

FIGURE VII - TYPICAL TWO TRACK SECTION

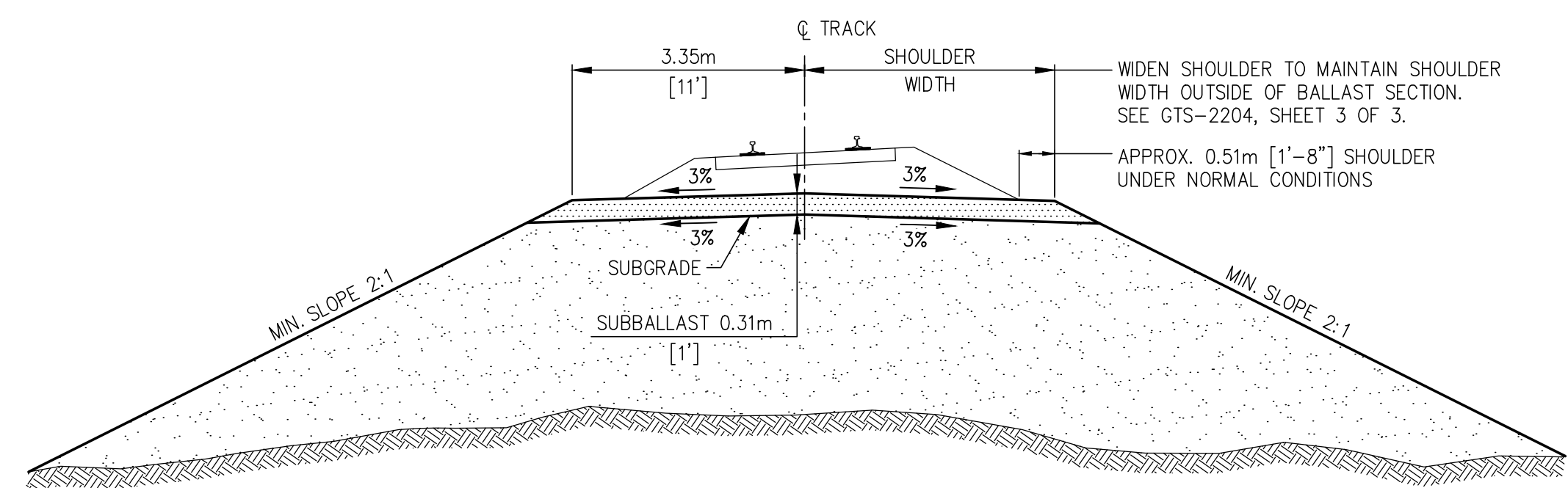


FIGURE VIII - CURVED SUPERELEVATED TRACK

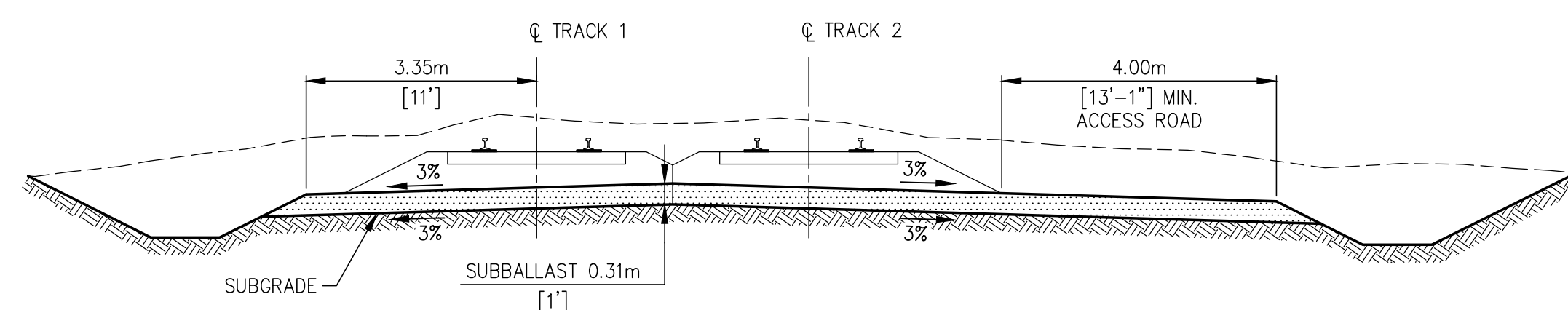


FIGURE IX - TYPICAL ACCESS ROAD SECTION

NOTES:

1. TRACK BED:
 - 1.A. TO ENSURE SATISFACTORY PERFORMANCE OF TRACK BED SOILS IT MAY BE NECESSARY:
 - 1.A.1. IN FILLS TO SELECT OR STABILIZE SOILS IN THE TOP OF SUBGRADE.
 - 1.A.2. IN CUTS TO STABILIZE INFERIOR SOILS IN PLACE OR EXCAVATE AND REPLACE THEM.
 - 1.A.3. IN ANY CASE TO PROVIDE A 3% GRADED FILTER LAYER OF SUB-BALLAST TO AVOID PUMPING OF SUBGRADE MATERIALS INTO BALLAST.
 - 1.B. REQUIRED DEPTH OF SUB-BALLAST TO BE MINIMUM 12" (0.30 m). HOWEVER, DEPTH OF SUB-BALLAST MAY BE INCREASED DEPENDING ON THE STRENGTH OF SUBGRADE SOIL, AS DETERMINED BY THE GEOTECHNICAL ENGINEER. SUB-BALLAST MATERIAL TO BE MODIFIED GRANULAR B TYPE II, BASED ON ONTARIO PROVINCIAL STANDARD SPECIFICATIONS (OPSS 1010) AND SITE SPECIFIC GEOTECHNICAL RECOMMENDATIONS. RECYCLED MATERIALS SHALL NOT BE PERMITTED. TO PREVENT SUB-BALLAST LAYER SATURATION, THE % PASSING THE No. 200 SIEVE (75 µm) SHALL BE LIMITED TO LESS THAN 5%.
2. TRACK BED DIMENSIONS:
 - 2.A. SUB-BALLAST WIDTH IS 22' (6.71 m) FROM SHOULDER TO SHOULDER.
 - 2.B. FOR MULTIPLE TRACKS THE WIDTH OF THE TRACK BED WILL BE INCREASED BY AN AMOUNT EQUAL TO THE DISTANCE BETWEEN CENTRES OF TRACKS. TRACK CENTRES SHALL BE IN ACCORDANCE WITH GO TRANSIT TRACK STANDARDS, LATEST ISSUE.
 - 2.C. ON CURVED SUPERELEVATED TRACK, TRACK BED TO BE WIDENED TO MAINTAIN SHOULDER WIDTH. REFER TO GTS-2204 SHEET 3 OF 3 FOR SUB-BALLAST WIDENING REQUIREMENTS.
3. EMBANKMENTS - COMMON MATERIAL:
 - 3.A. FOR FILLS HIGHER THAN 10'-0" (3.00 m), SLOPES SHALL BE EITHER 2:1 OR SPECIALLY DESIGNED BY A GEOTECHNICAL ENGINEER.
 - 3.B. SIDEHILL FILLS: THE CONSTRUCTION OF SIDEHILL FILLS INVOLVES THE STABILITY OF THE NATURAL SLOPES.
 - 3.B.1. THE OLD SURFACE SHALL BE THOROUGHLY STRIPPED, ROUGHED OR STEPPED.
 - 3.B.2. DRAINAGE SHALL BE PROVIDED WHERE REQUIRED TO INTERCEPT WATER ON THE UPHILL SIDE FROM SEEPING ALONG THE FILL-SLOPE INTERFACE.
 - 3.B.3. WHERE IT IS NOT REASONABLY POSSIBLE TO PROVIDE AN ADEQUATE UPHILL SLOPE, AN ADDED WIDTH OF DITCH OR OTHER PROTECTION SHALL BE PROVIDED ON THE UPHILL SIDE OF THE FILL.
4. EXCAVATIONS- COMMON MATERIAL:
 - 4.A. IN EVERY SOIL TYPE THE CONTROL NECESSARY TO MAINTAIN THE CUT SECTION AND TO REDUCE REQUIREMENTS FOR SLOPE RESTORATION AND DITCH CLEANING SHOULD BE A CONSIDERATION IN DESIGN. BERMS, DRAINAGE, EROSION PROTECTION, FILTER-LAYERS, VEGETATION AND SLOPE ANGLE SELECTION MAY BE USED.
 - 4.B. BERMS ARE TO BE DETERMINED BY A GEOTECHNICAL ENGINEER AND THROUGH A SLOPE STABILITY ANALYSIS.
 - 4.C. ROCK: STABILITY OF ROCK SLOPES IS GOVERNED BY MATERIALS IN THE SLOPE, AND SLOPE ANGLES SHOULD BE CHOSEN INDEPENDENTLY EVEN IN THE SAME CUT FOR SOUND ROCK, WEATHERED OR SHATTERED ROCK, AND OVERBURDEN.
 - 4.D. WHERE PERMANENT BENCHES OR ROCK DITCHES ARE TO INTERCEPT FALLING ROCK, ACCESS SHOULD BE PROVIDED FOR PERIODIC REMOVAL OF DEBRIS.
5. DITCHES:
 - 5.A. IN EXCAVATION, WIDE DITCHES ARE DESIRABLE WHERE SLOUGHED MATERIAL TENDS TO ACCUMULATE. IN ADDITION, WIDE DITCHES PROVIDE STORAGE SPACE FOR DEBRIS AND WORKING SPACE FOR EQUIPMENT.
 - 5.B. IN ROCK EXCAVATIONS, DITCH SHOULD BE DESIGNED WITH AMPLE WIDTH TO COLLECT ROCKFALL MATERIAL, KEEP IT OUT OF THE TRACK AREA AND PERMIT ECONOMICAL REMOVAL OF DEBRIS. IN LOCATIONS WHERE SLOPE OF HIGH CUT FACE MAY CAUSE STONES TO BOUNCE ACROSS THE DITCH ONTO TRACK, A SPECIAL ROCK DITCH SEPARATED FROM REGULAR DITCH BY AN INTERCEPTOR WALL SHOULD BE CONSIDERED.
6. SURFACE DRAINAGE:
 - 6.A. THE DITCH GRADE WILL NORMALLY BE GOVERNED BY THE TRACK GRADE, PARTICULARLY IN LONG CUTS WHEN DITCH IS CONSTRUCTED IN EARTH MATERIALS. THE MINIMUM GRADE MUST NOT BE LESS THAN 0.3 % TO MINIMIZE SEDIMENTATION. LIKewise TO PREVENT EROSION, THE MAXIMUM GRADE SHOULD BE DETERMINED BY THE STORM WATER MANAGEMENT ENGINEER.
 - 6.B. SEEPAGE WATER OCCURRING ON THE FACE OF A SLOPE MAY BE INTERCEPTED AND CONDUCTED AWAY ON BENCHES. THESE BENCHES SHOULD BE SLOPED BACK FROM THE FACE AND THENCE LATERALLY, AND LINED IF IT IS IMPORTANT TO PREVENT INFILTRATION.
7. ALL DITCH DIMENSIONS SHOWN ARE MINIMUM DIMENSIONS.

METRIC CONVERSION: 1 inch=25.4mm, 1 foot=304.8mm

2	23/10/31	UPDATED DITCH AND SUB-BALLAST DETAILS, ADDED ACCESS ROAD SECTION
1	19/01/25	ADDED METRIC CONVERSION, REVISED SUB-BALLAST SUPPLY REQUIREMENT
No.	Date	Revision
		By Approved

Standard / TYPICAL EMBANKMENTS & EXCAVATIONS TRACK BEDS FOR MAIN TRACK

Drawn NA Checked SJ Approved VP Engineering & Asset Management - Track



Date OCTOBER 31/2023 Plan Number GTS-2204 Rev 2

REFERENCE: TS-2204_SH2_R3 Sheet 2 OF 3