

Local Government & Community Development Department



Punjab Cities Program

PC-I Form

For

**Construction of Storm Water Drainage System in Daska
City (Zone-I and Zone-II)**

Estimated Cost. PKR 1003.13 million

February 2023

Municipal Unit, Daska

Punjab Cities Program

PC-I Form

Construction of Storm Water Drainage System in Daska City (Zone-I and Zone-II)

Table of contents

Sr. No.	Description	Page
1	PC-I Form	1-18
2	Annexure-A Location map	19
3	Annexure-B Existing Situation	20-25
4	Annexure-C Proposal for Disposal of Storm Water Drainage	26-35
5	Annexure-D Project cost Estimates	36-90
6	Annexure-D1 Hydraulic Statement	91
7	Annexure-E E & S Screening Checklist	93-170
8	Annexure-F Project Economic Analysis, Sensitivity Analysis	171-173
9	Annexure-G Project Implementation Period (Gant Chart)	174
10	Annexure-H Drawings	175-187

PC-I FORM
for
Construction of Storm water drainage system in Daska City (Zone-1&2)

Project Serial Number

Sector: Local Government & Community Development Department

Sub Sector:

1. Name of the project	Punjab Cities Program Construction of Storm Water drainage System in Daska City (Zone-I & 2)	
2. Location	Daska Town is located at 74°21' East and 32°20' North at a distance of 24 km in the north-east of Gujranwala City, 24 Km from Sialkot at its south-west and 24 KM from Wazirabad at its southeast. The present population is 280834, and the projected population by the year 2032 is 375589 at a growth rate of 2.95% per annum. The city's total area is 16.53 km ² , in the built-up area is 13.00 km ² The location map of the city is attached in Annexure-A	
3. Authorities responsible for		
i- Sponsoring	Government of the Punjab (through World Bank funding)	
ii- Execution	Municipal Committee Daska	
iii- Operation and Maintenance	Municipal Committee Daska	
iv- Concerned Provincial Department	Local Government and Community Development Department Punjab	
4a. Plan Provision		
i. If the project is included in medium term/five-year plan, specify actual allocation	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.	
	Total loan from World Bank	200.00 million USD
	Component-1 Infrastructure development (PforR)	180.00 million USD
	Component-2 Technical Assistance	20.00 million USD
	MCs share (20% of PforR component) equivalent to:	36.00 million USD
	Total Program cost	236.00 million USD

	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 Departments and is included in the medium term/ five-year plan and has been funded in ADP 2022-23 - under General Serial No-1769 with allocation of PKR 1329.90 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 MCs and is not proposed to be financed out of Block Allocation.
4b- Provision in the current year PSDP/ADP	Rs.1329.90 million under ADP 2022-23 at 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	<p><u>Sector Objectives</u> The sector objectives include:</p> <ol style="list-style-type: none"> 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. Effective use of land through master planning of urban areas. 5. Social uplifting and cohesion through provision of public open spaces and playgrounds. 6. Ease in mobility and communication. 7. Capacity building of Local Governments. <p><u>Objectives of the Project</u> The Punjab Cities Program aims at improvement of infrastructure of municipal services and institutional strengthening of the Urban Local Government included in the Program. Scope of the work for this particular project includes the rehabilitation and improvement of existing storm water drainage system, construction of new storm water drains where needed and de-silting of existing drains, desilting and remodeling of Irrigation drain Daska-1 and cleaning of 2 Nos syphons under BRBD Canal.</p>

	<p>The Project has the following objectives;</p> <ol style="list-style-type: none"> 1. Disposal of the rainwater and provide safety to pedestrians and traffic. 2. Reduction in road accidents. 3. Security of people traveling on the roads. 4. Improvement of environments of the city. 5. Reduction in urban flooding; 6. Alleviating the pressure from existing sewerage system. 7. Elimination of damages to the public as well as private property due to urban flooding 8. Reduction of damages to the road infrastructure due to water stagnancy. 9. Reduction of R&M cost of road infrastructure. 10. Prevention of water contamination and deterioration of its quality; 11. Contributing to the sustainability of urban spaces, making them more resilient to change <p>Hence, the objectives of the project are in line with the sector objectives mentioned at Sr. No-1, 3, 5 and 6 above and the project forms integral part of the concerned sector.</p>
6. Description, justification, technical parameters, and technology transfer aspects	
i. Present Condition	Existing situation of the storm water disposal and ponding created in the city has been given in Annexure-B
ii. Description of the subproject-	Storm water drain designed to flow in gravity in the Daska-1 Dain owned by Irrigation Department have been proposed for construction in Daska City. The remodeling of existing Daska-1 drain through certain reaches will be necessary for taking the storm water form Daska City. The detailed description of the subproject has been given in Annexure-C

<p>iii) Detail of civil works, equipment & machinery, and other physical facilities</p>	<p>The Storm Water Drainage System to be rehabilitated, desilted or constructed in the city in Part-A and Part-B is given below. The cost estimate has been framed in two parts due to below given reasons:</p> <ol style="list-style-type: none"> 1. Both zones have different routes & separate outfall drains and these are connected no where. Hence the construction of one part will not affect the other part. 2. It is a mega project and one contractor will not be able to complete it in short time. On the other hand longer contract timeline may result in cost over run due to rapid escalation in market rates. 3. Hence two contractors will be deployed, one for each part to complete the work in shorter time and to eliminate the cost over runs and larger price adjustments. <p>Part-A (Zone-I)</p> <table border="1" data-bbox="521 695 1432 947"> <thead> <tr> <th>S. N.</th> <th>Detail of works</th> <th>Quantity</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>Construction of RCC drains</td> <td>9,977 Rft</td> </tr> <tr> <td>2</td> <td>Construction of brick drains</td> <td>4,739 Rft</td> </tr> <tr> <td>3</td> <td>Rehabilitation of existing drains</td> <td>8,804 Rft</td> </tr> <tr> <td>4</td> <td>Construction of RCC culverts</td> <td>89 Rft</td> </tr> <tr> <td>5</td> <td>Desilting of existing drains & syphon</td> <td>13,543 Rft</td> </tr> <tr> <td>6</td> <td>Penstock including RCC structure</td> <td>One job</td> </tr> </tbody> </table> <p>Part-B (Zone-2)</p> <table border="1" data-bbox="521 1052 1432 1262"> <thead> <tr> <th>S. N.</th> <th>Detail of works</th> <th>Quantity</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>Construction of RCC drains</td> <td>15,979 Rft</td> </tr> <tr> <td>2</td> <td>Rehabilitation of existing drains</td> <td>23,027 Rft</td> </tr> <tr> <td>3</td> <td>Construction of RCC culverts</td> <td>194 Rft</td> </tr> <tr> <td>4</td> <td>Desilting of existing drains & syphon</td> <td>23,027 Rft</td> </tr> <tr> <td>5</td> <td>Penstock including RCC structure</td> <td>One job</td> </tr> </tbody> </table>	S. N.	Detail of works	Quantity	1	Construction of RCC drains	9,977 Rft	2	Construction of brick drains	4,739 Rft	3	Rehabilitation of existing drains	8,804 Rft	4	Construction of RCC culverts	89 Rft	5	Desilting of existing drains & syphon	13,543 Rft	6	Penstock including RCC structure	One job	S. N.	Detail of works	Quantity	1	Construction of RCC drains	15,979 Rft	2	Rehabilitation of existing drains	23,027 Rft	3	Construction of RCC culverts	194 Rft	4	Desilting of existing drains & syphon	23,027 Rft	5	Penstock including RCC structure	One job
S. N.	Detail of works	Quantity																																						
1	Construction of RCC drains	9,977 Rft																																						
2	Construction of brick drains	4,739 Rft																																						
3	Rehabilitation of existing drains	8,804 Rft																																						
4	Construction of RCC culverts	89 Rft																																						
5	Desilting of existing drains & syphon	13,543 Rft																																						
6	Penstock including RCC structure	One job																																						
S. N.	Detail of works	Quantity																																						
1	Construction of RCC drains	15,979 Rft																																						
2	Rehabilitation of existing drains	23,027 Rft																																						
3	Construction of RCC culverts	194 Rft																																						
4	Desilting of existing drains & syphon	23,027 Rft																																						
5	Penstock including RCC structure	One job																																						
<p>iv) Indicate governess issues of the sector relevant to the project and strategy to resolve them</p>	<ul style="list-style-type: none"> • Municipal Committee Daska is facing acute shortage of field staff. The smooth sailing of the Punjab Cities Program can only be assured when the required staff is available with MC. • The Repair and maintenance of the municipal services in not up to the mark in MC due to meager resources and shortage of staff. Apart from that the staff lacks the technical know how required for effective O&M of the municipal infrastructure. • 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 MCs are lacking at present. Hence inculcating the mind set for good 																																							

	<p>repair and maintenance is the major requirement for improving the service delivery level.</p> <ul style="list-style-type: none"> • NOC will be required from Irrigation Department for discharge of storm water into their channels 																																																																		
7- Capital Cost of Project	<p>The summary of the works included in the project is given below;</p> <p>Part-A (Zone-1)</p> <table border="1"> <thead> <tr> <th>Sub head</th> <th>Description</th> <th>Cost (million Rs.)</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>Construction of RCC drains</td> <td>188.201</td> </tr> <tr> <td>2</td> <td>Rehabilitation of existing drains in the city</td> <td>2.549</td> </tr> <tr> <td>3</td> <td>Construction of RCC drains culverts</td> <td>3.408</td> </tr> <tr> <td>4</td> <td>Remodeling of existing drain along Pasrur Bypass Road</td> <td>54.439</td> </tr> <tr> <td>5</td> <td>Desilting and cleaning of existing Drains</td> <td>3.103</td> </tr> <tr> <td>6</td> <td>Dewatering of surface water during execution</td> <td>0.090</td> </tr> <tr> <td>7</td> <td>Penstocks on outfall drain</td> <td>1.274</td> </tr> <tr> <td></td> <td style="text-align: right;">Sub-Total</td> <td>253.063</td> </tr> </tbody> </table> <p>Part-B (Zone-II)</p> <table border="1"> <thead> <tr> <th>Sub Head</th> <th>Description</th> <th>Cost (million Rs)</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>Construction of RCC drains</td> <td>428.510</td> </tr> <tr> <td>2</td> <td>Rehabilitation of existing drains in the city</td> <td>7.056</td> </tr> <tr> <td>3</td> <td>Construction of RCC drain culverts</td> <td>4.281</td> </tr> <tr> <td>4</td> <td>Desilting and cleaning of existing drains</td> <td>4.347</td> </tr> <tr> <td>5</td> <td>Dewatering of surface water during execution</td> <td>0.090</td> </tr> <tr> <td>6</td> <td>Penstocks on outfall drains</td> <td>1.423</td> </tr> <tr> <td></td> <td style="text-align: right;">Total in Million</td> <td>445.707</td> </tr> </tbody> </table> <table border="1"> <thead> <tr> <th>Sr. No</th> <th>Description</th> <th>Cost (Millions Rs.)</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>Part-A Storm Water Drains Zone-I</td> <td>253.063</td> </tr> <tr> <td>2</td> <td>Part-B Storm Water Drains Zone-II</td> <td>445.707</td> </tr> <tr> <td></td> <td style="text-align: right;">Sub-Total</td> <td>698.77</td> </tr> <tr> <td></td> <td>Remodeling of Daska-I Drain (Deposit Works to Irrigation Department) (Letter attached)</td> <td>208.51</td> </tr> </tbody> </table>	Sub head	Description	Cost (million Rs.)	1	Construction of RCC drains	188.201	2	Rehabilitation of existing drains in the city	2.549	3	Construction of RCC drains culverts	3.408	4	Remodeling of existing drain along Pasrur Bypass Road	54.439	5	Desilting and cleaning of existing Drains	3.103	6	Dewatering of surface water during execution	0.090	7	Penstocks on outfall drain	1.274		Sub-Total	253.063	Sub Head	Description	Cost (million Rs)	1	Construction of RCC drains	428.510	2	Rehabilitation of existing drains in the city	7.056	3	Construction of RCC drain culverts	4.281	4	Desilting and cleaning of existing drains	4.347	5	Dewatering of surface water during execution	0.090	6	Penstocks on outfall drains	1.423		Total in Million	445.707	Sr. No	Description	Cost (Millions Rs.)	1	Part-A Storm Water Drains Zone-I	253.063	2	Part-B Storm Water Drains Zone-II	445.707		Sub-Total	698.77		Remodeling of Daska-I Drain (Deposit Works to Irrigation Department) (Letter attached)	208.51
	Sub head	Description	Cost (million Rs.)																																																																
	1	Construction of RCC drains	188.201																																																																
	2	Rehabilitation of existing drains in the city	2.549																																																																
	3	Construction of RCC drains culverts	3.408																																																																
	4	Remodeling of existing drain along Pasrur Bypass Road	54.439																																																																
	5	Desilting and cleaning of existing Drains	3.103																																																																
	6	Dewatering of surface water during execution	0.090																																																																
	7	Penstocks on outfall drain	1.274																																																																
		Sub-Total	253.063																																																																
Sub Head	Description	Cost (million Rs)																																																																	
1	Construction of RCC drains	428.510																																																																	
2	Rehabilitation of existing drains in the city	7.056																																																																	
3	Construction of RCC drain culverts	4.281																																																																	
4	Desilting and cleaning of existing drains	4.347																																																																	
5	Dewatering of surface water during execution	0.090																																																																	
6	Penstocks on outfall drains	1.423																																																																	
	Total in Million	445.707																																																																	
Sr. No	Description	Cost (Millions Rs.)																																																																	
1	Part-A Storm Water Drains Zone-I	253.063																																																																	
2	Part-B Storm Water Drains Zone-II	445.707																																																																	
	Sub-Total	698.77																																																																	
	Remodeling of Daska-I Drain (Deposit Works to Irrigation Department) (Letter attached)	208.51																																																																	

	Contingencies @ 2%	13.975
	PRA @ 5%	34.939
	Escalation @ 5%	34.939
	Provision of traffic management for hard barications, informatory sign boards, regulatory sign boards, hiring of personnel by contractor for this purpose as directed by Deputy Director Dev (MOM attached)	1.00
	Environment & Social Management Cost IEE Implementation Cost	6.71
	RAP This compensation will be paid from 20% counterpart funding from MC own budget before the execution of the project.	4.28
	Total Cost	1003.13
	The detail of cost has been given in Annexure-D	
i- Indicate date of estimation of the project cost	The project estimate has been framed during the month of February, 2023	
ii- Basis of determining the estimates be provided.	<p>The cost estimates have been framed on the basis of bill of quantities calculated from the drawings and unit rates from the Market Rate System (MRS) issued by the Government of Punjab (District Sialkot first biannual of year 2023).</p> <p>For items not available in the MRS, the same have been analyzed as per prevailing market rates and based on the unit rates given in MRS.</p>	
iii- Provide year wise estimation of physical activities	<p>The physical and financial requirements, year-wise are included in the following table:</p> <p><i>The work will be carried out in two groups for speedy execution of the project to relieve the city from storm water stagnation as early as possible as one contractor may delay the work and the project may experience the cost over-runs.</i></p> <p>For both Groups the physical activities are proposed to be completed as given below: (All cost have been given in million Rs)</p>	

Part-A Zone-1				
Sr. No.	Description	Year 2022-23	Year 2023-24	
1	Construction of RCC drains	15%	85%	
2	Rehabilitation of existing drains in the city	20%	80%	
3	Construction of RCC drains culverts	10%	90%	
4	Remodeling of existing drain along Pasrur Bypass Road	15%	85%	
5	Desilting and cleaning of existing Drains	40%	60%	
6	Dewatering of surface water during execution	50%	50%	
7	Penstocks on outfall drain	0%	100%	
Part-B Zone-2				
Sr. No	Description	Year 2022-23	Year 2023-24	
1	Construction of RCC drains	20%	80%	
2	Rehabilitation of existing drains in the city	20%	80%	
3	Construction of RCC drain culverts	10%	90%	
4	Desilting and cleaning of existing drains	30%	70%	
5	Dewatering of surface water during execution	50%	50%	
6	Penstocks on outfall drains	0%	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)			
	Part-A (Zone-I)			
Sub head	Description	Cost (million Rs.)	Year 2022-23	Year 2023-24
1	Construction of RCC drains	188.201	28.230	159.971
2	Rehabilitation of existing drains in the city	2.549	0.510	2.039
3	Construction of RCC drains culverts	3.408	0.341	3.067
4	Remodeling of existing drain along Pasrur Bypass Road	54.439	8.166	46.273
5	Desilting and cleaning of existing Drains	3.103	1.241	1.862
6	Dewatering of surface water during execution	0.090	0.045	0.045
7	Penstocks on outfall drain	1.274	-	1.274
	Sub-Total	253.063	38.533	214.531

		Part-B (Zone-2)				
		Sr. No	Description	Total Cost	Year 2022-23	Year 2023-24
		1	Construction of RCC drains	428.510	85.70	342.81
		2	Rehabilitation of existing drains in the city	7.056	1.41	5.64
		3	Construction of RCC drain culverts	4.281	0.43	3.85
		4	Desilting and cleaning of existing drains	4.347	1.30	3.04
		5	Dewatering of surface water during execution	0.090	0.04	0.04
		6	Penstocks on outfall drains	1.423	-	1.42
			Sub Total	445.707	88.89	356.817
		The price contingencies, PRA tax and ESMP cost will be paid as per work done and expenditure incurred in both of the financial years				
8-Annual recurrent cost after completion of the project and source of financing		The annual O&M cost of the drainage system has been worked out to be PKR 6.98 million.				
9- Demand & Supply Analysis i- Existing Capacity of services		<p>B. Existing supply level</p> <p>There is no suitable arrangement of disposal of storm water in the city and the storm water is presently being collected in the disposal stations through sewers and being disposed of by pumping which not only involves lot of energy and its high cost but also gives long stagnancy periods which results in:</p> <ul style="list-style-type: none"> • Obstruction to traffic creating traffic hazards • Damages to the roads and streets • Damages to private and public properties • Inconvenience to the pedestrians • Refusal of approach to residential and commercial areas. • Emission of stinking smell from stagnant water • Breeding of vectors and creation of water related diseases 				

<p>ii- Projected Demand for 10 years</p>	<ul style="list-style-type: none"> • The outstanding demand of the city is to make storm water disposal arrangements at the earliest to save public as well as private property from damages and relieving the commuters and pedestrians from the frustration of travelling and walking in storm water mixed with sewage. • This project carries top importance over all other projects due to above given problems. Storm water drainage system has been designed for 2 main zones of the city where most of the storm water stagnation takes place. • Rest of the two zones have no such intensive and extensive problems and hence system in these zones will be designed and when the need arises. • The designed system is adequate for at east 50 years for drainage of storm water from Daska City.
<p>iii- Capacity of other similar projects being implemented in public/private sector</p>	<p>No other project of this nature is being implemented in the public as well as private sector because of funding constraints.</p>
<p>iv- Supply and Demand gaps</p>	<p>The nature of supply and demand gap has been explained in the preceding paras and in Annexure-B extensively and in detail which concludes as under;</p> <ul style="list-style-type: none"> • Non availability of the storm water drainage system creates havoc during the rainy season in the city and there is outstanding demand of this system to eliminate the damages, public frustration and inconvenience. • The existing infrastructure has poor efficiency resulting in unsatisfactory service delivery level. • Numerous public complaints about the stagnation of rain water and damage to roads infrastructure and private property are the talk of the day. • The rain water is mixed with waste water and remains stagnated for over a day which creates stinking smell and breeds vectors which create vector diseases. • Unsatisfactory municipal delivery in the form of non disposal of the storm water mixed with waste water is not encouraging the city to become engines of economic growth and hence the GDP of city is much lower than the peers in the developing world. <p>Hence there is a large gap between the supply and demand which is to be bridged by improvement in the storm water disposal infrastructure and its management.</p>

v-Designed capacity and output of the project	The storm water drainage system has been designed to drain the entire storm water from Zone-1 & zone-2 by gravity in the Daska -1 drain. The system has been designed for 25 years but can last easily for next 50 years. The water stagnancy will be reduced to not more than half to one hour and all roads and streets will be clear from the waste water mixed with stormwater after the rains.										
10. Financial Plan Sources of financing	Below given loan for the Punjab Cities Program has been funded by World Bank for 16 PCP cities in Punjab.										
<u>Debt</u>	<table border="1"> <tr> <td>Total loan to Government of Pakistan/Punjab</td> <td>200 million USD</td> </tr> <tr> <td>Component-1 for Infrastructure Development</td> <td>180 million USD</td> </tr> <tr> <td>Component-2 for Investment Project Financing For capacity building of MCs & three Govt. organization and program management.</td> <td>20 million USD</td> </tr> <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> </table>	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	20% share of Municipalities is equivalent to	36 million USD	Total funds available for Infrastructure Development	216 million USD
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										
20% share of Municipalities is equivalent to	36 million USD										
Total funds available for Infrastructure Development	216 million USD										
a) Indicate the local and foreign debt Loan	This project will be funded under this financing. The loan to the Federal Government will trickle down to Municipal Committees as grant. 20% co-financing will be deposited by MCs. The project will be financed through the funds available to Daska Municipal Committee according to its PFC share and score earned in the Annual Performance Assessment.										
b) Equity	<p>A. Loan/grant to MC</p> <p>The amount of loan converted to grant to MC Daska will be Rs. 802.504 million. The financing of the project will be as given below:</p> <table border="1"> <tr> <td>Grant to MC Daska from World Bank</td> <td>PKR 802.504 million</td> </tr> <tr> <td>20% Co-finance by MC</td> <td>PKR 200.626 million</td> </tr> <tr> <td>Total cost of project</td> <td>PKR 1003.13 million</td> </tr> </table> <p>B. Project Cost = PKR 1003.13 million</p> <p>*The loan is from World Bank to Government of Pakistan/Punjab which will trickle down to MC Daska as grant.</p>	Grant to MC Daska from World Bank	PKR 802.504 million	20% Co-finance by MC	PKR 200.626 million	Total cost of project	PKR 1003.13 million				
Grant to MC Daska from World Bank	PKR 802.504 million										
20% Co-finance by MC	PKR 200.626 million										
Total cost of project	PKR 1003.13 million										
c) Grants	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.										
d) Weighted cost of capital	Nil										
11-Project benefits and analysis											
i.Financial (including cost-benefit ratio):	<ul style="list-style-type: none"> The project comprises of improvement of storm water drainage system in the city. 										

<p>Income to the project with assumption</p>	<ul style="list-style-type: none"> • It is a social sector project and the capital cost of the project is not intended to be recovered. • The provision of storm water drainage is an economic public good. Users will not be tolled for using the roads or streets due to rapid drainage of storm water. • MC Daska has no plan to levy user charges as it is not feasible. • MC will meet the cost of repair and maintenance out of its own resources. • No revenues, public or private, will be directly generated. Hence, a financial analysis is not required as there is no positive cash flow or revenue stream that contributes to the calculation of Financial Internal Rate of Return (FIRR). • There is no land acquisition or resettlement plan requirement as the roads are owned by MC Daska.
<p>ii.Social benefits to the target group</p>	<p>The completion of the project will result in:</p> <ul style="list-style-type: none"> • Ease of mobility, transportation, greater enablement and access to economic opportunities and services. • Improvement of air quality and city environments • Easier access to domestic inhabitations, health and education services • Elimination of damage to the road infrastructure thus improving the life of the roads and their maintenance and repair costs. • Encourage citizen satisfaction, build trust with the government and minimizing frustration. • Elimination of traffic hazards due to water stagnancy • Reduction of damages to private and public properties • Elimination of inconvenience to the pedestrians • Clean approach to residential and commercial areas. • Elimination of stinking smell from stagnant water • Reduction in breeding of vectors and water related diseases
<p>iii.Environmental Impact negative/positive</p>	<p>During the construction phase, issues may arise from the generation of dust, emission of air pollution, noise, and traffic congestion due to traffic lane reduction and redirection. Nonetheless, there will be no permanent adverse impacts on the environment.</p> <p>To facilitate the selection of an optimal solution and for the inclusion of Safe Operating Procedures for Construction workers/labors; assessment indicators or an Environmental Screening Checklists have been developed which is attached as Annexure E (A) of this PC-1. The checklist focuses on Environmental Issues and social concerns and ensure that all environmental and social dimensions are adequately considered. Based on the remarks of the screening checklist, IEE has been prepared and the necessary costs for implementation of ESMPs have been provided in this PC-1. The Environment, Health and Safety SOPs for labor/workers are provided as Annexure E (B).</p>

iv.Quantifiable project outputs	The social and quantifiable out puts and benefits to the citizen have been described at Sr. No-11(ii). The Economic Analysis has been attached at Annexure-F												
v.Unit cost analysis	<p>The unit cost analysis is produced below;</p> <table border="1" data-bbox="529 338 1385 464"> <tr> <td>Project capital cost</td> <td>Rs 1003.13 million</td> </tr> <tr> <td>Population of the city in year 2022</td> <td>280,834 persons</td> </tr> <tr> <td>Unit capital cost per capita</td> <td>Rs. 3,571.97</td> </tr> </table> <ul style="list-style-type: none"> • Unit R&M cost: – The Repair & maintenance cost is already being borne by Daska unit. <table border="1" data-bbox="529 583 1385 705"> <tr> <td>Annual O&M cost</td> <td>Rs 5.08 million</td> </tr> <tr> <td>Population of the city in year 2022</td> <td>280,834 persons</td> </tr> <tr> <td>Unit O&M cost per capita per annum</td> <td>Rs. 18.088</td> </tr> </table>	Project capital cost	Rs 1003.13 million	Population of the city in year 2022	280,834 persons	Unit capital cost per capita	Rs. 3,571.97	Annual O&M cost	Rs 5.08 million	Population of the city in year 2022	280,834 persons	Unit O&M cost per capita per annum	Rs. 18.088
Project capital cost	Rs 1003.13 million												
Population of the city in year 2022	280,834 persons												
Unit capital cost per capita	Rs. 3,571.97												
Annual O&M cost	Rs 5.08 million												
Population of the city in year 2022	280,834 persons												
Unit O&M cost per capita per annum	Rs. 18.088												
vi.Employment generation (Direct and indirect)	<p><u>Employment Analysis</u></p> <p>Direct Employment</p> <p>a) <i>Planning and Design of projects</i></p> <p>The planning and design of the project has been entrusted to local consultants who have appointed staff and experts in Sewerage and Drainage 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.</p> <p>b) Execution of the Project</p> <p>a) <i>PMDFC</i></p> <p>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:</p> <ul style="list-style-type: none"> • 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 <p>b) <i>Consultants</i></p> <p>PMDFC has employed (M/s MM PAKISTAN) as consultants for detailed design and resident supervision of the projects who will deploy their staff for execution of the project.</p>												

	<p>c) Municipality MC Daska 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</p> <p>d) Contractor The contractor responsible for execution of the sub project will employ skilled and unskilled labor on this work.</p> <p>Indirect Employment Indirect employment for production of material such as cement, steel, stone metal, bitumen, bricks etc. will be generated.</p>
vii. Impacts of delays on project cost and viability	<p>The impact of delay in project implementation will;</p> <ul style="list-style-type: none"> • 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 May 2023 and to be completed by end of April 2024 with project implementation period of 12 months.
b) Item wise/year wise schedule in line chart	The Gant chart has been attached to Annexure-G
13- Management Structure and manpower requirements	
i. Administrative arrangements for the implementation of the project	<p>ii. 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.</p> <p>iii. Preparation of cost estimation The cost estimates have been prepared by the design consultants by actual measurements at site. The execution of the items of works included in these estimates /PC-I will be certified by these consultants.</p> <p>iv. Execution of the project</p> <ul style="list-style-type: none"> • The project will be executed by Municipal Committee Daska 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

	<p>and regional offices. The reporting of progress to LG & CDD & World bank and troubleshooting will also be responsibility of PMDFC.</p> <ul style="list-style-type: none"> • MO (I&S) of MC 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 the Procurement Committee of MC Daska as per PPRA Rules. <p>v. Verification of quantities included in PC-Is and Resident Supervision of the works by consultants</p> <p>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 MC after these contractor claims have been entered in the measurement books by the Project Manager/Engineer in Charge and pre audited as per LG Works Rules.</p>																				
<p>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</p>	<p>a) PMDFC experts and staff</p> <p>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/Khanewal.</p> <p>b) Resident Supervision Consultants</p> <p>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:</p> <table border="1" data-bbox="516 1289 1442 1908"> <thead> <tr> <th>S #</th> <th>Personnel</th> <th>Nos</th> <th>Qualification</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>Chief Resident Engineer/Team Leader</td> <td>01</td> <td>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</td> </tr> <tr> <td>2</td> <td>Resident Engineer</td> <td>01</td> <td>BSc;/BE Civil engineering with minimum 10 years' experience in site supervision and execution for projects of similar nature.</td> </tr> <tr> <td>3</td> <td>Assistant Resident Engineer</td> <td>01</td> <td>Bachelor Degree in Civil engineering with minimum 8 years' experience in site supervision and execution for projects of similar nature</td> </tr> <tr> <td>4</td> <td>Site Inspectors</td> <td>01</td> <td>DAE in Civil with minimum 10 years' experience in site supervision for projects of similar nature</td> </tr> </tbody> </table>	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	Resident Engineer	01	BSc;/BE Civil engineering with minimum 10 years' experience in site supervision and execution for projects of similar nature.	3	Assistant Resident Engineer	01	Bachelor Degree in Civil engineering with minimum 8 years' experience in site supervision and execution for projects of similar nature	4	Site Inspectors	01	DAE in Civil with minimum 10 years' experience in site supervision for projects of similar nature
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	Resident Engineer	01	BSc;/BE Civil engineering with minimum 10 years' experience in site supervision and execution for projects of similar nature.																		
3	Assistant Resident Engineer	01	Bachelor Degree in Civil engineering with minimum 8 years' experience in site supervision and execution for projects of similar nature																		
4	Site Inspectors	01	DAE in Civil with minimum 10 years' experience in site supervision for projects of similar nature																		

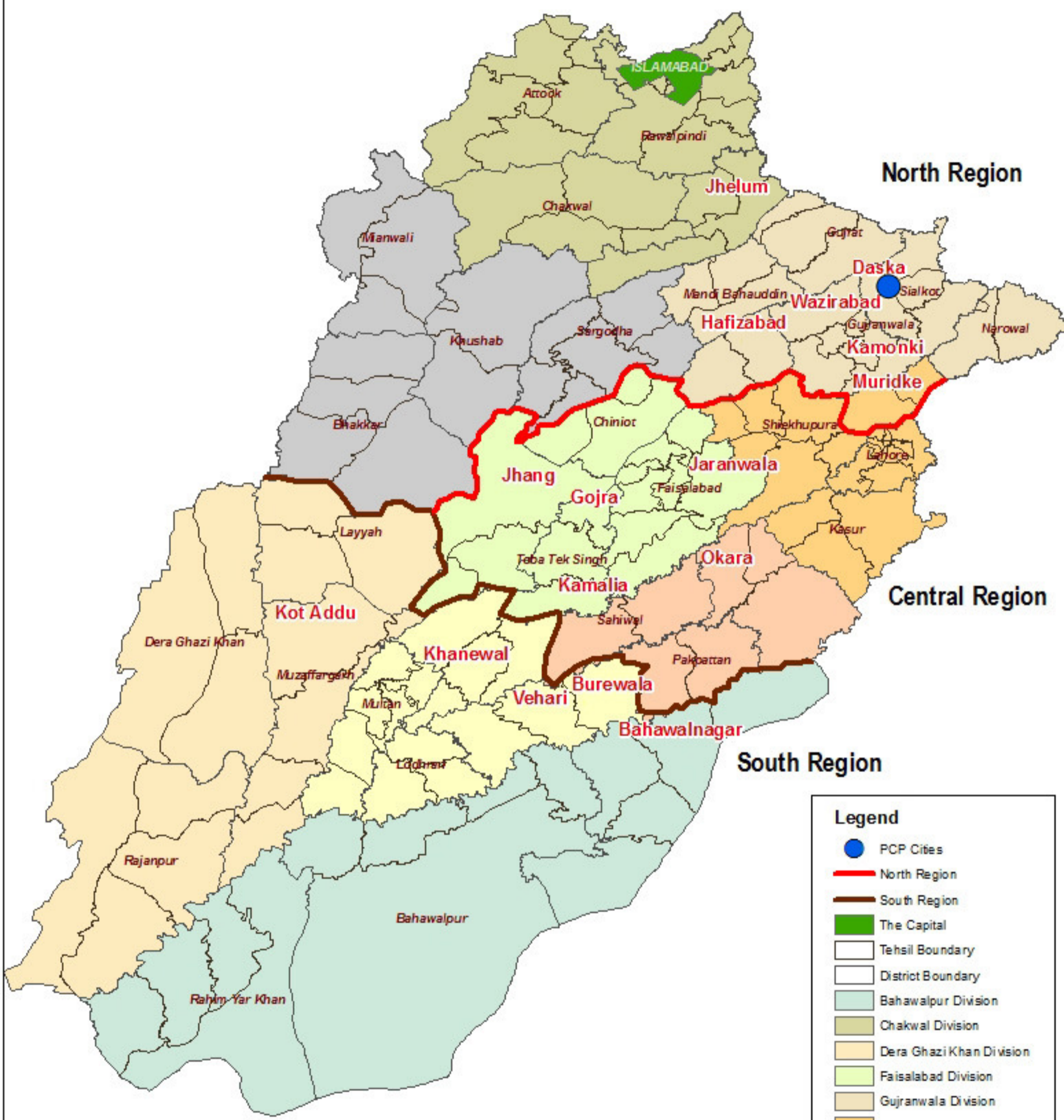
	5	Quantity Surveyor	01	DAE in Civil Technology with minimum 10 years' experience in estimation & costing of projects of similar nature. The person having public sector projects will be preferred.
	06	Environmental Expert	01	16 years of education in Environmental Sciences/Environmental Engineering from a HEC recognized university; Demonstrated experience of 05 years dealing with environment and social management and implementation ,preferably in WB funded projects; have sound knowledge of local laws/policies on environmental management, Environmental policies and procedures of WB and their compliance in field including monitoring and supervision of site-specific ESMMPs and EHS practices during projects execution and implementation.
	07	Social Safeguard/Resettlement Specialist	01	16 years of education in Sociology or Anthropology from a HEC recognized university; Demonstrated experience of at-least 05 years in dealing with social management and implementation, preferably in WB funded projects; have sound knowledge of local laws/policies and WB resettlement, social safeguards and gender policies and compliance of social safeguards and resettlement and abbreviated resettlement plans in infrastructure development projects.
	<p>c) Contractor's Technical staff, skilled & non skilled labor</p> <p>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.</p> <p>d) Repair & maintenance of the project</p> <p>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;</p> <ul style="list-style-type: none"> • Fill up the presently vacant slots • Recruit additional staff as per need of the infrastructure after obtaining the sanctions from the competent authorities. 			
14-Additional projects /decisions required to optimize the investment being undertaken	<p>1) Shortage of locally appointed staff</p> <p>MC is facing shortage in locally appointed staff. This will seriously affect the O&M of the project components. Provincial Government has recently lifted the ban on the recruitment and MC Daska should fill-up the vacant staff immediately for optimizing the investments in MC.</p>			

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 social sectors projects.
----------------	---

Prepared by	MM Pakistan	Stamp & Signatures	
Vetted by	Senior Program Officer (ID) PMDFC	Stamp & Signatures	
Checked by	Municipal officer (I&S) Municipal Committee Daska	Stamp & Signatures	
	Chief Officer Municipal Committee Daska	Stamp & Signatures	
Submitted by	Administrator Municipal Committee Daska	Stamp & Signatures	
Forwarded by	Secretary LG & CD Department	Stamp & Signatures	

Location Map (Punjab Cities Program)

ANNEXURE - A



Legend

- PCP Cities
- North Region
- South Region
- The Capital
- Tehsil Boundary
- District Boundary
- Bahawalpur Division
- Chakwal Division
- Dera Ghazi Khan Division
- Faisalabad Division
- Gujranwala Division
- Lahore Division
- Multan Division
- Sahiwal Division
- Sargodha Division



Annexure-B

Storm Water Drainage in Daska City

Existing situation

1. General

Daska city is located in a flat plain having very small slope and after inhabitation of the city and its expansion with passage of time, all the natural stormwater drainage paths have been obstructed. Because of this issue the storm water presently cannot flow through gravity to some specific direction and creates stagnancy at various points. In spite of the fact that the sewerage system in the city is working satisfactorily, the storm water cannot be drained off immediately after the rain and creates long stagnations thus bringing inconvenience for the inhabitants. Under the circumstances the need of stormwater drainage is intensely being felt.

2. Topography & overall surface drainage of the area

The topography of the city and the possible flow of the storm water under gravity is shown in Figure-1. The general ground level slopes from North East to South west. For drainage of storm water from this entire area a drainage channel named as Daska-1 Drain has been constructed by Irrigation Department which discharges its water into the Deg Nallah which ultimately joins Upper Chenab Canal further discharging in Ravi River.

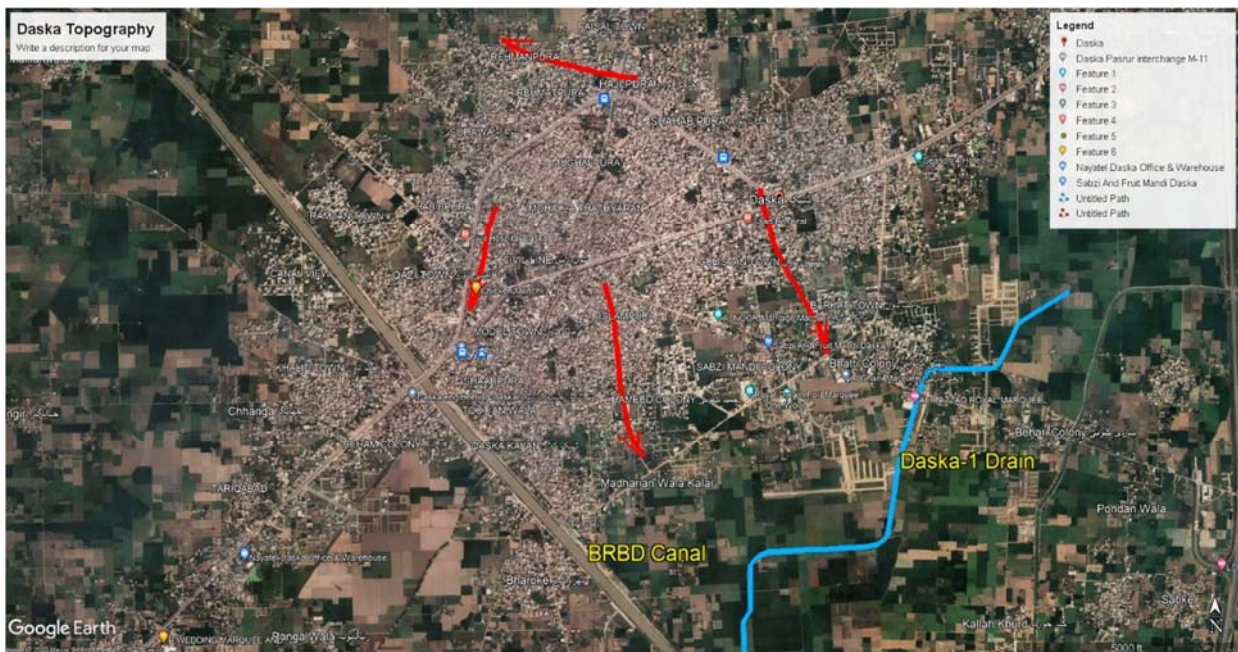


Figure-1 Topography and storm water natural flow directions

Two syphons have been constructed under the BRBD Canal passing through Daska City to discharge the storm water towards South and South West of the city, one for Daska-1 drain and the other near to Gujranwala Road. The latter is connected with a drain flowing towards south primarily constructed by Irrigation Department to take storm water from Daska City but this drain has been obstructed by construction of housing colonies and has no disposal anywhere. Hence this drain cannot be utilized now for draining the storm water from Daska.

The only drainage of storm water possible for major area of Daska city in in Daska -1 drain flowing at eastern periphery of the city. However, a small portion of the city can be drained towards west into another drain named as Malhianwala Drain which ultimately discharges into Upper Chenab Canal near Gujranwala city.

3. The sewerage system

- a) Daska city is equipped with sewerage system having main sewers on approximately 70% of the city area, but lateral sewers are missing in most of the city area. Due to non-provision of lateral sewers, sewerage water is collected through the surface drains and then discharged into the sewers without gullygrating chambers.
- b) The sewerage system is working with three disposal stations. One disposal station is located on Awami Road but new disposal station is under construction by the PHE Department on the left bank of the BRBD Canal which will replace the Awami Road disposal station. There are two other disposal stations on Pasrur road and Stadium Road. These were not in good condition previously and required repairs & replacement of machinery & other allied equipment which has been carried out under Rehabilitation subproject under PCP funding. The city has been divided in 3 Drainage Areas in respect of the waste water disposal /drainage. Each zone with its coverage is described below:

Drainage Area-1

This drainage area comprises of the eastern part of the city and is drained off into Pasrur road disposal works. 42” dia outfall sewer collects water from a 36” dia sewer from the Mohallah Naqshbandi, Mohallah Baghwala, Mohallah Barkat Town, Gulistan Colony, Gulistan Villas & other areas and also from a 24” size sewer serving Mohallah Baghwala & allied areas. The waste water collected at disposal Station is pumped into storm water drain (Daska-I) through a sullage carrier without treatment.

Drainage Area-2

This drainage area comprises of southern part of the city and is drained off into Awami road disposal works. The disposal station on the Awami road is in very poor condition although 3 Nos pumping units have been replaced through Rehabilitation subproject under PCP funding. This disposal station will be eliminated as soon as new under construction disposal station on left bank of BRBD Canal is completed and put into operation by PHE Department. Work on sewer (24” & 30”) along the B.R.B.D canal has been suspended due to some local issues. DC Sialkot was requested during meeting held on 7th December 2022 to intervene to resolve the issues. He directed AC Daska to pursue the case but it is unresolved so far. If this sewer is not laid then waste water of Mohallah Daska Kalan, Mohallah Tootianwala and Mohallah Sharif pura will remain stagnant along the road from 1122 office to Kutchery.

The waste water collected at Awami road disposal is pumped into a sullage carrier and ultimately being disposed off in storm water drain (Daska-1) through katcha drain.

Drainage Area-3

This area is comprised of portions of the city lying in the north west of the college road. A trunk sewer of 33 inch diameter collects the waste water from areas like Rehman pura, New Abadi Sohawa etc and it joins the 36" dia sewer coming from stadium road from the opposite side and then the 42" diameter outfall sewer is discharging in stadium disposal works.

The trunk sewers of this system has faced the crown failures at various points in a each of 1500 Rft which will be replaced under Rehabilitation subproject also funded under PCP. Waste water from this disposal works is pumped into a sullage carrier which ultimately ~~discharges~~ into Malianwala drain without treatment. In the way the water is also used for broad irrigation.

- c) The plan of sewerage system showing all these zones is attached at **Appendix-I**
- d) Gully grating chambers in the entire system are missing, due to which solid waste silt and floating materials are being pushed into sewer lines which lead to chocking of sewers.
- e) Disposal stations are operated under submerged conditions that restricts self-cleaning velocity in out fall sewers even in whole network. It is resulting in choking of sewer due to deposit of silt.
- f) Drains owned by Irrigation Department are being silted up because of discharge of waste water without treatment.

4. The outstanding problems

- There is no natural flow of storm water under gravity to any water body at present. Storm water is collected in the surface drains and enters in the sewerage system which is pumped from the disposal stations and discharged in the Irrigation Department storm water drains; Daska-I Drain flowing at the eastern boundary of the city and Malhianwala drain flowing at the western side of the city.
- As such each drop of storm water has to be pumped from the disposal station through existing sewerage system which has been designed as combined system for dry weather flow and 50% of the storm water flows. The sewerage system is already surcharged due to frequent power break downs responsible for silting up of the sewers and non-cleaning of the system by MC Daska.
- During rainy season the roads of the city are flooded with storm water with long stagnancy periods until the entire storm water is pumped through the sewerage system. The outstanding stagnancy spots are the college road and the surrounding roads as shown in the map below.

College road is most affected area due to rain water. Rain water from Circular Road, Samberial road (inside the ring of circular road), Wazirabad road and Katchery road travels and gathers on college road through side drains flowing along the roads & as

sheet flow as well. College road at Masjid Noor is most troubled area . The stagnancy period of the storm water on college road and other parts of city which drains into sewer system ranges from 10 to 15 hours and some times over a day and creates problems for all kind of traffic and pedestrians and causes inconvenience to general public, public & private transport as well.

- Rain water from Wazirabad road, Katchery road flows through road side drains and as sheet flow towards Lari Adda area from where it is connected with sullage carrier up to Syphon near 1122 headquarter which was previously disposed of into a storm water drain across the canal but now this drain is encroached and closed by nearby housing society which resulted in silting up of this drain and Syphon as well and rain water remains permanently stagnant in this drain and syphon.
- Waste water from Lari Adda area and Mohallah Tootianwala has become part of this stagnancy.
- Moreover, stagnant rain water damages private and public property and the roads infrastructure at low lying points suffers heavy damages thus reducing its life and increasing its repair and maintenance cost.

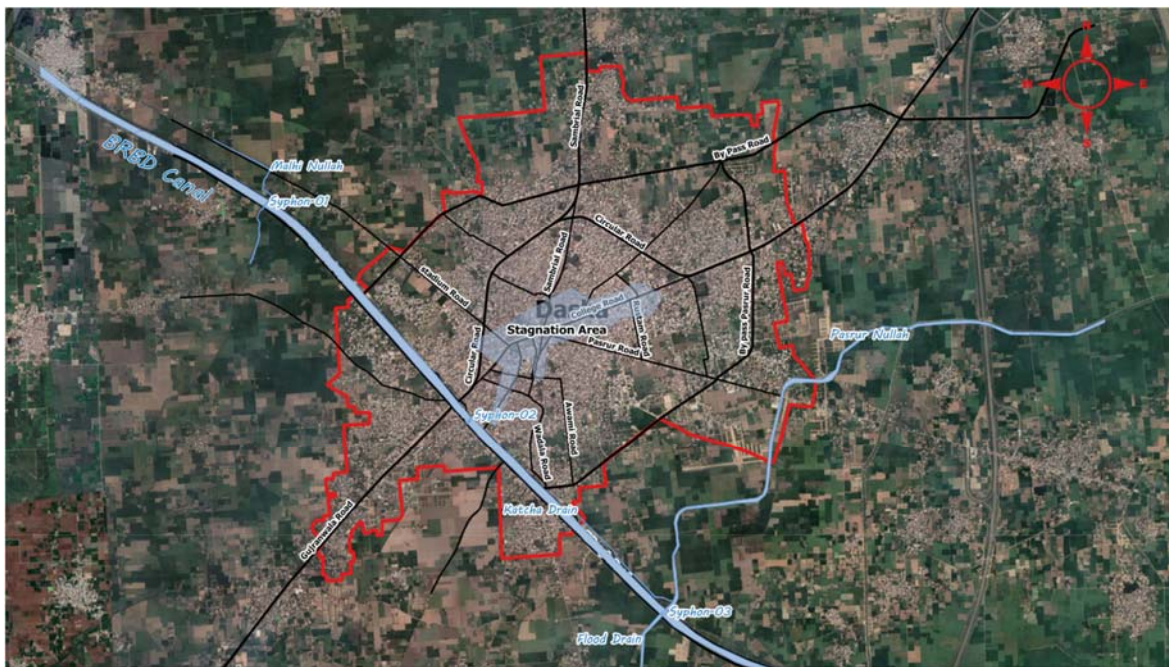


Figure-1 Storm water stagnation area shown in grey color

- The snaps of the storm water flooding on various roads of the city during and after rain are also given below;



Due to storm water flooding following issues are generated in the city:

- Obstruction to traffic creating traffic hazards
- Damages to the roads and streets
- Damages to private and public properties
- Inconvenience to the pedestrians
- Refusal of approach to residential and commercial areas.

- Emission of stinking smell from stagnant water
- Breeding of vectors and creation of water related diseases
- Percolation of storm / sewer water in the ground due to long stagnancy periods and in turn contaminating the ground water
- Damages to the vehicles because of plying in stagnant storm and waste water mixture
- Increase in maintenance & repair cost of vehicles.

Annexure-C
Proposal for Disposal of Storm Water Drainage:

1. General

In order to eliminate all the adverse effects and impacts of storm water stagnation, it has been proposed to construct independent storm water drainage system in the city. The storm water from this system will be discharged in the seepage cum storm water drains owned by the Irrigation Department by gravity. As per topography of the land and keeping in view the gravity flow of the system, the entire city has been divided in four zones which are described as under.

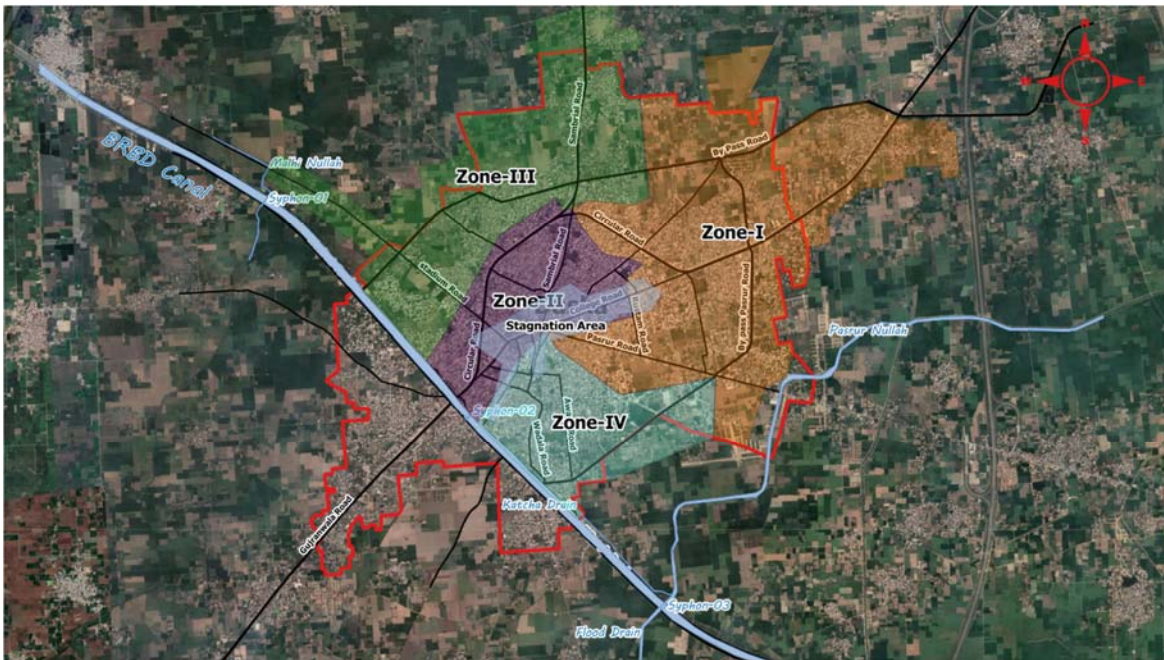


Figure-2 Proposed Storm Water Drainage Zones

2. Drainage Zones

a) Zone-I

- This drainage zone comprises of the North-Eastern portion of the city and the flow of drainage system is generally from North to South.
- Existing drains (A1-A4 and A2-A5) along the college roads from Puma Gas Station toward Chungi No.9 will collect surface water from their surrounding roads and streets and the water will be diverted to main out fall drain on Pasrur Road via Rustum road drain (A5-A7).
- Surface water from Pusur road starting from city towards Pusur (drain A6-A7) will be discharged into out fall drain (A7-A8 to outfall-1). The water will be finally discharged into Daska Drain-1 also mentioned as Pasrur Nallah in the Figure-2 by gravity.
- The invert level of the outfall drain will be kept slightly higher than full supply level of Daska-1 Drain (Pasrur Nallah) for free fall discharge. However, in case of very heavy flood in the Daska-1 Drain water back lash may occur in the outfall drain for which a penstock and diesel operated self priming pumping unit will be provided. In case of such event the penstock will be closed and pumping will be started from the outfall drain into Daska-1 Drain

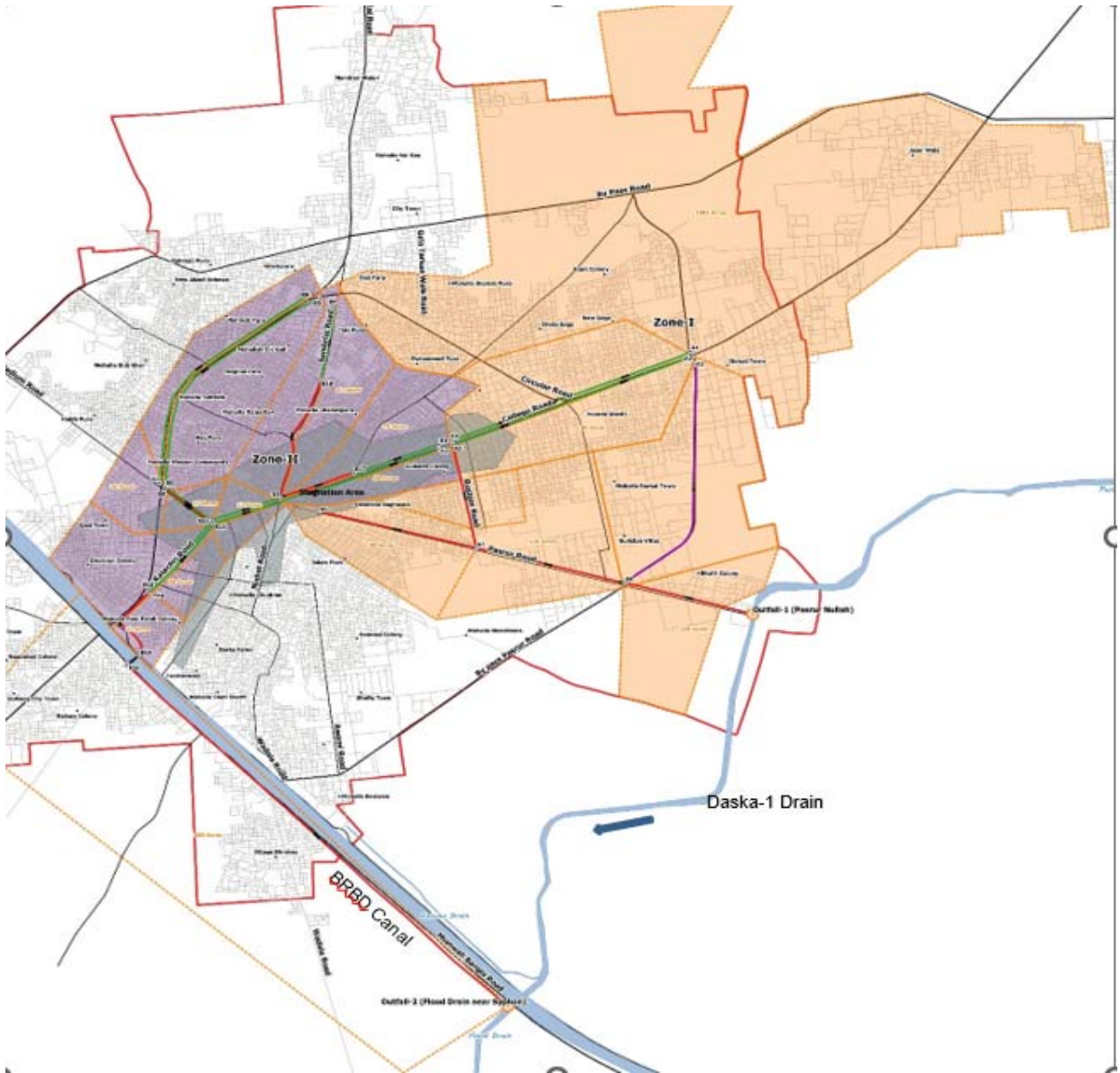


Figure-3 Zone-I & Zone-2 Storm Water Drainage Systems

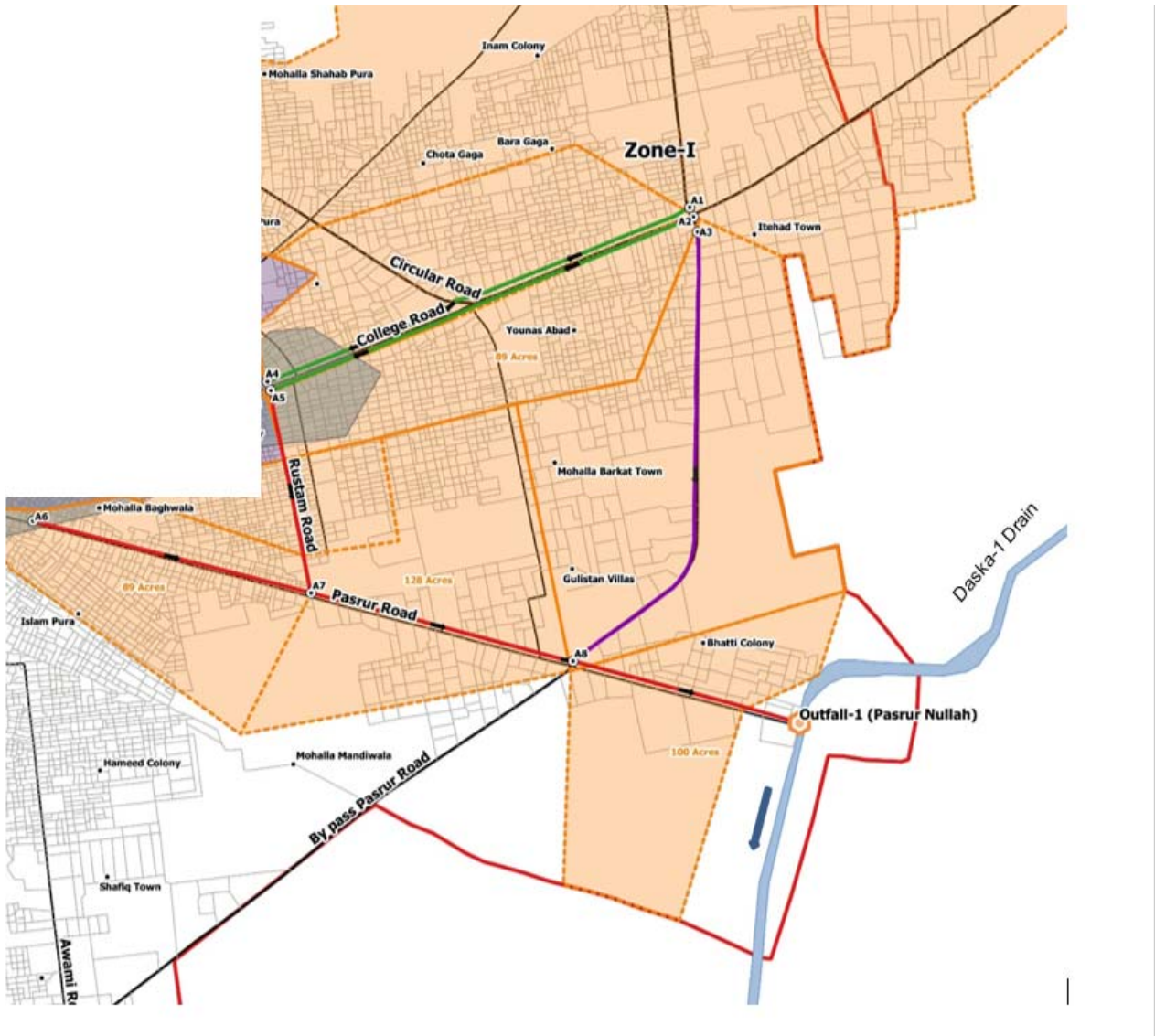


Figure-4 Storm Water Drainage System in Zone-1

b) Zone-II

- This zone comprises of central portion of the city located in the north of BRBD Canal.
- Existing drains of College road from Rustum road (B1-B17, B3-B12 & B2-B11) up to Bangla Chowk will be used for surface water collection and new drain (B17-B3) will be constructed from Masjid Noor to Samberial Road Chowk.
- Rain water of Samberial road via drain (B4-B18-B3) will join the existing drain (B3-B12). In this drain the B-18-B3 portion will be constructed as a new drain.
- Rain water from Circular Road through existing drains (B6-B7 & B5-B8) will be gathered through culvert (B7-B8) and will join existing drain (B12-B13) of Katchery road through existing (B8-B12). New drain (B9-B12) from Wazirabad road to Bangla Chowk will be constructed which will join existing drain (B12-B13).

- These drains will be joined together through culvert (B13-B14). A new drain (B14-B15) will be constructed up to the syphon near 1122 headquarter which will lead this rain water under the BRBD Canal through an existing syphon to the drain B16 to Outfall-2 to be constructed along the right bank of BRBD Canal where it will be disposed off into Daska- 1 Drain possessed by Irrigation Department through gravity at the downstream of the existing syphon constructed to cross the Daska-1 Drain under the BRBD Canal.
- The invert level of the outfall drain will be kept slightly higher than full supply level of Daska-1 Drain (Pasur Nallah) for free fall discharge. However, in case of very heavy flood in the Daska-1 Drain water back lash may occur in the outfall drain for which a penstock and diesel operated self priming pumping unit will be provided. In case of such event the penstock will be closed and pumping will be started from the outfall drain into Daska-1 Drain

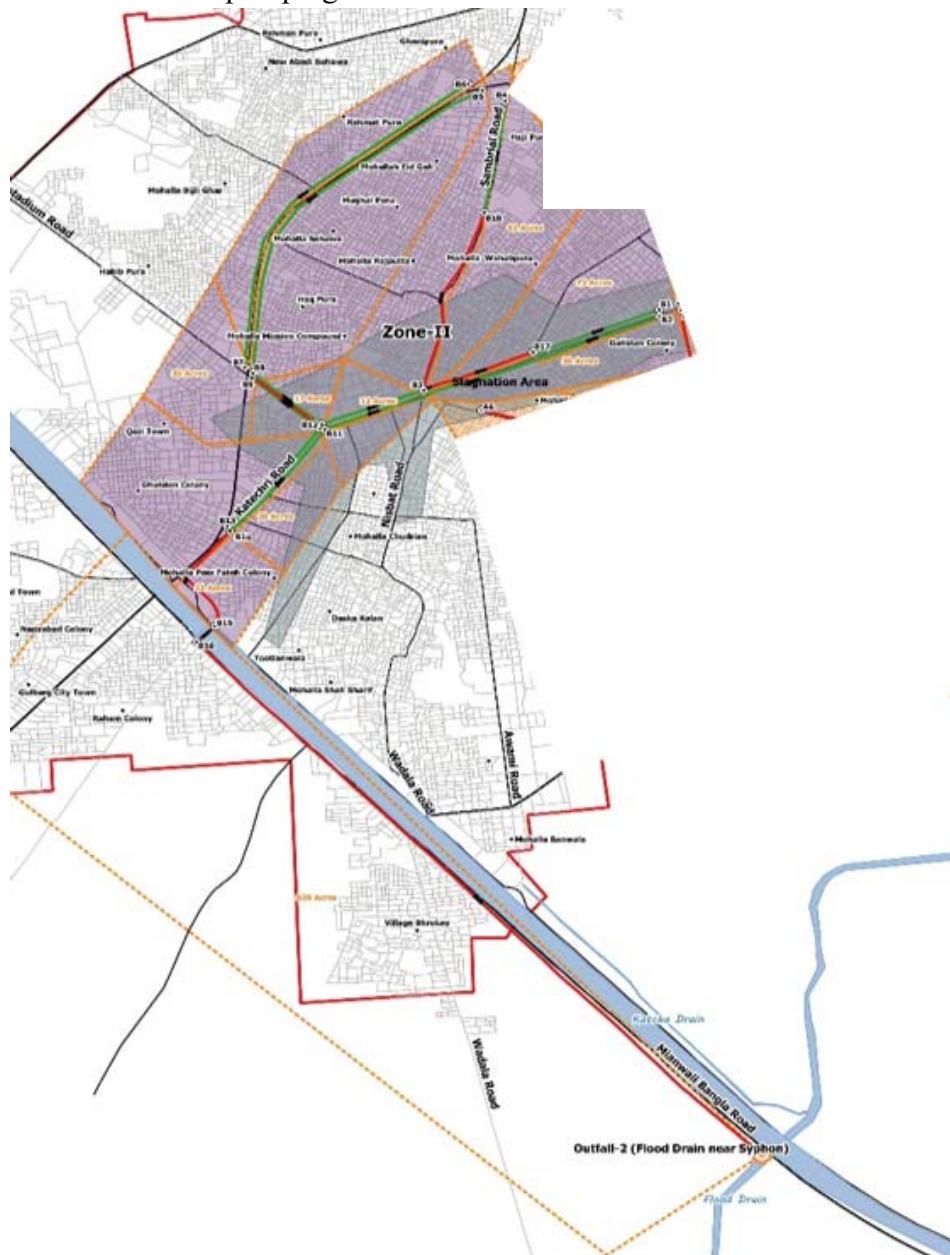


Figure-5 Storm Water Drainage System in Zone-II

c) Zone-III

As shown in Fig-2, the area of the city located in North and west side comprises of Drainage Zone-III. Thus area will be drained off towards west of the city along Stadium Road into Malhianwala storm water drain owned by the Irrigation Department. This drain ultimately joins Upper Chenab Canal near Gujranwala. The intensive stagnation of storm water does not take place in this zone as the water flows in the sewerage system and on to the roads in the form of sheet flow and does not create long stagnation.

Hence this Zone has not been included in the PC-I.

d) Zone-IV

As shown in Figure-2 this area is located at southern part of the city at north of BRBD Canal and constitutes Awami Road, Nisbet Road and Wadala Road and their surrounding. The area is presently served by Awami Road disposal works which is being shifted along left bank of BRBD Canal. Extensive ponding of storm water does not take place on these roads and the drainage of the area will be taken up after observing the impacts of operation of new disposal station being completed and commissioned by PHE Department shortly. Hence this Zone is not included in this PC-I

3. Remodeling of Daska-1 Drain

The total discharge calculated to be carried by the outfall drains of zone-I and Zone-2 is given below;

Zone	Outfall drain	Location	Discharge
Zone-1	A8 to Outfall-1	Along Pasrur Road	34.15 cusecs
Zone-2	B16 to Outfall-2	Along Bangla Road	77.13 cusecs
		Total Discharge	111.28 cusecs

The capacity of Daska-1 Drain is given below:

Existing carrying capacity at upstream of Pasrur Road = 50 cusecs

Existing carrying capacity at down stream of Raja Ghumman syphon = 70 cusecs

Hence the configuration of Drain-1 after addition of storm water from Daska City will be as under:

Existing capacity of Daska Drain-1 at upstream of Pasrur road	50.0 cusecs
Addition of water from A8 to Outfall-1 drain along Pasrur Road	34.15 cusecs
Required capacity of Daska-1 Drain between Pasrur Road and Raja Gumman Syphon	84.15 cusecs
Capacity of Gumman Syphon	804.0 cusecs
Addition of water from Outfall drain B-16 to Outfall-2 along Miani Bangla Road	77.13 cusecs
Existing capacity of Daska Drain-1 at down stream of Raja Ghumman syphon	70.0 cusecs
Required capacity of Daska Drain-1 at down stream of Gumman Syphon	161.28 cusecs

The existing capacity of the Daska-I drain and proposed flows are given below;

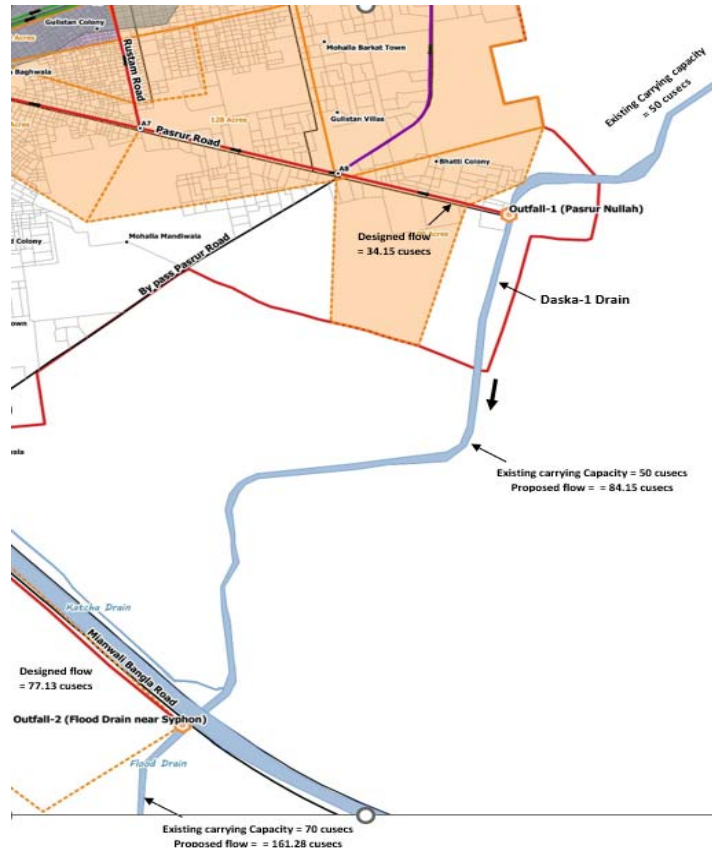


Figure-6 Existing and proposed discharge in Daska Drain-1

The matter of discharging of storm water from Daska City to Dain-1 Daska was taken up with Irrigation Department who suggested the remodeling of Daska Drain-1 from Pasrur Road to Raja Gumman village for taking the proposed discharge as shown in Figure-6. However the capacity of Daska Drain-1 is adequate beyond Raja Gumman village to take the proposed discharge.

Irrigation Department has submitted a cost estimate for remodeling of Daska Drain-1 amounting to Rs 208.514 million (**Appendix-II**) which will be included in the PC-I and the cost will be deposited with Irrigation Department for taking up the remodeling of the drain as deposit work.

Annexure-D
Design Criteria of Storm Water Drainage System

The Design Criteria adopted for the design of Storm Water Drainage in Dask City is given as below:

1. Design Flow of Drainage

The capacity of storm water drainage is calculated according to Rational method, which relates the flow to the rainfall intensity, the tributary area, and a coefficient, which represents the combined effects of ponding, percolation, and evaporation. This discharge is calculated as follows:-

$$Q = CIA$$

Where:-

Q = Discharge in cusecs

C = Run Off Co-efficient

I = Rain fall intensity

A = Drainage area in acre

Type of Surface	Run off Co-efficient
Water tight roof surface	0.70 – 0.95
Asphaltic cement streets	0.85-0.90
Portland cement streets	0.80-0.95
Brick paved driveways and walks with tightly cemented joints	0.75-0.85
Brick paved driveways and walks with un-cemented joints	0.70-0.80
Inferior block pavement with un-cemented joints	0.40-0.50
Gravel driveways and walks	0.15-0.30
<ul style="list-style-type: none"> • Lawns, sandy soil <ul style="list-style-type: none"> 2% slope 2-7% slope > 7% slope • Lawns, heavy soil <ul style="list-style-type: none"> 2% soil 2-7% slope > 7% slope • Business <ul style="list-style-type: none"> Downtown area Neighborhood area • Residential (Urban) <ul style="list-style-type: none"> Single Family area Multi-units, detached Multi-units, attached • Residential (Suburban) 	0.05-0.10 0.10-0.15 0.15-0.20 0.13-0.17 0.18-0.22 0.25-0.35 0.70-0.95 0.50-0.70 0.30-0.50 0.40-0.60 0.60-0.75 0.25-0.40

Apartment areas	
• Industrial	
Light	0.50-0.70
Heavy	0.50-0.80
• Parks, cemeteries	
• Playgrounds	0.60-0.90
• Railroad yards	0.10-0.25
• Unimproved areas	0.20-0.35
	0.20-0.40

- a) *The Runoff Coefficient of 0.20 has been adopted in Zone-I due to greater open areas and unimproved areas in this zone*
- b) *In Zone-II the Runoff Coefficient of 0.25 has been adopted for residential area and sub urban areas*

2. Rain Fall Intensity

For Southern Punjab an intensity of 1/30 inch/hour may be taken except for industrial cities where higher intensity (¼ inch/hour) be assumed. For Northern Punjab intensity of ¼ inch/hour is assumed for small towns while ½ inch/hour or a figure based on rational assessment should be assumed for larger cities.

- *Rainfall intensity has been adopted as 0.25 inch per hour as given above for small towns.*

3. Design of surface drains

- a) Drains have been designed to flow in gravity. No pumping of storm water into the drains will be adopted.
- b) Manning Formula as given below, has been used for flow in the open channels and the drains have been designed accordingly.

$$V = 1/n R^{2/3} S^{1/2} \text{ where;}$$

V = Velocity of flow in drains

n = Roughness coefficient

R= Hydraulic Radius = A/P

S = Slope of the drain

P = wetted perimeter of the drain section

$$\text{Discharge of the drain} = Q = AV$$

Where A = Area of flow

- c) Rectangular section of the drains has been used for determination of the size of drains.
- d) Brick masonry structure has been used for remodeling of the existing drains due to existing masonry drains.
- e) For new drains RRC sections have been adopted.
- f) Roughness coefficients as given below have been used for masonry drains and RCC drains.

g) RCC Box culverts have been designed for crossing of drains below the roads.

h) The Roughness Coefficients for various materials of the drains are given below:

Sr No.	Surface Material	Manning's Roughness Coefficient - <i>n</i> -
1	Asbestos cement	0.011
2	Asphalt	0.016
3	Brass	0.011
4	Brick and cement mortar sewers	0.015
5	Canvas	0.012
6	Cast or Ductile iron, new	0.012
7	Clay tile	0.014
8	Concrete - steel forms	0.011
9	Concrete (Cement) - finished	0.012
10	Concrete - wooden forms	0.015
11	Concrete - centrifugally spun	0.013
12	Copper	0.011
13	Corrugated metal	0.022
14	Earth, smooth	0.018
15	Earth channel - clean	0.022
16	Earth channel - gravelly	0.025
17	Earth channel - weedy	0.03
18	Earth channel - stony, cobbles	0.035
19	Floodplains - pasture, farmland	0.035
20	Floodplains - light brush	0.05
21	Floodplains - heavy brush	0.075
22	Floodplains - trees	0.15
23	Galvanized iron	0.016

$n = 0.11$ for steel forms

$n = 0.15$ for wooden forms

- *Average values of both, has been adopted which is 0.013 for RCC drains.*
- *For brick masonry drains n has been taken as 0.015*

4. Pumping of storm water in case of high floods

- a) Both outfall drains have been designed to discharge storm water in Daska-1 Drain by gravity and the invert level of these drains have been kept slightly above the full supply level of Daska-I Drain.

- b) However, very high floods may be experienced in Daska-1 Drain. For this purpose, self priming centrifugal pumping units operated by diesel engines will be used and two pumping units of 5.0 capacity, one for each outfall drain have been included in the PC-I.
- c) Penstocks of size as per sections of the outfall drains will be installed on both of the outfall drains. During pumping of storm water in the Daska-1 Drain, penstocks will be closed to eliminate back lash of flood in Daska-1 Drain.

<u>Rough Cost Estimate for Construction of Stormwater Drains in Daska City</u> <u>(Zone-I & Zone-II)</u>		
<u>Summary of Cost</u>		
Sr. No.	Description	Cost (Millions Rs.)
1	Part-A Storm Water Drains Zone-I	253.063
2	Part-B Storm Water Drains Zone-II	445.707
Sub-Total		698.77
Remodeling of Daska-I Drain (Deposit Works to Irrigation Department) (NOC/Letter attached)		208.51
Contingencies @ 2%		13.975
PRA @ 5%		34.939
Escalation @ 5%		34.939
Provision of traffic management for hard barications, inforamory sign boards, regulatory sign boards, hiring of personnel by contractor for this purpose as directed by Deputy Director Dev (MOM attached)		1.00
Environment & Social Managment Cost IEE Implementation Cost		6.71
RAP This compelsation will be paid from 20% counterpart funding funding from MC own budget before the execution of the project.		4.28
Total Cost		1003.130

**Storm Water Drain Zone-I
Part-A
Cost Estimate**

**Rough Cost Estimate for Construction of Stormwater Drains
in Daska City (Zone-I, Part A)**

Summary of Cost

Sub head	Description	Cost (Rs.)
1	Construction of RCC drains	188.201
2	Rehabilitation of existing drains	2.549
3	Construction of RCC drains culverts	3.408
4	Remodeling of existing drains	54.439
5	Desilting and cleaning of existing Drains	3.103
6	Dewatering of surface water during execution	0.090
7	Penstocks on outfall drain	1.274
	Sub-Total	253.063

Note: This Rough cost estimate has been prepared on rates of MRS, 1st BI-ANNUAL-2023 (01.01.2023 to 30.06.2023) and Non MRS items of work has been based prevalent Market rates