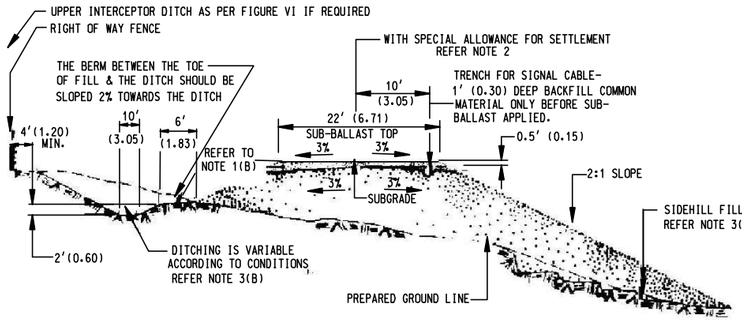

FIGURE 1

COMMON MATERIAL EMBANKMENT

UP TO 10 FOOT (3.05) FILL

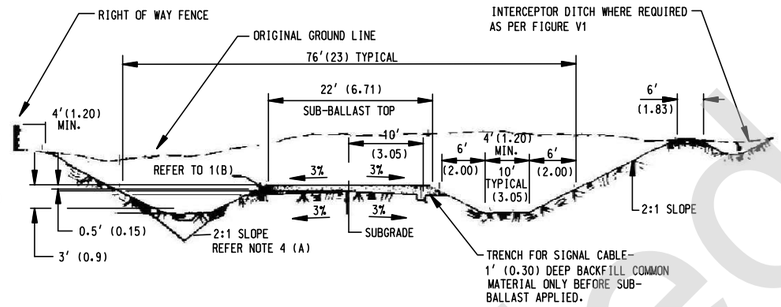

FIGURE 1V

COMMON MATERIAL EXCAVATION

UP TO 10 FOOT (3.05) CUT

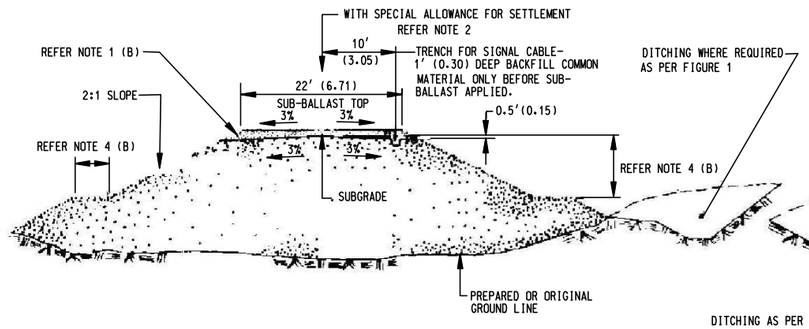

FIGURE I I

COMMON MATERIAL EMBANKMENT

OVER 10 FOOT (3.05) FILL - SPECIAL DESIGN

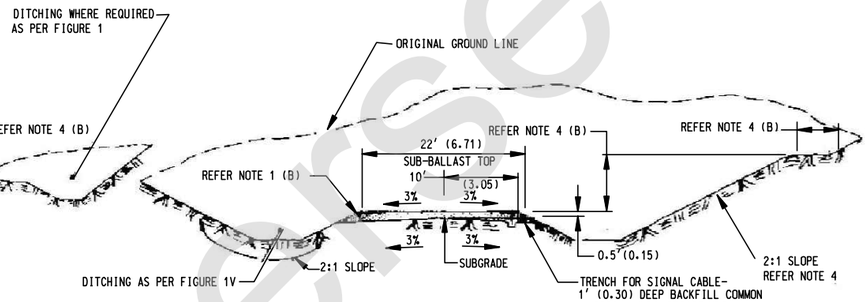

FIGURE V

COMMON MATERIAL EXCAVATION

OVER 10 FOOT (3.05) CUT - SPECIAL DESIGN

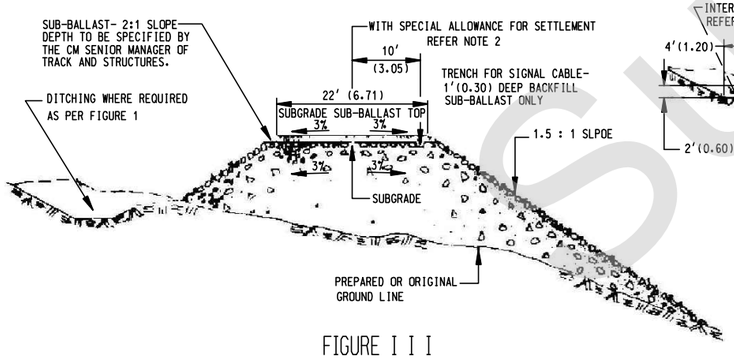

FIGURE I I I

ROCK EMBANKMENT

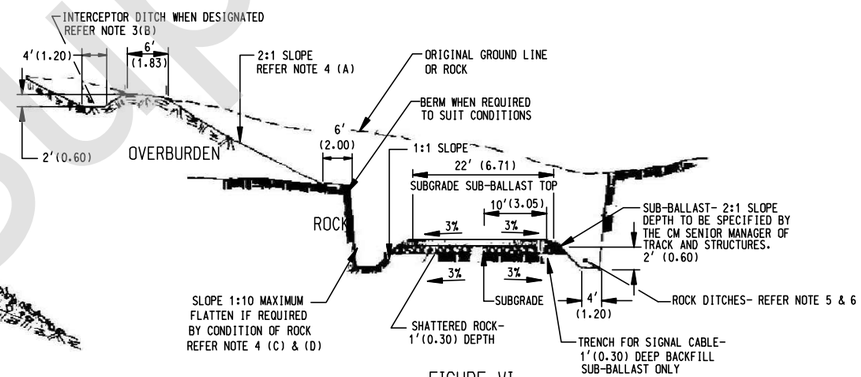

FIGURE VI

ROCK EXCAVATION

1. ROADBED:
   (A) TO ENSURE SATISFACTORY PERFORMANCE OF ROADBED SOILS IT MAY BE NECESSARY:
      1. IN FILLS TO SELECT OR STABILIZE SOILS IN THE TOP OF SUBGRADE.
      2. IN CUTS TO STABILZE INFERIOR SOILS IN PLACE OR EXCAVATE AND REPLACE THEM.
      3. IN ANY CASE TO PROVIDE A 3¼ GRADED FILTER LAYER OF SUB-BALLAST TO AVOID PUMPING OF OF SUBGRADE MATERIALS INTO BALLAST.
   (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 CM SENIOR MANAGER OF TRACK AND STRUCTURES. SUB-BALLAST MATERIAL TO BE MODIFIED GRANULAR B TYPE II, OR APPROVED EQUIVALENT, BASED ON ONTARIO PROVINCIAL STANDARD SPECIFICATIONS (OPSS 1010) AND SITE SPECIFIC GEOTECHNICAL RECOMMENDATIONS. RECYCLED MATERIALS SHALL NOT BE PERMITTED. TO PREVENT SUBBALLAST LAYER SATURATION, IT IS RECOMMENDED THAT THE % PASSING THE 200 SIEVE (75 μm) BE < 5%.
2. ROADBED DIMENSIONS:
   (A) ALTHOUGH THE WIDTH OF ROADBED CAN BE STANDARDIZED OVER THE LENGTH OF A NEW LINE, TRACK SHOULDERS SHOULD BE WIDER ON FILLS RESTING ON FOUNDATIONS THAT WILL SETTLE. THE WIDTH CHOSEN SHOULD BE BASED ON THE ESTIMATE OF THE ULTIMATE SETTLEMENT OF BOTH FOUNDATION & FILL.
   (B) SUB-BALLST WIDTH OF 22' (6.71M) IS AN ABSOLUTE DIMENSION MEASURED AT 1'-6" (0.45 M) BELOW BASE OF RAIL. IF THE 1'-6" (0.45 M) DIMENSION VARIES ± ( ) THE SUB BALLAST WIDTH SHOULD BE ADJUSTED (±) ACCORDINGLY.
   (C) FOR MULTIPLE TRACKS THE WIDTH OF THE ROADBED WILL BE INCREASED BY AN AMOUNT EQUAL TO THE DISTANCE BETWEEN CENTRES OF TRACKS. (TRACK CENTRES SHALL BE IN ACCORDANCE WITH GO TRACK STANDARDS SECTION 19.3 TRACK CLEARANCES AND CENTERS, LATEST ISSUE.
   (D) ON CURVED SUPERELEVATED TRACK, ROADBED TO BE WIDENED TO MAINTAIN SHOULDER WIDTH.
3. EMBANKMENTS- COMMON MATERIAL:
   (A) FOR FILLS UP TO 10'-0" (3.00M). MINIMUM SLOPES WITH COMMON MATERIAL TO BE 2:1. FOR FILLS OVER 10'-0" (3.00M), SLOPES SHALL BE EITHER 2:1, OR SPECIAL DESIGN SLOPE IF SPECIFIED, WITH BERMS IF REQUIRED.
   (B) SIDEHILL FILLS:
      THE CONSTRUCTION OF SIDEHILL FILLS INVOLVES THE STABILITY OF THE NATURAL SLOPES.
      1. THE OLD SURFACE SHOULD BE THOROUGHLY STRIPPED. ROUGHED OR STEPPED: AND
      2. DRAINAGE PROVIDED TO INTERCEPT WATER ON THE UPHILL SIDE FROM SEEPING ALONG THE FILL-SLOPE INTERFACE.
      3. WHERE IT IS NOT POSSIBLE ECONOMICALLY TO PROVIDE AN ADEQUATE FACTOR OF SAFETY FOR THE UPHILL SLOPE, AN ADDED WIDTH OF DITCH OR OTHER PROTECTION SHOULD BE PROVIDED ON THE UPHILL SIDE OF THE FILL.
4. EXCAVATIONS- COMMON MATERIAL:
   (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.
   (B) IF BERMS ARE REQUIRED, THE WIDTH OF BERM AS A GENERAL RULE SHOULD NOT BE LESS THAN ONE-HALF THE VERTICAL RISE. IN DEEPER CUTS, IF ACCESS IS REQUIRED. BERMS SHOULD BE AT LEAST 10'-0" (3.00M) WIDE.
   (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 OVERBURNDEN.
   (D) WHERE PERMANENT BENCHES OR ROCK DITCHES ARE TO INTERCEPT FALLING ROCK, ACCESS SHOULD BE PROVIDED FOR PERIODIC REMOVAL OF DEBRIS.
5. DITCHES:
   (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.
   (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:
   (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 SHOULD NOT BE LESS THAN 0.3 % TO MINIMIZE SEDIMENTATION. LIKEWISE TO PREVENT EROSION THE MAXIMUM GRADE SHOULD BE DETERMINED BY THE CM SENIOR MANAGER OF TRACK AND STRUCTURES.
   (B) SEEPAGE WATER OCCURING 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 ARE SHOWN MINIMUM DIMENSIONS.
8. ROADBEDS ARE TO BE CONSTRUCTED OR UPGRADED IN ACCORDANCE WITH GO TRANSIT STANDARDS, LATEST ISSUE.

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

No.	Date	Revision	By Approved
1	19/01/25	ADDED METRIC CONVERSION , REVISED SUBBALLAST SUPPLY REQUIREMENT	

Standard

TYPICAL EMBANKMENTS & EXCAVATIONS ROADBEDS FOR MAIN TRACKS

Drawn GEK Checked GWM Approved VP Engineering & Asset Management

METROLINX

Date SEPT 15/2017 Plan Number GTS-2204 Rev 1

REFERENCE: TS-2204_SH1_R3