

GENERAL NOTES

1. THE CONTRACTOR IS RESPONSIBLE FOR MEANS AND METHODS FOR CONSTRUCTION SITE SAFETY AND SHALL BE IN COMPLIANCE WITH OH&S AND CONSTRUCTION SAFETY PLAN.
2. STATIONING IS ALONG ROAD CENTERLINE UNLESS NOTED OTHERWISE.
3. PROFILES AND SPOT ELEVATIONS ARE FINISHED GRADE UNLESS NOTED OTHERWISE.
4. VERIFY LAYOUT WITH THE ENGINEER BEFORE EXECUTING THE ASSOCIATED WORK INCLUDING ELEVATION, DIMENSIONS, AND ANY CONFLICTS WITH EXISTING INFRASTRUCTURE.
5. THE CONTRACTOR IS RESPONSIBLE FOR ALL BURIED UTILITY LOCATES. THE LOCATIONS OF ANY UTILITIES SHOWN ON THE DRAWINGS SHALL NOT BE RELIED UPON.

ROAD DESIGN

1. ROAD DESIGN PARAMETERS:

| | |
|----------------------------------|---|
| MINIMUM HORIZONTAL CURVES RADIUS | 22 m. |
| DESIGN SPEED | 30 km/h |
| ROAD VERTICAL CURVE | $K > 5.0$ |
| ROAD MAX GRADE | 8.0% |
| AXLE LOAD | 1500 kg DUAL WHEEL 800 kPa TIRE PRESSURE. |
| MAXIMUM RUT DEPTH | 40 mm |
2. ROADS WILL REQUIRE PERIODIC MAINTENANCE INCLUDING ADDING SURFACING MATERIAL. GRADING MAINTENANCE FREQUENCY WILL DEPEND ON USAGE, WEATHER, AND SUBGRADE VARIABILITY.

QUANTITIES

1. MASS HAUL VOLUMES ARE INTENDED TO REPRESENT ROUGH GRADING WORK AND DO NOT INCLUDE: STRIPPING, ROAD BASE, ROAD SURFACING, SUBGRADE REWORK, TURBINE FOUNDATION EXCAVATION OR BACKFILL, BOOM ASSEMBLY AREA, CRANE PAD, INSULATING GRAVEL, OR RECLAMATION WORK. MASS HAUL VOLUMES ARE NOT STRICTLY ACCURATE BUT CONSIDERED APPROPRIATE FOR THE INTENDED PURPOSE. WHEREAS THE MASS HAUL VOLUMES ARE PROVIDED AS A REASONABLY CLOSE REPRESENTATION OF ROUGH GRADING QUANTITIES, THE WORKS SHALL NEVERTHELESS BE CONSTRUCTED TO THE LINES, GRADES, AND THICKNESSES SHOWN ON THE DRAWINGS AND NOT NECESSARILY TO THE MASS HAUL QUANTITIES.
2. QUANTITIES, LOCATIONS, ORIENTATIONS, EXTENTS, AND DETAILS OF WATER RELATED WORKS INCLUDING CREEK CROSSINGS, CULVERTS, TRENCH BLOCKS, DRAINS, SILT FENCE, GEOTEXTILE, DITCH BAFFLES, SAFETY BERM BREAKS, AND STRIPPING STOCKPILE BREAKS ARE SUBJECT TO FIELD REVIEW AND MODIFICATION BY THE ENGINEER.
3. ORIGINAL GROUND BASED ON SURVEY PROVIDED BY ARCTIC UAV.
4. SURFACE AND SUBSURFACE CONDITIONS ARE ESTIMATES BASED ON VISUAL INSPECTION AND EXPECTATIONS BASED ON OTHER PROJECT EXPERIENCE IN THE AREA. NO SITE SPECIFIC GEOTECHNICAL INVESTIGATION WORK HAS BEEN COMPLETED. DESIGNS SUBJECT TO CHANGE FURTHER TO OBSERVATION AND TESTING CONDUCTED BY THE GEOTECHNICAL ENGINEER DURING CONSTRUCTION.

MATERIALS LEGEND

| | | | |
|--|-----------------|--|----------------------|
| | OVERBURDEN | | BEDROCK |
| | COMMON FILL | | ARMOUR |
| | GRANULAR FILL | | COARSE SAND |
| | STRUCTURAL FILL | | INSULATING GRAVEL |
| | GRANULAR FILTER | | SEMI-IMPERVIOUS FILL |
| | CONCRETE | | ORGANICS |

ABBREVIATIONS

| | | | |
|---------|-----------------------------------|----------|-----------------------------------|
| BC | BEGINNING OF CURVE | MAX | MAXIMUM |
| BE | BOUNDARY ELEMENT | MIN | MINIMUM |
| BOT | BOTTOM | NF | NEAR FACE |
| C/W | COMPLETE WITH | NTS | NOT TO SCALE |
| CJ | CONSTRUCTION JOINT | OD | OUTSIDE DIAMETER |
| CL | CENTERLINE | OMC | OPTIMAL MOISTURE CONTENT |
| CLR | CLEAR | OUTLET Z | CULVERT OUTLET INVERT |
| CLSM | CONTROLLED LOW STRENGTH MATERIAL | PIL | PILASTER |
| CON J | CONTRACTION JOINT | PL | PLATE |
| CONC | CONCRETE | PROJ | PROJECTION |
| CTR J | CONTROL JOINT | R/W | REINFORCE WITH |
| DWG | DRAWING | REF | REFERENCE |
| EA | EACH | SIM | SIMILAR |
| EC | END OF CURVE | SPEC | SPECIFICATIONS |
| EF | EACH FACE | STA | STATION |
| EL | ELEVATION | STD | STANDARD |
| EMP | ENVIRONMENTAL MANAGEMENT PLAN | STIF | STIFFENER |
| EW | EACH WAY | T&B | TOP AND BOTTOM |
| EXP J | EXPANSION JOINT | TDC | TOP DEAD CENTER |
| FF | FAR FACE | TOF | TOP OF FOUNDATION |
| HOR | HORIZONTAL | THK | THICK |
| INLET Z | CULVERT INLET ELEVATION | TYP | TYPICAL |
| INV | INVERT | U/S | UNDER SIDE |
| IP X | CURVE INTERSECTION POINT EASTING | VERT | VERTICAL |
| IP Y | CURVE INTERSECTION POINT NORTHING | VIP | VERTICAL CURVE INTERSECTION POINT |
| L-STA | ROAD STATIONING (HORIZONTAL) | WP | WORKING POINT |
| LG | LONG | WS | WATERSTOP |
| LLH | LONG LEG HORIZONTAL | WTG | WIND TURBINE GENERATOR |
| LLV | LONG LEG VERTICAL | | |



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| A | 23 | 03 | 16 | NEW DRAWING | BY | AM | AM |
| REV | Y | M | D | REVISION DESCRIPTION | DES | CHK | DRN |



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|---------------------------------------|--|--|--|--|--|--|--|
| FOR PERMITTING - NOT FOR CONSTRUCTION | | | | | | | |
| NUNAVUT NUKKISAUTIT CORPORATION | | | | | | | |
| ANURIQJUAK NUKKISAUTIT PROJECT | | | | | | | |
| CIVIL - GENERAL | | | | | | | |
| GENERAL NOTES | | | | | | | |
| DETAILS | | | | | | | |
| PROJECT NUMBER 1096-003 | | | | | | | |
| CADD NUMBER 4.3.015 | | | | | | | |
| DRAWING NUMBER 2111 | | | | | | | |

1. SCOPE

- THIS SPECIFICATION PROVIDES THE REQUIREMENTS FOR EARTHWORKS INCLUDING STRIPPING, EXCAVATION, MATERIAL PROPERTIES, FILL PLACEMENT INCLUDING BACKFILL.
- SPECIFICATIONS FOR ROCKWORKS, LANDSCAPING, GEOSYNTHETICS, AND CARE OF WATER ARE PROVIDED ON OTHER DRAWINGS.

2. GENERAL REQUIREMENTS

- COMPLY WITH ALL REGULATIONS, PERMITS, AND LICENSES INCLUDING NUNAVUT OCCUPATIONAL HEALTH AND SAFETY REGULATIONS. WHERE COMPLETE DIMENSIONS AND DETAILS ARE NOT SHOWN ON THE DRAWINGS, THE REMAINING ASPECTS OF WORK SHALL BE DESIGNED AND CONSTRUCTED IN ACCORDANCE WITH OHS REGULATIONS. ENGAGE THE SERVICES OF A QUALIFIED PROFESSIONAL ENGINEER AS REQUIRED.
- PREVENT SLOUGHING AND LOOSE SOIL FROM FALLING INTO THE EXCAVATIONS. PROVIDE TEMPORARY SHORING, BRACING AND UNDERPINNING, AS REQUIRED. CAREFULLY INSPECT ALL EXCAVATIONS BEFORE DOING ANY WORK IN THE EXCAVATIONS. LOOK FOR SIGNS OF CRACKS ABOVE SLOPES, SEEPAGE, AND ANY OTHER SIGNS OF SLOPE INSTABILITY. REMOVE SOIL BLOCKS, BOULDERS, LOOSE ROCK AND OTHER FRAGMENTS THAT MAY SLIDE OR ROLL INTO THE EXCAVATED AREAS.
- LOCATE AND PROTECT UTILITY LINES, SURVEY REFERENCE POINTS, INSTRUMENTATION, CULVERTS, AND ALL OTHER EXISTING FACILITIES BEFORE COMMENCING EARTHWORKS OPERATIONS.
- SEQUENCE, SCHEDULE, AND PERFORM ALL EARTHWORKS OPERATIONS TO MAXIMIZE AND MAKE THE MOST EFFICIENT USE OF ALL MATERIALS AND PROTECT AND PREVENT SUITABLE MATERIALS FROM BECOMING UNSUITABLE.
- PERFORM EARTHWORKS IN A MANNER THAT PROVIDES FOR POSITIVE DRAINAGE AND AVOIDS PONDING OF WATER FROM RAINFALL AND SNOWMELT, RUN-OFF, AND SEEPAGE. SUSPEND EARTHWORKS OPERATIONS DURING RAIN, SNOW, WET GROUND CONDITIONS, HIGH WINDS, OR OTHER CONDITIONS THAT MAY RESULT IN CONTAMINATION, SEDIMENTATION, EROSION OR LOSS OF MATERIAL. PROVIDE TEMPORARY MEASURES AND SLOPING OF SURFACES TO PREVENT WATER PONDING AND INFILTRATION. REMOVE, REPLACE, OR REWORK ANY FILL MATERIAL OR FOUNDATION IMPACTED BY SUCH CONDITIONS AT NO ADDITIONAL COST TO THE OWNER.

3. SUBMITTALS

- SUBMIT THE FOLLOWING IN ACCORDANCE WITH THE CONTRACT REQUIREMENTS AND SCHEDULE.
 - EARTHWORKS PLAN INCLUDING QUANTITY ESTIMATES, EQUIPMENT, STOCKPILE LOCATIONS, IMPORTED MATERIAL SOURCES AND ASSOCIATED TEST RESULTS.
 - WEEKLY PROGRESS REPORT INCLUDING QA/QC INCLUDING IN-SITU AND LABORATORY MATERIAL TESTING RESULTS SUMMARY TABLE, DESCRIPTIONS OF WORK IN PROGRESS AND COMPLETED WORKS, DEFICIENCIES AND MITIGATIVE MEASURES
 - REDLINE DRAWING MARKUPS INDICATING LOCATION AND EXTENT OF MATERIALS USED.
- DO NOT PROCEED WITH WORK ASSOCIATED WITH A SUBMITTAL UNTIL REVIEWED BY THE ENGINEER.
- SUBMITTAL REVIEW BY THE ENGINEER SHALL NOT RELIEVE THE CONTRACTOR FROM THE FULL RESPONSIBILITY OF THE WORK.

4. QUALITY ASSURANCE AND CONTROL

- THE FOLLOWING MATERIAL TESTING SHALL BE CONDUCTED AT A MINIMUM RATE OF ONE TEST PER SPECIFIED VOLUME. MORE FREQUENT TESTING SHALL BE DONE AS DEEMED APPROPRIATE BY THE ENGINEER BASED ON THE MATERIAL VARIABILITY AND WORK METHODS USED.

| TEST | STANDARD | VOLUME |
|--|------------|--------|
| PARTICLE SIZE DISTRIBUTION | ASTM D422 | 200 |
| MOISTURE-DENSITY RELATIONSHIP | ASTM D698 | 1000 |
| IN PLACE DENSITY | ASTM D2922 | 100 |
| IN PLACE MOISTURE CONTENT | ASTM D3017 | 100 |
| IN PLACE MOISTURE CONTENT VERIFICATION | ASTM D2216 | 1000 |
| PLASTICITY | ASTM D4318 | 500 |
- TESTING SHALL BE CONDUCTED AT UNIFORM SPACING OR REGULAR INTERVALS SO AS TO DEMONSTRATE CONSISTENCY OF THE ENTIRE WORK.
- TESTING SHALL BE COMPLETED BY AN AGENCY MEETING THE REQUIREMENTS OF ASTM D3740 USING CSA CERTIFIED TESTING EQUIPMENT AND QUALIFIED PERSONNEL.
- CO-OPERATE WITH AND PROVIDE ACCESS TO TESTING PERSONNEL AND THE ENGINEER FOR MATERIAL TESTING.
- THE ENGINEER MAY REJECT EARTHWORK MATERIALS AT THE SOURCE, IN TRANSPORT, IN STOCKPILES, OR IN PLACE.
- PROOF ROLLING SHALL CONSIST OF LOADING WITH A RUBBER TIRE VEHICLE HAVING A SINGLE AXLE LOAD OF 12 TO 15 TONNES.
- PROOF ROLL ALL SUBGRADE. IN AREAS EXHIBITING EXCESSIVE DEFLECTION OR FAILURE, REMOVE ANY UNSUITABLE MATERIAL AS INDICATED BY THE ENGINEER AND PREPARE SUBGRADE IN ACCORDANCE WITH THE SPECIFICATIONS. IF PROOF ROLLING FAILS AFTER SUBGRADE REPAIRS, IMPLEMENT ADDITIONAL REMEDIAL MEASURES AS INDICATED BY THE ENGINEER.
- PROOF ROLL ALL FINISHED ROAD SURFACES.

5. MATERIALS

- GENERAL
 - MATERIALS SHALL BE SOURCED FROM EXCAVATION, BORROW AREAS APPROVED BY THE ENGINEER, OR IMPORTED MATERIAL.
 - UNLESS OTHERWISE SPECIFIED, ROYALTY PAYMENTS AND PERMITTING ASSOCIATED WITH MATERIALS WILL BE THE RESPONSIBILITY OF THE CONTRACTOR.
 - ALL EARTHWORK MATERIALS SHALL BE FREE OF ROOTS, FROZEN MATERIAL, ORGANICS, AND ANY OTHER DELETERIOUS MATERIALS.
 - UNLESS SPECIFIED OTHERWISE, MATERIALS SHALL BE WELL-GRADED (COEFFICIENT OF CONFORMITY GREATER THAN 4 AND COEFFICIENT OF CURVATURE BETWEEN 1 AND 3) WHEN SAMPLED AND TESTED AFTER PLACEMENT, WITH THE RESULTS OF SIEVE ANALYSES PRODUCING A SMOOTH GRADATION CURVE, FALLING COMPLETELY WITHIN THE UPPER AND LOWER BOUNDS OF THE ENVELOPE, DEFINED BY STRAIGHT LINES DRAWN DIRECTLY BETWEEN THE SPECIFIED POINTS. THERE SHALL BE NO EXCESS OR DEFICIENCY OF ANY PARTICULAR GRAIN SIZE.
 - WHERE BLENDING IS REQUIRED, THOROUGHLY MIX MATERIALS IN A MANNER THAT PRODUCES THE SPECIFIED GRADATION, PRIOR TO PLACING OR STOCKPILING THE MATERIAL.
 - CRUSH, SCREEN, WASH, OR OTHERWISE PROCESS MATERIALS AS SPECIFIED OR REQUIRED.
- COMMON FILL SHALL HAVE A MAXIMUM PARTICLE SIZE OF 150 mm, SMOOTH GRADATION CURVE, LOW TO MEDIUM PLASTICITY, MAXIMUM PLASTICITY INDEX OF 10%, LIQUID LIMIT LESS THAN 40%, PLASTIC LIMIT LESS THAN 20%.
- SEMI-IMPERVIOUS FILL SHALL BE 75 mm MAXIMUM SIZE WITH A MINIMUM OF 25% PASSING THE 80 mm SIEVE. MATERIAL SHALL BE LOW TO MEDIUM PLASTICITY, MINIMUM PLASTICITY INDEX OF 10%, AND LIQUID LIMIT LESS THAN 40%.
- AGGREGATE MATERIALS
 - AGGREGATE MATERIALS SHALL CONSIST OF NON-ARGILLACEOUS, DENSE (SPECIFIC GRAVITY GREATER THAN 2.5), DURABLE, HARD, SOUND, ROCK CLAST FRAGMENTS EXHIBITING LESS THAN 12% WEIGHT LOSS AFTER FIVE (5) CYCLES IN ACCORDANCE WITH CSA A23.2-9A.
 - PIT RUN GRAVEL SHALL BE UNPROCESSED MATERIAL FROM AN ENGINEER APPROVED SOURCE WITH NO GRADATION REQUIREMENTS.
 - FOR COARSE SAND, THE SLOPE OF A PLOT OF THE ACTUAL PERCENT PASSING BY MASS FOR ANY CHOSEN SIEVE SIZE LARGER THAN 630 μ m AND A SECOND SIEVE SIZE THAT IS FIVE (5) TIMES THE CHOSEN SIEVE SIZE SHALL BE FLATTER THAN 15%.
 - ELECTRICAL INSULATING GRAVEL SHALL BE 5 TO 20 mm SIZE, CRUSHED, WASHED ROCK CLASTS, WITH ALL PIECES HAVING AT LEAST 2 FRACTURED FACES. THE MINIMUM WET RESISTIVITY SHALL BE 3000 ohm-m WITH SUPPORTING TEST RESULTS.
 - ARMOUR ROCK PARTICLES SHALL BE FREE FROM CRACKS, SEAMS, AND OTHER DEFECTS THAT WOULD INCREASE POTENTIAL FOR DEGRADATION FROM FROST AND WATER ACTION.
 - AGGREGATE MATERIALS SHALL HAVE THE FOLLOWING GRADATION REQUIREMENTS

| SIEVE SIZE | PERCENT PASSING BY SIZE (%) | | | | | |
|------------------------------|-----------------------------|-----------------|-------------|-----------------|-------------|------------------|
| | GRANULAR FILL | STRUCTURAL FILL | COARSE SAND | GRANULAR FILTER | ARMOUR ROCK | SURFACING GRAVEL |
| 200 | | | | | 100 | |
| 125 | 100 | | | | 60-80 | |
| 80 | | | | | | |
| 50 | 55-100 | | | | | |
| 40 | | 100 | | | | |
| 25 | 38-100 | 70-94 | | 100 | 30-55 | |
| 20 | | | | | 15-30 | 100 |
| 16 | 32-85 | 55-85 | | 90-100 | | |
| 12.5 | | | | | | |
| 10 | | 44-74 | 100 | 45-75 | 0-15 | 30-77 |
| 8 | | | | | | |
| 5 | 20-65 | 32-62 | 70-90 | 0-15 | 0-5 | 15-55 |
| 1.25 | | 17-43 | 20-45 | 0-5 | | 0-30 |
| 0.630 | | 12-34 | | | | |
| 0.315 | 6-30 | 8-26 | 9-22 | | | |
| 0.160 | | 5-18 | 5-15 | | | |
| 0.080 | 0-5 | 0-5 | 0-10 | | | 0-12 |
| % FRACTURE BY MASS (2 FACES) | - | 50%+ | - | - | - | 50%+ |

6. STRIPPING

- STRIPPING SHALL APPLY TO THE UPPERMOST PART OF THE SOIL, NORMALLY RANGING IN DEPTH FROM 50 mm TO 200 mm. IT CORRESPONDS TO THE SURFACE "A" (ORGANO-MINERAL) HORIZON OF THE SOIL PROFILE AS DEFINED BY THE CANADA SYSTEM OF SOIL CLASSIFICATION DEPARTMENT OF AGRICULTURE PUBLICATION 1646.
- STRIPPING SHALL BE STOCKPILED FOR RECLAMATION.
- OBTAIN ENGINEER APPROVAL PRIOR TO STARTING STRIPPING.
- LIMIT TRAFFIC ON UNDISTURBED AREAS TO AS REQUIRED FOR THE STRIPPING OPERATION. USE PERMANENT AND TEMPORARY ACCESS ROADS. DO NOT DISTURB NATURAL AREAS.
- DO NOT STRIP FROM AREAS IN ADVANCE OF EXCAVATION AND FILL PLACEMENT OPERATIONS SUCH THAT THE STRIPPED AREA IS SUSCEPTIBLE TO WIND AND WATER EROSION.

7. EXCAVATION

- Maintain excavation slopes in a safe and neat condition at all times. Do not excavate temporary side slopes steeper than 1.5H:1V unless authorized by a professional engineer.
- If required or elected, process excavation material for use as fill. Place unsuitable and excess excavation material as waste fill in designated waste areas.
- Notify the engineer when foundation excavations have attained the required bottom elevation(s). The engineer shall then identify unsuitable bearing soils, if present, for over-excavation and removal and replacement with suitable fill materials.
- When borrow area excavations are complete, spread stockpiled unsuitable and unused materials as waste fill, and blend slopes to achieve natural-looking topography and re-establish natural drainage patterns. Final side slopes shall be no steeper than 3H:1V. Install natural features including swales and meanders to prevent erosion. Redistribute stripping material, seed, and plant as directed by the engineer.
- Fill unauthorized over-excavation with suitable material to the lines, elevations and dimensions indicated on the drawings, or as modified by the engineer.

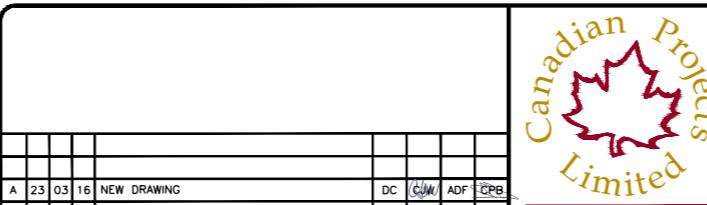
8. STOCKPILES

- Stockpile sites shall be cleared of all vegetation, trees, brush, rocks or other debris, graded to 2% minimum grade with drainage courses diverted away from the stockpile locations.
- Stockpiles shall be constructed only in designated and engineer-approved locations and when completed, shall be neat and regular in shape, occupying as small an area as is practicable.
- Stockpiles shall be built up in layers not exceeding 1.0 m in thickness. Material shall not be spilled over the edges of the piles.
- Take all necessary measures to avoid contamination or erosion of stockpiled material. Maintain a minimum separation of 3 m between stockpiles of different materials.
- Stripping material shall be stockpiled adjacent to the stripped area, and within the limits authorized by the engineer.
- Stockpiles shall not interfere with drainage courses. Keep stockpiles a minimum distance of 30 m from a river, stream, lake, reservoir, or other surface bodies of water or as required by the project CEMP, whichever is more stringent.
- Ensure all stockpiles are left in a safe condition so that the potential for collapse or falling materials is prevented.

9. FILL PLACEMENT

- Remove debris, snow, ice, water, and loose material from the receiving surface prior to starting fill placement. Do not place fill material when the material or the receiving surface is frozen. Do not place fill material on any surface until the prepared surface has been inspected by the engineer, and any defects identified by the engineer have been rectified.
- Place and spread fill materials in continuous and approximately horizontal layers of uniform thickness in such a manner as to prevent segregation and stratification and to obtain a homogeneous mass.
- The loose lift thickness shall not exceed 1.5 times the maximum particle size or 150 mm, whichever is greater.
- Prior to any suspension of fill operations, slope the fill surface at 3% to 5% and roll with a smooth cylindrical roller so as to leave the surface area in a smooth, even condition for drainage.
- Do not place fill material adjacent to cast-in-place concrete structures sooner than 3 days after placement for mass concrete, seven (7) days after placement for walls and deck slabs, or until 75% of the specified compressive concrete strength has been achieved.
- Place fill material equally on all sides of structures to minimize unbalanced loading.
- Condition, rework, and re-compact or remove, and replace any portion of the fill that has suffered a reduction in quality to the specified requirements due to drying, frost, rain, or any other reason before placing succeeding layers.
- Reroute construction traffic away from or stabilize areas to the satisfaction of the engineer where the fill or ground surfaces begin to rut or exhibit instability.
- Unless otherwise authorized by the engineer, maintain no more than 0.5 m maximum difference in elevation between adjacent fill zones, and maintain the temporary slopes within fill zones no steeper than 2H:1V.
- No heavy construction equipment shall travel over buried structures or pipes unless approved by the engineer.

FOR PERMITTING - NOT FOR CONSTRUCTION



NUNAVUT NUKKISAUTIIT CORPORATION
 ANURIQUAJUAK NUKKISAUTIIT PROJECT
 CIVIL - GENERAL
 EARTHWORKS
 SPECIFICATIONS

PROJECT NUMBER
1096-003
 CAD NUMBER
4.3.014
 DRAWING NUMBER
2121

10. COMPACTION

- UNLESS NOTED OTHERWISE ON THE DRAWINGS, ALL MATERIALS SHALL BE COMPAKTED TO 98% OF THE STANDARD PROCTOR MAXIMUM DRY DENSITY AS DETERMINED IN ACCORDANCE WITH ASTM D698.
- WHEN BEING COMPAKTED, ALL FILL MATERIALS AND SUBGRADE SHALL BE BETWEEN 0% AND +2% OF OPTIMUM MOISTURE CONTENT AS DETERMINED IN ACCORDANCE WITH ASTM D698 EXCEPT AGGREGATE MATERIALS SHALL BE BETWEEN 0% AND -2%.
- THE MOISTURE CONTENT OF FILL MATERIALS SHALL BE DETERMINED IN ACCORDANCE WITH ASTM D2216 AND SHALL BE UNIFORM THROUGHOUT.
- AS REQUIRED, ADD WATER TO MOISTURE CONDITION MATERIALS USING METHODS WHICH DO NOT CAUSE FINER MATERIALS TO BE WASHED OUT AND DRY MATERIAL BY SPREADING, DISCING, AND HARROWING.
- IF REQUIRED, SCARIFY IN PLACE MATERIALS AND SUBGRADE TO A MINIMUM DEPTH OF 200 mm.
- AS APPROPRIATE AND SUBJECT TO ENGINEER APPROVAL, MIX MATERIALS HAVING DIFFERENT IN SITU MOISTURE CONTENTS TO OBTAIN THE REQUIRED MOISTURE CONTENT. USE DISCS OR OTHER METHODS TO OBTAIN A HOMOGENEOUS MATERIAL.
- AGGREGATE FILLS LARGER THAN 40 mm, COMMON FILL, SEMI-IMPERVIOUS FILL, AND WASTE FILL SHALL BE COMPAKTED USING A MINIMUM OF THREE (3) PASSES OF A 10-TONNE VIBRATORY ROLLER OR OTHER SUITABLE ENGINEER-APPROVED COMPAKTION EQUIPMENT. EACH MATERIAL TYPE AND SOURCE SHALL BE SUBJECT TO A TEST COMPAKTION STRIP WITNESSED BY THE ENGINEER TO CONFIRM THE ADEQUACY OF THE COMPAKTION EFFORT AND SPECIFY IF ADDITIONAL EFFORT IS REQUIRED. A PASS MEANS THE COMPLETE COVERAGE OF THE FILL LIFT. OVERLAP REQUIRED FOR COMPLETE COVERAGE WILL NOT BE CONSIDERED TO PROVIDE ANY PORTION OF A SUBSEQUENT OR PREVIOUS PASS.
- ACHIEVE BOTH SPECIFIED MINIMUM DENSITY AND THE SPECIFIED MINIMUM NUMBER OF PASSES WITH COMPAKTION EQUIPMENT.
- IN AREAS THAT ARE NOT ACCESSIBLE TO LARGER COMPAKTION EQUIPMENT, OR WHICH ARE WITHIN 1000 mm OF STRUCTURES, REDUCE THE LIFT THICKNESS AND COMPACT FILL MATERIALS WITH HAND OPERATED PNEUMATIC OR MECHANICAL TAMPING EQUIPMENT.

11. WASTE FILL

- WASTE FILL SHALL BE EXCESS EXCAVATED MATERIAL AND / OR MATERIAL NOT SUITABLE FOR USE AS SPECIFIED FOR EARTHWORKS CONSTRUCTION. WASTE FILL IS GENERALLY USED IN AREAS WHERE NOTICEABLE SETTLEMENT CAN BE TOLERATED SUCH AS IN LANDSCAPED AREAS.
- PLACE WASTE FILL IN WASTE AREAS SHOWN ON THE DRAWINGS, AND AS DESIGNATED BY THE ENGINEER.
- WASTE AREAS SHALL BE CLEARED, GRUBBED, AND STRIPPED. RECEIVING SURFACES FOR WASTE FILL MAY BE FROZEN, BUT SHALL NOT BE COVERED WITH SNOW.
- PLACE WASTE FILL IN LOOSE LIFTS NOT EXCEEDING 300 mm AND COMPACT TO A MINIMUM OF 90% SPMDD.
- WASTE FILL MAY INCLUDE FROZEN MATERIAL, HOWEVER, TEMPORARILY STOCKPILE LARGE FROZEN PIECES THAT CANNOT BE BROKEN AND PLACED TO THE SPECIFIED LOOSE LIFT THICKNESS, AND COMPAKTED AS SPECIFIED. ALLOW STOCKPILED FROZEN MATERIAL TO THAW PRIOR TO PLACING AND COMPAKTING IN ITS FINAL LOCATION.
- COMPLETED WASTE FILL AREA SLOPES SHALL NOT BE STEEPER THAN 3H:1V.
- IF REQUIRED, REGRADE WASTE FILL AREAS AFTER THE PREVIOUSLY PLACED WASTE FILL MATERIALS HAVE SUBSIDED TO PROVIDE A NEAT, UNIFORM, AND FREE DRAINING SURFACE.
- WASTE FILL AREAS SHALL BE TOPSOILED AND SEDED IN ACCORDANCE WITH THE LANDSCAPING SPECIFICATION.

12. COLD WEATHER

- DO NOT ADD WATER TO THE FILL MATERIAL OR PERFORM DRYING OPERATIONS SUCH AS WHEN SUCH WORK CANNOT BE PERFORMED BECAUSE OF COLD WEATHER.
- PROTECT EXCAVATED SURFACES AGAINST WHICH FILL, CONCRETE OR ANY PERMANENT WORKS WILL BE PLACED FROM FREEZING BY SEQUENCING STRIPPING TO MINIMIZE THE EXPOSED AREA, BY USING A TEMPORARY LAYER OF SOIL OR INSULATING MATERIALS, OR OTHER MEANS AUTHORIZED BY THE ENGINEER. FROZEN MATERIAL SHALL BE EXCAVATED FROM SURFACES PRIOR TO PLACING NEW FILL AGAINST IT.
- PERFORM EXCAVATION, LOADING, HAULING, DUMPING, SPREADING AND COMPAKTION IN A CONTINUOUS OPERATION TO AVOID FREEZING OF MATERIALS BEFORE THE SPECIFIED COMPAKTION IS ACHIEVED.

13. TOLERANCES

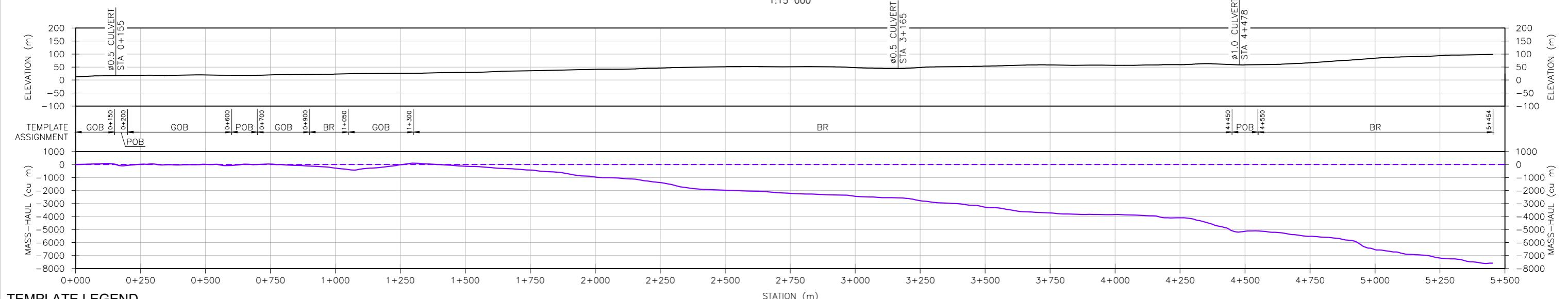
- PROVIDE FINISHED FILL SURFACES THAT ARE SMOOTH, REGULAR, AND UNIFORM.
- UNLESS SPECIFIED OTHERWISE, THE MAXIMUM DEVIATION FROM THE ELEVATIONS SHOWN ON THE DRAWINGS MEASURED NORMAL TO THE FINISHED SURFACE SHALL BE ± 50 mm.
- MAXIMUM DEVIATION FROM THE GRADES SHOWN ON THE DRAWINGS SHALL BE $\pm 0.5\%$.



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| (Large empty box for stamp) | | | | | | | | | | | |
| A 23 03 16 NEW DRAWING | | | DC C/W ADF CPB | | | QW | | | S | | |
| REV | Y | M | D | REVISION DESCRIPTION | | | DES | CHK | DRN | CHK | |



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| FOR PERMITTING - NOT FOR CONSTRUCTION | | | | | | | | | | | |
| NUNAVUT NUKKISAUTIIT CORPORATION | | | | | | | | | | | |
| ANURIQJUAK NUKKISAUTIIT PROJECT | | | | | | | | | | | |
| CIVIL - GENERAL | | | | | | | | | | | |
| EARTHWORKS | | | | | | | | | | | |
| SPECIFICATIONS | | | | | | | | | | | |
| PROJECT NUMBER 1096-003 | | | | | | | | | | | |
| CADD NUMBER 4.3.014 | | | | | | | | | | | |
| DRAWING NUMBER 2122 | | | | | | | | | | | |

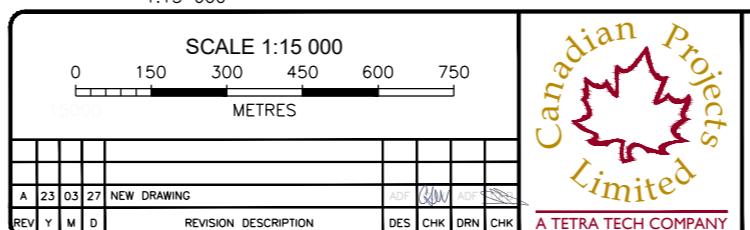


TEMPLATE LEGEND
(SEE DRAWING 2221 FOR
TEMPLATE DETAILS)

GOB GOOD OVERBURDEN
POB POOR OVERBURDEN
BR ON BEDROCK

NOTES

1. ALL DIMENSIONS AND ELEVATIONS ARE IN METRES, UNLESS NOTED OTHERWISE.
2. BASE MAPPING GENERATED FROM CANVEC OBTAINED FROM THE GOVERNMENT OF CANADA.
3. 2m INTERVAL CONTOURS GENERATED BY CANADIAN PROJECTS LIMITED FROM DEM DATA PROVIDED BY ARCTIC UAV IN OCTOBER, 2022.
4. HORIZONTAL DATUM: NAD83 (CSRS) UTM ZONE 17
5. VERTICAL DATUM: CGVD28 HT2.0 EPOCH



FOR PERMITTING - NOT FOR CONSTRUCTION

NUNAVUT NUKKISAUTIT CORPORATION
ANURIQJUAK NUKKISAUTIT PROJECT
CIVIL - ROADS
WIND TURBINE ROAD LAYOUT
PLAN AND PROFILE

| |
|----------------------------|
| PROJECT NUMBER 1096-003 |
| CADD NUMBER 4.3.020 |
| DRAWING NUMBER 2211 |

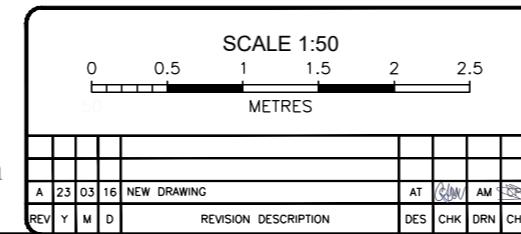
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NOTES

1. ALL DIMENSIONS ARE IN MILLIMETRES AND ELEVATIONS IN METRES, UNLESS NOTED OTHERWISE.
2. SEE DRAWING 2230 FOR WHERE EACH DESIGN SECTION APPLIES, SUBJECT TO CHANGE BASED ON SITE CONDITIONS AND ENGINEER DIRECTION.



Landsvirkju
Power



FOR PERMITTING - NOT FOR CONSTRUCTION

| NUNAVUT NUKKIKSAUTIIT CORPORATION | |
|-----------------------------------|----------------------------|
| ANURIQJUAK NUKKIKSAUTIIT PROJECT | PROJECT NUMBER 1096-003 |
| CIVIL - ROADS | CADD NUMBER 4.3.003 |
| DESIGN SECTIONS | DRAWING NUMBER |
| SECTIONS | 2221 |

PROJECT NUMBER
1096-003
CADD NUMBER
4.3.003
DRAWING NUMBER
2221

ROUGHEN BEDROCK SURFACES AS REQUIRED
MINIMUM RUGOSITY = 1.5

CL ROAD

300 MM

GRANULAR FILL

COMMON FILL

BEDROCK

ALL CUT AND ADJACENT SLOPES APPROVED BY
SLOPE STABILITY METHODS

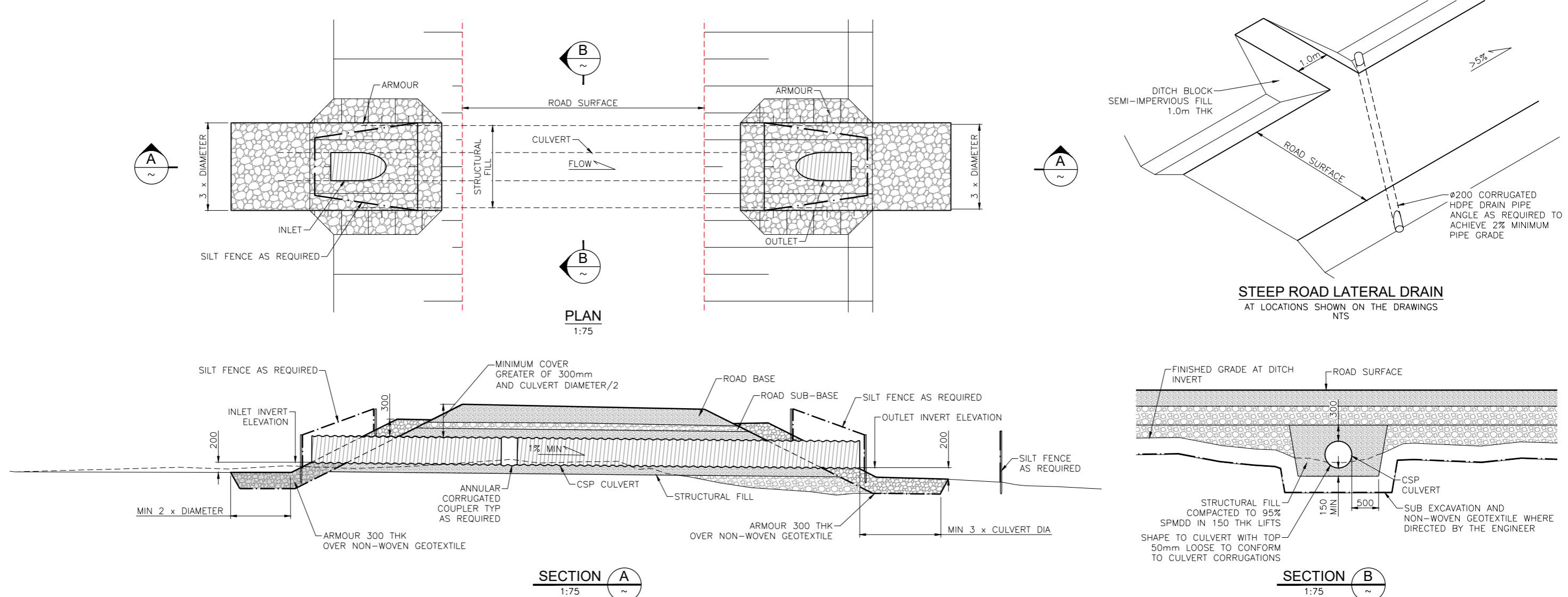
ROAD SECTION - ON BEDROCK

DETAILS AS PER GOOD OVERBURDEN SECTION, UNLESS NOTED OTHERWISE

1:50

ALL CUT AND ADJACENT NATURAL SLOPES ARE SUBJECT TO FIELD REVIEW AND APPROVAL BY THE GEOTECHNICAL ENGINEER. FLATTER SLOPES AND/OR SLOPE STABILITY MEASURES MAY BE REQUIRED IN SOME LOCATIONS.

ROAD SECTION - GOOD OVERBURDEN



1. GENERAL

- THE NUMBER AND LOCATION OF CULVERTS SHOWN ON THE DRAWINGS SHALL BE SUBJECT TO FIELD REVIEW BY THE ENGINEER. RELOCATE CULVERTS AND PROVIDE ADDITIONAL CULVERTS NOT SHOWN ON THE DRAWINGS WHEN AREAS REQUIRING A CULVERT ARE IDENTIFIED DURING CONSTRUCTION.
- WHEREAS CULVERT POSITION, ORIENTATION, ELEVATION, AND GRADE SHOWN ON THE DRAWINGS IS BASED ON LIMITED TOPOGRAPHIC SURVEY, THESE SHALL BE SUBJECT TO FIELD REVIEW AND REFINEMENT BY THE ENGINEER TO ACCOMMODATE EXACT SITE CONDITIONS.
- MINIMIZE IMPEDIMENT TO ROAD TRAFFIC RESULTING FROM CULVERT INSTALLATION.
- UNLOAD, HANDLE AND STORE MATERIALS IN ACCORDANCE WITH THE MANUFACTURER'S WRITTEN INSTRUCTIONS TO PREVENT DAMAGE TO THE GALVANIZED COATING AND THE PIPE.
- EARTHWORKS SHALL GENERALLY BE IN ACCORDANCE WITH DRAWINGS 2111, 2121, 2122 AND 2221. WHERE THERE IS A DIFFERENCE BETWEEN THIS AND OTHER DRAWINGS WITH RESPECT TO CULVERTS, THIS DRAWING SHALL GOVERN.

2. SUBMITTALS

- SUBMIT THE FOLLOWING IN ACCORDANCE WITH THE CONTRACT REQUIREMENTS AND SCHEDULE:
 - CSP CULVERT AND ANCILLARY PARTS SPECIFICATIONS AND PRODUCT DATA SHEETS FOR PRODUCT(S) TO BE USED
 - REDLINE DRAWING MARKUPS OF SITE PLANS INDICATING CULVERT SIZE, LENGTH, ELEVATION, GRADE, AND QUANTITY PLACED BY LOCATION.
 - DO NOT PROCEED WITH WORK ASSOCIATED WITH A SUBMITTAL UNTIL REVIEWED BY THE ENGINEER.
 - SUBMITTAL REVIEW BY THE ENGINEER SHALL NOT RELIEVE THE CONTRACTOR FROM THE FULL RESPONSIBILITY OF THE WORK.

3. PRODUCTS

- PIPE SHALL BE GALVANIZED, HELICAL CORRUGATED LOCK SEAM PIPE IN ACCORDANCE WITH CSA G401 WITH ANNULAR CORRUGATION RE-ROLLED ENDS TO SUIT COUPLERS AND HAVE A MINIMUM GALVANIZING ZINC COATING OF 610 G/M².
- PIPE CORRUGATIONS AND WALL THICKNESS SHALL BE AS FOLLOWS, UNLESS SPECIFIED OTHERWISE ON THE DRAWINGS:

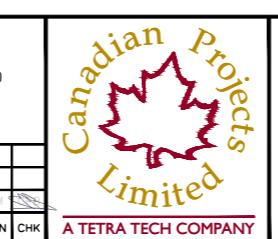
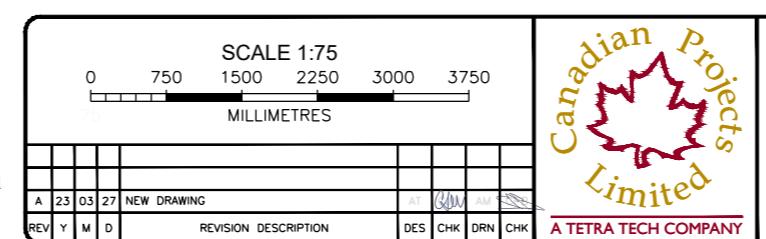
| DIAMETER | WALL THICKNESS | CORRUGATION |
|----------------|----------------|-------------|
| 500 - 900 mm | 2.0 mm | 68 X 13 mm |
| 1000 - 1800 mm | 3.5 mm | 68 X 13 mm |
| 2000 - 3600 mm | 3.5 mm | 125 X 25 mm |
- CSP COUPLERS SHALL BE GALVANIZED ANNULAR CORRUGATED TYPE WITH MINIMUM THICKNESS TO MATCH THE PIPE AND RUBBER GASKETS TO ASTM D1056. DIMPLED CONNECTOR BANDS SHALL NOT BE USED.

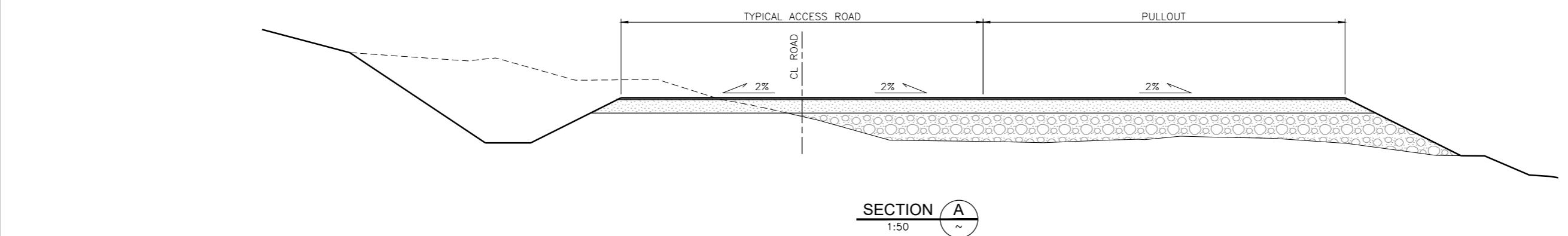
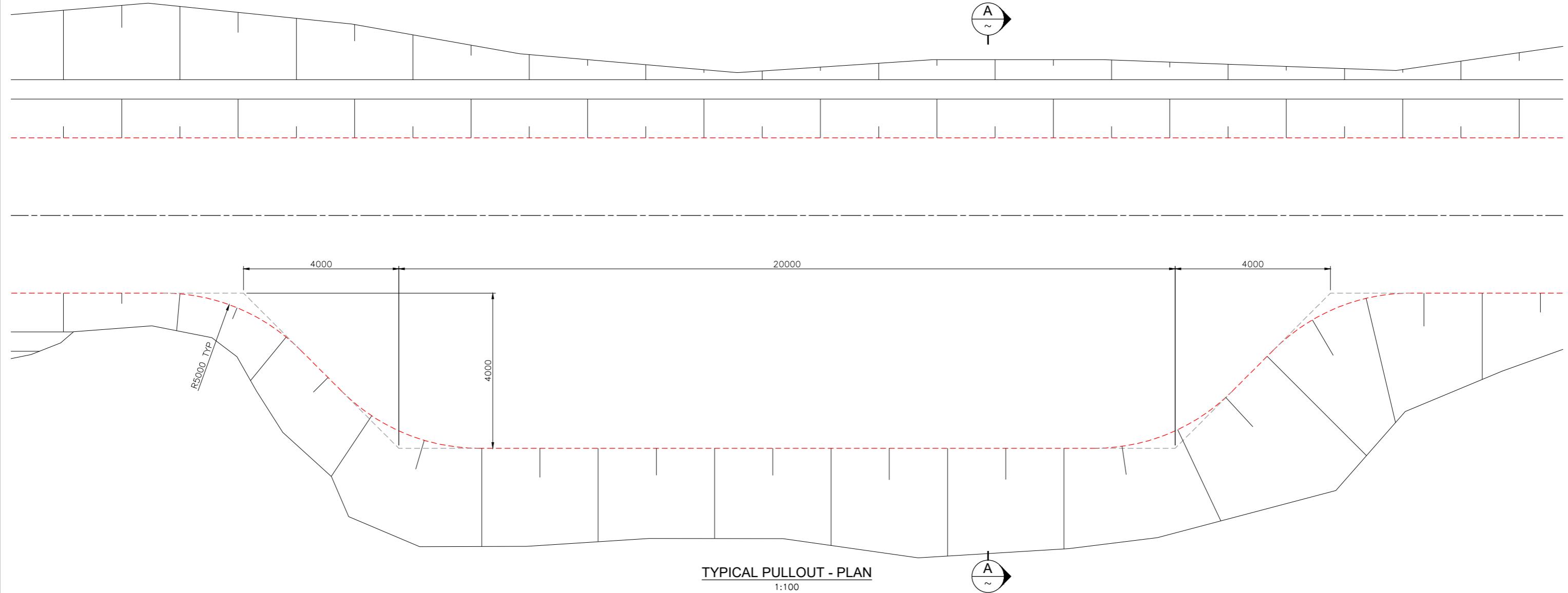
4. INSTALLATION

- WHERE PIPES ARE INSTALLED UNDER FILL SECTIONS, PLACE FILL TO A MINIMUM ELEVATION OF 300 MM ABOVE THE TOP OF THE PIPE, THEN EXCAVATE THE REQUIRED TRENCH FOR THE PIPE.
- COMPACT THE BASE OF THE EXCAVATION OR SUBGRADE TO PROVIDE A FIRM FOUNDATION OF UNIFORM DENSITY FOR THE ENTIRE LENGTH OF THE PIPE.
- SECURELY JOIN PIPE SECTIONS USING COUPLERS AND GASKETS INSTALLED IN ACCORDANCE WITH THE MANUFACTURER'S WRITTEN INSTRUCTIONS.
- DO NOT COMMENCE BACKFILLING OPERATIONS UNTIL THE INSTALLED PIPES HAVE BEEN INSPECTED BY THE ENGINEER.
- BED EACH PIPE AND COMPACT FILL UNDER THE HAUNCHES TO PREVENT SETTLEMENT, DEFLECTION, AND PREFERENTIAL SEEPAGE PATHS. BACKFILL MATERIAL SHALL FILL ALL CORRUGATIONS. PLACE FILL MATERIAL IN LIFTS NOT EXCEEDING 150 MM IN THICKNESS. COMPACT EACH LIFT USING PNEUMATIC OR MECHANICAL HAND TAMPING EQUIPMENT AS REQUIRED TO ACHIEVE THE SPECIFIED DENSITY. ROCKS LARGER THAN 80 MM SHALL NOT BE PLACED WITHIN 600 MM OF PIPES. BRING FILL LAYERS UP SIMULTANEOUSLY AND EVENLY ON BOTH SIDES OF THE PIPES.
- THE PIPES SHALL HAVE A VERTICAL DEFLECTION LESS THAN 5% ONCE BACKFILLING HAS BEEN COMPLETED TO ITS FINAL ELEVATION. AT NO TIME SHALL THE VERTICAL DEFLECTION EXCEED 10%.

- PREVENT DAMAGE TO THE GALVANIZED COATING. DO NOT PERMIT COMPACTION EQUIPMENT TO COME INTO DIRECT CONTACT WITH THE PIPES. REPAIR DAMAGED GALVANIZED SURFACES WITH ZINC-RICH PAINT. POWER TOOL CLEAN SURFACES TO BE REPAIRED TO A BRIGHT METAL APPEARANCE AND APPLY MULTIPLE COATS OF THE ZINC-RICH PAINT IN ACCORDANCE WITH THE MANUFACTURER'S WRITTEN INSTRUCTIONS. DRY FILM THICKNESS SHALL BE 50 MICRONS, OR AS STIPULATED BY THE PAINT MANUFACTURER, WHICHEVER IS GREATER.
- CULVERT LENGTH SHALL BE SUCH THAT CULVERT END PROTRUDES PAST THE FINISHED FILL NO GREATER THAN 200 mm.

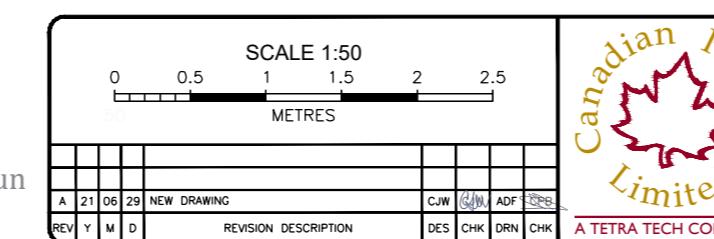
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NOTES

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ANURIQJUAK NUKKISAUTIT PROJECT
CIVIL - ROADS
PULLOUT
PLAN AND SECTION

| | |
|----------------|----------|
| PROJECT NUMBER | 1096-003 |
| CADD NUMBER | 4.3.003 |
| DRAWING NUMBER | 2223 |