

VOLUME 2: EIA – ANNEXES

ANNEX 5-1: SURVEY TOOLS FOR CONSULTATION AND BASELINE DATA COLLECTION



CHECKLIST FOR PHYSICAL BASELINE CONDITIONS

PHYSICAL ENVIRONMENT

a. Type of area

- Mountainous
- Arid
- Semi-arid
- Forest
- Dense forest
- Populated
- Densely populated

Any other _____ (specify)

b. Landuse of area

- Agriculture
- Barren
- Built-up
- Desert
- Access road
- Wetland

Any other _____ (specify)

c. Geological conditions

- is the geology of the area rocky _____
- is the origin of rocks sedimentary/igneous/metamorphic
- any other _____ (specify)

d. Seismology

- is there any record of earthquakes in the past 50 years
- presence of faults/fractures
- any other details _____ (specify)

e. Topography & soils

- are the soils mixtures of sand /silt/clay/gravel/rock/clayey silt _____
- any other _____ (specify)

Proposed site	Soil description

Other features

- Drains
- Hills
- Plain Areas
- Any other _____ (specify)



f. Climate historical data from nearest weather station ()

Temperature	Wind	Relative humidity	precipitation	Evapotranspiration

g. Surface and Ground water

Source of surface water

- Rivers
- Hill Torrents
- Surface Ponds
- Any other _____ (Specify)
- Surface water quality visual? _____

Sources of ground water

- Wells
- Hand Pumps
- Tube wells
- Any other _____ (Specify)
- Quality and Approx. depth _____

g. Air Quality

- Is the area visually pollution free _____
- Identification of point sources (Industries Refineries, power plants) or any other _____ (specify)
- Identification of non- point sources (cars, trucks, tractors) or any other _____ (specify)

h. Liquid effluents

- liquid effluents sources (industries/household/commercial)
- if any other _____ (specify)
- Identification of any disposal source for waste water from plant _____

Describe Details

i. Solid Waste

- Types of waste (Municipal, commercial, institutional, agriculture industrial, biomedical) any other _____ (Specify)
- Waste Disposal facility (Landfill, dumping stations)
- Approx. waste generated (tons/day) _____
- Responsible solid waste management authority? _____



- Waste management (Good or Poor)_____if poor, specify the reasons (lack of awareness among people, authority is not responsible enough)

j. Noise

- Sources of noise (traffic/industry or other _____)(Specify)
- Areas under high noise pollution? _____

k. Natural Hazards

- Does the project area has any previous records of flooding _____
- Are there any records of drought _____
- Any other _____(Specify)

l. Nearby Infrastructures in Study Area

Sr. No.	Infrastructure	Details
1.	Transmission Line Crossing	
2.	Surface Water Body	
3.	Water Supply Line	
4.	Roads	
5.	Quarry Area	
6.	Developmental Project	
7.	Sensitive Receptor	
8.	Other (Specify)	

Sr. No.	Significant Impacts	Details



ECOLOGICAL CHECKLIST FOR ESIA/ESMP

	Data Sheet No.		Date	/ /	Expert Name			
	Location/Village				District	Rawalpindi	RD/KMs.	
	BIODIVERSITY FEATURES							
(i)	Vegetation Description							
	Forests (Trees, Herbs, Shrubs)	Yes/No	Ecological Zone/Forest Type			Legal Status		
	Species Composition	ROW			No of Trees (Possibly Affected)			
	Diameter Class	0-15 cm	16-30 cm	31-45 cm	46-50 cm	51-65 cm	66-80 cm	81-95cm Above 95 cm
	Rangeland	Yes/No	Agricultural Land	Yes/No		Crop Type		
(ii)	Wildlife/ Fauna Description							
	Wildlife Protected Areas (Notified or Sensitive)							
	Mammals	Yes/No						
	Reptiles	Yes/No						
	Amphibians	Yes/No						
	Aquatic Habitat	Yes/No						
	Avifauna/Birds	Yes/No						
	Natural Wetland	Yes/No						
	Endangered Species	Yes/No						
	Other Biodiversity Features							
	Remarks/Comments:							



QUESTIONNAIRE FOR SOCIOECONOMIC BASELINE SURVEY

Date. -----

Photo No. -----

ID No. -----

1. IDENTIFICATION

1.1 Name of Respondent _____

1.2 Father's Name _____ 1.3 Cell. No: _____

1.3 Permanent Address of the Respondent:

Village: _____ Town _____ Tehsil _____ District: _____

1.5 Located _____ Caste _____

1.6 Demographic Profile of Respondent (Children up to 10 yrs (#): M _____, F _____ T _____)

Sr. No.	(a) Relationship with Respondent (See codes)	(b) Sex (See Codes)	Age (Yrs.)	(c) Education (See Codes)	(d) Name of Business/ Occupation (See Codes)		Income from Business/ Occupation (Rs. / Annum)		(e) Health Condition
					Main	Secondary	Main	Secondary	
1	Self								
2									
3									
4									
5									
6									
7									
8									
9									
10									

Demographic Codes:

a) Relationship: 1=Self, 2=Wife, 3=Son, 4=Daughter, 5=Father, 6=Mother, 7=Brother, 8=Sister, 9=Grand Father, 10=Grand Mother, 11=Sister in Law, 12=Nephew, 13=Father-in-Law, 14=Mother-in-Law, 15=Niece, 16=Uncle, 17=Aunty, 18= Son-in-law, 19= Daughter, 20= S. in Law, 21=D. in Law, 22= Other _____

b). Sex: 1=Male, 2=Female, 3= Transgender

c). Education: 1= Primary 2= Middle 3= Metric, 4= Intermediate, 5= Graduate, 6= Post Graduate, 7=Law, 8=Engineer, 9=MBBS, 10=Technical Diploma, 11=Dars-e-Nizami, 12=Can Read Quran, 13= Can Insert Signatures, 14= Illiterate

d). Occupations: 1=Agriculturist, 2=Shopkeeper, 3=Hotel, 4=Mechanic, 5=Barber, 6=Butcher, 7=Cobbler, 8= Business, 9= Govt. Servant, 10=Private Servant, 11=Labor, 12=Student, 13=House-Maid, 14=Housewife, 15=Advocate, 16=Livestock/Dairy, 17=Fishing, 18=Driver, 19=Health Related, 20=Teaching, 21=Entertainer, 22=Gone Abroad, 23=Retired/Old, 24=Other _____

e). Health: 1= Good, 2= Average, 3= Poor

1.8) Language Spoken _____ Religion _____



1.9) Type of family system: 1.Joint: _____ 2.Nuclear _____

2. AVERAGE MONTHLY EXPENDITURE ON FOOD AND NON- FOOD ITEMS (Rs.)

Items	Expenses
Food	
Non-food	
Utilities	
Health	
Education Care	
Other	

3. HOUSING CONDITIONS

3.1 Personal _____ Rented _____ Other _____

3.2 Type of Structure

(i) Katcha _____ (ii) Semi Pacca _____ (iii) Pacca _____

4. ACCESS TO SOCIAL AMENITIES (TICK)

Social Amenities	Available (Yes-No)	Satisfactory (Yes-No)	Reasons for Not Satisfaction
Electricity			
Gas			
Water Supply			
Water Filtration plant			
Telephone			
Sewerage/Drainage			
Hospital			
School (Boys-Girls)			
College (Boys-Girls)			
University (Boys-Girls)			
Religious Institution			
Road			
Source of Cooking if Sui Gas is not available			

5. CREDIT UTILIZATION

5.1 Have you obtained credit during last year? Yes___ No___ if yes, source of credit:

a) Formal b) Informal

5.2 Please write the name of relevant source

Formal source (s) _____

Informal source (s) _____

Purpose of Loan _____



6. WOMEN'S PARTICIPATION AND ROLE IN DIFFERENT HOUSEHOLD ACTIVITIES

6.1 Participation and Decision Making (Tick)

Activities	Participation Extent (%)	Decision Making Extent (%)
Household activities		
Child caring		
Farm/Crop activities		
Livestock rearing		
Sale & Purchase of properties		
Social obligations (marriage, birthday & other functions)		
Local representation (councilor/political gathering)		

7. SOURCE OF DRINKING WATER:

1. Public Water Supply 2. Hand Pumps 3. Borehole 4. Any other ____

7.1 Quality of water: Good _____ Poor: _____

If Poor (Reason) _____

8. DOES ANY NGO EXIST IN YOUR AREA?

Yes _____ No _____

If yes, Name of NGO -: _____

8.1 Are you member of NGO? yes----- No----- if yes,

Role in NGO:- _____

9. PERCEPTION OF RESPONDENTS FOR ACTION ASSOCIATED WITH THE PROJECT:

Possible impacts/effects of the Project	Increase	Decrease
Employment opportunities		
Industrial Development Opportunities		
Living standard		
Unemployment		
Income generating activities		
Improvement in transport		
Mobility (Access to Resources)		
Physical Displacement		
Other specify		

10. ANY OTHER HISTORICAL /ARCHEOLOGICAL MONUMENT IN OR NEARBY THE PROPOSED PROJECT AREA?

1. Yes _____ 2. No _____ If yes, please specify

Name _____ Type _____ Distance from the proposed project _____



11. MAJOR DISEASES COMMON IN THE PROPOSED PROJECT AREA

12. IN YOUR OPINION, WHAT ARE SOME PRESSING NEEDS OF THIS AREA?

13. GENERAL REMARKS OF THE RESPONDENT

14. GENERAL OBSERVATIONS OF INTERVIEWER

Name of Interviewer: _____ **Date:** _____



GENDER SURVEY

1. Location:

Settlement: _____

UC: _____ Tehsil: _____ District: _____

2. Identification

2.1: Name: _____ 2.2: Father's / Husband Name: _____

2.3: Permanent Address: _____

2.4: Contact No. _____

2.5: What is your age?

Age (year) 18 – 25 _____ 26 – 35 _____
36 – 45 _____ 46 and above _____

2.6: Marital status? I. Married _____ II. Unmarried _____

2.7: What is your family size? I. Male _____ II. Female _____

2.8: What is your caste /ethnic group? _____

2.9: What is your language? _____

2.10: What is your qualification?

I. Illiterate _____ II. Primary _____ III. Middle _____
IV. Metric _____ V. Intermediate _____ VI. Above Inter _____

3. What are the main roles and responsibilities of women?

Roles	Involvement(%age)
Household Activities	
Income Generation Activities	
Others	

Decision Making:

Who decides the following household matters?

Men = 1, Women = 2, Both = 3.	
	Decision maker
Education where to send, whom to send	
Health facilities (from where to avail)	
Number of children to have	
Children Marriages	
What HH assets to buy and sell	
Women to work outside home	



4. Access to Social/Financial Services and Mobility

4.1 Access to Education and Skills

Are there any constraints for girls accessing education? What are the main constraints?

4.2 Gender preferences for sending children to school?

4.3 Are there any vocational centers/schools for girls/women? What kinds of training courses are available with these vocational centers?

5. Access to Health

5.1 What kinds of health facilities are available in the area? Do women seek pre and post-natal health consultations and care? If not, what are the main constraints? _____

5.2 Distance from the nearest health facility in KMs? _____

5.3 What are the main health issues for men and women? Any common water borne diseases in the area?

6. Access to Drinking Water

6.1 What are the main sources of drinking water?

6.2 What are the key drinking water specific issues in the area?

6.3 Do women fetch water in the area from outside? Distance travelled by women _____?

6.4 Time used in fetching water? _____

7. Access to Finance

7.1 What kind of financial services (such as banking, micro-finance, and savings) are available to women?

7.2 What kind of challenges/constraints women face in accessing financial services?

8. Access and Control over Resources



8.1 What are the common trends of women ownership of land and assets?

8.2 What kind of issues, women face in access and control over resources/assets/property?

9 Access to Income Earning Opportunities

9.1 Are you involved in Income generating activities?

i) Yes _____ ii) No _____

If yes, what are common activities?

i) Stitching/Embroidery _____ ii) Livestock _____ iii) Job _____ iv) other _____

9.2 What is opinion of male about the job of female, whether they like and encourage the female in jobs?

9.3 Are women allowed to work outside home? What are the main constraints for women in accessing economic opportunities?

9.4 Do you satisfied with the private wage/salary?

Yes _____ No _____ if No, how much it should be per day or per month (Rs.)

9.5 Did you allow saving your salary/income independently in a separate bank account?

yes _____ No _____, If No, why explain the reason. _____

9.6 In which area, the female employees spend their salaries or earnings on?

House construction: _____ Marriage of her children: _____ Education: _____

Kitchen: _____ Livestock: _____ Other: _____

9.7 What are the key potentials in the area for increasing women's participation in economic activities?

10 What is the attitude of the husband/ in laws family in case of more girl baby births against the willing of boy baby?

11 Women's Participation in Local Forums/Training Programs



11.1 What kind of local forums (formal, informal) exist in the area where women can participate?

11.2 Are there any cultural norms and social constraints refraining women to participate in the local forums?

11.3 What are the key potentials for engaging women in the local area development?

11.4 Do women participate in training programs offered by development partners (NGOs/CSOs)? What kind of training programs has been imparted?

12 Vulnerabilities (Poor, Elderly, Disabled and Widows)

12.1 What are the key vulnerabilities for women in the area?

12.2 What kind of social protection mechanisms/programs for the vulnerable women?

13 Have you ever faced violence from male members of the household?

Yes _____ No _____ If Yes, Type

Physical _____ Mental _____ On what type of Issues?

i) Domestic _____ ii) Economic _____ iii) Others _____

14. Any complaint or voice rose against violence to NGO or Police?

Yes _____ No _____, if yes where _____

14.1 Was compensated to the affected woman? yes _____ No _____

If yes, what result and consequences of that complaint? _____

If Not. Why.. _____

15. Project Benefits for Women

15.1 What protective measures do you suggest regarding the project implementation?

15.2 How women's participation could be ensured in the project implementation? How project interventions will benefit women?

15.3 What are the key recommendations for maximizing project benefits for women?



15.4 What kind of negative impacts do this project has on women?

15.5 What are the pressing needs of women of the Project Area?

16. Existence of other development partners:

16.1 Are there any other development partners (funding agencies, CSOs/NGOs) working in this area for the socio-economic development of the communities? List down the names of the development partners.

16.2 What kind of development support is provided by other development partners for the socio-economic uplift of the communities in this area?

17. Any other concerns/comments

Interviewer's Signature _____

ANNEX 5-2: LIST OF SENSITIVE RECEPTORS



ANNEX 5-2: LIST OF SENSITIVE RECEPTORS

Section 7			
Sl.	Name Sensitive Receptors	Longitude	Latitude
1	Harvard College of Commerce and Science	72.998594	33.612931
2	Government College of Commerce	72.995231	33.61258
3	Ujala School System	72.985984	33.617552
4	Kohinoor Textile Mills Mosque	72.979744	33.617484
5	Punjab College of Commerce	72.975686	33.623002
6	University of Wah	72.790459	33.741755
7	Nasheman Institute of Special Education	72.788962	33.743046
8	Froebel's International School Peshawar Road	72.974239	33.623763
9	Quaid-e-Azam International Hospital	72.973104	33.624688
10	SKANS International Islamic School	72.965755	33.623598
11	NUST College of Electrical and Mechanical Engineering	72.960163	33.622366
12	Army Public School Golra	72.95496	33.626279
13	Masjid Jafria	72.943377	33.626482
14	Jamia Masjid Farooq-e- Azam	72.91467	33.646632
15	Jamia Majid Ghousia Tarnol	72.91282	33.652145
16	Grace International Hospital	72.887988	33.663503
17	Health Aid College of Nursing	72.887428	33.663611
18	Alfalah Hospital	72.852926	33.676441
19	National Excellenec Institute	72.840105	33.686088
20	Government Associate College for Women Taxila	72.824736	33.7054
21	Taxila Bypass Masjid	72.814607	33.712415
22	Jamia Masjid Ghosia	72.804393	33.721422
23	Wahdat Colony Playground	72.804039	33.722368
24	New Lasani Medical Complex	72.804257	33.728758
25	Wah International Hospital	72.804808	33.732987
26	Haider Mosque	72.800006	33.73505
27	Mashal Degree College for Women	72.791333	33.740965
28	Jamia Masjid Al-Habib	72.788795	33.739893
29	COMSATS University Islamabad	72.7868	33.74371
30	Iqbal Memorial Hospital & Diagnostic Center	72.781635	33.743321
31	PWCT01-Virtual University	72.781962	33.744039
32	Rawal Surgical Hospital Wah Cantt	72.782569	33.743854
33	Graveyard Wah Cantt	72.770035	33.7467
34	Alain Hospital	72.762804	33.75192
35	Al-Moeed Hospital	72.753734	33.755341
36	Government boys High School Losar Sharfoo Taxila	72.749467	33.75372
37	Wise Montessori Campus	72.738276	33.759297
38	Froebel's International School	72.728224	33.761722
39	Dar-ul-Madina. Girls Primay & Secondary school	72.726351	33.76224
40	PWCT04- Virtual University Wah Model Town Campus, Wah Cantt	72.724469	33.76782



Section 7			
Sl.	Name Sensitive Receptors	Longitude	Latitude
41	Jamia Masjoid-e-Ibrahim	72.718134	33.77259
42	Lalarukh Graveyard	72.720835	33.776126
43	Bilal Masjid	72.719111	33.778364
44	Imambargah Qasr-e-Shabbir, Wah Cantt	72.71818	33.77875
45	Umer Masjid	72.718916	33.78085
46	Saint Paul High School Girls Campus	72.720587	33.781076
47	Sharif Hospital	72.718538	33.782562
48	CB Public Boys School & College, Lalarukh Wah Cantt	72.720491	33.785501
49	Superior College Wah Cantt	72.719833	33.787599
50	Ayesha Mosque	72.720942	33.789616
51	Federal Science Degree College	72.721593	33.788559
52	CB Play gROUND	72.720948	33.791407
53	Noor Hospital Wah Cantt	72.720642	33.79295
54	Punjab Group of Colleges, GT Road, Wah Cantt	72.707004	33.803654
55	Qadir Town Graveyard	72.703041	33.807509
56	Mualij Homeopathic Hospital Hassanabdal	72.698068	33.807708
57	Presentation convent High school	72.696961	33.809255
58	Fud International School	72.691781	33.810988
59	Jamia Masjid Fatima (RA)	72.691208	33.811045
60	The Educator Abdalian Campus	72.691805	33.813111
61	Hassan Medical and Surgical Complex	72.689101	33.81403
62	Government Girls Elementary Model School	72.680824	33.82225
63	Cadet College Hassanabdal	72.676758	33.819331
64	NADRA Registration Centre	72.67707	33.822159
65	Majid Hanfia	72.668234	33.822356
66	Dar-ul Uloom Muhammadia Ghousia Gulzare Madina	72.667995	33.821795
67	Minhas Masjid	72.658871	33.824071
68	Government Associate College Hassanabdal	72.652767	33.825059
69	Masjid Qaba Madni	72.636998	33.824098
70	Graveyard Burhan	72.633331	33.825325
71	Jamia Masjid Dhoke Molian	72.610673	33.819639
72	Mosque Anwar-e-Madina	72.620305	33.820439
73	Al Abbas Hospital	72.79482	33.738528
74	Swedish College of Engineering And Technology, Wah Cantt	72.72058	33.770795
75	Islamabad Model College	72.913693	33.650088
76	Noor Hospital	72.908828	33.649018
77	Tariq Dawakhana	72.850962	33.674475
78	Darbar Shah Jhani Sarkar	72.851263	33.673708
79	B-17 Lake	72.832997	33.694964
80	Jamia Masjid Sddiq-e-Akbar	72.808645	33.715815
81	POF Institute of Technology	72.783831	33.74508
82	Health Care Lab	72.772594	33.746886



Section 7			
Sl.	Name Sensitive Receptors	Longitude	Latitude
83	IDC Lab and Diagnostic Center	72.770658	33.746652
84	Masjid Jamia Usman	72.764435	33.748986
85	Noorani Masjid	72.746927	33.756518
86	Wah OInstitute of Safety and Technology-WIST	72.719603	33.791587
87	Madni Masjid	72.713876	33.796003
88	Jamia Masjid Shan-e-Sahaba	72.708895	33.798287
89	Jamia Masjid Qadir Town	72.704401	33.805057
90	Punjab Academy of Sciences	72.680791	33.817918
91	Benchmark School	72.997215	33.614283
92	East West Law College Hassanabdal	72.62314	33.821399

**ANNEX 7-1: LIST OF OTHER INTERESTED PARTIES AND
MINUTES OF THEIR CONSULTATIONS.**

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Sr. No.	Date	Department/ Organization	Name/Designation	Concerns / Suggestions
Islamabad Capital Territory				
1.	23-10-2024	Islamabad Wildlife Management Board (IWMB)	Ms. Ume Habiba, Director Wildlife	- The NESPAK team visited the subject office to brief the officials regarding the Project and share details. - The official told that N-5 road is passing nearby Margalla national park. Therefore, care should be taken while designing and construction of road to protect the wildlife. - The official requested NESPAK team to submit the Project details along with the RoW of the road. The IWMB official will then physically verify the site. - The official told that NoC will be required from IWMB before the start of construction activities.
2.	23-10-2024	CDA Environment	Mr. Rana Kashif, Horticulture (west)	- The NESPAK team visited the subject office to brief the officials regarding the Project and share details. - The official appreciated the proposed Project due to the traffic congestion situation on N5 road. - The E&S team was requested to coordinate with CDA throughout the Project. The official also told that the EIA/IEE matters are dealt by Federal EPA.
3.	22-10-2024	Archaeology Department	Mr. Arshad Ullah-Deputy Director	- The official told that no cultural notified site is present near the N-5 in Islamabad Capital Territory. However, on site verification will still be required to confirm once the detailed design will be finalized and unground demarcation will be completed (as required).. - The official recommended to incorporate the chance find procedure to NESPAK team.

Sr. No.	Date	Department/ Organization	Name/Designation	Concerns / Suggestions
4.	22-10-2024	Federal Environment Protection Agency	Mr. Bin Yamin, Assistant Director	The NESPAK's relevant environment and social team briefed the official regarding the proposed Project. The official provided following suggestions: - All stakeholders should be taken on board and consultation should be carried out at each stage. - Measures should be taken to minimize cutting of trees. Following points must be considered while preparing Environmental Impact Assessment report: - Identification of location for construction camps alternate routes for traffic flow during construction - Arrangements for material storage and transport - Alternate routes shall be provided in consultation with Traffic Police to the residents and commuters. - Dust control mitigations shall be recommended to the contractor - Demolition waste shall be properly disposed if it cannot be reused.
5.	September – October 2024	NHA Environment, Afforestation and Land Section (EALS)	Mr. Farid Khan Ms. Nosheen Butt	Team is in close coordination with the EALS section of NHA for the land ownership. EALS Section wrote the letters to concerned regional maintenance offices and Road Asset Management Department (RAMD) for the provision of available ROW data, land ownership status/record and record of encroachment and lease within the ROW. Based on these letters, consultants visited the concerned maintenance offices to obtain the respective data.
Khyber Pakhtunkhwa Province				
6.	03-10-2024	Environmental Protection Agency- Khyber Pakhtunkhwa	Mr. Sami Ullah, Director General Mr. Mumtaz Ali Wazir, Deputy Director Legal	Overall, EPA was in favor of the proposed Project. The official briefed about advantages of the proposed Project as its implementation will benefit all the

Sr. No.	Date	Department/ Organization	Name/Designation	Concerns / Suggestions
				neighborhood along the route. Traffic congestions in the Project Area will be reduced. - E&S Consultant must fill and submit Schedule-I form provided in Khyber Pakhtunkhwa Environmental assessment rules, 2021 to agency through NHA and specified study must be submitted to EPA for obtaining NOC prior to start of work. - Collection of environmental, social and ecological baseline data must be ensured through primary means using field visit checklists and socio-economic tools; - Alternate routes shall be provided in consultation with Traffic Police to the residents, educational institutions and road users for their movement and to avoid the chaotic situation of traffic at this bottleneck;
7.	03-10-2024	Forest Department	Mr. Kifayatullah Baloch, Chief Conservator Forest Department	- No specific reserve forest and important area exist in the vicinity of the Project ROW however; the proponent will request cutting of trees from Forest department via letter. The concerned Divisional Forest Officers will visit the site with the NHA and E&S officials to verify the trees. - Tree cutting should be avoided up to maximum level; and - A feasible provision of budget for tree plantation plan should be included in the Project cost
8.	03-10-2024	Wildlife Department	Iftikhar uz Zaman, Conservator Wildlife department	The official appreciated that the E&S team is conducting meaningful consultations with the department prior to the start of the Project

Sr. No.	Date	Department/ Organization	Name/Designation	Concerns / Suggestions
			Mr. Ali Gohar, GIS Expert/ Range Officer	The official told that no as such impact is envisaged on wildlife. The concerned District Forest Officer (DFO) will be directed to verify and provide the No objection certificate if required.
9.	03-10-2024	Directorate of Archaeology and Museums Government of Khyber Pakhtunkhwa	Mr. Faheem Shahzad, Section Officer	The official told that no archeological site exists near the proposed section (Peshawar to Nowshera). However, he suggested to incorporate the procedure of any accidental and chance of finding any historical / archeological site during the execution of work.
10.	14-10-2024	Social Welfare & Women Development Complex Peshawar Division	Mr. Qayum Khan- Deputy Director	The official provided following suggestions: - Facilities of rest by areas and public toilets for the passengers should be provided. - At Bus Stop, waiting room for passengers should be constructed. - Prayer area must be provided for passengers. - Maximum skilled & unskilled labor should be hired from the local community during the Project construction activities so that local people can take maximum benefit of the Project. - Occupational health and safety should be taken care with respect during construction of the road. - Physical and livelihood disturbance should be avoided/minimized. - During the construction period safe movement of the pedestrian should be ensured and proper Traffic Management Plan (TMP) should be devised.

Sr. No.	Date	Department/ Organization	Name/Designation	Concerns / Suggestions
				- Awareness among the students should be created about the Project. Traffic should be managed properly in school hours during the construction work. - Awareness among the population about the risks associated the Project activities and mitigation measures should be adopted. - The environment of the most part of Project Area is friendly, but due to construction activities dust & air pollution may lead to respiratory diseases. Medical camp should be established in the area during the period of construction. - The official briefed about advantages of the proposed Project as its implementation will benefit all the neighborhood along the route; - Traffic congestions in the Project Area will be reduced.
11.	18-11-2024	KP Social Welfare Department (Child Protection Unit - CPO) KP Directorate of Social Welfare	Mr. Akhtar Muneer – Child Protection Officer Mr. Nayyab Ali - Social Case worker Mr. Haris Khan, Social Case worker	The official provided following suggestions/recommendations: - Build waiting rooms for commuters to provide shelter from harsh weather conditions. - Construct underground pedestrian crossings as they are more feasible and can also serve commercial purposes (e.g., shops). - Recommend underground passes in nearby and adjacent crowded areas. - Install visible signboards with clear instructions and emergency contact numbers. - Develop a green belt adjacent to the road with small forested areas and a playground for children.

Sr. No.	Date	Department/ Organization	Name/Designation	Concerns / Suggestions
				- Remove billboards in the area to reduce distractions for drivers. - Road Divider Installation: Install road dividers to prevent glare from opposite traffic
12.	19-11-2024	KP Social Welfare Department (Women Empowerment) KP Directorate of Social Welfare	Mr. Noor Muhammad, District Social welfare Officer Mr. Sardar Ali, District Social welfare Officer (NGO) Mr. Sahib, auxiliary works Musa Khan, Junior Clerk	The official provided following suggestions/recommendations - Passenger waiting rooms - Zebra crossing provision for the local population - Schools are located adjacent to the road; special precautions need to be considered - Road blockage during construction may cause traffic congestion and traffic Jam, careful planning is required - Overhead bridges and flyover need to be designed
13.	19-11-2024	Labour Department Government of Khyber Pakhtunkhwa KP Directorate of labour	Mr. Irfan, Director Labour Mr. Zaheer, PA to Director labour Mr. Azhar, Assistant Director Administration	The official provided following suggestions: - Compliance with Minimum wages and local labour laws to be ensured - Discourage child labour and forced labour - Implementation of CSR activities to support local people - Development of robust Environmental and Social Management plan to minimize the negative impacts on the community
14.	19-11-2024	Secours Islamique France (Islamic Relief France) Non-Governmental Organization	Mr. Asif Anwar, livelihood Officer Mr. Mansoor Ahmed, Meal Officer KP Ms. Sanam – Distribution Assistant, Ms. Azra, Meal Assitant,	The official provided following feedback: - Positive Impacts and Suggestions - Benefits of the Project, Reduction in accidents and traffic congestion. - Improved business opportunities and growth for local communities.

Sr. No.	Date	Department/ Organization	Name/Designation	Concerns / Suggestions
			Ms. Beenish, Livelihood Assistant	- Potential Issues that may arise during construction, - the Project construction may lead to environmental impacts and social issues in the area. - Resettlement of local residents and disruption to livelihoods are potential negative outcomes. - Social disconnection between the two sides of the area could occur due to road division - Construct flyovers, overhead bridges, and fencing to prevent road accidents, especially involving children. - Address traffic congestion during construction and operational phases. - Mitigation Measures the stakeholder suggested are, - To coordinate with all stakeholders in and around the area. - Compensate affected individuals through proper resettlement packages. - Address livelihood disruptions by providing alternative means of income (e.g., skill development programs). - Tree plantation in affected areas to minimize environmental impact. - Community Support Initiatives - Launch skill development programs such as mobile repair training, poultry farming, and indoor poultry farms.

Sr. No.	Date	Department/ Organization	Name/Designation	Concerns / Suggestions
				○ Provide seeds to encourage kitchen gardening in the community.
15.	19-11-2024	Foundation for Rural Development- (FRD) Non-Governmental Organization	Ms. Shumaila Murtaza, Meal Manager Ms. Sana Ibraheem, HR	The official provided following suggestions: • Concerns: ○ Possible tree cutting for the Project. ○ Issues for local women during the construction phase (e.g., accessibility and safety). ○ Issues related to Parda (Religious sensitivity) in the local Area ○ Gender Based Violence (GBV) ○ Transportation issues in the area • Recommendations during construction Phase: ○ Focus on greenery and reforestation efforts post-construction. ○ Design separate transport stops for men and women for cultural sensitivity. ○ Initiatives for the protection of women like Ababeel force etc. ○ Construct waiting rooms, zebra crossings, and flyovers to enhance pedestrian safety. ○ Ensure school road accessibility to avoid blockages that inconvenience residents. ○ Prioritize safety measures such as fencing, flyovers, and pedestrian crossings ○ Initiate compensation and community programs to reduce social and economic disruption. • Operational Phase Recommendations

Sr. No.	Date	Department/ Organization	Name/Designation	Concerns / Suggestions
				○ Capacity Building, Conduct training programs on gender-based violence (GBV) and local demand-driven skills. ○ Form committees involving women for inclusive planning and execution. ○ Infrastructure Enhancements ○ Build underpasses and overhead bridges for safer pedestrian access. ○ Separate transport stops for men and women.
Punjab Province				
16.	10-10-2024	Environmental Protection & Climate Change Department	Mr. Waseem Ahsan (Director – EIA) Mr. Noor Ahmad (Deputy Director – EIA)	• Official direct to seek NOC and approval from EPA as per the regulatory requirement prior to initiate the work. • Dust control in the area should be ensured. Dust suppressors (salt / water) preferably CaCl_2 should be sprayed on roadside. • Ensure minimal impact to nearby cities and communities. • Construction camps and asphalt plants should be installed away from the population. • Asphalt plants should preferably have a built-in pollution control technology. • Construction material disposal and transportation should be done properly as per existing laws.
17.	10-10-2024	Tourism, Archaeology and Museums Department	Ms. Sadaf Zafar (Additional Secretary)	• The official recommended that access roads to nearby tourist/ archeological sites should also be planned.

Sr. No.	Date	Department/ Organization	Name/Designation	Concerns / Suggestions
			Mr. Iqbal Khan Manj (Deputy Director – Admin)	- Archaeological sites within 200 – 300 ft. of distance from the Project area of impact should be avoided as much as possible. - Concerns were shown regarding the safety of Nicholson Tower which is located at Tarnol Pass on main GT Road in Rawalpindi to Burhan package. - A list of important archaeological sites of Punjab was shared with the consultant for assistance. It was preliminary observed that no notified archeological site exists in nearby ROW of N5. - Further meetings will be arranged for future planning at ESIA stage once the design of each package will be finalized.
18.	14-10-2024	Wildlife Department	Mr. Khurram Amin (Additional Secretary-Technical)	- It was suggested that wildlife corridors should be considered in the Project design and special measures must be considered for crossing of these wildlife if encountered. - Maps with marked species territory and protected areas will be provided by the wildlife department at later stage after finalization of ROW/ design to the consultants for assistance.
19.	14-10-2024	Forest Department	Mr. Sajid Mahmood (Deputy Director – Admin) Mr. Haroon Abdullah (Assistant Director – Admin)	- The official informed that the median and roadside/ canal side/ railway line side plantation in whole Punjab is a protected forest area. - He shared list of relevant Division Forest Officers (DFOs) of Punjab who will provide relevant data to the consultant.

Sr. No.	Date	Department/ Organization	Name/Designation	Concerns / Suggestions
				The official requested consultants to provide site plans and road maps to DFOs.
20.	10-10-2024	Social Welfare and Baitulmaal Department	Mr. Aslam Section Officer (Social Welfare) Mr. Shahid Iqbal Saroya – Section Officer – 0345-4042799 Mr. Muhammad Asif – PA to SS – 0333-4136827	- The official told that local people should be given employment opportunities in the proposed Project. - The official told that child labor should be strictly prohibited and due care and consideration should be given to the community health and safety
21.	21-11-2024	Child protection & Welfare Bureau Home Dept. Govt. of Punjab	Mr. Waseem Abbas – Media Officer Mr. Asif Nadeem – Social Protection Officer	The official discussed following points: - Provision for safe road crossing should be ensured, and overhead bridges should be constructed at suitable intervals to facilitate pedestrian movement. - Appropriate signage should be installed to indicate speed limits, particularly in areas near schools, to enhance safety for children. - Roads in the vicinity of schools should be fenced to prevent children from crossing haphazardly. - These measures are essential to minimize the risk of road accidents and ensure the safety of children and other pedestrians.
22.	21-11-2024	Women Development Department Govt. of Punjab	Ms. Naeem Afzal – Deputy Secretary Planning Mr. Shabbir Hussain – Admin Officer	The official discussed following points: - A dedicated pink lane should be established on the highway to ensure the safety and convenience of women commuters. - Road underpasses should be constructed to prevent dangerous crossings and ensure safe passage for women.

Sr. No.	Date	Department/ Organization	Name/Designation	Concerns / Suggestions
				- Separate bus stops should be designated exclusively for women to reduce the risk of harassment and ensure their safety. - The design of the road should restrict public access to these specific stops, ensuring a secure environment for women. - Clear signboards should be placed along the road to indicate speed limits and provide other essential instructions for drivers. - Accessibility for women with disabilities should be incorporated, with proper indicators and instructions to cater to their specific needs.
23.	21-11-2024	Office of the DG Labour welfare Labour & Human resource Department Govt. of Punjab	Mr. Zubair Hassan Rajput	The official discussed following points: - Workers should receive their salaries on time, ensuring compliance with minimum wage standards. For example, with a minimum wage of 37,000 PKR, the daily wage should be calculated as 37,000 divided by 26, resulting in 1,423 PKR per day. - Compliance with daily working hours regulations must be ensured, and workers should be granted appropriate rest periods. - Personal protective equipment (PPE) such as long shoes, gloves, goggles, and helmets should be provided during construction activities, along with other necessary workplace safety precautions. - Overtime should be limited to a maximum of two hours per day.

Sr. No.	Date	Department/ Organization	Name/Designation	Concerns / Suggestions
				- Female employees should be entitled to maternity leave in accordance with labor laws. - Employers are required to sign contracts with employees, and an appointment letter should be provided to each worker. - Employees must be given relevant Standard Operating Procedures (SOPs) and Job Descriptions (JDs). - Signboards must be installed at construction sites to promote safety, and all activities should comply with the Occupational Health and Safety Act of Punjab.
24.	21-11-2024	Punjab Rural Support Program (PRSP) Non-Governmental Organization	Nadeem Akram Siddiqui – Transport Officer – 0334-4201065	The official discussed following points: - Dividers should be installed along the highway with adequate width and height to prevent glare from oncoming traffic, ensuring better visibility and safety. - The socio-economic impact of the Project should be assessed, and compensation should be provided to local communities who are displaced or otherwise affected by the Project. - Workers and local residents may be impacted by dust and pollution during construction. Continuous water sprinkling should be implemented to minimize these environmental issues. - Tree plantation activities should be carried out promptly after the clearing of land, helping to restore the environment. - Upon Project completion, safety signs and toll-free emergency numbers should be displayed prominently,

Sr. No.	Date	Department/ Organization	Name/Designation	Concerns / Suggestions
				with specific attention to women's safety. Emergency contact numbers and rescue services should be easily accessible at suitable locations along the route. • Rest areas should be provided at 20-25-kilometer intervals, equipped with dispensaries, public washrooms, and law enforcement officers for added security. • Female staff should be employed in law enforcement agencies and ambulance services to ensure that women are catered to in a sensitive and appropriate manner during their travel. • Anti-fog measures should be implemented on the highway as per standard practices to improve visibility during low-visibility conditions.
25.	18-10-2024	NHA Maintenance Office	Mr. Iftexhar Sajid – GM Maintenance North Punjab (Regional Office Punjab) 0313-4319914	Team visited the regional office Punjab and met GM-Maintenance North Punjab. The official ensured to support the consultant in all aspects for the preparation of RAP documents and also provided the ROW data of Package 7. The office also facilitates the team during the site reconnaissance and onsite briefing of available ROW. The team also requested to share the encroachment data and lease data on which the official responded that the encroachment data is not much reliable and updated however he assured to share the lease data with consultant for the priority packages.

ANNEX 8-1: OUTLINE OF PROJECT LEVEL EMERGENCY PREPAREDNESS AND RESPONSE PLAN (EPRP)



ANNEX 8-1: OUTLINE OF PROJECT LEVEL EMERGENCY PREPAREDNESS AND RESPONSE PLAN (EPRP)

1. BACKGROUND
2. POLICY AND GUIDELINES
 - 2.1 AIIB ESF - Emergency Preparedness Plan
 - 2.2 OSHA 3122
 - 2.3 OSHA 3990 and 29 CFR 1910.1030
3. SCOPE OF PLAN
4. MANAGEMENT OF EPRP
 - 4.1 Importance of the EPRP
 - 4.2 Purpose of the Plan
 - 4.3 Application of this EPRP
5. EPRP MANAGEMENT STRUCTURE
 - 5.1 Introduction
 - 5.2 The Emergency Response Team (ERT)
 - 5.2.1 Membership
 - 5.2.2 Meetings
 - 5.2.3 Meeting Place
 - 5.2.4 Function
 - 5.3 Incidence Response Center (IRT)
 - 5.4 The IRT
 - 5.4.1 Organization
 - 5.4.2 Resources
 - 5.4.3 Funding
 - 5.4.4 Emergency Contact List
 - 5.4.5 Reporting
 - 5.5 Training
6. PREVENTION



- 6.1 Introduction
- 6.2 Emergency Risk Management
- 6.3 Prevention through Mitigation Measures
- 6.4 Review of Risks
- 7. PREPAREDNESS
 - 7.1 Preparedness Activities
 - 7.2 Exercises
 - 7.3 Updating the Emergency Contact List
- 8. EMERGENCY RESPONSE
 - 8.1 Introduction
 - 8.2 Incidence Response Teams
 - 8.3 Management of Multiple Emergency Events
 - 8.4 Communication Plan
 - 8.5 Logistics
 - 8.6 Public Relations and Media
- 9. RECOVERY
 - 9.1 Recovery Management
 - 9.2 Clean-up
 - 9.3 Investigative Follow-Up
 - 9.4 Other EPRPs
- 10. EQUIPMENT AND HEAVY MACHINERY WITH CONTRACTORS
 - 10.1 Contractor 1
 - 10.2 Contractor 2
 - 10.3 Contractor 3
- 11. IMPORTANT PHONE NUMBERS

ANNEX 10–1: ENVIRONMENTAL CODE OF PRACTICES (ECPS)



ANNEX 10–1: ENVIRONMENTAL CODE OF PRACTICES (ECPS)

INTRODUCTION

The objective of the Environmental Code of Practices (ECPs) is to address all potential and general construction related impacts and risks during implementation of the Project. The ECPs consist of environmental and social management guidelines to be followed by the contractors for sustainable management of all environmental and social issues. These ECPs shall be annexed to the general conditions of all the contracts, including subcontracts, carried out under the Project.

The list of ECPs prepared for the Project is given below.

- ECP 1: Waste Management
- ECP 2: Fuels and Hazardous Goods Management
- ECP 3: Water Resources Management
- ECP 4: Drainage Management
- ECP 5: Soil Quality Management
- ECP 6: Erosion and Sediment Control
- ECP 7: Top Soil Management
- ECP 8: Topography and Landscaping
- ECP 9: Borrow Areas Development & Operation
- ECP 10: Air Quality Management
- ECP 11: Noise and Vibration Management
- ECP 12: Protection of Flora
- ECP 13: Protection of Fauna
- ECP 14: Road Transport and Road Traffic Management
- ECP 15: Construction Camp Management
- ECP 16: Cultural and Religious Issues
- ECP 17: Construction and Operation Phase Security

Contractors will prepare site specific management plans, namely Construction Environmental and Social Action Plan (CESAP) and Occupational Health and Safety Plan, in compliance with World Bank and Government Regulation and guidelines and based on the guidance given in the ECPs. The CESAP and OHS Plan will form the part of the contract documents and will be used as monitoring tool for compliance. It is mandatory for the main contractors procured directly by the project to include these ECPs in their subcontracts. Violation of the compliance requirements will be treated as non-compliance leading to the corrections or otherwise imposing penalty on the contractors.



ECP 1: Waste Management

Project Activity/ Impact Source	Environmental Impacts	Mitigation Measures/ Management Guidelines
General Waste	Soil and water pollution from the improper management of wastes and excess materials from the construction sites.	The Contractor shall • Develop site specific waste management plan for various specific waste streams (e.g., reusable waste, flammable waste, construction debris, food waste etc.) prior to commencing of construction and submit to supervision consultant for approval. • Organize disposal of all wastes generated during construction in the designated disposal sites approved by the Project. • Minimize the production of waste materials by 3R (Reduce, Recycle and Reuse) approach. • Segregate and reuse or recycle all the wastes, wherever practical. • Vehicles transporting solid waste shall be covered with tarps or nets to prevent spilling waste along the route. • Train and instruct all personnel in waste management practices and procedures as a component of the environmental induction process. • Provide refuse containers at each worksite. • Request suppliers to minimize packaging where practicable. • Place a high emphasis on good housekeeping practices. • Maintain all construction sites in a cleaner, tidy and safe condition and provide and maintain appropriate facilities as temporary storage of all wastes before transportation and final disposal. • Potable water should be supplied in bulk containers to reduce the quantity of plastic waste (plastic bottles). Plastic bag use should be avoided.
Hazardous Waste	Health hazards and environmental impacts due to improper waste management practices	The Contractor shall • Collect chemical wastes in 200 liter drums (or similar sealed container), appropriately labeled for safe transport to an approved chemical waste depot. • Store, transport and handle all chemicals avoiding potential environmental pollution. • Store all hazardous wastes appropriately in bunded areas away from water courses.



Project Activity/ Impact Source	Environmental Impacts	Mitigation Measures/ Management Guidelines
		• Make available Material Safety Data Sheets (MSDS) for hazardous materials on-site during construction. • Collect hydrocarbon wastes, including lube oils, for safe transport off-site for reuse, recycling, treatment or disposal at approved locations. • Construct concrete or other impermeable flooring to prevent seepage in case of spills.

ECP 2: Fuels and Hazardous Goods Management

Project Activity/ Impact Source	Environmental Impacts	Mitigation Measures/ Management Guidelines
Fuels and hazardous goods.	Materials used in construction have a potential to be a source of contamination. Improper storage and handling of fuels, lubricants, chemicals and hazardous goods/materials on-site, and potential spills from these goods may harm the environment or health of construction workers.	The Contractor shall • Prepare spill control procedures and submit them for supervision consultant approval. • Train the relevant construction personnel in handling of fuels and spill control procedures. • Store dangerous goods in bunded areas on top of a sealed plastic sheet away from watercourses. • Refueling shall occur only within bunded areas. • Store and use fuels in accordance with material safety data sheets (MSDS). Make available MSDS for chemicals and dangerous goods on-site. • Transport waste of dangerous goods, which cannot be recycled, to a designated disposal site. • Provide absorbent and containment material (e.g., absorbent matting) where hazardous material are used and stored; and ensure personnel trained in the correct use. • Provide protective clothing, safety boots, helmets, masks, gloves, goggles, to the construction personnel, appropriate to materials in use.



Project Activity/ Impact Source	Environmental Impacts	Mitigation Measures/ Management Guidelines
		• Make sure all containers, drums, and tanks that are used for storage are in good condition and are labeled with expiry date. Any container, drum, or tank that is dented, cracked, or rusted might eventually leak. Check for leakage regularly to identify potential problems before they occur. • Store and use fuels in accordance with material safety data sheets (MSDSs). • Store all liquid fuels in fully bunded storage containers, with appropriate volumes, a roof, a collection point and appropriate filling/decanting point. • Store hazardous materials above flood level considered for construction purposes • Put containers and drums in temporary storages in clearly marked areas, where they will not be run over by vehicles or heavy machinery. The area shall preferably slope or drain to a safe collection area in the event of a spill. • Take all precautionary measures when handling and storing fuels and lubricants, avoiding environmental pollution. • Avoid the use of material with greater potential for contamination by substituting them with more environmentally friendly materials.

ECP 3: Water Resources Management

Project Activity/ Impact Source	Environmental Impacts	Mitigation Measures/ Management Guidelines
Hazardous material and Waste	Water pollution from the storage, handling and disposal of hazardous materials and general construction waste, and accidental spillage	The Contractor shall • Follow the management guidelines proposed in ECPs 1 and 2. • Minimize the generation of sediment, oil and grease, excess nutrients, organic matter, litter, debris and any form of waste (particularly petroleum and



Project Activity/ Impact Source	Environmental Impacts	Mitigation Measures/ Management Guidelines
		chemical wastes). These substances must not enter waterways or storm water systems.
Discharge from construction sites	Construction activities, sewerages from construction sites and work camps may affect the surface water quality. The construction works will modify groundcover and topography changing the surface water drainage patterns of the area. These changes in hydrological regime lead to increased rate of runoff, increase in sediment and contaminant loading, increased flooding, and effect habitat of fish and other aquatic biology.	The Contractor shall • Install temporary drainage works (channels and bunds) in areas required for sediment and erosion control and around storage areas for construction materials. • Install temporary sediment basins, where appropriate, to capture sediment-laden run-off from site. • Divert runoff from undisturbed areas around the construction site. • Stockpile materials away from drainage lines • Prevent all solid and liquid wastes entering waterways by collecting solid waste, oils, chemicals, bitumen spray waste and wastewaters from brick, concrete and asphalt cutting where possible and transport to an approved waste disposal site or recycling depot. • Wash out ready-mix concrete agitators and concrete handling equipment at washing facilities off site or into approved bunded areas on site. Ensure that tires of construction vehicles are cleaned in the washing bay (constructed at the entrance of the construction site) to remove the mud from the wheels. This should be done in every exit of each construction vehicle to ensure the local roads are kept clean.
Soil erosion and siltation	Soil erosion and dust from the material stockpiles will increase the sediment and contaminant loading of surface water bodies.	The Contractor shall • Stabilize the cleared areas not used for construction activities with vegetation or appropriate surface water treatments as soon as practicable following earthwork to minimize erosion. • Ensure that roads used by construction vehicles are swept regularly to remove dust and sediment.



Project Activity/ Impact Source	Environmental Impacts	Mitigation Measures/ Management Guidelines
		Water the loose material stockpiles, access roads and bare soils on an as required basis to minimize dust. Increase the watering frequency during periods of high risk (e.g., high winds).
Construction activities in water bodies	Construction works in the water bodies will increase sediment and contaminant loading, and effect habitat of fish and other aquatic biology.	The Contractor Shall - Dewater sites by pumping water to a sediment basin prior to release off site – do not pump directly off site. - Monitor the water quality in the runoff from the site or areas affected by dredge/excavation plumes, and improve work practices as necessary. - Protect water bodies from sediment loads by silt screen or other barriers. - Minimize the generation of sediment, oil and grease, excess nutrients, organic matter, litter, debris and any form of waste (particularly petroleum and chemical wastes). These substances must not enter waterways or storm water systems. - Do not discharge cement and water curing used for cement concrete directly into water courses and drainage inlets.
Drinking water	Untreated surface water is not suitable for drinking purposes due to presence of suspended solids and ecoli.	The Contractor Shall Provide the drinking water that meets NEQS standards. Drinking water to be chlorinated at source, and ensure presence of residual chlorine 0.1 ~ 0.25 ppm as minimum after 30 minutes of chlorine contact time.

ECP 4: Drainage Management

Project Activity/ Impact Source	Environmental Impacts	Mitigation Measures/ Management Guidelines
Excavation and earth works, and construction yards	Lack of proper drainage for rainwater/liquid waste or wastewater owing to the construction activities	The Contractor shall Prepare drainage management procedures and submit them for supervision consultant approval.



Project Activity/ Impact Source	Environmental Impacts	Mitigation Measures/ Management Guidelines
	harms environment in terms of water and soil contamination, and mosquito growth.	• Prepare a program to prevent/avoid standing waters, which supervision consultant will verify in advance and confirm during implementation. • Provide alternative drainage for rainwater if the construction works/earth-fillings cut the established drainage line. • Establish local drainage line with appropriate silt collector and silt screen for rainwater or wastewater connecting to the existing established drainage lines already there. • Rehabilitate road drainage structures immediately if damaged by contractors' road transports. • Build new drainage lines as appropriate and required for wastewater from construction yards connecting to the available nearby recipient water bodies. Ensure wastewater quality conforms to NEQS, before it is being discharged into the recipient water bodies. • Ensure that there will be no water stagnation at the construction sites and camps. • Provide appropriate silt collector and silt screen at the inlet and manholes and periodically clean the drainage system to avoid drainage congestion. • Protect natural slopes of drainage channels to ensure adequate storm water drains. • Regularly inspect and maintain all drainage channels to assess and alleviate any drainage congestion problem.
Ponding of water	Health hazards due to mosquito breeding	• Do not allow ponding of water especially near the waste storage areas and construction camps. • Discard all the storage containers that are capable of storing of water, after use or store them in inverted position.

ECP 5:Soil Quality Management



Project Activity/ Impact Source	Environmental Impacts	Mitigation Measures/ Management Guidelines
Storage of hazardous and toxic chemicals	Spillage of hazardous and toxic chemicals will contaminate the soils	The Contractor shall • Strictly manage the wastes management plans proposed in ECP1 and storage of materials in ECP2. • Construct appropriate spill contaminant facilities for all fuel storage areas. • Establish and maintain a hazardous material register detailing the location and quantities of hazardous substances including the storage, and their disposals. • Train personnel and implement safe work practices for minimizing the risk of spillage. • Identify the cause of contamination, if it is reported, and contain the area of contamination. The impact may be contained by isolating the source or implementing controls around the affected site. • Remediate the contaminated land using the most appropriate available method.
Construction material stock piles	Erosion from construction material stockpiles may contaminate the soils	The Contractor shall • Protect the toe of all stockpiles, where erosion is likely to occur, with silt fences, straw bales or bunds.

ECP 6: Erosion and Sediment Control

Project Activity/ Impact Source	Environmental Impacts	Mitigation Measures/ Management Guidelines
Clearing of construction sites	Cleared areas and slopes are susceptible for erosion of top soils, which affects the growth of vegetation and causes ecological imbalance.	The Contractor shall • Prepare site specific erosion and sediment control measures and submit them for supervision consultant approval. • Reinstate and protect cleared areas as soon as possible.



Project Activity/ Impact Source	Environmental Impacts	Mitigation Measures/ Management Guidelines
		Cover unused area of disturbed or exposed surfaces immediately with mulch/grass turf/tree plantations.
Construction activities and material stockpiles	The impact of soil erosion are (i) Increased run off and sedimentation causing a greater flood hazard to the downstream, and (ii) destruction of aquatic environment by erosion and/or deposition of sediment damaging the spawning grounds of fish	The Contractor shall - Locate stockpiles away from drainage lines. - Protect the toe of all stockpiles, where erosion is likely to occur, with silt fences, straw bales or bunds. - Remove debris from drainage paths and sediment control structures. - Cover the loose sediments of construction material and water them if required. - Divert natural runoff around construction areas prior to any site disturbance. - Install protective measures on site prior to construction, for example, sediment traps. - Install 'cut off drains' on large cut/fill batter slopes to control water runoff speed and hence erosion. - Observe the performance of drainage structures and erosion controls during rain and modify as required.
Soil erosion and siltation	Soil erosion and dust from the material stockpiles will increase the sediment and contaminant loading of surface water bodies.	The Contractor shall - Stabilize the cleared areas not used for construction activities with vegetation or appropriate surface water treatments as soon as practicable following earthwork to minimize erosion. - Ensure that roads used by construction vehicles are swept regularly to remove sediment. - Water the material stockpiles, access roads and bare soils on an as required basis to minimize dust. Increase the watering frequency during periods of high risk (e.g. high winds).

ECP 7: Top Soil Management



Project Activity/ Impact Source	Environmental Impacts	Mitigation Measures/ Management Guidelines
Land clearing and earth works	Earthworks will impact the fertile top soils that are enriched with nutrients required for plant growth or agricultural development.	The Contractor shall • Strip the top soil to a depth of 15 cm and store in stock piles of height not exceeding 2m. • Remove unwanted materials from top soil like grass, roots of trees and similar others. • The stockpiles will be done in slopes of 2:1 to reduce surface runoff and enhance percolation through the mass of stored soil. • Locate topsoil stockpiles in areas outside drainage lines and protect from erosion. • Construct diversion channels and silt fences around the topsoil stockpiles to prevent erosion and loss of topsoil. • Spread the topsoil to maintain the physico-chemical and biological activity of the soil. The stored top soil will be utilized for covering all disturbed area and along the proposed plantation sites. • Prior to the re-spreading of topsoil, the ground surface will be ripped to assist the bunding of the soil layers, water penetration and revegetation
Transport	Vehicular movement outside ROW or temporary access roads will affect the soil fertility of the agricultural lands	• Limit equipment and vehicular movements to within the approved construction zone. • Plan construction access to make use, if possible, of the final road alignment.

ECP 8: Topography and Landscaping

Project Activity/ Impact Source	Environmental Impacts	Mitigation Measures/ Management Guidelines
Land clearing and earth works	Construction activities especially earthworks will change topography and disturb the	The Contractor shall



Project Activity/ Impact Source	Environmental Impacts	Mitigation Measures/ Management Guidelines
	natural rainwater/flood water drainage as well as will change the local landscape.	• Prepare landscaping and plantation plan and submit the plan for supervision consultant approval. • Ensure the topography of the final surface of all raised lands (construction yards, approach roads and rails, access roads, etc.) are conducive to enhance natural draining of rainwater/flood water. • Keep the final or finished surface of all the raised lands free from any kind of depression that causes water logging. • Undertake mitigation measures for erosion control/prevention by grass-turfing and tree plantation, where there is a possibility of rain-cut that will change the shape of topography. • Cover immediately the uncovered open surface that has no use of construction activities with grass-cover and tree plantation to prevent soil erosion and bring improved landscaping. • Reinstate the natural landscape of the ancillary construction sites after completion of works.

ECP 9: Borrow Areas Development & Operation

Project Activity/ Impact Source	Environmental Impacts	Mitigation Measures/ Management Guidelines
Development and operation of borrow and quarry areas	Borrow and quarry areas will have impacts on local topography, landscaping and natural drainage.	The Contractor shall • Prepare borrow area management plan and submit the plan for supervision consultant approval. • Use only approved quarry and borrow sites



Project Activity/ Impact Source	Environmental Impacts	Mitigation Measures/ Management Guidelines
		• Identify new borrow and quarry areas in consultation with Project Director, if required. • Reuse excavated or disposed material available in the project to the maximum extent possible. • Store top soil for reinstatement and landscaping. • Develop surface water collection and drainage systems, anti-erosion measures (berms, revegetation etc.) and retaining walls and gabions where required. Implement mitigation measures in ECP 3: Water Resources Management, ECP 6: Erosion and Sediment Control • The use of explosive should be used in as much minimum quantity as possible to reduce noise, vibration and dust. • Control dust and air quality deterioration by application of watering and implementing mitigation measures proposed in ECP 10: Air Quality Management • Noise and vibration control by ECP 11: Noise and Vibration Management.

ECP 10: Air and Dust Quality Management



Project Activity/ Impact Source	Environmental Impacts	Mitigation Measures/ Management Guidelines
Construction vehicular traffic	Air quality can be adversely affected by vehicle exhaust emissions and combustion of fuels.	The Contractor shall • Prepare air quality management plan (under the Pollution Prevention Plan) and submit the plan for supervision consultant approval. • Fit vehicles with appropriate exhaust systems and emission control devices. Maintain these devices in good working condition. • Operate the vehicles in a fuel efficient manner. • Cover hauls vehicles carrying dusty materials moving outside the construction site. • Impose speed limits on all vehicle movement at the worksite to reduce dust emissions. • Control the movement of construction traffic. • Water construction materials prior to loading and transport. • Service all vehicles regularly to minimize emissions. • Limit the idling time of vehicles not more than 2 minutes.
Construction machinery	Air quality can be adversely affected by emissions from machinery and combustion of fuels.	The Contractor shall • Fit machinery with appropriate exhaust systems and emission control devices. Maintain these devices in good working condition in accordance with the specifications defined by their manufacturers to maximize combustion efficiency and minimize the contaminant emissions. Proof or maintenance register shall be required by the equipment suppliers and contractors/subcontractors. • Focus special attention on containing the emissions from generators. • Machinery causing excess pollution (e.g. visible smoke) will be banned from construction sites. • Service all equipment regularly to minimize emissions. • Provide filtering systems, duct collectors or humidification or other techniques (as applicable) to the concrete batching and mixing plant to control the particle



Project Activity/ Impact Source	Environmental Impacts	Mitigation Measures/ Management Guidelines
		emissions in all its stages, including unloading, collection, aggregate handling, cement dumping, circulation of trucks and machinery inside the installations.
Construction activities	Dust generation from construction sites, material stockpiles and access roads is a nuisance in the environment and can be a health hazard, and also can affect the local crops;	The Contractor shall • Water the material stockpiles, access roads and bare soils on an as required basis to minimize the potential for environmental nuisance due to dust. Increase the watering frequency during periods of high risk (e.g. high winds). Stored materials such as gravel and sand shall be covered and confined to avoid their being wind-drifted. • Minimize the extent and period of exposure of the bare surfaces. • Restore disturbed areas as soon as practicable by vegetation/grass-turfing. • Store the cement in silos and minimize the emissions from silos by equipping them with filters. • Establish adequate locations for storage, mixing and loading of construction materials, in a way that dust dispersion is prevented because of such operations. • Not water as dust suppression on potentially contaminated areas so that a liquid waste stream will be generated. • Crushing of rocky and aggregate materials shall be wet-crushed, or performed with particle emission control systems. • Not permit the burning of solid waste.

ECP 11: Noise and Vibration Management

Project Activity/ Impact Source	Environmental Impacts	Mitigation Measures/ Management Guidelines
Construction vehicular traffic	Noise quality will be deteriorated due to vehicular traffic	The Contractor shall • Prepare a noise and vibration management plan (under the Pollution Prevention Plan) and submit the plan for supervision consultant approval. • Maintain all vehicles in order to keep it in good working order in accordance with manufactures maintenance procedures.



Project Activity/ Impact Source	Environmental Impacts	Mitigation Measures/ Management Guidelines
		• Make sure all drivers will comply with the traffic codes concerning maximum speed limit, driving hours, etc. • Organize the loading and unloading of trucks, and handling operations for the purpose of minimizing construction noise on the work site.
Construction machinery	Noise and vibration may have an impact on people, property, fauna, livestock and the natural environment.	The Contractor shall • Appropriately site all noise generating activities to avoid noise pollution to local residents. • Use the quietest available plant and equipment. • Maintain all equipment in order to keep it in good working order in accordance with manufactures maintenance procedures. Equipment suppliers and contractors shall present proof of maintenance register of their equipment. • Install acoustic enclosures around generators to reduce noise levels. • Fit high efficiency mufflers to appropriate construction equipment. • Avoid the unnecessary use of alarms, horns and sirens.
Construction activity	Noise and vibration may have an impact on people, property, fauna, livestock and the natural environment.	The Contractor shall • Notify adjacent landholders prior any typical noise events outside of daylight hours. • Educate the operators of construction equipment on potential noise problems and the techniques to minimize noise emissions. • Employ best available work practices on-site to minimize occupational noise levels. • Install temporary noise control barriers where appropriate. • Notify affected people if major noisy activities will be undertaken, e.g. blasting. • Plan activities on site and deliveries to and from site to minimize impact.



Project Activity/ Impact Source	Environmental Impacts	Mitigation Measures/ Management Guidelines
		• Monitor and analyze noise and vibration results and adjust construction practices as required. • Avoid undertaking the noisiest activities, where possible, when working at night near the residential areas.

ECP 12: Protection of Flora

Project Activity/ Impact Source	Environmental Impacts	Mitigation Measures/ Management Guidelines
Vegetation clearance	Local flora are important to provide shelters for the birds, offer fruits and/or timber/fire wood, protect soil erosion and overall keep the environment very friendly to human-living. As such damage to flora has wide range of adverse environmental impacts.	The Contractor shall • Prepare a plan for protection of flora and submit the plan for supervision consultant approval. • Minimize disturbance to surrounding vegetation. • Use appropriate type and minimum size of machine to avoid disturbance to adjacent vegetation. • Get approval from supervision consultant for clearance of vegetation. • Make selective and careful pruning of trees where possible to reduce need of tree removal. • Control noxious weeds by disposing of at designated dump site or burn on site. • Clear only the vegetation that needs to be cleared in accordance with the engineering plans and designs. These measures are applicable to both the construction areas as well as to any associated activities such as sites for stockpiles, disposal of fill a, etc. • Not burn off cleared vegetation – where feasible, chip or mulch and reuse it for the rehabilitation of affected areas, temporary access tracks or landscaping. Mulch provides a seed source, can limit embankment erosion, retains soil moisture and nutrients, and encourages re-growth and protection from weeds.



Project Activity/ Impact Source	Environmental Impacts	Mitigation Measures/ Management Guidelines
		• Return topsoil and mulched vegetation (in areas of native vegetation) to approximately the same area of the roadside it came from. • Avoid work within the drip-line of trees to prevent damage to the tree roots and compacting the soil. • Minimize the length of time the ground is exposed or excavation left open by clearing and re-vegetate the area at the earliest practically possible. • Ensure excavation works occur progressively and re-vegetation done at the earliest • Provide adequate knowledge to the workers regarding nature protection and the need of avoid felling trees during construction • Supply appropriate fuel in the work camps to prevent fuel wood collection.

ECP 13: Protection of Fauna

Project Activity/ Impact Source	Environmental Impacts	Mitigation Measures/ Management Guidelines
Construction activities	The location of construction activities can result in the loss of wild life habitat and habitat quality,	The Contractor shall • Prepare a plan for protection of fauna and submit the plan for supervision consultant approval. • Limit the construction works within the designated sites allocated to the contractors. • Check the site for animals trapped in, or in danger from site works and use a qualified person to relocate the animal.
	Impact on migratory birds, its habitat and its active nests	The Contractor shall • Not be permitted to destruct active nests or eggs of migratory birds. • Minimize the tree removal during the bird breeding season. If works must be continued during the bird breeding season, a nest survey will be conducted by a qualified biologist prior to commence of works to identify and locate active nests.



Project Activity/ Impact Source	Environmental Impacts	Mitigation Measures/ Management Guidelines
		• If bird nests are located/ detected within the ledges and roadside embankments then those areas should be avoided. • Petroleum products should not come in contact with the natural and sensitive ecosystems. Contractor must minimize the release of oil, oil wastes or any other substances harmful to migratory birds' habitats, to any waters, wetlands or any areas frequented by migratory birds.
Vegetation clearance	Clearance of vegetation may impact shelter, feeding and/or breeding and/or physical destruction and severing of habitat areas	The Contractor shall • Restrict the tree removal to the minimum numbers required. • Relocate hollows, where appropriate. • Fell the hollow bearing trees in a manner which reduces the potential for fauna mortality. Felled trees will be inspected after felling for fauna and if identified and readily accessible will be removed and relocated or rendered assistance if injured. After felling, hollow bearing trees will remain unmoved overnight to allow animals to move of their own volition.
Night time lighting	Lighting from construction sites and construction camps may affect the visibility of night time migratory birds that use the moon and stars for navigation during their migrations.	The Contractor shall • Use lower wattage flat lens fixtures that direct light down and reduce glare, thus reducing light pollution, • Avoid flood lights unless they are absolutely required. • Use motion sensitive lighting to minimize unneeded lighting. • Use, if possible, green lights that are considered as bird's friendly lighting instead of white or red colored lights. • Install light shades or plan the direction of lights to reduce light spilling outside the construction area.
Construction camps	Illegal poaching	The Contractor shall • Provide adequate knowledge to the workers regarding protection of flora and fauna, and relevant government regulations and punishments for illegal poaching.



Project Activity/ Impact Source	Environmental Impacts	Mitigation Measures/ Management Guidelines
		Ensure that staff and Subcontractors are trained and empowered to identify, address and report potential environmental problems.

ECP 34: Road Transport and Road Traffic Management

Project Activity/ Impact Source	Environmental Impacts	Mitigation Measures/ Management Guidelines
Construction vehicular traffic	Increased traffic use of road by construction vehicles will affect the movement of normal road traffics and the safety of the road-users.	The Contractor shall - Prepare a traffic management plan and submit the plan for supervision consultant approval. - Strictly follow the Project's 'Traffic Management Plan' and work with close coordination with the Traffic Management Unit. - Prepare and submit additional traffic plan, if any of his traffic routes are not covered in the Project's Traffic Management Plan, and requires traffic diversion and management. - Include in the traffic plan to ensure uninterrupted traffic movement during construction: detailed drawings of traffic arrangements showing all detours, temporary road, temporary bridges temporary diversions, necessary barricades, warning signs / lights, road signs etc. - Provide signs at strategic locations of the roads complying with the schedules of signs contained in the National Traffic Regulations.
	Accidents and spillage of fuels and chemicals	The Contractor shall - Restrict truck deliveries, where practicable, to day time working hours. - Restrict the transport of oversize loads. - Operate vehicles, if possible, to non-peak periods to minimize traffic disruptions. - Enforce on-site speed limit. - Report any accident within 12-24 hours.



ECP 45: Construction Camp Management

Project Activity/ Impact Source	Environmental Impacts	Mitigation Measures/ Management Guidelines
Siting and Location of construction camps	Campsites for construction workers are the important locations that have significant impacts such as health and safety hazards on local resources and infrastructure of nearby communities.	The Contractor shall • Prepare a construction camp management plan ensuring labor influx management and submit the plan to NTDC, WB and supervision consultant for approval. • Locate the construction camps within the designed sites or at areas which are acceptable from environmental, cultural or social point of view. • Consider the location of construction camps away from communities in order to avoid social conflict in using the natural resources such as water or to avoid the possible adverse impacts of the construction camps on the surrounding communities. • Submit to the supervision consultant for approval a detailed layout plan for the development of the construction camp showing the relative locations of all temporary buildings and facilities that are to be constructed together with the location of site roads, fuel storage areas (for use in power supply generators), solid waste management and dumping locations, and drainage facilities, prior to the development of the construction camps. • Local authorities responsible for health, religious and security shall be duly informed on the set up of camp facilities so as to maintain effective surveillance over public health, social and security matters.
Construction Camp Facilities	Lack of proper infrastructure facilities, such as housing, water supply and sanitation facilities will increase pressure on the local services and generate substandard living standards and health hazards.	Contractor shall provide the following facilities in the campsites • Consider impacts of camps on local communities, keep distance and educate workers on code of conduct. • Adequate housing for all workers.



Project Activity/ Impact Source	Environmental Impacts	Mitigation Measures/ Management Guidelines
		• Safe and reliable water supply, which should meet NEQS. Drinking water to be chlorinated at source, and ensure presence of residual chlorine 0.1 ~ 0.25 ppm as minimum after 30 minutes of chlorine contact time (WHO guideline). • Hygienic sanitary facilities and sewerage system. The toilets and domestic waste water will be collected through a common sewerage. Provide separate latrines and bathing places for males and females with total isolation by location. The minimum number of toilet facilities required is one toilet for every ten persons. • Treatment facilities for sewerage of toilet and domestic wastes. • Storm water drainage facilities. • Paved internal roads. • Provide in-house community/common entertainment facilities. Dependence of local entertainment outlets by the construction camps to be discouraged/prohibited to the extent possible.
Disposal of waste	Management of wastes is crucial to minimize impacts on the environment	The Contractor shall • Ensure proper collection and disposal of solid wastes within the construction camps. • Insist waste separation by source; organic wastes in one container and inorganic wastes in another container at household level. • Store inorganic wastes in a safe place within the household and clear organic wastes on daily basis to waste collector. Establish waste collection, transportation and disposal systems with the manpower and equipment/vehicles needed. • Do not establish site specific landfill sites. All solid waste will be collected and removed from the work camps and disposed in approval waste disposal sites.



Project Activity/ Impact Source	Environmental Impacts	Mitigation Measures/ Management Guidelines
Fuel supplies for cooking purposes	Illegal sourcing of fuel wood by construction workers will impact the natural flora and fauna	The Contractor shall • Provide fuel to the construction camps for their domestic purpose, in order to discourage them to use fuel wood or other biomass. • Made available alternative fuels like natural gas or kerosene on ration to the workforce to prevent them using biomass for cooking. • Conduct awareness campaigns to educate workers on preserving the protecting the biodiversity and wildlife of the project area, and relevant government regulations and punishments on wildlife protection.
Health and Hygiene	Increased risk of communicable diseases and burden on local health services to be transmitted including malaria, exacerbated by inadequate health and safety practices.	The Contractor shall • Provide adequate health care facilities within construction sites. • Provide first aid facility round the clock. Maintain stock of medicines in the facility and appoint fulltime designated first aider or nurse. • Provide ambulance facility for the laborers during emergency to be transported to nearest hospitals. • Initial health screening of the laborers coming from outside areas. • Train all construction workers in basic sanitation and health care issues and safety matters, and on the specific hazards of their work. • Provide adequate drainage facilities throughout the camps to ensure that disease vectors such as stagnant water bodies and puddles do not form. Regular mosquito repellent sprays during rainy season in offices and construction camps and yards. • Not dispose food waste openly as that will attract rats and stray dogs. • Carryout short training sessions on best hygiene practices to be mandatorily participated by all workers. Place display boards at strategic locations within the camps containing messages on best hygienic practices.



Project Activity/ Impact Source	Environmental Impacts	Mitigation Measures/ Management Guidelines
Safety	In adequate safety facilities to the construction camps may create security problems and fire hazards	The Contractor shall • Provide appropriate security personnel (police or private security guards) and enclosures to prevent unauthorized entry in to the camp area. • Maintain register to keep a track on a head count of persons present in the camp at any given time. • Encourage use of flameproof material for the construction of labor housing / site office. Also, ensure that these houses/rooms are of sound construction and capable of withstanding wind storms/cyclones. • Provide appropriate type of firefighting equipment suitable for the construction camps • Display emergency contact numbers clearly and prominently at strategic places in camps. • Communicate the roles and responsibilities of laborers in case of emergency in the monthly meetings with contractors.
Social and cultural aspect for Camp setup	Labor Influx in the project area will have risk of social conflict, illicit behavior and crime, burden on and competition for public service provision	The Contractor will • The Contractor will schedule construction time particularly near the settlements, to cause least disturbance to the local population, particularly women. • Contractor will take due care of the local community and observe sanctity of local customs and traditions by his staff. Contractor will warn the staff strictly not to involve in any unethical activities and to obey the local norms and cultural restrictions. • The Contractor will carry out the construction activities in such a way that the open defecation timings by the local community should not be affected. The normal defecation timings are early in the morning and at late in the evening. So, the Contractor will have to take care of these timings.



Project Activity/ Impact Source	Environmental Impacts	Mitigation Measures/ Management Guidelines
		- During construction activities, if privacy of the nearby households is affected, the Contractor will inform the house owner to make some arrangements. Similarly, Contractor will take care as much as possible that the construction activities should not affect the privacy. - The Contractor will also ensure that noise and light pollution from the labor camp is kept at minimal levels especially at night. - Ensure an operational Grievance Mechanism, accessible to the public, is available.
Site Restoration	Restoration of the construction camps to original condition requires demolition of construction camps.	The Contractor shall - Dismantle and remove from the site all facilities established within the construction camp including the perimeter fence and lockable gates at the completion of the construction work. - Dismantle camps in phases and as the work gets decreased and not wait for the entire work to be completed. - Give prior notice to the laborers before demolishing their camps/units. - Maintain the noise levels within the national standards during demolition activities. - Different contractors should be hired to demolish different structures to promote recycling or reuse of demolished material. - Reuse the demolition debris to a maximum extent. Dispose remaining debris at the designated waste disposal site. - Handover the construction camps with all built facilities as it is if agreement between both parties (contractor and land-owner) has been made so. - Restore the site to its condition prior to commencement of the works or to an agreed condition with the landowner.



ECP 56: Cultural and Religious Issues

Project Activity/ Impact Source	Environmental Impacts	Mitigation Measures/ Management Guidelines
Construction activities near religious and cultural sites	Disturbance from construction works to the cultural and religious sites, and contractors lack of knowledge on cultural issues cause social disturbances.	The Contractor shall • Communicate to the public through community consultation regarding the scope and schedule of construction, as well as certain construction activities causing disruptions or access restriction. • Not block access to cultural and religious sites, wherever possible. • Restrict all construction activities within the foot prints of the construction sites. • Stop construction works that produce noise (particularly during prayer time) should there be any mosque/religious/educational institutions close to the construction sites and users make objections. • Take special care and use appropriate equipment when working next to a cultural/religious institution. • Stop work immediately and notify the site manager if, during construction, an archaeological or burial site is discovered. It is an offence to recommence work in the vicinity of the site until approval to continue is given. • Provide separate prayer facilities to the construction workers. • Show appropriate behavior with all construction workers especially women and elderly people. • Allow the workers to participate in praying during construction time. • Resolve cultural issues in consultation with local leaders and supervision consultants. • Establish a mechanism that allows local people to raise grievances arising from the construction process. • Inform the local authorities responsible for health, religious and security duly informed before commencement of civil works so as to



Project Activity/ Impact Source	Environmental Impacts	Mitigation Measures/ Management Guidelines
		maintain effective surveillance over public health, social and security matters.

ECP 17: Construction and Operation Phase Security

Project Activity/ Impact Source	Impacts /Concerns	Mitigation Measures/ Management Guidelines
Construction Phase	Inadequate construction site security poses a significant risk to assets, construction materials and property. Theft/vandalism of assets, materials and property would increase construction costs and cause delays in project completion.	The Contractor shall: • Provide appropriate security personnel (i.e. security guards) to prevent unauthorized entry into the camp area. • Employ night watchman for periods of significant on-site storage or when the area necessitates. • Ensure all assets (i.e., tools, equipment, etc.) and construction materials at construction site are identified, inventoried and tracked as closely as possible. All assets should be clearly labeled and marked. Keep records of tool serial numbers and check inventory on a regular basis. • All tools and equipment should have a check out/in system, if not in use should be secured and stored in a proper place to prevent theft or loss. Provide storage sheds for the secure storage of equipment and tools when not in use. • Ensure there is proper fencing around construction site perimeter. Fencing should be chain-link at least 2.4 m high and secured with a steel chain and lock. If possible the entire site should be fenced; if this is not possible, make sure construction trailer and any equipment storage areas are fenced.



Project Activity/ Impact Source	Impacts /Concerns	Mitigation Measures/ Management Guidelines
		• Ensure construction site has controlled access points (one or two entry points at most), allowing for close monitoring of comings and goings from the site. • Workers should be easily identified and have credentials that indicate site access. • No trespassing signs should be posted in conspicuous areas throughout the job site. • List of employees who have after hour access to the property should be available to the BWB and local authorities. • Ensure job site is properly lighted at night. Well-lit areas should include any office trailers and equipment storage trailers. Floodlights operated by sensors should also be installed where appropriate. • Pre-employment screening investigations should be used to verify the applicants relating to their employment, education and criminal history background.
	Improper security measures may pose security risk for construction workers and especially foreign staff on construction sites.	The Contractor shall: • Prepare site specific security plan. • Maintain register to keep track of number of persons present in the camp at any given time. • Provide appropriate security personnel at job sites as mentioned above. • Ensure proper fencing as mentioned above. • Ensure controlled access points to job site as mentioned above. • Ensure works have easily identified credentials as mentioned above. • Ensure job sites are properly lighted at night, as mentioned above.
Operation Phase	Vandalism/damage (including use of explosives) and theft of infrastructure (i.e. metals and etc.).	• Ensure strategic infrastructure sites are secure and fenced with controlled access points. Fencing should be chain-link at least 2.4 m high and secured with a steel chain and lock.

ANNEX 10-2: GUIDELINE ESMP SUB PLANS



ANNEX 10-2: GUIDELINE ESMP SUB PLANS

- [1]. Guideline Resources Conservation Plan
- [2]. Guideline for Vibration Management Plan
- [3]. Guideline Construction Waste Management Plan
- [4]. Guideline Sanitation Plan
- [5]. Guideline Quarry Management Plan
- [6]. Guideline Construction Health and Safety Management Plan
- [7]. Guideline Traffic Management Plan
- [8]. Guideline Construction Management Plan



I. GUIDELINE RESOURCES CONSERVATION PLAN

1. INTRODUCTION

The most of the resources in this world are finite and non-renewable in nature. We are completely dependent on these resources to fulfill all our daily requirements. Therefore, sustainable development calls for the need to conserve resources in a way that meet our needs of present generation as well as future generation, especially the non-renewable resources.

2. OBJECTIVE OF THE PLAN

The Resources Conservation Plan is intended to make an effort towards achieving sustainable development. The objective of the resources conservation plan is to:

- Minimize the use of natural resources; and
- Mitigate and prevent pollution contaminating the natural resources.

3. PLANNING

Careful estimations of quantities of material, fuel, water and energy required directly or indirectly shall be done to avoid excessive or unnecessary wastage of these materials. In addition to this, pollution prevention strategies shall also be devised to prevent contamination of resources.

- The estimations include the following:
 - Estimation of construction material required for the project;
 - Estimation of fuel consumption for construction machinery, construction vehicles and generators;
 - Estimations of the energy requirements during all the stages of the project; and
 - Estimations of water consumption for construction activities and construction camp sites.
- Strategies shall be planned to reduce loads on the identified resources to be consumed;
- Best management practices shall be devised to control or reduce pollution resulting from the activities during different stages of the project; and
- An inspector shall be assigned responsibility to oversee the ongoing activities to check the compliance of the planned strategies.

4. EXECUTION OF THE PLAN

The planned strategies shall be implemented to conserve the natural resources including but not limited to the following:

Material

- Material supplied shall be in conformance with the estimated quantities and excess material shall be returned to the supplier;
- Material wastage shall be avoided by using best management practices;
- Waste produced during the project execution shall be disposed off safely to the designated disposal sites through approved contractors; and
- Reuse of the materials shall be appreciated.



Energy

- Reduce trips and optimize routes to and from the construction site for all kinds of activities;
- Regular maintenance of equipment and vehicles to avoid leaks and sustain efficient fuel consumption;
- Switch off idle equipment and vehicles to avoid wastage of fuel;
- Minimize warm up time, unnecessary acceleration and deceleration of the construction equipment and vehicles;
- Avoid unnecessary burning of fuel for cooking in construction camps;
- Avoid unnecessary use of heating and cooling systems during extreme weather events;
- Construction shall start in early hours of the day to avoid heat in summers and utilization of day light; and
- Alternate energy sources shall be considered for electricity generations during construction and operation to conserve fossil fuel as it is non-renewable resource.

Water

- Avoid using potable water for sprinkling, curing and washing of equipment and vehicles. Surface water or treated effluent can be used instead;
- Wastage of water should be controlled through providing proper valves and through controlling pressure of the water;
- Unnecessary equipment washings should be avoided;
- Awareness amongst workers shall be raised to conserve water and immediately report for any leaks detected; and
- Ensure protection of canal water from contamination resulting from construction activities.

Pollution

- Emissions shall be reduced and controlled as far as possible and direct discharges to air shall be avoided by strictly adhering to the mitigation measures outlined in IEE report;
- Waste water shall not be discharged directly and must be managed as per the recommendations presented in IEE; and
- Construction and demolition waste, and municipal solid waste shall not be dumped and burnt openly, and shall be handled according to the preventative measure given in IEE report.

5. CHECKING AND CORRECTIVE ACTIONS

The NHA shall bind the construction contractor through contract agreement to comply with the strategies outlined in the Resources Conservation Plan. The Contractor shall also appoint an Inspector who shall monitor the daily onsite activities and shall report any issues and concerns raised in relation to Resources Conservation Plan. The inspector shall recommend adequate corrective actions to mitigate the issues raised.



II. GUIDELINE VIBRATION MANAGEMENT PLAN

1. PURPOSE

The VMP has been developed with specific information to allow for effective management and control of construction vibration impacts. This has been developed taking into consideration the related vibration standards.

The purpose of the Construction Vibration Management Framework is to describe how vibration impacts can be managed during construction of the proposed Project. The Construction Contractor may adopt/develop the guidelines described in this framework.

2. SCOPE

The scope of work required for the project involves but not limited to the following specific activities:

- Site Establishment;
- Vegetation clearing, including riparian vegetation, and topsoil stripping;
- Earthworks, including excavation or filling;
- Transportation of cut or fill materials;
- Site access;
- Drainage works;
- Stockpiling of topsoil, vegetation and other construction materials;
- Movement of heavy vehicles across exposed ground;
- Demolition works to remove structures;
- Piling works to facilitate the construction;
- Relocation of existing utilities; and
- Concrete paving

3. OBJECTIVE

The following construction vibration goals apply for the proposed project:

- For structural damage to heritage structures, the vibration limits set out in the German Standard DIN 4150-3: *Structural Vibration -effects of vibration on structure*; and
- For damage to other buildings and/or structures, the vibration limits set out in the British Standard BS 7385-1:1990 -*Evaluation and measurement for vibration in buildings*.

However, the German Standard DIN 4150-3 – Vibration in Buildings – Part 3: Effects on structures (**See Figure 1**) provides short term and long-term limits 2 for vibration at the foundation for various structures is considered international best practice and may be followed as part of the proposed Project.

DIN 4150-3 notes that “experience has shown that if these values are complied with, damage that reduces the serviceability of the building will not occur. If damage nevertheless occurs, it is to be assumed that other causes are responsible. Exceeding the value in the table does not necessarily lead to damage”.

Group	Type of structure	Guideline Values for Velocity (mm/s)				
		Short-term			Long-term	
		At foundation			Uppermost Floor	Uppermost Floor
		Less than 10 Hz	10 Hz to 50 Hz	50 to 100 Hz	All frequencies	All frequencies
1	Buildings used for commercial purposes, industrial buildings and buildings of similar design	20	20 to 40	40 to 50	40	10
2	Residential dwellings and buildings of similar design and/or use	5 (105 dB)	5 to 15	15 to 20	15	5 (105 dB)
3	Structures that because of their particular sensitivity to vibration, do not correspond to those listed in Lines 1 or 2 and have intrinsic value (e.g. buildings that are under a preservation order)	3 (100.5 dB)	2 to 8	8 to 10	8	2.5 (99.0 dB)

Figure 1: Guideline¹ Values for Vibration Velocity to be Used When Evaluating the Effects of Short-Term & Long-Term Vibration on Structures

4. VIBRATION CRITERIA

Effects of ground vibration on buildings resulting from construction can be classified as follows:

- Human exposure –disturbance to building occupants: vibration in which the occupants or users of the building are inconvenienced or possibly disturbed
- Effects on building contents –vibration where the building contents may be affected
- Effects on building structures –vibration in which the integrity of the building or structure itself may be prejudiced.

5. VIBRATION IMPACTS

Bulldozers and rollers typically generate less than 2mms^{-1} at 5m^2 and compactors less than 0.3 mms^{-1} at 30m . Pile driving typically generates less than 3mms^{-1} at 50m . Unless buildings are very close to construction operations, they are unlikely to be damaged by vibrations from the construction plant.

6. MITIGATION AND MANAGEMENT

To manage the potential vibration issues the following procedures will be followed by the Contractor.

Condition Surveys: Not later than 28 days before the commencement of construction works, Contractor and the Supervision Consultant will carry out joint condition surveys of all buildings within 10 meters of the access roads and proposed alignment that might be affected by vibration resulting from Contractor's construction vehicles.

¹ DIN 4150-3, Structural Vibration, Part 3: Effect of vibration on structures

² UZB: Gas Transmission Network Modernization & Efficiency Enhancement Project Appendix J5: Framework Construction Vibration Management Plan



The surveys shall be conducted in the presence of and with the permission of the property owners. The findings of the building condition surveys shall be recorded in reports that shall contain the following information, as a minimum:

- Building address and location;
- A description of the building condition and any cosmetic and/or structural damage;
- Sketches and photographs showing the location and extent of any damage;
- High resolution video recordings of the surveyed buildings; and
- Verification of the report by the building owner.

Vibration Monitoring:

- The Contractor shall establish a vibration monitoring and control system approved by the NHA, and measure vibrations at predetermined points.
- This monitoring shall consist of a continuous recording of the maximum single-component peak particle velocities for one-minute intervals. During the monitoring, Contractor shall document all events that are responsible for the measured vibration levels and submit the documentation to the NHA.
- All vibration monitoring data shall be recorded contemporaneously and plotted continuously on a graph by the data acquisition equipment.
- Each graph shall show time- domain wave traces (particle velocity versus time) for each measurement location with the same vertical and horizontal axes scale.

Claims for Construction Vibration Damages:

Claims for damage caused by vibration shall be handled through the **Project Grievance Redress Mechanism**.

Where the results of the vibration monitoring show that the specified construction vibration limit is reached at a particular location, Contractor shall identify alternative access routes.

7. MONITORING AND REPORTING

The Environmental and Social Officers of Contractor/Supervision Consultant will be responsible for ensuring that all of the above vibration management measures are applied throughout the construction phase. The officers shall monitor the implementation of the mitigation measures and report on a monthly basis to the NHA.

8. NON-CONFORMANCE, CORRECTIVE AND PREVENTATIVE ACTIONS

- Environmental inspection, observation and monitoring results are interpreted to identify actual and potential non-conformances and events that may result in nuisance, environmental harm and unacceptable loss of amenity or community complaints.
- Where non-conformances are identified during regular inspections, corrective actions are raised, tracked and closed out by the designated environmental and social officers.
- Following the identification of a non-conformance, corrective and/or preventative actions will be identified and assigned to the appropriate person with set timeframes. Timeframes will be set to ensure any damage incurred is rectified and any chance of



recurrence is eliminated as soon as practicable. Environmental Corrective Actions Register will be used to assign, track and close out corrective actions.

9. COMPLAINTS

Complaints will be recorded in accordance with the Project GRM. Information to be recorded will include location of complaint, time(s) of occurrence of alleged air quality impacts and perceived source. Resident complaints will be responded to in a timely manner and action taken recorded in accordance with the GRM.

10. TRAINING

- All personnel, including employees and sub-contractors, are required to complete a project induction containing relevant environmental information before they are authorized to work on the project.
- Contractor's designated environmental and social staff will provide information (e.g. project inductions, toolbox talks on appropriate environmental risks or management measures) so that project personnel can competently perform their duties and meet environmental obligations.
- Records of all training activities, including inductions, will be maintained. Records will include the name and role of the attendee, the name of the course and, where applicable, reference to the document controlled version of the material presented, and a copy of the assessment completed.

11. PLAN REVISION

Continual improvement is achieved through constant measurement and evaluation, audit and review of the effectiveness of the plan, and adjustment and improvement of the EMP. Monthly reviews undertaken by the designated staff provide specific opportunities to identify improvements in the EMP and/or this Plan.

This plan will be updated as required:

- To take into account changes to the environment or generally accepted environmental management practices, new risks to the environment or changes in law;
- Where requested or required by NHA or regulatory Authority (e.g. EPA); or
- In response to requests of the NHA.

The updated plan must be endorsed by the NHA. Where the environmental and social staff deems it necessary, the Plan will be provided to relevant stakeholders for review and comment if required.



III. GUIDELINE CONSTRUCTION WASTE MANAGEMENT PLAN

1. GENERAL INTRODUCTION

Construction work refers to a wide range of materials depending on their origin; they are categorized as excavation material, demolition materials and worksite waste material. Construction waste material of the proposed project consists mainly of concrete, bentonite, masonry, limestone, sandstone, metal, and wood. In addition to this, significant amount of municipal waste will also generate from the construction camps. The solid waste generation estimated to be 500 kilogram per day for 1,000 construction workers during construction phase of the proposed project.

2. ORIGINS AND CAUSES OF CONSTRUCTION WASTE

Origins of Waste	Causes of Waste
Contractual	▪ Errors in contract documents; and ▪ Contract documents incomplete at commencement of construction.
Design	▪ Design changes; ▪ Design and detailing complexity; ▪ Design and construction detail errors; ▪ Unclear and unsuitable specifications; and ▪ Poor coordination and communication (late information, last minute client requirements, slow drawing revision and distribution).
Procurement	▪ Ordering errors (i.e. ordering items not in compliance with specification); ▪ Over allowances (i.e. difficulties to order small quantities); and ▪ Supplier errors.
Transportation	▪ Damage during transportation; ▪ Difficulties for delivery vehicles accessing construction sites; ▪ Insufficient protection during unloading; and ▪ Inefficient methods of unloading
On-Site Management and Planning	▪ Lack of on-site waste management plans; ▪ Improper planning for required quantities; ▪ Delays in passing information on types and sizes of materials and components to be used; ▪ Lack of on-site material control; and ▪ Lack of supervision.
Material Storage	▪ Inappropriate site storage space leading to damage or deterioration; ▪ Improper storing methods; and ▪ Materials stored far away from point of application.
Material Handling	▪ Materials supplied in loose form; ▪ On-site transportation methods from storage to the point of application; and



Origins of Waste	Causes of Waste
	▪ Inadequate material handling.
Site Operation	▪ Accidents due to negligence; ▪ Unused materials and products; ▪ Equipment malfunction; ▪ Poor craftsmanship; ▪ Use of wrong materials resulting in their disposal; ▪ Time pressure; and ▪ Poor work ethics.
Residual	▪ Waste from application processes (i.e. over preparation of mortar); ▪ Off-cuts from cutting materials to length; ▪ Waste from cutting uneconomical shapes; and ▪ Packaging.
Other	▪ Weather ▪ Vandalism ▪ Theft

3. CONSTRUCTION WASTE MANAGEMENT PLAN

i) Waste Management Goals

The contractor established goal that this project will generate at least 50 percent less waste into landfills and the processes shall be employed to ensure that this goal is met. These shall include prevention of damage to materials to be incorporated into the work due to mishandling, improper storage, contamination, inadequate protection, minimizing poor quantity estimation, and through design.

ii) Responsibility

- a) The Contractor shall be responsible for the implementation of the administrative portions of this program, including the notification of subcontractor management, the training of the site supervisor and the onsite posting of this plan.
- b) The site supervisor shall be responsible for the implementation of the onsite portions of this program including the training of subcontractor personnel.

iii) Waste Prevention Planning

- a) In addition to other requirements specified herein it is a requirement for the work of this project that the contractor comply with the applicable city waste disposal requirements.
- b) Of the inevitable waste that is generated, the waste materials designated in this specification shall be salvaged for reuse and or recycling where practical and possible. Waste disposal in landfills shall be minimized as much as possible.
- c) Project Construction Documents: The Contractor will contractually require all subcontractors to comply with the Construction Waste Management Plan (WMP)". A copy



of the WMP will accompany all subcontractor agreements and require subcontractor participation.

- d) The "Construction Waste Management Plan" shall be implemented and executed as follows and as on the chart:
- i) Salvageable materials will be diverted from disposal where feasible;
 - ii) There will be a designated area on the construction site reserved for materials that can be recycled;
 - iii) Areas shall be marked to designate what recycle materials are to be stored there; and
 - iv) Hazardous waste shall be managed by a licensed hazardous waste vendor.

iv) Communication and Education Plan

- a) This Waste Management Plan will be posted onsite;
- b) Each subcontractor will be made aware of the intent of this project with respect to reduction of waste and recycling. Onsite recycling containers and/or areas will be plainly marked;
- c) The subcontractor will be expected to make sure all their crews comply with the Waste Management Plan;
- d) All recycling containers and areas will be clearly marked;
- e) Lists of acceptable and unacceptable materials will be posted at the site; and
- f) All subcontractors will be informed in writing of the importance of non-contamination with other materials or trash.

v) Motivation Plan

The Contractor will conduct a pre-award meeting for subcontractors. Subcontractors under consideration will be required to attend the meeting to review project goals and requirements with the project team. Attendance will be a prerequisite for award of subcontracts. This document will be an attachment to every subcontract. Copies of the attachment will be posted prominently at the job site.

vi) Expected Project Waste, Disposal, and Handling

The following chart identifies waste materials expected on the proposed project, their expected disposal methods and handling procedures. New items may be added as needed.

Material	Disposal Method	Handling Procedure
Land Clearing Debris and Trees	Keep separate for reuse and or wood sale. Suitable materials may be delivered to a composting site. Separate topsoil and rock for future landscaping use.	Keep separated in designated areas onsite.
Clean Dimensional Wood and Palette Wood	Keep separate for reuse by on-site construction or by site employees for either heating	Keep separated in designated areas onsite.



Material	Disposal Method	Handling Procedure
	stoves or reuse in home projects. May be offered to public.	
Painted or Treated Wood	Reuse, off site recycle, and landfill.	Keep separated in designated areas onsite. Place in "Trash" container.
Concrete	Recycle when possible.	Keep separated in designated areas onsite.
Concrete Masonry Units	Keep separate for re-use by on-site construction or by site employees	Keep separated in designated areas onsite
Metals	Recycle off site when possible. Separate copper wire when possible.	Keep separated in designated areas onsite. Place in "Metals" container.
Gypsum drywall (unpainted)	Recycle with supplier when possible.	Keep scraps separate for recycling – stack on pallets in provided onsite. All scrap drywall should be taken back by contractor to drywall supplier
Paint	Reuse onsite; donate to Habitat for Humanity Restore.	Keep separated in designated areas onsite
Insulation	Reuse and landfill.	Keep separated in designated areas onsite.
Glass	Recycle locally.	Keep separated in designated areas onsite.
Plastics	Plastic Bottles: recycle locally; be aware of plastics that are acceptable to recycle facility.	Keep separated in designated areas onsite.

vii) Recycle Hauler

- To be determined;
- Contact Address; and
- Some or all recycle may be hauled by the authorized representative.

viii) Possible Recycle Locations and Acceptable Materials

- Coordinate with companies in Ranipur, Sukkur, Rawalpindi, Hassanabdal, Peshawar, Nowshera, Taxila or which are registered with district waste management companies that accept materials for recycle; and
- Using the above as a resource, a list will be kept indicating local opportunities for recycle of expected materials. New locations should be added as needed.



IV. GUIDELINE SANITATION PLAN

1. INTRODUCTION

This plan outlines the measures that can improve conditions of sanitation at construction sites during construction and operation phase.

2. PURPOSE OF THE PLAN

The plan intends to ensure sanitation including the control of water supplies, excrete and wastewater disposal, refuse disposal, vectors of diseases, housing conditions, food supplies and handling, atmospheric conditions, and the safety of the working environment.

3. MANAGEMENT OF SANITATION DURING CONSTRUCTION PHASE

i) Responsibility

The Health and Safety Inspector designated by construction contractor shall also inspect sanitation conditions and ensure safe working environment for workers.

ii) Location of Camp Sites

The accommodation and ancillary facilities for labor shall be constructed and maintained to standards and scales approved by the Resident Engineer. The camps must be located such that the drainage from and through the camps shall not endanger any domestic or public water supply. All sites must be managed to avoid ditches and depressions to minimize nuisance due to stagnant water.

iii) Water Supply

An adequate and convenient water supply, approved by the appropriate health authority, must be provided in each camp for drinking, cooking, bathing and laundry purposes.

Potable water supply systems for labor camps occupants shall meet the drinking water quality standards. In addition, the design of water system facilities shall be based on the suppliers Engineer's estimates of water demands. The drinking water must be monitored regularly for drinking water quality parameters.

At all construction camps and other workplaces, good and sufficient water supply shall be provided and maintained to eliminate chances of waterborne diseases to ensure the health and hygiene of the workers.

iv) Toilet Facilities and Hygiene

According to health and safety guidelines OR-OSHA number of toilets required at construction site is as one toilet for 20 workers. **Table 1** shows the number of toilets required in accordance with the number of employees at construction site.



Table 1: Number of Toilets Required for Employees at Construction Site

No. of Employees	No. of Toilets and Urinals by OSHA	Total No. Toilets and Urinals Required at Construction Site
Up to 20 Employees	1 Toilet	5 Toilets
Up to 40 Employees	1 Urinal	2 Urinals

Within the premises of every workplace, toilets and urinals shall be provided in an accessible place, and the accommodation, separately for each of these, as per standards prevailing in the province and country.

Toilet facilities adequate for the capacity of the camp must be provided. Each toilet room must be located, so as to be accessible.

A toilet room must be located within 200 feet of the camp. No toilet may be closer than 100 feet to kitchen and sleeping area.

These toilets must be distinctly marked by signs printed in native language of the persons occupying the camp, or marked with easily understood pictures or symbols.

Urinals troughs in privies must drain freely into the pit or vault, and the construction of this drain must be such as to exclude flies and rodents from the pit.

Proper facility for hand washing and other cleaning activities to be provided as follows:

- Provide individual hand towels from a sanitary dispenser and receptacles for disposing of waste towels;
- Providing hand soap and industrial hand cleaner for removing paints and other contaminants;
- Prohibited use of gasoline or solvent for hand washing; and
- Keep the floor of facilities dry to prevent spills and falls.

v) Waste Disposal

The sewage system for the camp must be designed, built and operated in compliance with the relevant legislation so that no health hazard occurs and no pollution to the air, ground or adjacent watercourse takes place.

Garbage bins must be provided in the camps and regularly emptied and the garbage disposed of in a hygienic manner.

Unless otherwise arranged for by the local sanitary authority, arrangement for disposal of excreta should be done in the already existing sewerage system in the area.

On completion of the works, all such temporary structures shall be cleared away, all rubbish burnt, excreta tank and other disposal pits or trenches filled in and effectively sealed off and the outline site left clean and tidy, at the Contractor's expense, to the entire satisfaction of the engineer.

vi) Maintenance of Sanitary Facility

Proper maintenance of toilets and other sanitary facilities should assure by health and safety inspector. Toilets and other sanitary facilities shall be cleaned at least four times daily and at least twice during working hours and kept in a strict sanitary condition. Receptacles shall be tarred inside and outside at least once a year.



All buildings, rooms and equipment and the grounds surrounding them shall be maintained in a clean and operable condition, and be protected from rubbish accumulation.

All necessary means shall be employed to eliminate and control any infestations of insects and rodents within all parts of any labor camp.

4. MANAGEMENT OF SANITATION DURING OPERATIONAL PHASE

A proper sanitation plan is to be adopted for maintaining the hygienic conditions during the operational phase of the project. These includes

- Site Clearance;
- Sewage Pipe Clearing, and
- Solid Waste Management.

i) Site Clearance

The construction contractor shall assure the clearance of construction machinery, vehicle and other equipment used during the construction period after the completion of the project.

ii) Solid Waste Management

Municipal solid waste and medical waste produced along the road should be collected and managed properly by the concerned department. Waste bins should be placed along the road side; regular cleaning of the road should be carried out using mechanical sweepers and at least two to four sweepers should be deputed for the whole proposed road to assure regular cleaning.

iii) Awareness and Training

A training and awareness sessions shall be conducted for workers before commencement of the Project. The implementation of sanitation plan would be more effective if the importance of hygiene; sanitation and safety are known to the workers.



V. GUIDELINE QUARRY MANAGEMENT PLAN

1. INTRODUCTION

After the completion of construction phase of the proposed project, it is the responsibility of the contractor to restore the site that has been disturbed due to construction activities. NHA has a stewardship responsibility to ensure that the environmental value of the project area is maintained for future generations to appreciate.

2. GENERAL QUARRY PLANNING AND PROGRESSIVE REHABILITATION

A well-considered quarry development plan prior to starting work, or when opening up new areas will greatly reduce the effort required to achieve appropriate leading practice environmental and safety outcomes for quarry rehabilitation and closure.

The selection of a site, sequencing of quarrying and rehabilitation and final land-use should all be carefully planned prior to commencement of work at a quarry or borrow pit.

3. PROGRESSIVE REHABILITATION

Progressive rehabilitation refers to the rehabilitation of completed parts of a quarry while extractive operations continue in other parts of the quarry. As new quarry sections are opened, worked out areas should be progressively rehabilitated to avoid increasing the total disturbed area of a quarry. Overburden and topsoil can be stripped from areas being opened up and placed directly onto worked out areas which are being rehabilitated. This will avoid double handling of materials and prevent degradation of the topsoil.

Progressive rehabilitation helps to minimize the visual impact of a quarry, control dust and erosion. It also assists in fostering good landowner and community relations.

Recommended progressive rehabilitation practices are:

- Agree on the final land form and use of a site with the relevant landowner.
- Rehabilitate in accordance with the intended final use of the land.
- Plan and develop the quarry in stages towards terminal areas so that progressive rehabilitation works can commence as soon as possible).
- Once the final landform is established, re-vegetate areas to stabilize the landform and to give the vegetation maximum time to establish while the quarry is still in operation.

4. RE-VEGETATION

Establishing a self-sustaining cover of vegetation is the best way to stabilize disturbed sites in the long term. Re-vegetation also minimizes the visual impact of quarries. Generally, the vegetation type which existed before the disturbance, or a similar vegetation type will regenerate most successfully.

Prior to the commencement of a quarrying activity the type of re-vegetation should be agreed with the landowner, and should be consistent with the proposed final land-use.

Some indigenous plant species may not thrive in areas where soil conditions are substantially different after quarrying. If this is the case, and the objective is to re-establish vegetation, which fulfils the function of the original native vegetation, then some species from outside the quarry



area, may have to be introduced. Care must be taken to avoid introducing a species, which could become an unacceptable fire hazard, invade surrounding areas of native vegetation or become agricultural weeds.

Where agriculture is the planned land-use then the species planted should be those commonly used for pasture or crops known to be successful on soils of similar texture, drainage status, pH and fertility. Suitable legumes should always be considered for their ability to improve soil fertility.

5. REHABILITATION OF BORROW PITS

Borrow pits are areas either in a road reserve or adjacent land holdings that have been used to extract materials such as gravels and soils. They can vary considerably in size, depending on the quantity of material taken and the borrow pits' reserve body of remaining material. The variable size, shape and nature of borrow pits preclude very specific recommendations; however the following general conditions apply:

- Before extraction commences, licenses and permits should be checked and limits of disturbance and/or clearing must be clearly marked out on the site before any ground disturbing activity takes place; and
- At the completion of extraction, the former borrow pit must be made stable and safe. This usually requires the sides of the pit to be reshaped with gentle safe grades. All disturbed areas associated with borrow pits must be retopsoiled, seeded, fertilized and mulched (if appropriate) as part of the restoration plan. Main Roads has been discouraging the conversion of borrow pits to stock watering points.

Reinstatement of Borrow Pits

- Reinstatement will be completed prior to handover of the completed road section. This may include the following:
- Fill excavated site with overburden stockpiles and perimeter berms, and graded to the desired slope and drainage path;
- Spread topsoil on top of the overburden;
- Develop/construct suitable surface slopes, drainage ditches and conduits to prevent water from collecting at the sites;
- Establish a vegetation cover corresponding to at least 75%³ of the cover present prior to excavation (supporting photographs) and maintain following the first rains after reinstatement;
- Minimize erosion by focusing vegetation cover on side slopes of the excavated area; and
- Any required seeding will make use of local plant varieties

All the above mentioned measures need to be followed by the Contractor before handing over the site (s) back to the owner.

³ Rapid Program Borrow Pit Management Guidelines, USAID



VI. GUIDELINE ONSTRUCTION SAFETY MANAGEMENT PLAN

Occupational Health and Safety covers all personnel working under the project and will be in line with the World Bank EHS guidelines on health and safety.

The Occupational Health and Safety program will aim to ensure that the workplace is safe and healthy by: addressing the hazards and risks at the workplace; outlining the procedures and responsibilities for preventing, eliminating and minimizing the effects of those hazards and risks; identifying the emergency management plans for the workplace or workplaces; and, specifying how consultation, training and information are to be provided to employees at various workplaces.

Some of the risks/hazards associated with workplaces are due to working close to or at sites associated with the various project construction activities. Other risks associated with the project construction phase include risk of increase of vector borne and other different diseases.

The following sections will be implemented during the construction phase to address and ensure workers' health and safety.

1. SCREENING AND REGULAR UNANNOUNCED CHECKING OF WORKERS

As per the procedure for hiring workers, all contractors and labor agencies are required to make all prospective workers undergo medical tests to screen for diseases and sicknesses, prior to selection and employment of any worker. The contractor is also responsible for ensuring that no worker who has a criminal record is employed at the project site. It will be ensured that all workers undergo medical tests to screen diseases at source and at sites in consultation with the designated Health Officer.

In addition to this, the Project Management will also undertake sudden, unannounced checks on workers to look for diseases such as COVID-19, HIV, STDs, and hepatitis and take necessary steps as mandated by the Contractual agreement between the Contractor and the Worker(s).

2. MINIMIZING HAZARDS AND RISKS AT THE WORKPLACE

To ensure safety at all work sites, the following will be carried out:

- i. Installation of signboards and symbols in risky and hazardous areas, to inform workers to be careful.
- ii. Construction of barricades around construction sites and deep excavated pits, to cordon off and deter entry of unauthorized personnel and workers into these areas.
- iii. Providing a safe storage site/area for large equipment such as power tools and chains, to prevent misuse and loss.
- iv. Proper Housekeeping: Ensuring that materials are all stacked, racked, blocked, interlocked, or otherwise secured to prevent sliding, falling, or collapse. Brick stacks will not be more than 7 feet in height and for concrete blocks they will not be more than



- 6 feet high.
- v. Removing all scrap timber, waste material and rubbish from the immediate work area as the work progresses.
- vi. Where scaffolds are required, ensuring that each scaffold or its components shall be capable of supporting its own weight and at least 4 times the maximum intended load applied or transmitted to it. The platform/scaffold plank shall be at least 15 inches wide and 1.5 inches thick. The rope should be capable of supporting at least 6 times the maximum intended load applied or transmitted to that rope. Pole scaffolds over 60 feet in height shall be designed by a registered professional engineer and shall be constructed and loaded in accordance with that design. Where scaffolds are not provided, safety belts/safety nets shall be provided;
- vii. Ensure that all ramps or walkways are at least 6 feet wide, having slip resistance threads and not inclined at more than a slope of 1 vertical and 3 horizontal.
- viii. Stacking away all excavated earth at least 2 feet from the pit to avoid material such as loose rocks from falling back into the excavated area and injuring those working inside excavated sites.
- ix. Constructing support systems, such as bracing to adjoining structures that may be endangered by excavation works nearby.
- x. Only a trained electrician to construct, install and repair all electrical equipment to prevent risks of electrical shocks and electrocution.
- xi. Install fire extinguishers and/or other fire-fighting equipment at every work site to prepare for any accidental fire hazards.

3. PROVISION OF PERSONAL PROTECTIVE EQUIPMENT

Risks to the health and safety of workers can be prevented by provision of Personal Protective Equipment (PPEs) to all workers. This will be included in the construction cost for each Contractor. Depending on the nature of work and the risks involved, contractors must provide without any cost to the workers, the following protective equipment:

- i. High visibility clothing for all personnel during road works must be mandatory.
- ii. Helmet shall be provided to all workers, or visitors visiting the site, for protection of the head against impact or penetration of falling or flying objects.
- iii. Safety belt shall be provided to workers working at heights (more than 20 ft) such as roofing, painting, and plastering.
- iv. Safety boots shall be provided to all workers for protection of feet from impact or penetration of falling objects on feet.
- v. Ear protecting devices shall be provided to all workers and will be used during the occurrence of extensive noise.
- vi. Eye and face protection equipment shall be provided to all welders to protect against sparks.
- vii. Respiratory protection devices shall be provided to all workers during occurrence of fumes, dusts, or toxic gas/vapor.
- viii. Safety nets shall be provided when workplaces are more than 25 feet (7.5 m) above the ground or other surfaces where the use of ladders, scaffolds, catch platforms, temporary floors or safety belts is impractical.

The specific PPE requirements for each type of work are summarized below.

Table 1: PPE Requirement List



Type of Work	PPE
Elevated work	Safety helmet, safety belt (height greater than 20 ft), footwear for elevated work.
Handling work safety	Helmet, leather safety shoes, work gloves.
Welding and cutting work	Eye protectors, shield and helmet, protective gloves.
Grinding work	Dust respirator, earplugs, eye protectors.
Work involving handling of chemical substances	Dust respirator, gas mask, chemical-proof gloves. Chemical proof clothing, air-lined mask, eye protectors.
Wood working	Hard hat, eye protectors, hearing protection, safety footwear, leather gloves and dust respirator.
Blasting	Hard hat, eye and hearing protection.
Concrete and masonry work	Hard hat, eye protectors, hearing protection, safety footwear, leather gloves and dust respirator.
Excavation, heavy equipment, motor graders, and bulldozer operation	Hard hat, safety boots, gloves, hearing protection.
Quarries	Hard hat, eye protectors, hearing protection, safety footwear, leather gloves and dust respirator.

4. PROCEDURES TO DEAL WITH EMERGENCIES SUCH AS ACCIDENTS, SUDDEN ILLNESS AND DEATH OF WORKERS

First aid kits will be made available at all times throughout the entire construction period by the respective contractors. This is very important, because most work sites will be at some distance from the nearest hospital. In addition to the first aid kits, the following measures should be in place:

- Provision of dispensaries by the individual EPC contractor.
- A vehicle shall be on standby from the Project Office so that emergency transportation can be arranged to take severely injured/sick workers to the nearest hospital for immediate medical attention.
- A designated Health Officer/worker for the Project will be identified as a focal person to attend to all health and safety related issues. This employee's contact number will be posted at all work sites for speedy delivery of emergency services. The focal person shall be well versed with the medical system and facilities available at the hospital.
- Communication arrangements, such a provision of radios or mobile communication for all work sites, for efficient handling of emergencies, will be made.

5. RECORD MAINTENANCE AND REMEDIAL ACTION



The Project Management will maintain a record of all accidents and injuries that occur at the work site. This work will be delegated by the contractor to the site supervisor and regularly reviewed every quarter by project management. Reports prepared by the contractor shall include information on the place, date and time of the incident, name of persons involved, cause of incident, witnesses present and their statements. Based on such reports, the management can jointly identify any unsafe conditions, acts or procedures and recommend for the contractor to undertake certain mitigative actions to change any unsafe or harmful conditions.

6. COMPENSATION FOR INJURIES AND DEATH

Any casualty or injury resulting from occupational activities should be compensated as per the local labor laws of Pakistan. Where compensation is sought by the injured party, proper procedures for documentation of the case will be followed, including a detailed report on the accident, written reports from witnesses, report of the examining doctor and his/her recommendation for treatment. Each individual contractor will be responsible for ensuring compensation for the respective workers.

7. AWARENESS PROGRAMS

The Project management will undertake awareness programs through posters, talks, and meetings with the contractors to undertake the following activities:

- i. Dissemination sessions will clarify the rights and responsibilities of the workers regarding interactions with local people (including communicable disease risks, such as HIV/AIDS, COVID-19), work site health and safety, waste management (waste separation, recycling, and composting), and the illegality of poaching.
- ii. Make workers aware of procedures to be followed in case of emergencies such as informing the focal health person who in turn will arrange the necessary emergency transportation or treatment.

8. NOMINATION OF A HEALTH AND SAFETY FOCAL PERSON

Within each site (especially if different sites are being implemented by different contractors), a Health and Safety Focal Person will be appointed. The Terms of Reference for the focal person will mainly be as follows:

- i. Function as the focal person/representative for all health and safety matters at the workplace;
- ii. Responsible for maintaining records of all accidents and all health and safety issues at each site, the number of accidents and its cause, actions taken and remedial measures undertaken in case of safety issues;
- iii. Be the link between the contractor and all workers and submit grievances of the workers to the contractor and instructions/directives on proper health care and safety from the contractors back to the workers;
- iv. Ensure that all workers are adequately informed on the requirement to use Personal Protective Equipment and its correct use;
- v. Also responsible for the first aid kit and making sure that the basic immediate medicines are readily available.





VII. GUIDELINE TRAFFIC MANAGEMENT PLAN

1. NEED FOR PLAN

During the construction period of the project, considerable vehicular movement carrying large amounts of material and machinery is expected. This will definitely interrupt the local traffic and is therefore important to manage the traffic to avoid the nuisance to local residents in terms of noise, dust, congestion and inconvenience.

2. THE PLAN

The objective of Traffic Management Plan (TMP) is to define the requirements that should be implemented to mitigate any potential negative risks to the environment, workers or the community resulting from construction traffic.

The TMP will advise and inform site Contractors and external suppliers of equipment and materials of access and entry points along with other key information such as tipping areas and wash-out areas. It is intended to compliment and work alongside relevant EMP. The TMP will be classed as “live” and therefore be subjected to updates as required.

The Contractor, at the time of the execution of the project, will prepare a comprehensive TMP in coordination with local traffic police department / national highway authority, NHMP, emergency services and local administrative department. NHA and CSC will review and approve the Contractor's TMP. The Contractor's TMP shall include following mitigation measures during its preparation:

- Undertake a road conditions assessment prior to and following the peak construction period, to assess any damage to road infrastructure that can be attributed to Project development.
- Repair damage as appropriate or enter into a voluntary agreement with the relevant roads authority to reimburse the cost of any repairs required to the public road network as a result of the Project.
- Spoil dumpsites located close to project site to minimize journey distance and limit movements to site access roads.
- Construction of worker accommodation on site to reduce light vehicle movements relating to travel to/ from the site.
- Provision of bus/minibus services for personnel living in nearby settlements.
- Movements of construction workers will be planned to avoid the busiest roads and times of day when traffic is at its greatest.
- Schedule deliveries and road movements to avoid peak periods.
- Driver training for HGV drivers and refresher course every six months for project drivers.
- Speed restrictions for project traffic travelling through communities (to be agreed with National Highway Authority).
- Run a safety campaign to improve the people's knowledge of the traffic hazard on their roads, public information and other activities to address the issues.



- Run a pedestrian awareness programme.
- Temporary signage

The traffic management plan for the project corridor is provided below.

3. OTHER RECOMMENDATIONS

It is important to manage public access routes during construction because it can cause delay to local traffic and create a safety hazard both on and offsite. People working and living near the tower sites would be annoyed by the emissions, noise and visual intrusion of queuing vehicles. Some important factors involved in access routes and site traffic are as follows:

3.1. Public Access Routes

The use of public road for site access may be restricted in terms of:

- Vehicle size, width and type of load
- Time limits
- Parking
- Pedestrian conflicts

Contractor should have consultation with the local police or local authority to address these issues and to effectively manage them before the beginning of the construction.

3.2. Site Workers Traffic

Site personnel should not be permitted to park vehicles right on the road; this will lead to disruption in material deliveries. Designated parking areas with appropriate parking space will be needed for this purpose; any plain area near construction site can be used for this purpose.

3.3. Site Rules

- Access to and from the site must be only via the specified entrance.
- On leaving the site, vehicles must be directed to follow the directions given.
- Drivers must adhere to the site speed limits.
- All material deliveries to site must keep allocated time limits.
- No material or rubbish should be left in the loading-unloading area.
- Develop a map for alternate routes showing material delivery services.
- Assign designated personnel on site to receive deliveries and to direct the vehicles.
- Monitor vehicle movement to reduce the likelihood of queuing or causing congestion in and around the area.
- Project vehicles should have a unanimous badge or logo on windscreen displaying that they belong to the project.

4. CONTRACTOR'S OBLIGATION



The traffic management plan of the Contractor should be safe enough and widening of any access roads and construction of the detours (as applicable and practical) must be completed prior to start of project construction activities so that heavy vehicular transportation for construction activities do not hinder the normal course of traffic lanes. Contractor must ensure that road closures are carried out by a competent person. The Contractor obligation must include the display of traffic signs according to the need to divert the traffic volume and to guide the road users in advance. The traffic sign, traffic light should be placed from any diverting route or road marking.

The Contractor should consider the environmental and social impacts of the traffic during construction. It will be sole responsibility of the Contractor to implement a plan which produces minimum nuisance to the local people and to the environment. Safety of the people should be given due importance. It will be under Contractor obligation to notify the traffic management plan and its later changes to CSC, NHA, emergency services and Traffic Police, and also publish weekly programme in the local newspaper.



VIII. GUIDELINE CONSTRUCTION MANAGEMENT PLAN (CMP)

1. OBJECTIVE OF PLAN

The objective of a Construction Management Plan (CMP) is to plan works so as to minimize the impacts of construction activities on:

- Direct and indirect stakeholders including nearby residents;
- Users of public footpaths and roads;
- Parking in the vicinity of the site; and
- Surrounding streets used to access the site.

These guidelines are for all those contractors who shall be awarded work on program construction and campsites. It is important to note that the actual site conditions are not yet revealed at this stage and the contractor(s) have to develop all the relevant site-specific plans and standard operating procedures (SOP) to perform their awarded jobs keeping in view the actual ground situations. It is anticipated that these guidelines will help fulfill all such requirements and the contractor(s) are expected to follow them in a true professional sense and spirit to perform with quality and safety on the worksite.

2. CONSTRUCTION CAMP

The Contractor shall follow the guidelines provided as under.

- The site location for the construction camp must be acceptable from environmental, social, and cultural points of view. This means that the construction camp and related facilities should be of durable construction in terms of structural safety, taking into account local conditions, such as liability to earthquakes. The location of the camp should ensure that workers are not affected by air pollution, run-off or sewage or other wastes.
- The site for the construction camp must be at some distance from the nearby communities to avoid any social conflict e.g., the campsite must be set up at least 500m away from the nearest human settlement.
- Before setting up the construction camp, the contractor must submit a detailed layout plan of the construction camp, which should include (but not be limited to) the location of temporary buildings and offices, connecting roads, fuel storage areas, waste management locations, drainage facilities, etc. to the PMIU for approval. Approval from PMIU shall be mandatory for setting up the construction camp.
- The local administration shall be informed before the start of construction for their information only.
- Onsite safety & security shall be the responsibility of the Contractors.
- The construction site shall have suitable arrangements for adequate natural and artificial light during work hours.

3. HYGIENE & HOUSE KEEPING



The Contractor shall follow the guidelines provided as under.

- The construction camp shall ensure reasonable levels of decency, hygiene, and comfort.
- The construction camp shall have arrangements for adequate natural and artificial light.
- The camp should have safe and reliable drinking water, in compliance with Punjab Environmental Quality Standards (PEQS).
- The camp shall have adequate ventilation to ensure sufficient movement of air in all conditions of weather and climate; moreover, arrangements for appropriate cooling and heating where possible.
- The camp should have a separate, reasonably comfortable bed for each worker with adequate headroom, providing full and free movement, of not less than 6.5ft. The minimum inside dimensions of a sleeping space per person shall be at least 6.5ft by 2.5ft.⁴
- The portacabins set up for office or accommodation shall be earthed appropriately. Such cabins should also be installed with smoke detectors to prevent fire accidents.
- The camp should have adequate sanitary facilities that should include a minimum of one toilet, one wash basin, and one shower for every six persons. These facilities should be provided at a convenient location to prevent nuisance. The sanitary facilities provided should meet minimum standards of health and hygiene. They should also provide reasonable standards of comfort, including hot and cold fresh running water. The sanitary facilities shall have ventilation in the open air. All these facilities shall be regularly checked for leakages and maintained as and when required.
- The sanitary facilities at the camp shall be connected with a suitably designed septic tank. The sewage shall be connected with common sewer if available. Otherwise, the treated domestic/sanitary wastewater shall be collected and disposed of properly. Moreover, the camp should have an appropriately designed storm water drainage facility following provincial standards. Any stagnant water due to rain/leakage in the camp area shall immediately be cleaned.
- The camp shall have common dining rooms, canteens or mess rooms, located away from the sleeping areas.
- The camp shall have appropriate food preparation and a kitchen area where hygienic conditions shall be maintained all the time, which shall be inspected regularly.
- The camp shall have appropriately situated laundry with suitable facilities.

⁴https://www.ilo.org/sites/default/files/wcmsp5/groups/public/%40ed_emp/%40emp_ent/%40multi/documents/publication/wcms_116344.pdf



- The camp shall have arrangements for regular sprinkling of water (grey water if available) on the walkways and traffic routes to minimize and control over the dust levels in the ambient air.
- To manage solid waste in the camp, wastebins (with cover lids) shall be provided which shall be cleaned regularly and the collected waste shall be disposed of properly following the local waste disposal laws.
- The camp shall have appropriately maintained and tidy material storage areas including pantry for kitchen, mechanical workshop, scrap etc. Moreover, all the inflammable surplus material shall be stored at the designated locations in the storage area. All the storage areas shall be inspected regularly to maintain quality and tidiness.
- The camp accommodations shall be kept free of rats, mice, insects and vermin. In areas where mosquitoes are prevalent, workers shall be provided netting.
- The camp should have clear access routes and emergency exits all the time.
- In case of female workers, there shall be separate camp arrangements requiring approval from PIU/Employer/Consultant and the bank. This camp shall have arrangements for all special requirements relevant to female workers keeping the applicable local and international standards and shall positively adhere to the cultural norms of the scheme area.

4. CLINIC AND MEDICAL

The Contractor shall follow the guidelines provided as under:

- Each of the active construction sites shall have a Medical Evacuation Plan (preferably in local and English language) to rescue the patient/injured at the site. Ambulance, rescue, and other emergency contact numbers of nearby hospitals and medical centers shall be part of the plan and shall be displayed suitably in working areas. The plan shall be available and displayed at offices and messes.
- Each of the active construction sites shall have a health facility (dispensary) with a qualified health practitioner and suitable medicines to address the day-to-day medical issues of the workers at the site. The appointed health practitioner shall prepare a daily report for the HSE department. The outpatient records and medicine inventory shall be maintained regularly at the health facility.
- Each of the active construction sites shall have an ambulance available at the site to handle potential medical emergencies.
- The staff induction procedure shall include clearance of a complete medical checkup by a legally authorized doctor. All kitchen and mess staff shall go through regular medical checkups by authorized doctors.
- All possible measures should be taken to prevent the spread of diseases, e.g., separate facilities should be provided for sick workers to prevent the spread of transmissible diseases among the occupants.



- Emergency response procedures (in local and English language) shall be displayed at clinics, offices, and messes.
- A first aid box with suitable first aid materials shall be placed at the construction and campsites. These boxes shall go through regular inspection following a standard checklist.
- The campsites should have designated full-time first aid staff. This staff shall be nominated by the staff (workers) and trained at the site;
- Any injury that could result in a Loss Time analysis/injury (LTA/LTI) or Medical Treatment Case (MTC) shall be reported to HSE personnel /ESFP immediately
- The staff (workers) at the site shall be provided with education, awareness, and training including HIV, COVID-19, STI (sexually transmitted infections), etc.

5. VEHICLES AND CONSTRUCTION EQUIPMENT

The Contractor shall follow the guidelines provided as under:

- At each of the active camp sites, all vehicles shall be inspected and duly maintained regularly against items in the vehicle checklist by the mechanic. The checklists shall be submitted to HSE personnel/ESFPs
- At each of the active campsites, all the drivers shall possess a valid driving license and carry it during all work hours.
- Freight shall only be carried on vehicles that are properly designed for purpose and excess weight shall not be carried on vehicles. The vehicle shall not move until and unless the freight is ensured to be fixed appropriately.
- The number of passengers in the vehicles operating at each of the active construction and campsites shall not exceed the standard seating capacity of the vehicle.
- Each of the active construction/campsites shall have a suitable vehicle maintenance workshop. The workshop should have cemented floors and should be provided with drip trays.
- All the used oil shall be collected and disposed of properly in the workshops.
- The drivers and other staff in the workshops shall be provided with appropriate rest areas and resting or sleeping beneath the vehicles shall not be allowed.
- Record of safety rule violations by the drivers shall be maintained and provided to HSE personnel/ESFPs
- All the vehicles at active construction and campsites shall have a vehicle logbook. This logbook shall be maintained and filled with by the driver daily. The drivers shall perform routine checkups of their vehicles every morning before work. This checkup shall be recorded in the logbook.



- The speed limits for all types of vehicles at each of the active construction and campsites might be set at 25-40 km/h within the construction zone. At all times, the driver must be aware that the speed limit is only a guideline and not a target and they must drive as safely as the conditions will allow them. Moreover, nighttime driving shall not be allowed unless approved by site management in case of emergency or during a scheduled night shift for construction activities.
- Smoking shall be prohibited during refueling of vehicles.
- The construction and campsite shall be installed with suitable roadside markings along with traffic signs and signals. All the drivers shall obey the signs, signals, and road markings.
- Vehicles shall only be parked in the designated parking areas and not be parked on areas such as slopes, curves, intersections, and bridges.
- As a safety measure, each of the vehicles operating in the construction and campsite should have a First aid kit and suitable fire extinguisher.

6. ROAD TRAVEL & OPERATIONS

The Contractor shall follow the guidelines provided as under:

- All the drivers shall follow speed limits.
- Staff carrying vehicles (vans, buses, and lorries) shall accommodate only passengers for which there are seats and seat belts.
- All the drivers shall follow the defensive driving procedure
- Only authorized personnel shall be allowed to drive the vehicles
- Traffic routes in the area of construction shall be sprinkled with water regularly.
- Traffic warning signs shall be placed at 50-100m on either side of the work area.
- To regulate the traffic, Flag man shall be posted on either side of the work area.

7. TRANSPORTATION, STORAGE & HANDLING OF FUELS, OILS & CHEMICALS (FOC)

The Contractor shall follow the guidelines provided as under:

- Each of the construction and campsites shall have designated storage areas for fuels, oils, and chemicals (FOC). No FOC shall be stored outside the designated area.
- Each FOC container (>20 liters) shall be provided with secondary containment offering 110% of the container capacity.
- The storage areas shall have suitable spill response kits according to the waste disposal plan.



- The waste collected by using spill response kits shall be treated as hazardous waste and disposed of as per the local applicable laws.
- Precautions shall be maintained during handling and transferring fuel and oil (use of plastic liner under fuel transfer areas, use of siphons & funnels, etc.).
- The fuel storage containers/tanks shall be rust-free and in good physical condition.
- The storage facility should be installed with appropriate signage.
- The storage facility shall have suitable firefighting equipment, e.g., fire extinguishers shall be available and installed in sufficient quantity and quality throughout the storage area.

8. OPERATION OF BULLDOZERS

The Contractor shall follow the guidelines provided as under:

- The machine operator should use a hard hat/safety helmet and wear high-visibility clothing and safety boots in good condition during his job hours. The machine operator should also use eye protection where there is a danger of falling or flying debris from equipment or loads, especially in windy conditions. The machine operator should use hearing protection when exposed to noise levels exceeding 85 dBA.
- The machine operator shall inspect the bulldozer under his use to ensure its good mechanical condition. The cabin, steps, and mirrors must always be clean. The machine must be clean of debris before the start of the daily work. Once found in good condition, the operator should select the proper gears to maintain control and drive according to terrain conditions.
- After completing the job, the bulldozer must be parked on level ground, clear of hazards, to allow easy access.
- The bulldozer operator must make sure that all persons, vehicles, and equipment are clear of the danger zone before the vehicle or its components are moved. A danger zone is defined as the area around operating machines or working personnel, in which there is potential for being struck by moving equipment or objects. The danger zone may vary according to the machine or work being performed.
- The machine operator and the mechanic must each know who will be responsible for:
 - Starting or moving a machine
 - Ensuring that anyone involved is in a clear and safe position
 - Directing the movement of the machine
 - Ensuring that it is safe to resume working and that all guards are in place.

9. CRANES, SLINGS AND LIFTING GEARS



Rigging equipment for material handling shall be certified by a recognized third party, for its safe use, once every year. Defective rigging equipment shall be removed from service. The following aspects are to be considered for different load-lifting equipment.

10. CRANES

The Contractor shall follow the guidelines provided as under:

- A thorough, annual inspection of the cranes shall be made/performed by a third party, and a record of the dates and results of inspections for the crane and each hoisting machine/equipment.
- All lifts shall be subject to a risk assessment and shall be supervised by a competent person.
- Outriggers and stabilizers shall be used whenever a lift is being conducted.
- Guide ropes shall be used where necessary.
- Suspended loads shall not be moved over people
- Riding on suspended loads shall be prohibited.
- Movement of the crane with suspended loads shall be prohibited.
- Rated load capacities, and recommended operating speeds, special hazard warnings, or instruction, should be conspicuously posted on cranes. Instructions or warnings shall be visible to the operator while he is at his control station.
- Crane operators shall be assisted by a competent rigger, to observe clearance of the equipment and give timely warning for all operations and where it is difficult for the operator to maintain the desired clearance by visual means.
- Hand signals, to crane operators, shall be as per the standard industry set of signals.
- A designated competent person shall inspect all machinery and equipment before each use, and during use, to make sure it is in safe operating condition. Any deficiencies shall be repaired, or defective parts replaced, before continued use.
- A competent person must begin a visual inspection before each shift the equipment is used, which must be completed before or during that shift. The inspection must consist of observation of wire ropes (running and standing) that are likely to be in use during the shift for all apparent deficiencies. The inspector may follow the applicable Occupational Safety and Health Administration (OSHA) standard 1926.1413 - Wire rope—inspection⁵ or the latest available guidelines for the said inspection.
- Wire rope shall be taken out of service when any of the following conditions exist:

⁵ <https://www.osha.gov/laws-regs/regulations/standardnumber/1926/1926.1413>



- In running ropes, six randomly distributed broken wires in one lay or three broken wires in one strand in one lay.
- Wear of one-third the original diameter of outside individual wires. Kinking, crushing, bird caging, or any other damage resulting in distortion of the rope structure.
- Evidence of any heat damage from any cause.
- Belts, gears, shafts, pulleys, sprockets, spindles, drums, fly wheels, chains, or other reciprocating, rotating, or other moving parts or equipment shall be guarded properly if such parts are exposed to contact by employees, or otherwise created a hazard.
- Accessible areas within the swing radius of the rear of the rotating superstructure of the crane, either permanently or temporarily mounted, shall be barricaded in such a manner as to prevent an employee from being struck or crushed by the crane.

11. RIGGING EQUIPMENT

The Contractor shall follow the guidelines provided as under:

- A competent person must inspect all the rigging equipment for material handling before use on each shift and as necessary during its use to ensure that it is safe. Defective rigging equipment shall be removed from service. The inspector may follow the applicable Occupational Safety and Health Administration (OSHA) standard 1926.251 - Rigging equipment for material handling⁶ or the latest available guidelines for the said inspection.
- All rigging equipment shall be marked with their respective SWL (Safe Working Load).
- Loading the rigging equipment above the SWL shall be prohibited.
- All the rigging equipment shall be parked in a safe and level designated parking area after the completion of work.
- Special custom design grabs, hooks, clamps, or other lifting accessories, for such units as modular panels, prefabricated structures, and similar materials, shall be marked to indicate the safe working loads and shall be proof tested before use to 125 percent of their rated load.

12. SLINGS

The Contractor shall follow the guidelines provided as under:

- Each day before being used, the sling and all fastenings and attachments shall be inspected for damage or defects by a competent HSE Engineer. Damaged or defective slings shall be immediately removed from service.
- Welded alloy steel chain slings shall have permanently affixed durable identification stating size, grade, rated capacity, and sling manufacturer.

⁶ <https://www.osha.gov/laws-regs/regulations/standardnumber/1926/1926.251>



- Hooks, rings, oblong links, pear-shaped links, welded or mechanical coupling links, or other attachments, when used with alloy steel chains, shall have a rated capacity at least equal to that of the chain.
- Job or shop hooks and links, or makeshift fasteners, formed from bolts, rods, etc., or other such attachments, shall not be used.
- Whenever wear is found at any point of any chain link, the assembly shall be removed from service.

13. WIRE ROPE

The Contractor shall follow the guidelines provided as under:

- All wire ropes shall be used under their stated Safe Working Load (SWL).
- Protruding ends of strands in splices on slings and bridles shall be covered or blunted.
- Wire rope should not have any 'handmade' eye splicing.
- Eye splicing shall be performed by a competent HSE Engineer as per standards.
- Slings shall not be shortened with knots, bolts or other makeshift devices.
- Sling legs shall not be kinked.
- Slings shall be padded or protected from the sharp edges of their loads.
- Hands or fingers shall not be placed between the sling and its load while the sling is being tightened around the load.
- Shock loading is prohibited.
- A sling shall not be pulled from under a load when the load is resting on the sling.

14. SYNTHETIC FIBER ROPE

The Contractor shall follow the guidelines provided as under:

- All splices in rope slings shall be as per standard.
- In manila rope, eye splices shall contain at least three full tucks, and short splices shall contain at least six full tucks (three on each side of the center line of the splice).
- In laid synthetic fiber rope, eye splices shall contain at least four full tucks, and short splices shall contain at least eight full tucks (four on each side of the center line of the splice).
- For all eye splices, the eye shall be sufficiently large to provide an included angle of not greater than 60 deg. at the splice when the eye is placed over the load or support.
- Knots shall not be used instead of splices.

15. NATURAL FIBER ROPE



The Contractor shall follow the guidelines provided as under:

- Spliced fiber rope slings shall not be used.
- In manila rope, eye splices shall consist of at least three full tucks, and short splices shall consist of at least six full tucks, three on each side of the splice center line.
- Fiber rope slings shall have a minimum clear length of rope between eye splices equal to 10 times the rope diameter.
- Ropes shall not be used if signs of 'Abnormal' wear are found e.g. Powdered fiber between strands, broken or cut fibers, variations in the size or roundness of strands, Discoloration or rotting, Distortion of hardware in the sling.

16. SHACKLES AND HOOKS

The Contractor shall follow the guidelines provided as under:

- Shackles and hooks shall be used under specified Safe Working Load (SWL).
- Shackles shall be removed from service if the thread has been damaged on a pin or in a tapped hole, the pin is loose, does not seat correctly, the pin is not straight, or the shackle is deformed in any way, pin or shackle is reduced by 8% of the original diameter, nicks/gouges/cracks or corrosion is seen.

17. TRANSPORTATION OF HEAVY LOADS

The Contractor shall follow the guidelines provided as under:

- All the heavy loads shall be transported safely with all the loads tightly fixed and evenly loaded.
- Transportation of heavy loads shall be taken by the national and provincial guidelines i.e. Highway Authorities guidelines/NHA guidelines and others including NH&MP Dimension of Goods Transport Vehicles Rule, 2017, NH&MP Drivers Licensing Authority Rules, 2014, and National Highways Safety Ordinance 2000.

18. HAND POWER TOOLS

The Contractor should follow the guidelines provided as under:

- Regular and before-use inspection of tools shall be carried out.
- Damaged/defective tools shall be repaired/replaced immediately.
- Proper training for the staff in the correct use of tools should be provided.
- Good housekeeping for tools and auxiliaries shall be done.
- All electrical wires leading to power tools shall be well insulated.
- Hand tools such as chisels and punches that develop mushroom heads during use shall be repaired or replaced.



- Broken or fractured handles on hammers, axes, and similar equipment shall be replaced promptly.
- Worn or bent wrenches shall be replaced promptly.
- Appropriate handles shall be used on files and similar tools.
- Tool handles should be wedged tightly in the heads of all tools.
- Tool cutting edges shall be kept sharp.
- Power tools should be used with the correct shield, guard, or attachment recommended by the manufacturer.
- Effective guards should be placed over belts, pulleys, chains, and sprockets on equipment such as concrete mixers, air compressors, etc.

19. WORK AT HEIGHT

The Contractor shall follow the guidelines provided as under:

- The Contractor will use only approved and tagged equipment such as ladders, scaffolding & mobile lifts at the work site. Wooden ladders/scaffolds will not be allowed at the site.
- Ladders, scaffolds, hoists, and other equipment must be in good working condition and shall be maintained properly. Provide railings for all staircases used during the construction works.
- Safety harnesses must be worn while working at heights, on sloping roofs, scaffolding/ladders, etc. Safety harnesses must be properly secured and tested. Under no circumstances should a person be used as an anchor.
- Nonmetallic or insulated equipment will be used near energized electrical circuits.
- Mobile hoists will be operated only by trained personnel.

20. LADDERS

The Contractor shall follow the guidelines provided as under:

- Ladders in use should be in good working condition.
- Ladders in use should be secured to prevent slipping while working.
- The step size of the ladder shall be appropriate.
- Ladder handrails should be in place wherever required.
- Metal ladders should not be used during electric work.

21. SCAFFOLDING

The Contractor shall follow the guidelines provided as under:



- All scaffolding connections should be tied properly and set on solid ground.
- Walkways should be free of any obstruction.
- Guardrails/handrails should be provided where necessary.
- All workers working adjacent to scaffolding should be at a safe distance from falling objects.
- Scaffolding should not be overloaded with the materials.
- Ladders should be provided to all access areas on scaffolds.
- The width of the working area on scaffolds should be appropriate.
- All the surfaces on scaffolds should be free of slippage.
- Proper planks should be used for providing access.

22. EXCAVATION (TRENCH OR SMALL DIAMETER SHAFTS)

The Contractor shall follow the guidelines provided as under:

- Permit to work should be obtained for excavation.
- All the work should be carried out as per the instructions given in the permit to work.
- Shoring, battering, and barricading should be carried out during the excavation.
- Ladders shall be used for access to and egress from all trenches or pits.
- Vehicles should be maintained at a safe distance from the edges of pits.
- Work in pits should be supervised.

23. WELDING AND CUTTING

The Contractor shall follow the guidelines provided as under:

- No combustible material should be present within the reach of sparks or molten metals.
- PPE should be provided and used.
- Fire extinguishers should be present near welding and cutting.
- No welding should be done on pipes, or tanks which already contain flammable material.
- Frames of welding machines shall be properly grounded.
- Electrical wires and switchboards should be properly installed.
- Gas lines should be in good working condition.
- Gas cylinders should be secured upright and away from sparks.



- Welding should only be carried out by the authorized person.
- Welding in confined spaces should only be carried out after approval from the designated ESS team of PMIU/Employer HSE Engineer and proper ventilation and risk assessment.
- All welding equipment should be inspected regularly and defective equipment to be replaced promptly.
- The torch valve should be closed and the gas supply shut down when work is suspended.
- Reverse flow check valves shall be placed between the torch and hoses.

24. GAS CYLINDERS

The Contractor shall follow the guidelines provided as under:

- Cylinders should be stored in a ventilated location with the least exposure to heat and sunlight
- Cylinders should be erected upright and buried in the ground
- Cylinders should not be stored near any fire source
- Oxygen cylinders shall be stored separately from fuel gas cylinders
- Smoking should not be allowed near cylinders
- Empty cylinders should be stored separately from full cylinders
- Cylinder valve should be closed when not in use
- The cylinder storage area should be properly marked
- Protective caps should be used on cylinders when not in use.

25. HAZARDOUS MATERIAL USE AND MANAGEMENT

The Contractor shall follow the guidelines provided as under:

- The use of Hazardous materials, including flammable liquids, gases, and toxins, must be approved by the designated HSE Engineer (ESS team of PMIU/Employer).
- Before being introduced to the site, the Safety Data Sheet (SDS) for Hazardous materials and FOCs must be provided to the designated HSE Engineer (ESS team of PMIU/Employer).
- Disposal of any hazardous materials into drains, storm sewers, and trash receptacles will be strictly prohibited. The waste produced should be properly handled and disposed of.



- All Hazardous conditions including spills, leaks, exposure, or unsafe acts and accidents must be reported immediately to the designated HSE Engineer (ESS team of PMIU/Employer).
- General Risk Assessment shall be conducted for any Hazardous material observed.
- Where possible material should be lifted by mechanical means.
- A risk assessment shall be conducted should material be required to be manually handled.
- Manual handling training should be imparted to all personnel.
- A Spill Contamination plan should be available at the site.
- Proper segregation and storage shall be done according to MSDS.
- Firefighting equipment and first aid kits should be present near the storage/handling area.
- All the material should be properly labeled.
- Fencing of the hazardous area should be done and access to the area be restricted.

26. MAINTENANCE AND WORKSHOP

The Contractor shall follow the guidelines provided as under:

- The active construction and campsite should have a designated workshop area for regular maintenance of the vehicles and machinery in use at the site.
- All the maintenance activities should be carried out according to the laid down standards and procedures
- The workshop should be kept neat and tidy.
- Any sub-contractor or vendor mechanics who wish to use the workshop area or equipment shall do so under the supervision and management of the HSE Officer/Engineer program.
- All keys should be removed from vehicles in the workshop whilst they are under repair and a LOTO sign placed on the steering wheel.
- All vehicles under repair should be suitably choked, blocked and supported.

27. CONTROL OF FIRE

The Contractor shall follow the guidelines provided as under:

- The active construction and campsite should have an adequate amount of firefighting equipment e.g., ready-to-use fire extinguishers accessible and regularly inspected.
- The active construction and campsite should have dedicated assembly points marked with proper signage. All the staff, including labor, should be provided with training and



awareness about the fire emergency, including fire safety and firefighting at a suitable frequency.

- To respond to any fire emergency, manual and electric fire alarms should be available in good working conditions. The site office should have emergency response contact numbers of the local firefighting department.
- The active construction and campsite should have an Emergency Preparedness and Response Plan that must include fire emergency response procedures, firefighting teams, and a frequency of firefighting drills, etc.

28. CONFINED SPACE WORKING

The Contractor shall follow the guidelines provided as under:

- The permit-to-work should be mandatory for any work in a confined space issued by the HSE Engineer.
- Before any entry, the following must be in place:
- Correct training of all personnel both making the entry and performing standby duties.
- Formulation of a specific risk assessment for the confined space entry and works to be carried out.
- Formulation of a specific rescue plan in case personnel work within the confined space.
- Provision of all required PPE and safety equipment identified as necessary in the risk assessment (includes, but is not limited to, gas monitors, safety lights, lifeline etc.).
- Submission of all documents and training certificates to the designated ESS team of PMIU/Employer/HSE Engineer for approval.

29. WASTE COLLECTION, SEGREGATION, AND DISPOSAL

The Contractor shall follow the guidelines provided as under:

- All the solid and hazardous waste should be collected and dumped in the designated fenced area regularly and appropriately at all the active construction sites and campsites.
- The waste pit should be located downwind and away from the fuel storage.
- Separate and appropriately marked (color-coded) waste bins should be placed for tin, plastic, and combustible material around the active construction and campsites.
- The waste bins should be of good quality having top covers/lids and in good working condition i.e., free from any leakage.
- Waste bins for cigarette buds should be placed in designated smoking areas.
- Specialized waste bins shall be placed in medical/health units/dispensaries for medical waste. The medical waste should be properly collected, stored, and transported in



water-tight containers to a specialized waste management company for proper disposal through incineration.

- Recyclable waste should be properly collected, temporarily stored, and handed over to the approved contractor.
- All the waste bins should be emptied regularly.
- The contractor shall plan liaison with MC Faisalabad / FWMC staff for proper waste disposal.

30. SEWERS, SOAK PITS, AND SEPTIC TANKS

The Contractor shall follow the guidelines provided as under:

- Sewers built for the program site/camp should not leak.
- All the septic tanks, manholes, and soak pits shall be covered and fenced.
- The level of wastewater in the soak pits should be monitored regularly to avoid overflowing.
- Lime in sufficient quantity should be added in soak pits regularly to avoid hygiene issues.
- Areas near soak pits, sewers, and septic tanks should be checked daily for smell and flies, and appropriate corrective measures taken in case of smell or fly/mosquito infestation.
- Septic tank should be constructed at least 20 m away from the accommodation

31. LIGHTING

The Contractor shall follow the guidelines provided as under:

- All areas identified or marked as an HSE risk or being hazardous should be provided with adequate lighting.
- The active construction and campsite should be provided with adequate lighting during evening and night times.
- Security lighting should also be provided for the construction and campsite.

32. ELECTRICAL SAFETY

The Contractor shall follow the guidelines provided as under:

- The electric generator used for power generation purposes of the campsite shall be maintained by a qualified and competent HSE Engineer/Officer.
- There should be a standby generator to meet the minimum camp requirements, in case the primary generator fails.



- No splicing is allowed in the electrical wiring; all connections shall be through a junction box.
- All electrical wires should be in PVC conduits in areas where these may get damaged because of physical wear or high ambient temperatures.
- All junction boxes used should possess proper sealing arrangements, for weather protection.
- Generator area shall be out of bounds, for all personnel, except for the operator.
- All electrical connectors and cables around the program construction and campsite, as well as the Residual Current Detectors – RCD and Earth Leakage Circuit breakers – ELCB, which are to be installed throughout the electrical network, are to be checked regularly under the supervision of the designated responsible person and validated by the HSE Engineer.
- Electrical connections to individual tents and trailers will be regularly checked by the staff safety officer/electrician and all defects repaired immediately.
- Electrical maintenance jobs should all follow the Lockout Tagout system (LOTO) and work on live current wires shall be prohibited.

33. SAFETY SIGNAGE AND MARKINGS

The Contractor shall follow the guidelines provided as under.

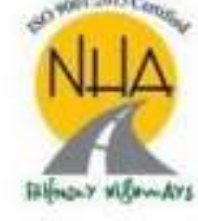
- There should be safety signage and markings in the local language (as well as in the English language) placed at all strategically important locations e.g., the generator area, workshops, entrance and exit points, hazardous areas, fuel storage area, muster points, fire extinguishers, etc.

34. SITE RESTORATION

The Contractor should follow the guidelines provided as under:

- Dismantle & remove all temporary facilities including fence, gate, etc. from the program construction and campsite.
- Dismantle camps in phases as the work decreases.
- Give prior notice to the laborers before dismantling the campsite.
- Promote the concept of reuse and recycling while dismantling.
- Restore the campsite as much as possible to its original condition.

ANNEX 10-3: PLANTATION PLAN



ANNEX 10-3: PLANTATION PLAN

The basic purpose of afforestation/plantation of suitable species in the project area is to reduce the risk been made due to different construction activities for the proposed project. The expected risk made will be compensated by planting of saplings to enhance green cover and improve the overall environment of the area. Afforestation will not only reduce the risk been made but will also increase the Green cover, carrying capacity and aesthetics of the area along with many positive aspects and impacts.

Plantation will be done after the construction work immediately. Plantation of indigenous trees species is highly important to maintain the biodiversity and ecological balance. It is also important to prevent global warming, soil erosion and pollution. Afforestation purifies the environment and helps in reducing the carbon dioxide level. Along with the importance of construction, the afforestation activity will further help in enhancing the socio-economic condition of the area and project sustainability.

Note: *The National Highway Authority and Forest Department may be engaged for carrying out the proposed activates.*

IMPORTANCE OF TREE PLANTATION

- Trees contribute to their environment by providing oxygen, improving air quality, climate amelioration, conserving water, preserving soil, and supporting wildlife.
- Trees control climate by moderating the effects of the sun, rain and wind. Leaves absorb and filter the sun's radiant energy, keeping things cool in summer.
- Trees also preserve warmth by providing a screen from harsh wind.
- Trees also lower the air temperature and reduce the heat intensity of the greenhouse effect by maintaining low levels of carbon dioxide.
- Both above and below ground, trees are essential to the eco-systems in which they reside.
- Trees absorb and store rainwater which reduce runoff and sediment deposit after storms. This helps the ground water supply recharge, prevents the transport of chemicals into streams and prevents flooding.
- Trees, shrubs and turf also filter air by removing dust and absorbing other pollutants like carbon monoxide, sulfur dioxide and nitrogen dioxide.

OBJECTIVES

- To Restore native species
- To improve the quality of air and reduce its pollution
- To add color to the landscape and enhances the beauty of the environment
- To uplift the quality of our living environment through active planting, proper maintenance and preservation of trees together with other vegetation.
- To Protect and conserve flora and fauna of the project area.
- To attract rain which is a positive impact on the project area at all.



- To reduce sedimentation by plantation in the project area which will act as protection wall against wind born dust particles.

AREA ENHANCEMENT PLAN

Plants will be raised along the nearby available project area or along roads, two on either side of the road. Distance from the outer boundary of the ROW and between two plants will be kept as 2 to 3 meters. Total number of plants to be planted is **25,450** Number for Section 2, **23,450** for Section 7 (Including ICT Section), and **35,000** Number for Section 8.

**The Forest Department or concerned authority may update the standards of planting and choice of species as per the requirements and suitability.*

Trees Recommended

Following trees are recommended for plantation, along this portion of the road on both sides.

Sr. No.	Local Name	Scientific Name
Peshawar – Nowshera Section		
1.	Mulberry	<i>Morus alba</i>
2.	Chir Pine	<i>Pinus roxburghii</i>
3.	Bottle Brush	<i>Callistemon spp</i>
4.	Phulai	<i>Acacia Modesta</i>
Rawalpindi –Burhan Section Including ICT Section		
5.	Sukh Chain	<i>Pongamia pinnata</i>
6.	Bottle Brush	<i>Callistemon spp</i>
7.	Kikar & Phulai	<i>Acacia nilotica & Modesta</i>
8.	Sirris	<i>Acacia lebbek</i>
9.	Jacarnda	<i>Jacaranda moniosifolia</i>
10.	Silver Oak	<i>Grevillea robusta</i>
11.	Shisham	<i>Dalbergia sissoo</i>
12.	Jaman	<i>Eugenia jambolina</i>
13.	Kachnar	<i>Bauhinia variegata</i>
Ranipur - Rohri Section		
14.	Babul	<i>Acacia nilotica</i>
15.	Neem	<i>Azadirachta indica</i>
16.	Shisham	<i>Dalbergia Sisso</i>
17.	Parkinsonia	<i>Parkinsonia aculeata</i>

Cost

Break-up of Expenditure per Avenue kilometer @ Rs. 1500/- per diem: Break-up of Expenditure per Avenue kilometer or 250 plants @ Rs. 1500/- per diem:

FIRST YEAR

Sr. No.	Item	Quantity	Rate	Amount (Rs.)
1.	Layout	1 Av.km	2 MD/Av.km	3000.00



Sr. No.	Item	Quantity	Rate	Amount (Rs.)
2.	Digging of Pits 2.5 ft. each 2.5x250 = 625 cft.	625 cft.	5 MD/Av.km	7500.00
3.	Cost of Plants including	250 No.	Rs100/- plant	25,000.00
4.	Cost of planting of plants	250 No.	Rs. 25/- plant	6250.00
5.	Carriage of plants from private nursery to site including loading/unloading	250 No.	Rs. 10/- plant	2500.00
6.	Cost of Manure and Bhall (silt) including carriage	1 Av. Km		20,000.00
7.	H/watering 50 times 250x50 with water bowser, one driver and one coolie	12500 no.	5MD/per %0	100,000.00
8.	Weeding twice 250x2	500 no.	2 MD/per %	15,000.00
9.	Reopening of Pits twice (250x2)/cft/pit	500 cft.	2 MD/per %	15,000.00
10.	Unforeseen			5885.00
Total				200,135.00

SECOND YEAR

Sr. No.	Item	Quantity	Rate	Amount (Rs.)
1.	Cost of Plants 20% Restocking	50 No.	Rs.100/- plant	5,000.00
2.	Cost of planting	50 No.	Rs. 25/- plant	1250.00
3.	Carriage of plants	50 No.	Rs. 10/- plant	500.00
4.	H/watering 50 times with water bowser, one driver and one coolie	12500 no.	5MD/per %0	100,000.00
5.	Reopening of Pits twice (250x2)	500 cft.	2 MD/per %	1,5000.00
6.	Weeding twice 250x2	500 no.	2 MD/per %	1,5000.00
7.	Unforeseen			1250.00
Total				1,38,000.00

THIRD YEAR

Sr. No.	Item	Quantity	Rate	Amount (Rs.)
1.	Cost of Plants 10% Restocking 25 No.	25 No.	Rs.100/- plant	2500.00



Sr. No.	Item	Quantity	Rate	Amount (Rs.)
2.	Cost of planting	25 No.	Rs. 25/- plant	625.00
3.	Carriage of plants	25 No.	Rs. 10/- plant	250.00
4.	H/watering 40 times x250 no.	10,000 no.	5MD/per %0	75000.00
5.	Reopening of Pits twice (250x2)	500	5MD/per %0	3850.00
6.	Unforeseen			2875.00
Total				85,100.00

FOURTH YEAR

Sr. No.	Item	Quantity	Rate	Amount (Rs.)
1.	H/watering 30 times	7500 no.	5MD/per %0	56350.00
5.	Pruning and cleaning of plants	250 no.	5MD/per %0	1875.00
6.	Unforeseen			1875.00
Total				60,100.00

FIFTH YEAR

Sr. No.	Item	Quantity	Rate	Amount (Rs.)
1.	H/watering 30 times	7500 no.	5MD/per %0	52350.00
5.	Pruning and cleaning of plants	250 no.	5MD/per %0	1875.00
6.	Unforeseen			1875.00
Total				56,100.00

Cost for raising 1 Av. Km and Maintenance of 250 plants in a single row: = Rs.539,435/-
For 5 years

Peshawar Nowshera Section

Total cost for **35,000** plants and their maintenance for 5 years = **PKR. 75,520,900/-**

Rawalpindi Hassanabdal Section (Including ICT Section)

Total cost for **23,500** plants and their maintenance for 5 years = **PKR. 50,706,890/-**

Ranipur to Rohri Section

Total cost for **25,500** plants and their maintenance for 5 years = **PKR. 55,022,370/-**

**The above calculations and standards are approximate and tentative provided on the basis of available data which may be updated by the implementing agency as per actual, during implementation.*