0.62	2.00	3.5	7.00		350.00		-
	5050	0.917	0.31	0.61	2.00	3.5	7.00		350.00		-
	5100	0.917	0.39	0.53	2.00	3.5	7.00		350.00		-
	5150	0.917	0.42	0.50	2.00	3.5	7.00		350.00		-
	5200	0.917	0.37	0.55	2.00	3.5	7.00		350.00		-
	5250	0.917	0.37	0.55	2.00	3.5	7.00		350.00		-
	5300	0.917	0.37	0.55	2.00	3.5	7.00		350.00		-
	5350	0.917	0.36	0.56	2.00	3.5	7.00		350.00		-
	5400	0.917	0.38	0.54	2.00	3.5	7.00		350.00		-
	5450	0.917	0.39	0.53	2.00	3.5	7.00		350.00		-
	5500	0.917	0.23	0.69	2.00	3.5	7.00		350.00		-
	5550	0.917	0.09	0.83	2.00	3.5	7.00		350.00		-
	5600	0.917	0.05	0.87	2.00	3.5	7.00		350.00		-
	5650	0.917	0.24	0.68	2.00	3.5	7.00		350.00		-
	5700	0.917	0.42	0.50	2.00	3.5	7.00		350.00		-
	5750	0.917	0.58	0.34	2.00	3.5	7.00		350.00		-
	5800	0.917	0.91	0.01	2.00	3.5	7.00		350.00		-
	5850	0.917	1.34		2.00	3.5	7.00		350.00	0.42	148.05
	5900	0.917	1.77		2.00	3.5	7.00		350.00	0.85	298.55
	5950	0.917	1.81		2.00	3.5	7.00		350.00	0.89	312.55
	6000	0.917	1.86		2.00	3.5	7.00		350.00	0.94	330.05
	6050	0.917	1.91		2.00	3.5	7.00		350.00	0.99	347.55
	6100	0.917	1.44		2.00	3.5	7.00		350.00	0.52	183.05
	6152	0.917	0.07	0.85	2.00	3.5	7.00		364.00		-
		TOTAL QUANTITY									**1,659.00**

Improvement, Widening and Raising of Road from Tank Chowk to Akbar Chowk along Canal Road

ANNEXURE – C

Economic Analysis, Sensitivity Analysis & Cost Benefit Ratio

Punjab Cities Program (PCP)

Improvement, Widening and Raising of Road from Tank Chowk to Akbar Chowk along Canal Road. Okara City

Annexure C for PC-I

Project Benefits and Analysis

Construction, widening and improving roads of any country are the backbone of social and economic development, enabling the provision of transport and logistics services to passengers & cargo and providing accessibility, which in turn induces mobility.

This project will address the following gapes in the road sector of Okara:-

- Limited access to road infrastructure
- Low quality / poor infrastructure
- High transportation cost

1). Project Economic and Financial Analysis

Economic analyses compares the benefits, costs, and return to the economy as a whole. While, the financial analyses of the project compare direct benefits/revenues, costs and return to the individual investor / enterprise OR operating authority.

1.1. Economics

Effective and efficient road network provides economic benefits that result in multiplier effects such as providing infrastructure results in improving (physical) accessibility that will enhance mobility of people and goods, resulting in improving overall economic welfare.

The proposed study relates to Improvement, Widening and Raising of Road from Tank Chowk to Akbar Chowk along Canal Road in Okara City

Length, proposed tasks and traffic type on the subject road is as detailed below:

Sr. No	City Road Names	Length (Km)	Proposed Works		Traffic Type
			Road Work	Street Lights Works	
1	Road fron Tank Chowk to Akbar Chowk along Canal Road	1.0214	Widening / Raising and Improvement	Street Lights - Electrical and Civil Work	Mostly Light city traffic

Above listed existing road/track under study in Okara City was constructed in past as a good / paved road, however, due to various activities for installation of utilities in these areas, the condition of the road has been deteriorated and needed immediate attention to be improved and widened and ease out the vehicles/ pedestrian traffic at large in the area. Traffic on this road is light city traffic. With the completion of proposed works, a large number of people of the city would be benefitted.

1.1.1. Project Economic Costs

Financial (market) estimates of project Investment (Capital) Costs are estimated as Rs.85.55 Million. These are converted in to Economic Costs by applying Standard Conversion Factor (SCF) of 0.87.

Sr. No.	Description	Financial Costs	Economic Costs @ 0.87 SCF
		Rs.	
1)	**Project Investment Costs**		
i.	Road Widening / Improvement / Works	Rs 67,349,609	Rs 58,594,160
ii.	Street Lights Electrical and Civil Works	Rs 23,298,395	Rs 20,269,604
iii.	Contingency, taxes, Environment. costs	Rs 7,678,360	Rs 6,680,173
	Total Investment Costs	Rs 98,326,364	Rs 85,543,937

1.1.2. O&M Costs

The roads are already being repaired and maintained by the District Council Unit Okara out of its own financial resources. No additional cost will be required after completion of the improvement and upgradation of the roads, rather the repair cost will be reduced for the initial years.

1.1.3. Project Economic Benefits

Theoretically, the project involves the provision of a public good so it is set to a number of 'wider' economic benefits to the entire population of the concerned area.

1.1.3.1. Direct Benefits

The major economic direct benefits from the project works include:

- **Road User Benefits**

a) Vehicle operating cost savings
   - These include fuel and lubricant costs, spare part cost, tyre cost, maintenance cost and depreciation cost among others

b) Travel time saving OR travel delay reductions

- **Other benefits**

c) Increase in land values / assets / properties along the project roads

1.1.3.2. Indirect Benefits

Some indirect economic benefits may include:

a) Reduced traffic congestion
b) Accident reduction, if any. (Cost of human fatal accident, injury, or hospitalization)
c) Induced travel, including new trips and changes in mode, route, and time of travel
d) Better and improved connectivity to further infrastructure.
e) Reduced fuel consumption due to reduction in stopped vehicular delays (idling fuel consumption)

Benefits of purely socio-economic nature may include:

a) Increased household income and appreciation in value of land adjacent to project roads, resulting in higher aggregate economic output

b) The project is expected to generate skilled and non-skilled jobs especially during construction period and onwards for rods maintenance works.

c) Development of commercial activities along improved / widened proposed project roads, resulting in income generation of project area people.

d) Overall Social and economic uplift of the project roads area.

e) Easy / comfortable travelling (made possible due to project works) provides a state of complete physical, mental, and social well-being to the people of the area.

For a project of a relatively mega scale involving main roads or other transport infrastructure, it is possible to quantify some of these benefits such as land appreciation, vehicle operating costs, travel time cots with necessary data inputs such as

- Sizeable average daily traffic data by vehicle type (existing and projected),
- Road geometry, pavement structure, road condition, and vehicle operating cost parameters, using the highway Development Model 4 (HDM-4).
- Vehicle operating cost data
- Travel time cost data etc.

1.1.4. Analysis

However, the proposed works are for the city road, are very small (in length) and do not have sizeable motorized traffic, thereby sizeable economic benefits not expected to accrue and thereby are not quantified and B/C Ratio, NPV and EIRR not calculated.

1.2. Financial Aspects

Provision of efficient / good roads facility is a public good and thereby responsibility of the Government. City road users will not thereby be tolled for using the improved project road. No revenues (public or private) are anticipated to be directly generated. Hence, a financial analysis is not required as there is no positive cash flow or direct revenue stream that contributes to the calculation of an international rate of return (IRR) or payback period or cost-benefit ratio. There is no land acquisition or resettlement requirement (in case of road's improvement / widening) as the road is owned by the government. Consequently, the capital cost of the project will not be recovered by the public. Any other realized costs after completion will be borne by the government from some other income source, such as municipal budgetary or other earmarked resources.

1.3. Social Benefits with Indicators

With the ease of transportation that comes with the construction of project roads, women will have greater enablement and access to economic opportunities and services. An overall change/uplift in livelihood of people around project site is expected due to increase in employment opportunities, raise in incomes, and raise in commercial activities (shops) along road (if any) etc. The road works would decrease transport costs, ease / increase access to jobs, schools, stores / markets, recreation and other community services and amenities, , foster economic integration, stimulate competition, generate agglomeration economies, encourage citizen satisfaction ad build trust with the government. These effects can be reflected in increased land values.

1.4. Employment Generation (direct and indirect)

Increased access to the economy from the improvement of the subject road will increase employment in and across project site. It will also create a positive effect on employees, working in various institutions/offices along project road, in terms of their performance and productivity and, hence wages. During construction, employment for the local people of the project area will be available. There will be indirect employment resulting from easier and greater access to opportunities across local geographies. Expected construction of commercial activities / shops (if any) along proposed road will also result in increased employment generation.

1.5. Environmental Impact and Clean Development Mechanism Assessment

Air emission and greenhouse gas reduction will result from the construction/improvement of project roads. During the construction phase, however, issues may arise from the generation of dust, emission of air pollution, noise, and traffic congestion due to traffic lane reduction and redirection.

Paved / improved road would reduce dust element and hence elimination of challenges to human health.

Positive change in the aesthetic/visual scene of the area would occur due to construction of paved and clean roads and expected plantation / greenery along roadsides (if space available).

1.6. Impact of delays on project cost and viability

Delays in the project will cause the total cost of the project to go up due to ever increasing inflationary pressures.

ANNEXURE – D

Implementation Period (Gant Chart)

Improvement, Widening and Raising of Road from Tank Chowk to Akbar Chowk along Canal Road

Project Implementation Period Chart

Sr No	Activity	Month 1	Month 2	Month 3	Month 4	Month 5	Month 6
1	Scarifying and dismantling of Road						
2	Preparation of Sub - Grade						
3	Laying of Sub - Base						
4	Laying of Base Course						
5	Asphalt Wearing- Course·						
6	Installation of Street lights						

ANNEXURE – E

Environment Impact Assessment

Environmental and Social Management Plan (ESMP)
Improvement, Widening and Raising of Road from Tank Chowk to Akbar Chowk (Canal Road)
MC Okara

November 2022

Table of Contents

List of Figures

List of Tables

List of Annexures

ACRONYMS

AHs	Affected Households
BOD	Biological Oxygen Demand
DPO	Deputy Program Officer
CO	Chief Officer
CPMT	Central Program Management Team
CTS	Complaints Tracking System
DPO	Deputy Program Officer
EHS	Environment Health & Safety
EIA	Environmental Impact Assessment
EMMP	Environmental Management and Monitoring Plan
EPA	Environment Protection Agency
EPD	Environment Protection Department
ESFPs	Environmental & Social Focal Persons
ESM	Environmental & Social Management
ESMF	Environmental & Social Management Framework
ESMP	Environmental & Social Management Plan
ESMMP	Environmental & Social Management and Monitoring Plan
ESSs	Environmental & Social Safeguards
GoP	Government of the Punjab
GRC	Grievance Redress Committee
GRM	Grievance Redress Mechanism
HIV/AIDS	Human Immunodeficiency Virus / Acquired Immune Deficiency Syndrome
HSE	Health Safety & Environment
IEE	Initial Environmental Examination
LG&CD	Local Government & Community Development
LESCO	Lahore Electric Supply Company
MC	Municipal Corporation/Committee
MO-I	Municipal Officer Infrastructure
MO-P	Municipal Officer Planning
NEQS	National Environmental Quality Standards
NOC	No Objection Certificate
OHS	Occupational Health & Safety
OPs	Operational Policies
PAPs	Project Affected Persons
PC-I	Planning Commission Form-I
PCP	Punjab Cities Program
PCRs	Physical Cultural Resources
PD	Project Director
PDO	Program Development Objectives
PEPA	Punjab Environment Protection Act
PHED	Public Health Engineering Department
PMDFC	Punjab Municipal Development Fund Company
PMU	Project Management Unit
PPEs	Personal Protective Equipment
PO	Program Officer
RoW	Right of Way
RPF	Resettlement Policy Framework
SMP	Social Management Plan
SOPs	Standard Operating Procedures
SPOs	Senior Program Officer
STIs	Site Transmission Infections
TORs	Terms of References
WB	World Bank

Executive Summary

Government of Punjab (Govt. of Punjab) sought support from the World Bank for the economic growth of urban sectors in Punjab and launched Punjab Cities Program (PCP). Program is expected to achieve overarching goals of ending poverty and promoting shared prosperity by delivering improved urban infrastructure inclusively and in ways that enhance economic growth and development in the participating cities. The Project has a number of financial, social, economic and environmental benefits, including institutional development, widening and improvement of municipal services, capital investments, better quality of life and employment generation. In addition, a large number of secondary benefits are also likely to accrue in the medium to long term such as institutional reforms at the local level. Environmental and social management under the program will be largely based on the existing legal, regulatory and institutional systems in Pakistan and in the Punjab province. PCP-IPF Window (technical assistance component) supports the strengthening of social and environmental risk management systems in the participating cities. It will finance the strengthening of:

a) Social and environmental focal points in each city;

b) The creation of social and environmental management system at the city level; and

c) Rolling out a training program by PMDFC for city officials.

This Environmental and Social Management Plan (ESMP) is prepared according to the World Bank Core Principles for PforR financing modality and Environmental and Social laws of Government of Punjab (GoPb). It will be used to identify and mitigate the environmental and social impacts that may emerge during implementation of proposed sub-project “Improvement, Widening and Raising of Road from Tank Chowk to Akbar Chowk along Canal Road” which will be executed by MC Okara from the financial grant of PCP. This ESMP follows the social and environmental appraisal and compliance as mentioned in the Environmental and Social Management Framework (ESMF) of PCP.

Sub-project Summary:

Scope of Work	**Sub-Project Involves** Improvement, Widening and Raising of Road from Tank Chowk to Akbar Chowk along Canal Road.
Location	The alignment of Canal Road exists in between Tank Chowk to Akbar Chowk in Okara City.
Sub-project Cost	PKR 100.53 /- Million
ESMP Implementation Cost	PKR /-1,333,000

Sub-project Duration	Six months approx. 30/35 workers/labor will be engaged
Major Work Activities	i. Scarifying and dismantling of road ii. Preparation of sub-grade iii. Laying of sub-base iv. Laying of base course v. Asphalt wearing course vi. Installation of street lights
Executing Agency	MC Okara
Monitoring Agency	Punjab Municipal Development Fund Company (PMDFC)
Sub-project Financed By	World Bank under Punjab Cities Program (PCP)
Environmental Category	E-2
Social Category	S-2

Environment & Social Management:

This ESMP report presents the sub-project site-specific baseline data, identification, assessment and evaluation of sub-project impacts and environmental management and monitoring plan for mitigation of adverse impacts that may arise due to the proposed sub-project interventions.

Screening of Impacts:

Environment and social screening checklist included in the ESMF to screen the sub-projects has been used to screen the impacts of "Improvement, Widening and Raising of Road from Tank Chowk to Akbar Chowk (Canal Road)" and filled as per the environmental and social survey conducted in the sub-project area during 31st October to 3rd November 2022. The screening checklist (Annex-i) revealed that environmental and social impacts of the sub-project are minor to moderate and temporary and can be mitigated and managed with prevailing good civil construction measures.

Impact Assessment:

Overall, the subproject will be beneficial. However, during construction phase, there will be some negative environmental and social impacts including construction waste generation during dismantling of road, noise pollution, obstruction in vehicular and pedestrian movement, and temporary disturbance in the accessibility of residents due to road closure. There will be

no impact on PCRs as project interventions are outside of the PCR boundaries. There are 05 schools along the entire stretch of road, where educational activities may be affected due to project interventions. Ramps of three schools will be partially dismantled during widening of Canal road and one electric pole needs to be relocated. It will be advised to implement traffic management plan during construction and ensure safety of children by applying SOPs related to construction safety while executing activities near schools. Further it will be required to monitor noise levels of machinery and equipment to keep them within safe limits. There are community safety and occupational safety prospects envisaged. Land acquisition is not required in the sub-project.

Mitigation Measures:

These impacts require appropriate mitigation and management measures to curtail them. The sub-project specific measures suggested are;

a) ESFPs will conduct regular visit to the construction sites and fortnightly by DPO-ESM to monitor the compliance of E & S aspects

(b) Dismantling material will be disposed of simultaneously to designated site approved by the construction supervision engineer

(c) It will be ensured to execute the work in portions to minimize the temporary disturbance in accessibility of the people

(d) Public safety will be ensured

(e) Workforce will be provided with the PPEs

(f) Corona SOPs will be followed

(g) Contractor will use efficient machinery and equipment to reduce noise and air pollution impacts

(h) Contractor will ensure public convenience during the course of sub-project.

Grievance Redress Mechanism (GRM):

GRM for subproject implementation will cater to all sub-project beneficiaries. The GRM mechanism is based on two-tier grievance redress committees at MC Okara, and PMDFC/ LG & CDD level. At construction site contact numbers of GRC members will be displayed.

Stakeholder Consultations:

Stakeholder consultations were carried out during preparation of ESMP. Interviews were undertaken with primary and secondary stakeholders to discuss present working condition of road and improvements recommended. Meetings were held with MC Okara Officials and key environmental and social issues were discussed. Consultations revealed that overwhelming majority of the respondents were not satisfied with the current condition of road as presently the road taken for improvement in the sub-project is narrow and shows traffic problems, surface drainage and aesthetics. All the respondents were in favor of widening and improvement of the road.

Section-1 Introduction

1.1. Punjab Cities Program (PCP)

Punjab Cities Program (PCP) Program-for-Results (PforR) will support participating MC Okara to improve their urban management and service delivery performance. The operation will provide capacity-building and institutional support to 16 secondary cities in Punjab, with an estimated total population of 4.1 million, half of whom are female.

Program Development Objectives (PDO) *is to strengthen the performance of participating urban local governments in urban management and service delivery.*

By achieving the Program Development Objective (PDO), the execution of the sub-project is expected to contribute to the overarching goals of ending extreme poverty and promoting shared prosperity by delivering improved urban infrastructure on an inclusive basis and in ways that enhance economic growth and development in the participating cities. Achievement of the PDO will also make a significant contribution to attaining Sustainable Development Goal-11 (sustainable cities and communities).

1.2. Environment & Social Management Framework (ESMF)

Environmental and Social Management Framework (ESMF) has been prepared for Punjab Cities Program (PCP). ESMF will facilitate and technically assist the MC Okara in better understanding and compliance of social and environmental management processes and procedures as per the World Bank Core Principles under PforR financing modality, local policies and legal framework. Under ESMF procedures, each sub-project will be screened for the severity and extent of environmental and social impacts. All the sub-projects will be screened through an environmental and social screening checklist and those having negligible environmental and or social impacts will require no further assessment. sub-projects having some negative but localized environmental and or social impacts will require a generic Environmental and Social Management Plan (ESMP) or SMP, while those having environmental impacts of significant nature or they come under Schedule I or II of PEPA Review of IEE/EIA Regulation 2000 will require to conduct the detailed studies (IEE/EIA) and further submission of reports to PEPA for review and to obtain NOC/ environmental approval.

1.3. Environment & Social Assessment Categories

1.3.1. Environmental Categories:

Depending on size, cost, location and the nature, scheme will have varying impacts on city environment. The rigorousness of environmental assessment requires identifying and mitigating the impacts, largely dependent upon the complexities of scheme. To facilitate effective screening, ESMF categorized schemes into three categories viz. E-1, E-2 and E-3.

E-1	schemes are those wherein major environmental impacts are foreseen;
E-2	schemes are expected to have only moderate environmental impacts; and
E-3	schemes are the schemes with negligible environmental impacts and hence, these can be termed as “environmentally benign”.

1.3.2. Social Categories:

Based on the number of households that may be affected by the scheme, i.e., Affected Households (AHs) and magnitude of impacts, schemes are categorized as S-1, S-2 and S-3.

S-1	schemes are those that will impact more than 40 households, and are expected to have significant negative social consequences;
S-2	schemes are those which will impact less than 40 households and are expected to have significant social consequences affecting local inhabitants
S-3	schemes are not expected to have any significant adverse social impacts.

1.3.3. Environment & Social Assessment Category of the Sub-project

Sub-project has been screened to assess the environment and social impacts anticipated as per scope of work. As per findings of the site visit conducted during 31-10-2022 to 01.11.2022, discussion with officials and stakeholder consultations, sub-project area does not fall in any of the wildlife habitat or reserve area/ environmental sensitive areas; therefore, it will not cause any harmful environmental impact directly or indirectly during or after execution of civil works. sub-project will have no irreversible environmental and social impacts. There are some moderate environmental impacts (minor excavations and civil works) as per scope of work which will be minimized by providing mitigation measures mentioned in Table 7-1. sub-project is categorized as E-2 and ESMP is prepared under this category.

Involuntary land acquisition is not required, and therefore there will be no physical displacement or impacts on livelihoods nor restrictions on access of the local community. Anyhow, sub-project may have temporary social impacts related to community health and safety and accessibility. Therefore,

sub-project is categorized as S-2, as there is no negative impact in terms of livelihood, business loss and any other economic loss is anticipated*.* Ramps of three schools i.e. Allied School, The Knowledge School and Dar-e-Arqam School will be partially affected due to widening of road and one electric pole will have to be relocated.

1.4. Environment & Social Management Plan (ESMP)

The Environmental and Social Management Plan (ESMP) is prepared for the following sub-project in compliance with the guidelines provided in the Environmental and Social Management Framework (ESMF) for the PCP-project

"Improvement, Widening and Raising of Road from Tank Chowk to Akbar Chowk (Canal Road)"

1.5. Objectives of ESMP

The primary objectives of the ESMP are as follows:

- To facilitate the implementation of the identified mitigation measures.
- To define responsibilities of the project proponents, Contractor, and other members of the project team.
- To define a monitoring mechanism and identify monitoring parameters in order to ensure complete implementation of all mitigation measures and ensure effectiveness of the mitigation measures.

1.6. Sub-Project Team

Following team members (Tabe-1-1) participated during the preparation of ESMP.

Table 1-1: Composition of Sub-project Team

Sr. No.	Name	Designation	Department
1	Mr. Asif Gilani	DPO-ESS	PMDFC
2	Mr. Ali Raza	Sub-Engineer	MC Okara
3	Dr. Muhammad Ashraf Bodla	Environmental Specialist	MM-Pakistan
4	Mr. Moazzam Ali	Environmentalist	MM-Pakistan
5	Mr. Saqib Sadiq	Sociologist	MM-Pakistan

Section-2 Sub-Project Description

2.1. Area Description

The alignment of Canal Road exists in between Tank Chowk and Akbar Chowk in Okara city. The present physical conditions of Canal road is presented in the Figure 2-1.

Figure 2-1: Canal Road Okara

2.2. Problem Statement

This sub-project has been formulated on the basis of demand from communities residing along with the alignment of the sub-Project. The road proposed for widening and improvement have been damaged because of poor maintenance. Due to various activities for installation of utilities in these areas the condition of the areas highlighted by district council, Okara is narrow and needed immediate attention to improve the vehicles/ pedestrian traffic to ease out the public at large in the area. The road is damaged at various places and needs widening and improvement. Therefore, MC Okara also decided to construct road under this sub-project.

2.3. Description of Work Activities

The subproject is Improvement, Widening and Raising of Road from Tank Chowk to Akbar Chowk (Canal Road)

The sub-project has the following interventions:

- Scarifying and dismantling of road
- Preparation of sub-grade
- Laying of sub-base
- Laying of base course
- Asphalt wearing course
- Installation of street lights.

2.4. Environmental Management Cost

Total cost of the scheme: 100.93 Million/- PKR

ESMP implementation cost: 1.33/- Million. PKR (Break-up of this cost described in Table 7-2).

2.5. Duration of the Sub-project

Implementation Schedule/Duration: 06 month maximum.

No. of workers/labor involved: 30-35 approx.

2.6. Sub-project Alternatives

Sub-project involves Improvement, Widening and Raising of Road from Tank Chowk to Akbar Chowk along Canal Road.

2.6.1. Do Nothing Scenario

The no-build alternative involves letting the current situation continue without addressing the on-going deterioration of the air quality, level of service and other environmental and social impacts occurring in the subproject area. If the project is not carried out the expected consequences are:

- Deterioration in air quality, and increase in noise levels due to traffic jam.

- An increase in the severity of socio-economic impacts in the surrounding area.
- The project shall eventually have to be undertaken as the demand from the communities shall soon reach its peak levels.
- The cost of the proposed design shall increase in future due to inflation, social issues, environmental impacts etc.

2.6.2. Site Alternative

Sub-project involves Improvement, Widening and Raising of Road from Tank Chowk to Akbar Chowk (Canal Road), so there is no site alternative envisaged because no other site available to serve this purpose.

Section-3 Legal & Policy Framework

3.1. Introduction

The Government of Pakistan and Government of Punjab (GOP) have enacted a range of laws, regulations, policies and procedures for management and mitigation of social and environmental impacts for infrastructure development projects. This chapter discusses the relevant and applicable laws and WB Core Principles for PforR financing modality applicable for PCP to deal with the environmental and social issues.

3.2. National and Provincial Laws, Regulations, Procedures and Guidelines dealing with the Environmental & Social Aspects

Table 3-1: National and Provincial Laws, Regulations, Procedures and Guidelines dealing with the Environmental & Social Aspects

Sr. No.	Applicable laws, regulations, Guidelines	Relevancy/Applicability
I.	Punjab Environmental Protection Act 2012	PEPA does not require IEE or EIA of widening projects
II.	PEPA Review of IEE/EIA Regulations, 2000	IEE/EIA regulations do not require IEE or EIA of widening projects.
III.	Notification No.SO (Tech)/EPD/1-26/2004 issued by Government of the Punjab, Environment Protection Department “Delegation of Powers for Environmental Approvals Rules 2017	ESMP do not require review and subsequent NOC from the relevant authority
IV.	Punjab Local Government Act, 2019	Follows the environmental and social assessment procedures stated in PEPA 2012
V.	Punjab Environmental Quality Standards for Motor Vehicle Exhaust and Noise	Applied to vehicles used by the contractor
VI.	Punjab Environmental Quality Standards for Ambient Air (2016)	Compliance required during construction activities
VII.	Punjab Environmental Quality Standards for Noise (2016)	Compliance required during construction activities
VIII.	Punjab Environmental Quality Standards for Drinking Water	Compliance required during construction activities

IX.	Punjab Restriction of Employment of Children Act 2016	Compliance required during construction activities
X.	Protection Against Harassment of Women at the Workplace Act, 2010	Compliance required during construction activities

3.3. World Bank Policy Core Principles and Applicability on Sub-project

Core Principles	Applicability
Core Principle 1 Environmental and social management procedures and processes are designed to (a) Avoid, minimize, or mitigate against adverse impacts; (b) Promote environmental and social sustainability in program design; and (c) Promote informed decision making relating to a program's environmental and social effects.	ESMP prepared under the light of this Principle in order to mitigate negative impacts envisaged in this sub-project. ESMP implementation will help in achieving environmental and social sustainability
Core Principle 2 Environmental and social management procedures and processes are designed to avoid, minimize, and mitigate against adverse effects on natural habitats and physical cultural resources resulting from the program	All the mitigation measures have been incorporated in the Table 7-1.
Core Principle 3 Program procedures ensure adequate measures to protect public and worker safety against the potential risks associated with (a) construction and/or operations of facilities or other operational practices developed or promoted under the Program and (b) exposure to toxic chemicals, hazardous wastes, and otherwise dangerous materials	All the mitigation measures have been incorporated in the Table 7-1 to address risks associated with workers and community health and safety. Contractor will ensure compliance with these attributes.
Core Principle 4 Land acquisition and loss of access to natural resources are managed in a way that avoids or minimizes displacement, and affected people are assisted in improving, or at least restoring, their livelihoods and living standards	This core principle doesn't trigger in this sub-project as no land acquisition is required during the replacement of existing sewer-line.
Core Principle 5 Due consideration is given to cultural appropriateness of, and equitable access to, program benefits, giving special attention to rights and interests of indigenous peoples and to the needs or concerns of vulnerable groups.	No indigenous/ Vulnerable groups exist in the sub-project sites.

Core Principles	Applicability
Core Principle 6 Avoid exacerbating social conflict, especially in fragile states, post-conflict areas, or areas subject to territorial disputes.	This principle is not relevant for this Sub-project.

3.4. World Bank Environmental, Health and Social Guidelines

The principal World Bank publications that contain environmental and social guidelines are listed below.

- Environment, Health, and Safety (EHS) Guidelines prepared by International Finance Corporation and World Bank in 2007
- Pollution Prevention and Abatement Handbook 1998: Towards Cleaner Production
- Environmental Assessment Sourcebook, Volume I: Policies, Procedures, and Cross-Sectoral Issues.
- Social Analysis Sourcebook
- WB Group Gender Strategy

Details of related EHSG can be found in Annexure ii.

3.5. PMDFC Environment Health and Safety SOPs for labor/workers (including Women)

EHS SOPs for labor/ workers (including women workers) will be applicable during the labor work and made part of the contractual agreement of the contractor

3.6. COVID-19 SOPs

During the construction and implementation of the Sub-project, the Standard Operating Procedures (SOPs) will be strictly followed during construction activities, stakeholder consultations or applicable in any other relevant aspect. The SOPs attached as Annexure iii.

Section-4 Environment & Social Baseline

4.1. City profile

Okara district is composed of three sub-divisions Okara, Renala Khurd and Depalpur. Okara, the District Headquarters is about 127 Kilometers to the southwest of Lahore, on the National Highway and on the main Lahore-Karachi Railway track. Okara district spreads between latitudes of 30^{o} -18' 'to 31°-08' North, and the longitudes of 73^{0}-14' to 74$^{0'}$-09' East. The city coordinates are 30^{o} -49' North latitude, and 73^{o} -27' East longitude.

4.2. Climate

Climate of the district varies from hot to very hot in summer and cold in winter especially in December and January. During the months of July and August, the weather is humid whereas spring is pleasant. Summer season starts in April and continues till September. June is the hottest month with mean maximum and minimum temperature of about 45 and 27 degree Celsius respectively. Winter season starts from November and lasts till February. Mean maximum and minimum temperature recorded during the month of January is about 20 and 6 degree Celsius respectively. Light rainfalls during winter season especially in the months of January and February is succeeded by a spell of pleasant spring weather. Monsoon starts in the first week of July. The average annual rainfall is about 625 millimeters.

4.3. Demographic Status

The population census report of year 2017 has not been published by Government of Pakistan. However the provisional data available for this census shows the population of 357,935 persons for the city within municipal limits. A land scan process was done to estimate the population of entire inhabited areas of city in close approximation which was found to be 443,396 persons in the year 2017 with an annual growth rate of 2.32 % and it is expected to rise to 557,695 persons in the year 2027. A large and thick inhabitation has developed outside the municipal limits of the city and the municipal limits need to be extended.

4.4. Water Resources

The city is divided into two zones by Lahore-Karachi railway track and is called North & South Zones. Originally 19 tube wells for north zone were installed on the bank of Lower Bari Doab Canal (LBDC) between the LBDC and 4-L distributary whereas the tube wells for south zone were installed on the bank of 4-L distributary. Both the irrigation channels diverge away from each other at the south-western end of the city.

The discharge of 4-L distributary is 260 cusecs only and after some time the water quality of the tube wells installed on the banks of this channel, deteriorated because of excessive withdrawals as compared to the recharge and became unfit for human consumption. In this way acute water shortage was experienced in the south zone.

4.4.1. Water Quality

No specific primary and secondary data available in context of Okara City. MC Okara has not sampled/analyzed any drinking water since PHED handed over whole water supply infrastructure to MC.

4.5. Solid Waste Management

Some portion of the city is either un-served or partially served because of shortage of sanitary staff and machinery & equipment whereas the existing machinery and equipment is inefficient having costly operation and maintenance and need repairs. The solid waste is being dumped at two different points along the LBDC because no proper landfill site is available which is creating hazards like obnoxious smell, sub soil water pollution and breeding of vectors causing water borne and vector diseases. Apart from that this is also creating insanitary conditions resulting in frustration in the citizens. MC has a piece of land measuring 13 acres for the development of Landfill site but it could not be developed due to financial constraints.

4.6. Sewerage Facility

The city is equipped with sewerage system in 71% area. The city has been divided in to three areas called as Zones with respect to the drainage. In zone-1 the outfall sewer line of 48” diameter was choked and has been subsequently got replaced by a 54” diameter sewer. The Disposal works of this system is located in Chack No-2/4L and the waste water from this disposal works is being pumped into a seepage/storm water drain through a force main up to LBDC and sullage carrier up to drain. The section of the sullage carrier is not adequate to carry the entire quantity of water and hence it overflows in private lands. To eliminate the overflow, the farmers divert the water to LBDC thus polluting this channel.

The disposal works of zone-2 is located in Chack No-1/4L. No problem in this zone is experienced as the sewers are relatively of much lesser age than the rest of the systems and not posing any problem of flooding of streets and roads. However the ultimate disposal of waste water is broad irrigation in the private lands across LBDC. When water is not required by the farmers, they divert this water into LBDC thus polluting the canal. The sullage carrier needs to be extended up to the seepage drain to eliminate pollution of the canal.

Zone-3 is relatively much bigger systems and covers most of the area lying in the south-east of railway track. The waste water is being discharged by gravity into a seepage/storm water drain flowing in the south eastern side of Okara city at a distance 6 Km through the outfall sewer of 66 inches diameter converting into a sullage carrier from its mid length to the end.

4.7. Seismologic Zone

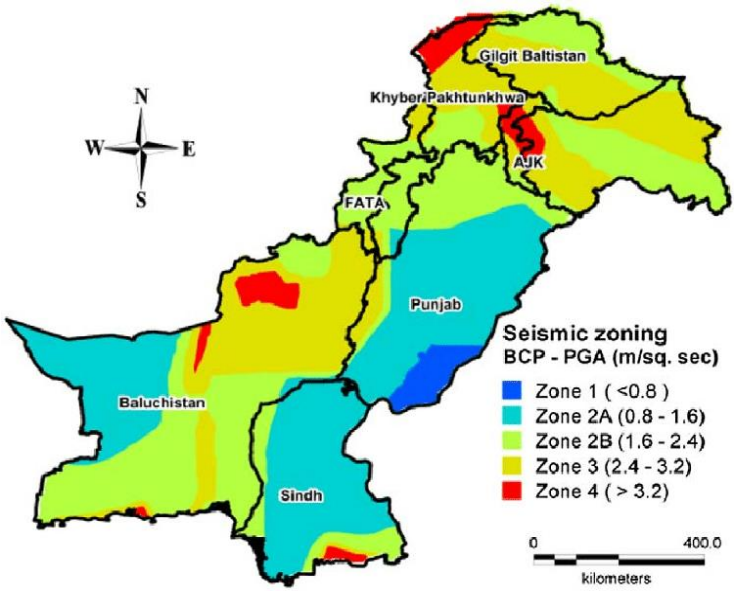

Figure 4-1: Project Area Seismic Zone Location[1]

Table 4-1: Seismic Zones of Tehsils of Pakistan

Tehsil	Seismic Zone	Tehsil	Seismic Zone	Tehsil	Seismic Zone
Punjab					
Bhakkar	2A	Kasur	2A	Kot Addu	2A
Kalur Kot	2B	Chunian	2A	Bahawalpur	2A
Mankera	2A	Pattoki	2A	Hasilpur	2A
Darya Khan	2A	**Okara**	2A	Yazman	2A
Khushab	2B	Depalpur	2A	Ahmadpur East	2A
Nurpur	2A	Renala Khurd	2A	Khairpur Tamawali	2A

According to the Seismic data of Pakistan; Okara lies in 2A zone with minimum risks to any earthquakes[2].

[1] Source: Geological Survey of Pakistan
[2] Source: Geological Survey of Pakistan

4.8. Natural Disasters Data

Geographically Okara lies at a distance of 32 Km and 111 Km from River Ravi and Satluj respectively and is therefore historically not affected by floods.

4.8.1. Potential hazards of the District Okara

Table 4-2: Risk Analysis of Potential Hazards of District Okara

Hazards Risk	Likelihood Score (1-5)	Impact Score (1-5)	
Floods	5	5	25
Urban Flooding	1	1	1
Flash Floods	1	1	1
Hill Torrent	1	1	
Glacial Lake Outburst Flood (GLOF)	1	1	1
Landslide	1	1	1
Tornado	1	1	1
Earthquake	5	5	25
Drought	1	1	1
Epidemic	2	4	8
Fire Incidents	1	1	1
Other Major Accidents (Building Collapse, road traffic accidents, train accident, Stampede, plane crash)	1	1	1
Environmental Hazards (industrial accidents, severe pollution etc.)	1	1	1
Risk = Impact x Likelihood Low: 1-7 Medium: 8-14 High: 15-25			

Source: District Disaster Management Plan 2020 (District Okara)

4.9. Environmentally and Socially Sensitive Receptors

Environmental sensitive areas are more prone towards human disturbance. For this sub-project, no wetland, estuarine, river, protected areas lie within scope of work of scheme area and no significant environmental impacts have been envisaged. 05 schools are located within 100m of Canal road. There will only be impediment in the movement of local community during school timings. The ramps of three schools will be partially affected during construction works and one electric pole will have to be relocated due to widening of road.

4.10. Flora & Fauna

18 trees of Jaman, Datepalm, Neem, Toot and Sufaida are growing along the footpath where tuff paver are proposed, however, these trees are outside of the paver boundary and will not be cut/uprooted. Similarly, 35 trees of same species are growing on the other side of the road but

outside of RoW. No tree cutting is involved during the execution of the project. No wild animal/ endangered species is found in the area.

4.11. Right of Way and Corridor of Impact

The existing Right of Way (RoW) of Canal Road is 30-33 ft. The existing carriage way is 14.5 to 15.5ft and proposed carriage way is 24ft which is the Corridor of Impact (COI) where the widening/ improvement works of roads will be confined.

4.12. Socio - Economic Baseline

The socio-economic characteristics are a comprehensive review of the current conditions of the project area. It is based on a literature review, site visits, and consultations with institutional and community stakeholders. The baseline provides a glance of the conditions of the community of the project area. It includes provision of social infrastructure facilities available in the area. Moreover, the existing conditions of utilities and the presence of cultural and religious sites are also discussed. Most of residents along the road fall under the high income category and are engaged with politics, education and business.

4.12.1. Demographic Characteristics

The population of Okara is 357,935 as recorded in 2017. The project lies in the urban area. Birth, Death, fertility, mortality, fecundity, Crude and net birth rate and migration are the most important demographic factors.

4.12.2. Educational institutions

05 schools are present in the vicinity of project location, where temporary impediment in the movement of school children is anticipated. Construction works in front of these schools will be done after school hours or civil activities will be executed in sections to avoid any blockage in the movement of students or any interference in educational activities during working hours.

4.12.3. Housing

Majority of the houses are made of material such as bricks and cement-concrete. Basic utilities, which are included gas, water supply and sewerage system, are also available at the proposed project site.

4.12.4. Archaeological, Historical, and Cultural Resources

There is no identified archaeological, historical, and cultural resources along the sub-project route that will be impacted by the road construction except 05 schools that are located outside of

subproject Corridor of Impact (COI). There will be no impact on the structures. However, temporary impediment in the movement of people during the school timings might happen. This impact would be mitigated by keeping the passageway clear during study timings.

4.12.5. Identification of Project Affected Persons (PAP)

The residential and commercial structures adjacent to the road will not be affected as no land acquisition is required. The ramps of Allied School, The Knowledge School and Dar-e- Arqam School will be partially affected and one electric pole owned by LESCO will have to be relocated (Figure 4.2). The details are as under:

Sr. No.	Name of PAP	Type of Asset	Size in Sq. Feet	Name of Institution	Contact No.
1.	Irshad Ali (Principal)	Tough Paver	91	Allied School	04427067256
2.	Muhammad Idrees (Teacher)	Tough Paver	200	The Knowledge School	03136962254
3.	Prinipal	Tough Paver	400	Dar-e- Arqam School	0404400672
Total Cost				144,720 Pkr	
Cost for Relocation of 1 Electric pole				10,00,000 Pkr	

Figure 4-2: Photographs of assets to be partially removed and pole to be relocated

Section-5 Stakeholder Consultation

Timely and broad-based stakeholder involvement is an essential element for an effective environmental and social assessment. Stakeholder engagement and consultation during environmental & social assessment contributes in the improvement of the project design, environmental compliance and social acceptability.

5.1. General

This section describes the outcomes of the public consultation sessions held within MC Okara about the proposed sub-project area. The objectives of this process were to:

- Share information with stakeholders on the widening of the proposed project and expected impacts on the physical, biological and socio-economic environment of the project;
- Understand stakeholder's concerns regarding various aspects of the project and the likely impacts of construction related activities and operation of the project;
- Understand the perceptions, assessment of social impacts and concerns of the affected people/ MC Okara of the proposed project;
- Provide an opportunity to the public regarding their valuable suggestions in a positive manner; and
- Reduce the chances of conflict through the early identification of controversial issues, and consult them to find acceptable solutions.

In preparation for the ESMP, two major groups of stakeholders were identified:

(i) Local communities who are the direct beneficiaries of the project interventions and therefore identified as the primary stakeholders

(ii) Institutions who have an important role in enabling the realization of the project interventions and therefore identified as the secondary stakeholders.

5.2. Public Consultation

For public information/ consultation, visits were made in the proposed sub-project areas to record the concerns of communities regarding sub-project activities. Methodology used for selection of interviewee was Random Sampling/ Focus Group Discussion. Table 5.1 depicts the concerns of the Institutional and community representatives and the replies from the consultant team. The

pictorial record of Institutional and community consultations are given in Figure 5-1 & 5-2 respectively.

Table 5.1 Stakeholders Consultation

Sr. No.	Institutional Concerns	Consultant Responses
1	Mr. Zahid Iqbal, Additional Deputy Commissioner (General) asked about any broacher on the sub-project prepared? If so send a copy	Project brief has been prepared by Punjab Municipal Development Finance Company (PMDFC) and may be provided to the stakeholders in due course
2	Mr. Zaheer Liaqat Baig, Administrator MC Okara asked about the removal of electric poles and transformers from the roads. He also enquired about the cutting of trees. An alternate plantation of tree cutting should be made prior to subproject execution. He commented that the green belts of roads should not be decreased. He was fully agreed with the construction of roundabout and U-Turn at Multan Road. He said, it is a dire need to take urgent initiatives accordance with the available space.	It was informed that the electric poles will be removed by Lahore Electric Supply Company (LESCO) for which Demand Notice has been received. About tree cutting, he was informed that 1o trees will be planted for every cut/uprooted tree.
3	Mr. Muhammad Nasim Chief Officer has positive response to the subproject. He commented that the sub-project may be executed at the earliest as per need of the citizens.	Well appreciated his views.
4	Ahsan Bilal, Circle Head Draftsman was briefed about the shifting of electricity poles. He enquired about the shifting cost of the electric poles as per their Demand Notice.	He was informant that demand notice has been received and payment to LESCO being arranged.
5	Mr. Sarfraz Ali Sub Divisional Officer Irrigation has no issue about the roads but has concern about disposal of untreated sewage in to Lower Bari Doab Canal and 4.L Distributary.	He was informed that the sewage will not be disposed of in to the water bodies.
6	Mr. Javaid Suleman Assistant Forest asked that whether any forest tree will be cut/uprooted. In doing so replenishment cost has to be paid to the Forest Department prior to execution of the subproject. He provided copy of SOP for cutting of forest trees.	He was informed that No forest tree will be cut/uprooted
7	Mr. Muhammad Tufail Principal Savvy School, and Mr. Arshad Ali Principal Allied School supported the subproject.	Appreciated their support

Sr. No.	Community Concerns	Consultant Responses
1	The residents showed their concern about the existing bad and narrow condition of road and asked for urgent widening.	The project team said that this project would be completed on an urgent basis.
2	There is dire need to establish a supervision committee to monitor the construction works of road to ensure quality at site	The team briefed that all construction works will be monitored by MC itself as well as PMDFC representative and team of supervision consultants. Quality will be ensured at every stage.
3	The provision of speed breakers should be added particularly near schools while designing road to avoid over speeding and ensure safety of school children	The team answered that this provision of speed breakers close to schools will be considered while designing road.
4	Fence and foot path must be added in the scope of work towards canal side	The team answered that this suggestion will be communicated to design team.
5	The local people suggested that there should be lease involvement of political leaders in this project and should only focus need of local residents and common user of road.	Acknowledged by the consultants and replied they recognize the dire need of the local people and will fulfill the needs accordingly.
6	School owners, showed their concern about impediment in movement of students coming to school.	Sociologist of MMP responded, this impact is already in our mind and shall not only be addressed properly in environment management plan but also strictly implemented during construction to avoid impediment in the movement of pedestrians.
7	There is a heavy load of traffic on this road, how it will be managed during construction?	Acknowledged, The contractor will prepare Traffic Management Plan before the start of construction activities and shall implement during execution. Consultant and PMDFC staff will monitor its implementation throughout the project duration.
8	Speed breakers should be designed according to prescribed standards to avoid damage to vehicles and unnecessary speed breakers should be avoided.	Acknowledged, all speed breakers will be designed as per specifications and need based.
9.	The road along the right bank of canal should also be improved along with this project	This project is for the improvement of left bank of canal road, but this suggestion will be communicated to concerned authorities as a prospect for future development needs.
10.	The trees on this road should not be cut while widening of road	The team ensured to the community that no tree will be cut or uprooted.

Consultation with Administrator MC Okara

Consultation with Executive Engineer-LESCO

Consultation with Sub-Divisional Officer, Irrigation Department

Consultation with Superintendent Forest Department

Figure 5-1: Pictorial view of Institutional Consultations

Figure 5-2: Pictorial view of Public Consultation

Section-6 Grievance Redress Mechanism

In order to receive and facilitate the resolution of affected people concerns, compliments, and grievance about the project's environmental and social performance an Environmental Grievance Redress Mechanism (GRM) has been established. The GRM will address affected people's concerns and complaints proactively and promptly, using an understandable and transparent process that is gender responsive, culturally appropriate and readily accessible to all segments of the affected people at no costs and without retribution.

The GRM will be accessible to diverse members of the communities, including women, senior citizens, and people with disabilities, laborers/workers, and other vulnerable groups. Culturally appropriate communication mechanisms will be used at all sub-project sites both to spread awareness regarding the GRM process as well as complaints management. *ESMF GRM will be integrated with the PCP's overall program GRM hotline to be developed by the Consultants under the scope of PCP.*

GRM has been designed which will utilize the web platform and also android app.

6.1. Grievance Redress Mechanism at Sub-Project Site

Grievance Redress Mechanism (GRM) is to provide a robust system of procedures and processes that provides for transparent and rapid resolution of concerns and complaints identified at the local level. For integration of GRM into existing Complaint Tracking System (CTS), Grievance Redress Committee (GRC) - MC will be notified under umbrella of Punjab Cities Program (PCP) comprising of the following members and TORs.

Chief Officer MC	Chairperson
Municipal Officer (Infrastructure Development)	Convener
Municipal Officer (Planning)	Member
Municipal Officer (Regulation)	Member

TORs of GRC-MC are as follows:

- ESFPs designated by the MCs for environmental and social management will be responsible to manage the GRM effectively. The ESFPs with the support of DPO-ESM will play an instrumental role in steering the GRC functions both at city and regional level.

- CO MC will be responsible to share monthly recorded grievances data with regional GRC.

6.2. GRM at Regional Level

Grievance Redress Committee at Regional level will also be notified under umbrella of Punjab Cities Program (PCP) comprising of the following members and TORs:

Deputy Program Officer (Environmental & Social Management)	Chairperson & Convener
Deputy Program Officer (Infrastructure Development)	Member
Deputy Program Officer (Institutional Strengthening)	Member

TORs of GRC-Regional are as follows:

- Committee will be responsible to manage the GRM effectively as per data provided by MC GRC.
- DPO-ESM will support ESFPs in steering the GRC functions both at city and regional level.
- DPO ESM will maintain monthly complaint records from ESFPs.

A Grievance Redress Committee (GRC- PMDFC/LG & CDD) will be responsible to oversee the overall functions of the GRM at a strategic level including monthly reviews. It will be headed by the Secretary LG &CDD.

6.3. Types of Grievances

The following are some of the environmental and social issues that could be subject for grievance from the affected people:

Environmental Issues	Social Issues	EHS Issues
• Noise Pollution • Air Pollution • Fugitive Dust • Water Pollution • Solid Waste Management • House Keeping • Cutting of Trees • Borrow Areas Management	• Accidental Insurance for labor • Non-Provision of PPEs to labor as per nature of their jobs • Loss of any public infrastructure • Protection of sensitive receptors	• First Aid • Fire Safety • Workplace Safety • Tools Box Talks • Provision of PPEs • Work at Height Safety • Excavation Safety • Heavy Machinery Issues

• Protection of Wildlife • Campsite Management	• Compensation for any economic losses • Traffic Management • Labor grievance redressal • Gender discrimination • Security Arrangements • Impacts on livelihood • Irregular Traffic Movement • Obstruction in access • Intensive schedule of construction activities • Child Labor • Unsafe conditions for the community (Community Health and Safety, CHS)	

Section-7 Environmental and Social Management and Monitoring Plan

7.1. Objective

The purpose of Environmental and Social Management and Monitoring Plan (ESMMP) for widening and improvement of road is to ensure that all necessary identified measures have been adopted in order to protect the environment and social situations and to comply with country environmental legislation and applicable World Bank Core Principles for PforR financing modality. After the preparation of ESMF, PMDFC ESM Wing outlined site-specific ESMMP for the Contractors and executing agency. Environmental and social checklist was prepared by PMDFC ESM Wing with the help of the field teams and was used to assess the potential impacts of sub-project on the basis of its scale/ size, nature and significant negative impacts.

7.2. Institutional Arrangements

The specific responsibilities of the institutions involved in the ESMP implementation are described below:

7.2.1. MC Okara

MC Okara will be responsible for implementation, monitoring and reporting of ESMP with the technical assistance of ESM Wing PMDFC throughout the project period.

Notification of ESFPs in MC Okara under PCP has been done.

MOI has been nominated for Environment Focal Person, he is responsible for implementation & monitoring of environmental aspects. MOP has been nominated for Social Focal Person he is responsible for implementation & Monitoring of social Aspects

7.2.2. PMDFC ESM Wing

ESM Wing will provide support to ESFPs (MOI for Environment focal person and MOP for Social focal person) for managing environment and social aspects of the subproject and implementation of the present ESMP. ESM Wing would also support communities' participation, consultations and other social activities from the sub-project identification to completion stage. PMDFC ESM wing will also monitor the subproject activities to ensure the project remains complaint as per World Bank and national/provincial policies and regulations. Therefore, regular reports will be submitted to the Word Bank accordingly.

7.2.3. The Contractor

The Contractor will be responsible for on-field implementation of the ESMP and environmental protection liabilities under the Punjab Environmental Protection Act (Amendment 2012) and World Bank's Environmental and Social Core Principles for PforR financing. He will also be responsible for compliance of ESMP provisions keeping in view his contract with the MC Okara. The Contractor will train his crews in all aspects for implementation of the ESMP.

Contractors have to comply with the following responsibilities:

- Observation of timings and make a schedule that the surrounding communities should not affect from noise pollution, air emissions and disturbances in their routine work
- Sage of machinery/equipment's producing negligible/low noise.
- Ensure health, safety and protective measures including safety equipment, safe drinking water, first aid boxes etc. to the workforce as per nature of their jobs.
- Water sprinkling to avoid air pollution.
- Indicate alternate routes and provide indicators on suitable places during work timings.
- Local labor should be preferred to work.
- Child labor is strictly prohibited as per labor law. All labor should be more than 14 year of age individually.
- Minimize livelihood disturbance of hawkers and shopkeepers
- Proper disposal of wastes and garbage.
- Health, safety and protective measures for the labor.
- Notice board of emergency numbers should be placed on proper place
- Contractors shall also provide safety equipment's i.e., PPEs, safe drinking water, first aid boxes etc. to the workforce as per nature of their jobs. By ensuring all these mitigation measures; not only their company profile shall boost up but also enable them to qualify and win the future sub-projects.

7.2.4. Supervisory Consultant

Compliance of ESMP's all attributes will be ensured by Resident Supervision Consultant.

7.3. Monitoring Mechanism

The ESFPs will carry out the monitoring at the field level on a continuous basis. The DPO ESSs will perform periodic monitoring during their site visits. Two complementary methodology approaches are being applied to monitor the proposed actions under the ESMP:

- Compliance monitoring; which checks whether the actions proposed by the ESMP have been carried out by visual observation, photographic documentation and the use of checklists prepared for the ESMP;

- Effects monitoring; which records the consequences of program activities on the biophysical and social environment; as applicable, these effects are repeatedly measured by applying selected indicators.

The plan also defines the monitoring mechanism and identifies a set of verifiable monitoring parameters to ensure that all proposed mitigation measures laid down in the ESMP are completely and effectively implemented.

Monitoring will be carried out to ensure that the mitigation plans are regularly and effectively implemented. It will be performed at two levels. At the PMDFC, the environmental team will do ESMP compliance monitoring to ensure that the mitigation plans are being effectively implemented. At Contractor's level, the Environmental & Social Monitoring Checklist (Annexure i) will be filled on weekly basis by their Environmental Manager.

7.4. Reports

The Contractor will submit weekly compliance monitoring checklist and PMDFC ESM Wing will submit quarterly and annual monitoring reports as well as a final report of the sub-project based on safeguard implementation status. The monitoring reports will also include process and outcome of consultations with the Project Affected Persons. The distribution of periodic reports is given below:

Distribution of Periodic Reports Report	Prepared by	Reviewed by	Distribution
Weekly	Contractor	PMDFC DPO ESSs	PD, The Engineer
Quarterly	PMDFC DPO ESSs	PMDFC SPO ESSs	PD, The Engineer, The World Bank

Annual	PMDFC DPO ESSs	PMDFC SPO ESSs	PD, The Engineer, The World Bank
Final	PMDFC DPO ESSs	PMDFC SPO ESSs	PD, The Engineer, The World Bank

7.5. Inclusion of ESMP in Bidding/ Contract Documents

The present ESMP has been included in the bidding/ contract documents and their implementation will be a contractual binding for the Contractors. In addition, the Contractor's guidelines prepared by PMDFC/ safeguards procedures will also be made part of contracts.

7.6. Environmental and Social Non-Compliance

Any environmental and social non-compliance during first half of the reporting month will be considered as a "minor deviation". In case the non- compliance attains the status of "non-mitigation" during the second half of the reporting month, it would be considered a "moderate non-compliance". In case non-compliance continues in the second month, it will fall in the category of "undone" and as such would be considered as a major non-compliance and eventually leading to serious action including the suspension of Contractor's payment or any other penalty as may be considered appropriate with the recommendation of the DPO ESSs/Engineer. No payment will be made to Contractor against non-compliance and no arrears will be paid thereof.

7.7. Environmental and Social Management and Monitoring Plan

The impacts, mitigation measures, monitoring indicators, frequency and responsibility has been discussed in Environmental and Social Management and Monitoring Plan (ESMMP).

Table 7-1: Environmental & Social Management & Monitoring Plan

Sub-project: Widening and Improvement of Roads and Streetlights in Okara City

Proposed Sub-project activities	Potential Env./Soc. Impacts	Magnitude of Impact	Mitigation Measures	Mitigation Implementation Responsibility	Monitoring Indicators	Monitoring Frequency	Monitoring Responsibility
Design Phase							
	Conflict on design	**Negligible**	To avoid conflicts at design phase public consultations was conducted, in this subproject no conflict was raised during public consultation	MC ESFPs	Minutes of meeting records, attendance sheets and pictures	Design E&S Consultants	ESM team of PMDFC
Construction Phase							
Dismantling, Excavation fine aggregate, base coarse and cleaning & grabbing)	**a) Land Use:** • The current land use is residential cum commercial with shops, houses and commercial structures including schools on one side and canal on other side of the road.	High	○ Excavated material will be disposed within 24 hours at the designated place of MC Okara. ○ Updated and tuned machinery will be used to control noise. ○ Water sprinkling will be carried out	Contractor	Visual/ Photographic record, Public consultation, Environment Quality Analysis reports, GRM Complaints record	• Daily site visit during construction phase • Fortnightly/ Weekly • Once during the construction phase	• ESFPs • DPO ESM • Supervision Consultants E&S team

Proposed Sub-project activities	Potential Env./Soc. Impacts	Magnitude of Impact	Mitigation Measures	Mitigation Implementation Responsibility	Monitoring Indicators	Monitoring Frequency	Monitoring Responsibility
	b) Environmental Issues: • Dust which may affect visibility, community and labor health • Noise from machineries/ equipment • Waste may be generated due these activities • Safety hazards to labor and nearby resident population. • Worse House Keeping **c) Social Issues:** • Excavated material may cause disturbance in mobility • Temporary blockage of		at consecutive intervals as per instructions ○ Avoiding construction activities during nights. ○ Removal of excess matter/ debris from the site within 24 hours. ○ Provide PPEs (See Annexure v). ○ Provide appropriate signage near the construction activities to sensitize the communities and minimize accidents. ○ Public must be informed about project major activities, duration of scheme, time				

Proposed Sub-project activities	Potential Env./Soc. Impacts	Magnitude of Impact	Mitigation Measures	Mitigation Implementation Responsibility	Monitoring Indicators	Monitoring Frequency	Monitoring Responsibility
	road may restrict mobility • Conflict with public and public complaints • Economic losses • Livelihood's loss. • Temporary loss of structures and private property • Economic loss of permanent and mobile vendors due to obstruction of passage • Presence of Physical Cultural Resources (PCRs) of Archeological importance • Air and dust pollution • Noise pollution		and schedule, anticipated impacts and their proposed Mitigation Measures. ○ The contact Nos. of focal person of Grievance Redress Committee will be displayed at different locations and residents will also be informed about it. ○ Traffic controllers will be placed at strategic locations to control traffic and ensure safety of pedestrians ○ Safety/ caution sign boards and				

Proposed Sub-project activities	Potential Env./Soc. Impacts	Magnitude of Impact	Mitigation Measures	Mitigation Implementation Responsibility	Monitoring Indicators	Monitoring Frequency	Monitoring Responsibility
			reflective tape will be installed at site during work. ○ Construction work will be scheduled in such a way that business of the shopkeepers and schools located along the roads will not be affected. ○ Temporary hindrance in mobility for which contractor will be instructed to execute that work by providing the alternate route for community mobility. ○ Contractor will ensure that work should be executed in				

Proposed Sub-project activities	Potential Env./Soc. Impacts	Magnitude of Impact	Mitigation Measures	Mitigation Implementation Responsibility	Monitoring Indicators	Monitoring Frequency	Monitoring Responsibility
			portions to avoid the temporary disturbances in the accessibility and placement of the temporary vendors ○ Contractor will make sure that labor must not damage the property and structures of the communities (tough paver ramps of three schools will be partially affected which will be compensated as per market rate and one electric pole will be relocated) and in case of damage				

Proposed Sub-project activities	Potential Env./Soc. Impacts	Magnitude of Impact	Mitigation Measures	Mitigation Implementation Responsibility	Monitoring Indicators	Monitoring Frequency	Monitoring Responsibility
			compensation will be provided as per entitlements. o If there will be any PCR found during excavation; Contractor will follow guidelines (Annexure vi) of chance find procedure. o Air quality will be analyzed by the contractor from EPD certified Lab at pre, during and after execution stage of the work. o Noise quality will be analyzed by the contractor from EPD certified Lab at pre, during and after				

Proposed Sub-project activities	Potential Env./Soc. Impacts	Magnitude of Impact	Mitigation Measures	Mitigation Implementation Responsibility	Monitoring Indicators	Monitoring Frequency	Monitoring Responsibility
			execution of the work				
Construction material storage, handling and use	**Environmental Issues:** ○ Ground water may be contaminated due to the any oil spillages from machinery. ○ Health risk to workers and local inhabitants. ○ Poor Housekeeping **Social Issues:** ○ Land acquisition for storage of construction material ○ Accidents/Injuries expected if neglected ○ Blockage of passage for pedestrians ○ Haphazard arrangement of construction material	Medium to negligible	• Construction material will be covered to ensure safe passage between the destinations during transportation. • Materials will not be loaded to a higher level than the side and tail boards and shall be covered with a good quality tarpaulin; • Sufficient space is available within the RoW of roads for storage of construction material. Anyhow, if land may need to be acquired for	Contractor	Visual/ Pictures	• Daily site visit during construction phase • Fortnightly/ Weekly • Once during the construction phase	• ESFPs • DPO ESM • Supervision Consultants E&S team

Proposed Sub-project activities	Potential Env./Soc. Impacts	Magnitude of Impact	Mitigation Measures	Mitigation Implementation Responsibility	Monitoring Indicators	Monitoring Frequency	Monitoring Responsibility
			temporary storage of machinery & materials contractor will be liable to compensate the land owner accordingly through agreement/ negotiations/voluntarily. Contractor will submit satisfactory handing over certificate from land owner verified by DPO-ESS to the supervision consultant • Contractor will lay/ utilize construction materials as per work requirement				

Proposed Sub-project activities	Potential Env./Soc. Impacts	Magnitude of Impact	Mitigation Measures	Mitigation Implementation Responsibility	Monitoring Indicators	Monitoring Frequency	Monitoring Responsibility
			from his storage site. • Contractor will use night vision reflective signboards/ reflective tapes to cordon off the area during construction activities.				
Labor Camp (if established by Contractor)	○ Health impacts due to absence of housing and sanitation facilities in labor camp. ○ Security of labor ○ Unhygienic conditions	Medium	• Contractor will prepare Occupational Health and Safety Plan and get approval from DPO-ESSs before the execution of work. • For the execution of this sub-project, 30/35 number of workers/ laborers will be required to work for almost 06 months and	Contractor	Visual/ Pictures	• Daily site visit during construction phase • Fortnightly/Weekly • Once during the construction phase	• ESFPs • DPO ESM • Supervision Consultants E&S team

Proposed Sub-project activities	Potential Env./Soc. Impacts	Magnitude of Impact	Mitigation Measures	Mitigation Implementation Responsibility	Monitoring Indicators	Monitoring Frequency	Monitoring Responsibility
			contractor will be instructed (will be included in his term of reference and in the form of EHS SOPs, implementation), to prefer the local labor to be engaged, for which labor camp will not be required to be established. Anyhow, for temporary labor site, following mitigation measures will be provided • Contractor will ensure provision of appropriate housing, water supply, and sanitation facilities to				

Proposed Sub-project activities	Potential Env./Soc. Impacts	Magnitude of Impact	Mitigation Measures	Mitigation Implementation Responsibility	Monitoring Indicators	Monitoring Frequency	Monitoring Responsibility
			construction labor. • Good housekeeping will be ensured inside campsite • Labor will be provided with quality food. • During winter hot water will be provided for bathing and likewise as per the weather condition. • Accommodation will be ensured by the Contractor. • It's better to accommodate labor in Containers Camps/houses with all amenities. • Contractor will submit Campsite				

Proposed Sub-project activities	Potential Env./Soc. Impacts	Magnitude of Impact	Mitigation Measures	Mitigation Implementation Responsibility	Monitoring Indicators	Monitoring Frequency	Monitoring Responsibility
			Management Plan and get approval from DPO-ESSs before the execution of work.				
Vehicle Movements	• Traffic congestion • Conflicts • Vehicle emissions	High	○ Contractor will prepare Traffic management plan and get approval from DPO-ESSs before the execution of work. ○ Sign boards and posters will also be displayed at sub-project site and adjacent areas as well. Inform the residents about timing, schedule and construction work duration.	Contractor	Visual/ Pictures, Vehicle emission tests reports, GRM Complaints record	• Daily site visit during construction phase • Fortnightly/Weekly • Once during the construction phase	• ESFPs • DPO ESM • Supervision Consultants E&S team

Proposed Sub-project activities	Potential Env./Soc. Impacts	Magnitude of Impact	Mitigation Measures	Mitigation Implementation Responsibility	Monitoring Indicators	Monitoring Frequency	Monitoring Responsibility
			○ Work will be done in portions so that the half portion of road may be used safely and vehicles movement will not be disturbed. ○ Vehicle emissions testing will be ensured (Hand platter, Compactor) once during execution of work				
Site Safety Issues	• Accidents	High	Contractor will ensure site safety using safety cautions (night vision), boards, flagmen, cordon tapes for smooth flow of traffic and pedestrians during the construction	Contractor	Visual/ Pictures	• Daily site visit during construction phase • Fortnightly/Weekly • Once during the construction phase	• ESFPs • DPO ESM • Supervision Consultants E&S team

Proposed Sub-project activities	Potential Env./Soc. Impacts	Magnitude of Impact	Mitigation Measures	Mitigation Implementation Responsibility	Monitoring Indicators	Monitoring Frequency	Monitoring Responsibility
			phase of the sub-Project.				
Public access	Problems for pedestrians. Normal mode of transport may be disturbed during sub-project execution. 05 schools exist within 100m of the Canal road. There will be impediment in the movement of local community during school working hours.	Medium	• If it required to provide an alternated access route, contractor will ensure that the alternate access route must consider the safety aspects for all kind of pedestrian i.e. women, children, disabled. • Cordon off the construction zone. • Ensure to work at night for major part of work in which heavy machinery may hinder the public accessibility • Implement a proper traffic management plan.	Contractor	No hindrance in the community movement. Visual/ Pictures	• Daily site visit during construction phase • Fortnightly/Weekly • Once during the construction phase	• ESFPs • DPO ESM • Supervision Consultants E&S team

Proposed Sub-project activities	Potential Env./Soc. Impacts	Magnitude of Impact	Mitigation Measures	Mitigation Implementation Responsibility	Monitoring Indicators	Monitoring Frequency	Monitoring Responsibility
Occupational Health & Safety	• Injuries to workers/LTI	High	• Contractor will follow PMDFC designed Environment, Health and Safety SOPs for Labor/ Workers for all activities on the site and these SOPs will be the part of his term of reference and contractual agreement. • Workers will be trained by the PMDFC ESM team and guided to follow SOPs and will be provided with necessary PPEs (Safety Helmets, Safety Shoes, Gloves, Chemical Masks etc.) wherever required. • First aid will be provided onsite	Contractor	Visual/ Pictures	• Daily site visit during construction phase • Fortnightly/Weekly •Once during the construction phase	•ESFPs •DPO ESM •Supervision Consultants E&S team

Proposed Sub-project activities	Potential Env./Soc. Impacts	Magnitude of Impact	Mitigation Measures	Mitigation Implementation Responsibility	Monitoring Indicators	Monitoring Frequency	Monitoring Responsibility
			• Careful monitoring will also be carried out.				
Laying of coarse base, gravel, sub base	• Injuries to workers	High	• Contractor will provide Safety Shoes, Hand Gloves, Safety Helmet, and Reflective Vest to all the labor.	Contractor	Visual/ Pictures	• Daily site visit during construction phase • Fortnightly/Weekly • Once during the construction phase	• ESFPs • DPO ESM • Supervision Consultants E&S team
Damage to Public Infrastructure/ utilities	• Accidents/Incidents/ Injuries • Structural loss: • Social Conflicts	High	• Contractor will ensure no damage to public utilities or structures. • Contractor will provide compensation for the damages to entitles accordingly	Contractor	Visual/ Pictures/payment record	• Daily site visit during construction phase • Fortnightly/Weekly • Once during the construction phase	• ESFPs • DPO ESM • Supervision Consultants E&S team
Sexual Harassment-Labor Influx-Child Labor	• Social Conflicts	Low	• Contractor will give behavioral training to the workforce.	Contractor	Visual/ Pictures/Reported/Complains by public during visit	• Daily site visit during construction phase	• ESFPs • DPO ESM • Supervision Consultants E&S team

Proposed Sub-project activities	Potential Env./Soc. Impacts	Magnitude of Impact	Mitigation Measures	Mitigation Implementation Responsibility	Monitoring Indicators	Monitoring Frequency	Monitoring Responsibility
			• Contractor will hire local labor for un-skilled works. • No child labor is allowed onsite below 14 years. • GRM at site level will be ensured to report in case of any such incident			• Fortnightly/Weekly • Once during the construction phase	
CoViD-19 SOPs implementation	• Spread of Corona among the labor	Low	• Contractor will provide face masks to the labor on daily basis to reduce Corona impact. • Contractor will follow CoViD-19 guidelines during construction works (Annexure iii)	Contractor	Visual/ Pictures	• Daily site visit during construction phase • Fortnightly/Weekly • Once during the construction phase	• ESFPs • DPO ESM • Supervision Consultants E&S team
	Operational Phase						
Road Maintenance-Road Furniture	• Accidents • Complains	Low	• MC will maintain road lighting system for night vision. • Road surface will be	Contractor	Visual/ Pictures	•	• MC Officials

Proposed Sub-project activities	Potential Env./Soc. Impacts	Magnitude of Impact	Mitigation Measures	Mitigation Implementation Responsibility	Monitoring Indicators	Monitoring Frequency	Monitoring Responsibility
			repaired/maintained by MC.				

7.8. Environmental and Social Management Plan Implementation Budget

Table 7-2: Environmental Implementation Budget

Sr. No.	Description	Quantity	Per Unit Cost (PKR)	Total Cost (PKR)
1. Environmental Monitoring				
1.1	Drinking Water Quality Testing	2 sample	15,000	30,000
1.2	Air quality monitoring covering CO, SO_2, O_2, NO_2, NO, NOx, CO_2, PM2.5, and PM2.10, Smoke	2	25,000	50,000
1.3	Noise level Monitoring	2	1000	2,000
			Subtotal (1)	**82,000**
2. Implementation of OHS Requirements				
2.1	Remuneration of Environmental Manager	1 for 6 Months	70,000	420,000
2.2	Remuneration of Health and Safety Officer (2 months)	1 for 6 Months	50,000	300,000
2.3	Purchase of PPEs			
a.	Safety Shoes Pairs	25	4,000	100,000
b.	P. Caps	50	200	10,000
c.	Hard Hats	30	500	15,000
d.	Glowing Jackets	60	300	18,000
e.	Pairs of Gloves	100	110	11,000
f.	Face Masks	1,000	10	10,000
g.	Sanitizers	60	300	18,000
2.4	Establishment of dispensary (Salary of Dispenser)	1 for 6 months	25,000	150,000
2.5	Medicines (LS)	Lump Sum	50,000	50,000
2.6	First Aid Box	12	2000	24,000
2.7	Misc.	Lump Sum	10,000	10,000
			Subtotal (2)	**1,136,000**
3. Training sessions with contractor labour force and with local communities at site on code of ethics and GRM				
3.1	Boarding and Lodging	Lump Sum	25,000	25,000
3.2	Transportation	Lump Sum	25,000	25,000
3.3	Training Material	Lump Sum	15,000	15,000
3.4	Entertainment	Lump Sum	30,000	40,000
3.5	Misc.	Lump Sum	10,000	10,000
			Subtotal (3)	**115,000**
			Total (1+2+3+4)	**1,333,000**

Section-8 Capacity Building

8.1. General

A comprehensive program will be followed to strengthen the technical and institutional capacities of the executing agency (MC Okara), contractors, and laborers.

Table 8-1: Training/ Awareness and Sensitization Plan

Components	Audience	Level	Modality	Frequency	Responsibility
ESMF Site Specific requirements and E&S Management and Mitigation Plan	MO-1 MO-P and MC field staff[3]	Training	Briefing Presentations Mock Activities	Before execution of sub-project and time to time instructions	PMDFC ESM team
ESMP Implementation and Monitoring Plan	MO-1 MO-P MC field staff	Training	Briefing Presentations Mock Activities		
	Contractor	Awareness and sensitization	Briefing	At the time of Contract signing and before execution	DPO-ESM ESFPs
	Labor	Awareness and sensitization	Briefing	Before execution and time to time during execution	DPO-ESM ESFPs
EHS SOPs for Labor/Workers (including women workers)	Contractor	Awareness and sensitization	Briefing and Illustrations	Before execution and time to time during execution	DPO-ESM ESFPs
	Labor/ workers	Awareness and sensitization on SOPs Training on Use of PPEs	Presentations Illustrations Mock activities Resource material	Before execution and time to time during execution	DPO-ESM ESFPs
GRM	Contractor	Awareness and sensitization	Briefing	Before execution and time to time during execution	DPO-ESM ESFPs

[3] For ESFPs and MC field staff, PMDFC will organize time to time trainings and a training/ capacity building program has been designed in this regard

Components	Audience	Level	Modality	Frequency	Responsibility
	Labor/ workers	Awareness and sensitization	Briefing and resource material	Before execution and time to time during execution	DPO-ESM ESFPs
	Public/ communities	Awareness	Briefing during public consultation Resource material	Before and during execution	DPO-ESM ESFPs

Annexure i: Environment & Social Screening Checklist

Instructions:

Environmental and Social Focal Persons (ESFPs)[1] nominated by the MCs for PCP environmental and social management, will use this checklist in field for environmental and social screening and categorization of each and every sub-project proposed to be executed under the Program.

Deputy Program Officers-Environmental and Social Management deputed by PMDFC in regional offices will technically assist and support the ESFPs/MCs in filling in of this Checklist

It is to be attached with the main document[2] of sub-projects at planning stage and will be duly signed by the relevant ESFP and endorsed by the respective DPO-ESM

This checklist focuses on environmental issues and social concerns. To ensure that social dimensions are adequately considered, Involuntary Resettlement Screening Checklist will also be used

(iii) The purpose of this E&S Screening Checklists is to identify potential "Negative" impacts of environmental and social attributes or to enhance the existing environmental & social benefits. Use the "remarks" section to discuss any anticipated mitigation measures.

Name of ESFP: Mushtaq Manda

Name of MC: Okara

Sub-Project Sector: Roads

Sub-Project Title: Improvement, Widening and Raising of Road from Tank Chowk to Akbar Chowk along Canal Road

Sub- Project Categorization: E-2 S-2

Date of Screening: 01.11.2022

Anticipated Project Activities:

- Scarifying and dismantling of road
- Preparation of Sub- Grade
- Laying of Sub- Base
- Laying of Base Course
- Asphalt wearing course
- Installation of street lights

Estimated Cost of Subproject: 100.93 Million

Tentative Completion Time/ Duration:6 Months

Estimated Labor for Subproject: 20-30

[1] In all MCs, ESFPs are notified by Local government; MO (I&S) are focal persons for environmental sector and MO (P) are focal persons for social sectors.

[2] It is meant as PC-I and/or engineering estimates of sub-project

Screening Questions	Yes	No	Remarks
A. Project Siting Is the Sub-Project area adjacent to or within any of the following:			
Environmentally sensitive areas?			
Legally protected Area		✓	No legally protected are i.e. wildlife sanctuary, national park or game reserve exist within or near the project area
Any surface water body (river, canal, stream, lake, wetland) within 250 meter of the proposed sub project[3]	✓		A canal is flowing at right side along the road and surface water may be affected due to project activities
Estuarine		✓	No estuarine within or near the project area
Special area for protecting biodiversity		✓	No ecological significant habitat exists within or near the project area
Buffer zone of protected area		✓	No protected area exists in the vicinity of the subproject area
Mangroves Forest		✓	No mangrove forest is located near the project area
Man-made forest /game reserve, orchid/ crops or any other area of environmental importance	✓		There are 53 mature trees on both sides of canal road but no tree will be required to cut or uprooted.
Socially sensitive /important areas/communities/ people?			
PCRs and or any site of cultural/ religious importance (Graveyard, Shrine, Mosque, Church, *Gordwarah*, Temple, Fort, archeological/ historical site) within 100 m of the proposed subproject[4]		✓	No PCR was noted within or near the subproject area
Sensitive receptors (Schools, colleges, hospitals and clinics) within 100 meter of the proposed sub project[5]	✓		There are 05 schools along the entire stretch of road, where educational activities may be affected due to project interventions. Ramps of three schools (Allied School, The Knowledge school and Dar-e-Arqam) will be partially affected due to widening of road. It will be advised to implement traffic management plan during construction and ensure safety of children by applying SOPs related to construction safety while executing activities near schools. Further it will be required to monitor noise levels of machinery and equipment to keep them within safe limits.
Any graveyard of local community (Muslims or Christians)		✓	No graveyard

Any demographic or socio-economic aspects of the sub-project area that are already vulnerable (e.g., high incidence of marginalized populations, rural-urban migrants, illegal settlements, squatters, ethnic minorities, people with disabilities, people in old age, socially isolated segments[6] of the society and women or children)?		✓	No vulnerable group exists within the sub-project area
Already existing infrastructure [7](including public amenities) which may be required to dismantle or may be affected temporarily by any means?	✓		The ramps, tough paver ramps of 03 schools will have to be dismantled and reconstructed after the widening of road from 14 to 24 feet. Further 01 electric pole will also have to be relocated.
B. Potential Environmental Impacts Will the Sub-Project cause…			
1. Disturbance to habitats/ biodiversity of environmentally sensitive or protected areas?		✓	No sensitive habitats or protected area exist in the subproject area
2. Cutting of trees?	✓		There are 53 mature trees on both sides of canal road but no tree will be required to cut or uprooted.
3. Disruption to habitats/ biodiversity of surrounding ecosystem/ environment?	✓		Cutting of trees can disturb the associated fauna.
4. Generation of wastewater during construction or operation?		✓	No separate establishment of contractor's camp is anticipated so no waste water would be generated during construction
5. Pollution of surface water/ground water due to wastewater discharge from construction site or due to direct/indirect disposal of waste water?		✓	No waste water will be generated due to subproject interventions
6. Alteration of surface water hydrology of waterways resulting in increased sediment in streams/ rivers or due to increased soil erosion at construction site?		✓	No alteration of surface water hydrology due to subproject interventions
7. Deterioration of surface water quality due to silt runoff and sanitary wastes from worker-based camps and chemicals used in construction?		✓	No deterioration of surface water quality due to subproject interventions
8. Over pumping of ground water, leading to salinization and ground subsidence?		✓	No over pumping of groundwater will be required for the subproject
9. Serious contamination of soil due to construction works?	✓		Due to use of chemicals (asphalt, oil/ fuel) and movement of project machinery there are chances of soil contamination which will be mitigated by avoiding spill of oil/ fuel and safe use of coal tar to avoid soil contamination

10. Aggravation of solid waste problems in the area?	✓		Due to widening of existing road there are chances of aggravation of construction waste in the project area, which may cause hindrance in the movement of local people. All generated waste will be required to be removed daily to an environmentally safe waste dumping site immediately
11. Generation of hazardous waste?		✓	Bitumen mixed solid waste will be generated as a result of dismantling of road that would be harmful if not properly disposed of. The excavated materials would be disposed of as per approval of the supervision engineer
12. Increased air pollution due to sub-project construction and operation?	✓		Due to project interventions it is anticipated that ambient air of the project area may be temporarily affected due to dust emissions and smoke generated from project vehicles and machinery. Water sprinkling will be required to be done periodically on daily basis and contractor will have to keep his machinery and equipment well-tuned to avoid smoke emissions
13. Noise and vibration due to sub-project construction or operation?	✓		Noise produced from machinery operating at project site may cause disturbance to residents and workers. Contractor will be required to use new machinery to avoid noise emissions. Contractor will provide ear plugs/ muffs to workers near noise producing machinery and shall monitor noise levels periodically throughout the day during construction works.
14. Creation of temporary breeding habitats for diseases such as those transmitted by mosquitoes and rodents due to solid/liquid?		✓	No temporary breeding habitats will be developed due to sub project interventions
15. Use of chemicals during construction?	✓		Due to use of chemicals (asphalt, oil/ fuel) and movement of project machinery there are chances of soil contamination which will be mitigated by avoiding spill of oil/ fuel and safe use of coal tar to avoid soil contamination
C: Potential Social Impacts Will the Sub-Project cause…			
1. Impairment of historical/ cultural areas; disfiguration of landscape or potential loss/ damage to Physical Cultural Resources (PCRs)?		✓	There will be no damages to Physical Cultural Resources (PCRs)

2. Displacement or involuntary resettlement of people? (physical displacement and/ or economic displacement) (If "Yes", please also fill Involuntary Resettlement Screening Checklist)	✓		The tough paver ramps of 03 schools will have to be dismantled and reconstructed after the widening of road from 14 to 24 feet. Further 01 electric pole will also have to be relocated.
3. Disproportionate impacts on the poor, women and children and or other vulnerable groups [8](mentioned above)?		✓	There will be no disproportionate impacts on the poor, women and children and or other vulnerable groups due to subproject interventions
4. Temporary impediments in movements of people/ transport and animals?	✓		Due to project interventions there will be temporary impediment in the movement of local people which will be managed by working in patches so as to provide alternate passage way on other side and dump construction in a way that does not interfere with the commutation of local community and passersby.
5. Large population influx during sub-project construction and operation that causes increased burden on social infrastructure and services (such as water supply and sanitation systems)?		✓	There will be no population influx during sub-project execution
6. Social conflicts if workers from other areas are [illegible]?		✓	Mostly local workers will be hired.
7. Risks and vulnerabilities related to occupational health and safety due to physical, chemical, biological, and radiological hazards during project construction and operation?	✓		Workers will be provided PPEs, and trainings will be imparted to them regarding their use. Site related OHS guidelines shall be displayed at site and will be implemented by the contractor and supervision consultant will monitor its implementation at site
8. Risks to community health and safety due to the transport, storage, and use and/ or disposal of materials such as explosives, fuel and other chemicals during construction and operation?	✓		Construction material will be transported to site while covered with tarpaulin to avoid impact on community. Oil/ fuel will be transferred safely at a workshop or fuel station to avoid risk.
9. Community safety risks due to both accidental and natural causes, especially where the structural elements or components of the project are accessible to members of the affected community or where their failure could result in injury to the community throughout project construction, operation and decommissioning?	✓		Entrance to working site will be restricted by installing barricade tape. Safety/ caution sign boards will be erected and flag men will be appointed to control traffic and keep irrelevant persons away from project site

10. Any impact on sensitive receptors (mentioned above)	✓		There are 5 schools along the entire stretch of road, where educational activities may be affected due to project interventions. It will be advised to implement traffic management plan during construction and ensure safety of children by applying SOPs related to construction safety while executing activities near schools. Further it will be required to monitor noise levels of machinery and equipment to keep them within safe limits
11. Any impact of negative nature on already existing infrastructure including public amenities	✓		The tough paver ramps of 03 schools will have to be dismantled and reconstructed after the widening of road from 14 to 24 feet. Further 01 electric pole will also have to be relocated.

Prepared by:

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ii. Saqib Sadiq-Sociologist, MMP

Annexure ii: IFC EHS Guidelines for Construction and Decommissioning

General EHS Guidelines [Complete version] at: **www.ifc.org/ehsguidelines**

IFC International Finance Corporation World Bank Group

Environmental, Health, and Safety (EHS) Guidelines
GENERAL EHS GUIDELINES: CONSTRUCTION AND DECOMMISSIONING

WORLD BANK GROUP

4.0 Construction and Decommissioning

Applicability and Approach

This section provides additional, specific guidance on prevention and control of community health and safety impacts that may occur during new project development, at the end of the project life-cycle, or due to expansion or modification of existing project facilities. Cross referencing is made to various other sections of the General EHS Guidelines.

4.1 Environment{ TC "4.1 Environment" \f C \l "2" }

Noise and Vibration

During construction and decommissioning activities, noise and vibration may be caused by the operation of pile drivers, earth moving and excavation equipment, concrete mixers, cranes and the transportation of equipment, materials and people. Some recommended noise reduction and control strategies to consider in areas close to community areas include:

- Planning activities in consultation with local communities so that activities with the greatest potential to generate noise are planned during periods of the day that will result in least disturbance
- Using noise control devices, such as temporary noise barriers and deflectors for impact and blasting activities, and exhaust muffling devices for combustion engines.
- Avoiding or minimizing project transportation through community areas

Soil Erosion

Soil erosion may be caused by exposure of soil surfaces to rain and wind during site clearing, earth moving, and excavation activities. The mobilization and transport of soil particles may, in turn, result in sedimentation of surface drainage networks, which may result in impacts to the quality of natural water systems and ultimately the biological systems that use these waters. Recommended soil erosion and water system management approaches include:

Sediment mobilization and transport

- Reducing or preventing erosion by:
  - Scheduling to avoid heavy rainfall periods (i.e., during the dry season) to the extent practical
  - Contouring and minimizing length and steepness of slopes
  - Mulching to stabilize exposed areas
  - Re-vegetating areas promptly
  - Designing channels and ditches for post-construction flows
  - Lining steep channel and slopes (e.g. use jute matting)
- Reducing or preventing off-site sediment transport through use of settlement ponds, silt fences, and water treatment, and modifying or suspending activities during extreme rainfall and high winds to the extent practical.

Clean runoff management

- Segregating or diverting clean water runoff to prevent it mixing with water containing a high solids content, to minimize the volume of water to be treated prior to release

Road design

- Limiting access road gradients to reduce runoff-induced erosion
- Providing adequate road drainage based on road width, surface material, compaction, and maintenance

Disturbance to water bodies

- Depending on the potential for adverse impacts, installing free-spanning structures (e.g., single span bridges) for road watercourse crossings
- Restricting the duration and timing of in-stream activities to lower low periods, and avoiding periods critical to biological cycles of valued flora and fauna (e.g., migration, spawning, etc.)
- For in-stream works, using isolation techniques such as berming or diversion during construction to limit the exposure of disturbed sediments to moving water
- Consider using trenchless technology for pipeline crossings (e.g., suspended crossings) or installation by directional drilling

Structural (slope) stability

- Providing effective short term measures for slope stabilization, sediment control and subsidence control until long term measures for the operational phase can be implemented
- Providing adequate drainage systems to minimize and control infiltration

Air Quality

Construction and decommissioning activities may generate emission of fugitive dust caused by a combination of on-site excavation and movement of earth materials, contact of construction machinery with bare soil, and exposure of bare soil and soil piles to wind. A secondary source of emissions may include exhaust from diesel engines of earth moving equipment, as well as from open burning of solid waste on-site. Techniques to consider for the reduction and control of air emissions from construction and decommissioning sites include:

- Minimizing dust from material handling sources, such as conveyors and bins, by using covers and/or control equipment (water suppression, bag house, or cyclone)
- Minimizing dust from open area sources, including storage piles, by using control measures such as installing enclosures and covers, and increasing the moisture content
- Dust suppression techniques should be implemented, such as applying water or non-toxic chemicals to minimize dust from vehicle movements
- Selectively removing potential hazardous air pollutants, such as asbestos, from existing infrastructure prior to demolition
- Managing emissions from mobile sources according to Section 1.1
- Avoiding open burning of solid (refer to solid waste management guidance in Section 1.6)

Solid Waste

Non-hazardous solid waste generated at construction and decommissioning sites includes excess fill materials from grading and excavation activities, scrap wood and metals, and small concrete spills. Other non-hazardous solid wastes include office, kitchen, and dormitory wastes when these types of operations are part of construction project activities. *Hazardous solid waste* includes contaminated soils, which could potentially be encountered on-site due to previous land use activities, or small

amounts of machinery maintenance materials, such as oily rags, used oil filters, and used oil, as well as spill cleanup materials from oil and fuel spills. Techniques for preventing and controlling non-hazardous and hazardous construction site solid waste include those already discussed in Section 1.6.

Hazardous Materials

Construction and decommissioning activities may pose the potential for release of petroleum based products, such as lubricants, hydraulic fluids, or fuels during their storage, transfer, or use in equipment. These materials may also be encountered during decommissioning activities in building components or industrial process equipment. Techniques for prevention, minimization, and control of these impacts include:

- Providing adequate secondary containment for fuel storage tanks and for the temporary storage of other fluids such as lubricating oils and hydraulic fluids,
- Using impervious surfaces for refueling areas and other fluid transfer areas
- Training workers on the correct transfer and handling of fuels and chemicals and the response to spills
- Providing portable spill containment and cleanup equipment on site and training in the equipment deployment
- Assessing the contents of hazardous materials and petroleum-based products in building systems (e.g. PCB containing electrical equipment, asbestos-containing building materials) and process equipment and removing them prior to initiation of decommissioning activities, and managing their treatment and disposal according to Sections 1.5 and 1.6 on Hazardous Materials and Hazardous Waste Management, respectively
- Assessing the presence of hazardous substances in or on building materials (e.g., polychlorinated biphenyls, asbestos-containing flooring or insulation) and decontaminating or properly managing contaminated building materials

Wastewater Discharges

Construction and decommissioning activities may include the generation of sanitary wastewater discharges in varying quantities depending on the number of workers involved. Adequate portable or permanent sanitation facilities serving all workers should be provided at all construction sites. Sanitary wastewater in construction and other sites should be managed as described in Section 1.3.

Contaminated Land

Land contamination may be encountered in sites under construction or decommissioning due to known or unknown historical releases of hazardous materials or oil, or due to the presence of abandoned infrastructure formerly used to store or handle these materials, including underground storage tanks. Actions necessary to manage the risk from contaminated land will depend on factors such as the level and location of contamination, the type and risks of the contaminated media, and the intended land use. However, a basic management strategy should include:

- Managing contaminated media with the objective of protecting the safety and health of occupants of the site, the surrounding community, and the environment post construction or post decommissioning
- Understanding the historical use of the land with regard to the potential presence of hazardous materials or oil prior to initiation of construction or decommissioning activities
- Preparing plans and procedures to respond to the discovery of contaminated media to minimize or reduce the risk to health, safety, and the environment consistent with the approach for Contaminated Land in Section 1.6
- Preparation of a management plan to manage obsolete, abandoned, hazardous materials or oil consistent with the approach to hazardous waste management described in Section 1.6.

Successful implementation of any management strategy may require identification and cooperation with whoever is responsible and liable for the contamination.

4.2 Occupational Health and Safety{ TC "4.2 Occupational Health and Safety" \f C \l "2" }

Over-exertion

Over-exertion, and ergonomic injuries and illnesses, such as repetitive motion, over-exertion, and manual handling, are among the most common causes of injuries in construction and decommissioning sites. Recommendations for their prevention and control include:

- Training of workers in lifting and materials handling techniques in construction and decommissioning projects, including the placement of weight limits above which mechanical assists or two-person lifts are necessary
- Planning work site layout to minimize the need for manual transfer of heavy loads
- Selecting tools and designing work stations that reduce force requirements and holding times, and which promote improved postures, including, where applicable, user adjustable work stations
- Implementing administrative controls into work processes, such as job rotations and rest or stretch breaks

Slips and Falls

Slips and falls on the same elevation associated with poor housekeeping, such as excessive waste debris, loose construction materials, liquid spills, and uncontrolled use of electrical cords and ropes on the ground, are also among the most frequent cause of lost time accidents at construction and decommissioning sites. Recommended methods for the prevention of slips and falls from, or on, the same elevation include:

- Implementing good house-keeping practices, such as the sorting and placing loose construction materials or demolition debris in established areas away from foot paths
- Cleaning up excessive waste debris and liquid spills regularly
- Locating electrical cords and ropes in common areas and marked corridors
- Use of slip retardant footwear

Work in Heights

Falls from elevation associated with working with ladders, scaffolding, and partially built or demolished structures are among the most common cause of fatal or permanent disabling injury at construction or decommissioning sites. If fall hazards exist, a fall protection plan should be in place which includes one or more of the following aspects, depending on the nature of the fall hazard[95]:

- Training and use of temporary fall prevention devices, such as rails or other barriers able to support a weight of 200 pounds, when working at heights equal or greater than two meters or at any height if the risk includes falling into operating machinery, into water or other liquid, into hazardous substances, or through an opening in a work surface
- Training and use of personal fall arrest systems, such as full body harnesses and energy absorbing lanyards able to support 5000 pounds (also described in this section in Working at Heights above), as well as fall rescue procedures to deal with workers whose fall has been successfully arrested. The tie in point of the fall arresting system should also be able to support 5000 pounds
- Use of control zones and safety monitoring systems to warn workers of their proximity to fall hazard zones, as well as

[95] Additional information on identification of fall hazards and design of protection systems can be found in the United States Occupational Health and Safety Administration's (US OSHA) web site: http://www.osha.gov/SLTC/fallprotection/index.html

securing, marking, and labeling covers for openings in floors, roofs, or walking surfaces

Struck By Objects

Construction and demolition activities may pose significant hazards related to the potential fall of materials or tools, as well as ejection of solid particles from abrasive or other types of power tools which can result in injury to the head, eyes, and extremities. Techniques for the prevention and control of these hazards include:

- Using a designated and restricted waste drop or discharge zones, and/or a chute for safe movement of wastes from upper to lower levels
- Conducting sawing, cutting, grinding, sanding, chipping or chiseling with proper guards and anchoring as applicable
- Maintaining clear traffic ways to avoid driving of heavy equipment over loose scrap
- Use of temporary fall protection measures in scaffolds and out edges of elevated work surfaces, such as hand rails and toe boards to prevent materials from being dislodged
- Evacuating work areas during blasting operations, and using blast mats or other means of deflection to minimize fly rock or ejection of demolition debris if work is conducted in proximity to people or structures
- Wearing appropriate PPE, such as safety glasses with side shields, face shields, hard hats, and safety shoes

Moving Machinery

Vehicle traffic and use of lifting equipment in the movement of machinery and materials on a construction site may pose temporary hazards, such as physical contact, spills, dust, emissions, and noise. Heavy equipment operators have limited fields of view close to their equipment and may not see pedestrians close to the vehicle. Center-articulated vehicles create a significant impact or crush hazard zone on the outboard side of a turn while moving. Techniques for the prevention and control of these impacts include:

- Planning and segregating the location of vehicle traffic, machine operation, and walking areas, and controlling vehicle traffic through the use of one-way traffic routes, establishment of speed limits, and on-site trained flag-people wearing high-visibility vests or outer clothing covering to direct traffic
- Ensuring the visibility of personnel through their use of high visibility vests when working in or walking through heavy equipment operating areas, and training of workers to verify eye contact with equipment operators before approaching the operating vehicle
- Ensuring moving equipment is outfitted with audible back-up alarms
- Using inspected and well-maintained lifting devices that are appropriate for the load, such as cranes, and securing loads when lifting them to higher job-site elevations.

Dust

- Dust suppression techniques should be implemented, such as applying water or non-toxic chemicals to minimize dust from vehicle movements
- PPE, such as dusk masks, should be used where dust levels are excessive

Confined Spaces and Excavations

Examples of confined spaces that may be present in construction or demolition sites include: silos, vats, hoppers, utility vaults, tanks, sewers, pipes, and access shafts. Ditches and trenches may also be considered a confined space when access or egress is limited. In addition to the guidance provided in Section 2.8 the occupational hazards associated with confined spaces and excavations in construction and decommissioning sites should be prevented according to the following recommendations:

- Controlling site-specific factors which may contribute to excavation slope instability including, for example, the use of excavation dewatering, side-walls support, and slope gradient adjustments that eliminate or minimize the risk of collapse, entrapment, or drowning
- Providing safe means of access and egress from excavations, such as graded slopes, graded access route, or stairs and ladders
- Avoiding the operation of combustion equipment for prolonged periods inside excavations areas where other workers are required to enter unless the area is actively ventilated

Other Site Hazards

Construction and decommissioning sites may pose a risk of exposure to dust, chemicals, hazardous or flammable materials, and wastes in a combination of liquid, solid, or gaseous forms, which should be prevented through the implementation of project-specific plans and other applicable management practices, including:

- Use of specially trained personnel to identify and remove waste materials from tanks, vessels, processing equipment or contaminated land as a first step in decommissioning activities to allow for safe excavation, construction, dismantling or demolition
- Use of specially trained personnel to identify and selectively remove potentially hazardous materials in building elements prior to dismantling or demolition including, for example, insulation or structural elements containing asbestos and Polychlorinated Biphenyls (PCBs), electrical components containing mercury[96]
- Use of waste-specific PPE based on the results of an occupational health and safety assessment, including respirators, clothing/protective suits, gloves and eye protection

[96] Additional information on the management and removal of asbestos containing building materials can be found in ASTM Standard E2356 and E1368

4.3 Community Health and Safety{ TC "4.3 Community Health and Safety" \f C \l "2" }

General Site Hazards

Projects should implement risk management strategies to protect the community from physical, chemical, or other hazards associated with sites under construction and decommissioning. Risks may arise from inadvertent or intentional trespassing, including potential contact with hazardous materials, contaminated soils and other environmental media, buildings that are vacant or under construction, or excavations and structures which may pose falling and entrapment hazards. Risk management strategies may include:

- Restricting access to the site, through a combination of institutional and administrative controls, with a focus on high risk structures or areas depending on site-specific situations, including fencing, signage, and communication of risks to the local community
- Removing hazardous conditions on construction sites that cannot be controlled affectively with site access restrictions, such as covering openings to small confined spaces, ensuring means of escape for larger openings such as trenches or excavations, or locked storage of hazardous materials

Disease Prevention

Increased incidence of communicable and vector-borne diseases attributable to construction activities represents a potentially serious health threat to project personnel and residents of local communities. Recommendations for the prevention and control of communicable and vector-borne diseases also applicable to

construction phase activities are provided in Section 3.6 (Disease Prevention).

Traffic Safety

Construction activities may result in a significant increase in movement of heavy vehicles for the transport of construction materials and equipment increasing the risk of traffic-related accidents and injuries to workers and local communities. The incidence of road accidents involving project vehicles during construction should be minimized through a combination of education and awareness-raising, and the adoption of procedures described in Section 3.4 (Traffic Safety).

Annexure iii: COVID-19 Pandemic and Health Safety Measures

Given the unprecedented nature of the COVID-19 pandemic, contractors are bound to take all necessary precautions to maintain the health and safety related measures at site and to ensure suitable arrangements regarding hygiene requirements for the prevention of pandemic. Following are the measures that should be implemented at the construction site to avoid the spread of Covid-19:

Activities	Adaptive Measures
Pre- Execution Phase	
A. Profile preparation	• Detail profile of project workforce • Enlist the names, addresses and contact # • Breakdown of the workforce (workers from local communities and those who have on site accommodation) • Assigning the task against each person • Schedule the key activities and their duration at site
B. Initial Screening	• All enlisted workforce should go through initial screening process • Ensuring the availability of Thermo gun at site • Record keeping against initial screening • Identifying all workers who are initially at more risk of contracting Covid-19
During Execution Phase	
A. Preliminary Screening	**Regular Screening:** • Regular screening by using Thermo gun on daily basis before starting civil work at site • Checking and recording temperatures of workers and other people entering the site or requiring self-reporting prior to or on entering the site. • If a worker has symptoms of COVID-19 (e.g. fever, dry cough, fatigue) the worker should be removed immediately from work activities and isolated on designated site. • Co-workers (i.e. workers with whom the sick worker was in close contact) should be required to stop work, and to quarantine themselves for 14 days, even if they have no symptoms. **Sequential Screening:** • Concerned DHQ medical staff is requested for screening at regular intervals. List should also be shared with DHQ for avoiding future inconvenience **or hire health safety officer on weekly basis.**
B. Special Arrangements regarding PPEs	• Ensuring availability of hand washing facilities (sanitizers/soaps) at site • Presence of closed waste bins at key places throughout site, including at entrances/exits to work areas (toilet, canteen or food distribution, or provision of drinking water; in worker accommodation; at waste stations; at stores; and in common spaces). • Special arrangements regarding PPEs and sanitation at site • Record keeping of stock availability on daily basis
C. Restricted Movement/	• Encourage employees to wash their hands at least for 20 seconds with soap and stay at least one meter away from people who are coughing or sneezing

Activities	Adaptive Measures
Demobilization of staff	• Breakdown of workers who reside at home (i.e. workers from the communities), workers who lodge within the local communities and workers in on-site accommodation. Workers accommodated on site should be required to minimize contact with people near the site, and in certain cases be prohibited from leaving the site for the duration of their contract, so that contact with local communities is avoided. • Workers from local communities, who return home daily, weekly or monthly, will be more difficult to manage. They should be subject to health checks at entry to the site (as set out above) and at some point, circumstances may make it necessary to require them to either use accommodation on site or not to come to work. • All workers should be provided separate accommodation.
D. Training sessions	• Health and safety training for Contractor's Personnel (which include project workers and all personnel that the Contractor uses on site, including staff and other employees of the Contractor and Subcontractors and any other personnel assisting the Contractor in carrying out project activities. • Sessions related to safety procedures, use of construction PPEs, occupational health and safety issues, and code of conduct specially privacy issues including social distancing. • Arranging daily briefings with workforce, reminding workers to self-monitor for possible symptoms (fever, cough) and to report to their supervisor or the COVID-19 focal point if they have symptoms or are feeling unwell. • Placing posters and sign boards around the site in local languages. • Appointing one person on daily basis among the workforce who will serve as trainer for conducting awareness session and encouraging the rest to take preventive measures.
E. Operationalization of Grievance Redress Mechanism	• Effective implementation of GRM at site • Encouraging to report any COVID-19 related health issue and concerns about the health of their co-workers and other staff as well. • In case of unavailability of the PPEs at site, grievance would be lodged directly to PMU.
F. Role of PMU	• PMU is required to arrange regular meetings with Contractors and workforce to monitor all procedural implementation of COVID-19 prevention related mechanism. • Arrange meeting with concerned DHQs for immediate support and guidance in case of emergency. • During inspection visit by PMU Staff, if a worker is found to has symptoms of COVID-19, the worker should be removed immediately from work activities and isolated on designated site.
Post Execution Phase	
A. Post Screening	• Screening should be done at the end of the day on daily basis, if a worker is found to have any symptoms of COVOD-19, he should be immediately reported to concerned health department.
B. Cleaning and waste disposal	• All waste (PPEs and sanitation related) shall be disposed properly at designated sites.

Annexure iv: List of Persons Consulted

Sr. No.	Name	Designation	Department/Contact No.
Institution Consultation			
1.	Zahid Iqbal	Additional Deputy Commissioner (General)	District Administration 044 9200035
2.	Zaheer Liaqat Baig	Administrator	MC Okara 0301 4488600
3.	Muhammad Nasim	Chief Officer	MC Okara 0333 8402836
4.	Mr. Ali Raza	Sub-Engineer	MC Okara 0312 6062810
5.	Rana Irfan Ali Masood	Executive Engineer	LESCO
6.	Ahsan Bilal	Circle Head Draftsman	LESCO 0322 6990702
7.	Sarfraz Ali	Sub Divisional Officer	Irrigation 0345 7490533
8.	Javaid Suleman	Assistant	Forest 0345 7501415
9.	Rashid Ahmad	Head Clerk	Forest 0347 6744971
10.	Mahmood Ahmad	Sr. Clerk	Forest 0301 7336921
11.	Muhammad Tufail	Principal	Savvy School, Canal Road
12.	Arshad Ali	Principal	Allied School, Canal Road 044 27067256
Communities Consultation			
Canal Road			
	Name	**Location**	**Contact No.**
1.	Muhammad Tufail	Canal Road	35302-1869660-5
2.	Muhammad Aizaz	Canal Road	--
3.	Ch. M. Siddique	Canal Road	--
4.	Zohaib Ahmad	Canal Road	03007095630
5.	M. Nadeem	Canal Road	03027346310
6.	Haji M. Rafique	Canal Road	03039972267
7.	Umar Rafique	Canal Road	03027192508
8.	Muhammad Usama	Canal Road	03226921008
9.	Ahmad Baloch	Canal Road	03007140730

10.	Haji Naeem	Canal Road	03137265099
11.	Sadiq Minhas	Canal Road	03347424662
12.	Ibrar Hussain	Canal Road	03226921008
13.	Muhammad Arsalan	Canal Road	03059591034
14.	Muhammad Shafiq	Canal Road	03004694073
15.	Muhammad Awais	Canal Road	03217097613
16.	Sarfraz Ali	Canal Road	03449112518
17.	Muhammad Arshad	Canal Road	03017561240

Annexure v: Personal Protective Equipment According to Hazard[4]

Objective	Workplace Hazards	Suggested PPE
Eye and face protection	Flying particles, molten metal, liquid chemicals, gases or vapors, light radiation.	Safety Glasses with side-shields, protective shades, etc.
Head protection	Falling objects, inadequate height clearance, and overhead power cords.	Plastic Helmets with top and side impact protection.
Hearing protection	Noise, ultra-sound.	Hearing protectors (ear plugs or ear muffs).
Foot protection	Falling or rolling objects, pointed objects. Corrosive or hot liquids.	Safety shoes and boots for protection against moving & falling objects, liquids and chemicals.
Hand protection	Hazardous materials, cuts or lacerations, vibrations, extreme temperatures.	Gloves made of rubber or synthetic materials (Neoprene), leather, steel, insulating materials, etc.
Respiratory protection	Dust, fogs, fumes, mists, gases, smokes, vapors.	Facemasks with appropriate filters for dust removal and air purification (chemicals, mists, vapors and gases). Single or multi-gas personal monitors, if available.
	Oxygen deficiency	Portable or supplied air (fixed lines). On-site rescue equipment.
Body/leg protection	Extreme temperatures, hazardous materials, biological agents, cutting and laceration.	Insulating clothing, body suits, aprons etc. of appropriate materials.

[4] Source: IFC Environmental, Health, and Safety (EHS) Guidelines

Annexure vi: Chance Find Procedures

Chance finds procedures which will be used during this Project are as follows:

- Stop the construction activities in the area of the chance find;
- Delineate the discovered site or area;
- Secure the site to prevent any damage or loss of removable objects. In cases of removable antiquities or sensitive remains, a night guard shall be present until the responsible local authorities and the Ministry in charge of Department of Archaeology take over;
- Notify the supervisory Engineer who in turn will notify the responsible local authorities and the Ministry immediately (within 24 hours or less);
- Responsible local authorities and the Ministry in charge of Department of Archaeology would oversee protecting and preserving the site before deciding on subsequent appropriate procedures. This would require a preliminary evaluation of the findings to be performed by the archaeologists of the Department of Archaeology and Museums (within 72 hours). The significance and importance of the findings should be assessed according to the various criteria relevant to cultural heritage; those include the aesthetic, historic, scientific or research, social and economic values;
- Decisions on how to handle the finding shall be taken by the responsible authorities and the Ministry in charge of Department of Archaeology. This could include changes in the layout (such as when finding an irremovable remain of cultural or archaeological importance) conservation, preservation, restoration and salvage;
- Implementation for the authority decision concerning the management of the finding shall be communicated in writing by the Ministry in charge of Department of Archaeology; and
- Construction work could resume only after permission is given from the responsible local authorities and the Ministry in charge of Department of Archaeology concerning safeguard of the heritage.

These procedures will be referred to as standard provisions in construction contracts, when applicable. During project supervision, the Site Engineer will monitor the above regulations relating to the treatment of any chance find encountered are observed.

ANNEXURE - F

Drawings

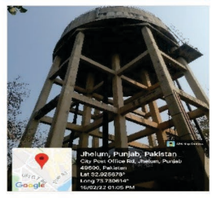


SUSTAINABLE CITIES AND COMMUNITIES

CLEAN WATER AND SANITATION

GOOD HEALTH AND WELL-BEING

DECENT WORK AND ECONOMIC GROWTH

Detailed Design of Infrastructure Sub- Projects Sectoral Planning & Resident Supervision in 16 cities of Punjab (Package-V – Okara)

Road Works Drawings

Improvement, Widening and Raising from Tank Chowk to Akbar Chowk along Canal Road

(STA 0+000 TO STA 6+152)

October 22

MM Pakistan (Pvt) Ltd.

General Drawings

MM Pakistan (Pvt) Ltd.

LIST OF DRAWINGS

S. No.	DWG. No.	DRAWING TITLE
	GENERAL DRAWINGS	
1.	MMP-1076P05-OKR-RD-GN-001	LIST OF DRAWINGS
2.	MMP-1076P05-OKR-RD-GN-002	GENERAL NOTES
3.	MMP-1076P05-OKR-RD-GN-003	LOCATION PLAN
4.	MMP-1076P05-OKR-RD-GN-004	TYPICAL PAVEMENT MARKINGS
5.	MMP-1076P05-OKR-RD-GN-005	ARROW MARKINGS
6.	MMP-1076P05-OKR-RD-GN-005a	TYPICAL CATEYE DETAIL
7.	MMP-1076P05-OKR-RD-GN-005b	CATEGORY - 1 TYPICAL SIGN DETAILS
8.	MMP-1076P05-OKR-RD-GN-006	TYPICAL MANHOLE DETAIL
	CANAL ROAD	
9.	MMP-1076P05-OKR-RD-GN-007	CANAL ROAD TYPICAL CROSS SECTION (RD 0+000 TO 2+000)
10.	MMP-1076P05-OKR-RD-GN-008	CANAL ROAD TYPICAL CROSS SECTION (RD 2+000 TO 4+690)
11.	MMP-1076P05-OKR-RD-GN-009	CANAL ROAD TYPICAL CROSS SECTION (RD 4+690 TO 4+825)
12.	MMP-1076P05-OKR-RD-GN-010	CANAL ROAD TYPICAL CROSS SECTION (RD 4+825 TO 6+152)
13.	MMP-1076P05-OKR-RD-GN-012	CANAL ROAD LIST OF CONTROL POINTS
14.	MMP-1076P05-OKR-RD-TP-001 ~ 003	CANAL ROAD TOPOGRAPHIC SURVEY
15.	MMP-1076P05-OKR-RD-P-001 ~ 005	CANAL ROAD PLAN AND PROFILE (STA 0+000 TO STA 6+152)
16.	MMP-1076P05-OKR-SL-GN-001	SINGLE ARM POLE DETAIL
	MMP-1076P05-OKR-SL-GN-002	DOUBLE ARM POLE DETAIL
17.	MMP-1076P05-OKR-SL-GN-003	SINGLE AND DOUBLE ARM POLE FOUNDATION
18.	MMP-1076P05-OKR-SL-GN-004	CANAL ROAD SLD AND CONTROL PANEL DETAIL
19.	MMP-1076P05-OKR-SL-P-001 ~ 003	CANAL ROAD STREET LIGHT PLAN
20.	MMP-1076P05-OKR-RD-DR-001 ~ 003	CANAL ROAD DRAINAGE PLAN
21.		
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Client

GOVERNMENT OF PUNJAB

Punjab Municipal Development Fund Company Department (PMDFC)

Financing Agency

WORLD BANK

Project

Punjab Cities Program (PCP)
Detailed Design of Infrastructure Sub-Projects, Sectoral Planning & Resident Supervision in 16 Cities of Punjab(Package-5)

Rev.	Date	Description	Checked	Approved
0	24-10-2022		SA	PHK

Title: LIST OF DRAWINGS

Drawing No. MMP-1076P05-OKR-RD-GN-001

Designed	M. Abdullah
Drawn	M. Tayyab
Checked	Sajjad Anwar
Approved	Pervez Hayat Khan
Scale	AS SHOWN
Rev No:	0

Drawing file path & name: F:\PMDFC\Package_V_Roads_P&P\Okara Roads\2. TOC\Only Canal TOC.dwg
User and Plot Date: Tayyab – Mon, 24 Oct 2022 – 2:55pm

GENERAL NOTES:

1. EXCEPT WHEN OTHERWISE INDICATED, ALL DIMENSIONS AND UNITS ARE IN THE IMPERIAL SYSTEM OF MEASUREMENT.
2. ALL COORDINATES ARE MEASURED IN FEET AND CORRESPOND TO THE GIRD REFERENCE OF UNIVERSAL TRANSVERSE MERCATOR.
3. ALL ELEVATIONS ARE REFERENCED TO MEAN SEA LEVEL.
4. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO VERIFY THE LOCATION OF ALL UTILITIES OR AS OTHERWISE ENCOUNTERED DURING EXCAVATION PROCESS. ANY DAMAGE TO UTILITIES WILL BE RESTORED AT HIS OWN COST.
5. BEFORE COMMENCEMENT OF WORK,CONTRACTOR SHALL VERIFY THE EXISTING ELEVATION SHOWN IN TENDER DRAWINGS ALONG WITH THE ENGINEER'S REPRESENTATIVE.
6. ANY DISCREPANCIES ON DRAWINGS SHALL BE BROUGHT TO THE ATTENTION OF ENGINEER FOR THE CLARIFICATION BEFORE PROCEEDING WITH THE WORK INVOLVED.
7. THE TENDERER SHOULD VISIT THE SITE AND ASSESS SCOPE AND NATURE OF THE WORKS SPECIALLY DISMANTLING ITEMS AND GET INFORMATION/ MEASUREMENTS AT HIS OWN AND SATISFY HIMSELF BEFORE QUOTING RATES.
8. THE DEMOLISHED MATERIAL WILL BE HANDED OVER TO THE CONCERNED DEPARTMENT WILL BE THE RESPONSIBILITY OF THE CONTRACTOR.
9. THE PROPOSED DESIGN OF PAVEMENT IS A TENTATIVE DESIGN AND IT IS BASED ON ASSUMED VALUE OF CBR 5%. HOWEVER AT CONSTRUCTION STAGE IS RECOMMENDED THAT CLIENT MAY PROVIDE THE GEOTECHNICAL INVESTIGATION REPORT AND DESIGN WILL BE REVISED ACCORDINGLY AS PER OUR TOR.
10. THE GEOMETRIC DESIGN IS BASED ON THE TOPOGRAPHIC SURVEY. HOWEVER, AT CONSTRUCTION STAGE, IT IS RESPONSIBILITY OF THE CONTRACTOR TO VERIFY THE SURVEY AND ANY DISCREPANCY IF FOUND SHALL BE CORRECTED AND DESIGN MAY BE REVISED ACCORDINGLY.
11. ALL PROFILE DRAWINGS SHALL BE READ IN CONJUNCTION WITH RELEVANT PLAN AND CROSS SECTIONAL DRAWINGS.
12. ALL EXISTING STRUCTURES/UTILITY POLES,WHICH LIE IN THE PROPOSED CROSS SECTION, ARE REQUIRED TO BE DEMOLISHED/RELOCATED BY THE CONTRACTOR COORDINATION WITH THE CONCERNED UTILITY DEPARTMENT OR AS DIRECTED BY THE ENGINEER
13. PAVEMENT WIDENING SHALL BE REQUIRED WHERE EXISTING PAVEMENT WIDTH IS LESS THAN THE WIDTH SHOWN ON THE TYPICAL CROSS SECTION OR SHOWN ELSEWHERE ON THE DRAWINGS.
14. All DEFECTIVE PORTIONS OF SUB-GRADE/GRANULAR SUB BASE COURSE FAILURE OF THE EXISTING PAVEMENT AS DETERMINED BY THE ENGINEER SHALL BE REMOVED AND RELAYED AS PER DRAWINGS AND SPECIFICATIONS OR AS DIRECTED BY THE ENGINEER.
15. THE EXISTING MANHOLES LYING BELOW THE FINAL DESIGN LEVELS ARE REQUIRED TO BE RAISED AND MATCHED WITH FINAL DESIGN ELEVATION.
16. ACCESS TO RESIDENTIAL AREAS WITHIN THE CONSTRUCTION ZONE SHALL NOT BE BLOCKED BY THE CONTRACTOR AT ANY TIME ALL EXISTING ACCESSES WILL BE RETAINED.
17. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL TEMPORARY TRAFFIC DIVERSIONS ON THE ROAD, CONSTRUCTION OF DETOUR,MAINTENANCE,SPRINKLING OF WATER,GRADING AND COMPACTION,TRAFFIC SAFETY DEVICES, BEACON LIGHTS WHEN AND WHERE REQUIRED, OR AS DIRECTED BY THE ENGINEER.
18. GENERAL SPECIFICATIONS TO BE USED SHALL BE THE LATEST AVAILABLE EDITION OF **STANDARD SPECIFICATIONS FOR ROAD & BRIDGE CONSTRUCTION** PUBLISHED BY PUNJAB COMMUNICATION AND WORKS DEPARTMENT
19. CLEANING AND MAINTENANCE OF GULLY GRATING CHAMBER IS THE RESPONSIBILITY OF MUNICIPAL COMMITTEE.
20. GULLY GRATING CHAMBER ARE PROVIDED DUE TO ABSENCE OF DEDICATED INFRASTRUCTURE FOR SURFACE RUNOFF.

ABBREVIATIONS

HORIZONTAL / VERTICAL CURVES		
S.NO.	DESCRIPTION	SYMBOL
1	STATION	STA
2	POINT OF INTERSECTION	PI
3	EASTING	E
4	NORTHING	N
5	ANGLE OF DEFLECTION	d
6	RADIUS	R
7	LENGTH OF TANGENT	T
8	LENGTH OF CIRCULAR CURVE	LC
9	EXTERNAL ORDINATE	E
10	DEGREE OF CURVE	D
11	RATE OF SUPER ELEVATION	SE
12	POINT OF COMMENCEMENT (CIRCULAR CURVE)	PC
13	POINT OF TERMINATION (CIRCULAR CURVE)	PT
14	VERTICAL POINT OF INTERSECTION	VPI
15	ELEVATION	EL
16	LENGTH OF HORIZONTAL/VERTICAL CURVE	L
17	MIDDLE ORDINATE	M
18	NORMAL CROSSFALL	NC
19	REVERSE CROWN	RC
20	SUPER ELEVATION RUNOFF	SR
21	TANGENT RUNOUT	TR
22	POINT OF COMPOUND CURVATURE	PCC
23	POINT OF REVERSE CURVE	PRC
24	VERTICAL POINT OF CURVATURE	VPC
25	VERTICAL POINT OF TANGENCY	VPT
26	VERTICAL GRADIENT	G

LEGEND

PROPOSED CENTERLINE		BUILDING		CENTER LINE		TUBEWELL	TW
FRL		CANAL		ELECTRIC POLE		MANHOLE	MH
NSL		DRAIN		PYLON		SIGN BOARD	S.B
EDGE OF TRAVELWAY		ROAD		LIGHT POLE		HAND PUMP	HP
LANE		TRACK		TREE		OPTICAL FIBER CABLE	OFC
EDGE OF PAVED SHOULDER		PCC		RAILWAY LINE		MOSQUE	
PROPOSED CARRIAGEWAY		TUFF TILE		TELEPHONE POLE		ELEVATION	EL=210.256
PROPOSED PAVERS		FENCE		FOOT PATH		GRAVEYARD	
PROPOSED GULLY GRATING CHAMBER		GREEN BELT		KARB STONE			

MISCELLANEOUS

S.NO.	DESCRIPTION	SYMBOL
1.	MAXIMUM	MAX.
2.	MINIMUM	MIN.
3.	FINISHED ROAD LEVEL	FRL
4.	NATURAL SURFACE LEVEL	NSL
5.	HIGH FLOOD LEVEL	HFL
6.	SHOULDER	SHLDR

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Client
GOVERNMENT OF PUNJAB
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Financing Agency
WORLD BANK

Project
Punjab Cities Program (PCP)
Detailed Design of Infrastructure Sub-Projects, Sectoral Planning & Resident Supervision in 16 Cities of Punjab(Package-5)

Rev.	Date	Description	Checked	Approved
0	11-10-2022		SA	PHK

Title: GENERAL NOTES

Designed	M. Abdullah
Drawn	M. Tayyab
Checked	Sajjad Anwar
Approved	Pervez Hayat Khan
Scale	AS SHOWN

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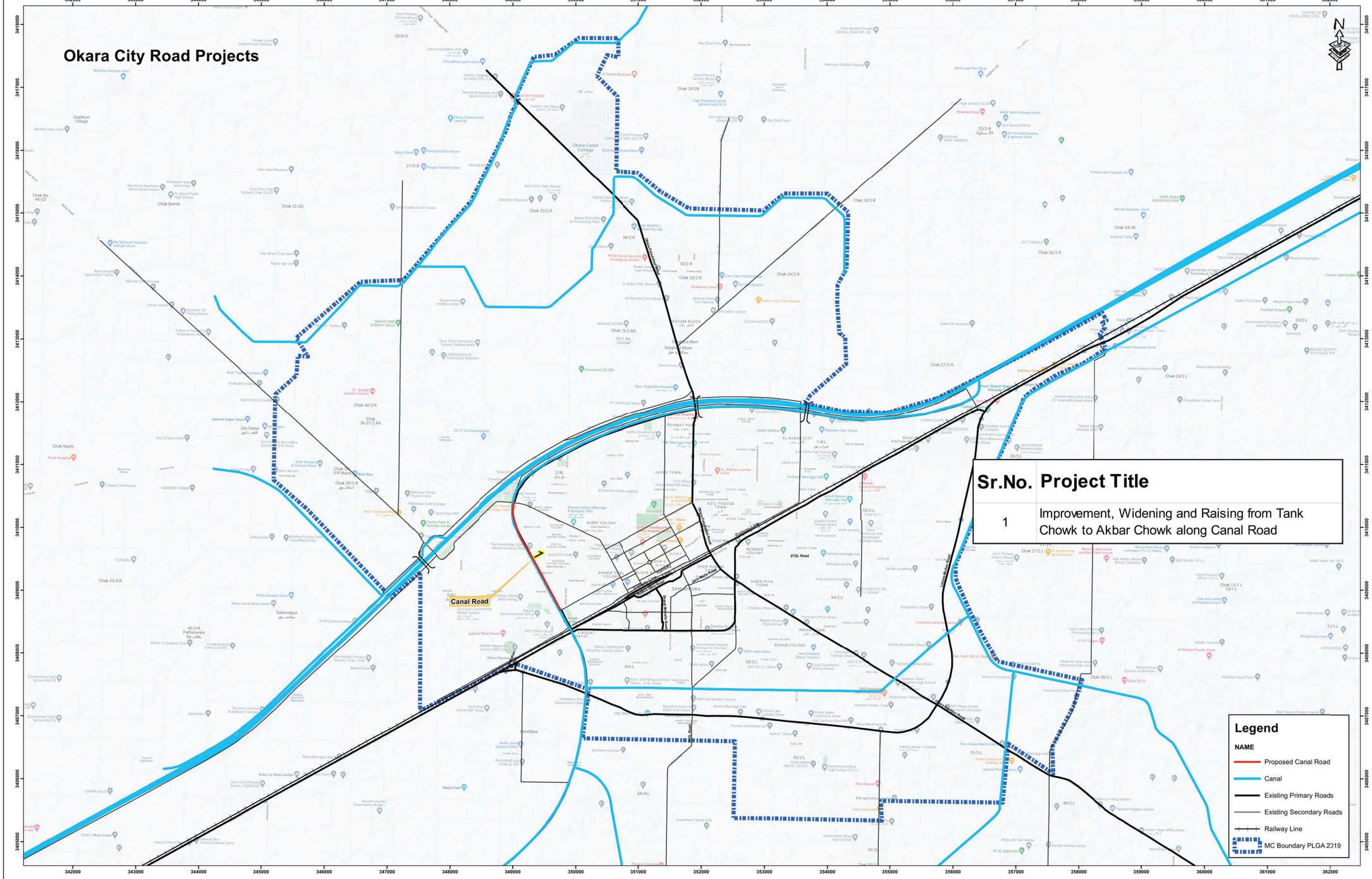
Rev No: 0

Drawing file path & name: F:\PMDFC\Package_V_Roads_P&P\Okara Roads\3. General Notes\General Notes.dwg
User and Plot Date: Tayyab – Tue, 11 Oct 2022 – 11:50am

Okara City Road Projects



Sr.No.	Project Title
1	Improvement, Widening and Raising from Tank Chowk to Akbar Chowk along Canal Road

Legend

NAME

- Proposed Canal Road
- Canal
- Existing Primary Roads
- Existing Secondary Roads
- Railway Line
- MC Boundary PLGA 2019

Drawing file path & name: F:\PMDFC\Package_V_Roods_P&P\Okara Roads\4. LP\LP.dwg
User and Plot Date: Tayyab – Fri, 21 Oct 2022 – 3:18pm

Consultants

MMP

CENTRAL DESIGN CELL
2nd Floor, CTI Building,
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http://www.mmpakistan.com

Client

GOVERNMENT OF PUNJAB

Punjab Municipal Development Fund Company Department (PMDFC)

Financing Agency

WORLD BANK

Project

Punjab Cities Program (PCP)
Detailed Design of Infrastructure Sub-Projects, Sectoral Planning & Resident Supervision in 16 Cities of Punjab(Package-5)

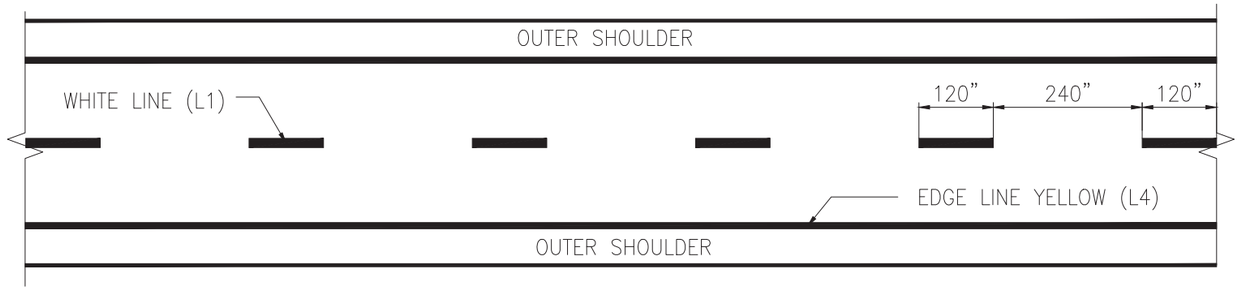
Rev.	Date	Description	Checked	Approved
0	21-10-2022		SA	PHK

Title: LOCATION PLAN

Designed	M. Abdullah
Drawn	M. Tayyab
Checked	Sajjad Anwar
Approved	Pervez Hayat Khan
Scale	AS SHOWN
Drawing No.	MMP-1076P05-OKR-RD-GN-003
Rev No:	0

NOTES:-

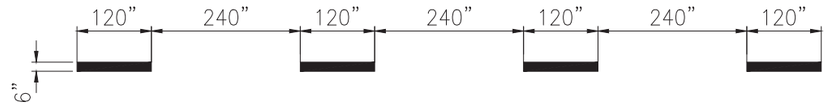
1. ALL DIMENSIONS ARE IN INCHES UNLESS SHOWN OTHERWISE.
2. CAT EYES TO BE PROVIDED AT 36' C/C ON EDGES AND CENTERLINE OR AS DIRECTED BY THE ENGINEER



TYPICAL PAVEMENT MARKING

L2– CONTINUOUS LINE (WHITE)

AT CENTERLINE OF HIGHWAY WHERE OVERTAKING PROHIBITED

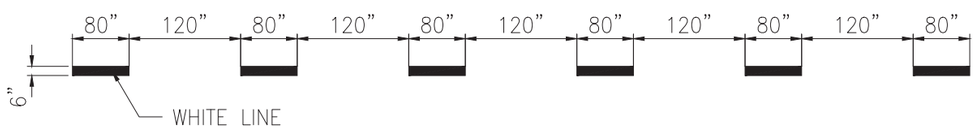


L1– BROKEN GUIDE LINE (WHITE)

AT CENTERLINE OF HIGHWAY

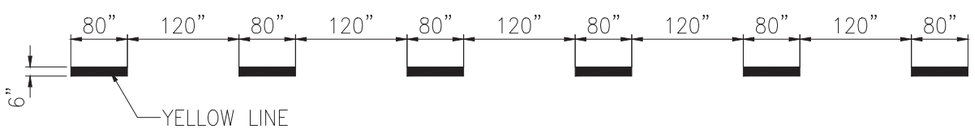
L4– CONTINUOUS LINE (YELLOW)

AT EDGE OF PAVEMENT



L3– DASHED LINE (WHITE)

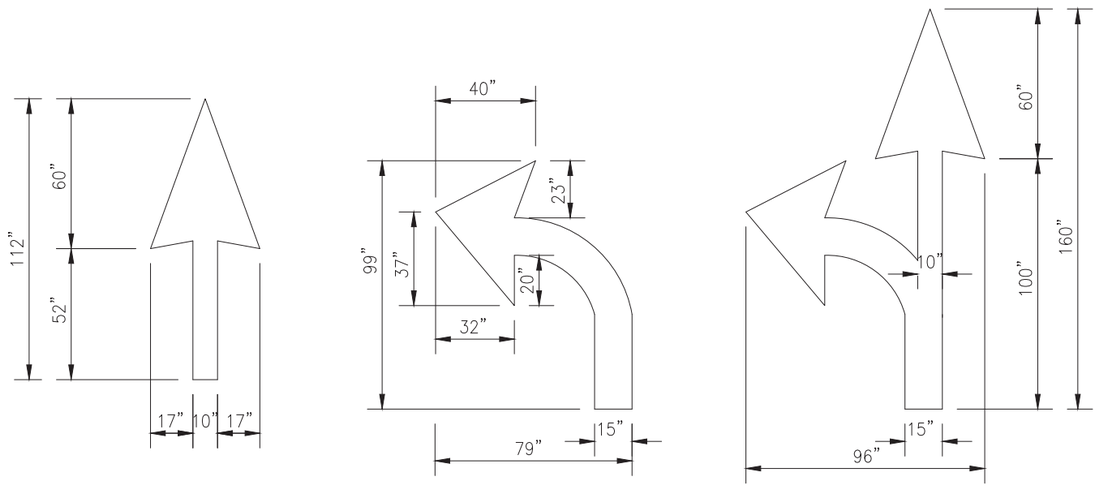
CONTINUITY LINE



L5– DASHED LINE (YELLOW)

AT EDGE OF PAVEMENT AT MINOR CROSSING

Consultants: MMP (MM Pakistan) — CENTRAL DESIGN CELL, 2nd Floor, CTI Building, 27-Empress Road, Lahore, 042-36292525-7, 042-36292528, mmpdcc@mmpakistan.com, http://www.mmpakistan.com	Client: GOVERNMENT OF PUNJAB — Punjab Municipal Development Fund Company Department (PMDFC)	Financing Agency: WORLD BANK Project: Punjab Cities Program (PCP) Detailed Design of Infrastructure Sub-Projects, Sectoral Planning & Resident Supervision in 16 Cities of Punjab(Package-5)	Rev.	Date	Description	Checked	Approved
			0	29-09-2022		SA	PHK
Title: TYPICAL PAVEMENT MARKINGS	Designed: M. Abdullah	Drawn: M. Tayyab	Checked: Sajjad Anwar	Approved: Pervez Hayat Khan	Scale: AS SHOWN	Drawing No.: MMP-1076P05-OKR-RD-GN-004	Rev No: 0



ARROWS FOR PAVEMENT MARKING

NOTES:-

1. ALL DIMENSIONS ARE IN INCHES UNLESS SHOWN OTHERWISE.

Consultants

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http://www.mmpakistan.com

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GOVERNMENT OF PUNJAB

Punjab Municipal Development Fund Company Department (PMDFC)

Financing Agency

WORLD BANK

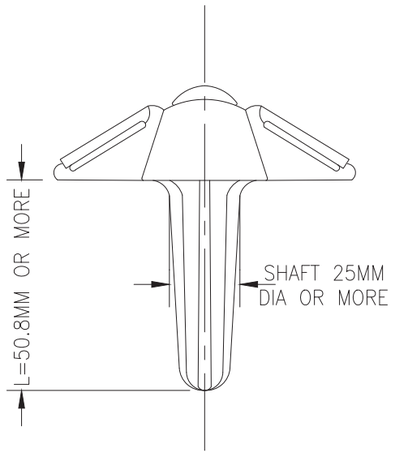
Project

Punjab Cities Program (PCP)
Detailed Design of Infrastructure Sub-Projects, Sectoral Planning & Resident Supervision in 16 Cities of Punjab(Package-5)

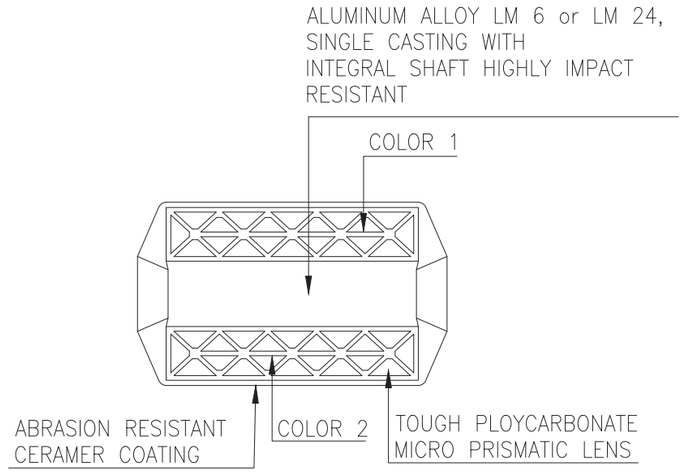
Rev.	Date	Description	Checked	Approved
0	29-09-2022		SA	PHK

Title: ARROW MARKINGS

Designed	M. Abdullah
Drawn	M. Tayyab
Checked	Sajjad Anwar
Approved	Pervez Hayat Khan
Scale	AS SHOWN
Drawing No.	MMP-1076P05-OKR-RD-GN-005
Rev No:	0



CATEYE SHAFT



DOUBLE PROFILE CATEYE

NOTE:-
DIMENSIONS SHOWN ARE INDICATIVE ONLY AND NOT NECESSARILY BE FOLLOWED. HOWEVER ACTUAL DIMENSIONS SHALL BE GIVEN BY MANUFACTURER/SUPPLIER

NOTES:-
1. ALL DIMENSIONS ARE IN MILLIMETER UNLESS SHOWN OTHERWISE.
2. CATEYE SPACING 30 FEET C/C

Consultants
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Client
GOVERNMENT OF PUNJAB
Punjab Municipal Development Fund Company
Department (PMDFC)

Financing Agency
WORLD BANK

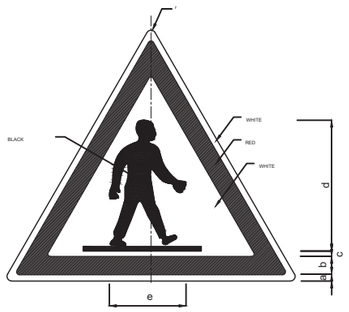
Project
Punjab Cities Program (PCP)
Detailed Design of Infrastructure Sub-Projects, Sectoral Planning & Resident Supervision in 16 Cities of Punjab(Package-5)

Rev.	Date	Description	Checked	Approved
0	11-10-2022		SA	PHK

Title
TYPICAL CATEYE DETAIL

Drawing No.
MMP-1076P05-OKR-RD-GN-005a

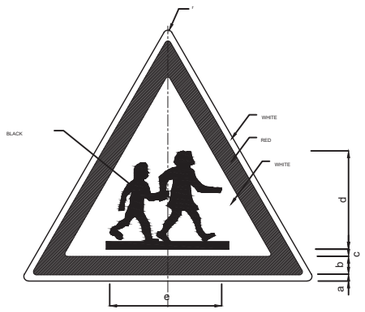
Designed	M. Abdullah
Drawn	M. Tayyab
Checked	Sajjad Anwar
Approved	Pervez Hayat Khan
Scale	AS SHOWN
Rev No:	0



PEDESTRIAN CROSSING SIGN
(W-17)

DIMENSION(cm)

PARTS	SIGN SIZE		
	90cm	105cm	120cm
r	3.5	4.1	-
a	1.0	1.2	-
b	6.5	7.6	-
c	2.5	2.9	-
d	43.0	52.2	-
e	23.0	26.8	-

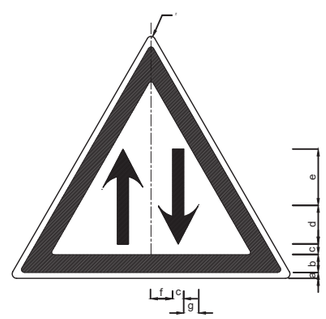


CHILDREN CROSSING SIGN

(W-18)

DIMENSION(cm)

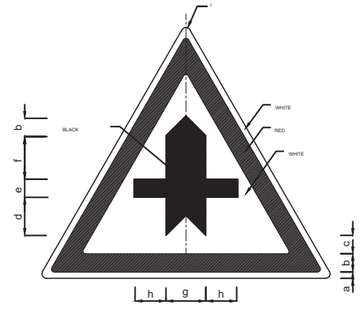
PARTS	SIGN SIZE		
	90cm	105cm	120cm
r	3.5	4.1	-
a	1.0	1.2	-
b	6.5	7.6	-
c	4.5	5.3	-
d	28.5	33.3	-
e	37.5	43.8	-



TWO WAY TRAFFIC AHEAD
(W-26)

DIMENSION(cm)

PARTS	SIGN SIZE		
	90cm	105cm	120cm
r	3.5	4.1	4.7
a	1.0	1.2	1.3
b	6.5	7.6	8.7
c	4.0	4.7	5.3
d	9.0	10.5	12.0
e	19.0	22.2	25.3
f	5.0	5.8	6.7
g	3.5	4.1	4.7



MINOR ROAD CROSSING AT RIGHT ANGLE (W-27)

DIMENSION(cm)

PARTS	SIGN SIZE		
	90cm	105cm	120cm
r	3.5	4.1	4.7
a	1.0	1.2	1.3
b	6.5	7.6	8.7
c	4.0	4.7	5.3
d	15.0	17.5	20.0
e	6.0	7.0	8.0
f	11.0	12.8	14.7
g	13.5	15.7	18.0
h	8.5	9.9	11.3

NOTES:

1. ALL DIMENSIONS ARE IN CENTIMETERS UNLESS OTHERWISE SPECIFIED
2. THE 90 cm SIGNS WILL BE USED
3. ALL SIGNS HAVE WHITE BACKGROUND WITH BLACK WRITING / MARKINGS AND RED BOARDER
4. ALL SHEETING IS OF HIGH INTENSITY PRISMATIC REFLECTIVE SHEET FOR SIGNS.
5. SIGN BOARD SHOULD BE PLACED 2 ft FROM EDGE OF SHOULDER, WITH 10 ft POLE.
6. FOR TRAFFIC SAFETY NO FIX STRUCTURE/POLE/TREE SHOULD BE PRESENT WITHIN 2 ft OF EDGE OF ROADWAY.

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GOVERNMENT OF PUNJAB

Punjab Municipal Development Fund Company Department (PMDFC)

Financing Agency

WORLD BANK

Project

Punjab Cities Program (PCP)
Detailed Design of Infrastructure Sub-Projects, Sectoral Planning & Resident Supervision in 16 Cities of Punjab(Package-5)

Rev.	Date	Description	Checked	Approved
0	11-10-2022		SA	PHK

Title

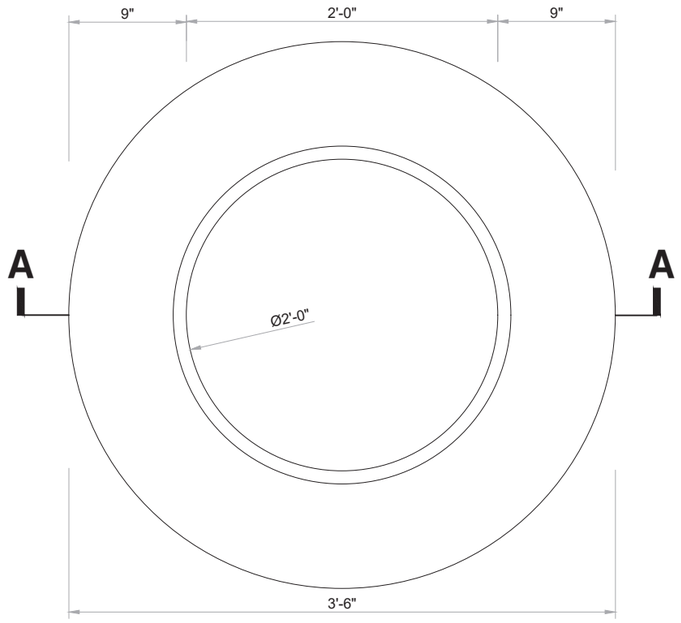
CATEGORY - 1
TYPICAL SIGN DETAILS

Designed	M. Abdullah
Drawn	M. Tayyab
Checked	Sajjad Anwar
Approved	Pervez Hayat Khan
Scale	AS SHOWN

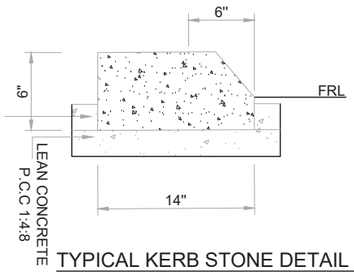
Drawing No. MMP-1076P05-OKR-RD-GN-005b

Rev No: 0

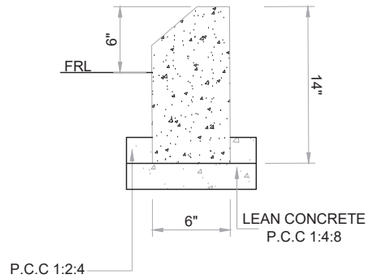
Drawing file path & name: F:\PMDFC\Package_V_Roads_P&P\Okara Roads\7.1. Typical Road Signs\Typical Road Signs.dwg
User and Plot Date: Toyyab - Tue, 11 Oct 2022 - 11:50am



PLAN OF MANHOLE COLLAR

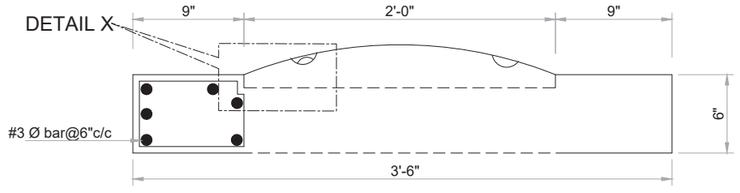


TYPICAL KERB STONE DETAIL B



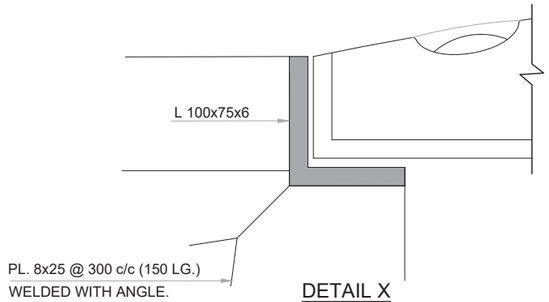
TYPICAL KERB STONE DETAIL A

TYPICAL KERB STONE DETAIL A



SECTION OF MANHOLE COLLAR

SECTION A-A



DETAIL X

RAISING OF EXISTING MANHOLE

NOTES:-

1. ALL DIMENSIONS ARE IN FEET UNLESS SHOWN OTHERWISE.
2. TYPICAL KERB DETAIL B TO BE PROVIDED WHERE EXISTING DRIVEWAY IS PRESENT OR AS DIRECTED BY THE ENGINEER.

Consultants

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http://www.mmpakistan.com

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Financing Agency

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Punjab Cities Program (PCP)
Detailed Design of Infrastructure Sub-Projects, Sectoral Planning & Resident Supervision in 16 Cities of Punjab(Package-5)

Rev.	Date	Description	Checked	Approved
0	2-12-2022		SA	PHK

Title: TYPICAL MANHOLE DETAIL

Designed	M. Abdullah
Drawn	M.Tayyab
Checked	Sajjad Anwar
Approved	Pervez Hayat Khan
Scale	AS SHOWN

Drawing No. MMP-1076P05-OKR-RD-GN-006

Rev No: 0

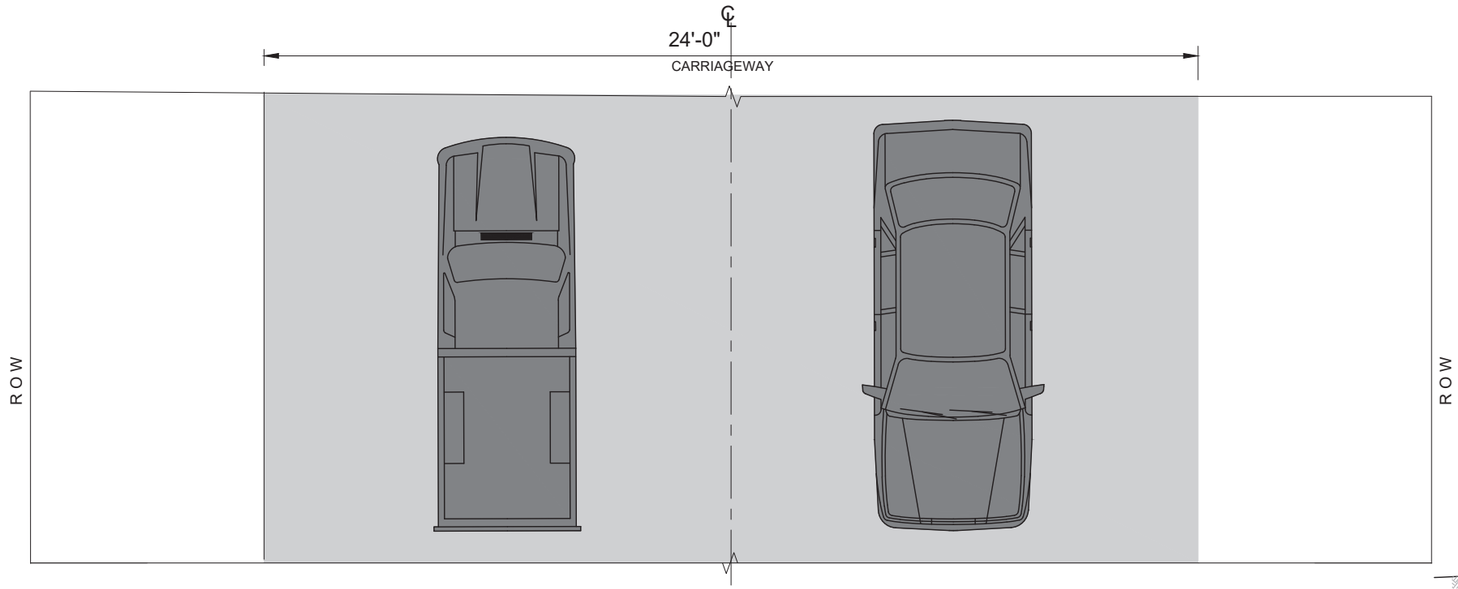
Status PRE

Drawing file path & name: F:\PMDFC\Package_V_Roads_P&P\Okara Roads\6. Typical Cross Sections\Okara Roads Typical Cross Sections and Drain.dwg
User and Plot Date: Tayyab – Fri, 02 Dec 2022 – 2:54pm

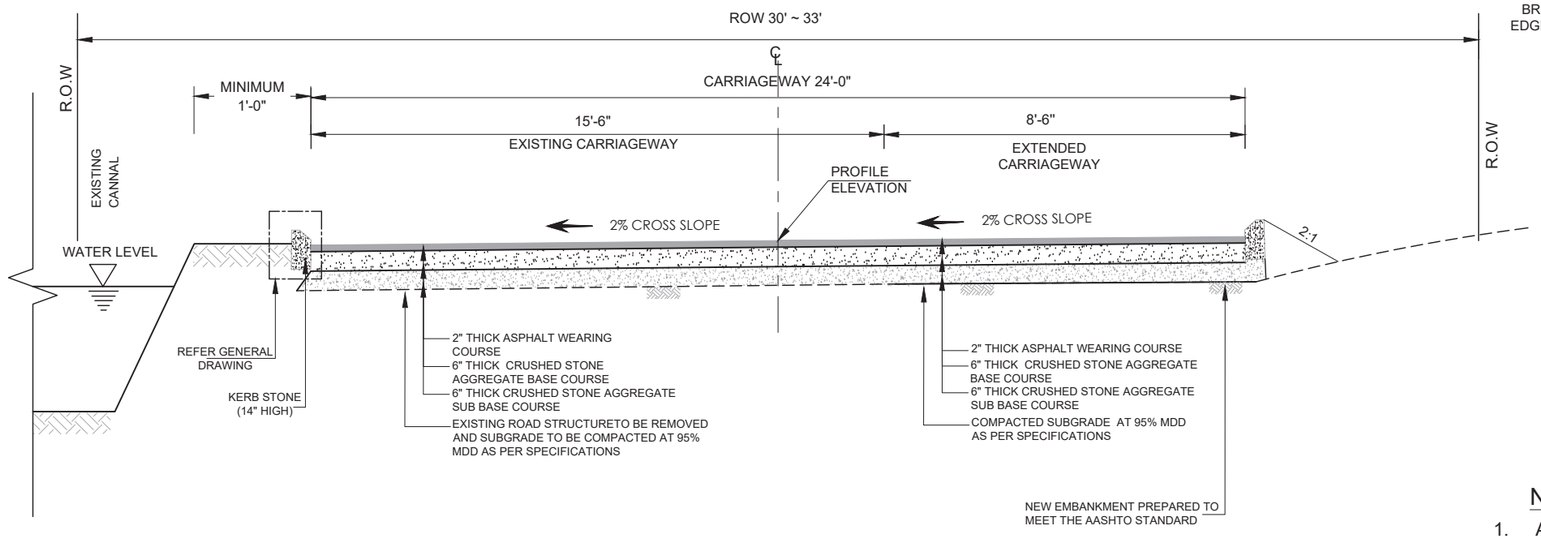
Typical Cross Section

MM Pakistan (Pvt) Ltd.

PROPOSED ROAD SECTION



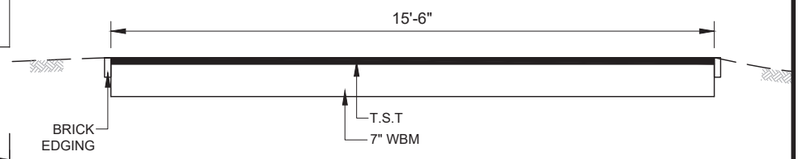
PLAN



TYPICAL ROADWAY SECTION
(0+000 TO 2+000)

SCALE 1/4"=1'-0"

EXISTING ROAD SECTION



(RD 0+000 TO 2+000)

SCALE 1/4"=1'-0"

NOTES:-

1. ALL DIMENSIONS ARE IN FEET EXCEPT SHOWN OTHERWISE.
2. EXISTING TST SHALL BE REMOVED.
3. EXISTING ROAD BASE WILL BE ADJUSTED ACCORDING TO PROFILE LEVEL.
4. DRAINAGE SLOPE SHALL BE REWORK DURING SURFACE PREPARATION.
5. EXISTING LEVEL AT THE CROSSINGS / INTERSECTIONS SHALL BE MATCHED AS PER SITE CONDITION OR AS DIRECTED BY THE ENGINEER.
6. TWO CURB STONES WILL BE REMOVED EVERY 50 FT TO ALLOW FOR SURFACE DRAINAGE.

Consultants

MMP

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mmpdcc@mmpakistan.com
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Client

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WORLD BANK

Project

Punjab Cities Program (PCP)
Detailed Design of Infrastructure Sub-Projects, Sectoral Planning & Resident Supervision in 16 Cities of Punjab(Package-5)

Rev.	Date	Description	Checked	Approved
0	2-11-2022		SA	PHK

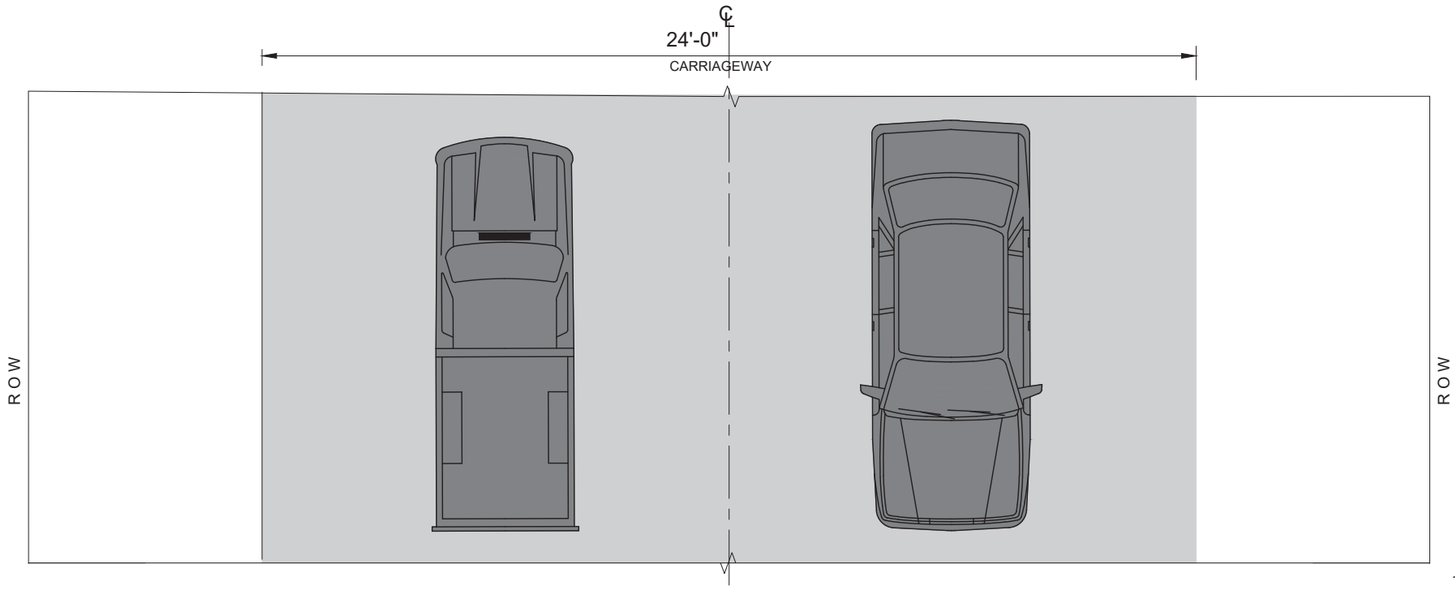
Title

CANAL ROAD TYPICAL CROSS SECTION
(0+000 TO 2+000)

Designed	M. Abdullah
Drawn	M.Tayyab
Checked	Sajjad Anwar
Approved	Pervez Hayat Khan
Scale	AS SHOWN
Drawing No.	MMP-1076P05-OKR-RD-GN-007
Rev No:	0
Status	PRE

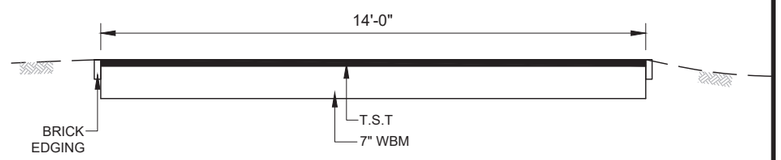
Drawing file path & name: F:\PMDFC\Package_V_Roads_P&P\Okara Roads\6. Typical Cross Sections\Okara Roads Typical Cross Sections and Drain.dwg
User and Plot Date: Tayyab – Wed, 02 Nov 2022 – 11:25pm

PROPOSED ROAD SECTION



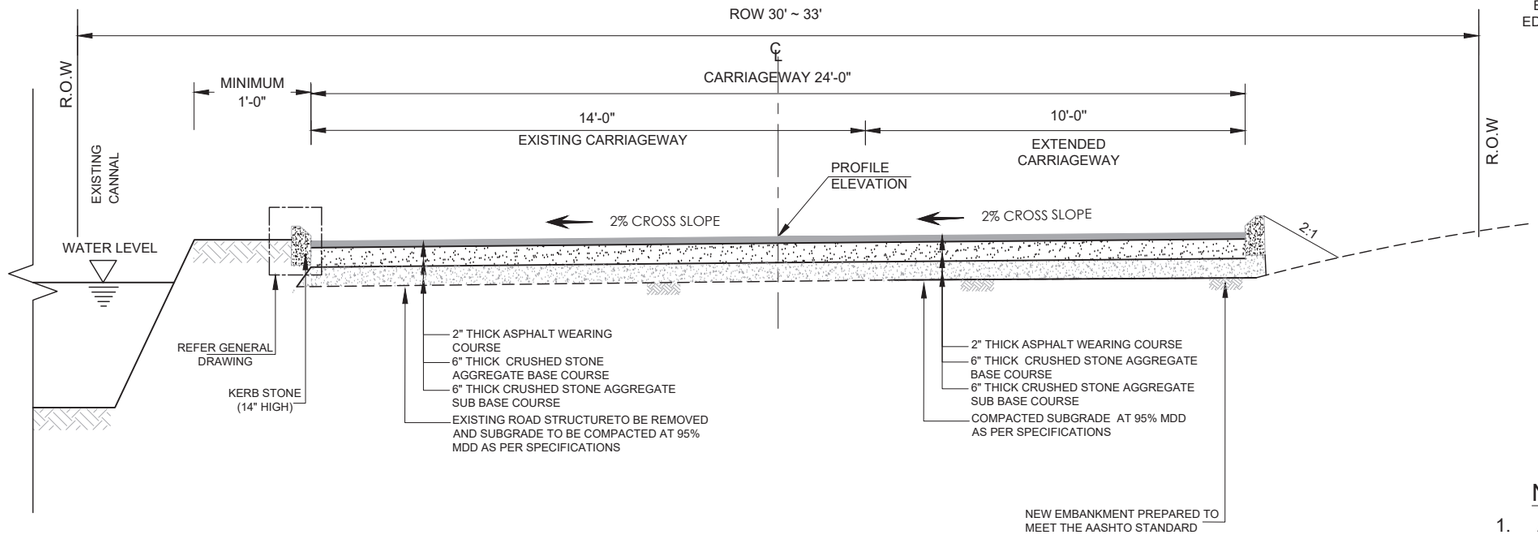
PLAN

EXISTING ROAD SECTION



(RD 2+000 TO 4+690)

SCALE 1/4"=1'-0"



TYPICAL ROADWAY SECTION

(2+000 TO 4+690)

SCALE 1/4"=1'-0"

NOTES:-

1. ALL DIMENSIONS ARE IN FEET EXCEPT SHOWN OTHERWISE.
2. EXISTING TST SHALL BE REMOVED.
3. EXISTING ROAD BASE WILL BE ADJUSTED ACCORDING TO PROFILE LEVEL.
4. DRAINAGE SLOPE SHALL BE REWORK DURING SURFACE PREPARATION.
5. EXISTING LEVEL AT THE CROSSINGS / INTERSECTIONS SHALL BE MATCHED AS PER SITE CONDITION OR AS DIRECTED BY THE ENGINEER.
6. TWO CURB STONES WILL BE REMOVED EVERY 50 FT TO ALLOW FOR SURFACE DRAINAGE.

Consultants

MMP

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Client

GOVERNMENT OF PUNJAB

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Financing Agency

WORLD BANK

Project

Punjab Cities Program (PCP)
Detailed Design of Infrastructure Sub-Projects, Sectoral Planning & Resident Supervision in 16 Cities of Punjab(Package-5)

Rev.	Date	Description	Checked	Approved
0	2-11-2022		SA	PHK

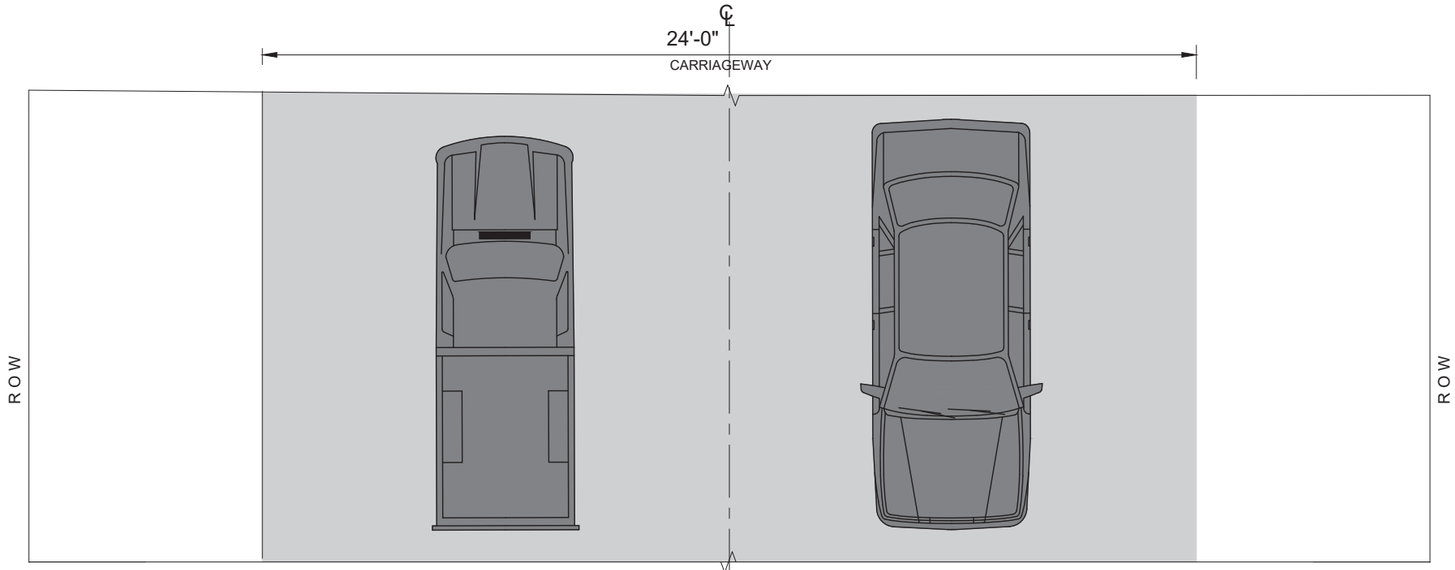
Title

CANAL ROAD TYPICAL CROSS SECTION
(2+000 TO 4+690)

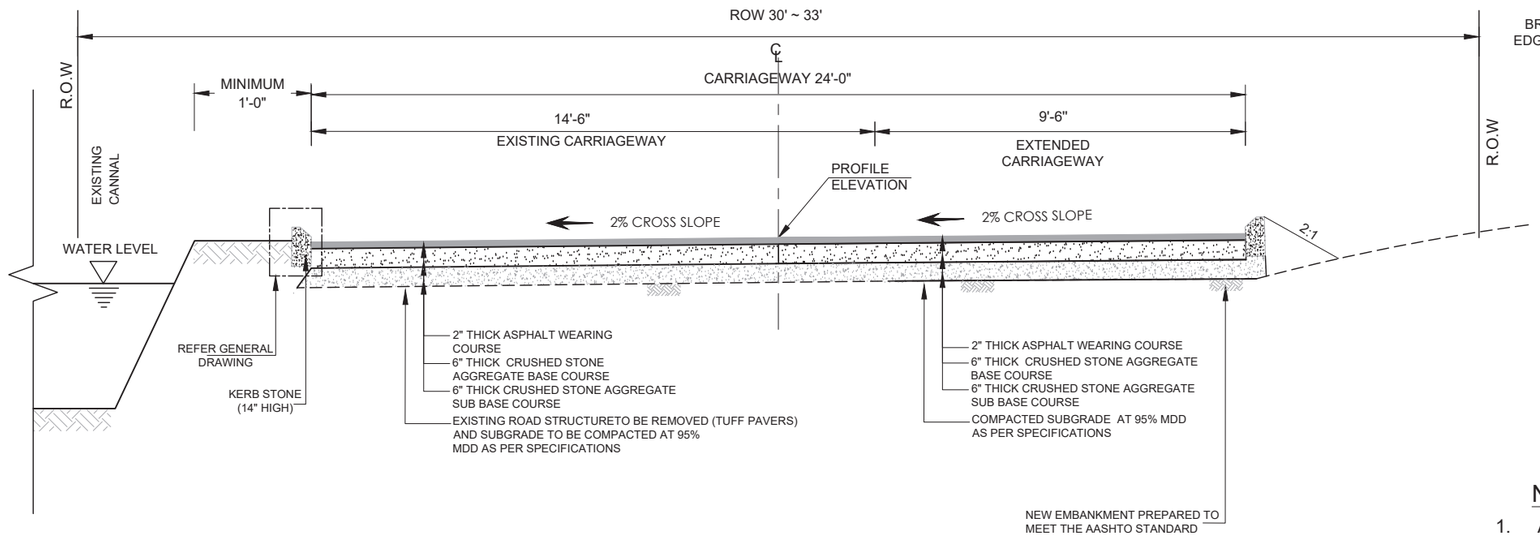
Designed	M. Abdullah
Drawn	M.Tayyab
Checked	Sajjad Anwar
Approved	Pervez Hayat Khan
Scale	AS SHOWN
Drawing No.	MMP-1076P05-OKR-RD-GN-008
Rev No:	0
Status	PRE

Drawing file path & name: F:\PMDFC\Package_V_Roads_P&P\Okara Roads\6. Typical Cross Sections\Okara Roads Typical Cross Sections and Drain.dwg
User and Plot Date: Tayyab – Wed, 02 Nov 2022 – 11:25pm

PROPOSED ROAD SECTION



PLAN

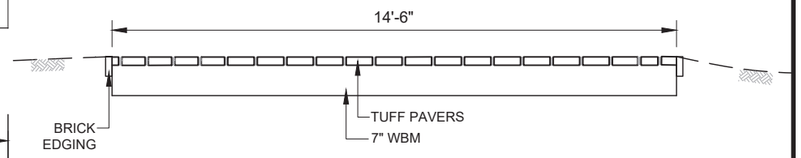


TYPICAL ROADWAY SECTION

(4+690 TO 4+825)

SCALE 1/4"=1'-0"

EXISTING ROAD SECTION



(RD 4+690 TO 4+885)

SCALE 1/4"=1'-0"

NOTES:-

1. ALL DIMENSIONS ARE IN FEET EXCEPT SHOWN OTHERWISE.
2. EXISTING TST SHALL BE REMOVED.
3. EXISTING ROAD BASE WILL BE ADJUSTED ACCORDING TO PROFILE LEVEL.
4. DRAINAGE SLOPE SHALL BE REWORK DURING SURFACE PREPARATION.
5. EXISTING LEVEL AT THE CROSSINGS / INTERSECTIONS SHALL BE MATCHED AS PER SITE CONDITION OR AS DIRECTED BY THE ENGINEER.
6. TWO CURB STONES WILL BE REMOVED EVERY 50 FT TO ALLOW FOR SURFACE DRAINAGE.

Consultants

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WORLD BANK

Project

Punjab Cities Program (PCP)
Detailed Design of Infrastructure Sub-Projects, Sectoral Planning & Resident Supervision in 16 Cities of Punjab(Package-5)

Rev.	Date	Description	Checked	Approved
0	2-11-2022		SA	PHK

Title

CANAL ROAD TYPICAL CROSS SECTION
(4+690 TO 4+825)

Designed	M. Abdullah
Drawn	M.Tayyab
Checked	Sajjad Anwar
Approved	Pervez Hayat Khan
Scale	AS SHOWN

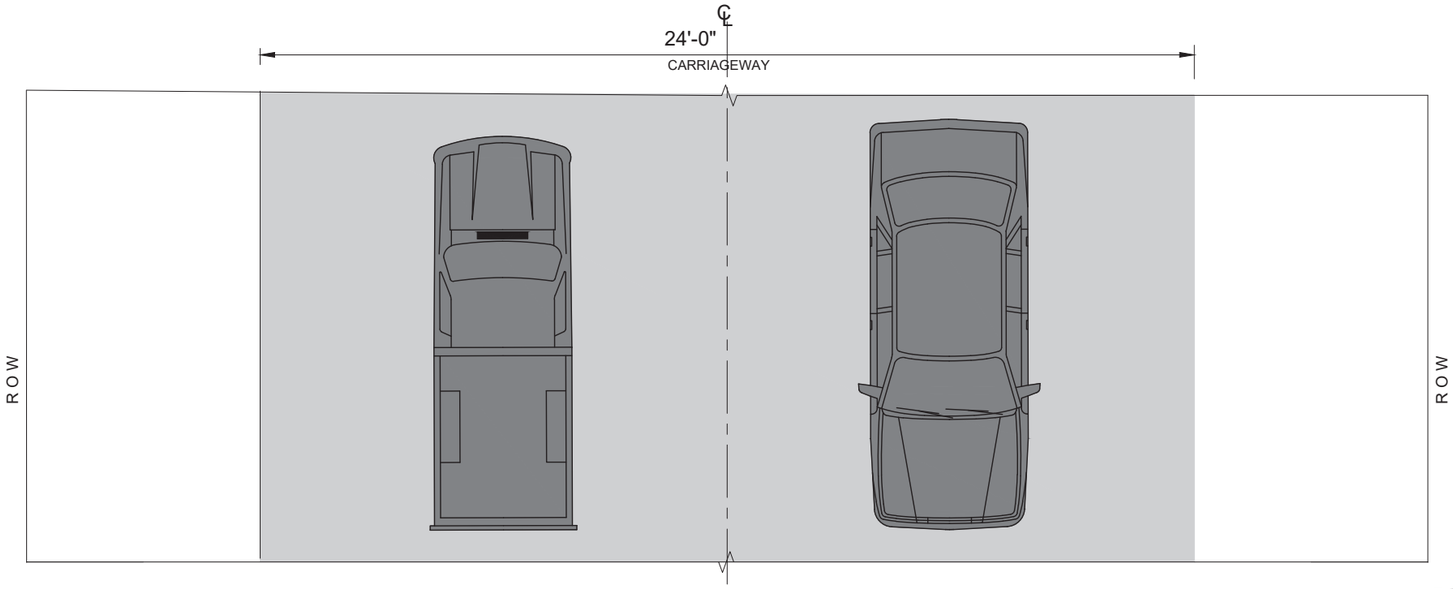
Drawing No. MMP-1076P05-OKR-RD-GN-009

Rev No: 0

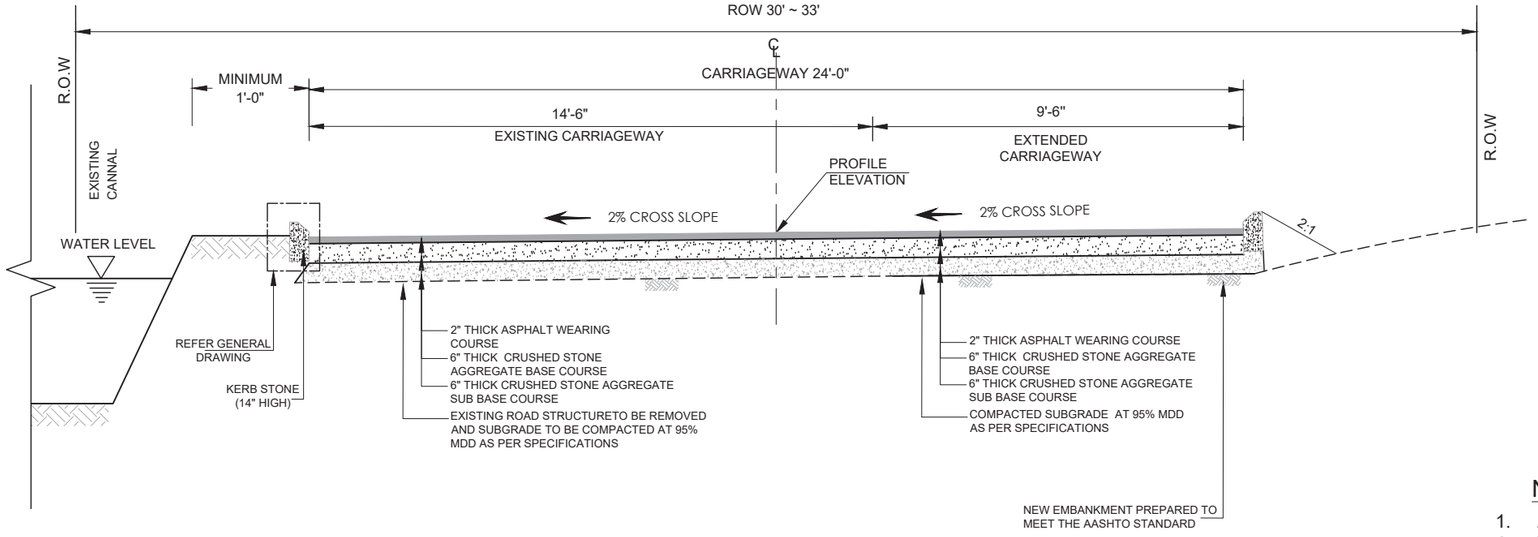
Status PRE

Drawing file path & name: F:\PMDFC\Package_V_Roads_P&P\Okara Roads\6. Typical Cross Sections\Okara Roads Typical Cross Sections and Drain.dwg
User and Plot Date: Tayyab – Wed, 02 Nov 2022 – 11:25pm

PROPOSED ROAD SECTION



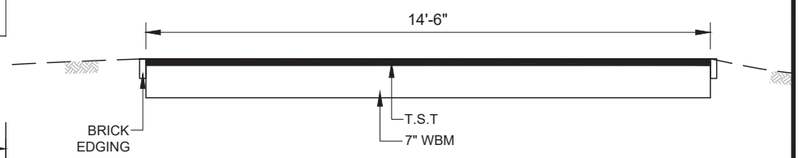
PLAN



TYPICAL ROADWAY SECTION
(4+825 TO 6+152)

SCALE 1/4"=1'-0"

EXISTING ROAD SECTION



(RD 4+825 TO 6+152)

SCALE 1/4"=1'-0"

NOTES:-

1. ALL DIMENSIONS ARE IN FEET EXCEPT SHOWN OTHERWISE.
2. EXISTING TST SHALL BE REMOVED.
3. EXISTING ROAD BASE WILL BE ADJUSTED ACCORDING TO PROFILE LEVEL.
4. DRAINAGE SLOPE SHALL BE REWORK DURING SURFACE PREPARATION.
5. EXISTING LEVEL AT THE CROSSINGS / INTERSECTIONS SHALL BE MATCHED AS PER SITE CONDITION OR AS DIRECTED BY THE ENGINEER.
6. TWO CURB STONES WILL BE REMOVED EVERY 50 FT TO ALLOW FOR SURFACE DRAINAGE.

Consultants

MMP

CENTRAL DESIGN CELL
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27-Empress Road, Lahore
042-36292525-7
042-36292528
mmpdcc@mmpakistan.com
http://www.mmpakistan.com

Client

GOVERNMENT OF PUNJAB

Punjab Municipal Development Fund Company Department (PMDFC)

Financing Agency

WORLD BANK

Project

Punjab Cities Program (PCP)
Detailed Design of Infrastructure Sub-Projects, Sectoral Planning & Resident Supervision in 16 Cities of Punjab(Package-5)

Rev.	Date	Description	Checked	Approved
0	2-11-2022		SA	PHK

Title

CANAL ROAD TYPICAL CROSS SECTION
(4+825 TO 6+152)

Designed	M. Abdullah
Drawn	M.Tayyab
Checked	Sajjad Anwar
Approved	Pervez Hayat Khan
Scale	AS SHOWN

Drawing No. MMP-1076P05-OKR-RD-GN-010

Rev No: 0

Status PRE

Drawing file path & name: F:\PMDFC\Package_V_Roads_P&P\Okara Roads\6. Typical Cross Sections\Okara Roads Typical Cross Sections and Drain.dwg
User and Plot Date: Tayyab – Wed, 02 Nov 2022 – 11:25pm

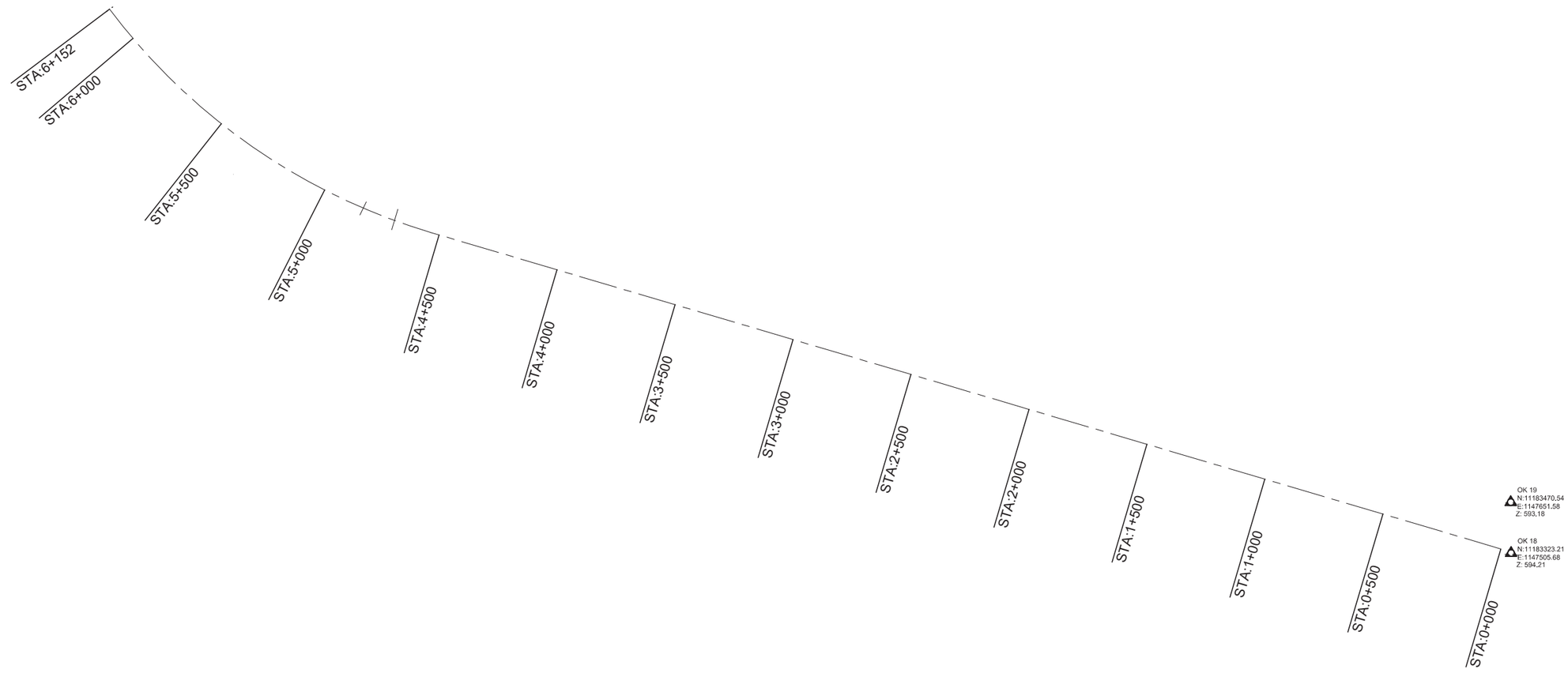
Topographic Survey

MM Pakistan (Pvt) Ltd.

OK1
N:11190473.13
E:1145643.45
Z: 579.99

OK2
N:11190252.91
E:1145439.05
Z: 589.11

List of Control Points				
Point	Northing	Easting	Elevation	Description
1	11190473.13	1145643.45	579.99	OK1
2	11190252.91	1145439.05	589.11	OK2
11	11183323.21	1147505.68	594.21	OK 18
12	11183470.54	1147651.58	593.18	OK 19



Consultants

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042-36292528
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Financing Agency

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Project

Punjab Cities Program (PCP)
Detailed Design of Infrastructure Sub-Projects, Sectoral Planning & Resident Supervision in 16 Cities of Punjab(Package-5)

Rev.	Date	Description	Checked	Approved
0	30-09-2022		SA	SA

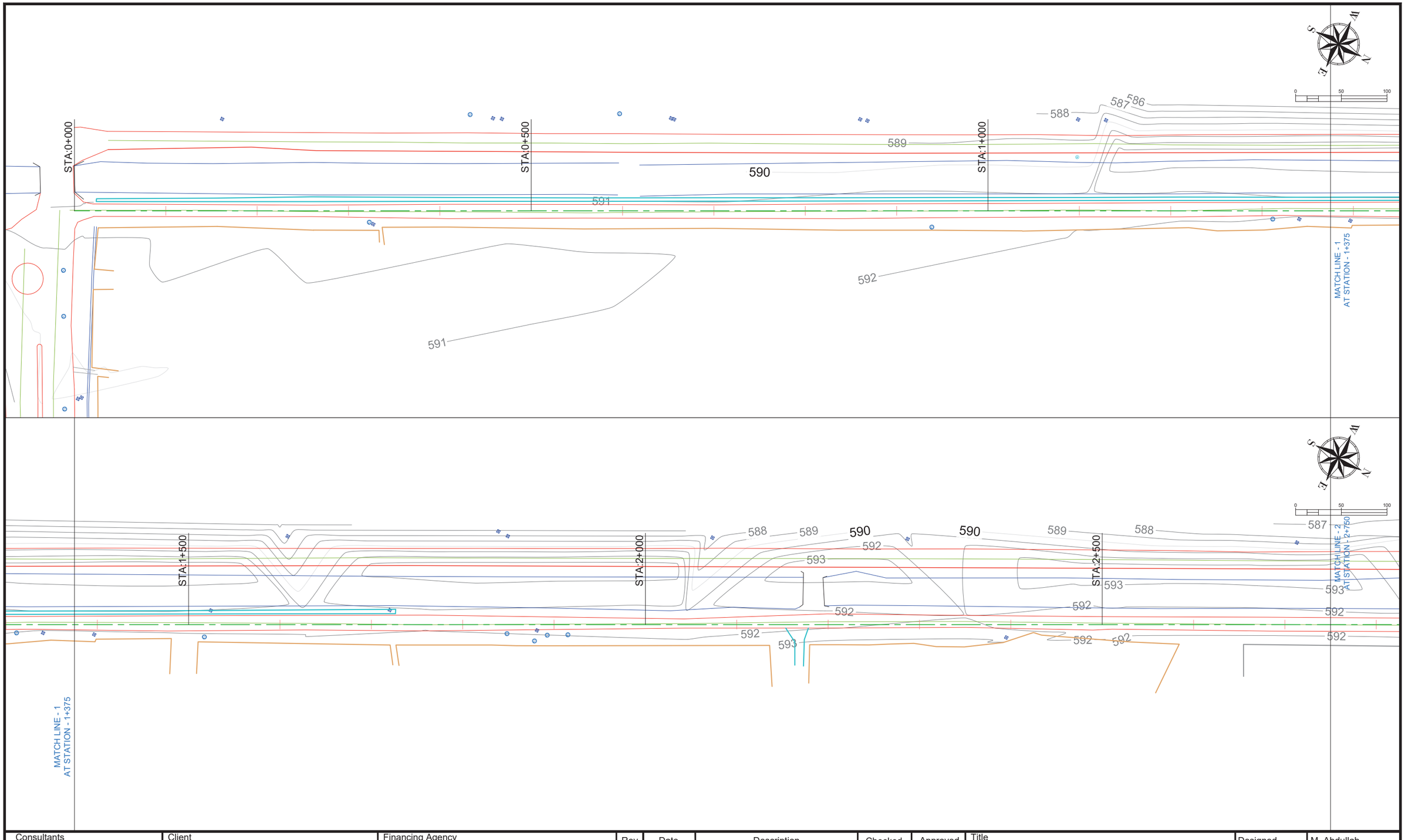
Title

CANAL ROAD LIST OF CONTROL POINTS

Drawing No.
MMP-1076P05-OKR-RD-GN-012

Designed	M. Abdullah
Drawn	M. Tayyab
Checked	Sajjad Anwar
Approved	Sajjad Anwar
Scale	1" : 500'
Rev No:	0

Drawing file path & name: F:\PMDFC\Package_V_Roads_P&P\Okara Roads\5. CP\Okara Canal Road CP Sheet.dwg
User and Plot Date: Tayyab – Fri, 30 Sep 2022 – 12:46pm

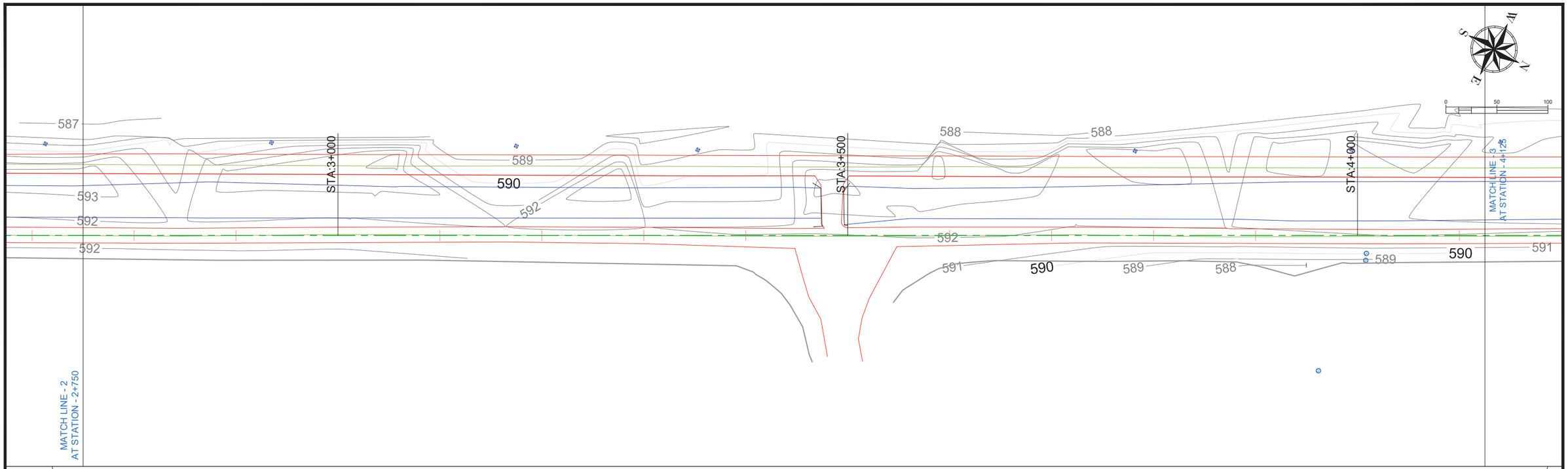


Consultants: MMP — CENTRAL DESIGN CELL, 2nd Floor, CTI Building, 27-Empress Road, Lahore, 042-36292525-7, 042-36292528, mmpdcc@mmpakistan.com, http://www.mmpakistan.com	Client: GOVERNMENT OF PUNJAB — Punjab Municipal Development Fund Company Department (PMDFC)	Financing Agency: WORLD BANK	Project: Punjab Cities Program (PCP) Detailed Design of Infrastructure Sub-Projects, Sectoral Planning & Resident Supervision in 16 Cities of Punjab(Package-5)			

Rev.	Date	Description	Checked	Approved
0	30-09-2022		SA	SA

Title	CANAL ROAD TOPOGRAPHIC SURVEY
Drawing No.	MMP-1076P05-OKR-RD-TP-001

Designed	M. Abdullah
Drawn	M. Tayyab
Checked	Sajjad Anwar
Approved	Sajjad Anwar
Scale	1" : 100'
Rev No:	0



Consultants

MMP

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27-Empress Road, Lahore
042-36292525-7
042-36292528
mmpdcc@mmpakistan.com
http://www.mmpakistan.com

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GOVERNMENT OF PUNJAB

Punjab Municipal Development Fund Company
Department (PMDFC)

Financing Agency

WORLD BANK

Project

Punjab Cities Program (PCP)
Detailed Design of Infrastructure Sub-Projects, Sectoral Planning & Resident Supervision in 16 Cities of Punjab(Package-5)

Rev.	Date	Description	Checked	Approved
0	30-09-2022		SA	SA

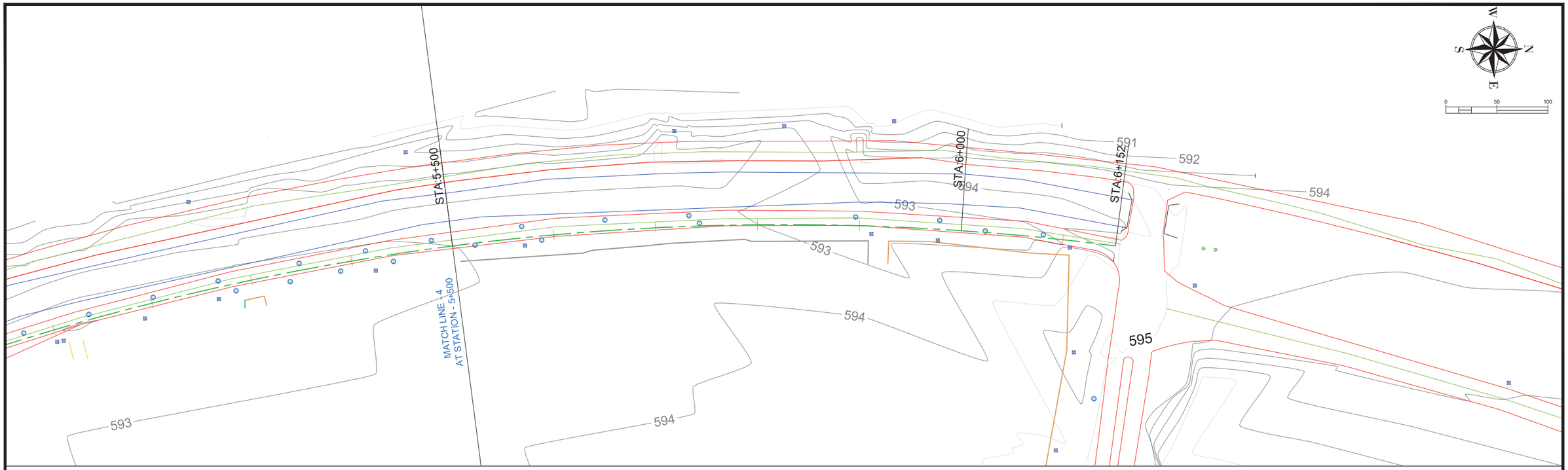
Title

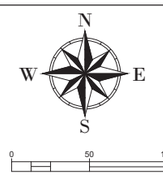
CANAL ROAD TOPOGRAPHIC SURVEY

Drawing No. MMP-1076P05-OKR-RD-TP-002

Designed	M. Abdullah
Drawn	M. Tayyab
Checked	Sajjad Anwar
Approved	Sajjad Anwar
Scale	1" : 100'
Rev No:	0

Drawing file path & name: F:\PMDFC\Package_V_Roads_P&R\Okara Roads\13. Topographic Survey\Okara Canal Road Topographic Sheets.dwg
User and Plot Date: Tayyab – Fri, 30 Sep 2022 – 6:21pm





Drawing file path & name: F:\PMDFC\Package_V_Roads_P&P\Okara Roads\13. Topographic Survey\Okara Canal Road Topographic Sheets.dwg
User and Plot Date: Tayyab – Fri, 30 Sep 2022 – 6:21pm

Consultants

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Financing Agency

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Punjab Cities Program (PCP)
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Rev.	Date	Description	Checked	Approved
0	30-09-2022		SA	SA

Title

CANAL ROAD TOPOGRAPHIC SURVEY

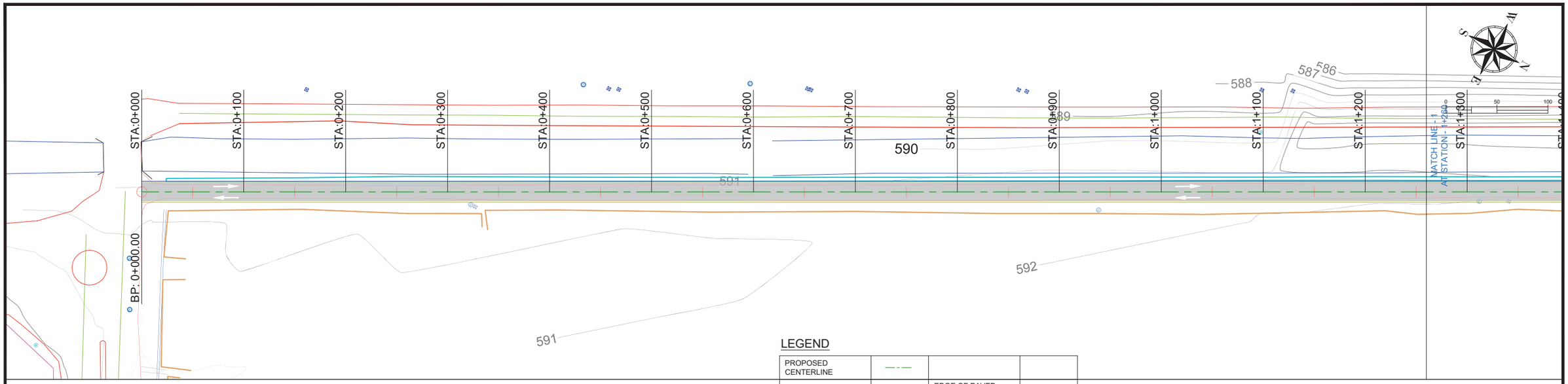
Drawing No.

MMP-1076P05-OKR-RD-TP-003

Designed	M. Abdullah
Drawn	M. Tayyab
Checked	Sajjad Anwar
Approved	Sajjad Anwar
Scale	1" : 100'
Rev No:	0

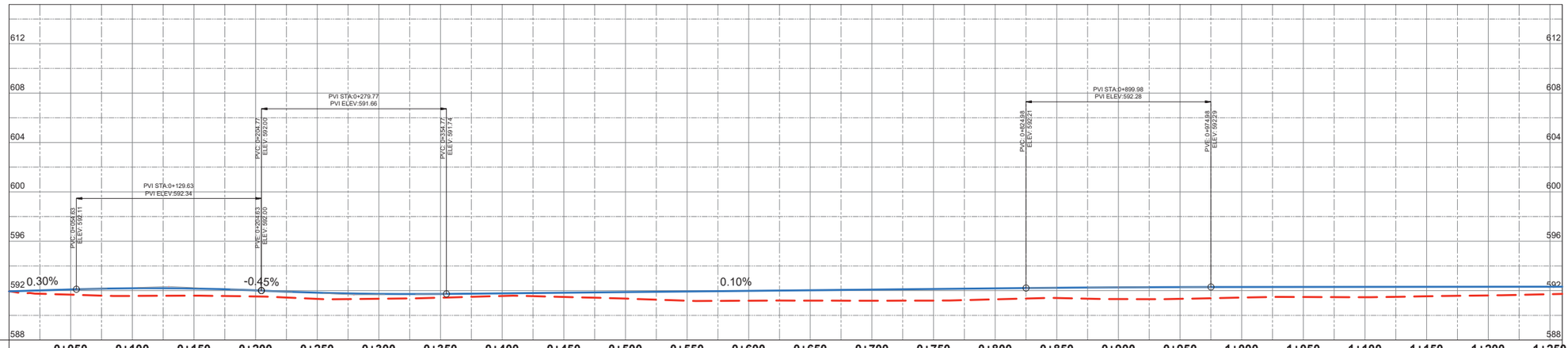
Plan and Profile Drawings

MM Pakistan (Pvt) Ltd.



LEGEND

PROPOSED CENTERLINE			
EDGE OF TRAVELWAY		EDGE OF PAVED SHOULDER	
LANE		PROPOSED CARRIAGEWAY	



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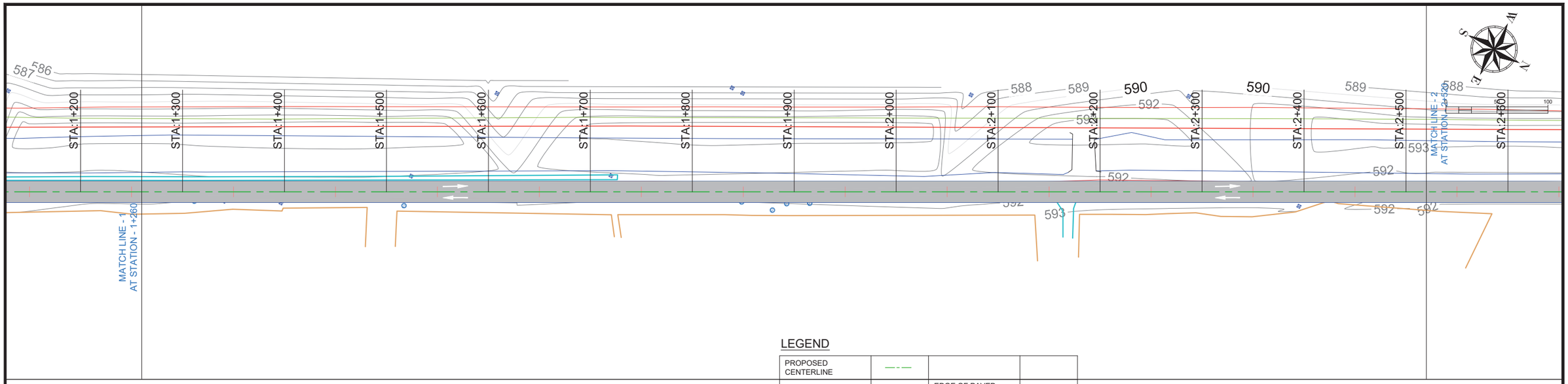
FRL	592.10	592.20	592.17	592.02	591.83	591.74	591.73	591.78	591.83	591.88	591.93	591.98	592.03	592.08	592.13	592.18	592.23	592.27	592.29	592.29	592.30	592.30	592.31	592.31	592.32
NSL	591.67	591.57	591.59	591.53	591.34	591.34	591.43	591.57	591.49	591.36	591.19	591.19	591.19	591.19	591.20	591.30	591.40	591.32	591.34	591.44	591.49	591.47	591.55	591.61	591.72
Level Difference	0.42	0.62	0.58	0.49	0.50	0.40	0.30	0.21	0.34	0.53	0.75	0.80	0.84	0.90	0.94	0.88	0.83	0.95	0.95	0.85	0.81	0.83	0.76	0.70	0.60
Horizontal Geometry	L=4531.56'																								
Vertical Geometry	L= 54.63'	L= 150.00' K= 198.95		0.14'	L= 150.00' K= 272.73			L= 470.21'									L= 150.00' K= 1666.67			L= 3845.36'					
Superelevation																									

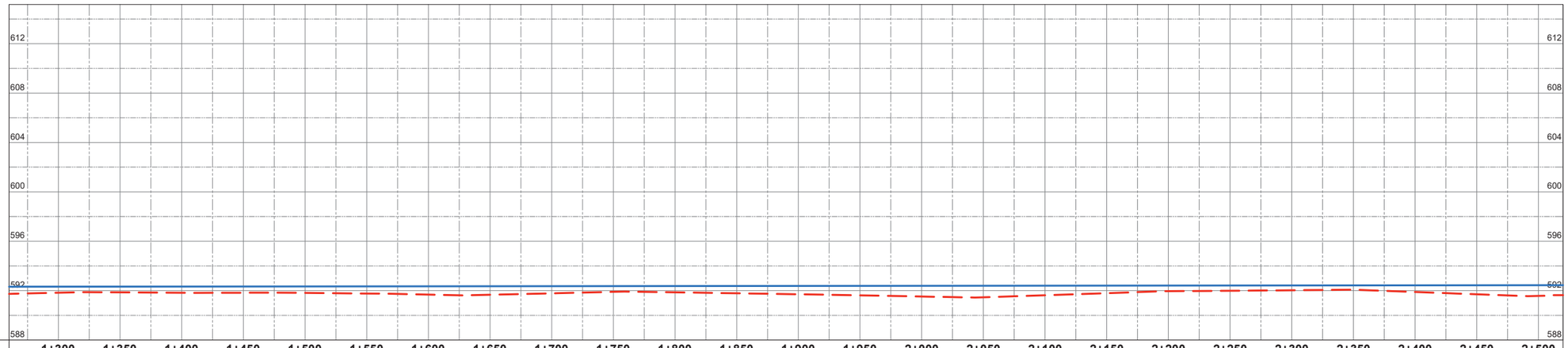
Consultants	Client	Financing Agency	Rev.	Date	Description	Checked	Approved	Title	Designed	M. Abdullah
MMP CENTRAL DESIGN CELL 2nd Floor, CTI Building, 27-Empress Road, Lahore 042-36292525-7 042-36292528 mmpdcc@mmpakistan.com http://www.mmpakistan.com	GOVERNMENT OF PUNJAB Punjab Municipal Development Fund Company Department (PMDFC)	WORLD BANK Project: Punjab Cities Program (PCP) Detailed Design of Infrastructure Sub-Projects, Sectoral Planning & Resident Supervision in 16 Cities of Punjab(Package-5)	0	2-11-2022		SA	PHK	CANAL ROAD PLAN AND PROFILE (STA 0+000.00 TO STA 1+260.00)	Drawn	M. Tayyab
									Checked	Sajjad Anwar
									Approved	Pervez Hayat Khan
									Scale	H= 1" : 100' V= 1" : 10'
								Drawing No. MMP-1076P05-OKR-RD-PP-001	Rev No:	0

Drawing file path & name: C:\Users\Tayyab\AppData\Local\Temp\AcPublish_14432\Okara Canal Road P&P.dwg
User and Plot Date: Tayyab – Wed, 02 Nov 2022 – 11:25pm



LEGEND

PROPOSED CENTERLINE			
EDGE OF TRAVELWAY		EDGE OF PAVED SHOULDER	
LANE		PROPOSED CARRIAGEWAY	



Station	1+300	1+350	1+400	1+450	1+500	1+550	1+600	1+650	1+700	1+750	1+800	1+850	1+900	1+950	2+000	2+050	2+100	2+150	2+200	2+250	2+300	2+350	2+400	2+450	2+500
FRL	592.32	592.33	592.33	592.34	592.34	592.35	592.35	592.36	592.36	592.37	592.37	592.38	592.38	592.39	592.39	592.40	592.40	592.41	592.41	592.42	592.42	592.43	592.43	592.44	592.44
NSL	591.83	591.86	591.83	591.83	591.82	591.77	591.68	591.67	591.78	591.90	591.86	591.79	591.71	591.62	591.53	591.47	591.63	591.80	591.96	591.99	592.03	592.08	591.89	591.71	591.57
Level Difference	0.49	0.47	0.51	0.51	0.53	0.58	0.67	0.69	0.58	0.46	0.51	0.59	0.67	0.77	0.87	0.93	0.78	0.61	0.45	0.43	0.39	0.35	0.54	0.73	0.87
Horizontal Geometry	L=4531.56'																								
Vertical Geometry	L= 3845.36'																								
Superelevation																									

Consultants

MMP

CENTRAL DESIGN CELL
2nd Floor, CTI Building,
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Client

GOVERNMENT OF PUNJAB

Punjab Municipal Development Fund Company Department (PMDFC)

Financing Agency

WORLD BANK

Project

Punjab Cities Program (PCP)
Detailed Design of Infrastructure Sub-Projects, Sectoral Planning & Resident Supervision in 16 Cities of Punjab(Package-5)

Rev.	Date	Description	Checked	Approved
0	2-11-2022		SA	PHK

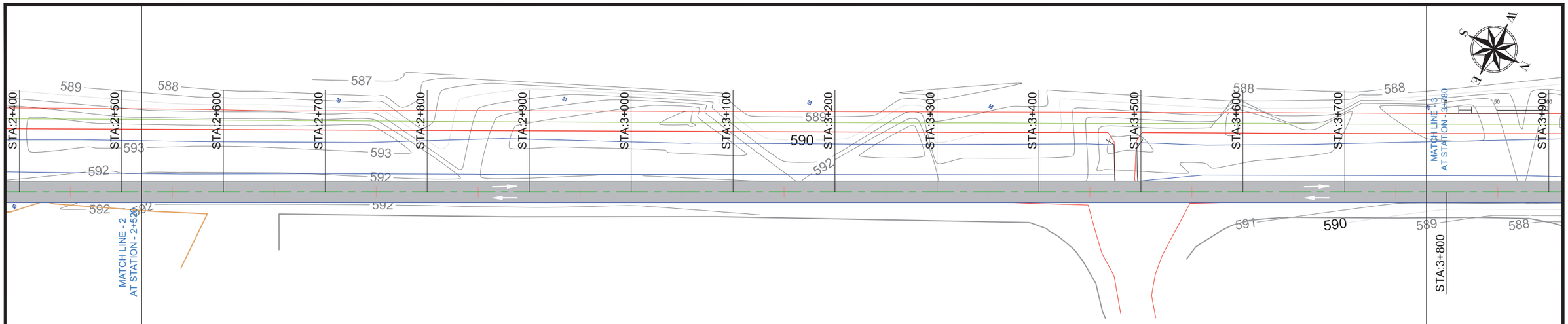
Title

CANAL ROAD PLAN AND PROFILE (STA 1+260.00 TO STA 2+520.00)

Drawing No. MMP-1076P05-OKR-RD-PP-002

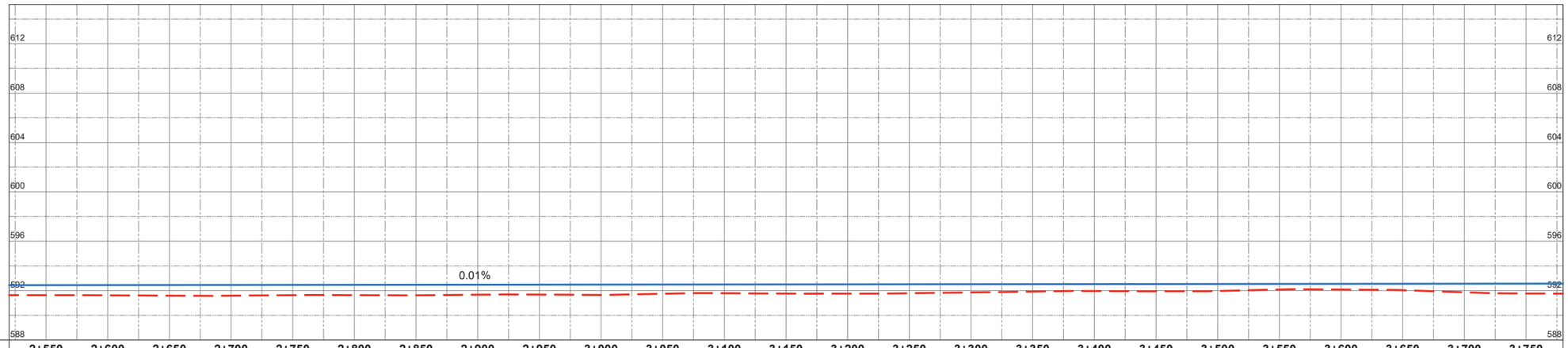
Designed	M. Abdullah
Drawn	M. Tayyab
Checked	Sajjad Anwar
Approved	Pervez Hayat Khan
Scale	H= 1" : 100' V= 1" : 10'
Rev No:	0

Drawing file path & name: C:\Users\Tayyab\AppData\Local\Temp\AcPublish_14432\Okara Canal Road P&P.dwg
User and Plot Date: Tayyab – Wed, 02 Nov 2022 – 11:25pm



LEGEND

PROPOSED CENTERLINE			
EDGE OF TRAVELWAY		EDGE OF PAVED SHOULDER	
LANE		PROPOSED CARRIAGEWAY	



Station	2+550	2+600	2+650	2+700	2+750	2+800	2+850	2+900	2+950	3+000	3+050	3+100	3+150	3+200	3+250	3+300	3+350	3+400	3+450	3+500	3+550	3+600	3+650	3+700	3+750
FRL	592.45	592.45	592.46	592.46	592.47	592.47	592.48	592.48	592.49	592.49	592.50	592.50	592.51	592.51	592.52	592.52	592.53	592.53	592.54	592.54	592.55	592.55	592.56	592.56	592.57
NSL	591.63	591.62	591.60	591.59	591.64	591.64	591.62	591.67	591.68	591.66	591.75	591.79	591.76	591.76	591.79	591.86	591.93	591.97	591.95	591.97	592.09	592.09	592.04	591.87	591.77
Level Difference	0.81	0.83	0.86	0.87	0.83	0.84	0.85	0.81	0.81	0.84	0.75	0.71	0.74	0.75	0.73	0.67	0.60	0.57	0.59	0.57	0.46	0.46	0.52	0.70	0.80
Horizontal Geometry	L=4531.56'																								
Vertical Geometry	L= 3845.36'																								
Superelevation																									

Consultants

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042-36292528
mmpdcc@mmpakistan.com
http://www.mmpakistan.com

Client

GOVERNMENT OF PUNJAB

Punjab Municipal Development Fund Company Department (PMDFC)

Financing Agency

WORLD BANK

Project

Punjab Cities Program (PCP)
Detailed Design of Infrastructure Sub-Projects, Sectoral Planning & Resident Supervision in 16 Cities of Punjab(Package-5)

Rev.	Date	Description	Checked	Approved
0	2-11-2022		SA	PHK

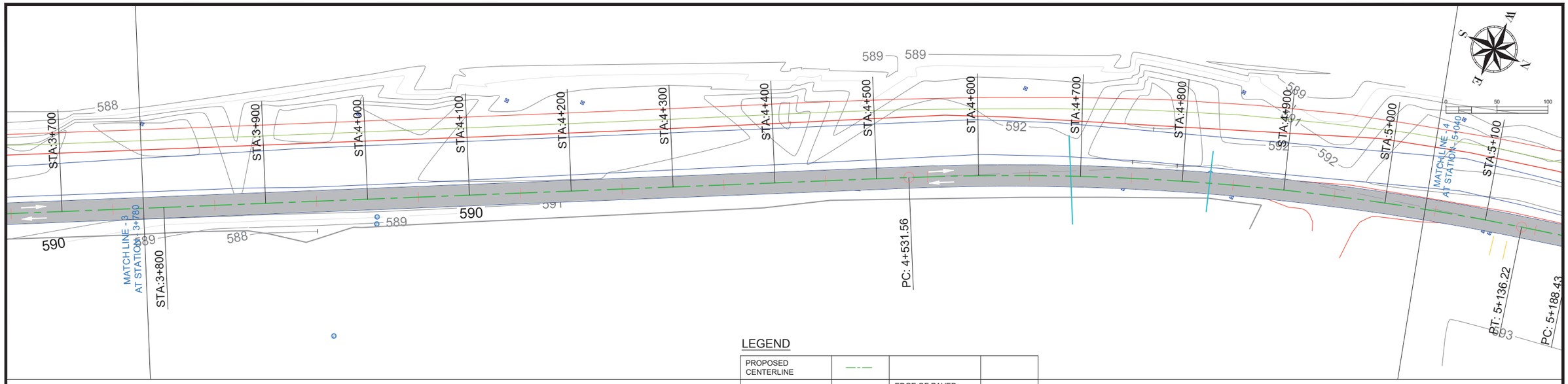
Title

CANAL ROAD PLAN AND PROFILE (STA 2+520.00 TO STA 3+780.00)

Drawing No. MMP-1076P05-OKR-RD-PP-003

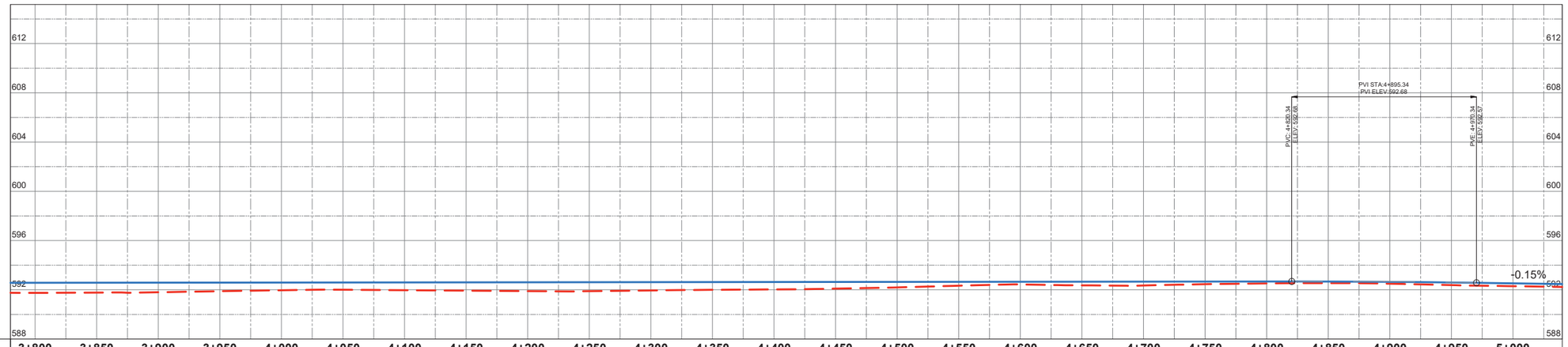
Designed	M. Abdullah
Drawn	M. Tayyab
Checked	Sajjad Anwar
Approved	Pervez Hayat Khan
Scale	H= 1" : 100' V= 1" : 10'
Rev No:	0

Drawing file path & name: C:\Users\Tayyab\AppData\Local\Temp\AcPublish_14432\Okara Canal Road P&P.dwg
User and Plot Date: Tayyab – Wed, 02 Nov 2022 – 11:25pm



LEGEND

PROPOSED CENTERLINE			
EDGE OF TRAVELWAY		EDGE OF PAVED SHOULDER	
LANE		PROPOSED CARRIAGEWAY	



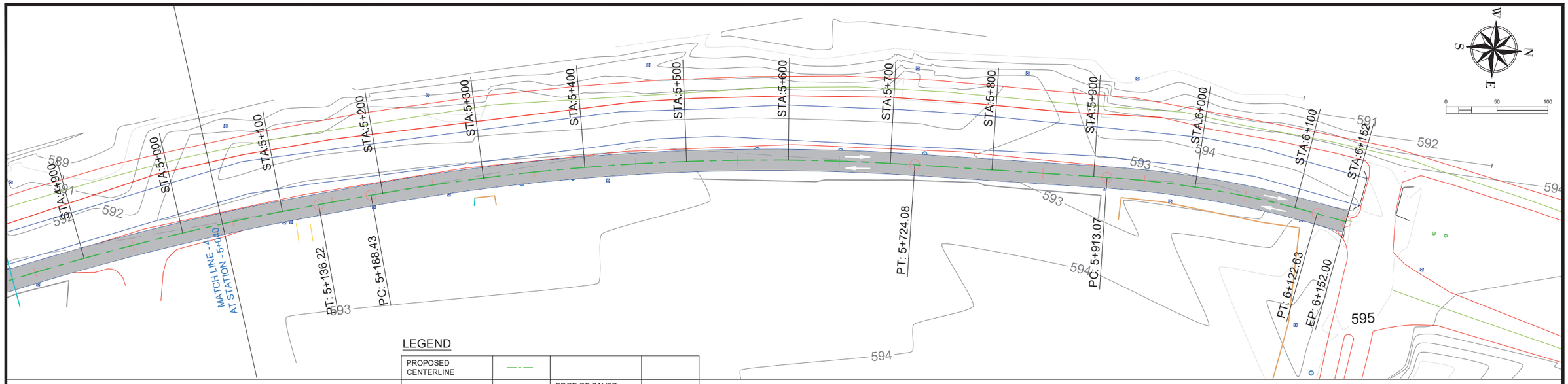
Station	3+800	3+850	3+900	3+950	4+000	4+050	4+100	4+150	4+200	4+250	4+300	4+350	4+400	4+450	4+500	4+550	4+600	4+650	4+700	4+750	4+800	4+850	4+900	4+950	5+000
FRL	592.57	592.58	592.58	592.59	592.59	592.60	592.60	592.61	592.61	592.62	592.62	592.63	592.63	592.64	592.64	592.65	592.65	592.66	592.66	592.67	592.67	592.67	592.65	592.60	592.53
NSL	591.75	591.78	591.80	591.89	591.96	592.01	591.97	591.93	591.89	591.89	591.95	592.00	592.04	592.10	592.19	592.33	592.44	592.36	592.35	592.46	592.52	592.54	592.50	592.38	592.30
Level Difference	0.82	0.80	0.78	0.70	0.63	0.59	0.63	0.68	0.72	0.73	0.67	0.63	0.60	0.54	0.45	0.31	0.22	0.29	0.31	0.21	0.15	0.13	0.15	0.22	0.23
Horizontal Geometry	L=4531.56'																L=604.66' R=2500.00'								
Vertical Geometry	L= 3845.36'																					L= 150.00' K= 937.50		84.56'	
Superelevation																									

Consultants	Client	Financing Agency	Rev.	Date	Description	Checked	Approved
MMP	GOVERNMENT OF PUNJAB	WORLD BANK	0	2-11-2022		SA	PHK
CENTRAL DESIGN CELL 2nd Floor, CTI Building, 27-Empress Road, Lahore 042-36292525-7 042-36292528 mmpdcc@mmpakistan.com http://www.mmpakistan.com	Punjab Municipal Development Fund Company Department (PMDFC)	Project: Punjab Cities Program (PCP) Detailed Design of Infrastructure Sub-Projects, Sectoral Planning & Resident Supervision in 16 Cities of Punjab(Package-5)					

Title	CANAL ROAD PLAN AND PROFILE (STA 3+780.00 TO STA 5+040.00)
Drawing No.	MMP-1076P05-OKR-RD-PP-004

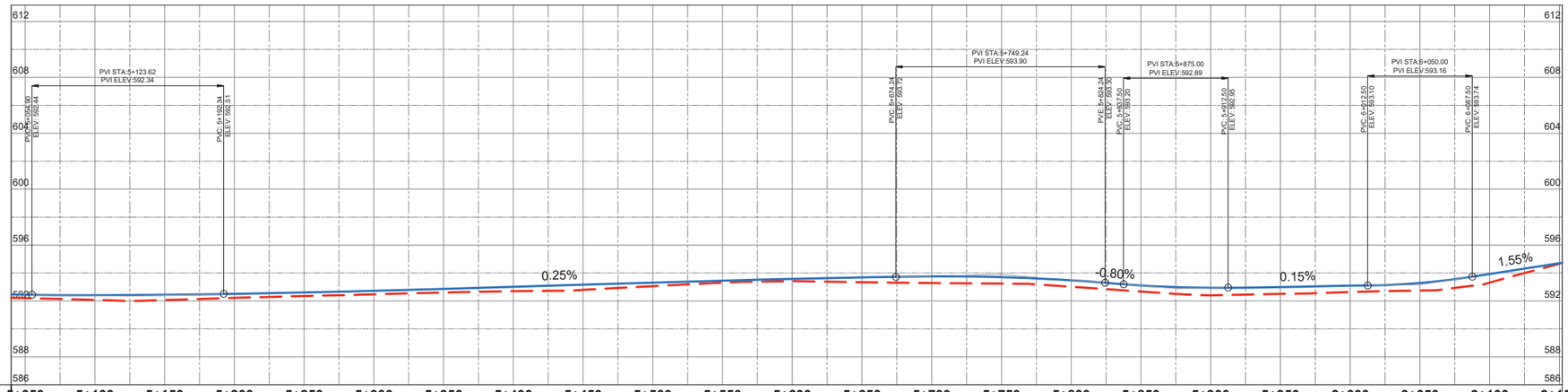
Designed	M. Abdullah
Drawn	M. Tayyab
Checked	Sajjad Anwar
Approved	Pervez Hayat Khan
Scale	H= 1" : 100' V= 1" : 10'
Rev No:	0

Drawing file path & name: C:\Users\Tayyab\AppData\Local\Temp\AcPublish_14432\Okara Canal Road P&P.dwg
User and Plot Date: Tayyab - Wed, 02 Nov 2022 - 11:25pm



LEGEND

PROPOSED CENTERLINE			
EDGE OF TRAVELWAY		EDGE OF PAVED SHOULDER	
LANE		PROPOSED CARRIAGEWAY	

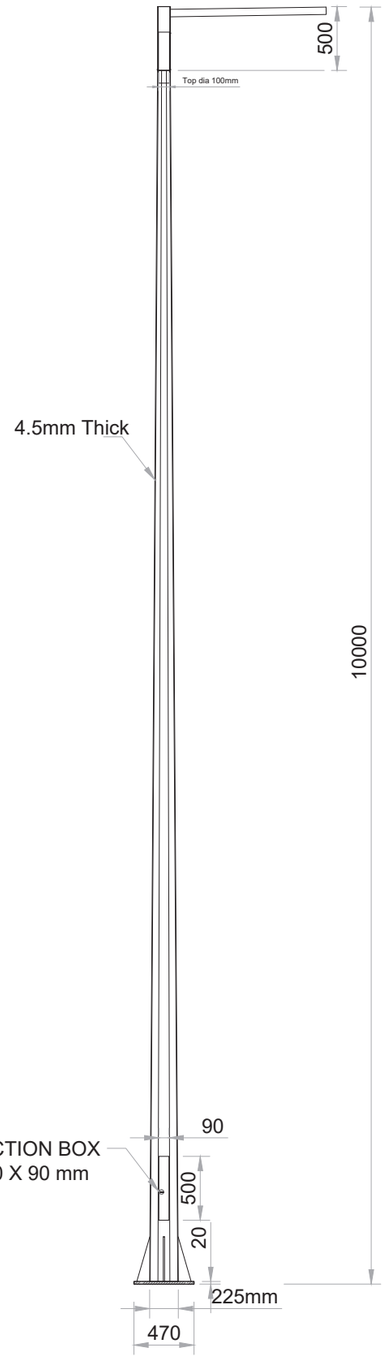


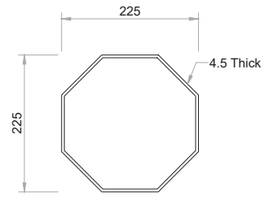
Station	5+050	5+100	5+150	5+200	5+250	5+300	5+350	5+400	5+450	5+500	5+550	5+600	5+650	5+700	5+750	5+800	5+850	5+900	5+950	6+000	6+050	6+100	6+150
FRL	592.45	592.41	592.43	592.53	592.66	592.78	592.91	593.03	593.16	593.28	593.41	593.53	593.66	593.76	593.70	593.48	593.11	592.94	593.01	593.08	593.29	593.93	594.70
NSL	592.21	592.08	592.06	592.22	592.35	592.48	592.61	592.70	592.79	593.06	593.31	593.42	593.34	593.28	593.24	593.02	592.68	592.40	592.50	592.64	592.75	593.31	594.67
Level Difference		0.24	0.33	0.37	0.31	0.30	0.30	0.30	0.33	0.36	0.22	0.10	0.12	0.32	0.48	0.46	0.46	0.43	0.54	0.50	0.44	0.54	0.62	0.04
Horizontal Geometry		L=604.66' R=2500.00'		L=52.20'					L=535.66' R=2200.00'								L=188.99'				L=209.55' R=1000.00'			L=29.38'
Vertical Geometry		84.50'	L= 137.43' K= 343.58						L= 481.90'					L= 150.00' K= 142.39		152.50'	L= 75.00' K= 78.66		L= 100.00'		L= 75.00' K= 53.71		L= 64.50'	
Superelevation																							

Consultants	Client	Financing Agency	Rev.	Date	Description	Checked	Approved	Title	Designed	M. Abdullah
MMP CENTRAL DESIGN CELL 2nd Floor, CTI Building, 27-Empress Road, Lahore 042-36292525-7 042-36292528 mmpdcc@mmpakistan.com http://www.mmpakistan.com	GOVERNMENT OF PUNJAB Punjab Municipal Development Fund Company Department (PMDFC)	WORLD BANK Project Punjab Cities Program (PCP) Detailed Design of Infrastructure Sub-Projects, Sectoral Planning & Resident Supervision in 16 Cities of Punjab(Package-5)	0	2-11-2022		SA	PHK	CANAL ROAD PLAN AND PROFILE (STA 5+040.00 TO STA 6+152.00)	Drawn	M. Tayyab
									Checked	Sajjad Anwar
									Approved	Pervez Hayat Khan
									Scale	H= 1" : 100' V= 1" : 10'
								Drawing No. MMP-1076P05-OKR-RD-PP-005	Rev No:	0

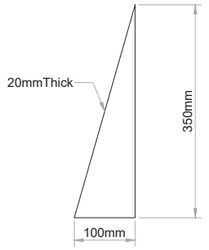
Street Lights Plan

MM Pakistan (Pvt) Ltd.

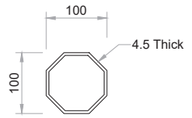




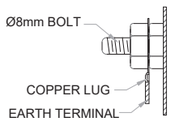
BASE DIA



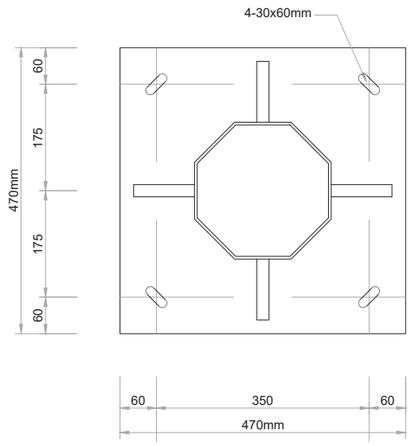
STIFFENER



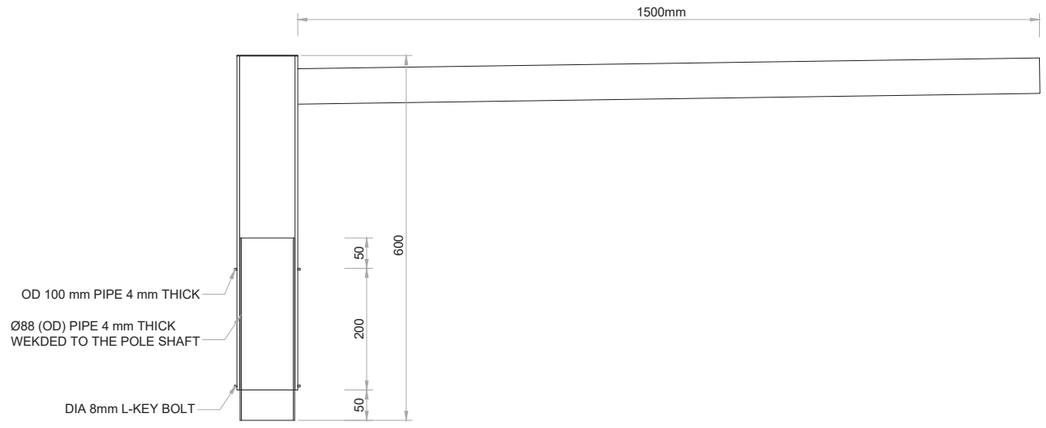
TOP DIA



DETAIL-EARTH TERMINAL



470x470X20 mm THICK
BASE PLATE



SINGLE ARM DETAIL

NOTES:-

1. ALL DIMENSIONS ARE IN MILLIMETER UNLESS SHOWN OTHERWISE.

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Department (PMDFC)

Financing Agency

WORLD BANK

Project

Punjab Cities Program (PCP)
Detailed Design of Infrastructure Sub-Projects, Sectoral Planning & Resident Supervision in 16 Cities of Punjab(Package-5)

Rev.	Date	Description	Checked	Approved
0	3-10-2022		BA	PHK

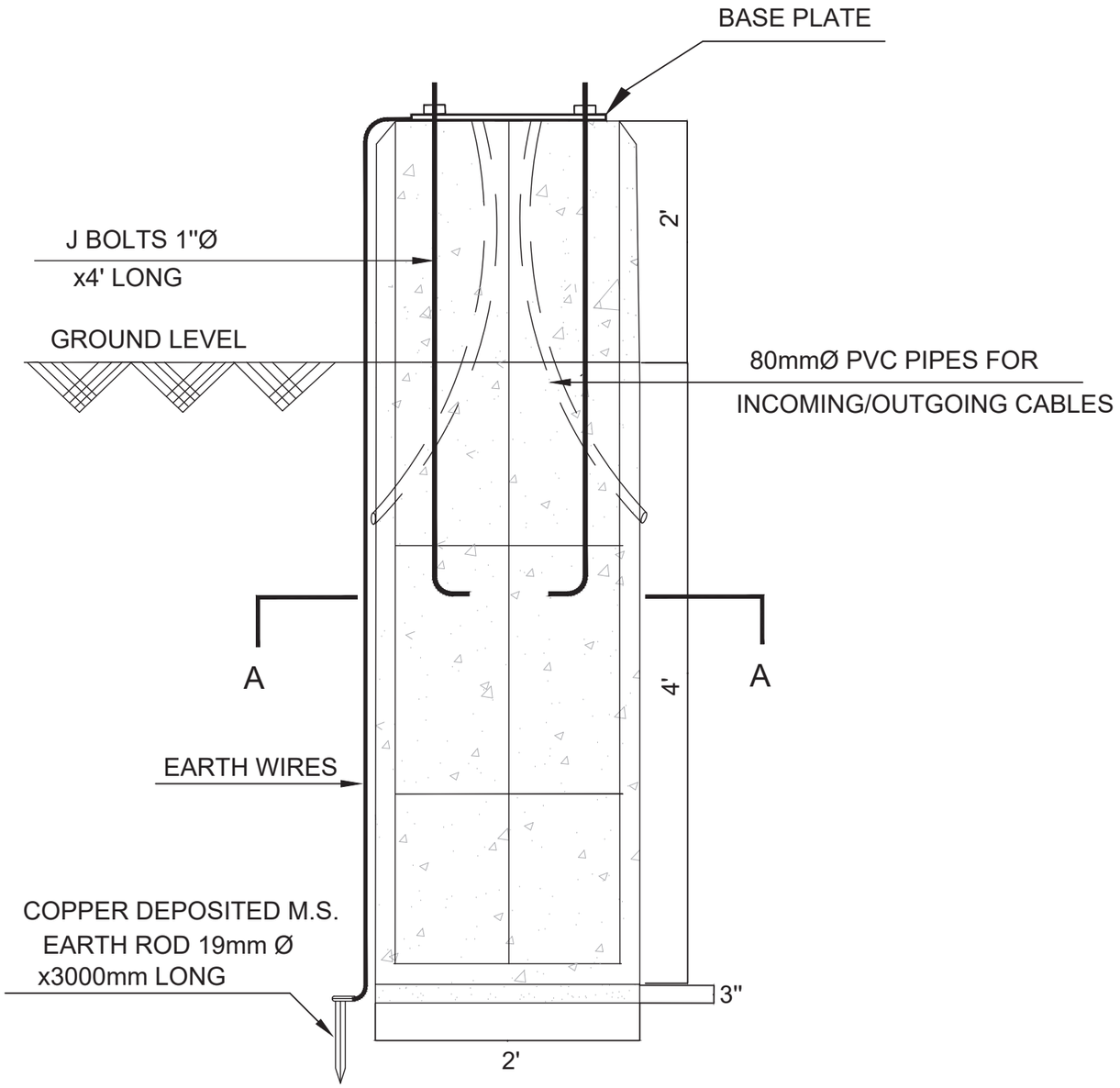
Title

SINGLE ARM POLES DETAILS

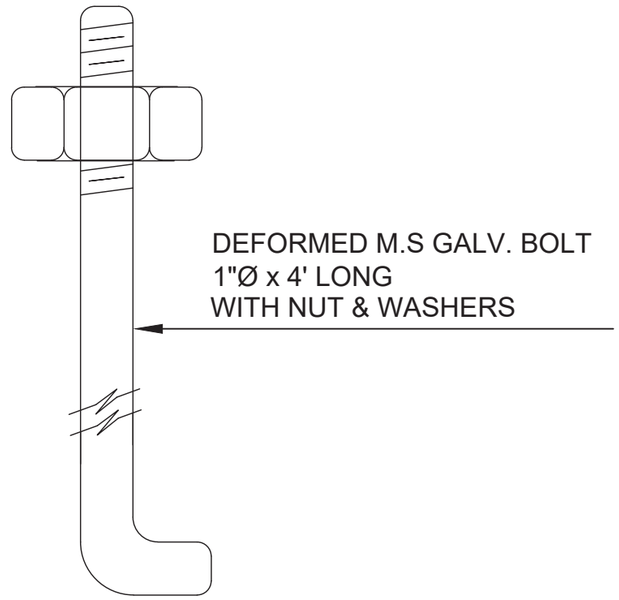
Designed	Ahsan Rasheed
Drawn	Ahsan Rasheed
Checked	Bilal Ashraf
Approved	Pervez Hayat Khan
Scale	AS SHOWN

Drawing No. MMP-1076P05-OKR-SL-GN-001

Rev No: 0



POLE FOUNDATION



J- BOLT

NOTES:-

1. ALL DIMENSIONS ARE IN FEET UNLESS SHOWN OTHERWISE.

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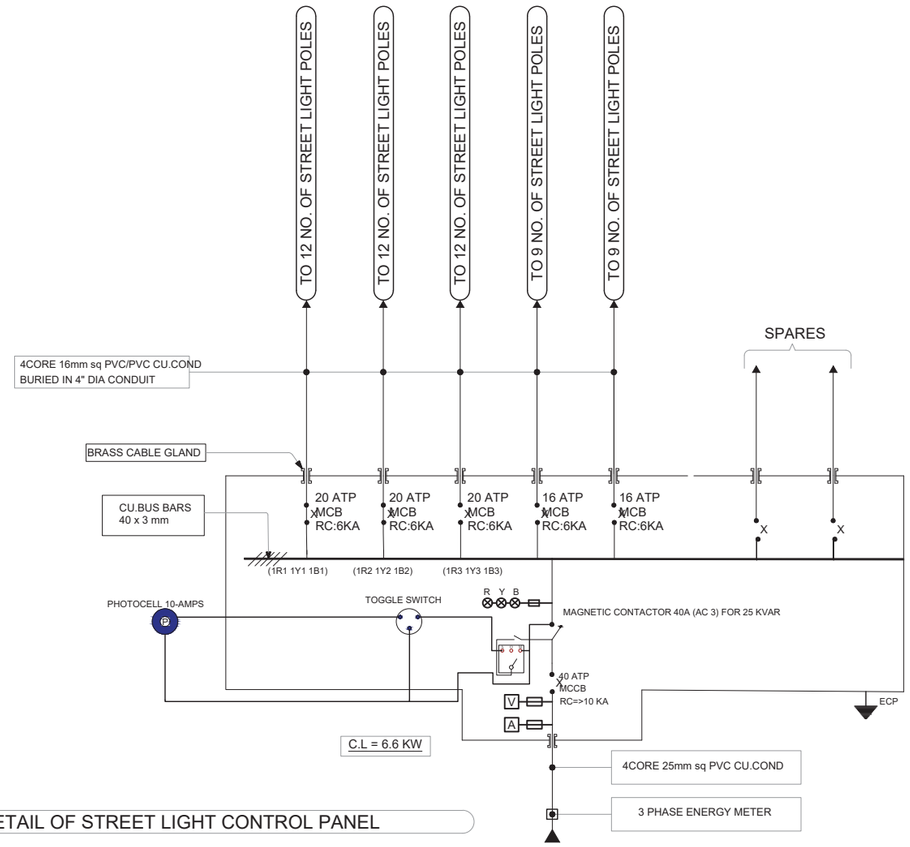
Rev.	Date	Description	Checked	Approved
0	3-10-2022		BA	PHK

Title: SINGLE AND DOUBLE ARM POLE FOUNDATION

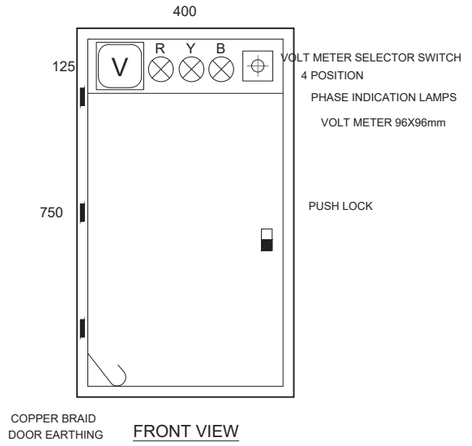
Designed	Ahsan Rasheed
Drawn	Ahsan Rasheed
Checked	Bilal Ashraf
Approved	Pervez Hayat Khan
Scale	AS SHOWN
Drawing No.	MMP-1076P05-OKR-SL-GN-003
Rev No:	0



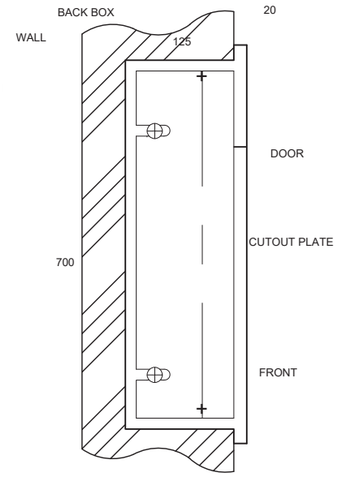
TYPICAL DETAIL OF STREET LIGHT CONTROL PANEL

INCOMING CABLE
FROM 25 KVA TRANSFORMER

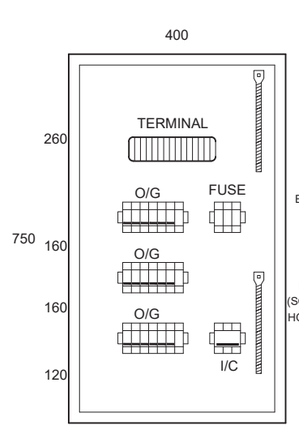
TENTATIVE CONSTRUCTIONAL DETAIL OF:-
DISTRIBUTION BOARD.



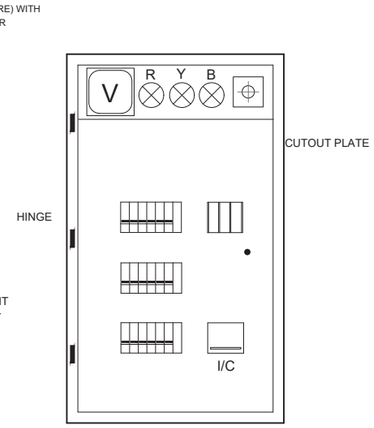
FRONT VIEW



SECTIONAL SIDE.



FRONT VIEW
INTERNAL ARRANGMENT



FRONT VIEW
WITH CUT OUT PLATE.

NOTE:-

DIMENSIONS SHOWN ARE INDICATIVE ONLY AND NOT NECESSARILY BE FOLLOWED. HOWEVER ACTUAL DIMENSIONS OF DB SHALL BE GIVEN BY DB MANUFACTURER/SUPPLIER

NOTES:-

1. ALL DIMENSIONS ARE IN MILLIMETER UNLESS SHOWN OTHERWISE.

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Rev.	Date	Description	Checked	Approved
0	3-10-2022		BA	PHK

Title

CANAL ROAD SLD AND CONTROL PANEL DETAIL

Designed	Ahsan Rasheed
Drawn	Ahsan Rasheed
Checked	Bilal Ashraf
Approved	Pervez Hayat Khan
Scale	AS SHOWN

Drawing No. MMP-1076P05-OKR-SL-GN-004

Rev No: 0

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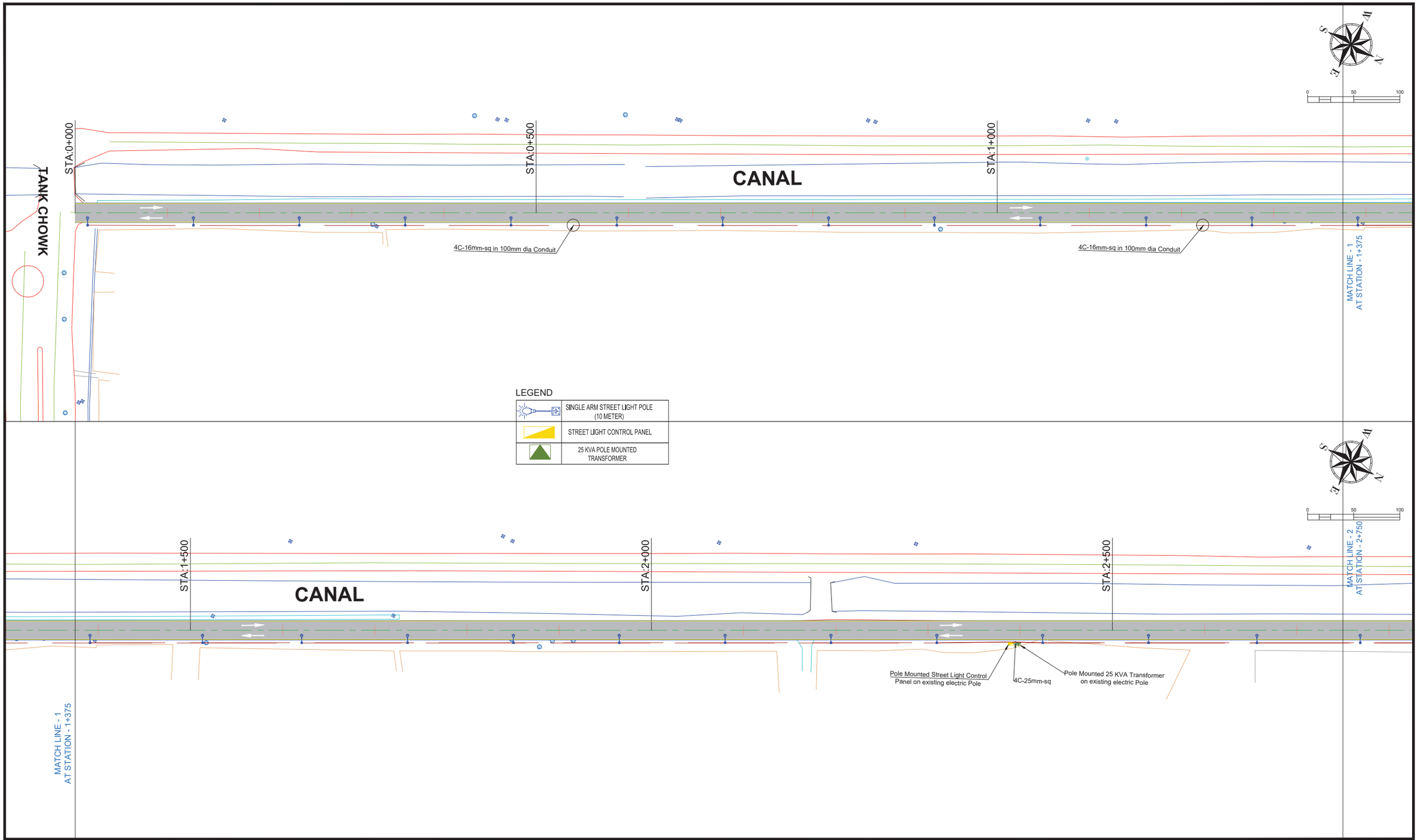
User and Plot Date: Tayyab – Mon, 03 Oct 2022 – 6:41pm



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Rev.	Date	Description	Checked	Approved
0	2-11-2022		SA	SA

Title

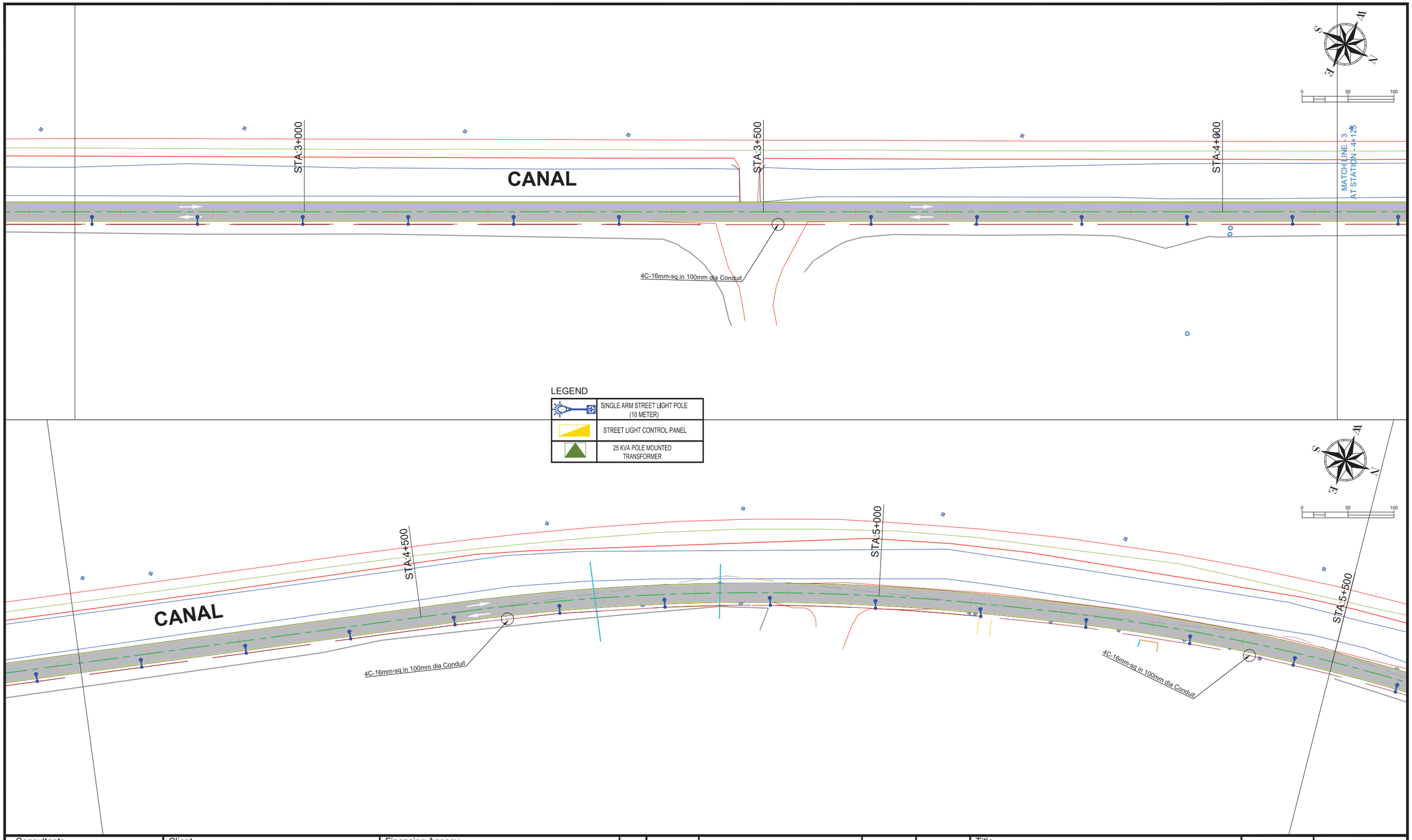
CANAL ROAD STREET LIGHT PLAN

Drawing No.

MMP-1076P05-OKR-SL-P-001

Designed	M. Abdullah
Drawn	M. Tayyab
Checked	Sajjad Anwar
Approved	Sajjad Anwar
Scale	1" : 100'
Rev No:	0

Drawing file path & name: F:\PMDFC\Package_V_Roads_P&P\Okara Roads\14. Street Lights\Okara Canal Road Street Light Plan.dwg
User and Plot Date: Toyyab – Wed, 02 Nov 2022 – 11:46pm



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Rev.	Date	Description	Checked	Approved
0	2-11-2022		SA	SA

Title

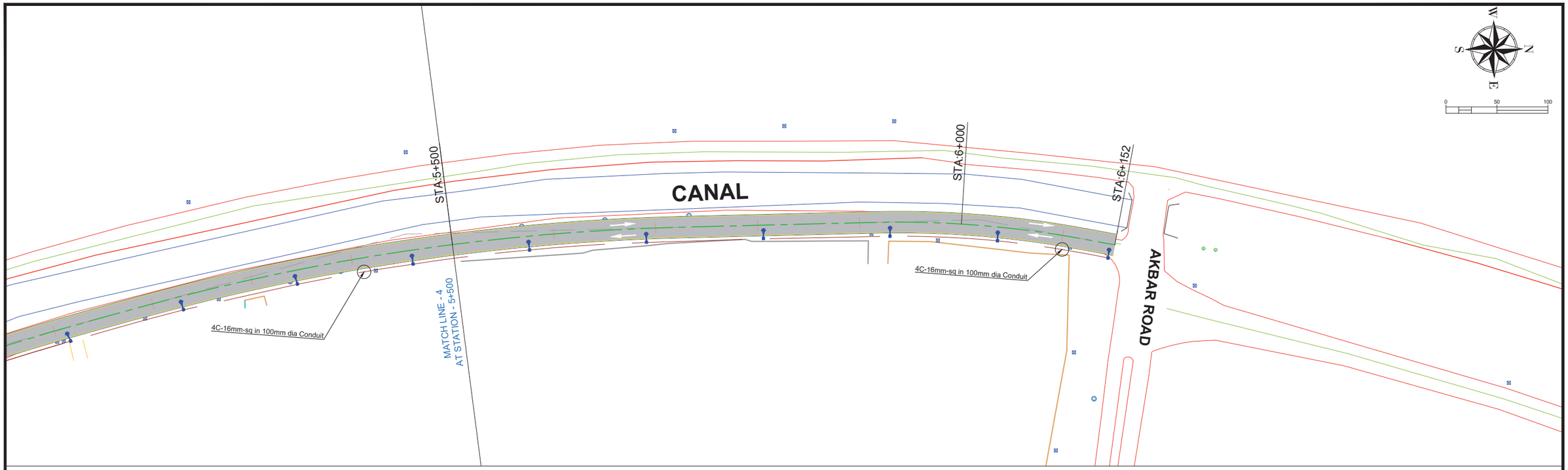
CANAL ROAD STREET LIGHT PLAN

Drawing No.

MMP-1076P05-OKR-SL-P-002

Designed	M. Abdullah
Drawn	M. Tayyab
Checked	Sajjad Anwar
Approved	Sajjad Anwar
Scale	1" : 100'
Rev No:	0

Drawing file path & name: F:\PMDFC\Package_V_Roads_P&P\Okara Roads\14. Street Lights\Okara Canal Road Street Light Plan.dwg
User and Plot Date: Tayyab – Wed, 02 Nov 2022 – 11:46pm



LEGEND

	SINGLE ARM STREET LIGHT POLE (10 METER)
	STREET LIGHT CONTROL PANEL
	25 KVA POLE MOUNTED TRANSFORMER

Consultants

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Rev.	Date	Description	Checked	Approved
0	2-11-2022		SA	SA

Title

CANAL ROAD STREET LIGHT PLAN

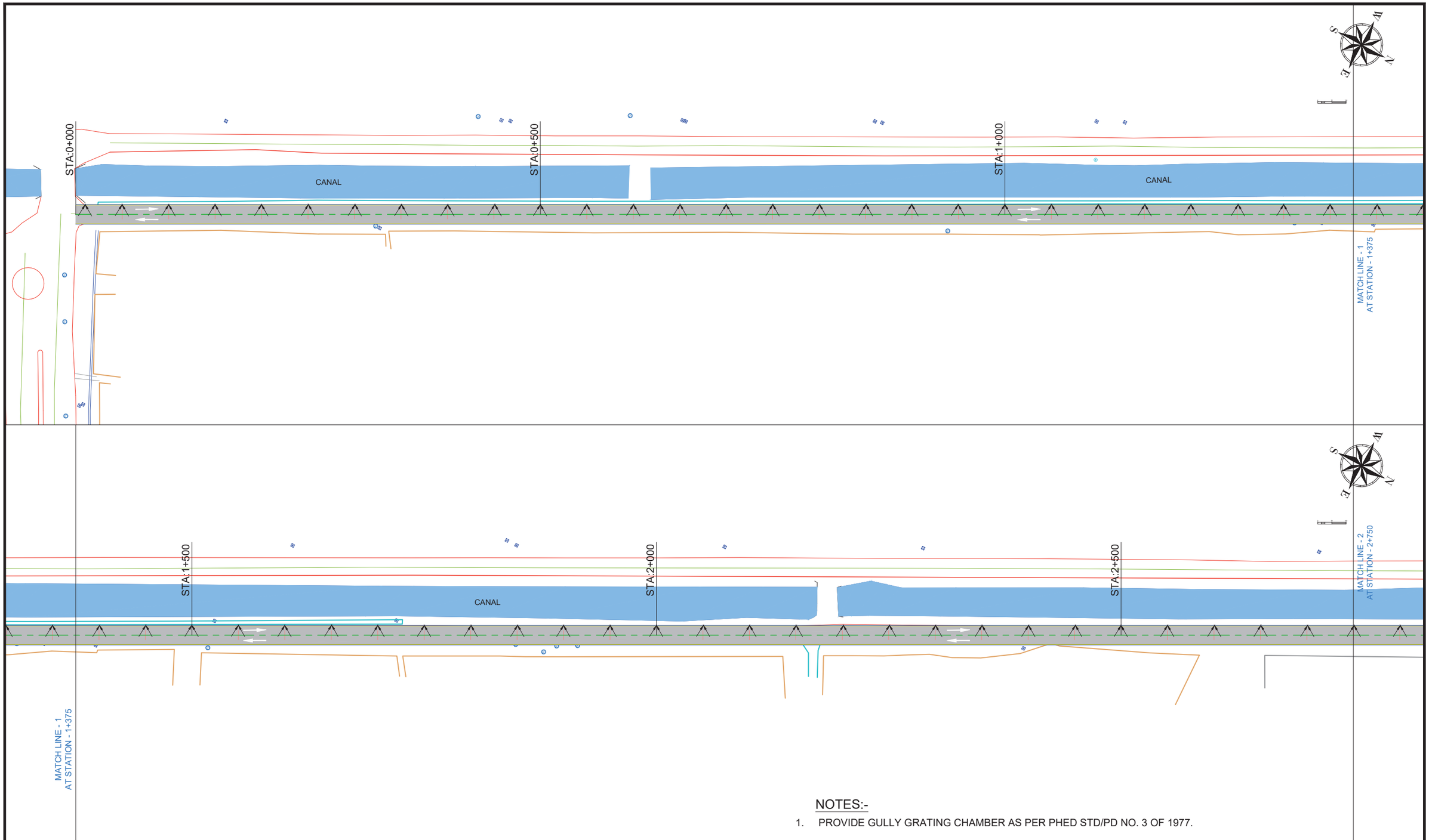
Drawing No. MMP-1076P05-OKR-SL-P-003

Designed	M. Abdullah
Drawn	M. Tayyab
Checked	Sajjad Anwar
Approved	Sajjad Anwar
Scale	1" : 100'
Rev No:	0

Drawing file path & name: F:\PMDFC\Package_V_Roads_P&R\Okara Roads\14. Street Lights\Okara Canal Road Street Light Plan.dwg
User and Plot Date: Tayyab – Wed, 02 Nov 2022 – 11:46pm

Drainage Plan

MM Pakistan (Pvt) Ltd.



NOTES:-

1. PROVIDE GULLY GRATING CHAMBER AS PER PHED STD/PD NO. 3 OF 1977.

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Rev.	Date	Description	Checked	Approved
0	2-11-2022		SA	SA

Title

CANAL ROAD DRAINAGE PLAN

Drawing No. MMP-1076P05-OKR-RD-DR-001

Designed	M. Abdullah
Drawn	M. Tayyab
Checked	Sajjad Anwar
Approved	Sajjad Anwar
Scale	1" : 100'
Rev No:	0

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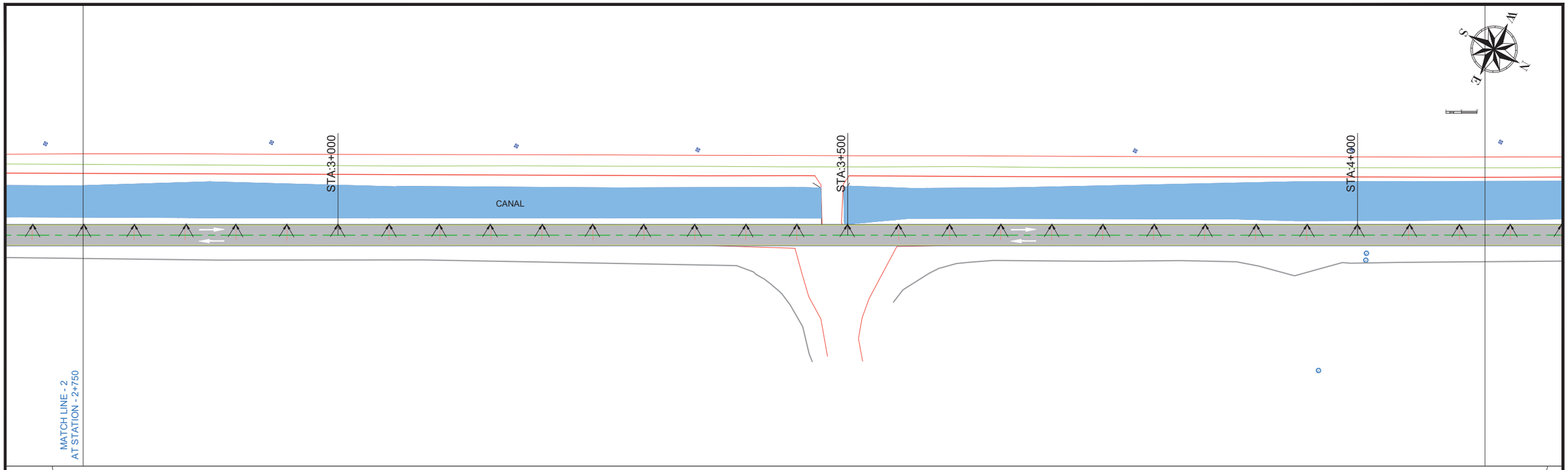
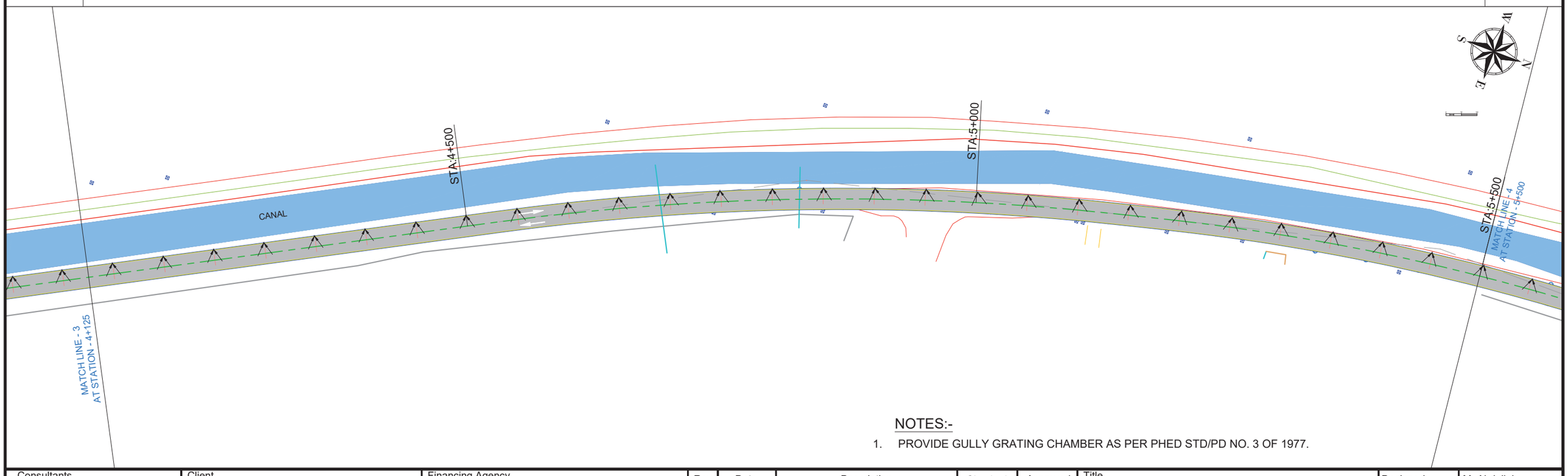
User and Plot Date: Tayyab – Wed, 02 Nov 2022 – 11:46pm





NOTES:-

1. PROVIDE GULLY GRATING CHAMBER AS PER PHED STD/PD NO. 3 OF 1977.

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Title

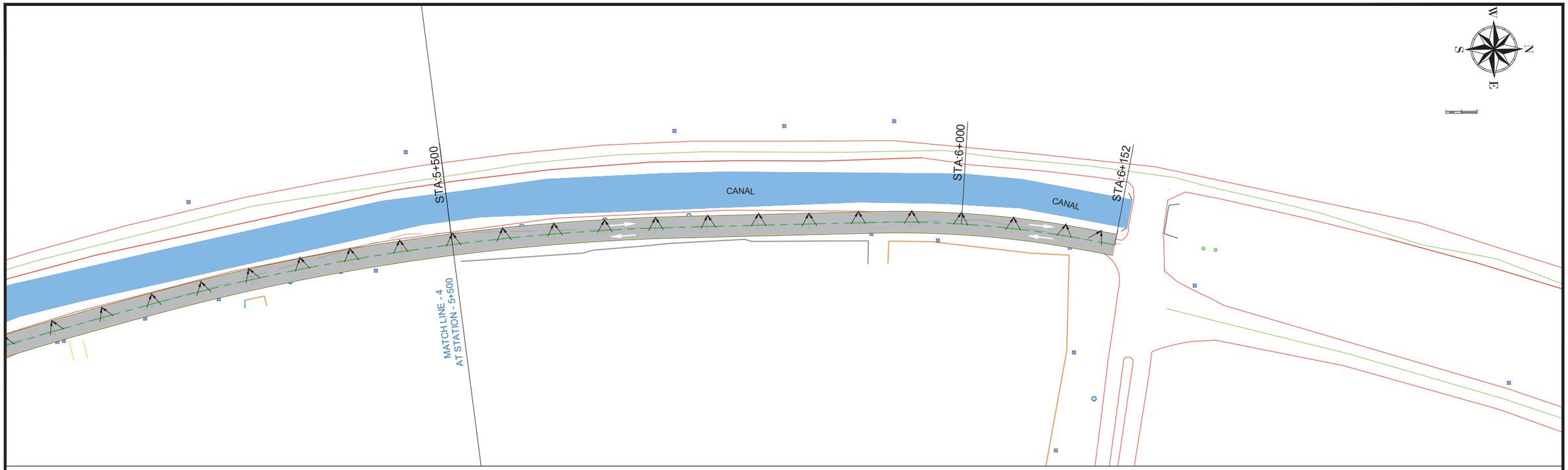
CANAL ROAD DRAINAGE PLAN

Drawing No.

MMP-1076P05-OKR-RD-DR-002

Designed	M. Abdullah
Drawn	M. Tayyab
Checked	Sajjad Anwar
Approved	Sajjad Anwar
Scale	1" : 100'
Rev No:	0

Drawing file path & name: C:\Users\Tayyab\AppData\Local\Temp\AcPublish_14432\Okara Canal Road Drainage Plan.dwg
User and Plot Date: Tayyab – Wed, 02 Nov 2022 – 11:46pm



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1. PROVIDE GULLY GRATING CHAMBER AS PER PHED STD/PD NO. 3 OF 1977.

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Drawing No.

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Drawing file path & name: C:\Users\Tayyab\AppData\Local\Temp\AcPublish_14432\Okara Canal Road Drainage Plan.dwg
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