

ActionAid Afghanistan

PREVALE Year#2 Irrigation Infrastructure Project

Dahan e Dara Canal Lining and Protection Wall Package



Province : Faryab

District : Pashton kut

Village : Dahan e Dara

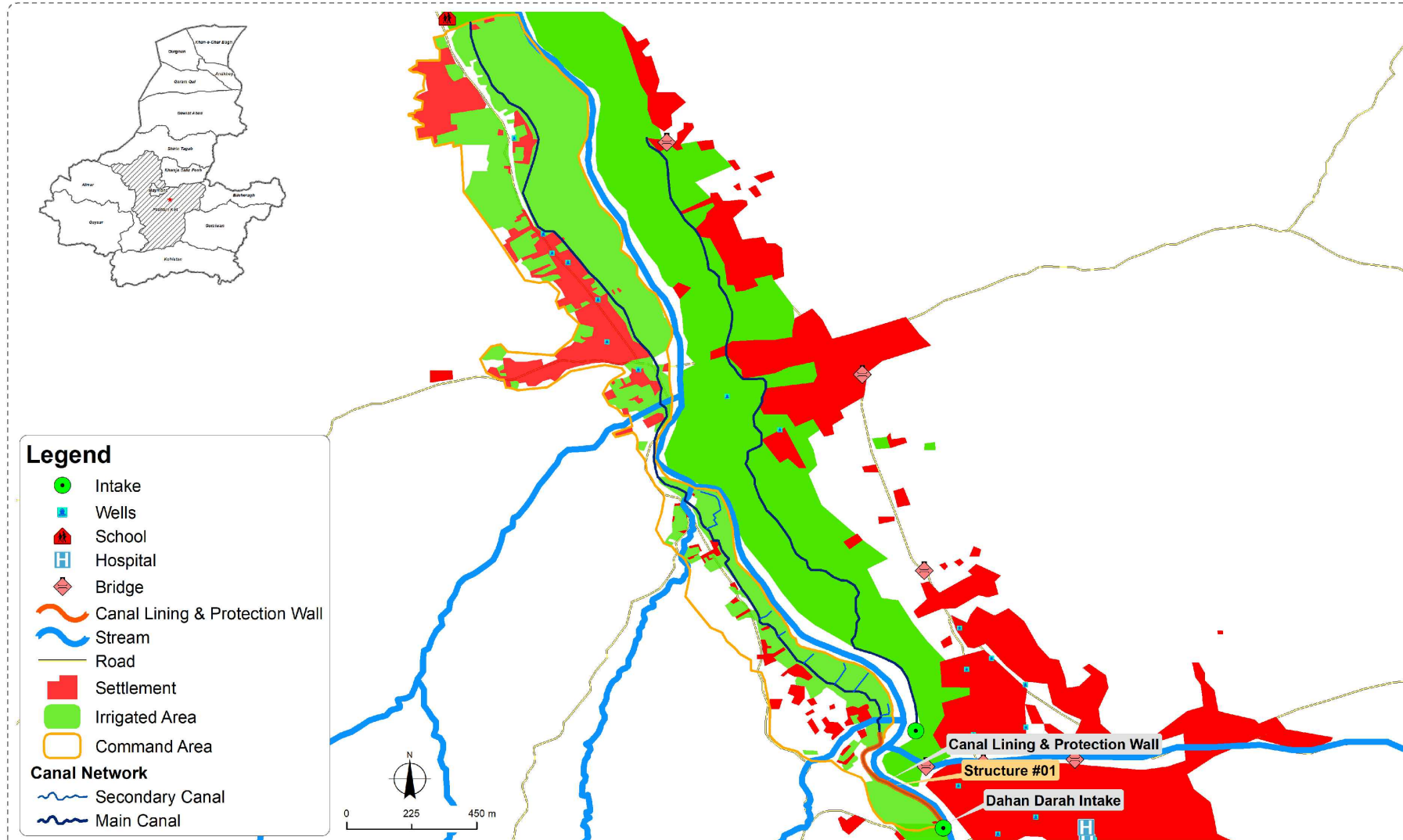
Year: 2026



DAHAN DARAH | Site Plan Map



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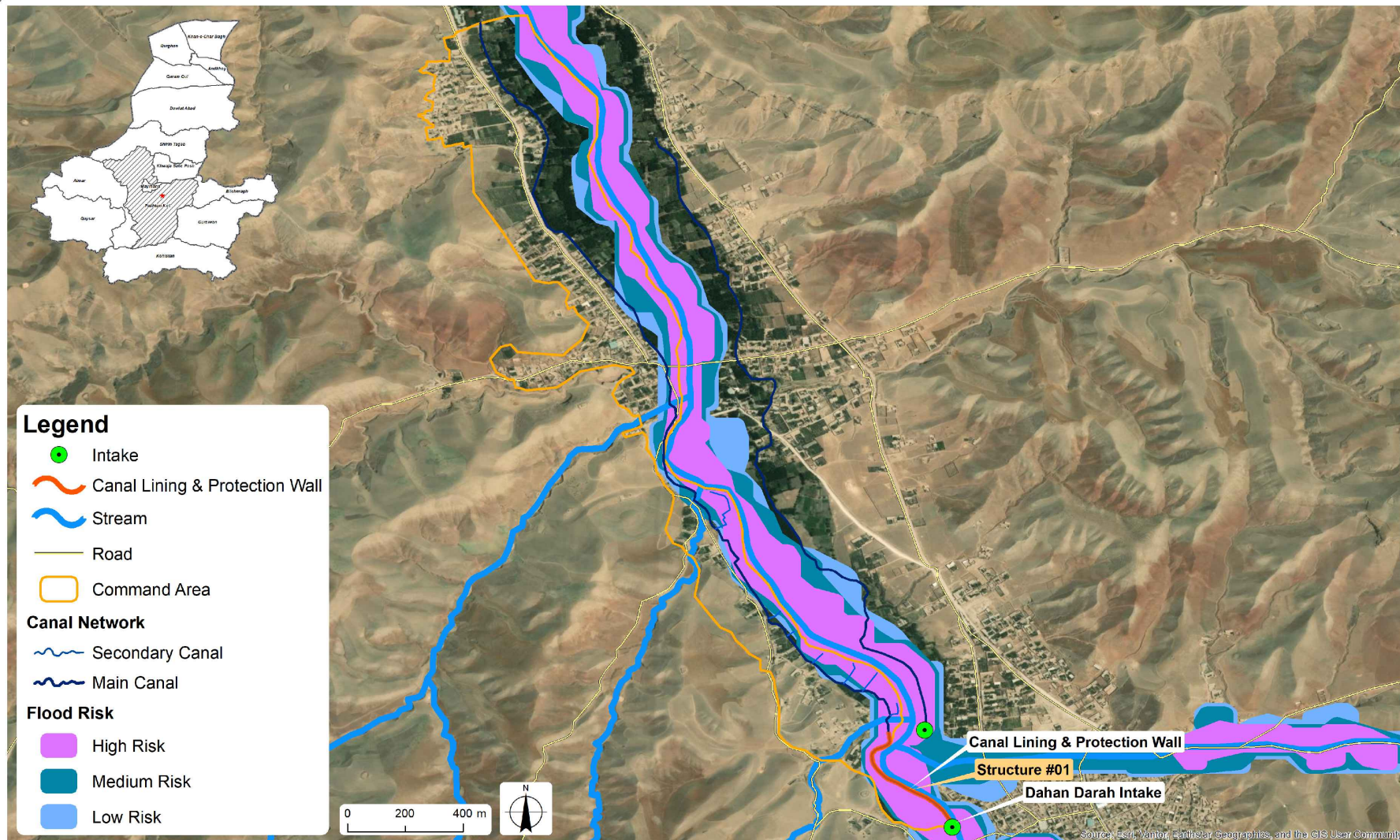
Description: This Site Plan Map of the Dahan Darah Main Canal project in Pashtun Kot District, Faryab Province, Afghanistan, illustrates the overall layout of the irrigation infrastructure and associated project components. The map shows key features such as canal lining and protection wall structure, also include the canal network, irrigated areas, canal intake, residential area, command area and other relevant site features, providing a clear reference for project planning, design, construction, and site management.

Data Sources: AGCHO Datum/**Projection:** WGS84/Geographic, **Date Created:** 06 July, 2026

DAHAN DARAH | Flood Risk Exposure Map



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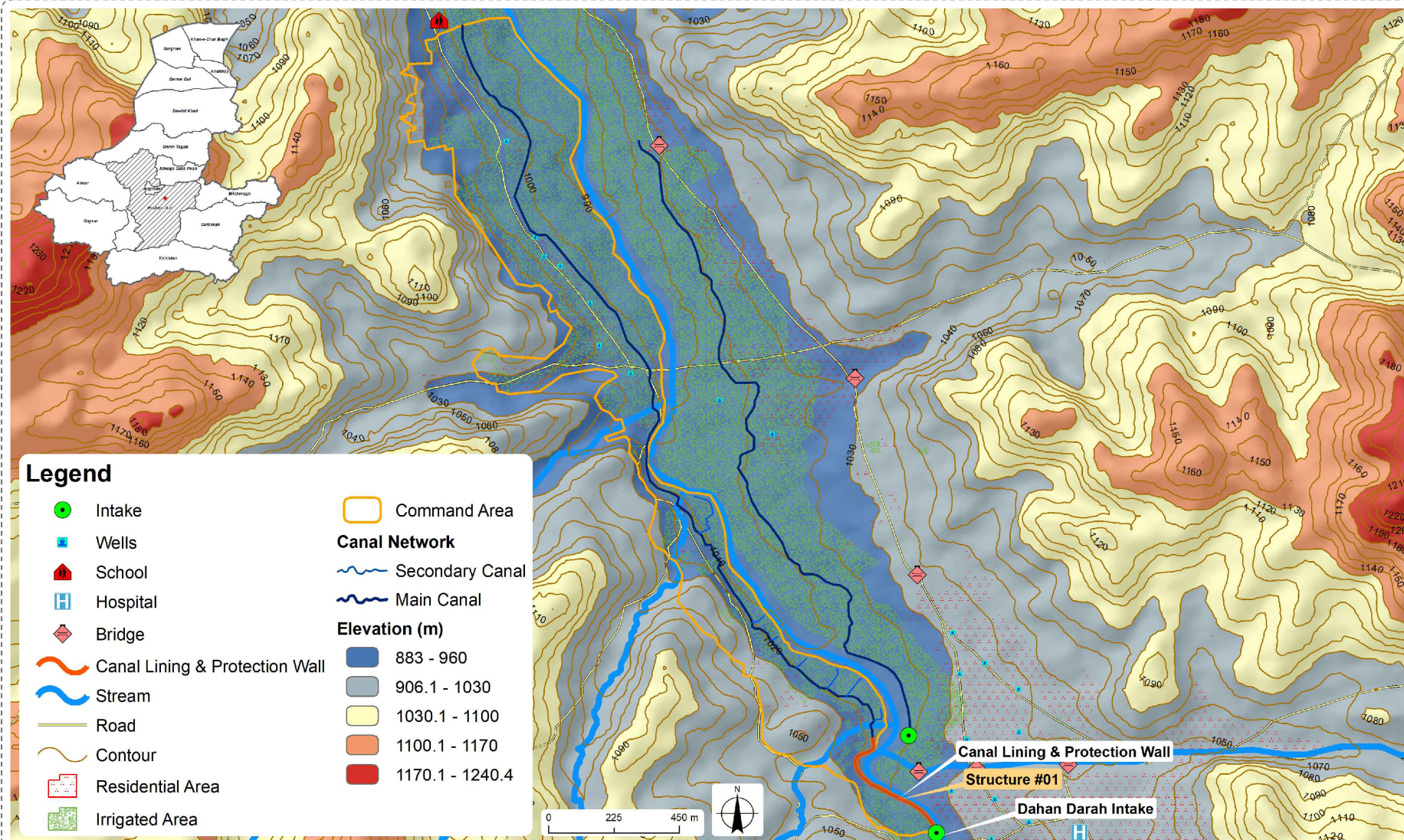
Description: This Flood Risk Exposure Map of the Dahan Darah in Pashtun Kot District, Faryab Province, Afghanistan shows areas vulnerable to flooding based on potential flood depth and exposure. The map highlights low, moderate, and high flood risk zones, along with key features such as canal lining and protection wall structure, also include the canal network, canal intake, command area and other relevant site features to support effective flood preparedness and risk management.

Data Sources: AGCHO, Afghanistan Flood Hazard Map v.2. 1:100 000, Emlin Hagen, NATO C3 Agency NC3A (2008), **Datum/Projection:** WGS84/Geographic, **Date Created:** 06 July, 2026

DAHAN DARAH | Topographic Map



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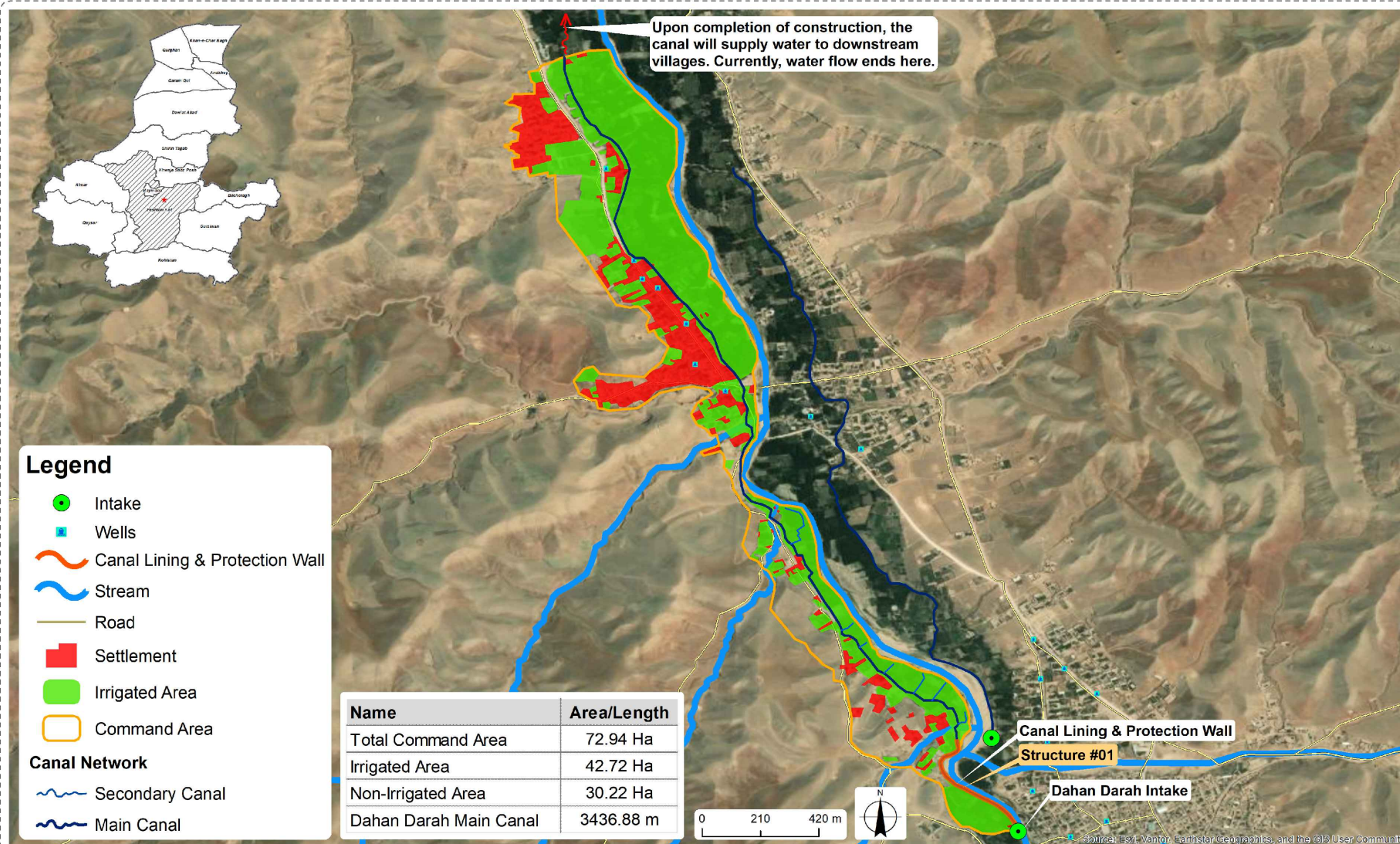
Description: This topographic map of the Dahan Darah area in Pashtun Kot District, Faryab Province, Afghanistan, shows the terrain characteristics and elevation variation of the site. The map shows key features such as canal lining and protection wall structure, also include the canal network, irrigated areas, canal intake, residential area, command area and other relevant site features, providing a detailed overview of the area's physical landscape.

Data Sources: AGCHO, ALOS PALSAR DEM (ASF), **Datum/Projection:** WGS84/Geographic, **Date Created:** 06 July, 2026

DAHAN DARAH | Main Canal Map

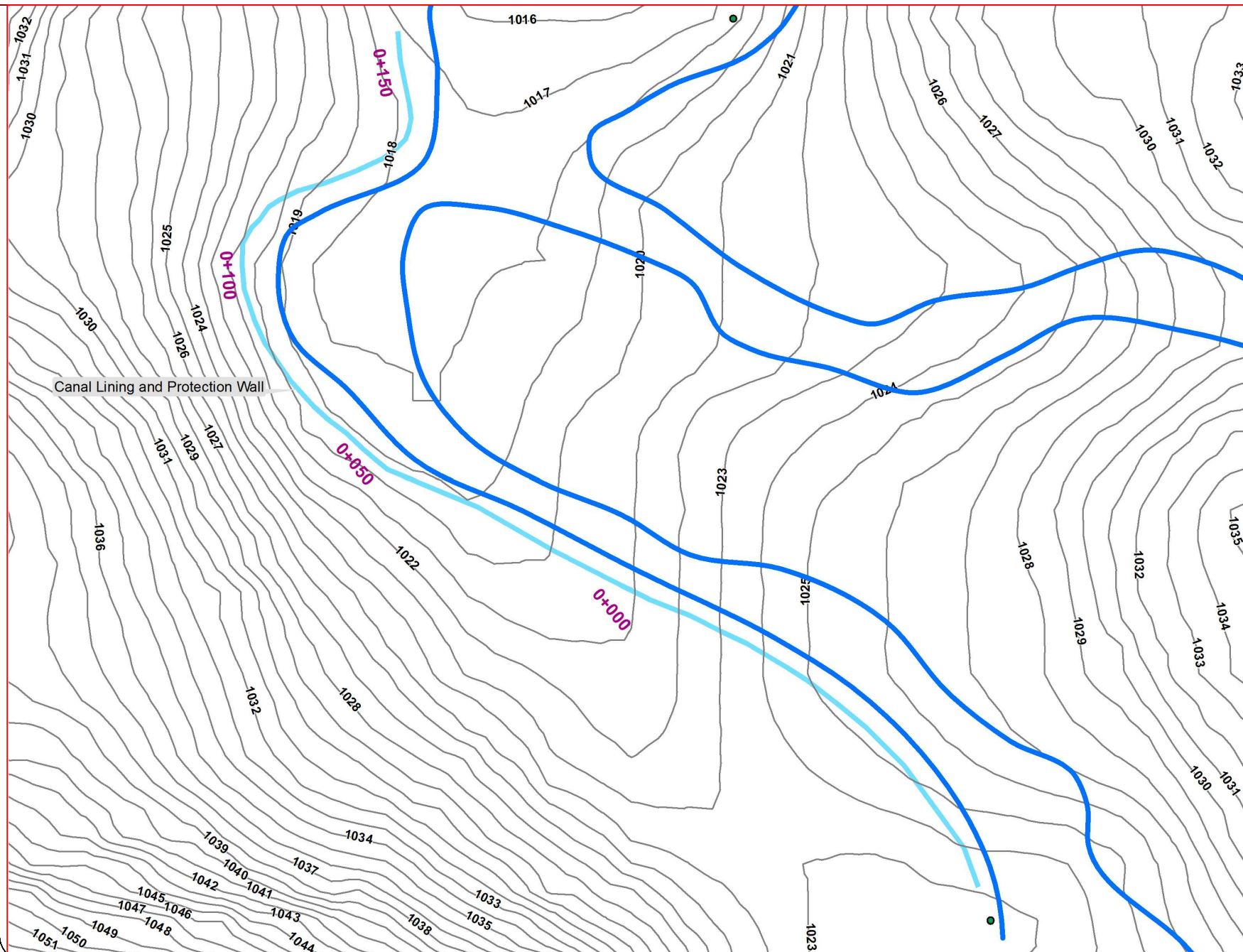


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Description: This Main Canal Map of the Dahan Darah area in Pashtun Kot District, Faryab Province, Afghanistan, presents the key irrigation infrastructure and land-use features supporting agricultural water distribution and irrigation management. The map shows key features such as canal lining and protection wall structure, also include the canal network, irrigated areas, canal intake, residential area, command area and other relevant site features, providing an overview for irrigation planning, operation, maintenance, and water resource management.

Data Sources: AGCHO **Datum/Projection:** WGS84/Geographic, **Date Created:** 05 July, 2026



PROJECT LEGEND

1. Stone Masonry Works Gray color



2. PCC B, C, D Gray color



3. RCC A, B,



4. Main outline of drawing structure black color



thic 0.15mm

5. Stone patching Gray color



6. Compacted gravel



7. Gabion box gray color



8. Steel work gray color



9. Structure slope side



10. Natural slope side



11. Compacted back filling



12. Original Ground



13. Pipe



14. Filter (fine gravel)



15. Rubber water stop



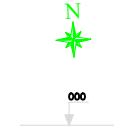
16. Gate



17. Dimension line showing red color



1. North Arrow



2. Elevation mark



3. Section mark



4. Bench mark



5. Direction of water flow blue color



6. Temporary BM red spot



7. Trees showing by green color



8. Existing structure Magenta Color



9. Road



10. Culvert or bridges



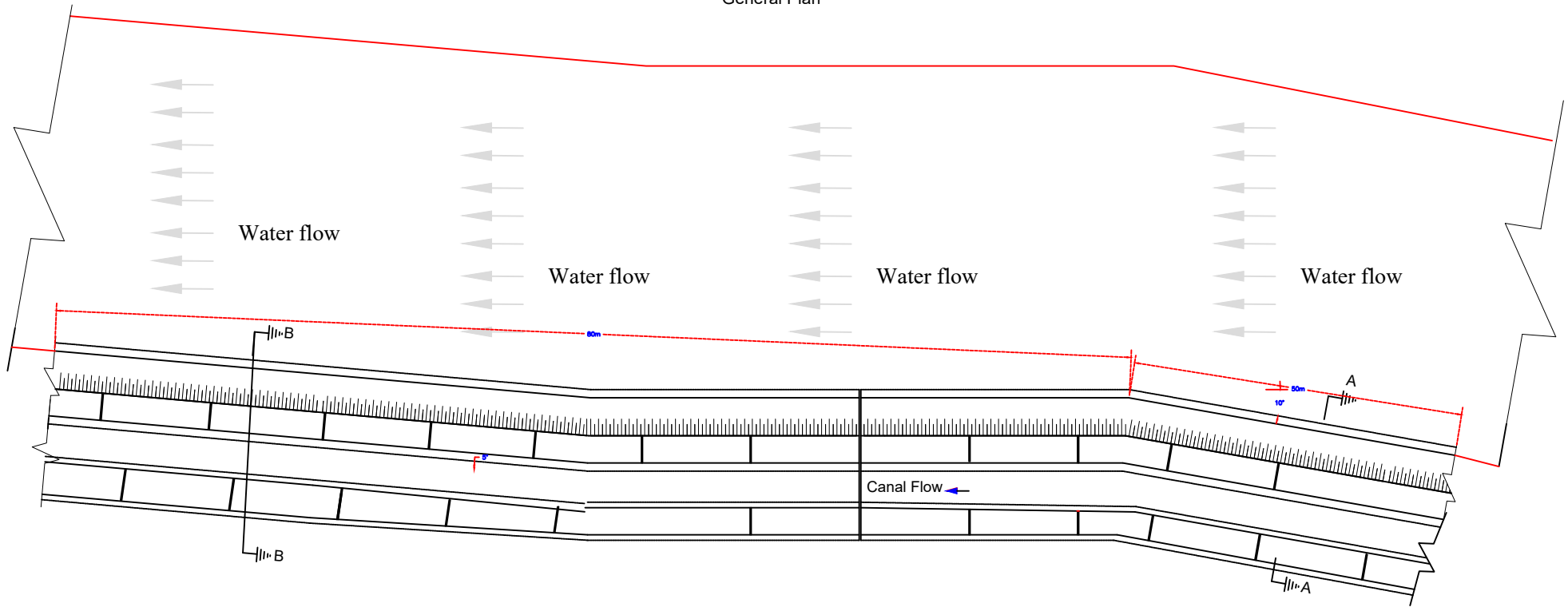
11. GI Earth line, showing by gray color



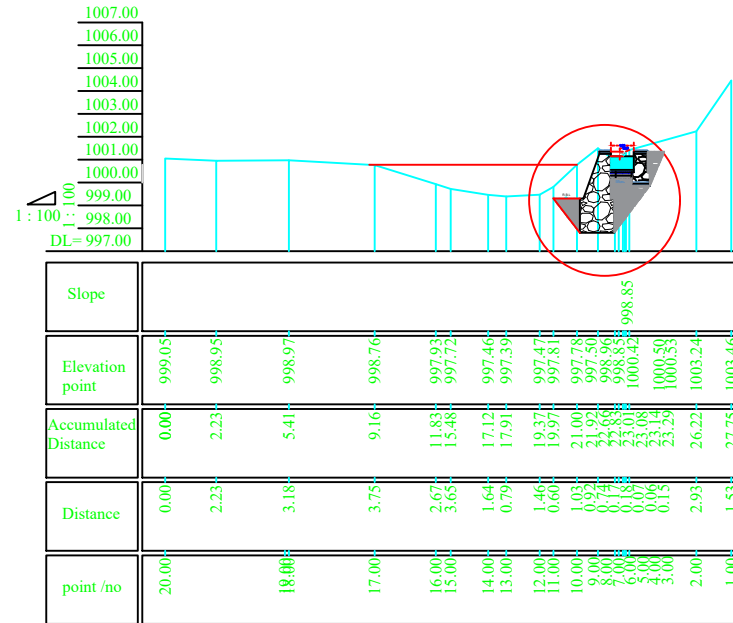
12. Bank line



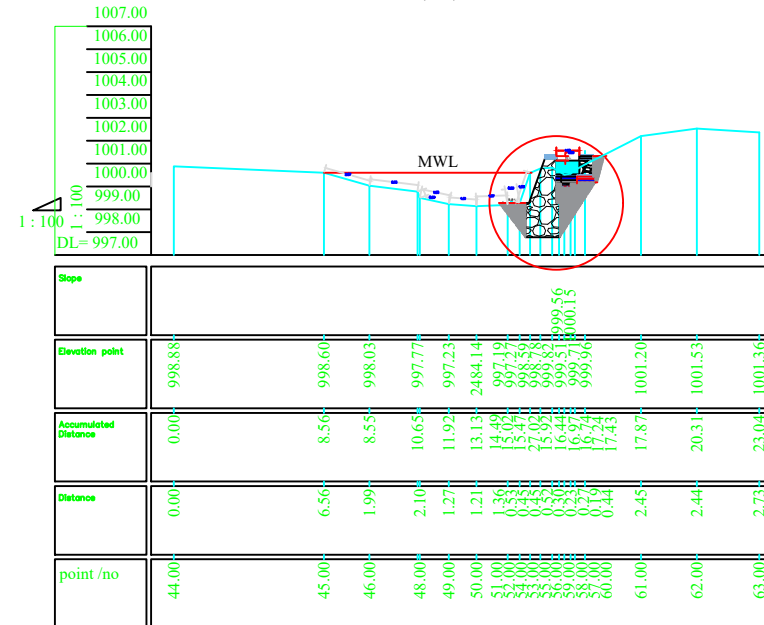
General Plan



CROSS SECTIONS

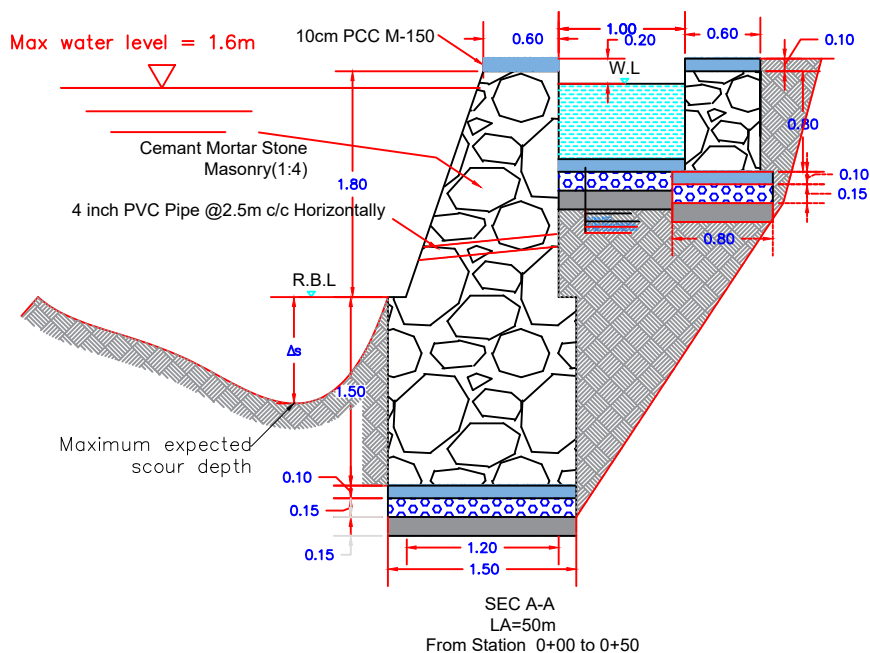
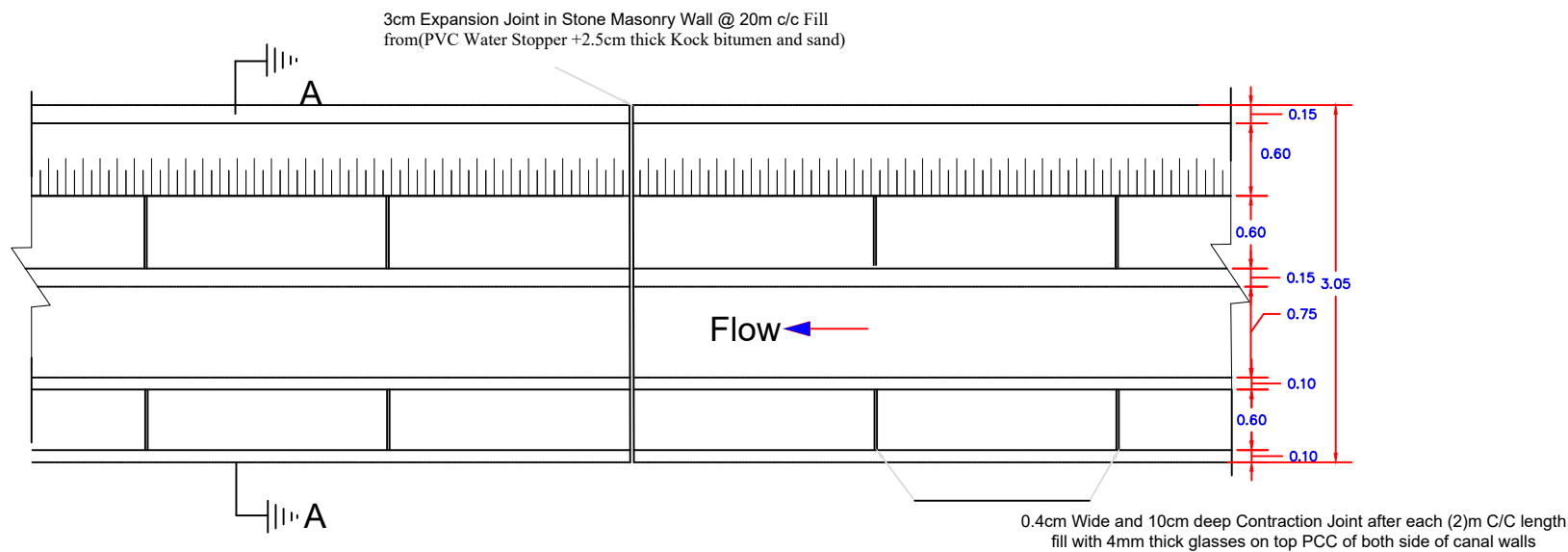


Sec(B-B) 0+080



Sec(A-A) 0+080 to 0+130

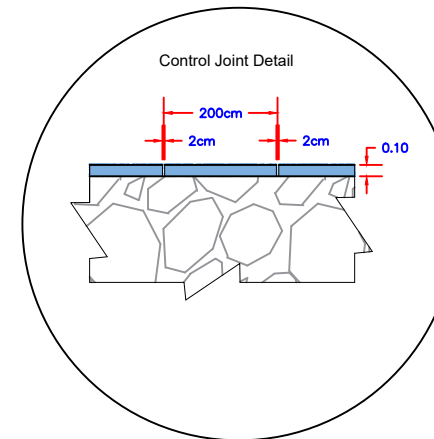
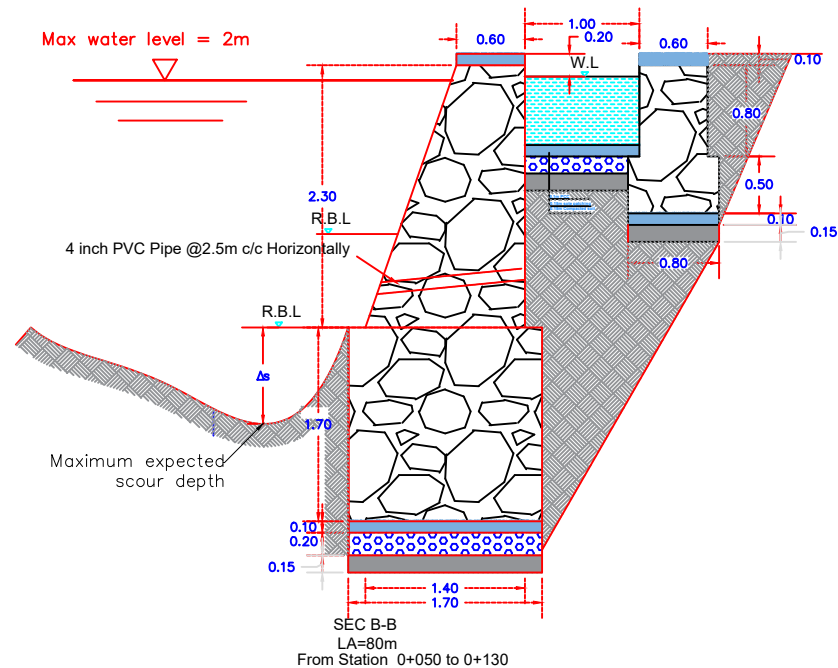
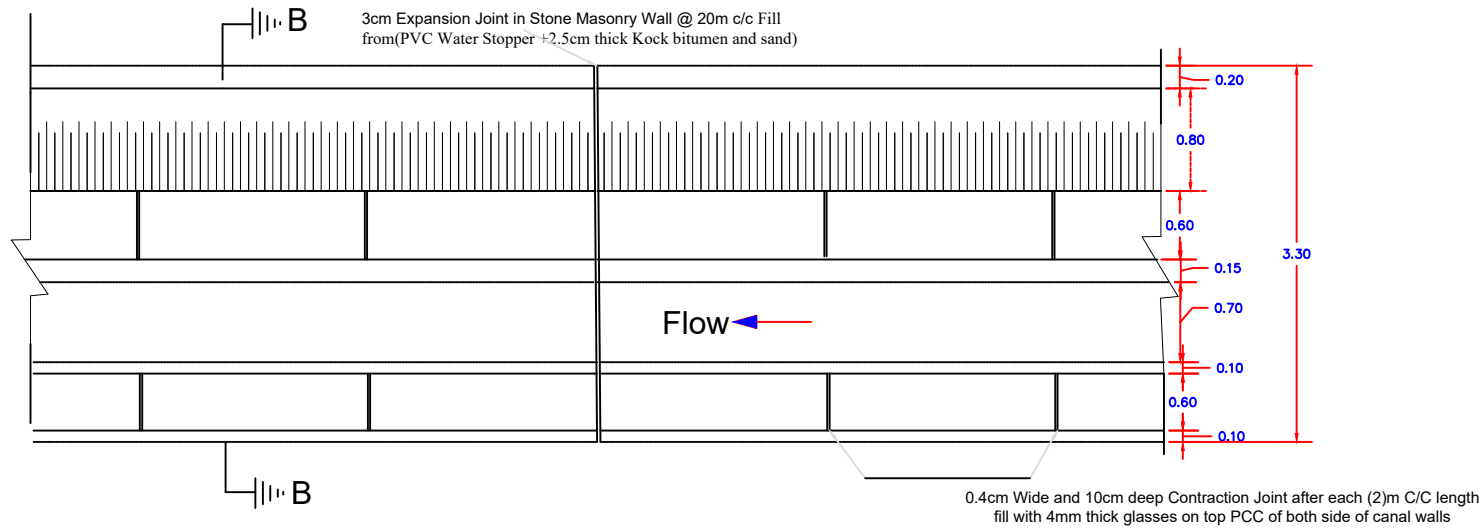
Plan and Section



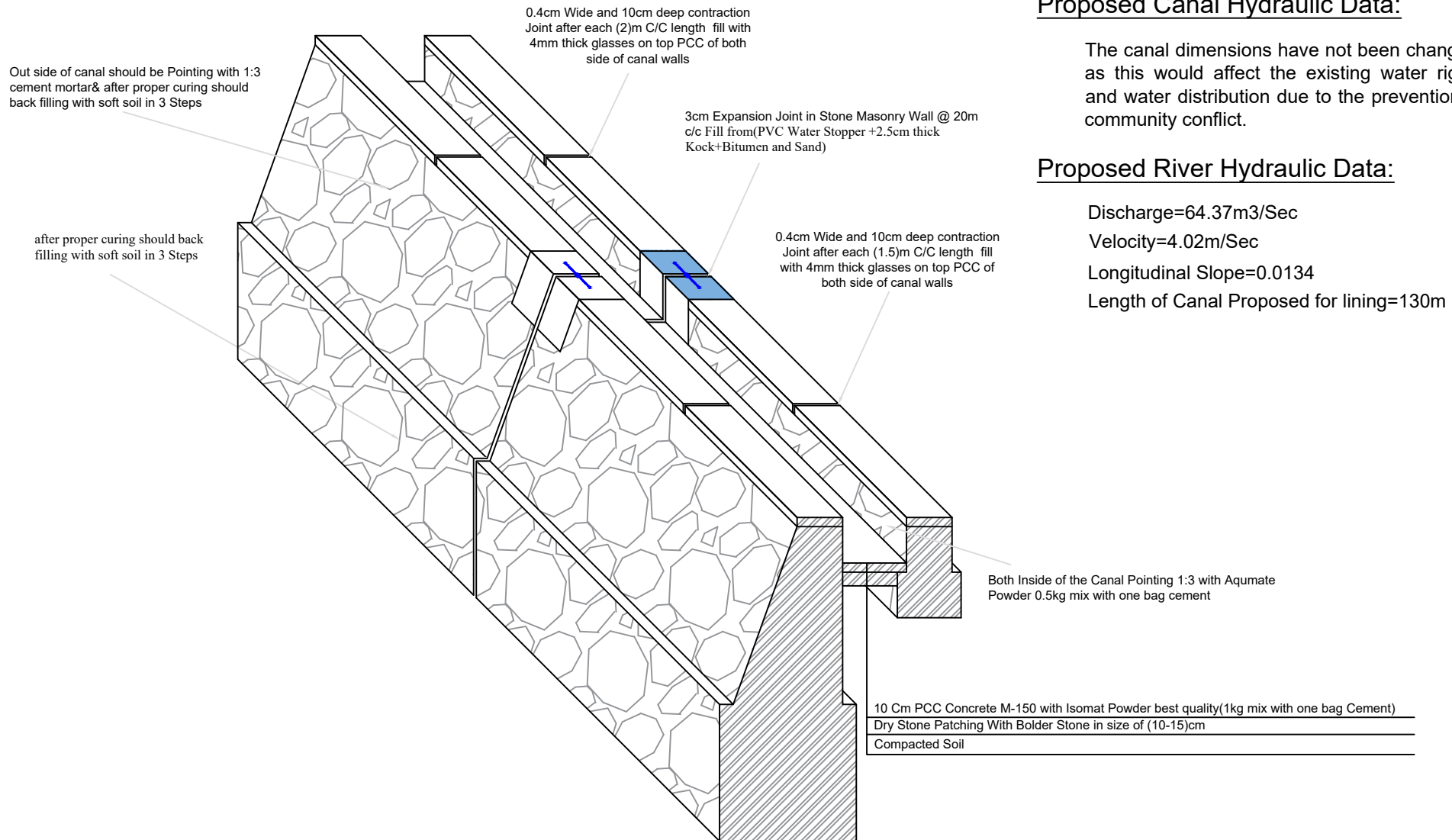
Technical Specification

1. Stones used for lining should be mountain crashed stone.
2. All the stones should have a reasonably uniform size.
3. Individual stones should be sound, hard and durable and should be such that they will be able to sustain weathering and water action.
4. They should be free from laminations, soft spots, cracks and other defects.
5. Use cement mortar with 1:4 for all stone masonry works.
6. All the exposed surface should be pointed with 1:3 cement:sand proportions.
7. Provide 3cm joint at each 15-20m interval.

Plan and Section



Isometric View



Proposed Canal Hydraulic Data:

The canal dimensions have not been changed, as this would affect the existing water rights and water distribution due to the prevention of community conflict.

Proposed River Hydraulic Data:

Discharge=64.37m³/Sec
Velocity=4.02m/Sec
Longitudinal Slope=0.0134
Length of Canal Proposed for lining=130m

1-CEMENT :

ORDINARY PORTLAND CEMENT

a) SETTING TIME :

INITIAL SETTING TIME : NOT LESS THAN 45 MINUTES FINAL

SETTING TIME : NOT GREATER THAN 8 HOURS

b) STRENGTH :

COMPRESSING STRENGTH (STANDARD CUBE) : 28 DAYS :

450MPa (6500 psi)

c) QUALITY :

A- Original Packing .

B- Free From Caked/ lump.

C- Slippery when rubbed by Finger.

D- feel Cool when placed hand in the Cement .

E- feel Hot when a grip of Cement placed into water .

F- Good Drinking water to be Used .

2-CONCRETE :

A-FOR ALL LEAN CONCRETE (PCC): 28 DAYS

STANDARD CYLINDER STRENGTH : $f_c' = 20 \text{ N/mm}^2$ (2800 psi)

B-Weight per unit volume of concrete $W=2400 \text{ kg/m}^3$

C-Concrete design based on a compressive strength of $f_c = 250 \text{ kg/cm}^2$ or as specified.

3-STONE:

A- Almost Regular and Shape.

B- Stone Size not Less then 200mm in minimum dimension and not more then 500mm in thickness and shall have a length less then 1.5 time of their width.

C- well Solid.

D- Crushed mountainous stone.

E- Not Rounded River Stone .

F- Do not have lime in its composition

G- Do not have crack and do not absorb water

4-SAND:

A- Free From Clay and Vegetation.

B- Should be Free From Salt.

C- Well Graded .

Technical Specification

5-GOOD QUALITY OF MASONRY WORK:

A- well socked stone to be used .

B- Clean Stone to be Used .

C- Gaps Between Stone must be filled with mortar.

D- Joint Should be staggered.

E- Height of Masonry work will be Maximum 1.2m of one day .

F- Masonry work must be Cured for 14 days.

GENERAL NOTE:

1- Duration of curing of all concrete work, Stone Masonry work and Pointing work not be less than 15 days.

2-All mortar for pointing 1:3 , stone masonry 1:4 and PCC 1:2:4, PCC Concrete and Stone stone Masonry

Mortar Should be Mixing by Mixer Machine

3-The Max slump should be between 5-7.5 cm

4-All dimensions are in centimeter or as specified.

5-Scale is vertical to horizontal fit.

6-All exposed surfaces to water of stone masonry should be pointed.

7-Contractor must adapt designs to site conditions under the direction and with the prior approval of the CARE provincial office .

8-The setting out of the structure and elevations must be confirmed on the site.

9-General and technical specifications, as included on the bidding documents.

10-Sand or fine aggregate shall be free from salt,alkali,calcium sulphate or vegetable and it shall not contain more than 0.5 percent by weight of clay.

11-Location of the structure, setting out and elevations to be confirmed by the Engineer before construction.

12-The contractor shall construct and maintain all necessary channels, diversions and other temporary works necessary to ensure that irrigation water supplies are not interrupted during construction works.

13-Site engineer should check all design and existing elevations and adjust the structure according to the site because the riverbed is changing season by season and the bed is scoured.

14-During the cold weather, concreting should be stop or the contractor has to consider the cold weather

ActionAid Afghanistan (A.A.A)

Promoting Resilient and Equitable Recovery of Agriculture and Livelihood in Afghan Communities

Engineering Department

احجام کار و مواد مصرفی برای سیستم آبیاری دهندره ولسوالی پشتونکوت ولایت فاریاب

Bill of Quantity for the Irrigation Infrastructure for Dahan e Dara Village, PTK District of Faryab Province

Dahan e Dara PCC Canal Lining and Canal Protection

S/NO شماره	Descriptions تشریحات	Unit واحد	Quantity مقدار	Cost/Unit (Afg) قیمت فی واحد (افغانی)	Total Cost (Afg) قیمت مجموعی (افغانی)	Remarks ملاحظات
A	BoQ for Canal Lining and Canal Protection					
1	site preparation(cleaning before excavation and final site cleaning of the construction)	md	21.60			
2	Foundation Levelling and Compaction with Mechanical(to achieve a minimum of 95% of the Maximum Dry Density (MDD))	m2	432.00			
3	Water Pump for Dewatering and Flow Diversion / Coffe Dams	LUM	1.00			
4	Foundation excavation with excavator or other needed machinery for canal and protection wall according to the design and drawing in land type 3-5.	M3	586.10			
5	Dry Ston Patching with Stone bolder (Mountain stone) with 10cm to 15cm diameter, according to the drawing and specification	M3	73.20			
6	Stone Massonry work with Mountain stone 20-45cm size and M300 (1:4) the work should done according to the technical specifications, Mountain stone should provide from the specific area as per engineer instruction.	M3	703.10			
7	Pointing stone wall, with cement, sand in canal inside should add waterproof mortar 1:3: M-400, the pointing should done according to the technical specification and drawings	M2	499.50			
8	PCC M-150 1:2:4 , send, Crash and fresh cement should mixed with mixer also the waterproof powder should use for bed of canal and work should done according to drawing and technical specification	M3	60.75			
9	Backfilling with Compaction: Earth work should be done with gravelling and compaction as per the drawing and given specification for the structures. The work should get done as per the specification and technical person input.	M3	105.50			
10	Kock for expansion joints with 2.5 cm thickness best quality	M2	9.75			
11	Water stopper with 15-20 cm width best quality	M	4.88			
12	Glasses 4mm thick for Control Joints	M2	13.00			
13	Stone Sign Board including the project detail, 60x50cm size with installation on the field	LM	1.00			
14	PVC Pipe for weep holes 4" diameter, Class C should install in each 2.5m according to drawing	M	67.60			
Total Cost for Canal Lining and Canal Protection(Afg)						

Technical specifications for construction (Canal Lining and Canal Protection) for Dahan e Dara Watershed of Pashton Kot district, Faryab Province

Location of Project:

1. **Province: Faryab**
2. **District: Pashton Kot**
3. **Village: Dahan e Dara**

General Information

The project consists of the construction of (Canal Lining and Canal Protection) Works in accordance with the contract documents, approved drawings, technical specifications, and other relevant contract requirements.

The project is in Dahan-e-Dara Village, Pashton Kot District, Faryab Province, Afghanistan. The community has long faced significant challenges in securing a reliable supply of irrigation water for agricultural activities. Upon completion, the canal will provide a safe and reliable irrigation water supply to approximately (3,500) families across eight (8) villages, thereby improving agricultural productivity and supporting local livelihoods.

It should be noted that the communities in this area have been adversely affected by years of conflict and recurrent natural disasters. Based on community consultations and participatory planning meetings, the construction of this canal was identified as the highest-priority infrastructure intervention to address the community's urgent irrigation needs.

Project Objective:

The primary objective of this project is to provide a safe, reliable, and sustainable irrigation water supply to the targeted communities. The project aims to improve the efficiency of the existing irrigation system through canal lining and protection works, thereby reducing water losses and ensuring a more dependable water supply for agricultural purposes.

Upon completion, the project is expected to achieve the following objectives:

- ✓ Reduce water losses through seepage and improve water conveyance efficiency.
- ✓ Enhance the reliability and distribution of irrigation water to agricultural lands.
- ✓ Increase agricultural productivity and crop yields through improved water management.
- ✓ Protect the canal and surrounding farmland from seasonal floods, erosion, and structural damage.
- ✓ Generate temporary employment opportunities for local community members during the construction phase.
- ✓ Improve farmers' livelihoods by increasing agricultural income and strengthening food security.
- ✓ Contribute to the long-term sustainability and resilience of the irrigation infrastructure for the benefit of present and future generations.

Basic components of the project:

- 1- Site preparation and excavation
- 2- PCC Work
- 3- Stone Masonry
- 4- Pointing
- 5- Miscellaneous Work

Site preparation and excavation and Back Filling

For construction of canal lining and canal protection wall we need to, cleaning the area and excavation the 3-4 type land is necessary for foundation of protection or canal wall, which should be done in accordance with drawing and following specifications:

Site preparation and excavation and back filling:

- 1- After contract award, the Contractor shall clear, level, and prepare the construction site.
- 2- All organic matter, debris, and unsuitable materials shall be removed and disposed of outside the work area.
- 3- The Contractor shall set out the foundation lines in accordance with the approved drawings. The setting out shall be inspected and approved by the ActionAid Engineer before excavation begins.
- 4- Excavation shall be carried out to the required lines, levels, and dimensions shown on the drawings.
- 5- Any loose or unsuitable soil encountered during excavation shall be removed until firm ground is reached.
- 6- Excavation may be carried out in soil, gravel, silt, or rock, depending on site conditions and the approved design.
- 7- Backfilling shall be carried out with approved moist material and compacted in layers where required.
- 8- Where specified, compaction shall be performed using a mechanical compactor to achieve the required density.
- 9- All excavation and backfilling works shall be inspected and approved by the ActionAid Engineer before the next stage of construction proceeds.

PCC work

PCC shall be placed as specified in the approved drawings to provide a firm and level foundation and to strengthen the base and other structural elements of the canal lining and protection wall. All PCC works shall be carried out in accordance with the approved design and technical specifications.

PCC Specifications:

- 1- PCC shall be Grade M150 (1:2:4) or as specified in the approved design.
- 2- All PCC materials should be of approved quality and free from harmful impurities.
- 3- Only clean, fresh water shall be used for concrete mixing; salt water is strictly prohibited.
- 4- Cement shall be fresh, standard (M500), and approved by the Engineer before use.
- 5- Coarse aggregates shall be clean, well-graded, and not exceed 20 mm in size.

- 6- The concrete materials shall be mixed using a mechanical concrete mixer to ensure a uniform and consistent mix
- 7- Mixed concrete shall be placed within one hour of batching.
- 8- Concrete shall be properly cured and kept continuously moist for 7–14 days.
- 9- All PCC materials and works shall be inspected and approved by the AAA Engineer before placement.
- 10- For the canal bed PCC, waterproofing admixture shall be added where specified by the ActionAid Engineer.
- 11- Formwork boards shall be made of hardwood and shall have a minimum thickness of 2.5 cm. The surface of the boards shall be smooth, free from cracks, splits, and joints. No gaps exist between adjacent boards. Alternatively, standard steel formwork may be used.
- 12- All formworks shall be inspected and approved by the AAA Engineer before the commencement of reinforcement fixing and concrete pouring.

Stone Masonry

Stone masonry for the canal lining and protection wall shall be constructed using the best quality durable facing stones. The stones shall be sound, hard, clean, and free from cracks or other defects, and shall be laid in accordance with the approved drawings.

Specifications of masonry materials:

- 1- Stones shall have adequate resistance against pressure and erosion, with good quality, color, and appearance.
- 2- Limestone and sea stones shall not be used.
- 3- The maximum size of stones shall not exceed two-thirds (2/3) of the wall thickness.
- 4- Small stones shall only be used where necessary and shall be kept to a minimum.
- 5- Stones shall be properly arranged to minimize gaps. Any remaining gaps shall be filled with mortar.
- 6- Mortar shall comprise approximately 30–35% of the total stone masonry volume and shall be mixed at a ratio of 1:4 (cement) using high-quality cement and clean, washed sand free from soil and impurities. Only clean potable water shall be used for mixing.
- 7- Vertical placement of stones within the wall shall be avoided.
- 8- Proper construction joints should be provided as required.
- 9- Stone masonry shall be constructed in a uniform and regular manner according to the approved drawings.
- 10- Completed masonry work shall be kept continuously moist for a minimum of 14 consecutive days for proper curing.
- 11- Cement and sand mortar shall be used for all stone masonry works.
- 12- All spaces around the stones shall be fully filled with cement mortar, ensuring that no voids remain within the masonry.

Pointing Work

Pointing work shall be carried out to improve the durability, water resistance, and appearance of the canal lining and protection wall. The joints between stones shall be properly cleaned and filled with approved mortar to provide a smooth, strong, and watertight finish in accordance with the approved drawings.

Specifications of pointing

- 1- Pointing mortar shall be prepared using a 1:3 cement-to-sand ratio.
- 2- The pointed joints shall be highlighted with black color after completion, as required.
- 3- In addition to cement and sand, approved waterproofing powder (Padlow powder) shall be added to the pointing mortar.
- 4- Sand shall be clean, washed, and completely free from soil and other impurities.
- 5- Completed pointing work shall be kept moist for the specified curing period mentioned in the contract documents.
- 6- If the Contractor fails to use approved materials, properly mix the mortar, maintain moisture, or achieve acceptable workmanship, the defective pointing works shall be removed and reconstructed at the Contractor's cost.
- 7- Pointing work shall be neat, uniform, and executed to the satisfaction of the Engineer.

Miscellaneous work (Note):

- 1- If the included materials are not considered necessary according to the needs of the field engineer, or if they are already available in the field and do not need to be converted, the budget will be returned to the project sponsor's account.
- 2- Due to the normal progress of technical work and careful monitoring of the project, the contracting company must assign one of its own engineers in the field and monitor the project until the end of the construction work.
- 3- The work of the project is implemented according to the plan proposed by the engineering department of the AAA office. In case the work does not progress according to the plan, the respected contractor is obliged to pay a penalty according to the contract.
- 4- The work of the project is always and regularly monitored by the AAA engineers, and in case of technical problems, it even causes its destruction and reconstruction.
- 5- It is the responsibility of the contracting company to prepare the conditions and comply with the safe technical principles, and all the employees of this project must be equipped with masks, hats, glasses, and workers' uniforms, and the workers' vests must be decorated with the company's brand, PPE should be considered.
- 6- If any important contractual matter is forgotten, please write it in the last part of the page and give it a price on the attached table, otherwise, he will not have the right to complain in the future.

Contractor Name and signature

AAA Technical lead Signature