NH-12014/1248/ 2018/PB/Zone-II

Government of India

Ministry of Road Transport & Highways

Transport Bhawan, 1, Parliament Street, New Delhi-110001

Date:28.03.2018

The Secretary
Government of Punjab,
Public Works Department.

Sub:- **Rehabilitation & up gradation to 2 Lane with paved Shoulders of Abohar-Sito Gunno-Dabwali Road from Km. 0.00 to Km. 50.885 of NH-354E including construction of one High Level Major Steel Bridge on EPC Mode in the State of Punjab.**

[Job No. NH-354E-PB-2017-18-493]

Ref.:- Letter no. 1014/NH dated 22.02.2018 received from CE(NH), State PWD, Punjab.

Sir,

I am directed to convey the technical, financial sanction and administrative approval of the President of India to the estimate for the work mentioned in the subject heading as per the following details subject to the condition stipulated in the attached technical note:

1.	Amount as indicated in the estimate sent by the State Govt. of Punjab	Rs. 358.92 Crore
2.	Amount as modified in the Ministry	Rs. 322.48 Crore
3.	Amount of technical approval (Inclusive of agency charges @ 3%)	Rs. 322.48 Crore
4.	Amount of financial sanction (Inclusive of agency charges @ 3%)	Rs. 322.48 Crore

(Rupees Three Hundred, Twenty two Crore and Forty Eight Lakh Only)

2. This sanction is further subject to the following conditions:

(i) The work shall be executed by inviting the tender on EPC mode.

(ii) The work should be completed as targeted and indicated in the enclosed technical note.

(iii) In accordance with the order contained in this Ministry's Circular letter No. RW/NH-11026/2/99-US (D-I) dated 29.10.2001 issued in supersession of earlier Circular No. RW/NH-11026/2/99-US (D-I) dated 13-1-2000, if the cost of tender exceeds 5% of the sanctioned estimated cost, the revised estimate be got sanctioned from the Ministry.

Vijay
28/3/18

Further, the tenders for the work shall be invited by adopting e-procurement / e-tendering procedure as per Ministry's Circular No. RW/NH-24035/4/2008-P &M/PIC dated 21.05.2011, in addition to guidelines issued by this Ministry vide Circular letter No. 11024/3/99-US (D-I) dated 09.03.2000, No. RW/NH-24035/4/2008-P&M dated 21.05.2010 and No. NH-12037/67/2010/LWE dated 02.08.2010. The work shall be awarded as per guidelines issued by the Ministry vide Letter No. NH-15015/29/2001-PL dated 05.07.2001.

(iv) On completion of 50% work if the appraisal of the project shows that it will necessitate revision of the estimate based upon the physical completion of the project vis-à-vis financial expenditure immediate action should be taken to submit the revised estimate so as to ensure that the sanction revised estimate is available before necessity for incurring expenditure beyond permissible limits arises and;

(v) The expenditure during the current financial year on this work as also on other sanctioned work should not exceed the allotment placed at the disposal of the State Government during the year.

3. The expenditure on the work is debatable to NH (O) Plan Head 5054, Roads & Bridges, 01-National Highways, 01.337 Roads Works, 03-National Highways (Major Works); 03.01 works financed by Central road Fund ; 03.01.53 Major works for which the corresponding Demand for the current financial year 2017-2018 is "81" Ministry of Road Transport and Highways.

4. Quarterly progress reports in the stipulated proforma may be sent to this Ministry as is being done for all sanctioned works.

5. The technical approval and financial sanction may lapse after **six months** from the date of its issue in case the work is not awarded within that period.

6. The following physical and financial target shall be strictly adhered subject to availability of fund:

Financial Year	Physical	Cumulative Progress (Rs. crore)			
		Construction including centages	LA and other pre-construction	Maintenance	Total
2017-2018	Preliminary	5.00	10.00	0.00	15.00
2018-2019	70%	190.87	39.55	0.00	230.42
2019-2020	100%	272.68	39.55	1.03	313.25
2020-2021	100%	272.68	39.55	3.08	315.30
2021-2022	100%	272.68	39.55	6.15	318.38
2022-2023	100%	272.68	39.55	10.25	322.48

7. The Regional Officer, Chandigarh will be the Drawing and Disbursing Officer.

28/3/18

8. This sanction issues with the concurrence of the Finance Division vide their U.O No. 3350/TF-II/2018 dated 05.03.2018.

Yours faithfully,

Encl: As above

(Vijay Kumar Patnayak)
Under Secretary to the Government of India

Copy with a copy of technical note forwarded to: -

1. The Accountant General, Punjab Government, Chandigarh.
2. The Pay & Accounts Officer, Department of R.T. &H, IDA Building, Jamnagar House, New Delhi.
3. R.O., Chandigarh: it is requested that you will be the DDO in respect of this sanction.
4. Regional Pay & Accounts Officer, Ministry of Road Transport and Highways, 6th Floor, Kendriya Sadan, Sector -9A, Chandigarh.
5. The Principal Director of Audit, Economics & Services Ministries, A.G.C.R. Building, New Delhi.
6. The Chief Engineer (R&B), NH, State PWD, Civil Secretariat, Sector-9, Chandigarh

Encl: As above.

(Vijay Kumar Patnayak)
Under Secretary to the Government of India

Copy with enclosures also forwarded to: -

CE (Zone-II) / SE (Zone-II)/ AEE (Zone-II) / SE (Mon.)/ W.A. Section/ FW (TF-II) / Guard file.

Encl: As above.

(Ghanshyam Meena)
Section Officer (Zone-II)

No.RW/NH-12014/1248/2018/PB/Zone-II
Government of India
Ministry of Road Transport & Highways
Transport Bhawan, 1, Parliament Street, New Delhi-110001

Date: 28.03.2018

TECHNICAL NOTE

1.	**Name of work**	Rehabilitation & up gradation to 2 Lane with paved Shoulders of Abohar-Sito Gunno-Dabwali Road from Km. 0.00 to Km. 50.885 of NH-354E including construction of one High Level Major Steel Bridge on EPC Mode in the State of Punjab	
2.	**State/Division**	Punjab/Ferozepur	
3.	**NH No.**	In-Principle road	
4.	**Estimated cost including 3% agency charges**	**As proposed by the State PWD (Rs. in cr.)**	**As agreed in the Ministry (Rs. in cr.)**
		358.92	322.48
5.	**Length (in km)**	50.89	50.89
6.	**Reference**	letter no. 1014/NH dated 22.02.2018 from CE (NH), State PWD Punjab	

COMMENTS

1. **Scope of the project:**

1.1 The scope of the instant project is Rehabilitation & up gradation to 2 Lane with paved Shoulders of Abohar-Sito Gunno-Dabwali Road from Km. 0.00 to Km. 50.885 of NH-354E including construction of one High Level Major Steel Bridge on EPC Mode in the State of Punjab in the State of Punjab is envisaged as under:

1.2 The Scheme of the improvement is as follow:

Sr. No.	Scheme of widening	Length (in km)	Cross sections
i.	Raising of FRL of existing road and construction of **Four Lane** road with Flexible Pavement	4.715	TCS-1
ii.	Raising of FRL of existing road and construction **of two Lane** road with paved shoulders ,Flexible Pavement	19.295	TCS-2&3
iii.	Raising of FRL of existing road and construction of **two Lane road** with paved shoulders, Flexible Pavement in **Cattle under pass**	2.040	TCS-4&5
iv.	Concentric Widening & Strengthening of existing road to **Two Lane** with paved shoulders , Flexible Pavement	22.085	TCS-6,7&8
v.	Reconstruction of existing road to **Two Lane** with paved shoulders ,Flexible Pavement **(low lying area)**	1.625	TCS-9 & 10
vi.	Two laning with paved shoulders, **New Construction at Additional Bridge parallel to the existing Bridge** with Flexible Pavement	0.725	TCS-11

vii.	Toll Plaza : Rigid Pavement	0.400	
	Total	**50.885**	

TCS 1: Typical cross section-1 refers to the configuration for Raising to four Lane divided Carriageway (Flexible Pavement) with Paver Block & Footpath cum drain in heavy built-up area having carriageway width of 7.0 m on both side with overall width of 23.5 m i.e. (2*7.0 m carriageway width+2*0.50 Kerb Shyness + 2*1.5 m footpath cum drain + 2*2.0 m paver block+ 2*2.0m utility corridor).

TCS-2&3: Typical cross section-2&3 refers to the carriageway configuration for Raising of existing road to two lane plus paved shoulder (2L+PS) having carriageway width of 7.0 m and overall width of 14.0 m i.e. (2*1.5 m paved shoulder on both side + 2*2.0 m earthen shoulder).

TCS-4&5: Typical cross section-4&5 refers to the carriageway configuration for Raising of existing road at Cattle underpass locations to two lane plus paved shoulder (2L+PS) having carriageway width of 7.0 m and overall width of 17.0 m i.e. (2*2.0 m paved shoulder on both side + 2*2.50 m earthen shoulder).

TCS-6,7&8: Typical cross section-6,7&8 refers to the carriageway configuration for widening & strengthening of existing road to two lane plus paved shoulder (2L+PS) having carriageway width of 7.0 m and overall width of 14.0 m i.e. (2*1.5 m paved shoulder on both side + 2*2.0 m earthen shoulder).

TCS-9&10: Typical cross section-9&10 refers to the carriageway configuration for Reconstruction of existing road to two lane plus paved shoulder (2L+PS) having carriageway width of 7.0 m and overall width of 14.0 m i.e. (2*1.5 m paved shoulder on both side + 2*2.0 m earthen shoulder).

TCS-11: Typical cross section-11 refers to the carriageway configuration for Two lane with paved shoulders, New Construction at Additional Bridge parallel to the existing bridge Locations with Flexible Pavement having carriageway width of 7.0 m and overall width of 14.0 m i.e. (2*1.5 m paved shoulder on both side + 2*2.0 m earthen shoulder) and 1*7.0 m carriageway width on existing road side.

1.3 Bridges/ Culverts:

1.3.1 Major Bridge: An existing major bridge (7*10 m=70 m) at km 40+975 is proposed to be constructed parallel to the existing bridge having carriageway configuration of 11.0 m and overall width of 16.0 m as per IRC: SP:73-2015 as per following details:

Sr. No.	Bridge Location	Span Arrangement	Super-structure	Waterway
1	40+975	1x80.0	Steel Bridge	66

1.3.2 Minor Bridge: There are total 7 nos. of existing Minor Bridges in the project stretch, 3 No.'s are reconstructed and 1 is proposed parallel to the existing minor bridge and 3 No's. are proposed to be widened in accordance with Clause No. 7.3 of IRC: SP: 73-2015 (For reconstruction) carriageway width of 11.0 m, 2*1.50 footpath, 2*0.50 RCC crash barrier, 2*0.50 RCC Railing i.e. overall width of 16.0 m & for additional bridge carriageway width of 16.0 m, 2*1.50 footpath, 2*0.50 RCC crash barrier, 2*0.50 RCC Railing & overall width of 16.0 m). The details of reconstructed, widen & additional bridge proposal are given below:

Sr. No.	Bridge Location	Proposed Span Arrangement (Minimum)	Waterway	Remarks
1	3+041	1x16.0(Skew)	13.0m	Reconstruction
2	5+958	1x20.0(Skew)	17.0m	Reconstruction
3	8+741	3x7.0(Skew)	19.0m	Widening
4	25+278	2x8.70(Skew)	15.0m	Widening
5	32+940	1x20.0(Skew)	20.0m	Reconstruction
6	40+909	1x30.0	24.0m	Additional bridge
7	42+595	2x7.60	13.0m	Widening

1.3.3 Culvert: There are total 105 nos of existing culverts up to road width in the project stretch which are in poor & distress condition which are proposed to be reconstructed as per following details. The location and type of these culverts have been included in the schedule B.

Sr. No	Type of culvert	Existing No.	To be reconstructed	New Construction	Total
1	Hume Pipe	45	45	20	65
2	Box/slab Culvert	56	56	12	68
3	Slab Culverts	4	Abandoned	NIL	NIL
	Total	**105**	**101**	**32**	**133**

1.3.4 Additional Pipe culverts: At junctions 30 No. Hume Pipe Culverts have also been proposed and allowed in the scope of the estimate.

1.3.5 Junctions Improvement: The State PWD has proposed the provision for improvement of three (03) major and 69 nos. of minor junctions at grade in the

cost estimate. Besides, 22 nos. of Bus lay bays along with bus shelters have also been allowed in the scope of the estimate.

1.3.6 **Drains and Protective works:** Provision of concrete lined drain cum footpath for 10.630 Km (details mentioned in schedule B) in built portion of NH and unlined drain for remaining portion of the road on both side of carriageway has also been proposed and allowed in the estimate. Besides, w-metal beam crash barrier for a length of 17320 m for road embankment having height more than 3 m and turfing sods for lesser height is allowed in the scope of cost estimate.

1.3.7 **Toll Plaza:** The total design length of the instant project is 50.885 km. State PWD has proposed 1 No. of 8 lane (4+4) staggered Toll Plaza on this stretch at Km 5+250 which is allowed.

1.3.8 **Slip/Service road:** Aggregate length of 300 m long and 3.75 wide Service road has been proposed at the location of from 17+500 to 17+650 along CUP. No service road has been proposed in built area.

1.3.9 Diversion Road: There is no provision of diversion road proposed in the estimate except at reconstruction locations of Minor bridges.

1.3.10 Besides, Cantilever overhead signages (12), Full width overhead sign (4), Cantilever type (8), Street light (161 nos. Double arm) & 6 nos. high mast lights as per schedule (C) at bus lay byes, truck lay byes and built up area); Bus Bay-byes(22 nos.); pedestrian guard rail; inter locking paver block etc. have also been allowed as per details mentioned in the schedule B.

2. **Geometric Design and General Features:** Geometric design and general features of the Project Highway shall be in accordance with the section 2 of Manual (IRC:SP 73-2015). The design speed shall be 100 kmph and 80 kmph for ruling design and minimum design speed respectively for plain terrain.

3. **Horizontal curves**: There are 6 horizontal curves in the existing alignment and to meet the desirable minimum design speed of 80kmph as per IRC: SP: 73-2015, these are proposed to be improved within available ROW.

4. **Land acquisition and afforestation**: It is reported by the State PWD that land acquisition of 5.663 acre area needs to be done at Toll Plaza location at Ch 5+250 near Village Chakra and additional bridge locations at Km. 40+909, km 40+975 & 42+595. However, 49.11 km project length **(96.51% length)** is encumbrance free.

5. **State PWD shall ensure that encumbrance free land is made available to the contractor at the time of award/LoA. Any increase in cost on account of delays in handing over the land and other pre-construction obligations on the part of state PWD shall be borne by the State Government, recoverable from agency charges.**

6. Besides, wild life and environment clearance is also required from RD 5+500 to 22+500. Provision of Rs. 2.82 crore (@ Rs. 50 lakh per Acre) for LA has been taken in the estimate proposed by Sate PWD and allowed. Further, the provision of Rs 32.15 crore for 10650 nos. Tree felling/Avenues Plantation and compensatory afforestation have been proposed by the State PWD which has been allowed for estimate purpose. It is reported by State PWD vide letter dated 08.03.2018 that NOC has already been given by Wild life Division, Forest Department with the instructions that height of fence be increased from 1.20 m to 3.0 m on 17.01.2018. **Further, it is also emphasized that State PWD shall sort out the issues relating to wild life/ forest clearance with the concerned Department of State Government well before start of project in conformity with the applicable rules and regulations.**

7. **Utility Shifting:** Provision of Rs. 5.08 crore (as per following details) for shifting of utility service has been allowed as proposed for estimate purpose. However, State PWD should obtain the sub-estimate from the concerned department and got approved Regional officer. Besides, B&R Department, Punjab shall take necessary action to ensure shifting of the utilities well in advance so that the progress of the work is not affected.

Sr. No.	Utility to be shifted	Estimated amount(Rs. in lakh)	Details/Remarks
1	PSPCL HT/LT line, Transformer etc.	437.20	11KV electric poles=369, Light poles=7,
3	Shifting and replacement of existing delivery pipe or irrigating fields from Sirhind Canal	20.00	65.0 m length , 200 mm di and 460 m length is of 350 mm dia
Total		**457.20**	

8. **Amount proposed in the estimate for utility shifting (US) for the above mentioned project had been taken for estimate purposes. However, the scope of utility shifting works shall be restricted as per original specifications and shall not include any augmentation/ up-gradation of utilities at MoRTH cost. This is in line with stipulations of Ministry's guidelines issued vide letter No. NH-18011/1/2012-P&M (Pt.II) dated11th March, 2016, which, inter-alia, stipulate that *"shifting proposals do not involve augmentation of utility infrastructure"*. This shall be ensured by State PWD/ RO at the time of approval of US estimates. However, in case the concerned utility is agreeable to bear the incremental cost, the same may be considered. Further, the**

materials salvaged from dismantling of the existing utility services shall be disposed of through open auction and the proceeds shall become a part of the project funding. Further, Secretary (RT&H) also noted that the State PWD shall ensure that utility services are shifted to the edge of ROW and no further cost towards shifting shall be paid in future if they are required to be shifted on account of further road widening. Moreover, the cost of shifting of BSNL cables and telephone poles was deliberated and proposed to be deleted from the scope of the estimate. Accordingly, the total cost of utility shifting has been modified from Rs. 5.08 Cr. to Rs. 4.57 Cr.

9. **Pavement Design:**

(a) The crust in main carriageway for widening and new construction has been designed for a design life of 15 years and design traffic as 50 MSA. The proposed crust is BC 40 mm + DBM 100mm + WMM 250 mm+ GSB 230 mm (total 620 mm).

(b) The thickness of overlay on existing carriageway of 5.50 m is 295 mm (BC 40 mm + DBM 100 mm + WMM 155 mm).

(c) Rigid pavement: Rigid pavement has been proposed for Toll plaza area in a length of 340 m for a design life of 30 years. The crust proposed for a rigid pavement PQC 270 mm + DLC 150 mm + GSB 150 mm.

10. **Design specifications including deviations, if any:** All material, design and construction operations for the project are proposed conforming to IRC: SP: 73-2015. To carry out improvement of geometrics within existing land availability in some urban location and to avoid impact on settlement, cross sections are proposed to be customized as against recommended in manual applicable for the project alignment.

Sr. No.	Clause Referred in Manual	Item	Provision as per Manual	Modified Provisions
1	Clause 2.12.2 of the manual.	Service Road RD14+965 to 15+115 m	5.5 m	3.75 m At CUP location for access to link roads

11. **Cost estimates & rates:** Rates of different items have been worked out based on Rate Analysis of Ministry's standard data book and common S.O.R (year 2010) of Punjab along with latest premium of year 2013 and Cement & Steel rates of year 2016 along with aggregate rates as per approved quarry rates of Punjab Govt. dated 14.06.2017. These rates are effective for Year 2017-18 too.

12. **Miscellaneous:** Retro-reflectorized cautionary, mandatory and informatory sign as per IRC:67-2012, hot applied thermoplastic compound 2.5 mm thick centre line and edge line marking as per IRC:35-2015, Painting two coats after filling the surface with synthetic enamel paint in all shades on new plastered concrete surfaces in accordance with Ministry's technical specifications clause No.803 shall be provided to serve the appropriate structural and functional need of road and structures.

13. The details of the cost estimate are as given below:

Sr. No.	Item Description	Cost Proposed by State PWD (Rs.)	Cost modified in Ministry (Rs.)
1	**Civil cost of the work**	**273,73,19,751**	**2,39,25,74,091**
2	Contingencies @ 2.8% of (A) above	7,66,44,953	6,69,92,075
3	**Sub Total (B)**	**281,39,64,704**	**2,45,95,66,166**
4	Supervision charges @ 3% of (B) above	8,44,18,941	7,37,86,985
5	Agency charges @ 3% of (B) above	8,44,18,941	7,37,86,985
6	Quality Control @ 0.25% of (B) above	70,34,911	0.00
7	Road Safety @ 0.25% of (B) above	70,34,911	0.00
8	Escalation @ 5 % for 18 months	20,52,98,981	11,96,28,705
9	Maintenance charges @ 5.0 % on road and 1.75% on structure for 4 years	13,68,65,987	10,25,81,549
10	Utilities Shifting	7,63,27,500	4,57,20,000
11	Land Acquisition Cost	4,65,80,000	2,81,65,000
12	Forest (Tree Cutting) & afforestation	12,72,12,500	32,15,59,330
13	**Grand Sum (C)**	**358,91,57,379**	**3,22,47,94,719**
14	**Say (crore)**	**358.92**	**322.48**

14. Modifications:

14.1 Construction period has been retained as 18 months as proposed and escalation charges have been allowed total @ 5%. Contingencies @ 2.8%, Agency charges @ 3%, and Maintenance charges @ 5.0 % for four years [0.5% for 1st year & 1%, 1.5% & 2% for 2nd, 3rd and 4th year respectively for road works and 1.75 % for bridge works (0.25 % for 1st year, and 0.5 % for each year for three years) has been considered in the estimate as per Ministry's circulars dated 14.08.2013,15.01.2014 & 11.09.2015. Further, out of 2.8% contingency provision, 0.05% of the total estimated cost of the civil work shall be used for skill development of workmen in the Highway sector as per conditions stipulated in Ministry's circular no. RW/NH-12037/17/2016-EAP dated 18th October, 2016 and balance 2.75% of contingency provision shall be available for main work.

14.2 Earlier, State PWD has proposed LA of 9.316 Ha at parallel Toll Plaza and new construction of Bridges. However, to minimize the land acquisition, staggered Toll Plaza was suggested at Ministry and accordingly, LA was reduced to 5.6 acre.

14.3 Provision of lossening and compaction has been deleted from the scope of the estimate in raising portion as the same may not be required due to raising of proposed FRL by about 2.0 m.

14.4 It is also mentioned that State PWD had proposed DBM in VG-30 and BC in CRMB which is not as per IRC:37-2012 therefore, grade of bitumen in DBM & BC has been modified to VG-40 as per afore said IRC codal provisions. Provision of fly ash in embankment has replaced with earthwork from borrow pit are as the provision of flyash in water logging area may endanger the soil slope stability.

14.5 Further, BC layer should be provided strictly in accordance with IRC:111-2009 after carrying proper job mix design (section 4). Construction operations (section 5), and quality controls (section 6) in conjunction with Ministry's specifications for Road and Bridge works (5th revision) need to be strictly adhered.

14.6 Provisions of road marking, traffic sign boards, roadside furniture, road safety works, crash barrier, delineators, boundary/ hectometer/kilometer, pedestrian facilities, etc. have been proposed in the scope of work.

14.7 The work shall be executed as per provisions in Model Engineering Procurement and Construction (EPC) document for Construction of Two lane National Highway works, communicated by Ministry vide letter No. RW/NH-37010/4/2010/PIC dated 17.01.2017 and subsequent amendments made thereon till appointed date of the contractor.

14.8 RFP is proposed to be invited from fresh bidders in single stage two cover systems by prescribing necessary eligibility (qualifying) criteria of the bidders as per Ministry's standard RFP document & Ministry's extant guidelines. The work will be executed by State PWD, Punjab.

14.9 Construction period for this work has been proposed as 18 months including the rainy period. Defects liability period and maintenance period has been considered as 4 years as specified in the Model EPC Document approved by the Ministry.

14.10 Detailed Technical note along with schedule B will be sent to State PWD. Remaining EPC schedules need to be approved from Regional officer, Chandigarh before award of work.

15. The time limit for awarding of this work is **6 months** from the date of sanction and should be strictly followed as per the instructions communicated to all State PWDs vides this Ministry's letter no. RW/NH-15015/29/2001-PL dated 05.07.2001 and compliance reported submitted to the Ministry. If the work is not awarded within the stipulated time, it may lead to de-sanction of the work unless Ministry's prior approval to extension of the time limit is obtained.

16. **General observations:**

16.1 The provision of contingencies should be utilized as per Ministry's circular letter no. RW/G-20011/8/98-WA(R) dated 16.08.2002 and subsequent circulars issued from time to time as per the norms. The estimates for carrying out the activities under the provision of contingencies **including change in scope** of work will be approved by Ministry on assurance/certification by Authority's Engineer/ CE(NH), State PWD, Punjab that the amount provided against contingencies is available and the same has not been indirectly utilized by accepting higher tender rates. Authority's Engineer/ CE(NH), State PWD shall also certify that approval of estimates to be charged to contingencies will not cause revision of the sanctioned estimate.

16.2 Collection of material on the roadside should be so planned that it should commensurate with the physical progress of work and the collected material should not cause any hindrance to the traffic. It must be ensured that the contractor arranges for separate land for storage of road construction material and machinery and these shall not be allowed to be stacked on roadside.

16.3 No work beyond the scope of the sanctioned estimate leading to increase in the scope of the work or change in specification should be undertaken without obtaining prior written approval of the Ministry. In case, the estimate needs revision due to change in rates/tender rates for any reasons, the revised estimate shall be submitted immediately for Ministry's approval. No expenditure beyond permissible In this connection, this Ministry's letter No. RW/NHIII/Coord/32/84 dated 19.5.84 and NH-11026/2/99-US (DI) dated 29.10.2001 may be referred.

16.4 In order to ensure that there is no slippage in achieving the targets, the progress may be closely monitored by CE(NH), State PWD, Punjab /RO, MoRT&H, Chandigarh and quarterly status report furnished to the Ministry in the prescribed Performa.

16.5 During the course of execution, the traffic may be regulated in accordance with guidelines laid down vide Ministry's letter no. NHIII-33 (126)/72 dated 20.03.1973 and letter No.RW/NH-11060/1/1998-D.O.1 dated 07.10.1987. Smooth flow of the traffic

may be ensured by providing adequate traffic control devices in accordance with stipulation of IRC: SP: 55:2001 "Guidelines on Safety in construction Zone".

16.6 It is observed that simultaneous working at large number of work fronts in long stretches is causing severe inconvenience to traffic during construction. Therefore, it is suggested that fronts may not be operated in more than 3 km length simultaneously, without completing the bituminous surfacing in the stretches where excavation/granular layers are carried out. Suitable provisions in the contract shall be incorporated for proper traffic management.

16.7 The display boards on development activities of the work shall be made as per guidelines issued vide Ministry's letter no. RW/NH-33044/10/2002-S&R (R) dated 26th May, 2003. The cost of the same will be met out of the provision of contingencies allowed in the estimate.

17. **Targets:** Following cumulative physical targets and financial phasing of expenditure shall be adhered to subject to overall availability of funds:

Financial Year	Physical	Cumulative Progress (Rs. crore)			
		Construction including centages	LA and other pre-construction	Maintenance	Total
2017-2018	Preliminary	5.00	10.00	0.00	15.00
2018-2019	70%	190.87	39.55	0.00	230.42
2019-2020	100%	272.68	39.55	1.03	313.25
2020-2021	100%	272.68	39.55	3.08	315.30
2021-2022	100%	272.68	39.55	6.15	318.38
2022-2023	100%	272.68	39.55	10.25	322.48

28/03/2018

(Devender Kumar)
Asst. Executive Engineer (Zone-II)
For Director General (RD) & Special Secretary

Schedule-B

SCHEDULE - B

(See Clause 2.1)

Development of the Project Highway

1 Development of the Project Highway

Development of the Project Highway shall include design and construction of the Project Highway as described in this Schedule-B and in Schedule-C.

2 Rehabilitation and Augmentation

Rehabilitation and Augmentation shall include 2 / 4Laning and strengthening of the Project Highway as described in Annex.-I of this Schedule-B and in Schedule-C.

3 Specifications and Standards

The Project Highway shall be designed and constructed in conformity with the Specifications and Standards specified in Annex.-I of Schedule-D.

Annex - I

(Schedule-B)

Description of Two-Laning

The Project Highway comprises the section of National Highway no 354 E commencing on NH-07 (Malout-Abohar- Ganga Nagar Section). i.e. Abohar Bye Pass in the Abohar city via Sito Gunno and ends on junction with existing National Highway (NH-09 Malout-Dabwali Road) in the state of Punjab.

1 WIDENING OF THE EXISTING HIGHWAY

1.1 The Project Highway shall follow the existing alignment unless otherwise specified by the Authority and shown in the alignment plans specified in Annex III of Schedule-A. Geometric deficiencies, if any, in the existing horizontal and vertical profiles shall be corrected as per the prescribed standards for plain terrain to the extent land is available.

1.2 WIDTH OF CARRIAGEWAY

1.2.1 Two-Laning with paved shoulders shall be undertaken. The paved carriageway shall be 10 m (7.0 m carriageway + 2x1.5m paved shoulder) in accordance with the typical cross section/ drawings enclosed herewith.

Provided that in the built-up areas the width of carriageway shall be as specified in table below :

Sr. No.	Built-up stretch (Township)	Location (km to km)	Width (m)	Typical cross section (Ref. to Manual)
1	Abohar	0+000 to 0+650	2x7.50 + 1x1.50 Median 2x2.0 paver Block + 2x1.50 RCC Drain	Fig. 2.5 of Manual (TCS : 4 Lane divided carriageway, builtup area)
2	Abohar	0+650 to 1+465	2x7.50 + 1x1.50 Median 2x2.0 paver Block + 2x1.50 Footpath	As per Schedule D
3	Sito - Gunno	15+865 to 16+560 17+720 to 18+280	2x7.50 + 1x1.50 Median 2x2.0 paver Block + 2x1.50 RCC Drain	Fig. 2.5 of Manual (TCS : 4 Lane divided carriageway, builtup area)
4	Sito - Gunno	16+560 to 17+720 18+280 to 19+115	2x7.50 + 1x1.50 Median 2x2.0 paver Block + 2x1.50 Footpath	As per Schedule D
3	-	24+265 to 25+115	2 Lane carriageway with paved shoulder & footpath cum drain	TCS-3 (Sr. No. 2.11 Annex.-I Schedule –B.)

Sr. No.	Built-up stretch (Township)	Location (km to km)	Width (m)	Typical cross section (Ref. to Manual)
4	-	27+290 to 27+960 36+650 to 36+965 37+465 to 37+915	2 Lane carriageway with paved shoulder & footpath cum drain	TCS-7 (Sr. No. 2.11 Annex.-I Schedule –B.)
5	-	32+800 to 33+310 36+965 to 37+465 37+915 to 38+030	2 Lane carriageway with paved shoulder & footpath cum drain	TCS-10 (Sr. No. 2.11 Annex.-I Schedule –B.)

1.2.2 Except as otherwise provided in this Agreement, the width of the paved carriageway and cross-sectional features shall conform to paragraph 1.2 above.

2 GEOMETRIC DESIGN AND GENERAL FEATURES

2.1 General

Geometric design and general features of the Project Highway shall be in accordance with Section 2 of the Manual.

(The alignment of the project shall be finalized to ensure that minimum sight distance equal to double the stopping sight distance is available to the road users at all locations).

2.2 Design speed

The ruling design speed shall be 100 km/hr. & the minimum design speed shall be 80 km/hr at 5 locations as shown in plan & profile drawings.

2.3 Improvement of the existing road geometrics

In the following sections, where improvement of the existing road geometrics to the prescribed standards is not possible, the existing road geometrics shall be improved to the extent possible within the given right of way and proper road signs and safety measures shall be provided:.

Sr. No.	Stretch (from km to km)	Type of Deficiency	Remarks
1	Curve at RD 17+913	Design speed 80 km/hr	
2	Curve at RD 18+280	Design speed 80 km/hr	
3	Curve at RD 18+517	Design speed 80 km/hr	
4	Curve at RD 28+217	Design speed 80 km/hr	
5	Curve at RD 45+154	Design speed 80 km/hr	

2.4 Right of Way

Details of the Right of Way are given in Annex II of Schedule-A.

2.5 Type of shoulders

(a) In built-up sections, footpaths /fully paved shoulders shall be provided in the following stretches:

Sr. No.	Location (km to km)	Fully paved shoulder/Footpath /Paver block	Reference to cross Section
1	0+000 to 0+650 15+865 to 16+560 17+720 to 18+280	2x2.0 paver Block + 2x1.50 RCC Drain	Fig. 2.5 of Manual (TCS : 4 Lane divided carriageway, builtup area)
2	0+650 to 1+465 16+560 to 17+720 18+280 to 19+115	2x2.0 paver Block + 2x1.50 Footpath	Fig. 2.5 of Manual (TCS : 4 Lane divided carriageway, builtup area)
3	24+265 to 25+115	Paved shoulder & footpath cum drain	TCS-3 (Sr. No. 2.11 Annex.-I Schedule –B.)
4	27+290 to 27+960 36+650 to 36+965 37+465 to 37+915	Paved shoulder & footpath cum drain	TCS-7 (Sr. No. 2.11 Annex.-I Schedule –B.)
5	32+800 to 33+310 36+965 to 37+465 37+915 to 38+030	Paved shoulder & footpath cum drain	TCS-10 (Sr. No. 2.11 Annex.-I Schedule –B.)

(b) In open country, paved shoulders of 1.5 m width shall be provided and earthen shoulders of 2.0m width shall be covered with 150 mm thick compacted layer of granular material.

(c) Design and specifications of paved shoulders and earthen shoulders shall conform to the requirements specified in paragraphs 5.10 and 5.11 of the Manual.

(d) Space between the main carriageway and drain will be paved with Heavy duty paver blocks in following locations.

Sr. No.	Design chainage (km)		Length(m)	Width (m)
	From	To		
1	0+000	1+465	2 X1465	2+2
2	15+865	19+115	2 X 3250	2+2

2.6 Lateral and vertical clearances at underpasses

2.6.1 Lateral and vertical clearances at underpasses and provision of guardrails/crash barriers shall be as per paragraph 2.10 of the Manual.

2.6.2 Lateral clearance: The width of the opening at the underpasses shall be as follows:

Sr. No.	Location (chainage) (km)	Span/opening (m) / H	Remarks
1	7+465	7 x 3	Cattle underpass in wild life sanctuary. Total width of the structure shall be 17.0m, Size (7.0 x 3.0). The structures shall have flared wing walls as shown in tender drawings.
2	10+465	7 x 3	
3	14+735	7 x 3	
4	21+415	7 x 3	

2.7 Lateral and vertical clearances at overpasses

2.7.1 Lateral and vertical clearances at overpasses shall be as per paragraph 2.11 of the Manual.

2.7.2 Lateral clearance: The width of the opening at the overpasses shall be as follows:

Sr. No.	Location(chainage) (from km to km)	Span/opening (m)	Remarks
Nil			

2.8 Service roads

Service roads shall be constructed at the locations and for the lengths indicated below.

Sr. No	Stretch (from km to km)		Fully paved shoulders/ footpath	Reference to cross section.	Remarks	
	From	To			Sides	Width
1	14+965	15+115	-	TCS - 5	Both	*3.75 m

*3.75 m width in approach to cattle under pass at RD 14+735.

2.9 Grade separated structures

2.9.1 Grade separated structures shall be provided as per paragraph 2.13 of the Manual. The requisite particulars are given below:

Sr. No.	Design Chainage (km)	Length (m)	Number and length of spans (m)	Approach Gradient (%)	Remarks, if any
1	7+465	7	1X7	As per Plan & profile	Cattle underpass in wild life sanctuary. Total width of the structure shall be 17.0m, Size (7.0 x 3.0). The structures shall have flared wing walls as shown in tender drawings.
2	10+465	7	1X7	As per Plan & profile	
3	14+735	7	1X7	As per Plan & profile	
4	21+415	7	1X7	As per Plan & profile	

2.10 Cattle and pedestrian underpass /overpass

Cattle and pedestrian underpass/ overpass shall be constructed as follows:

Sr. No.	Location	Type of Crossing
1	7+465	Cattle under pass
2	10+465	Cattle under pass
3	14+735	Cattle under pass
4	21+415	Cattle under pass

2.11 Typical cross-sections of the Project Highway

The details of typical cross-Sections along with different types of cross section required to be developed in different segments of the project highway are as follows.

Start RD (Km)	End RD (Km)	Length (M)	LHS (M)	RHS (M)	Applicable TCS
0	650	650	7.50	7.50	TCS-1
650	1465	815	7.50	7.50	TCS-1A
1465	5025	3560	10.00		TCS-2
5025	5425	400	TOLL PLAZA		
5425	7230	1805	10.00		TCS-2
7230	7700	470	12.00		TCS-4
7700	10235	2535	10.00		TCS-2
10235	10695	460	12.00		TCS-4
10695	14465	3770	10.00		TCS-2
14465	14965	500	12.00		TCS-4
14965	15115	150	12.00		TCS-5
15115	15865	750	10.00		TCS-2
15865	16560	695	7.50	7.50	TCS-1
16560	17720	1160	7.50	7.50	TCS-1A
17720	18280	560	7.50	7.50	TCS-1
18280	19115	835	7.50	7.50	TCS-1A
19115	21185	2070	10.00		TCS-2
21185	21645	460	12.00		TCS-4
21645	24265	2620	10.00		TCS-2
24265	25115	850	10.00		TCS-3
25115	26450	1335	10.00		TCS-2
26450	27290	840	10.00		TCS-6
27290	27960	670	10.00		TCS-7
27960	30365	2405	10.00		TCS-8
30365	30665	300	10.00		TCS-9
30665	32800	2135	10.00		TCS-8
32800	33310	510	10.00		TCS-10
33310	36650	3340	10.00		TCS-8
36650	36965	315	10.00		TCS-7
36965	37465	500	10.00		TCS-10
37465	37915	450	10.00		TCS-7

Start RD (Km)	End RD (Km)	Length (M)	LHS (M)	RHS (M)	Applicable TCS
37915	38030	115	10.00		TCS-10
38030	40550	2520	10.00		TCS-8
40550	41275	725	10.00		TCS-11
41275	43065	1790	10.00		TCS-8
43065	43265	200	10.00		TCS-9
43265	50885	7620	10.00		TCS-8

3 INTERSECTIONS AND GRADE SEPARATORS

All intersections and grade separators shall be as per Section 3 of the Manual. Existing intersections which are deficient shall be improved to the prescribed standards.

Properly designed intersections shall be provided at the locations and of the types and features given in the tables below:

(a) At-grade intersections:-

List of Major Intersections

Sr. No	Design Chainage	Type of Junction	REMARKS
1	0+000	X	Malout-Sri Ganganagar Section of NH-07 i.e Abohar Byepass (Start of Project)
2	17+700	X	Malout Sito-Gunno Ganganagar road \SH-16(Sito Gunno Village)
3	50+885	T	At Malout Dabwali Road NH-09 (End of Project Road)

Note : All the Major junctions shall be redesigned to tie in with the main carriageway as per manual. However the cross-section component, length and width shall not be less/inferior to the indicative plan & cross-section with schedules. The minimum crust on cross road shall not be less than the crust proposed in main carriageway/project highway.

List of Minor Intersections

Sr. No.	Design Chainage	Connecting Road SIDE	Type of Junction	REMARKS
1.	0+325	R.H.S	T	-
2.	0+785	L.H.S	T	-
3.	2+735	R.H.S	Y	-
4.	3+305	L.H.S	T	-
5.	3+640	R.H.S	T	-
6.	3+815	R.H.S	Y	-
7.	4+100	L.H.S	T	
8.	4+270	R.H.S	Y	-
9.	6+945	L.H.S	T	-
10.	7+885	L.H.S	Y	Village Sardarpura
11.	9+150	L.H.S	Y	-
12.	9+280	R.H.S	T	-
13.	9+590	R.H.S	Y	-

Sr. No.	Design Chainage	Connecting Road SIDE	Type of Junction	REMARKS
14.	11+350	R.H.S	Y	-
15.	12+590	R.H.S	Y	-
16.	13+580	R.H.S	T	-
17.	14+950	L.H.S	T	
18.	16+340	L.H.S	T	-
19.	16+450	L.H.S	T	-
20.	17+590	L.H.S	T	-
21.	17+940	R.H.S	Y	-
22.	18+290	R.H.S	T	To Sito Gunno
23.	18+490	L.H.S	Y	To Meharana
24.	18+550	R.H.S	T	To Sito Gunno
25.	18+580	L.H.S	T	-
26.	19+160	L.H.S	T	-
27.	19+320	R.H.S	Y	-
28.	20+150	L.H.S	T	-
29.	20+735	L.H.S	Y	
30.	21+085	R.H.S	Y	To Himmatpura
31.	24+460	L.H.S	T	To Khuban
32.	24+905	L.H.S	T	To Sangria
33.	27+465	L.H.S	T	
34.	27+465	R.H.S	T	To Bazidpura
35.	27+745	L.H.S	Y	-
36.	27+925	L.H.S	Y	To Tarmala
37.	28+220	L.H.S	Y	To Tarmala
38.	28+220	R.H.S	Y	To Kandu
39.	32+650	L.H.S	T	
40.	32+700	R.H.S	T	Dhani Jora Singh
41.	32+840	L.H.S	T	To Bhittiwala
42.	32+950	R.H.S	Y	To Talinwali
43.	33+080	R.H.S	T	To Village Sangria
44.	33+300	L.H.S	T	
45.	33+435	R.H.S	T	-
46.	34+585	R.H.S	T	-
47.	36+080	R.H.S	T	
48.	37+140	R.H.S	Y	To Bhullar Wala
49.	37+140	L.H.S	Y	To Bhittiwal
50.	37+940	L.H.S	T	To Hakam wala
51.	37+940	R.H.S	T	To Kakhanwali
52.	39+255	L.H.S	T	To Kakhanwali
53.	40+530	R.H.S	T	To Middu Khera
54.	40+860	R.H.S	T	Kakhanwali
55.	41+930	-	X	To Middu Khera - Lambi
56.	42+580	R.H.S	Y	Middu Khera
57.	42+630	L.H.S	Y	To Middu Singh Wala

Sr. No.	Design Chainage	Connecting Road SIDE	Type of Junction	REMARKS
58.	43+775	R.H.S	T	-
59.	44+470	L.H.S	Y	To Kakhanwali
60.	44+490	R.H.S	Y	-
61.	44+680	R.H.S	Y	To Ghumiara
62.	45+020	L.H.S	T	To Chak Minder Singh Wala
63.	45+070	L.H.S	Y	-
64.	45+070	R.H.S	Y	
65.	46+405	R.H.S	Y	To Lohara
66.	46+405	L.H.S	Y	To Lambi
67.	46+595	R.H.S	T	-
68.	47+560	R.H.S	Y	To Killanwala
69.	50+360	R.H.S	Y	To Waring Khera

Note : All the Minor junctions shall be redesigned to tie in with the main carriageway as per manual. The crust for junctions excluding main carriageway & for meeting road upto the length of 30.0 m from the edge of main carriageway shall be of flexible type with minimum thickness as below :

- BC = 40 mm
- DBM = 50 mm
- Base & Sub base = As per manual

(b) Grade separated intersection with/without ramps

Sr. No.	Location	Salient features	Minimum length of viaduct to be provided	Road to be carried over/under the structures
NIL				

4. ROAD EMBANKMENT AND CUT SECTION

4.1 Widening and improvement of the existing road embankment/cuttings and construction of new road embankment/ cuttings shall conform to the Specifications and Standards given in section 4 of the Manual and the specified typical cross sectional details. Deficiencies in the plan and profile of the existing road shall be corrected.

Note: - 1.The water table in complete stretch of the alignment is high being water logged area. The level of sub grade shall be fixed as per clause 4.2.1 of the Manual, subject to the condition that proposed FRL of the road is not lower than provided in Plan and profile drawings. The final FRL shall be fixed as per the provisions of Scheduled D with the consultations of PWD/ Authority Engineer subject to the condition that the difference between Finish Road Levels and the ground levels at the proposed centre line given in enclosed Plan & Profile shall be retained as minimum. However, the FRL at structure locations and its approaches shall be governed by the minimum clearance required as per specifications of manual and the requirement of vertical alignment.

4.2 **Raising of the existing road (Refer to Paragraph 4.2.1 of the manual)**

The existing road shall be raised in the following sections:

Sr. No.	Section (from km to km)	Length in m	Extent of raising
1	0+000 to 26+450	26+450	As per Clause 4.1 of Schedule B

Note:- 1.The water table in complete stretch of the alignment is high being water logged area. Hence the level of sub grade shall be fixed as per clause 4.2.1 of the Manual , The capillary cut off technique described under Para 4.7 of IRC:34-2011 for water logged area shall be adopted in making embankment in reaches given under clause 4.2 of schedule-B as per the typical drawing shown in Fig.4.7 (a) of the IRC:34-2011.

5 PAVEMENT DESIGN

5.1 Pavement design shall be carried out in accordance with Section 5 of the Manual.

5.2 Type of pavement

Type of Pavement shall be flexible except at Toll Plaza location.

Note: The flexible pavement in the stretches given in clause 4.2 of schedule-B shall be designed in accordance with clause 5.1.5 of the manual. A special treatment of capillary cut off technique as explained in note-1 of clause 4.2 of schedule- B shall be adopted in this stretch.

5.3 Design requirements

5.3.1 Design Period and strategy

Flexible pavement for new pavement or for widening and strengthening of the existing pavement shall be designed for a minimum design period of 15years and rigid pavement for 30 years. Stage construction shall not be permitted.

5.3.2 Design Traffic

Notwithstanding anything to the contrary contained in this Agreement or the Manual, the Contractor shall design the flexible pavement for a minimum design traffic of **50 (Fifty) Million Standard Axles**.

In any case the crust composition for flexible pavement in widening & new construction shall not be less than as specified under:

(i) New Construction/ Raising

BC =40 mm, DBM =100 mm, WMM = 250 mm, GSB = 230 mm. with a capillary cut off layer as per Fig. 4.7(a)of IRC 34 : 2011.

(ii) Design of Overlay

Overlay shall be designed as per IRC:81-1997.Design period for overlay shall be 15 years.

Design shall be computed for 50 MSA .The minimum overlay shall be as follows:-
Bituminous course (BC) = 40mm ,Dense Bituminous Macadam(DBM)=100 mm and Wet Mix Macadam (WMM)=155 mm

(iii) Rigid Pavement.

Rigid Pavement shall be provided in the Toll plaza area from RD 5+025 to 5+425. Rigid pavement shall be designed as per IRC-58 for a design period of 30 Years.
In any case the crust composition for rigid pavement shall not be less than as specified under:

Pavement Quality Concrete =280mm
Dry lean concrete =150mm
Granular Sub base =150mm
Sub Grade =500mm

(iv) Service Road:

The crust shall be designed for a minimum design traffic of **10 MSA** as per clause 5.5.8 of IRC: SP:73-2015 . The design shall be carried out as per IRC 37 subject to the following minimum crust composition. Bituminous Concrete = 40mm + Dense Bituminous Macadam = 60mm+ Wet Mix Macadam = 250mm+ Granular Sub Base = 230mm.

(v) Paver Blocks:

Minimum pavement thickness between carriageway and drain in built up areas (TCS-4)

- Paver Block(M-35) = 80 mm
- Sand Bed = 30 mm
- WMM = 250 mm
- GSB = 150 mm
- Sub grade = 500 mm

5.4 Reconstruction of stretches

The following stretches of the existing road shall be reconstructed. These shall be designed as new pavement.

Sr. No.	Stretch From km to km	Remarks
1	30+365 to 30+665	Reconstruction.
2	32+665 to 33+265	Reconstruction.
3	36+965 to 37+465	Reconstruction.
4	37+915 to 38+065	Reconstruction.
5	43+065 to 43+265	Reconstruction.

6 Roadside Drainage:

6.1 Drainage system including surface and subsurface drains for the Project Highway shall be provided as per Section 6 of the Manual. The minimum locations/length of new construction of RCC covered side drains shall be provided as below:

Sr. No.	Location (Km)		Length (M)	Size (m)	Side
	From	To			
1.	At Junction RD 0+000 towards Abohar city		2 x 215 = 430	1.5x1.0	Both
2.	0+000	0+650	1300	1.5x1.0	Both
3.	15+865	16+560	1390	1.5x1.0	Both
4.	17+720	18+280	1120	1.5x1.0	Both
5.	24+265	25+115	1700	1.5x1.0	Both
6.	27+290	27+960	1340	1.5x1.0	Both
7.	32+800	33+310	1020	1.5x1.0	Both
8.	36+650	37+465	1630	1.5x1.0	Both
9.	37+465	38+030	1130	1.5x1.0	Both

Note : These drains shall be extended in a length that the water is disposed to the disposal point

6.2 **Rain Water Harvesting:** As per Ministry of environment and forest notification dated 14-01-1997 as amended on 13-01-1998, 05-01-1999 and 06-11-2000.

7 Design of Structures

7.1 General

7.1.1 All bridges, culverts and structures shall be designed and constructed in accordance with section 7 of the Manual and shall conform to the cross- sectional features and other details specified therein.

7.1.2 Width of the carriageway of new bridges and structures shall be as follows:

Major Bridges: Nil

Minor Bridge: Nil

7.1.3 The following structures shall be provided with footpaths:

Sr. No.	Location at km	Remarks
1	3+041	As per Fig. 7.6 of the Manual
2	5+958	As per Fig. 7.6 of the Manual
3	8+741	As per Fig. 7.6 of the Manual
4	25+278	As per Fig. 7.6 of the Manual
5	32+940	As per Fig. 7.6 of the Manual
6	40+909	As per Fig. 7.6 of the Manual
7	40+975	As per Fig. 7.6 of the Manual
8	42+595	As per Fig. 7.6 of the Manual

7.1.4 All bridges shall be high-level bridges.

7.1.5 The following structures shall be designed to carry utility services specified in table below:

Sl. No.	Bridge at km	Utility service to be Carried	Remarks
1	3+041	Utility services as per site requirement	-
2	5+958	Utility services as per site requirement	-
3	8+741	Utility services as per site requirement	-
4	25+278	Utility services as per site requirement	-
5	32+940	Utility services as per site requirement	-
6	40+909	Utility services as per site requirement and irrigation/ tube well water pipe lines.	-
7	40+975	Utility services as per site requirement and irrigation/ tube well water pipe lines.	-
8	42+595	Utility services as per site requirement	-

7.1.6 Cross-section of the new culverts and bridges at deck level for the Project Highway shall conform to the typical cross-sections given in section 7 of the Manual.

7.1.7 *Lining of the existing canals shall be reconstructed/repaired adjacent to the existing & proposed bridges as per specifications & requirements of irrigation department.*

7.1.8 *Temporary diversion roads with provision of required waterway will be provided adjacent to the proposed bridges before these are dismantled. This diversion shall be maintained and dismantled after completion of project.*

7.2 Culverts

7.2.1 Overall width of all culverts shall be equal to the roadway width of the approaches.

7.2.2 Reconstruction of existing culverts:

5 No. of existing culverts shall be abandoned.

2 No. culverts not to be considered in the project as left in the portion before start of the project.

The balance existing culverts at the following locations shall be re-constructed as new culverts:

Sr. No.	Culvert Location	Type	Span/Opening (m)	Remarks/ Minimum Width (m)
1.	-0+072	Box	1 X 2 X 2	24.0
2.	0+381	Box	1 X 2 X 2	24 .0
3.	0+776	Box	1 X 2 X 2	24 .0
4.	1+805	Box	1 X 2 X 2	15 .0
5.	4+255	Pipe	1200 Dia	15 .0
6.	4+720	Pipe	1200 Dia	20 .0
7.	5+890	Box	1 X 2 X 2	15.0
8.	6+024	Box	1 X 2 X 2	15.0
9.	6+230	Box	1 X 2 X 2	15.0
10.	6+530	Box	1 X 2 X 2	15.0

Sr. No.	Culvert Location	Type	Span/Opening (m)	Remarks/ Minimum Width (m)
11.	7+018	Pipe	1200 Dia	15.0
12.	8+546	Pipe	1200 Dia	25.0
13.	8+850	Pipe	1200 Dia	25.0
14.	9+025	Box	1 X 2 X 2	20.0
15.	9+407	Box	1 X 2 X 2	20.0
16.	9+820	Box	1 X 2 X 2	20.0
17.	10+850	Box	1 X 2 X 2	24.0
18.	11+044	Box	1 X 2 X 2	18.0
19.	11+636	Box	1 X 2 X 2	15.0
20.	12+018	Box	1 X 2 X 2	15.0
21.	12+410	Box	1 X 2 X 2	15.0
22.	12+682	Box	1 X 2 X 2	18.0
23.	12+835	Pipe	1200 Dia	20.0
24.	13+473	Pipe	1200 Dia	15.0
25.	13+566	Box	1 X 3 X 2	16.0
26.	14+050	Pipe	1200 Dia	22.5
27.	15+180	Pipe	1200 Dia	20.0
28.	16+260	Pipe	1200 Dia	22.5
29.	18+270	Pipe	1200 Dia	22.5
30.	18+687	Pipe	1200 Dia	22.5
31.	18+935	Pipe	1200 Dia	22.5
32.	21+899	Pipe	1200 Dia	25.0
33.	22+560	Pipe	1200 Dia	15.0
34.	23+997	Pipe	1200 Dia	15.0
35.	24+967	Box	1 X 2 X 2	15.0
36.	25+552	Pipe	1200 Dia	15.0
37.	25+651	Box	1 X 2 X 2	15.0
38.	25+695	Pipe	1200 Dia	15.0
39.	25+902	Box	1 X 2 X 2	15.0
40.	26+435	Box	1 X 2 X 2	15.0
41.	27+290	Pipe	1200 Dia	15.0
42.	27+557	Pipe	1200 Dia	18.0
43.	28+424	Box	1 X 3 X 3	15.0
44.	29+053	Box	1 X 1.5 X 1.5	20.0
45.	29+470	Box	1 X 1.5 X 1.5	20.0
46.	29+986	Pipe	1200 Dia	15.0
47.	30+275	Box	1 X 1.5 X 1.5	15.0
48.	30+668	Box	1 X 1.5 X 1.5	15.0

Sr. No.	Culvert Location	Type	Span/Opening (m)	Remarks/ Minimum Width (m)
49.	30+803	Pipe	1200 Dia	15.0
50.	31+003	Box	1 X 1.5 X 1.5	15.0
51.	32+316	Box	1 X 2 X 2	15.0
52.	32+575	Box	1 X 1.5 X 1.5	15.0
53.	33+006	Pipe	1200 Dia	15.0
54.	33+475	Pipe	1200 Dia	15.0
55.	33+592	Box	1 X 1.5 X 1.5	15.0
56.	33+890	Box	1 X 2 X 2	15.0
57.	34+050	Box	1 X 2 X 2	15.0
58.	34+260	Box	1 X 2 X 2	15.0
59.	34+595	Box	1 X 2 X 2	15.0
60.	34+865	Box	1 X 2 X 2	15.0
61.	35+015	Pipe	1200 Dia	15.0
62.	35+537	Box	1 X 2 X 2	15.0
63.	36+045	Box	1 X 3 X 2	16.0
64.	36+423	Pipe	1200 Dia	15.0
65.	37+303	Pipe	1200 Dia	15.0
66.	38+029	Box	1 X 2 X 2	18.0
67.	38+315	Pipe	1200 Dia	15.0
68.	38+648	Box	1 X 2 X 2	15.0
69.	38+748	Box	1 X 2 X 2	15.0
70.	38+848	Pipe	1200 Dia	15.0
71.	39+253	Box	1 X 2 X 2	15.0
72.	39+495	Box	1 X 2 X 2	15.0
73.	39+996	Pipe	1200 Dia	20.0
74.	40+160	Box	1 X 1.5 X 1.5	27.0
75.	40+197	Pipe	1200 Dia	15.0
76.	40+325	Box	1 X 1.5 X 1.5	15.0
77.	40+665	Pipe	1200 Dia	20.0
78.	40+847	Box	1 X 2 X 2	36.0
79.	41+058	Box	1 X 2 X 2	36.0
80.	41+268	Pipe	1200 Dia	20.0
81.	41+510	Pipe	1200 Dia	20.0
82.	41+938	Pipe	1200 Dia	15.0
83.	43+344	Box	1 X 1.5 X 1.5	15.0
84.	43+545	Pipe	1200 Dia	15.0
85.	43+868	Box	1 X 1.5 X 1.5	15.0
86.	43+876	Box	1 X 3 X 2	16.0

Sr. No.	Culvert Location	Type	Span/Opening (m)	Remarks/ Minimum Width (m)
87.	43+888	Box	1 X 2 X 2	18.0
88.	44+350	Box	1 X 1.5 X 1.5	15.0
89.	44+578	Box	1 X 1.5 X 1.5	15.0
90.	45+138	Pipe	1200 Dia	15.0
91.	45+567	Box	1 X 1.5 X 1.5	15.0
92.	45+714	Pipe	1200 Dia	15.0
93.	46+135	Pipe	1200 Dia	15.0
94.	46+691	Pipe	1200 Dia	15.0
95.	47+036	Pipe	1200 Dia	15.0
96.	47+389	Pipe	1200 Dia	15.0
97.	47+550	Pipe	1200 Dia	15.0
98.	47+560	Box	2 X 2 X 2	18.0
99.	47+661	Pipe	1200 Dia	15.0
100.	48+557	Pipe	1200 Dia	15.0
101.	50+113	Box	1 X 2 X 2	15.0

7.2.3 Widening of existing culverts

All existing culverts which are not to be reconstructed shall be widened to the roadway width of the Project Highway as per the typical cross section given in section 7 of the Manual. Repairs and strengthening of existing structures where required shall be carried out.

Sr. No.	Culvert location	Type, span, height and width of existing culvert(m)	Repairs to be carried out [specify]
Nil			

7.2.4 Additional new culverts shall be constructed as per particulars given in the table below:

Sr. No.	Culvert Location	Span/Opening (m)
1	2+410*	1X1.200 , NP-4, HUME PIPE
2	2+720*	1 X 2 X 2, RCC BOX
3	3+360*	1X1.200 , NP-4, HUME PIPE
4	4+140*	1X1.200 , NP-4, HUME PIPE
5	4+990*	1X1.200 , NP-4, HUME PIPE
6	6+930*	1X1.200 , NP-4, HUME PIPE
7	7+360*	1 X 2 X 2, RCC BOX
8	7+560*	1 X 2 X 2, RCC BOX
9	8+160*	1 X 2 X 2, RCC BOX
10	10+160*	1X1.200 , NP-4, HUME PIPE
11	10+370*	1 X 2 X 2, RCC BOX

Sr. No.	Culvert Location	Span/Opening (m)
12	10+560*	1 X 2 X 2, RCC BOX
13	11+320*	1X1.200 , NP-4, HUME PIPE
14	14+360*	1 X 2 X 2, RCC BOX
15	14+660*	1 X 2 X 2, RCC BOX
16	14+810*	1 X 2 X 2, RCC BOX
17	15+220*	1X1.200 , NP-4, HUME PIPE
18	17+110*	1X1.200 , NP-4, HUME PIPE
19	19+400*	1 X 2 X 2, RCC BOX
20	19+650*	1X1.200 , NP-4, HUME PIPE
21	20+120*	1X1.200 , NP-4, HUME PIPE
22	20+560*	1X1.200 , NP-4, HUME PIPE
23	21+110*	1X1.200 , NP-4, HUME PIPE
24	21+310*	1 X 2 X 2, RCC BOX
25	21+510*	1 X 2 X 2, RCC BOX
26	22+310*	1X1.200 , NP-4, HUME PIPE
27	23+180*	1X1.200 , NP-4, HUME PIPE
28	23+510*	1X1.200 , NP-4, HUME PIPE
29	24+260*	1X1.200 , NP-4, HUME PIPE
30	31+510*	1X1.200 , NP-4, HUME PIPE
31	43+000*	1X1.200 , NP-4, HUME PIPE
32	48+000*	1X1.200 , NP-4, HUME PIPE
33	At locations of Crossing of Link Roads at **30 locations** .	1X1.200 NP-4, HUME PIPE, Length as per site requirements.

*****The locations shown are tentative & shall be finalized in consultation with A.E./Client.

7.2.5 Repairs/replacements of railing/parapets, flooring and protection works of the existing culverts shall be undertaken as follows:

Sr. No.	Location of Culvert	Remarks
NIL		

7.2.6 Floor protection works shall be as specified in the relevant IRC Codes and Specifications.

7.3 Bridges.

7.3.1 Existing bridges to be re- constructed/widened

(i) The existing bridges at the following locations shall be re-constructed as new Structures:

Sr. No.	Bridge location (km)	Salient details of existing bridge	Adequacy or otherwise of the existing waterway, vertical clearance, etc*	Remarks
1	3+041	RCC Slab H.L. bridge over canal,abutment/pier of brick masonry Span=3x4.6 m, Total width=7.75m	Inadequate	Existing bridge shall be replaced with new structure. Single Span 16.0 m(Skew) as per
2	5+958	RCC Slab H.L. bridge over canal,abutment/pier of brick masonry Span=1x 8.5 m, Total width=7.60m	Inadequate	Existing bridge shall be replaced with new structure. Single Span 20.0 m(Skew) as per Fig. 7.6 of Manual
3	32+940	RCC Slab H.L. bridge over canal,abutment/pier of brick masonry Span=3x5.5 m, Total width=7.6m	Inadequate	Existing bridge shall be replaced with new structure Single Span 20.0 m(Skew) as per Fig. 7.6 of Manual

**Typical GAD attached.*

The following narrow bridges shall be widened:

Sr. No.	Location (km)	Existing width	Extent of widening (m)	Cross-section at deck level for widening @
1	8+741	8.50	7.50	Total width 16 m. Carriageway= 11 m Footpath =2x1.5 m Crash Barriers =3x.50 RCC Railing = 1x0.50 (Total width as per Fig. 7.6 of Manual)
2	25+275	9.0	7.0	Total width 16 m. Carriageway= 11 m Footpath =2x1.5 m Crash Barriers =3x.50 RCC Railing = 1x0.50 (Total width as per Fig. 7.6 of Manual)
3	42+595	8.50	7.50	Total width 16 m. Carriageway= 11 m Footpath =2x1.5 m Crash Barriers =3x.50 RCC Railing = 1x0.50 (Total width as per Fig. 7.6 of Manual)

Note : The bridge will be either widened or reconstructed keeping in view :

i) The latest loading/codal provisions of IRC.

ii) Structural adequacy of existing structure

iii) Stability and serviceability of existing structure after widening.

7.3.2 Additional new bridges

New bridges at the following locations on the Project Highway shall be constructed parallel to the existing narrow bridge.

Major Bridge:

Sr. No.	Bridge at km	Width of carriageway and cross sectional features @	Remarks
1	40+975	Width of carriageway=11 m and Railing= 2x0.50 m ,Footpath= 2x1.50 m , Crash barrier= 2x0.50 m	Proposed Steel Bridge Single Span 80.0 m As per Fig. 7.6 of Manual (Parallel to existing narrow Major Bridge on D/S)

Minor Bridge:

Sr. No.	Bridge at km	Width of carriageway and cross sectional features @	Remarks
1	40+909	Width of carriageway=11 m and Railing= 2x0.50 m ,Footpath= 2x1.50 m , Crash barrier= 2x0.50 m	Proposed Steel Bridge Single Span 30.0 m As per Fig. 7.6 of Manual (Parallel to existing narrow Minor Bridge on D/S)

7.3.3 The railings of existing bridges shall be replaced by crash barriers at the following locations:

Sr. No.	Location at km	Remarks
1	40+909	R.C.C. crash barrier on both sides of existing bridge shall be provided.
2	40+975	R.C.C. crash barrier on both sides of existing bridge shall be provided.

7.3.4 Repairs/replacements of railing/parapets of the existing bridges shall be undertaken as follows:

Sr. No.	Location at km	Remarks
Nil		

7.3.5 Drainage system for bridge decks

An effective drainage system for bridge decks shall be provided as specified in paragraph 7.20 of the Manual

7.3.6 Structures in marine environment **Nil**

7.4. Rail-road bridges

7.4.1 Design, construction and detailing of ROB/RUB shall be as specified in section of the Manual red along with MORTH circular No. RW-NH-35075/9/2006-& R(B) dated 2 Sep,2016

7.4.2 **Road over-bridges**

Road over-bridges (ROB) (road over rail) shall be provided at the following level crossings,

as per GAD drawings attached:

Sr. No.	Location of Level crossing (chainage km)	Length of bridge (m)
Nil		

Note:- *The span arrangement and height in railway portion shall be as per requirements of railways/GAD to be approved by railways.

7.4.3 **Road under-bridges**

Road under-bridges (road under railway line) shall be provided at the following level crossings, as per GAD drawings attached:

Sl. No.	Location of Level crossing (chainage km)	Number and length of span (m)
Nil		

7.5 Grade separated structures

The grade separated structures shall be provided at the locations and of the type and length specified in paragraphs 2.9 and 3 of this Annex-I.

Sr. No.	Location (km)	Type of Structure	Remarks
1	7+465	Cattle Under Pass (RCC Box.)	1x7x3 (17.0 m)
2	10+465	Cattle Under Pass (RCC Box.)	1x7x3 (17.0 m)
3	14+735	Cattle Under Pass (RCC Box.)	1x7x3 (17.0 m)
4	21+415	Cattle Under Pass (RCC Box.)	1x7x3 (17.0 m)

7.6 Repairs and strengthening of bridges and structures

The existing bridges and structures to be repaired/strengthened, and the nature and extent of repairs /strengthening required are given below:

A. Bridges

Sr. No.	Location of bridge	Nature and extent of repairs /strengthening to be carried out
1	8+741	Visual inspection, Protection of foundation, Jacketing of sub structure ,crack sealing treatment if any, replacement of bearings, expansion joints and wearing coat etc.
2	25+278	
3	40+909	
4	40+975	
5	42+595	

B. ROB / RUB

Sl. No.	Location of ROB/RUB (km)	Nature and extent of repairs /strengthening to be carried out
Nil		

C. Overpasses/Underpasses and other structures

Sl. No.	Location of Structure (km)	Nature and extent of repairs /strengthening to be carried out
Nil		

7.7 List of Major Bridges and Structures

The following is the list of the Major Bridges and Structures:

Sr. No.	Location
Major Bridge	
1	40+975
Minor Bridge	
1	3+041
2	5+958
3	8+741
4	25+278
5	32+940
6	40+909
7	42+595
Cattle Underpass	
1	7+465
2	10+465
3	14+735
4	21+415

TRAFFIC CONTROL DEVICES AND ROAD SAFETY DEVICES

8.1 Traffic control devices and road safety devices shall be provided in accordance with Section 9 of the Manual.

8.2 Properly designed 3.0 m high G.I. wire chain link fence with supporting structure & foundation will be provided on both sides at ROW in the wild life sanctuary from RD 5+500 to RD 22+500. Its design will be as per requirements of wild life department.

9 ROADSIDE FURNITURE

9.1 Roadside furniture shall be provided in accordance with the provisions of Section 9 of the Manual. ***In addition to the provision as per Section 9. Specially designed fence 3.0 m high in wildlife sanctuary portion from Km. 5+500 to Km. 22+500 shall be fixed. Fencing & any other furniture required for wildlife area shall be provided as per the requirements of wild life (Ministry of Environment & forest).***

9.2 **Overhead traffic signs: location and size**

(i) Full width Overhead traffic signs – Minimum 4 nos.

(ii) Cantilever type Overhead traffic signs – Minimum 8 nos.

10 Compulsory Afforestation

10.1 Refer to section 11 of the Manual and Double the number of trees which will be uprooted required to be planted by the Contractor as compensatory afforestation - **Minimum 20,000 No**.

10.2 Barricading of the ROW with plantation of hedge like species (Ficus/Poplars) as per clause 1(vi)a of NHAI policy matter 10.01.16/2017.

11. hazardous Locations

The safety barriers shall also be provided at the following hazardous locations**:**

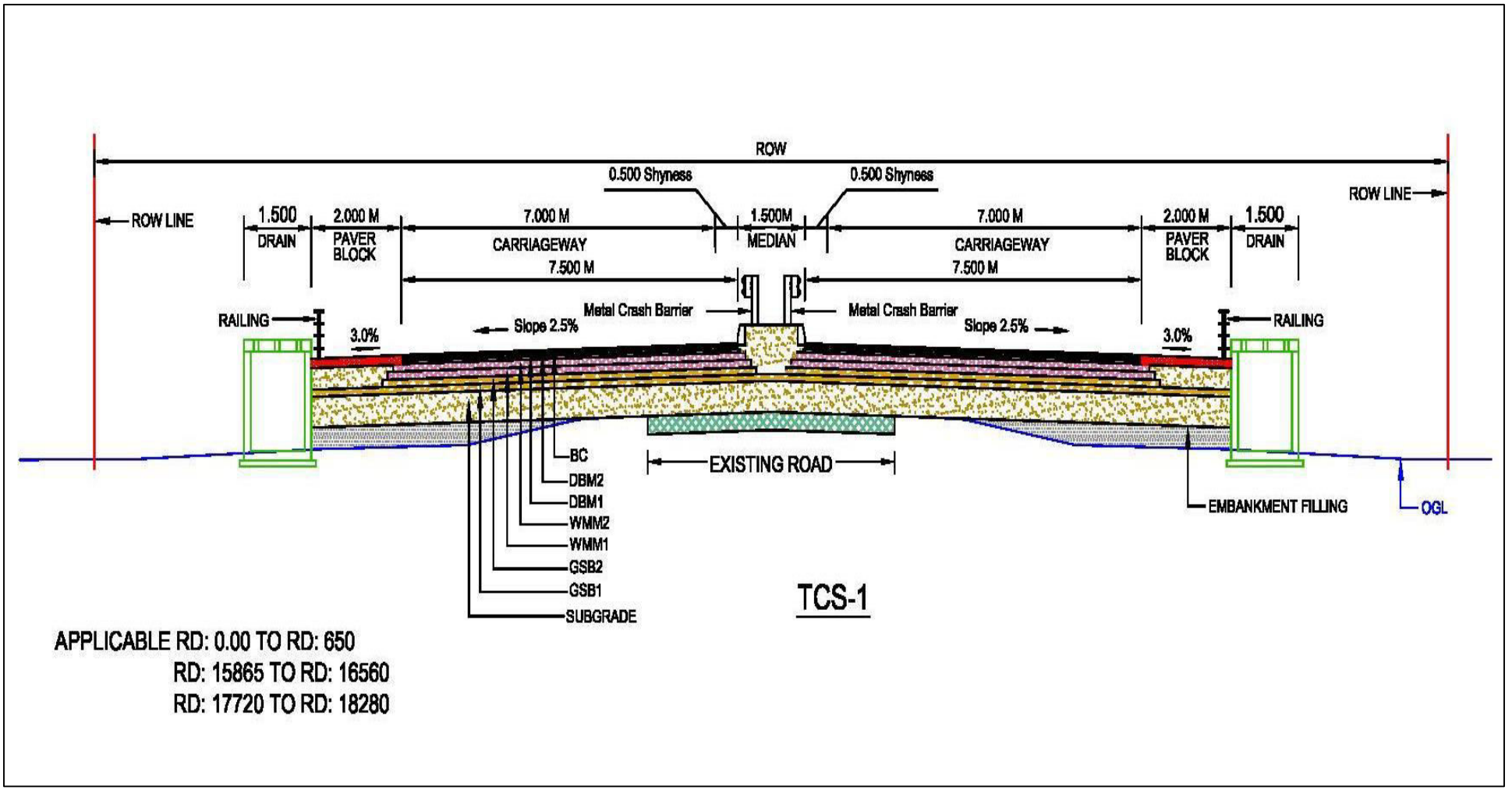
Sl. No.	**Location stretch from (km) to (km)**	**LHS/RHS**
As per the Manual		

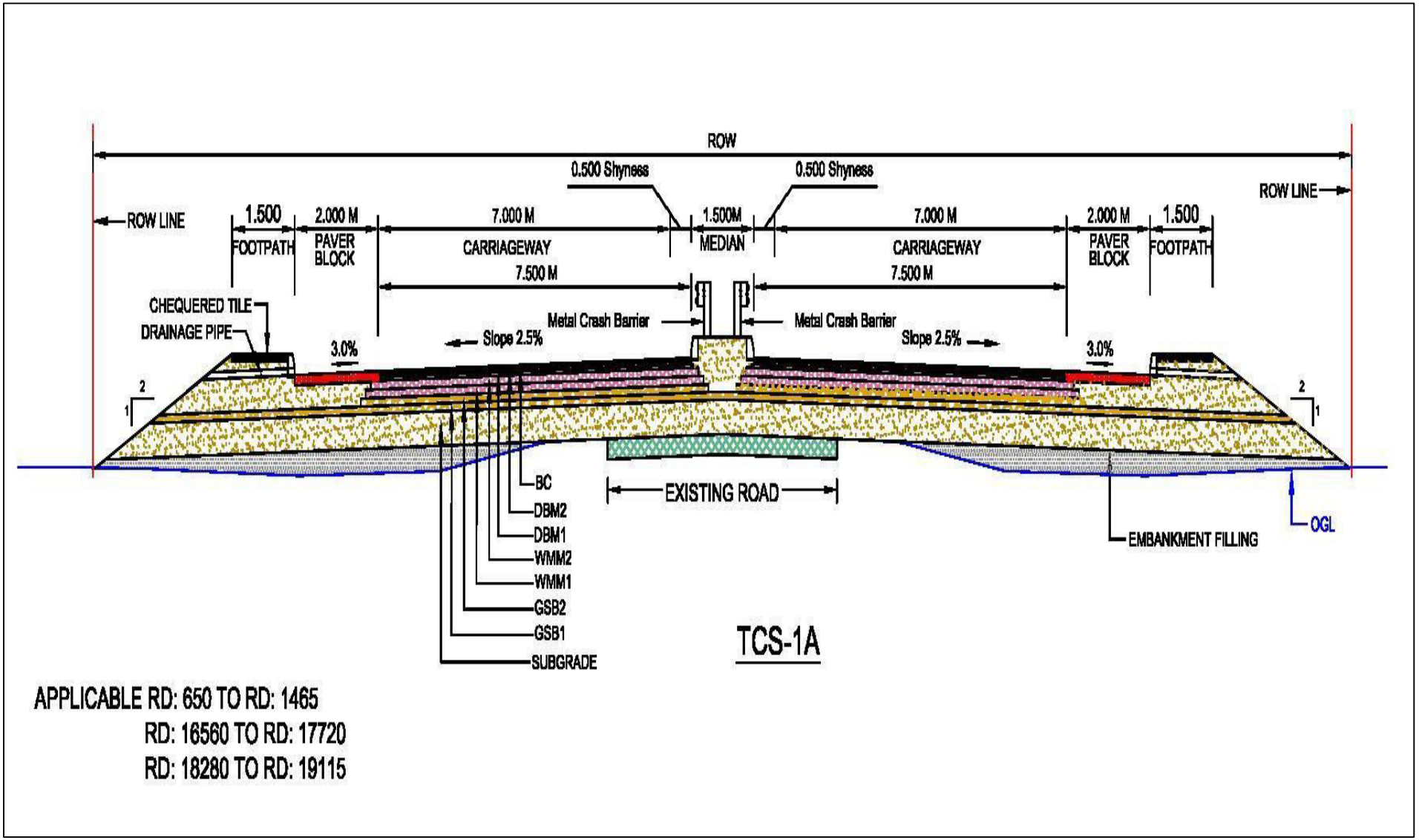
12 Special requirement for hill roads: **Nil**

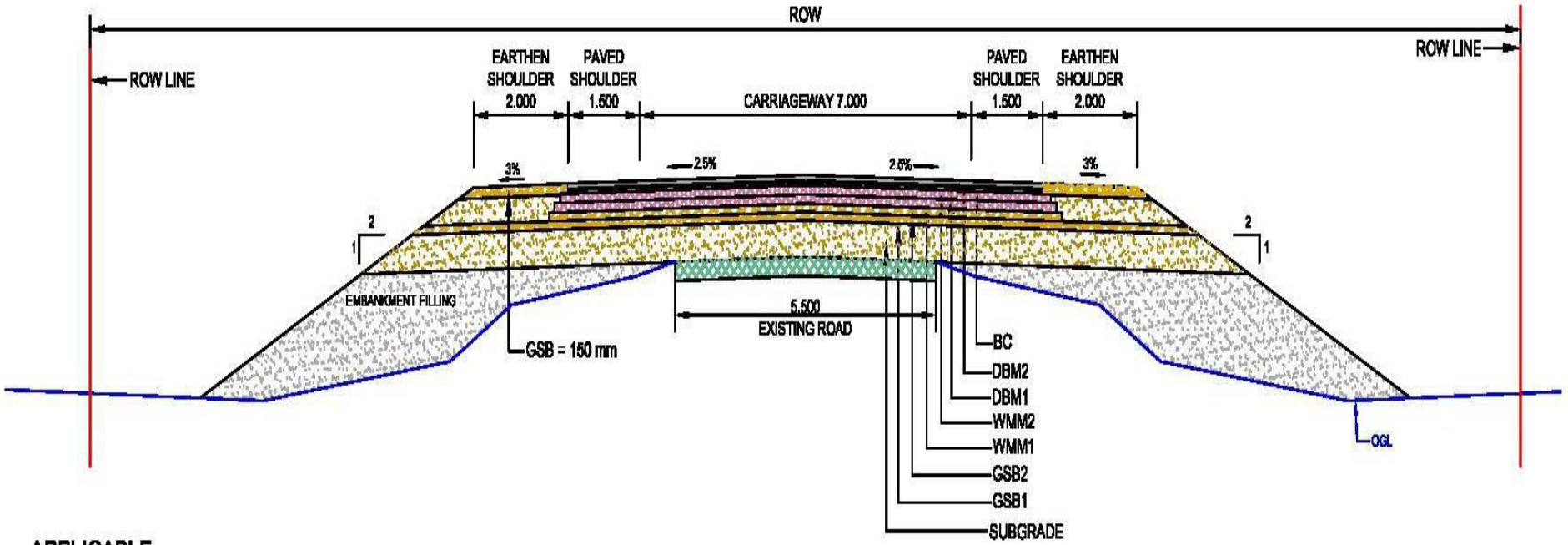
13 Change of Scope

The length of Structures and bridges specified herein above shall be treated as an approximate assessment. The actual lengths as required on the basis of detailed investigations shall be determined by the Contractor in accordance with the Specifications and Standards. Any variations in the lengths specified in this Schedule-B shall not constitute a Change of Scope, save and except any variations in the length arising out of a Change of Scope expressly undertaken in accordance with the provisions of Article 13.

Annex-1 (Schedule : B)



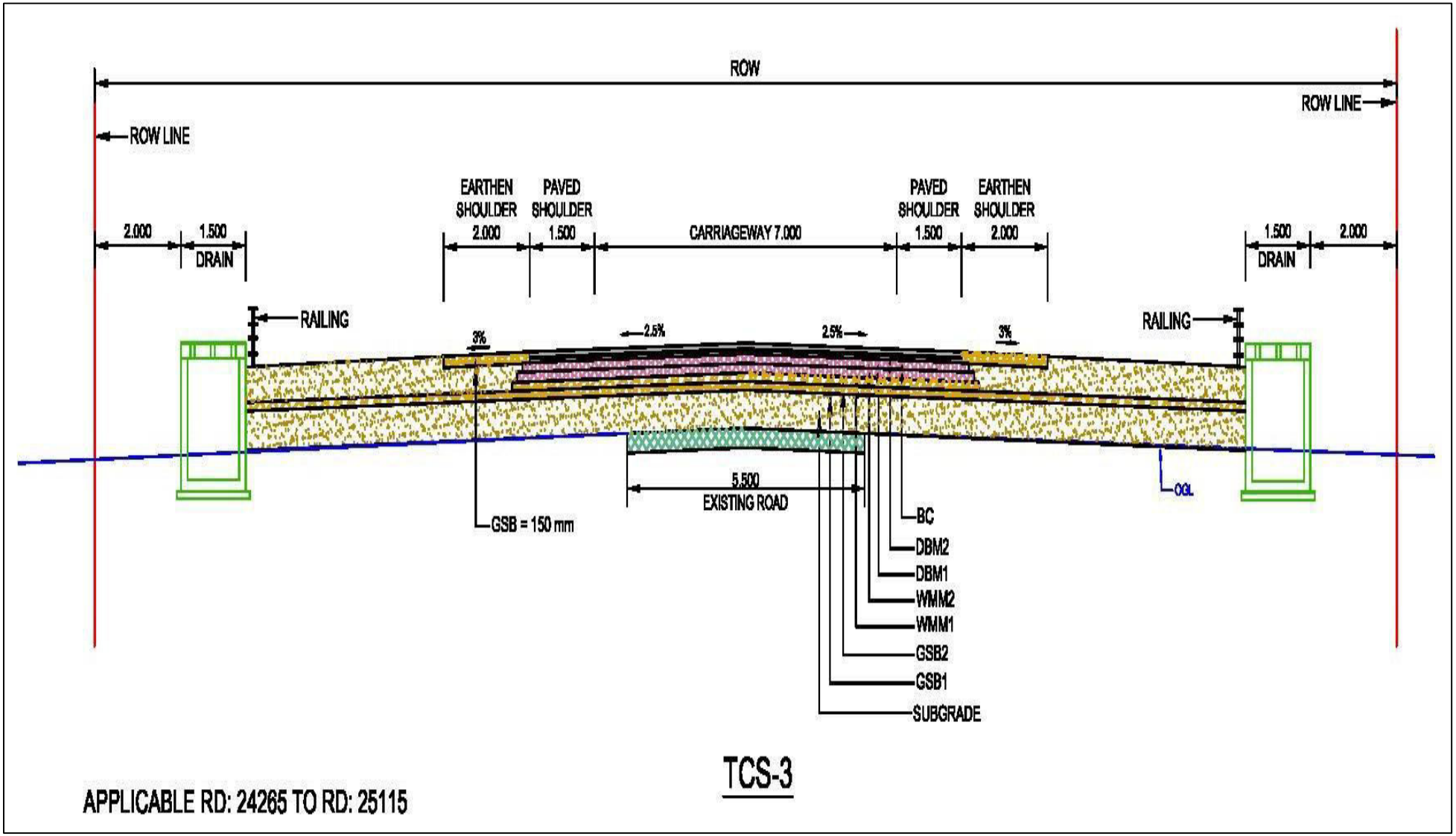

ROW
0.500 Shyness
0.500 Shyness
ROW LINE
ROW LINE
1.500
FOOTPATH
2.000 M
PAVER BLOCK
7.000 M
CARRIAGEWAY
1.500M
MEDIAN
7.000 M
CARRIAGEWAY
2.000 M
PAVER BLOCK
1.500
FOOTPATH
7.500 M
7.500 M
CHEQUERED TILE
DRAINAGE PIPE
Metal Crash Barrier
Metal Crash Barrier
Slope 2.5%
Slope 2.5%
3.0%
3.0%
2
1
2
1
BC
DBM2
DBM1
WMM2
WMM1
GSB2
GSB1
SUBGRADE
EXISTING ROAD
EMBANKMENT FILLING
OGL
TCS-1A
APPLICABLE RD: 650 TO RD: 1465
RD: 16560 TO RD: 17720
RD: 18280 TO RD: 19115

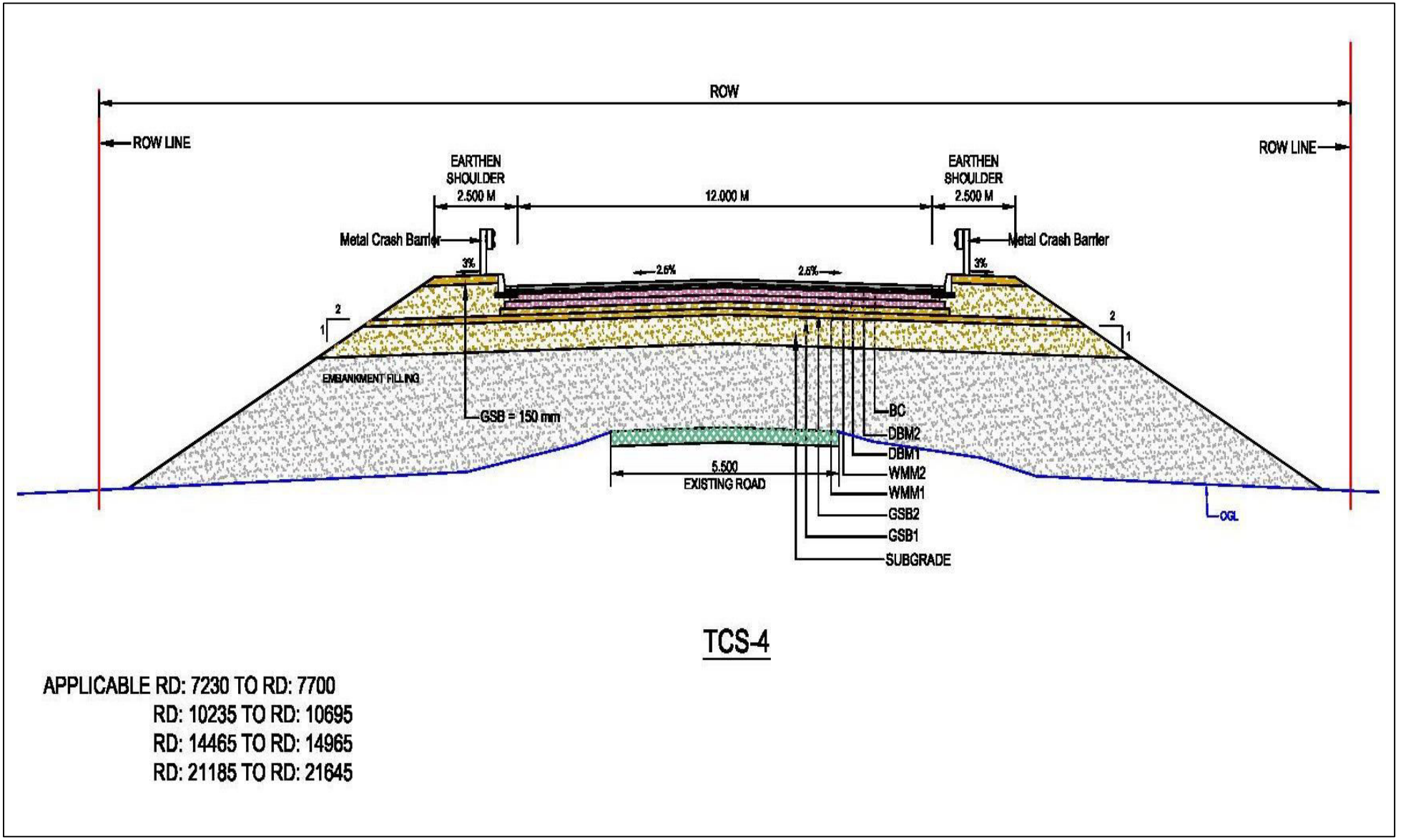


APPLICABLE

RD: 1465 TO RD: 5025	RD: 15115 TO RD: 15865
RD: 5425 TO RD: 7230	RD: 19115 TO RD: 21185
RD: 7700 TO RD: 10235	RD: 21645 TO RD: 24265
RD: 10695 TO RD: 14465	RD: 25115 TO RD: 26450

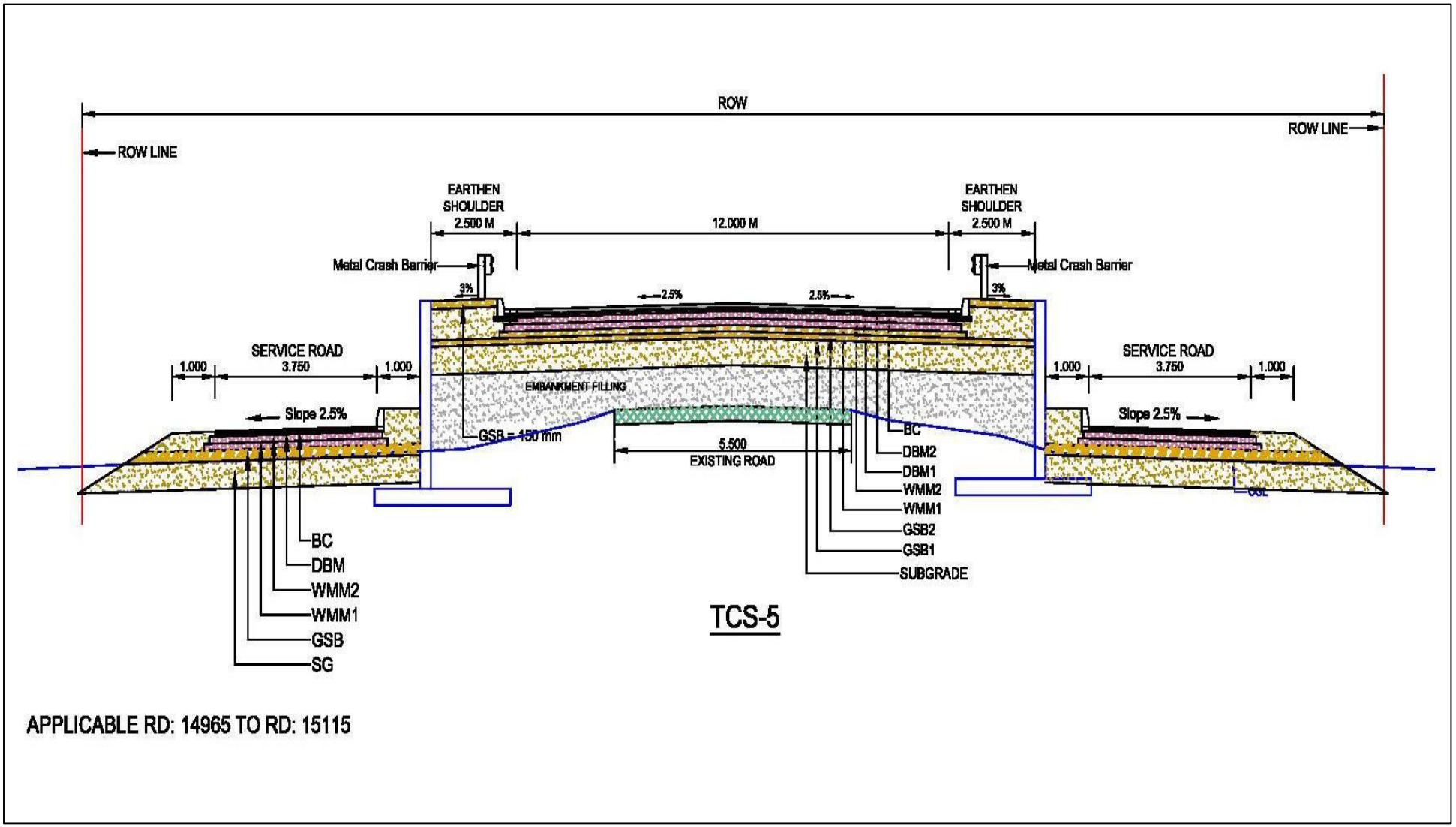
TCS-2

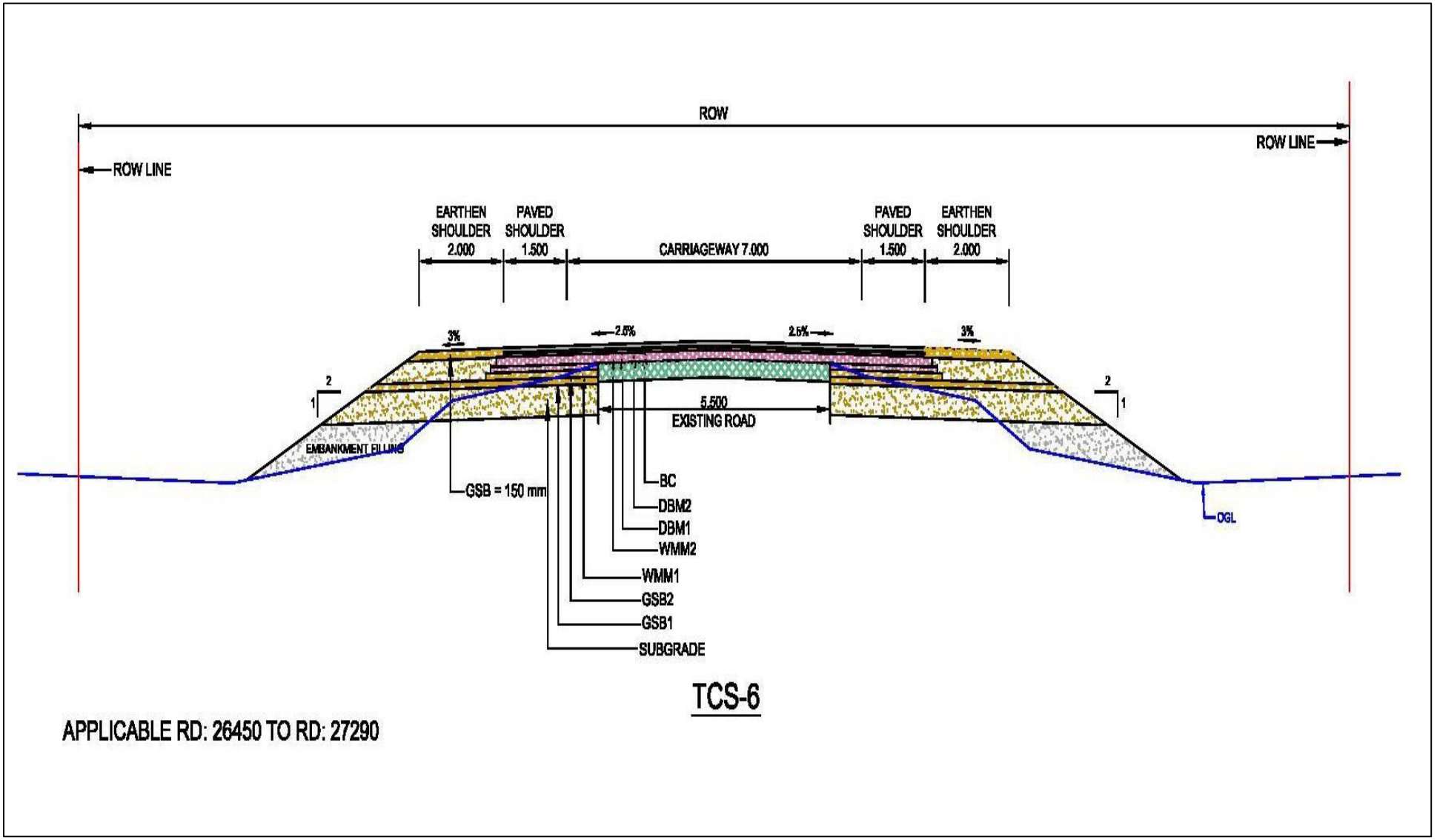

ROW
ROW LINE
ROW LINE
EARTHEN SHOULDER 2.000
PAVED SHOULDER 1.500
CARRIAGEWAY 7.000
PAVED SHOULDER 1.500
EARTHEN SHOULDER 2.000
2.000
1.500 DRAIN
1.500 DRAIN
2.000
RAILING
RAILING
3%
2.5%
2.5%
3%
5.500 EXISTING ROAD
GSB = 150 mm
OGL
BC
DBM2
DBM1
WMM2
WMM1
GSB2
GSB1
SUBGRADE
TCS-3
APPLICABLE RD: 24265 TO RD: 25115

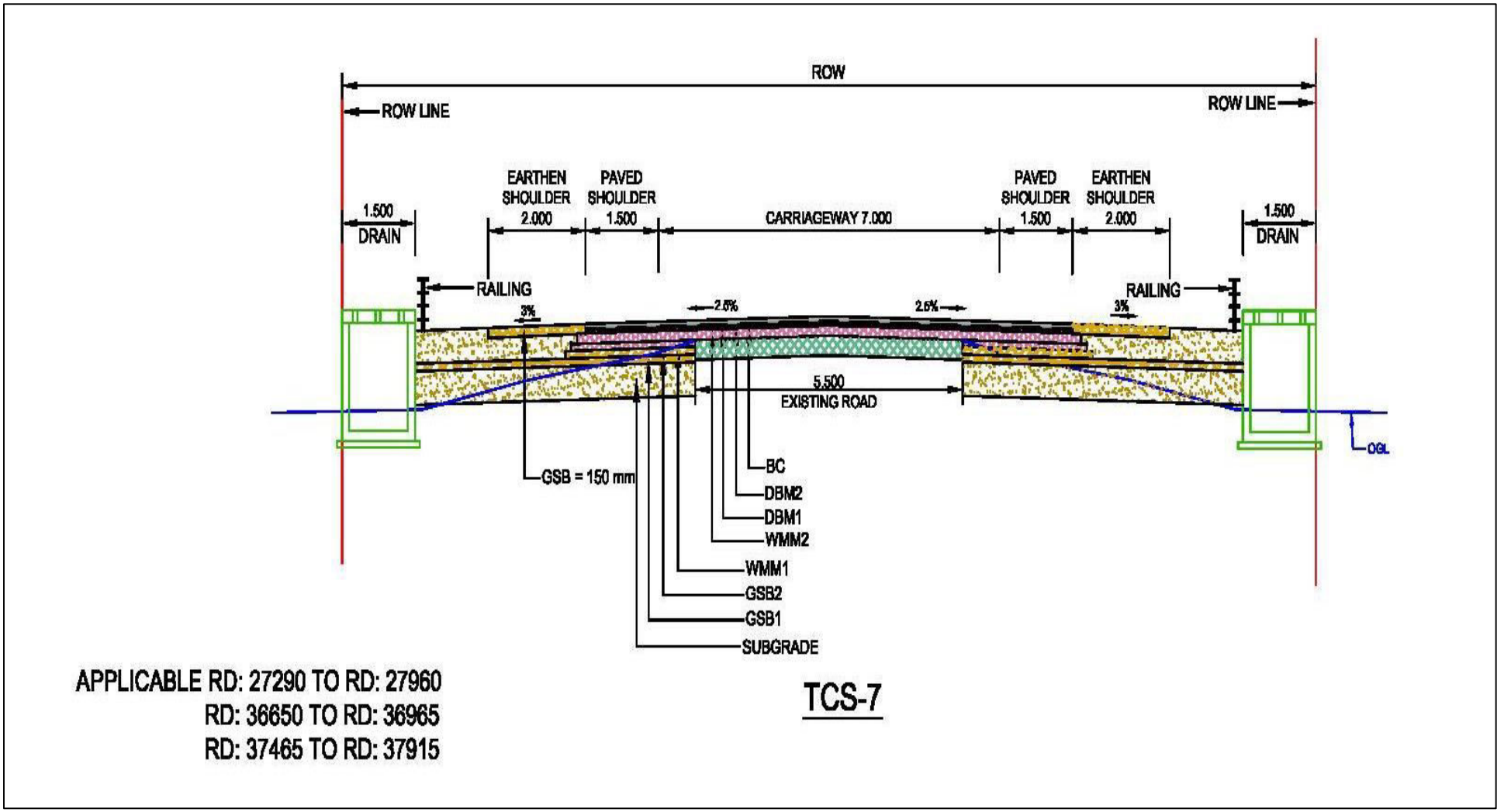


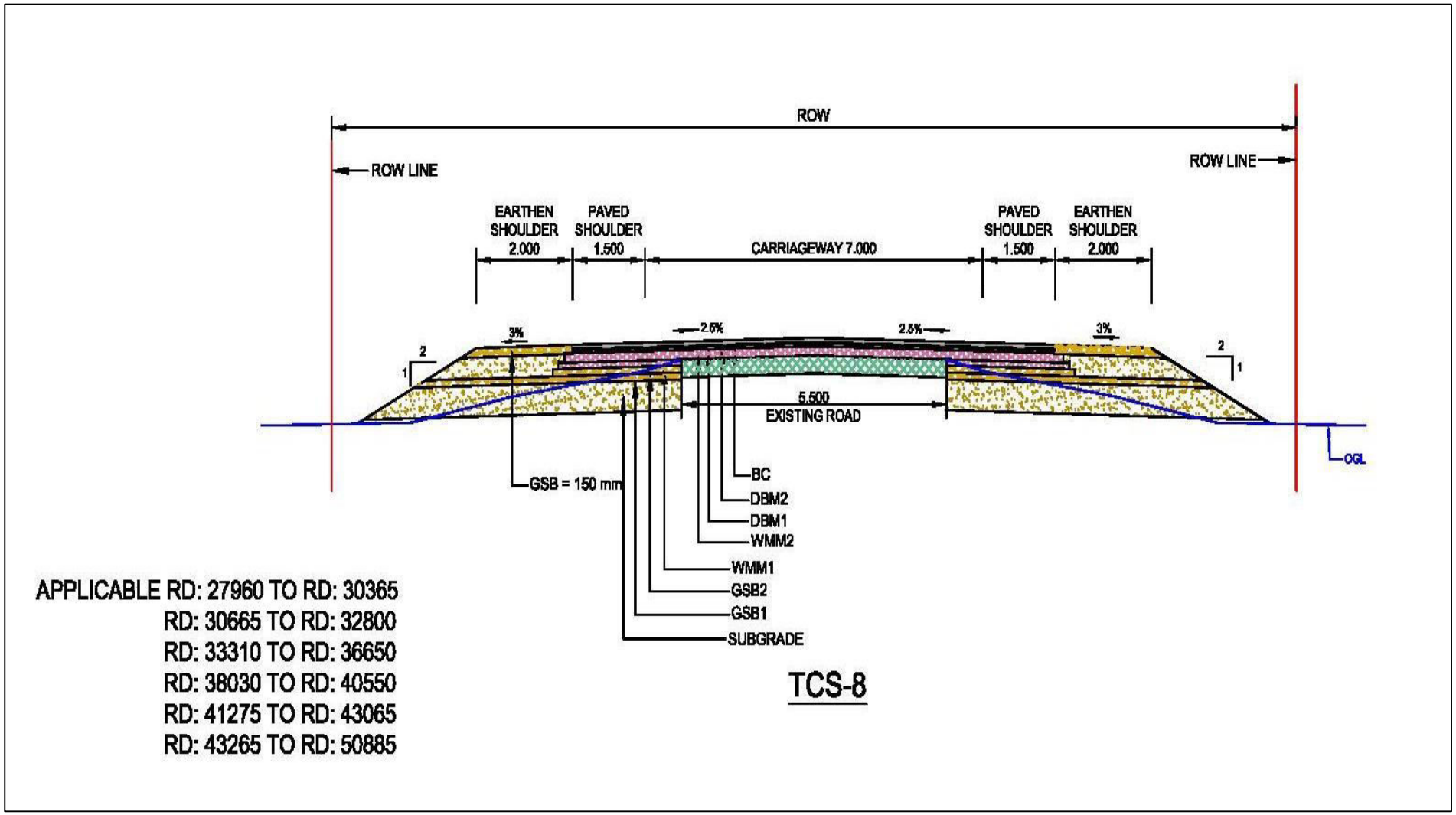
TCS-4

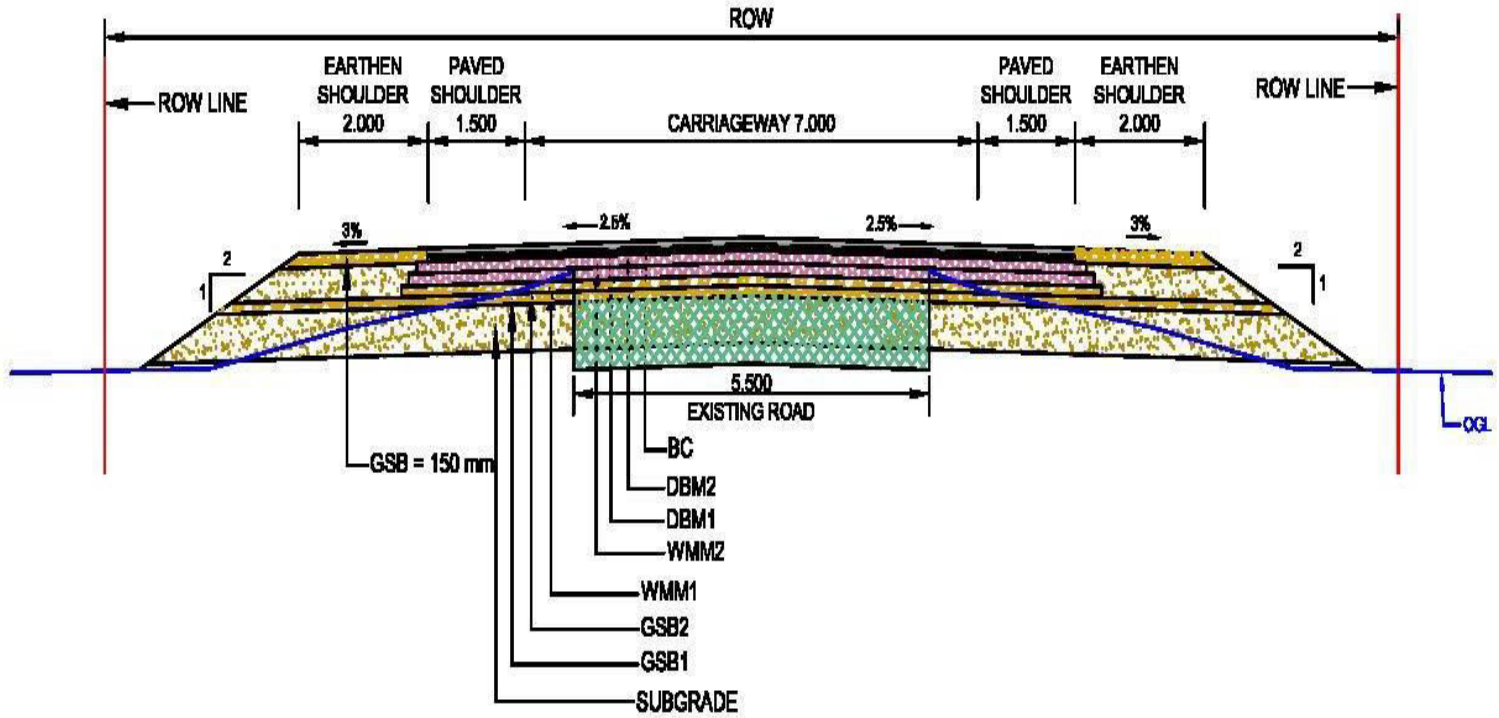
APPLICABLE RD: 7230 TO RD: 7700
RD: 10235 TO RD: 10695
RD: 14465 TO RD: 14965
RD: 21185 TO RD: 21645


ROW
ROW LINE
ROW LINE
EARTHEN SHOULDER 2.500 M
12.000 M
EARTHEN SHOULDER 2.500 M
Metal Crash Barrier
Metal Crash Barrier
3%
2.5%
2.5%
3%
SERVICE ROAD 3.750
1.000
1.000
EMBANKMENT FILLING
Slope 2.5%
GSB = 150 mm
5.500 EXISTING ROAD
SERVICE ROAD 3.750
1.000
1.000
Slope 2.5%
BC
DBM2
DBM1
WMM2
WMM1
GSB2
GSB1
SUBGRADE
BC
DBM
WMM2
WMM1
GSB
SG
TCS-5
APPLICABLE RD: 14965 TO RD: 15115


ROW
ROW LINE
ROW LINE
EARTHEN SHOULDER 2.000
PAVED SHOULDER 1.500
CARRIAGEWAY 7.000
PAVED SHOULDER 1.500
EARTHEN SHOULDER 2.000
3%
2.5%
2.5%
3%
2
1
2
1
5.500
EXISTING ROAD
EMBANKMENT FILLING
GSB = 150 mm
BC
DBM2
DBM1
WMM2
WMM1
GSB2
GSB1
SUBGRADE
OGL
TCS-6
APPLICABLE RD: 26450 TO RD: 27290

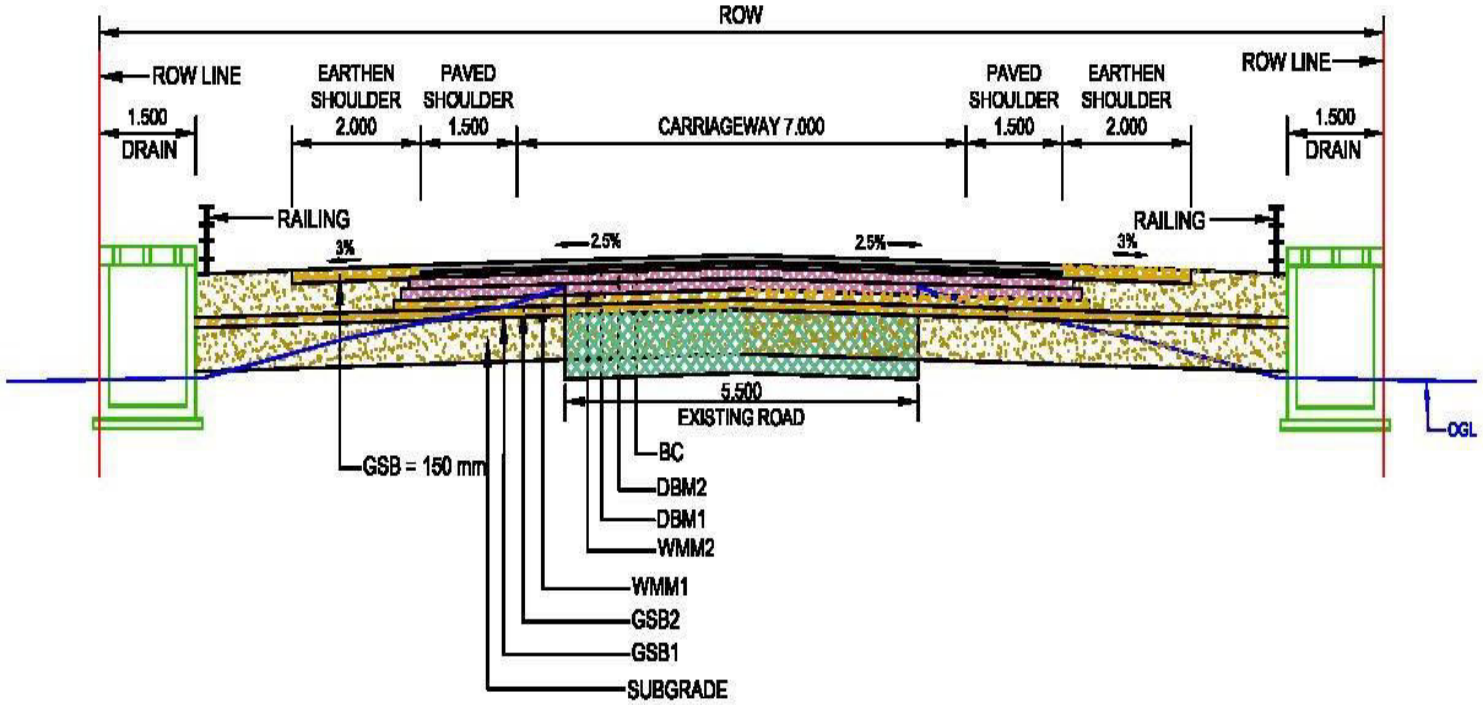

ROW
ROW LINE
ROW LINE
EARTHEN SHOULDER 2.000
PAVED SHOULDER 1.500
CARRIAGEWAY 7.000
PAVED SHOULDER 1.500
EARTHEN SHOULDER 2.000
1.500 DRAIN
1.500 DRAIN
RAILING
RAILING
3%
2.5%
2.5%
3%
5.500 EXISTING ROAD
OGL
GSB = 150 mm
BC
DBM2
DBM1
WMM2
WMM1
GSB2
GSB1
SUBGRADE
APPLICABLE RD: 27290 TO RD: 27960
RD: 36650 TO RD: 36965
RD: 37465 TO RD: 37915
TCS-7


ROW
ROW LINE
ROW LINE
EARTHEN SHOULDER 2.000
PAVED SHOULDER 1.500
CARRIAGEWAY 7.000
PAVED SHOULDER 1.500
EARTHEN SHOULDER 2.000
3%
2.5%
2.5%
3%
2
1
2
1
5.500
EXISTING ROAD
OGL
GSB = 150 mm
BC
DBM2
DBM1
WMM2
WMM1
GSB2
GSB1
SUBGRADE
APPLICABLE RD: 27960 TO RD: 30365
RD: 30665 TO RD: 32800
RD: 33310 TO RD: 36650
RD: 38030 TO RD: 40550
RD: 41275 TO RD: 43065
RD: 43265 TO RD: 50885
TCS-8



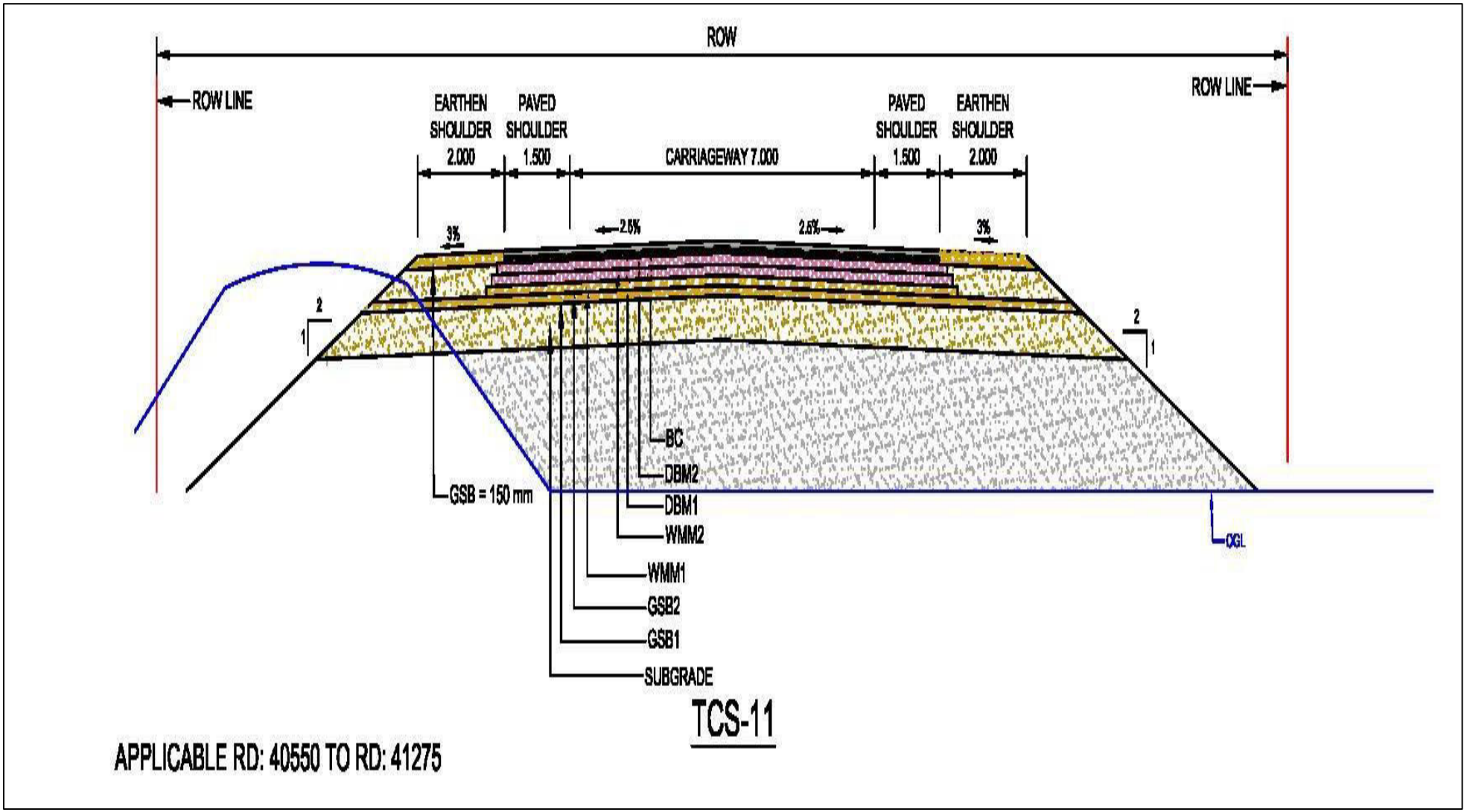
TCS-9

APPLICABLE RD: 30365 TO RD: 30665
RD: 43065 TO RD: 43265



TCS-10

APPLICABLE RD: 32800 TO RD: 33310
RD: 36965 TO RD: 37465
RD: 37915 TO RD: 38030


ROW
ROW LINE
ROW LINE
EARTHEN SHOULDER 2.000
PAVED SHOULDER 1.500
CARRIAGEWAY 7.000
PAVED SHOULDER 1.500
EARTHEN SHOULDER 2.000
3%
2.5%
2.5%
3%
2
1
2
1
BC
DBM2
DBM1
WMM2
WMM1
GSB2
GSB1
SUBGRADE
GSB = 150 mm
OGL
TCS-11
APPLICABLE RD: 40550 TO RD: 41275