

HARYANA RAIL INFRASTRUCTURE DEVELOPMENT CORPORATION LIMITED

(A Joint Venture Govt. of Haryana and Ministry of Railways)

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Tender No.: HORC/HRIDC/C-4/2022

Date: 04.01.2023

Reference: Specific Procurement Notice dated 04.11.2022.

CORRIGENDUM NO. 2

Name of Work: C-4: Composite Contract package in connection with New BG Railway Line of HORC project for:

- (i) Design & Construction of Twin Tunnel using NATM and Cut & Cover method from km 24.880 to km 29.580;
- (ii) Design & Installation of Ballastless Track (excluding supply of rails) from km 24.856 to km 29.680;
- (iii) Detailed Design, Supply, Installation, Testing & Commissioning of General Electrical Services including Supply, Erection, Testing and Commissioning of 11kV HT/LT Power and Control Cable Network, GIS Substation (11/0.433) kVA, Tunnel lighting system, etc. from km 24.880 to km 29.680;
- (iv) Design & Construction of Embankment, Bridges and other miscellaneous works from km 12.00 to km 18.00.

S. No.	Tender Document Part / Section/ Clause No.	Description of Existing Clause	Modified Description of Existing Clause / New Clause
1.	Part 1, Section IV, Tender Forms, Appendix B to Financial Part: Price Schedules, Sub-Clause 1.1	The Price Schedules shall be read in conjunction with the Instructions to Tenderers, the General Conditions, the Particular Conditions and the Employer's Requirements (General Specifications, Design Requirements Criteria, Technical Specifications, Drawings) and the Addenda (if any).	The Price Schedules shall be read in conjunction with the Instructions to Tenderers, the General Conditions, the Particular Conditions and the Employer's Requirements { <i>General, Functional (Civil and BLT), Design (Civil), Construction (Civil), Outline Design Specifications (ODS)- Civil and BLT, Outline Construction Specifications (OCS)-Civil and BLT, General Electrical Services, Tender drawings and documents and Appendices</i> } and the Addenda (if any).
2.	Part 1, Section IV, Tender Forms, Appendix B to Financial Part: Price		Add new Sub-Clause 1.13 at the end of Sub-Clause 1.12 The rates quoted by the Tenderer are for design and construction of the Works as per approved Alignment

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	Schedules, Preamble, Sub-Clause 1.12		Plan and L-Section and approved GADs of bridges as per Scope of the Works.
3.	Part 1, Item No. 17, Corrigendum No. 1 Section IV, Tender Forms, Appendix B to Financial Part: Price Schedules	Section IV, Tender Forms, Appendix B to Financial Part: Price Schedules, Schedule 'C'/R1	The existing Schedule 'C'/R1 of Appendix B to Financial Part: Price Schedules is replaced with Schedule 'C'/R2 and annexed as “ Attachment 1 ” of this Corrigendum No. 2.
4.	Part 2, Employer’s Requirements, Section VII-1: <i>General, Abbreviations</i>	RL: Rail Level	RL: <i>Reduced</i> Level
5.	Part 2, Employer’s Requirements, Section VII-2: <i>Functional (Civil and BLT)</i> , Sub-Clause 1.5	Employer’s Requirements- Functional (Civil & BLT) shall be read in conjunction with Employer’s Requirements-Design, Construction, Outline Design Specification (ODS)-Civil & BLT, Outline Construction Specifications (OCS)-Civil & BLT and other requirements of the Contract.	Employer’s Requirements- Functional (Civil & BLT) shall be read in conjunction with Employer’s Requirements-Design, Construction, Outline Design Specification (ODS)-Civil & BLT, Outline Construction Specifications (OCS)-Civil & BLT and other requirements of the Contract. <i>The price quoted by the Contractor shall be deemed to have included cost of Works as per Part 2-Employer’s Requirements (General, Functional (Civil and BLT) , Design (Civil), Construction (Civil) , Outline Design Specifications (ODS)- Civil and BLT , Outline Construction Specifications (OCS)-Civil and BLT , General Electrical Services , Tender drawings and Documents and Appendices).</i>
6.	Part 2, Employer’s Requirements, Section VII-2: <i>Functional (Civil and BLT)</i> , Sub-Clause 2.1.1	f) Design and construction of portals at both ends of tunnel including drainage arrangement for surface runoff from cut slopes and protection against fall of boulders.	f) Design and construction of portals at both ends of tunnel including <i>rock cutting at Portal P-1</i> and drainage arrangement for surface runoff from cut slopes and protection against fall of boulders.

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7.	Part 2, Employer's Requirements, Section VII-2: <i>Functional (Civil and BLT)</i> , Sub-Clause 2.1.2	Design and construction of ballastless track including transition from ballastless track to ballasted track at each end and derailment guard in entire length of tunnel as well as in approach of tunnels. The work also includes supply of spares and maintenance of ballastless track for a period of one year after start of traffic.	Design and construction of ballastless track <i>from Ch. 24856m to Ch. 29680m</i> including transition from ballastless track to ballasted track at each end and derailment guard in entire length of tunnel as well as in approach of tunnels. The work also includes supply of spares and maintenance of ballastless track for a period of one year after start of traffic.
8.	Part 2, Employer's Requirements, Section VII-2: Functional (Civil and BLT), Sub-Clause 2.1.3, Design and construction of railway formation		Add the following at the end of Sub-Clause 2.1.3 <i>After Taking Over the Works, the Contractor shall maintain embankment / cutting slopes for a period of one (01) year and shall make good any loss of soil/damage to drains due to rain cuts, pedestrian movement or any other reason.</i>
9.	Part 2, Employer's Requirements, Section VII-2: Functional (Civil and BLT), Sub-Clause 2.1.4, Design and construction of cutting, sump, precast RCC drain on berms in the approach of Portal P-2		Add the following at the end of Sub-Clause 2.1.4 <i>After Taking Over the Works, the Contractor shall maintain slopes of cutting including sump, pre-cast RCC drain on berms, side drains, catchwater drains, chutes etc. for a period of one (01) year and shall make good any loss of soil/ damage due to rain cuts, pedestrian movement or any other reason.</i>
10.	Part 2, Employer's Requirements, Section VII-2: <i>Functional (Civil and BLT)</i> , Sub-Clause 2.1.1	Note- Excavated earth/rock from tunnelling/cutting shall be property of the Contractor. Royalty for using the excavated earth/rock for construction of the Works shall be borne by the Contractor. Surplus excavated earth/rock from tunnel shall be disposed off by the Contractor at his own cost.	Notes- 1. Excavated earth/rock from tunnelling/cutting shall be property of the Contractor. Royalty for using the excavated earth/rock for construction of the Works shall be borne by the Contractor. Surplus excavated earth/rock from tunnel shall be disposed off by the Contractor at his own cost.

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			<p>2. <i>The Contractor shall take all safety precautions during construction (specially during blasting operations and rock cutting) and ensure that there is no damage caused to the DFC Track and its structures near proposed Portal-P1. In case of failure of the Contractor to ensure the above, DFC Track and structures shall have to be restored in the original condition by the Contractor at his own cost.</i></p>
11.	Part 2, Employer's Requirements, Section VII-2: <i>Functional (Civil and BLT)</i> , Sub-Clause 2.1.9	Design and construction of precast RCC retaining wall near the toe of embankment wherever ROW is inadequate. Approximate locations of retaining wall is shown in Annexure- F-4.	Deleted
12.	Part 2, Employer's Requirements, Section VII-2: <i>Functional (Civil and BLT)</i> , Sub-Clause 2.1.18 (i), last sentence	No claim whatsoever on account of any discrepancy about the rock/soil parameters and sub soil water conditions that may be actually encountered at the time of execution of the work and those given in these tender documents shall be admissible to the contractor under any circumstances.	No claim whatsoever on account of any discrepancy/ <i>change in geology</i> about the rock/soil parameters and sub soil water conditions that may be actually encountered at the time of execution of the work and those given in these tender documents shall be admissible to the contractor under any circumstances.
13.	Part 2, Employer's Requirements, Section VII-2: <i>Functional (Civil and BLT)</i> , Sub-Clause 2.1.19, Contractor's Facilities & Site Office		<p><i>Add new para at the end of Sub-Clause 2.1.19</i> <i>Land as shown in Sketches (enclosed in Attachment No.5 of Corrigendum No. 2) Section VII-8: Tender drawings and documents, Part 2-Employer's Requirements) will be made available by the Employer which can be utilised by the Contractor with the approval of the Engineer. Any land required beyond the above area will have to be arranged by the Contractor at his own cost.</i></p>
14.	Part 2, Employer's Requirements, Section	Scope under BOQ Schedule 'B'	Scope under BOQ Schedule 'B'

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	VII-2: <i>Functional (Civil and BLT)</i> , Sub-Clause 2.2	<p>Under this Schedule, the Contractor is required to carry out works which are not covered in Schedule 'A'. Broadly following works shall be carried out under this Schedule 'B':</p> <p>a) Construction of approach roads for shafts and portals including paving of area.</p> <p>b) Construction of bridges as per list given in Annexure-F-3</p> <p>c) Any other item as directed by the Engineer related to the Works.</p>	<p>Under this Schedule, the Contractor is required to carry out works which are not covered in Schedule 'A'. Broadly following works shall be carried out under this Schedule 'B':</p> <p>a) Construction of bridges as per list given in Annexure-F-3</p> <p>b) Any other item as directed by the Engineer related to the Works.</p>
15.	Part 2, Employer's Requirements, Section VII-2: <i>Functional (Civil and BLT)</i> , Sub-Clause 2.6	<p>The Employer may appoint an independent agency to ensure the quality checking of design, supply, fabrication, erection and construction of all works under Scope of the Works. The Contractor shall ensure the complete co-operation with the agency to perform their work satisfactorily. In addition, the Employer also reserves right to undertake quality check and inspection directly by itself.</p>	<p>The Employer may appoint an independent agency to ensure the quality checking of design, supply, fabrication, erection and construction of all works under Scope of the Works. <i>Payment to the independent agency shall be made by the Employer separately.</i> The Contractor shall ensure the complete co-operation with the agency to perform their work satisfactorily. In addition, the Employer also reserves right to undertake quality check and inspection directly by itself.</p>

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16.	Part 2, Employer's Requirements, Section VII-2: <i>Functional (Civil and BLT)</i> , Sub-Clause 2.7.3		Add new Sub-Clause 2.7.3 at the end of Sub-Clause 2.7.2 <i>The ground levels shown in Conceptual Alignment Plan & L-Section tender drawings are based on preliminary survey. Detailed survey will have to be carried out by the Contractor for confirming and preparation of final Alignment Plan & L-Section. No cost implication shall be considered for any variation in the ground levels with respect to ground levels shown in conceptual Alignment Plan & L-Section tender drawings.</i>
17.	Part 2, Employer's Requirements, Section VII-2: <i>Functional (Civil and BLT)</i> , Annexure-F-4	Annexure- F-4: Approximate Locations of Retaining Wall	<i>Deleted</i>
18.	Part 2, Employer's Requirements, Section VII-3: Design – (Civil & BLT), Sub-Clause 1.7	The Contractor shall get the design of NATM tunnel, Cut & Cover tunnel, BLT, Permanent Ventilation Shafts and Portals, proof checked by Detailed Design Consultant appointed by the Employer. The cost of proof checking shall be borne by the Employer. Proof checked design shall be submitted to the Engineer for approval.	The Contractor shall submit the design of NATM tunnel, Cut & Cover tunnel, BLT, Permanent Ventilation Shafts and Portals <i>etc. to the Engineer for approval. In addition, the designs can be got checked from the third party appointed by the Employer. The cost of third party checking shall be borne by the Employer.</i>
19.	Part 2, Employer's Requirements, Section VII-3: <i>Design (Civil & BLT)</i> , Sub-Clause 5.1 (n)	preliminary section of the NATM tunnel shape and size, keeping the rail level same as indicated in the tender drawings and keeping the provisions for systems such as OHE, walkway and other Electrical services	preliminary section of the NATM tunnel shape and size.
20.	Part 2, Employer's Requirements, Section VII-3: <i>Design (Civil &</i>	the details of the portals and primary support system at permanent ventilation shafts;	the details of the portals and primary support system at permanent ventilation shafts <i>and Construction cum Utility Shaft;</i>

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	<i>BLT</i>), Sub-Clause 5.2.1 (b)		
21.	Part 2, Employer's Requirements, Section VII-3: <i>Design (Civil & BLT)</i> , Sub-Clause 5.2.1		Add new para (v) and (w) at the end of para (u) (v) Design of formation including slope stability analysis from Ch. 12000m to Ch. 18000m and Ch. 29580m to Ch. 29680m (w) Design of retaining wall, if required
22.	Part 2, Employer's Requirements, Section VII-3: Design (Civil & BLT), Sub-Clause 5.2.2 (f)	Detail of the portals and permanent ventilation shafts;	Detail of the portals and permanent ventilation shafts <i>and Construction cum Utility Shaft</i> ;
23.	Part 2, Employer's Requirements, Section VII-3: Design (Civil & BLT), Sub-Clause 5.2.2		Add new para (q) and (r) at the end of para (p) (q) <i>formation from Ch. 12000m to Ch. 18000m and Ch. 29580m to Ch. 29680m</i> (r) <i>Retaining wall, if required.</i>
24.	Part 2, Employer's Requirements, Section VII-3: Design – (Civil & BLT), Sub-Clause 9.3	The Contractor shall submit the Design Submission Programme to the Engineer within thirty (30) days of the Commencement Date, and thereafter up-dated versions thereof at intervals of not more than one (1) month throughout the Design Phase.	Deleted
25.	Part 2, Employer's Requirements, Section VII-3: Design – (Civil & BLT), Sub-Clause 12.4	The contractor to provide two licensed working software copy being used by its DDC to Employer/Engineer's design department maintained for the entire contract period.	The contractor to provide <i>one</i> licensed working software copy being used by its DDC to Employer/Engineer's design department maintained for the entire contract period.
26.	Part 2, Employer's Requirements, Section VII-3: Design – (Civil & BLT), Sub-Clause 13.3		Add the following Note at the end of Sub-Clause 13.3 Note: <i>The qualifications of DDC given above are based on Railway Boards letter No. 2016/39/CE-III/BR/BLT dated</i>

S. No.	Tender Document Part / Section/ Clause No.	Description of Existing Clause	Modified Description of Existing Clause / New Clause
			<i>06.02.2018. If the criteria given in Railway Boards letter is modified by Railway Board / concerned government authority / RDSO, the same will be followed. However, the modified criteria will not be stricter than the criteria given above.</i>
27.	Part 2, Employer's Requirements, Section VII-3: Design – (Civil & BLT), Sub-Clause 13.5	The Contractor shall submit test report of the proposed fastening system from a reputed independent institute/laboratory. The test report shall be accompanied with the drawing of the fastening system including its components which have been tested and reported upon. The Contractor shall propose the same fastening system for which test report has been submitted. The testing shall be done for Cat 'E' as specified in EN-13401 Pt-1:2012 & EN-13401 Pt-5:2012 for 60Kg UIC rail section. The Contractor shall also submit a statement showing compliance or otherwise, in juxtaposition to each Clause and Sub-Clause as specified in EN-13401 Pt-1:2012 & EN-13401 Pt-5:2012.	The Contractor shall submit test report of the proposed fastening system from a reputed independent institute/laboratory. The test report shall be accompanied with the drawing of the fastening system including its components which have been tested and reported upon. The Contractor shall propose the same fastening system for which test report has been submitted. The testing shall be done for Cat 'E' as specified in EN-13481 Pt-1:2012 & EN-13401 Pt-5:2017 for 60Kg UIC rail section. The Contractor shall also submit a statement showing compliance or otherwise, in juxtaposition to each Clause and Sub-Clause as specified in EN-13481 Pt-1:2012 & EN-13481 Pt-5:2017. <i>The above Specifications are based on Railway Boards letter No. 2016/39/CE-III/BR/BLT dated 06.02.2018. If the Specifications given in Railway Boards letter are modified by Railway Board / concerned government authority / RDSO, the same will be followed. The Contractor shall design and construct the BLT system as per the modified Specifications without any additional cost to the Employer.</i>
28.	Part 2, Employer's Requirements, Section VII-4: Construction –	Sub-Clause 7.1. (b) Static inspection	The table under Sub-Clause 7.1. (b) Static inspection is revised and annexed as Attachment 2 of this Corrigendum No. 2.

S. No.	Tender Document Part / Section/ Clause No.	Description of Existing Clause	Modified Description of Existing Clause / New Clause
	(Civil & BLT), Sub-Clause 7.1 (b)		
29.	Part 2, Employer's Requirements, Section VII-4: Construction – (Civil & BLT), Sub-Clause 8.1	Upon award of the Contract, the Contractor shall engage Sub-Contractor for Construction of ballast less Track System. The Contractor shall submit details of Sub-Contractor proposed to be engaged for Construction of ballast less Track System for the approval of the Engineer. Sub-Contractor for Construction of ballast less track system shall be engaged within twelve months of the Commencement Date.	Upon award of the Contract, the Contractor shall engage Sub-Contractor for Construction of ballastless Track System. The Contractor shall submit details of Sub-Contractor proposed to be engaged for Construction of ballast less Track System for the approval of the Engineer.
30.	Part 2, Employer's Requirements, Section VII-4: Construction – (Civil & BLT), Sub-Clause 8.3	Sub-Contractor to be engaged shall submit experience certificate for construction of ballast less track system issued by the user railway administration. In case the user railway administration is from foreign country and the certificate is issued in language other than English, the supporting documents shall be translated into English. The translation of the certificate shall be either stamped by Embassy/High Commission of India or Partner Countries of Hague convention may submit these documents with "Apostille" stamp. The experience certificate issued by foreign user railway administration in English shall also be either stamped by Embassy/High Commission of India or submitted with "Apostille" stamp.	Sub-Contractor to be engaged shall submit experience certificate for construction of ballast less track system issued by the user railway administration. In case the user railway administration is from foreign country and the certificate is issued in language other than English, the supporting documents shall be translated into English <i>language. The translation of Certificates / documents in foreign language shall be done by the licensed translator. The Contractor must submit copy of license issued by the competent authority in their country of origin.</i>
31.	Part 2, Employer's Requirements, Section VII-4: Construction (Civil	Attachment C-1: Minimum Organisation Structure Required	The existing " Attachment C-1: Minimum Organisation Structure Required" is revised and annexed as Attachment 3 of this Corrigendum No. 2.

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	and BLT), Attachment C-1		
32.	Part 2, Employer's Requirements, Section VII-4: Construction (Civil and BLT), Attachment C-2	Attachment C-2: Minimum Qualification & Experience of Project Personnel	The existing " Attachment C-2: Minimum Qualification & Experience of Project Personnel" is revised and annexed as Attachment 3 of this Corrigendum No. 2.
33.	Part 2, Employer's Requirements, Section VII-4: Construction (Civil and BLT), Attachment C-3	Attachment C-3: Minimum Resources required for the Project- Plants & Equipment	The existing " Attachment C-3: Minimum Resources required for the Project- Plants & Equipment" is revised and annexed as Attachment 3 of this Corrigendum No. 2.
34.	Part 2, Employer's Requirements, Section VII-6: Outline Construction Specifications (OCS) — Civil & BLT, Sub-Clause 2.3.21, First Sentence	2.3.21 LAND REQUIREMENT i. Employer has acquired the required land for permanent components of the project work, approach roads to various project components which shall be handed over to the contractor on as is where is basis.	Employer has acquired the required land for permanent components of the project work which shall be handed over to the contractor on as is where is basis.
35.	Part 2, Employer's Requirements, Section VII-5: Outline Design Specifications – Civil and BLT, Sub-Clause 4.1	The Contractor shall be responsible for determining for his design purposes the Geology and the Geotechnical parameters of the sub-surface strata along the route. Geotechnical Investigations have been carried out by the Employer and the Geotechnical Investigations Reports are given in Employer's Requirements, Section VII-8, Tender drawings and documents for information only. These shall be confirmed and supplemented if considered necessary by the Contractor by way of additional boreholes.	The Contractor shall be responsible for determining for his design purposes the Geology and the Geotechnical parameters of the sub-surface strata along the route. Geotechnical Investigations have been carried out by the Employer and the <i>Preliminary</i> Geotechnical Investigations Reports are given in Employer's Requirements, Section VII-8, Tender drawings and documents for information only. These shall be confirmed and supplemented, if considered necessary, by the Contractor by way of additional boreholes. <i>Minimum depth of confirmatory / additional boreholes below tunnel</i>

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			<i>invert level shall be 1.5 times the excavation width /depth of the tunnel whichever is more.</i>
36.	Part 2, Employer's Requirements, Section VII-5: Outline Design Specifications (ODS) – Civil & BLT, Chapter 7, Sub-Clause 7.1.1	In preparing his designs and method statements the Contractor shall carry out his own assessment of the adequacy of the available geological and geotechnical information, and shall indicate where he considers such information to be deficient having regard to the particular works or activities to which the design or method statement relates.	In preparing his designs and method statements the Contractor shall carry out his own assessment of the adequacy of the available geological and geotechnical information.
37.	Part 2, Employer's Requirements, Section VII-5: Outline Design Specifications (ODS) – Civil & BLT, Sub-Clause 15.2		<p>Add the following Note at the end of Sub-Clause 15.2 (xvii)</p> <p>Note:</p> <p><i>The qualifications of DDC given above are based on Railway Boards letter No. 2016/39/CE-III/BR/BLT dated 06.02.2018. If the criteria given in Railway Boards letter is modified by Railway Board / concerned government authority / RDSO, the same will be followed. However, the modified criteria will not be stricter than the criteria given above.</i></p>
38.	Part 2, Employer's Requirements, Section VII-6: Outline Construction Specifications (Civil & BLT), Chapter 4	CHAPTER -4 Dewatering, Drainage and Pumping	CHAPTER-4 has been renamed as Dewatering, Drainage, Pumping and <i>Waterproofing</i>

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39.	Part 2, Employer's Requirements, Section VII-7: Particular Specifications (PS)- General Electrical Services, Sub Clause No. 4.2.4	<p>The trial operation shall occur with full responsibility of the contractor. The trial operation shall take place after finishing the tests on completion. For starting the trial operation, it is required, that all tests on completion are finished positive for the entire installation and shall occur within 21 days.</p> <p>The trial operation shall show the evidence of a fully functional operation of the tunnel and that security is given during operation. Therefore, the trial operation shall occur without significant malfunctions. The contractor shall test different operation cases during the trial operation (e.g. loss of different equipment etc.).</p> <p>The contractor shall make organizational measurements during the trial operation, so that malfunctions can be rectified as soon as possible (within max. 2 days).</p> <p>The results of the different tests during trial operation shall be shown in a protocol. This protocol shall be signed by the contractor and the Engineer.</p>	<p>The trial operation shall occur with full responsibility of the contractor. The trial operation shall take place after finishing the tests on completion. For starting the trial operation, it is required, that all tests on completion are finished positive for the entire installation and shall occur within 21 days.</p> <p>The trial operation shall show the evidence of a fully functional operation of the tunnel and that security is given during operation. Therefore, the trial operation shall occur without significant malfunctions. The contractor shall test different operation cases during the trial operation (e.g. loss of different equipment etc.).</p> <p>The contractor shall make organizational measurements during the trial operation, so that malfunctions can be rectified as soon as possible (within max. 2 days).</p> <p>The results of the different tests during trial operation shall be shown in a protocol. This protocol shall be signed by the contractor and the Engineer.</p> <p><i>The cost of all consumables including Water, Electricity and fuel lube oil for trial Operation shall be borne by the Contractor.</i></p>

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40.	Part 2, Employer's Requirements, Section VII-7: Particular Specifications (PS)-General Electrical Services, Sub Clause No.5.4	The Contractor shall be responsible for all the Defects and deficiencies, till the expiry of a period of 01 (One) year . The Contractor shall repair or rectify all Defects and deficiencies observed by the Authority Engineer during the Defects Notification Period within time period as may be determined by the Engineer in accordance with Good Industry Practice.	The Contractor shall be responsible for all the Defects and deficiencies, till the expiry of a period of 01 (One) year . The Contractor shall repair or rectify all Defects and deficiencies observed by the Authority Engineer during the Defects Notification Period within time period as may be determined by the Engineer in accordance with Good Industry Practice. <i>The cost of all consumables and spares for carrying out the above repairs/ rectifications including Water, Electricity and fuel lube oil etc. shall be borne by the Contractor.</i>
41.	Part 2, Employer's Requirements, Section VII-7: Particular Specifications (PS)-General Electrical Services, Sub-Clause 6.2.3, S. No. 7	(i) Material: Extruded Semiconducting compound (bonded type) followed by a layer of copper tape	(i) Material: <i>Copper conductor with non-metallic semi-conducting screening, shielded with extruded semi-conducting compound, cross linked polyethylene insulated, shielded with extruded semi-conducting compound and copper tape, shielded cores laid up with fillers, inner sheath of extruded PVC</i>
42.	Part 2, Employer's Requirements, Section VII-7: Particular Specifications (PS)-General Electrical Services, Sub Clause No. 6.2.4, S. No. 5	(i) Material: Annealed Plain Copper Conductor as per IS 8130	(i) Material: <i>Multicore, colour coded, annealed stranded high conductivity copper, single conductor, insulated with PVC insulation, PVC sheathed, conforming to IS 1554 (Part I & II) / IS 7098 Part 1, relevant IEC</i>
43.	Part 2, Employer's Requirements, Section VII-7: Particular Specifications (PS)-General Electrical	The cable flame temperature shall conform to category B 750 ± 40 °C for 3 has stipulated in BS 6387:1994.	<i>Deleted</i>

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	Services, Sub Clause No. 6.2.5, last sentence		
44.	Part 2, Employer's Requirements, Section VII-7: Particular Specifications (PS)- General Electrical Services, Sub-Clause 6.4.1, first Para	This covers the complete Tunnel Lighting System for the tunnel, consisting of tunnel lighting and emergency lighting including control, all required equipment, materials, and accessories. The detail drawing of power supply arrangement (Indicative) is attached in section VII-II: Tender Drawings and Documents.	This covers the complete Tunnel Lighting System for the tunnel, consisting of tunnel lighting, <i>Portal Lighting (Tunnel External Lighting)</i> and emergency lighting including control, all required equipment, materials, and accessories. The detail drawing of power supply arrangement (Indicative) is attached in Section VII-8: Tender Drawings and Documents.
45.	Part 2, Employer's Requirements, Section VII-7: Particular Specifications (PS)- General Electrical Services, Sub Clause 6.6.1	The UPS units (Uninterruptible power supply) will be installed with two hours (120 minutes) autonomy period as required to guarantee that following plants/ equipments can be supplied power in case of main power failure: a. Tunnel emergency lighting b. Emergency call system c. Signs, escape route lighting and orientation signage, other sign guidance d. Public address & sound system (if Available) e. Integrated tunnel control system (SCADA) f. Other emergency requirement g. Fire detection and fire alarm system	The UPS units (Uninterruptible power supply) will be installed with two hours (120 minutes) autonomy period as required to guarantee that following plants/ equipment can be supplied power in case of main power failure: a. Tunnel emergency lighting b. Signs, escape route lighting and orientation signage, other sign guidance
46.	Part 2, Employer's Requirements, Section VII-7: Particular Specifications (PS)- General Electrical Services, Sub Clause 6.10	EXTENSION/AUGMENTATION OF ELECTRICAL POWER SUPPLY (3 PHASE, 11 KV) FOR BOTH SUBSTATIONS OF HORC TUNNEL AND ALL ASSOCIATED WORKS:-	ELECTRICAL POWER SUPPLY (3 PHASE, 11 KV) FOR BOTH SUBSTATIONS (SEPARATE FEEDER CIRCUIT FOR EACH SUBSTATION) OF HORC TUNNEL AND ALL ASSOCIATED WORKS:- The EPC Contractor shall make his own arrangements for obtaining reliable and separate feeder electrical

S. No.	Tender Document Part / Section/ Clause No.	Description of Existing Clause	Modified Description of Existing Clause / New Clause
		<p>The EPC contractor has to take (3 Phase,11 kV) connection from Dakshin Haryana Bijli Vitran Nigam (DHBVN) at both side of tunnel.</p> <p>Total Sanctioned load/connected load of each substation will be decided by the EPC contractor after load calculation of each tunnel. This includes all HT/ LT work, metering arrangement, Cabling work, liaising work with state electricity authority and other related works to complete this work.</p>	<p><i>connections (3 Phase,11 kV) from Dakshin Haryana Bijli Vitran Nigam (DHBVN)-one at Substation 1 (SS1) near Construction cum Utility Shaft and another at Substation 2 (SS2) near Sonipat end portal of tunnel. The Contractor shall liaise, and apply for 11kV power supply to Electricity Board on behalf of the Employer for which all payments are to be borne by the Contractor.</i></p> <p><i>The Contractor shall assess the total Sanctioned load/connected load of each substation after load calculation for each tunnel and obtain approval of the Engineer.</i></p> <p><i>The work under this Sub-Clause shall include all HT/ LT work, metering arrangement, Cabling work, liaising work with state electricity authority and other related works.</i></p>
47.	Part 2, Employer's Requirements, Section VII-7: Particular Specifications (PS)-General Electrical Services, Sub-Clause 1.1.1, S. No. 10	Extension/Augmentation of Electrical Power Supply (3 phase, 11 kV) for both sub-stations of tunnel and associated works including all liaison work from state electricity board. Total Sanctioned load/connected load of each sub-station will be decided by the EPC contractor after load calculation of each tunnel.	<i>Reliable</i> Electrical Power Supply (3 phase, 11 kV) for both sub-stations (<i>Separate feeder circuit for each substation</i>) of tunnel and associated works including all liaison work from state electricity board. <i>The Contractor shall assess the total Sanctioned load/connected load of each substation after load calculation for each tunnel and obtain approval of the Engineer.</i>
48.	Part 2, Employer's Requirements, Section VII-7: Particular Specifications (PS)-General Electrical Services, Sub Clause 6.12.5		New Sub-Clause 6.12.6 "Lightning protection" is added at the end of Sub-Clause 6.12.5 and is annexed as Attachment 4 of this Corrigendum No. 2

S. No.	Tender Document Part / Section/ Clause No.	Description of Existing Clause	Modified Description of Existing Clause / New Clause
49.	Part 2, Section VII-8, Tender Drawings and Documents	Section VII-8A: Tender Drawings	The existing Section VII-8A: Tender Drawings is replaced and annexed as Attachment 5 of this Corrigendum No. 2.
50.	Part 2, Section VII-8, Tender Drawings and Documents, Design Basis Report, Sub-Clause 13.6.4, E1-Earthquake/Seismic Load, first Para	Following the seismic mapping as per Indian Seismic Zoning Map IS 1893 and 1984, the project site is situated in seismic zone V, the highest seismic zone in India. Seismic coefficient has been calculated as per IS 1893-1:2002,	Following the seismic mapping as per Indian Seismic Zoning Map IS 1893 and 1984, the project site is situated in seismic zone <i>IV</i> . Seismic coefficient has been calculated as per IS 1893-1:2002,
51.	Part 2, Section VII-8, Tender Drawings and Documents, List of Curve and Gradients	List of Curve and Gradients	List of Curve and Gradients is revised and annexed as Attachment 6 of this Corrigendum No. 2
52.	Part 2, Section VII-9, Employer's Requirements- Appendices, Appendix 2	Appendix 2 Contract Key Dates and Completion Date	The existing Appendix 2- Contract Key Dates and Completion Date is revised and annexed as Attachment 7 of this Corrigendum No. 2.
53.	Part 2, Section VII-9, Employer's Requirements- Appendices, Appendix 5, Interface, Coordination and Cooperation with Other Parties, Sub-Clause 5.1 List of Contract Packages in HORC, S. No. 8	Design, Supply, Installation, Testing & Commissioning of OHE and General Electrical services in connection with laying of New BG Double Railway line of HORC Project from Km -2.14 to Km 125.98 (excluding Tunnel portion i.e from Km 24.856 to km 29.680) and its connectivities to IR/DFC networks from Prithla to New Prithla, New Patli to Patli, New Patli to Sultanpur, Badsa to Sultanpur and Mandothi to Asaudha including modifications in Sultanpur and Asaudha station yards.	Design, Supply, Installation, Testing & Commissioning of OHE and General Electrical services in connection with laying of New BG Double Railway line of HORC Project from Km -2.14 to Km 125.98 (<i>including</i> Tunnel portion i.e from Km 24.856 to km 29.680) and its connectivities to IR/DFC networks from Prithla to New Prithla, New Patli to Patli, New Patli to Sultanpur, Badsa to Sultanpur and Mandothi to Asaudha including modifications in Sultanpur and Asaudha station yards.

S. No.	Tender Document Part / Section/ Clause No.	Description of Existing Clause	Modified Description of Existing Clause / New Clause
54.	Part 2, Section VII-9, Employer's Requirements- Appendices, Appendix 10, Sub-Clause 10.2.2	The Contractor shall make its own arrangements, subject to the consent of the Engineer, for access required to the Site. The Contractor shall negotiate with the landowners or other appropriate government agencies to seek temporary occupation of land and seeking necessary permission for construction of temporary access roads.	The Contractor shall make its own arrangements for access required to the Site. The Contractor shall negotiate with the landowners or other appropriate government agencies to seek temporary occupation of land and seeking necessary permission for construction of temporary access roads.
55.	Part 2, Section VII-9, Employer's Requirements- Appendices, Appendix 10, Sub-Clause 10.20.1 (b)	(1) The Contractor shall establish a horizontal and vertical control system (x, y, z) at the Site and establish Haryana Orbital Rail Corridor (HORC) benchmarks using the TBMs provided by the Employer and locate/ confirm the ROW marks given by the Employer. The scaling factor shall be as approved by the Engineer.	(1) The Contractor shall revalidate/derive the elevations of Secondary Control Points (SCPs) and Tertiary Control Points (TCPs) using the Reduced Level (RL) of the Standard Benchmark (Type M) at SDC Quarters, Palwal with MSL value of 195.41 metres. Survey and levelling should be done using Total Station and Digital level. Thereafter, the Contractor shall establish a horizontal and vertical control system (x, y, z) at the Site which shall be approved by the Engineer. Final drawings and profiles shall be prepared based on the above Reduced Levels.
56.	Part 2, Section VII-9, Employer's Requirements- Appendices, Appendix 12	Appendix 12- Contractor's Site Laboratory	The existing Appendix 12- Contractor's Site Laboratory is revised and annexed as Attachment 8 of this Corrigendum No. 2.
57.	Part 3, Section IX, Conditions of Contract, Part B: Specific Provisions, PCC, Sub-Clause 1.5	Priority of Documents (m) Contractor's Proposal and any other documents forming part of the Contract.	Priority of Documents (m) any other documents forming part of the Contract.
58.	Part 3, Section IX, Conditions of Contract, Part B: Specific	D)Price Schedule 'A' a) For Bridges involving pile foundations, the quoted price of Schedule 'A' shall include providing	D)Price Schedule 'A' a) For Bridges involving pile foundations, the quoted price of Schedule 'A' shall include

S. No.	Tender Document Part / Section/ Clause No.	Description of Existing Clause	Modified Description of Existing Clause / New Clause
	Provisions, PCC, Sub-Clause 13.3.1, A.(I)	<p>piles, upto a pile depth of 20 m (below bottom of pile cap). Any increase or decrease in pile depth above/below the value of 20 m shall be payable/recoverable at the accepted rate of relevant item in Schedule 'C'.</p> <p>b) For any variation in the Scope of the Works in Schedule 'A', cost of additional quantities/items shall be worked out based on the accepted rates of items provided in Schedule 'B' or Schedule 'C'. In case, items involving variation are not covered in Schedule 'B' or Schedule 'C', rates of such items shall be taken from North Western Railway Unified Standard Schedule of Rates (NWR USSOR) -2019 (for Formation and Bridge works) duly adjusted for escalation @5% per annum from Nov' 2019 and Delhi Schedule of Rates (DSR) -2021 Vol I &II (for items other than Formation and Bridge works) duly adjusted for escalation @5% per annum from Apr' 2021. In cases where items involving variation are not covered in DSR or NWR USSOR, the rates of such items shall be worked out based on the rates available for similar items in DSR/NWR USSOR.</p> <p>a) Deriving Rates for New Items / Negotiation In case Engineer introduces an item for which the Contract does not contain any rates or prices applicable to the varied Works, the rate of such items shall be derived, wherever possible, from rate for similar items available in the Price Schedules of the Accepted Contract Amount. In case this is not</p>	<p>providing piles, upto a pile depth of 20 m (below bottom of pile cap). Any increase or decrease in pile depth above/below the value of 20 m shall be payable/recoverable at the accepted rate of relevant item in Schedule 'C'.</p> <p><i>b) No other variation shall be paid under Schedule 'A' unless Scope of the Works under Schedule 'A' changes.</i></p> <p><i>c) In case, there is variation in Scope of the Works in Schedule 'A', the cost of variation shall be worked out based on the accepted rates of items provided in Schedule 'B' or Schedule 'C'.</i></p>

S. No.	Tender Document Part / Section/ Clause No.	Description of Existing Clause	Modified Description of Existing Clause / New Clause
		<p>possible, the rate shall be decided on the following basis:</p> <ul style="list-style-type: none"> i) Cost of Materials at current market price, as actually utilized in the final finished Permanent Works, including a reasonable percentage for wastage and transportation. ii) Cost of enabling works if any (unless provided for separately) worked out on the above basis but with less stringent quality. Specifications minus salvage value of serviceable material released after completion of Work and cost of material released as scrap. iii) Cost of labour actually used at the site of Work at rates under Payment of Minimum Wages Act for the area of Work for each category of worker, further enhanced by a percentage of 10% of the aforesaid rates to account for labour not directly utilized at Site and other ancillary and incidental expenses on labour. iv) Hire charges for Plant & Machinery, scaffolding, shuttering, forms, etc., required to be used at the site of the work. The tools used by the various trades shall not be counted as Plant & Machinery for this purpose. 	

S. No.	Tender Document Part / Section/ Clause No.	Description of Existing Clause	Modified Description of Existing Clause / New Clause
		<p>v) An amount of 15% of items c) (i), (ii), (iii) and (iv) above to allow for Contractor's overheads including water/electricity charges and labour cess etc., profits and corporate taxes etc. No such percentage shall be applicable to the estimated cost of Materials supplied free of cost to the Contractor.</p> <p>vi) In all cases where extra items of Work are involved, for which there are no rates in the Accepted Contract Amount, the Contractor shall give a notice to the Engineer, of at least 7 days before the need for its execution arises.</p>	
59.	Part 3, Section IX, Conditions of Contract, Part B: Specific Provisions, PCC, Sub-Clause 21.6.1 B	<p>b) The disputes so referred to arbitration shall be settled in accordance with the Indian Arbitration & Conciliation Act, 1996 and amended by the Arbitration and Conciliation (Amendment) Act, 2015 and any statutory modification or re-enactment thereof. Further, it is agreed between the parties as under:</p> <p>Number of Arbitrators - The Arbitral tribunal shall consist of:</p> <p>(i) Sole Arbitrator (or)</p> <p>(ii) 3 (three) arbitrators</p> <p>1. Procedure for Appointment of Arbitrators</p> <p>The arbitrators shall be appointed as per following procedure:</p> <p>(i) In case of Sole Arbitrator:</p>	<p>b) The disputes so referred to arbitration shall be settled in accordance with the Indian Arbitration & Conciliation Act, 1996 and amended by the Arbitration and Conciliation (Amendment) Act, 2015 and any statutory modification or re-enactment thereof. Further, it is agreed between the parties as under:</p> <p>Number of Arbitrators - The Arbitral tribunal shall consist of 3 (<i>three</i>) arbitrators</p> <p>1. Procedure for Appointment of Arbitrators</p> <p>The arbitrators shall be appointed as per following procedure:</p> <p>a) Within 30 days from the day when a written and valid demand for Arbitration is received by MD/HRIDC, the Employer will forward a panel of not fewer than five (05)</p>

S. No.	Tender Document Part / Section/ Clause No.	Description of Existing Clause	Modified Description of Existing Clause / New Clause
		<p>Within 30 days from the day when a written and valid demand for Arbitration is received by MD/HRIDC, the Employer will forward a panel of 03(three) names to the Contractor. The Contractor shall have to choose one Arbitrator from the panel of three, to be appointed as Sole Arbitrator within 30 days of dispatch of the request by the Employer. In case the Contractor fails to choose one Arbitrator within 30 days of dispatch of the request by the Employer, then MD/HRIDC shall appoint any one Arbitrator from the panel of Arbitrators as sole Arbitrator.</p> <p>(ii) In case of 03 Arbitrators:</p> <p>a) Within 30 days from the day when a written and valid demand for Arbitration is received by MD/HRIDC, the Employer will forward a panel of not fewer than five (05) nominees to the Contractor. The Contractor will then give his consent for any one name out of the panel to be appointed as one of the arbitrators within 30 days of dispatch of the request by the Employer.</p> <p>b) The Employer will decide the second Arbitrator. MD/HRIDC shall appoint the two Arbitrators, including the name of one Arbitrator for whom consent was given by the Contractor, within 30 days from the receipt of the consent for one name of the Arbitrator from the Contractor. In case the Contractor fails to give his consent within 30 days of the request of the Employer, MD/HRIDC shall nominate both the Arbitrators from the panel. The third Arbitrator shall</p>	<p>nominees to the Contractor. The Contractor will then give his consent for any one name out of the panel to be appointed as one of the arbitrators within 30 days of dispatch of the request by the Employer.</p> <p>b) The Employer will decide the second Arbitrator. MD/HRIDC shall appoint the two Arbitrators, including the name of one Arbitrator for whom consent was given by the Contractor, within 30 days from the receipt of the consent for one name of the Arbitrator from the Contractor. In case the Contractor fails to give his consent within 30 days of the request of the Employer, MD/HRIDC shall nominate both the Arbitrators from the panel. The third Arbitrator shall be chosen by the two Arbitrators so appointed by the parties out of the panel of Arbitrators provided to Contractor or from the larger panel of Arbitrators to be provided to them by the Employer at the request of two appointed Arbitrators (if so desired by them) and who shall act as presiding Arbitrator. In case of failure of the two appointed Arbitrators to reach upon consensus within a period of 30 days from their appointment, then, upon the request of either or both parties, the presiding Arbitrator shall be appointed by the MD/HRIDC within 14 days of receipt of request from either party or both parties.</p> <p>c) If one or more of the Arbitrators appointed as above refuses to act as Arbitrator, withdraws from his office as Arbitrator, or vacates his/their office/offices or is/are unable or unwilling to perform his functions as Arbitrator for any reason whatsoever or dies or in the opinion of the MD/HRIDC fails to act without undue delay, the</p>

S. No.	Tender Document Part / Section/ Clause No.	Description of Existing Clause	Modified Description of Existing Clause / New Clause
		<p>be chosen by the two Arbitrators so appointed by the parties out of the panel of Arbitrators provided to Contractor or from the larger panel of Arbitrators to be provided to them by the Employer at the request of two appointed Arbitrators (if so desired by them) and who shall act as presiding Arbitrator. In case of failure of the two appointed Arbitrators to reach upon consensus within a period of 30 days from their appointment, then, upon the request of either or both parties, the presiding Arbitrator shall be appointed by the MD/HRIDC within 14 days of receipt of request from either party or both parties.</p> <p>c) If one or more of the Arbitrators appointed as above refuses to act as Arbitrator, withdraws from his office as Arbitrator, or vacates his/their office/offices or is/are unable or unwilling to perform his functions as Arbitrator for any reason whatsoever or dies or in the opinion of the MD/HRIDC fails to act without undue delay, the MD/HRIDC shall appoint new Arbitrator/Arbitrators to act in his/their place except in case of new presiding Arbitrator who shall be chosen following the same procedure as mentioned in para (b) above. Such reconstituted Tribunal may, at its discretion, proceed with the reference from the stage at which it was left by the previous Arbitrator(s).</p> <p>d) The Employer at the time of offering the panel of Arbitrator(s) to be appointed as Arbitrator shall also supply the information with regard to the qualifications of the said Arbitrators nominated in the</p>	<p>MD/HRIDC shall appoint new Arbitrator/Arbitrators to act in his/their place except in case of new presiding Arbitrator who shall be chosen following the same procedure as mentioned in para (b) above. Such reconstituted Tribunal may, at its discretion, proceed with the reference from the stage at which it was left by the previous Arbitrator(s).</p> <p>d) The Employer at the time of offering the panel of Arbitrator(s) to be appointed as Arbitrator shall also supply the information with regard to the qualifications of the said Arbitrators nominated in the panel along with their professional experience, phone nos. and addresses to the Contractor. The minimum qualification and experience of the arbitrators which may be appointed by the Parties in accordance with the contract is set out below:</p> <p>(i) A working/retired officer (not below E-8 grade in a central public sector undertaking in India, with which the Employer has no direct business relationship), of engineering or accounts/finance discipline, having experience in management of construction contracts; or</p> <p>(ii) A retired officer (not below the SAG level in Indian Railways) of any Engineering Services of Indian Railways or Indian Railway Accounts Service, having experience in management of construction contracts;</p>

S. No.	Tender Document Part / Section/ Clause No.	Description of Existing Clause	Modified Description of Existing Clause / New Clause						
		<p>panel along with their professional experience, phone nos. and addresses to the Contractor. The minimum qualification and experience of the arbitrators which may be appointed by the Parties in accordance with the contract is set out below:</p> <p>(i) A working/retired officer (not below E-8 grade in a central public sector undertaking in India, with which the Employer has no direct business relationship), of engineering or accounts/finance discipline, having experience in management of construction contracts; or</p> <p>(ii) A retired officer (not below the SAG level in Indian Railways) of any Engineering Services of Indian Railways or Indian Railway Accounts Service, having experience in management of construction contracts;</p>							
60.	Part 3, Section IX, Particular Conditions of Contract (PCC) Part A – Contract Data, Sub-Clause 2.1, Time for access to the Site	<p>90% length of the Tunnel portion and the length of the formation shall be handed over to the Contractor within 7 days after the Commencement Date.</p> <p>The balance length shall be handed over within 90 days after the commencement Date.</p>	<p>Land will be Handed over as per details given in Table below. The referred Sketches are available in Section VII-8: Tender drawings and Documents, Part 2-Employer’s Requirements.</p> <table border="1" data-bbox="1406 1072 2105 1278"> <thead> <tr> <th data-bbox="1406 1072 1503 1174">S. No.</th> <th data-bbox="1503 1072 1718 1174">Location</th> <th data-bbox="1718 1072 2105 1174">Details regarding Handing Over of the Site</th> </tr> </thead> <tbody> <tr> <td data-bbox="1406 1174 1503 1278">1.</td> <td data-bbox="1503 1174 1718 1278">km 12.00 to km. 18.00</td> <td data-bbox="1718 1174 2105 1278">Within 7 days of Commencement Date</td> </tr> </tbody> </table>	S. No.	Location	Details regarding Handing Over of the Site	1.	km 12.00 to km. 18.00	Within 7 days of Commencement Date
S. No.	Location	Details regarding Handing Over of the Site							
1.	km 12.00 to km. 18.00	Within 7 days of Commencement Date							

S. No.	Tender Document Part / Section/ Clause No.	Description of Existing Clause	Modified Description of Existing Clause / New Clause		
			2.	Portal 1	Part land within 7 days and balance land within 90 days of Commencement Date Refer Sketch No. HRIDC-C4-SK-LANDPLAN-001_A0
			3.	Permanent Ventilation Shaft 1 & 2	Part land within 7 days and balance land within 90 days of Commencement Date Refer Sketch No. HRIDC-C4-SK-LANDPLAN-002_A0
			4.	Construction cum Utility Shaft	Part land within 7 days and balance land within 90 days of Commencement Date Refer Sketch No. HRIDC-C4-SK-LANDPLAN-003_A0
			5.	Permanent Ventilation Shaft 3 & 4	Part land within 7 days and balance land within 90 days of Commencement Date Refer Sketch No. HRIDC-C4-SK-LANDPLAN-004_A0

S. No.	Tender Document Part / Section/ Clause No.	Description of Existing Clause	Modified Description of Existing Clause / New Clause		
			6.	Km 28.341 to Km 29.680	Within 7 days of Commencement Date Refer Sketch No. HRIDC-C4-SK-LANDPLAN-005_A0
61.	Part 2, Employer's Requirements, Section VII-9: Appendices, Appendix 10, Sub-Clause 10.19.12	The Contractor shall provide 04 SUV type vehicles having make not later than 2022 for use of the Engineer's Staff from the Commencement Date till completion of the Contract. The Contractor shall also bear the expenditure of deploying experienced drivers along with fuel and other incidental expenses associated with the operation of the vehicle. Only experienced drivers shall be deployed.	The Contractor shall provide 02 SUV type vehicles having make not later than 2022 for use of the <i>Employer's</i> Staff from the Commencement Date till completion of the Contract. The Contractor shall also bear the expenditure of deploying experienced drivers along with fuel and other incidental expenses associated with the operation of the vehicle. Only experienced drivers shall be deployed.		
62.	Part 2, Employer's Requirements, Section VII-9: Appendices, Appendix 10, Sub-Clause 10.20.2 (a)	A set of the benchmarks comprising a horizontal control system (x, y) and vertical control system (z) shall be established at the Site based on the Temporary Bench Marks which are established and maintained by the Employer and the Global Navigation Satellite System (GNSS) Survey, applying the Universal Transverse Mercator (UTM)	A set of the benchmarks comprising a horizontal control system (x, y) and vertical control system (z) shall be established at the Site based on the Temporary Bench Marks which are established and maintained by the Employer <i>only after revalidation is done as per Sub-Clause 10.20.1 (b) of Appendix 10, Section VII-9: Appendices</i> and the Global Navigation Satellite System		

S. No.	Tender Document Part / Section/ Clause No.	Description of Existing Clause	Modified Description of Existing Clause / New Clause
		coordinate system and World Geodetic System 84 (WGS 84). A description of the various benchmarks along the route alignment has been provided by the Employer along with their height above Mean Sea Level. The Contractor shall ensure that the horizontal and vertical position (x, y, z) of each HORC benchmark shall not be subject to any interference and that they shall not be affected by any of the Permanent and Temporary Works.	(GNSS) Survey, applying the Universal Transverse Mercator (UTM) coordinate system and World Geodetic System 84 (WGS 84). A description of the various benchmarks along the route alignment has been provided by the Employer along with their height above Mean Sea Level. The Contractor shall ensure that the horizontal and vertical position (x, y, z) of each HORC benchmark shall not be subject to any interference and that they shall not be affected by any of the Permanent and Temporary Works.
63.	Part 2, Employer's Requirements, Section VII-9: Appendices, Appendix 10, Sub-Clause 10.20.4 (a)	The Contractor shall establish a vertical control system at the Site by Direct Levelling, providing each HORC Benchmark with a vertical coordinate (z). The vertical coordinate (z) shall be checked with reference to as many of the GTS Benchmarks of the Survey of India as practical, to ensure the entire vertical control system is consistent, including the equivalent system of adjacent Interfacing Contractor(s). The Contractor shall include the survey results and the description in the Survey Report as described in the following paragraphs. Upon consent of the Engineer the system shall be the sole vertical control system for the Works under this Contract.	The Contractor shall establish a vertical control system at the Site by Direct Levelling, providing each HORC Benchmark with a vertical coordinate (z). The vertical coordinate (z) shall be <i>established using the Reduced Level (RL) of the Standard Benchmark (Type M) at SDC Quarters, Palwal with MSL value of 195.41 metres</i> , to ensure the entire vertical control system is consistent, including the equivalent system of adjacent Interfacing Contractor(s). The Contractor shall include the survey results and the description in the Survey Report as described in the following paragraphs. Upon consent of the Engineer the system shall be the sole vertical control system for the Works under this Contract.
64.	Part 2, Employer's Requirements, Section VII-9: Appendices, Appendix 10, Sub-Clause 10.22 (a)	The Horizontal Alignment defined by the coordinates (x, y) of the centerline of the track of <i>Priority Section</i> shall be staked at an interval of twenty (20) meters in addition to TPTC, TP, TPCC points along the proposed alignment. While staking the Horizontal alignment at Site, the Contractor shall confirm the Right of Way (ROW) staking already done by the	The Horizontal Alignment defined by the coordinates (x, y) of the centerline of the track shall be staked at an interval of twenty (20) meters in addition to TPTC, TP, TPCC points along the proposed alignment. While staking the Horizontal alignment at Site, the Contractor shall confirm the Right of Way (ROW) staking already done by the Employer at Site and provide and install any missing

S. No.	Tender Document Part / Section/ Clause No.	Description of Existing Clause	Modified Description of Existing Clause / New Clause
		Employer at Site and provide and install any missing stakes. The Contractor shall ensure that staking of the ROW is carried out as per the relevant provisions of Indian Railways Engineering Code.	stakes. The Contractor shall ensure that staking of the ROW is carried out as per the relevant provisions of Indian Railways Engineering Code.
65.	Part 2, Employer's Requirements, Section VII-9: Appendices, Appendix 10, Sub-Clause 10.22 (b)	The Contractor shall consistently use the TBMs provided by the Employer in addition to the benchmarks established by the Contractor for staking the alignment. The proposed formation level shall also be also marked on stakes to indicate embankment height or excavation depth.	The Contractor shall use the TBMs provided by the Employer <i>only after revalidation is done as per Sub-Clause 10.20.1 (b) of Appendix 10, Section VII-9: Appendices</i> , in addition to the benchmarks established by the Contractor for staking the alignment.

List of Attachments to Corrigendum No. 2

S. No.	Attachment	Description
1.	Attachment 1	Section IV: Tender Forms- Schedule 'C'/R2, Item rate for miscellaneous works/R2
2.	Attachment 2	Section VII-4: Employer's Requirements -Construction (Civil and BLT), Sub-Clause 7.1 (b)-Static Inspection
3.	Attachment 3	Section VII-4: Employer's Requirements-Construction (Civil & BLT) 1. Attachment C-1/R1: Minimum Organisation Structure Required 2. Attachment C-2/R1: Minimum Qualification & Experience of Project Personnel 3. Attachment C-3/R1: Minimum Resources Required for the Project- Plants & Equipment
4.	Attachment 4	Section VII-7: Employer's Requirements- General Electrical Services, New Sub-Clause 6.12.5: Lightning Protection System
5.	Attachment 5	Section VII-8: Employer's Requirements-Tender Drawings and documents, Section VII-8A: Tender Drawings
6.	Attachment 6	Section VII-8: Tender Drawings and Documents, Section VII-8B: List of Documents, List of Curve and Gradients/R1
7.	Attachment 7	Section VII-9: Employer's Requirements-Appendices, Appendix – 2/R1, Contract Key Dates and Completion Date
8.	Attachment 8	Section VII-9: Employer's Requirements-Appendices, Appendix – 12/R1; Contractor's Site Laboratory

Tender No. HORC/HRIDC/C-4/2022

Attachment 1

to

Corrigendum No. 2

**Part 1, Section IV, Tender Forms
Appendix B to Financial Part: Price Schedules**

Schedule 'C'/R2

Item rate for miscellaneous works/R2

Schedule 'C'/R2						
Item rate for miscellaneous works						
S. No	Item Reference DSR-21/USSOR- 2019 (NWR)/NS	Description of Item	Unit	Basic Rate in INR	Add % Above for Estimate	Estimated Rate in INR
DSR-21 Items						
1	DSR-21 19.35	Providing and laying Non Pressure NP-3 class (Medium duty) R.C.C. pipes including collars/spigot jointed with stiff mixture of cement mortar in the proportion of 1:2 (1 cement : 2 fine sand) including testing of joints etc. complete.				
I	19.35.1	450mm dia. RCC pipes	Metre	2385.5	8.64%	2,591.61
II	19.35.2	600 mm dia RCC pipes.	Metre	3051.55	8.64%	3,315.20
2	DSR-21 19.6	Providing and laying non-pressure NP2 class (light duty) R.C.C. pipes with collars jointed with stiff mixture of cement mortar in the proportion of 1:2 (1 cement : 2 fine sand) including testing of joints etc. complete :				
I	19.6.1	100 mm dia. R.C.C. pipe	Metre	447.25	8.64%	485.89
II	19.6.2	150 mm dia. R.C.C. pipe	Metre	493.1	8.64%	535.70
III	19.6.3	250 mm dia. R.C.C. pipe	Metre	811	8.64%	881.07

Schedule 'C'/R2						
Item rate for miscellaneous woks						
S. No	Item Reference DSR-21/USSOR- 2019 (NWR)/NS	Description of Item	Unit	Basic Rate in INR	Add % Above for Estimate	Estimated Rate in INR
3	DSR-2021 16.90	Providing and laying tactile tile (for vision impaired persons as per standards) of size 300x300x9.8mm having with water absorption less than 0.5% and conforming to IS:15622 of approved make in all colours and shades in for outdoor floors such as footpath, court yard, multi modals location etc., laid on 20mm thick base of cement mortar 1:4 (1 cement : 4 coarse sand) in all shapes & patterns including grouting the joints with white cement mixed with matching pigments etc. complete as per direction of Engineer-in-Charge.	Sqm	1719	8.64%	1,867.52
4	DSR-21 11.26	Kota stone slab flooring over 20 mm (average) thick base laid over and jointed with grey cement slurry mixed with pigment to match the shade of the slab, including rubbing and polishing complete with base of cement mortar 1 : 4 (1 cement : 4 coarse sand) Cost of cement is included in this item.				
I	11.26.1	25 mm thick	Sqm	1706.6	8.64%	1,854.05
USSOR-2019(NWR) Items						
5	USSOR- 2019(NWR) 031110	Load testing of one or more spans of bridge as selected by the Engineer as per approved load test procedure following relevant IS/IRC/Railway codes with contractor's labour, deflection measuring instruments, loading materials, recoding and analyzing the load testing results including all lead & lift, etc. complete as required. The rates are all inclusive and will be paid after load test is finished and girder is cleared of the kentledges/loading material etc. The load shall be 1.25 times the stipulated design load.				

Schedule 'C'/R2						
Item rate for miscellaneous woks						
S. No	Item Reference DSR-21/USSOR- 2019 (NWR)/NS	Description of Item	Unit	Basic Rate in INR	Add % Above for Estimate	Estimated Rate in INR
I	031111	For Span design load upto 100 MT	Each	85662.09	12.13%	96,052.90
II	031112	Extra for every increase 1 MT or part thereof in the span design load capacity upto 800 MT	MT	845.81	12.13%	948.41
6	021010	Exploratory drilling of boreholes down to required depth, drilling of 150mm dia. boreholes in all type of soils except hard rock & large boulders (boulder core more than 30cm) including refilling, reinstating surface and disposing off surplus material including use of mechanical rigs with power operated winches as well as percussion/chiselling tool for advancing through occasional seams of hard strata to be employed, where necessary in Dry area.				
I	021011	0m to 10m	Metre	1,213.51	12.13%	1,360.71
II	021012	10m to 20m	Metre	1,296.46	12.13%	1,453.73
III	021013	20m to 30m	Metre	1,431.59	12.13%	1,605.24
IV	021014	30m to 40m	Metre	1,554.68	12.13%	1,743.26
7	021050	Drilling of NX size borehole (75mm dia.) in all types of hard rock and collection of rock core samples from boreholes and preserving in boxes				
I	021051	0m to 10m	Metre	3,189.64	12.13%	3,576.54
II	021052	10m to 20m	Metre	3,418.43	12.13%	3,833.09
III	021053	20m to 30m	Metre	3,775.66	12.13%	4,233.65

Schedule 'C'/R2						
Item rate for miscellaneous woks						
S. No	Item Reference DSR-21/USSOR- 2019 (NWR)/NS	Description of Item	Unit	Basic Rate in INR	Add % Above for Estimate	Estimated Rate in INR
8	021060	Conducting in-situ full size Plate Load Test (PLT) at selected location as per IS:1888 including making loading arrangements & casting of RCC/cast in-situ concrete footing as per codal provisions including excavation and refilling of trial pit				
I	021062	Plate size 45cm x 45cm	Each	27,754.18	12.13%	31,120.76
II	021063	Plate size 60cm x 60cm	Each	31,000.02	12.13%	34,760.32
9	021080	Conducting SCPT for soil as per IS:4968	Each	47,313.49	12.13%	53,052.62
10	021090	Conducting DCPT for soil as per IS:4968	Each	37,394.02	12.13%	41,929.91
11	021110	Taking out 100mm dia. & 450mm long undisturbed samples of soil from bore holes, including provision of air tight containers for packing and, labelling incl. transporting the samples to laboratory. Piston sampler shall be used for extracting undisturbed samples where necessary. Samples shall be collected as per IS:2720.	Each	152.52	12.13%	171.02
12	021120	Taking out 100mm dia. & 450mm long disturbed samples of soil from bore holes, including provision of air tight containers for packing, labelling and transporting the samples to laboratory. Samples shall be collected as per IS:2720.	Each	164.57	12.13%	184.53
13	021130	Conducting standard penetration test as per IS:2131 at approximate 1.5m intervals in bore holes, as directed by the Engineer in charge	Each	852.27	12.13%	955.65

Schedule 'C'/R2						
Item rate for miscellaneous woks						
S. No	Item Reference DSR-21/USSOR- 2019 (NWR)/NS	Description of Item	Unit	Basic Rate in INR	Add % Above for Estimate	Estimated Rate in INR
14	021150	Conducting laboratory Tests on collected soil samples as per relevant IS code				
I	021151	Moisture Content/Dry Density	Each	287.66	12.13%	322.55
II	021152	Atterberg Limits	Each	586.02	12.13%	657.10
III	021153	Specific Gravity	Each	631.51	12.13%	708.11
IV	021154	Grain size analysis including Hydrometer analysis	Each	731.85	12.13%	820.62
V	021155	Direct Shear Test	Each	2,140.70	12.13%	2,400.37
VI	021156	Natural Density	Each	709.11	12.13%	795.13
VII	021157	Consolidation Test	Each	6,886.37	12.13%	7,721.69
VIII	021158	Unconfined Compression Test	Each	2,006.91	12.13%	2,250.35
IX	021159	Tri-axial Test	Each	2,408.29	12.13%	2,700.42
NS Items						
15	NS-1	Boring 1200 mm diameter piles using Hydraulic Rig in all kinds of strata including boulder studded soil, underground structure like channel, sewer manholes, old foundation or any other obstruction, irrespective of sub-soil water level in all conditions whether dry or under water, shoe and temporary casing pipe, if required, with contractor plant, machinery & equipment for pile boring, use of bentonite slurry including all operations, cleaning of bore holes, supplying and laying in-situ with tremie pipe M-35 RCC in piles as per approved design mix with admixtures and manufactured in fully automatic batching plant and transported to site of work in transit mixer for all lifts & leads, having	Rmt	10,232.00	6.00%	10,845.92

Schedule 'C'/R2						
Item rate for miscellaneous works						
S. No	Item Reference DSR-21/USSOR- 2019 (NWR)/NS	Description of Item	Unit	Basic Rate in INR	Add % Above for Estimate	Estimated Rate in INR
		<p>continuous agitated mixer, pumping concrete from transit mixer to site of laying including supplying & fixing form work (centering & shuttering), compacting, finishing, curing, chipping off pile top to remove laitance concrete above cut off level, removal and disposal of surplus excavated earth/debris/muck outside ROW including all lead, lift, ascends, descends, loading, unloading handling, re-handling, crossing of stream, nallahs, railway track, level crossing etc. with all labour, material, tools, plants, machinery and equipment, taxes, cess etc. as a complete job in accordance with the Specification and the Drawings.</p> <p>Note –</p> <p>i. Cost of cement is included in the above item.</p> <p>ii. Cost of Reinforcement steel is not included in the above item and will be paid separately under relevant item of Schedule-B.</p> <p>iii. Cost of temporary casing pipe is included in the above item. However, cost of permanent casing pipe is not included in this item and shall be paid separately under item, if required and approved by the Engineer.</p>				

Total Estimated cost of Schedule 'C' - INR 2.00 Crore (INR 20 million).

Tender No. HORC/HRIDC/C-4/2022
Attachment 2
to
Corrigendum No. 2

Part 2, Section VII-4: Employer's Requirements -
Construction (Civil and BLT)
Sub-Clause 7.1 (b)-Static Inspection

7.1 (b) Static Inspection

The inspection listed in the following table shall be conducted by the Engineer, in coordination with Interfacing Contractors as necessary.

The Contractor shall prepare and submit for review and approval by the Engineer a Static Inspection Plan detailing and explaining how the Contractor will plan, perform and document all tests and inspections that shall be conducted to verify and validate the Works. The Static Inspection Plan shall consist of a narrative description supported by graphics, diagrams and tabulations as required.

Structure	Inspection Item		Inspection Method		
			Confirmation of "As-Built" Records	Visual Inspection	Measurement Test Check
Earthwork	Formation width	At every 100m on straight line, at every 20m on curved line, at each terminal point of structures	✓		✓
	Cross section	Drawings at every 100m on straight line, at every 20m on curved line, at each terminal point of structures.	✓		✓
	Retaining wall	List of location of retaining walls	✓	✓	
	Construction	Soil test records, compaction records, CBR & deformation modulus (E_{v2}) records, construction photos	✓		
	Blanketing layer	Blanket material test records, compaction test records, CBR & deformation modulus (E_{v2}) test records.	✓		
		Thickness	✓		✓
	Structures Crossing	List of structures crossing the Railway (earth cover, overhead clearance, etc.)	✓		✓
	Drainage system	Drainage works at embankment/cutting, drainage diagram	✓		✓
Bridges	Formation width	At each bridge	✓		✓

Structure	Inspection Item		Inspection Method		
			Confirmation of "As-Built" Records	Visual Inspection	Measurement Test Check
	Construction	Quality records of aggregate used, reinforcement, cement concrete quality control data, measurement records of cast-in-situ piles/open foundation etc.	✓		
	Repairing of structures	Records of repaired parts of structures	✓	✓	
	Rebar cover	Records of measurement of rebar cover	✓		
	Clearance under girder/slab	Above roads/rail	✓		✓
	Abutment/pier structures/RCC box etc.	All Structural drawings	✓	✓	
	Concrete strength	Schmidt hammer tests	✓		✓
	List of bridges	List of bridges	✓	✓	
	PSC slab/girder	Test record of prestressing cable, anchorage system & prestressing record.	✓		
	Pile load test	Pile load test parameters	NA		
	Steel Girder	Material test record, fabrication, welding & trial assembly records, dead load camber	NA		
	Bearings	Acceptance test record	NA		
	Track on OWG	Track parameters at every sleeper location	NA		
	Load test	Load test parameters of superstructure (PSC girder/slab)	✓		✓
		Load test parameters of skew RCC box	✓		
Tunnel	Construction	Quality control record, Instrumentation data	✓		
	Profile	Tunnel profile at every 10 m interval, at each		✓	✓

Structure	Inspection Item		Inspection Method		
			Confirmation of "As-Built" Records	Visual Inspection	Measurement Test Check
		<i>cross passage & portal</i>			
<i>Ballast less Track</i>	<i>Construction</i>	<i>Quality control record, acceptance test record of fastening system</i>	✓		
	<i>Track Parameters</i>	<i>Track parameters at every sleeper</i>		✓	✓
	<i>Toe Load</i>	<i>Toe Load at every sleeper</i>			✓
Station	Platform length, width	At every 10m on straight line, at every 5m on curved line, control points of curve			
	Clearance of isolated and continuous structures on platform as per SOD	All structures			
	Staircase and pavement	Results of stair width measurement			NA
	Drainage of platform & yard	Section & slope at every 20m			
	Safety fence, etc.	List of facilities (clearance from platform end to fixed/movable fence, etc.)			
Protective facilities	Abutment/ Pier protection	Drawings	✓	✓	
	Slope protection works	List, location and Drawings of slope protection works	✓	✓	

After Static Inspection of the Works as mentioned above the Contractor shall submit the Inspection Report in the agreed format in four (4) signed copies to the Engineer for review and approval.

Tender No. HORC/HRIDC/C-4/2022
Attachment 3
to
Corrigendum No. 2

**Part 2, Section VII-4: Employer's
Requirements-Construction (Civil & BLT)**

- 1. Attachment C-1/R1: Minimum Organisation Structure Required**
- 2. Attachment C-2/R1: Minimum Qualification & Experience of Project Personnel**
- 3. Attachment C-3/R1: Minimum Resources Required for the Project- Plants & Equipment**

ATTACHMENT - C-1/R1
MINIMUM ORGANISATION STRUCTURE REQUIRED

The figures indicated in Table 1 below are the minimum number of Project-Personnel required which are to be deployed as per the minimum level of supervision. The qualification/experience of such Project personnel is given under Attachment-C-2

TABLE-1 LIST OF MINIMUM ORGANISATION STRUCTURE REQUIRED

S. No.	Designation of Project Personnel	Minimum no. of Project-Personnel required	Penalty for Non-deployment per week or part thereof per person
1.	Contractor's Representative/ Project Manager	1	Rs 1,00,000/-
2.	Senior Tunnel Expert (NATM)	4	Rs 40,000/- for first 3 months and Rs. 80,000/- thereafter
3.	Tunnel Expert (NATM)	4	
4.	Ballast less Track Expert	1	-
5.	Planning Engineer	1	Rs 40,000/- for first 3 months and Rs. 80,000/- thereafter
6.	Senior Quality Assurance /Quality Control Expert	2	Rs 40,000/- for first 3 months and Rs. 80,000/- thereafter
7.	Quality Assurance /Quality Control Expert	2	
8.	Health & Safety Expert	4	Rs 40,000/- for first 3 months and Rs. 80,000/- thereafter
9.	Surveyor	5	-
10.	Tunnel Expert (Cut & Cover)	2	Rs 40,000/- for first 3 months and Rs. 80,000/- thereafter
11.	Bridge Expert	1	-
12.	Procurement Manager	1	-
13.	Senior Geologist	1	Rs 40,000/- for first 3 months and Rs. 80,000/- thereafter
14.	Geologist	1	-

S. No.	Designation of Project Personnel	Minimum no. of Project-Personnel required	Penalty for Non-deployment per week or part thereof per person
15.	Environmental Expert	1	-
16.	Senior Geotechnical Engineer	1	Rs 40,000/- for first 3 months and Rs. 80,000/- thereafter
17.	Geotechnical Engineer	1	
18.	Blast Expert	1	
19.	Civil Engineer (Concrete Expert)	4	

NOTES:-

- i. The Contractor shall deploy resources as per the above-mentioned table. The Contractor shall also confirm to deploy manpower over and above the minimum numbers indicated above, if the work so requires.
- ii. The performance of project personnel deployed will be evaluated periodically by the Engineer during the contract period. In case the performance of any of the project personnel is not satisfactory, the Contractor shall replace them with good personnel immediately as per directions of the Engineer.
- iii. The personnel at Sr.No.1, must be deployed by Commencement Date. Personnel at Sr.No.2, 5, 6, 8, 10, 13 & 16 in the above table must be deployed within 30 days of Commencement Date. Non adherence to these provisions shall attract penalty as indicated in the table above.
- iv. The resources indicated in table above are for peak requirement. All resources need not be mobilized simultaneously for entire duration of the contract. The Contractor shall mobilize the resources as per the deployment programme approved by the Engineer.
- v. In case of non-deployment of project personnel, the penalty shall be imposed as indicated above and deducted from Contractor's running / final bills. The decision of the Engineer in this regard shall be final and binding.

ATTACHMENT C-2
MINIMUM QUALIFICATION & EXPERIENCE OF PROJECT PERSONNEL

S. No.	DESIGNATION	QUALIFICATION	EXPERIENCE LEVEL
1.	Contractor's Representative/ Project Manager (Team Leader)	Graduate in Civil Engineering	Minimum total experience of 15 years out of which, minimum 5 years as In-charge in tunnel projects of Railway/ DFC/ Metro/ RRTS/ Highway /Expressways.
2.	Senior Tunnel Expert (NATM)	Graduate/Diploma in Civil Engineering	Minimum total experience of 10/12 years out of which minimum 05/08 years in relevant field in tunnel projects of Railway/ DFC/ Metro/ RRTS/ Highway /Expressways
3.	Tunnel Expert (NATM)	Graduate/Diploma in Civil Engineering	Minimum total experience of 8/10 years out of which minimum 03/05 years in relevant field in tunnel projects of Railway/ DFC/ Metro/ RRTS/ Highway /Expressways
4.	Tunnel Expert (Cut & Cover)	Graduate/Diploma in Civil Engineering	Minimum total experience of 8/10 years out of which minimum 03/05 years in relevant field in tunnel projects of Railway/ DFC/ Metro/ RRTS/ Highway /Expressways
5.	Ballastless Track Expert	Graduate/Diploma in Civil Engineering	Minimum total experience of 8/10 years out of which minimum 02/04 years in relevant field in ballastless track projects of Railway/ DFC/ Metro/ RRTS
6.	Bridge Expert	Graduate/Diploma in Civil Engineering	Minimum total experience of 08/10 years out of which minimum 03/05 years in relevant field in infrastructure projects involving bridges of Railway/ DFC/ Metro/ RRTS/ Highway /Expressways
7.	Planning Engineer	Graduate in Civil Engineering with certification Primavera software	Minimum total experience of 10 years out of which minimum 05 years in planning of Infrastructure projects.
8.	Senior Quality Assurance (QA) /Quality control (QC) Expert	Graduate/Diploma in Civil Engineering	Minimum total experience of 10/12 years out of which minimum 05/07 Yrs. In QA (Field) and at least one year as In-Charge in Infrastructure Project
9.	Quality Assurance (QA) /Quality control (QC) Expert	Graduate/Diploma in Civil Engineering	Minimum total experience of 08/10 years out of which minimum 03/05 Yrs. in QA (Field) in Infrastructure Project
10.	Procurement Manager	Graduate in Engineering / Diploma in procurement	Minimum total experience of 05/08 years in Procurement in Infrastructure Project.

S. No.	DESIGNATION	QUALIFICATION	EXPERIENCE LEVEL
11.	Senior Geologist	Master's degree in Geology	Minimum total experience of 10 years out of which minimum 05 years in tunnel projects.
12.	Geologist	Master's degree in Geology	Minimum total experience of 05 years out of which minimum 03 years in relevant field in tunnel projects.
13.	Health & Safety Expert	Graduate/Diploma in Engineering/Science with one year full time Diploma in Industrial safety or equivalent	Minimum total experience of 06/08 years with relevant experience of 3 years in Infrastructure projects.
14.	Environment Expert	Graduate in Environmental Engineering/ Master's degree in Environmental Engineering/Environmental Science or equivalent	Minimum total experience of 06 years out of which 3 years of experience of working on environmental aspects in Infrastructure projects.
15.	Surveyor	Diploma in Civil Engineering / ITI	Minimum total Experience of 05/08 Years in Survey Work for linear Infrastructure project
16.	Blast Expert	Graduate/Diploma in Engineering	Minimum Experience of 05/07 years in blasting
17.	Civil Engineer (Concrete Expert)	Graduate in Civil Engineering	Minimum total experience of 05 years out of which minimum 03 years in relevant field in Infrastructure projects.

Notes:

1. The CVs of concerned personnel shall be submitted to the Engineer for approval. No person mentioned in table above shall be deployed in the project without Engineer's approval.
2. Relaxation in qualification / experience can be given by the Engineer in exceptional cases where candidates have got high level of professional competency. Decision of the Engineer in such cases shall be final and binding.

ATTACHMENT C-3**MINIMUM RESOURCES REQUIRED FOR THE PROJECT- PLANTS & EQUIPMENT**

The figures indicated below are the minimum number of equipment required.

S. No.	Types of Equipment Required for the Work	Minimum No. of Unit of Equipment Required for the Work
1.	Double Boomer	02
2.	Robotic Shotcrete Machine	07
3.	Concrete Batching Plant (each 60 cum/hr)	02
4.	Excavator (75 cum/hr)	07
5.	Grader	02
6.	Dozer (150 Cum/hr)	02
7.	Vibratory Roller (10 T)	02
8.	Pugmil/Crusher(200MT/hr)	01
9.	Concrete Boom Placer	02
10.	Stationary Concrete Pumps (36 cum/hr)	04
11.	Transit mixtures	10
12.	Survey Instruments (Total Station)	03
13.	Lab Testing equipment- fully equipped for site tests.	As per Appendix 12 of Section VII-9: Appendices, Part 2- Employer's Requirements
14.	Digital Level (Leica, Sokia)	04
15.	Tunnel lining gantry of minimum length 15 m	04

Note:

- i. These resources are for peak period of each activity. All plants and equipment need not be mobilized simultaneously. Plants and equipment as required as per the progress of the work shall be brought at site in advance as directed by the Engineer.

Tender No. HORC/HRIDC/C-4/2022
Attachment 4
to
Corrigendum No. 2

Part 2, Section VII-7: Employer's
Requirements- General Electrical Services

New Sub-Clause 6.12.5: Lightning Protection System

6.12.5 LIGHTNING PROTECTION SYSTEM

SCOPE:

The scope of work under this section covers the Engineering / Design, supply, installation, connection, testing and commissioning of lightning protection system. The lightning protection system shall be designed and installed as per IS / IEC 62305 and additional requirements (if any) of this specification. General arrangement of the protection system shall be as indicated in the drawings and consisting of the following:

- Air termination network.
- Down conductors.
- Joint and Bonds.
- Conductor Holders
- Expansion Piece
- Testing Links.
- Earth termination network.

CODES AND STANDARDS:

The Component and accessories covered by this specification shall be designed, manufactured and tested in compliance with the latest relevant standards published by the Indian Standards institution wherever available in order that specific aspects under Indian conditions are taken care of.

The Component and accessories for which Indian Standards are not available shall be designed, manufactured and tested in accordance with the latest and relevant IEC.

The component and installation shall also conform to the latest Indian Electricity Rules and requirement of Indian Electricity Act. Nothing in this specification shall be constructed to relieve the Contractor of his responsibilities.

Generally, the Lightning protection system shall conform to IS/IEC: 62305 unless otherwise stated. Following standards shall also be applicable: -

• IS/IEC:	62305-1	Protection against lightning – General Principles.
• IS/IEC:	62305-2	Protection against lightning – Risk Management.
• IS/IEC:	62305-3	Protection against lightning – Physical Damage to
the		structure and life hazard.
• IS/IEC:	62305-4	Protection against lightning – Electrical and
electronic		system within structure.

- IEC: 62561-1 Requirements for Lightning Protection components – connection components.
- IEC: 62561-2 Requirements for Lightning Protection components – conductors and earth electrodes.
- IEC: 62561-3 Requirements for Lightning Protection components – isolating spark-gaps.
- IEC: 62561-4 Requirements for Lightning Protection components – conductor fasteners.
- IEC: 62561-5 Requirements for Lightning Protection components – Earth electrode inspection housing and earth electrode seals.
- IEC: 62561-6 Requirements for Lightning Protection components – Lightning strike counters.
- IEC: 62561-7 Requirements for Lightning Protection components – Earth enhancement compounds.
- NBC – 2016 National Building Code 2016

EXTERNAL LIGHTNING PROTECTION SYSTEM:

- i. As air terminals shall be installed on the highest roof of the building, the air terminals shall be joined to horizontal roof conductor by means of proper clamps & connectors.
- ii. Roof conductor shall be laid horizontally on the roof.
- iii. Down conductor shall be installed on the vertical surface of the building. The down conductor shall be joined with roof conductors in the method as prescribed by the code.
- iv. The down conductor shall be joined with earth termination network or to the earthing station as indicated on the drawing.
- v. At every 1 mtr, the roof conductor holder for mesh and wall conductor holder for down conductor should be used.
- vi. At every 20 mtr, an expansion piece should be connected in order to avoid unnecessary contraction and expansion of conductor due to change in weather conditions.
- vii. At the connection of the earth-termination, a test joint should be fitted on each down conductor.

- viii. A test joint shall be provided in the down conductor 1000 mm above the ground level at a place which is easily accessible for testing.

COMPONENT / PARTS:

Vertical Air Terminal at Portal Stations

The probability of structure penetration by a lightning current is considerably decreased by the presence of a properly designed air-termination system as per IS/IEC 62305 and NBC 2016.

Air termination systems can be composed of any combination of the following elements-

- a) Rods (including free-standing masts)
- b) Catenary Wires
- c) Meshed Conductors

The individual air-terminations rods should be connected together at roof level to ensure current division.

Vertical air terminals shall be provided for the Air Termination network, at the highest points, corners, and edges and at connection to down conductor, as per approved drawing. The Contractor shall co-ordinate the installation detail to allow for bonding of the network with the external façade elements, to comply with the requirement of IEC 62305-

3. All fixing accessories, installation materials etc. as required, shall be included in the Contract. Roof mounted electrical/electronic equipment (for example, chillers, antennas, cameras etc.) need vertical air-termination to avoid direct flashover.

All metallic projections, chimneys, ducts, vent pipe, railings, gutters etc., on or above the main surface of the roof of the structure shall be bonded to and form part of the air termination network.

The air terminal of 15 mm dia., 1 meter length made up of copper bonded steel material shall be installed at every corner of the building.

Horizontal Conductor/ Mesh Conductor

Copper bonded steel conductor of 8mm (min.) dia. can be used. The conductor shall be made of high tensile low carbon steel, molecularly bonded with copper on outer surface to comply the requirements of IS/IEC 62305. The minimum thickness of copper bonding shall be 250 microns.

The conductors shall be installed at locations in compliance with the code requirement and as per approved Drawings. The conductor and Air terminals shall be securely fixed in place with suitable clamps and hardware, to the building structure. The clamps / hardware used for jointing Air terminal to the roof conductor and for fixing of roof conductor to the metallic / Masonry / glass surface of facade, shall be according to the relevant part of IS/IEC 62305.

Wherever possible, the horizontal conductors shall be of continuous lengths. Where saddled to masonry the fixing screws shall be set in expansion type plugs contained in properly formed holes. All roof conductors are to be secured by roof conductor holders at intervals of 1000mm.

Drawings showing the various roof levels of the building indicating the general arrangement and layout of the air termination system. The Contractor shall ensure that air termination system, installed over its total route of the roof shall maintain absolute electrical continuity. Provision shall be made with suitable fittings to allow for expansion and contraction of the horizontal conductors at every 20 meter.

Down Conductor:

The Down Conductors shall be in compliance with the IEC 62561-2. Copper bonded steel rods of 8mm (min.) dia. can be used. The rod/ conductor shall be made of high tensile low carbon steel, molecularly bonded with copper on outer surface to comply the requirements of IEC 62561. The minimum thickness of copper bonding shall be 250 microns.

The down conductor shall be distributed around the outside wall / façade of the structure. Minimum Spacing between the down-conductors shall be as per designed level of protection and as per IS/IEC 62305-3. Down-Conductors are to be secured at intervals of 1000mm.

Any external metal running vertically through the structure shall be bonded to the down conductors. A down conductor shall follow the most direct path possible between the air terminals and the earth termination. Separation distance needs to be calculated and maintained from live parts/services while routing the down-conductors.

At the structures, which cannot be punctured for holding the down-conductors, like tin roofs, glass façade etc., the down-conductors should be supported with adhesive type clamps tested for weather durability, wind speed and for withstanding lightning currents as per designed Lightning Protection Level.

Joints and Bonds/ Connectors

- a) The lightning protection system shall have minimum joints as possible. Joints and bonds shall be mechanically and electrically effective. Joints exposed to the atmosphere/open air can be clamped, screwed, bolted, riveted or exothermically welded joints. Joints and bonds made below earth and in concrete shall be through exothermic welding only.
- b) With overlapping joint, the length of overlapping shall not be less than 25mm for all types of conductor. Contact surfaces shall be first cleaned, and then inhibited from oxidation with a suitable non-corrosive compound. Joints of dissimilar metals shall be protected from moisture by an inert, tenacious material.

Fixing Accessories/Conductor Holders

Suitable fixing accessories to be considered to support Roof conductor as well as down conductor at every 1 meter as per IS/IEC 62305-3. The fixing accessories and the conductor holders shall be complying IEC 62561.

Lightning Strike Counter

The Lightning systems shall be installed complete with the lightning strike recorder. The lightning strike recorder shall contain a mechanical 6-digit display which will register all lightning discharges. The lightning strike recorder shall be housed in an IP 67 rated enclosure and operate without reliance on batteries or on any other external power source.

Test Clamp

Each down conductor shall be provided with a testing joint in such a position that, it is convenient for testing (about 1000 mm above Ground level). It shall be made of copper and shall be connected at every down conductor for connection and disconnection purpose.

Earth termination Network

The resistance from any part of the lightning protection system to earth shall not exceed 10 Ohm before any bonding has been affected to metal in or on a structure or to services below ground. If the value obtained exceeds the specified 10 Ohm it shall be reduced by adding to the number of earth electrode.

An earth termination network shall consist of vertical and horizontal conductor comprising of ring earthing at a min. distance of 3.0 meter from the structure.

Tender No. HORC/HRIDC/C-4/2022
Attachment 5
to
Corrigendum No. 2

**Part 2, Section VII-8: Employer's
Requirements-Tender Drawings and
documents**

Section VII-8A: Tender Drawings

Section VII-8: Tender Drawings and Documents

A- Tender Drawings

B- Tender Documents

Section VII-8

A: Tender Drawings

List of Drawings



-Black colour shows Tender drawings which have not been revised



-Blue colour shows Tender drawings which have been revised



-Red colour shows New additional Tender drawings

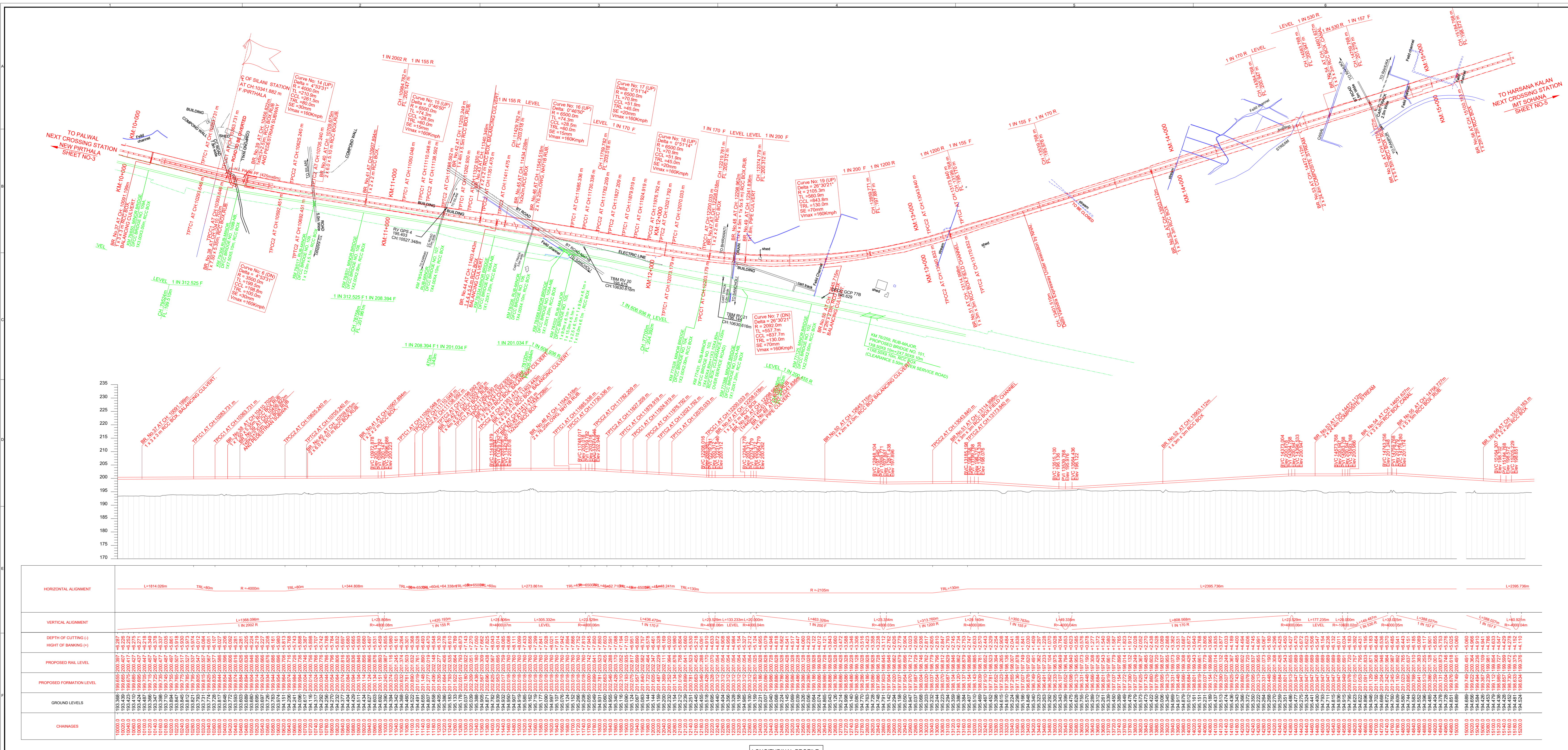
S. No	TITLE	DRAWING NO.
1 CONCEPTUAL PLAN AND LONGITUDINAL SECTION:		
1.	Conceptual plan and longitudinal section from chainage 10.0KM to chainage 15.185KM (tunnel)	GC-HRIDC-ALL-DRW-ALN-P&P-10-15KM_A1
2.	Conceptual plan and longitudinal section from chainage 15.185KM to chainage 20.0KM	GC-HRIDC-ALL-DRW-ALN-P&P-15-20KM_A1
3.	Conceptual plan and longitudinal section from chainage 24.0KM to chainage 30.0KM (tunnel)	GC-HRIDC-ALL-DRW-ALN-P&P-24-30KM_A1
2 TUNNEL		
1.	Conceptual drawing for Single track tunnel cross section (Rock)	GC-HRIDC-C4-DRW-TTL-CLT-01001_A1
2.	Conceptual drawing for Single track tunnel cross section (Soil)	GC-HRIDC-C4-DRW-TTL-CLT-01002_A1
3.	Conceptual drawing for Support class III from CH: 24940 to CH: 26000	GC-HRIDC-C4-DRW-TTL-CLT-01003_A0
4.	Conceptual drawing for Support class IV from CH: 24880 to CH: 24940	GC-HRIDC-C4-DRW-TTL-CLT-01004_A0
5.	Conceptual drawing for Support class VI (i) from CH: 26000 to CH: 28420	GC-HRIDC-C4-DRW-TTL-CLT-01005_A0
6.	Conceptual drawing for Support class VI(ii) from CH: 28420 to CH: 28480	GC-HRIDC-C4-DRW-TTL-CLT-01006_A0
7.	Conceptual drawing for Tunnel typical detail of lattice girder	GC-HRIDC-C4-DRW-TTL-CLT-01007_A0
8.	Conceptual drawing for Cut & cover section of tunnel	GC-HRIDC-C4-DRW-TTL-CLT-01008_A1
9.	Conceptual drawing for Cross passage junction with main tunnel	GC-HRIDC-C4-DRW-TTL-CLT-01009_A1
10.	Conceptual drawing for Permanent Ventilation shaft junction with main tunnel	GC-HRIDC-C4-DRW-TTL-CLT-01010_A1 (Sheet 1 of 3)
		GC-HRIDC-C4-DRW-TTL-CLT-01010_A1 (Sheet 2 of 3)
		GC-HRIDC-C4-DRW-TTL-CLT-01010_A1 (Sheet 3 of 3)

S. No	TITLE	DRAWING NO.
11.	Conceptual drawing for Construction cum utility shaft	GC-HRIDC-C4-DRW-TTL-CLT-01011_A1
12.	Conceptual drawing for Portal-1 & Abutment A2 of viaduct with drainage excavation plan & sections	GC-HRIDC-C4-DRW-TTL-CLT-01012_A0
13.	Conceptual drawing for Portal-2 & open cutting area with 100m ballastless track	GC-HRIDC-C4-DRW-TTL-CLT-01013_A0
3 BRIDGES		
3.1 MINOR BRIDGES		
1.	Conceptual general arrangement drawing for Balancing culvert Bridge no. 047 Span 1.0x2.0x2.0 RCC box at Ch: 12208.018	GC-HRIDC-C4-DRW-BRD-GAD-01047_A1
2.	Conceptual general arrangement drawing for Drain + Road Bridge no. 048 span 1x4.0x5.0+1x5x5 RCC box at Ch: 12298.962	GC-HRIDC-C4-DRW-BRD-GAD-01048_A1
3.	Conceptual general arrangement drawing for pipe culvert Bridge no. 049 span 1.0x1.80ø Pipe culvert at Ch: 12341.836	GC-HRIDC-C4-DRW-BRD-GAD-01049_A1
4.	Conceptual general arrangement drawing for Balancing culvert Bridge no. 050 Span 1.0x2.0x2.0 RCC box at Ch: 12645.715	GC-HRIDC-C4-DRW-BRD-GAD-01050_A1
5.	Conceptual general arrangement drawing canal Bridge no. 051 span 1.0x3.0x3.0 RCC box at Ch: 13114.998	GC-HRIDC-C4-DRW-BRD-GAD-01051_A1
6.	Conceptual general arrangement drawing for Balancing culvert Bridge no. 052 Span 1.0x3.0x3.0 RCC box at Ch: 13903.112	GC-HRIDC-C4-DRW-BRD-GAD-01052_A1
7.	Conceptual general arrangement drawing for canal Bridge no. 054 1.0x3.0x3.0 RCC box at Ch: 14601.627	GC-HRIDC-C4-DRW-BRD-GAD-01054_A1
8.	Conceptual general arrangement drawing for Road under bridge, Bridge	GC-HRIDC-C4-DRW-BRD-GAD-01055_A1

S. No	TITLE	DRAWING NO.
	no. 055 Span 1×5.0×5.0 RCC box at Ch: 14756.727	
9.	Conceptual general arrangement drawing for Balancing culvert Bridge no. 056 Span 1.0x2.0x2.0 RCC box at Ch: 15100.163	GC-HRIDC-C4-DRW-BRD-GAD-01056_A1
10.	Conceptual general arrangement drawing for Road under bridge, Bridge no. 057 Span 1×5.0×5.0 RCC box at Ch: 15944	GC-HRIDC-C4-DRW-BRD-GAD-01057_A1
11.	Conceptual general arrangement drawing proposed RUB no. 060 Span 2×7.0×5.6 RCC box at Ch: 16827	GC-HRIDC-C4-DRW-BRD-GAD-01060_A1
3.2 MAJOR BRIDGES		
1.	Conceptual general arrangement drawing for stream bridge no.53 2x24.4 CG at Ch: 14472.112m	GC-HRIDC-C4-DRW-BRD-GAD-01053_A1
2.	Conceptual general arrangement drawing for Canal Br.no. 058 1 x 5 x 5.4m + 1 x 12.2m + 1 x 5 x 5.4m PSC U slab Ch: 16127	GC-HRIDC-C4-DRW-BRD-GAD-01058_A1
3.	Conceptual general arrangement drawing proposed RUB no. 059 2 x 12.2m PSC U slab Ch: 16727	GC-HRIDC-C4-DRW-BRD-GAD-01059_A1
4.	Conceptual general arrangement drawing proposed Canal Br. No. 061 1x5x5.4+1x12.2+1x5x5.4m PSC U slab Ch: 16917	GC-HRIDC-C4-DRW-BRD-GAD-01061_A1
5.	Conceptual general arrangement drawing proposed RUB no. 062 1 x 12.2m PSC U slab Ch: 17500	GC-HRIDC-C4-DRW-BRD-GAD-01062_A1
4 MISCELLANEOUS DRAWINGS (CONCEPTUAL PLANS)		
1.	Jurisdictional sketch of C-4 package	GC-HRIDC-C4-SK-CIVIL-001_A0
2.	Schematic diagram of HORC tunnel	GC-HRIDC-C4-SK-TUNNEL-001_A0
3.	Conceptual Plan Typical embankment/cutting profile	GC-HRIDC-SK-GEN-001_A1

S. No	TITLE	DRAWING NO.
4.	Conceptual Plan Drains for Embankment	GC-HRIDC-SK-GEN-008_A1
5.	Conceptual Plan Steel barricade	GC-HRIDC-SK-GEN-009
6.	Conceptual Plan Interfacing location bank benching	GC-HRIDC-C4-SK-012_A1
7.	Conceptual Plan CC Toe wall	GC-HRIDC-SK-GEN-014_A1
8.	Conceptual Plan Typical details of protection work	GC-HRIDC-SK-GEN-015_A1
9.	Conceptual Plan Barbed wire fencing	GC-HRIDC-SK-GEN-016_A1
10.	Conceptual Plan for Transition system of bridge approaches	GC-HRIDC-SK-GEN-019
11.	Conceptual plan for Trolley Refuge in embankment	GC-HRIDC-SK-GEN-022
12.	Conceptual plan for Trolley Refuge in cutting	GC-HRIDC-SK-GEN-023
13.	Conceptual sketch for NP4 pipe of 450mm Dia	GC-HRIDC-SK-GEN-028
14.	Conceptual sketch for precast RCC box 500 x 500 mm size	GC-HRIDC-SK-GEN-029
5 GENERAL ELECTRICAL SERVICES DRAWINGS		
1.	Indicative layout plan of Sub-station 11/0.433KV near utility shaft	GC-HRIDC-C4-DRW-TTL-ELE-001_A1
2.	Indicative layout plan of Sub-station 11/0.433KV	GC-HRIDC-C4-DRW-TTL-ELE-002_A1
3.	Power supply for lighting arrangement (indicative)	GC-HRIDC-C4-DRW-TTL-ELE-003_A1
4.	Power supply arrangement for emergency and maintenance power socket diagram (indicative)	GC-HRIDC-C4-DRW-TTL-ELE-004_A1
5.	Single line diagram of HT system in tunnel (indicative)	GC-HRIDC-C4-DRW-TTL-ELE-005_A0
6 LAND AREA FOR TUNNEL		
1.	Land area near Portal-1	HRIDC-C4-SK-LANDPLAN-001_A0
2.	Land area near permanent Ventilation shaft 1 & 2	HRIDC-C4-SK-LANDPLAN-002_A0
3.	Land area near Construction cum utility shaft	HRIDC-C4-SK-LANDPLAN-003_A0
4.	Land area near permanent Ventilation shaft 3 & 4	HRIDC-C4-SK-LANDPLAN-004_A0
5.	Land details from Ch: 28341m to 29680m	HRIDC-C4-SK-LANDPLAN-005_A0

1. Conceptual Plan and Longitudinal Section



- LEGEND:**
- EXISTING RAILWAY TRACK
 - PROPOSED UP & DN LINE
 - DISMANTLING WORKS
 - DFCC WORKS
 - PROPOSED DIVERSIONS
 - EXISTING ROAD
 - PRO HORC BOUNDARY
 - EXPRESSWAY BOUNDARY
 - HT LINE
 - ELECTRICAL LINE(L)
 - STREAM / CANAL / DRAIN
 - WELL
 - POND
 - PRO TOE LINE

- NOTE:**
- ALL DIMENSIONS ARE IN METRE UNLESS OTHERWISE STATED
 - ALL THE LEVELS ARE WITH RESPECT TO MEAN SEA LEVEL.
 - TRACK CENTRE BETWEEN MAIN LINES OF HORC HAS BEEN KEPT AS MIN 5.30m
 - PUBLIC UTILITIES HT/LT LINES OFC CABLES WATER/SEWER LINES ETC INTERFERING WITH DFC TRACKS SHALL BE RELOCATED.
 - ARRANGEMENT & SIZE OF THE BRIDGE SHOWN IN THE DRAWING IS TENTATIVE AND MAY CHANGE AS PER THE APPROVED GAD.
 - VERTICAL CLEARANCE FROM LOWEST CONDUCTOR OF HT POWER LINE TO PROPOSED RAIL LEVEL ARE SHOWN

- PROPOSED TRACK STRUCTURE (TO SUIT FOR 25T AXLE LOAD)**
- 1. TRACK = 60KG RAILS
 - 2. SLEEPER DENSITY = 1660 No S PER KM
 - 3. BALLAST CUSHION: 350mm
 - 4. ALL TURNOUTS ARE: 1 in 12 UNLESS OTHERWISE SPECIFIED.

- ABBREVIATIONS:**
- BVC - BEGIN OF VERTICAL CURVE
 - PVI - POINT OF VERTICAL INTERSECTION
 - EVC - END OF VERTICAL CURVE

- LEGEND FOR PROFILE:**
- PROPOSED RAIL PROFILE
 - PROPOSED FORMATION PROFILE
 - GROUND PROFILE

GCHORC		HRIDC	
NAME / DESIGNATION	SIGN	NAME / DESIGNATION	SIGN
CHAHAYI RAM PD	<i>[Signature]</i>	SHIVOM DWIVEDI CPM/HRDC	<i>[Signature]</i>
SUDHIR AGRAWAL DPO/CIVIL	<i>[Signature]</i>	RAJU SOLANKI DGM/CIVIL/SOUTH	<i>[Signature]</i>
KRISHAN CHAND SAINI CRE/CIVIL	<i>[Signature]</i>		

PROJECT:
HARYANA ORBITAL RAIL CORRIDOR
CONNECTING PALWAL TO SONIPAT BYPASSING DELHI AREA BY LINKING ASAOTI-PATLI-SULTANPUR-ASADAH BY NEW ELECTRIFIED B/D DOUBLE LINE

CLIENT:
HARYANA RAIL INFRASTRUCTURE DEVELOPMENT CORPORATION LIMITED.

GENERAL CONSULTANT:
GENERAL CONSULTANT FOR HARYANA ORBITAL RAIL CORRIDOR
RITES Limited in consortium with SMEC International Pty. Ltd.

CD DRG NO.	GC-HRIDC-ALL-DRW-ANP-10-IEMX-AL
DATE:	07.31.2022
REVISION DATE:	02.01.2023
CONSULTANTS:	AARVEE ASSOCIATES
DRWN:	TANMAY
CHECKED:	G PRASAD / M J N. RAO (VP)
APPROVED:	[Signature]

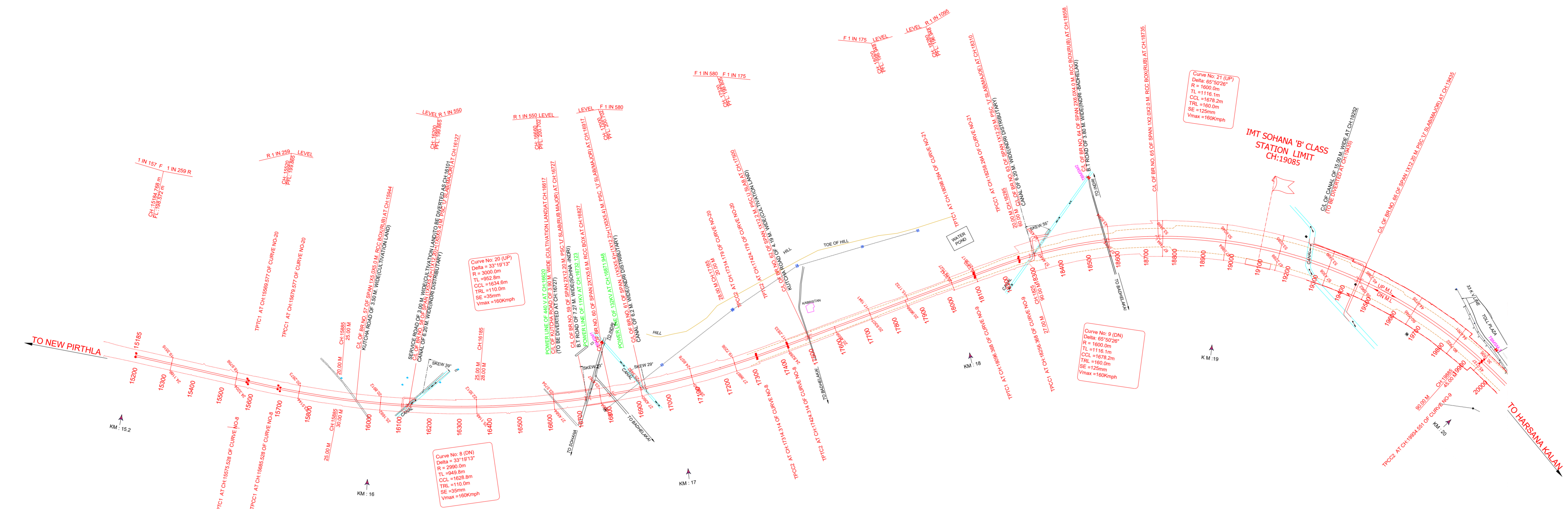
TITLE: CONCEPTUAL PLAN AND LONGITUDINAL SECTION FROM CHANGE BUREAU TO CHANGE (SUSSEX (U.NSW))

DWG NO. AA/22564/D/ANP/RP/3 **SHEET No. 5 OF 24**
SCALE: H = 1:5000 V = 1:500 **ISSUED DATE:** 26.11.2019 **REV DT:** 06-08-2022

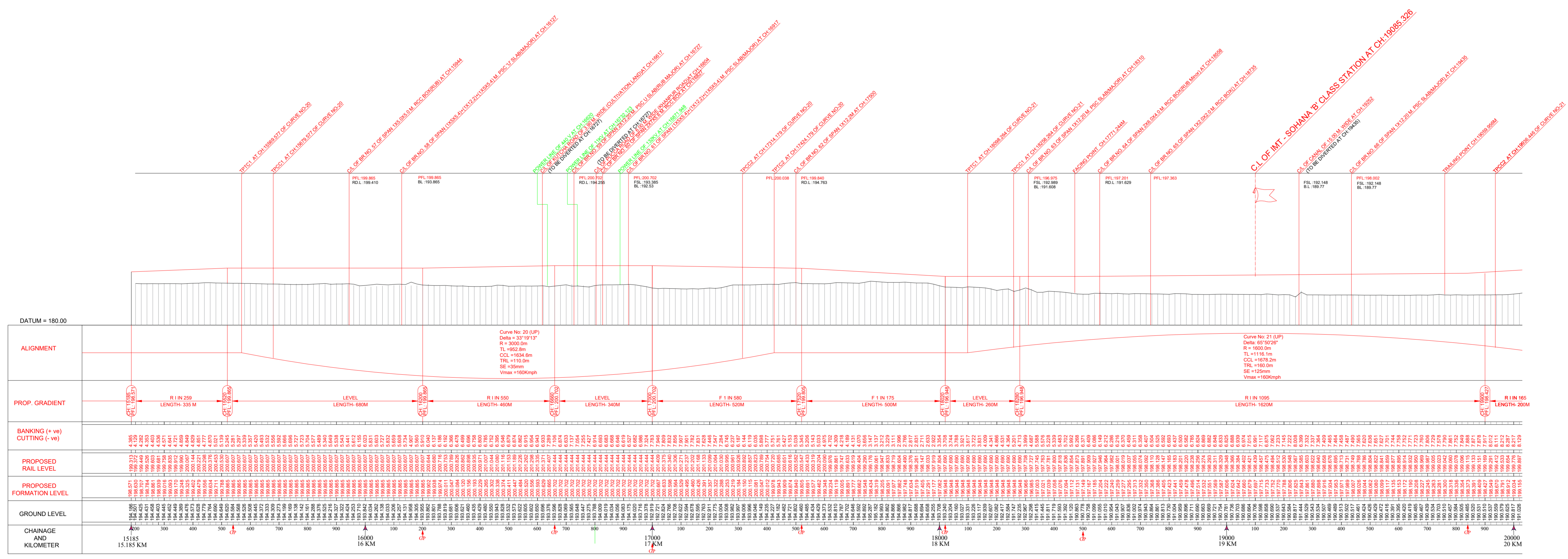
- NOTES:-**
- EXISTING WORK SHOWN IN BLACK.
 - PROPOSED WORK SHOWN IN RED.
 - ALL DIMENSIONS ARE IN METER UNLESS OTHERWISE SPECIFIED.
 - CHAINAGE IS RECKONED 0.60 FROM C.L. OF NEW PITHLA STATION BUILDING.
 - RAIL LEVEL SHOULD BE 0.742M ABOVE FORMATION LEVEL FOR TRACK STRUCTURE 60KG NEW RAIL ON PSC SLEEPER (1660KM) WITH 350mm BALLAST CUSHION.
 - RULLING GRADIENT IS 1 IN 150 OF THIS SECTION (COMPENSATED).
 - VERTICAL CURVE WILL BE PROVIDED AS PER IRPWV PARA 419.
 - CROSS LONGITUDINAL DRAINAGE ARRANGEMENT BET TRACK SHOULD BE PROVIDED WHEREVER REQUIRED.
 - TROLLEY REFUGE IN BANKING / CUTTING SHALL BE PROVIDED AS PER PROVISION OF IRPWV.
 - STANDARD OF LOADING (FOR PROP. LINE)- 32.5 T LOADING-2008 & HIGH RISE OHE.
 - TELEPHONE CABLE TO BE LAID FOR TELECOMMUNICATION.
 - ALL ELECTRICAL XING WILL BE AS PER PARA II (D) OF CHAPTER I GENERAL OF SCHEDULE I OF S.O.D.2004.

TBM No.	Easting	Northing	Elevation
SM-1	705588.878	3121113.675	194.387
SM-2	704954.348	3119500.444	193.724
SM-3	703625.564	3118824.368	193.601

EXISTING CENTRE LINE	—
PROPOSED CENTRE LINE	—
DFC CENTRE LINE	—
EXISTING TPTC	—
PROPOSED TPTC	—
TBM	—
KM-STONE	—
PROPOSED BOUNDARY	—
EXISTING BRIDGE	—
PROPOSED BRIDGE	—
NALA/CANAL/DRAIN	—
PERMANENT STRUCTURE	—
TEMPORARY STRUCTURE	—
PROPOSED GATE LODGE	—
TOE LINE	—
ROAD	—
POWER LINE WITH POLE	—
PYLON	—
EMBANKMENT / BUND	—
ROCKY AREA	—
COMPOUND WALL	—
DITCH / QUARRY	—
BARBED WIRE FENCING	—
GROUND LEVEL	—



PLAN



SECTION

GCMORC		HRIDC	
NAME / DESIGNATION	SIGN	NAME / DESIGNATION	SIGN
CHAHATEY RAM JOS		SHRY OM DAVEDI	
SUDHR AGRAWAL		RAJU SOLANG	
KRISHAN CHAND SAINI		JAYESH KUMAR	
CHEGILLI			

NORTHERN RAILWAY
DELHI DIVISION

PROJECT: HARYANA ORBITAL RAIL CORRIDOR
CONNECTING PALWAL TO SONPAT BYPASSING DELHI AREA BY LINING ASAOI-PATILSULA-TANPUR-ASALUDAH BY NEW ELECTRIFIED BG DOUBLE LINE.

CLIENT: HARYANA RAIL INFRASTRUCTURE DEVELOPMENT CORPORATION LIMITED.

GENERAL CONSULTANT: GENERAL CONSULTANT FOR HARYANA ORBITAL RAIL CORRIDOR
RTES Limited in consortium with SIMEC International Pty. Ltd.

RTES
THE INSTITUTE PEOPLE

SMEC
SMEC INTERNATIONAL PTY. LTD.

DRAWING NAME: CONCEPTUAL PLAN AND LONGITUDINAL SECTION
FROM CHAINAGE 15185KM TO CHAINAGE 20.00KM

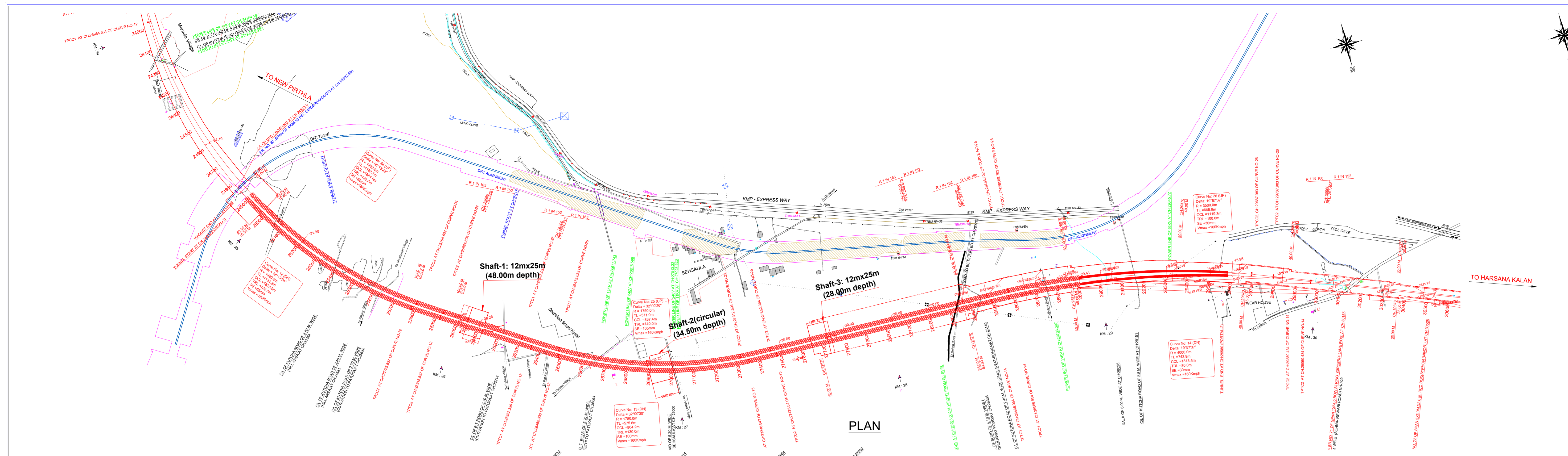
ISSUE DATE: 07.11.2023
REVISION DATE: 02.01.2023

SCALE: AS SHOWN

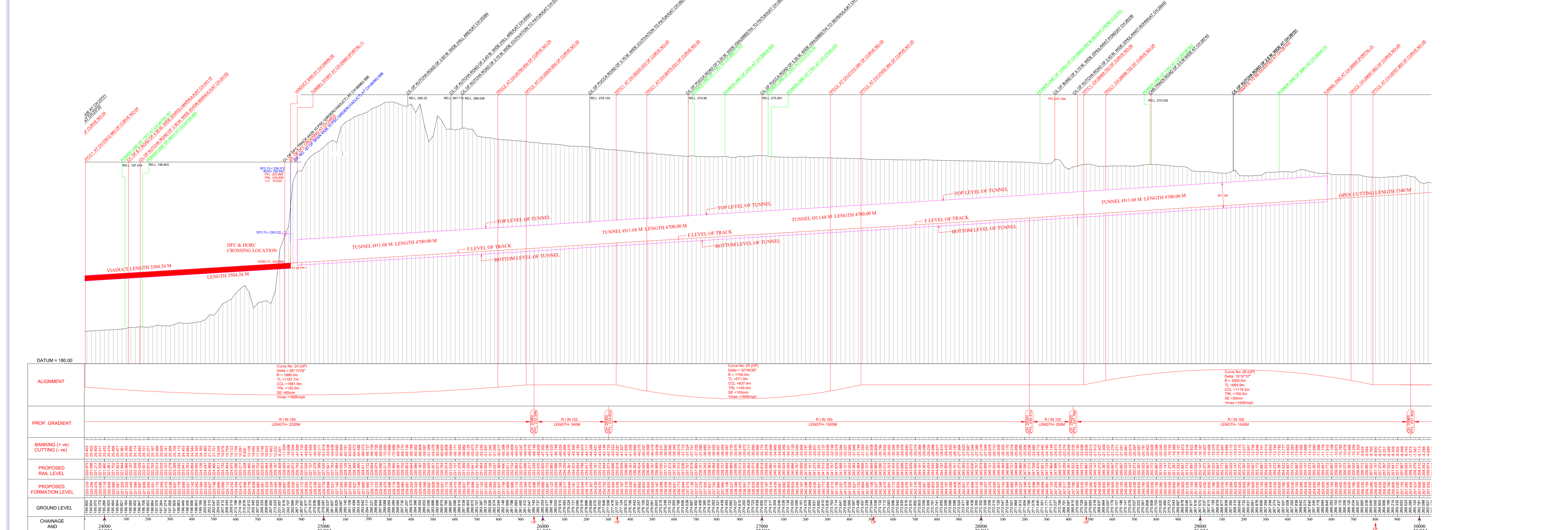
CONTAINT: S.M. CONSULTANTS

DRAWN BY: L.MOHANTY
CHECKED BY: SVRANK J

PREPARED FOR: PRELIMINARY FOR APPROVAL
TENDER:
CONSTRUCTION:



PLAN



SECTION

- NOTES :-
- EXISTING WORK SHOWN IN BLACK.
 - PROPOSED WORK SHOWN IN RED.
 - ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE SPECIFIED.
 - CHANGE IS RECORDED 800 FROM C.L. OF NEW PRITHLA STATION BUILDING.
 - RAIL LEVEL SHOULD BE 675cm ABOVE FORMATION LEVEL FOR TRACK STRUCTURE.
 - NEW RAIL ON P.C. SLEEPER (600x60) WITH 150mm BALLAST CUSHION.
 - BULLING GRADIENT IS 1 IN 150 OF THIS SECTION (COMPENSATED).
 - VERTICAL CURVE WILL BE PROVIDED AS PER IRPM PARA 419.
 - CROSS / LONGITUDINAL DRAINAGE ARRANGEMENT BET TRACK SHOULD BE PROVIDED WHEREVER REQUIRED.
 - TROLY REFUGE IN BANKING / CUTTING SHALL BE PROVIDED AS PER PROVISION OF IRPM.
 - CRS SANCTION WILL BE OBTAINED BEFORE EXECUTION OF WORK FALLING UNDER PARA 1302(D) OF IRPM.
 - STANDARD OF LOADING (FOR PROP. LINE)- 32.5 T LOADING-2008 & HIGH RISE OR.
 - TELEPHONE CABLE TO BE LAID FOR TELECOMMUNICATION.
 - ALL ELECTRICAL WORK WILL BE AS PER PARA 1110 OF CHAPTER I GENERAL OF SCHEDULE 1 OF S.O. 2004.

LIST OF TBM

TBM No	Easting	Northing	Elevation
SM-9	699327.653	3121290.632	253.2
SM-10	699401.046	3122185.520	271.558
SM-11	698349.641	3122451.730	284.291
SM-12	697601.855	3122685.020	278.11

LEGEND

EXISTING CENTRE LINE	---
PROPOSED CENTRE LINE	---
DPC CENTRE LINE	---
EXISTING TPTC	---
PROPOSED TPTC	---
TOE	---
KM STONE	---
PROPOSED BOUNDARY	---
EXISTING BRIDGE	---
PROPOSED BRIDGE	---
MAA CANAL/DRYIN	---
PERMANENT STRUCTURE	---
TEMPORARY STRUCTURE	---
PROPOSED GATE LODGE	---
TOE LINE	---
ROAD	---
POWER LINE WITH POLE	---
P.Y.C.M.	---
EMBANKMENT / BUND	---
ROCKY AREA	---
COMPOUND WALL	---
DITCH / QUARRY	---
BARBED WIRE FENCING	---
GROUND LEVEL	---

NAME / DESIGNATION	SIGN	NAME / DESIGNATION	SIGN
CHWARTER MARK	---	SHY. CM. DIVERG.	---
SURVEY SIGNAL	---	CHWARTER MARK	---
B.P.C.V. (BENCH MARK)	---	B.M. (BENCH MARK)	---
PROVISED CHWARTER MARK	---	CHWARTER MARK	---

NORTHERN RAILWAY
DELHI DIVISION

PROJECT: HARYANA ORBITAL RAIL CORRIDOR
CONNECTING PALWA TO SONPAT BYPASSING DELHI AREA BY LINKING ASHOTI PATU-SULTANPUR-ASAHAH BY NEW ELECTRICISED DOUBLE LINE

CLIENT: HARYANA RAIL INFRASTRUCTURE DEVELOPMENT CORPORATION LIMITED.

GENERAL CONSULTANT: GENERAL CONSULTANT FOR HARYANA ORBITAL RAIL CORRIDOR
RITES Limited in consortium with SIMEC International Pvt. Ltd.

DRAWING NAME: CONCEPTUAL PLAN AND LONGITUDINAL SECTION FROM CHANGHE 24 KM TO CHANGHE 30 KM (TUNNEL)

SCALE: 1:1000

DATE: 01/11/2023

DESIGNED BY: GEP/193

DRAWN BY: L.MOHANTY

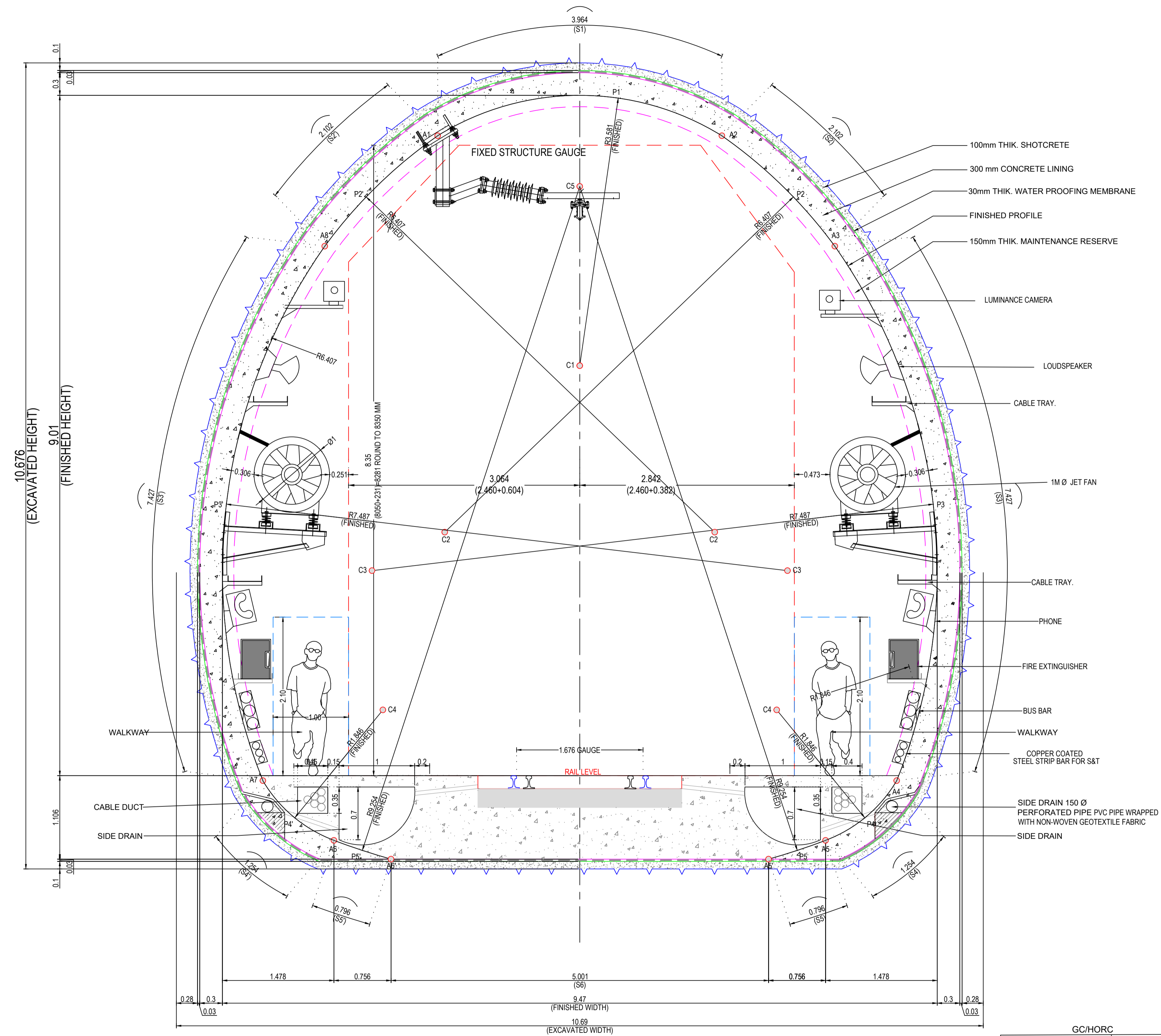
CHECKED BY: SURAJ J.

RELEASED FOR: PRELIMINARY APPROVAL

STATUS: TENDER

CONSTRUCTION

2. Tunnel



NOTES:-

- ALL DIMENSIONS, NORTHING & EASTING AND LEVELS ARE IN METER, UNLESS OTHERWISE SPECIFIED.
- NO DIMENSIONS SHALL BE MEASURED FROM DRAWING.
- TUNNEL EXCAVATED BY HEADING AND BENCHING METHOD (NATM).
- THE GRADE OF SHOTCRETE WITH SFRS AS PER DETAIL DESIGN.
- NEAR PORTAL PULL LENGTH SHOULD BE LIMITED TO 500 MM, ONLY AFTER SUPPORTING EXCAVATED STRETCH (500 MM), THEN NEXT CYCLE OF EXCAVATION SHALL BE CARRIED OUT.
- IT IS PROPOSED TO PROVIDE 50 MM THICK SFRS IMMEDIATELY AFTER EXCAVATION OF FACE.
- IT IS PROPOSED TO PROVIDE 100 MM THICK SFRS ON SLOPE PROTECTION. ALTERNATIVELY, PLAIN SHOTCRETE WITH WIREMESH 150x150x5mm MAY ALSO BE USED.
- PROPOSED ROCK BOLT SHALL BE WITH FOLLOWING SPECIFICATION CONFORMING TO IS 1786, DIAMETER OF ROCK BOLT = 25 MM, GRADE OF ROCK BOLT Fe415 FULLY GROUTED, SIZE OF ANCHOR PLATE = 150X150X8MM
- PROPOSED SUPPORT SYSTEM IS BASED ON GIR PROVIDED BY GEOLOGIST. ACTUAL SUPPORT SYSTEM MAY BE REVISED BASED ON ACTUAL RESPONSE OF STRATA DURING EXCAVATION.
- THE NUT OF THE GROUTED ROCK BOLT SHALL BE TIGHTENED 12 HOURS AFTER INSTALLATION TO ACHIEVE A FORCE AT THE ANCHOR PLATE OF APPROX. 20KN. THIS FORCE SHALL BE APPLIED BY CALIBRATED TORQUE WRENCH.
- THE LENGTH AND THE DIRECTION OF ROCK BOLTS MAY BE ALTERED IN CONSULTATION WITH SITE GEOLOGIST AND ENGINEER-IN-CHARGE. WHEREVER REQUIRED, ADDITIONAL SPOT BOLTING SHALL BE DONE IN LOCALIZED AREA OF POTENTIAL INSTABILITY OR WEAKNESS AS DETERMINED DURING EXCAVATION.
- SLOPE SUPPORT SHALL BE INSTALLED AS EXCAVATION PROGRESSES SUCH THAT NOT MORE THAN 2.0m VERTICAL HEIGHT OF SLOPE IS LEFT UNSUPPORTED AT ANY TIME.
- PULLOUT TEST SHALL BE CARRIED OUT ON ROCK BOLTS FOR 190KN.
- DRAINAGE PIPE SHALL BE 150mmØ, PERFORATED PVC PIPE WRAPPED WITH NON-WOVEN GEOTEXTILE FABRIC AS PER IS-4984.
- EXCAVATION SEQUENCE WILL BE PROVIDED BASED ON GFC.
- EXCAVATION AT EAST PORTAL LOCATION SHALL BE MATCHED WITH DEEP CUT EXCAVATION.
- GUARD RAIL SHALL BE PROVIDED THROUGHOUT THE LENGTH OF BALLASTLESS TRACK.
- BALLASTLESS TRACK TO BE DESIGN FOR 32.5 T AXLE LOADING.
- DIMENSIONS OF PRIMARY SUPPORT & CONCRETE ARE TENTATIVE.
- 230V SOCKET AT 200M INTERVAL FOR S&T SYSTEM SHALL BE PROVIDED.
- SEPARATE EARTHING MET CONNECTION FOR S&T SYSTEM SHALL BE PROVIDED.
- ANCHOR BOLT FOR ROCS SHALL BE INSTALLED DURING TUNNEL LINING.
- CABLE CROSSING SHALL BE PROVIDED AT EVERY CROSS PASSAGE.
- LUMINANCE CAMERA, LOUDSPEAKER, JET FAN, PHONE, BUS BAR, COPPER COATED STEEL STRIP BAR FOR S&T AND ROCS WORK (EXCLUDING ANCHOR BOLTS) IS NOT IN THE SCOPE OF WORK OF C-4.

S.N.	CURVE NAME	RADIUS (m.)	START	END	ARCH. LENGTH (m.)
1	S1	R3.581	A1	A2	3.964
2	S2	R6.407	A2	A3	2.102
3	S3	R7.487	A3	A4	7.427
4	S4	R1.846	A4	A5	1.254
5	S5	R9.254	A5	A5'	0.796
6	S6	R0	A5'	A6'	5.001
7	S5'	R9.254	A6'	A6	0.796
8	S4'	R1.846	A6	A7	1.254
9	S3'	R7.487	A7	A8	7.427
10	S2'	R6.407	A8	A1	2.102

EXCAVATED AREA	= 91.704 Sqm.
FINISHED AREA	= 71.063 Sqm.
EXCAVATED WIDTH	= 10.690m
EXCAVATED HEIGHT	= 10.676m
FINISHED WIDTH	= 9.470m
FINISHED HEIGHT	= 9.010m

PROJECT:- HARYANA ORBITAL RAIL CORRIDOR
CONNECTING PALWAL TO SONPAT BYPASSING DELHI AREA BY LINKING ASAOTI-PATLI-SULTANPUR-ASAUDAH BY NEW ELECTRIFIED BG DOUBLE LINE

CLIENT:- HARYANA RAIL INFRASTRUCTURE DEVELOPMENT CORPORATION LIMITED.

GENERAL CONSULTANT:- GENERAL CONSULTANT FOR HARYANA ORBITAL RAIL CORRIDOR
RITES Limited in consortium with SMEC International Pty. Ltd.

GC/HORC		HRDC	
NAME / DESIGNATION	SIGN	NAME / DESIGNATION	SIGN
CHAHATEY RAM PD	<i>Chahatey Ram</i>	SHIV OM DWIVEDI CPM/HRDC	<i>Shiv Om Dwivedi</i>
SUDHIR AGRAWAL DPD/CIVIL	<i>Sudhir Agrawal</i>	RAJU SOLANKI DGM/CIVIL/S	<i>Raju Solanki</i>
		AM/S&T	
REETU PATIAL CDE/CIVIL	<i>Reetu Patial</i>		
AMARNATH SINGH CRE/S&T	<i>Amarnath Singh</i>	AM/Civil/Pig	<i>Amarnath Singh</i>
STIPHEN SAHOO SRE/Elect.	<i>Stephen Sahoo</i>	JGM/L&U	<i>Stephen Sahoo</i>

GC/HORC DRG. NO:- GC-HRDC-C4-DRW-TTL-CLT-01001_A1

DRAWING NAME: CONCEPTUAL DRAWING FOR SINGLE TRACK TUNNEL CROSS SECTION (ROCK)

ISSUE DATE: 07.11.2022 | REVISED DATE: 03.01.2023

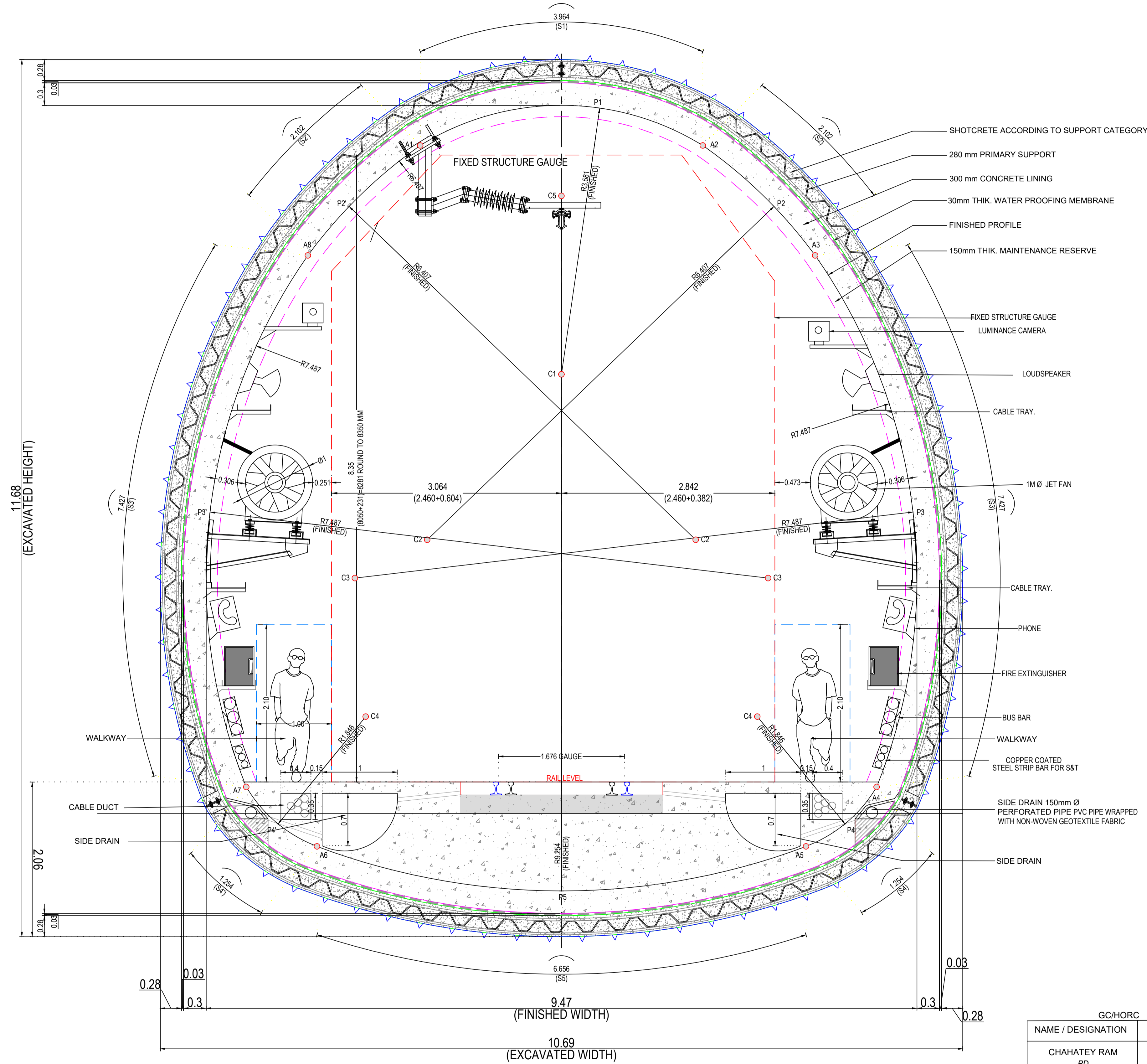
SCALE: AS SHOWN

SMC DRG. NO:- SMC/HRDC/TUNICS-7

CONSULTANT: S.M. CONSULTANTS

DESIGNER: DIVENDRA KUMAR (TUNNEL DESIGNER) | B.R. SHARMA (CONSULTANT / TUNNEL) | A.A. SAMANT (PROJECT INCHARGE)

RELEASED FOR: PRELIMINARY FOR APPROVAL TENDER CONSTRUCTION



- ALL DIMENSIONS, NORTHING & EASTING AND LEVELS ARE IN METER, UNLESS OTHERWISE SPECIFIED.
- NO DIMENSIONS SHALL BE MEASURED FROM DRAWING.
- TUNNEL EXCAVATED BY HEADING, BENCHING / MULTI DRIFT METHOD (NATM).
- THE GRADE OF SHOTCRETE WITH SFRS AS PER DETAIL DESIGN.
- PROPOSED SUPPORT SYSTEM IS BASED ON GIR PROVIDED BY GEOLOGIST. ACTUAL SUPPORT SYSTEM MAY BE REVISED BASED ON ACTUAL RESPONSE OF STRATA DURING EXCAVATION.
- DRAINAGE PIPE SHALL BE 150mmØ, PERFORATED PVC PIPE WRAPPED WITH NON-WOVEN GEOTEXTILE FABRIC AS PER IS-4989
- EXCAVATION SEQUENCE WILL BE PROVIDED BASED ON GFC.
- PIPE ROOFING/FOREPILING OF 114 MM DIA SHALL BE PROVIDED WHERE EVER IT IS REQUIRED.
- SELF DRILLING ANCHOR OF CAPACITY 190 KN SHALL BE PROVIDED FOR PRIMARY SUPPORT DURING EXCAVATION.
- LATTICE GIRDER 25-25-32 OF DEPTH 187 MM/ ISMB 200 MM SHALL BE INCASED IN SFRS OF MINIMUM THICKNESS 250 MM.
- GUARD RAIL SHALL BE PROVIDED THROUGHOUT THE LENGTH OF BALLASTLESS TRACK.
- BALLASTLESS TRACK TO BE DESIGN FOR 32.5 T AXLE LOADING.
- DIMENSION OF PRIMARY SUPPORT & CONCRETE ARE TENTATIVE.
- SEPARATE EARTHING MET CONNECTION FOR S&T SYSTEM SHALL BE PROVIDED.
- ANCHOR BOLT FOR ROCS SHALL BE INSTALLED DURING TUNNEL LINING.
- CABLE CROSSING SHALL BE PROVIDED AT EVERY CROSS PASSAGE.
- LUMINANCE CAMERA, LOUDSPEAKER, JET FAN, PHONE, BUS BAR, COPPER COATED STEEL STRIP BAR FOR S&T AND ROCS WORK (EXCLUDING ANCHOR BOLTS) IS NOT IN THE SCOPE OF WORK OF C-4.

S.N.	CURVE NAME	RADIUS (m.)	START	END	ARCH. LENGTH (m.)
1	S1	R3.581	A1	A2	3.964
2	S2	R6.407	A2	A3	2.102
3	S3	R7.487	A3	A4	7.427
4	S4	R1.846	A4	A5	1.254
5	S5	R9.254	A5	A6	6.656
6	S4	R1.846	A6	A7	1.254
7	S3	R7.487	A7	A8	7.427
8	S2	R6.407	A8	A1	2.102

EXCAVATED AREA	= 101.090 Sqm.
FINISHED AREA	= 71.063 Sqm.
EXCAVATED WIDTH	= 10.690m
EXCAVATED HEIGHT	= 11.680m
FINISHED WIDTH	= 9.470m
FINISHED HEIGHT	= 9.010m

PROJECT:- HARYANA ORBITAL RAIL CORRIDOR
 CONNECTING PALWAL TO SONIPAT BYPASSING DELHI AREA BY LINKING
 ASAOTI-PATLI-SULTANPUR-ASAUDAHA BY NEW ELECTRIFIED BG DOUBLE LINE

CLIENT:- HARYANA RAIL INFRASTRUCTURE DEVELOPMENT CORPORATION LIMITED.

GENERAL CONSULTANT:- GENERAL CONSULTANT FOR HARYANA ORBITAL RAIL CORRIDOR
 RITES Limited in consortium with SMEC International Pty. Ltd.

GC/HORC	SIGN	HRIDC	SIGN
CHAHATEY RAM PD	<i>Chahatey Ram</i>	SHIV OM DWIVEDI CPM/HRIDC	<i>Shiv Om Dwivedi</i>
SUDHIR AGRAWAL DPD/CIVIL	<i>Sudhir Agrawal</i>	RAJU SOLANKI DGM/CIVIL/S	<i>Raju Solanki</i>
		AM/S&T	
REETU PATIAL CDE/CIVIL	<i>Reetu Patial</i>		
AMARNATH SINGH CRE/S&T	<i>Amarnath Singh</i>	AM/Civil/Pig	<i>Amarnath Singh</i>
STIPHEN SAHOO SRE/Elect.	<i>Stephen Sahoo</i>	JGM/L&U	<i>Stephen Sahoo</i>

GC/HORC DRG. NO:- GC-HRIDC-C4-DRW-TTL-CLT-01002_A1

DRAWING NAME: CONCEPTUAL DRAWING FOR SINGLE TRACK TUNNEL CROSS SECTION (SOIL)

ISSUE DATE: 07.11.2022 | REVISION DATE: 03.01.2023

SCALE: AS SHOWN

SMC DRG. NO.: SMC/HRIDC/TUNICS-7

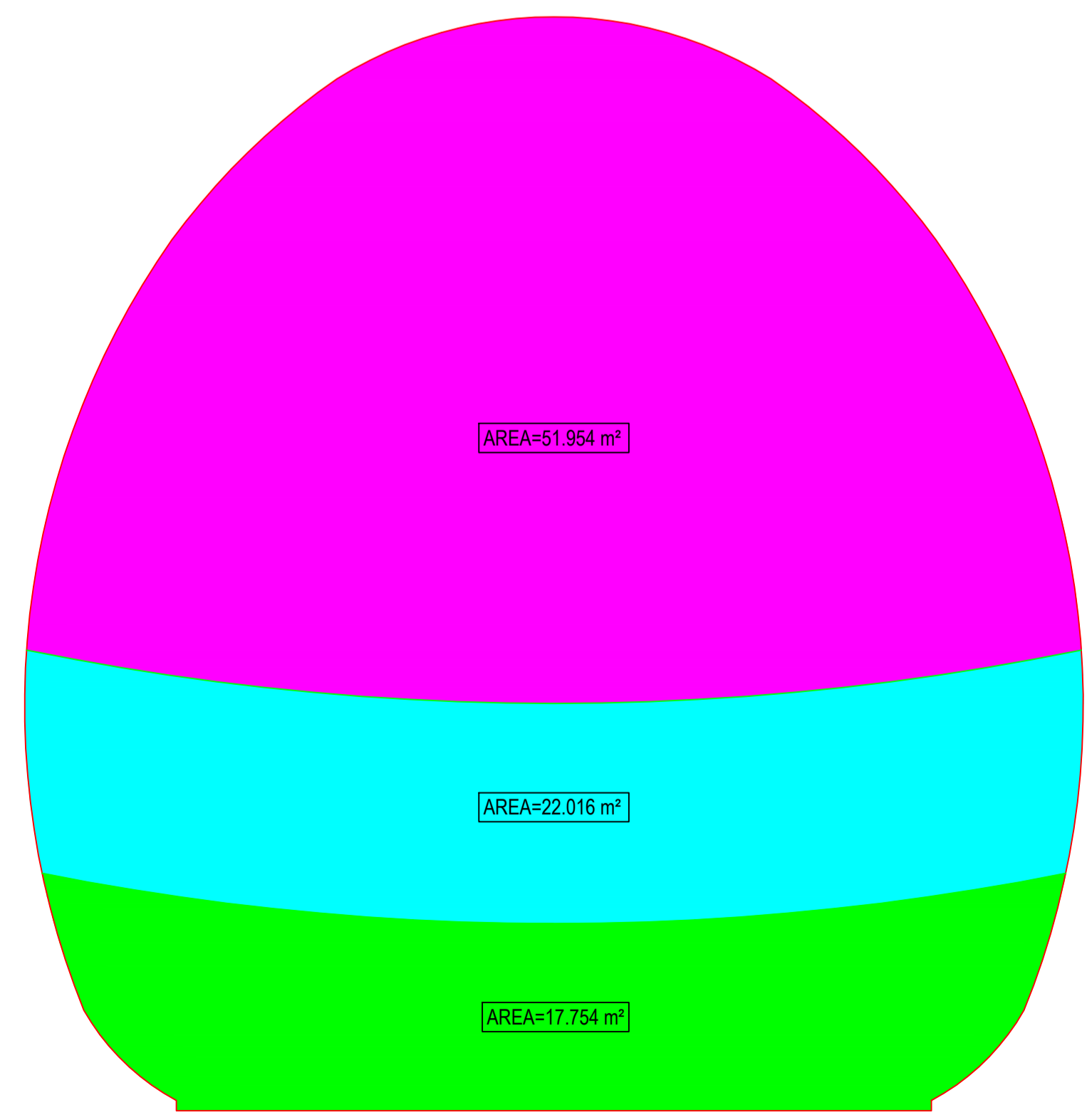
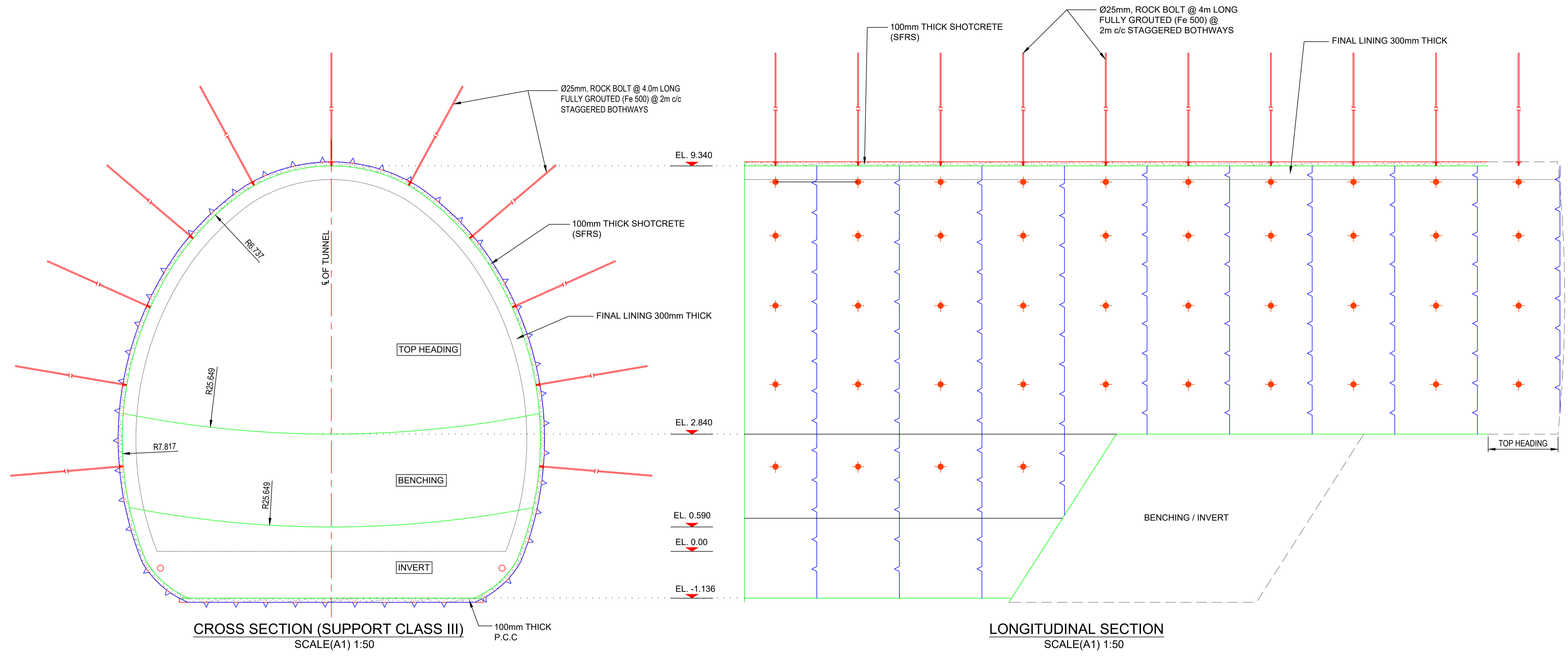
CONSULTANT: S.M. CONSULTANTS (An ISO 9001 Company)

DESIGNED BY: SIVENDRA KUMAR (TUNNEL DESIGNER)

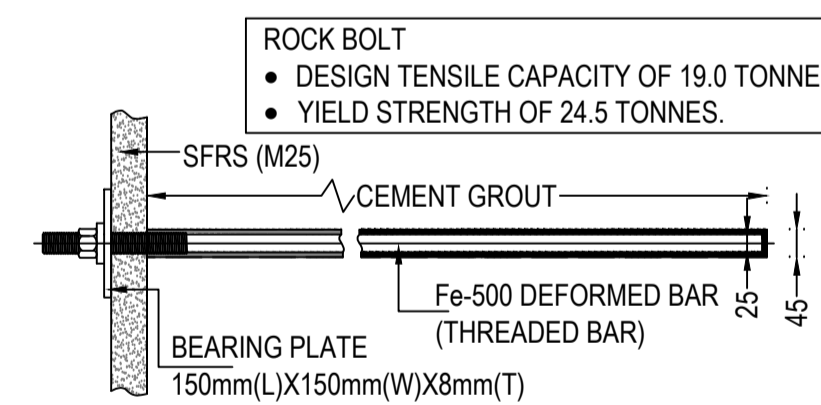
CHECKED BY: B.R. SHARMA (CONSULTANT/TUNNEL)

PROJECT INCHARGE: A.A. SAMANT

RELEASED FOR: PRELIMINARY FOR APPROVAL TENDER CONSTRUCTION



EXCAVATION AREA
SCALE(A1) 1:50



FULLY CEMENT GROUTED SPOT / ROCK BOLT

GC/HORC		HRDC	
NAME / DESIGNATION	SIGN	NAME / DESIGNATION	SIGN
CHAHATEY RAM PD	<i>Chahatey Ram</i>	SHIV OM DWIVEDI CPM/HRDC	<i>Shiv Om Dwivedi</i>
SUDHIR AGRAWAL DPD/CIVIL	<i>Sudhir Agrawal</i>	RAJU SOLANKI DGM/CIVIL/S	<i>Raju Solanki</i>
		AM/S&T	
REETU PATIAL CDE/CIVIL	<i>Reetu Patial</i>		
AMARNATH SINGH CRE/S&T	<i>Amarnath Singh</i>	AM/Civil/Pig	<i>Amarnath Singh</i>
STIPHEN SAHOO SRE/Elect.	<i>Stephen Sahoo</i>	JGM/L&U	<i>Stephen Sahoo</i>

PROJECT:- HARYANA ORBITAL RAIL CORRIDOR
CONNECTING PALWAL TO SONPAT BYPASSING DELHI AREA BY LINKING
ASAOTI-PATLI-SULTANPUR-ASAUDAHA BY NEW ELECTRIFIED BG DOUBLE LINE

CLIENT:- HARYANA RAIL INFRASTRUCTURE DEVELOPMENT CORPORATION LIMITED.

GENERAL CONSULTANT:- GENERAL CONSULTANT FOR HARYANA ORBITAL RAIL CORRIDOR
RITES Limited in consortium with SMEC International Pty. Ltd.

GC/HORC DRG. NO:- GC-HRDC-C4-DRW-TTL-CLT-01003_AD

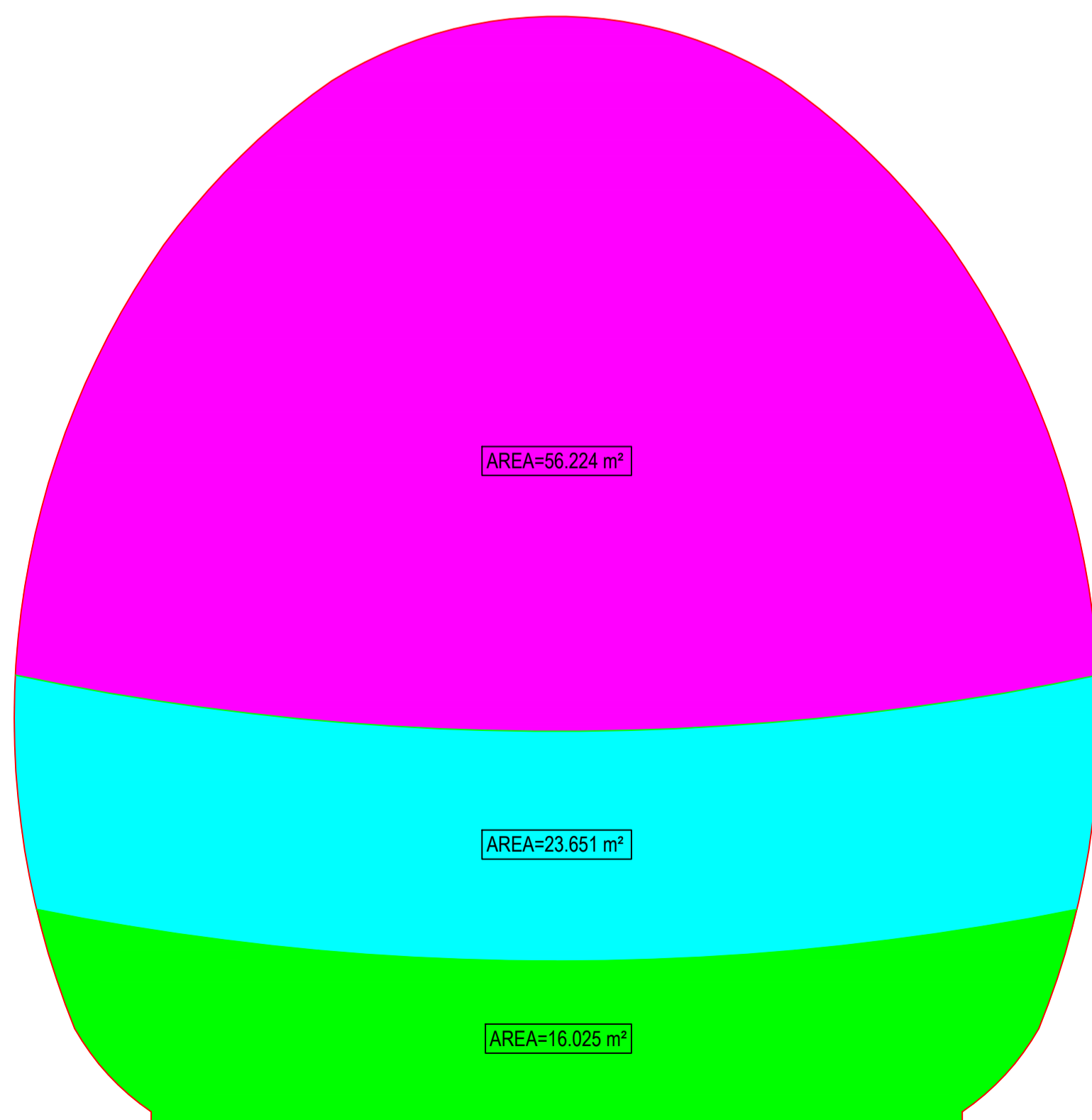
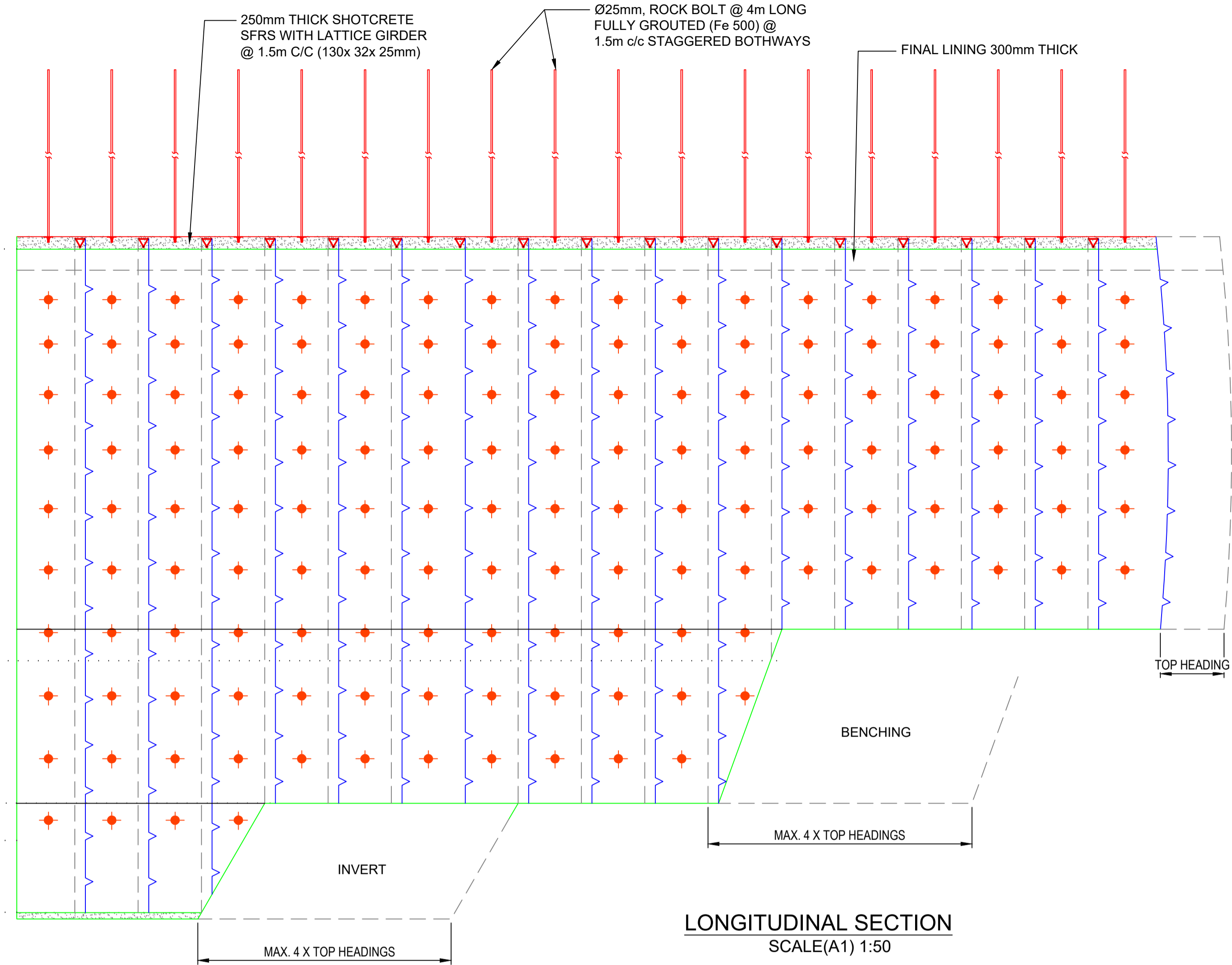
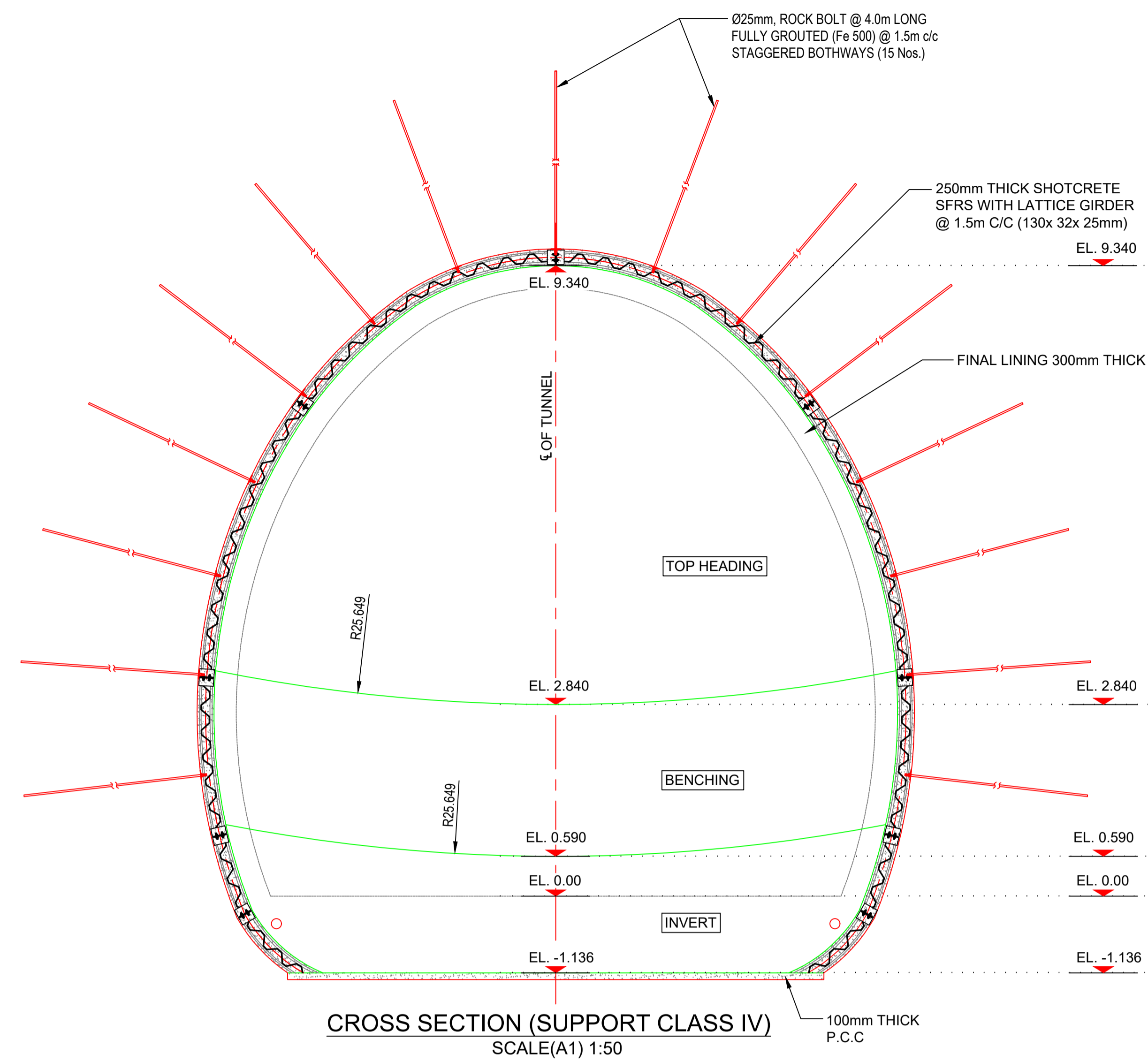
DRAWING NAME: CONCEPTUAL DRAWING FOR SUPPORT CLASS III FROM CH:24940 TO CH:26000

ISSUE DATE: 07.11.2022
SCALE: AS SHOWN
SMC DRG. NO.: SMC/HRDC/TUNICS-7

CONSULTANT: RITES (The Infrastructure People) and SMEC (Member of the Stantec Group)

DESIGNER: DIVENDRA KUMAR TUNNEL DESIGNER
CHECKER: B. R. SHARMA S/CONSULTANT / TUNNEL
PROJECT INCHARGE: A. A. SAMANT

RELEASED FOR: PRELIMINARY FOR APPROVAL TENDER CONSTRUCTION



GC/HORC		HRIDC	
NAME / DESIGNATION	SIGN	NAME / DESIGNATION	SIGN
CHAHATEY RAM PD	<i>Chahatey Ram</i>	SHIV OM DWIVEDI CPM/HRIDC	<i>Shiv</i>
SUDHIR AGRAWAL DPD/CIVIL	<i>Sudhir</i>	RAJU SOLANKI DGM/CIVIL/S	<i>Raju</i>
		AM/S&T	
REETU PATIAL CDE/CIVIL	<i>Reetu</i>		
AMARNATH SINGH CRE/S&T	<i>Amarnath Singh</i>	AM/Civil/Plg.	<i>Amarnath</i>
STIPHEN SAHOO SRE/Elect.	<i>Stephen</i>	JGML&U	<i>JGML&U</i>

PROJECT:- HARYANA ORBITAL RAIL CORRIDOR
CONNECTING PALWAL TO SONIPAT BYPASSING DELHI AREA BY LINKING
ASAOTI-PATLI-SULTANPUR-ASAUDAHA BY NEW ELECTRIFIED BG DOUBLE LINE

CLIENT:- HARYANA RAIL INFRASTRUCTURE DEVELOPMENT CORPORATION LIMITED.

GENERAL CONSULTANT:- GENERAL CONSULTANT FOR HARYANA ORBITAL RAIL CORRIDOR
RITES Limited in consortium with SMEC International Pty. Ltd.

GC/HORC DRG. NO.: GC-HRIDC-C4-DRW-TTL-CLT-01004_AD

DRAWING NAME: CONCEPTUAL DRAWING FOR SUPPORT CLASS IV FROM CH.24880 TO 24940

ISSUE DATE: 07/11/2022 **REVISED DATE:**

SCALE: AS SHOWN

SMC DRG. NO.: SMC-HRIDC/TUNICS-7

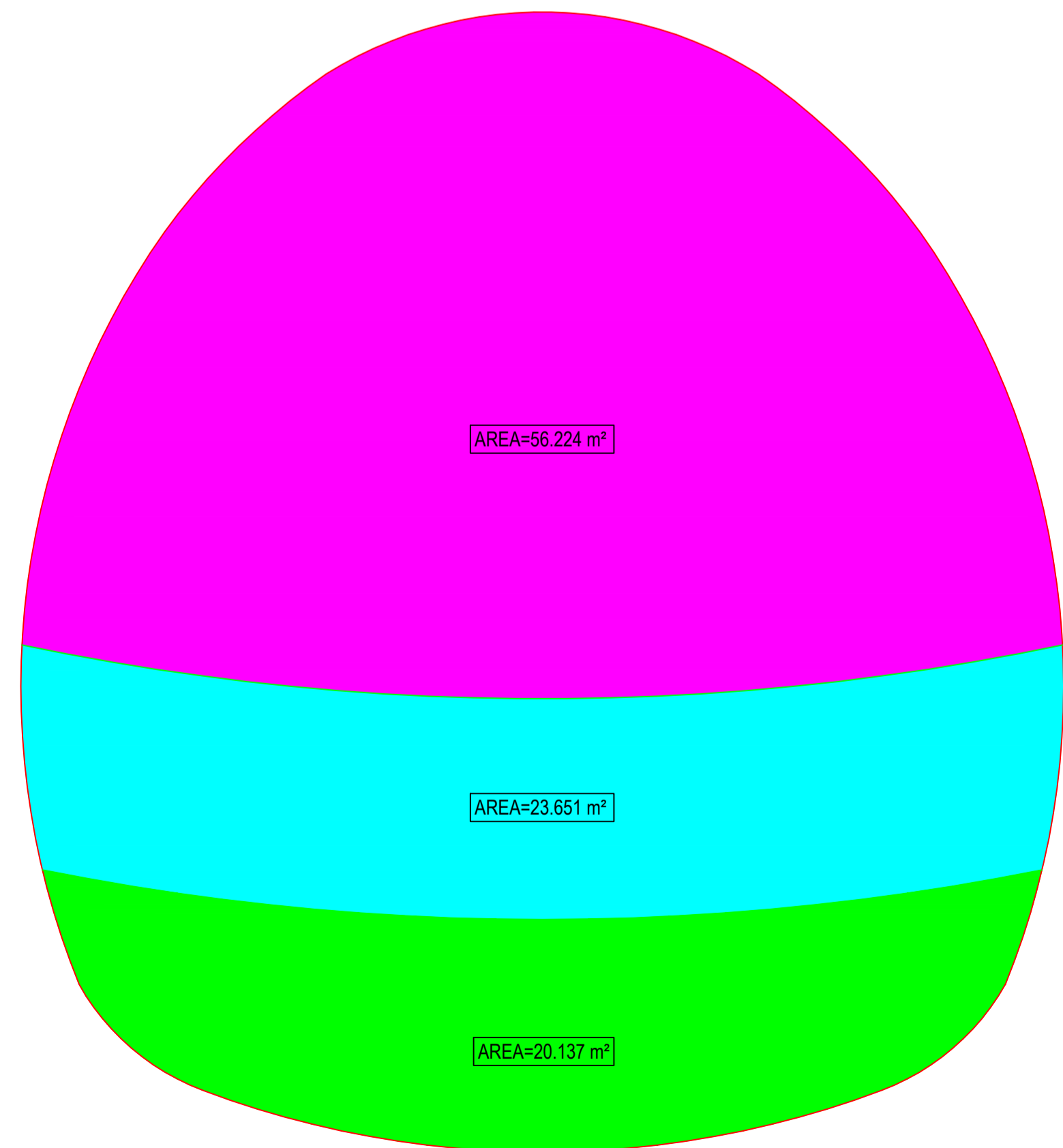
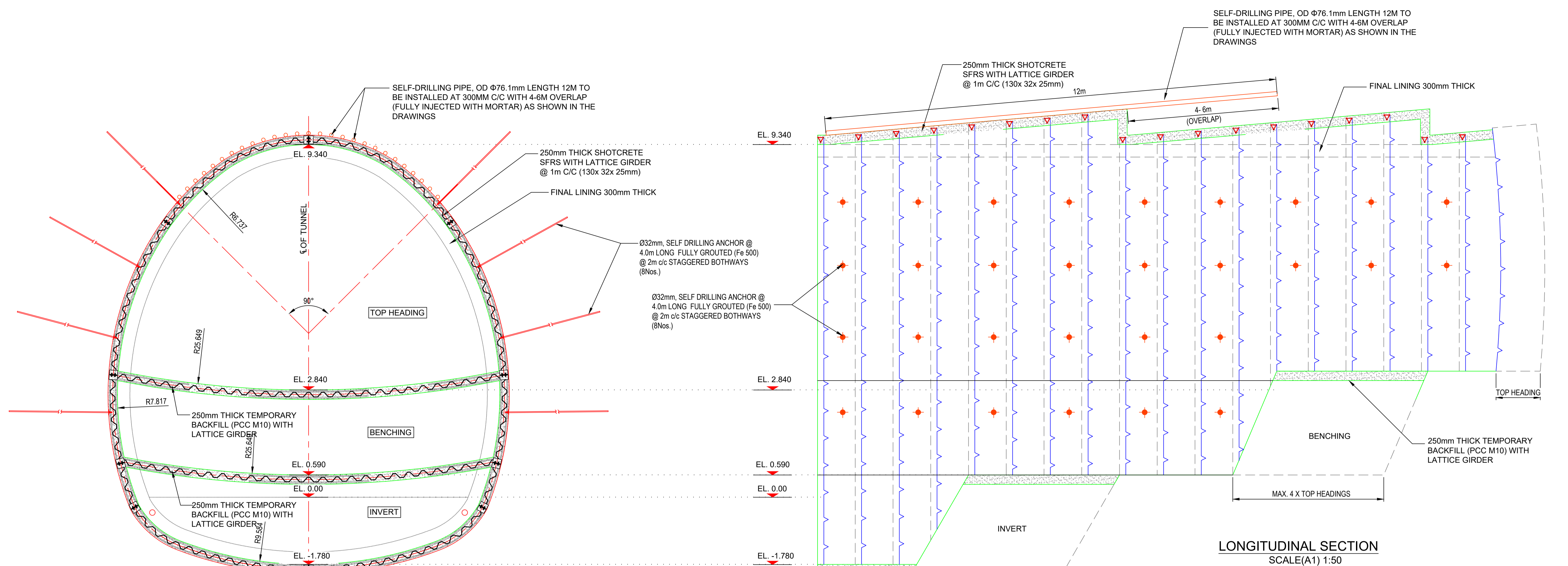
CONSULTANT: RITES (The Infrastructure People) and SMEC (Member of the Sellen Group)

DESIGNER: SUDHIR AGRAWAL (DPD/CIVIL)

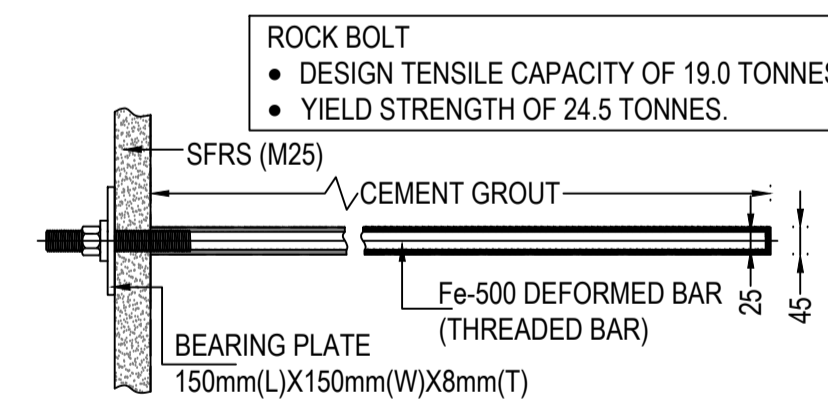
CHECKER: AMARNATH SINGH (CRE/S&T)

APPROVED: SHIV OM DWIVEDI (CPM/HRIDC)

RELEASED FOR: PRELIMINARY FOR APPROVAL TENDER CONSTRUCTION



EXCAVATION AREA
SCALE(A1) 1:50



FULLY CEMENT GROUTED SPOT / ROCK BOLT

GC/HORC		HRIDC	
NAME / DESIGNATION	SIGN	NAME / DESIGNATION	SIGN
CHAHATEY RAM PD	<i>Chahatey Ram</i>	SHIV OM DWIVEDI CPM/HRIDC	<i>Shiv Om Dwivedi</i>
SUDHIR AGRAWAL DPD/CIVIL	<i>Sudhir</i>	RAJU SOLANKI DGM/CIVIL/S	<i>Raju Solanki</i>
		AM/S&T	
REETU PATIAL CDE/CIVIL	<i>Reetu</i>		
AMARNATH SINGH CRE/S&T	<i>Amarnath Singh</i>	AM/Civil/Plg.	<i>Amarnath Singh</i>
STIPHEN SAHOO SRE/Elect.	<i>Stephen Sahoo</i>	JGM/L&U	<i>Stephen Sahoo</i>

PROJECT:- HARYANA ORBITAL RAIL CORRIDOR
CONNECTING PALWAL TO SONIPAT BYPASSING DELHI AREA BY LINKING
ASAOTI-PATLI-SULTANPUR-ASAUDAHA BY NEW ELECTRIFIED BG DOUBLE LINE

CLIENT:- HARYANA RAIL INFRASTRUCTURE DEVELOPMENT CORPORATION LIMITED.

GENERAL CONSULTANT:- GENERAL CONSULTANT FOR HARYANA ORBITAL RAIL CORRIDOR
RITES Limited in consortium with SMEC International Pty. Ltd.

IRITES **SMEC**

GC/HORC DRG. NO:- GC-HRIDC-C4-DRAW-TTL-CLT-01005_A0

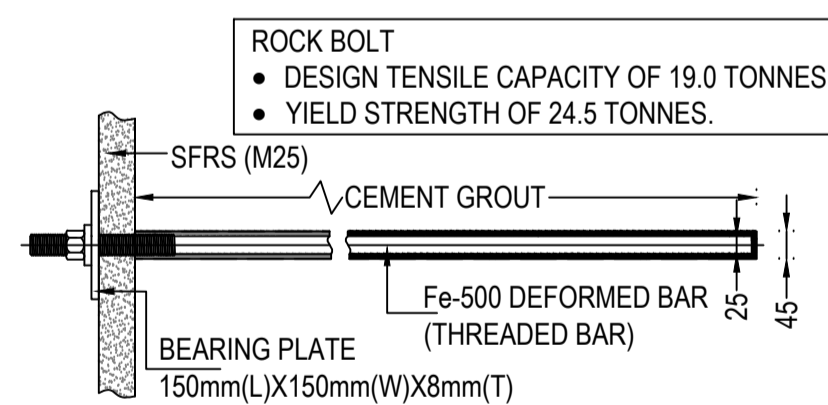
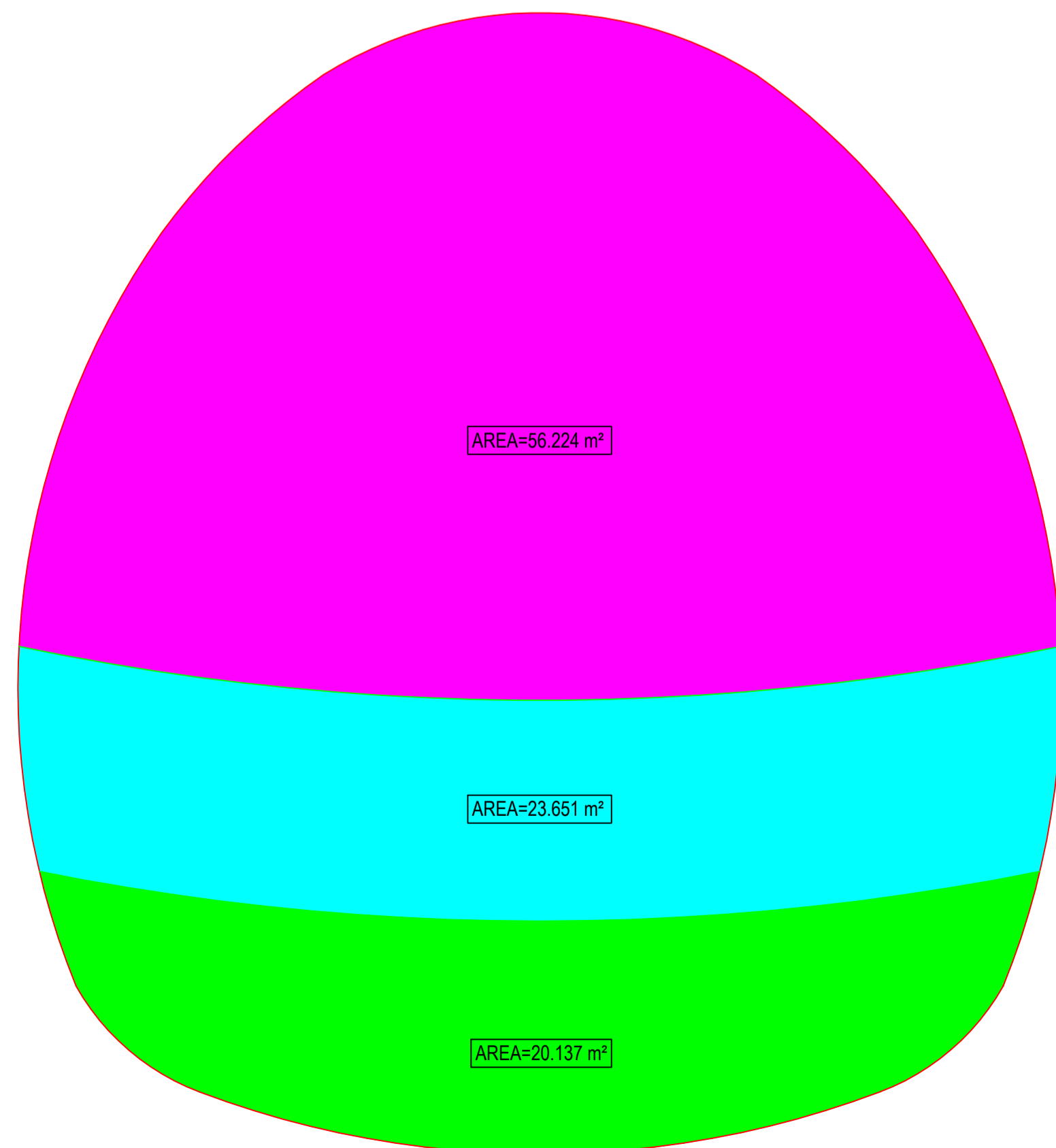
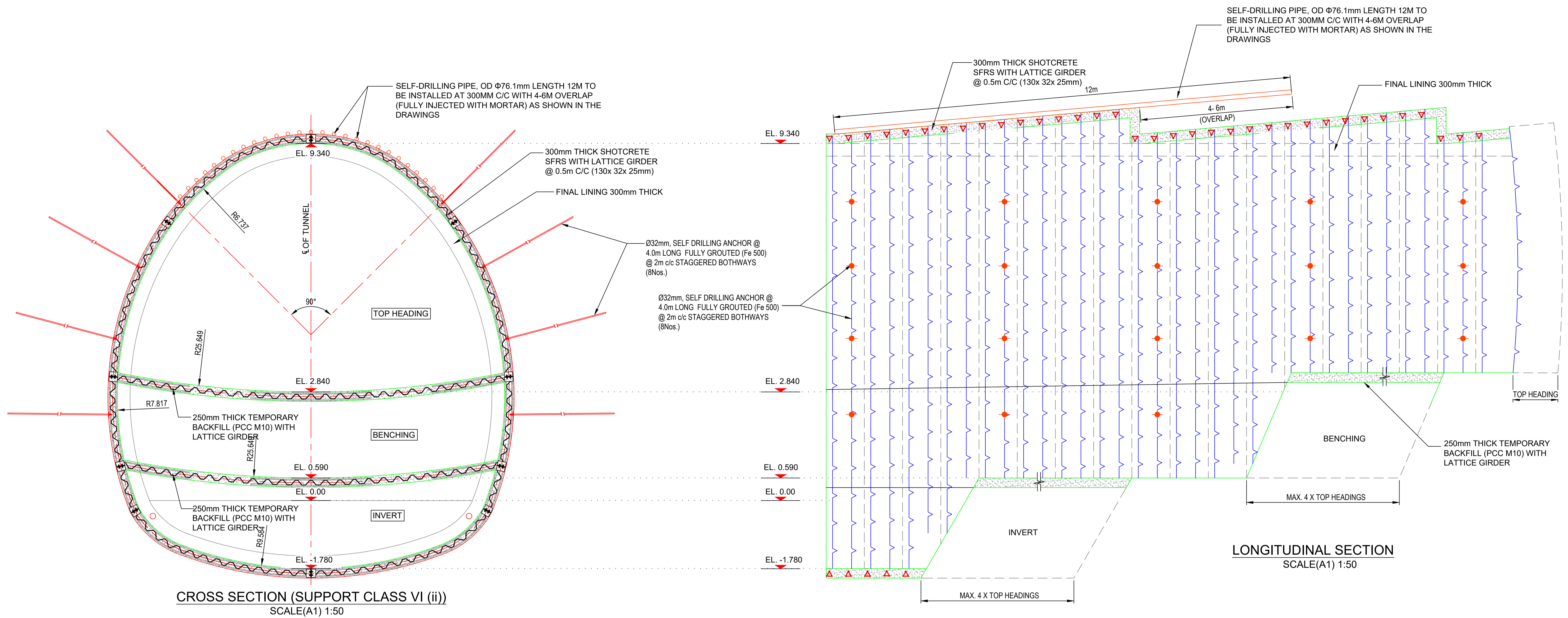
DRAWING NAME: CONCEPTUAL DRAWING FOR SUPPORT CLASS VI(i) FROM CH:26000 TO 28420

ISSUE DATE: 07/11/2022
SCALE: AS SHOWN
SMC DRG. NO.: SMCHRIDC/TUNICS-7

CONSULTANT: **IRITES** **SMEC**

RELEASED FOR: PRELIMINARY FOR APPROVAL TENDER CONSTRUCTION

RELEASER: SIVENDRA KUMAR TUNNEL DESIGNER
DESIGNER: B R SHARMA S CONSULTANT / TUNNEL
PROJECT INCHARGE: A. A. SAMANT



FULLY CEMENT GROUTED SPOT / ROCK BOLT

GC/HORC		HRIDC	
NAME / DESIGNATION	SIGN	NAME / DESIGNATION	SIGN
CHAHATEY RAM PD	<i>Chahatey Ram</i>	SHIV OM DWIVEDI CPM/HRIDC	<i>Shiv Om Dwivedi</i>
SUDHIR AGRAWAL DPD/CIVIL	<i>Sudhir Agrawal</i>	RAJU SOLANKI DGM/CIVIL/S	<i>Raju Solanki</i>
		AM/S&T	
REETU PATIAL CDE/CIVIL	<i>Reetu Patial</i>		
AMARNATH SINGH CRE/S&T	<i>Amarnath Singh</i>	AM/Civil/Plg.	<i>Amarnath Singh</i>
STIPHEN SAHOO SRE/Elect.	<i>Stephen Sahoo</i>	JGM/L&U	<i>Stephen Sahoo</i>

PROJECT: HARYANA ORBITAL RAIL CORRIDOR
CONNECTING PALWAL TO SONIPAT BYPASSING DELHI AREA BY LINKING
ASAOTI-PALI-SULTANPUR-ASAUDAH BY NEW ELECTRIFIED BG DOUBLE LINE

CLIENT: HARYANA RAIL INFRASTRUCTURE DEVELOPMENT CORPORATION LIMITED.

GENERAL CONSULTANT: GENERAL CONSULTANT FOR HARYANA ORBITAL RAIL CORRIDOR
RITES Limited in consortium with SMEC International Pty. Ltd.

GC/HORC DRG. NO.: GC-HRIDC-C4-DRW-TTL-CLT-01006_A0

DRAWING NAME: CONCEPTUAL DRAWING FOR SUPPORT CLASS VI(ii) FROM CH:28420 TO CH:28480

ISSUE DATE: 07.11.2022 **REVISED DATE:**

SCALE: AS SHOWN

SMC DRG. NO.: SMC/HRIDC/TUNCS-7

CONSULTANT: S.M. CONSULTANTS
An ISO 9001 Company
Engineers / Builders / Surveyors / Soil-Testers / New Delhi
www.smcindia.com, C-168, Kirti Enclave

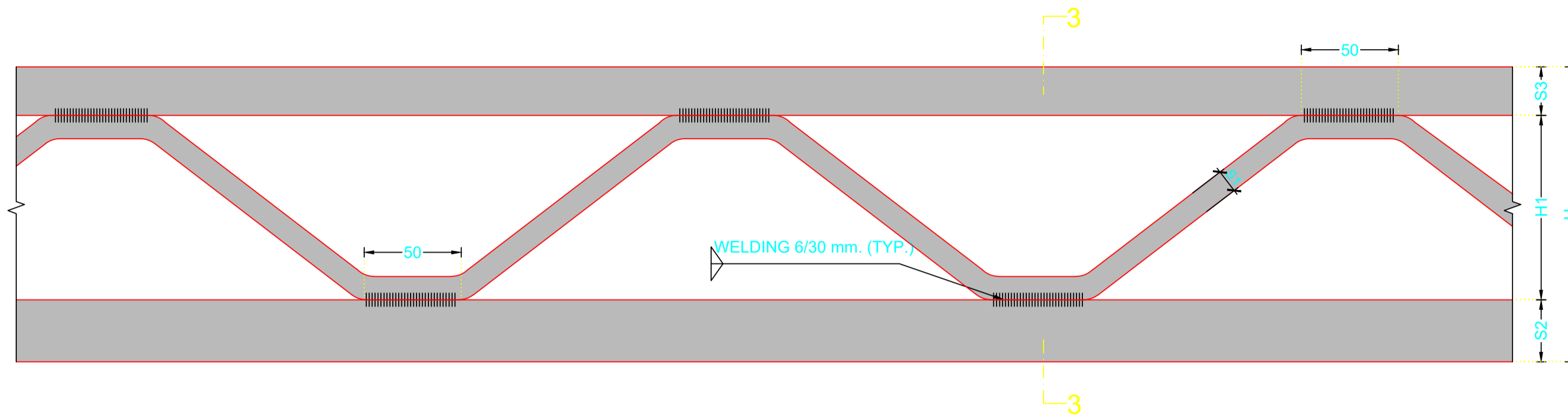
RELEASED FOR: PRELIMINARY FOR APPROVAL TENDER CONSTRUCTION

APPROVALS:
SIVENDRA KUMAR, TUNING DESIGNER
B. R. SHARMA, S. CONSULTANT / ENGINEER
A. A. SAMANT, PROJECT INCHARGE

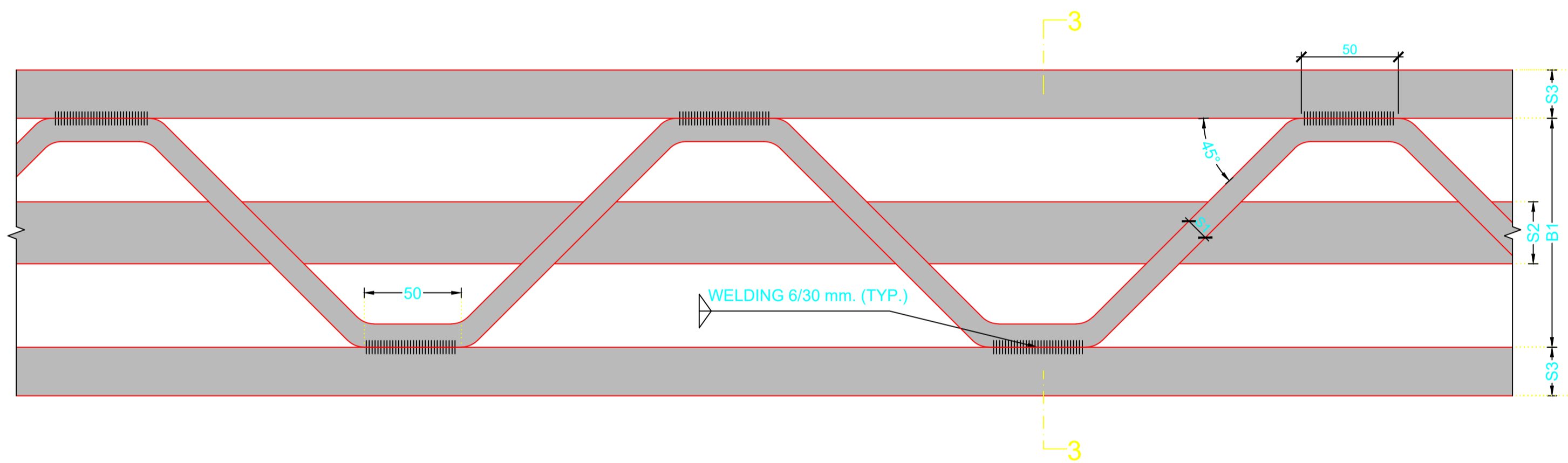
DETAILS OF LATTICE GIRDERS

TYPE	H (mm)	H1 (mm)	B (mm)	B1 (mm)	S1 (mm)	S2 (mm)	S3 (mm)	BXB (mm)	T (mm)
TYPE-1	187	130	208	158	Ø12	Ø32	Ø25	240X240	12

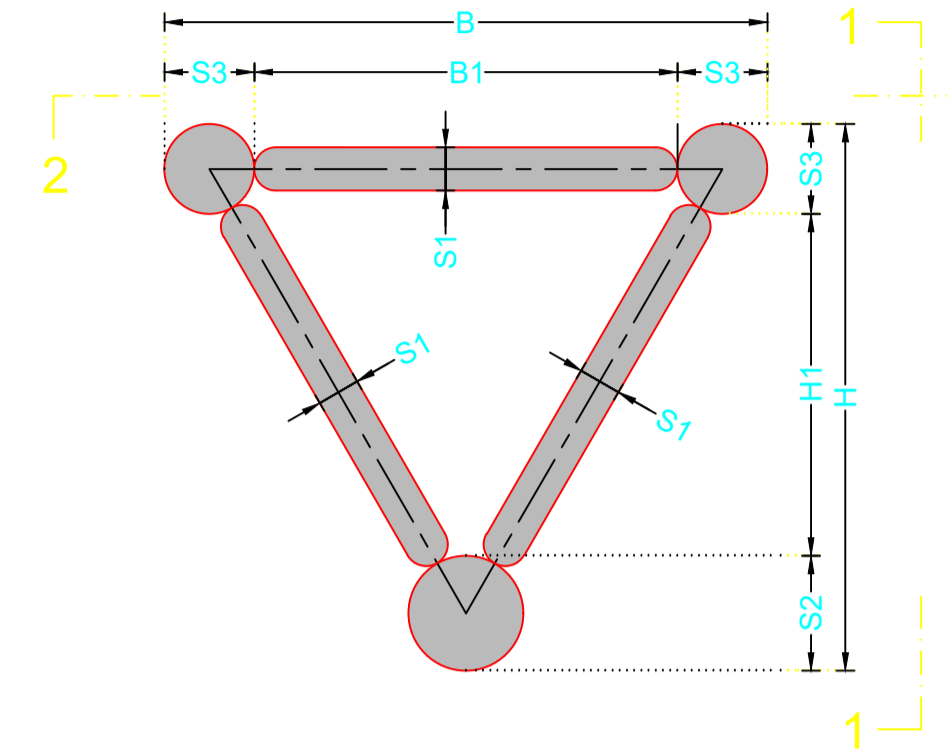
VIEW 1-1



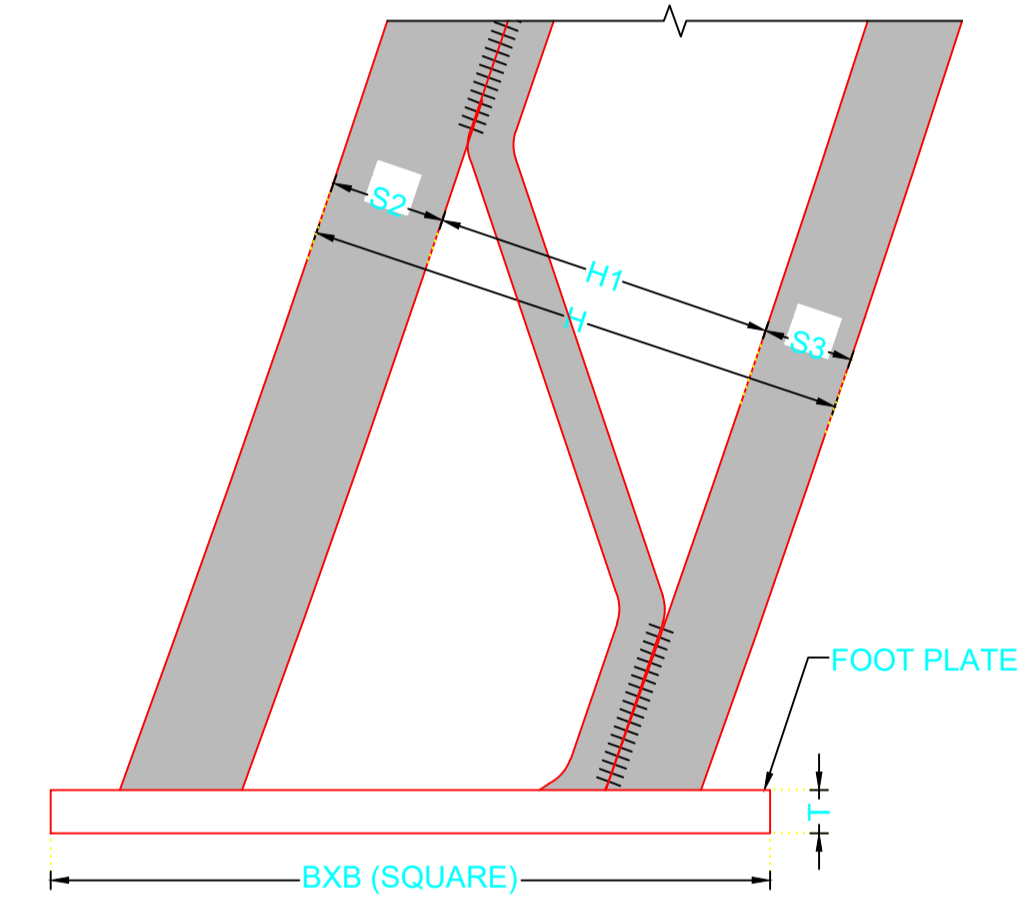
VIEW 2-2



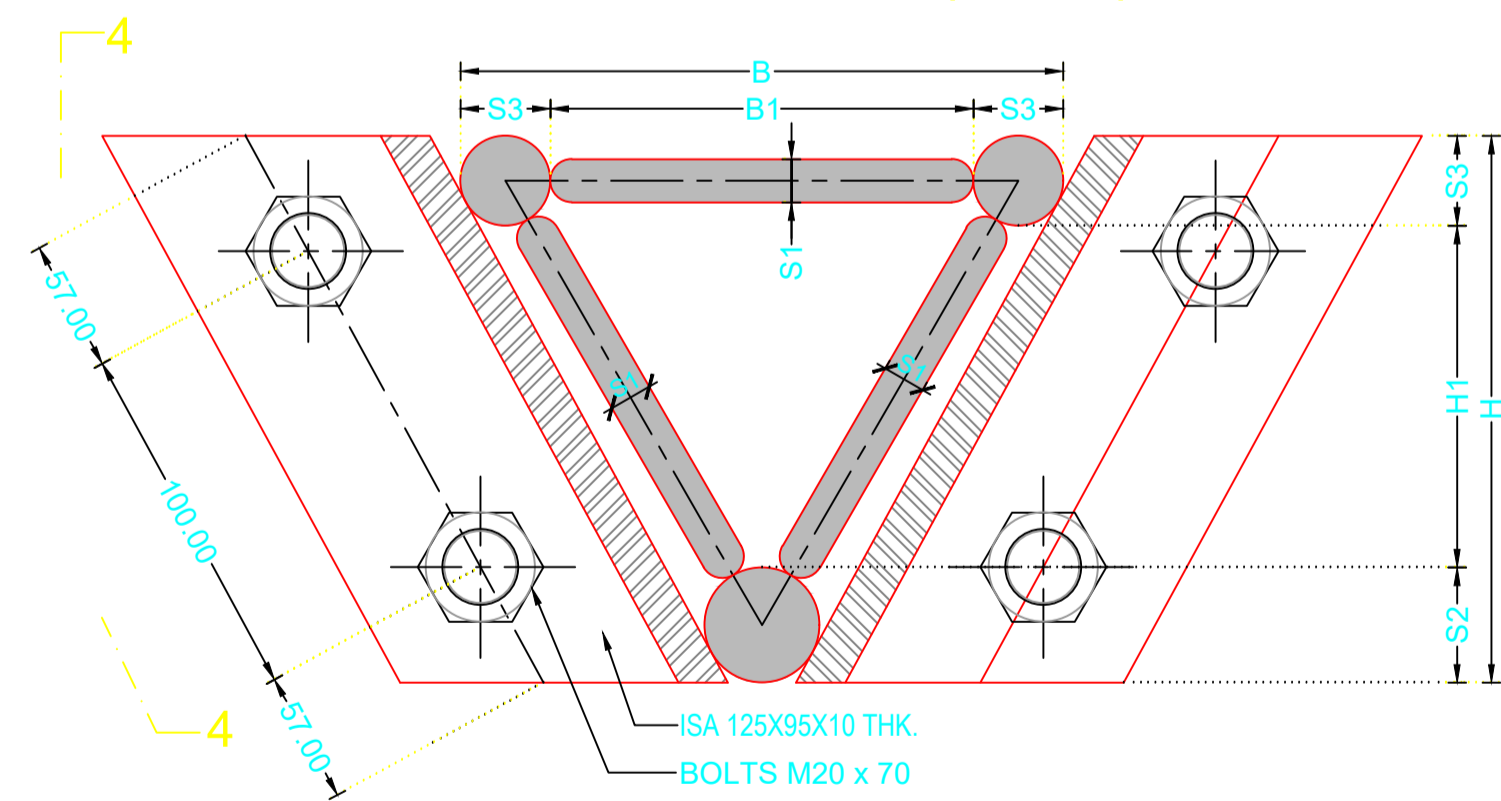
SECTION 3-3



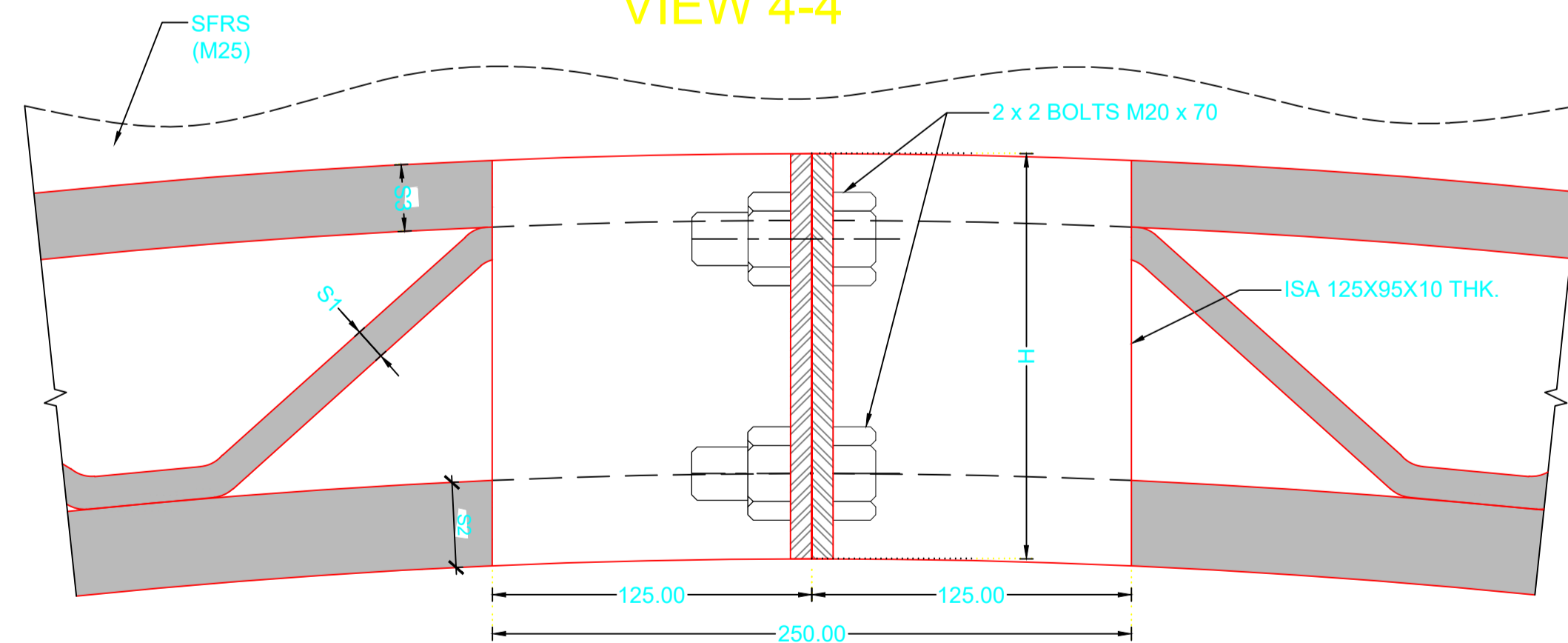
**DETAIL OF FOOT PLATE
(VALID FOR TEMPORARY STRUCTURE)**



JOINT DETAIL (TYP.)



VIEW 4-4



NOTES:-

1. ALL DIMENSIONS ARE IN MILLIMETERS, UNLESS OTHERWISE SPECIFIED.
2. NO DIMENSION SHALL BE MEASURED FROM THE DRAWING.
3. STEEL BARS SHOWN AS S1, S2 & S3 SHALL BE OF GRADE Fe-500 CONFORMING TO IS:1786.
4. ALL STRUCTURAL STEELS SHALL CONFORM TO IS:2062.
5. ALL WELDING SHALL BE CARRIED OUT BY USING SHIELDED ARC METHOD AS DESCRIBED IN THE SP-12, ISI HANDBOOK FOR GAS WELDERS AND ISI HANDBOOK OF MANUAL METAL ARC WELDING FOR WELDERS.

PROJECT:- HARYANA ORBITAL RAIL CORRIDOR
CONNECTING PALWAL TO SONIPAT BYPASSING DELHI AREA BY LINKING ASAOHI-PATLI-SULTANPUR-ASAUDAH BY NEW ELECTRIFIED BG DOUBLE LINE

CLIENT:- HARYANA RAIL INFRASTRUCTURE DEVELOPMENT CORPORATION LIMITED.

GENERAL CONSULTANT:- GENERAL CONSULTANT FOR HARYANA ORBITAL RAIL CORRIDOR
RITES Limited in consortium with SMEC International Pty. Ltd.

GC/HORC DRG. NO:- GC-HRIDC-C4-DRW-TTL-CLT-01007_A0

DRAWING NAME: CONCEPTUAL DRAWING FOR TUNNEL TYPICAL DETAIL OF LATTICE GIRDER

ISSUE DATE: 07/11/2022
SCALE: AS SHOWN
SMC DRG. NO.: SMC/HRIDC/TUNICS-7

GC/HORC	SIGN	HRIDC	SIGN
CHAHATEY RAM PD	<i>Chahatey Ram</i>	SHIV OM DWIVEDI CPM/HRIDC	<i>Shiv Om Dwivedi</i>
SUDHIR AGRAWAL DPD/CIVIL	<i>Sudhir Agrawal</i>	RAJU SOLANKI DGM/CIVIL/S	<i>Raju Solanki</i>
REETU PATIAL CDE/CIVIL	<i>Reetu Patial</i>	AM/S&T	
AMARNATH SINGH CRE/S&T	<i>Amarnath Singh</i>	AM/Civil/Pig	<i>Amarnath Singh</i>
STIPHEN SAHOO SRE/Elect.	<i>Stephen Sahoo</i>	JGM/L&U	<i>Stephen Sahoo</i>

CONSULTANT: S.M. CONSULTANTS
An ISO 9001 Company
Professional Address: 120, Connaught Place, New Delhi
110 004, India. Tel: +91 11 2610 2000. Fax: +91 11 2610 2001. Email: info@smconsultants.com

RELEASED FOR: PRELIMINARY FOR APPROVAL TENDER CONSTRUCTION

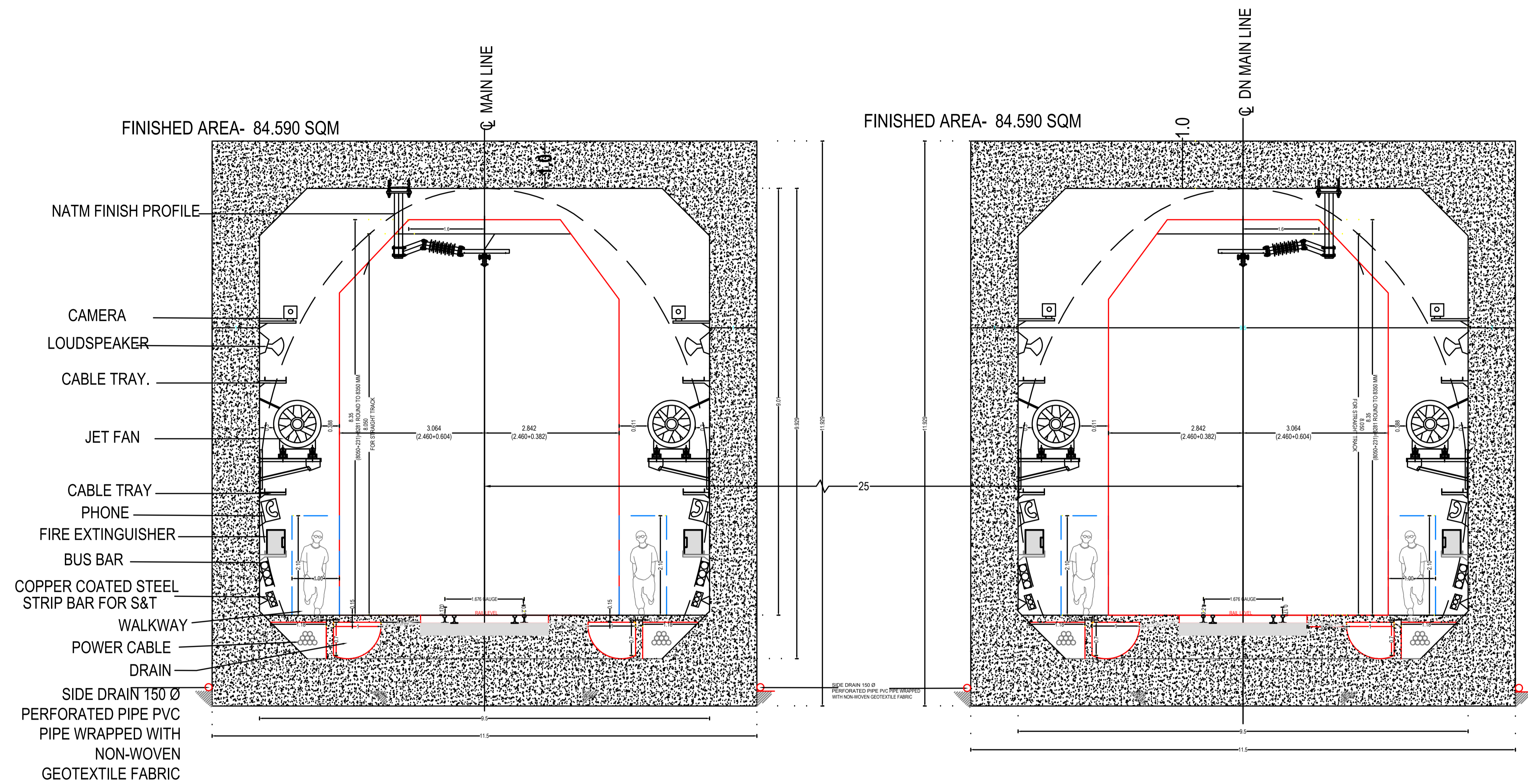
DESIGNED BY: SIVENDRA KUMAR
TUNNEL DESIGNER

CHECKED BY: B.R. SHARMA
S.CONSULTANT/TUNNEL

PROJECT INCHARGE: A.A. SAMANT

NOTES:~

1. ALL DIMENSIONS ARE IN MILLIMETERS AND LEVELS ARE IN METERS, UNLESS OTHERWISE SPECIFIED.
2. NO DIMENSION SHALL BE MEASURED FROM THE DRAWING.
3. MINIMUM EXCAVATION LINE SHALL INCLUDE CONSTRUCTION & DEFORMATION TOLERANCE.
4. GUARD RAIL SHALL BE PROVIDED THROUGHOUT THE LENGTH OF BALLASTLESS TRACK
5. BALLASTLESS TRACK TO BE DESIGN FOR 32.5 T AXLE LOADING
6. DIMENSIONS OF SLAB THICKNESS ARE TENTATIVE.
7. SEPARATE EARTHING MET CONNECTION FOR S&T SYSTEM SHALL BE PROVIDED.
8. ANCHOR BOLT FOR ROCS SHALL BE INSTALLED DURING TUNNEL LINING.
9. CABLE CROSSING SHALL BE PROVIDED AT EVERY CROSS PASSAGE.
10. LUMINANCE CAMERA, LOUDSPEAKER, JET FAN, PHONE, BUS BAR, COPPER COATED STEEL STRIP BAR FOR S&T AND ROCS WORK (EXCLUDING ANCHOR BOLTS) IS NOT IN THE SCOPE OF WORK OF C-4.



PROJECT:- HARYANA ORBITAL RAIL CORRIDOR
 CONNECTING PALWAL TO SONIPAT BYPASSING DELHI AREA BY LINKING
 ASAOTI-PATLI-SULTANPUR-ASAUDAHA BY NEW ELECTRIFIED BG DOUBLE LINE

CLIENT:- HARYANA RAIL INFRASTRUCTURE DEVELOPMENT CORPORATION LIMITED.

GENERAL CONSULTANT:
 GENERAL CONSULTANT FOR HARYANA ORBITAL RAIL CORRIDOR
 RITES Limited in consortium with SMEC International Pty. Ltd.

GC/HORC		HRIDC	
NAME / DESIGNATION	SIGN	NAME / DESIGNATION	SIGN
CHAHATEY RAM PD	<i>Chahatey Ram</i>	SHIV OM DWIVEDI CPM/HRIDC	<i>Shiv Om Dwivedi</i>
SUDHIR AGRAWAL DPD/CIVIL	<i>Sudhir Agrawal</i>	RAJU SOLANKI DGM/CIVIL/S	<i>Raju Solanki</i>
		AM/S&T	
REETU PATIAL CDE/CIVIL	<i>Reetu Patial</i>		
AMARNATH SINGH CRE/S&T	<i>Amarnath Singh</i>	AM/Civil/Plg.	<i>Amarnath Singh</i>
STIPHEN SAHOO SRE/Elect.	<i>Stephen Sahoo</i>	JGM/L&U	<i>Stephen Sahoo</i>

GC/HORC DRG. NO:- GCHRIDC-C4-DRW-TTL-CLT-01008_A1

DRAWING NAME: CONCEPTUAL DRAWING FOR CUT & COVER SECTION OF TUNNEL

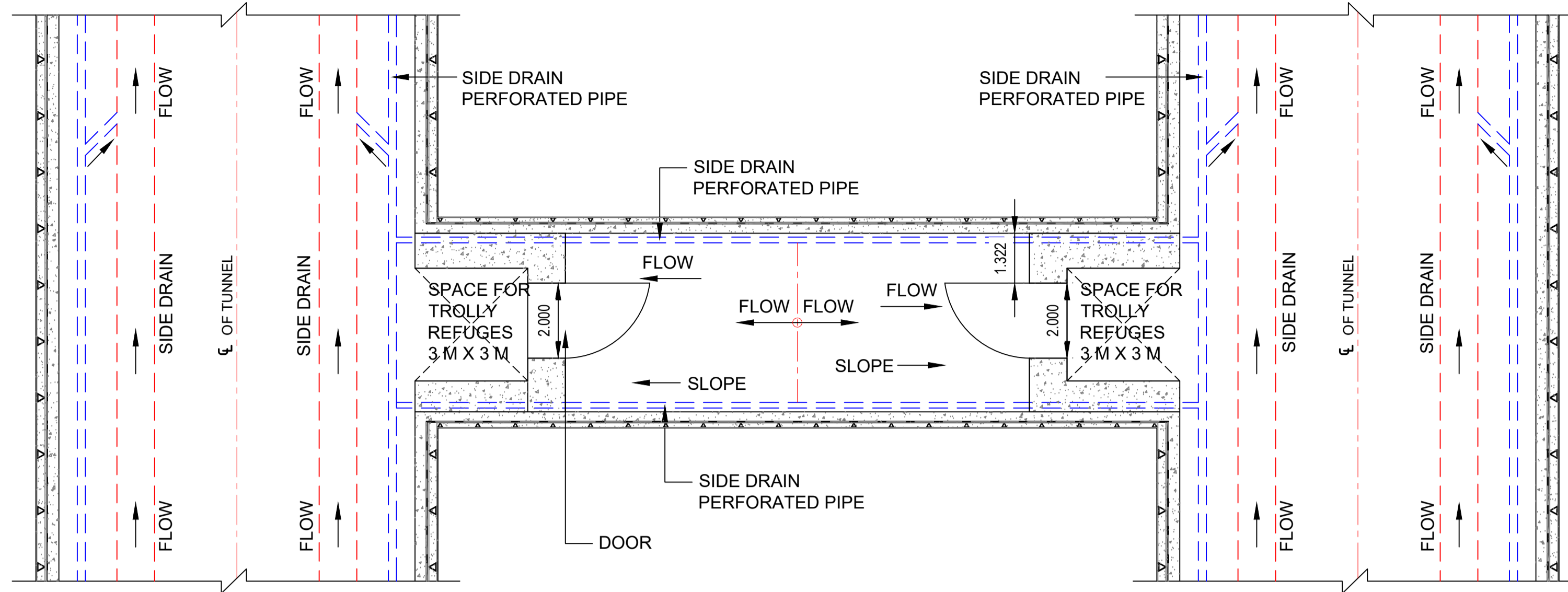
ISSUE DATE: 07.11.2022 | REVISED DATE: 03.01.2023

SCALE: AS SHOWN

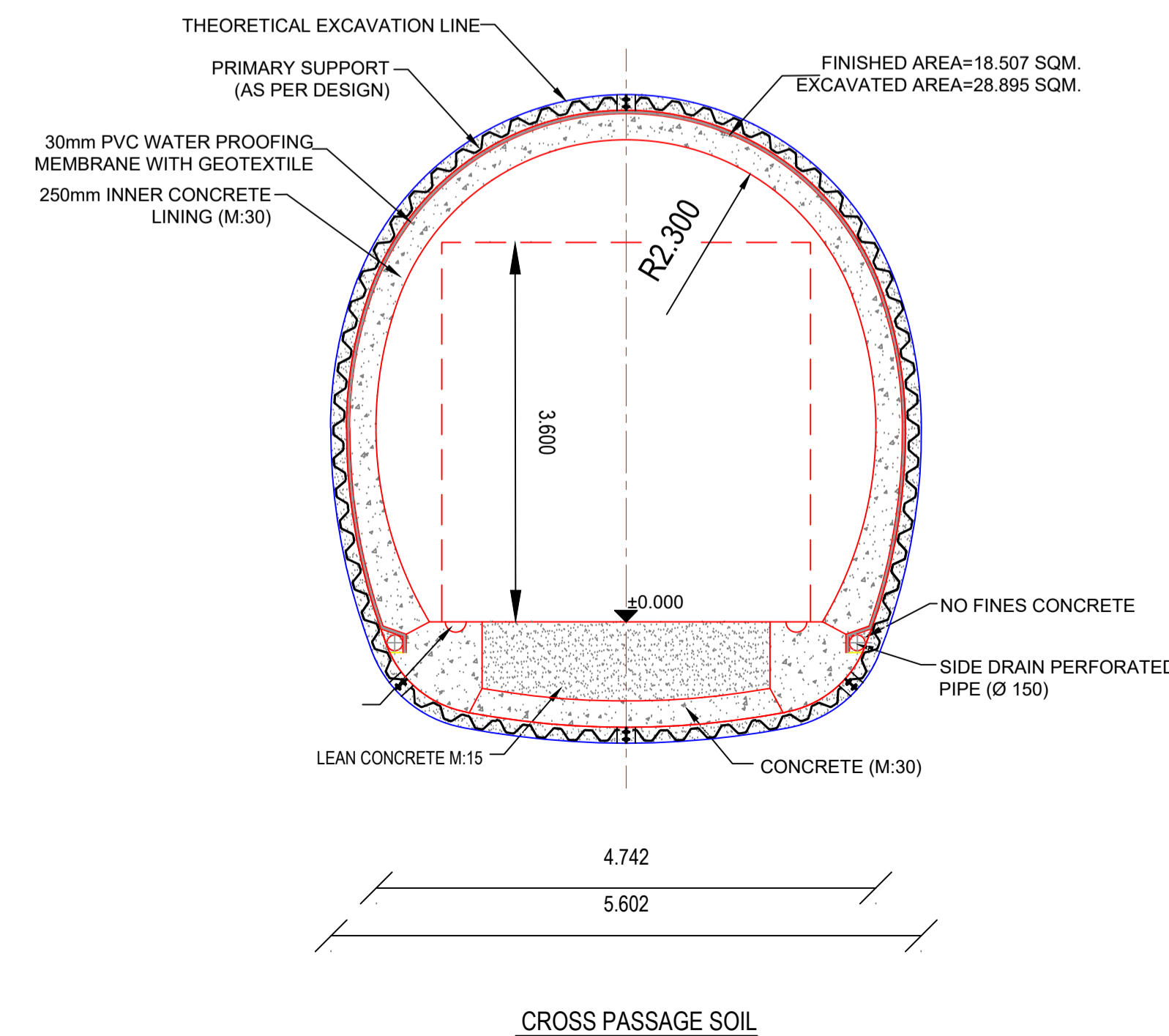
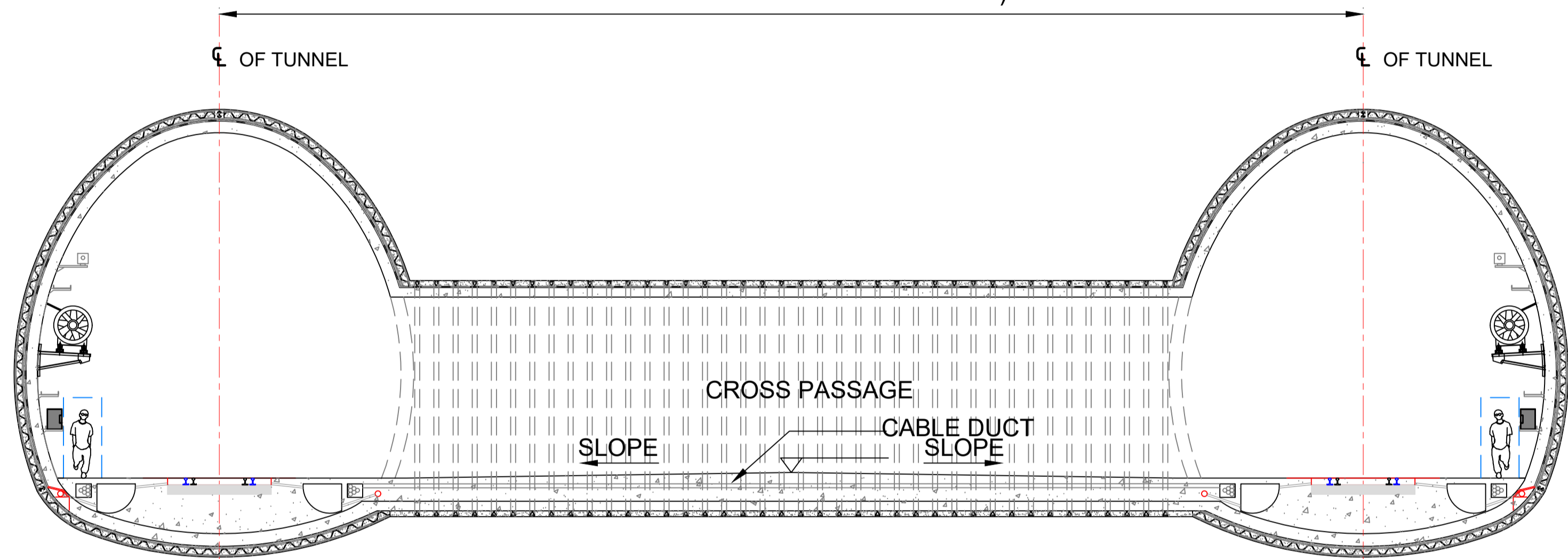
SMC DRG. NO.: SMC/HRIDC/TUNICS-7

CONSULTANT: S.M. CONSULTANTS

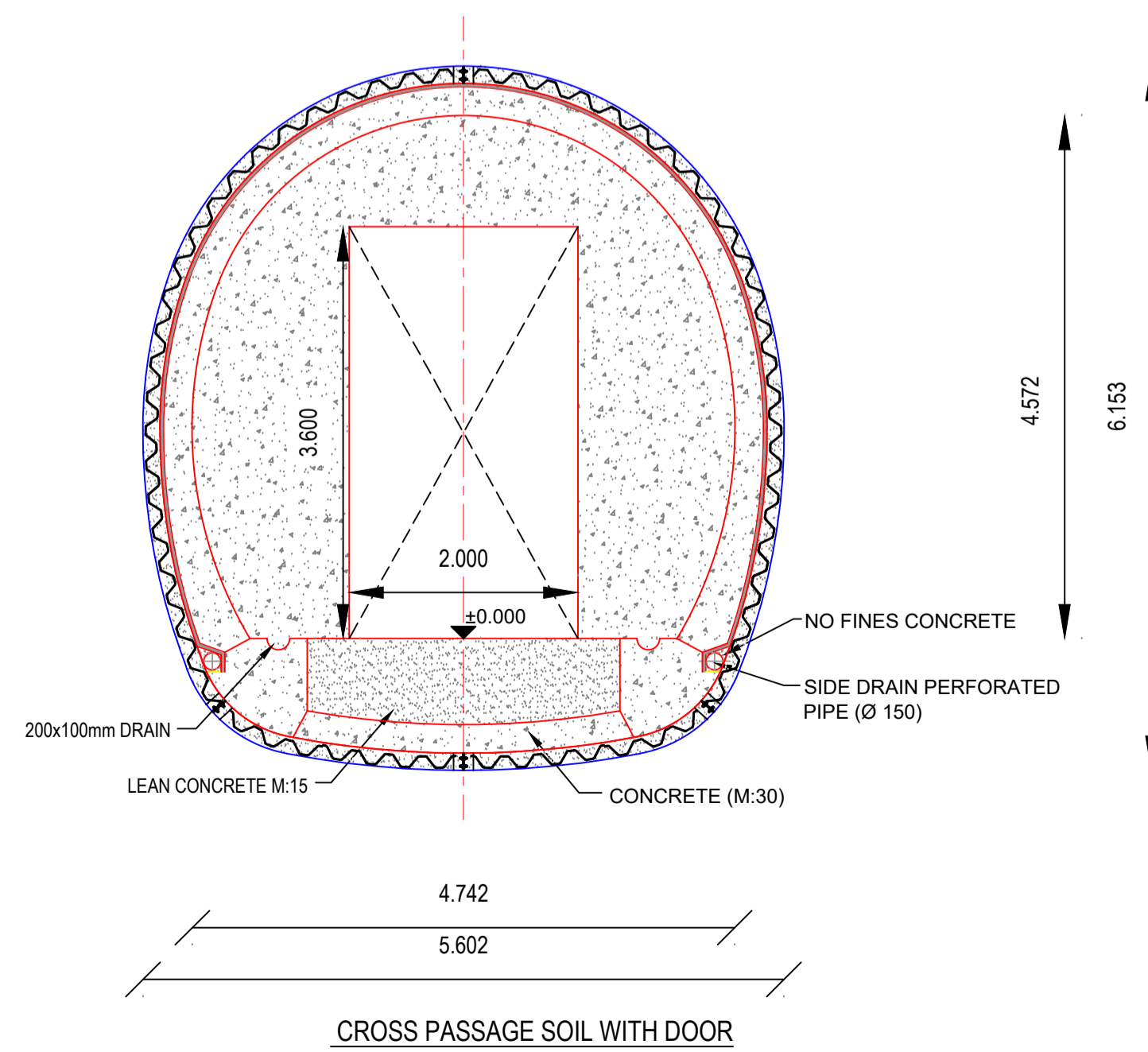
RELEASER FOR: PRELIMINARY FOR APPROVAL TENDER CONSTRUCTION



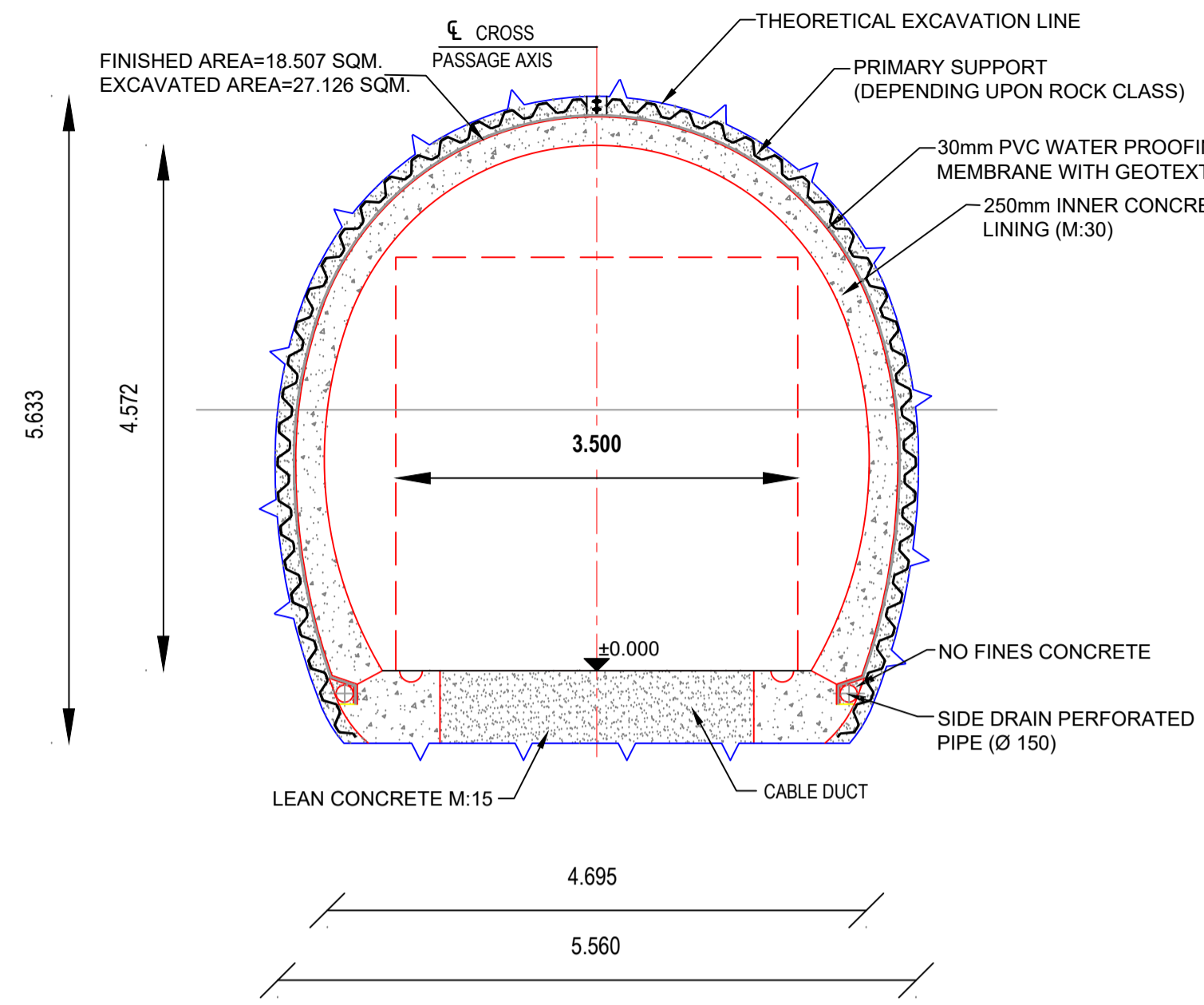
29.815(C/C DISTANCE BETWEEN TWO TUBES CAN VARY AS PER CP LOCATION)



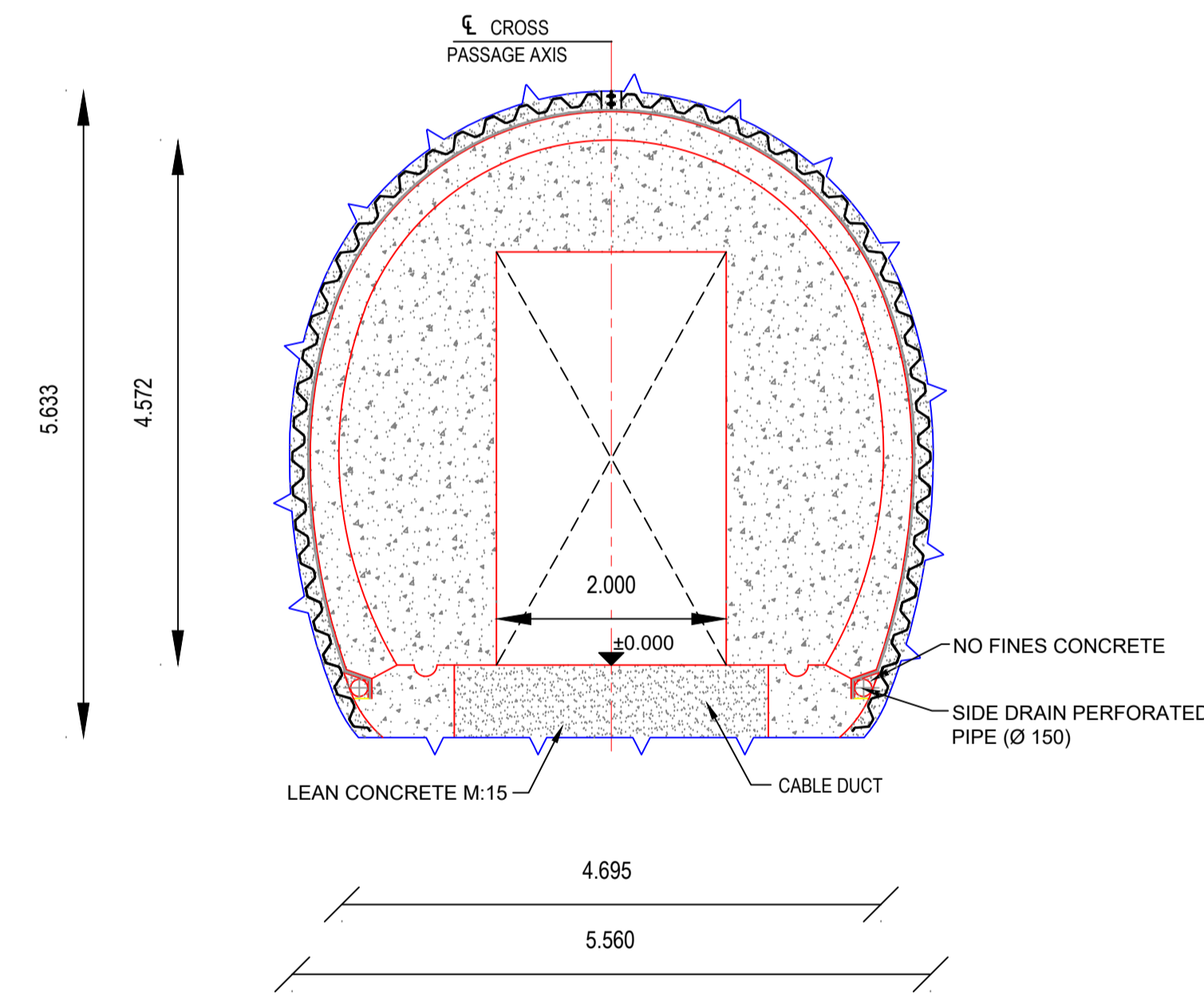
CROSS PASSAGE SOIL



CROSS PASSAGE SOIL WITH DOOR



CROSS PASSAGE ROCK



CROSS PASSAGE ROCK WITH DOOR

- NOTES:-**
1. ALL DIMENSIONS, NORTHING & EASTING AND LEVELS ARE IN METRE, UNLESS OTHERWISE SPECIFIED.
 2. NO DIMENSIONS SHALL BE MEASURED FROM DRAWING.
 3. TUNNEL EXCAVATED BY HEADING, BENCHING / MULTI DRIFT METHOD (NATM).
 4. CROSS PASSAGE SHALL BE PROVIDED AT 400 M INTERVAL.
 5. THE GRADE OF SHOTCRETE WITH SFERS AS PER DETAIL DESIGN.
 6. PROPOSED SUPPORT SYSTEM IS BASED ON GIR PROVIDED BY GEOLOGIST. ACTUAL SUPPORT SYSTEM MAY BE REVISED BASED ON ACTUAL RESPONSE OF STRATA DURING EXCAVATION.
 7. DRAINAGE PIPE SHALL BE 150mmØ, PERFORATED PVC PIPE WRAPPED WITH NON-WOVEN GEOTEXTILE FABRIC AS PER IS-4989
 8. EXCAVATION SEQUENCE WILL BE PROVIDED BASED ON GFC.
 9. PIPE ROOFING/FOREPULPING OF 114 MM DIA SHALL BE PROVIDED WHERE EVER IT IS REQUIRED.
 10. SELF DRILLING ANCHOR OF CAPACITY 190 KN SHALL BE PROVIDED FOR PRIMARY SUPPORT DURING EXCAVATION.
 11. LATTICE GIRDER 25-25-32 OF DEPTH 187 MM/ ISMB 200 MM SHALL BE INCASD IN SFERS OF MINIMUM THICKNESS 250 MM.
 12. DIMENSION OF PRIMARY SUPPORT & CONCRETE ARE TENTATIVE.

PROJECT:- HARYANA ORBITAL RAIL CORRIDOR
CONNECTING PALWAL TO SONIPAT BYPASSING DELHI AREA BY LINKING ASAOJI-PATLI-SULTANPUR-ASAUDAH BY NEW ELECTRIFIED BG DOUBLE LINE

CLIENT:- HARYANA RAIL INFRASTRUCTURE DEVELOPMENT CORPORATION LIMITED.

GENERAL CONSULTANT:- GENERAL CONSULTANT FOR HARYANA ORBITAL RAIL CORRIDOR
RITES Limited in consortium with SMEC International Pty. Ltd.

GC/HORC DRG. NO:- GC-HRIDC-C4-DRW-TTL-CLT-01009_A1

DRAWING NAME: CONCEPTUAL DRAWING FOR CROSS PASSAGE JUNCTION WITH MAIN TUNNEL

ISSUE DATE: 07/11/2022 REVISED DATE: 03/01/2023

SCALE: AS SHOWN SMC DRG. NO: SMC/HRIDC/TUN/CS-7

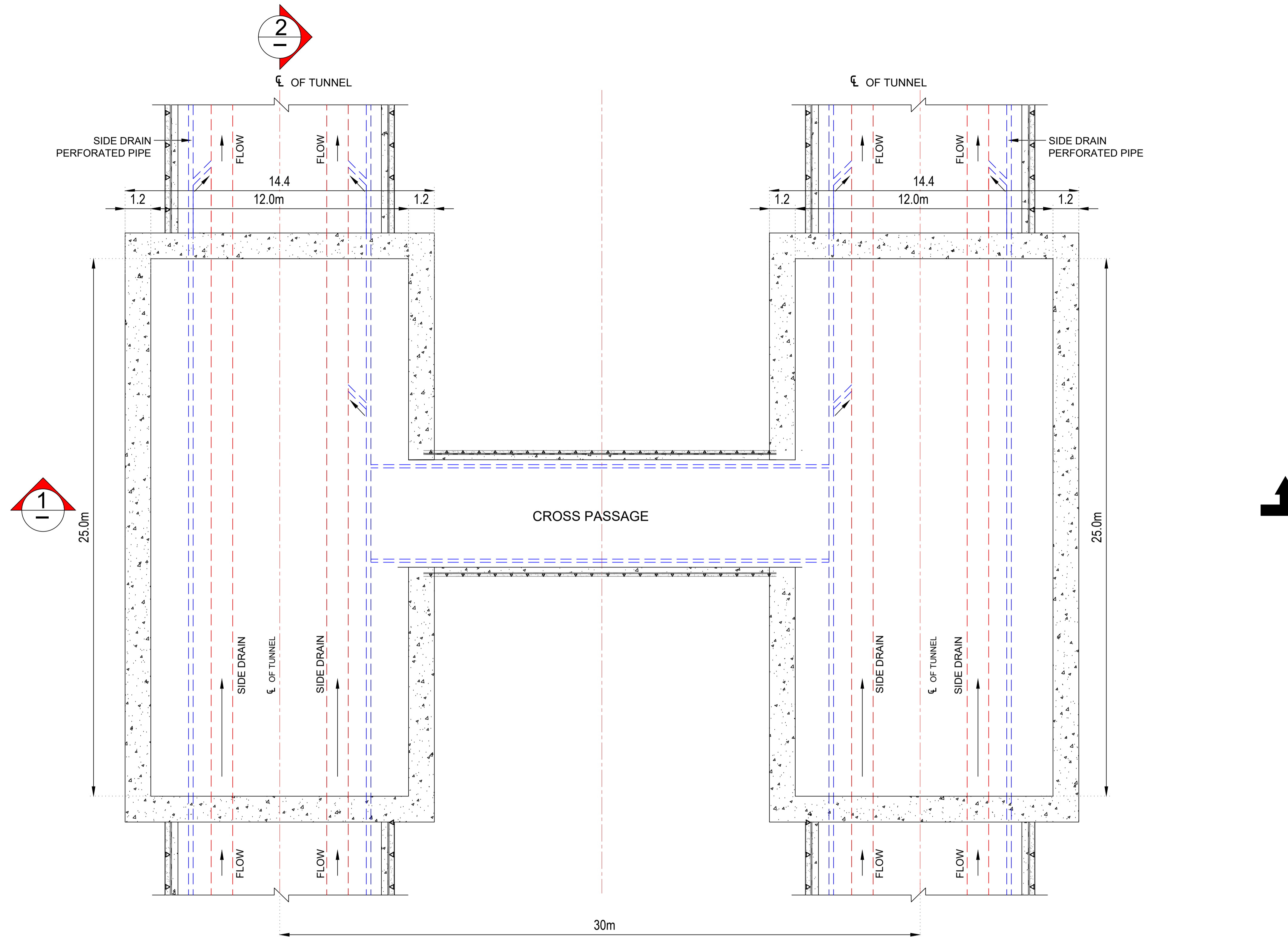
CONSULTANT: REETU PATIAL CDE/CIVIL AM/S&T

AMARNATH SINGH CRE/S&T AM/Civil/Plg

STIPHEN SAHOO SRE/Elect. JGM/L&U

GC/HORC		HRIDC	
NAME / DESIGNATION	SIGN	NAME / DESIGNATION	SIGN
CHAHATEY RAM PD	<i>Chahatey Ram</i>	SHIV OM DWIVEDI CPM/HRIDC	<i>Shiv Om</i>
SUDHIR AGRAWAL DPD/CIVIL	<i>Sudhir</i>	RAJU SOLANKI DGM/CIVIL/S	<i>Raju Solanki</i>
		AM/S&T	
REETU PATIAL CDE/CIVIL	<i>Reetu</i>		
AMARNATH SINGH CRE/S&T	<i>Amarnath Singh</i>	AM/Civil/Plg	<i>Amarnath Singh</i>
STIPHEN SAHOO SRE/Elect.	<i>Stephen Sahoo</i>	JGM/L&U	<i>Stephen Sahoo</i>

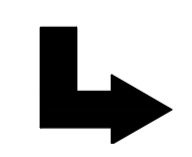
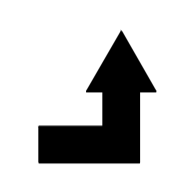
RELEASED FOR: PRELIMINARY FOR APPROVAL TENDER CONSTRUCTION



PLAN

- NOTES:-**
1. ALL DIMENSIONS, NORTHING & EASTING AND LEVELS ARE IN METER, UNLESS OTHERWISE SPECIFIED.
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 10. LATTICE GIRDER 25-25-32 OF DEPTH 187 MM/ ISMB 200 MM SHALL BE INCASED IN SFERS OF MINIMUM THICKNESS 250 MM.
 11. DIMENSION OF PRIMARY SUPPORT & CONCRETE ARE TENTATIVE. INSERT PLATES SHALL BE PROVIDED IN THE WALL FOR PROVISION OF MS LADDER.
 12. TRUSS ROOF TO BE PROVIDED OVER SHAFTS.

LOCATION	
SHAFT-1	CH:26080
SHAFT-2	
SHAFT-3	CH:27680
SHAFT-4	



GC/HORC		HRIDC	
NAME / DESIGNATION	SIGN	NAME / DESIGNATION	SIGN
CHAHATEY RAM PD	<i>[Signature]</i>	SHIV OM DWIVEDI CPM/HRIDC	<i>[Signature]</i>
SUDHIR AGRAWAL DPD/CIVIL	<i>[Signature]</i>	RAJU SOLANKI DGM/CIVIL/S	<i>[Signature]</i>
		AM/S&T	
REETU PATIAL CDE/CIVIL	<i>[Signature]</i>		
AMARNATH SINGH CRE/S&T	<i>[Signature]</i>	AM/Civil/Pig	<i>[Signature]</i>
STIPHEN SAHOO SRE/Elect.	<i>[Signature]</i>	JGM/L&U	<i>[Signature]</i>

PROJECT:- HARYANA ORBITAL RAIL CORRIDOR
CONNECTING PALWAL TO SONIPAT BYPASSING DELHI AREA BY LINKING
ASAOTI-PATLI-SULTANPUR-ASAUDAHA BY NEW ELECTRIFIED BG DOUBLE LINE

CLIENT:- HARYANA RAIL INFRASTRUCTURE DEVELOPMENT CORPORATION LIMITED.

GENERAL CONSULTANT:
GENERAL CONSULTANT FOR HARYANA ORBITAL RAIL CORRIDOR
RITES Limited in consortium with SMEC International Pty. Ltd.

IRITES **SMEC**
THE INFRASTRUCTURE PEOPLE

GC/HORC DRG. NO:- GC-HRIDC-C4-DRW-TTL-CLT-01010_A0 SHEET: 1 OF 3

DRAWING NAME: CONCEPTUAL DRAWING FOR PERMANENT VENTILATION SHAFT JUNCTION WITH MAIN TUNNEL

ISSUE DATE: 07.11.2022 REVISED DATE: 03.01.2023

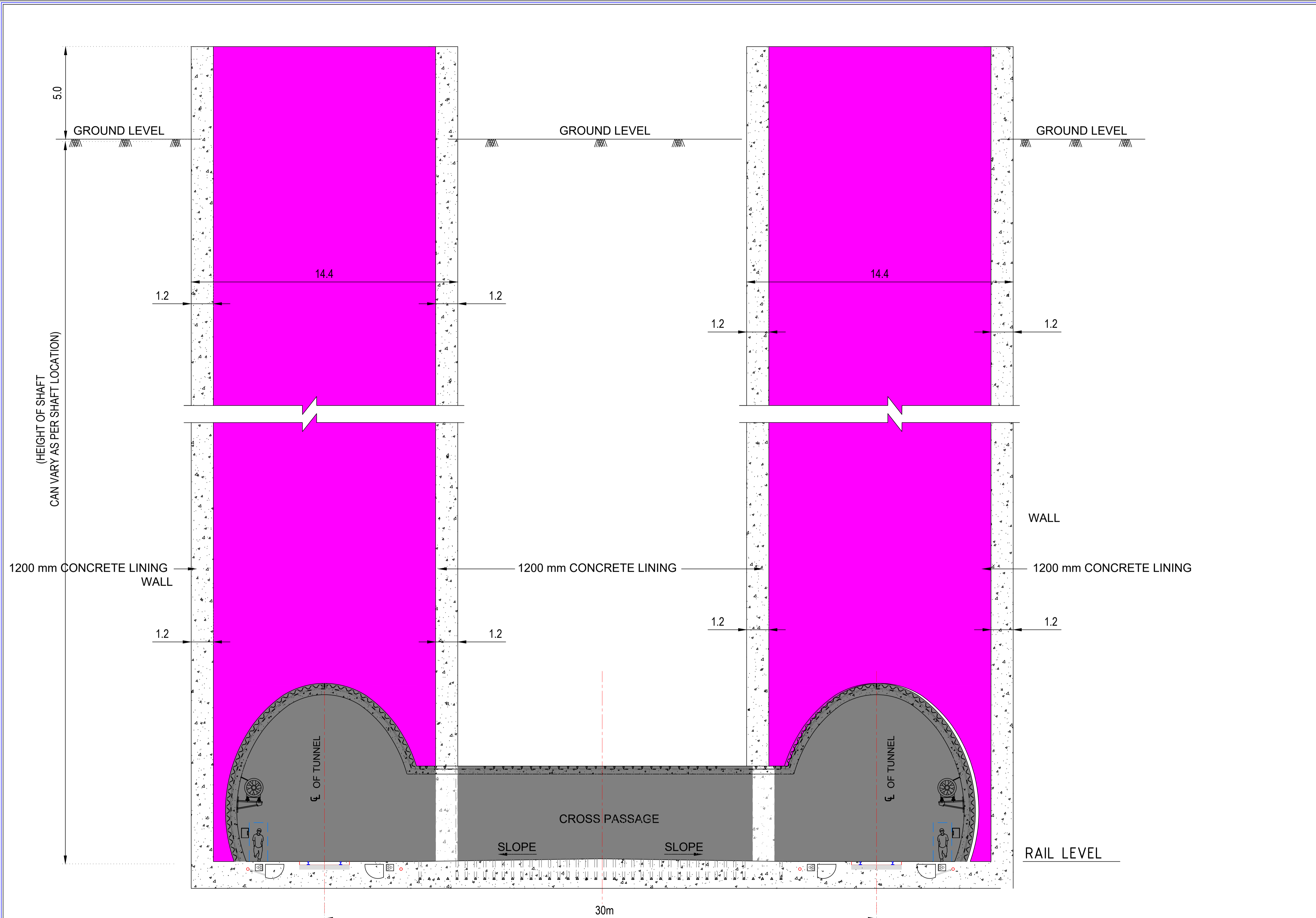
SCALE: AS SHOWN

SMC DRG. NO.: SMC/HRIDC/TUNICS-7

CONSULTANT: **S.M. CONSULTANTS**
An ISO 9001 Company
Professional Address: Sector-31, Gurgaon, Haryana, India
P.O. Box: 308030, Gurgaon, Haryana, India

RELEASED FOR: PRELIMINARY FOR APPROVAL TENDER CONSTRUCTION

DESIGNED BY: SIVENDRA KUMAR
CHECKED BY: B.R. SHARMA
PROJECT INCHARGE: A.A. SAMANT



SECTIONAL ELEVATION 1-1

- NOTES:-**
1. ALL DIMENSIONS, NORTHING & EASTING AND LEVELS ARE IN METER, UNLESS OTHERWISE SPECIFIED.
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 12. INSERT PLATES SHALL BE PROVIDED IN THE WALL FOR PROVISION OF MS LADDER.

LOCATION	
SHAFT-1	CH:26080
SHAFT-2	
SHAFT-3	CH:27680
SHAFT-4	

1200 mm CONCRETE LINING WALL

1200 mm CONCRETE LINING

WALL

1200 mm CONCRETE LINING

RAIL LEVEL

PROJECT:- HARYANA ORBITAL RAIL CORRIDOR
 CONNECTING PALWAL TO SONIPAT BYPASSING DELHI AREA BY LINKING ASAOHI-PATLI-SULTANPUR-ASAUDAH BY NEW ELECTRIFIED BG DOUBLE LINE

CLIENT:- HARYANA RAIL INFRASTRUCTURE DEVELOPMENT CORPORATION LIMITED.

GENERAL CONSULTANT:- GENERAL CONSULTANT FOR HARYANA ORBITAL RAIL CORRIDOR
 RITES Limited in consortium with SMEC International Pty. Ltd.

GC/HORC		HRIDC	
NAME / DESIGNATION	SIGN	NAME / DESIGNATION	SIGN
CHAHATEY RAM PD	<i>Chahatey Ram</i>	SHIV OM DWIVEDI CPM/HRIDC	<i>Shiv Om Dwivedi</i>
SUDHIR AGRAWAL DPD/CIVIL	<i>Sudhir Agrawal</i>	RAJU SOLANKI DGM/CIVIL/S	<i>Raju Solanki</i>
		AM/S&T	
REETU PATIAL CDE/CIVIL	<i>Reetu Patial</i>		
AMARNATH SINGH CRE/S&T	<i>Amarnath Singh</i>	AM/Civil/Pig	<i>Amarnath Singh</i>
STIPHEN SAHOO SRE/Elect.	<i>Stephen Sahoo</i>	JGM/L&U	<i>Stephen Sahoo</i>

GC/HORC DRG. NO:- GC-HRIDC-C4-DRW-TTL-CLT-01010_A1 SHEET: 2 OF 3

DRAWING NAME: CONCEPTUAL DRAWING FOR PERMANENT VENTILATION SHAFT JUNCTION WITH MAIN TUNNEL

ISSUE DATE: 07.11.2022 REVISION DATE: 03.01.2023

SCALE: AS SHOWN

SMC DRG. NO:- SMC/HRIDC/TUNICS-7

CONSULTANT: **IRITES** THE INFRASTRUCTURE PEOPLE **SMEC** Member of the Sellen Group

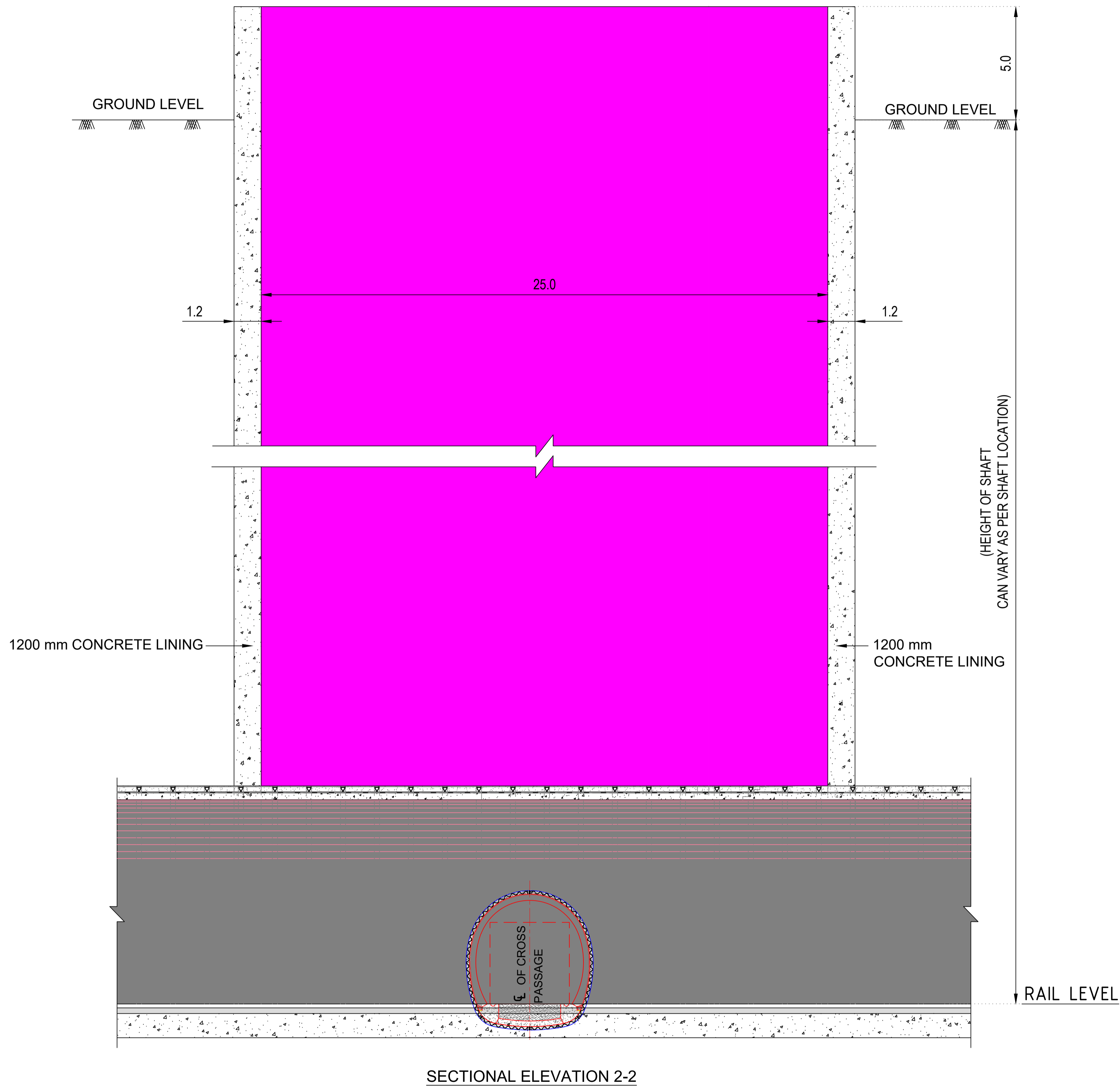
DESIGNED BY: *Skumar* B R SHARMA S/CONSULTANT / TUNNEL PROJECT INCHARGE

CHECKED BY: *A.A. Samant* A. A. SAMANT PROJECT INCHARGE

RELEASED FOR: PRELIMINARY FOR APPROVAL TENDER CONSTRUCTION

- NOTES:-**
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LOCATION	
SHAFT-1	CH:26080
SHAFT-2	
SHAFT-3	CH:27680
SHAFT-4	



GC/HORC		HRIDC	
NAME / DESIGNATION	SIGN	NAME / DESIGNATION	SIGN
CHAHATEY RAM PD	<i>ChahateyRam</i>	SHIV OM DWIVEDI CPM/HRIDC	<i>Shiv</i>
SUDHIR AGRAWAL DPD/CIVIL	<i>ASud</i>	RAJU SOLANKI DGM/CIVIL/S	<i>Raju</i>
		AM/S&T	
REETU PATIAL CDE/CIVIL	<i>Reetu</i>		
AMARNATH SINGH CRE/S&T	<i>AmarnathS</i>	AM/Civil/Pig	<i>Pig</i>
STIPHEN SAHOO SRE/Elect.	<i>Stiphen</i>	JGM/L&U	<i>JGM</i>

PROJECT:- HARYANA ORBITAL RAIL CORRIDOR
CONNECTING PALWAL TO SONIPAT BYPASSING DELHI AREA BY LINKING
ASAOTI-PATLI-SULTANPUR-ASAUDAHA BY NEW ELECTRIFIED BG DOUBLE LINE

CLIENT:- HARYANA RAIL INFRASTRUCTURE DEVELOPMENT CORPORATION LIMITED.

GENERAL CONSULTANT:-
GENERAL CONSULTANT FOR HARYANA ORBITAL RAIL CORRIDOR
RITES Limited in consortium with SMEC International Pty. Ltd.

GC/HORC DRG. NO:- GC-HRIDC-C4-DRW-TTL-CLT-01010_A1
SHEET: 3 OF 3

DRAWING NAME:- CONCEPTUAL DRAWING FOR PERMANENT VENTILATION SHAFT JUNCTION WITH MAIN TUNNEL

ISSUE DATE: 07.11.2022
REVISED DATE: 03.01.2023

SCALE: AS SHOWN

SMC DRG. NO:- SMCHRIDCTUNICS-7

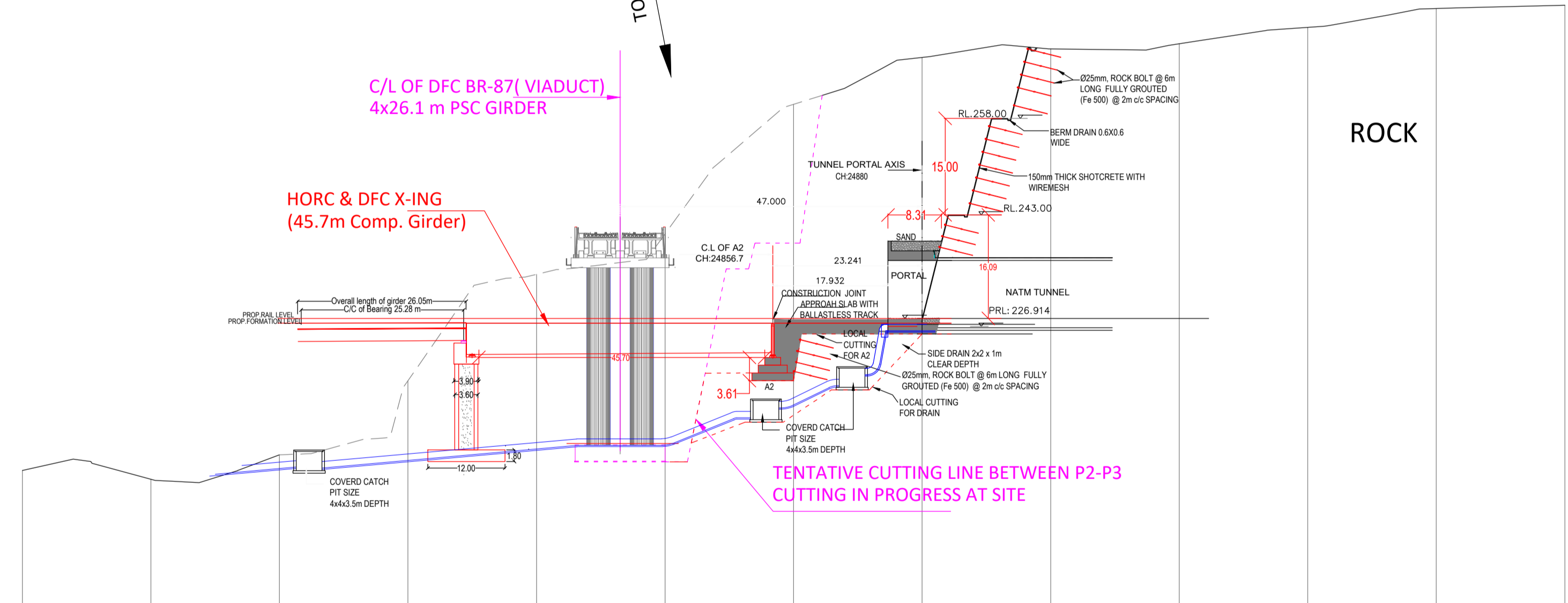
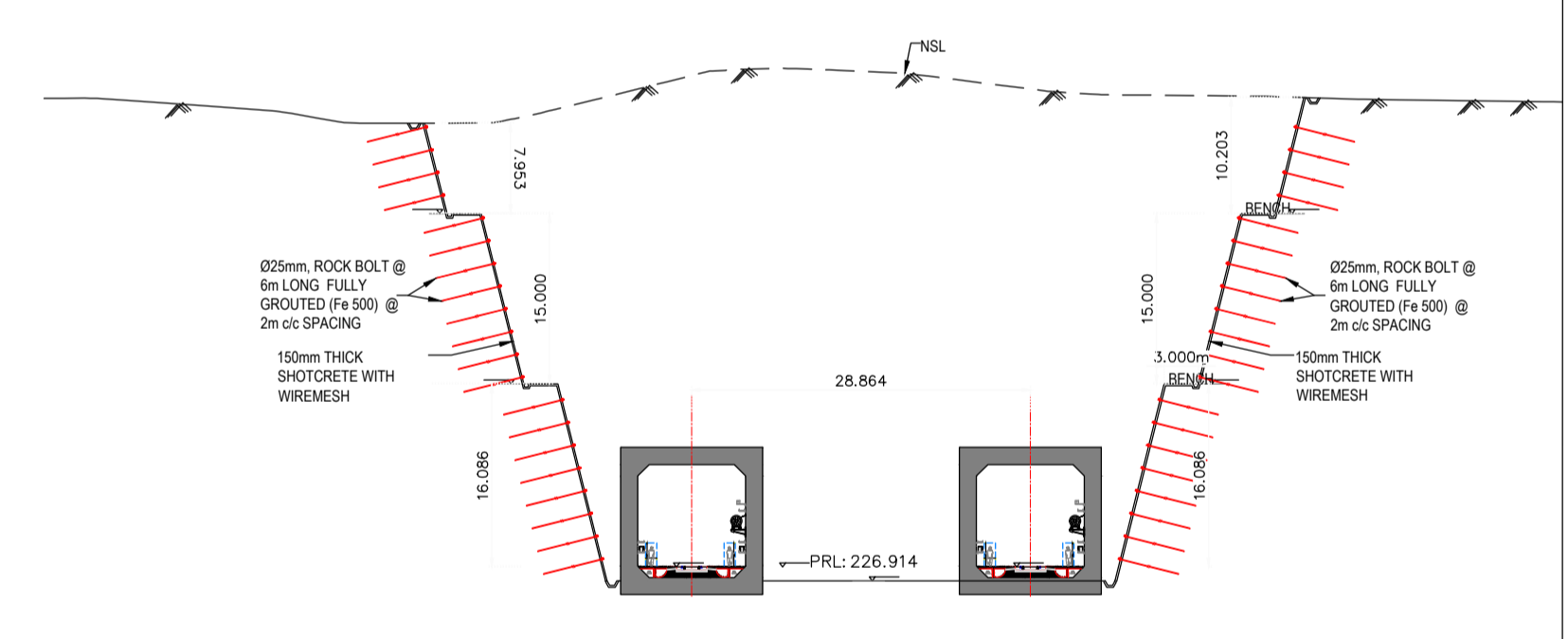
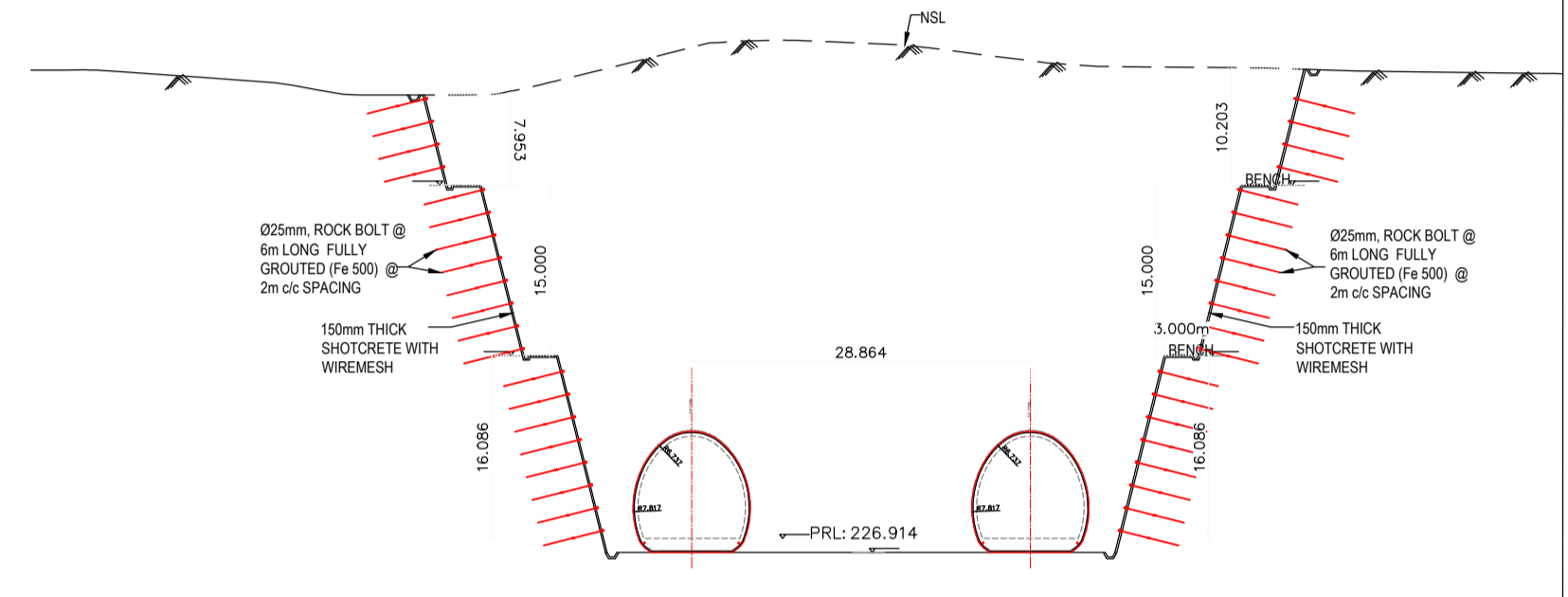
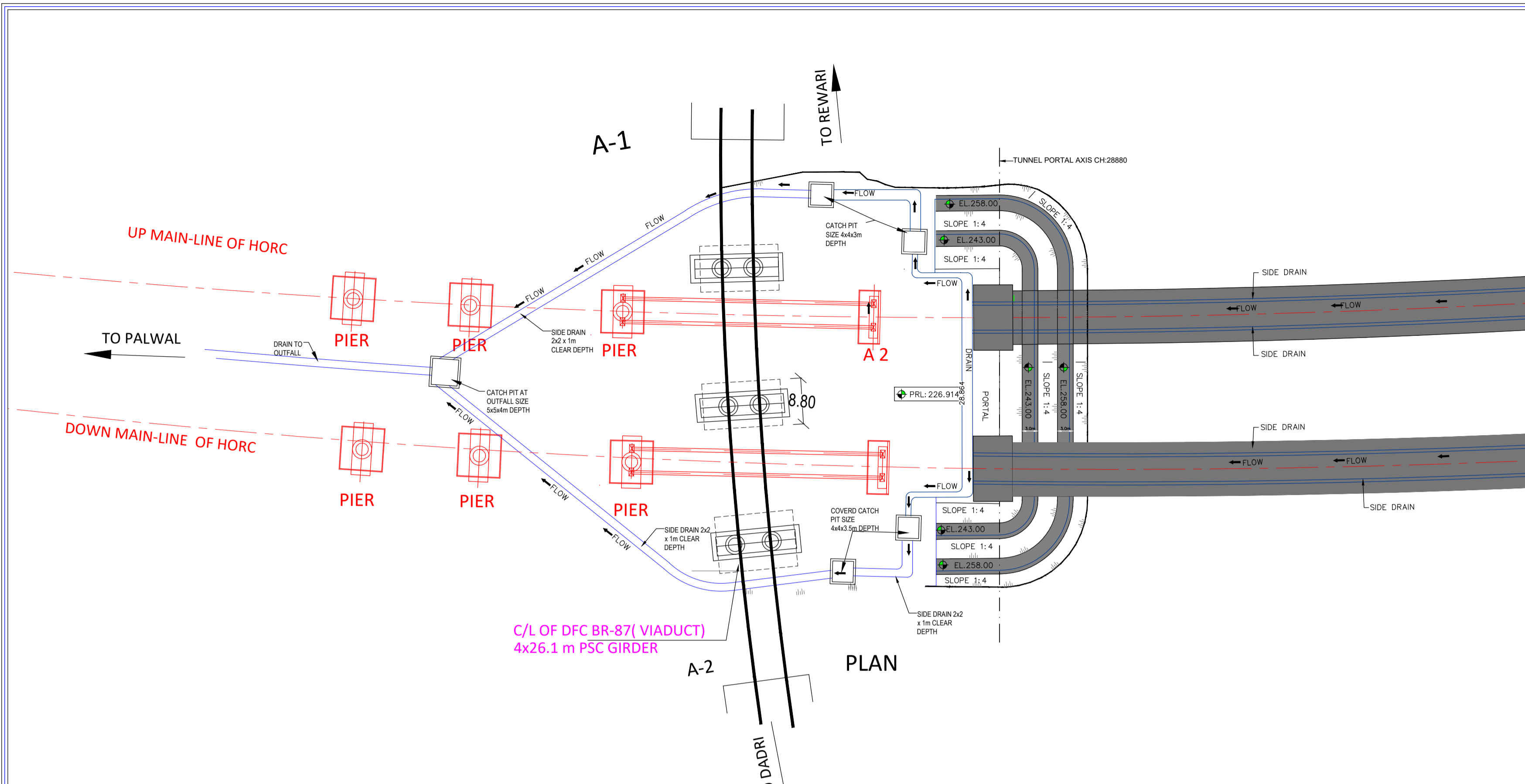
CONSULTANT:
RITES Limited
S M CONSULTANTS
AN ISO 9001 Company
Professional Address: 10/15/2000/1/2/3/4/5/6/7/8/9/10/11/12/13/14/15/16/17/18/19/20/21/22/23/24/25/26/27/28/29/30/31/32/33/34/35/36/37/38/39/40/41/42/43/44/45/46/47/48/49/50/51/52/53/54/55/56/57/58/59/60/61/62/63/64/65/66/67/68/69/70/71/72/73/74/75/76/77/78/79/80/81/82/83/84/85/86/87/88/89/90/91/92/93/94/95/96/97/98/99/100

RELEASED FOR: PRELIMINARY FOR APPROVAL [] TENDER [x] CONSTRUCTION []

SK/SMC/01
DIVENDRA KUMAR
TUNNEL DESIGNER

B R SHARMA
S CONSULTANT / TUNNEL

A. A. SAMANT
PROJECT INCHARGE



DATUM 180	24740	24760	24780	24800	24820	24840	24860	24880	24900	24920	24940	24960	24980
HARC FORMATION LEVEL	225.202	225.324	225.445	225.566	225.687	225.808	225.930	226.051	226.172	226.293	226.415	226.536	226.657
GROUND LEVEL	208.699	207.462	213.223	231.957	237.616	242.707	262.984	267.750	267.897	271.977	274.370	275.936	276.968
CHAINAGE OF HARC	24740	24760	24780	24800	24820	24840	24860	24880	24900	24920	24940	24960	24980

SECTION

- NOTES:-
1. ALL DIMENSIONS, NORTHING & EASTING AND LEVELS ARE IN METER, UNLESS OTHERWISE SPECIFIED.
 2. NO DIMENSIONS SHALL BE MEASURED FROM DRAWING.
 3. TUNNEL EXCAVATED BY HEADING, BENCHING / MULTI DRIFT METHOD.
 4. THE GRADE OF SHOTCRETE WITH SFERS AS PER DETAIL DESIGN.
 5. PROPOSED SUPPORT SYSTEM IS BASED ON GIR PROVIDED BY GEOLOGIST. ACTUAL SUPPORT SYSTEM MAY BE REVISED BASED ON ACTUAL RESPONSE OF STRATA DURING EXCAVATION.
 6. FORCES DUE TO CONTINUATION OF LWR/CR SHALL BE CONSIDERED AS PER CORRECTION SLIP NO. 45 OF IRS BRIDGE RULES.
 7. HYSD BARS OF Fe 500/550 STRENGTH GRADE SHOULD BE PROVIDED AS PER IS 1786-2008.
 8. STANDARD OF LOADING FOR SUB-STRUCTURE IS 32.5 T LOADING-2008. FOR SUPER-STRUCTURE 2BT LOADING & HIGH RISE O.H.E.
 9. O.H.E MAST AND INSPECTION LADDERS PROVISION SHALL BE KEPT AS PER RAILWAY DESIGN DIRECTLY SUPPORTING THEM ON PERMANENT FOR MAJOR/IMPORTANT BRIDGES AS PER REQUIREMENT R.D.S.O. REFERENCE.
 10. HOLES SHALL BE PROVIDED IN THE PROPOSED BED BLOCK, AT THE TIME OF CASTING OF R.C.C. BED FOR THE FIXING / ERECTION OF BEARINGS, AT REQUIRED POSITION.
 11. ENGINEER IN CHARGE SHOULD ENSURE THAT ALL DIMENSIONS & LEVEL ARE CHECKED BEFORE EXECUTION OF WORK.
 12. CUTTING PROFILE SHOWN AT A/S PER THE D.F.C CROSS SECTIONAL DRAWING, THE WORK FOR WHICH IS IN PROGRESS. FOUNDING LEVEL OF A2 WILL BE DECIDED AFTER THE COMPLETION OF CUTTING BY DFOCL GROUND LEVEL ARE SHOWN AS PER SURVEY IN YEAR 2021.

PROJECT:- HARYANA ORBITAL RAIL CORRIDOR
CONNECTING PALWAL TO SONIPAT BYPASSING DELHI AREA BY LINKING ASAOHI-PATLI-SULTANPUR-ASAUDAH BY NEW ELECTRIFIED BG DOUBLE LINE

CLIENT:- HARYANA RAIL INFRASTRUCTURE DEVELOPMENT CORPORATION LIMITED.

GENERAL CONSULTANT:- GENERAL CONSULTANT FOR HARYANA ORBITAL RAIL CORRIDOR
RITES Limited in consortium with SMEC International Pty. Ltd.

GC/HARC DRG. NO:- GC-HRIDC-C4-DRW-TTL-CLT-01012_A0

DRAWING NAME: CONCEPTUAL DRAWING FOR PORTAL-1 & ABUTMENT A2 OF VIADUCT WITH DRAINAGE EXCAVATION PLAN & SECTIONS

ISSUE DATE: 07/11/2022
SCALE: AS SHOWN
SMC DRG. NO.: SMCHRIDC/TUNICS-7

CONSULTANT: RITES (Infrastructure People) & SMEC

DESIGNER: SUDHIR AGRAWAL
CHECKER: REETU PATIAL
APPROVED: AMARNATH SINGH
RELEASED FOR: STIPHEN SAHOO

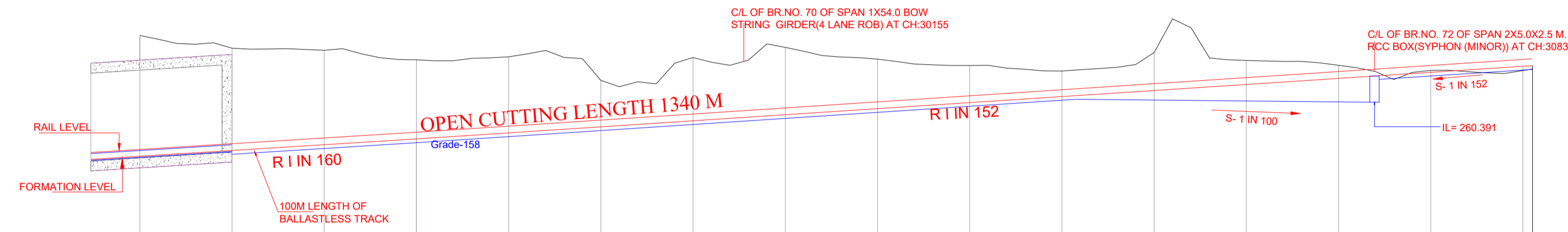
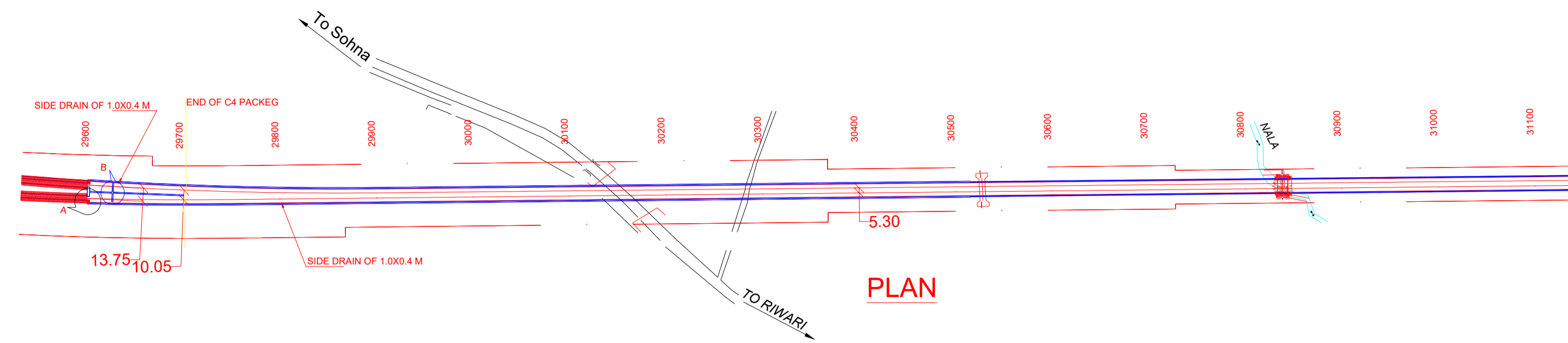
DESIGNER: SHIV OM DWIVEDI
CHECKER: RAJU SOLANKI
APPROVED: AM/S&T
RELEASED FOR: JGML&U

PROJECT INCHARGE: A. A. SAMANT

RELEASED FOR: PRELIMINARY FOR APPROVAL TENDER CONSTRUCTION

GC/HARC		HRIDC	
NAME / DESIGNATION	SIGN	NAME / DESIGNATION	SIGN
CHAHATEY RAM PD	<i>Chahatey Ram</i>	SHIV OM DWIVEDI CPM/HRIDC	<i>Shiv Om Dwivedi</i>
SUDHIR AGRAWAL DPD/CIVIL	<i>Sudhir Agrawal</i>	RAJU SOLANKI DGM/CIVIL/S	<i>Raju Solanki</i>
		AM/S&T	
REETU PATIAL CDE/CIVIL	<i>Reetu Patial</i>		
AMARNATH SINGH CRE/S&T	<i>Amarnath Singh</i>	AM/Civil/Pig	<i>Amarnath Singh</i>
STIPHEN SAHOO SRE/Elect.	<i>Stephen Sahoo</i>	JGML&U	<i>JGML&U</i>

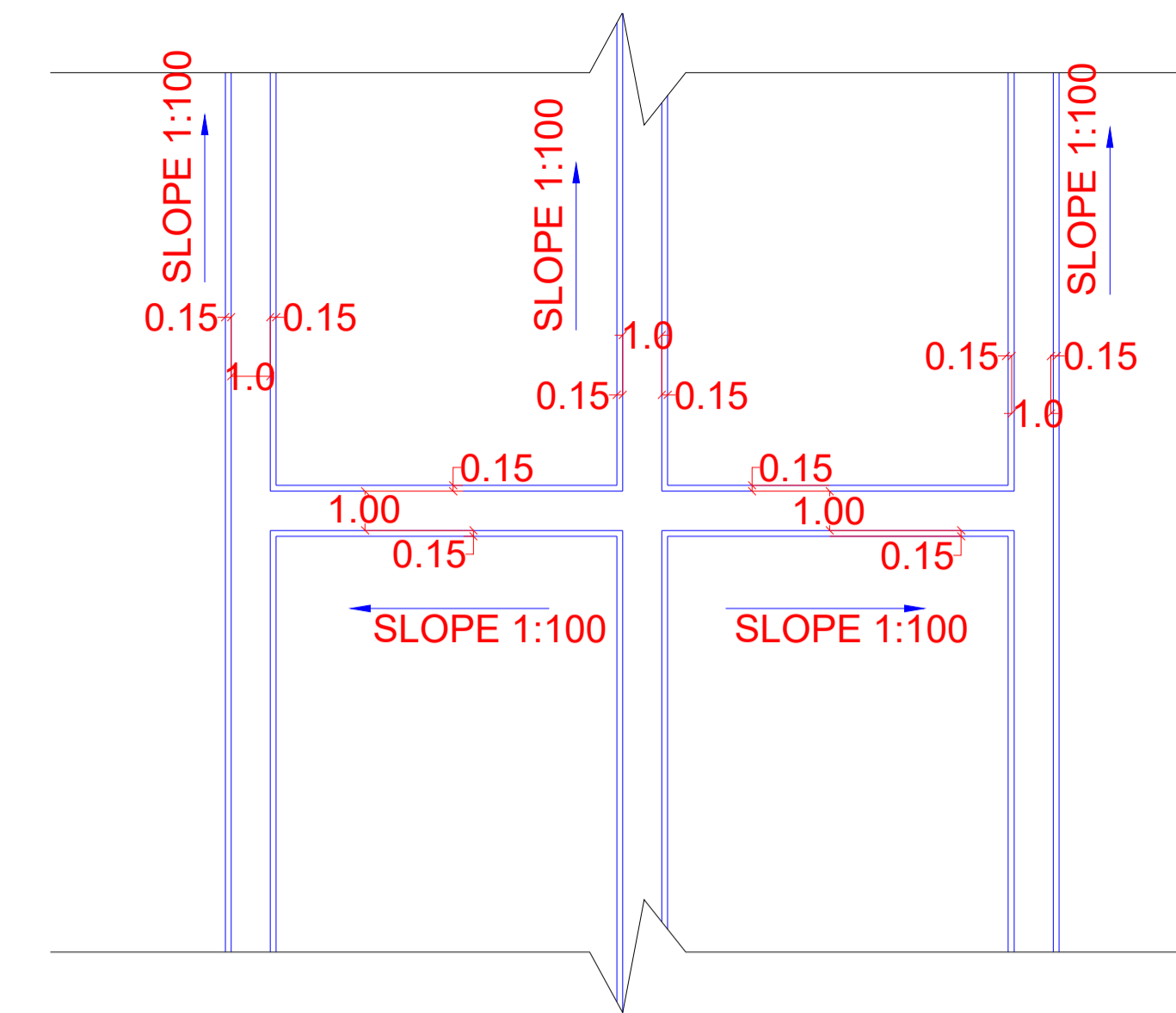
DETAILS OF SIDE DRAIN & PORTAL 2



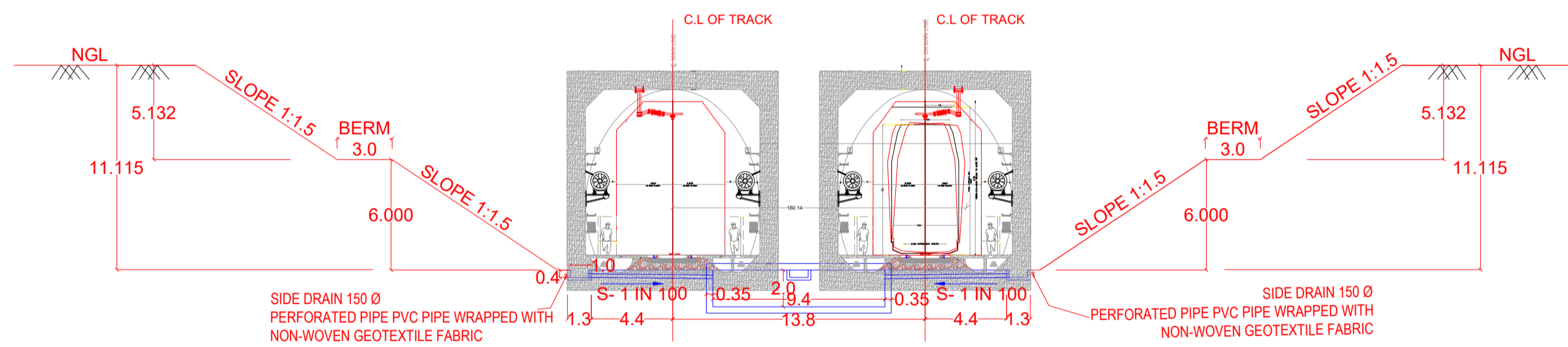
DATUM = 240.00

	29500	29600	29700	29800	29900	30000	30100	30200	30300	30400	30500	30600	30700	30800	30900	31000
BANKING (+ ve) CUTTING (- ve)	-13.110	-11.108	-10.254	-8.600	-8.269	-5.060	-6.878	-7.315	-5.376	-4.025	-2.777	-4.112	-2.612	-1.418	-0.218	0.468
PROPOSED FORMATION LEVEL	254.530	255.155	255.780	256.405	257.063	257.721	258.379	259.037	259.695	260.353	261.010	261.668	262.326	262.984	263.642	264.300
GROUND LEVEL	267.640	266.263	266.034	265.005	265.332	262.781	265.257	266.352	265.071	264.378	263.787	265.780	264.938	264.402	263.860	263.832
CHAINAGE	29500	29600	29700	29800	29900	30000	30100	30200	30300	30400	30500	30600	30700	30800	30900	31000

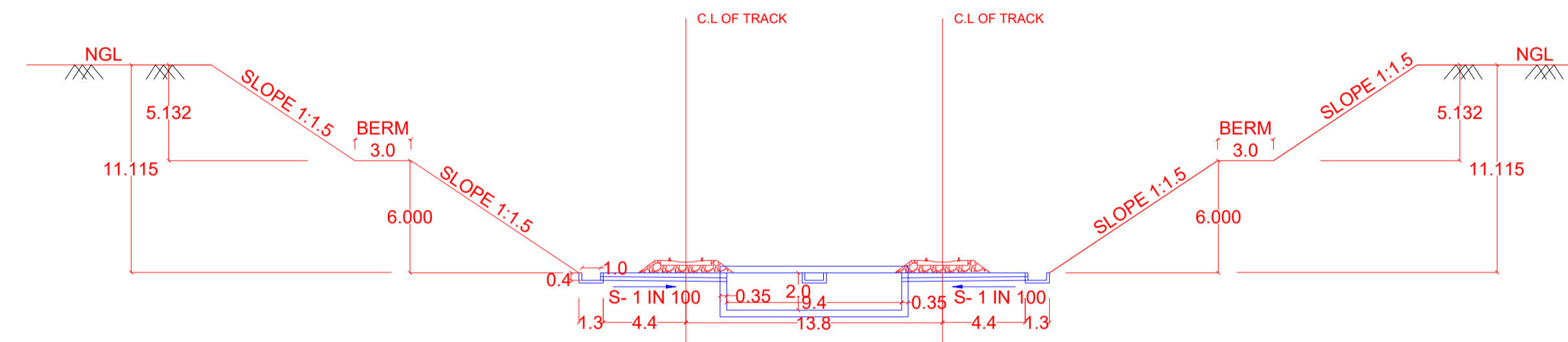
LONGITUDINAL SECTION



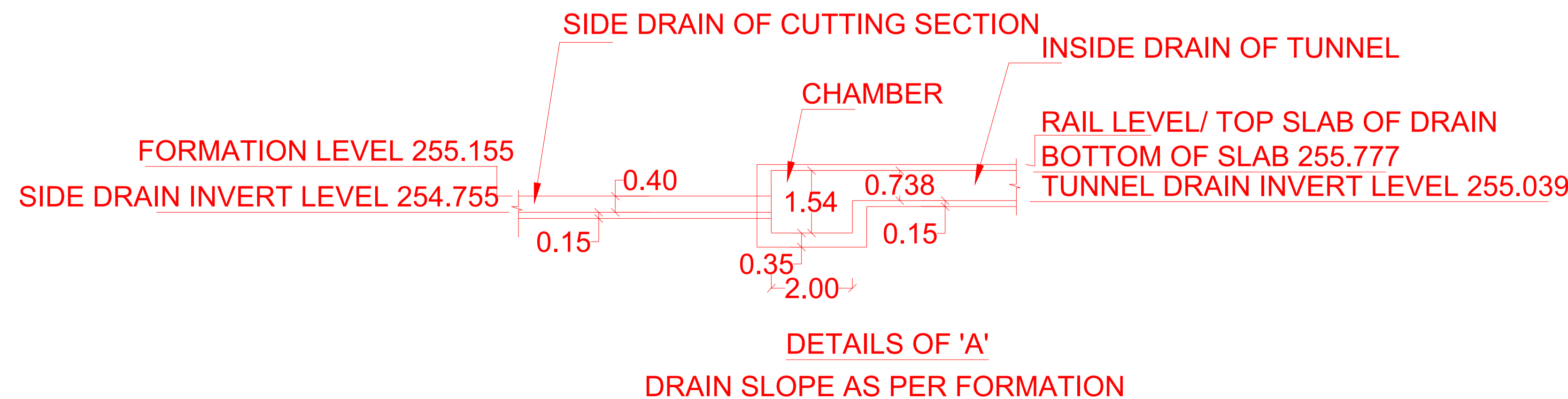
DETAILS OF B



CROSS SECTION AT CUTTING AT PORTAL



CROSS SECTION AT CUTTING BEFORE PORTAL



GC/HORC		HRDC	
NAME / DESIGNATION	SIGN	NAME / DESIGNATION	SIGN
CHAHATEY RAM PD	<i>Chahatey Ram</i>	SHIV OM DWIVEDI CPM/HRDC	<i>Shiv</i>
SUDHIR AGRAWAL DPD/CIVIL	<i>Sudhir</i>	RAJU SOLANKI DGM/CIVIL/S	<i>Raju</i>
		AM/S&T	
REETU PATIAL CDE/CIVIL	<i>Reetu</i>		
AMARNATH SINGH CRE/S&T	<i>Amarnath Singh</i>	AM/Civil/Pig	<i>Amarnath</i>
STIPHEN SAHOO SRE/Elect.	<i>Stephen</i>	JGM/L&U	<i>Stephen</i>

PROJECT:- HARYANA ORBITAL RAIL CORRIDOR
CONNECTING PALWAL TO SONIPAT BYPASSING DELHI AREA BY LINKING
ASAOTI-PATLI-SULTANPUR-ASAUDAHA BY NEW ELECTRIFIED BG DOUBLE LINE

CLIENT:- HARYANA RAIL INFRASTRUCTURE DEVELOPMENT CORPORATION LIMITED.

GENERAL CONSULTANT:- GENERAL CONSULTANT FOR HARYANA ORBITAL RAIL CORRIDOR
RITES Limited in consortium with SMEC International Pty. Ltd.

GC/HORC DRG. NO:- GC-HRIDC-C4-DRW-TTL-CLT-01013_A0

DRAWING NAME: CONCEPTUAL DRAWING FOR PORTAL -2 & OPEN CUTTING AREA WITH 100M BALLASTLESS TRACK

ISSUE DATE: 07/11/2022
SCALE: AS SHOWN
SMC DRG. NO.: SMC/HRDC/TUNICS-7

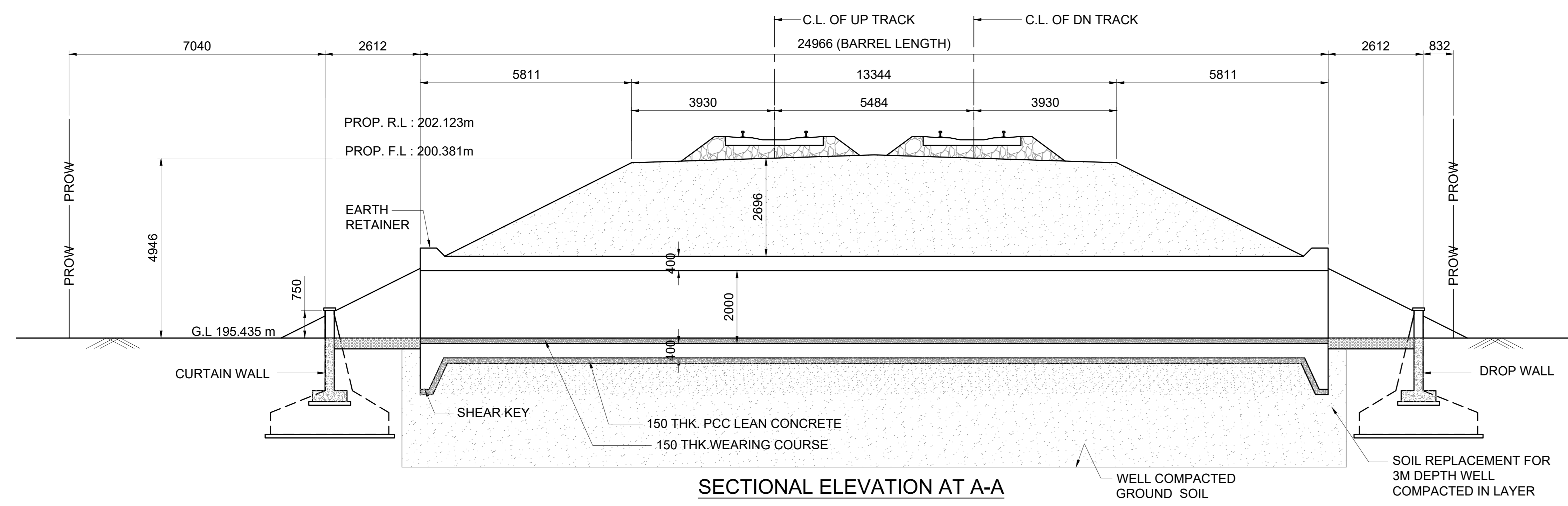
CONSULTANT: RITES (Infrastructure People) and SMEC (Member of the Sellen Group)

DESIGNER: SIVENDRA KUMAR TUNNEL DESIGNER
CHECKER: B R SHARMA S CONSULTANT / TUNNEL
PROJECT INCHARGE: A A SAMANT

RELEASED FOR: PRELIMINARY FOR APPROVAL TENDER CONSTRUCTION

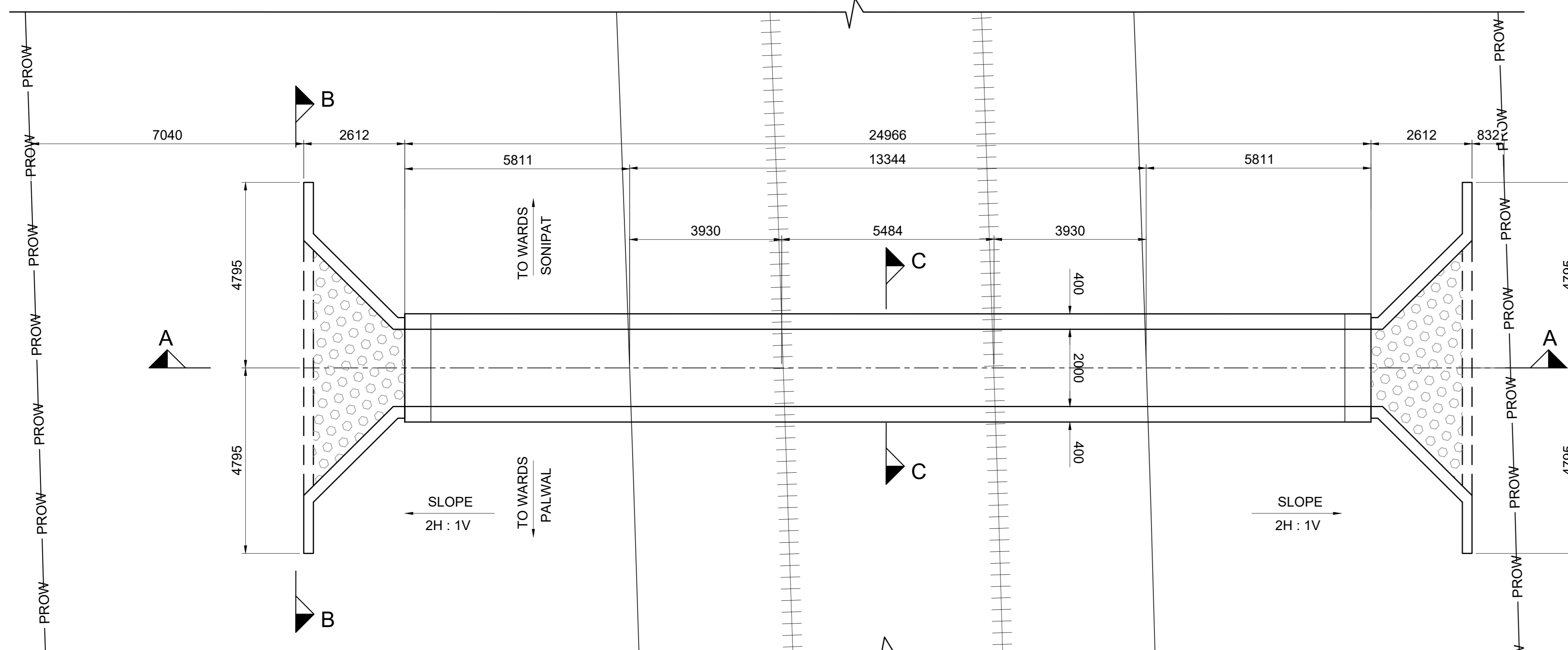
3. Bridges

3.1 Minor Bridges



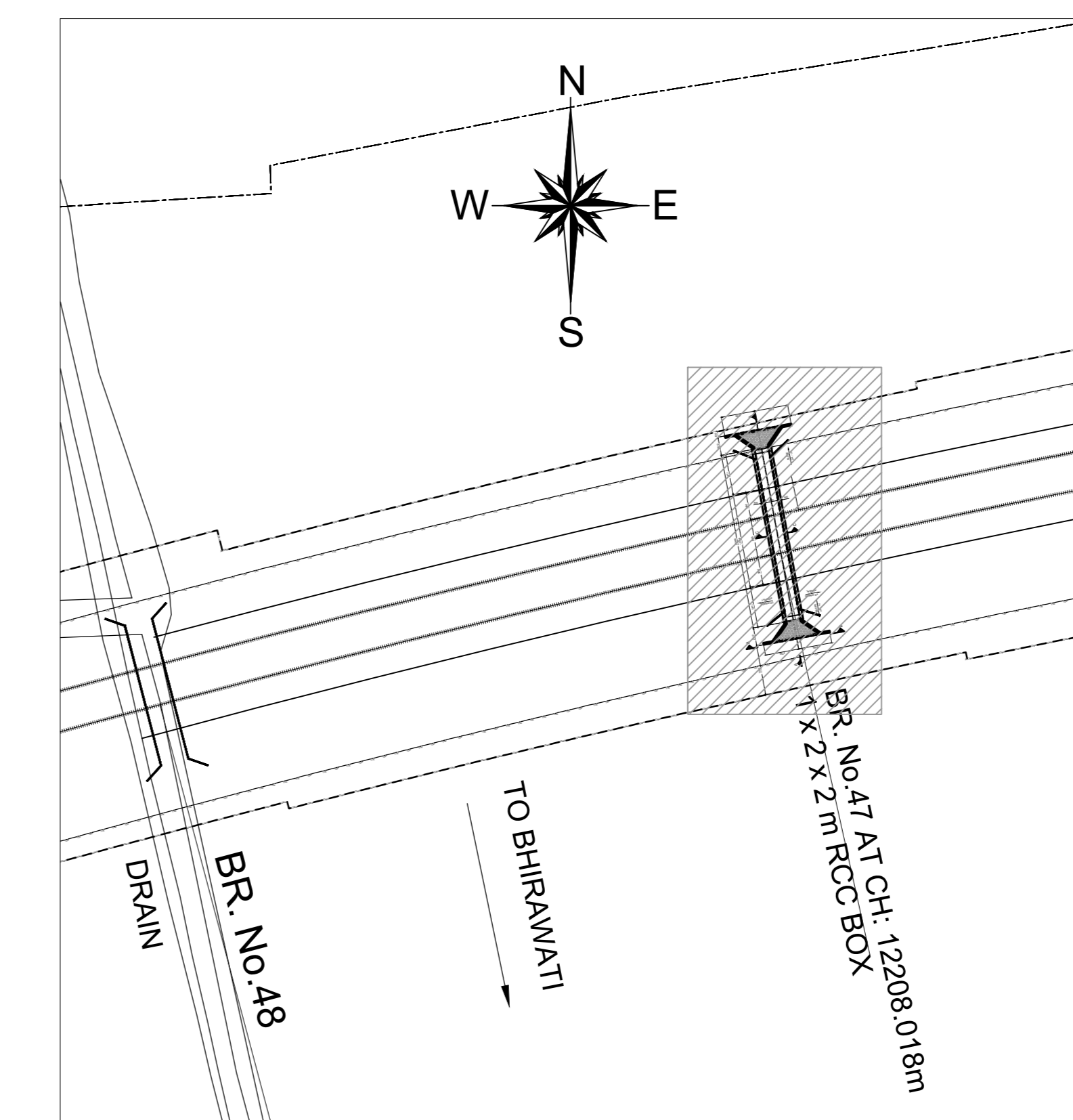
SECTIONAL ELEVATION AT A-A

SCALE 1:100



PLAN AT TOP

SCALE 1:100



KEY PLAN

(NOT TO SCALE)

LEGEND

PRL	PROPOSED RAIL LEVEL
PFL	PROPOSED FORMATION LEVEL
HFL	HIGHEST FLOOD LEVEL
GL	GROUND LEVEL

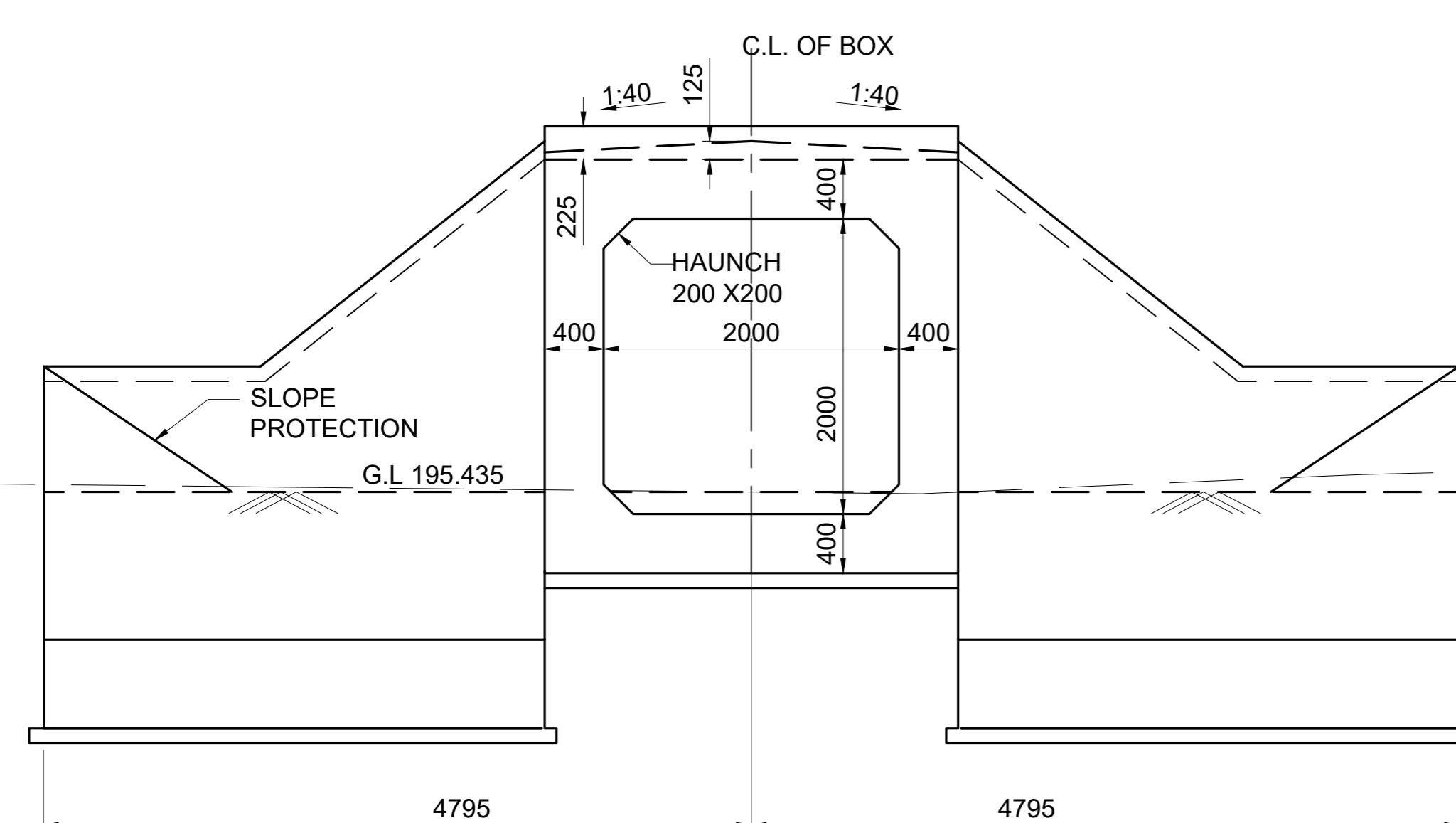
NOTES :

A) GENERAL NOTES

1. ALL DIMENSIONS ARE IN MILLIMETERS EXCEPT LEVELS WHICH ARE IN METER, UNLESS OTHERWISE MENTIONED.
2. THE CHAINAGES SHOWN ARE RECKONED FROM C/L OF PRITHALA STATION BUILDING TAKEN AS 0.00 M, WITH RESPECT TO UP MAIN LINE.
3. FOR RAIL LEVELS, FORMATION LEVEL, GRADES ETC. REFER L-SECTION.
4. BOX BRIDGE IS TO BE DESIGNED FOR 32.5 T LOADING AS APPLICABLE.
5. THE EXISTING DETAILS ARE AS PER SITE SURVEY AND SHALL BE VERIFIED BY THE CONTRACTOR BEFORE EXECUTION.
6. ENGINEER IN CHARGE/ SITE ENGINEER SHOULD VERIFY THE RAIL LEVEL FORMATION LEVEL, BED LEVEL & TRACK CENTER AT SITE BEFORE COMMENCEMENT OF WORK.
7. SUITABLE BED SLOPE SHALL BE PROVIDED AND ADJUSTED AS PER SITE CONDITIONS.
8. ENGINEER IN CHARGE/SITE ENGINEER SHALL ENSURE THE SAFETY OF TRACK/ROAD AT ALL THE TIME AND SHALL TAKE NECESSARY PRECAUTIONS TO PREVENT DAMAGE OF S&T CABLE /OFC DURING EXECUTION OF WORK CONCERNED DEPT. SUCH AS BSNL/AIRTEL/SSE/SIG/ADSTE ETC. SHALL BE INFORMED WELL IN ADVANCE BEFORE EXECUTION OF WORK.
9. THIS DRAWING IS THE PROPERTY OF HRIDC AND FOR EXCLUSIVE USE OF HORC.
10. DETAILED DESIGN DRAWING WILL BE PREPARED BASED ON THIS CONCEPTUAL APPROVED GAD.
11. THICKNESS OF STRUCTURAL MEMBERS ARE TENTATIVE AND WILL BE FINALISED AFTER DETAILED DESIGN.

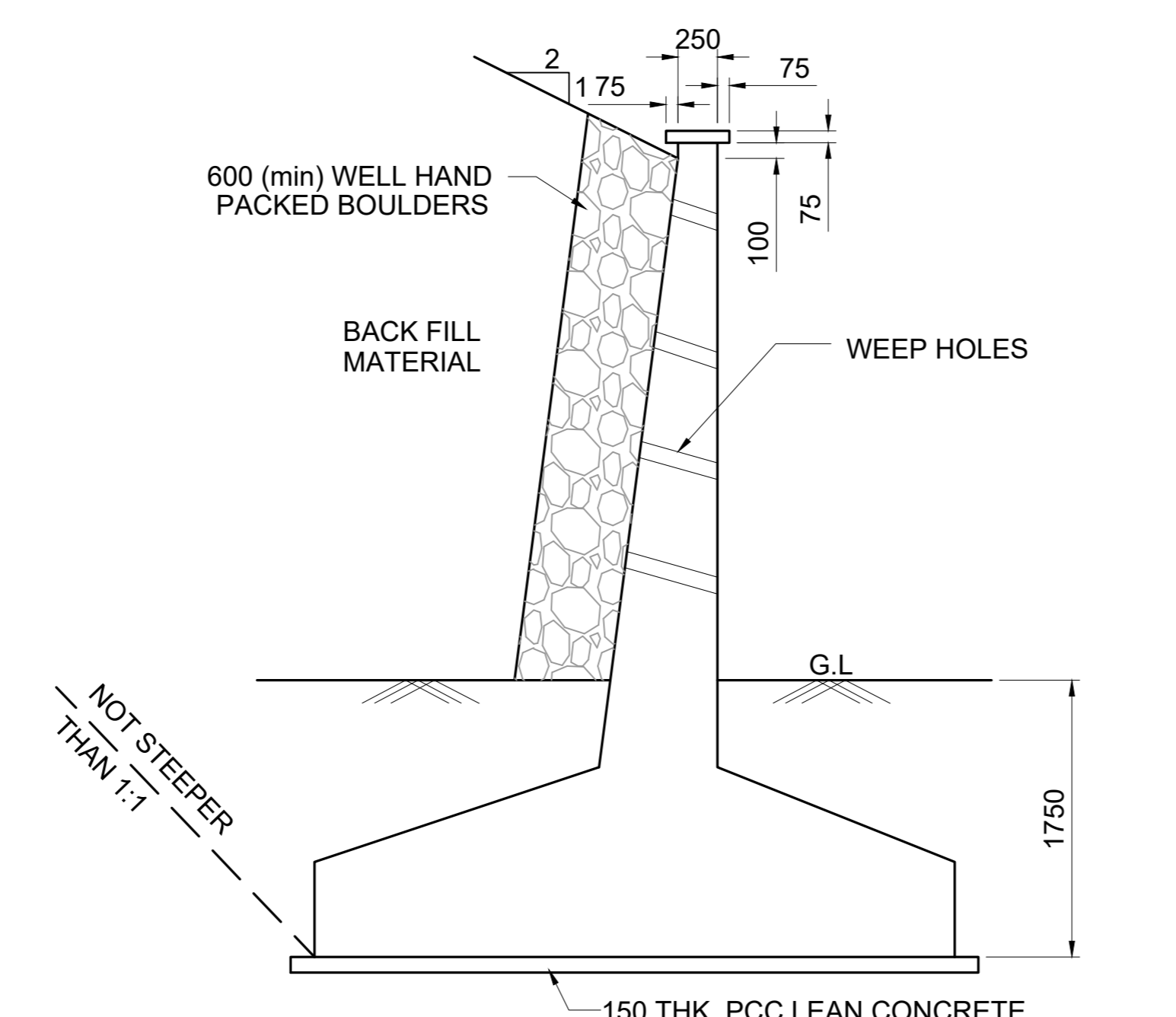
B) TECHNICAL NOTES :

1. PROTECTION WORK ON SLOPE OF BANK UP TO 15M BOTH SIDES ON APPROACHES OF BRIDGE SHALL BE DONE AS PER SKETCH NO. GC-HRIDC-SK-GEN-015.
2. INSPECTION STEPS SHALL BE PROVIDED AT DIAGONALLY OPPOSITE ENDS OF THE BOX AFTER PROTECTION WORK.
3. FOR PROPER DRAINAGE OF WATER, 50mm PCC M-20 WITH SUITABLE SLOPE TO BE USED ON TOP OF BOX SLAB.
4. ALL CLEAN/ EXPANSION JOINTS SHALL BE FILLED WITH THERMOCOL.
5. PLACEMENT LEVEL OF BOX AS SHOWN IN THIS GAD IS INDICATIVE AND MAY BE SUITABLY LOWERED/ELEVATED BASED UPON THE REQUIREMENT OF CLEARANCE, DRAINAGE & NATURAL GROUND PROFILE.
6. DIMENSION OF THE BOX MAY BE SUITABLY MODIFIED AS PER SITE REQUIREMENT HEIGHT OF BOX SHOWN INCLUDES MINIMUM REQUIRED CLEAR OPENING HEIGHT AND WEARING COARSE. OVERALL HEIGHT OF BOX OPENING MAY VARY AS PER SITE REQUIREMENT AND ACTUAL ROAD/GROUND PROFILE.
7. DESIGN CRITERIA SHALL BE BASED ON FOLLOWING IRS CODES
 - (i) IRS BRIDGE RULE
 - (ii) IRS CONCRETE BRIDGE CODE
 - (iii) IRS BRIDGE SUB-STRUCTURE & FOUNDATION CODE
8. SEISMIC ZONE - IV
9. EXPOSURE CONDITION - MODERATE.
10. DURING CONSTRUCTION, IF REQUIRED, ROAD CLOSURE TO BE OBTAINED FROM CONCERNED ROAD/CIVIL AUTHORITIES. DIVERSION OF ROAD IF ANY, REQUIRED IS TO BE DONE BY CONTRACTOR AT HIS COST.
11. THE BACK FILL MATERIAL SHALL BE CONFORMING TO CLAUSE 7.5 OF IRS SUB- STRUCTURE AND FOUNDATION CODE.
12. ALL RCC SURFACES COMING IN CONTACT WITH SOIL SHOULD BE PAINTED WITH BITUMEN OR COAL TAR OF APPROVED QUALITY @ 1.464 K.G/SQM. CONFORMING TO IS-3117.
13. REINFORCEMENT SHALL BE Fe 500D (TMT) CONFORMING TO IS 1786
14. FOR CONCRETE SPECIFICATION REFER IRS CONCRETE BRIDGE CODE. GRADE OF CONCRETE :
 - (i) ALL RCC WEARING COURSE(WC) =M:35/DETAILED DESIGN DRG.
 - (ii) LEVELING COURSE/LEAN CONCRETE =M:20/DETAILED DESIGN DRG.
15. BEARING CAPACITY OF SOIL SHALL BE ENSURED AS PER DETAILED DESIGN REQUIREMENT. GROUND IMPROVEMENT SHALL BE CARRIED OUT AS PER GT REPORT AND CONFIRMED THROUGH FIELD TESTING.
16. FOUNDATION LEVEL SHOWN IN DRAWING IS TENTATIVE. DETAILED DESIGN DRAWING SHALL BE FOLLOWED FOR FOUNDATION LEVEL DURING EXECUTION.
17. ADEQUATE SLOPE IN BOTTOM SLAB OF RCC BOX TOWARDS DIRECTION OF FLOW SHALL BE PROVIDED.



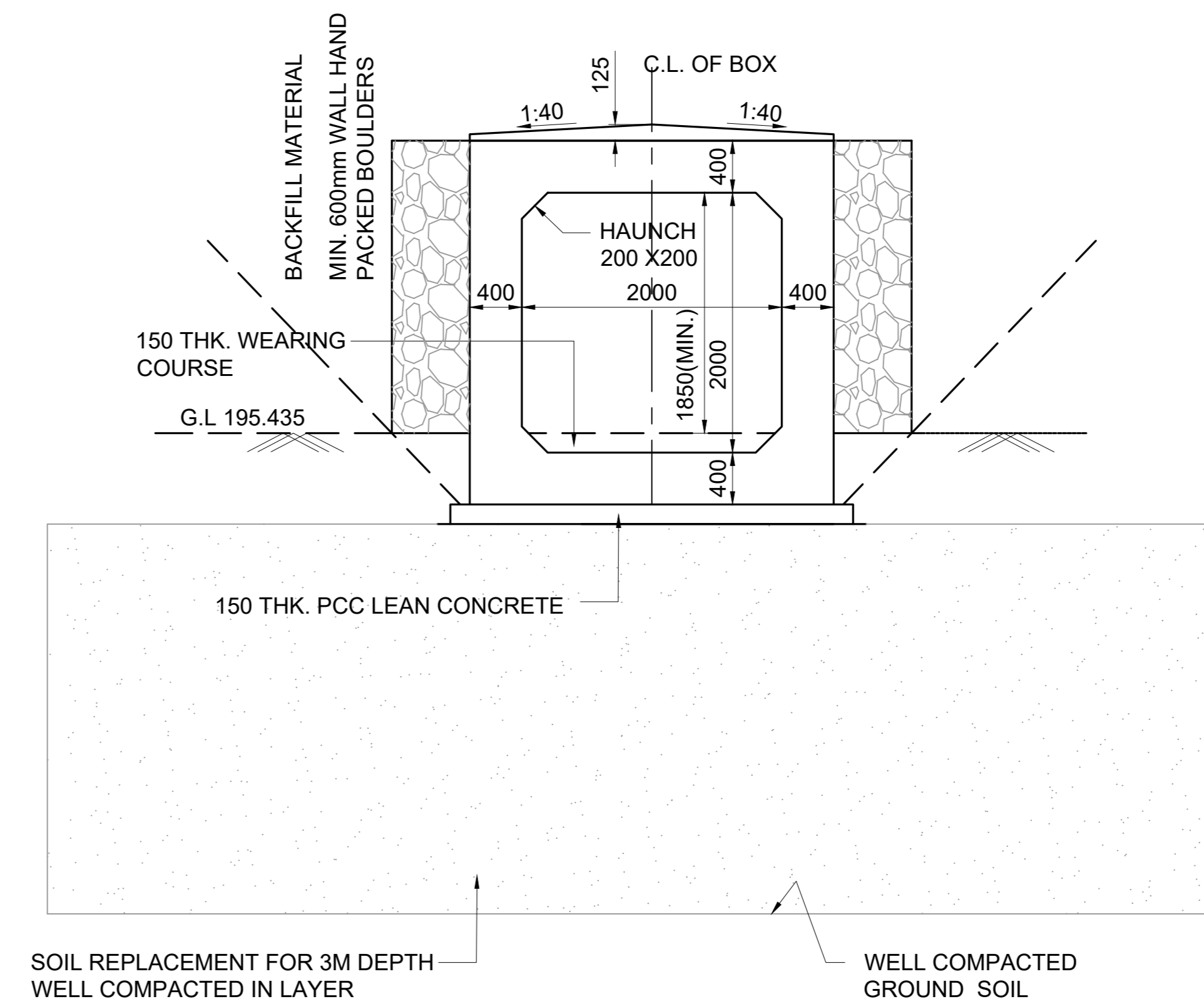
VIEW AT B-B

SCALE 1:50



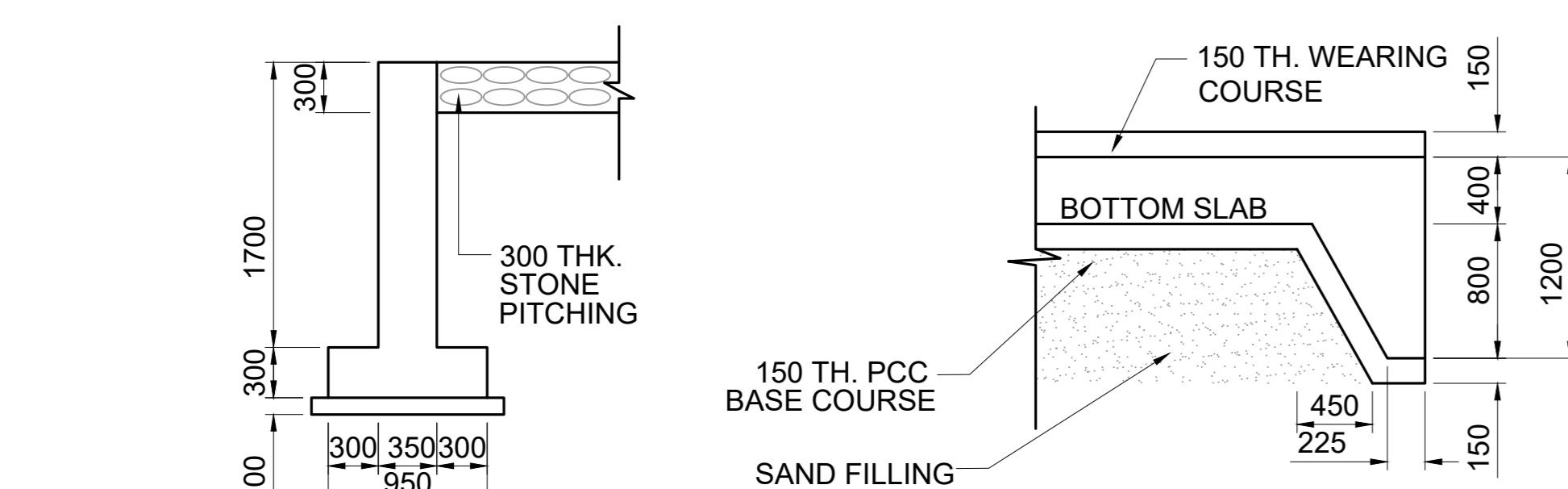
TYPICAL DETAIL OF RETURN WALL / WING WALL

SCALE 1:50



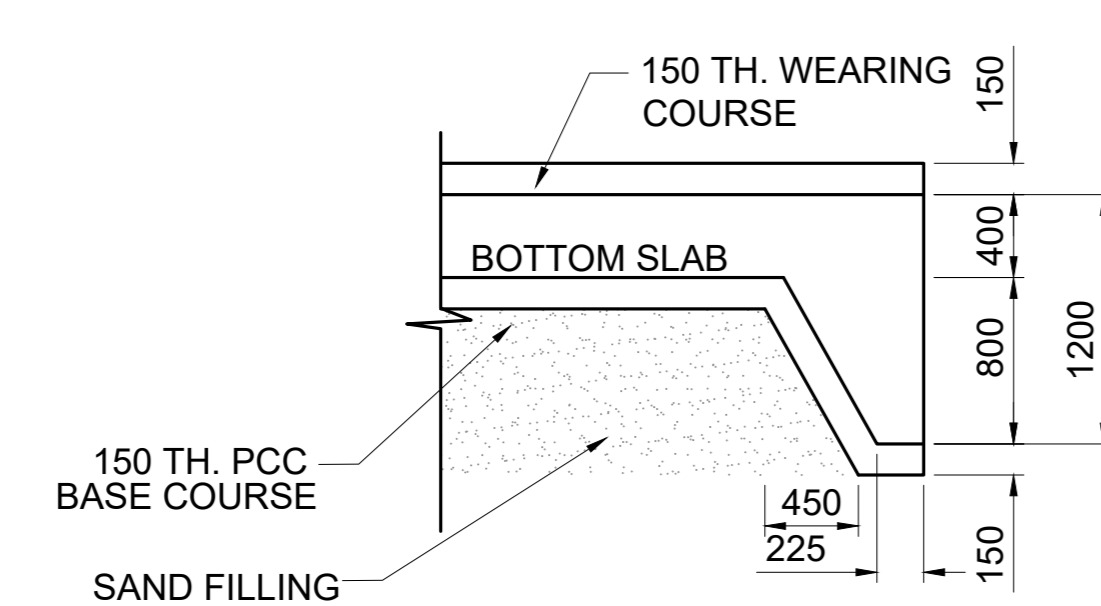
SECTION C-C

SCALE 1:50



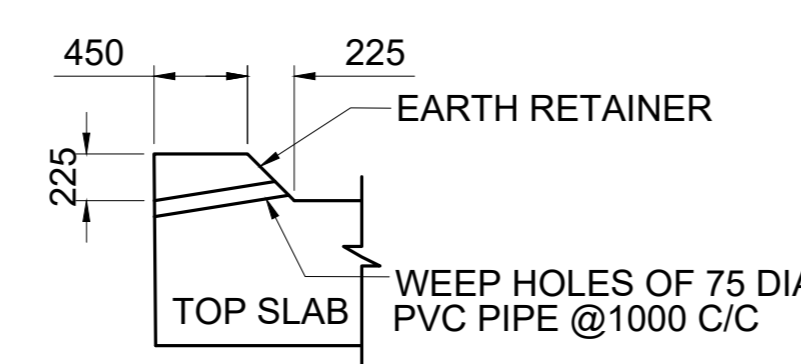
DROP / CURTAIN WALL DETAILS

SCALE 1:50



SHEAR KEY

SCALE 1:50



EARTH RETAINER

SCALE 1:50

GC/HORC		HRIDC	
NAME / DESIGNATION	SIGN	NAME / DESIGNATION	SIGN
CHAHATEY RAM PD	<i>Chahatey Ram</i>	SHIV OM DWIVEDI CPM/HRIDC	<i>Shiv</i>
SUDHIR AGRAWAL DPD/CIVIL	<i>Sudhir</i>	RAJU SOLANKI DGM/CIVIL/SOUTH	<i>Raju</i>
REETU PATIAL CDE/ CIVIL	<i>Reetu</i>		

PROJECT:

HARYANA ORBITAL RAIL CORRIDOR

CONNECTING PALWAL TO SONIPAT BYPASSING DELHI AREA BY LINKING ASAOTI-PATLI-SULTANPUR-ASAUDAH BY NEW ELECTRIFIED BG DOUBLE LINE

CLIENT:

HARYANA RAIL INFRASTRUCTURE DEVELOPMENT CORPORATION LIMITED.

CONSULTANT:

GENERAL CONSULTANT FOR HARYANA ORBITAL RAIL CORRIDOR
RITES Limited in consortium with SMEC International Pty. Ltd.

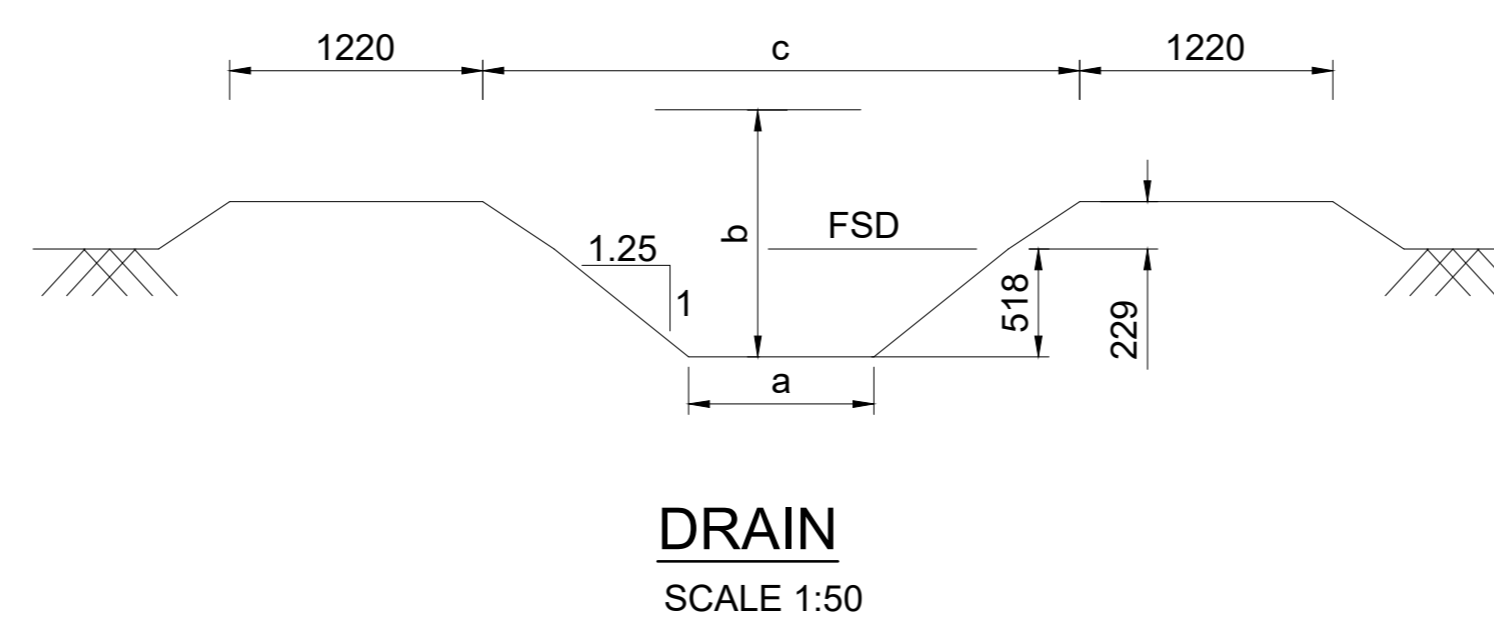
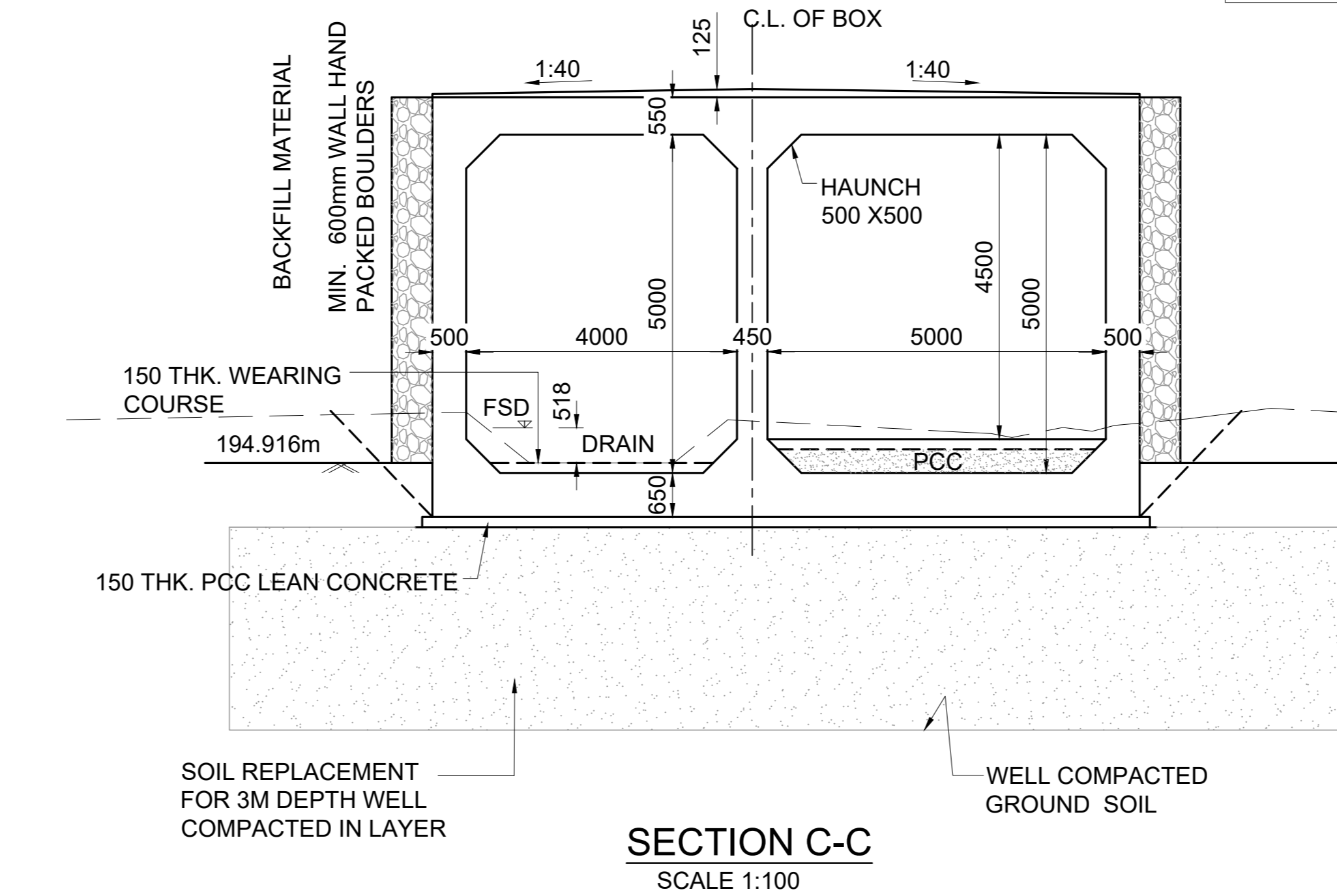
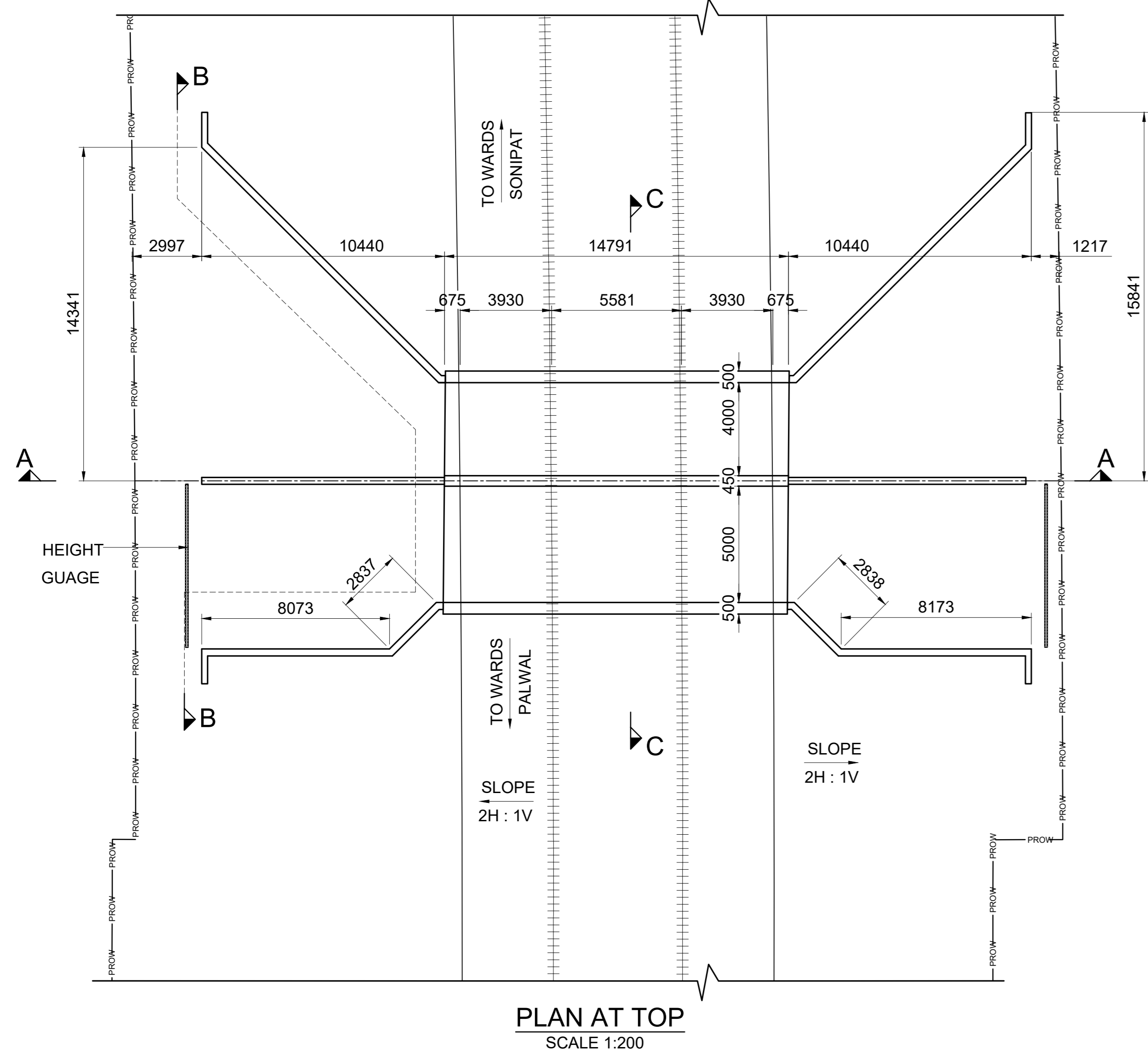
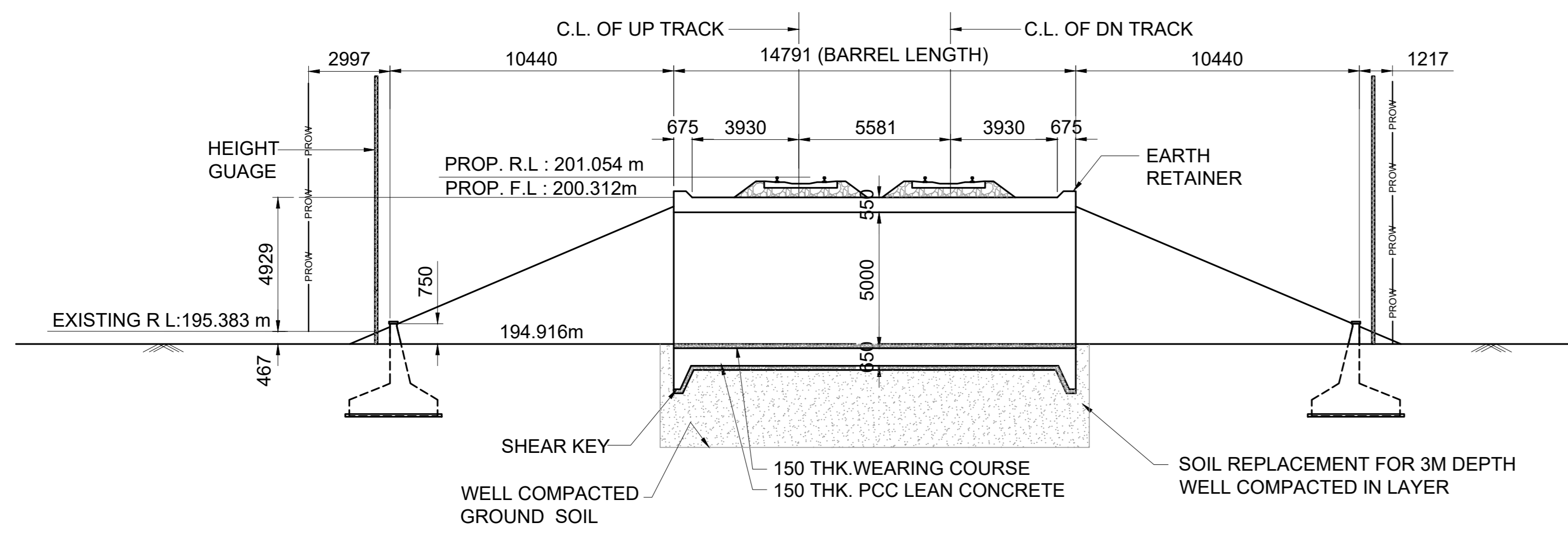


TITLE:- CONCEPTUAL GENERAL ARRANGEMENT DRAWING

FOR BALANCING CULVERT BRIDGE NO. 047
SPAN 1.0X2.0X2.0 RCC BOX AT CH: 12208.018

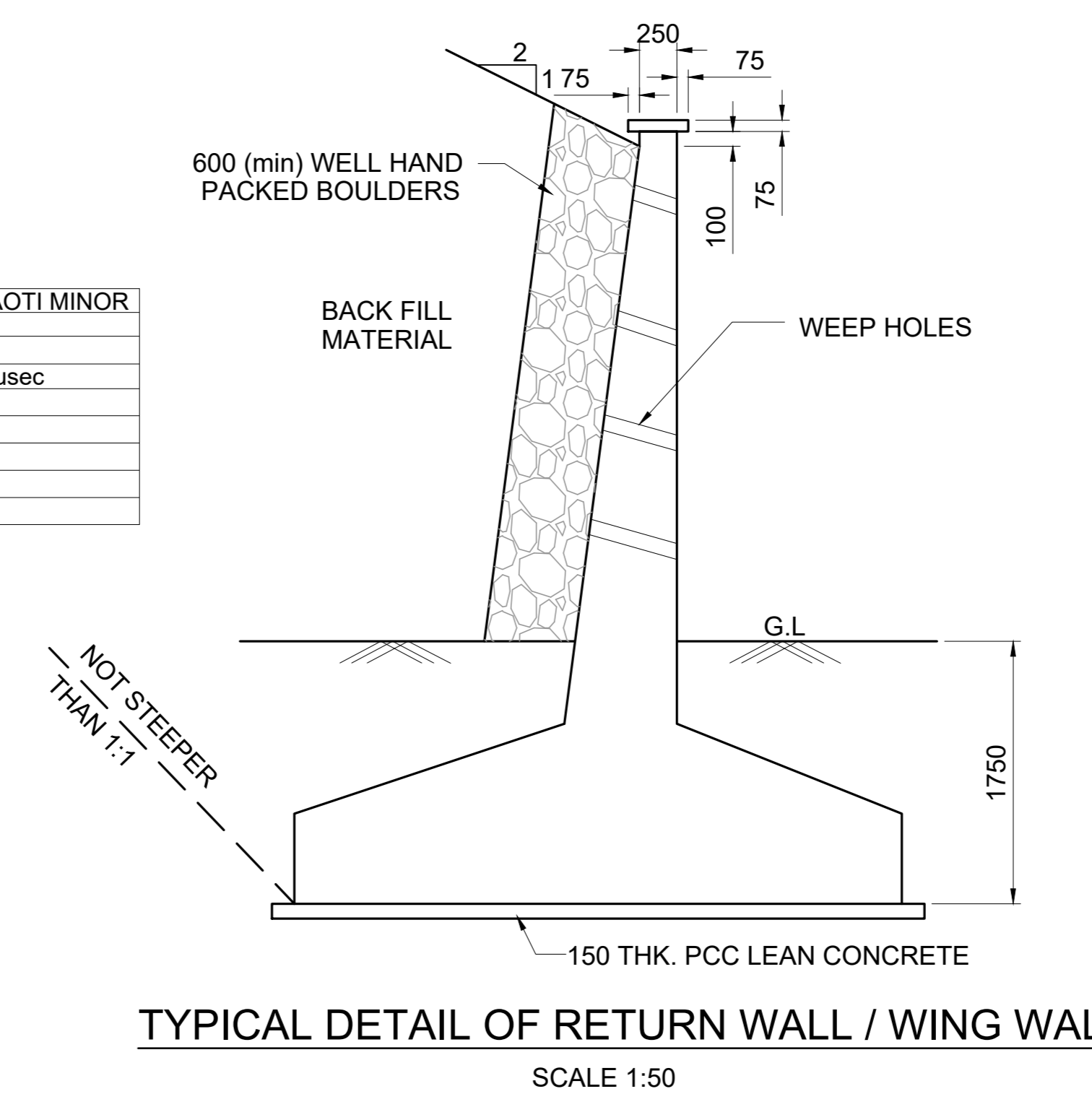
DRG. NO. GC-HRIDC-C4-DRW-BRD-GAD-01047_A1 SHEET NO. 1 OF 1

SCALE : AS SHOWN ISSUE DATE 07-11-2022 REVISED DATE 21-11-2022



HYDRAULIC DATA OF DRAIN

Sl. No.	NAME OF MINOR	BHIRAOTI MINOR
1	RD	1120
2	FREE BOARD	0.229
3	DISCHARGE	7.00 Cusec
4	BED WIDTH	a 0.893
5	F.S.D	b 0.518
6	SIDE SLOPE	c 1.25%
7	TOP WIDTH	c 2.188
8	SHAPE	
9		



LEGEND

PRL	PROPOSED RAIL LEVEL
PFL	PROPOSED FORMATION LEVEL
HFL	HIGHEST FLOOD LEVEL
GL	GROUND LEVEL
RL	ROAD LEVEL
FSD	FULL SUPPLY DEPTH

- NOTES :**
- A) GENERAL NOTES**
- ALL DIMENSIONS ARE IN MILLIMETERS EXCEPT LEVELS WHICH ARE IN METER, UNLESS OTHERWISE MENTIONED.
 - THE CHAINAGES SHOWN ARE RECKONED FROM C/L OF PRITHALA STATION BUILDING TAKEN AS 0.00 M, WITH RESPECT TO UP MAIN LINE.
 - FOR RAIL LEVELS, FORMATION LEVEL, GRADES ETC. REFER L-SECTION.
 - BOX BRIDGE IS TO BE DESIGNED FOR 32.5 T LOADING AS APPLICABLE.
 - THE EXISTING DETAILS ARE AS PER SITE SURVEY AND SHALL BE VERIFIED BY THE CONTRACTOR BEFORE EXECUTION.
 - ENGINEER IN CHARGE/SITE ENGINEER SHOULD VERIFY THE RAIL LEVEL FORMATION LEVEL, BED LEVEL & TRACK CENTER AT SITE BEFORE COMMENCEMENT OF WORK.
 - SUITABLE BED SLOPE SHALL BE PROVIDED AND ADJUSTED AS PER SITE CONDITIONS.
 - ENGINEER IN CHARGE/SITE ENGINEER SHALL ENSURE THE SAFETY OF TRACK/ROAD AT ALL THE TIME AND SHALL TAKE NECESSARY PRECAUTIONS TO PREVENT DAMAGE OF S&T CABLE /OFC DURING EXECUTION OF WORK CONCERNED DEPT. SUCH AS BSNL/AIRTEL/SSE/SIG/ADSTE ETC. SHALL BE INFORMED WELL IN ADVANCE BEFORE EXECUTION OF WORK.
 - THIS DRAWING IS THE PROPERTY OF HRIDC AND FOR EXCLUSIVE USE OF HRDC.
 - DETAILED DESIGN DRAWING WILL BE PREPARED BASED ON THIS CONCEPTUAL APPROVED GAD.
 - THICKNESS OF STRUCTURAL MEMBERS ARE TENTATIVE AND WILL BE FINALISED AFTER DETAILED DESIGN.
- B) TECHNICAL NOTES :**
- PROTECTION WORK ON SLOPES OF BANK UP TO 15M BOTH SIDES ON APPROACHES OF BRIDGE SHALL BE DONE AS PER SKETCH NO. GC-HRIDC-SK-GEN-015.
 - INSPECTION STEPS SHALL BE PROVIDED AT DIAGONALLY OPPOSITE ENDS OF THE BOX AFTER PROTECTION WORK.
 - FOR PROPER DRAINAGE OF WATER, 50mm PCC M-20 WITH SUITABLE SLOPE TO BE USED ON TOP OF BOX SLAB.
 - ALL CLEAN EXPANSION JOINTS SHALL BE FILLED WITH THERMOCOL.
 - PLACEMENT LEVEL OF BOX AS SHOWN IN THIS GAD IS INDICATIVE AND MAY BE SUITABLY LOWERED/ELEVATED BASED UPON THE REQUIREMENT OF CLEARANCE, DRAINAGE & NATURAL GROUND PROFILE.
 - DESIGN CRITERIA SHALL BE BASED ON FOLLOWING IRS CODES
 - IRS BRIDGE RULE
 - IRS CONCRETE BRIDGE CODE
 - IRS BRIDGE SUB-STRUCTURE & FOUNDATION CODE
 - SEISMIC ZONE- IV
 - EXPOSURE CONDITION- MODERATE.
 - DURING CONSTRUCTION, IF REQUIRED, ROAD CLOSURE TO BE OBTAINED FROM CONCERNED ROAD/CIVIL AUTHORITIES. DIVERSION OF ROAD IF ANY, REQUIRED IS TO BE DONE BY CONTRACTOR AT HIS COST.
 - THE BACK FILL MATERIAL SHALL BE CONFORMING TO CLAUSE 7.5 OF IRS SUB-STRUCTURE AND FOUNDATION CODE.
 - ALL RCC SURFACES COMING IN CONTACT WITH SOIL SHOULD BE PAINTED WITH BITUMEN OR COAL TAR OF APPROVED QUALITY @ 1.464 K.G/SQM CONFORMING TO IS-3117.
 - REINFORCEMENT SHALL BE Fe 500D (TMT) CONFORMING TO IS 1786
 - FOR CONCRETE SPECIFICATION REFER IRS CONCRETE BRIDGE CODE. GRADE OF CONCRETE :
 - ALL RCC /WEARING COURSE(WC) =M-35/DETAILED DESIGN DRG.
 - LEVELING COURSE/LEAN CONCRETE =M-20/DETAILED DESIGN DRG.
 - BEARING CAPACITY OF SOIL SHALL BE ENSURED AS PER DETAILED DESIGN REQUIREMENT. GROUND IMPROVEMENT SHALL BE CARRIED OUT AS PER GT REPORT AND CONFIRMED THROUGH FIELD TESTING.
 - FOUNDATION LEVEL SHOWN IN DRAWING IS TENTATIVE. DETAILED DESIGN DRAWING SHALL BE FOLLOWED FOR FOUNDATION LEVEL DURING EXECUTION.
 - HEIGHT GAUGE SHALL BE PROVIDED AS PER RDSO STANDARD DRAWING NO. RDSO/M0001.
 - SPEED BREAKER SHOULD BE PROVIDED ON EITHER APPROACH OF RUB AT A DISTANCE OF 20M FROM THE BRIDGE COVERING FULL WIDTH OF THE ROAD INCLUDE BERMS.
 - SMOOTH TRANSITION SHALL BE PROVIDED BETWEEN THE EXISTING LINED CANAL/DRAIN AND THE BOX.

IMPORTANT NOTE:
TOP OF BOTTOM SLAB OF RCC BOX SHALL NOT BE KEPT ABOVE THE NATURAL GROUND LEVEL. HOWEVER, ROAD LEVEL AND VERTICAL CLEARANCE ABOVE ROAD LEVEL SHALL BE MAINTAINED AS SHOWN IN THE DRAWING. OVERALL HEIGHT OF THE BOX MAY NEED MODIFICATION ACCORDINGLY. THE HEIGHT OF RCC BOX SHALL BE PROVIDED KEEPING ABOVE PROVISION IN VIEW.

PROJECT:
HARYANA ORBITAL RAIL CORRIDOR
CONNECTING PALWAL TO SONIPAT BYPASSING DELHI AREA BY LINKING ASAOTI-PATLI-SULTANPUR-ASAUDAH BY NEW ELECTRIFIED BG DOUBLE LINE

CLIENT:
HARYANA RAIL INFRASTRUCTURE DEVELOPMENT CORPORATION LIMITED.

CONSULTANT:
GENERAL CONSULTANT FOR HARYANA ORBITAL RAIL CORRIDOR
RITES Limited in consortium with SMEC International Pty. Ltd.

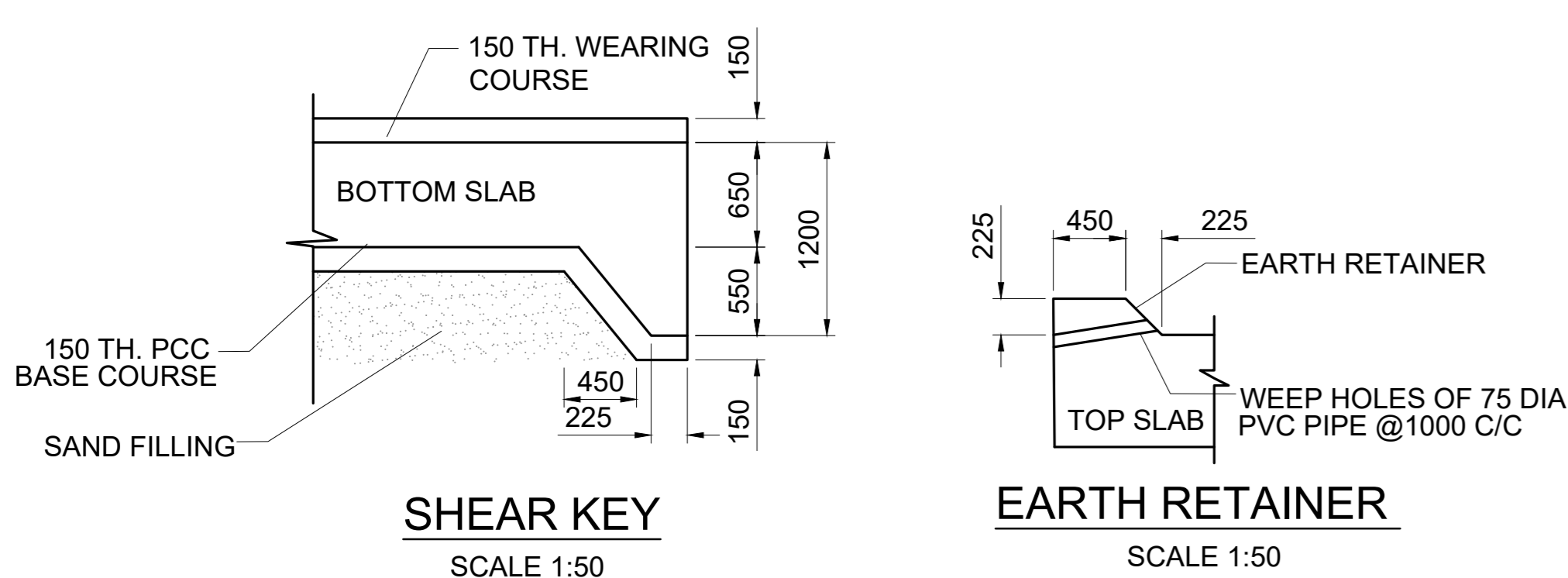


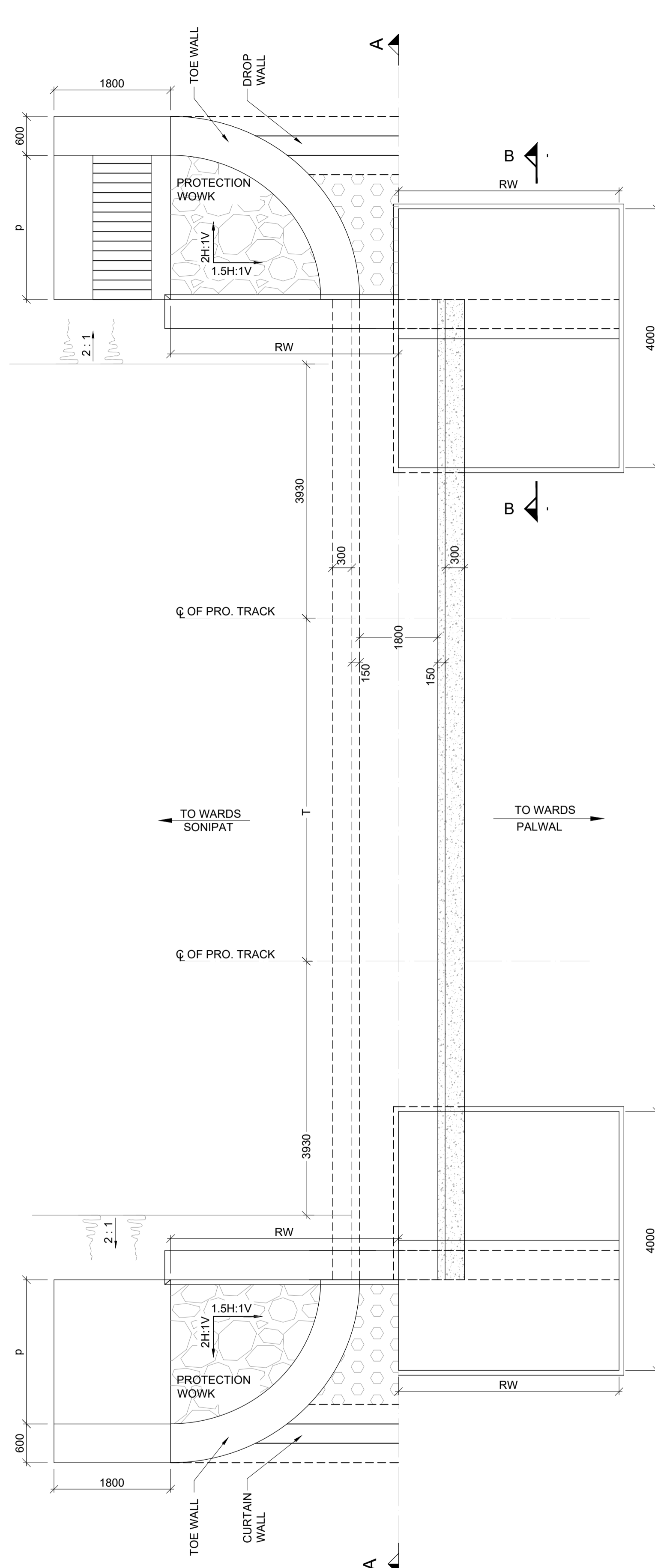
TITLE:- CONCEPTUAL GENERAL ARRANGEMENT DRAWING
FOR DRAIN + ROAD BRIDGE NO. 048 SPAN 1x4.0x5.0+1x5x5 RCC BOX AT CH: 12298.962

DRG. NO. GC-HRIDC-C4-DRW-BRD-GAD-01048_A1
SHEET NO. 1 OF 1

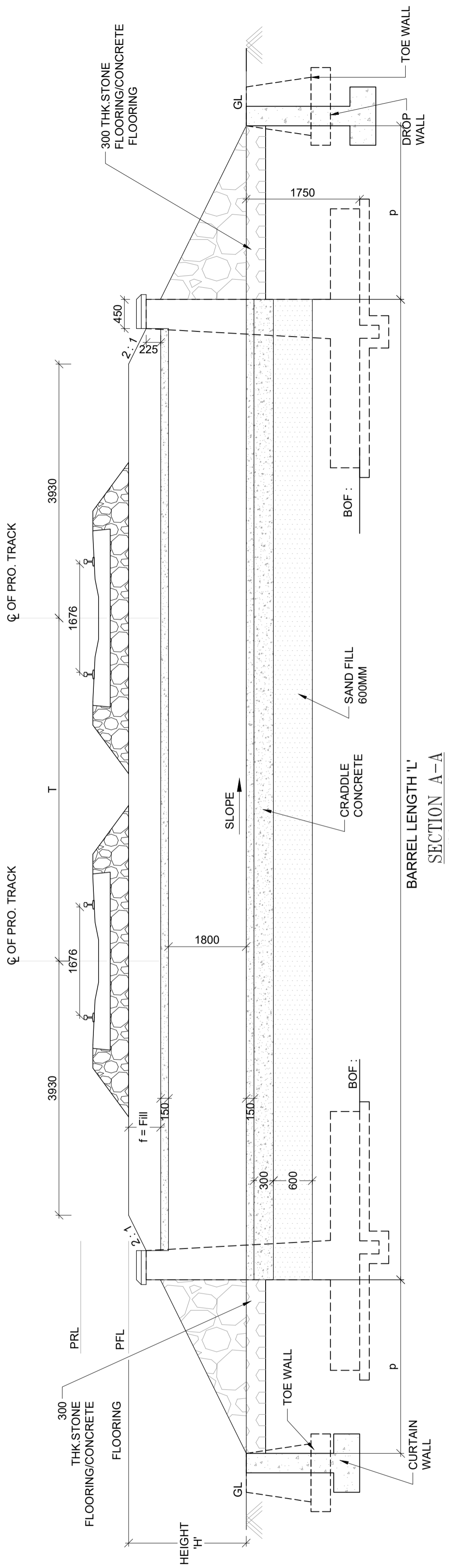
SCALE : AS SHOWN
ISSUE DATE 07-11-2022
REVISED DATE 21-11-2022

GC/HORC		HRIDC	
NAME / DESIGNATION	SIGN	NAME / DESIGNATION	SIGN
CHAHATEY RAM PD	<i>Chahatey Ram</i>	SHIV OM DWIVEDI CPM/HRIDC	<i>Shiv</i>
SUDHIR AGRAWAL DPD/CIVIL	<i>Sudhir</i>	RAJU SOLANKI DGM/CIVIL/SOUTH	<i>Raju</i>
REETU PATIAL CDE/ CIVIL	<i>Reetu</i>		

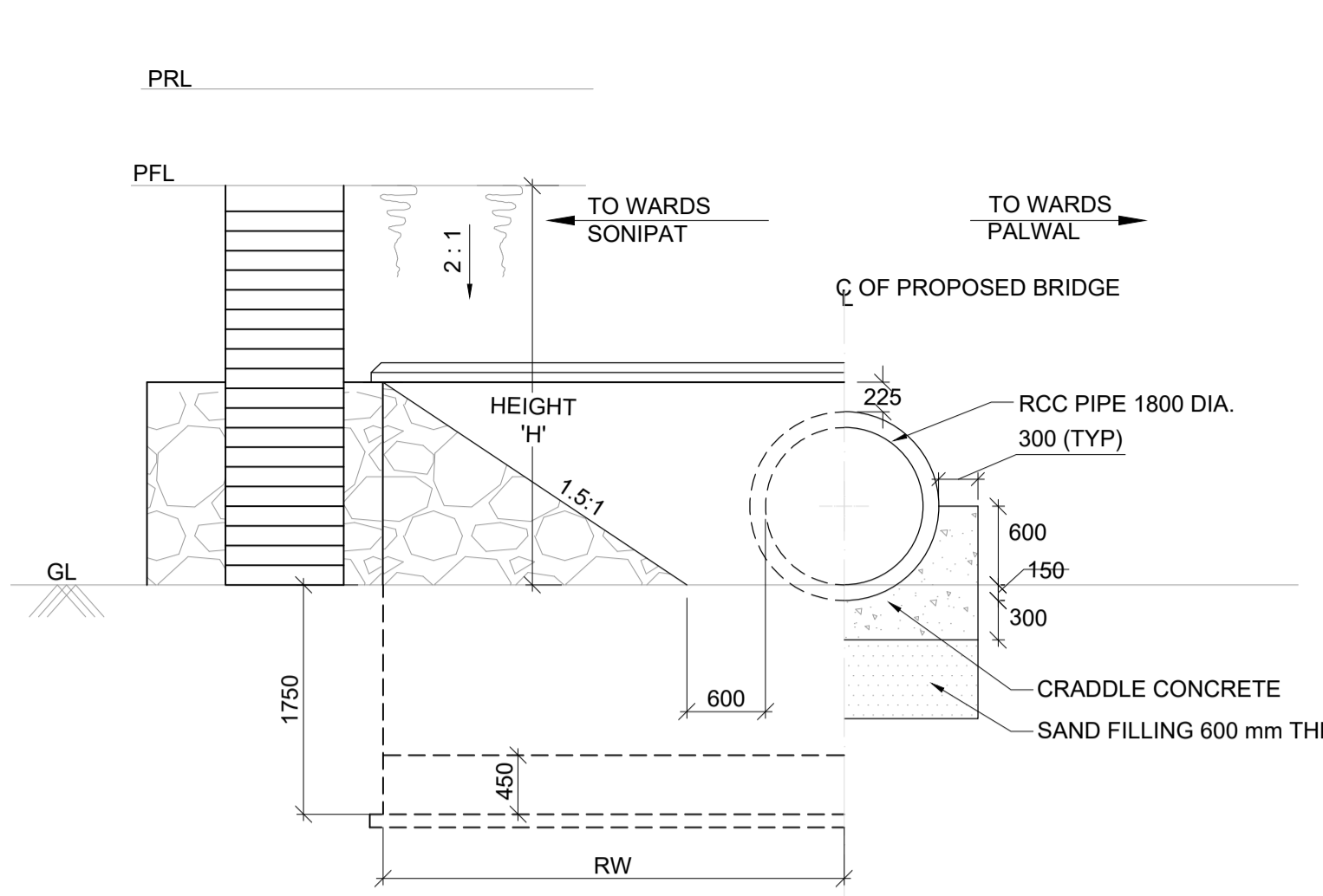




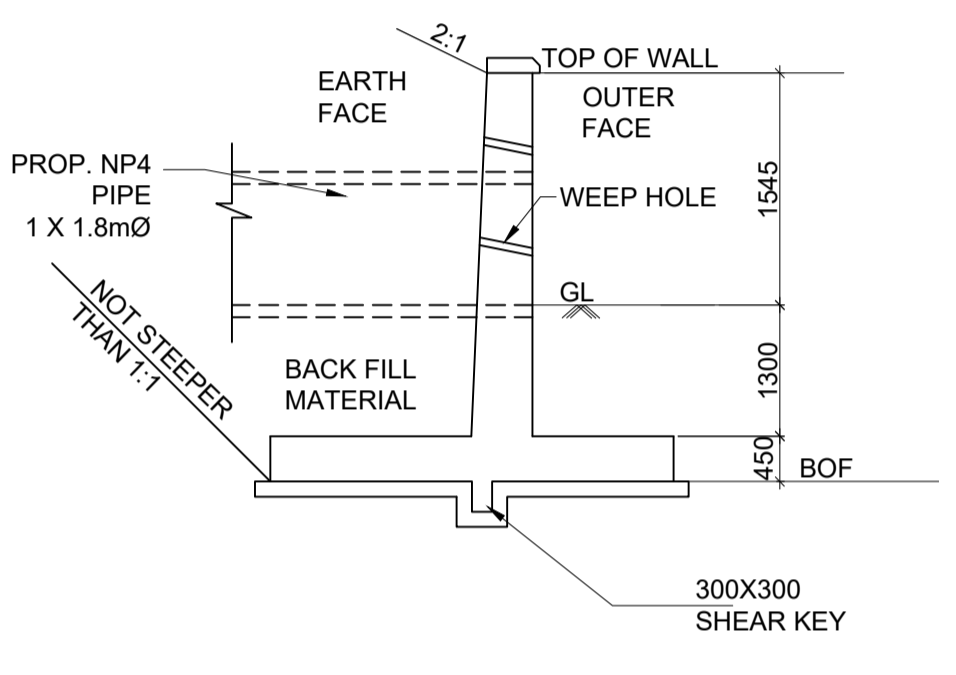
HALF PLAN AT TOP HALF PLAN AT BOTTOM (SCALE 1:50)



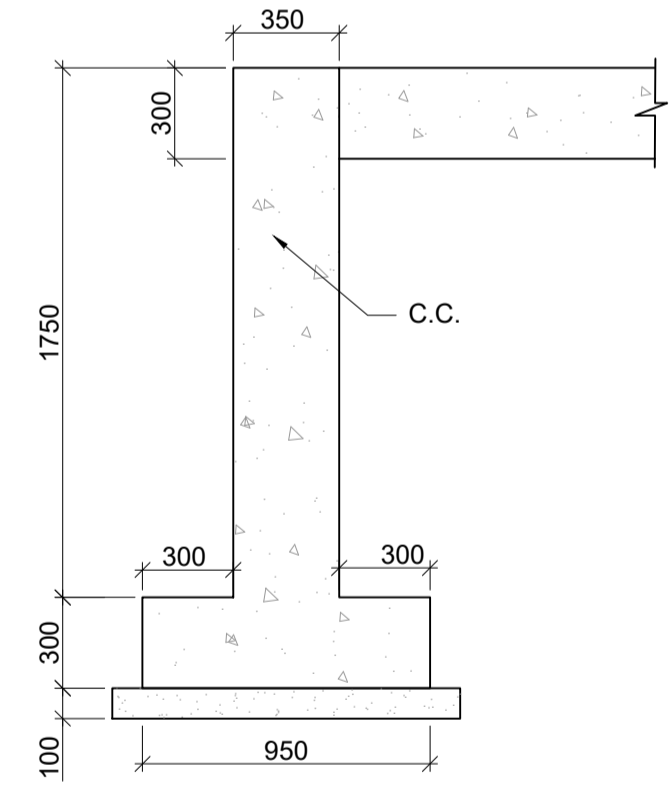
SECTION A-A (SCALE 1:50)



HALF ELEVATION HALF SECTION (SCALE 1:50)



SECTION B-B (SCALE 1:75)



DROP / CURTAIN WALL (SCALE 1:25)

LEGEND

P.F.L	PROPOSED FORMATION LEVEL
P.R.L	PROPOSED RAIL LEVEL
G.L	GROUND LEVEL
BOF	BOTTOM OF FOUNDATION
PROP.	PROPOSED
EXG.	EXISTING
THK.	THICKNESS
CH.	CHAINAGE
PCC	PLAIN CEMENT CONCRETE
RCC	REINFORCED CEMENT CONCRETE
BR.	BRIDGE

CONSTRUCTION DEPTH

1) RAIL (60kg)	172 mm
2) RUBBER PAD	10 mm
3) WIDER PSC SLEEPER HEIGHT AT RAIL SEAT	210 mm
4) MINIMUM BALLAST THK.	350 mm
TOTAL	742 mm

COLOR CODE LEGEND

RED	PROPOSED
CONTINUOUS	VISIBLE
DOTTED	INVISIBLE
BLACK	EXISTING

Sr. No.	Chainage (in m)	Br. No.	Span	Prop. RL	Prop. FL	BL	Clear Height	Track on	No. of tracks	T c/c	RW	P	f	H	L
1	12341.836	49	1x1.8m	201.054	200.312	194.996	1.800	Curve	2	5.640	4.765	3.3	3.366	5.316	26.064

GC/HORC		HRIDC	
NAME / DESIGNATION	SIGN	NAME / DESIGNATION	SIGN
CHAHATEY RAM PD	<i>Chahatey Ram</i>	SHIV OM DWIVEDI CPM/HRIDC	<i>Shiv</i>
SUDHIR AGRAWAL DPD/CIVIL	<i>Sudhir</i>	RAJU SOLANKI DGM/CIVIL/SOUTH	<i>Raju</i>
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- NOTES :**
- A) GENERAL NOTES**
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 - THE CHAINAGES SHOWN ARE RECKONED FROM C/L OF PRITHALA STATION BUILDING TAKEN AS 0.00 M, WITH RESPECT TO UP MAIN LINE.
 - FOR RAIL LEVELS, FORMATION LEVEL, GRADES ETC. REFER L-SECTION.
 - STRUCTURE IS TO BE DESIGNED FOR 32.5 T LOADING AS APPLICABLE.
 - THE EXISTING DETAILS ARE AS PER SITE SURVEY AND SHALL BE VERIFIED BY THE CONTRACTOR BEFORE EXECUTION.
 - ENGINEER IN CHARGE/SITE ENGINEER SHOULD VERIFY THE RAIL LEVEL FORMATION LEVEL, BED LEVEL & TRACK CENTER AT SITE BEFORE COMMENCEMENT OF WORK.
 - SUITABLE BED SLOPE SHALL BE PROVIDED AND ADJUSTED AS PER SITE CONDITIONS.
 - ENGINEER IN CHARGE/SITE ENGINEER SHALL ENSURE THE SAFETY OF TRACK/ROAD AT ALL THE TIME AND SHALL TAKE NECESSARY PRECAUTIONS TO PREVENT DAMAGE OF S&T CABLE /OFC DURING EXECUTION OF WORK CONCERNED DEPT. SUCH AS BSNL/AIRTEL/SSE/SIG/ADSTE ETC. SHALL BE INFORMED WELL IN ADVANCE BEFORE EXECUTION OF WORK.
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 - ALL CLEAN/ EXPANSION JOINTS SHALL BE FILLED WITH THERMOCOL.
 - PLACEMENT LEVEL OF PIPE AS SHOWN IN THIS GAD IS INDICATIVE AND MAY BE SUITABLY LOWERED/ELEVATED BASED UPON THE REQUIREMENT OF DRAINAGE & NATURAL GROUND PROFILE.
 - DESIGN CRITERIA SHALL BE BASED ON FOLLOWING IRS CODES
 - IRS BRIDGE RULE
 - IRS CONCRETE BRIDGE CODE
 - IRS BRIDGE SUB-STRUCTURE & FOUNDATION CODE
 - SEISMIC ZONE- IV
 - EXPOSURE CONDITION- MODERATE.
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 - REINFORCEMENT SHALL BE Fe 500D (TMT) CONFORMING TO IS 1786
 - FOR CONCRETE SPECIFICATION REFER IRS CONCRETE BRIDGE CODE.
 - GRADE OF CONCRETE :-
 - ALL RCC /WEARING COURSE =M.35/DETAILED DESIGN DRG.
 - LEVELING COURSE/LEAN CONCRETE =M.20/DETAILED DESIGN DRG.
 - BEARING CAPACITY OF SOIL SHALL BE ENSURED AS PER DETAILED DESIGN REQUIREMENT. IF REQUIRED GROUND IMPROVEMENT MAY BE CARRIED OUT AND CONFIRMED THROUGH FIELD TESTING.

PROJECT:
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 CONNECTING PALWAL TO SONIPAT BYPASSING DELHI AREA BY LINKING ASAOOTI-PATLI-SULTANPUR-ASAUDAH BY NEW ELECTRIFIED BG DOUBLE LINE

CLIENT:

HARYANA RAIL INFRASTRUCTURE DEVELOPMENT CORPORATION LIMITED.

CONSULTANT:

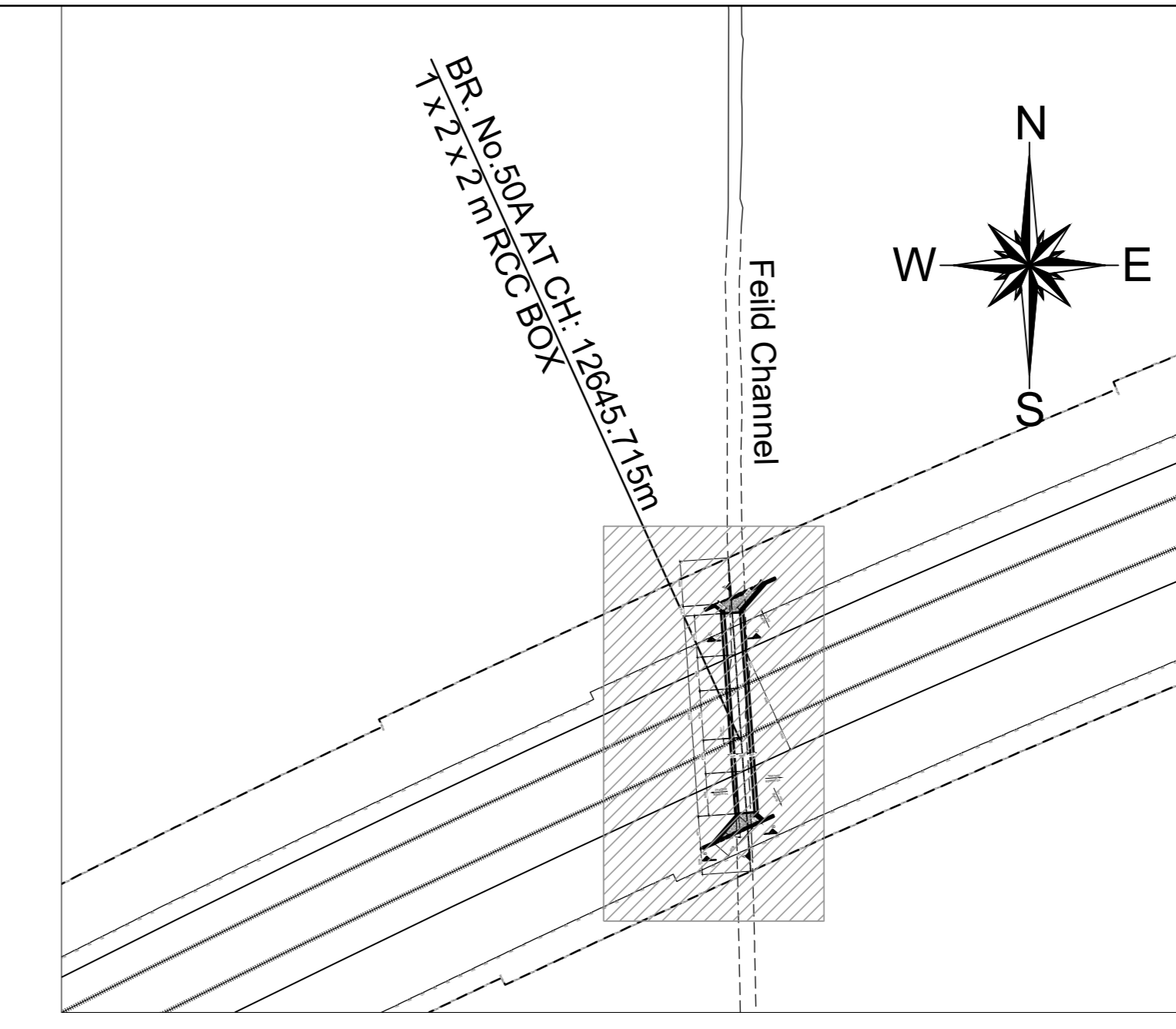
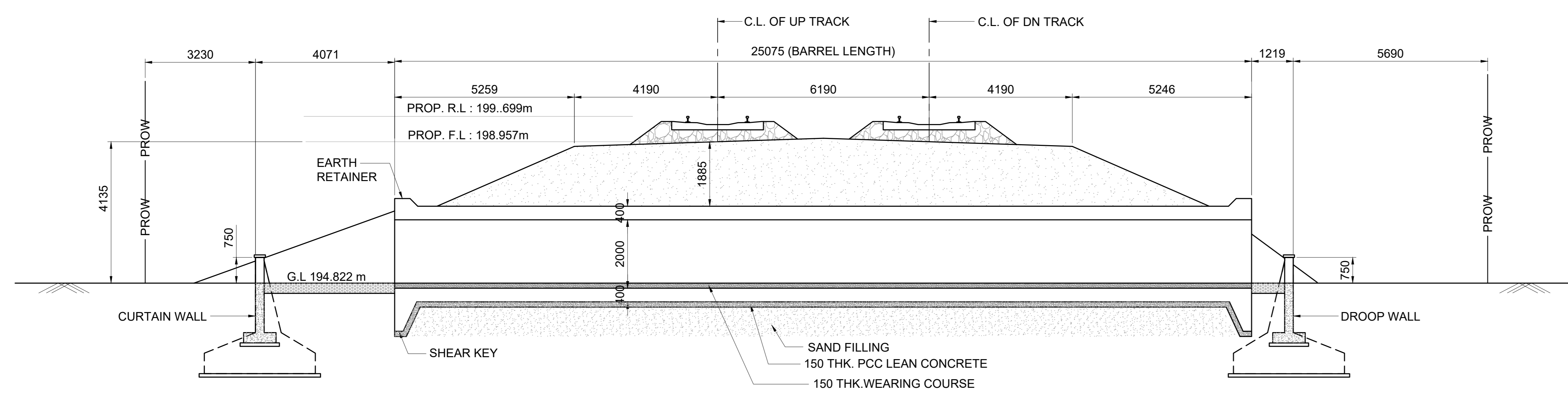
GENERAL CONSULTANT FOR HARYANA ORBITAL RAIL CORRIDOR
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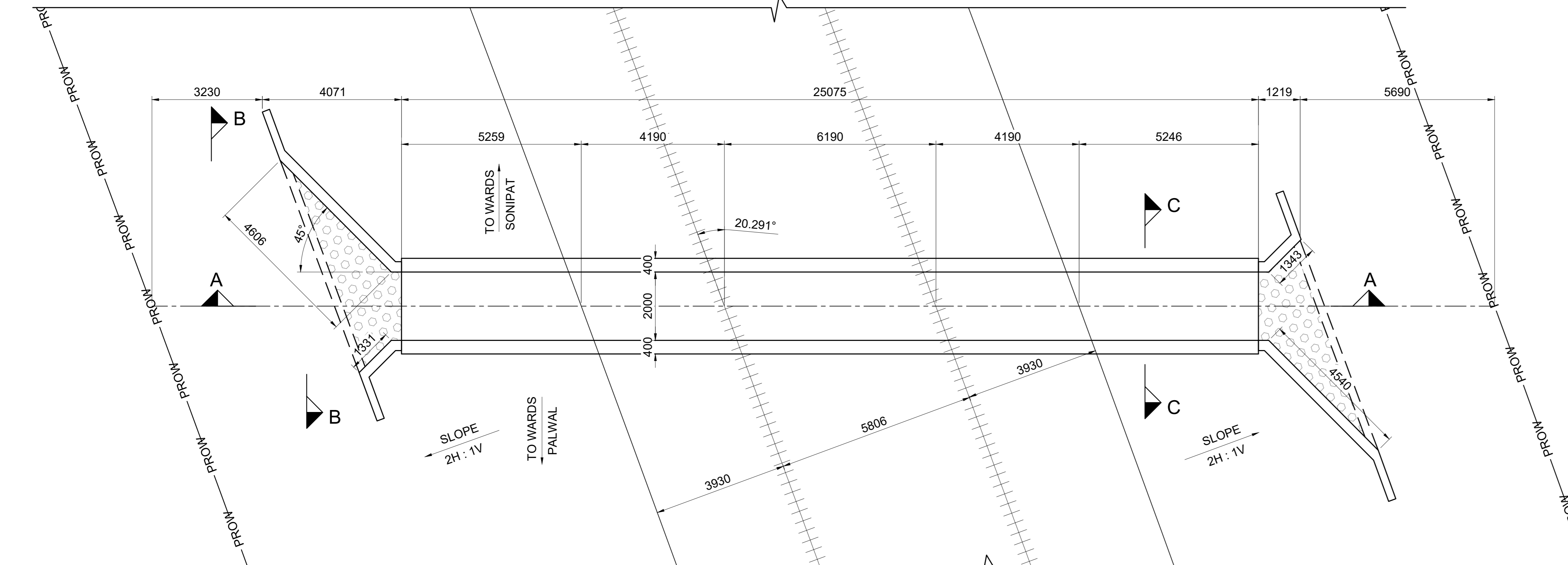
TITLE:- **CONCEPTUAL GENERAL ARRANGEMENT DRAWING**
 FOR PIPE CULVERT BRIDGE NO. 049 SPAN 1.0X1.800 PIPE CULVERT AT CH: 12341.836

DRG. NO. GC-HRIDC-C4-DRW-BRD-GAD-01049_A1 **SHEET NO.** 1 OF 1

SCALE : AS SHOWN **ISSUE DATE** 07-11-2022 **REVISED DATE** 21-11-2022

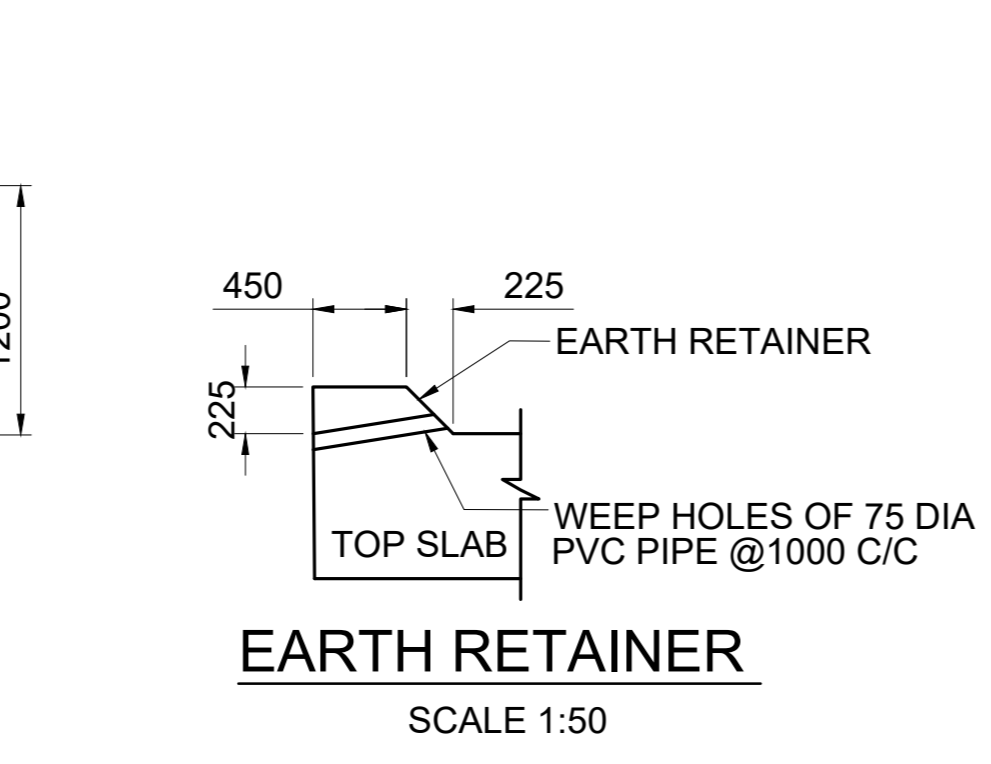
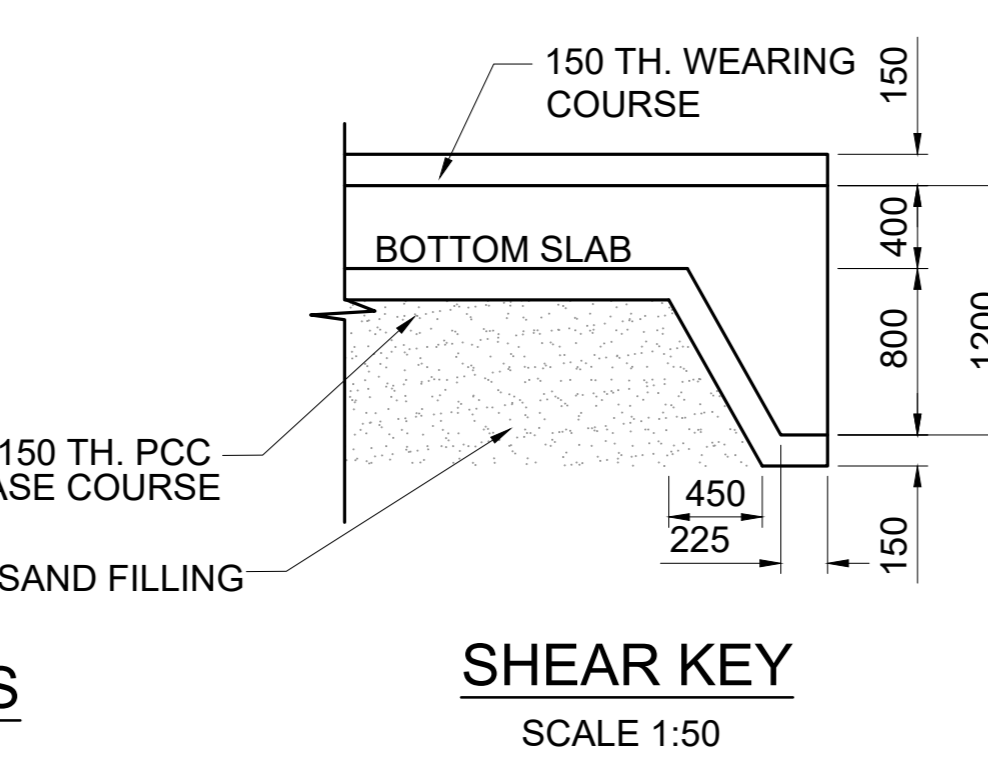
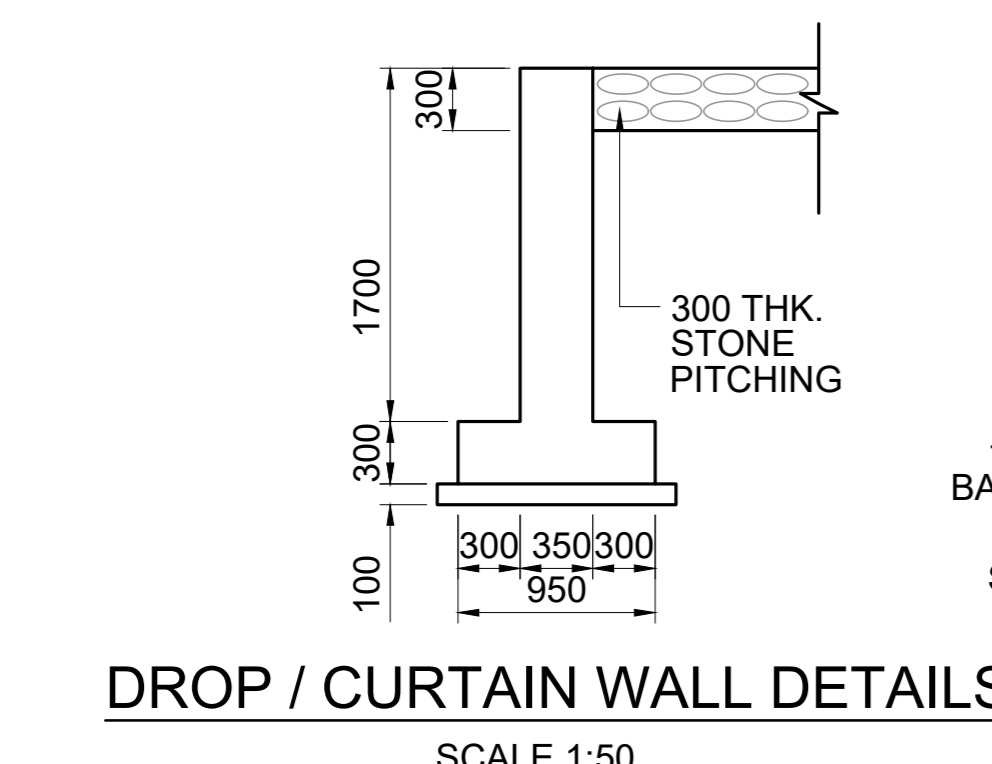
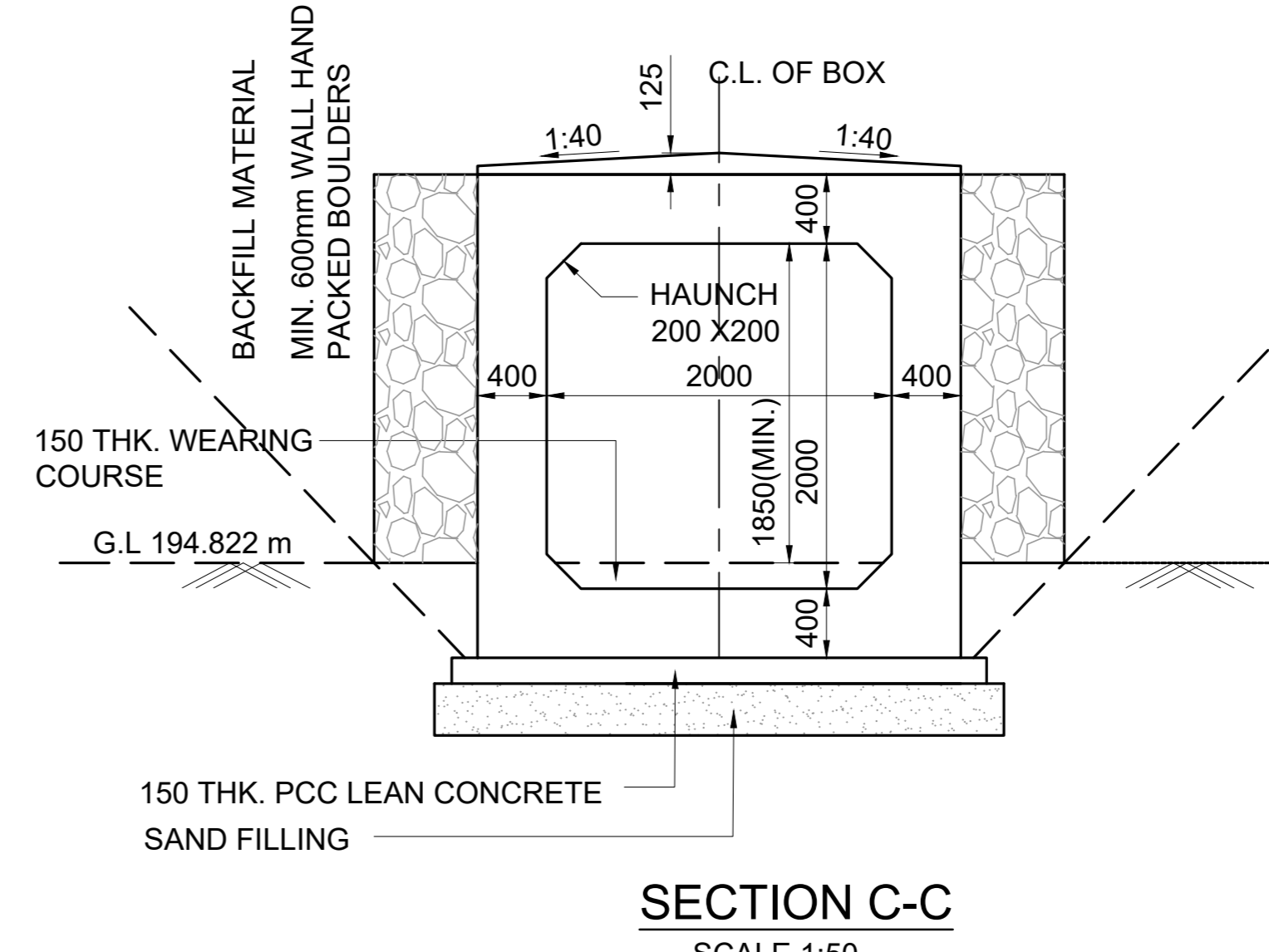
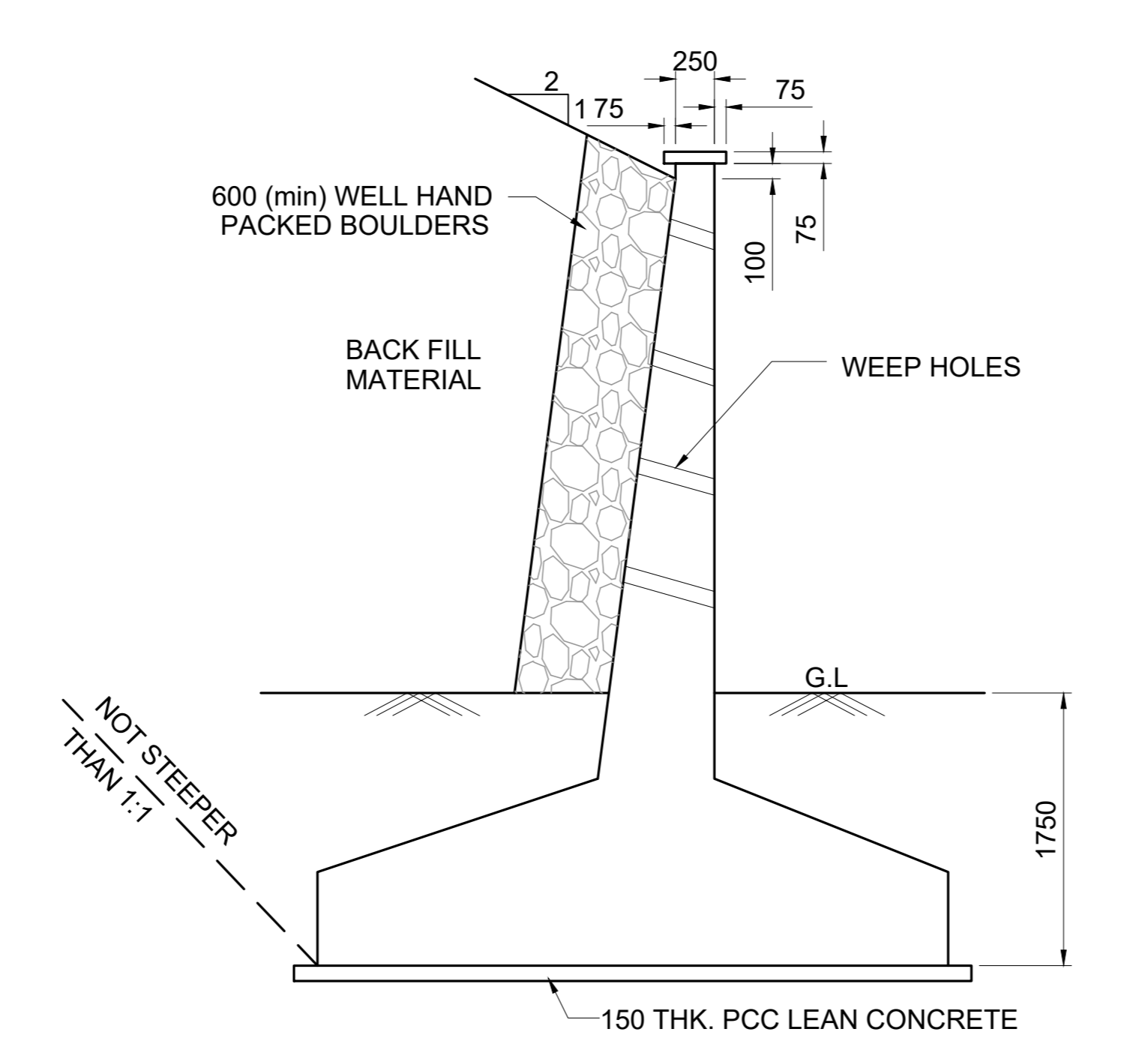
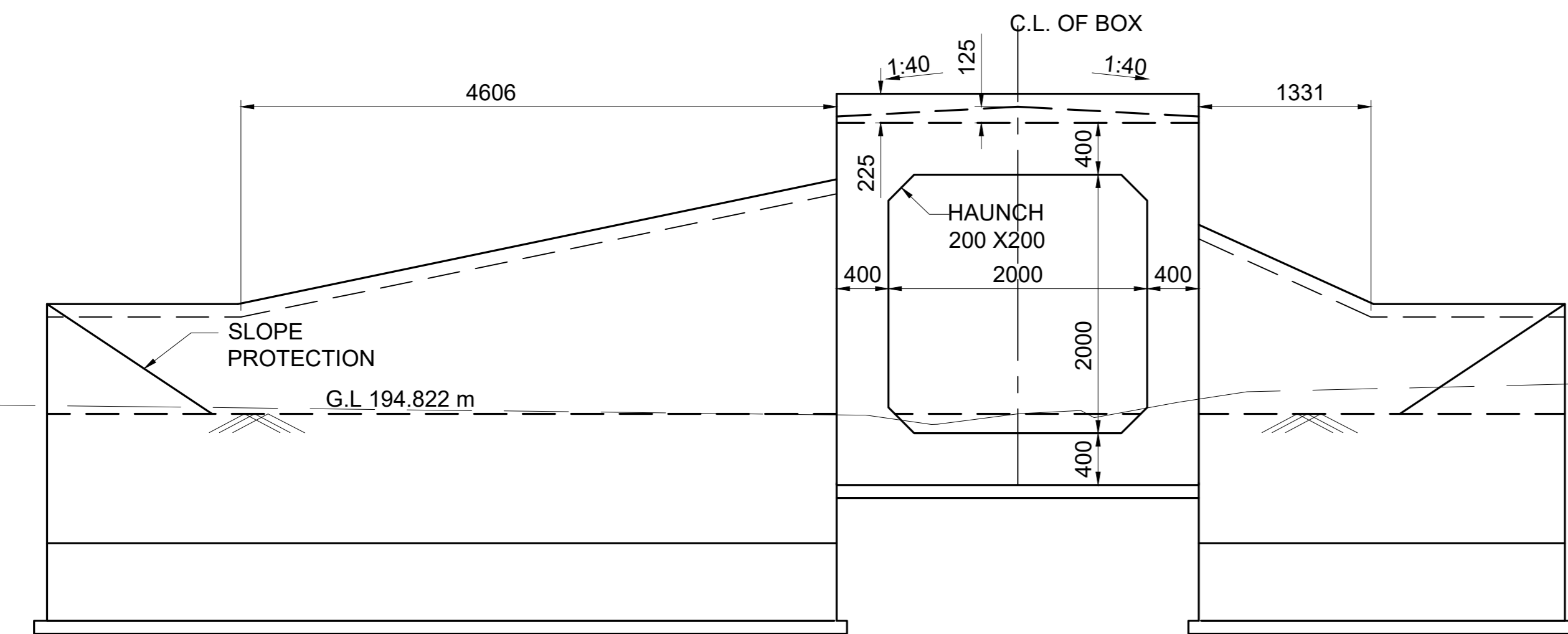


- NOTES :**
- A) GENERAL NOTES**
- ALL DIMENSIONS ARE IN MILLIMETERS EXCEPT LEVELS WHICH ARE IN METER, UNLESS OTHERWISE MENTIONED.
 - THE CHAINAGES SHOWN ARE RECKONED FROM C/L OF PRITHALA STATION BUILDING TAKEN AS 0.00 M, WITH RESPECT TO UP MAIN LINE.
 - FOR RAIL LEVELS, FORMATION LEVEL, GRADES ETC. REFER L-SECTION.
 - BOX BRIDGE IS TO BE DESIGNED FOR 32.5 T LOADING AS APPLICABLE.
 - THE EXISTING DETAILS ARE AS PER SITE SURVEY AND SHALL BE VERIFIED BY THE CONTRACTOR BEFORE EXECUTION.
 - ENGINEER IN CHARGE/ SITE ENGINEER SHOULD VERIFY THE RAIL LEVEL FORMATION LEVEL, BED LEVEL & TRACK CENTER AT SITE BEFORE COMMENCEMENT OF WORK.
 - SUITABLE BED SLOPE SHALL BE PROVIDED AND ADJUSTED AS PER SITE CONDITIONS.
 - ENGINEER IN CHARGE/SITE ENGINEER SHALL ENSURE THE SAFETY OF TRACK/ROAD AT ALL THE TIME AND SHALL TAKE NECESSARY PRECAUTIONS TO PREVENT DAMAGE OF S&T CABLE /OFC DURING EXECUTION OF WORK CONCERNED DEPT. SUCH AS BSNL/AIRTEL/SSE/SIG/ADSTE ETC. SHALL BE INFORMED WELL IN ADVANCE BEFORE EXECUTION OF WORK.
 - THIS DRAWING IS THE PROPERTY OF HRIDC AND FOR EXCLUSIVE USE OF HORC.
 - DETAILED DESIGN DRAWING WILL BE PREPARED BASED ON THIS CONCEPTUAL APPROVED GAD.
 - THICKNESS OF STRUCTURAL MEMBERS ARE TENTATIVE AND WILL BE FINALISED AFTER DETAILED DESIGN.
- B) TECHNICAL NOTES :**
- PROTECTION WORK ON SLOPE OF BANK UP TO 15M BOTH SIDES ON APPROACHES OF BRIDGE SHALL BE DONE AS PER SKETCH NO. GC-HRIDC-SK-GEN-015.
 - INSPECTION STEPS SHALL BE PROVIDED AT DIAGONALLY OPPOSITE ENDS OF THE BOX AFTER PROTECTION WORK.
 - FOR PROPER DRAINAGE OF WATER, 50mm PCC M-20 WITH SUITABLE SLOPE TO BE USED ON TOP OF BOX SLAB.
 - ALL CLEAN/ EXPANSION JOINTS SHALL BE FILLED WITH THERMOCOL.
 - PLACEMENT LEVEL OF BOX AS SHOWN IN THIS GAD IS INDICATIVE AND MAY BE SUITABLY LOWERED/ELEVATED BASED UPON THE REQUIREMENT OF CLEARANCE, DRAINAGE & NATURAL GROUND PROFILE.
 - DIMENSION OF THE BOX MAY BE SUITABLY MODIFIED AS PER SITE REQUIREMENT HEIGHT OF BOX SHOWN INCLUDES MINIMUM REQUIRED CLEAR OPENING HEIGHT AND WEARING COARSE. OVERALL HEIGHT OF BOX OPENING MAY VARY AS PER SITE REQUIREMENT AND ACTUAL ROAD/GROUND PROFILE.
 - DESIGN CRITERIA SHALL BE BASED ON FOLLOWING IRS CODES
 - (i) IRS BRIDGE RULE
 - (ii) IRS CONCRETE BRIDGE CODE
 - (iii) IRS BRIDGE SUB-STRUCTURE & FOUNDATION CODE
 - SEISMIC ZONE- IV
 - EXPOSURE CONDITION- MODERATE.
 - DURING CONSTRUCTION, IF REQUIRED, ROAD CLOSURE TO BE OBTAINED FROM CONCERNED ROAD/CIVIL AUTHORITIES. DIVERSION OF ROAD IF ANY, REQUIRED IS TO BE DONE BY CONTRACTOR AT HIS COST.
 - THE BACK FILL MATERIAL SHALL BE CONFORMING TO CLAUSE 7.5 OF IRS SUB- STRUCTURE AND FOUNDATION CODE.
 - ALL RCC SURFACES COMING IN CONTACT WITH SOIL SHOULD BE PAINTED WITH BITUMEN OR COAL TAR OF APPROVED QUALITY @ 1.464 K.G/SQM. CONFORMING TO IS-3117.
 - REINFORCEMENT SHALL BE Fe 500D (TMT) CONFORMING TO IS 1786 K.G/SQM. CONFORMING TO IS-3117.
 - FOR CONCRETE SPECIFICATION REFER IRS CONCRETE BRIDGE CODE. GRADE OF CONCRETE :
 - (i) ALL RCC WEARING COURSE(WC) =M:35/DETAILED DESIGN DRG.
 - (ii) LEVELING COURSE/LEAN CONCRETE =M:20/DETAILED DESIGN DRG.
 - BEARING CAPACITY OF SOIL SHALL BE ENSURED AS PER DETAILED DESIGN REQUIREMENT. GROUND IMPROVEMENT SHALL BE CARRIED OUT AS PER GT REPORT AND CONFIRMED THROUGH FIELD TESTING.
 - FOUNDATION LEVEL SHOWN IN DRAWING IS TENTATIVE. DETAILED DESIGN DRAWING SHALL BE FOLLOWED FOR FOUNDATION LEVEL DURING EXECUTION.
 - ADEQUATE SLOPE IN BOTTOM SLAB OF RCC BOX TOWARDS DIRECTION OF FLOW SHALL BE PROVIDED.



LEGEND

PRL	PROPOSED RAIL LEVEL
PFL	PROPOSED FORMATION LEVEL
HFL	HIGHEST FLOOD LEVEL
GL	GROUND LEVEL



GC/HORC		HRIDC	
NAME / DESIGNATION	SIGN	NAME / DESIGNATION	SIGN
CHAHATEY RAM PD	<i>ChahateyRam</i>	SHIV OM DWIVEDI CPM/HRIDC	<i>Shiv</i>
SUDHIR AGRAWAL DPD/CIVIL	<i>MS</i>	RAJU SOLANKI DGM/CIVIL/SOUTH	<i>Raju</i>
REETU PATIAL CDE/ CIVIL	<i>R.P.T.</i>		

PROJECT:
HARYANA ORBITAL RAIL CORRIDOR
CONNECTING PALWAL TO SONIPAT BYPASSING DELHI AREA BY LINKING ASAOTI-PATLI-SULTANPUR-ASAUDAH BY NEW ELECTRIFIED BG DOUBLE LINE

CLIENT:
HARYANA RAIL INFRASTRUCTURE DEVELOPMENT CORPORATION LIMITED.

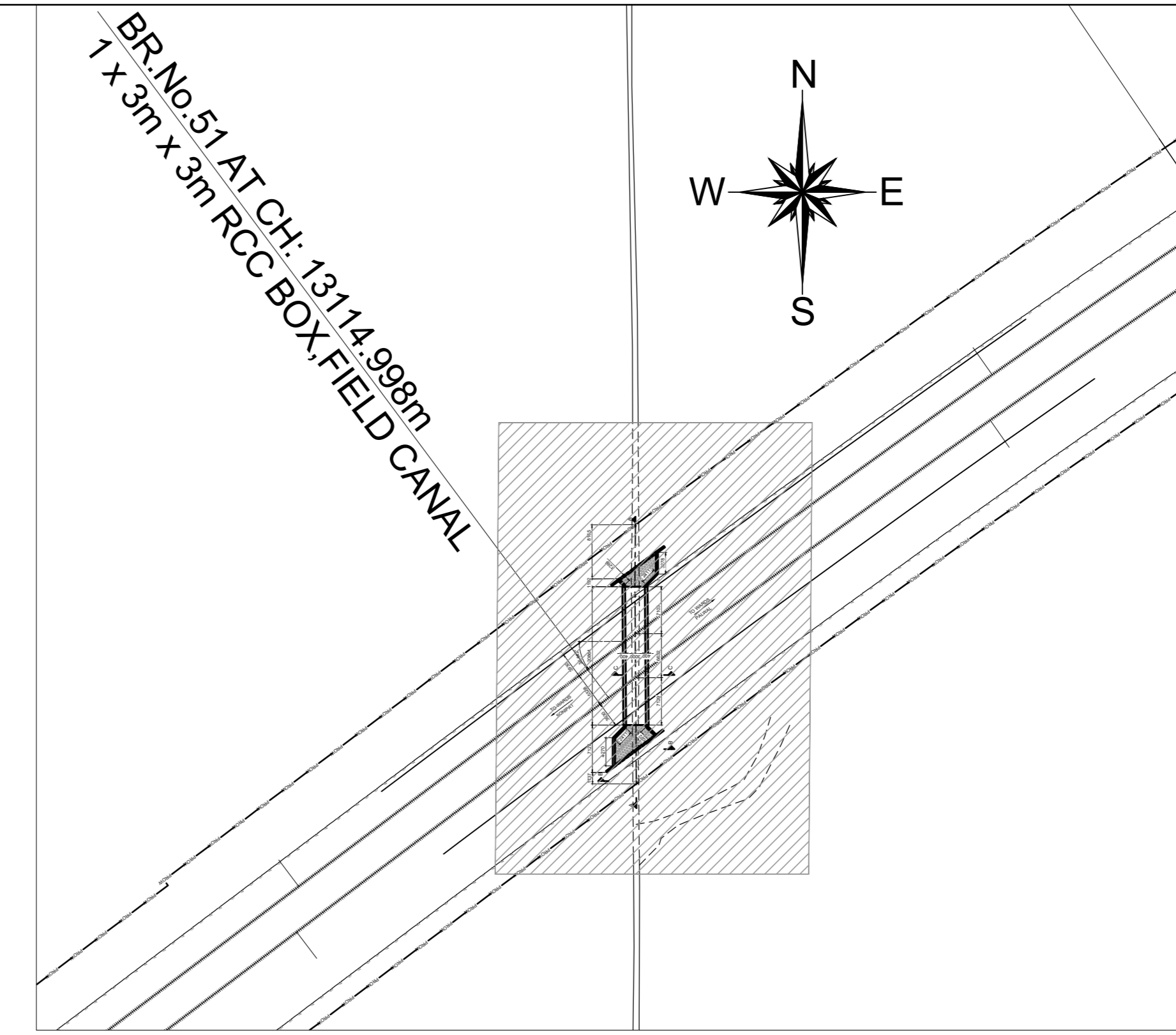
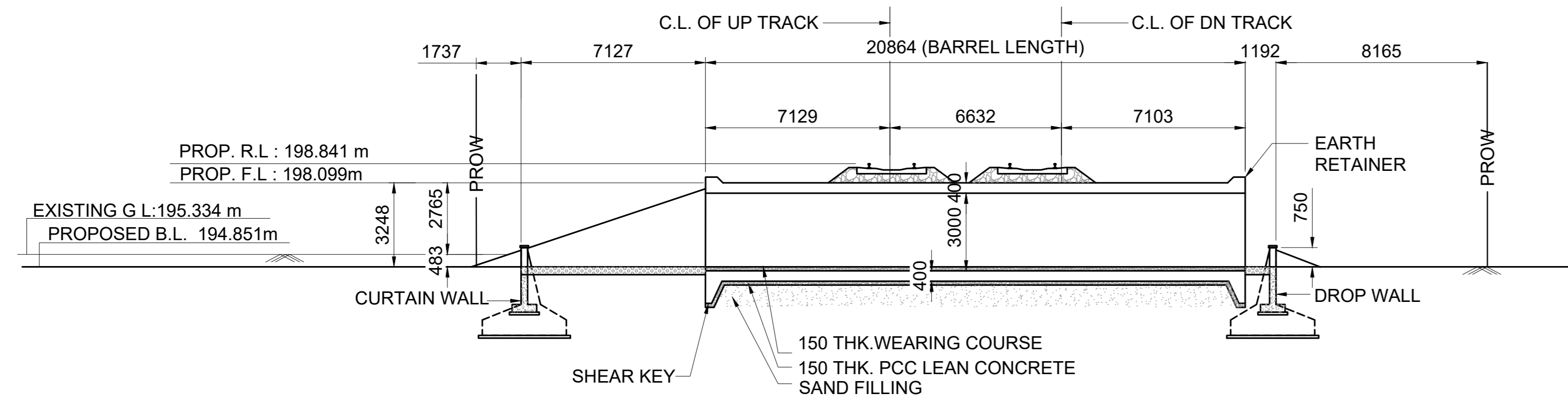
CONSULTANT:
GENERAL CONSULTANT FOR HARYANA ORBITAL RAIL CORRIDOR
RITES Limited in consortium with SMEC International Pty. Ltd.



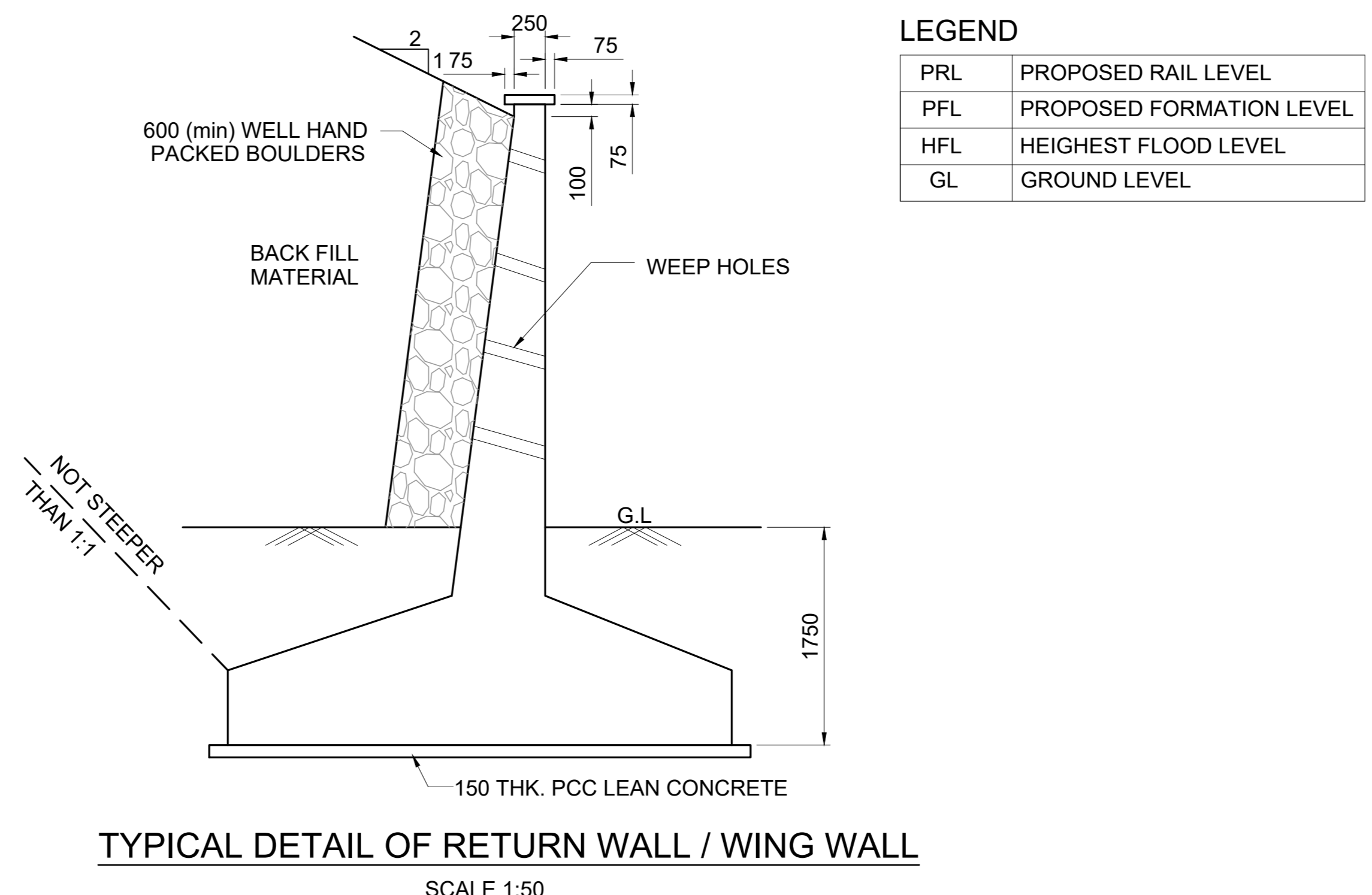
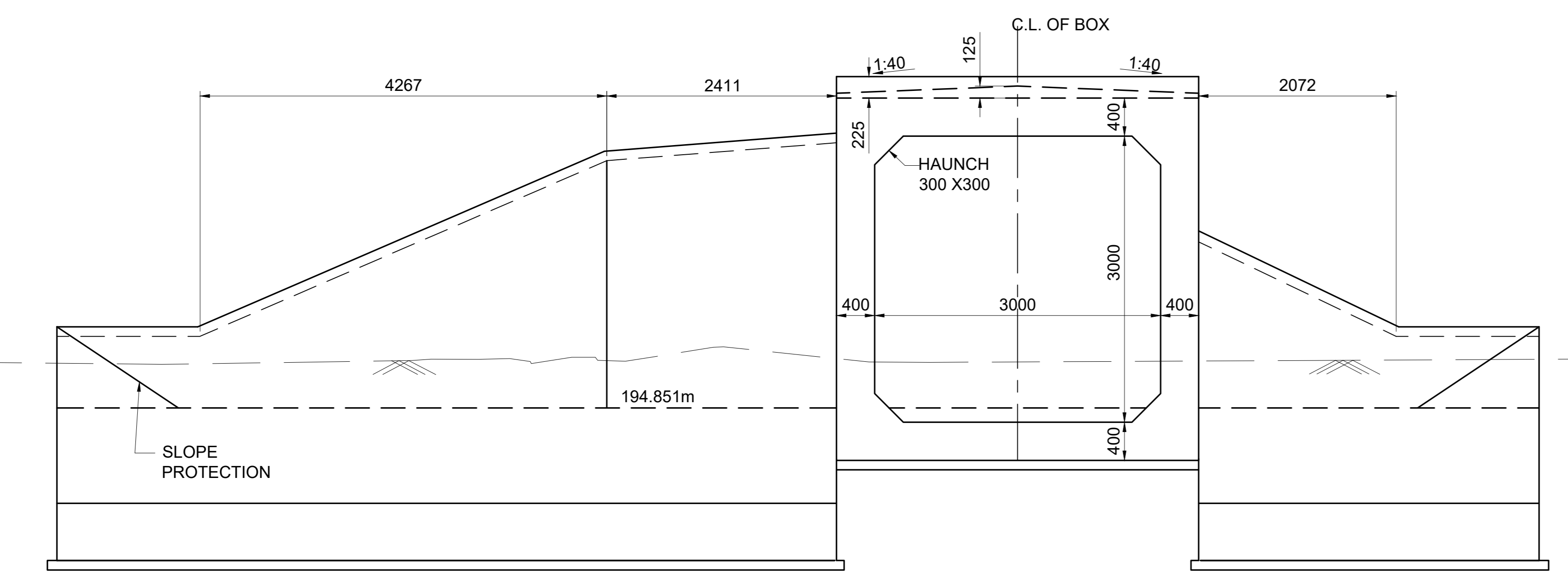
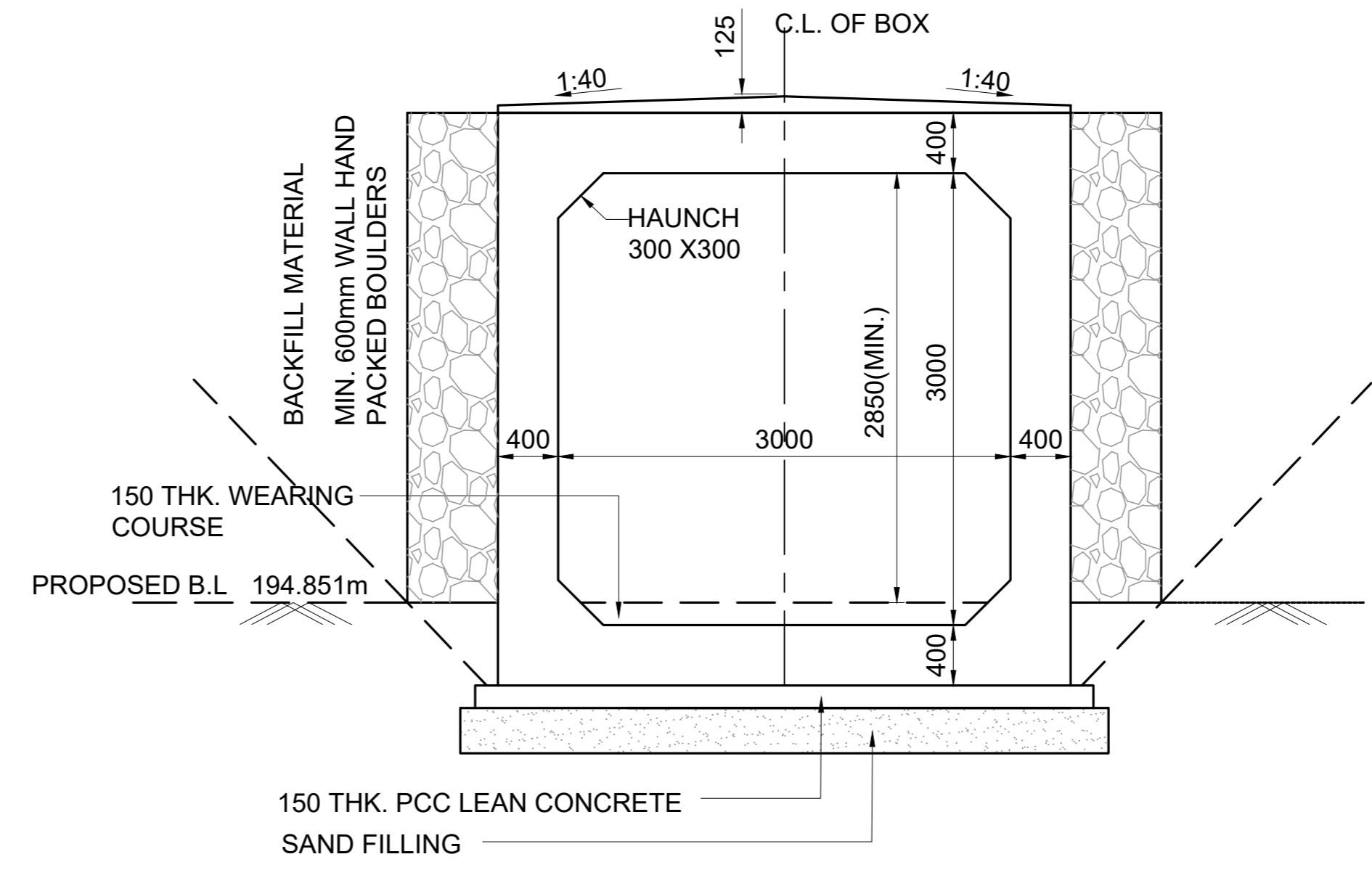
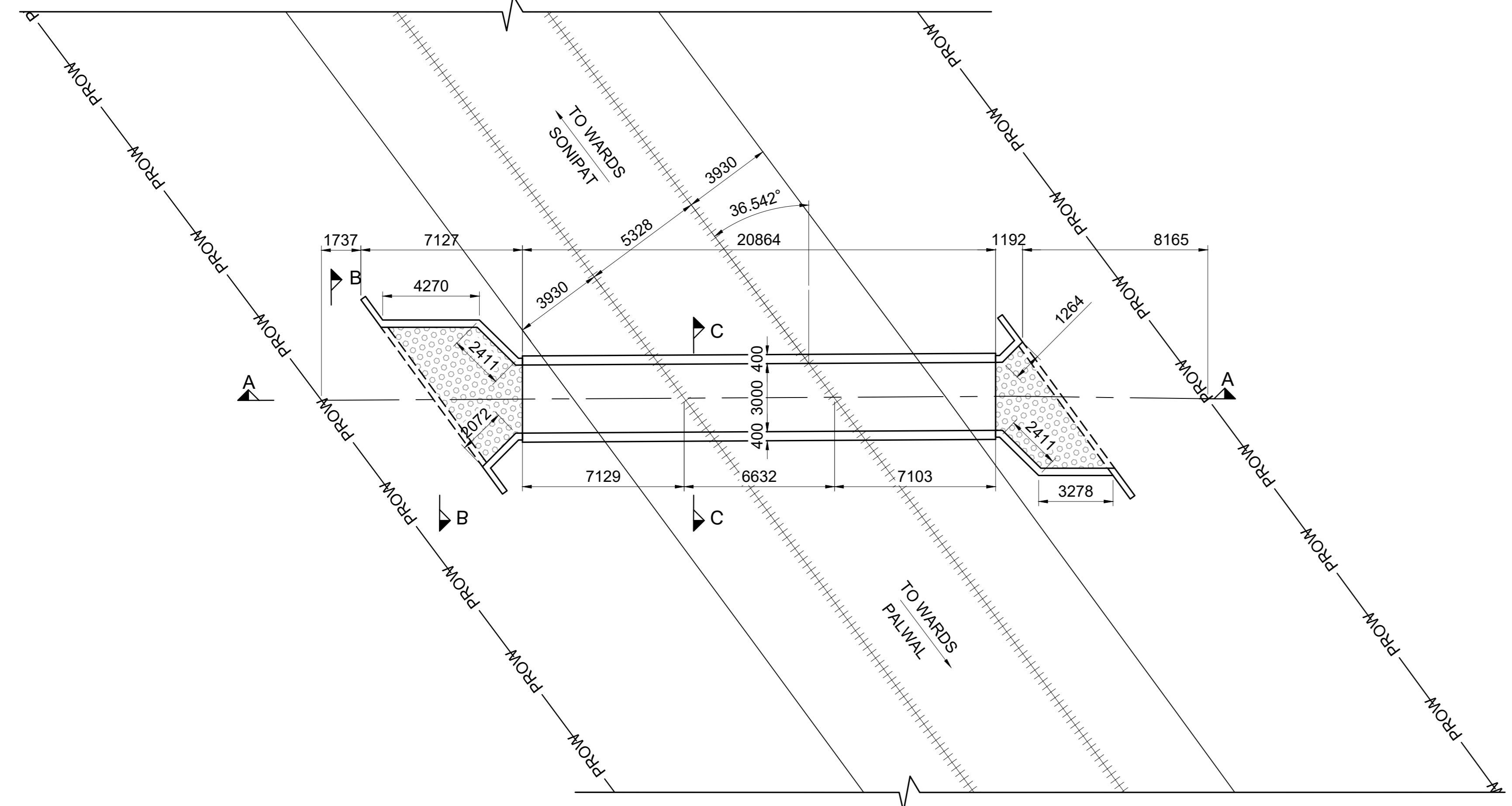
TITLE:- CONCEPTUAL GENERAL ARRANGEMENT DRAWING
FOR BALANCING CULVERT BRIDGE NO. 050
SPAN 1.0X2.0X2.0 RCC BOX AT CH: 12645.715

DRG. NO. GC-HRIDC-C4-DRW-BRD-GAD-01050_A1
SHEET NO. 1 OF 1

SCALE : AS SHOWN
ISSUE DATE 07-11-2022
REVISED DATE 21-11-2022

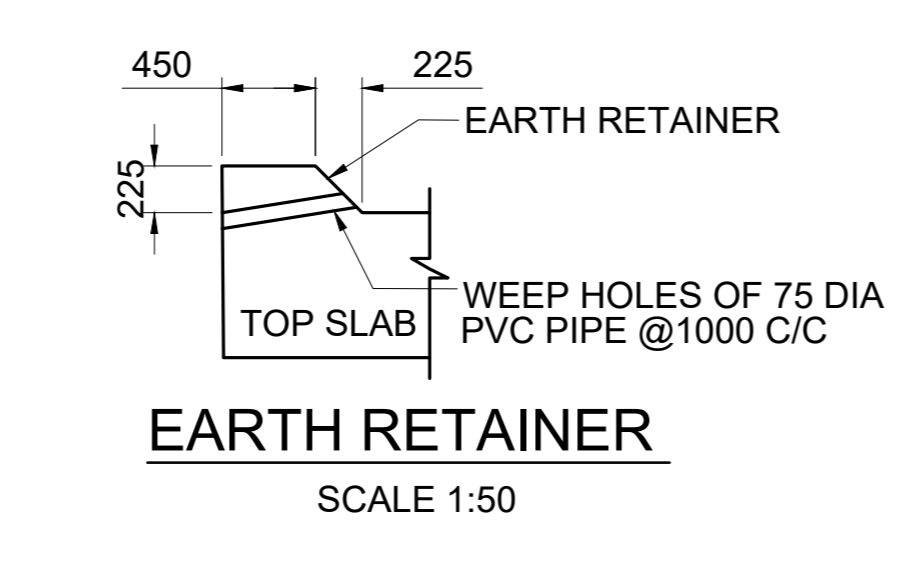
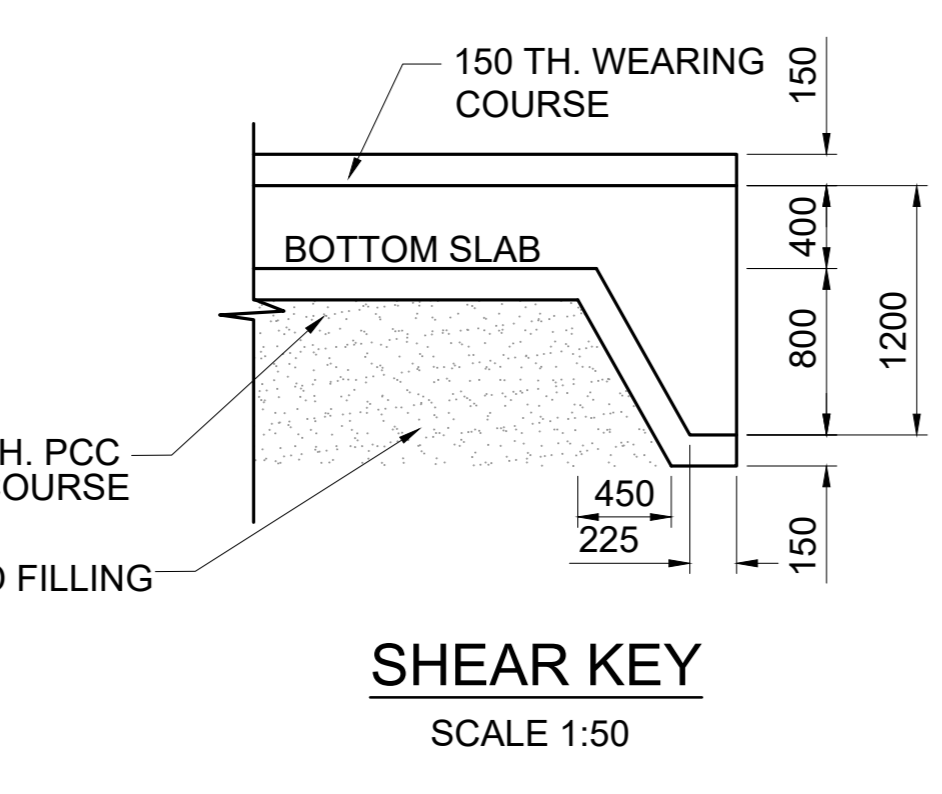
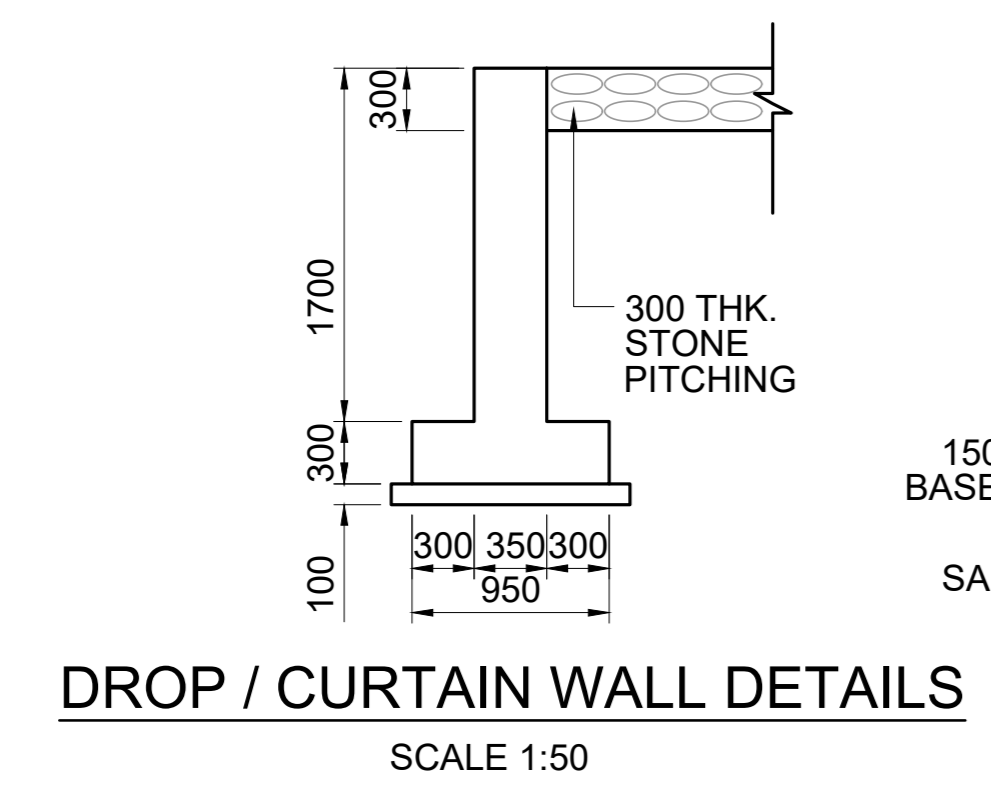


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 - WING WALL SHALL FOLLOW CANAL PROFILE.
 - SMOOTH TRANSITION SHALL BE PROVIDED BETWEEN THE EXISTING LINED CANAL/DRAIN AND THE BOX.



LEGEND

PRL	PROPOSED RAIL LEVEL
PFL	PROPOSED FORMATION LEVEL
HFL	HIGHEST FLOOD LEVEL
GL	GROUND LEVEL

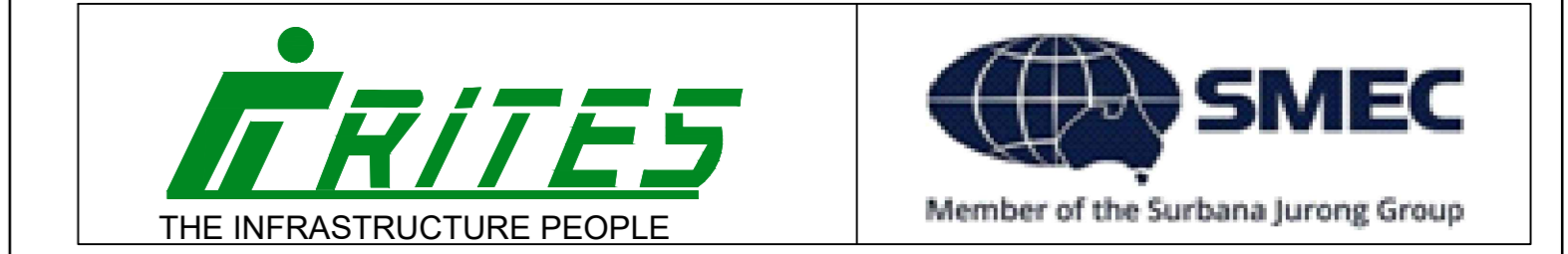


GC/HORC		HRIDC	
NAME / DESIGNATION	SIGN	NAME / DESIGNATION	SIGN
CHAHATEY RAM PD	<i>Chahatey Ram</i>	SHIV OM DWIVEDI CPM/HRIDC	<i>Shiv</i>
SUDHIR AGRAWAL DPD/CIVIL	<i>AS</i>	RAJU SOLANKI DGM/CIVIL/SOUTH	<i>Raju</i>
REETU PATIAL CDE/ CIVIL	<i>Reetu</i>		

PROJECT:
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CLIENT:
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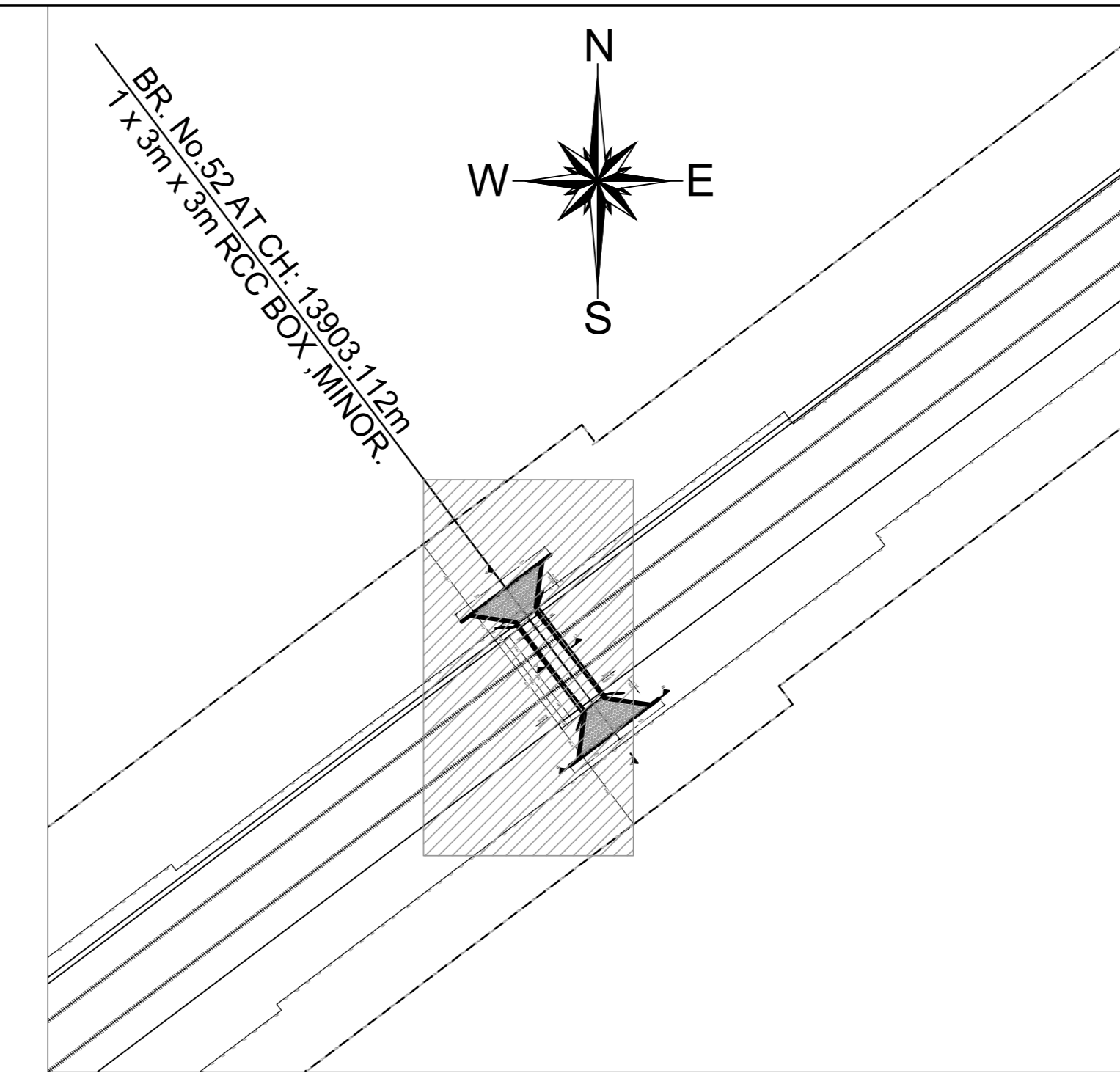
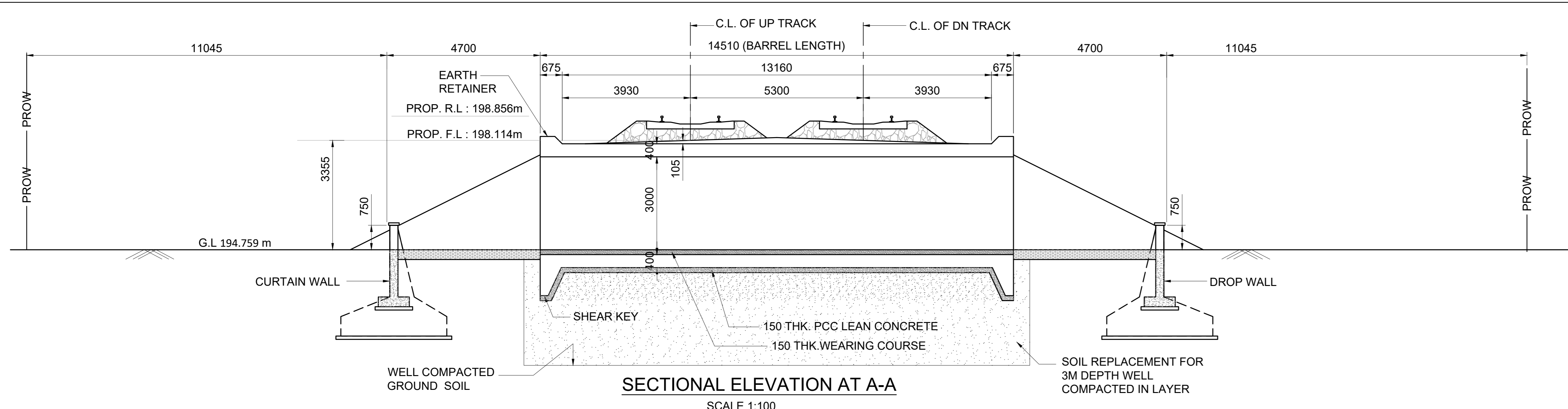
CONSULTANT:
 GENERAL CONSULTANT FOR HARYANA ORBITAL RAIL CORRIDOR
RITES Limited in consortium with SMEC International Pty. Ltd.



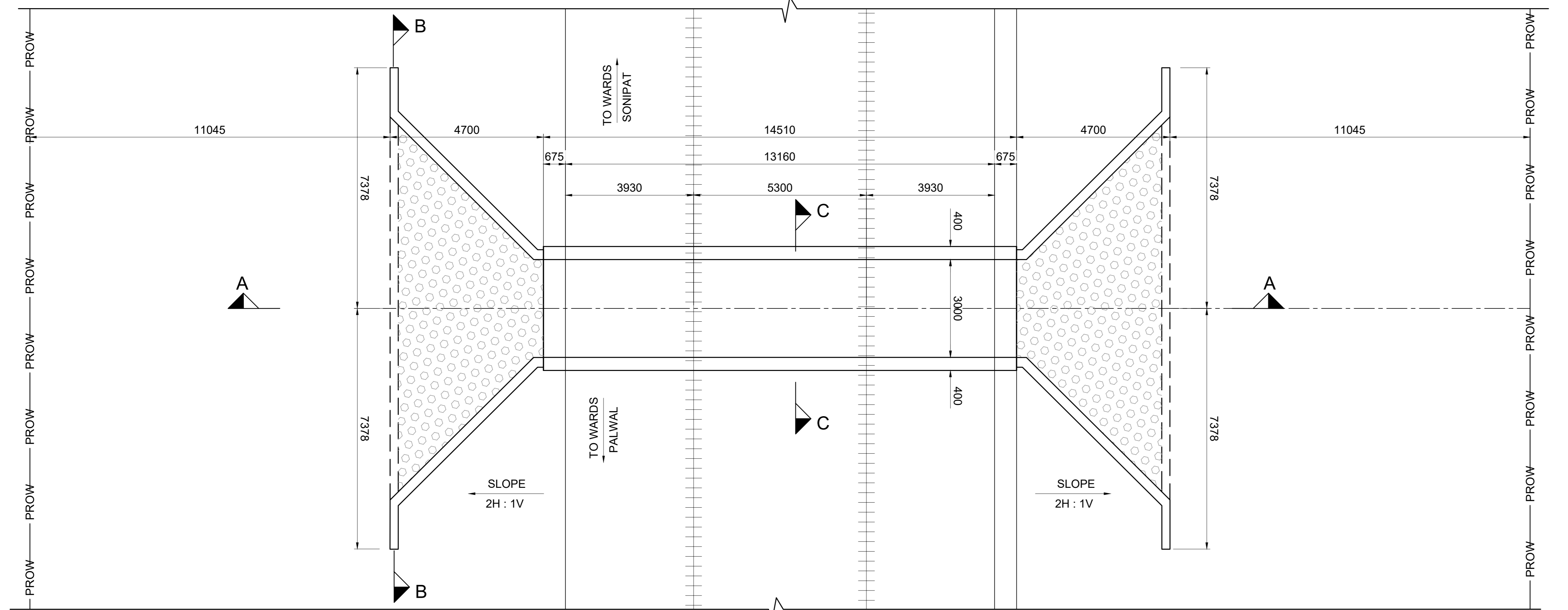
TITLE:- CONCEPTUAL GENERAL ARRANGEMENT DRAWING
CANAL BRIDGE NO. 051 SPAN
1.0X3.0X3.0 RCC BOX AT CH: 13114.998

DRG. NO. GC-HRIDC-C4-DRW-BRD-GAD-01051_A1
SHEET NO. 1 OF 1

SCALE : AS SHOWN
ISSUE DATE 07-11-2022
REVISED DATE 21-11-2022



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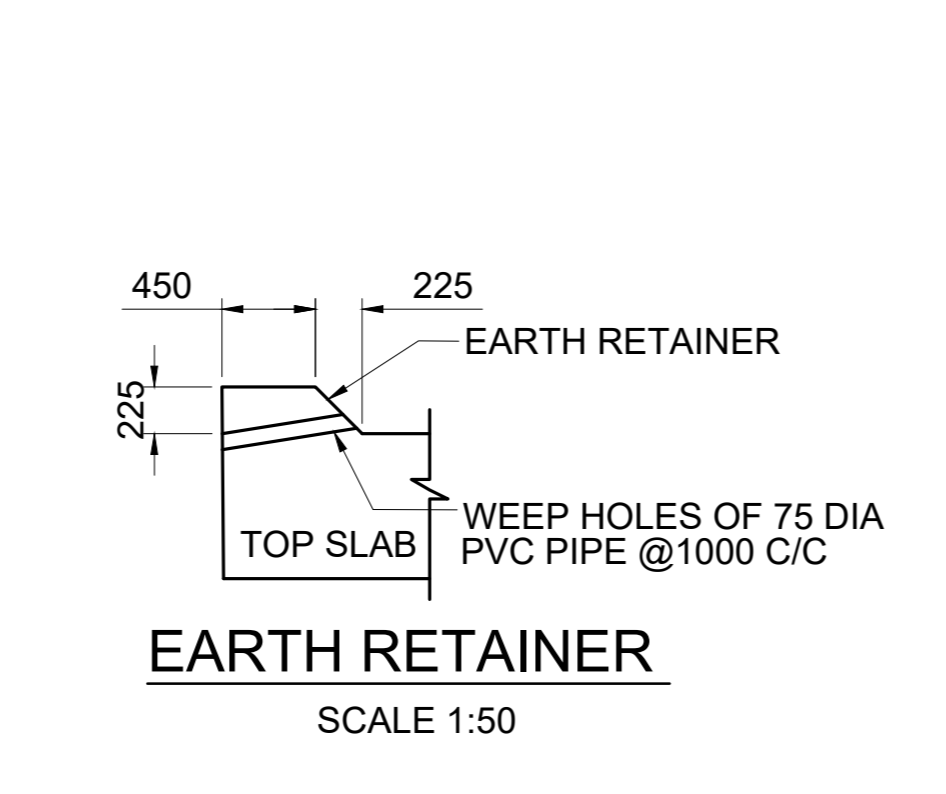
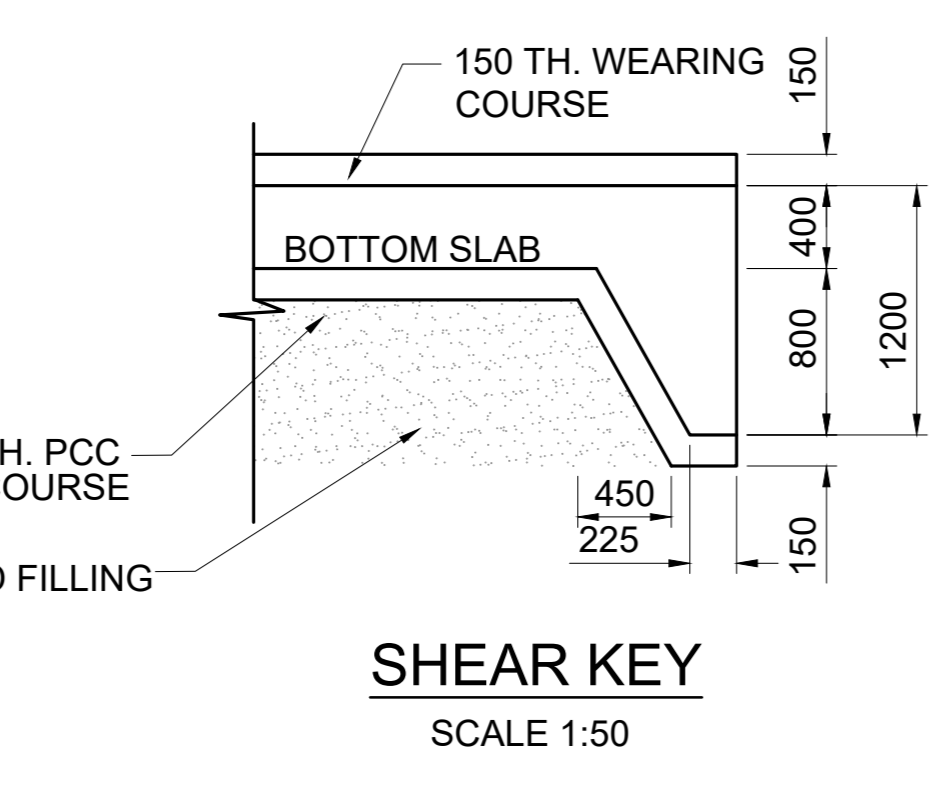
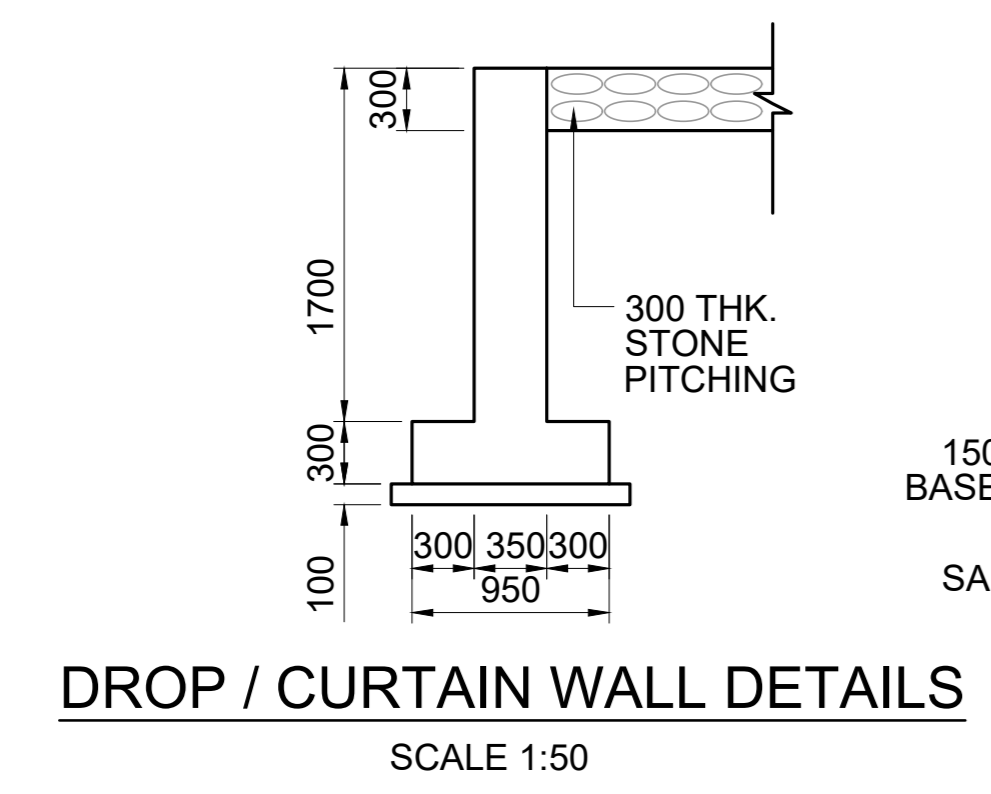
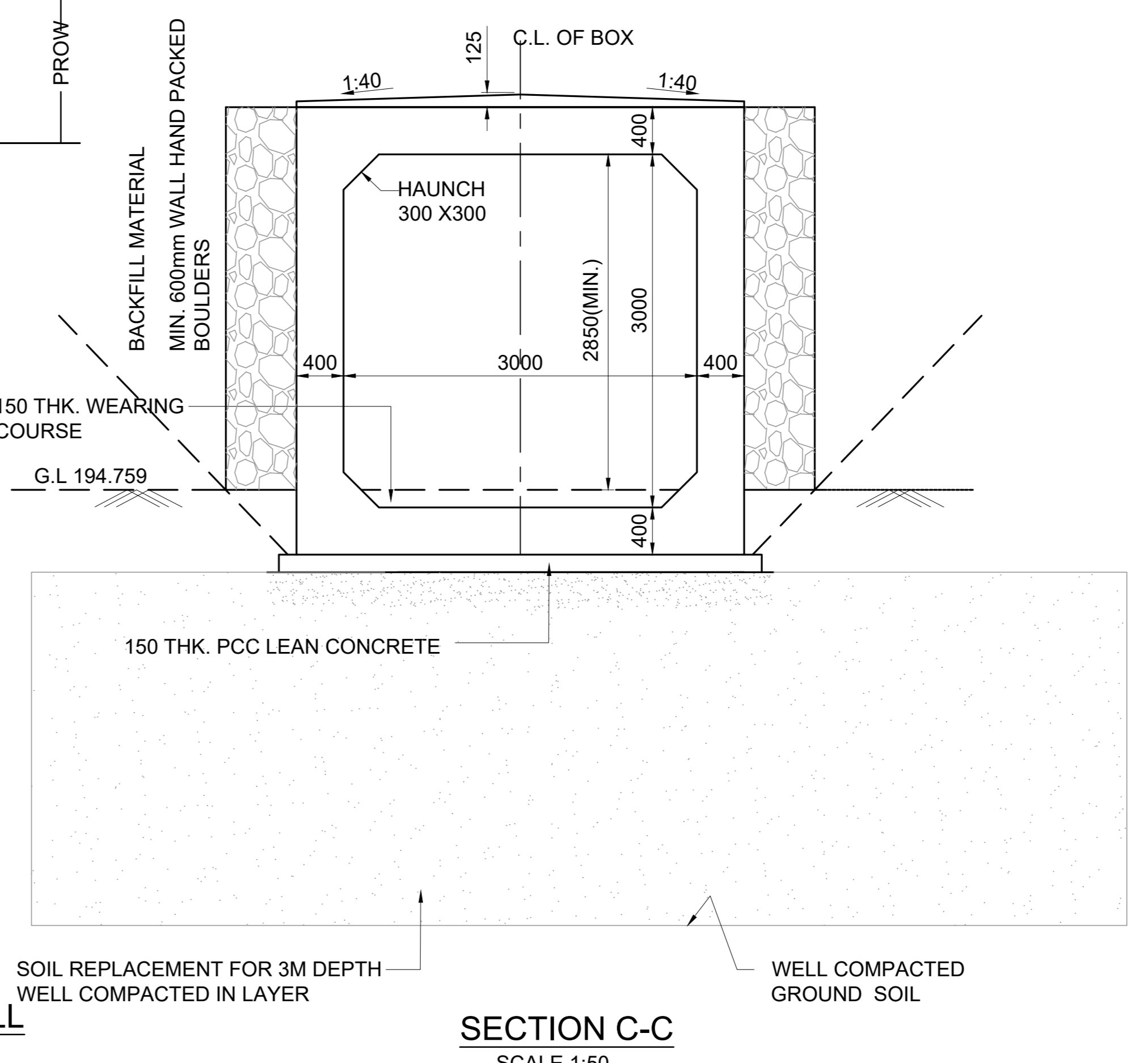
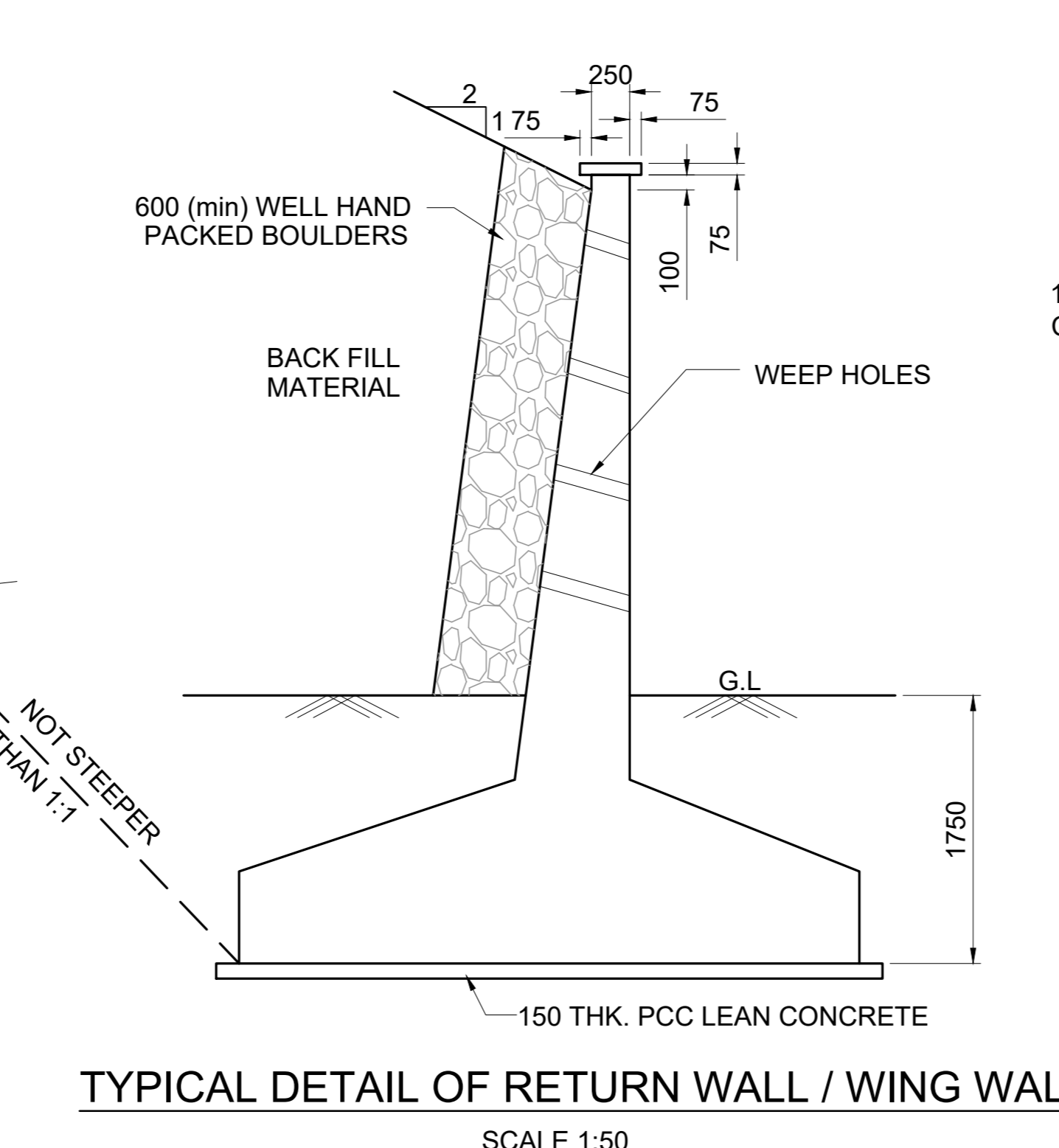
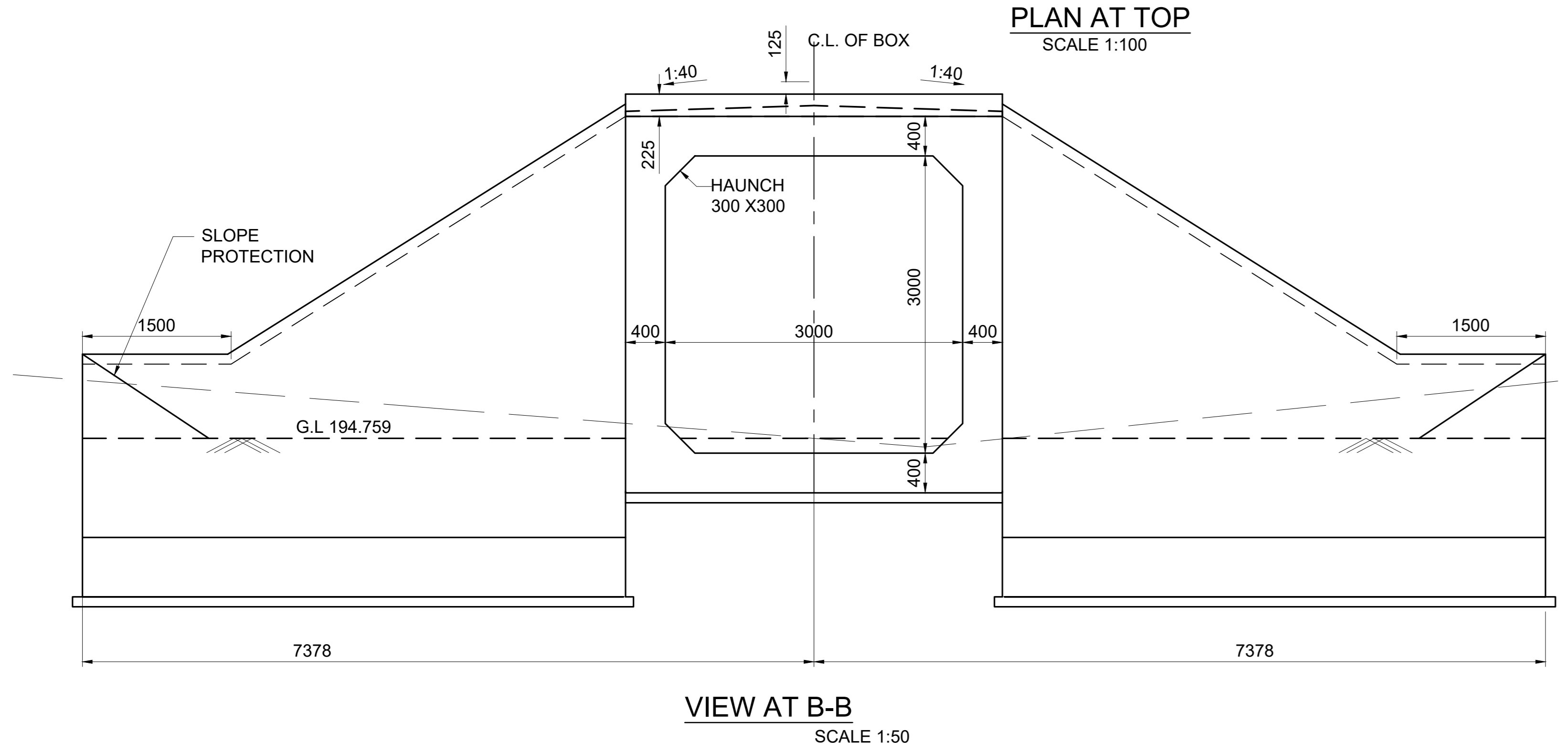
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GRADE OF CONCRETE :

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LEGEND

PRL	PROPOSED RAIL LEVEL
PFL	PROPOSED FORMATION LEVEL
HFL	HIGHEST FLOOD LEVEL
GL	GROUND LEVEL



GC/HORC		HRIDC	
NAME / DESIGNATION	SIGN	NAME / DESIGNATION	SIGN
CHAHATEY RAM PD	<i>Chahatey Ram</i>	SHIV OM DWIVEDI CPM/HRIDC	<i>Shiv</i>
SUDHIR AGRAWAL DPD/CIVIL	<i>Sudhir</i>	RAJU SOLANKI DGM/CIVIL/SOUTH	<i>Raju</i>
REETU PATIAL CDE/ CIVIL	<i>Reetu</i>		

PROJECT:
HARYANA ORBITAL RAIL CORRIDOR
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CLIENT:
HARYANA RAIL INFRASTRUCTURE DEVELOPMENT CORPORATION LIMITED.

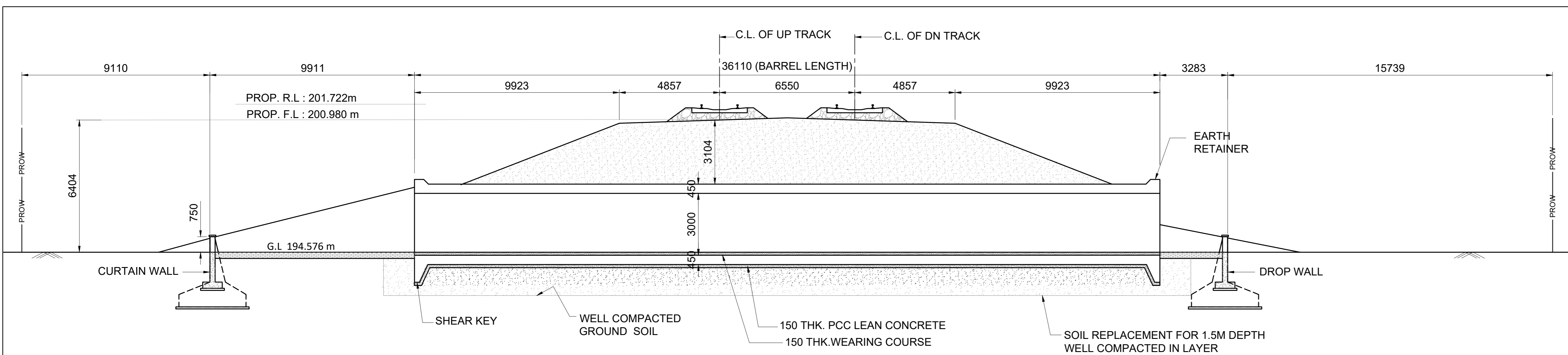
CONSULTANT:
GENERAL CONSULTANT FOR HARYANA ORBITAL RAIL CORRIDOR
RITES Limited in consortium with SMEC International Pty. Ltd.



TITLE:- CONCEPTUAL GENERAL ARRANGEMENT DRAWING
FOR BALANCING CULVERT BRIDGE NO. 052
SPAN 1.0X3.0X3.0 RCC BOX AT CH: 13903.112

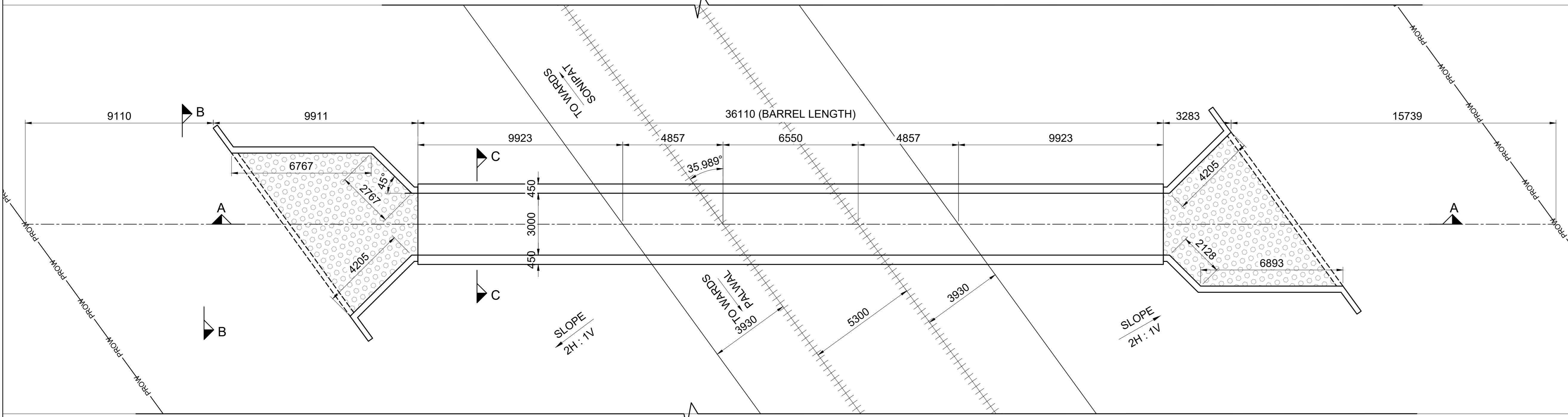
DRG. NO. GC-HRIDC-C4-DRW-BRD-GAD-01052_A1
SHEET NO. 1 OF 1

SCALE : AS SHOWN
ISSUE DATE 07-11-2022
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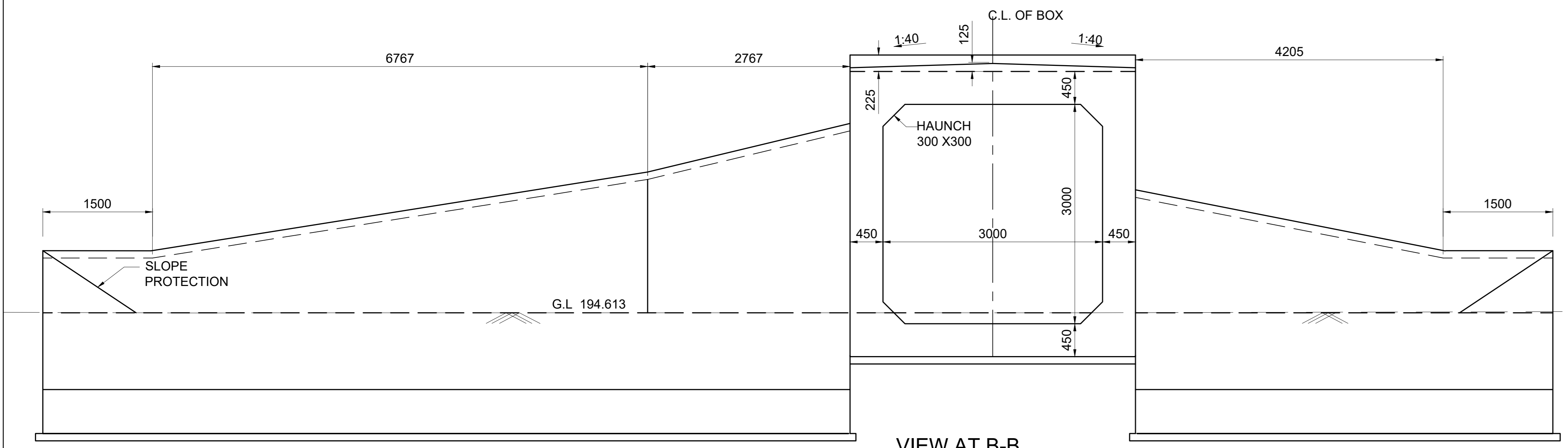
SECTIONAL ELEVATION AT A-A

SCALE 1:150



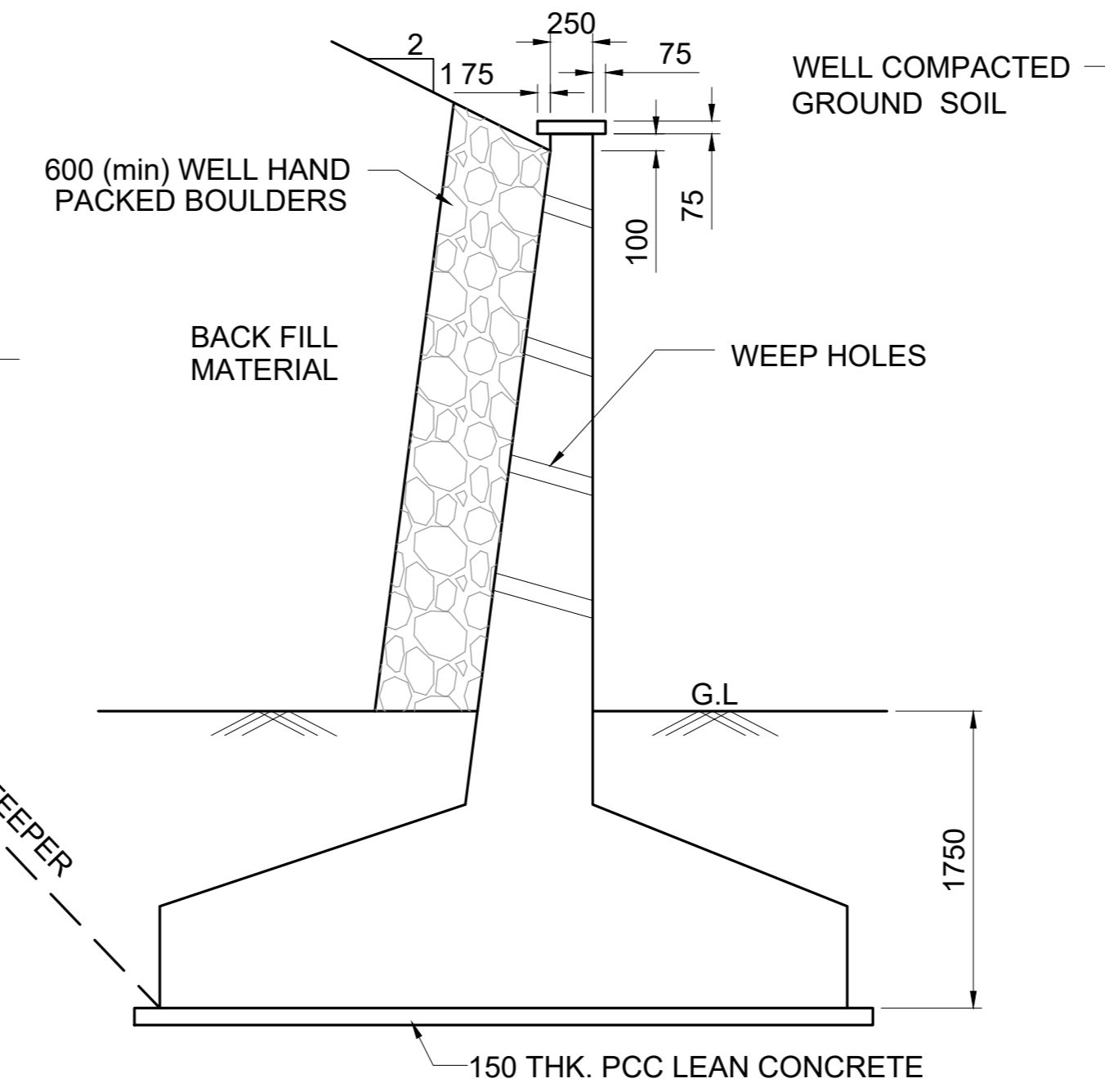
PLAN AT TOP

SCALE 1:180



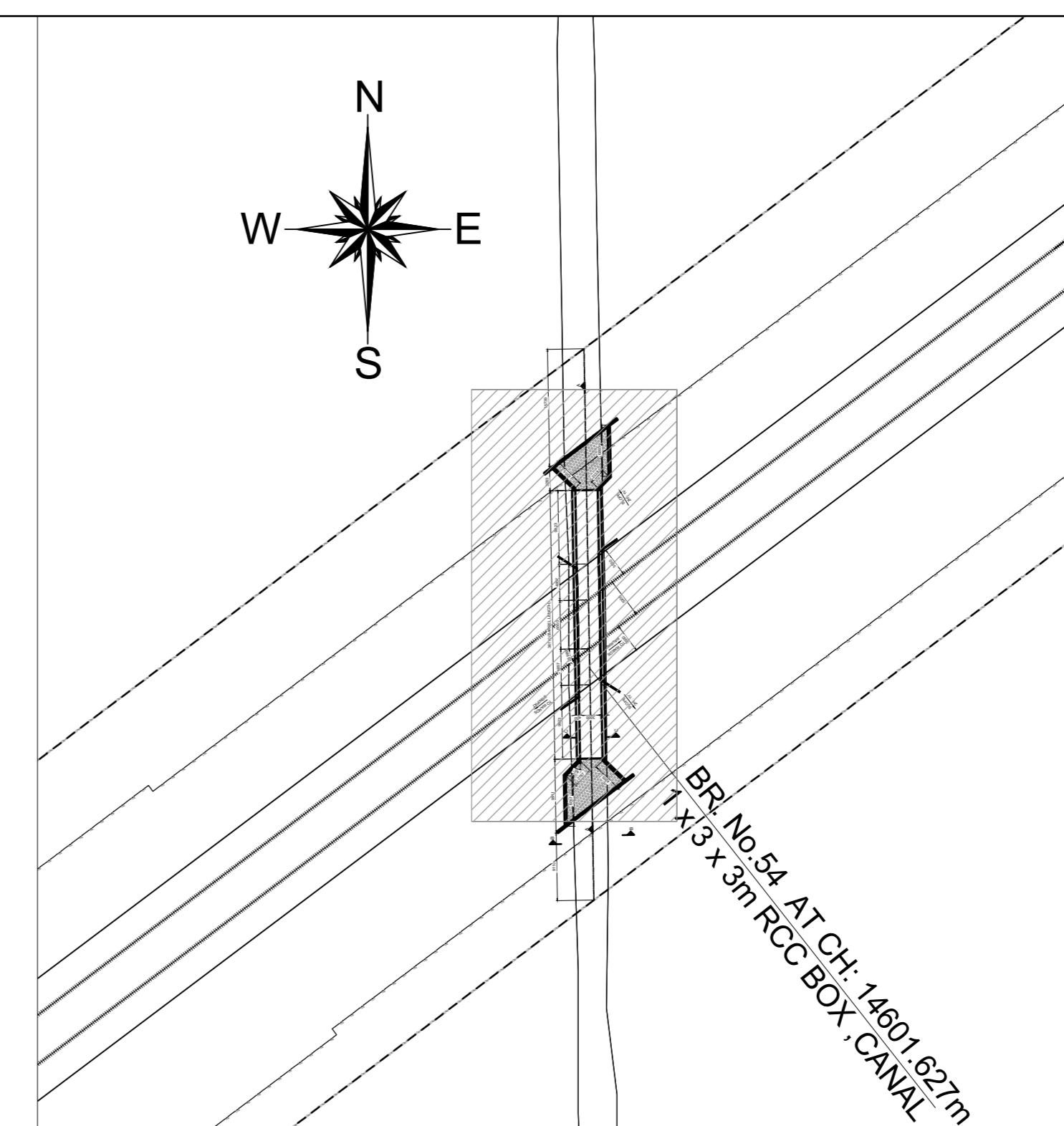
VIEW AT B-B

SCALE 1:50



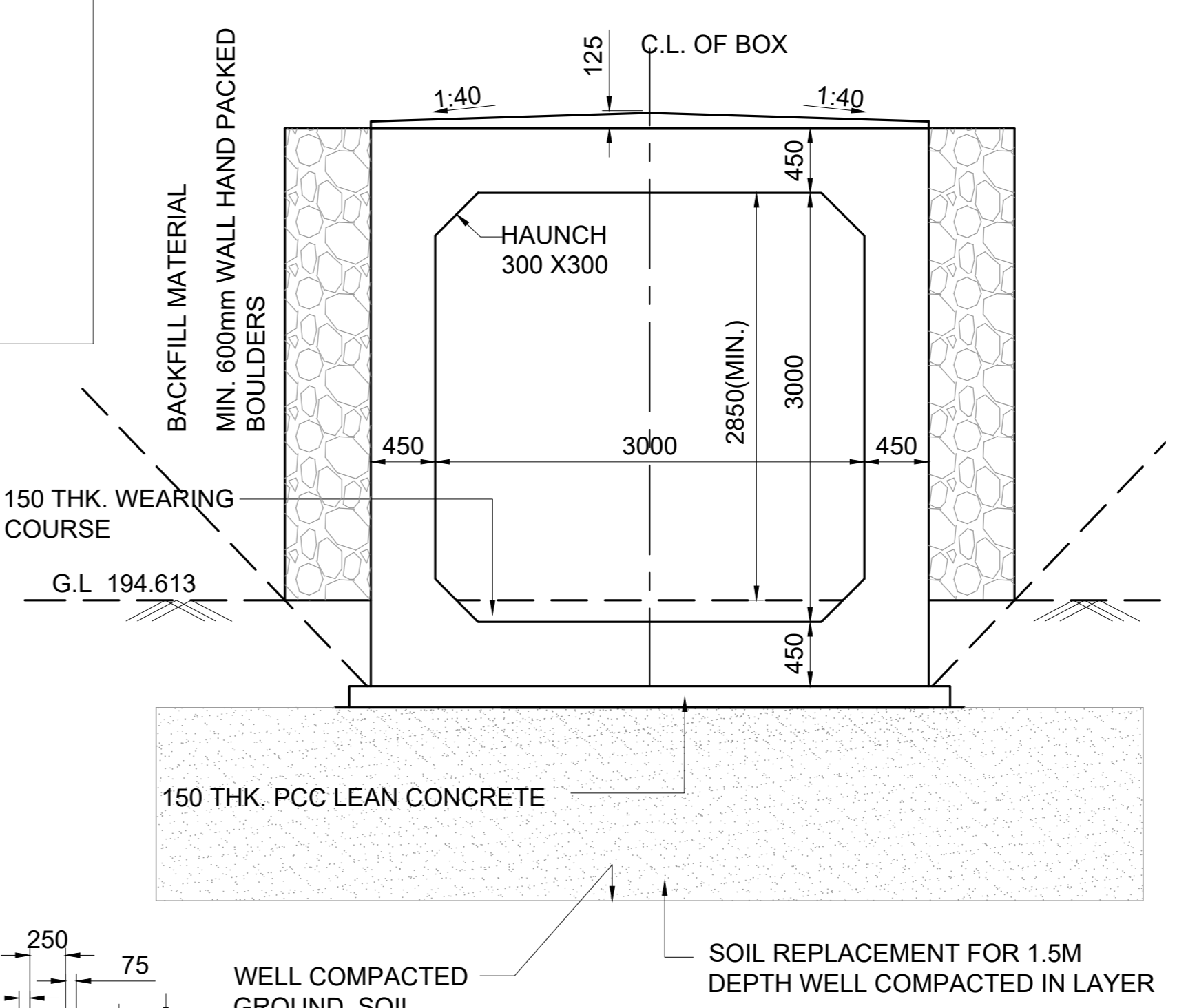
TYPICAL DETAIL OF RETURN WALL / WING WALL

SCALE 1:50



KEY PLAN

(NOT TO SCALE)

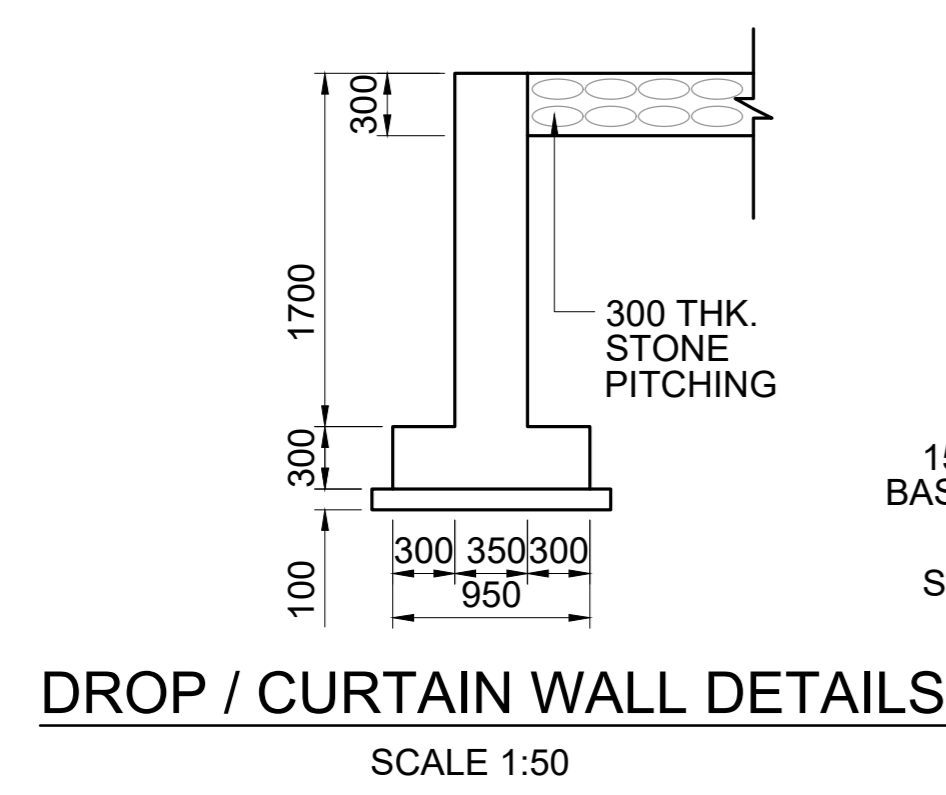


SECTION C-C

SCALE 1:50

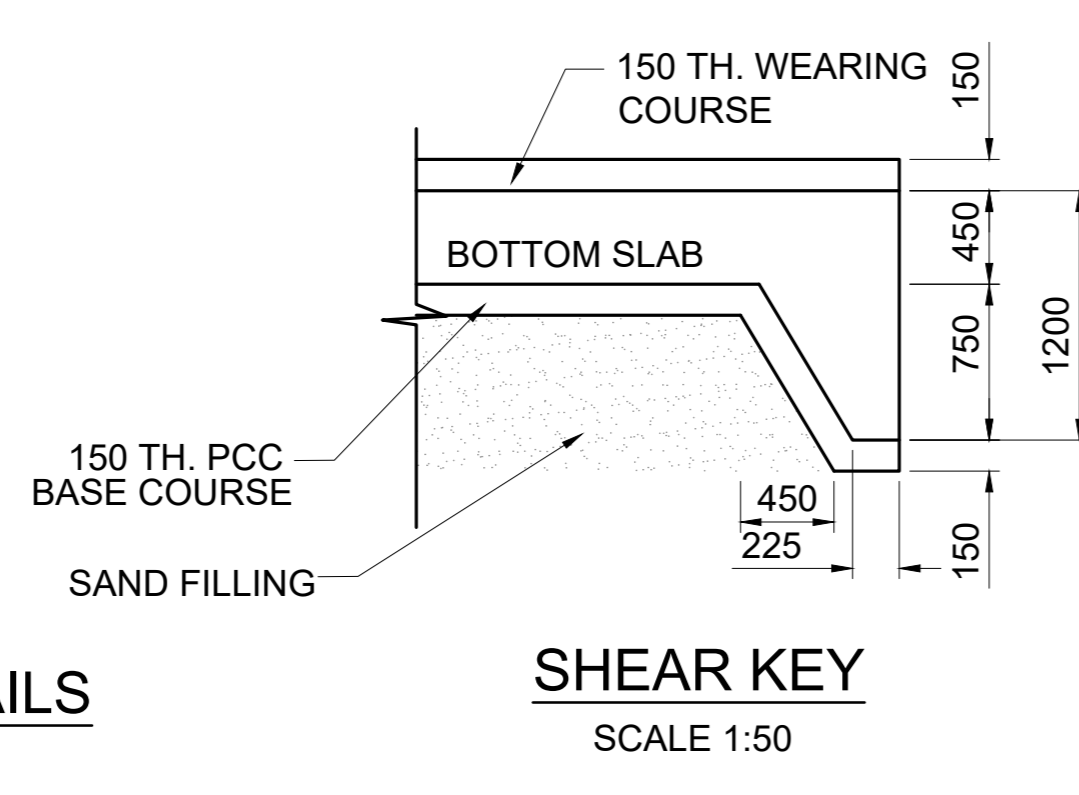
LEGEND

PRL	PROPOSED RAIL LEVEL
PFL	PROPOSED FORMATION LEVEL
HFL	HIGHEST FLOOD LEVEL
GL	GROUND LEVEL



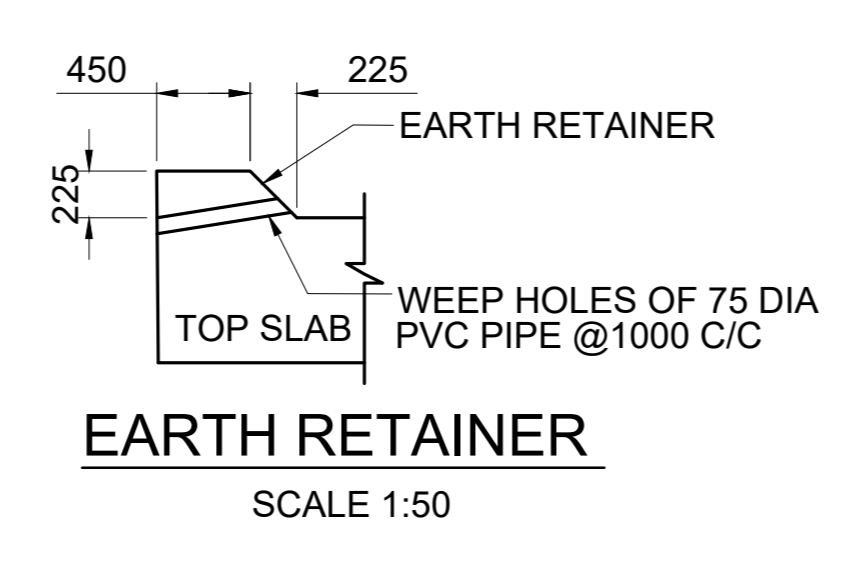
DROP / CURTAIN WALL DETAILS

SCALE 1:50



SHEAR KEY

SCALE 1:50



EARTH RETAINER

SCALE 1:50

NOTES :

A) GENERAL NOTES

1. ALL DIMENSIONS ARE IN MILLIMETERS EXCEPT LEVELS WHICH ARE IN METER, UNLESS OTHERWISE MENTIONED.
2. THE CHAINAGES SHOWN ARE RECKONED FROM C/L OF PRITHALA STATION BUILDING TAKEN AS 0.00 M, WITH RESPECT TO UP MAIN LINE.
3. FOR RAIL LEVELS, FORMATION LEVEL, GRADES ETC. REFER L-SECTION.
4. BOX BRIDGE IS TO BE DESIGNED FOR 32.5 T LOADING AS APPLICABLE.
5. THE EXISTING DETAILS ARE AS PER SITE SURVEY AND SHALL BE VERIFIED BY THE CONTRACTOR BEFORE EXECUTION.
6. ENGINEER IN CHARGE/ SITE ENGINEER SHOULD VERIFY THE RAIL LEVEL FORMATION LEVEL, BED LEVEL & TRACK CENTER AT SITE BEFORE COMMENCEMENT OF WORK.
7. SUITABLE BED SLOPE SHALL BE PROVIDED AND ADJUSTED AS PER SITE CONDITIONS.
8. ENGINEER IN CHARGE/SITE ENGINEER SHALL ENSURE THE SAFETY OF TRACK/ROAD AT ALL THE TIME AND SHALL TAKE NECESSARY PRECAUTIONS TO PREVENT DAMAGE OF S&T CABLE /OFC DURING EXECUTION OF WORK CONCERNED DEPT. SUCH AS BSNL/AIRTEL/SSE/SIG/ADSTE ETC. SHALL BE INFORMED WELL IN ADVANCE BEFORE EXECUTION OF WORK.
9. THIS DRAWING IS THE PROPERTY OF HRIDC AND FOR EXCLUSIVE USE OF HORC.
10. DETAILED DESIGN DRAWING WILL BE PREPARED BASED ON THIS CONCEPTUAL APPROVED GAD.
11. THICKNESS OF STRUCTURAL MEMBERS ARE TENTATIVE AND WILL BE FINALISED AFTER DETAILED DESIGN.

B) TECHNICAL NOTES :

1. PROTECTION WORK ON SLOPE OF BANK UP TO 15M BOTH SIDES ON APPROACHES OF BRIDGE SHALL BE DONE AS PER SKETCH NO. GC-HRIDC-SK-GEN-015.
2. INSPECTION STEPS SHALL BE PROVIDED AT DIAGONALLY OPPOSITE ENDS OF THE BOX AFTER PROTECTION WORK.
3. FOR PROPER DRAINAGE OF WATER, 50mm PCC M-20 WITH SUITABLE SLOPE TO BE USED ON TOP OF BOX SLAB.
4. ALL CLEAN/ EXPANSION JOINTS SHALL BE FILLED WITH THERMOCOL.
5. PLACEMENT LEVEL OF BOX AS SHOWN IN THIS GAD IS INDICATIVE AND MAY BE SUITABLY LOWERED/ELEVATED BASED UPON THE REQUIREMENT OF CLEARANCE, DRAINAGE & NATURAL GROUND PROFILE.
6. DIMENSION OF THE BOX MAY BE SUITABLY MODIFIED AS PER SITE REQUIREMENT. HEIGHT OF BOX SHOWN INCLUDES MINIMUM REQUIRED CLEAR OPENING HEIGHT AND WEARING COARSE. OVERALL HEIGHT OF BOX OPENING MAY VARY AS PER SITE REQUIREMENT AND ACTUAL ROAD/GROUND PROFILE.
7. DESIGN CRITERIA SHALL BE BASED ON FOLLOWING IRS CODES
 - (i) IRS BRIDGE RULE
 - (ii) IRS CONCRETE BRIDGE CODE
 - (iii) IRS BRIDGE SUB-STRUCTURE & FOUNDATION CODE
8. SEISMIC ZONE- IV
9. EXPOSURE CONDITION- MODERATE.
10. DURING CONSTRUCTION, IF REQUIRED, ROAD CLOSURE TO BE OBTAINED FROM CONCERNED ROAD/CIVIL AUTHORITIES. DIVERSION OF ROAD IF ANY, REQUIRED IS TO BE DONE BY CONTRACTOR AT HIS COST.
11. THE BACK FILL MATERIAL SHALL BE CONFORMING TO CLAUSE 7.5 OF IRS SUB- STRUCTURE AND FOUNDATION CODE.
12. ALL RCC SURFACES COMING IN CONTACT WITH SOIL SHOULD BE PAINTED WITH BITUMEN OR COAL TAR OF APPROVED QUALITY @ 1.464 K.G/SQM. CONFORMING TO IS-3117.
13. REINFORCEMENT SHALL BE Fe 500D (TMT) CONFORMING TO IS 1786
14. FOR CONCRETE SPECIFICATION REFER IRS CONCRETE BRIDGE CODE. GRADE OF CONCRETE :
 - (i) ALL RCC WEARING COURSE(WC) =M.35/DETAILED DESIGN DRG.
 - (ii) LEVELING COURSE/LEAN CONCRETE =M.20/DETAILED DESIGN DRG.
15. BEARING CAPACITY OF SOIL SHALL BE ENSURED AS PER DETAILED DESIGN REQUIREMENT. GROUND IMPROVEMENT SHALL BE CARRIED OUT AS PER GT REPORT AND CONFIRMED THROUGH FIELD TESTING.
16. FOUNDATION LEVEL SHOWN IN DRAWING IS TENTATIVE. DETAILED DESIGN DRAWING SHALL BE FOLLOWED FOR FOUNDATION LEVEL DURING EXECUTION.
17. ADEQUATE SLOPE IN BOTTOM SLAB OF RCC BOX TOWARDS DIRECTION OF FLOW SHALL BE PROVIDED.
18. WING WALL FOLLOW DRAIN PROFILE.
19. SMOOTH TRANSITION SHALL BE PROVIDED BETWEEN THE EXISTING LINED CANAL/DRAIN AND THE BOX.

PROJECT:

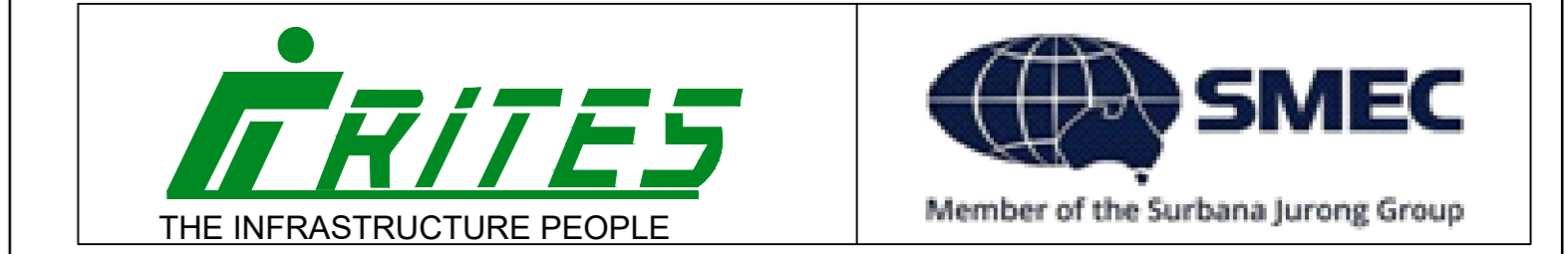
HARYANA ORBITAL RAIL CORRIDOR
CONNECTING PALWAL TO SONIPAT BYPASSING DELHI AREA BY LINKING ASAOTI-PATLI-SULTANPUR-ASAUDAH BY NEW ELECTRIFIED BG DOUBLE LINE

CLIENT:

HARYANA RAIL INFRASTRUCTURE DEVELOPMENT CORPORATION LIMITED.

CONSULTANT:

GENERAL CONSULTANT FOR HARYANA ORBITAL RAIL CORRIDOR
RITES Limited in consortium with SMEC International Pty. Ltd.



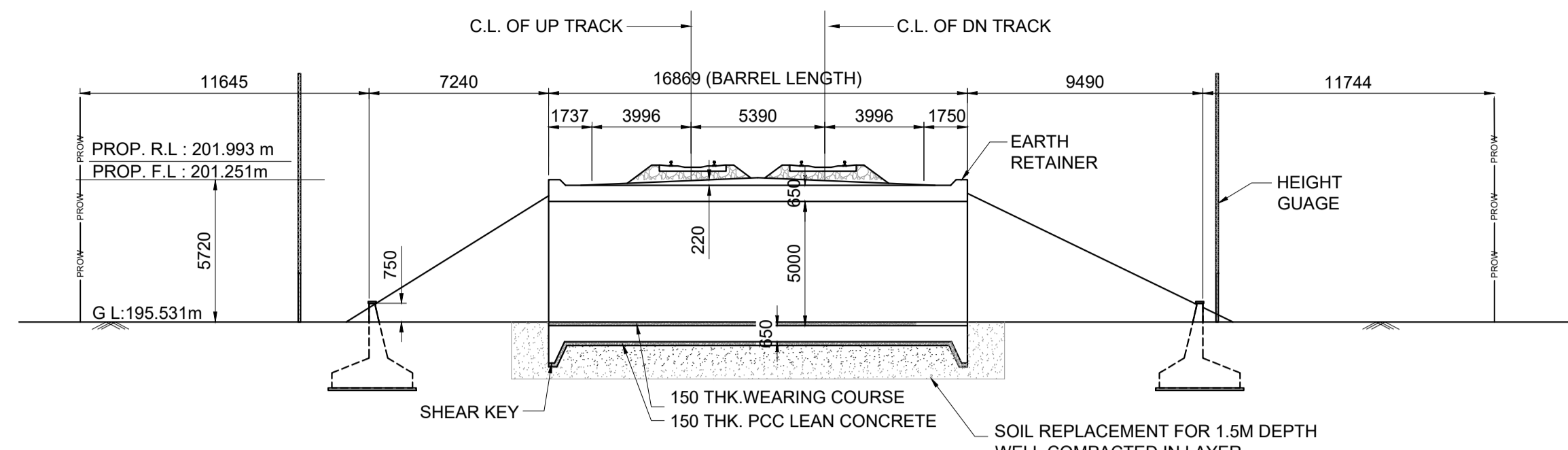
TITLE:- **CONCEPTUAL GENERAL ARRANGEMENT DRAWING**

FOR CANAL BRIDGE NO. 054
1.0X3.0X3.0 RCC BOX AT CH: 14601.627

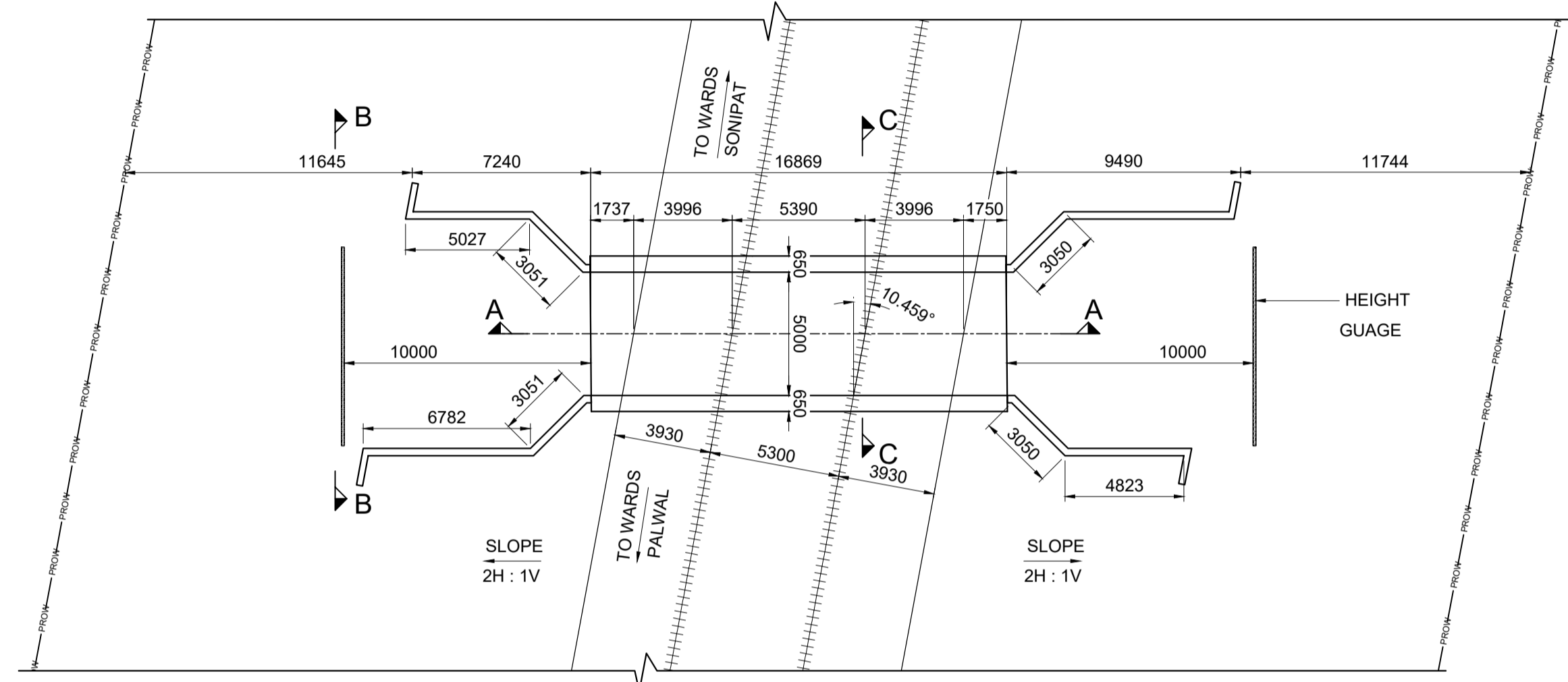
DRG. NO. GC-HRIDC-C4-DRW-BRD-GAD-01054_A1 SHEET NO. 1 OF 1

SCALE : AS SHOWN ISSUE DATE 07-11-2022 REVISED DATE 21-11-2022

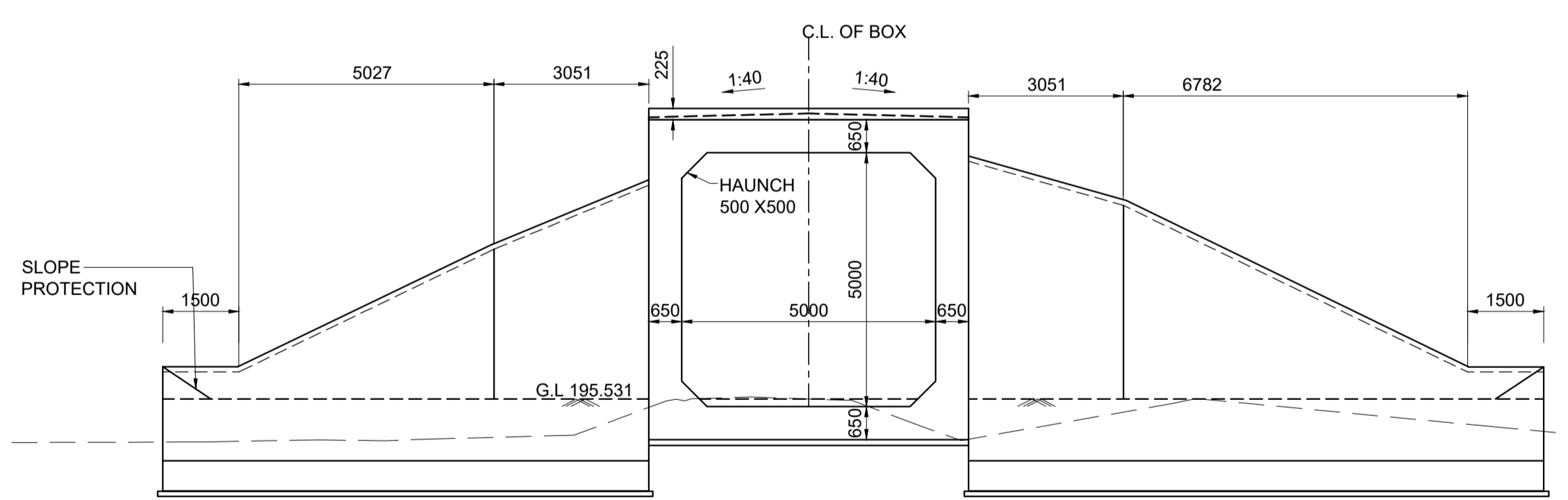
GC/HORC		HRIDC	
NAME / DESIGNATION	SIGN	NAME / DESIGNATION	SIGN
CHAHATEY RAM PD	<i>Chahatey Ram</i>	SHIV OM DWIVEDI GM/HRIDC	<i>Shiv</i>
SUDHIR AGRAWAL DPD/CIVIL	<i>MSH</i>	RAJU SOLANKI DGM/CIVIL/SOUTH	<i>Raju</i>
REETU PATIAL CDE/ CIVIL	<i>Reetu</i>		



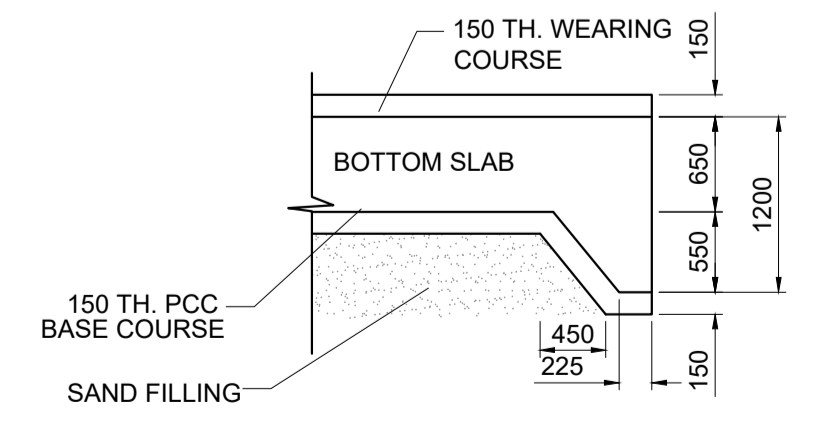
SECTIONAL ELEVATION AT A-A
SCALE 1:200



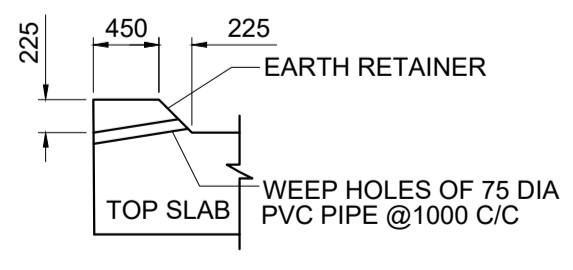
PLAN AT TOP
SCALE 1:200



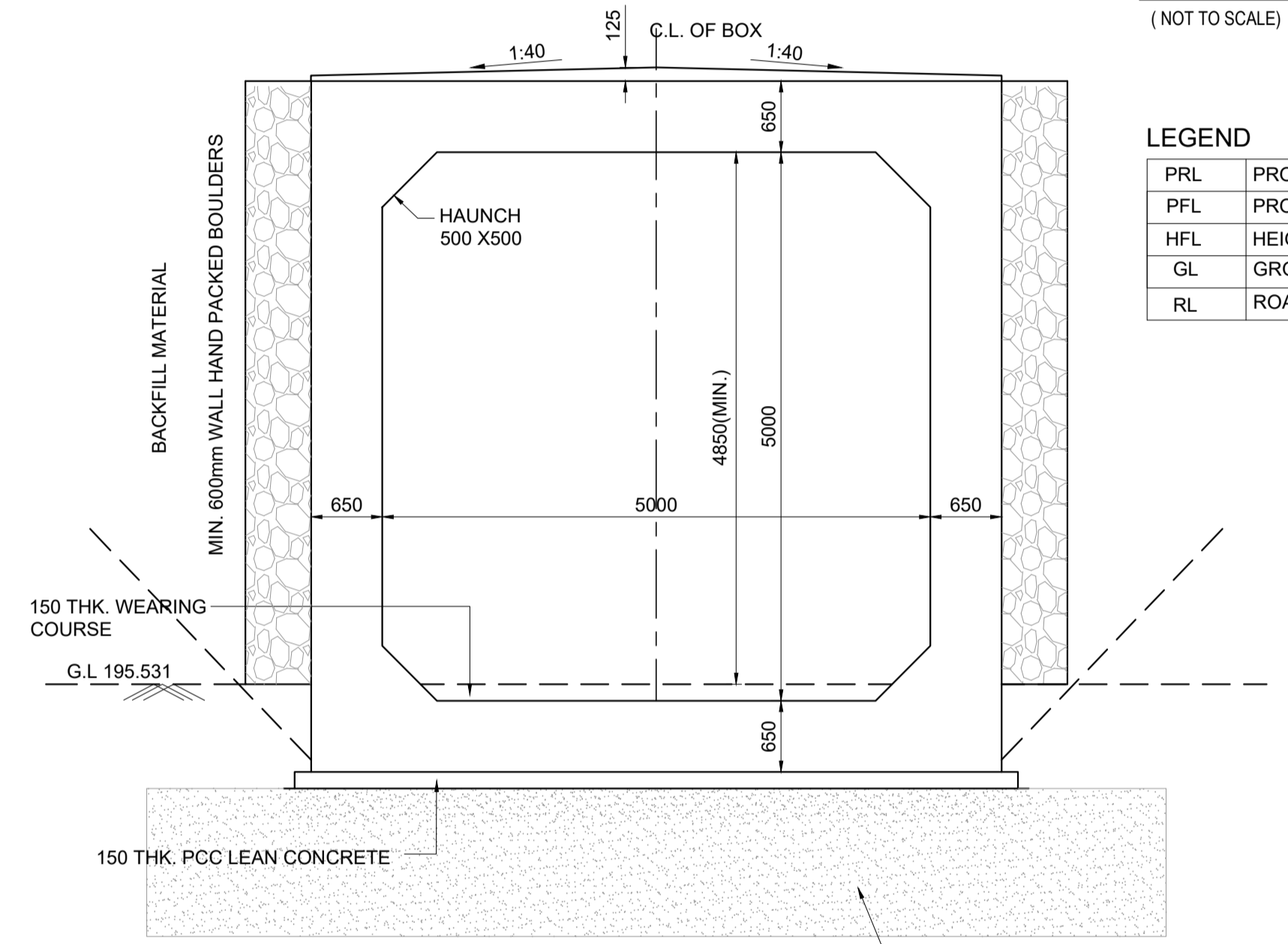
VIEW AT B-B
SCALE 1:100



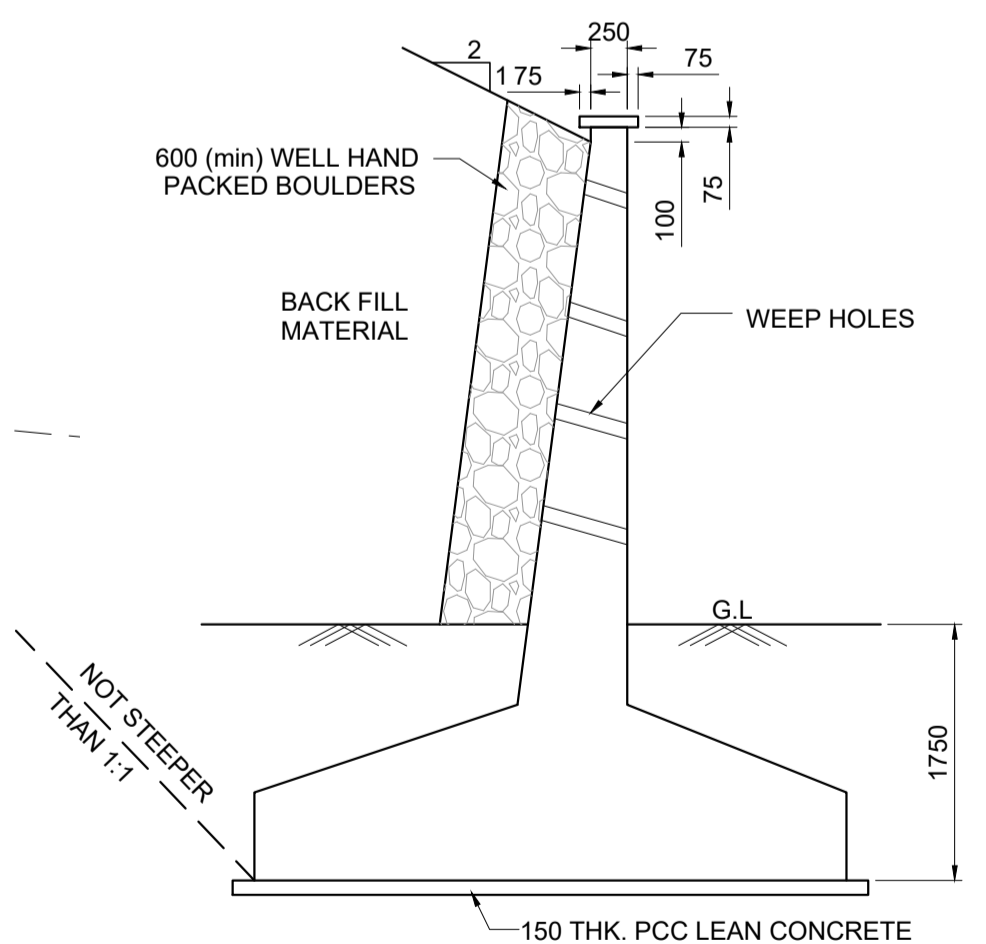
SHEAR KEY
SCALE 1:50



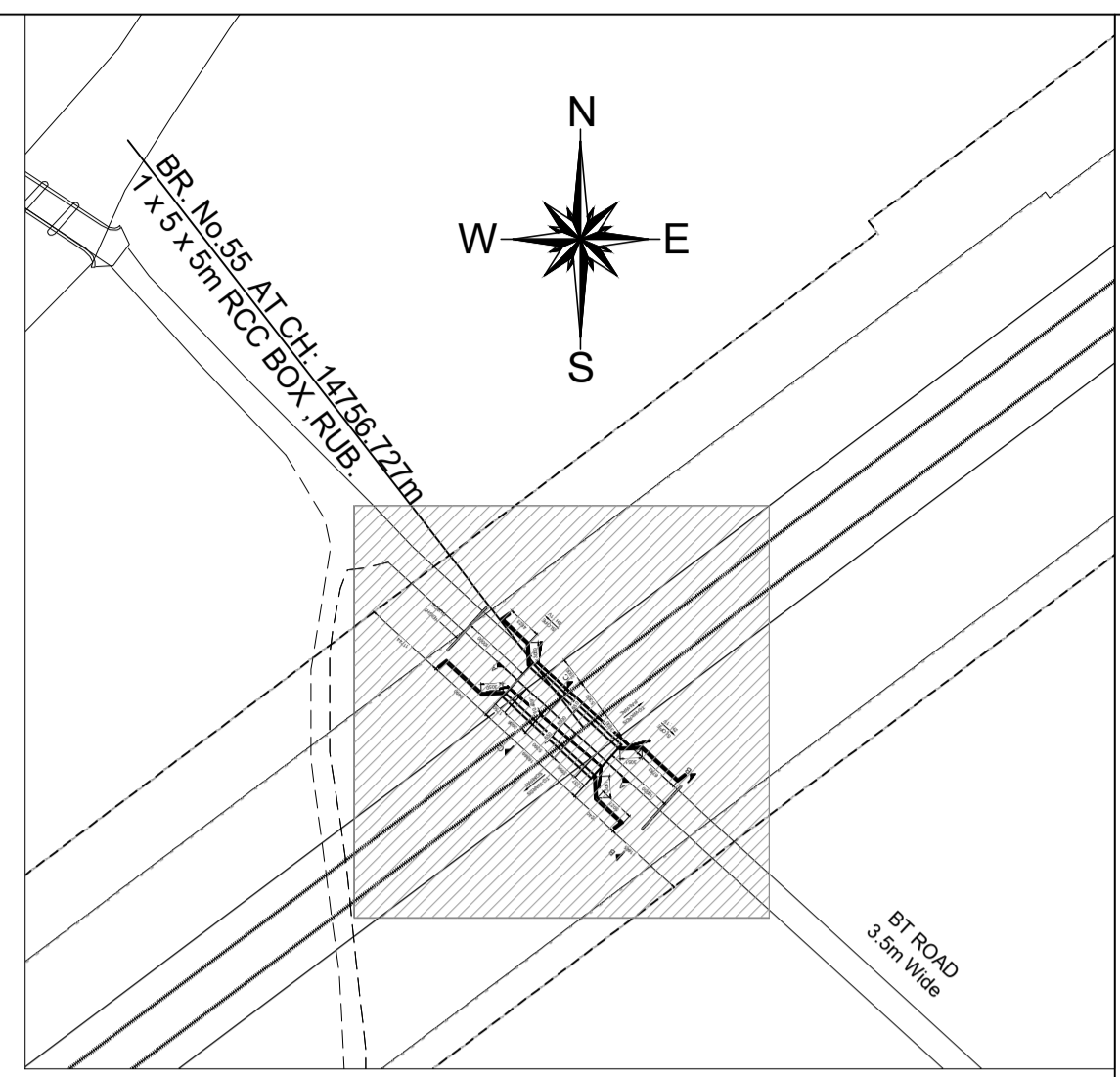
EARTH RETAINER
SCALE 1:50



SECTION C-C
SCALE 1:50



TYPICAL DETAIL OF RETURN WALL / WING WALL
SCALE 1:50



KEY PLAN
(NOT TO SCALE)

LEGEND

PRL	PROPOSED RAIL LEVEL
PFL	PROPOSED FORMATION LEVEL
HFL	HIGHEST FLOOD LEVEL
GL	GROUND LEVEL
RL	ROAD LEVEL

- NOTES :**
- A) GENERAL NOTES :**
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 - THIS DRAWING IS THE PROPERTY OF HRIDC AND FOR EXCLUSIVE USE OF HORC.
 - DETAILED DESIGN DRAWING WILL BE PREPARED BASED ON THIS CONCEPTUAL APPROVED GAD.
 - THICKNESS OF STRUCTURAL MEMBERS ARE TENTATIVE AND WILL BE FINALISED AFTER DETAILED DESIGN.
- B) TECHNICAL NOTES :**
- PROTECTION WORK ON SLOPES OF BANK UP TO 15M BOTH SIDES ON APPROACHES OF BRIDGE SHALL BE DONE AS PER SKETCH NO. GC-HRIDC-SK-GEN-015.
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(ii) IRS CONCRETE BRIDGE CODE
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 - SEISMIC ZONE- IV
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 - THE BACK FILL MATERIAL SHALL BE CONFORMING TO CLAUSE 7.5 OF IRS SUB- STRUCTURE AND FOUNDATION CODE.
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 - FOUNDATION LEVEL SHOWN IN DRAWING IS TENTATIVE. DETAILED DESIGN DRAWING SHALL BE FOLLOWED FOR FOUNDATION LEVEL DURING EXECUTION.
 - HEIGHT GAUGE SHALL BE PROVIDE AS PER RDSO STANDARD DRAWING NO. RDSO/M0001.
 - SPEED BREAKER SHOULD BE PROVIDED ON EITHER APPROACH OF RUB AT A DISTANCE OF 20M FROM THE BRIDGE COVERING FULL WIDTH OF THE ROAD INCLUDE BERMS.

IMPORTANT NOTE:
TOP OF BOTTOM SLAB OF RCC BOX SHALL NOT BE KEPT ABOVE THE NATURAL GROUND LEVEL. HOWEVER, ROAD LEVEL AND VERTICAL CLEARANCE ABOVE ROAD LEVEL SHALL BE MAINTAINED AS SHOWN IN THE DRAWING. OVERALL HEIGHT OF THE BOX MAY NEED MODIFICATION ACCORDINGLY. THE HEIGHT OF RCC BOX SHALL BE PROVIDED KEEPING ABOVE PROVISION IN VIEW.

PROJECT:
HARYANA ORBITAL RAIL CORRIDOR
CONNECTING PALWAL TO SONIPAT BYPASSING DELHI AREA BY LINKING ASAOTI-PATLI-SULTANPUR-ASAUDAH BY NEW ELECTRIFIED BG DOUBLE LINE

CLIENT:
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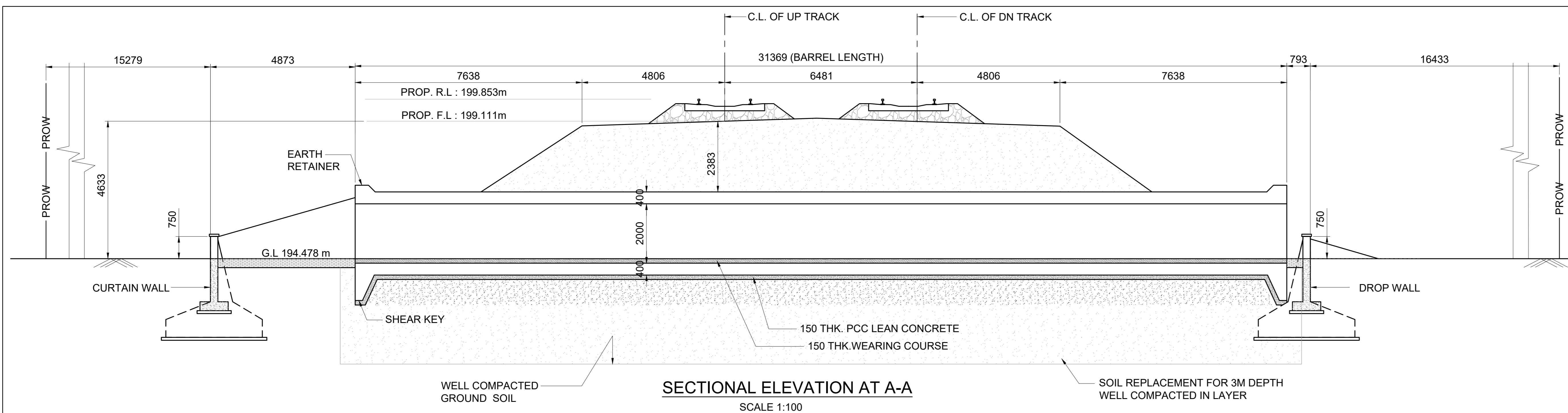
CONSULTANT:
 GENERAL CONSULTANT FOR HARYANA ORBITAL RAIL CORRIDOR
RITES Limited in consortium with SMEC International Pty. Ltd.

TITLE:- CONCEPTUAL GENERAL ARRANGEMENT DRAWING
FOR ROAD UNDER BRIDGE, BRIDGE NO. 055
SPAN 1x5.0x5.0 RCC BOX AT CH: 14756.727

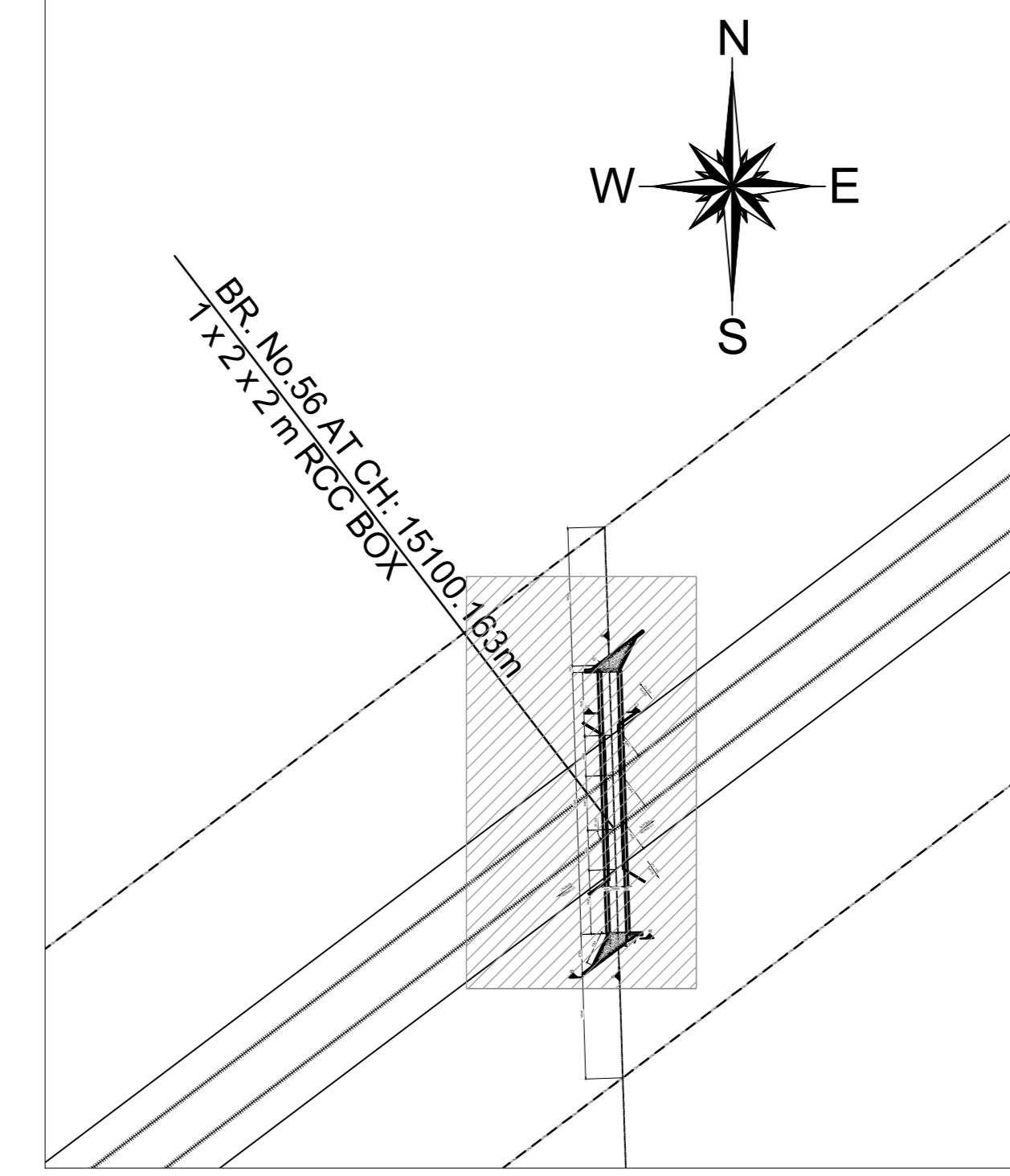
DRG. NO. GC-HRIDC-C4-DRW-BRD-GAD-01055_A1 **SHEET NO.** 1 OF 1

SCALE : AS SHOWN **ISSUE DATE** 07-11-2022 **REVISED DATE** 21-11-2022

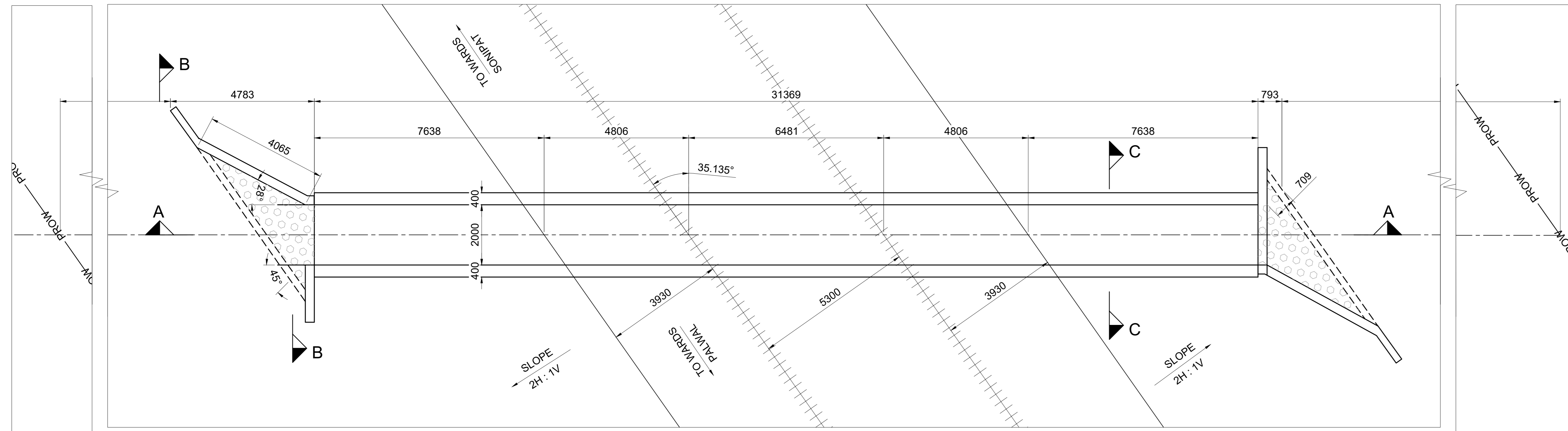
GC/HORC		HRIDC	
NAME / DESIGNATION	SIGN	NAME / DESIGNATION	SIGN
CHAHATEY RAM PD		SHIV OM DWIVEDI CPM/HRIDC	
SUDHIR AGRAWAL DPD/CIVIL		RAJU SOLANKI DGM/CIVIL/SOUTH	
REETU PATIAL CDE/ CIVIL			



SECTIONAL ELEVATION AT A-A
SCALE 1:100



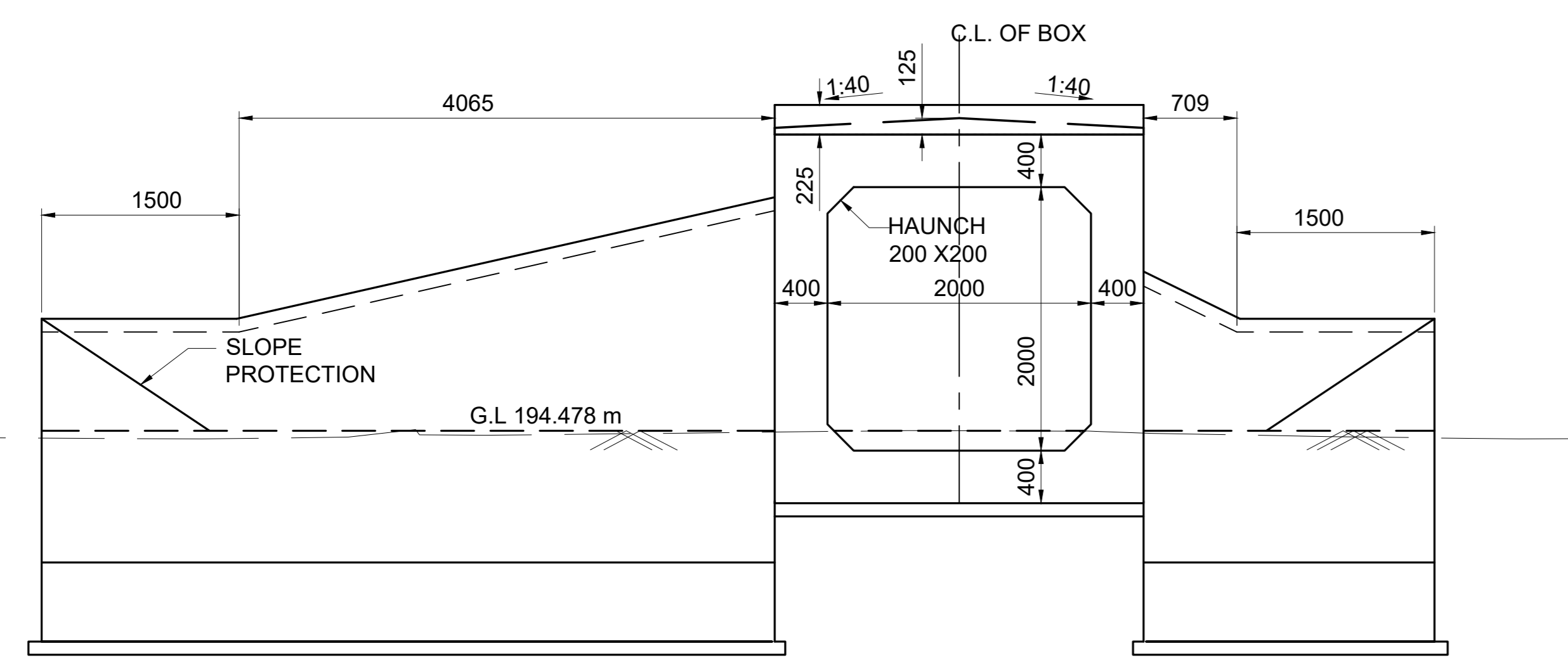
KEY PLAN
(NOT TO SCALE)



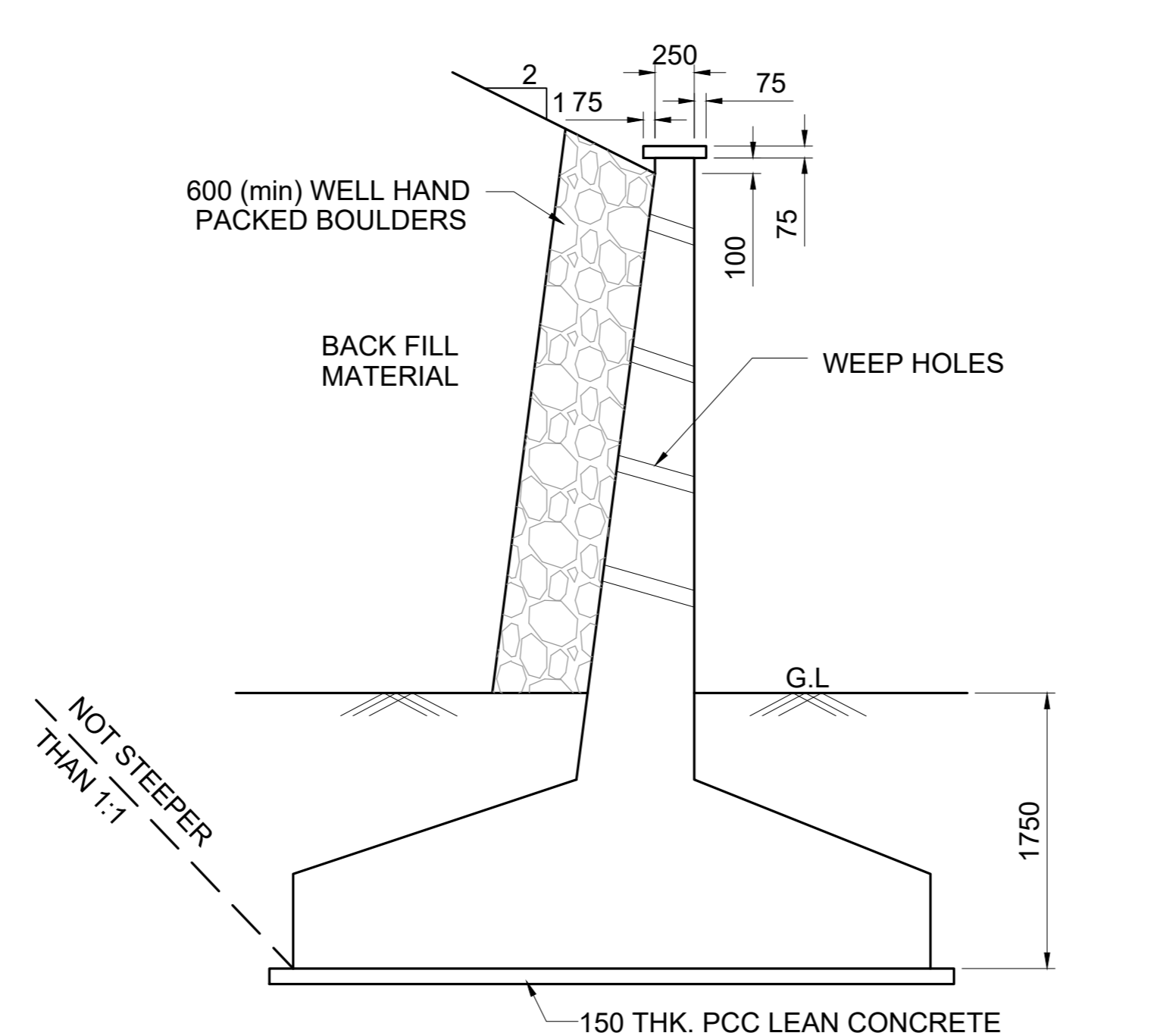
PLAN AT TOP
SCALE 1:100

LEGEND

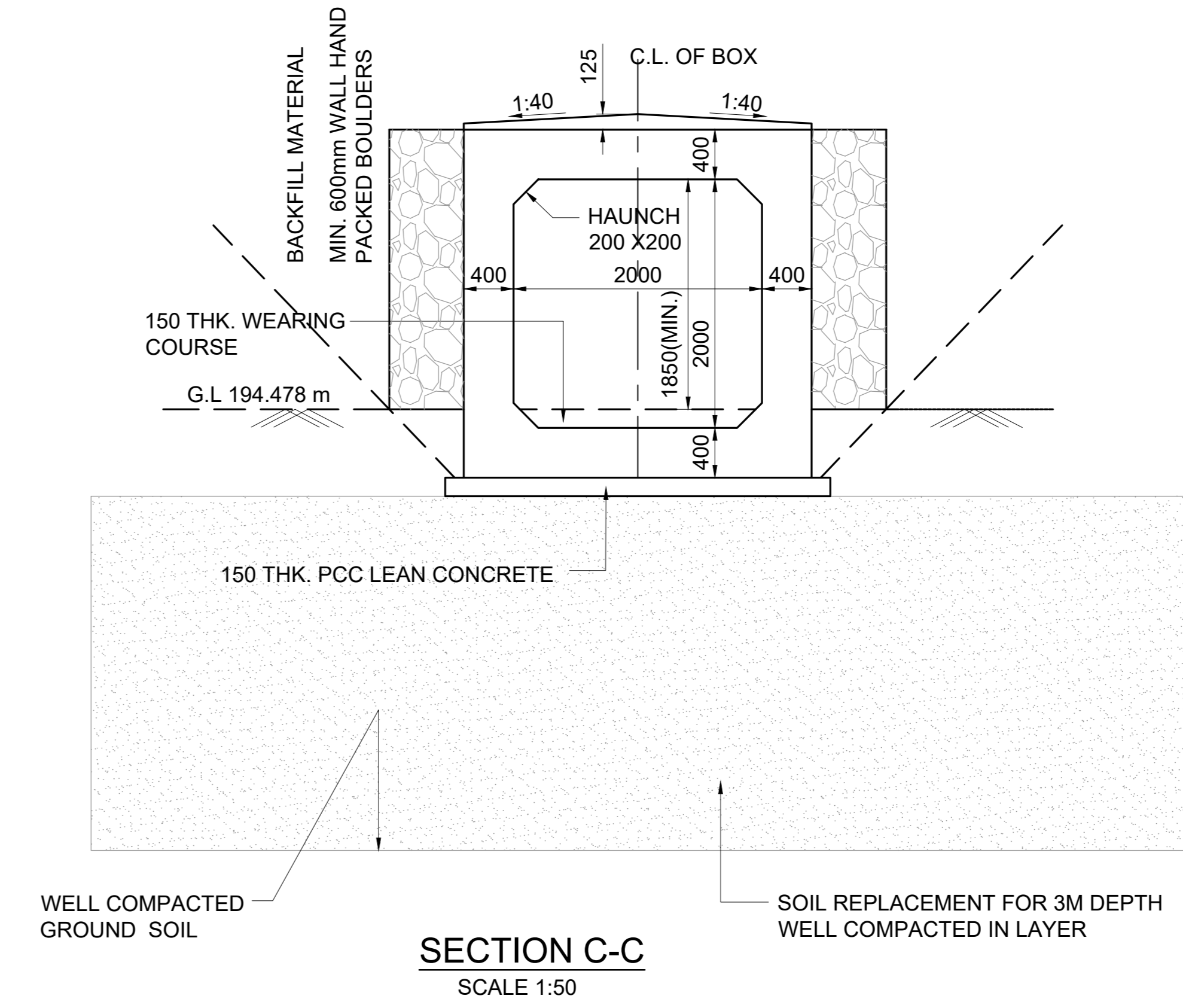
PRL	PROPOSED RAIL LEVEL
PFL	PROPOSED FORMATION LEVEL
HFL	HIGHEST FLOOD LEVEL
GL	GROUND LEVEL



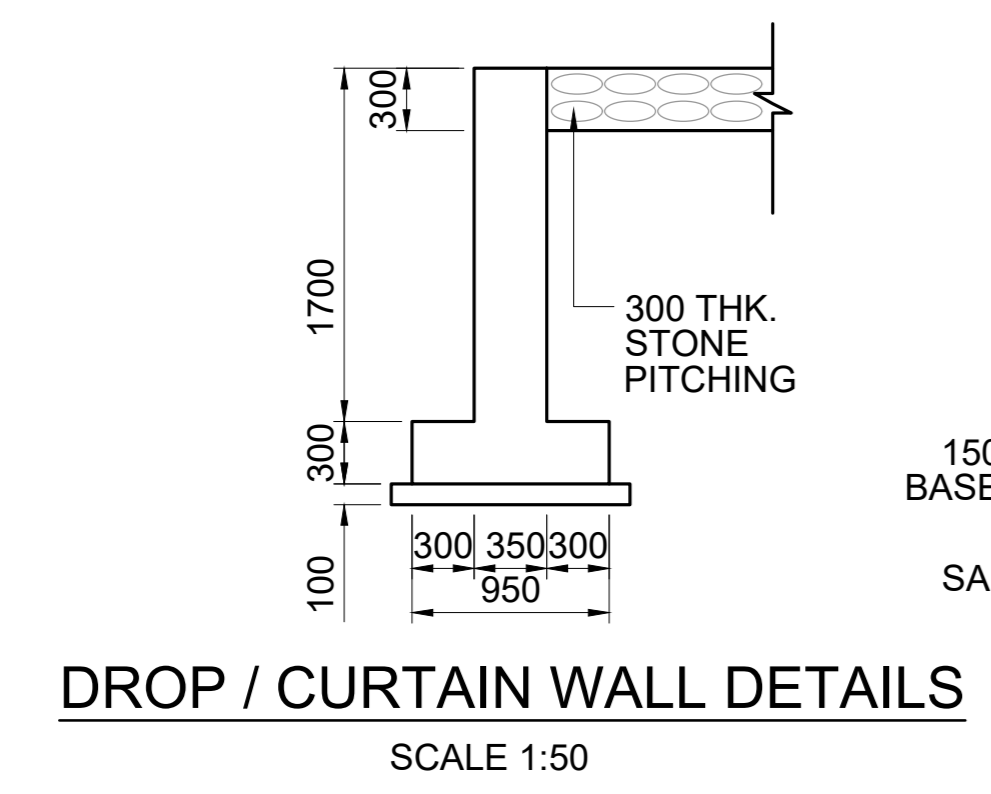
VIEW AT B-B
SCALE 1:50



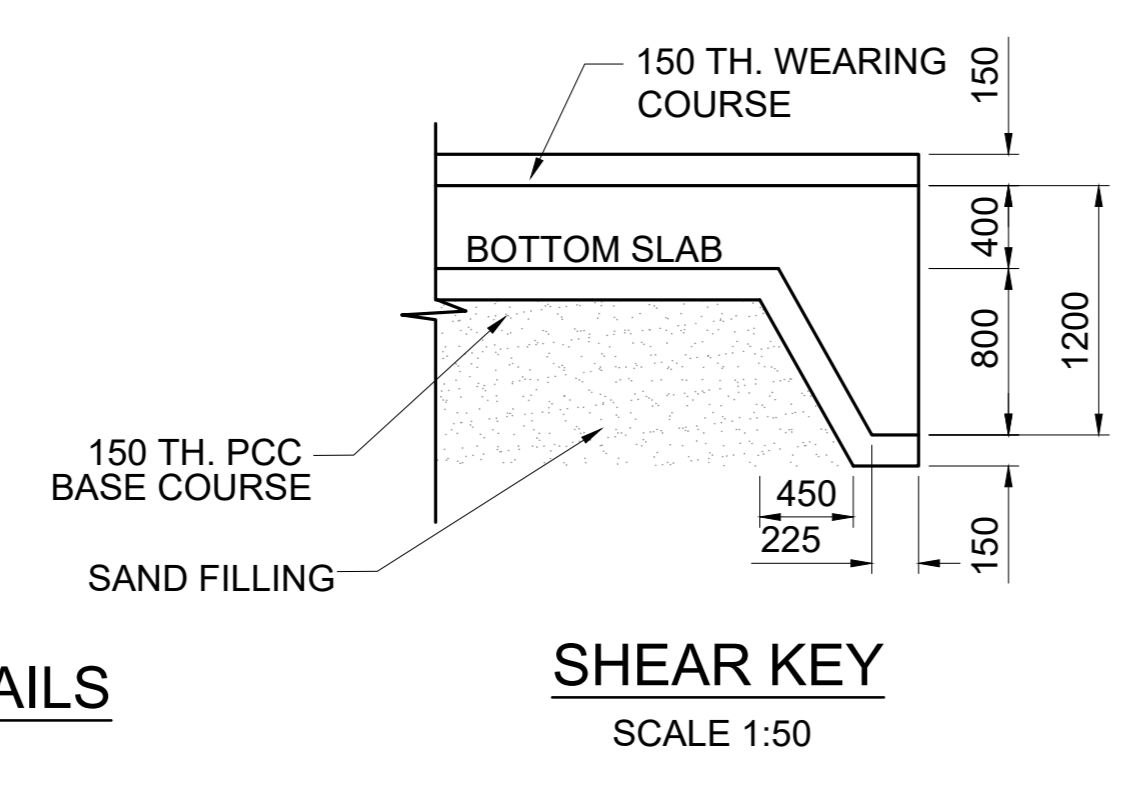
TYPICAL DETAIL OF RETURN WALL / WING WALL
SCALE 1:50



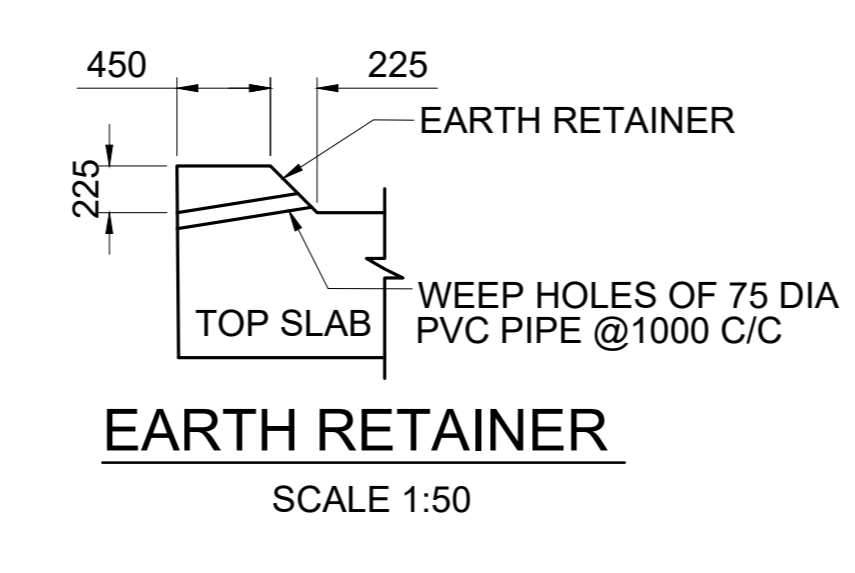
SECTION C-C
SCALE 1:50



DROP / CURTAIN WALL DETAILS
SCALE 1:50



SHEAR KEY
SCALE 1:50



EARTH RETAINER
SCALE 1:50

NOTES :

A) GENERAL NOTES

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- THE CHAINAGES SHOWN ARE RECKONED FROM C/L OF PRITHALA STATION BUILDING TAKEN AS 0.00 M, WITH RESPECT TO UP MAIN LINE.
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- ADEQUATE SLOPE IN BOTTOM SLAB OF RCC BOX TOWARDS DIRECTION OF FLOW SHALL BE PROVIDED.

PROJECT:

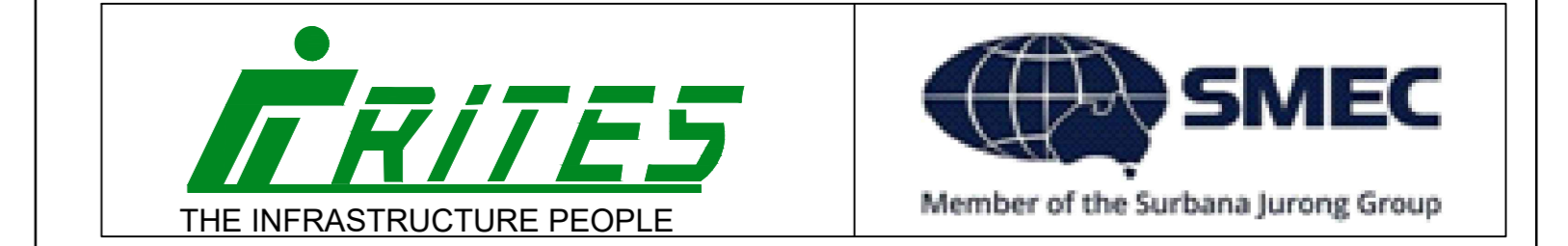
HARYANA ORBITAL RAIL CORRIDOR
CONNECTING PALWAL TO SONIPAT BYPASSING DELHI AREA BY LINKING ASAOTI-PATLI-SULTANPUR-ASAUDAH BY NEW ELECTRIFIED BG DOUBLE LINE

CLIENT:

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CONSULTANT:

GENERAL CONSULTANT FOR HARYANA ORBITAL RAIL CORRIDOR
RITES Limited in consortium with SMEC International Pty. Ltd.



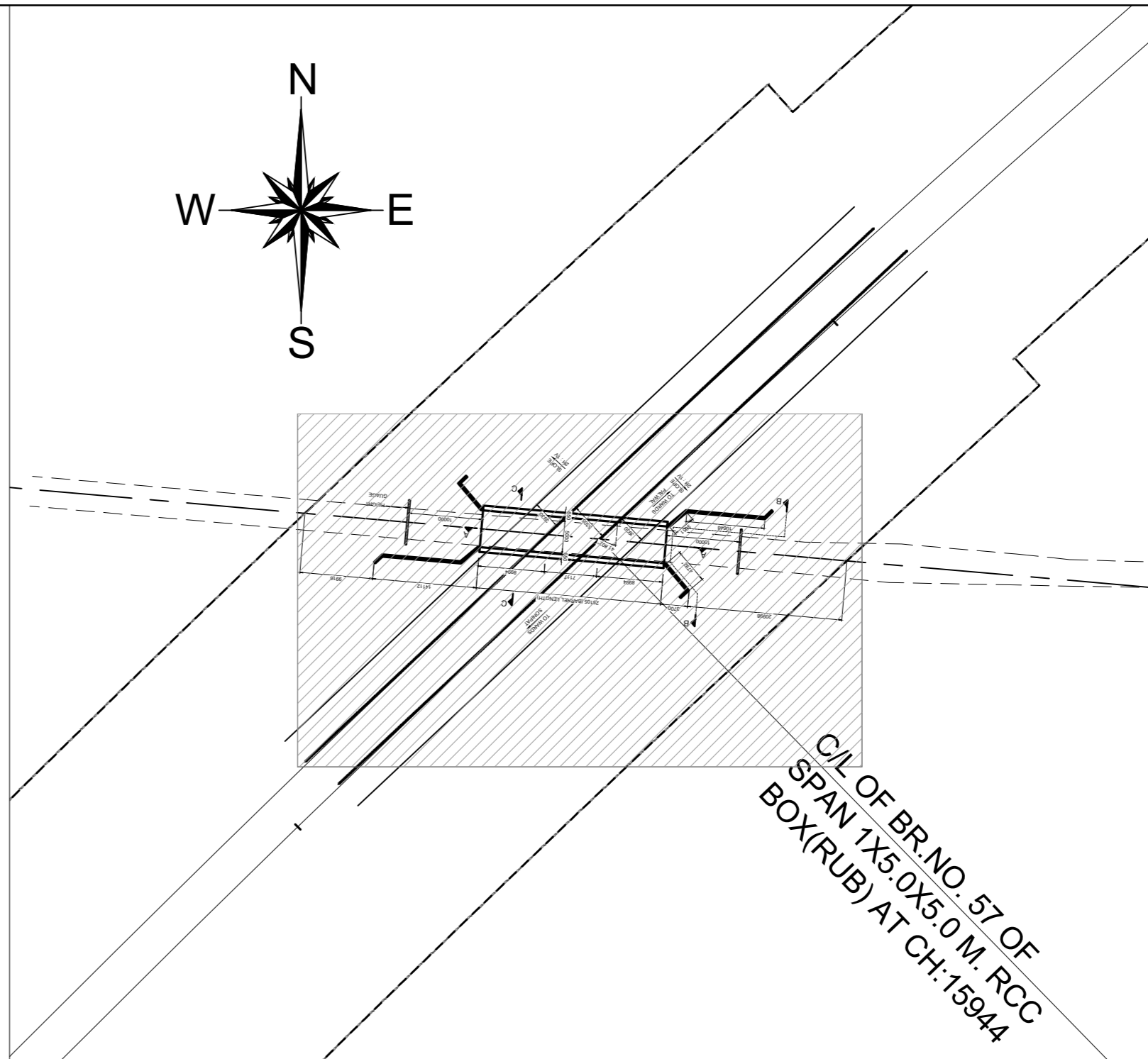
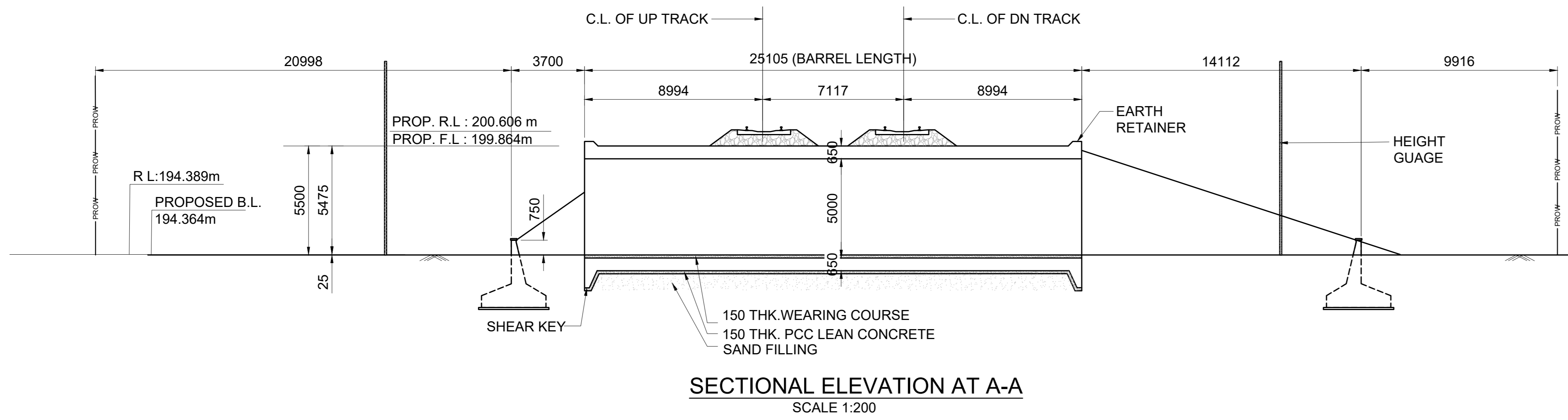
TITLE:- CONCEPTUAL GENERAL ARRANGEMENT DRAWING

FOR BALANCING CULVERT BRIDGE NO. 056
SPAN 1.0X2.0X2.0 RCC BOX AT CH: 15100.163

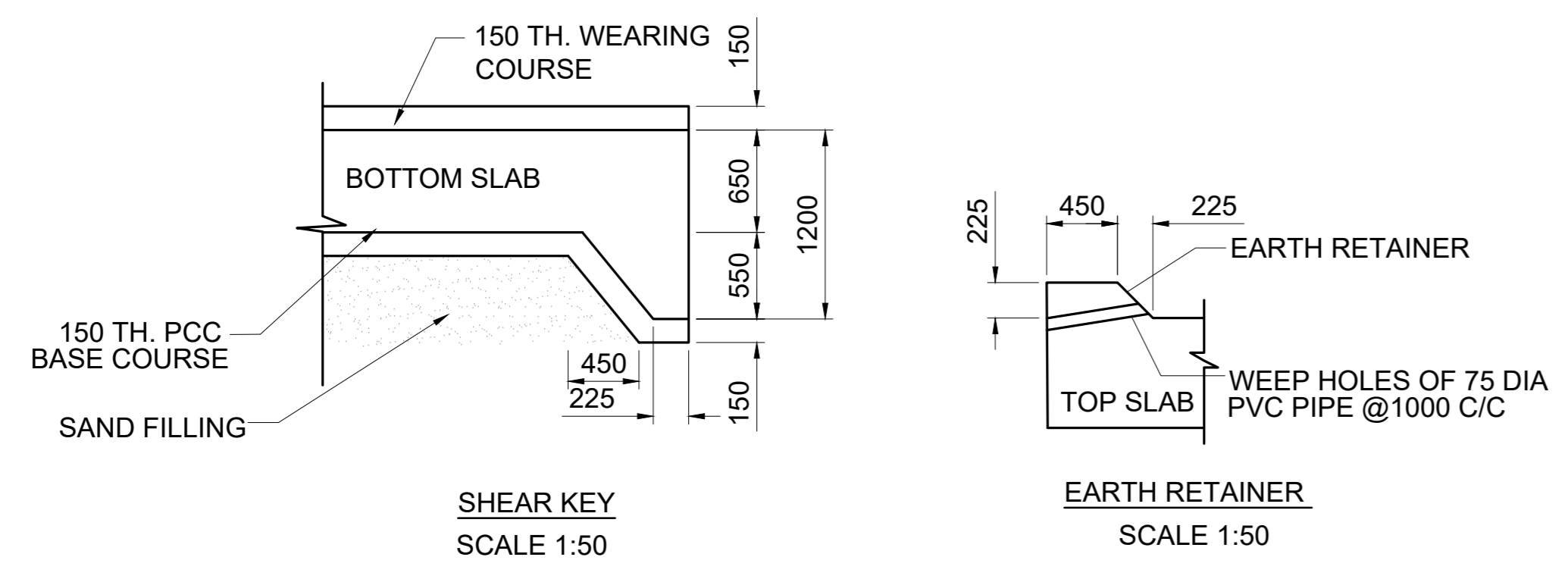
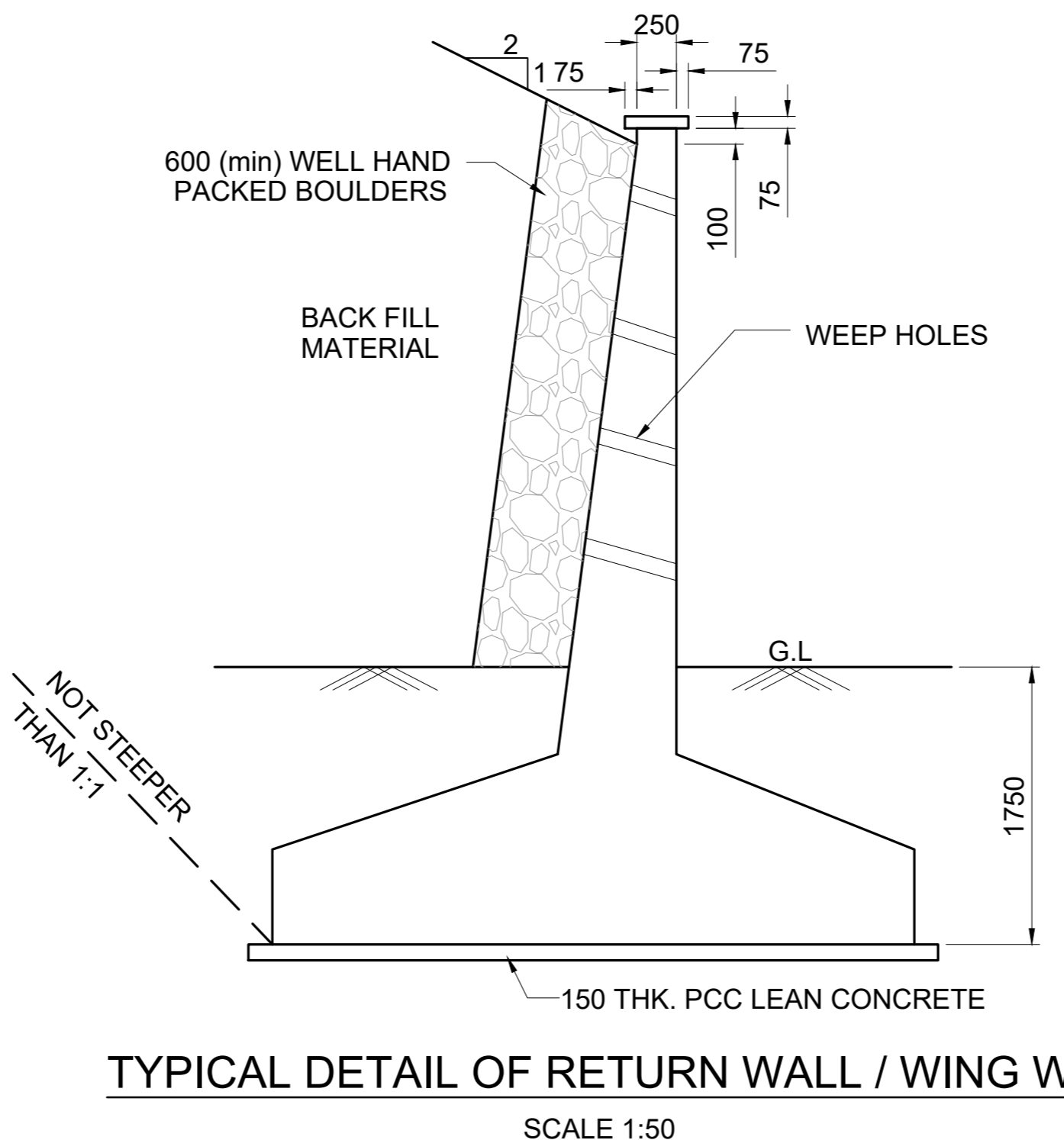
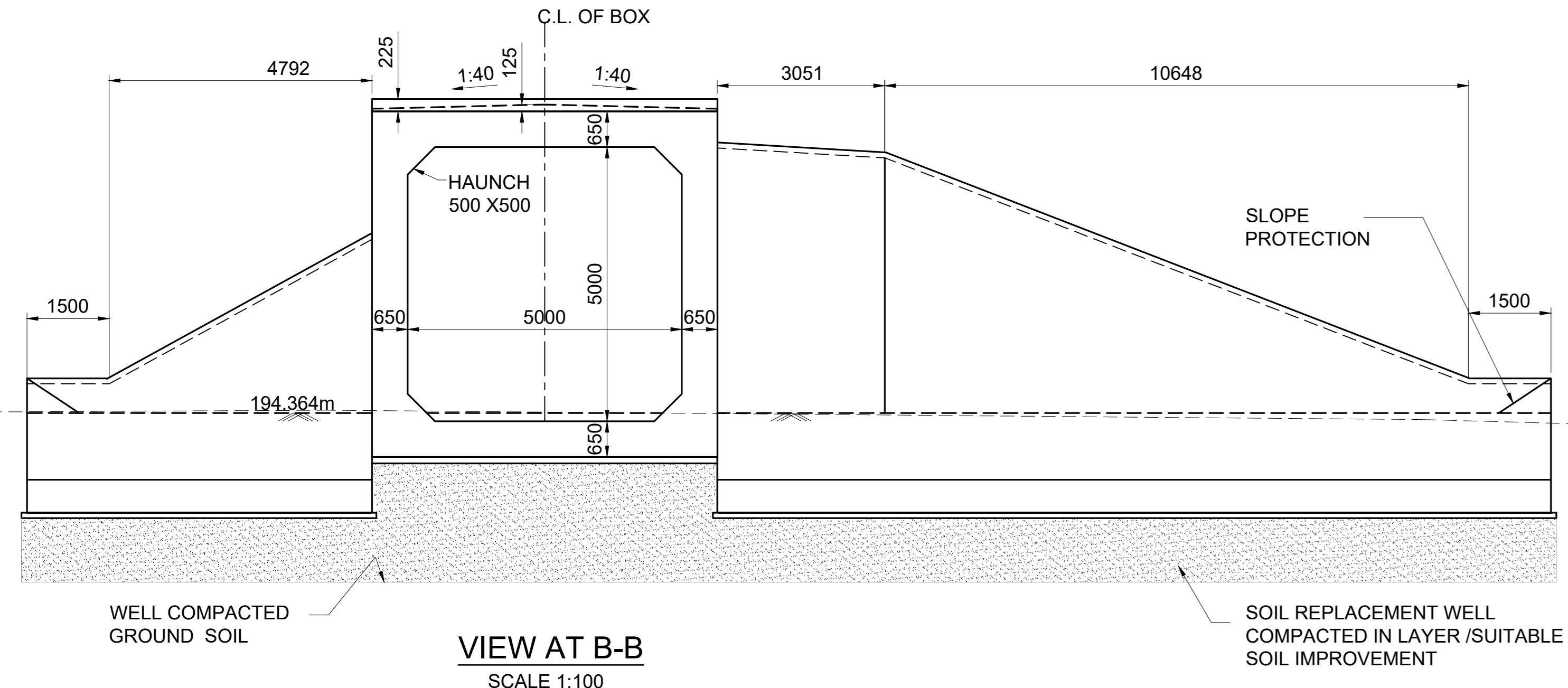
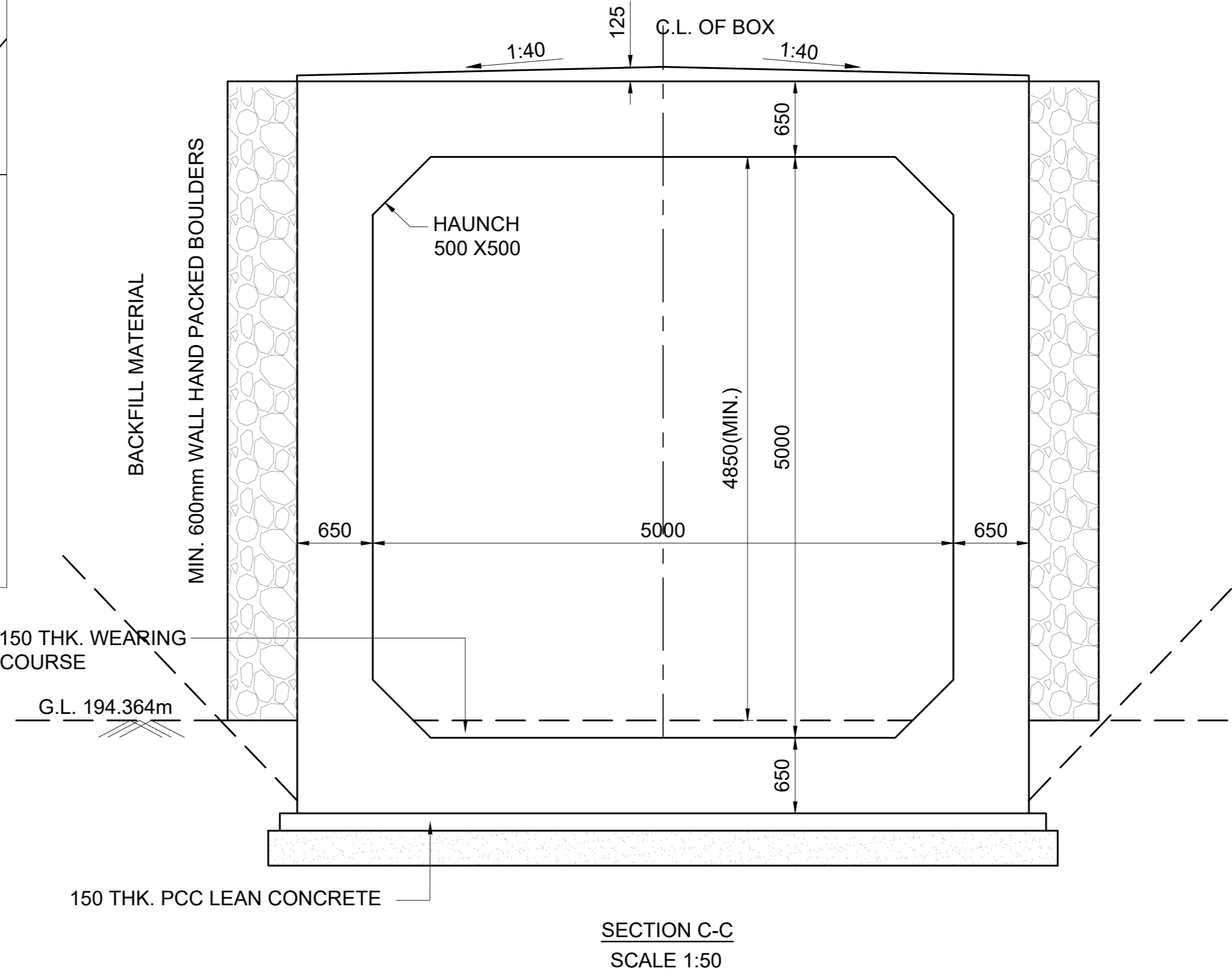
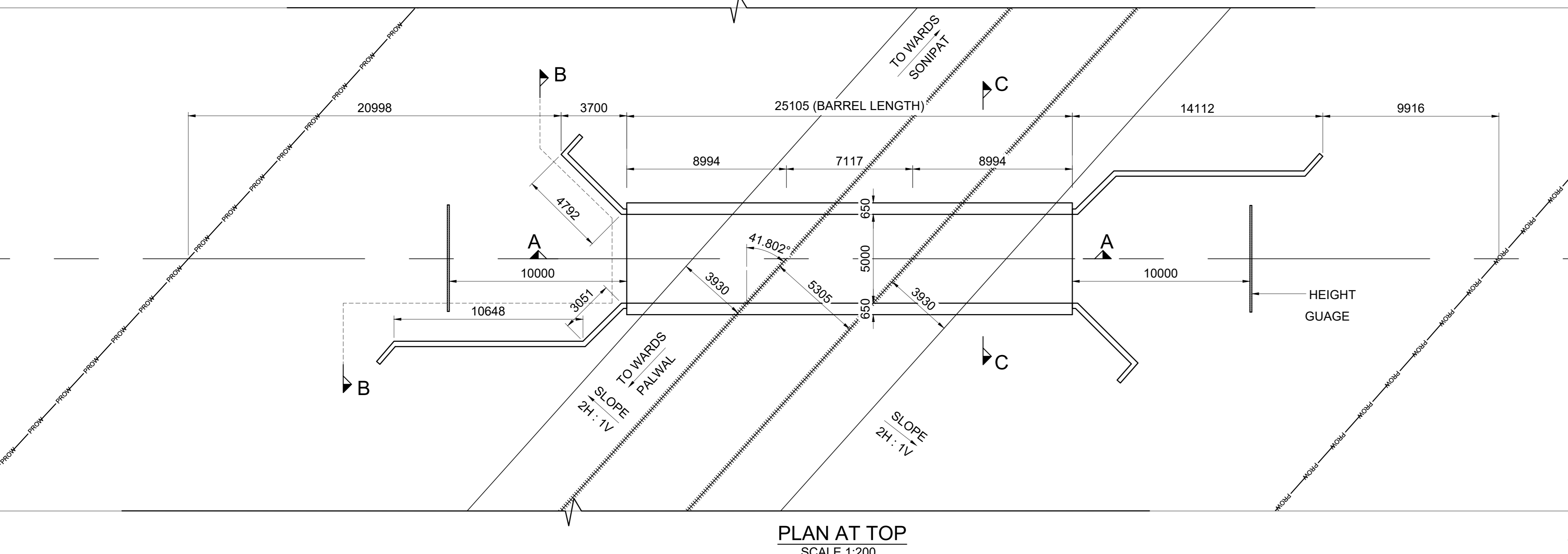
DRG. NO. GC-HRIDC-C4-DRW-BRD-GAD-01056_A1
SHEET NO. 1 OF 1

SCALE : AS SHOWN
ISSUE DATE 07-11-2022
REVISED DATE 21-11-2022

GC/HORC		HRIDC	
NAME / DESIGNATION	SIGN	NAME / DESIGNATION	SIGN
CHAHATEY RAM PD	<i>ChahateyRam</i>	SHIV OM DWIVEDI CPM/HRIDC	<i>Shiv</i>
SUDHIR AGRAWAL DPD/CIVIL	<i>MS</i>	RAJU SOLANKI DGM/CIVIL/SOUTH	<i>Raju</i>
REETU PATIAL CDE/ CIVIL	<i>RE</i>		



- NOTES :**
- A) GENERAL NOTES**
- ALL DIMENSIONS ARE IN MILLIMETERS EXCEPT LEVELS WHICH ARE IN METER, UNLESS OTHERWISE MENTIONED.
 - THE CHAINAGES SHOWN ARE RECKONED FROM C/L OF PRITHALA STATION BUILDING TAKEN AS 0.00 M, WITH RESPECT TO UP MAIN LINE.
 - FOR RAIL LEVELS, FORMATION LEVEL, GRADES ETC. REFER L-SECTION.
 - BOX BRIDGE IS TO BE DESIGNED FOR 32.5 T LOADING AS APPLICABLE.
 - THE EXISTING DETAILS ARE AS PER SITE SURVEY AND SHALL BE VERIFIED BY THE CONTRACTOR BEFORE EXECUTION.
 - ENGINEER IN CHARGE/SITE ENGINEER SHOULD VERIFY THE RAIL LEVEL FORMATION LEVEL, BED LEVEL & TRACK CENTER AT SITE BEFORE COMMENCEMENT OF WORK.
 - SUITABLE BED SLOPE SHALL BE PROVIDED AND ADJUSTED AS PER SITE CONDITIONS.
 - ENGINEER IN CHARGE/SITE ENGINEER SHALL ENSURE THE SAFETY OF TRACK/ROAD AT ALL THE TIME AND SHALL TAKE NECESSARY PRECAUTIONS TO PREVENT DAMAGE OF S&T CABLE /OFC DURING EXECUTION OF WORK CONCERNED DEPT. SUCH AS BSNL/AIRTEL/SSE/SIG/ADSTE ETC. SHALL BE INFORMED WELL IN ADVANCE BEFORE EXECUTION OF WORK.
 - THIS DRAWING IS THE PROPERTY OF HRDC AND FOR EXCLUSIVE USE OF HORC.
 - DETAILED DESIGN DRAWING WILL BE PREPARED BASED ON THIS CONCEPTUAL APPROVED GAD.
 - THICKNESS OF STRUCTURAL MEMBERS ARE TENTATIVE AND WILL BE FINALISED AFTER DETAILED DESIGN.
- B) TECHNICAL NOTES :**
- PROTECTION WORK ON SLOPES OF BANK UP TO 15M,BOTH SIDES ON APPROACHES OF BRIDGE SHALL BE DONE AS PER SKETCH NO. GC-HRIDC-SK-GEN-015.
 - INSPECTION STEPS SHALL BE PROVIDED AT DIAGONALLY OPPOSITE ENDS OF THE BOX AFTER PROTECTION WORK.
 - FOR PROPER DRAINAGE OF WATER, 50mm PCC M-20 WITH SUITABLE SLOPE TO BE USED ON TOP OF BOX SLAB.
 - ALL CLEAN EXPANSION JOINTS SHALL BE FILLED WITH THERMOCOL.
 - PLACEMENT LEVEL OF BOX AS SHOWN IN THIS GAD IS INDICATIVE AND MAY BE SUITABLY LOWERED/ELEVATED BASED UPON THE REQUIREMENT OF CLEARANCE, DRAINAGE & NATURAL GROUND PROFILE.
 - DESIGN CRITERIA SHALL BE BASED ON FOLLOWING IRS CODES
 - (i) IRS BRIDGE RULE
 - (ii) IRS CONCRETE BRIDGE CODE
 - (iii) IRS BRIDGE SUB-STRUCTURE & FOUNDATION CODE
 - SEISMIC ZONE- IV
 - EXPOSURE CONDITION- MODERATE.
 - DURING CONSTRUCTION, IF REQUIRED, ROAD CLOSURE TO BE OBTAINED FROM CONCERNED ROAD/CIVIL AUTHORITIES. DIVERSION OF ROAD IF ANY, REQUIRED IS TO BE DONE BY CONTRACTOR AT HIS COST.
 - THE BACK FILL MATERIAL SHALL BE CONFORMING TO CLAUSE 7.5 OF IRS SUB- STRUCTURE AND FOUNDATION CODE.
 - ALL RCC SURFACES COMING IN CONTACT WITH SOIL SHOULD BE PAINTED WITH BITUMEN OR COAL TAR OF APPROVED QUALITY @ 1.464 K.G/SQM.CONFORMING TO IS-3117.
 - REINFORCEMENT SHALL BE Fe 500D (TMT) CONFORMING TO IS 1786
 - FOR CONCRETE SPECIFICATION REFER IRS CONCRETE BRIDGE CODE. GRADE OF CONCRETE :
 - (i) ALL RCC/WEARING COURSE(WC) =M:35/DETAILED DESIGN DRG.
 - (ii) LEVELING COURSE/LEAN CONCRETE =M:20/DETAILED DESIGN DRG.
 - BEARING CAPACITY OF SOIL SHALL BE ENSURED AS PER DETAILED DESIGN REQUIREMENT. SUITABLE GROUND IMPROVEMENT SHALL BE CARRIED OUT AS PER GT & DESIGN REQUIREMENT AND CONFIRMED THROUGH FIELD TESTING.
 - FOUNDATION LEVEL SHOWN IN DRAWING IS TENTATIVE. DETAILED DESIGN DRAWING SHALL BE FOLLOWED FOR FOUNDATION LEVEL DURING EXECUTION.
 - HEIGHT GAUGE SHALL BE PROVIDE AS PER RDSO STANDARD DRAWING NO. RDSO/M0001.
 - SPEED BREAKER SHOULD BE PROVIDED ON EITHER APPROACH OF RUB AT A DISTANCE OF 20M FROM THE BRIDGE COVERING FULL WIDTH OF THE ROAD INCLUDE BERMS AS PER ANNEXURE 9/5 OF P WAY MANUAL.



LEGEND

PRL	PROPOSED RAIL LEVEL
PFL	PROPOSED FORMATION LEVEL
HFL	HIGHEST FLOOD LEVEL
GL	GROUND LEVEL
RL	ROAD LEVEL

PROJECT:
HARYANA ORBITAL RAIL CORRIDOR
CONNECTING PALWAL TO SONIPAT BYPASSING DELHI AREA BY LINKING ASAOTI-PATLI-SULTANPUR-ASAUDAH BY NEW ELECTRIFIED BG DOUBLE LINE

CLIENT:
HARYANA RAIL INFRASTRUCTURE DEVELOPMENT CORPORATION LIMITED.

CONSULTANT:
GENERAL CONSULTANT FOR HARYANA ORBITAL RAIL CORRIDOR
RITES Limited in consortium with SMEC International Pty. Ltd.

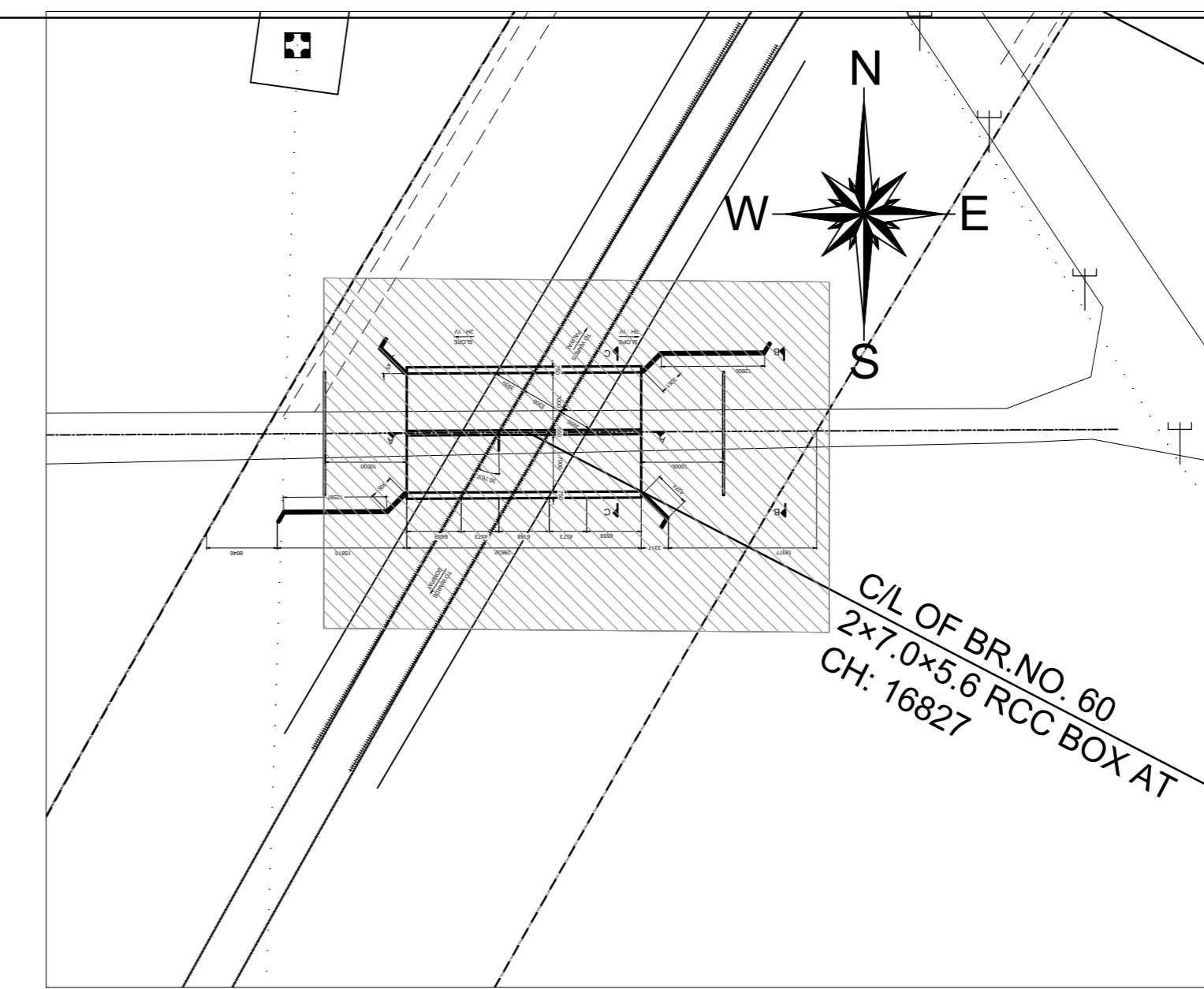
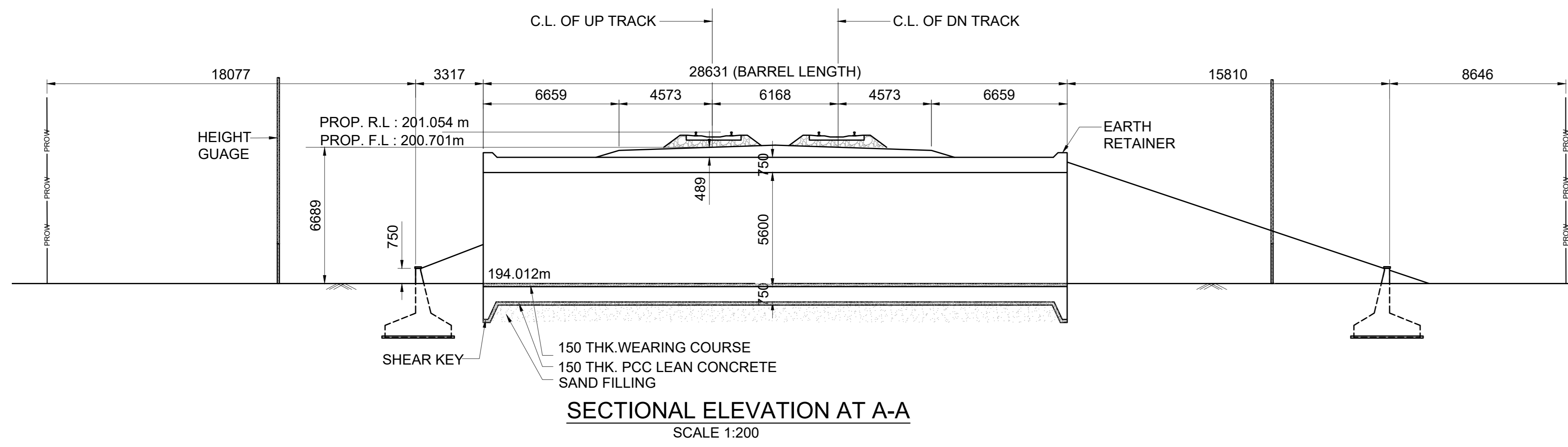
IRITES THE INFRASTRUCTURE PEOPLE
SMEC Member of the Surbana Jurong Group

GC/HORC		HRDC	
NAME / DESIGNATION	SIGN	NAME / DESIGNATION	SIGN
CHAHATEY RAM PD	<i>ChahateyRam</i>	SHIV OM DWIVEDI CPM/HRDC	<i>Shiv</i>
SUDHIR AGRAWAL DPD/CIVIL	<i>MS</i>	RAJU SOLANKI DGM/CIVIL/SOUTH	<i>Raju</i>
REETU PATIAL CDE/ CIVIL	<i>Reetu</i>		

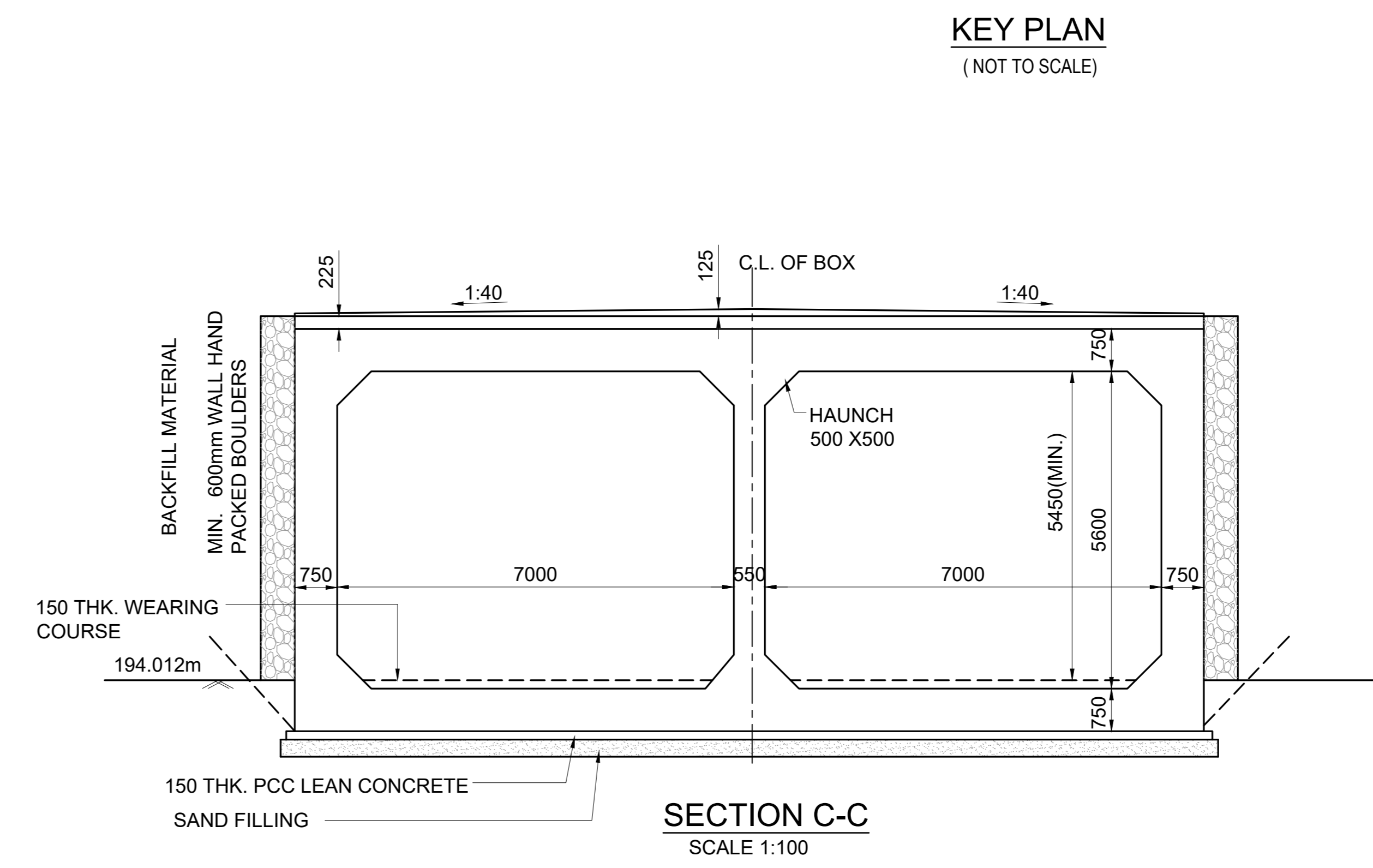
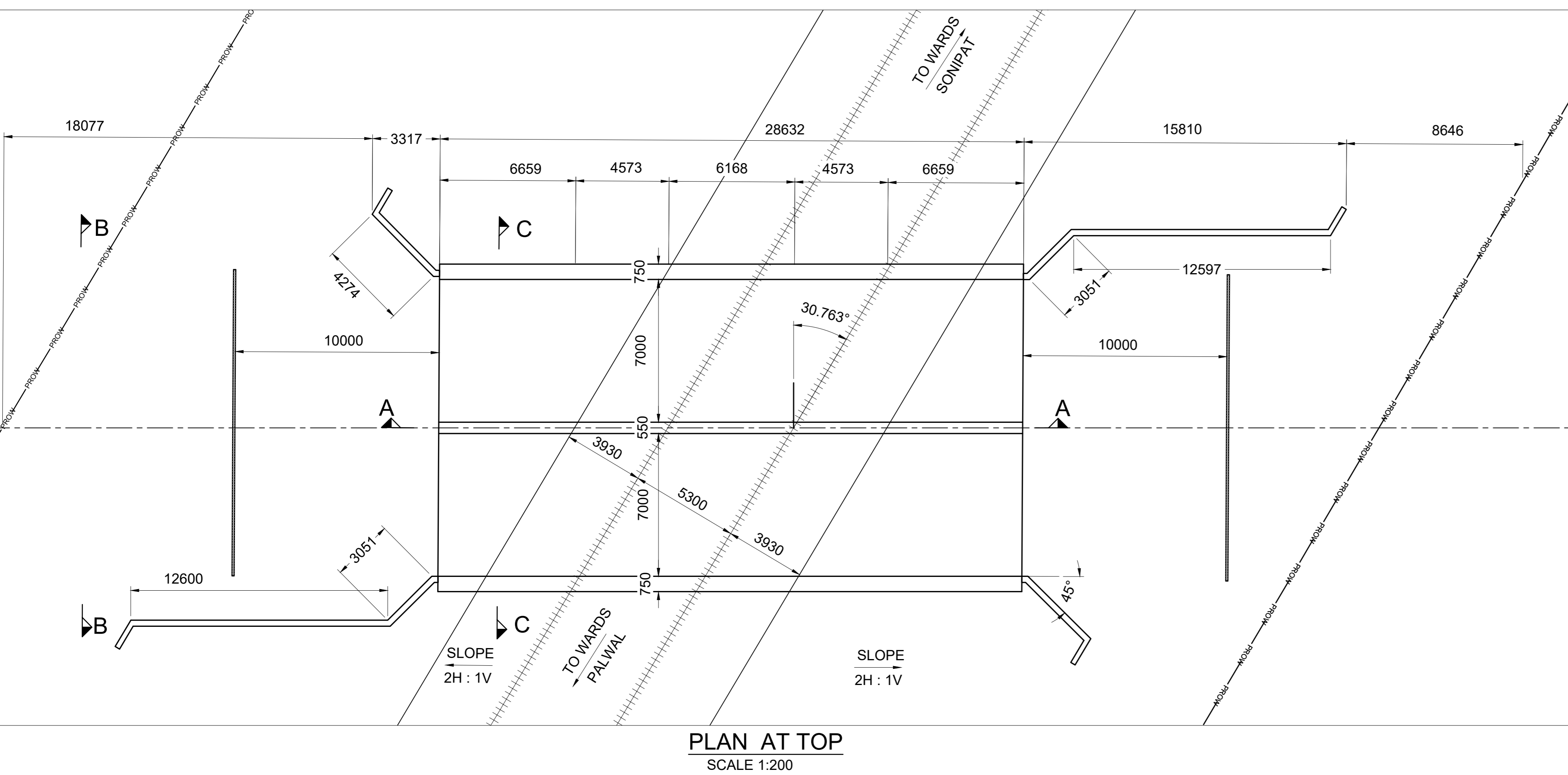
TITLE:- CONCEPTUAL GENERAL ARRANGEMENT DRAWING
FOR ROAD UNDER BRIDGE, BRIDGE NO. 057
SPAN 1x5.0x5.0 RCC BOX AT CH: 15944

DRG. NO. GC-HRIDC-C4-DRW-BRD-GAD-01057_A1
SHEET NO. 1 OF 1

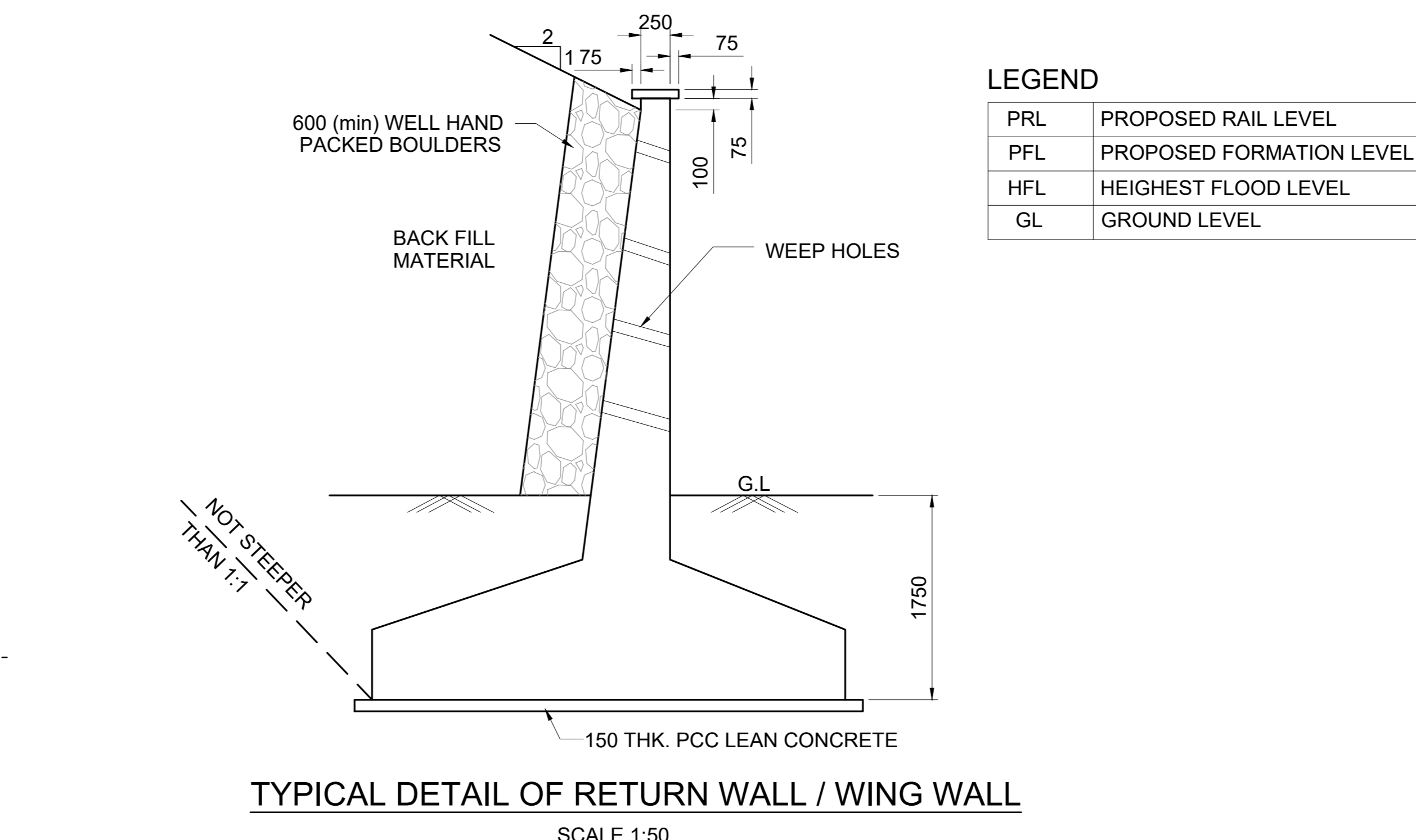
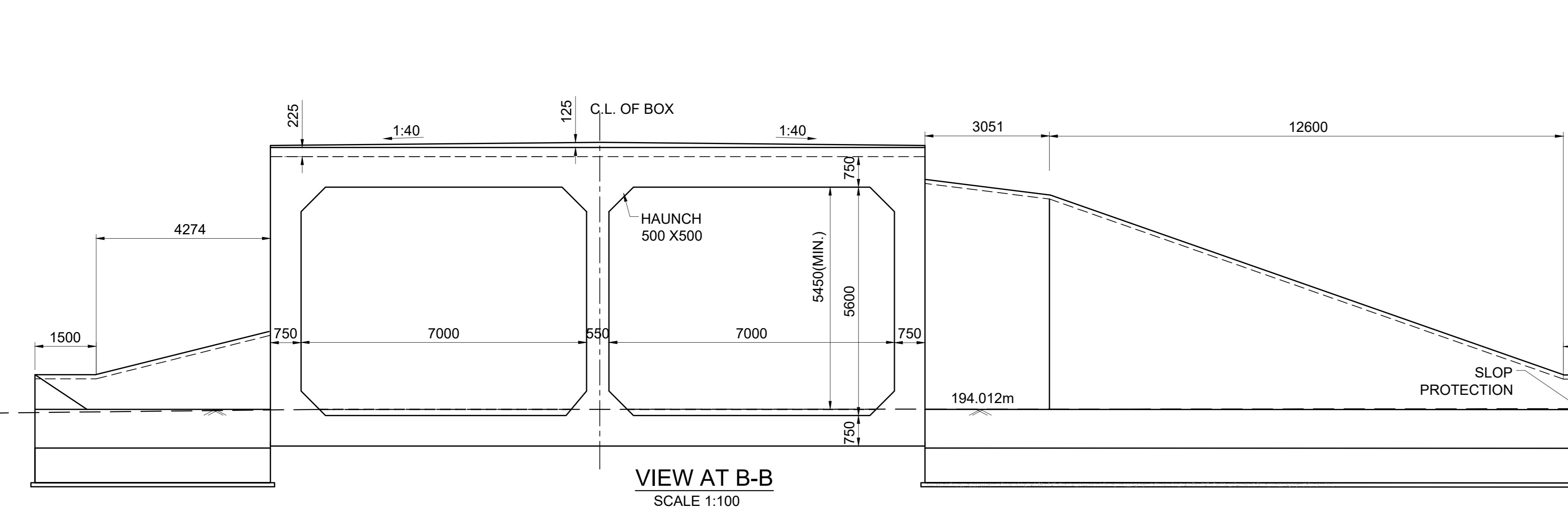
SCALE : AS SHOWN
ISSUE DATE 07-11-2022
REVISED DATE 21-11-2022



- NOTES :**
- A) GENERAL NOTES**
- ALL DIMENSIONS ARE IN MILLIMETERS EXCEPT LEVELS WHICH ARE IN METER, UNLESS OTHERWISE MENTIONED.
 - THE CHAINAGES SHOWN ARE RECKONED FROM C/L OF PRITHALA STATION BUILDING TAKEN AS 0.00 M, WITH RESPECT TO UP MAIN LINE.
 - FOR RAIL LEVELS, FORMATION LEVEL, GRADES ETC. REFER L-SECTION.
 - BOX BRIDGE IS TO BE DESIGNED FOR 32.5 T LOADING AS APPLICABLE.
 - THE EXISTING DETAILS ARE AS PER SITE SURVEY AND SHALL BE VERIFIED BY THE CONTRACTOR BEFORE EXECUTION.
 - ENGINEER IN CHARGE/ SITE ENGINEER SHOULD VERIFY THE RAIL LEVEL FORMATION LEVEL, BED LEVEL & TRACK CENTER AT SITE BEFORE COMMENCEMENT OF WORK.
 - SUITABLE BED SLOPE SHALL BE PROVIDED AND ADJUSTED AS PER SITE CONDITIONS.
 - ENGINEER IN CHARGE/SITE ENGINEER SHALL ENSURE THE SAFETY OF TRACK/ROAD AT ALL THE TIME AND SHALL TAKE NECESSARY PRECAUTIONS TO PREVENT DAMAGE OF S&T CABLE /OFC DURING EXECUTION OF WORK CONCERNED DEPT. SUCH AS BSNL/AIRTEL/SSE/SIG/ADSTE ETC. SHALL BE INFORMED WELL IN ADVANCE BEFORE EXECUTION OF WORK.
 - THIS DRAWING IS THE PROPERTY OF HRDC AND FOR EXCLUSIVE USE OF HORC.
 - DETAILED DESIGN DRAWING WILL BE PREPARED BASED ON THIS CONCEPTUAL APPROVED GAD.
 - THICKNESS OF STRUCTURAL MEMBERS ARE TENTATIVE AND WILL BE FINALISED AFTER DETAILED DESIGN.
- B) TECHNICAL NOTES :**
- PROTECTION WORK ON SLOPES OF BANK UP TO 15M BOTH SIDES ON APPROACHES OF BRIDGE SHALL BE DONE AS PER SKETCH NO. GC-HRDC-SK-GEN-015.
 - INSPECTION STEPS SHALL BE PROVIDED AT DIAGONALLY OPPOSITE ENDS OF THE BOX AFTER PROTECTION WORK.
 - FOR PROPER DRAINAGE OF WATER, 50mm PCC M-20 WITH SUITABLE SLOPE TO BE USED ON TOP OF BOX SLAB.
 - ALL CLEAN/ EXPANSION JOINTS SHALL BE FILLED WITH THERMOCOL.
 - PLACEMENT LEVEL OF BOX AS SHOWN IN THIS GAD IS INDICATIVE AND MAY BE SUITABLY LOWERED/ELEVATED BASED UPON THE REQUIREMENT OF CLEARANCE, DRAINAGE & NATURAL GROUND PROFILE.
 - DESIGN CRITERIA SHALL BE BASED ON FOLLOWING IRS CODES
 - IRS BRIDGE RULE
 - IRS CONCRETE BRIDGE CODE
 - IRS BRIDGE SUB-STRUCTURE & FOUNDATION CODE
 - SEISMIC ZONE- IV
 - EXPOSURE CONDITION- MODERATE.
 - DURING CONSTRUCTION, IF REQUIRED, ROAD CLOSURE TO BE OBTAINED FROM CONCERNED ROAD/CIVIL AUTHORITIES. DIVERSION OF ROAD IF ANY, REQUIRED IS TO BE DONE BY CONTRACTOR AT HIS COST.
 - THE BACK FILL MATERIAL SHALL BE CONFORMING TO CLAUSE 7.5 OF IRS SUB-STRUCTURE AND FOUNDATION CODE.
 - ALL RCC SURFACES COMING IN CONTACT WITH SOIL SHOULD BE PAINTED WITH BITUMEN OR COAL TAR OF APPROVED QUALITY @ 1.464 K.G/SQM. CONFORMING TO IS-3117.
 - REINFORCEMENT SHALL BE Fe 500D (TMT) CONFORMING TO IS 1786.
 - FOR CONCRETE SPECIFICATION REFER IRS CONCRETE BRIDGE CODE. GRADE OF CONCRETE :
 - ALL RCC /WEARING COURSE(WC) =M:35/DETAILED DESIGN DRG.
 - LEVELING COURSE/LEAN CONCRETE =M:20/DETAILED DESIGN DRG.
 - BEARING CAPACITY OF SOIL SHALL BE ENSURED AS PER DETAILED DESIGN REQUIREMENT. GROUND IMPROVEMENT SHALL BE CARRIED OUT AS PER GT REPORT AND CONFIRMED THROUGH FIELD TESTING.
 - FOUNDATION LEVEL SHOWN IN DRAWING IS TENTATIVE. DETAILED DESIGN DRAWING SHALL BE FOLLOWED FOR FOUNDATION LEVEL DURING EXECUTION.
 - HEIGHT GAUGE SHALL BE PROVIDE AS PER RDSO STANDARD DRAWING NO. RDSO/M0001.
 - SPEED BREAKER SHOULD BE PROVIDED ON EITHER APPROACH OF RUB AT A DISTANCE OF 20M FROM THE BRIDGE COVERING FULL WIDTH OF THE ROAD INCLUDE BERMS.



- PROTECTION WORK ON SLOPES OF BANK UP TO 15M BOTH SIDES ON APPROACHES OF BRIDGE SHALL BE DONE AS PER SKETCH NO. GC-HRDC-SK-GEN-015.
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- ALL CLEAN/ EXPANSION JOINTS SHALL BE FILLED WITH THERMOCOL.
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 - IRS BRIDGE SUB-STRUCTURE & FOUNDATION CODE
- SEISMIC ZONE- IV
- EXPOSURE CONDITION- MODERATE.
- DURING CONSTRUCTION, IF REQUIRED, ROAD CLOSURE TO BE OBTAINED FROM CONCERNED ROAD/CIVIL AUTHORITIES. DIVERSION OF ROAD IF ANY, REQUIRED IS TO BE DONE BY CONTRACTOR AT HIS COST.
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- REINFORCEMENT SHALL BE Fe 500D (TMT) CONFORMING TO IS 1786.
- FOR CONCRETE SPECIFICATION REFER IRS CONCRETE BRIDGE CODE. GRADE OF CONCRETE :
 - ALL RCC /WEARING COURSE(WC) =M:35/DETAILED DESIGN DRG.
 - LEVELING COURSE/LEAN CONCRETE =M:20/DETAILED DESIGN DRG.
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- FOUNDATION LEVEL SHOWN IN DRAWING IS TENTATIVE. DETAILED DESIGN DRAWING SHALL BE FOLLOWED FOR FOUNDATION LEVEL DURING EXECUTION.
- HEIGHT GAUGE SHALL BE PROVIDE AS PER RDSO STANDARD DRAWING NO. RDSO/M0001.
- SPEED BREAKER SHOULD BE PROVIDED ON EITHER APPROACH OF RUB AT A DISTANCE OF 20M FROM THE BRIDGE COVERING FULL WIDTH OF THE ROAD INCLUDE BERMS.



LEGEND

PRL	PROPOSED RAIL LEVEL
PFL	PROPOSED FORMATION LEVEL
HFL	HIGHEST FLOOD LEVEL
GL	GROUND LEVEL

IMPORTANT NOTE:
TOP OF BOTTOM SLAB OF RCC BOX SHALL NOT BE KEPT ABOVE THE NATURAL GROUND LEVEL HOWEVER, ROAD LEVEL AND VERTICAL CLEARANCE ABOVE ROAD LEVEL SHALL BE MAINTAINED AS SHOWN IN THE DRAWING. OVERALL HEIGHT OF THE BOX MAY NEED MODIFICATION ACCORDINGLY. THE HEIGHT OF RCC BOX SHALL BE PROVIDED KEEPING ABOVE PROVISION IN VIEW.

PROJECT:
HARYANA ORBITAL RAIL CORRIDOR
CONNECTING PALWAL TO SONIPAT BYPASSING DELHI AREA BY LINKING ASAOTI-PATLI-SULTANPUR-ASAUDAH BY NEW ELECTRIFIED BG DOUBLE LINE

CLIENT:
 HARYANA RAIL INFRASTRUCTURE DEVELOPMENT CORPORATION LIMITED.

CONSULTANT:
 GENERAL CONSULTANT FOR HARYANA ORBITAL RAIL CORRIDOR
RITES Limited in consortium with SMEC International Pty. Ltd.

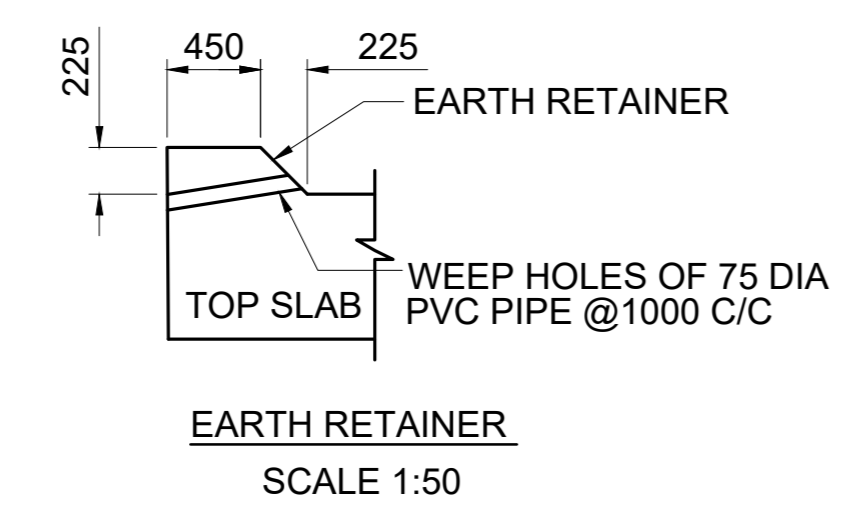
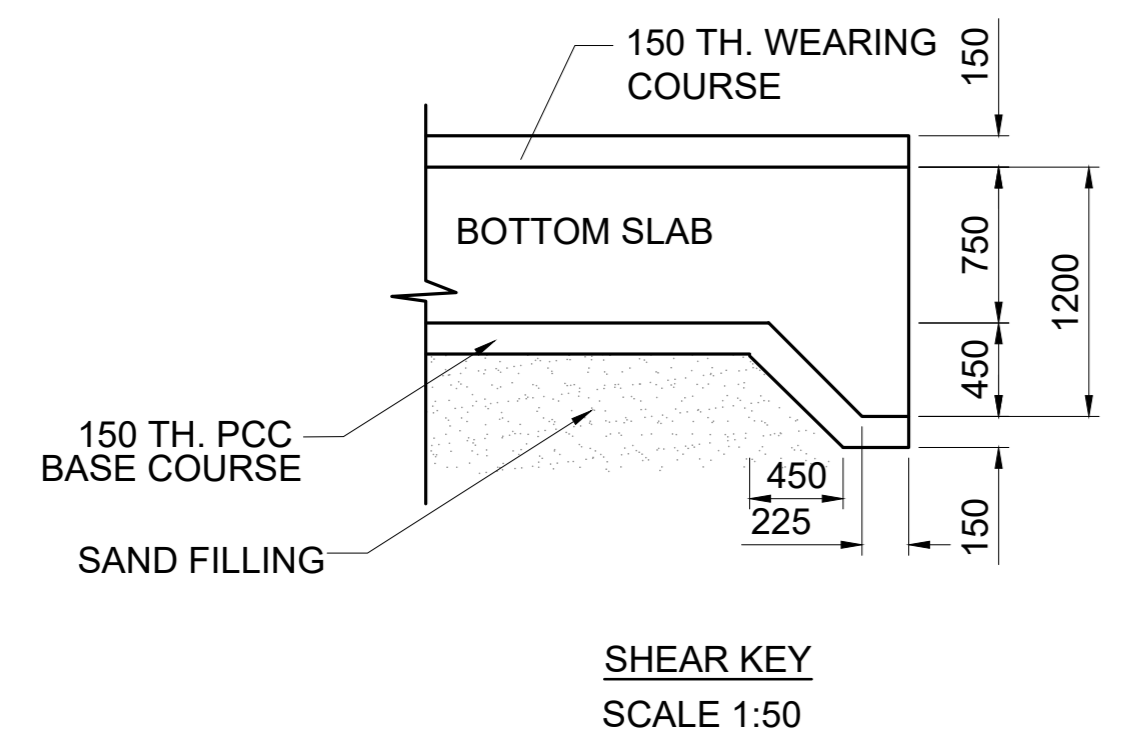


TITLE:- CONCEPTUAL GENERAL ARRANGEMENT DRAWING
PROPOSED RUB NO. 060
SPAN 2x7.0x5.6 RCC BOX AT CH: 16827

DRG. NO. GC-HRDC-C4-DRW-BRD-GAD-01060_A1
SHEET NO. 1 OF 1

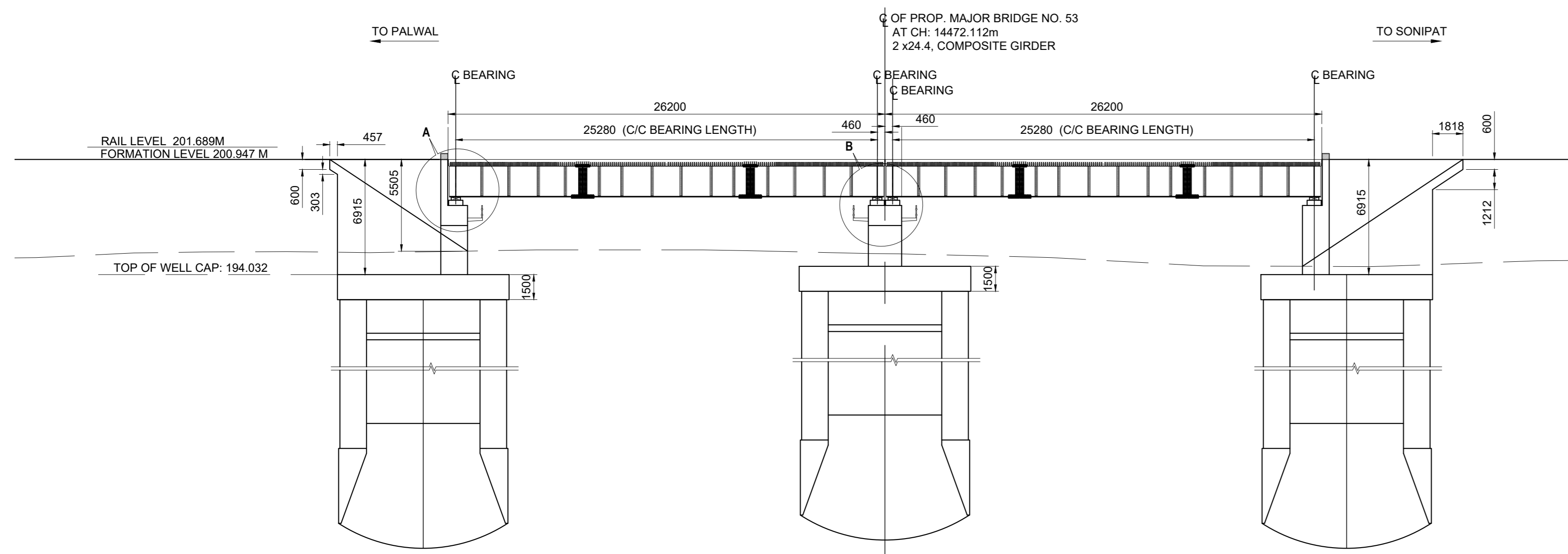
SCALE : AS SHOWN
ISSUE DATE 07-11-2022
REVISED DATE 21-11-2022

GC/HORC		HRDC	
NAME / DESIGNATION	SIGN	NAME / DESIGNATION	SIGN
CHAHATEY RAM PD		SHIV OM DWIVEDI CPM/HRDC	
SUDHIR AGRAWAL DPD/CIVIL		RAJU SOLANKI DGM/CIVIL/SOUTH	
REETU PATIAL CDE/ CIVIL			



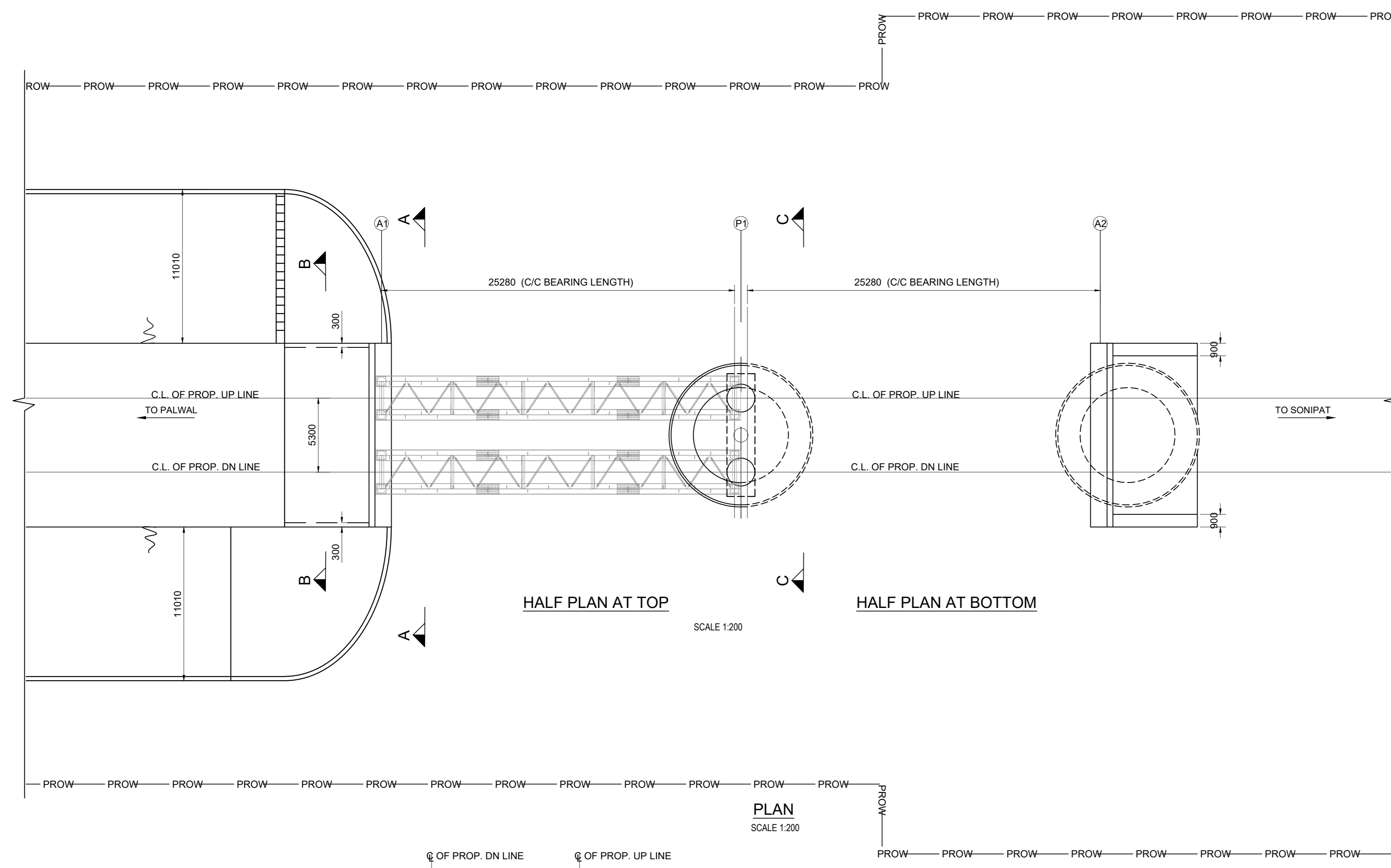
3. Bridges

3.2 Major Bridges



FORMATION LEVEL	200.947	200.947	200.947
GROUND LEVEL	195.402	195.520	194.915
CHAINAGE	14446.452	14472.112	14497.772

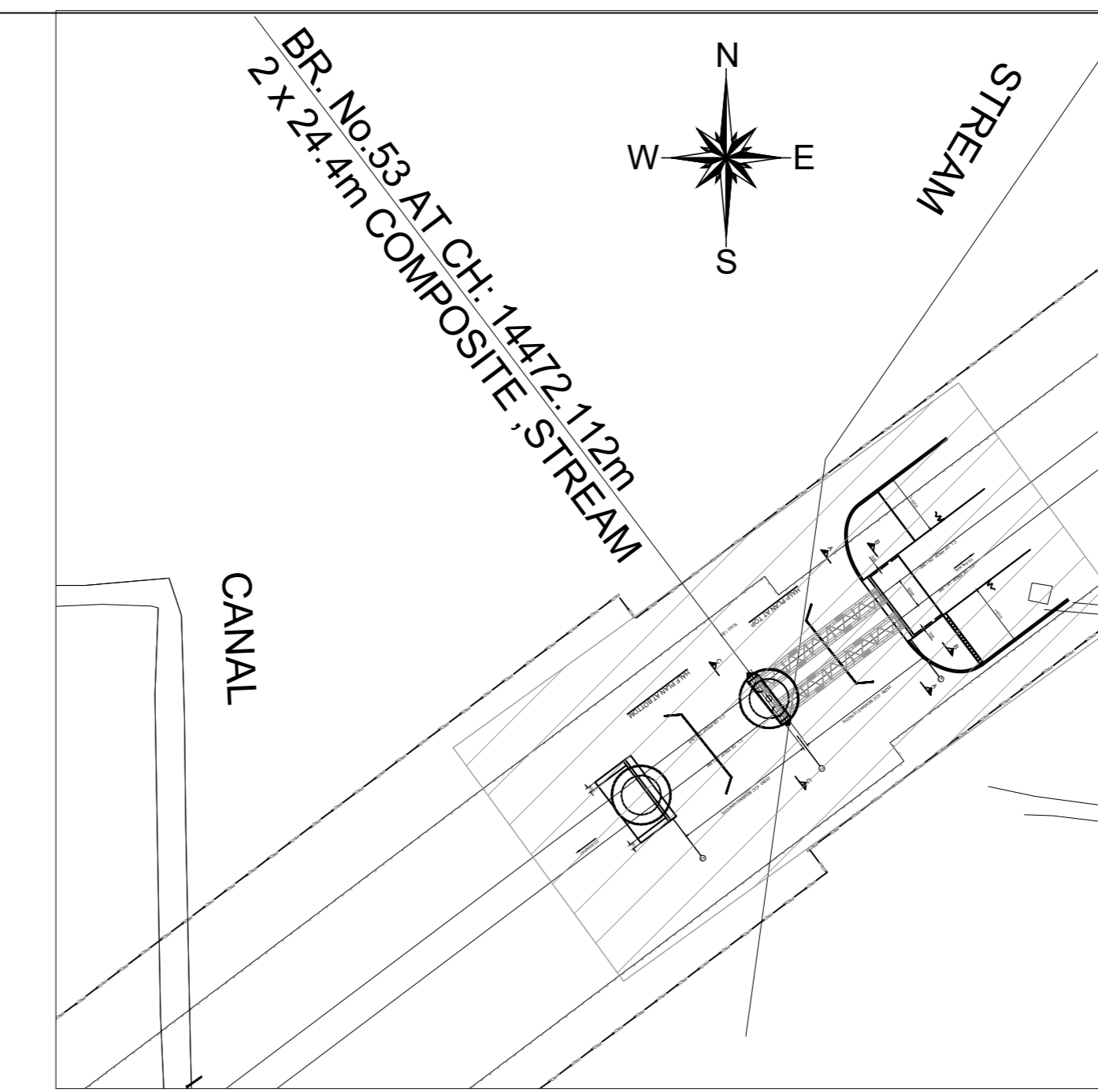
SECTIONAL ELEVATION
SCALE 1:200



HALF PLAN AT TOP
SCALE 1:200

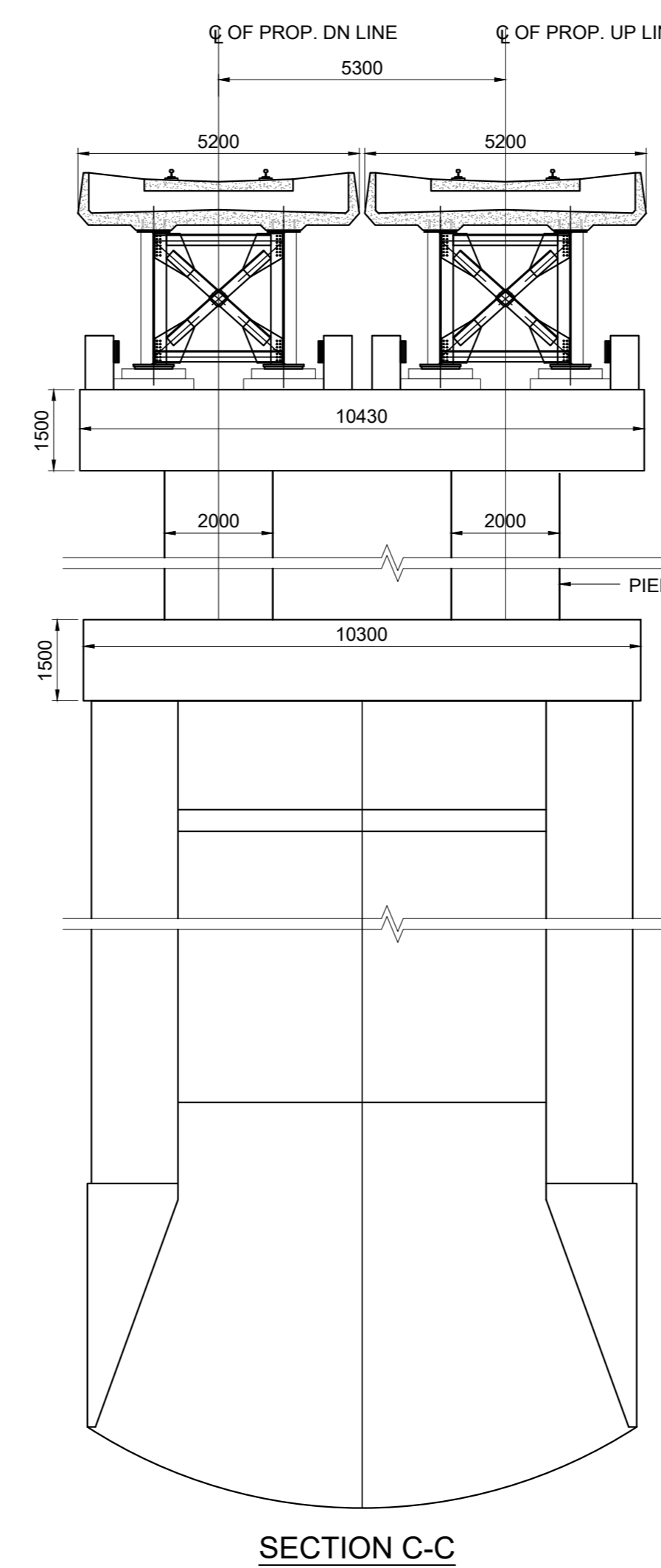
HALF PLAN AT BOTTOM
SCALE 1:200

PLAN
SCALE 1:200

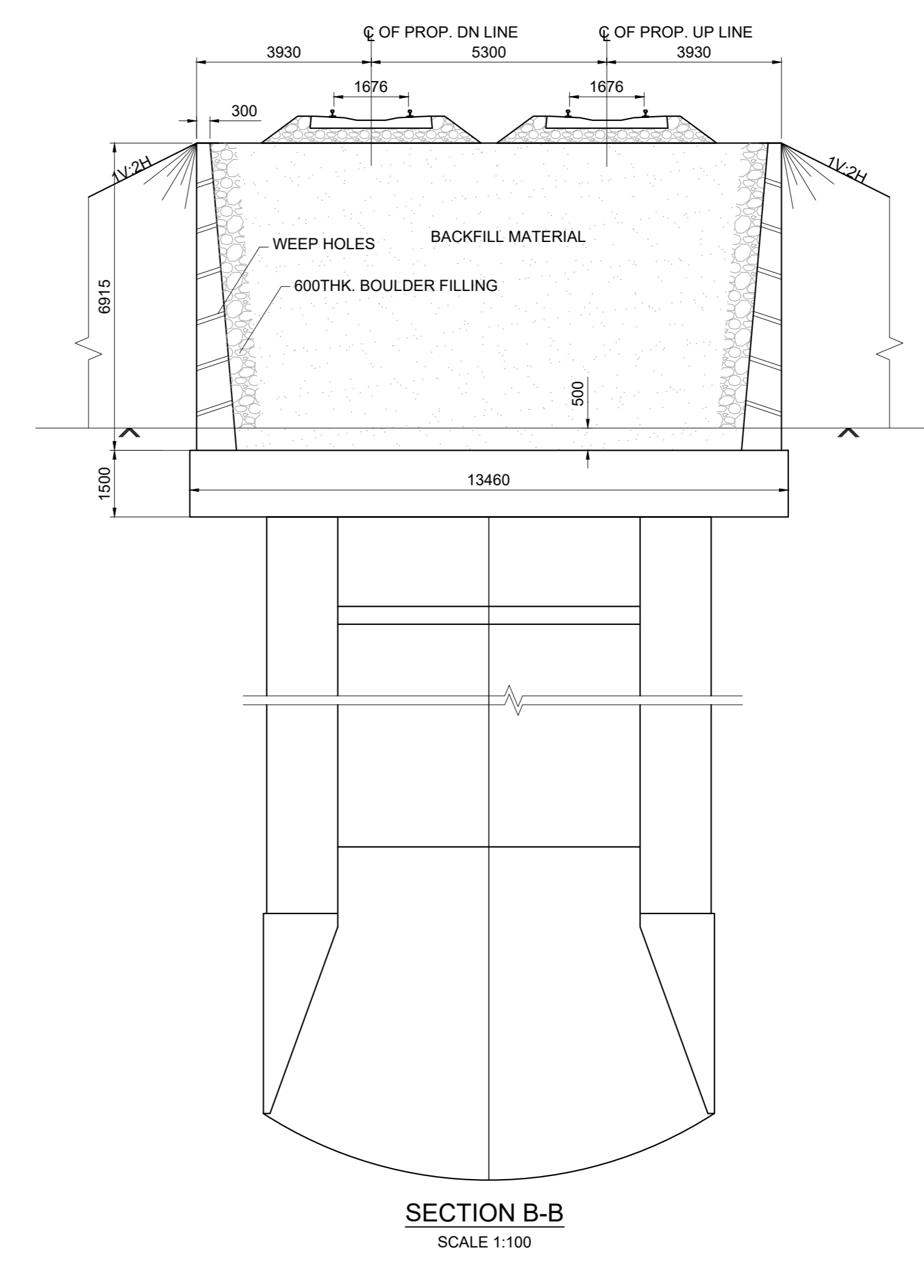


KEY PLAN
(NOT TO SCALE)

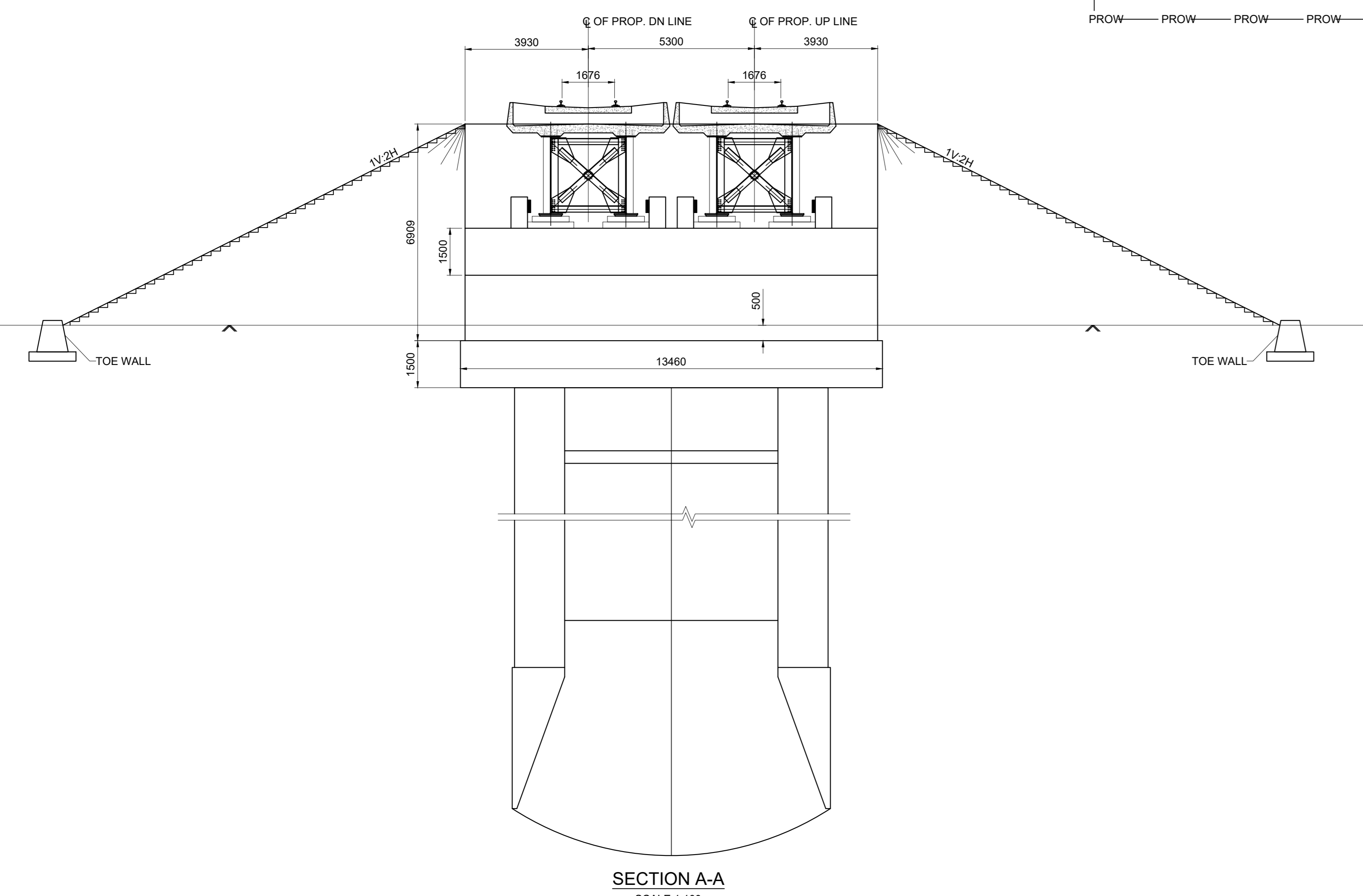
- NOTES:
1. ALL DIMENSIONS ARE IN MILLIMETERS AND LEVELS ARE IN METER
 2. DIMENSIONS ARE NOT TO BE SCALED ONLY WRITTEN DIMENSIONS TO BE FOLLOWED
 3. DESIGN CRITERIA
 - i) IRS BRIDGE SUBSTRUCTURE AND FOUNDATION CODE 2013.
 - ii) IRS CONCRETE BRIDGE CODE 2014.
 - iii) IRS BRIDGE RULES 2014.
 - iv) IS 2911 PART-1 SECTION-2.
 - v) EXPOSURE CONDITION - MODERATE.
 - vi) SEISMIC ZONE - IV
 - vii) STANDARD OF LOADING - SUPER STRUCTURE-25T (RDSO STANDARD CG) & SUB STRUCTURE-32-ST-2008 LOADING
 4. THE STRUCTURAL DIMENSIONS AND SIZES ARE INDICATIVE AND THESE MAY VARY DURING DETAIL DESIGN.
 5. SIZE AND TYPE OF FOUNDATION SHOWN IS TENTATIVE AND MAY CHANGE DURING DETAILED DESIGN.
 6. ALL RCC AND CC WORKS SHALL BE DONE IN ACCORDANCE WITH SPECIFICATION LAID DOWN IN IRS CONCRETE BRIDGE CODE.
 7. THE GRADE OF CONCRETE
 - i) FOR ABUTMENT DIRT & RETURN WALL WEARING COURSE(WC)-----M35
 - ii) FOR FOUNDATION -----M35
 - iii) FOR LEVELING COURSE -----M20
 8. ALL CONCRETE WORK SHALL BE MECHANICALLY MIXED AND VIBRATED.
 9. MIX DESIGN SHALL BE APPROVED BY ENGINEER - IN CHARGE.
 10. HIGH YIELD STRENGTH DEFORMED BARS OF GRADE Fe-500D CONFORMING TO IS: 1786-2008 SHALL BE USED AS REINFORCEMENT.
 11. BED LEVEL & ROAD LEVEL FORMATION LEVEL AND RAIL LEVEL & ALIGNMENT SHALL BE VERIFIED BY THE ENGINEER AT SITE BEFORE EXECUTION OF WORK.
 12. ANGLE OF INTERNAL FRICTION OF BACK FILL SHALL NOT BE LESS THAN 35.
 13. PROTECTION WORK ON SLOPES OF BANK UP TO 30M BOTH SIDES ON APPROACHES OF BRIDGE SHALL BE DONE AS PER SKETCH NO. GC-HRIDC-SK-GEN-015.
 14. BACK FILL SHALL BE AS PER CL. 7.5 OF IRS BRIDGE SUBSTRUCTURE & FOUNDATION CODE 2013.
 15. ALL RCC SURFACES COMING IN CONTACT WITH SOIL SHOULD BE PAINTED WITH BITUMEN OR COAL TAR OF APPROVED QUALITY @ 1.464 KG/SQM. CONFORMING TO IS-3117.
 16. CURING SHALL BE DONE AS PER CLAUSE NO 8.4 OF IRS CONCRETE BRIDGE CODE.
 17. SAFETY & PROTECTION OF THE PROPOSED WORK IS TO BE ENSURED BY THE CONTRACTOR AS PER PARA 826 OF IRPMM WITH UPDATED CORRECTION SLIPS OF 2011-12.
 18. THE SPECIFICATIONS FOR THE COMPOSITE GIRDER SHALL BE IN ACCORDANCE WITH RDSO DRG NOS: RDSO B-11751/R1 TO 11751/8.
 19. CONCRETING SHALL BE DONE IN ACCORDANCE WITH IRS CONCRETE BRIDGE CODE WITH 20MM MAXIMUM SIZE AGGREGATE.
 20. ALL DIMENSIONS AND LEVELS SHOULD BE VERIFIED AT SITE BEFORE EXECUTION.
 21. BRIDGE DETAILS LIKE DL, INSPECTION STEPS PAINTINGS ETC SHOULD BE FOLLOWED AS PER BRIDGE MANUAL DURING CONSTRUCTION.
 22. THIS DRAWING IS PROPERTY OF HARYANA RAIL INFRASTRUCTURE DEVELOPMENT CORPORATION LIMITED (HRIDC) AND EXCLUSIVE USE OF HRIDC.
 23. ARRANGEMENT FOR PATHWAY SHALL BE PROVIDED AS PER RDSO DWG. NO. CBS-0046 (FOR CG).
 24. SEISMIC ARRESTOR SHALL BE PROVIDED ON THE PIER/ABUTMENT CAP.



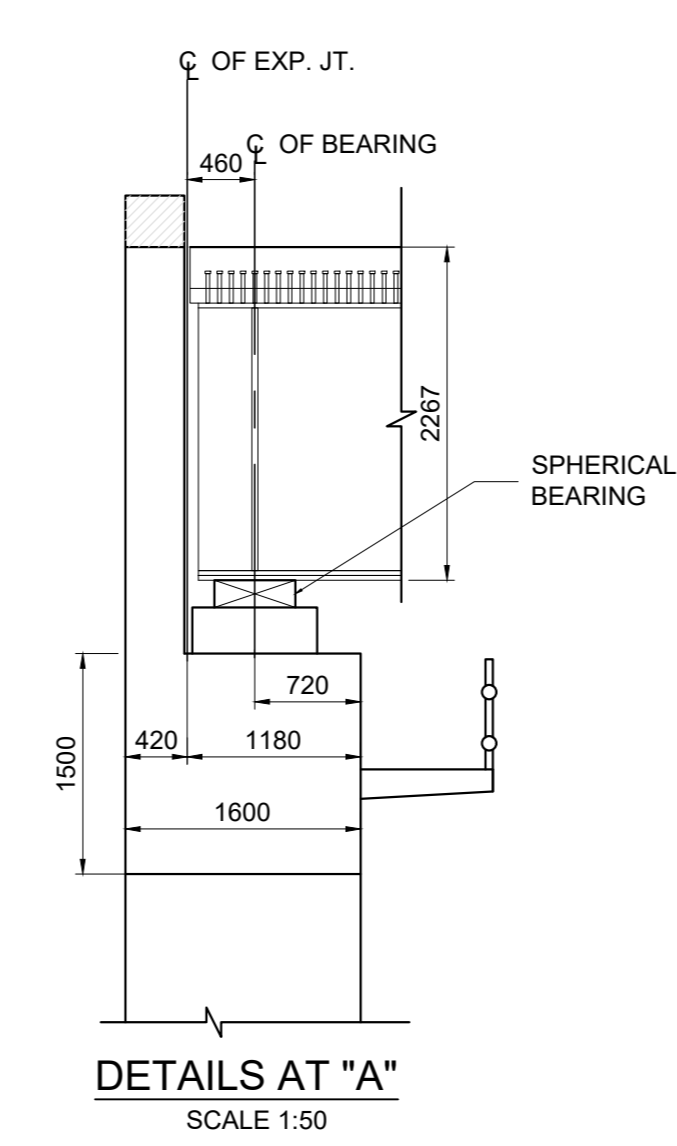
SECTION C-C
SCALE 1:100



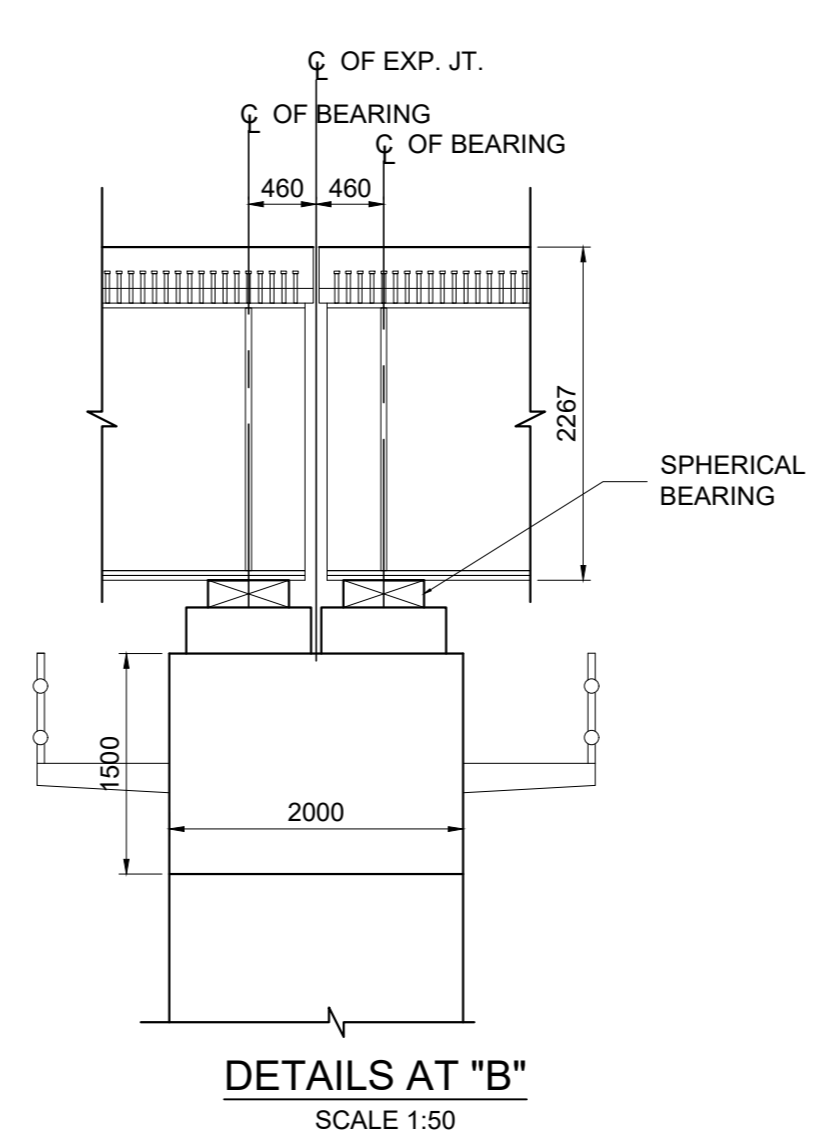
SECTION B-B
SCALE 1:100



SECTION A-A
SCALE 1:100



DETAILS AT "A"
SCALE 1:50



DETAILS AT "B"
SCALE 1:50

GC/HORC		HRIDC	
NAME / DESIGNATION	SIGN	NAME / DESIGNATION	SIGN
CHAHATEY RAM PD	<i>Chahatey Ram</i>	SHIV OM DWIVEDI CPM/HRIDC	<i>Shiv</i>
SUDHIR AGRAWAL DPD/CIVIL	<i>MS</i>	RAJU SOLANKI DGM/CIVIL/SOUTH	<i>Raju</i>
REETU PATIAL CDE/ CIVIL	<i>Reetu</i>		

PROJECT:
HARYANA ORBITAL RAIL CORRIDOR
CONNECTING PALWAL TO SONIPAT BYPASSING DELHI AREA BY LINKING ASAOTI-PATLI-SULTANPUR-ASAUDAH BY NEW ELECTRIFIED BG DOUBLE LINE

CLIENT:
 HARYANA RAIL INFRASTRUCTURE DEVELOPMENT CORPORATION LIMITED.

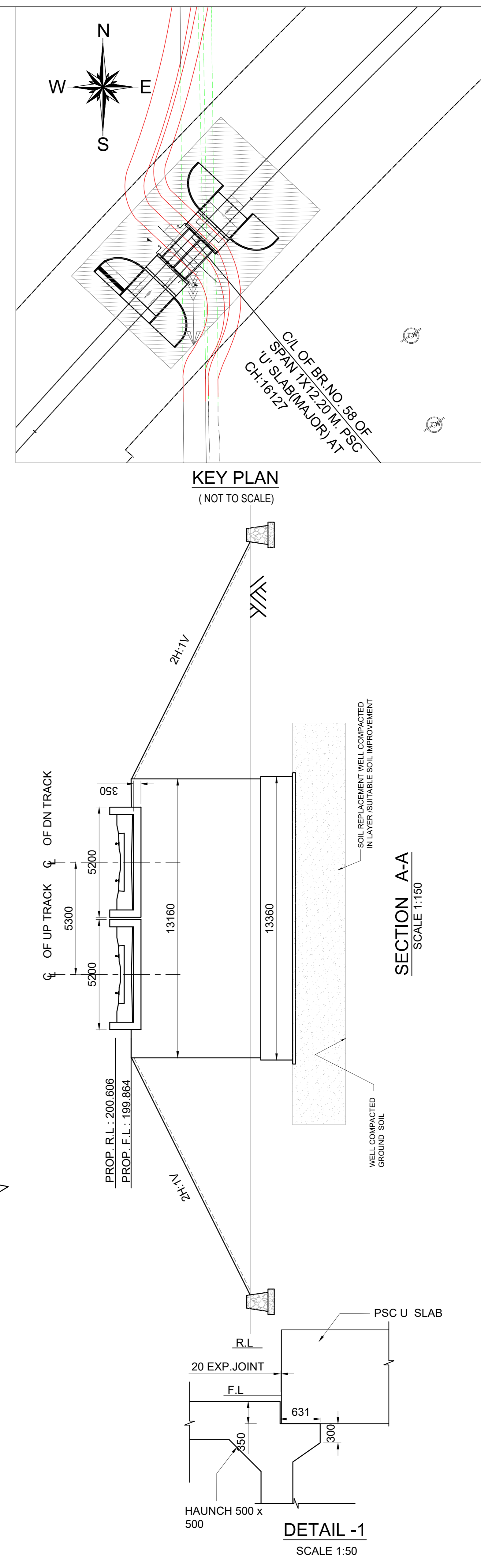
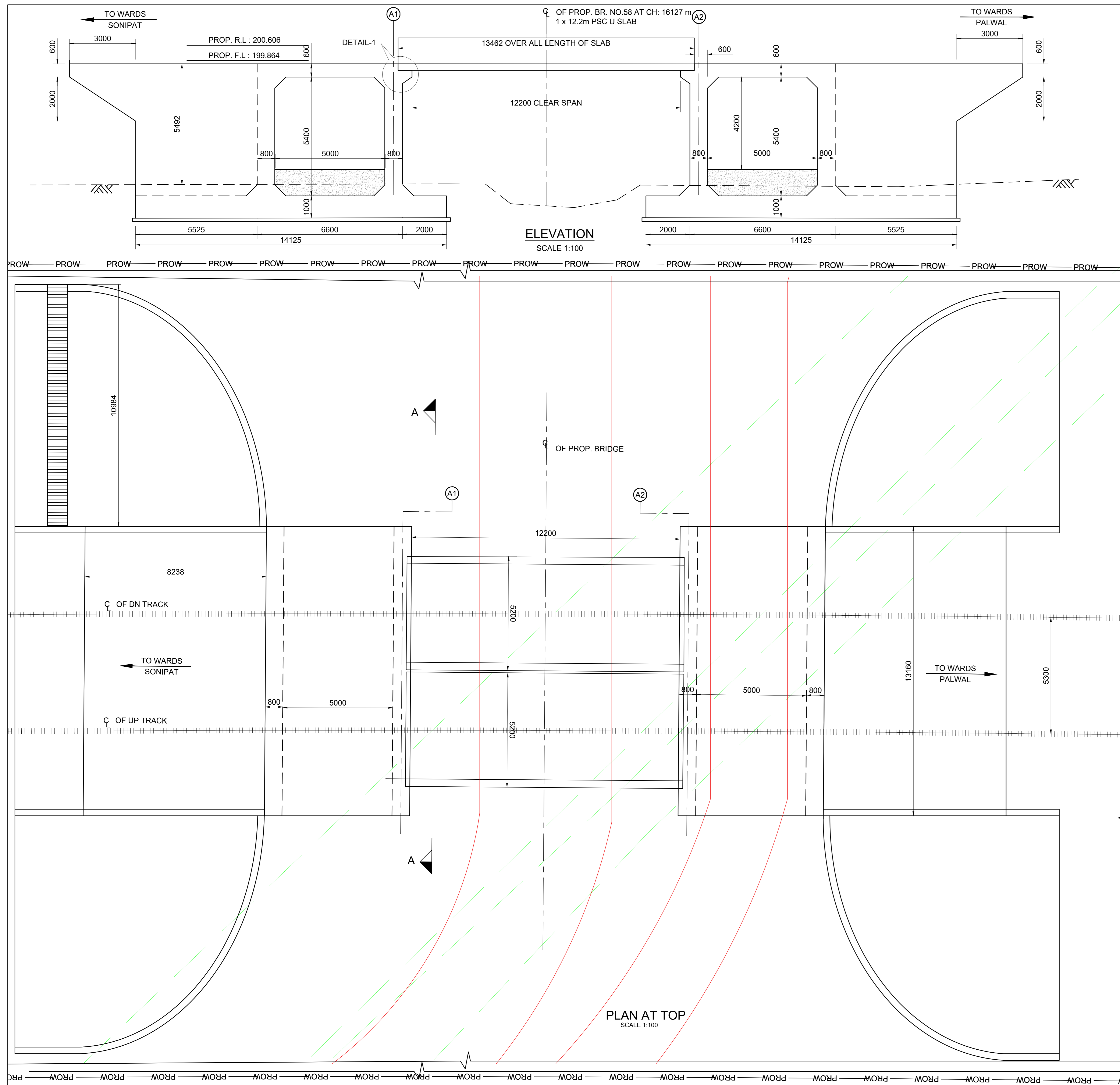
CONSULTANT:
 GENERAL CONSULTANT FOR HARYANA ORBITAL RAIL CORRIDOR
RITES Limited in consortium with SMEC International Pty. Ltd.



TITLE:- **CONCEPTUAL GENERAL ARRANGEMENT DRAWING**
FOR STREAM BRIDGE NO.53
2x24.4 CG AT CH: 14472.112m

DRG. NO. GC-HRIDC-C4-DRW-BRD-GAD-01053_A1 SHEET NO. 1 OF 1

SCALE : AS SHOWN ISSUE DATE 07-11-2022 REVISED DATE 21-11-2022



- NOTES:**
- ALL DIMENSIONS ARE IN MILLIMETERS AND LEVELS ARE IN METER DIMENSIONS ARE NOT TO BE SCALED ONLY WRITTEN DIMENSIONS TO BE FOLLOWED
 - DESIGN CRITERIA
 - IRS BRIDGE SUBSTRUCTURE AND FOUNDATION CODE 2013.
 - IRS CONCRETE BRIDGE CODE 2014.
 - IRS BRIDGE RULES 2014.
 - IS 2911 PART-1 SECTION-2.
 - EXPOSURE CONDITION - MODERATE.
 - SEISMIC ZONE - IV
 - STANDARD OF LOADING - SUPER STRUCTURE-25T (RDSO STANDARD) & SUB STRUCTURE-32.5T-2008 LOADING.
 - THE STRUCTURAL DIMENSIONS AND SIZES ARE INDICATIVE AND THESE MAY VARY DURING DETAIL DESIGN.
 - SIZE & TYPE OF FOUNDATION SHOWN IS TENTATIVE AND MAY CHANGE DURING DETAILED DESIGN.
 - ALL RCC AND CC WORKS SHALL BE DONE IN ACCORDANCE WITH SPECIFICATION LAID DOWN IN IRS CONCRETE BRIDGE CODE.
 - THE GRADE OF CONCRETE
 - FOR ABUTMENT, DIRT & RETURN WALL WEARING COURSE(WC)---M35
 - FOR FOUNDATION-----M35
 - FOR LEVELING COURSE-----M20
 - ALL CONCRETE WORK SHALL BE MECHANICALLY MIXED AND VIBRATED.
 - MIX DESIGN SHALL BE APPROVED BY ENGINEER - IN CHARGE.
 - HIGH YIELD STRENGTH DEFORMED BARS OF GRADE Fe-500D CONFORMING TO IS: 1786-2008 SHALL BE USED AS REINFORCEMENT.
 - BED LEVEL & ROAD LEVEL, FORMATION LEVEL AND RAIL LEVEL & ALIGNMENT SHALL BE VERIFIED BY THE ENGINEER AT SITE BEFORE EXECUTION OF WORK.
 - ANGLE OF INTERNAL FRICTION OF BACK FILL SHALL NOT BE LESS THAN 35.
 - PROTECTION WORK ON SLOPES OF BANK UP TO 30M, BOTH SIDES ON APPROACHES OF BRIDGE SHALL BE DONE AS PER SKETCH NO.
 - GC-HRIDC-SK-GEN-015.
 - BOULDER FILLING & BOULDER PACKING BEHIND ABUTMENT TO BE DONE AS PER IRS FOUNDATION & SUBSTRUCTURE CODE CL.7.5.2.
 - BACK FILL SHALL BE AS PER CL.7.5 OF IRS BRIDGE SUBSTRUCTURE & FOUNDATION CODE 2013.
 - 75mm DIA WEEP HOLES TO BE PROVIDED @1000 C/C HORZ. AND 1000 MM C/C VERTICALLY ABOVE LOWEST WATER LEVEL IN RETURN WALL AS PER IRS SUB STRUCTURE CODE CLAUSE 7.6.
 - ALL RCC SURFACES COMING IN CONTACT WITH SOIL SHOULD BE PAINTED WITH BITUMEN OR COAL TAR OF APPROVED QUALITY @ 1.464 KG/SQM. CONFORMING TO IS-3117.
 - CURING SHALL BE DONE AS PER CLAUSE NO 8.4 OF IRS CONCRETE BRIDGE CODE.
 - SAFETY & PROTECTION OF THE PROPOSED WORK IS TO BE ENSURED BY THE CONTRACTOR AS PER PARA 826 OF IRPWW WITH UPDATED CORRECTION SLIPS OF 2011-12.
 - THE SPECIFICATIONS FOR THE PSC U SLAB SHALL BE IN ACCORDANCE WITH RDSO DRG. NO'S : RDSO 10281, 10281/1 AND 10281/2.
 - CONCRETING SHALL BE DONE IN ACCORDANCE WITH IRS CONCRETE BRIDGE CODE WITH 20MM MAXIMUM SIZE AGGREGATE.
 - ALL DIMENSIONS AND LEVELS SHOULD BE VERIFIED AT SITE BEFORE EXECUTION.
 - BRIDGE DETAILS LIKE , DL, INSPECTION STEPS PAINTINGS ETC SHOULD BE FOLLOWED AS PER MANUAL DURING CONSTRUCTION.
 - THIS DRAWING IS PROPERTY OF HARYANA RAIL INFRASTRUCTURE DEVELOPMENT CORPORATION LIMITED (HRIDC) AND EXCLUSIVE USE OF HRIDC.
 - FOR TOE WALL DETAILS REFER SEPARATE SKETCH NO. GC-HRIDC-SK-GEN-014.
 - BEARING CAPACITY OF SOIL SHALL BE ENSURED AS PER DETAILED DESIGN REQUIREMENT. SUITABLE GROUND IMPROVEMENT SHALL BE CARRIED OUT AS PER GT & DESIGN REQUIREMENT AND CONFIRMED THROUGH FIELD TESTING.
 - SMOOTH TRANSITION SHALL BE PROVIDED BETWEEN THE EXISTING LINED CANAL/DRAIN AND THE BOX.
 - TRANSITION SYSTEM TO BE ADOPTED ON BRIDGE APPROACHES SHALL BE AS PER RDSO REPORT NO. GE-R-50(TRANSITION SYSTEM ON APPROACHES OF BRIDGES). FOR DETAILS REFER SKETCH NO. GC-HRIDC-SK-GEN-019.

LEGEND

PRL	PROPOSED RAIL LEVEL
PFL	PROPOSED FORMATION LEVEL
HFL	HIGHEST FLOOD LEVEL
GL	GROUND LEVEL
TOF	TOP OF FOUNDATION
BOF	BOTTOM OF FOUNDATION
---	PROPOSED
---	TO BE DISMANTELED

PROJECT:
HARYANA ORBITAL RAIL CORRIDOR
 CONNECTING PALWAL TO SONIPAT BYPASSING DELHI AREA BY LINKING ASAOTI-PATLI-SULTANPUR-ASAUDAH BY NEW ELECTRIFIED BG DOUBLE LINE

CLIENT:
HARYANA RAIL INFRASTRUCTURE DEVELOPMENT CORPORATION LIMITED.

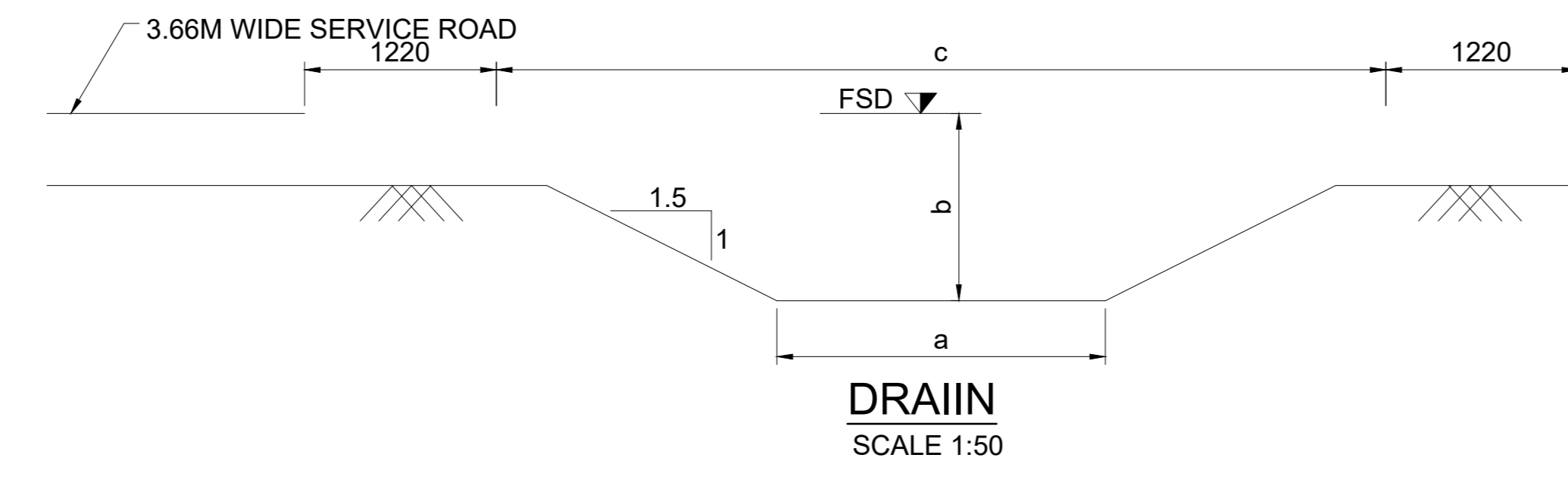
CONSULTANT:

GENERAL CONSULTANT FOR HARYANA ORBITAL RAIL CORRIDOR
 RITES Limited in consortium with SMEC International Pty. Ltd.

THE INFRASTRUCTURE PEOPLE **SMEC**
 Member of the Surbana Jurong Group

HYDRAULIC DATA OF DISTRIBUTARY

1	NAME OF MINOR	INDRI DISTRIBUTARY
2	RD	2650/16127
3	FREE BOARD	0.45
4	DISCHARGE	45.02 Cusec
5	BED WIDTH	a 2.088
6	F.S.D	b 1.19
7	SIDE SLOPE	1.5:1
8	TOP WIDTH	c 5.65
9	SHAPE	



GC/HORC

NAME / DESIGNATION	SIGN
CHAHATEY RAM PD	<i>Chahatey Ram</i>
SUDHIR AGRAWAL DPD/CIVIL	<i>AS</i>
REETU PATIAL CDE/ CIVIL	<i>RE</i>

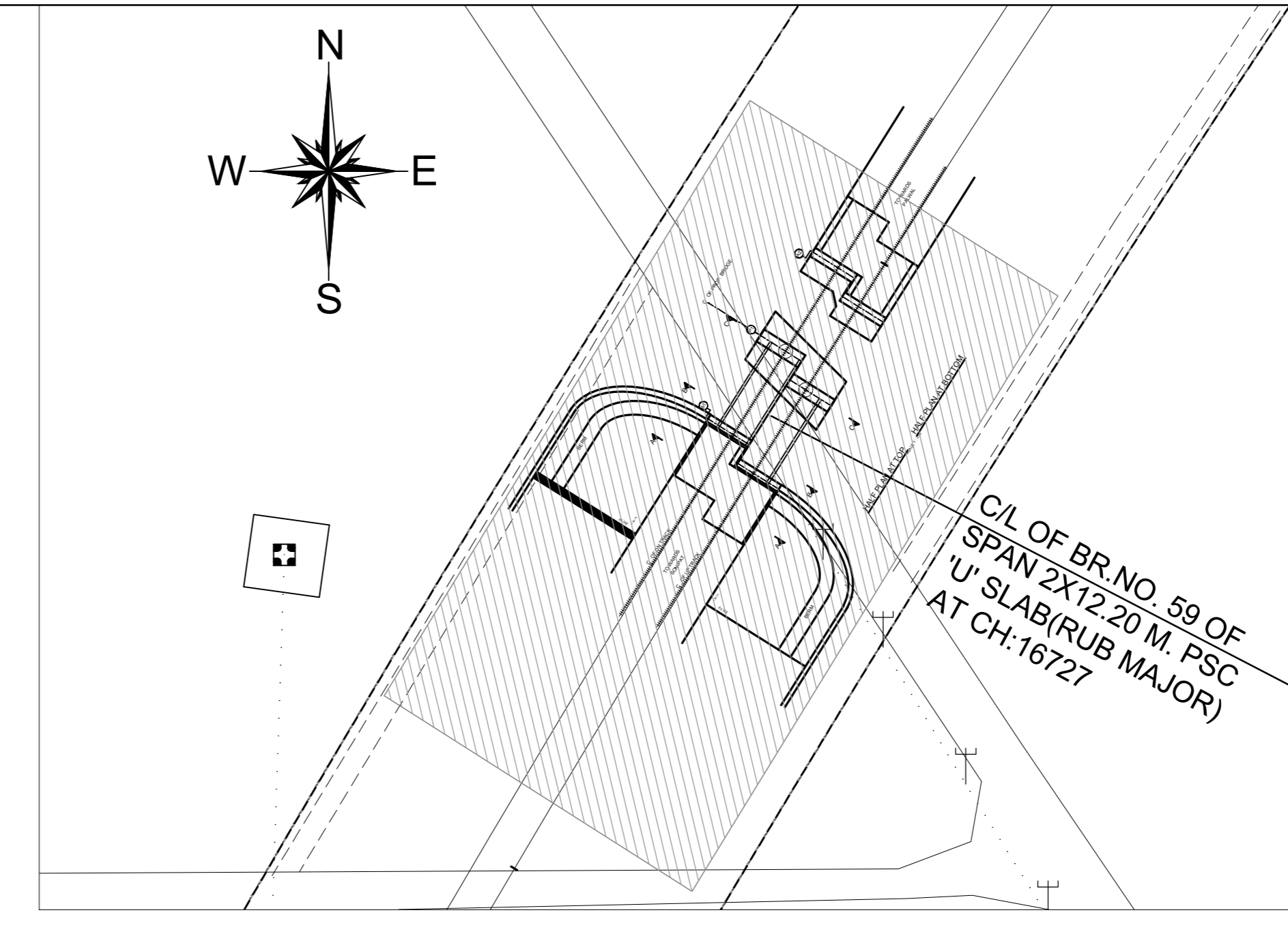
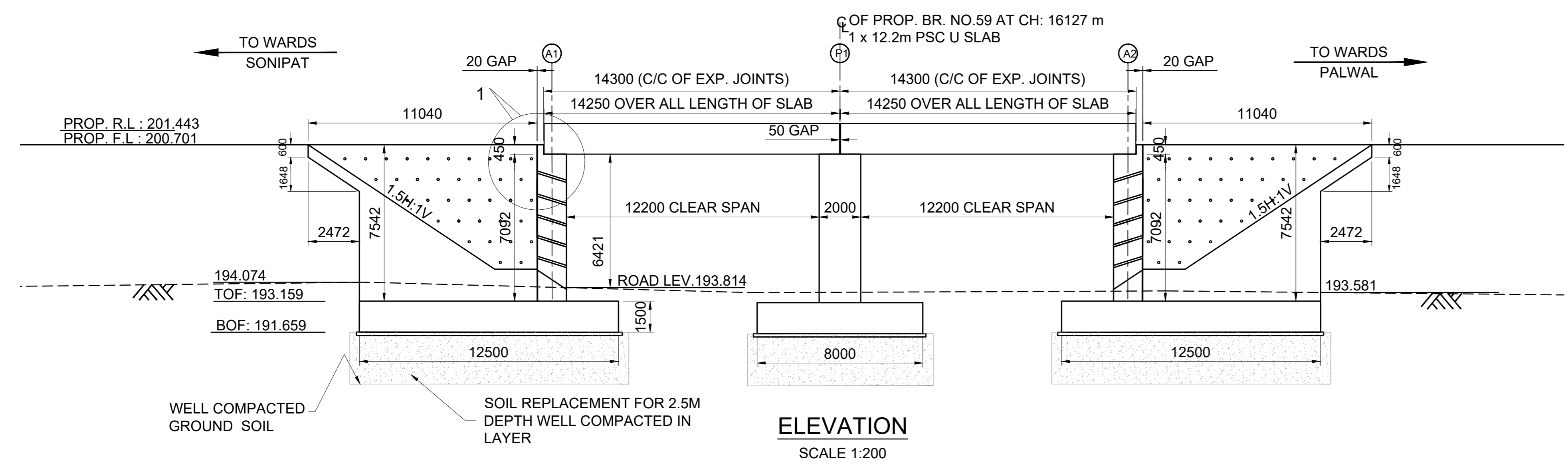
HRIDC

NAME / DESIGNATION	SIGN
SHIV OM DWIVEDI CPM/HRIDC	<i>Shiv</i>
RAJU SOLANKI DGM/CIVIL/SOUTH	<i>Raju</i>

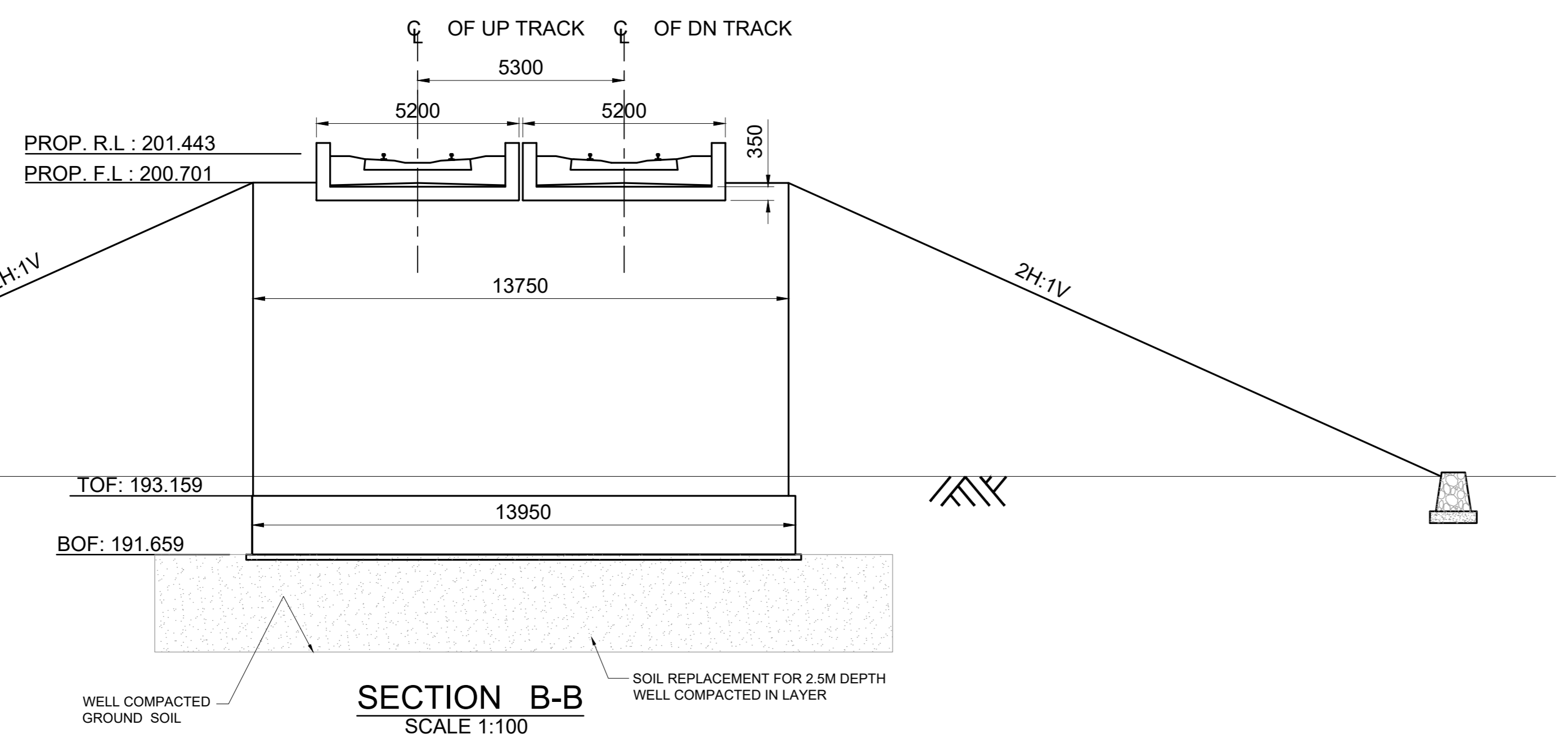
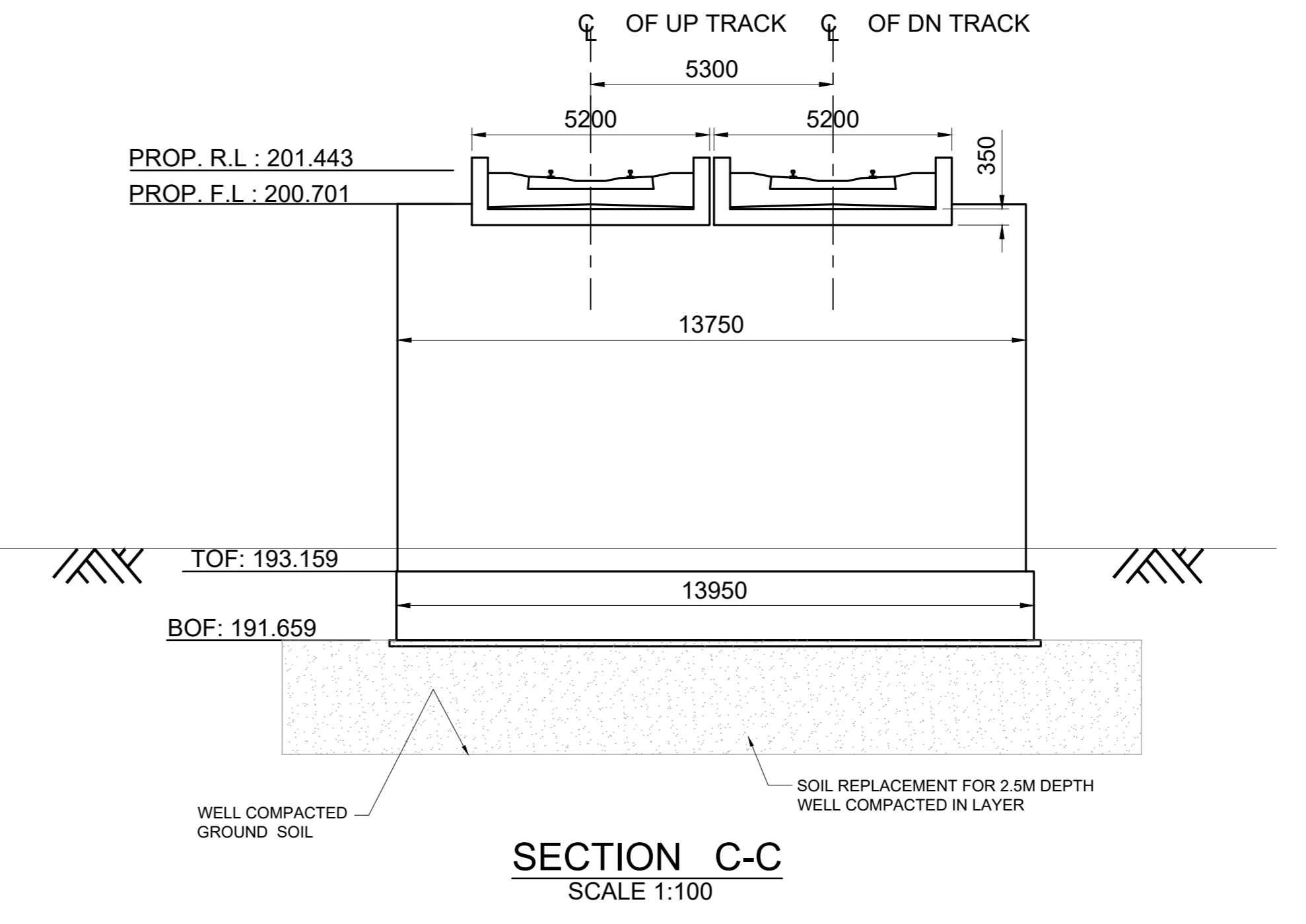
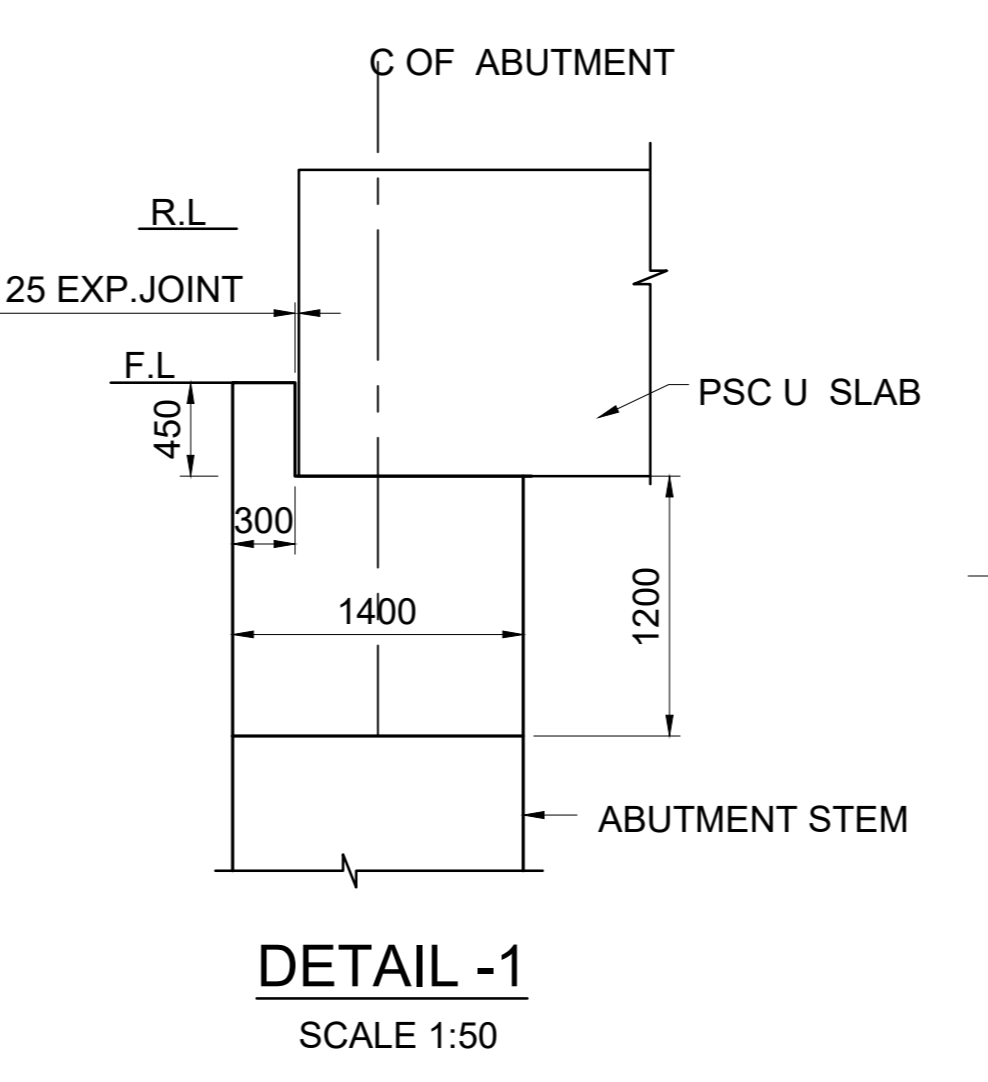
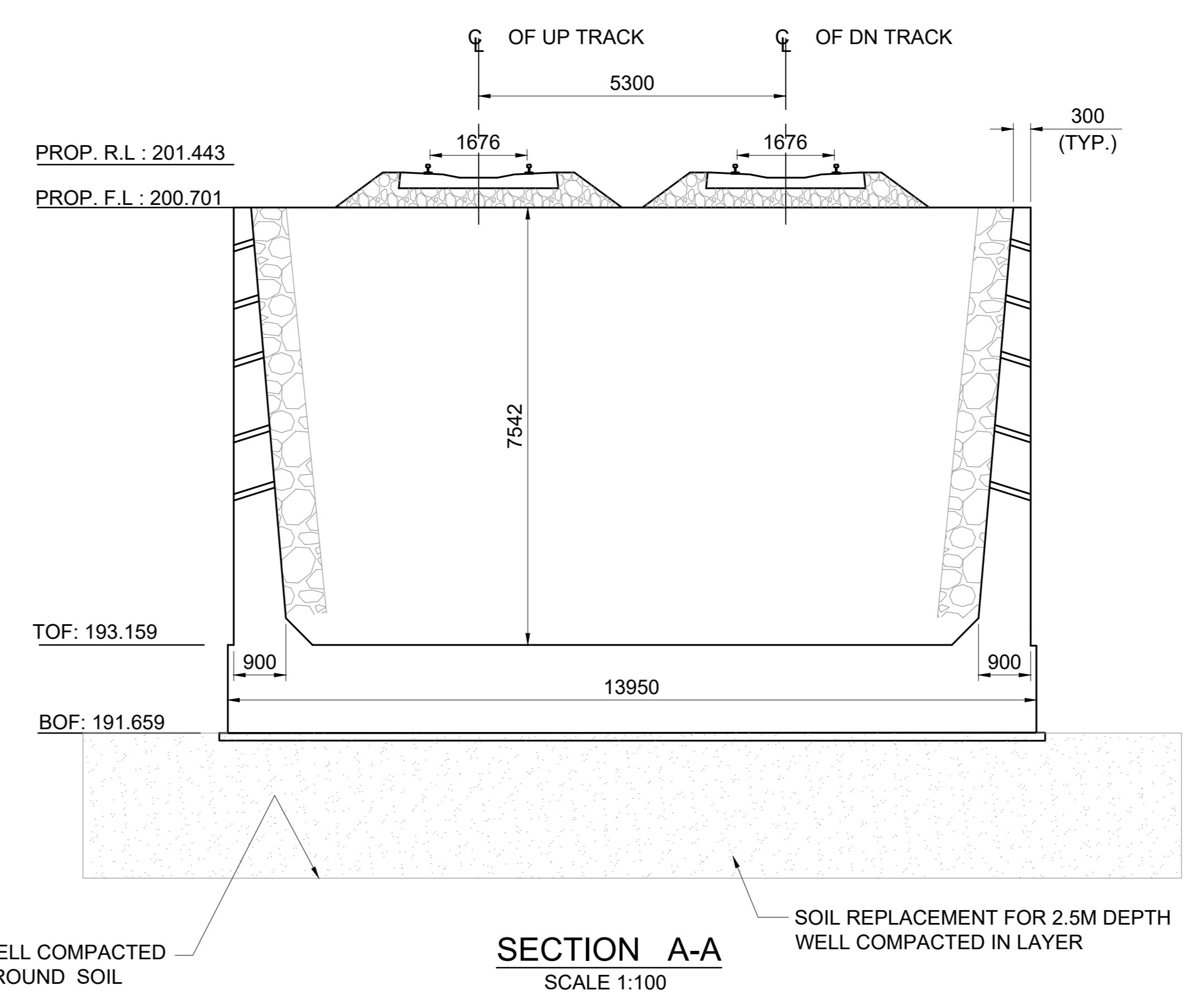
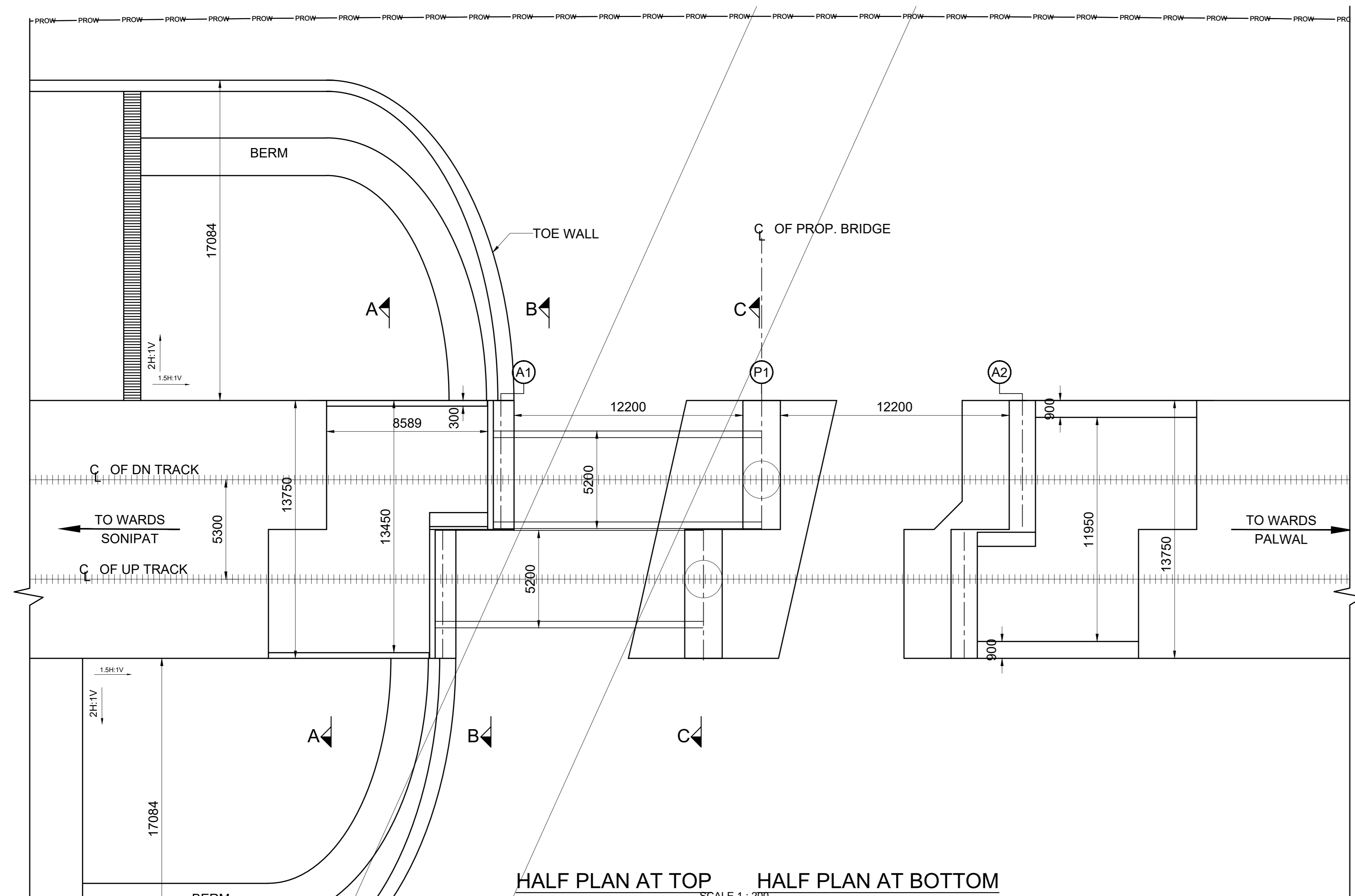
TITLE:- CONCEPTUAL GENERAL ARRANGEMENT DRAWING
 FOR CANAL BR.NO. 058
 1 x 5 x 5.4m + 1 x 12.2m + 1 x 5 x 5.4m PSC U SLAB CH: 16127

DRG. NO. GC-HRIDC-C4-DRW-BRD-GAD-01058_A1 **SHEET NO.** 1 OF 1

SCALE : AS SHOWN **ISSUE DATE** 07-11-2022 **REVISED DATE** 21-11-2022



- NOTES:**
- ALL DIMENSIONS ARE IN MILLIMETERS AND LEVELS ARE IN METER DIMENSIONS ARE NOT TO BE SCALED ONLY WRITTEN DIMENSIONS TO BE FOLLOWED
 - DESIGN CRITERIA
 - IRS BRIDGE SUBSTRUCTURE AND FOUNDATION CODE 2013.
 - IRS CONCRETE BRIDGE CODE 2014.
 - IRS BRIDGE RULES 2014.
 - IS 2911 PART-1 SECTION-2.
 - EXPOSURE CONDITION - MODERATE.
 - SEISMIC ZONE - IV
 - STANDARD OF LOADING - SUPER STRUCTURE-25T (RDSO STANDARD) & SUB STRUCTURE-32.5T - 2008 LOADING.
 - THE STRUCTURAL DIMENSIONS AND SIZES ARE INDICATIVE AND THESE MAY VARY DURING DETAIL DESIGN.
 - SIZE & TYPE OF FOUNDATION SHOWN IS TENTATIVE AND MAY CHANGE DURING DETAILED DESIGN.
 - ALL RCC AND CC WORKS SHALL BE DONE IN ACCORDANCE WITH SPECIFICATION LAID DOWN IN IRS CONCRETE BRIDGE CODE. THE GRADE OF CONCRETE
 - FOR ABUTMENT, DIRT & RETURN WALL - M35
 - FOR FOUNDATION - M30
 - FOR LEVELING COURSE - M20
 - ALL CONCRETE WORK SHALL BE MECHANICALLY MIXED AND VIBRATED. MIX DESIGN SHALL BE APPROVED BY ENGINEER - IN CHARGE.
 - HIGH YIELD STRENGTH DEFORMED BARS OF GRADE Fe-500D CONFORMING TO IS: 1786-2008 SHALL BE USED AS REINFORCEMENT.
 - BED LEVEL & ROAD LEVEL, FORMATION LEVEL AND RAIL LEVEL & ALIGNMENT SHALL BE VERIFIED BY THE ENGINEER AT SITE BEFORE EXECUTION OF WORK.
 - ANGLE OF INTERNAL FRICTION OF BACK FILL SHALL NOT BE LESS THAN 35.
 - PROTECTION WORK ON SLOPES OF BANK UP TO 30M, BOTH SIDES ON APPROACHES OF BRIDGE SHALL BE DONE AS PER SKETCH NO.
 - GC-HRIDC-SK-GEN-015.
 - BOULDER FILLING & BOULDER PACKING BEHIND ABUTMENT TO BE DONE AS PER IRS FOUNDATION & SUBSTRUCTURE CODE CL 7.5.2.
 - BACK FILL SHALL BE AS PER CL 7.5 OF IRS BRIDGE SUBSTRUCTURE & FOUNDATION CODE 2013.
 - 75mm DIA WEEP HOLES TO BE PROVIDED @1000 C/C HORZ. AND 1000 MM C/C VERTICALLY ABOVE LOWEST WATER LEVEL IN RETURN WALL AS PER IRS SUB STRUCTURE CODE CLAUSE 7.6.
 - ALL RCC SURFACES COMING IN CONTACT WITH SOIL SHOULD BE PAINTED WITH BITUMEN OR COAL TAR OF APPROVED QUALITY @ 1.464 KG/SQM CONFORMING TO IS-3117.
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 - THE SPECIFICATIONS FOR THE PSC U SLAB SHALL BE IN ACCORDANCE WITH RDSO DRG. NO'S : RDSO 10281, 10281/1 AND 10281/2.
 - CONCRETING SHALL BE DONE IN ACCORDANCE WITH IRS CONCRETE BRIDGE CODE WITH 20MM MAXIMUM SIZE AGGREGATE.
 - ALL DIMENSIONS AND LEVELS SHOULD BE VERIFIED AT SITE BEFORE EXECUTION.
 - BRIDGE DETAILS LIKE , DL, INSPECTION STEPS PAINTINGS ETC SHOULD BE FOLLOWED AS PER BRIDGE MANUAL DURING CONSTRUCTION.
 - THIS DRAWING IS PROPERTY OF HARYANA RAIL INFRASTRUCTURE DEVELOPMENT CORPORATION LIMITED (HRIDC) AND EXCLUSIVE USE OF HRIDC.
 - FOR TOE WALL DETAILS REFER SEPARATE SKETCH NO. GC-HRIDC-SK-GEN-014.
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 - TRANSITION SYSTEM TO BE ADOPTED ON BRIDGE APPROACHES SHALL BE AS PER RDSO REPORT NO. GE-R-50 (TRANSITION SYSTEM ON APPROACHES OF BRIDGES). FOR DETAILS REFER SKETCH NO. GC-HRIDC-SK-GEN-019.



LEGEND

PRL	PROPOSED RAIL LEVEL
PFL	PROPOSED FORMATION LEVEL
HFL	HIGHEST FLOOD LEVEL
GL	GROUND LEVEL
TOF	TOP OF FOUNDATION
BOF	BOTTOM OF FOUNDATION

PROJECT:
HARYANA ORBITAL RAIL CORRIDOR
CONNECTING PALWAL TO SONIPAT BYPASSING DELHI AREA BY LINKING ASAOTI-PATLI-SULTANPUR-ASAUDAH BY NEW ELECTRIFIED BG DOUBLE LINE

CLIENT:
 HARYANA RAIL INFRASTRUCTURE DEVELOPMENT CORPORATION LIMITED.

CONSULTANT:
 GENERAL CONSULTANT FOR HARYANA ORBITAL RAIL CORRIDOR
RITES Limited in consortium with SMEC International Pty. Ltd.

TITLE:- **CONCEPTUAL GENERAL ARRANGEMENT DRAWING**
PROPOSED RUB NO. 059
2 x 12.2m PSC U SLAB CH: 16727

DRG. NO.
GC-HRIDC-C4-DRW-BRD-GAD-01059_A1

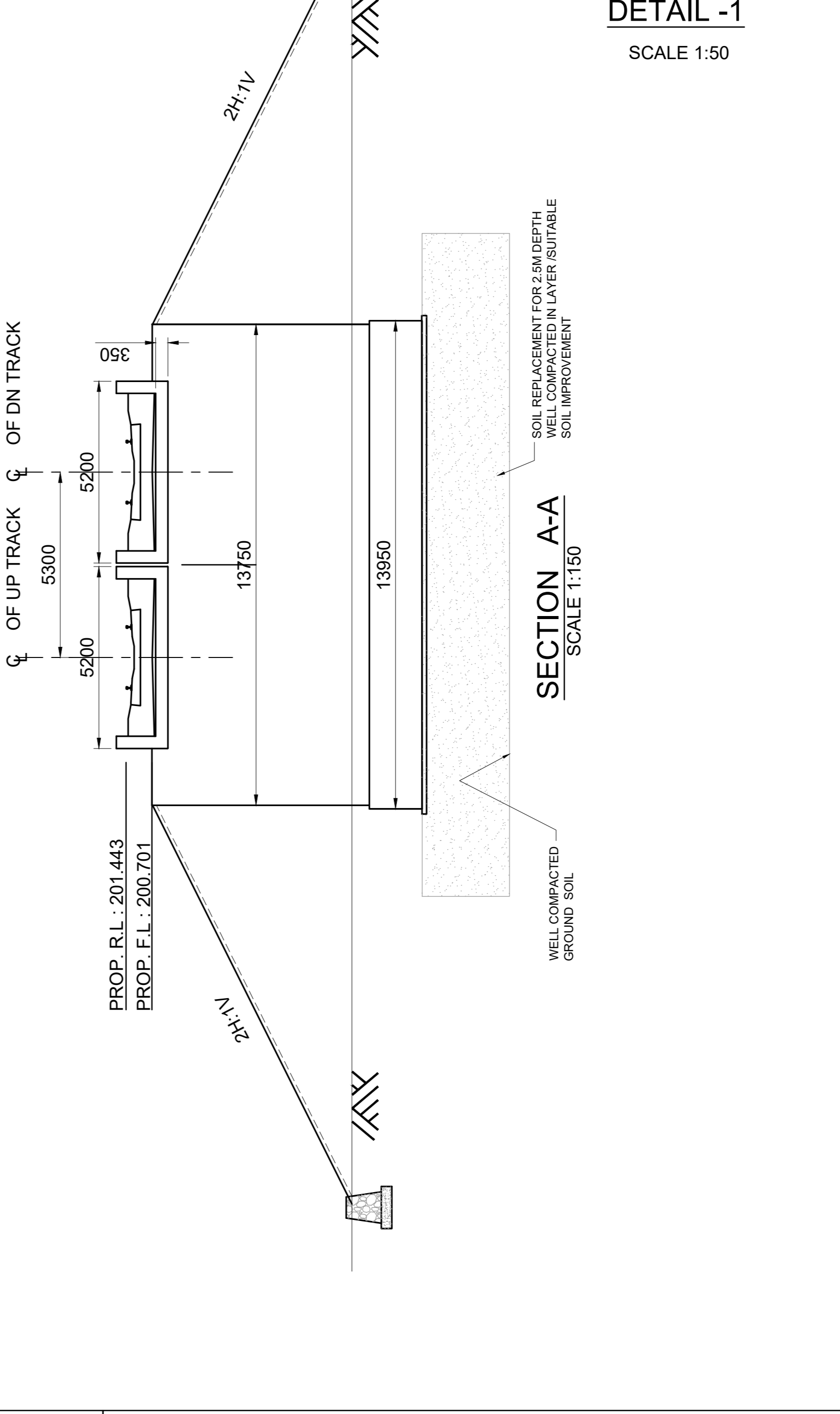
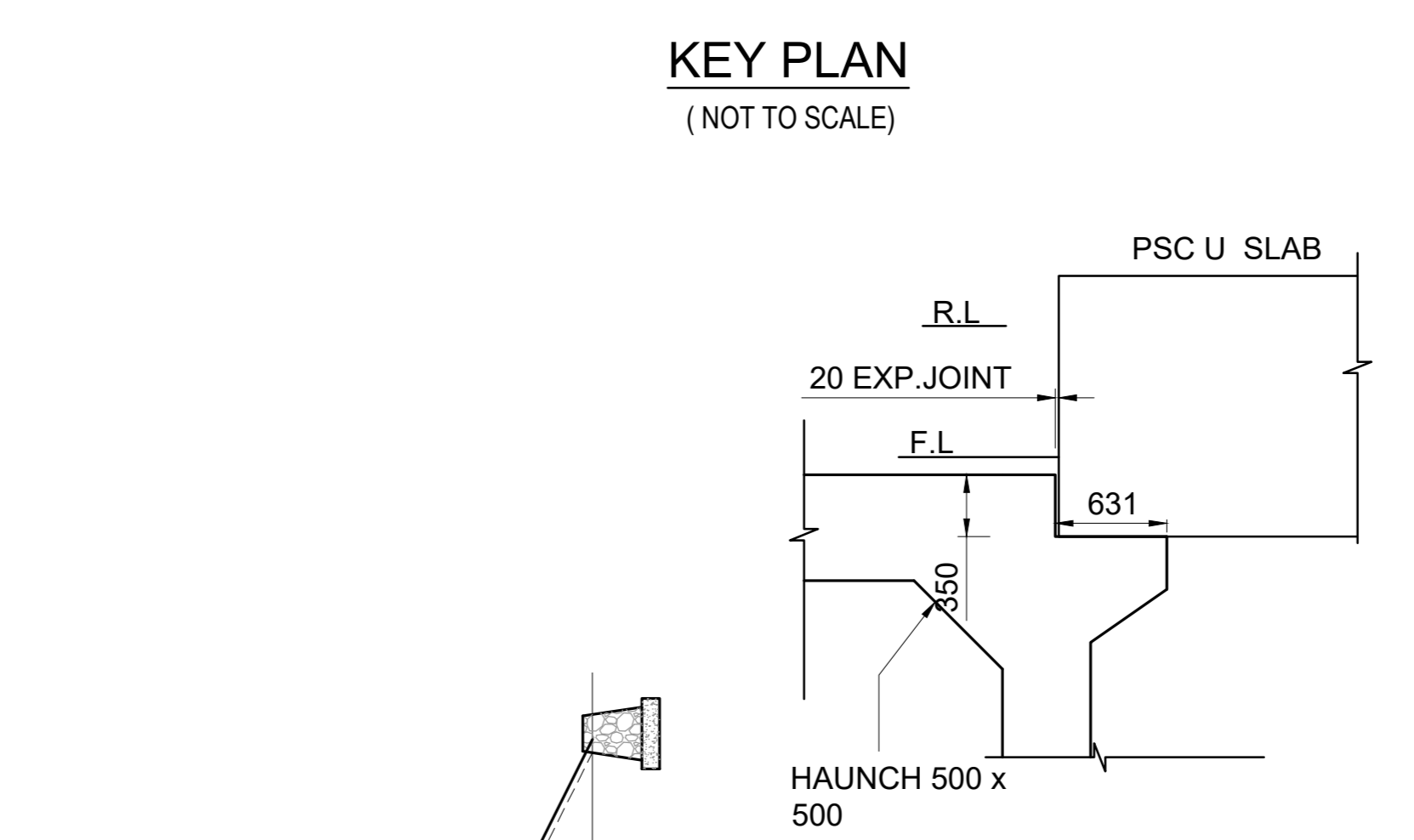
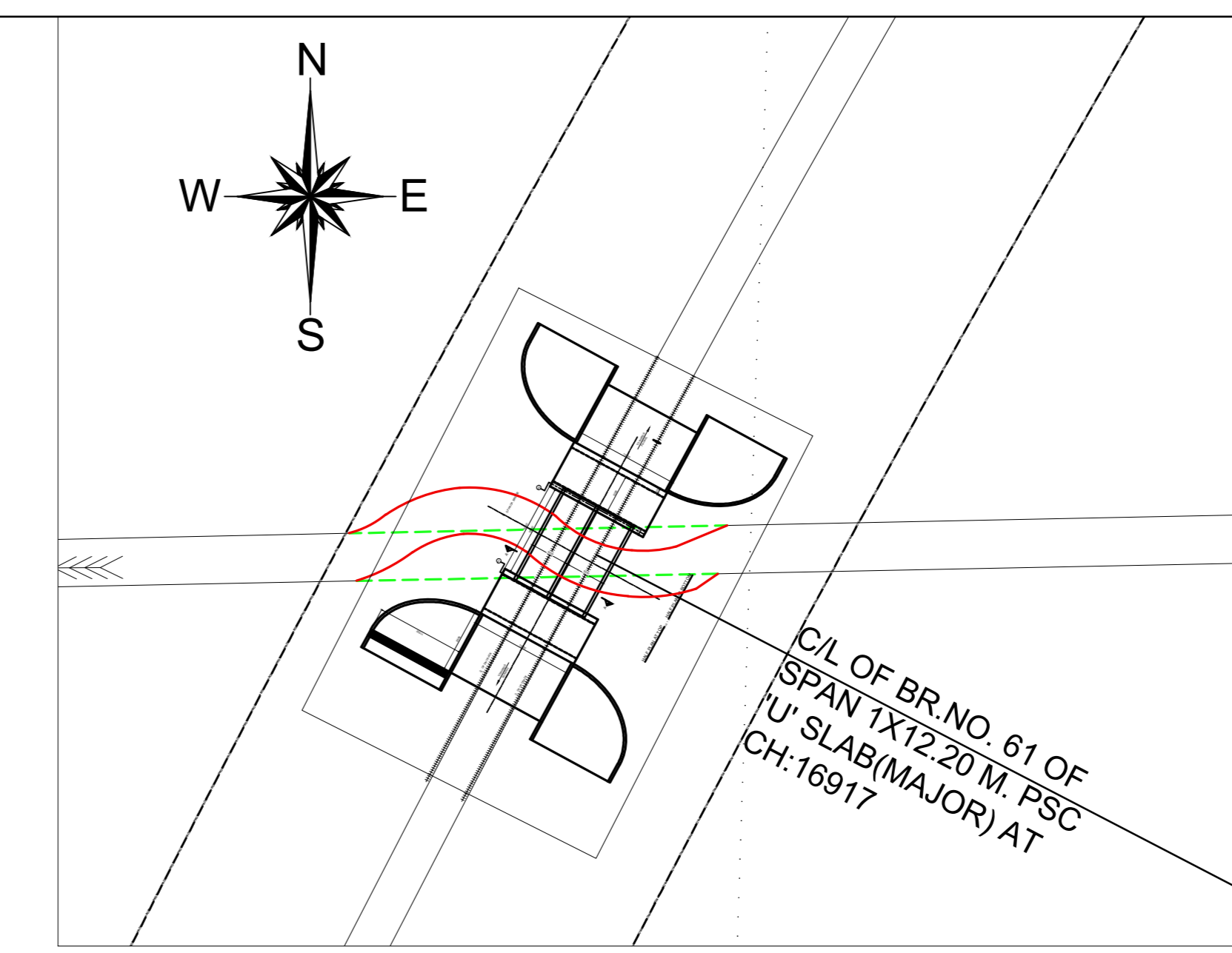
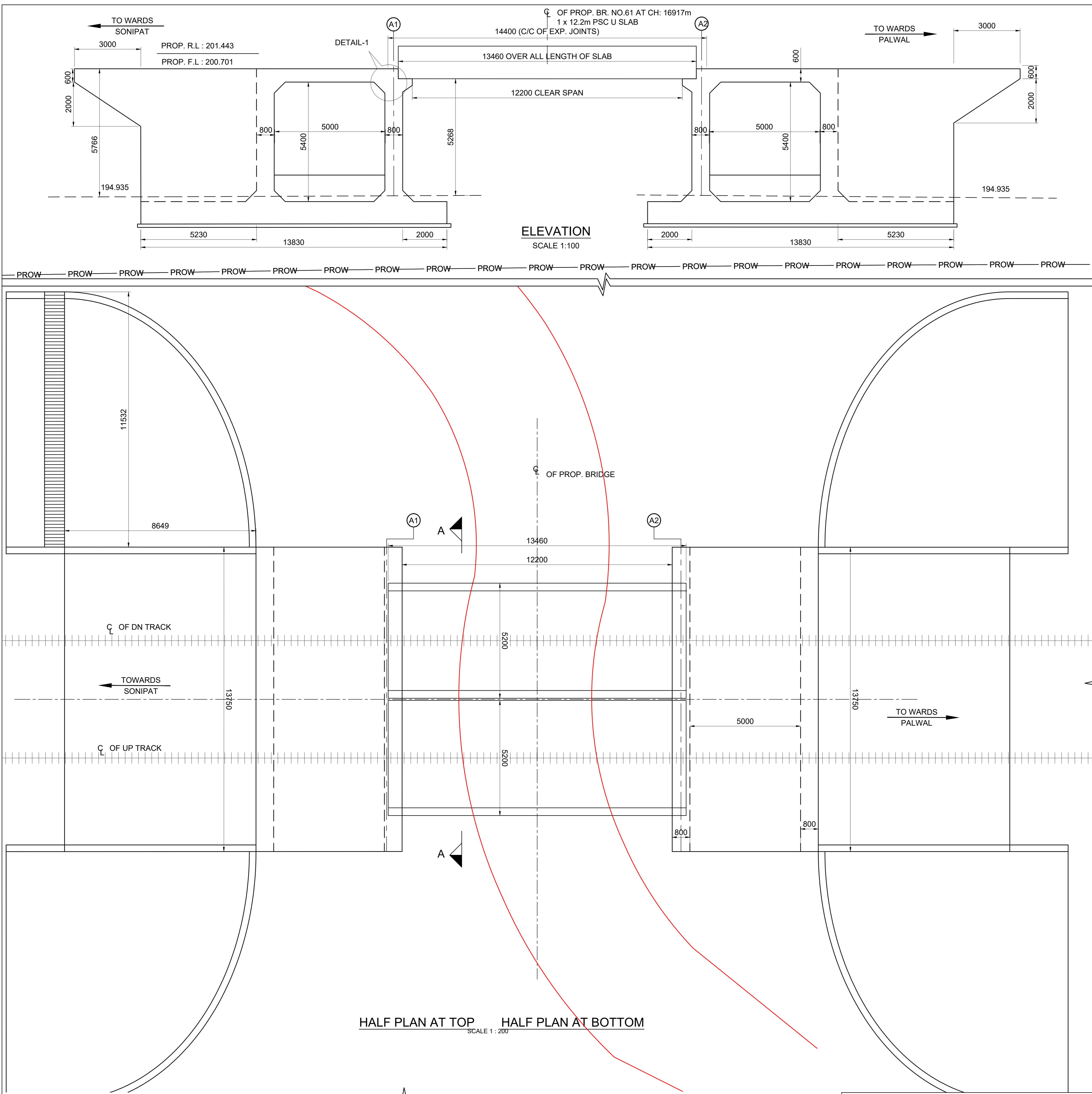
SHEET NO.
1 OF 1

SCALE :
AS SHOWN

ISSUE DATE
07-11-2022

REVISED DATE
21-11-2022

GC/HORC		HRIDC	
NAME / DESIGNATION	SIGN	NAME / DESIGNATION	SIGN
CHAHATEY RAM PD		SHIV OM DWIVEDI CPM/HRIDC	
SUDHIR AGRAWAL DPD/CIVIL		RAJU SOLANKI DGM/CIVIL/SOUTH	
REETU PATIAL CDE/ CIVIL			



- NOTES:**
- ALL DIMENSIONS ARE IN MILLIMETERS AND LEVELS ARE IN METER DIMENSIONS ARE NOT TO BE SCALED ONLY WRITTEN DIMENSIONS TO BE FOLLOWED
 - DESIGN CRITERIA
 - IRS BRIDGE SUBSTRUCTURE AND FOUNDATION CODE 2013.
 - IRS CONCRETE BRIDGE CODE 2014.
 - IRS BRIDGE RULES 2014.
 - IS 2911 PART-1 SECTION-2.
 - EXPOSURE CONDITION - MODERATE.
 - SEISMIC ZONE - IV
 - STANDARD OF LOADING - SUPER STRUCTURE-25T (RDSO STANDARD) & SUB STRUCTURE-32.5T - 2008 LOADING.
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 - ALL RCC AND CC WORKS SHALL BE DONE IN ACCORDANCE WITH SPECIFICATION LAID DOWN IN IRS CONCRETE BRIDGE CODE. THE GRADE OF CONCRETE
 - FOR ABUTMENT, DIRT & RETURN WALL.....M35
 - FOR FOUNDATION.....M35
 - FOR LEVELING COURSE.....M20
 - ALL CONCRETE WORK SHALL BE MECHANICALLY MIXED AND VIBRATED. MIX DESIGN SHALL BE APPROVED BY ENGINEER - IN CHARGE.
 - HIGH YIELD STRENGTH DEFORMED BARS OF GRADE Fe-500D CONFORMING TO IS: 1786-2008 SHALL BE USED AS REINFORCEMENT.
 - BED LEVEL & ROAD LEVEL, FORMATION LEVEL AND RAIL LEVEL & ALIGNMENT SHALL BE VERIFIED BY THE ENGINEER AT SITE BEFORE EXECUTION OF WORK.
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 - PROTECTION WORK ON SLOPES OF BANK UP TO 30M, BOTH SIDES ON APPROACHES OF BRIDGE SHALL BE DONE AS PER SKETCH NO. GC-HRIDC-SK-GEN-015.
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 - BACK FILL SHALL BE AS PER CL 7.5 OF IRS BRIDGE SUBSTRUCTURE & FOUNDATION CODE 2013.
 - 75mm DIA WEEP HOLES TO BE PROVIDED @1000 C/C HORIZ. AND 1000 MM C/C VERTICALLY ABOVE LOWEST WATER LEVEL IN RETURN WALL AS PER IRS SUB STRUCTURE CODE CLAUSE 7.6.
 - ALL RCC SURFACES COMING IN CONTACT WITH SOIL SHOULD BE PAINTED WITH BITUMEN OR COAL TAR OF APPROVED QUALITY @ 1.464 KG/SQM. CONFORMING TO IS-3117.
 - CURING SHALL BE DONE AS PER CLAUSE NO 8.4 OF IRS CONCRETE BRIDGE CODE.
 - SAFETY & PROTECTION OF THE PROPOSED WORK IS TO BE ENSURED BY THE CONTRACTOR AS PER PARA 826 OF IRPWM WITH UPDATED CORRECTION SLIPS OF 2011-12.
 - THE SPECIFICATIONS FOR THE PSC U SLAB SHALL BE IN ACCORDANCE WITH RDSO DRG. NO'S : RDSO 10281, 10281/1 AND 10281/2.
 - CONCRETING SHALL BE DONE IN ACCORDANCE WITH IRS CONCRETE BRIDGE CODE WITH 20MM MAXIMUM SIZE AGGREGATE.
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 - BRIDGE DETAILS LIKE , DL, INSPECTION STEPS PAINTINGS ETC SHOULD BE FOLLOWED AS PER BRIDGE MANUAL DURING CONSTRUCTION.
 - THIS DRAWING IS PROPERTY OF HARYANA RAIL INFRASTRUCTURE DEVELOPMENT CORPORATION LIMITED (HRIDC) AND EXCLUSIVE USE OF HRIDC.
 - FOR TOE WALL DETAILS REFER SEPARATE SKETCH NO. GC-HRIDC-SK-GEN-014.
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 - SMOOTH TRANSITION SHALL BE PROVIDED BETWEEN THE EXISTING LINED CANAL DRAIN AND THE BOX.
 - TRANSITION SYSTEM TO BE ADOPTED ON BRIDGE APPROACHES SHALL BE AS PER RDSO REPORT NO. GE-R-50 (TRANSITION SYSTEM FOR BRIDGES OF BRIDGES). FOR DETAILS REFER SKETCH NO. GC-HRIDC-SK-GEN-019.

LEGEND

PRL	PROPOSED RAIL LEVEL
PFL	PROPOSED FORMATION LEVEL
HFL	HIGHEST FLOOD LEVEL
GL	GROUND LEVEL
TOF	TOP OF FOUNDATION
BOF	BOTTOM OF FOUNDATION
—	PROPOSED
- - -	TO BE DISMANTELED

PROJECT:
HARYANA ORBITAL RAIL CORRIDOR
 CONNECTING PALWAL TO SONIPAT BYPASSING DELHI AREA BY LINKING ASAOTI-PATLI-SULTANPUR-ASAUDAH BY NEW ELECTRIFIED BG DOUBLE LINE

CLIENT:
HARYANA RAIL INFRASTRUCTURE DEVELOPMENT CORPORATION LIMITED.

CONSULTANT:
GENERAL CONSULTANT FOR HARYANA ORBITAL RAIL CORRIDOR
 RITES Limited in consortium with SMEC International Pty. Ltd.

TITLE:- **CONCEPTUAL GENERAL ARRANGEMENT DRAWING**
 PROPOSED CANAL BR. NO. 061
 1x5x5.4+1x12.2+1x5x5.4m PSC U SLAB CH: 16917

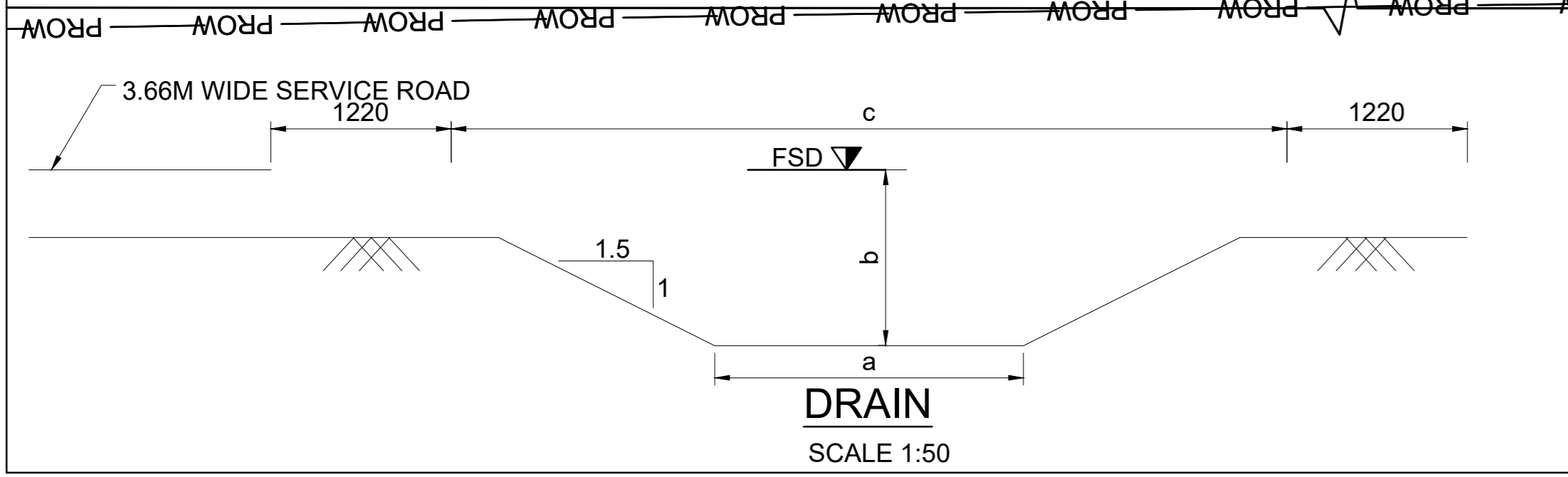
DRG. NO. GC-HRIDC-C4-DRW-BRD-GAD-01061_A1 **SHEET NO.** 1 OF 1

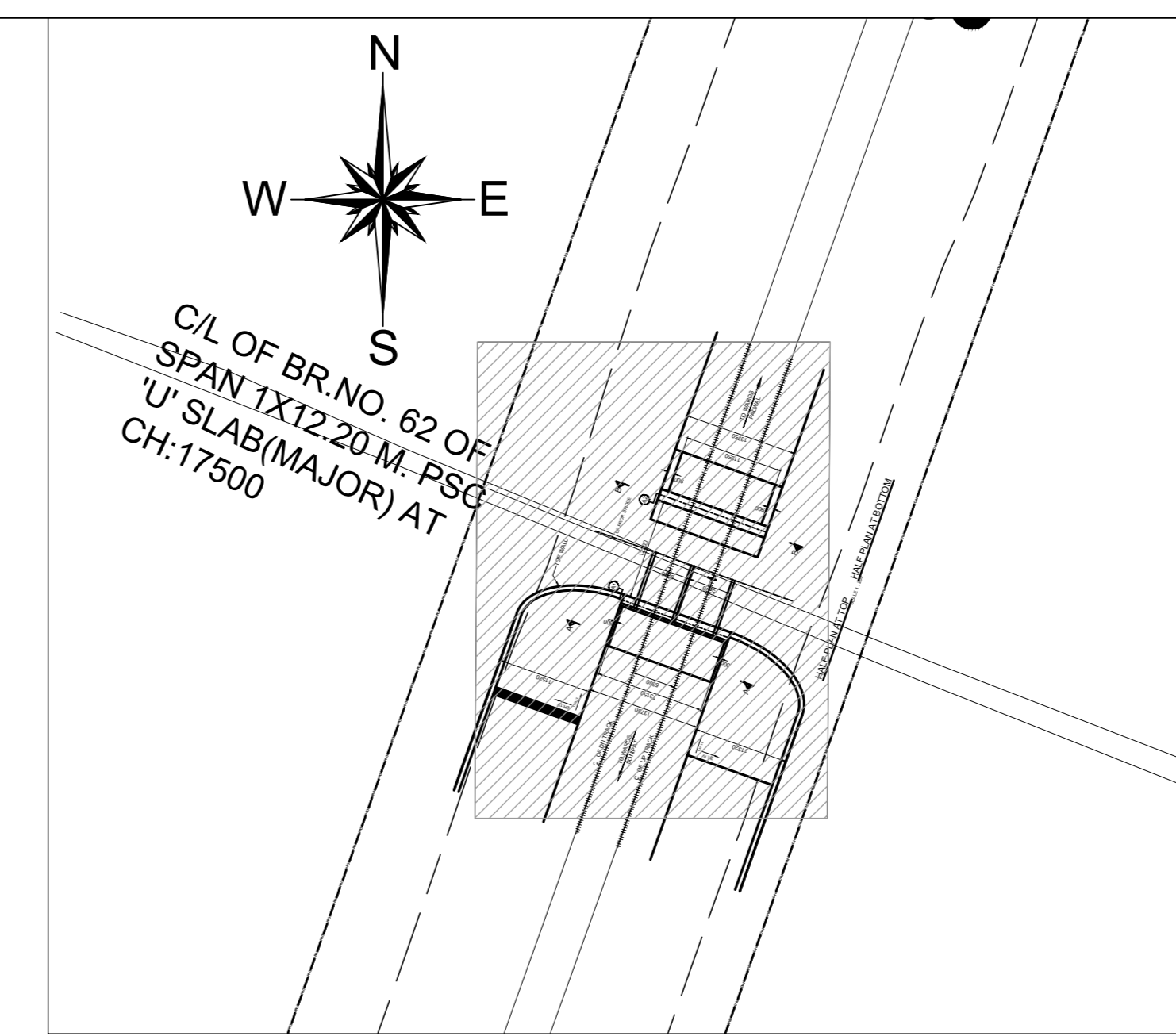
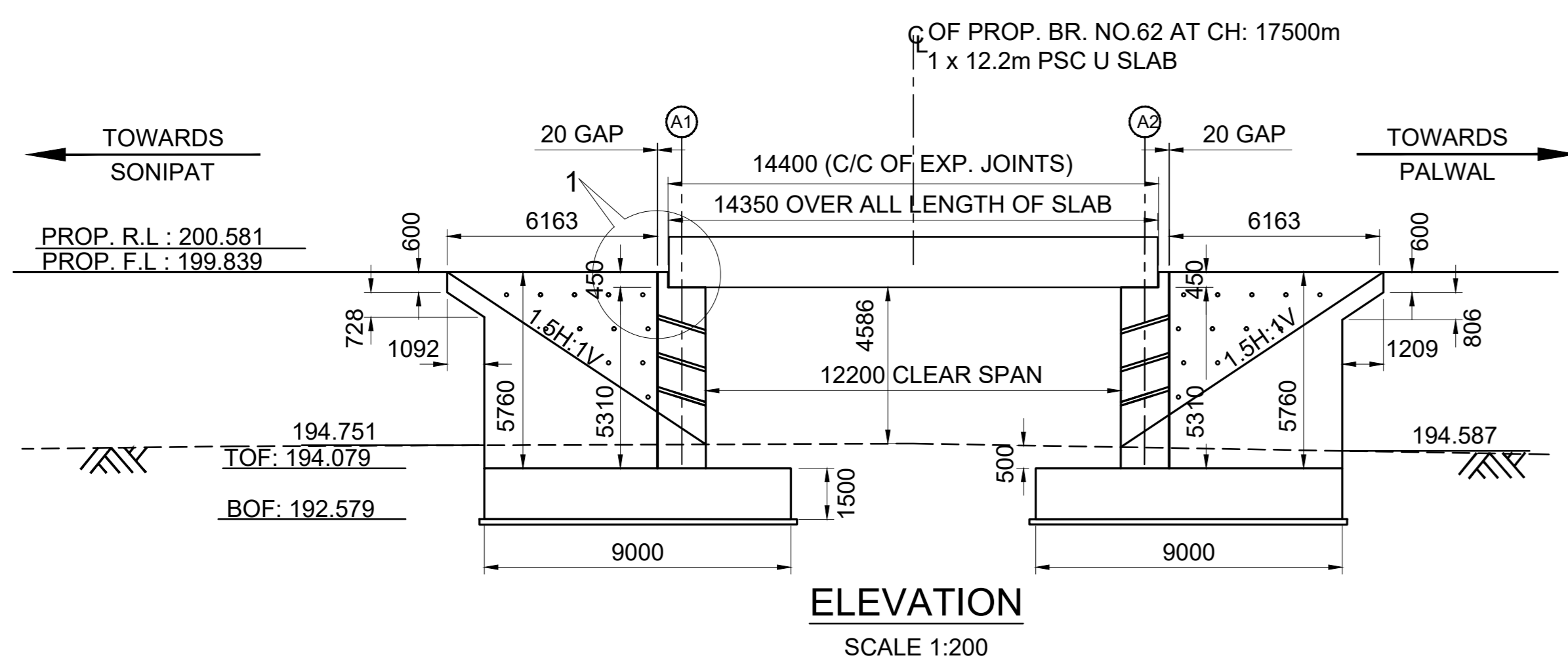
SCALE : AS SHOWN **ISSUE DATE** 07-11-2022 **REVISED DATE** 21-11-2022

HYDRAULIC DATA OF DRAIN

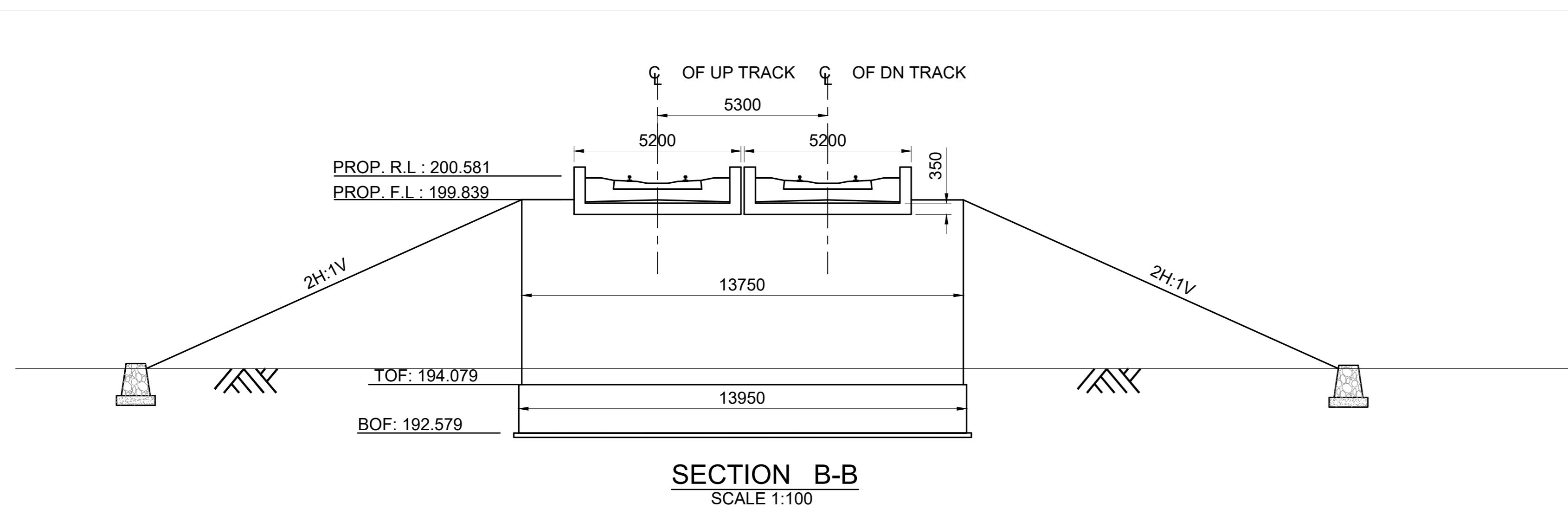
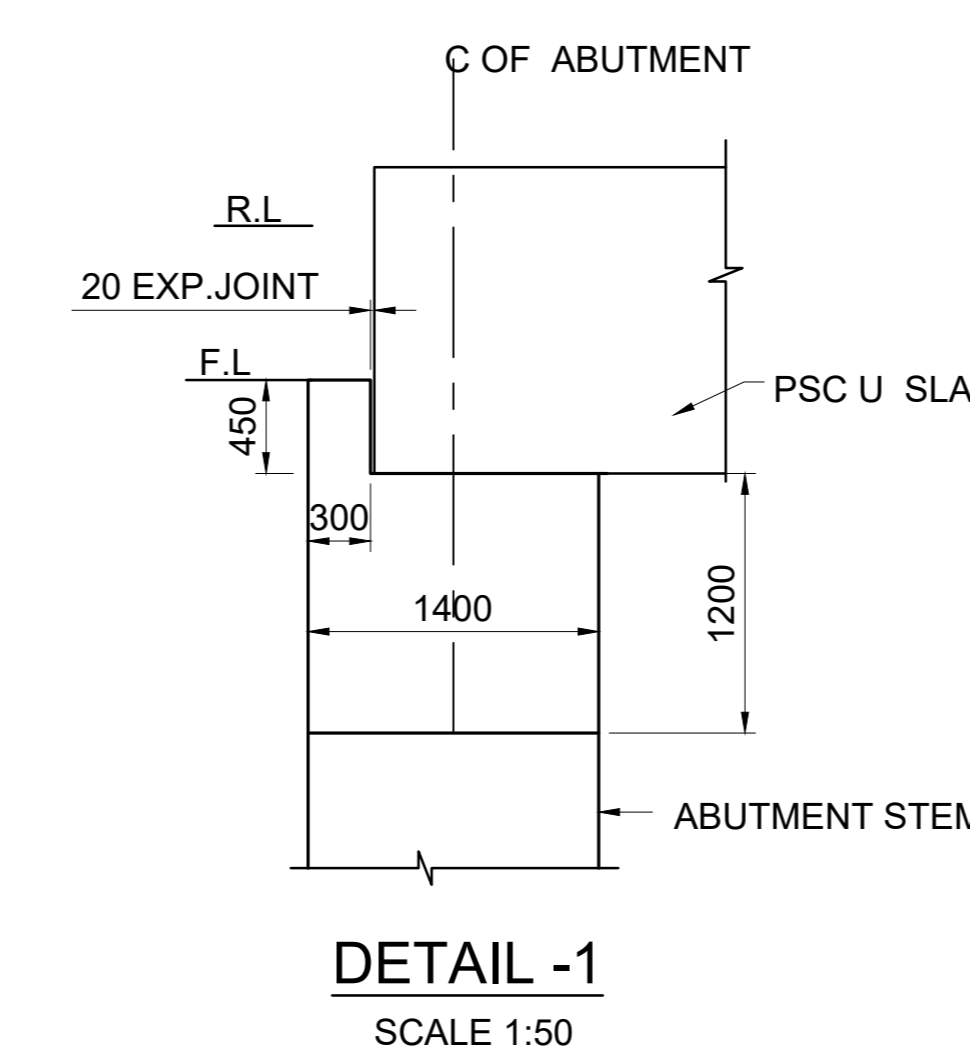
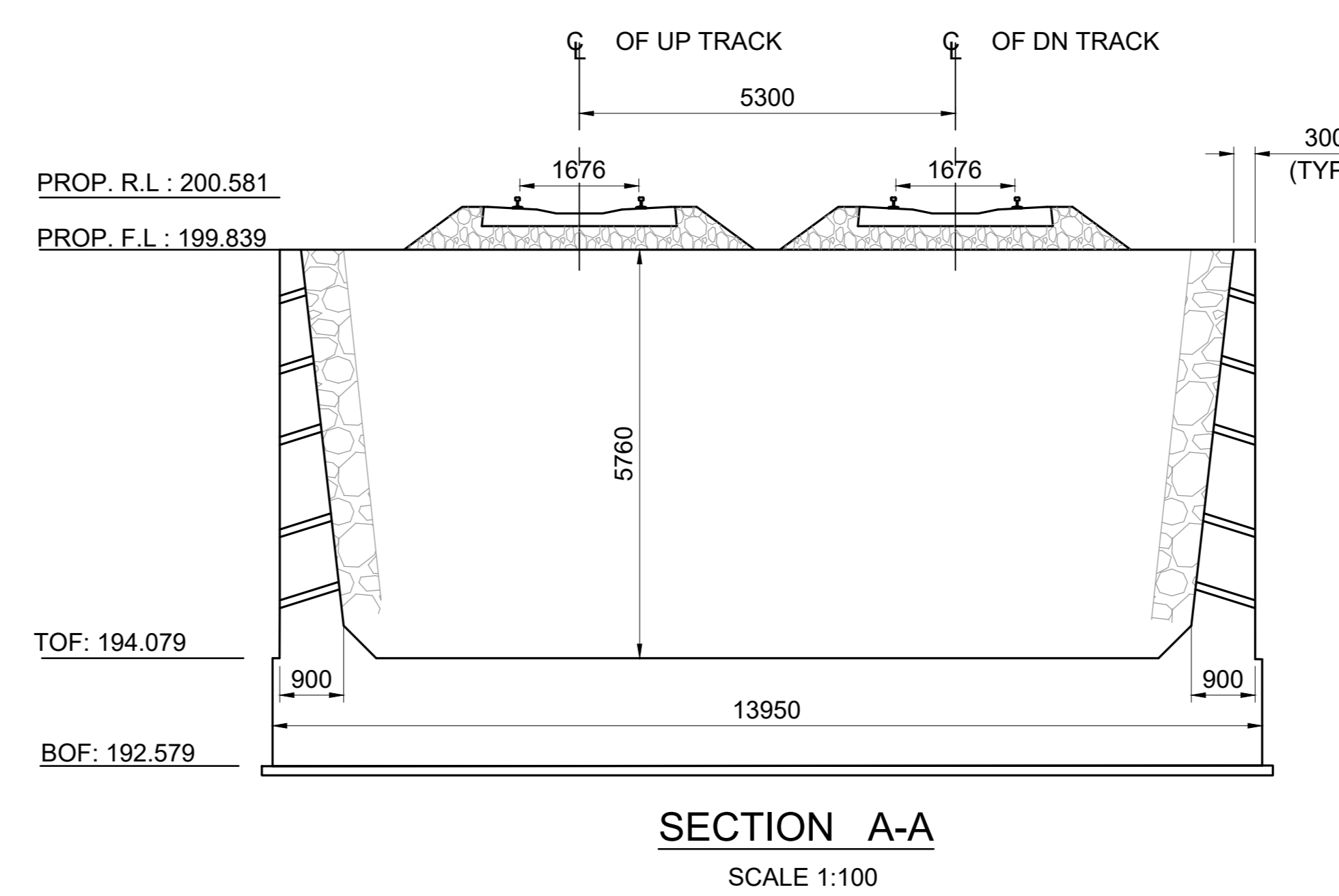
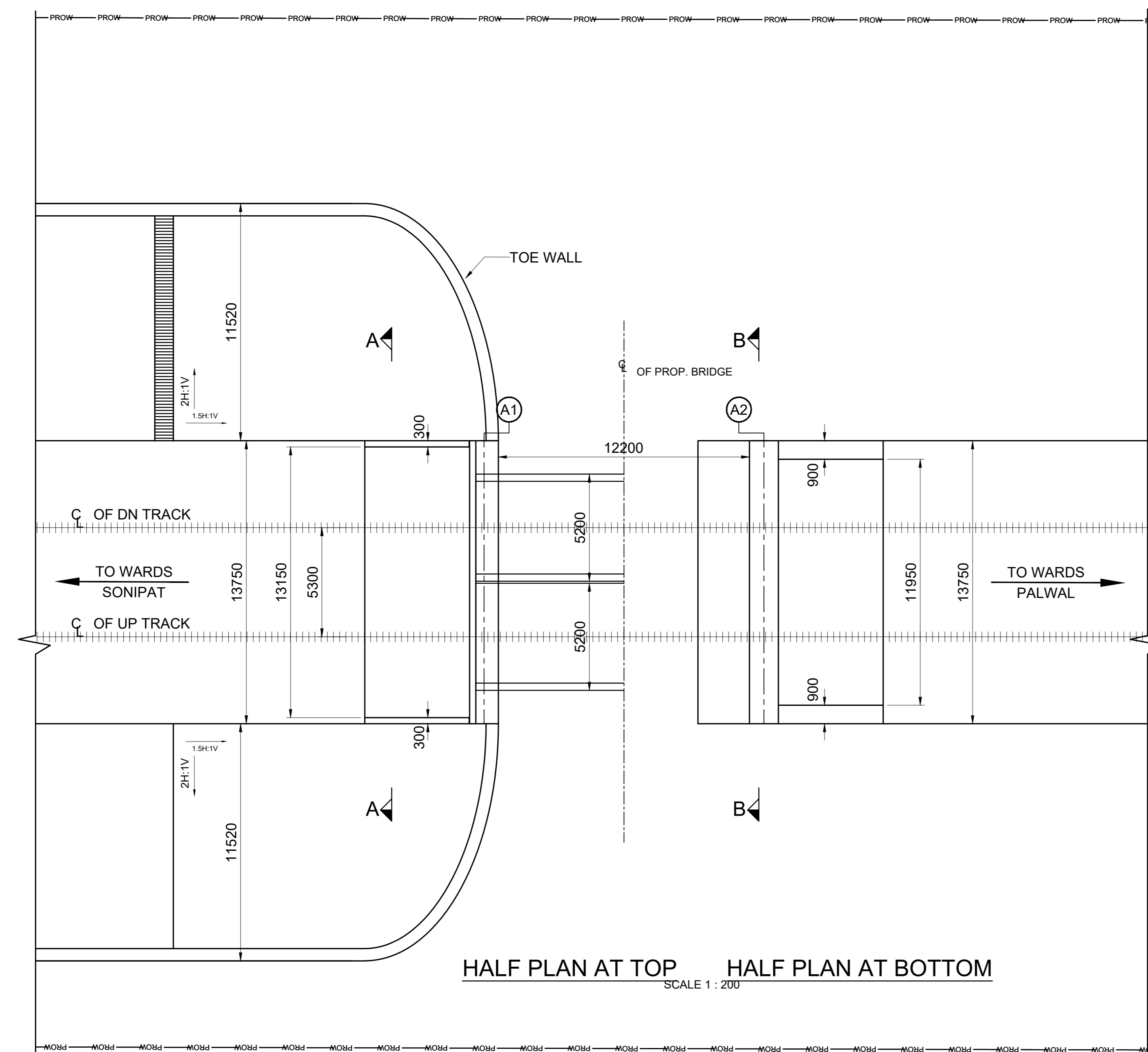
1	NAME OF MINOR	BHIRAOTI MINOR
2	RD	6050/16917
3	FREE BOARD	0.45
4	DISCHARGE	45.02 Cusec
5	BED WIDTH	a 2.088
6	F.S.D	b 1.19
7	SIDE SLOPE	1.5:1
8	TOP WIDTH	c 5.65
9	SHAPE	

GC/HORC		HRIDC	
NAME / DESIGNATION	SIGN	NAME / DESIGNATION	SIGN
CHAHATEY RAM PD	<i>Chahatey Ram</i>	SHIV OM DWIVEDI CPM/HRIDC	<i>Shiv</i>
SUDHIR AGRAWAL DPD/CIVIL	<i>Sudhir</i>	RAJU SOLANKI DGM/CIVIL/SOUTH	<i>Raju</i>
REETU PATIAL CDE/ CIVIL	<i>Reetu</i>		





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 - DESIGN CRITERIA
 - IRS BRIDGE SUBSTRUCTURE AND FOUNDATION CODE 2013.
 - IRS CONCRETE BRIDGE CODE 2014.
 - IRS BRIDGE RULES 2014.
 - IS 2911 PART-1 SECTION-2.
 - EXPOSURE CONDITION - MODERATE.
 - SEISMIC ZONE - IV
 - STANDARD OF LOADING - SUPER STRUCTURE -25T (RDSO STANDARD) & SUB STRUCTURE -32.5T - 2008 LOADING.
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LEGEND

PRL	PROPOSED RAIL LEVEL
PFL	PROPOSED FORMATION LEVEL
HFL	HIGHEST FLOOD LEVEL
GL	GROUND LEVEL
TOF	TOP OF FOUNDATION
BOF	BOTTOM OF FOUNDATION

PROJECT:
HARYANA ORBITAL RAIL CORRIDOR
CONNECTING PALWAL TO SONIPAT BYPASSING DELHI AREA BY LINKING ASAOTI-PATLI-SULTANPUR-ASAUDAH BY NEW ELECTRIFIED BG DOUBLE LINE

CLIENT:
 HARYANA RAIL INFRASTRUCTURE DEVELOPMENT CORPORATION LIMITED.

CONSULTANT:
 GENERAL CONSULTANT FOR HARYANA ORBITAL RAIL CORRIDOR
RITES Limited in consortium with SMEC International Pty. Ltd.

THE INFRASTRUCTURE PEOPLE **SMEC**
Member of the Surbana Jurong Group

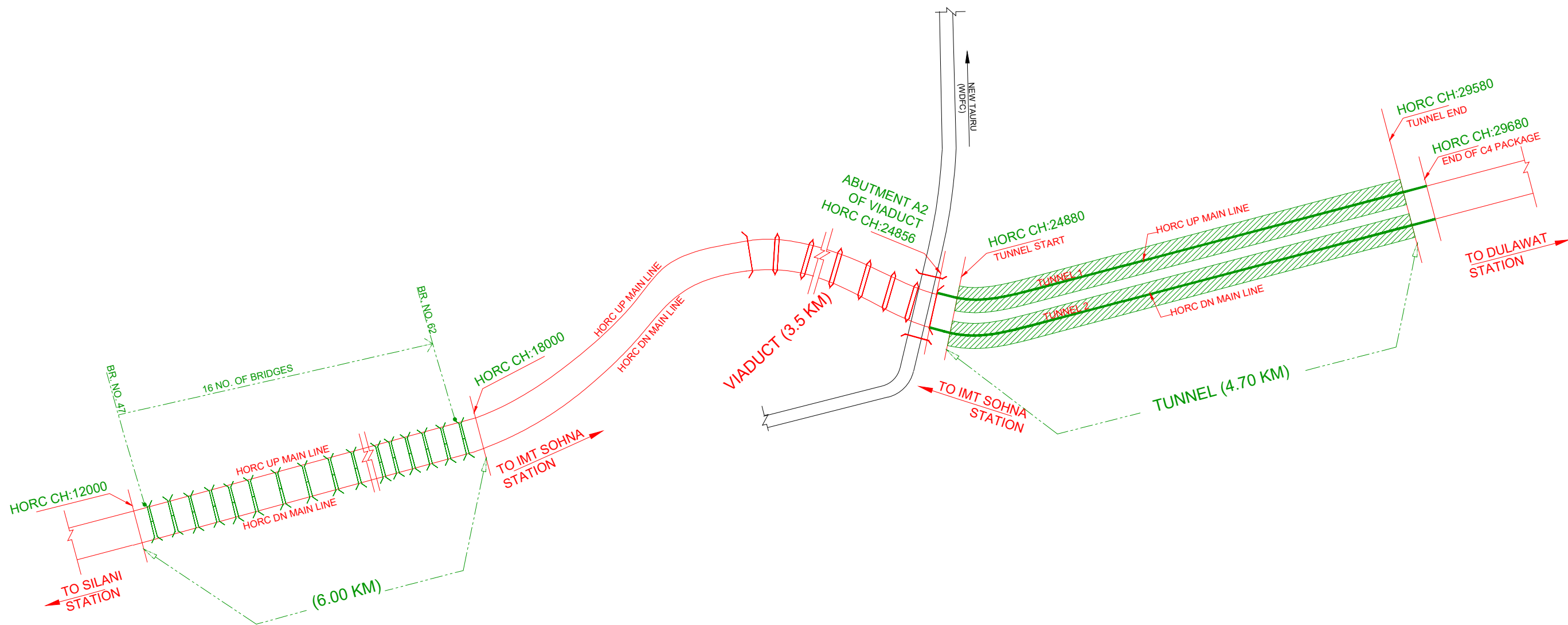
TITLE:- CONCEPTUAL GENERAL ARRANGEMENT DRAWING
PROPOSED RUB NO. 062
1 x 12.2m PSC U SLAB CH: 17500

DRG. NO. GC-HRIDC-C4-DRW-BRD-GAD-01062_A1 **SHEET NO.** 1 OF 1

SCALE : AS SHOWN **ISSUE DATE** 07-11-2022 **REVISED DATE** 21-11-2022

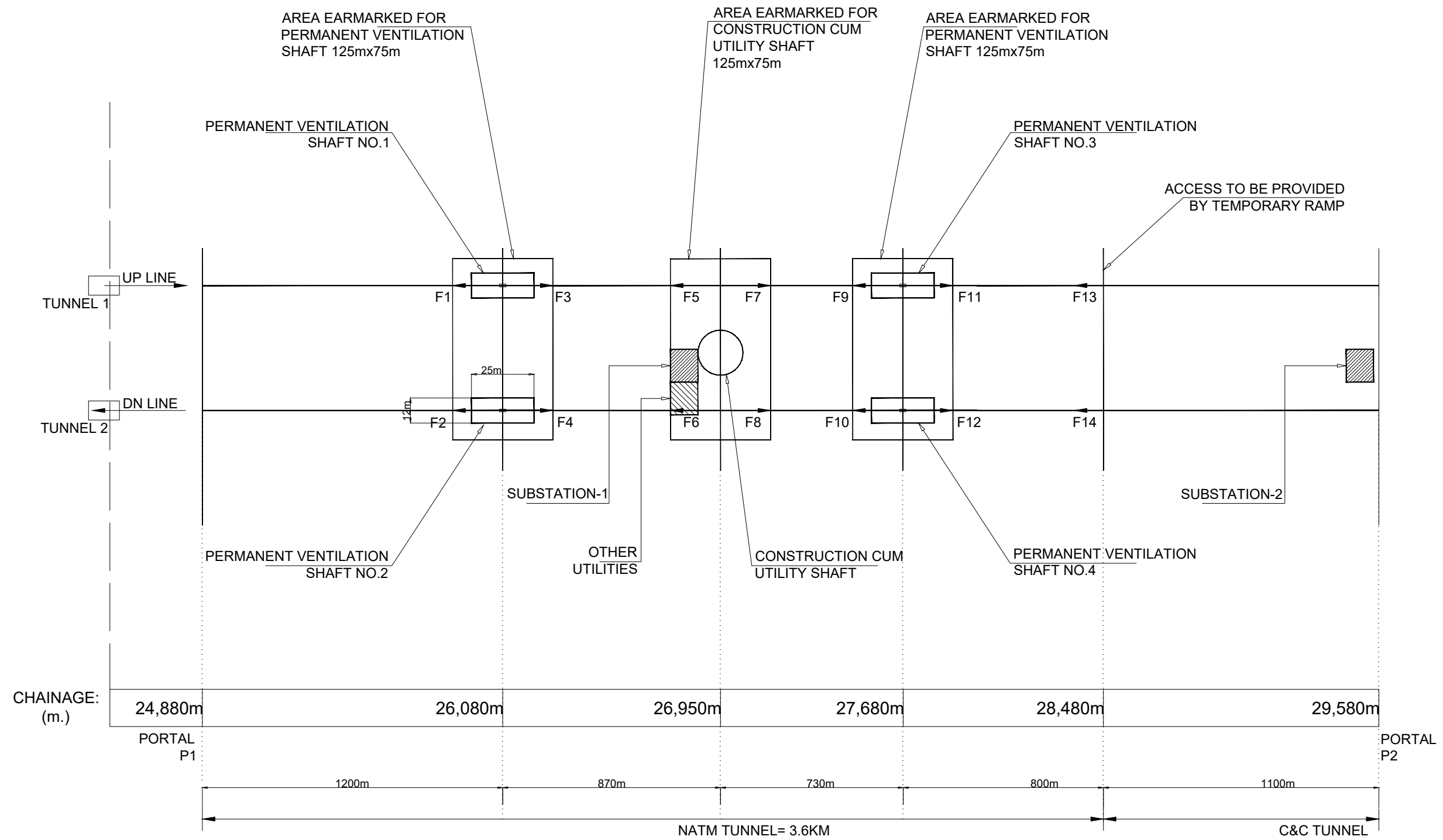
GC/HORC		HRIDC	
NAME / DESIGNATION	SIGN	NAME / DESIGNATION	SIGN
CHAHATEY RAM PD		SHIV OM DWIVEDI CPM/HRIDC	
SUDHIR AGRAWAL DPD/CIVIL		RAJU SOLANKI DGM/CIVIL/SOUTH	
REETU PATIAL CDE/ CIVIL			

4. Miscellaneous Drawings (Conceptual Plans)



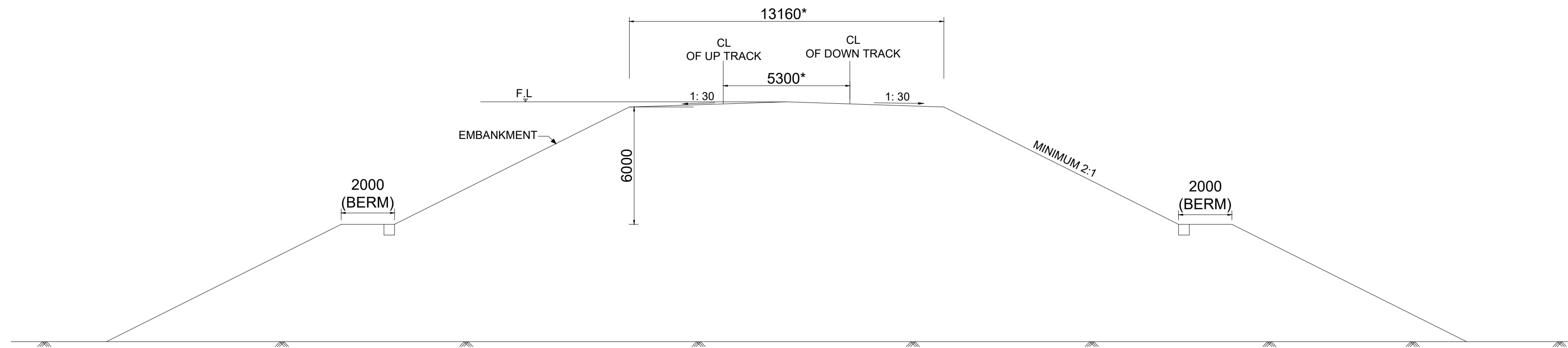
NOTE: JURISDICTION OF C4 PACKAGE SHOWN IN GREEN COLOUR.

GC/HORC	HRIDC	TITLE: JURISDICTIONAL SKETCH OF C-4 PACKAGE
<i>Chakraborty</i> PD	CPM	
<i>MH</i> DPD/ CIVIL	DGM	DRAWING NO. : GC-HRIDC-C4-SK-CIVIL-001_A0

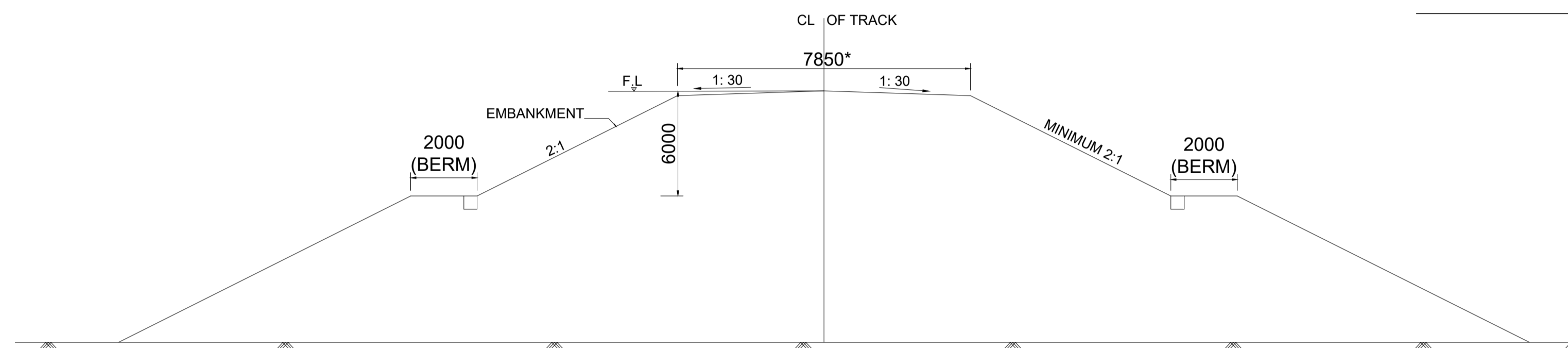


NOTE: F1 - F14 ARE THE WORKING FACES OF NATM TUNNEL.

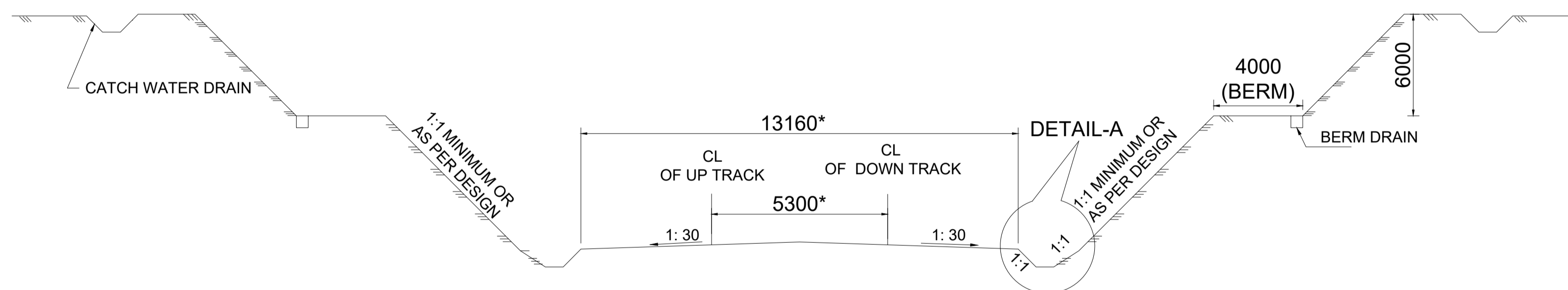
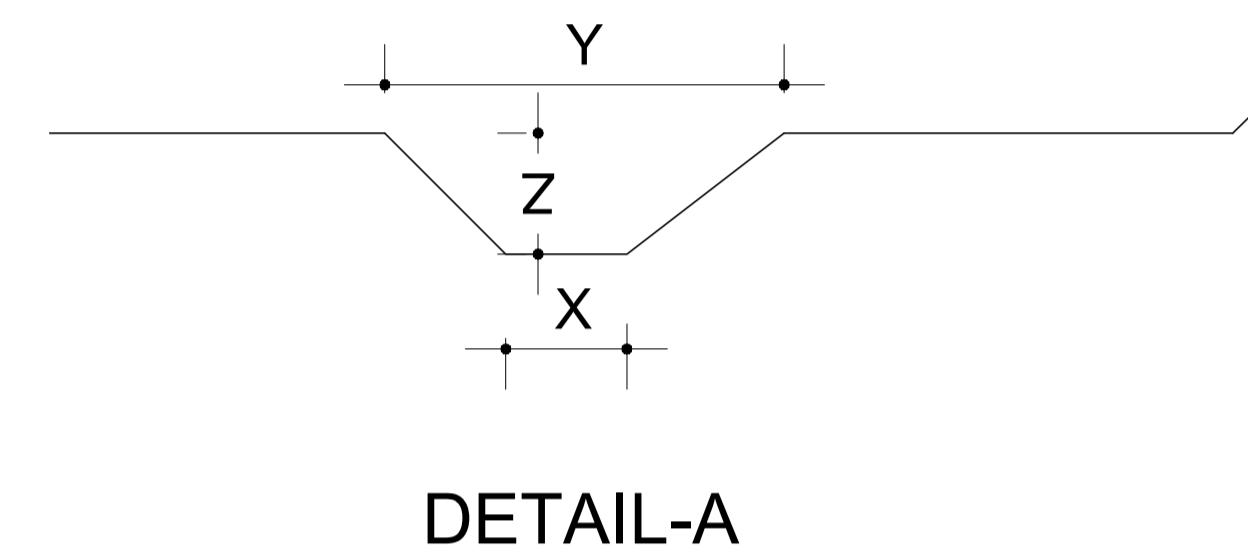
GC/HORC	HRIDC	TITLE: SCHEMATIC DIAGRAM OF HORC TUNNEL
<i>Chakraborty</i> PD	CPM	
<i>ML</i> DPD/ CIVIL	DGM	DRAWING NO. GC-HRIDC-C4-SK-TUNNEL-001_A0



TYPICAL CROSS-SECTION OF EMBANKMENT
(FOR DOUBLE TRACK)



TYPICAL CROSS-SECTION OF EMBANKMENT
(FOR SINGLE TRACK)




TYPICAL CROSS-SECTION OF CUTTING
(FOR DOUBLE TRACK)

- NOTES:
1. ALL DIMENSION ARE IN MM.
 2. DEPTH OF BALLAST CUSHION SHOULD BE PROVIDED AS PER PARA 212(2) OF IRPWM.
 3. CROSS SLOPE OF 1IN 30 SHALL BE PROVIDED.
 4. MINIMUM FORMATION WIDTH OF 13160 MM SHALL BE ENSURED FOR NEW WORKS IN BOTH EMBANKMENT AND IN CUTTING (EXCLUDING SIDE DRAIN)
 5. * FORMATION WIDTH SHALL BE INCREASED BASED ON CURVE & SUPER ELEVATION AS PER IRSOD.
 6. X, Y, Z DIMENSIONS SHALL BE AS PER DESIGN.

PROJECT:
HARYANA ORBITAL RAIL CORRIDOR
CONNECTING PALWAL TO SONIPAT BYPASSING DELHI AREA BY LINKING ASAOTI-PATLI-SULTANPUR-ASAUDAH BY NEW ELECTRIFIED BG DOUBLE LINE

CLIENT:
 HARYANA RAIL INFRASTRUCTURE DEVELOPMENT CORPORATION LIMITED.


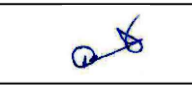

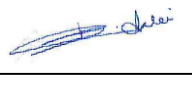

CONSULTANT:
 GENERAL CONSULTANT FOR HARYANA ORBITAL RAIL CORRIDOR
RITES Limited in consortium with SMEC International Pty. Ltd.

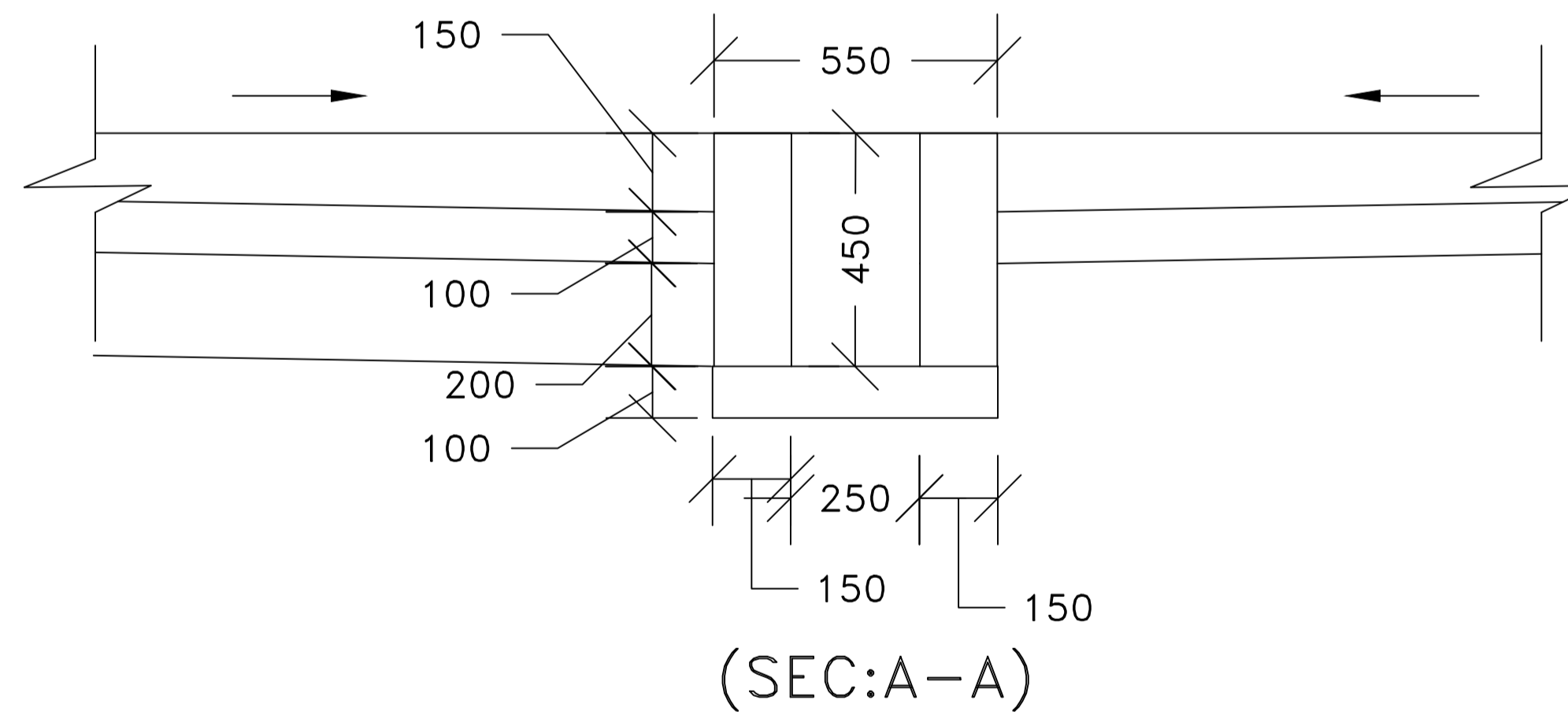
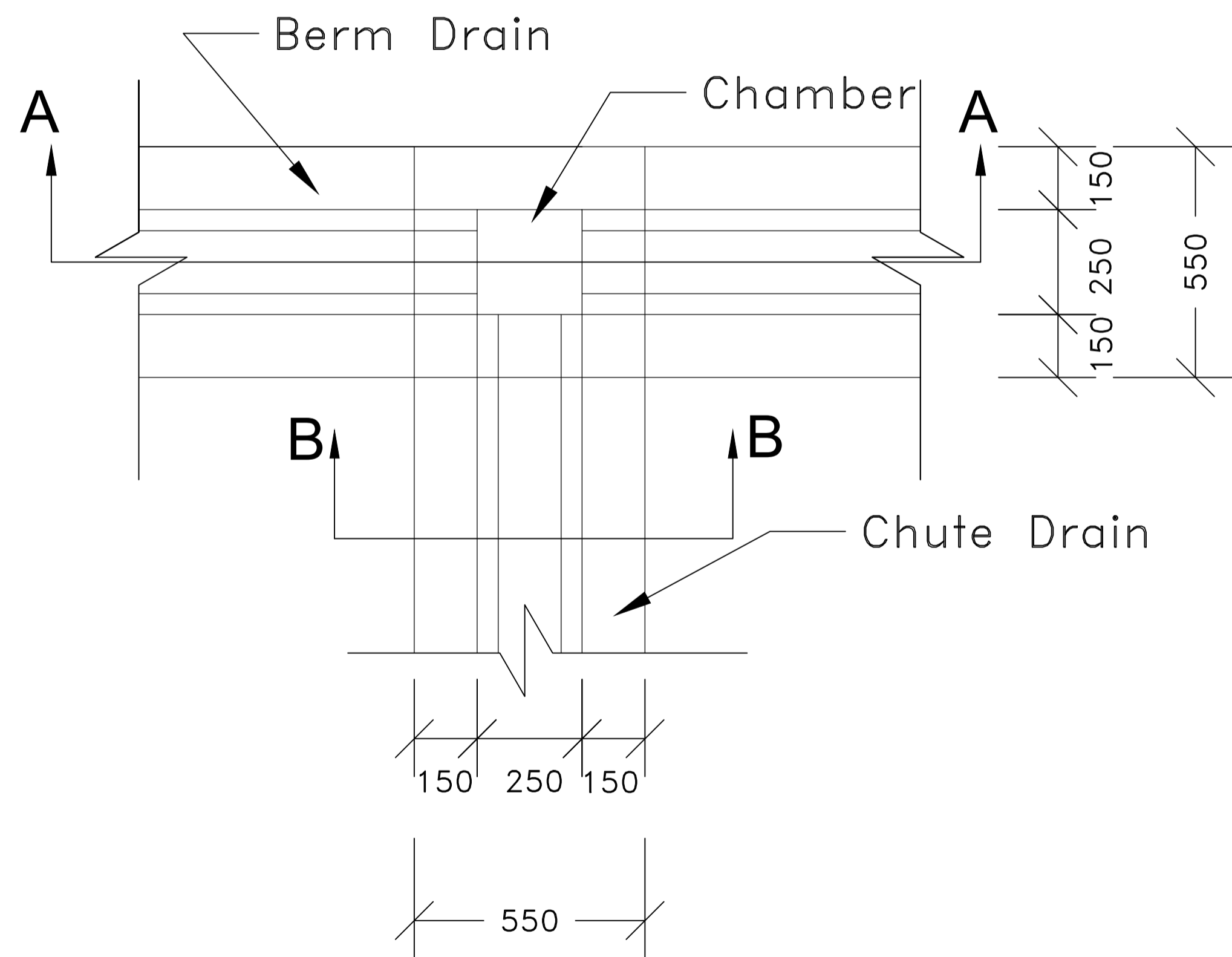
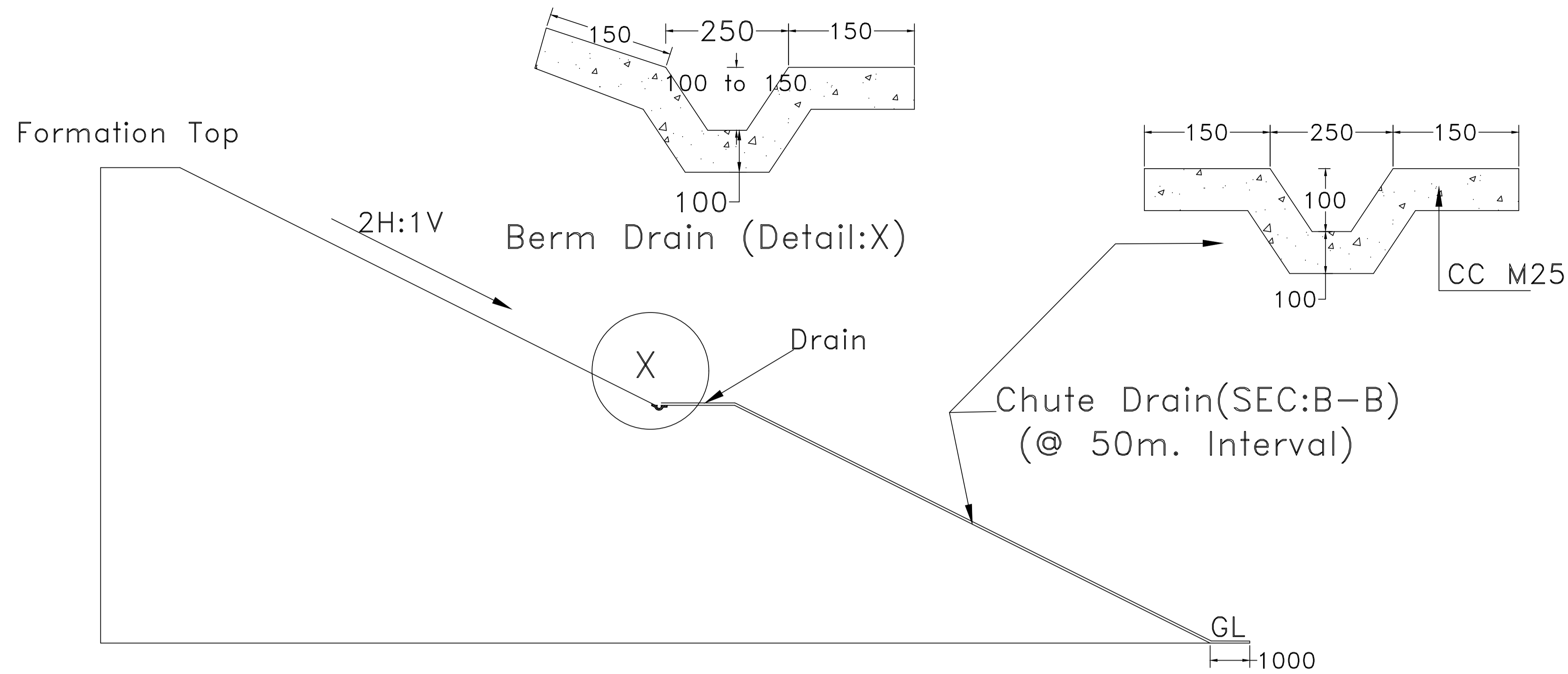


TITLE:- CONCEPTUAL PLAN
TYPICAL EMBANKMENT/CUTTING PROFILE

DRG. NO. GC-HRIDC-SK-GEN-001_A1 SHEET NO.

SCALE : AS SHOWN
ISSUE DATE 28.12.2022

GC/HORC		HRIDC	
NAME / DESIGNATION	SIGN	NAME / DESIGNATION	SIGN
CHAHATEY RAM PD		R. R. KUMAR GM/ IP&P	
SUDHIR AGRAWAL DPD/CIVIL		RAJU SOLANKI DGM/C-SOUTH	
REETU PATIAL CDE/ CIVIL			



NOTES:-

1. ALL DIMENSION ARE IN MM UNLESS OTHERWISE SPECIFIED.
2. NO DIMENSION SHALL BE SCALED FROM DRAWING ONLY WRITTEN DIMENSION ARE TO BE FOLLOWED.

PROJECT:
HARYANA ORBITAL RAIL CORRIDOR
 CONNECTING PALWAL TO SONIPAT BYPASSING DELHI
 AREA BY LINKING ASAOTI-PATLI-SULTANPUR-ASAUDAH BY
 NEW ELECTRIFIED BG DOUBLE LINE

CLIENT:
 **HARYANA RAIL INFRASTRUCTURE
 DEVELOPMENT CORPORATION LIMITED.**


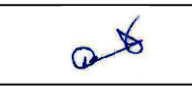

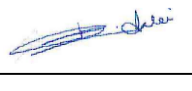

CONSULTANT:
 **GENERAL CONSULTANT FOR
 HARYANA ORBITAL RAIL CORRIDOR**
 RITES Limited in consortium with SMEC International Pty. Ltd.



TITLE:- **CONCEPTUAL PLAN
 DRAINS FOR EMBANKMENT**

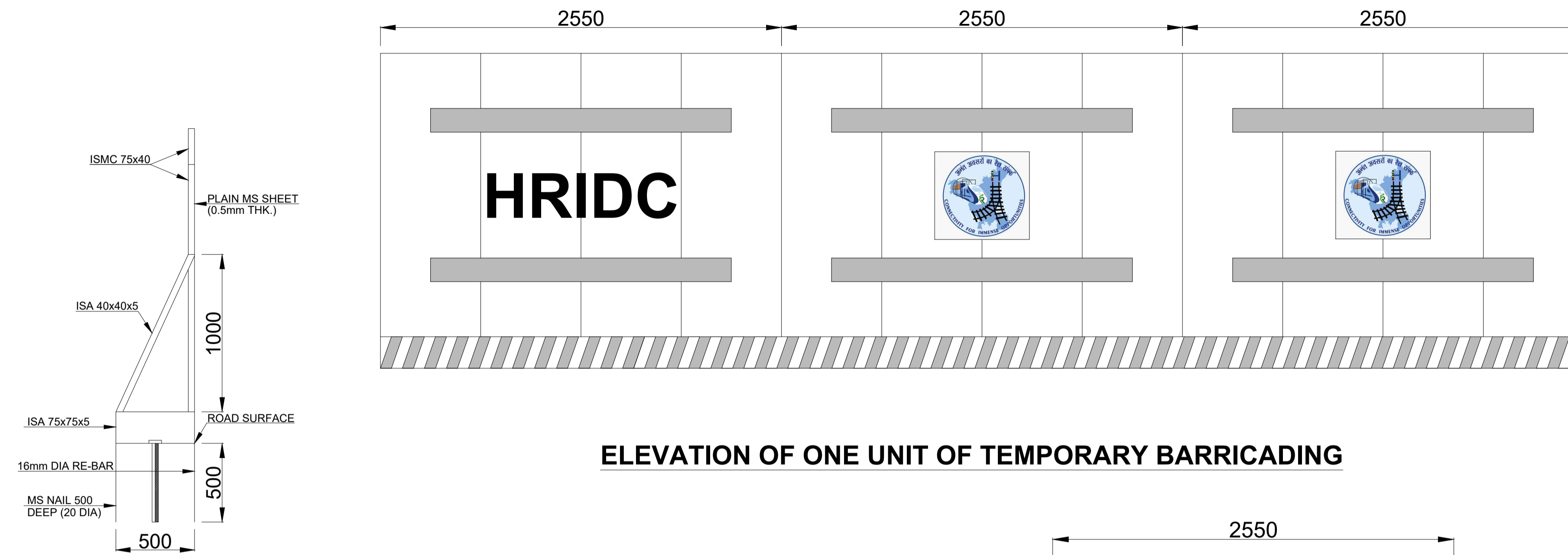
DRG. NO. **GC-HRIDC-SK-GEN-008_A1** SHEET NO.
1 OF 1

SCALE : **AS SHOWN** ISSUE DATE
28.12.2022

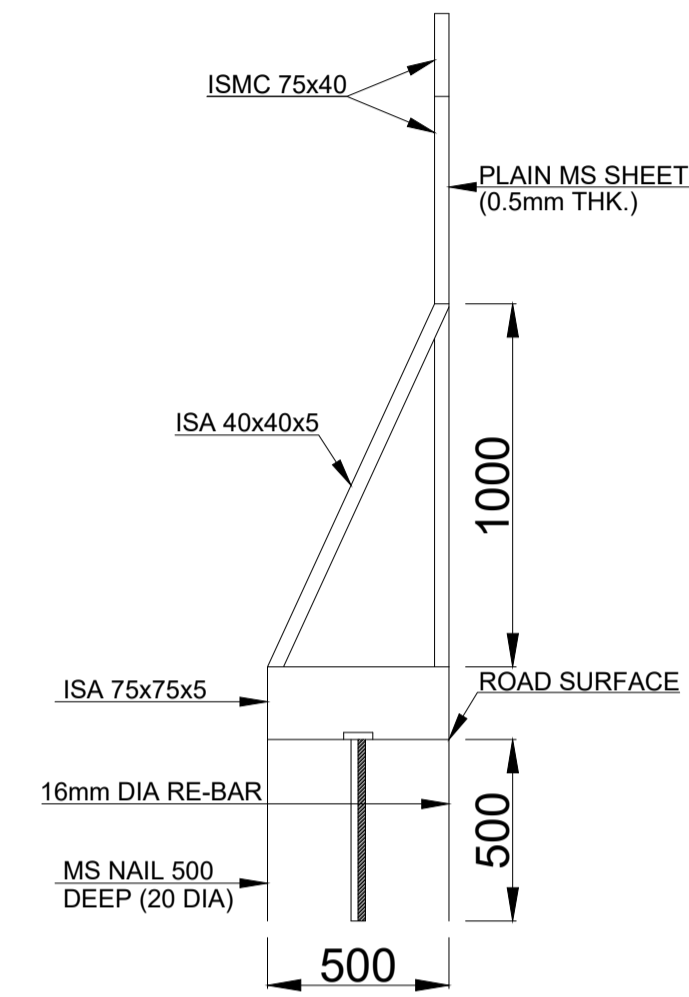
GC/HORC		HRIDC	
NAME / DESIGNATION	SIGN	NAME / DESIGNATION	SIGN
CHAHATEY RAM PD		R. R. KUMAR GM/ IP&P	
SUDHIR AGRAWAL DPD/CIVIL		RAJU SOLANKI DGM/C-SOUTH	
REETU PATIAL CDE/ CIVIL			

NOTES:

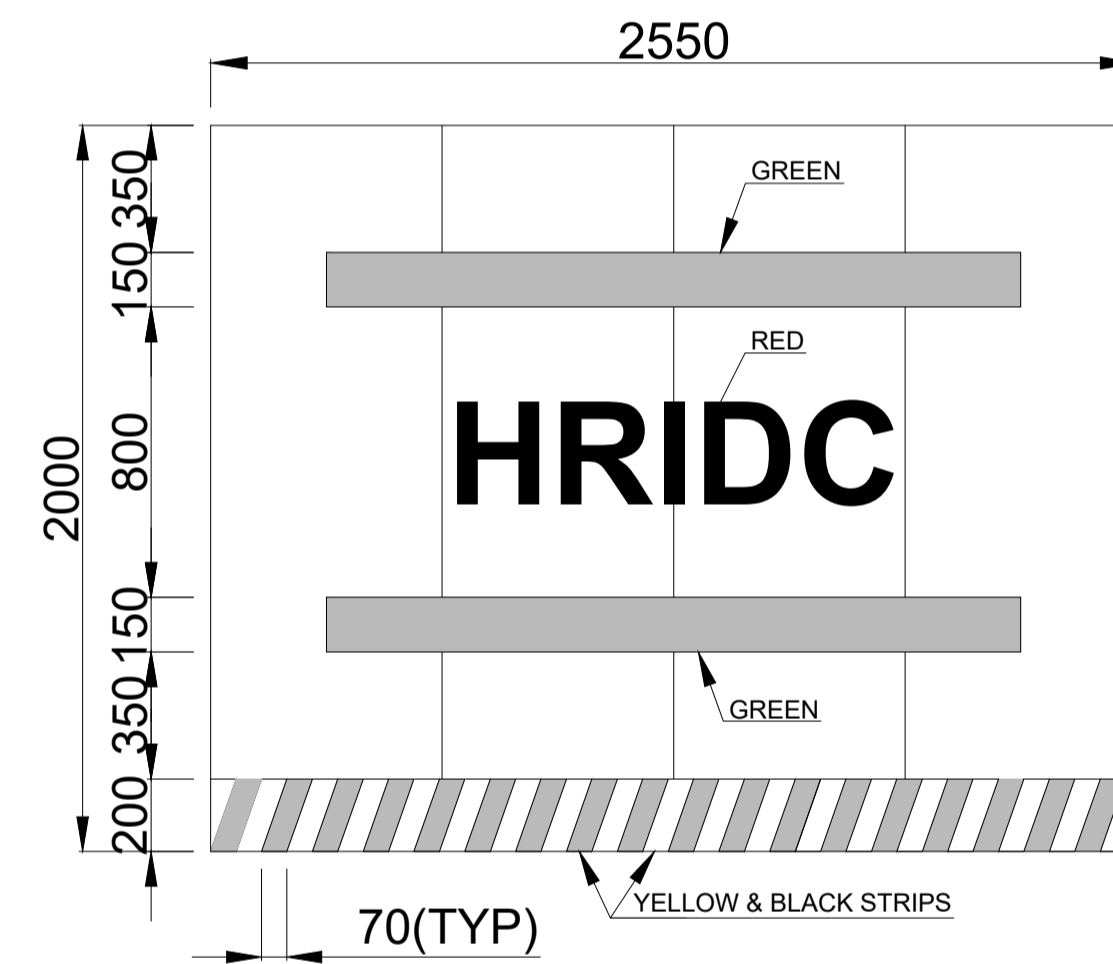
1. ALL DIMENSIONS SHOWN ARE IN MILLIMETERS, UNLESS OTHERWISE MENTIONED.
2. THIS BARRICADING SHALL BE USED AT LOCATION OF ROAD AND PEDESTRIAN TRAFFIC.



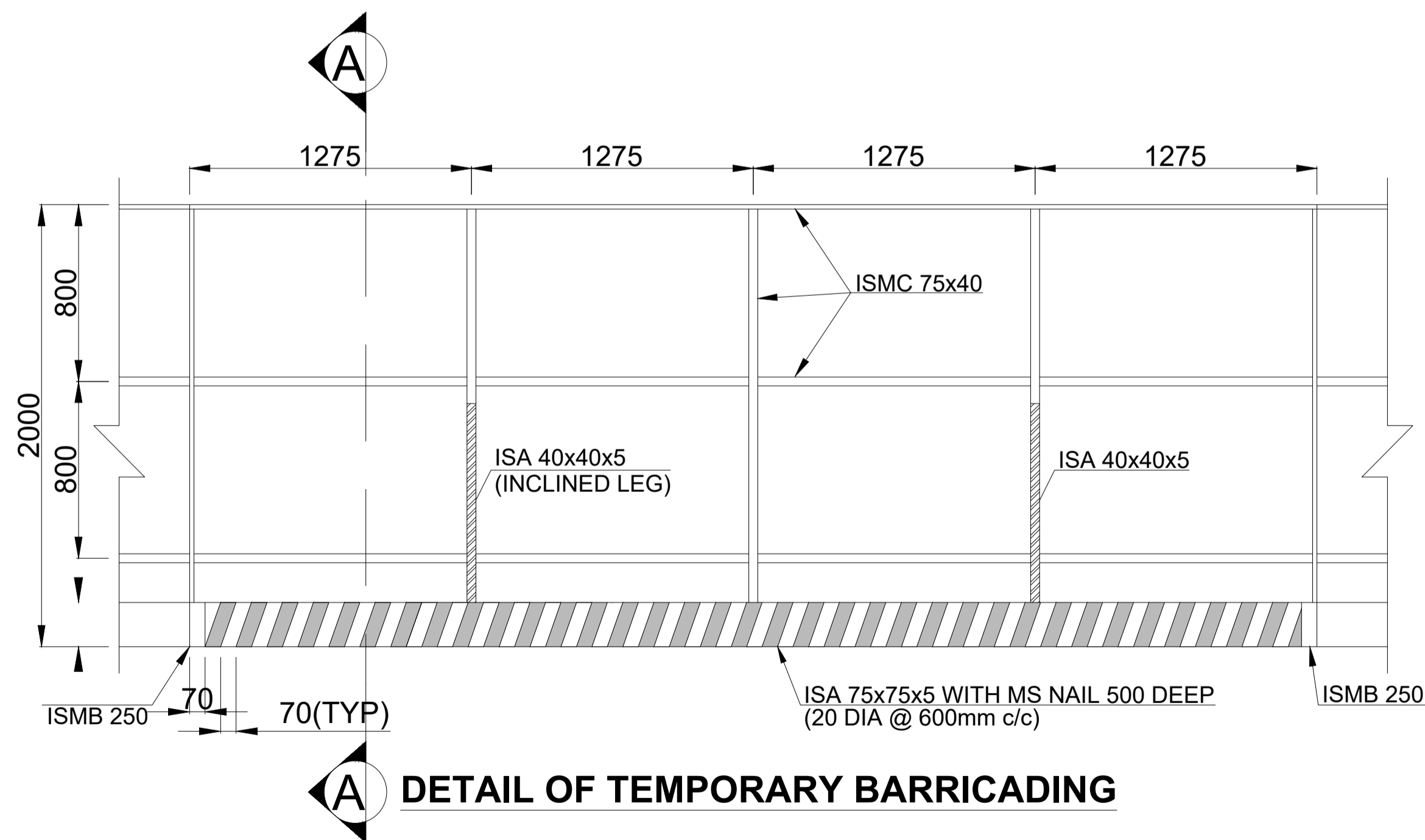
ELEVATION OF ONE UNIT OF TEMPORARY BARRICADING



SECTION A-A



ELEVATION OF ONE SET OF TEMPORARY BARRICADING



DETAIL OF TEMPORARY BARRICADING

PROJECT:
HARYANA ORBITAL RAIL CORRIDOR
 CONNECTING PALWAL TO SONIPAT BYPASSING DELHI
 AREA BY LINKING ASAOTI-PATLI-SULTANPUR-ASAUDAH BY
 NEW ELECTRIFIED BG DOUBLE LINE

CLIENT:
 **HARYANA RAIL INFRASTRUCTURE
 DEVELOPMENT CORPORATION LIMITED.**

CONSULTANT:
 **GENERAL CONSULTANT FOR
 HARYANA ORBITAL RAIL CORRIDOR**
 RITES Limited in consortium with SMEC International Pty. Ltd.

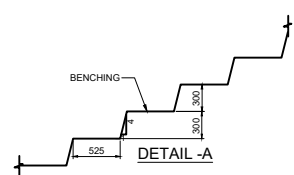
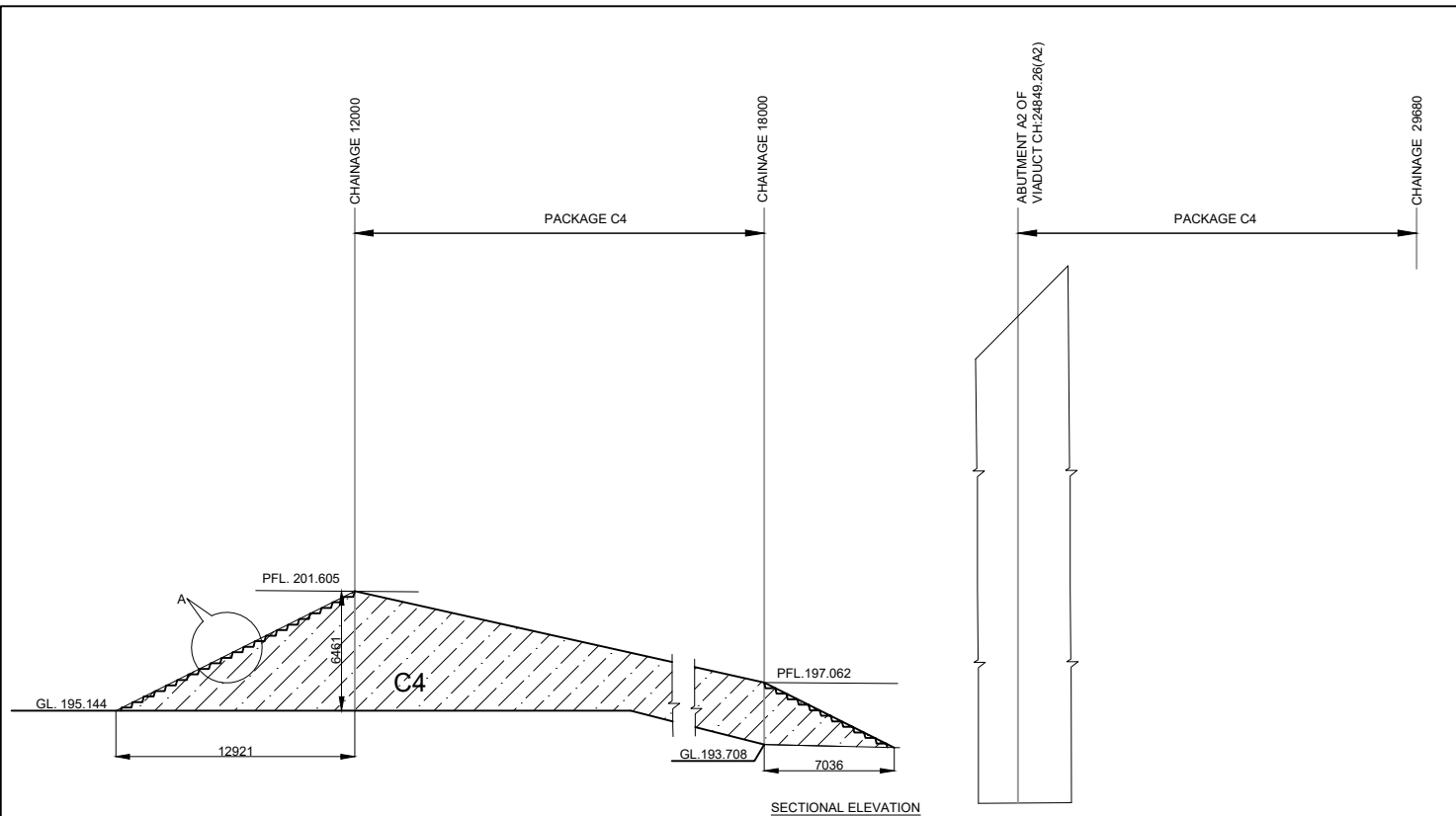


TITLE:- **CONCEPTUAL PLAN
 STEEL BARRICADE**

DRG. NO. **GC-HRIDC-SK-GEN-009** SHEET NO.

SCALE : **AS SHOWN** ISSUE DATE REVISED DATE

GC/HORC		HRIDC	
NAME / DEGINATION	SIGN	NAME / DEGINATION	SIGN
CHAHATEY RAM PD	<i>Chahatey Ram</i>	SHIV OM DWIVEDI CPM/HRIDC	<i>Shiv Om Dwivedi</i>
SUDHIR AGRAWAL DPD/CIVIL	<i>Sudhir</i>	UMA.M.RAO DGM/C-1	<i>Uma M Rao</i>
REETU PATIAL CDE/ CIVIL	<i>Reetu</i>		




- NOTES :**
1. ALL DIMENSIONS ARE IN MILLIMETERS.
 2. FOR OTHER DETAILS REFER RDSO SPECIFICATION NO. RDSO/2020/GE:IRS-004 SEPTEMBER 2020 "COMPREHENSIVE GUIDELINES AND SPECIFICATIONS FOR RAILWAY FORMATION".
 3. HATCHED AREA IS IN THE SCOPE OF C-4.

PROJECT:
HARYANA ORBITAL RAIL CORRIDOR
 CONNECTING PALWAL TO SONIPAT BYPASSING DELHI AREA BY LINKING ASOTI-PATLI-SULTANPUR-ASAUDAH BY NEW ELECTRIFIED BG DOUBLE LINE

CLIENT:

HARYANA RAIL INFRASTRUCTURE DEVELOPMENT CORPORATION LIMITED

CONSULTANT:

GENERAL CONSULTANT FOR HARYANA ORBITAL RAIL CORRIDOR
 RITES Limited in consortium with SMEC International Pty. Ltd.

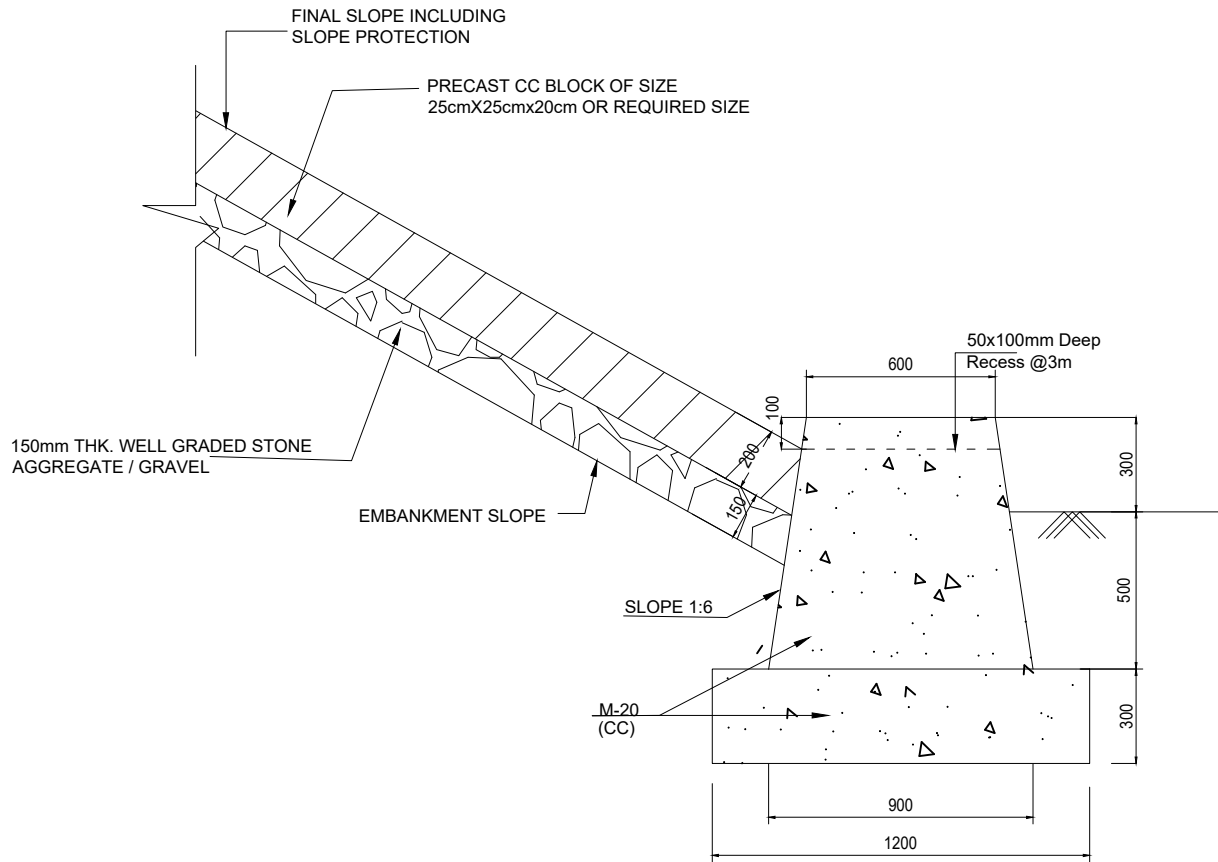


GC/HORC		HRIDC	
NAME / DESIGNATION	SIGN	NAME / DESIGNATION	SIGN
CHAHATEY RAM PD		SHY OM DWIVEDI CPM/HRIDC	
SUDHIR AGRAWAL SPS/CIVIL		RAJU SOLANKI DGM/CIVIL/SOUTH	
REETU PATIL CDE/ CIVIL			

TITLE:- CONCEPTUAL PLAN INTERFACING LOCATION BANK BENCHING

SKETCH NO. GC-HRIDC-C4-SK-012_A1 **SHEET NO.** 1 OF 1

SCALE :	ISSUE DATE	REVISED DATE
AS SHOWN	07-11-2022	




NOTES:-

1. ALL DIMENSIONS ARE IN MILLIMETRE UNLESS OTHERWISE MENTIONED.
2. M-20 GRADE CONCRETE SHALL BE USED FOR TOE WALL.
3. 25MM EXPANSION GAP SHALL BE PROVIDED AT 30m (MAX.) OF LENGTH OF WALL.






PROJECT:
 HARYANA ORBITAL RAIL CORRIDOR
 CONNECTING PALWAL TO SONPAT BYPASSING DELHI
 AREA BY LINKING ASAOTI-PATLI-SULTANPUR-ASAJDAH BY
 NEW ELECTRIFIED BG DOUBLE LINE

CLIENT:
 HARYANA RAIL INFRASTRUCTURE
 DEVELOPMENT CORPORATION LIMITED

CONSULTANT:
 GENERAL CONSULTANT FOR
 HARYANA ORBITAL RAIL CORRIDOR
 RITES Limited in consortium with SMEC International Pty. Ltd.

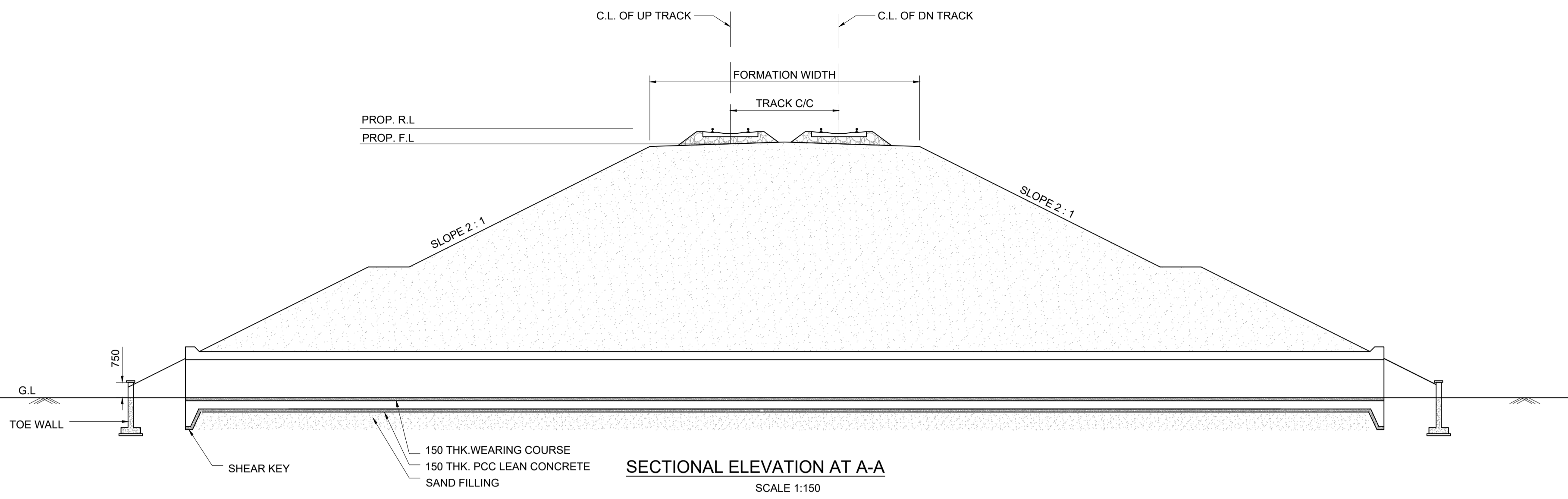


TITLE:- CONCEPTUAL PLAN
 CC TOE WALL

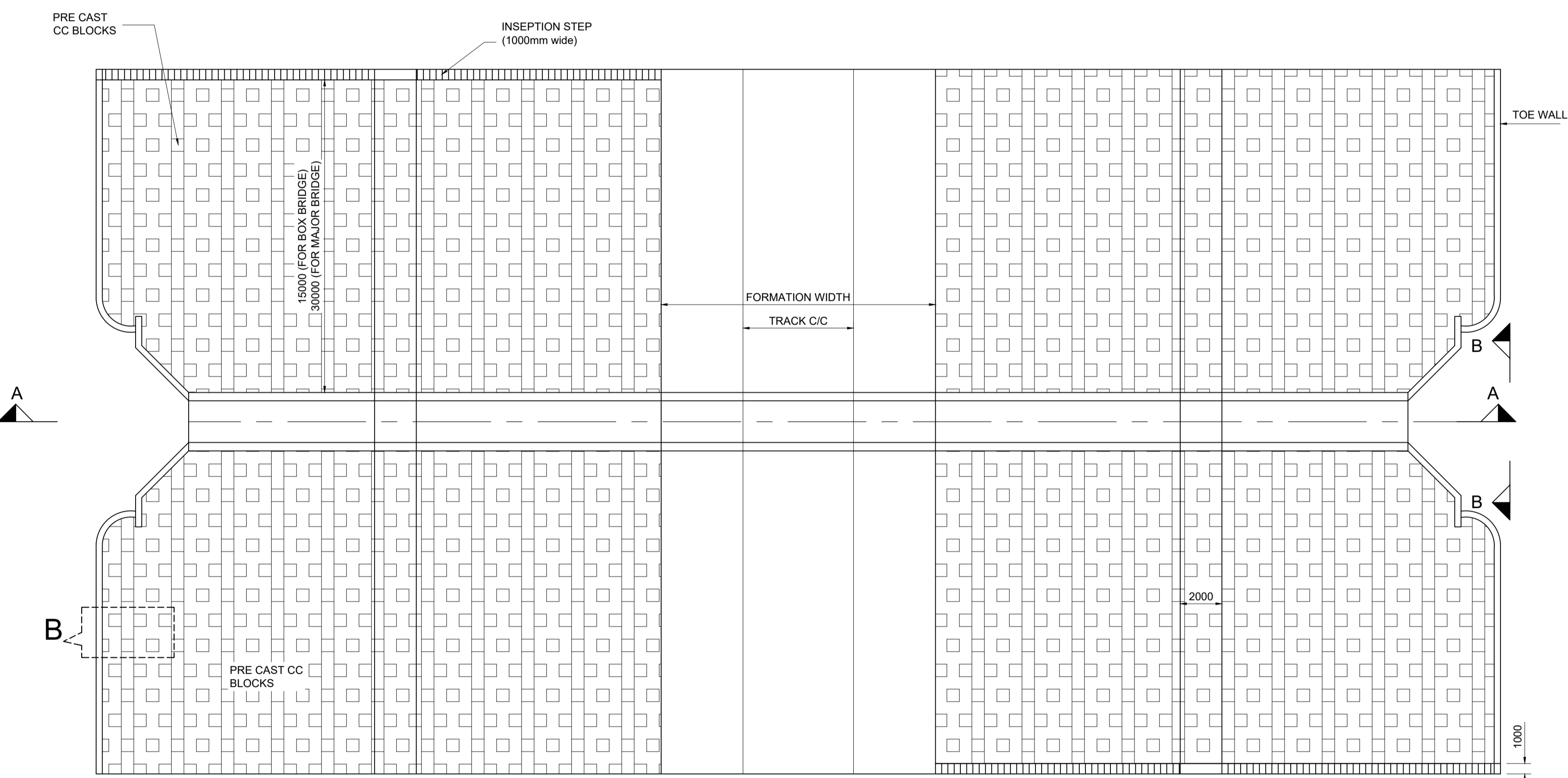
GC/HORC		HRIDC	
NAME / DESIGNATION	SIGN	NAME / DESIGNATION	SIGN
CHAHATEY RAM PD		R. R. KUMAR GM/ IP&P	
SUDHIR AGRAWAL DPO/CIVIL		RAJU SOLANKI DGM/C-SOUTH	
REETU PATEL CDE/ CIVIL			

DRG. NO. GC-HRIDC-SK-GEN-014_A1 **SHEET NO.** 1 OF 1

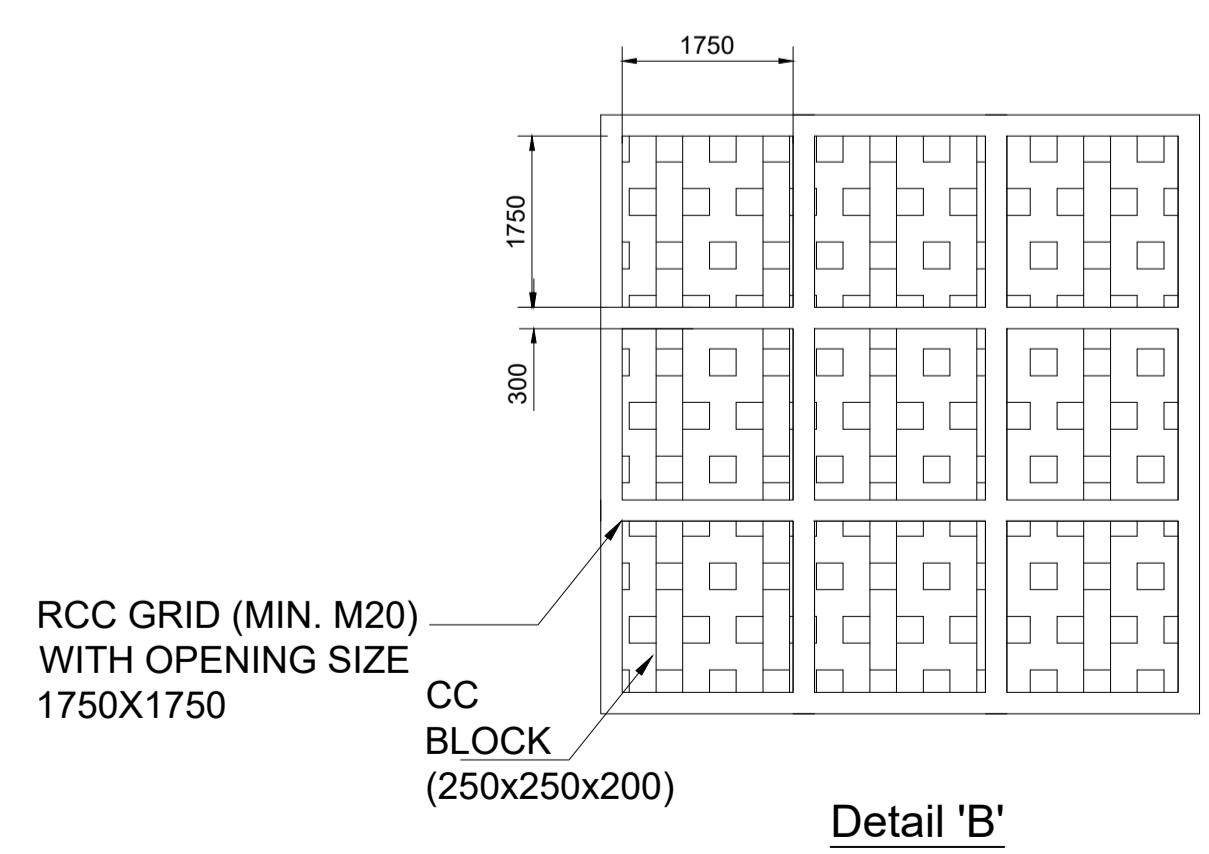
SCALE : AS SHOWN **ISSUE DATE** 28.12.2022



SECTIONAL ELEVATION AT A-A
SCALE 1:150



PLAN AT TOP
SCALE 1:150



Detail 'B'

- NOTES :**
1. ALL DIMENSIONS ARE IN MILLIMETERS, UNLESS OTHERWISE MENTIONED.
 2. PROTECTION WORK WITH PRECAST CC BLOCK ON BOTH SIDES OF BRIDGES SHALL BE DONE FOR 15m LENGTH AND 30m LENGTH FOR MINOR BRIDGES & MAJOR BRIDGES RESPECTIVELY.
 3. THIS DRAWING IS VALID FOR SINGLE/MULTIPLE NO. OF TRACKS. TRACKS SHOWN IN DRAWING ARE SYMBOLIC PRESENTATION ONLY.

LEGEND

PRL	PROPOSED RAIL LEVEL
PFL	PROPOSED FORMATION LEVEL
HFL	HEIGHTEST FLOOD LEVEL
GL	GROUND LEVEL

PROJECT:
HARYANA ORBITAL RAIL CORRIDOR
 CONNECTING PALWAL TO SONIPAT BYPASSING DELHI AREA BY LINKING ASAOTI-PATLI-SULTANPUR-ASAUDAH BY NEW ELECTRIFIED BG DOUBLE LINE

CLIENT:
 **HARYANA RAIL INFRASTRUCTURE DEVELOPMENT CORPORATION LIMITED.**

CONSULTANT:
 **GENERAL CONSULTANT FOR HARYANA ORBITAL RAIL CORRIDOR**
 RITES Limited in consortium with SMEC International Pty. Ltd.



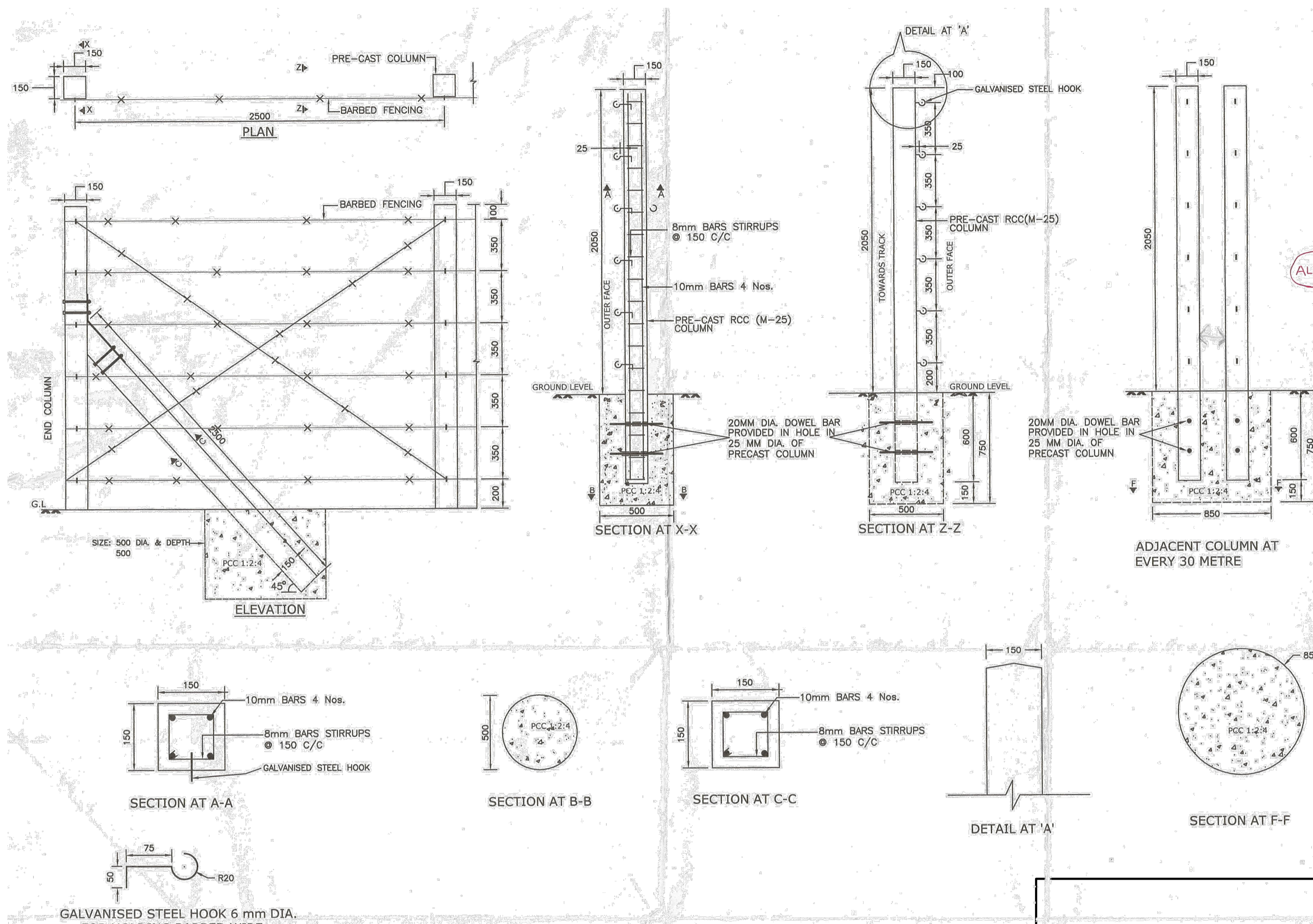
TITLE:- CONCEPTUAL PLAN
TYPICAL DETAILS OF PROTECTION WORK

GC/HORC		HRIDC	
NAME / DESIGNATION	SIGN	NAME / DESIGNATION	SIGN
CHAHATEY RAM PD	<i>Chahatey Ram</i>	R. R. KUMAR GM/ IP&P	<i>RRK</i>
SUDHIR AGRAWAL DPD/CIVIL	<i>AS</i>	RAJU SOLANKI DGM/C-SOUTH	<i>RS</i>
REETU PATIAL CDE/ CIVIL	<i>RP</i>		

DRG. NO. GC-HRIDC-SK-GEN-015_A1	SHEET NO.
SCALE : AS SHOWN	ISSUE DATE 28.12.2022

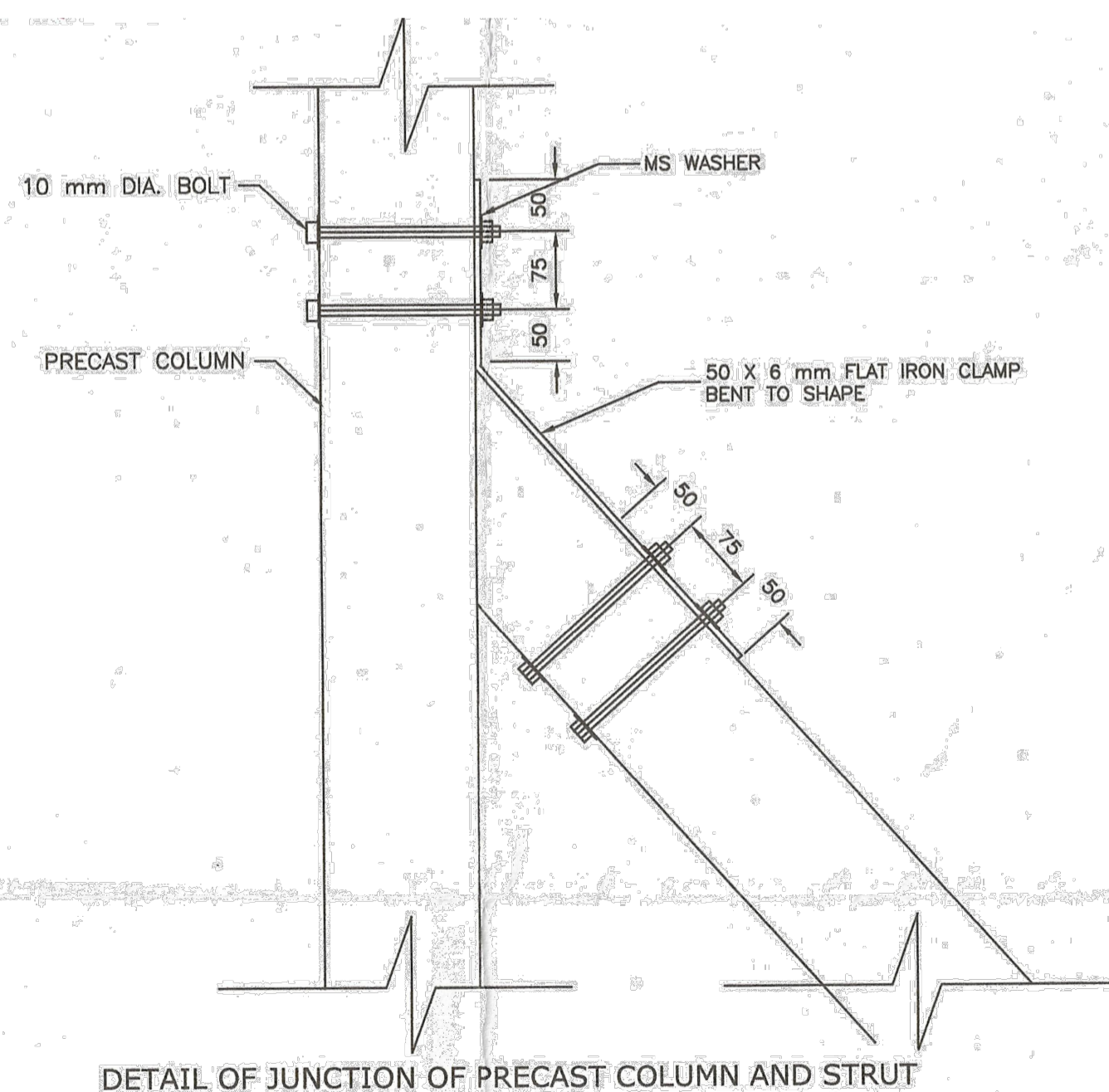
Notes:

1. THIS DRAWING IS BASED ON RDSO DRAWING NO. RDSO/WKS/2019/2.
2. GRADE OF CONCRETE M25.



NOTES:


1. ALL DIMENSIONS ARE IN mm UNLESS OTHERWISE SPECIFIED.
2. BARBED FENCING SHALL BE MADE OF G.I. BARBED WIRES CONFIRMING TO IS: 278. THE WEIGHT OF G.I. BARBED WIRE SHALL BE AS PER SOR.
3. THE G.I. BARBED WIRES SHALL BE FIXED TO THE COLUMNS WITH HOOKS MADE OF 6 mm DIA. GALVANIZED STEEL. ANOTHER END OF GALVANIZED STEEL HOOK SHALL BE PLACED BEHIND STIRRUPS AND TIED WITH STIRRUPS AS PER DRAWING TO PROVIDE STRENGTH.
4. FOR ERECTION OF WIRE FENCING, RECOMMENDATIONS GIVEN IN IS:4996-1984 SHALL BE FOLLOWED. FENCING WIRE SHALL BE TIED TO GALVANIZED STEEL HOOKS WITH SHORT PIECE OF LIGHT WIRE.
5. M-25 GRADE CONCRETE SHALL BE USED IN PRECAST COLUMN/ STRUT. COLUMN/ STRUT SHALL BE CAST AT CENTRALIZED DEPOT UNDER CONTROLLED CONDITION AS PER IS :456-2000.
6. TMT BARS OF GRADE FE 415/ 500 OF SPECIFIED DIA. SHALL BE USED. TMT BAR SHALL BE CONFIRMING TO IS:1786 (LATEST).
7. ZONAL RAILWAY MAY PAINT THEIR INITIALS (SUCH AS NR, SER etc.) ON COLUMN AND STRUT.
8. STRUT OR BRACE SHALL BE FIXED WITH END RCC COLUMN BY SUITABLE ARRANGEMENT AS DETAILED IN DRAWING. 50 X 6 mm MS FLAT SHALL BE USED TO CONNECT STRUT/BRACE TO RCC COLUMN. 10 mm DIA. MS BOLT BLACK HEXAGONAL HEAD ROUND NECK WITH HEXAGONAL NUTS AND TWO WASHER SHALL BE USED. AFTER TIGHTING NUT, END OF BOLT SHALL BE HAMMERED TO MAKE ANTITHEFT.
9. SUPPORTING STRUT SHALL BE PROVIDED AT FIRST / END COLUMN OR CHANGE OF DIRECTION.
10. 1:20 SLOPE SHALL BE PROVIDED ON TOP OF COLUMN AT THE TIME OF CASTING.
11. AT EVERY 30 METRE TWO COLUMN SHALL BE GROUTED SIDE BY SIDE.
12. IN UNDULATING AREA, COLUMN SHALL BE PLACED ACCORDINGLY SO THAT BARBED WIRE ARE ALIGNED HORIZONTAL. VERTICALITY OF COLUMN SHALL BE CHECKED DURING ERECTION.
13. FOUNDATION SHALL BE DUG USING AUGAR/ MECHANICAL BORING EARTH SHALL BE RAMMED PROPERLY AND 50 MM SAND SHALL BE PLACED BEFORE FOUNDATION CASTING. FOUNDATION SHALL BE CURED PROPERLY.
14. THIS CATTLE FENCE SHALL BE PROVIDED AT RAILWAY BOUNDARY.



→ IS: 456 (LATEST) SHALL BE FOLLOWED IN ALL R.C.C & P.C.C. WORKS.

PROJECT:
HARYANA ORBITAL RAIL CORRIDOR
 CONNECTING PALWAL TO SONIPAT BYPASSING DELHI
 AREA BY LINKING ASAOTI-PATLI-SULTANPUR-ASAUDAH BY
 NEW ELECTRIFIED BG DOUBLE LINE

CLIENT:
 **HARYANA RAIL INFRASTRUCTURE
 DEVELOPMENT CORPORATION LIMITED**

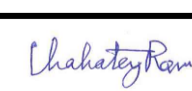
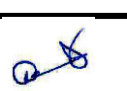

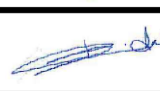

CONSULTANT:
 **GENERAL CONSULTANT FOR
 HARYANA ORBITAL RAIL CORRIDOR**
 RITES Limited in consortium with SMEC International Pty. Ltd.

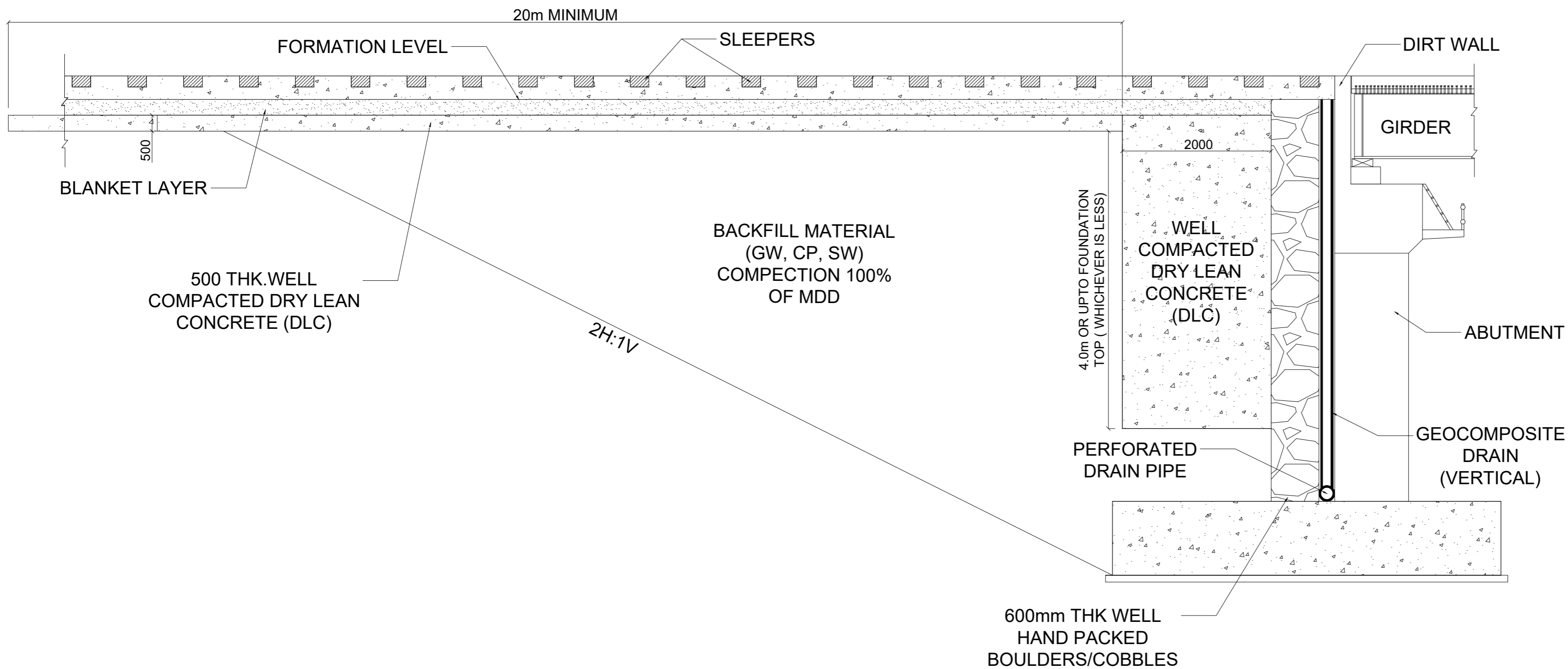
 **THE INFRASTRUCTURE PEOPLE**  **SMEC**
 Member of the Surbana Jurong Group

TITLE:- **CONCEPTUAL PLAN
 BARBED WIRE FENCING**

DRG. NO. **GC-HRIDC-SK-GEN-016_A1** SHEET NO. **1 OF 1**

SCALE : **AS SHOWN** ISSUE DATE **28.12.2022**

GC/HORC		HRIDC	
NAME / DESIGNATION	SIGN	NAME / DESIGNATION	SIGN
CHAHATEY RAM PD		R. R. KUMAR GM/ IP&P	
SUDHIR AGRAWAL DPD/CIVIL		RAJU SOLANKI DGM/C-SOUTH	
REETU PATIAL CDE/ CIVIL			



TRANSITION SYSTEM ON APPROACHES OF BRIDGES

NOTES:

1. ALL DIMENSIONS ARE IN MILLIMETERS EXCEPT STATED.
2. DO NOT SCALE THE DRAWING FOLLOW ONLY WRITTEN.
3. THIS DRAWING IS PREPARED BASED UPON REFER RDSO REPORT NO. GE:R-50 DATED JULY-2021 FOR DETAILS THIS REPORT SHALL BE FOLLOWED.
4. GEOCOMPOSITE DRAINS TO BE USED BEHIND BRIDGE ABUTMENT SHALL BE AS PER RDSO/2018/GE:IRS-006, MARCH-2019 AND COMPREHENSIVE GUIDELINE AND SPECIFICATIONS FOR RAILWAY FORMATION.
5. PROVISION IN RETURN WALL SHALL BE KEPT TO TAKE OUT THE DISCHARGE FROM PERFORATED DRAIN PIPE.


PROJECT:

HARYANA ORBITAL RAIL CORRIDOR
CONNECTING PALWAL TO SONIPAT BYPASSING DELHI AREA BY LINKING ASAOTI-PATLI-SULTANPUR-ASAUDAH BY NEW ELECTRIFIED BG DOUBLE LINE

CLIENT:

 **HARYANA RAIL INFRASTRUCTURE DEVELOPMENT CORPORATION LIMITED.**

CONSULTANT:






 **GENERAL CONSULTANT FOR HARYANA ORBITAL RAIL CORRIDOR**
RITES Limited in consortium with SMEC International Pty. Ltd.

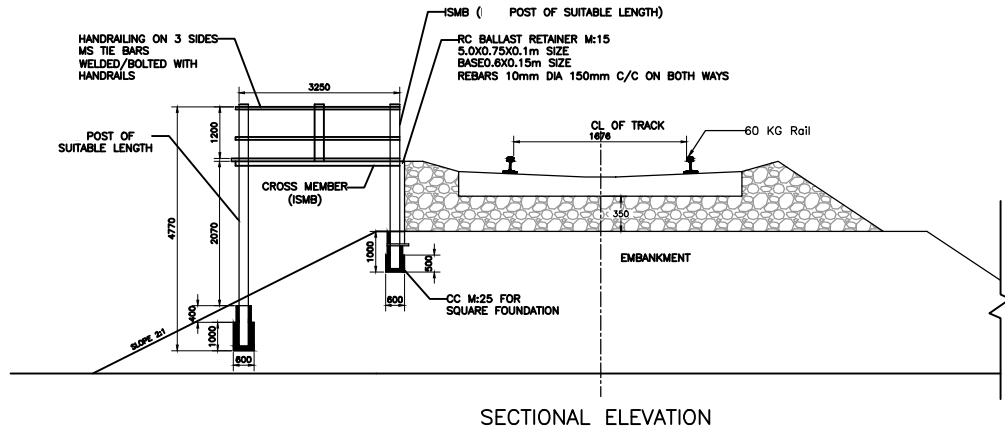
 **THE INFRASTRUCTURE PEOPLE**  **SMEC**
Member of the Surbana Jurong Group

TITLE:-
CONCEPTUAL PLAN FOR TRANSITION SYSTEM OF BRIDGE APPROACHES

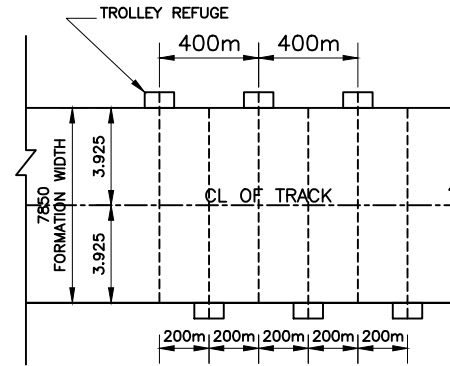
DRG. NO. GC-HRIDC-SK-GEN-019 **SHEET NO.** 1 OF 1

SCALE : AS SHOWN **ISSUE DATE** 28.12.2022

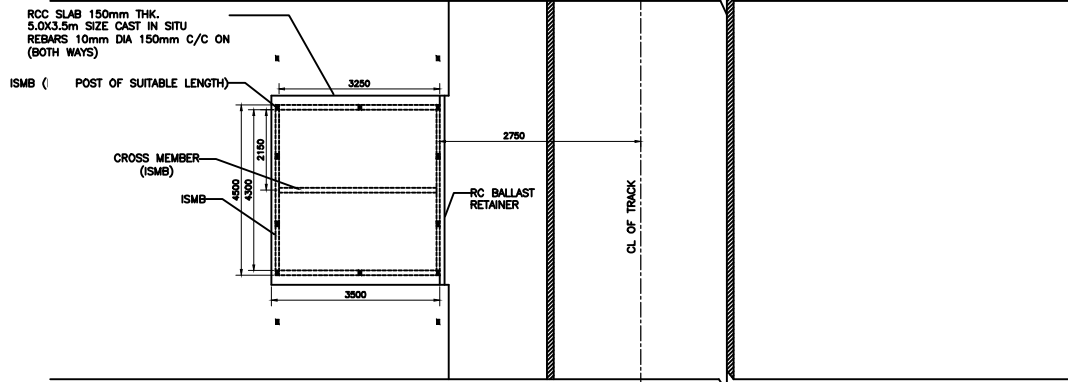
GC/HORC		HRIDC	
NAME / DESIGNATION	SIGN	NAME / DESIGNATION	SIGN
CHAHATEY RAM PD		R. R. KUMAR GM/ IP&P	
SUDHIR AGRAWAL DPD/CIVIL		RAJU SOLANKI DGM/C-SOUTH	
REETU PATIAL CDE/ CIVIL			



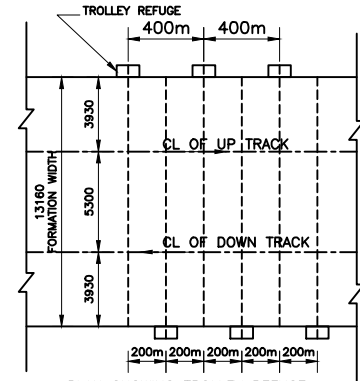
SECTIONAL ELEVATION



PLAN SHOWING TROLLEY REFUGE SPACING FOR SINGLE TRACK



PLAN



PLAN SHOWING TROLLEY REFUGE SPACING FOR DOUBLE TRACK

NOTES:
 1. ALL DIMENSIONS ARE IN MILLIMETERS EXCEPT STATED.
 2. DO NOT SCALE THE DRAWING FOLLOW ONLY WRITTEN DIMENSIONS.






PROJECT:
 HARYANA ORBITAL RAIL CORRIDOR
 CONNECTING PALWAL TO SONPAT BYPASSING DELHI
 AREA BY LINKING ASAOJI-PATLI-SULTANPUR-ASAJDAH BY
 NEW ELECTRIFIED BG DOUBLE LINE

CLIENT:
 HARYANA RAIL INFRASTRUCTURE
 DEVELOPMENT CORPORATION LIMITED

CONSULTANT:
 GENERAL CONSULTANT FOR
 HARYANA ORBITAL RAIL CORRIDOR
 RITES Limited in consortium with SMEC International Pty. Ltd.

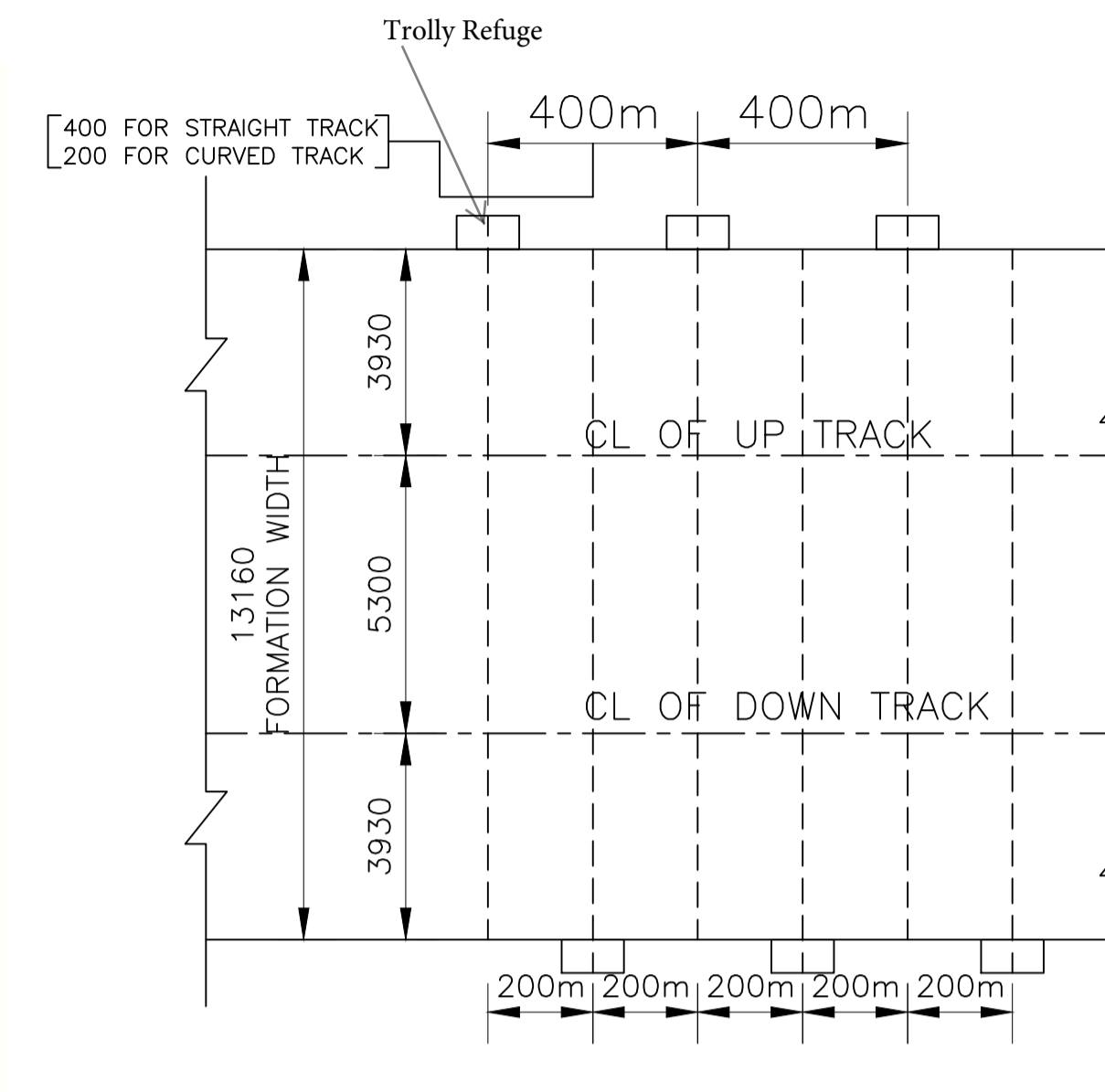
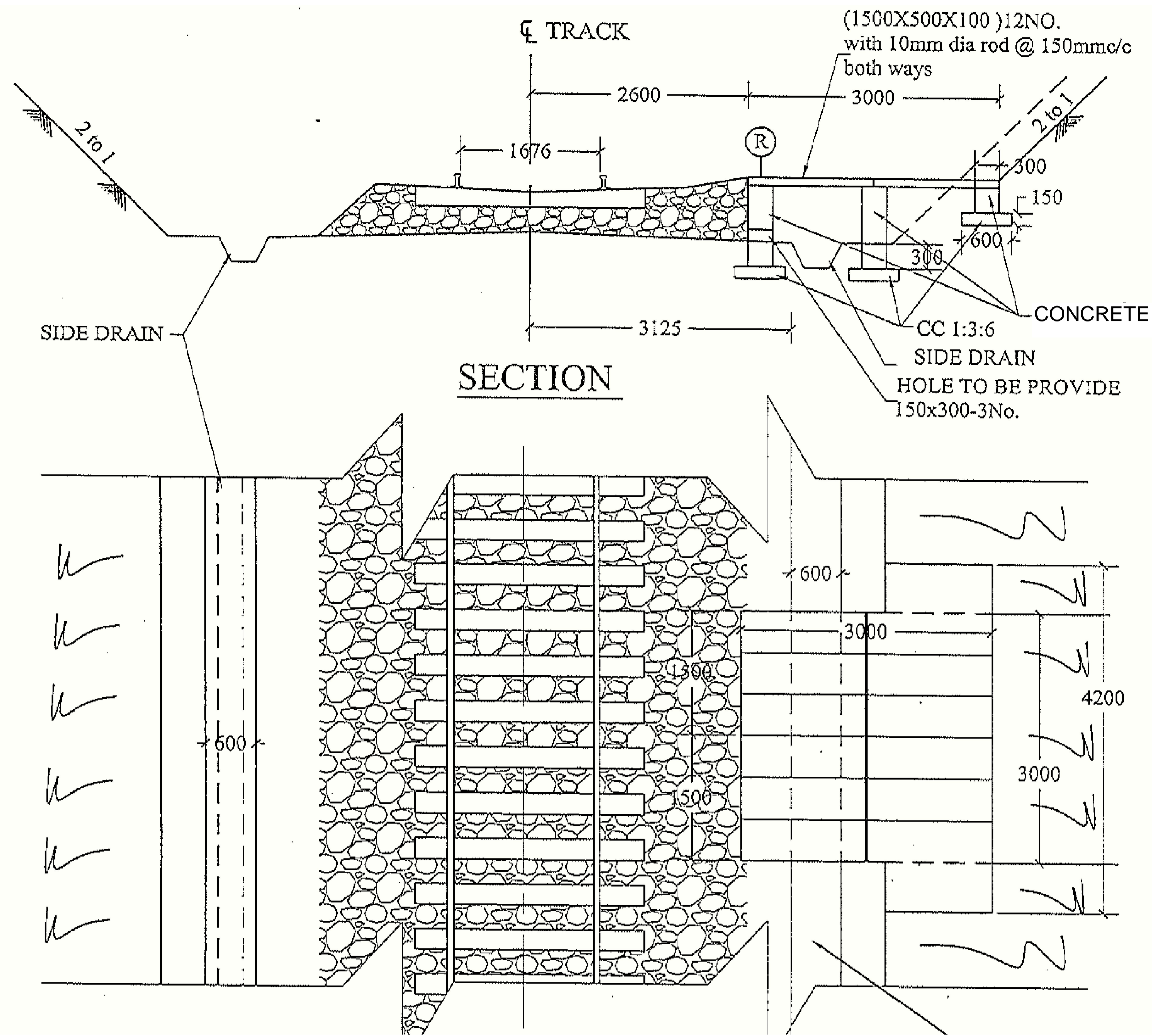


TITLE:-
 CONCEPTUAL PLAN FOR
 TROLLEY REFUGE IN EMBANKMENT

GC/HORC		HRIDC	
NAME / DESIGNATION	SIGN	NAME / DESIGNATION	SIGN
CHAHATEY RAM PD		R. R. KUMAR GM/ IP&P	
SUDHIR AGRAWAL DIR/CIVIL		RAJU SOLANKI DG/MC-SOUTH	
RETU PARTIAL CDE/ CIVIL			

DRG. NO. GC-HRIDC-SK-GEN-022 SHEET NO. 1 OF 1

SCALE : AS SHOWN ISSUE DATE 28.12.2022




- NOTES:
- ALL DIMENSIONS ARE IN MILLIMETERS EXCEPT STATED.
 - DO NOT SCALE THE DRAWING FOLLOW ONLY WRITTEN DIMENSIONS.
 - RCC PRECAST SLAB M35 (1500X500X100)

PROJECT:
HARYANA ORBITAL RAIL CORRIDOR
 CONNECTING PALWAL TO SONIPAT BYPASSING DELHI
 AREA BY LINKING ASAOTI-PATLI-SULTANPUR-ASAUDAH BY
 NEW ELECTRIFIED BG DOUBLE LINE

CLIENT:

**HARYANA RAIL INFRASTRUCTURE
 DEVELOPMENT CORPORATION LIMITED.**

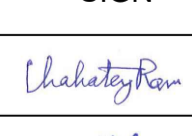
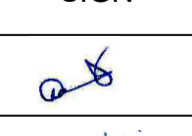

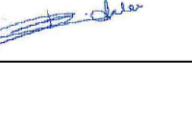
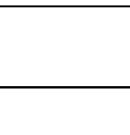
CONSULTANT:

**GENERAL CONSULTANT FOR
 HARYANA ORBITAL RAIL CORRIDOR**
 RITES Limited in consortium with SMEC International Pty. Ltd.



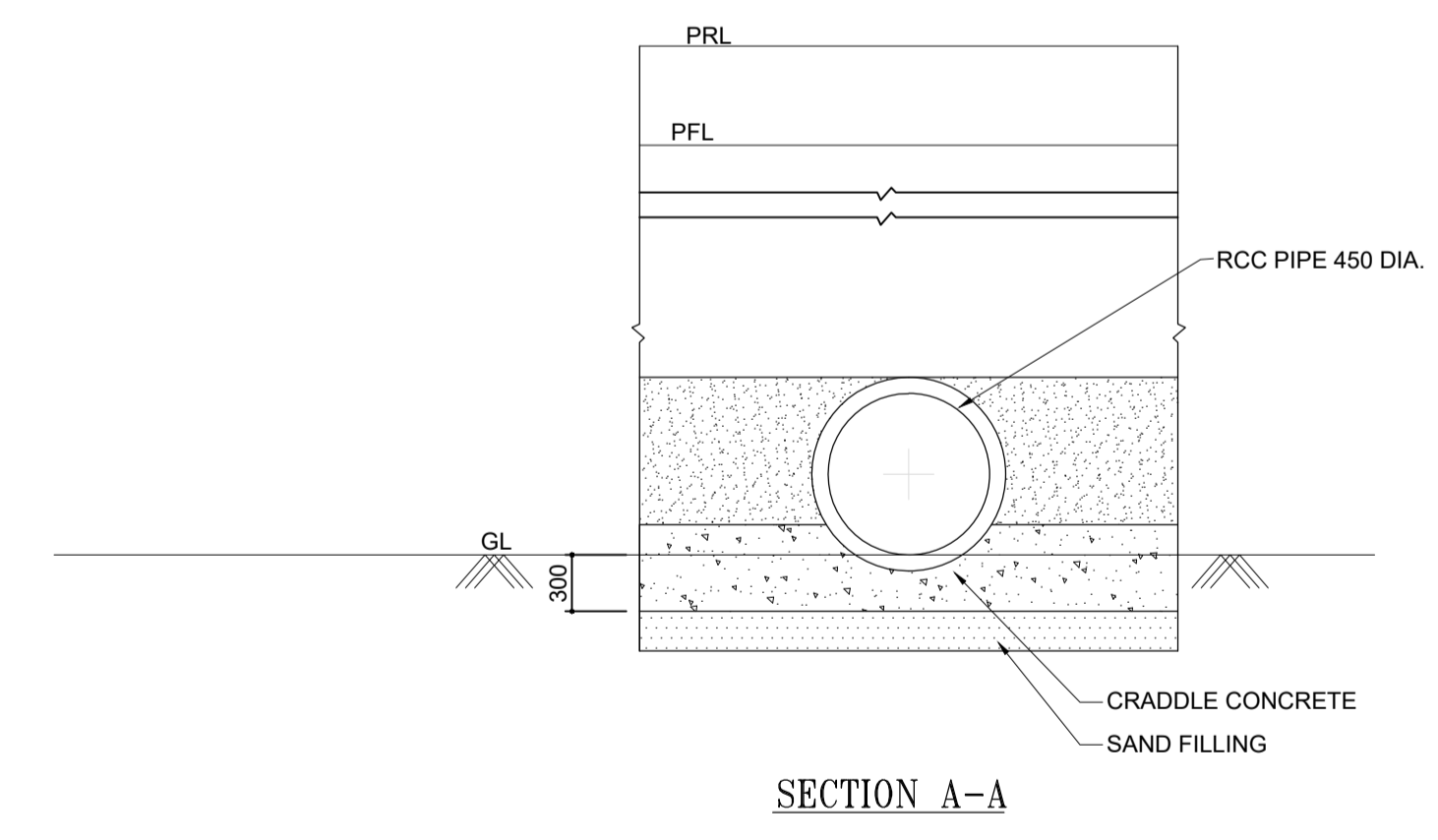
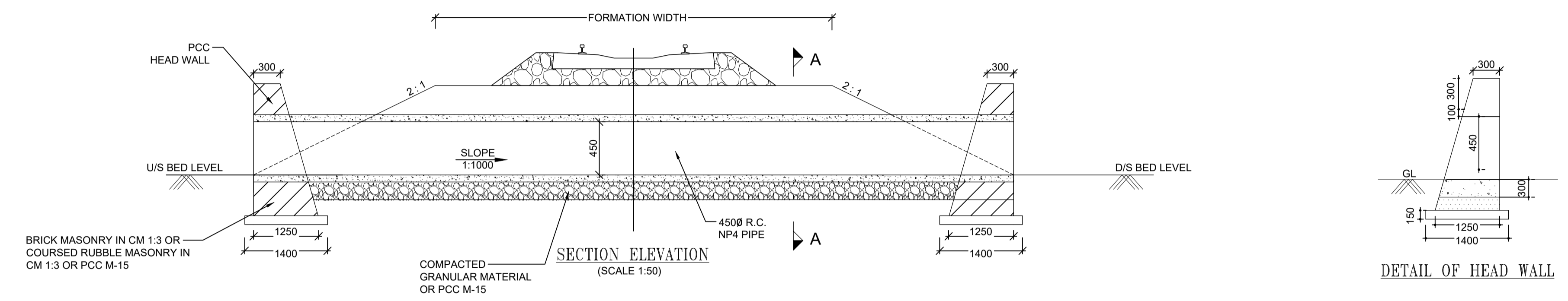
TITLE:-
 CONCEPTUAL PLAN FOR
 TROLLEY REFUGE IN CUTTING

DRG. NO. GC-HRIDC-SK-GEN-023 SHEET NO. 1 OF 1

SCALE : AS SHOWN ISSUE DATE 28.12.2022


GC/HORC		HRIDC	
NAME / DESIGNATION	SIGN	NAME / DESIGNATION	SIGN
CHAHATEY RAM PD		R. R. KUMAR GM/ IP&P	
SUDHIR AGRAWAL DPD/CIVIL		RAJU SOLANKI DGM/C-SOUTH	
REETU PATIAL CDE/ CIVIL			

- NOTES:
1. ALL DIMENSIONS ARE IN MILLIMETERS EXCEPT STATED.
 2. DO NOT SCALE THE DRAWING FOLLOW ONLY WRITTEN DIMENSIONS.
 3. LOOSE/UNSUITABLE SOIL BELOW CULVERTS IS REPLACED WITH SUITABLE GRANULAR MATERIAL.
 4. LONGITUDINAL SLOPE OF PIPE SHALL BE MIN. 1 IN 1000.
 5. BEDDING CONDITION BELOW NP-04 PIPE SHALL BE AS PER IS:458.



PROJECT:
HARYANA ORBITAL RAIL CORRIDOR
 CONNECTING PALWAL TO SONIPAT BYPASSING DELHI AREA BY LINKING ASAOTI-PATLI-SULTANPUR-ASAUDAH BY NEW ELECTRIFIED BG DOUBLE LINE

CLIENT:
 **HARYANA RAIL INFRASTRUCTURE DEVELOPMENT CORPORATION LIMITED.**

CONSULTANT:
 **GENERAL CONSULTANT FOR HARYANA ORBITAL RAIL CORRIDOR**
 RITES Limited in consortium with SMEC International Pty. Ltd.



GC/HORC		HRIDC	
NAME / DESIGNATION	SIGN	NAME / DESIGNATION	SIGN
CHAHATEY RAM PD	<i>Chahatey Ram</i>	R. R. KUMAR GM/ IP&P	<i>R.R. Kumar</i>
SUDHIR AGRAWAL DPD/CIVIL	<i>Sudhir</i>	RAJU SOLANKI DGM/C-SOUTH	<i>Raju Solanki</i>
REETU PATIAL CDE/ CIVIL	<i>Reetu</i>		

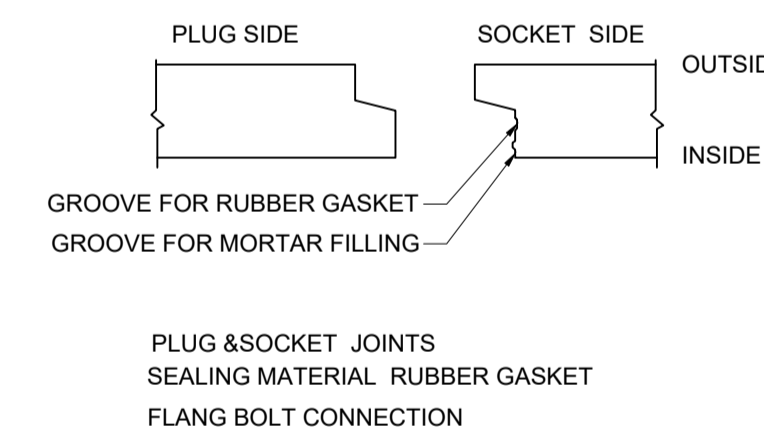
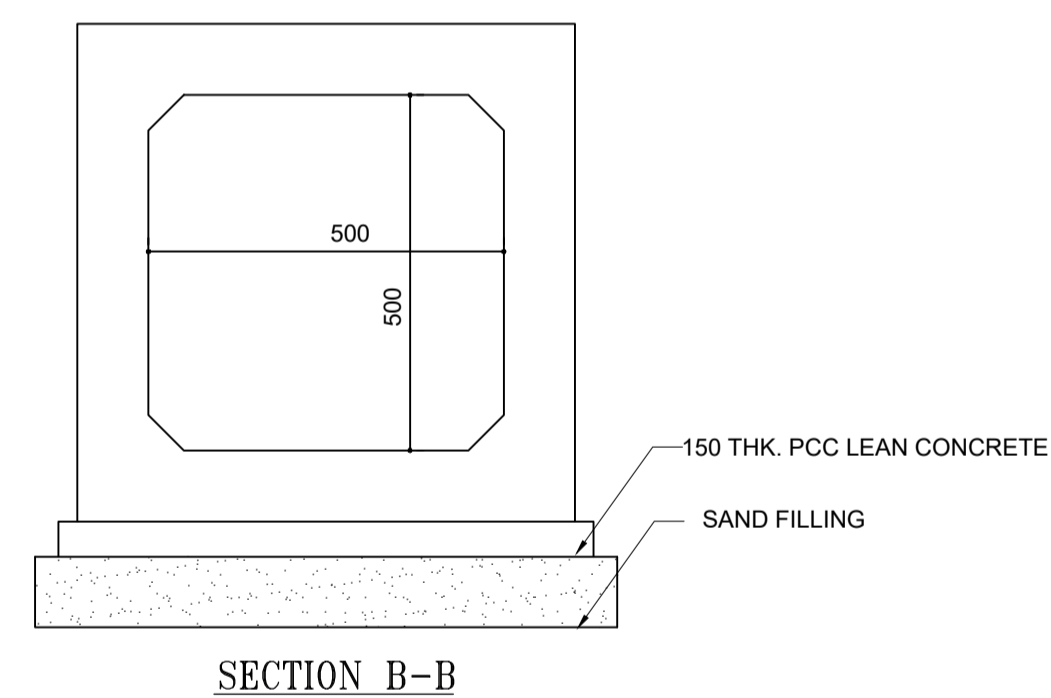
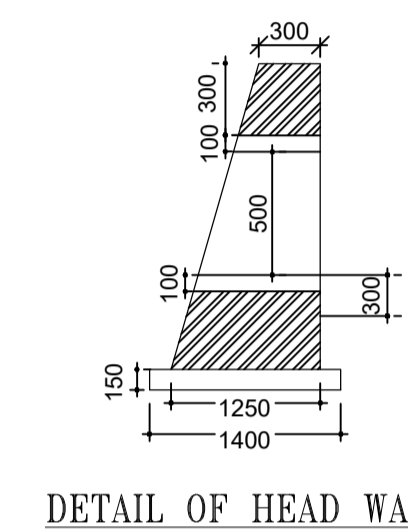
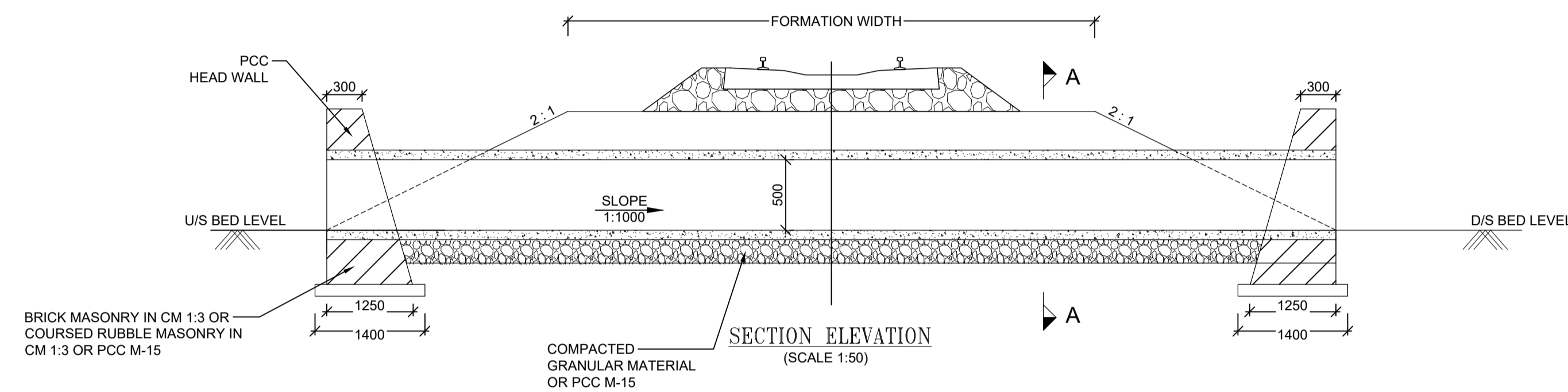
TITLE:- CONCEPTUAL SKETCH FOR NP4 PIPE OF 450mm DIA

DRG. NO. GC-HRIDC-SK-GEN-028 **SHEET NO.** 1 OF 1

SCALE : AS SHOWN **ISSUE DATE** 28.12.2022

NOTES:

1. ALL DIMENSIONS ARE IN MILLIMETERS EXCEPT STATED.
2. DO NOT SCALE THE DRAWING FOLLOW ONLY WRITTEN DIMENSIONS.
3. LOOSE/UNSUITABLE SOIL BELOW CULVERTS IS REPLACED WITH SUITABLE GRANULAR MATERIAL.
4. STRUCTURE IS TO BE DESIGNED FOR 32.5 T LOADING AS APPLICABLE.



PROJECT:
HARYANA ORBITAL RAIL CORRIDOR
 CONNECTING PALWAL TO SONIPAT BYPASSING DELHI AREA BY LINKING ASAOTI-PATLI-SULTANPUR-ASAUDAH BY NEW ELECTRIFIED BG DOUBLE LINE

CLIENT:
 **HARYANA RAIL INFRASTRUCTURE DEVELOPMENT CORPORATION LIMITED.**

CONSULTANT:
 **GENERAL CONSULTANT FOR HARYANA ORBITAL RAIL CORRIDOR**
 RITES Limited in consortium with SMEC International Pty. Ltd.



GC/HORC		HRIDC	
NAME / DESIGNATION	SIGN	NAME / DESIGNATION	SIGN
CHAHATEY RAM PD	<i>Chahatey Ram</i>	R. R. KUMAR GM/ IP&P	<i>R.R. Kumar</i>
SUDHIR AGRAWAL DPD/CIVIL	<i>Sudhir</i>	RAJU SOLANKI DGM/C-SOUTH	<i>Raju Solanki</i>
REETU PATIAL CDE/ CIVIL	<i>Reetu</i>		

TITLE:- CONCEPTUAL SKETCH FOR PRECAST RCC BOX 500 X 500 MM SIZE

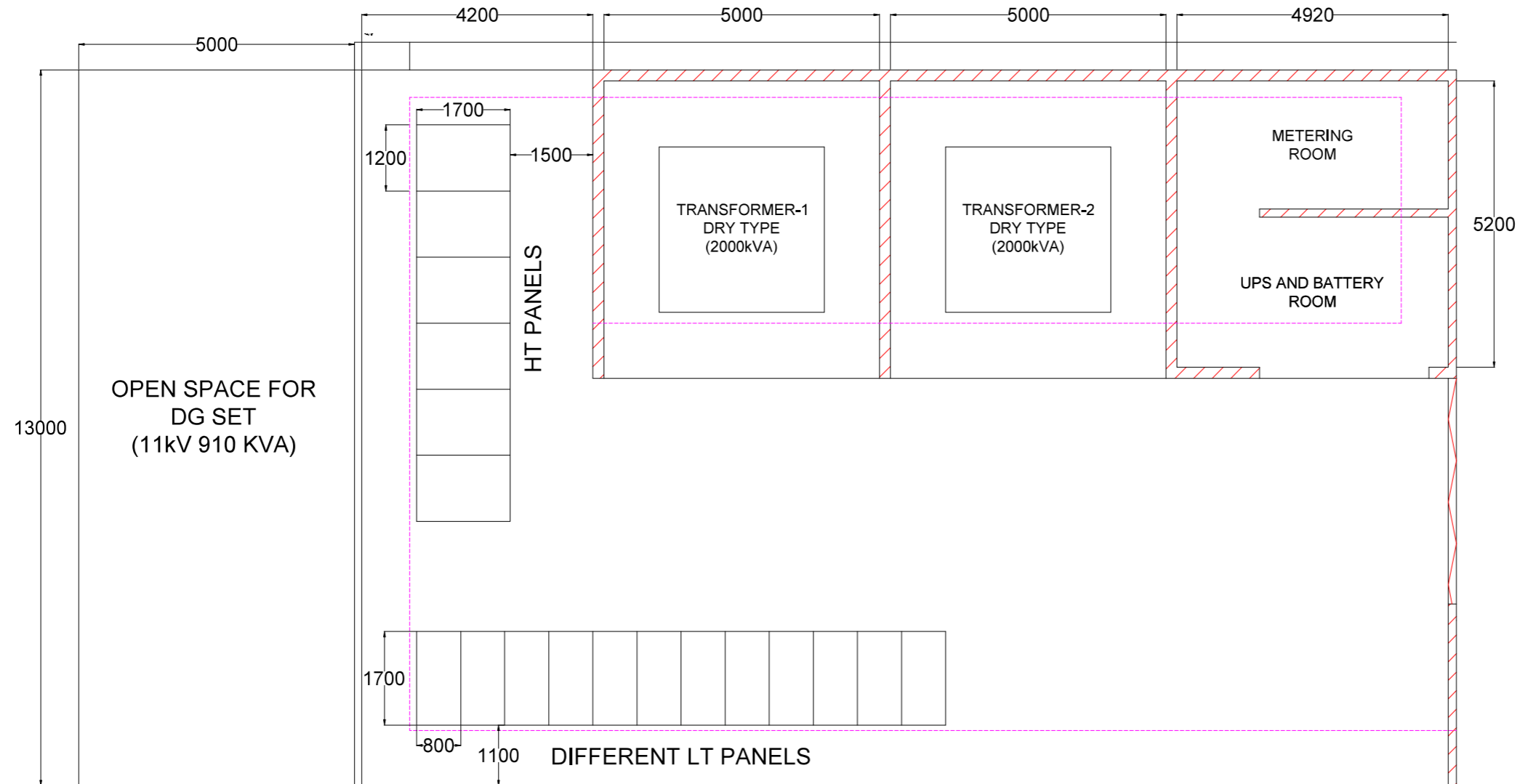
DRG. NO. GC-HRIDC-SK-GEN-029 **SHEET NO.** 1 OF 1

SCALE : AS SHOWN **ISSUE DATE** 28.12.2022

5. General Electrical Services Drawings

- NOTES:
- 1 SUBSTATION TO BE PROVIDED WITH VENTILATION SYSTEM * TO CATER LOAD OF EQUIPMENTS.
 - 2 FIRE WALL HEIGHT SHALL COVER TOP OF THE TRANSFORMER LEVEL.
 - 3 THE CABLE LAYING ARRANGEMENT INSIDE THE TRENCHES SHALL BE LAID AS PER SITE CONDITION.
 - 4 THE BENDING RADIUS OF HT/LT CABLES SHALL CONFIRM TO IS-STANDARDS.

THIS DRAWING SHALL BE READ IN CONJUNCTION WITH TENDER SPECIFICATION



**INDICATIVE LAYOUT PLAN OF SUB-STATION (SS1) NEAR CONSTRUCTION CUM UTILITY SHAFT OF TUNNEL
11/0.443kV(20M X 13M) FOR REFERENCE PURPOSE ONLY**




PROJECT:
HARYANA ORBITAL RAIL CORRIDOR
CONNECTING PALWAL TO SONIPAT BYPASSING DELHI
AREA BY LINKING ASAOTI-PATLI-SULTANPUR-ASAUDAH BY
NEW ELECTRIFIED BG DOUBLE LINE

CLIENT:
 HARYANA RAIL INFRASTRUCTURE
DEVELOPMENT CORPORATION LIMITED.

CONSULTANT:
 GENERAL CONSULTANT FOR
HARYANA ORBITAL RAIL CORRIDOR
RITES Limited in consortium with SMEC International Pty. Ltd.



TITLE:- INDICATIVE LAYOUT PLAN OF
SUB-STATION 11/0.433kV NEAR UTILITY
SHAFT

GC/HORC		HRIDC	
NAME / DEGINATION	SIGN	NAME / DEGINATION	SIGN
CHAHATEY RAM PD		SHIV OM DWIVEDI CPM/HRIDC	
SUDHR AGRAWAL DPD/CIVIL		MENDLEEF KATYAR AM/Elect.	
A.S. JANGHU CRE/Elect.			

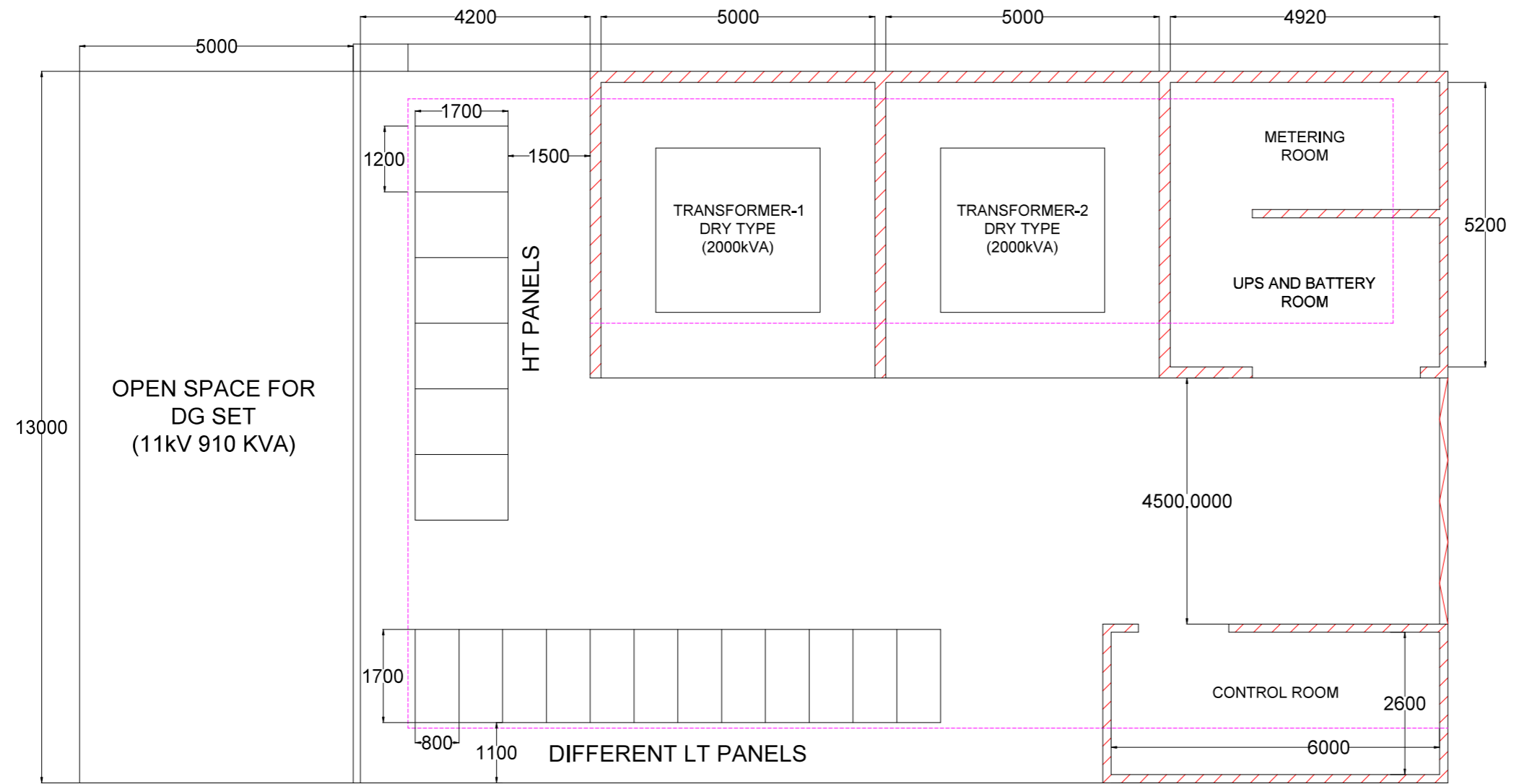
DRG. NO.
GC-HRIDC-C4-DRW-TTL-ELE-001_A1

SHEET NO.

SCALE :
AS SHOWN

ISSUE DATE
07.11.2022

REVISED DATE
03.01.2023




- NOTES:
- 1 SUBSTATION TO BE PROVIDED WITH VENTILATION SYSTEM * TO CATER LOAD OF EQUIPMENTS.
 - 2 FIRE WALL HEIGHT SHALL COVER TOP OF THE TRANSFORMER LEVEL.
 - 3 THE CABLE LAYING ARRANGEMENT INSIDE THE TRENCHES SHALL BE LAID AS PER SITE CONDITION.
 - 4 THE BENDING RADIUS OF HT/LT CABLES SHALL CONFIRM TO IS-STANDARS

THIS DRAWING SHALL BE READ IN CONJUNCTION WITH TENDER SPECIFICATION

INDICATIVE LAYOUT PLAN OF SUB-STATION (SS2) NEAR SONIPAT END PORTAL OF TUNNEL 11/0.443kV(20M X 13M) FOR REFERENCE PURPOSE ONLY

PROJECT:
HARYANA ORBITAL RAIL CORRIDOR
 CONNECTING PALWAL TO SONIPAT BYPASSING DELHI AREA BY LINKING ASAOTI-PATLI-SULTANPUR-ASAUDAH BY NEW ELECTRIFIED BG DOUBLE LINE

CLIENT:
 **HARYANA RAIL INFRASTRUCTURE DEVELOPMENT CORPORATION LIMITED.**

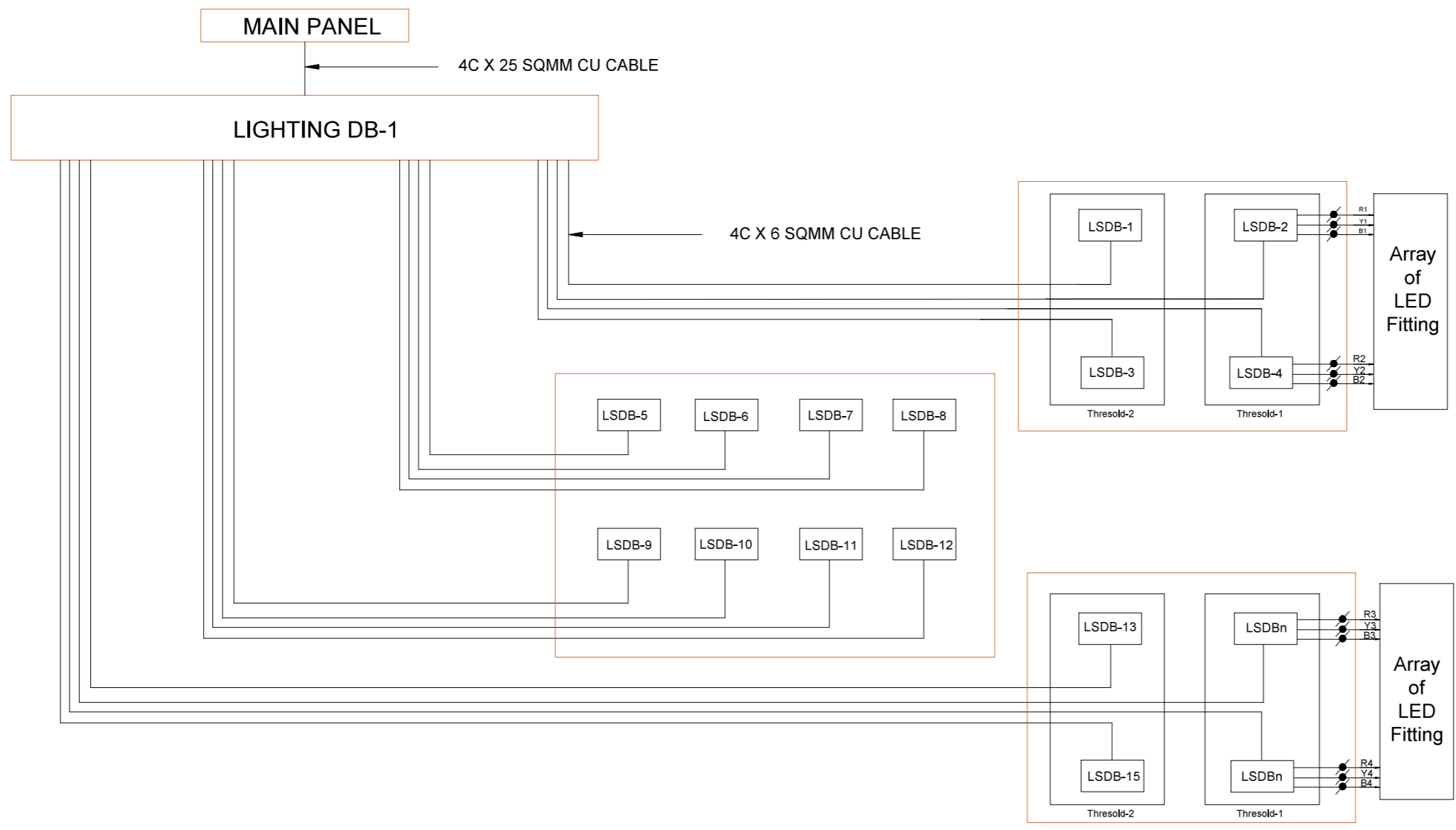
CONSULTANT:
 **GENERAL CONSULTANT FOR HARYANA ORBITAL RAIL CORRIDOR**
 RITES Limited in consortium with SMEC International Pty. Ltd.



TITLE:- **INDICATIVE LAYOUT PLAN OF SUB-STATION 11/0.433KV**

GC/HORC		HRIDC	
NAME / DEGINATION	SIGN	NAME / DEGINATION	SIGN
CHAHATEY RAM PD	<i>Chahatey Ram</i>	SHIV OM DWIVEDI CPM/HRIDC	
SUDHIR AGRAWAL DPD/CIVIL	<i>Sudhir</i>	MENDLEE KATIYAR AM/Elect.	
A.S. JANGHU CRE/Elect.	<i>A.S. Janghu</i>		


DRG. NO. GC-HRIDC-C4-DRW-TTL-ELE-002_A1	SHEET NO.
SCALE : AS SHOWN	ISSUE DATE 07.11.2022
	REVISED DATE 03.01.2023



**POWER SUPPLY FOR LIGHTING
ARRANGEMENT AT TUNNEL-1 & TUNNEL-2**

PROJECT:
HARYANA ORBITAL RAIL CORRIDOR
CONNECTING PALWAL TO SONIPAT BYPASSING DELHI
AREA BY LINKING ASAOTI-PATLI-SULTANPUR-ASAUDAH BY
NEW ELECTRIFIED BG DOUBLE LINE

CLIENT:
 HARYANA RAIL INFRASTRUCTURE
DEVELOPMENT CORPORATION LIMITED.

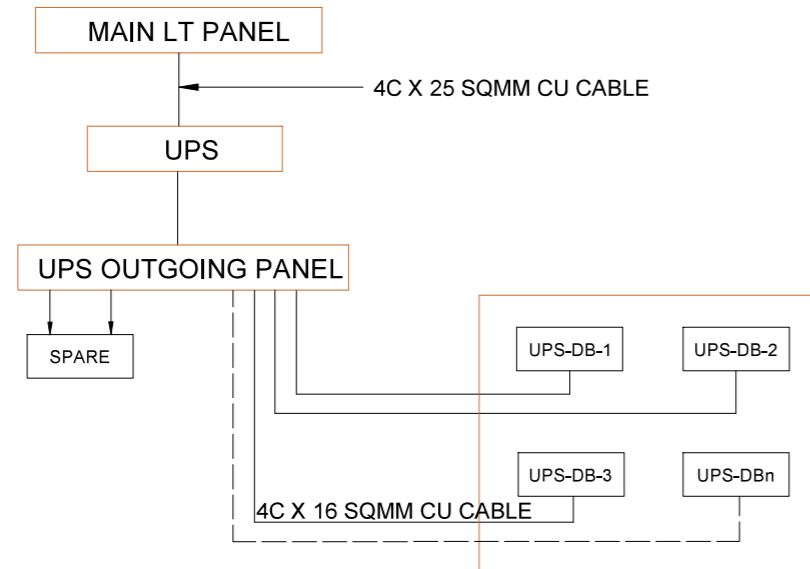
CONSULTANT:
 GENERAL CONSULTANT FOR
HARYANA ORBITAL RAIL CORRIDOR
RITES Limited in consortium with SMEC International Pty. Ltd.



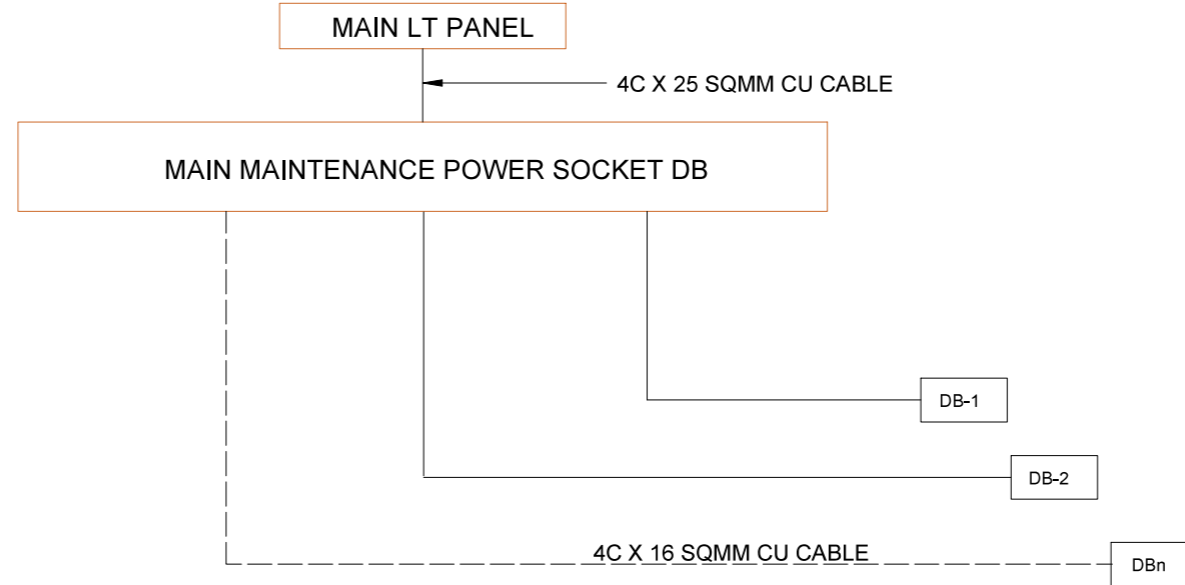
TITLE:- POWER SUPPLY FOR LIGHTING
ARRANGEMENT (INDICATIVE)

GC/HORC		HRIDC	
NAME / DESIGNATION	SIGN	NAME / DESIGNATION	SIGN
CHAHATEY RAM PD	<i>Chahatey Ram</i>	SHIV OM DWIVEDI CPM/HRIDC	
SUDHIR AGRAWAL DPD/CIVIL	<i>AS</i>	MENDLEEF KATYAR AM/Elect.	
A.S. JANGHU CRE/Elect.	<i>A.S. Janghu</i>		

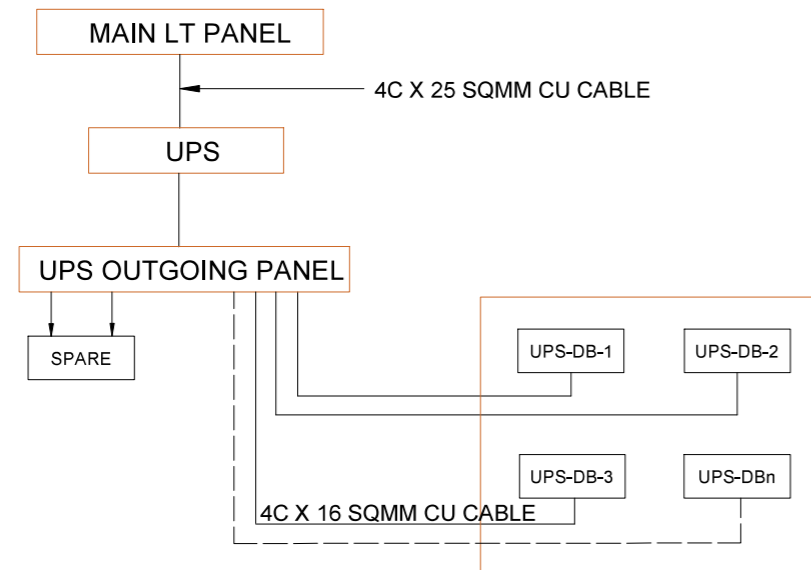
DRG. NO. GC-HRIDC-C4-DRW-TTL-ELE-003_A1	SHEET NO.
SCALE : AS SHOWN	ISSUE DATE 07.11.2022 REVISED DATE 03.01.2023



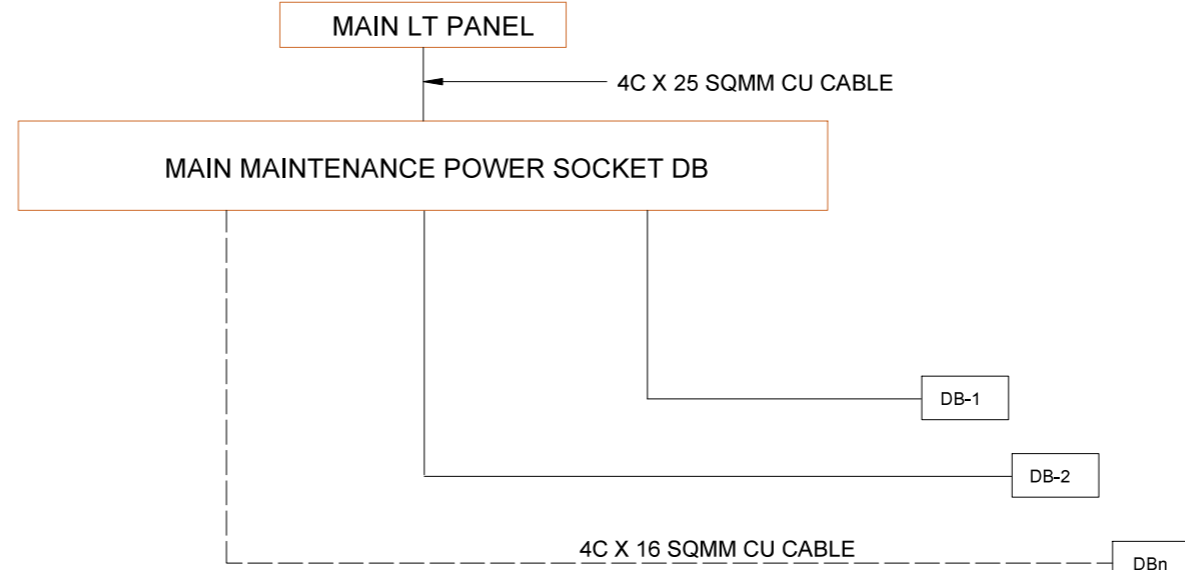
POWER SUPPLY ARRANGEMENT FOR UPS SUPPLY AT SS-1



MAINTENANCE POWER SOCKET DB DIAGRAM AT TUNNEL -1




POWER SUPPLY ARRANGEMENT OF UPS MAIN PANEL AT SS-2



MAINTENANCE POWER SOCKET DB DIAGRAM AT TUNNEL -2

PROJECT:
HARYANA ORBITAL RAIL CORRIDOR
CONNECTING PALWAL TO SONIPAT BYPASSING DELHI AREA BY LINKING ASAOTI-PATLI-SULTANPUR-ASAUDAH BY NEW ELECTRIFIED BG DOUBLE LINE

CLIENT:
 HARYANA RAIL INFRASTRUCTURE DEVELOPMENT CORPORATION LIMITED.




CONSULTANT:
 GENERAL CONSULTANT FOR HARYANA ORBITAL RAIL CORRIDOR
RITES Limited in consortium with SMEC International Pty. Ltd.



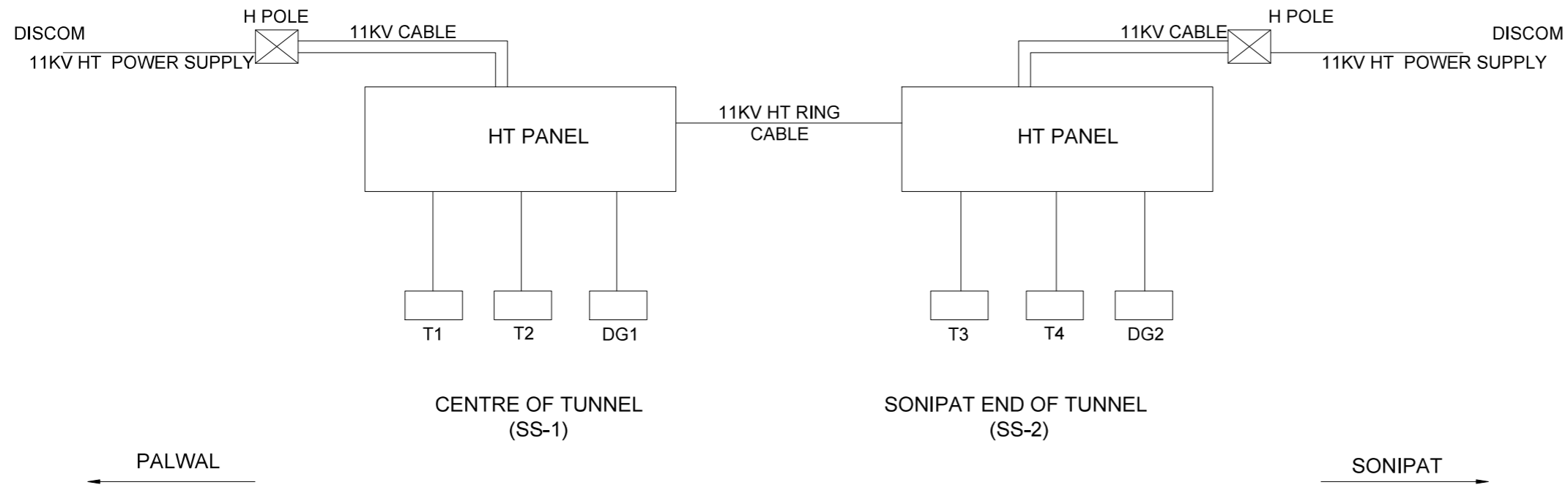
TITLE:- POWER SUPPLY ARRANGEMENT FOR EMERGENCY AND MAINTENANCE POWER SOCKET DIAGRAM (INDICATIVE)

DRG. NO. GC-HRIDC-C4-DRW-TTL-ELE-004_A1 **SHEET NO.**

SCALE : AS SHOWN **ISSUE DATE** 07.11.2022 **REVISED DATE** 03.01.2023

GC/HORC		HRIDC	
NAME / DESIGNATION	SIGN	NAME / DESIGNATION	SIGN
CHAHATEY RAM PD		SHIV OM DWIVEDI CPM/HRIDC	
SUDHIR AGRAWAL DPD/CIVIL		MENDLEEF KATYAR AM/Elect.	
A.S. JANGHU CRE/Elect.			

SINGLE LINE DIAGRAM OF HT POWER SUPPLY SYSTEM IN TUNNEL



- NOTES:**
- 1 11 KV POWER SUPPLY FROM DISCOM MAY BE BY OVERHEAD LINE OR CABLE.
 - 2 CABLE BENDING RADIUS TO BE MAINTAINED AS PER IS STANDARD.

THIS DRAWING SHALL BE READ IN CONJUNCTION WITH TENDER SPECIFICATION

PROJECT:
 HARYANA ORBITAL RAIL CORRIDOR
 CONNECTING PALWAL TO SONIPAT BYPASSING DELHI AREA BY LINKING ASAOTI-PATLI-SULTANPUR-ASAUDAH BY NEW ELECTRIFIED BG DOUBLE LINE

CLIENT:
 HARYANA RAIL INFRASTRUCTURE DEVELOPMENT CORPORATION LIMITED.

CONSULTANT:
 GENERAL CONSULTANT FOR HARYANA ORBITAL RAIL CORRIDOR
 RITES Limited in consortium with SMEC International Pty. Ltd.



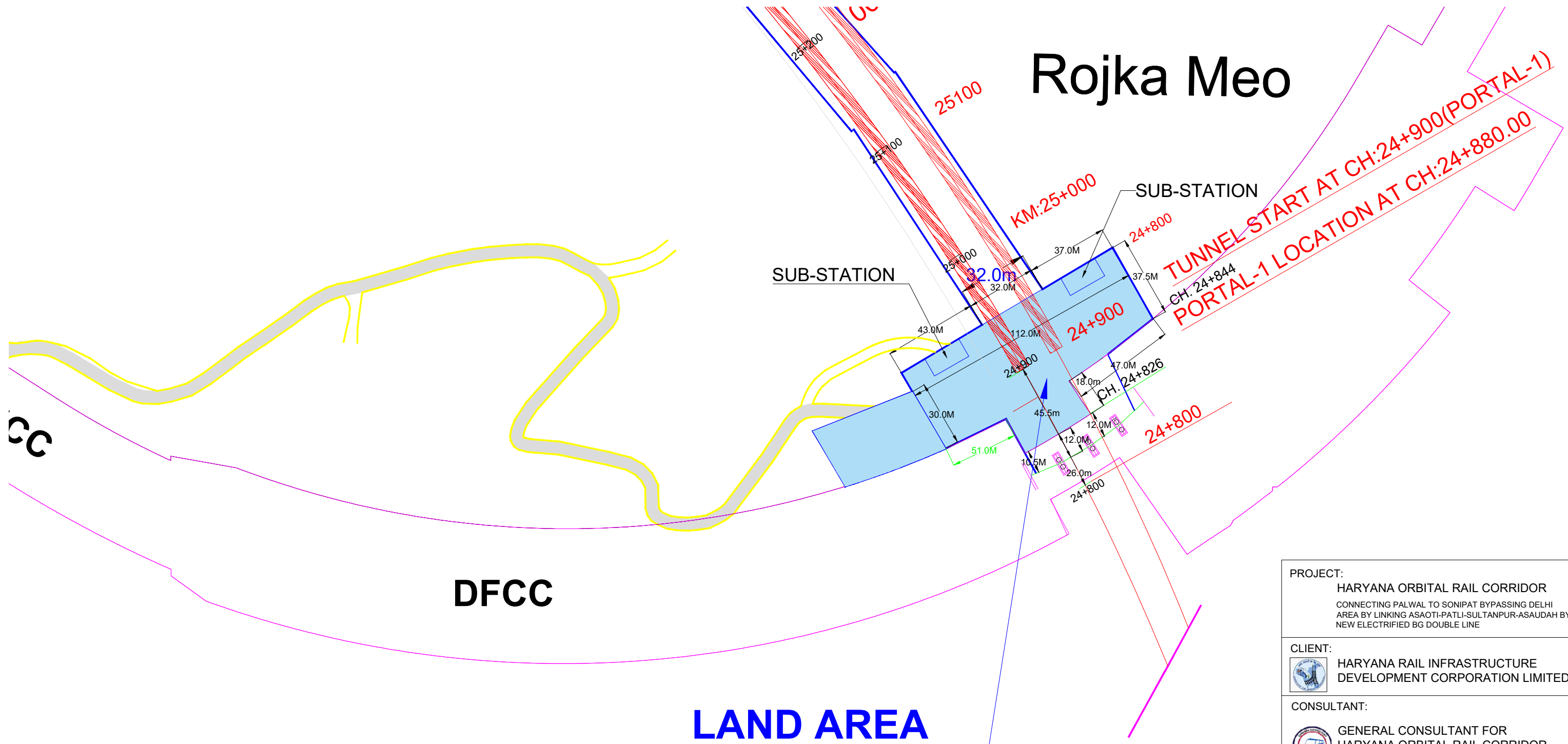
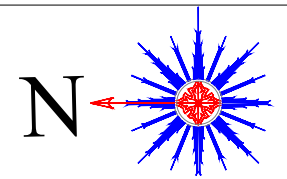
TITLE:- SINGLE LINE DIAGRAM OF HT SYSTEM IN TUNNEL (INDICATIVE)

GC/HORC		HRDC	
NAME / DEGINATION	SIGN	NAME / DEGINATION	SIGN
CHAHATEY RAM PD	<i>Chahatey Ram</i>	SHIV OM DWIVEDI CPM/HRDC	
SUDHIR AGRAWAL DPD/CIVIL	<i>AS</i>	MENDLEEF KATYAR AM/Elect.	
A.S. JANGHU CRE/Elect.	<i>A.S. J.</i>		

DRG. NO. GC-HRIDC-C4-DRW-TTL-ELE-005_A0	SHEET NO.
SCALE : AS SHOWN	ISSUE DATE 03.01.2023 REVISED DATE

6. Land Area for Tunnel

Land Area Taken for Execution of Tunnel & Shafts



LAND AREA NEAR PORTAL - 1

LEGEND:
 WILL BE HANDED OVER IN D+7 DAYS
D- COMMENCEMENT DATE

PROJECT:
 HARYANA ORBITAL RAIL CORRIDOR
 CONNECTING PALWAL TO SONIPAT BYPASSING DELHI AREA BY LINKING ASAOTI-PATLI-SULTANPUR-ASAUDAH BY NEW ELECTRIFIED BG DOUBLE LINE

CLIENT:
 HARYANA RAIL INFRASTRUCTURE DEVELOPMENT CORPORATION LIMITED.

CONSULTANT:
 GENERAL CONSULTANT FOR HARYANA ORBITAL RAIL CORRIDOR
 RITES Limited in consortium with SMEC International Pty. Ltd.

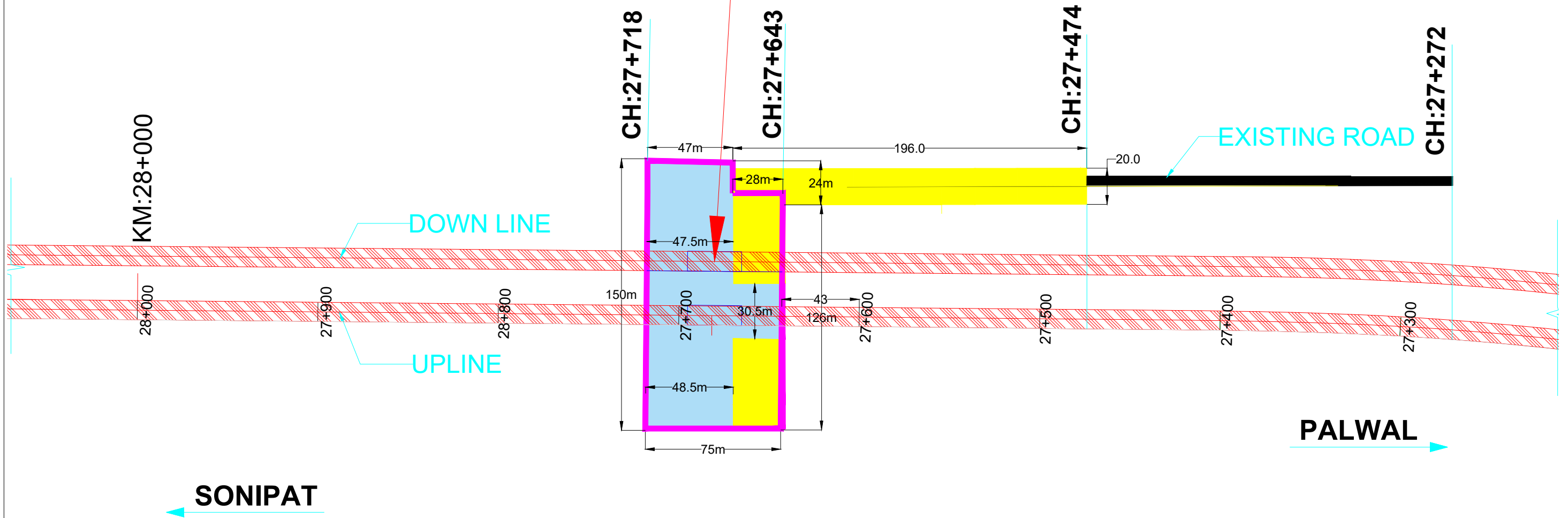


TITLE:-
 LAND AREA NEAR PORTAL-1

SKETCH NO. HRIDC-C4-SK-LANDPLAN-001_A0	SHEET NO.
SCALE : AS SHOWN	ISSUE DATE 03.01.2023
REVISED DATE	

GC/HORC		HRIDC	
NAME / DESIGNATION	SIGN	NAME / DESIGNATION	SIGN
CHAHATEY RAM PD	<i>Chahatey Ram</i>	SHIV OM DWIVEDI CPM/HRIDC	<i>Shiv</i>
REETU PATIAL CDE/ CIVIL	<i>Reetu</i>	RAJU SOLANKI DGM/CIVIL/SOUTH	<i>Raju</i>

PERMANENT VENTILATION SHAFT 3 & 4 CH. 27+680 M



LEGEND:

WILL BE HANDED OVER IN D+7 DAYS

WILL BE HANDED OVER IN D+90 DAYS

D- COMMENCEMENT DATE

PROJECT:
HARYANA ORBITAL RAIL CORRIDOR
 CONNECTING PALWAL TO SONIPAT BYPASSING DELHI
 AREA BY LINKING ASAOTI-PATLI-SULTANPUR-ASAUDAH BY
 NEW ELECTRIFIED BG DOUBLE LINE

CLIENT:
**HARYANA RAIL INFRASTRUCTURE
 DEVELOPMENT CORPORATION LIMITED.**

CONSULTANT:
**GENERAL CONSULTANT FOR
 HARYANA ORBITAL RAIL CORRIDOR**
 RITES Limited in consortium with SMEC International Pty. Ltd.



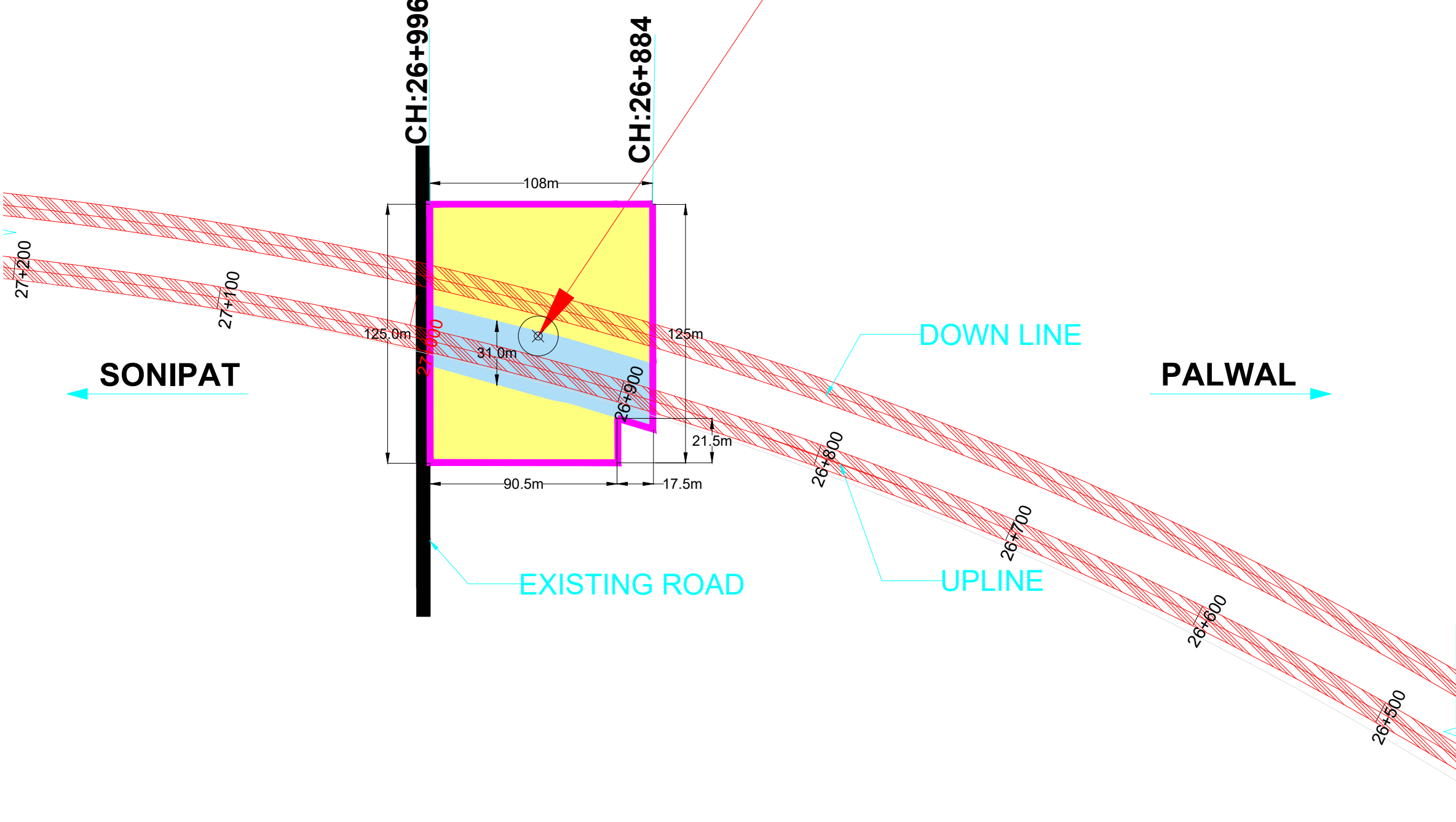
GC/HORC		HRIDC	
NAME / DESIGNATION	SIGN	NAME / DESIGNATION	SIGN
CHAHATEY RAM PD		SHIV OM DWIVEDI CPM/HRIDC	
REETU PATIAL CDE/ CIVIL		RAJU SOLANKI DGM/CIVIL/SOUTH	

**TITLE:-
 LAND AREA NEAR PERMANENT
 VENTILATION SHAFT 1 & 2**

SKETCH NO. SHEET NO.
 HRIDC-C4-SK-LANDPLAN-002_A0

SCALE : ISSUE DATE REVISED DATE
 AS SHOWN 03.01.2023

**CONSTRUCTION CUM
UTILITY SHAFT
CH. 26+950 M**



LEGEND:

WILL BE HANDED OVER IN D+7 DAYS

WILL BE HANDED OVER IN D+90 DAYS

D- COMMENCEMENT DATE

PROJECT:
HARYANA ORBITAL RAIL CORRIDOR
CONNECTING PALWAL TO SONIPAT BYPASSING DELHI
AREA BY LINKING ASAOTI-PATLI-SULTANPUR-ASAUDAH BY
NEW ELECTRIFIED BG DOUBLE LINE

CLIENT:
HARYANA RAIL INFRASTRUCTURE
DEVELOPMENT CORPORATION LIMITED.

CONSULTANT:
GENERAL CONSULTANT FOR
HARYANA ORBITAL RAIL CORRIDOR
RITES Limited in consortium with SMEC International Pty. Ltd.



TITLE:-
LAND AREA NEAR
CONSTRUCTION CUM UTILITY SHAFT

SKETCH NO.
HRIDC-C4-SK-LANDPLAN-003_A0

SHEET NO.

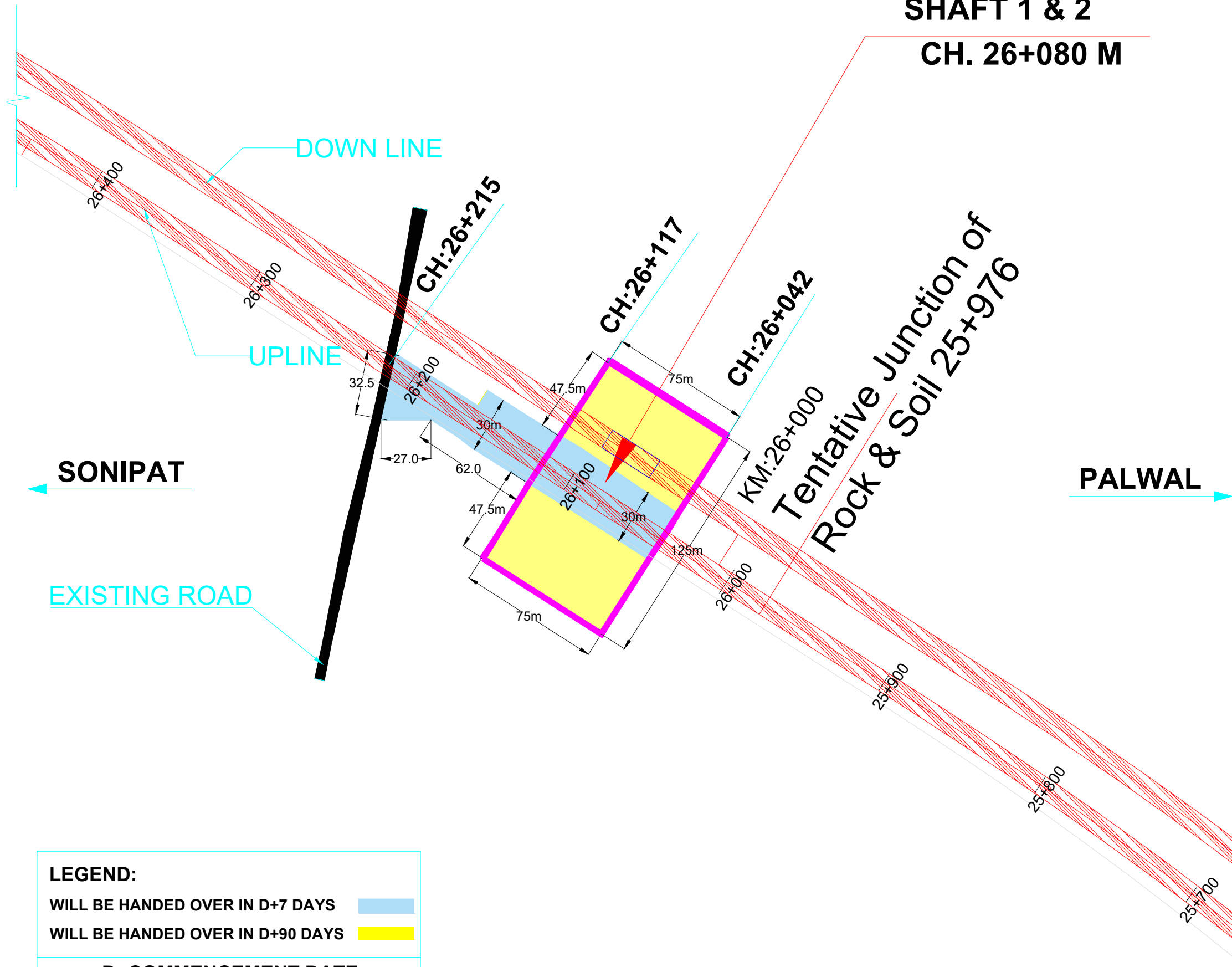
SCALE :
AS SHOWN

ISSUE DATE
03.01.2023

REVISED DATE

GC/HORC		HRIDC	
NAME / DESIGNATION	SIGN	NAME / DESIGNATION	SIGN
CHAHATEY RAM PD	<i>Chahatey Ram</i>	SHIV OM DWIVEDI CPM/HRIDC	<i>Shiv</i>
REETU PATIAL CDE/ CIVIL	<i>Reetu</i>	RAJU SOLANKI DGM/CIVIL/SOUTH	<i>Raju</i>

PERMANENT VENTILATION SHAFT 1 & 2 CH. 26+080 M



LEGEND:

WILL BE HANDED OVER IN D+7 DAYS

WILL BE HANDED OVER IN D+90 DAYS

D- COMMENCEMENT DATE

PROJECT:
HARYANA ORBITAL RAIL CORRIDOR
CONNECTING PALWAL TO SONIPAT BYPASSING DELHI
AREA BY LINKING ASAOTI-PATLI-SULTANPUR-ASAUDAH BY
NEW ELECTRIFIED BG DOUBLE LINE

CLIENT:
 HARYANA RAIL INFRASTRUCTURE
DEVELOPMENT CORPORATION LIMITED.

CONSULTANT:
 GENERAL CONSULTANT FOR
HARYANA ORBITAL RAIL CORRIDOR
RITES Limited in consortium with SMEC International Pty. Ltd.



GC/HORC		HRIDC	
NAME / DESIGNATION	SIGN	NAME / DESIGNATION	SIGN
CHAHATEY RAM PD		SHIV OM DWIVEDI CPM/HRIDC	
REETU PATIAL CDE/ CIVIL		RAJU SOLANKI DGM/CIVIL/SOUTH	

TITLE:-
LAND AREA NEAR PERMANENT
VENTILATION SHAFT 3 & 4

SKETCH NO.
HRIDC-C4-SK-LANDPLAN-004_A0

SHEET NO.

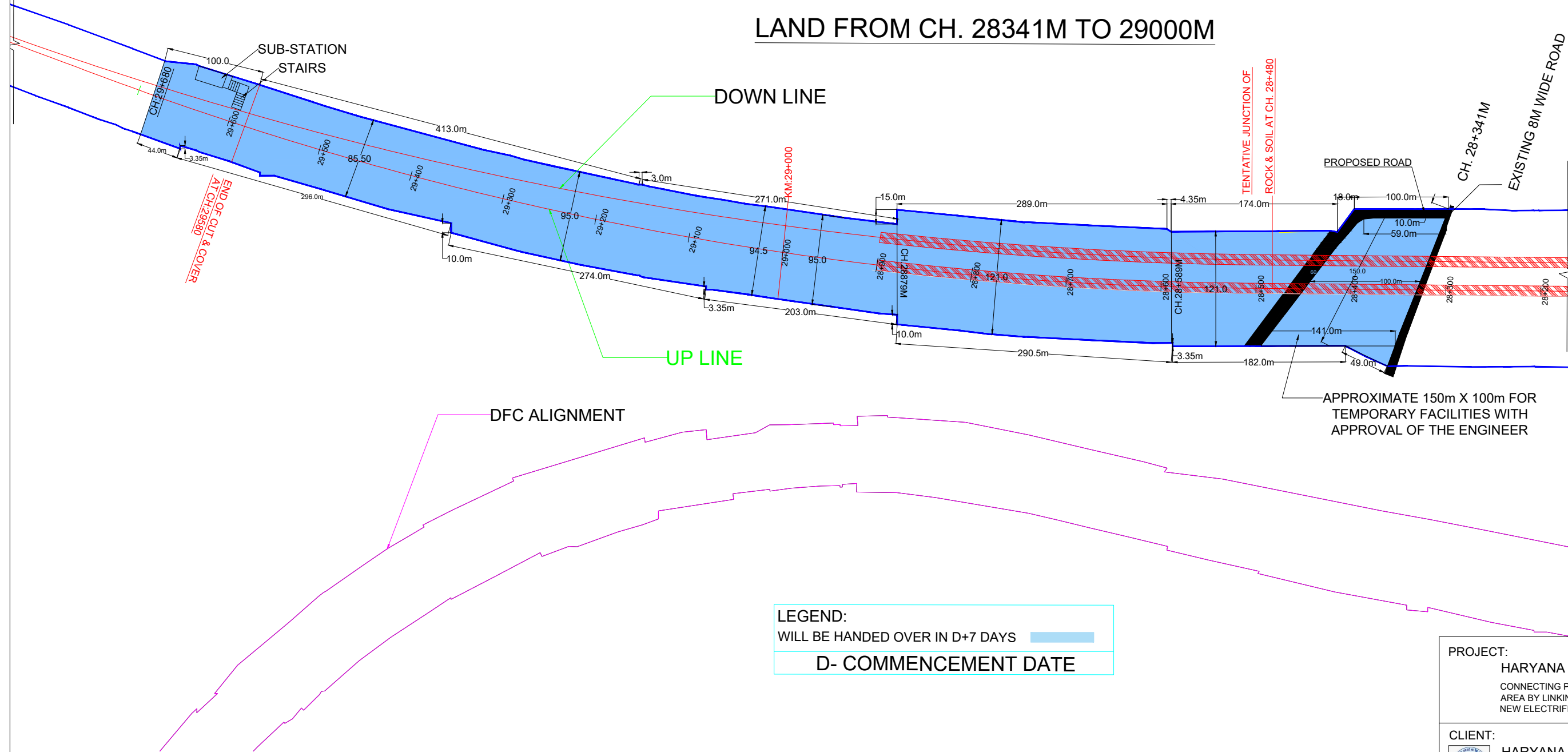
SCALE :
AS SHOWN

ISSUE DATE
03.01.2023

REVISED DATE

LAND DETAILS FROM CH.28+341M TO 29+680M


LAND FROM CH. 28341M TO 29000M



LEGEND:
 WILL BE HANDED OVER IN D+7 DAYS
D- COMMENCEMENT DATE

PROJECT:
 HARYANA ORBITAL RAIL CORRIDOR
 CONNECTING PALWAL TO SONIPAT BYPASSING DELHI
 AREA BY LINKING ASAOTI-PATLI-SULTANPUR-ASAUDAH BY
 NEW ELECTRIFIED BG DOUBLE LINE





CLIENT:
 HARYANA RAIL INFRASTRUCTURE
 DEVELOPMENT CORPORATION LIMITED.

CONSULTANT:
 GENERAL CONSULTANT FOR
 HARYANA ORBITAL RAIL CORRIDOR
 RITES Limited in consortium with SMEC International Pty. Ltd.



TITLE:-
 LAND DETAILS FROM
 CH: 28341m TO 29680m

SKETCH NO. HRIDC-C4-SK-LANDPLAN-005_A0	SHEET NO.
SCALE : AS SHOWN	ISSUE DATE 03.01.2023
REVISED DATE	

GC/HORC		HRIDC	
NAME / DESIGNATION	SIGN	NAME / DESIGNATION	SIGN
CHAHATEY RAM PD		SHIV OM DWIVEDI CPM/HRIDC	
REETU PATIAL CDE/ CIVIL		RAJU SOLANKI DGM/CIVIL/SOUTH	

Tender No. HORC/HRIDC/C-4/2022
Attachment 6
to
Corrigendum No. 2

Part 2, Section VII-8: Tender Drawings and Documents

Section VII-8B: List of Documents

List of Curve and Gradients/R1

Gradient Details PKG-C4 with Tunnel Portion/R1								
S.No.	Chainage KM		Length metre	Gradient 1 in	RISE/FALL	PFL		Remarks
	From	upto				From	To	
1	11748	12208	460	170	F	203.018	200.312	Main Line
2	12208	12374	166	LEVEL		200.312	200.312	
3	12374	12859	485	200	F	200.312	197.945	
4	12859	13198	339	1200	R	197.945	198.158	
5	13198	13539	341	1201	F	198.158	196.136	
6	13539	14373	834	170	R	196.136	200.878	
7	14373	14573	200	LEVEL		200.878	200.947	
8	14573	14743	170	530	R	200.947	201.248	
9	14743	15000	257	157	F	201.248	199.749	
10	15185	15520	335	259	R	198.571	199.864	
11	15520	16200	680	LEVEL		199.864	199.864	
12	16200	16660	460	550	R	199.864	200.701	
13	16660	17000	340	LEVEL		200.701	200.701	
14	17000	17520	520	580	F	200.701	199.804	
15	17520	18020	500	175	F	199.804	196.947	
16	18020	18500	480	LEVEL		196.947	196.947	
17	18500	19840	1340	1200	R	196.947	198.064	
18	19840	20000	160	165	R	198.064	199.033	
19	23740	25960	2220	165	R	219.142	232.596	TUNNEL
20	25960	26300	340	152	R	232.596	234.833	
21	26300	28230	1930	165	R	234.833	246.53	
22	28230	28420	190	152	R	246.53	247.78	
23	28420	29800	1380	160	R	247.78	256.405	

Horizontal Curve Details PKG-C4 with Tunnel Portion/R1													
S.No.	Curve No.	SIDE	DEGREE	RADIUS	DEF.ANGLE (Delta)	CANT {SE} (mm)	TANGEN T LENGTH	Circular Curve Length(CC L)	TRANSITION LENGTH In M	CH. TPTC-1	CH. TPTC-2	TOTAL LENGTH	
1	18	RHS	0.269	6500.000	0°51'14"	20.000	70.900	51.900	45.000	11879.919	12021.79 2	141.873	Main Line UP line
2	19	LHS	0.831	2105.300	26°30'21"	70.000	560.900	843.800	130.000	12070.033	13173.84 0	1103.807	
3	20	LHS	0.583	3000.000	33°19'13"	35.000	952.800	1634.600	110.000	15569.577	17424.17 9	1854.602	
4	24	LHS	0.884	1980.000	58°13'28"	80.000	1167.700	1881.900	130.000	23782.660	25924.60 4	2141.944	
5	25	LHS	1.000	1750.000	32°00'26"	105.00 0	571.900	834.400	140.000	26335.033	27452.39 4	1117.361	
6	26	RHS	0.500	3500.000	19°57'37"	30.000	665.900	1119.300	100.000	28468.702	29787.98 3	1319.281	
1	7	RHS	0.837	2092.000	26°30'21"	70.000	557.700	837.700	130.000	12073.179	13170.83 2	1097.653	Main Line DN line
2	8	RHS	0.585	2990.000	33°19'13"	35.000	949.800	1628.800	110.000	15575.528	17424.31 4	1848.786	
3	12	RHS	0.911	1920.000	58°13'24"	85.000	1134.300	1820.900	130.000	23834.934	25915.85 7	2080.923	
5	13	RHS	0.983	1780.000	32°00'30"	100.00 0	575.600	864.200	130.000	26352.336	27476.54 0	1124.204	
6	14	LHS	0.438	4000.000	19°57'37"	30.000	743.900	1313.500	80.000	28486.954	29960.43 4	1473.480	

Tender No. HORC/HRIDC/C-4/2022
Attachment 7
to
Corrigendum No. 2

Part 2, Section VII-9: Employer's
Requirements-Appendices

Appendix – 2/R1
Contract Key Dates and Completion Date

APPENDIX – 2/R1
CONTRACT KEY DATES AND COMPLETION DATE

Key Dates	Weeks from		Description of Stage	Delay Damage for each week of delay or part thereof for non-achieving the key dates
	LOA	Commencement Date		
Key Date 1	8		Submission and approval of Definitive Design of Shafts including construction methodology. (Duration of 8 weeks includes two weeks for third party checking by DDC appointed by the Employer and approval by GC.)	0.001% of the fixed lump sum price quoted in Schedule 'A'.
Key Date 2	16		Submission and approval of Definitive Design for Cut & Cover Tunnel and NATM tunnel (soil) including construction methodology. (Duration of 16 weeks includes three weeks for third party checking by DDC appointed by the Employer and approval by GC.)	0.001% of the fixed lump sum price quoted in Schedule 'A'.
Key Date 3		30	Completion of Construction of Permanent Ventilation Shaft No. 3 and 4 at Chainage 27680m	0.002% of the fixed lump sum price quoted in Schedule 'A'.
Key Date 4		32	Completion of Construction cum Utility Shaft at Chainage 26950m	0.002% of the fixed lump sum price quoted in Schedule 'A'.
Key Date 5		34	Completion of Construction of Permanent Ventilation Shaft No. 1 and 2 at Chainage 26080m	0.002% of the fixed lump sum price quoted in Schedule 'A'.
Key Date 6		85	Construction of Cut & Cover Tunnel No. 1 between Chainage 28480 and Chainage 29580.	-
Key Date 7		90	Completion of excavation and primary support of Tunnel No. 1 between Construction cum Utility Shaft and Permanent Ventilation Shaft No. 3.	-

Key Dates	Weeks from		Description of Stage	Delay Damage for each week of delay or part thereof for non-achieving the key dates
	LOA	Commencement Date		
Key Date 8		95	Completion of excavation and primary support from Permanent Ventilation Shaft No.1 (Chainage 26080m) to Portal P-1 (Chainage 24880m) in Tunnel No.1.	
Key Date 9		95	Completion of excavation and primary support of Tunnel No. 1 between Permanent Ventilation Shaft No. 3 and Chainage 28480.	-
Key Date 10		111	Completion of excavation and primary support of Tunnel No. 1 between Permanent Ventilation Shaft No. 1 and Construction cum Utility Shaft.	0.002% of the fixed lump sum price quoted in Schedule 'A'.
Key Date 11		137	Construction of Cut & Cover Tunnel No. 2 between Chainage 28480 and Chainage 29580.	-
Key Date 12		141	Secondary lining of Tunnel 1 from Portal P-1 (Chainage 24880m) to Chainage 28480 m including invert concreting.	0.002% of the fixed lump sum price quoted in Schedule 'A'.
Key Date 13		142	Completion of excavation and primary support of Tunnel No. 2 between Construction cum Utility Shaft and Permanent Ventilation Shaft No. 4.	-
Key Date 14		142	Completion of excavation and primary support of Tunnel No. 2 between Portal P-2 and Permanent Ventilation Shaft No. 4.	-
Key Date 15		147	Completion of excavation and primary support between Portal P-1 and Permanent Ventilation Shaft No. 2 in Tunnel-2.	-
Key Date 16		152	Completion of General Electrical Services works in Tunnel-1.	-

Key Dates	Weeks from		Description of Stage	Delay Damage for each week of delay or part thereof for non-achieving the key dates
	LOA	Commencement Date		
Key Date 17		153	Completion of Ballastless track in Tunnel-1	-
Key Date 18		154	Completion of Tunnel-1 in all respect	0.003% of the fixed lump sum price quoted in Schedule 'A'.
Key Date 19		163	Completion of excavation and primary support of Tunnel No. 2 between Permanent Ventilation Shaft No. 2 and Construction cum Utility Shaft.	0.002% of the fixed lump sum price quoted in Schedule 'A'.
Key Date 20		193	Secondary lining of Tunnel 2 from Portal P-1 (Chainage 24880m) to Chainage 28480 m including invert concreting.	
Key Date 21		204	Completion of General Electrical Services works in Tunnel-2.	-
Key Date 22		205	Completion of Ballastless track in Tunnel-2	-

Permanent Ventilation Shaft No. 1 & 2 – Chainage 26080
 Construction cum Utility Shaft – Chainage 26950
 Permanent Ventilation Shaft No. 3 & 4 – Chainage 27680

Note- Delay damage recovered for not achieving Key Date-18 shall not be returned to the Contractor even if the entire Works are completed within the stipulated Time for Completion.

Tender No. HORC/HRIDC/C-4/2022
Attachment 8
to
Corrigendum No. 2

Part 2, Section VII-9: Employer's
Requirements-Appendices

Appendix – 12/R1

Contractor's Site Laboratory

**APPENDIX 12/R1
CONTRACTOR'S SITE LABORATORY**

12. SITE LABORATORY

12.1 The Site Laboratory shall be approximately 250m² in area. It shall consist of the following accommodation:

1 concrete laboratory	60m ² floor area
1 Soil laboratory	30m ² floor area
2 office	each 15m ² floor area
1 store room	10m ² floor area
1 kitchen	10m ² floor area
Male & female toilets, changing room & shower	sufficient for 6 persons

12.2 The remainder of the 250m² shall consist of storage area for concrete cube curing tanks. The laboratory, office etc. shall be in one building; the curing tank storage building may be in a separate building, but if so, it shall be adjacent to the laboratory building & connected to it by a level, weatherproof passageway. In addition, an area of covered hard standing of 50m² for motor vehicles shall be provided adjacent to the laboratory.

12.3 STANDARD OF CONSTRUCTION

12.3.1 The laboratory shall be constructed to the best Engineering practice and as approved by the Engineer. Two independent telephone lines with two extensions each shall be provided for the laboratory. Telephones shall be located in areas as agreed with the Engineer.

12.3.2 A water tank with minimum capacity of 2000 litres shall be installed, as a source of constant water pressure (15 kPa minimum) for each laboratory.

12.3.3 In the case of sinks used for washing samples, adequate trapping and/or separating devices shall be provided to ensure the proper functioning of the facility.

12.4 FURNISHINGS AND FIXTURES

The contractor's site laboratory shall be provided with required furnishings and fixtures.

12.5 LABORATORY EQUIPMENT

12.5.1 The laboratory equipment, as listed below, shall be approved by the Engineer. The Contractor shall submit for the Engineer's approval within 2 weeks of the order to commence work the name of the supplier it intends to use for each piece of apparatus together with the relevant catalogue number. All the equipment shall be ISI marked. The list of equipment for earthwork shall be as per Annexure-VIII and Appendix -N of RDSO Specification No. RDSO/2020/GE:IRS-0004, September 2020. Equipment for concreting shall conform to specification given in relevant IS codes.

12.5.2 The layout of the equipment in the testing laboratory shall be instructed by the Engineer. The equipment shall be maintained to an accuracy appropriate to the required testing methods with routine calibration by an accredited organisation as recommended by the appropriate Authority. Equipment shall also be calibrated after maintenance or relocation.

12.5.3 The Contractor's site laboratory shall be equipped with the following material testing equipment as a minimum given in the below Table. The nature and quantity of equipment required for testing may be varied by the Engineer depending on the detail of the Contractor's Design and Construction methods or for any other reason which he deems to be valid and necessary for the proper control of quality:

S. No.	Description	Unit
1	Determining Liquid Limit	1 Set.
2	Liquid limit device (Casagrande type)	2 Set.
3	Cone penetrometer	2 Nos.
4	Grooving tools	3 Nos.
5	Evaporating dish	2 Nos.
6	Spatula 100mm blade	2 Nos.
7	Laboratory balance, capacity 500 gm, (Sensitivity 0.01 gms.)	1Nos.
8	Wash bottle, capacity 500 ml.	3 Nos.
9	Wash bottle, capacity 1 lit.	2 Nos.
10	Moisture cans, capacity 50 ml.	36 Nos.
11	Determining Plastic Limit (1 complete set) Glass plate 50cm x50cm x10 mm	3 Nos.
12	Stainless steel rods, 3 mm dia.	2 Nos.
13	Determining Moisture Content	1 Set.
14	Micro Oven- thermostatically controlled to maintain a temperature 105 to 110 °c.	1 Nos.
15	Electronic weighing machine capacity 200 gm., sensitivity 0.01 gm.	2 Set.
16	Lab. Tongs	1 Nos.
17	Moisture cans 75ml. with lid	36 Nos.
18	Compaction Characteristics	1 Set.
19	Standard compaction mould 100mm dia.	6 Nos.
20	Modified compaction mould 150mm dia.	6 Nos.
21	Standard compaction Rammer, 2.6 kg.	2 Nos.
22	Modified compaction Rammer, 4.89 kg.	2 Nos.
23	Straight edge 300mm long	2 Nos.
24	Sample ejector for 100mm and 150mm mould	2 Nos.
25	Sample tray 60 x 60 x 8 cm	10 Nos.
26	Wash bottle, 500 ml.	2 Nos.
27	Moisture cans 250 ml.	80 Nos.
28	Density of soil in-place by sand cone method	2 Set.
29	Sand density cone apparatus, 150mm	2 Nos.
30	Plate, 300mmx300mm with center hold 150mm	2 Nos.
31	Glass jug for sand cone	2 Nos.
32	Chisel 25mmx 150mm	6 Nos.
33	Hammer	6 Nos.
34	One-gallon field cans	24 Nos.
35	Sampling spoon	3 Nos.
36	Soft hairbrush	3 Nos.
37	Sieve Analysis	
38	Electric Sieve shaker (portable)	1 Unit

S. No.	Description	Unit
39	Coarse sieves In Sizes from 100mm to 10mm (As per IS 383 table no. 2)	1 Set.
40	Fine Sieves 10mm, 4.75mm, 2.63mm, 1.18mm, .600mm, .300mm, .150mm, each) Pans & Covers Specific Gravity and Absorption of Coarse Aggregate Wire basket, 200mm dia. Heavy duty suspension balance, 20 kg x 1 gm. with accessory for weight in water.	2 Set.
41	Suitable water container	1 Nos.
42	Unit Weight of Aggregate Balance, 100 kg. capacity with 10 gm precision	1 Nos.
43	Tamping rod 16mm diameter x 600mm long	3 Nos.
44	Measuring containers (3,10,15,30 liters) Flakiness and Elongation	1 each
45	Flakiness gauge, elongation index	2 Set.
46	Soundness Test	
47	Sodium sulphate	25 Kg.
48	Soaking tank	1 Nos.
49	Balance, Capacity 3 kg., Sensitivity 0.1 gm.	1 Set.
50	Sieves: Coarse	1 Set.
51	Fine	1 Set.
52	Concrete	
53	Buckets for concrete sampling	12 Nos.
54	Slump cone	12 Nos.
55	Tamping rod	12 Nos.
56	Base plate	12 Nos.
57	Mixing pan for concrete	2 Nos.
58	Scoop for general purpose	6 Nos.
59	Concrete thermometer	6 Nos.
60	Concrete cylinder mould, 150 mm * 300 mm;	30 each
61	150 mm * 200 mm	30 each
62	Concrete cube mould, 100 mm cube & 150 mm cube	10+100 each
63	Adjustable spanners for dismantling cube moulds	6 Nos.
64	Capping set	2 Nos.
65	Capping compound	As per requirement
66	Riffle	1 No.
67	Concrete curing tank with capacity for 270 cubes,	
68	temperature controlled, with circulation system drain and lockable cover	2 Nos.
69	Schmidt test hammer	1 Nos.
70	Compression testing machine (Fully automated)	1 Nos
71	Mould oil	
72	Temperature chart recorder	1 Nos.
73	Miscellaneous Vernier calipers to measure up to 200mm, with elongated jaws	5 Nos.
74	Steel rule, 300 mm long graduated	2 Nos.
75	Rubber gloves	10 pr.
76	Cotton working gloves	20 pr.
77	First aid kit	1 Set.
78	Wire brush	6 Nos.
79	Steel tape, 3m, 5m, 30m	3 each.

S. No.	Description	Unit
80	Ball peen hammer, 1 kg	2 Nos.
81	Paint scraper. Approx. 100mm wide	8 Nos.
82	Float, steel Approx.280 x 120 mm	8 Nos.
83	Sack barrow	1 Nos.
84	Shovel: Square Mouthed	2 Nos.
85	Round Mouthed	2 Nos.
86	24- wheel trolley, heavy duty, approx. 0.7m x 1.0m long pneumatic tyred type	2 Nos.
87	Wheelbarrow, rubber tyred	1 Nos.
88	Comprehensive tool kit. To include screwdrivers, pliers, claw hammer, multi-grips, spanners (adjustable)	1 Nos.
89	Type NR Schmidt Hammer and tester with recording device	1 Nos.
90	Testing Anvil for Schmidt Hammer test (SHT)	1 Nos.
91	Chart recording paper for SHT	10 pkts.
92	Cover meter for detecting metal objects to depth of 100mm below the surface of non-magnetic objects	3 Nos.
93	Noise meter	1 Nos.
94	RCPT Testing Machine with mould	1 Nos.
95	Permeability Testing Machine	1 Nos.
96	RAIN GAUGE	1 Set.
97	Loss angle abrasion machine	1 Set.
98	Mortar cube casting machine	1 Set.
99	Cement testing kit as per Is-4031	1 Set.
100	Nuclear Moisture Density Gauge (NMDG) Apparatus	2 Set.
101	Core cutter with dolly and hammer (as per appendix D od RDSO-004)	4 Set.

S. No	Consumable Item	Unit
1	Sieve brush Wire brush	
2	Sodium carbonate	
3	Sodium hexa meta phosphate.	
4	Kerosene Mercury	

S. No.	Additional Equipment	Unit
1	Hand auger 150mm dia with extension rod	
2	Sampling tube 100mm dia. And 450mm length	

Note: All machines and equipment should have Calibration Certificate.