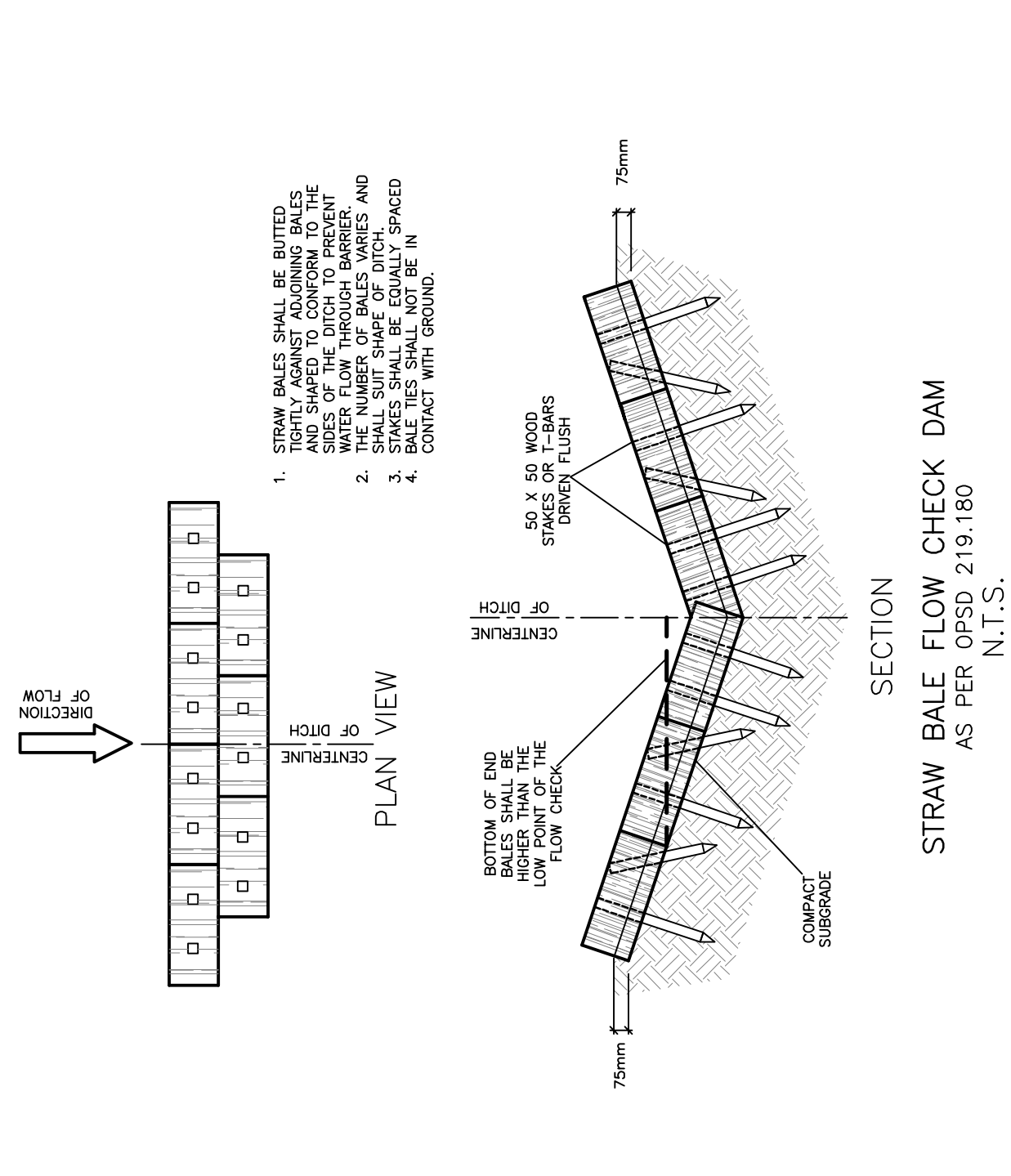


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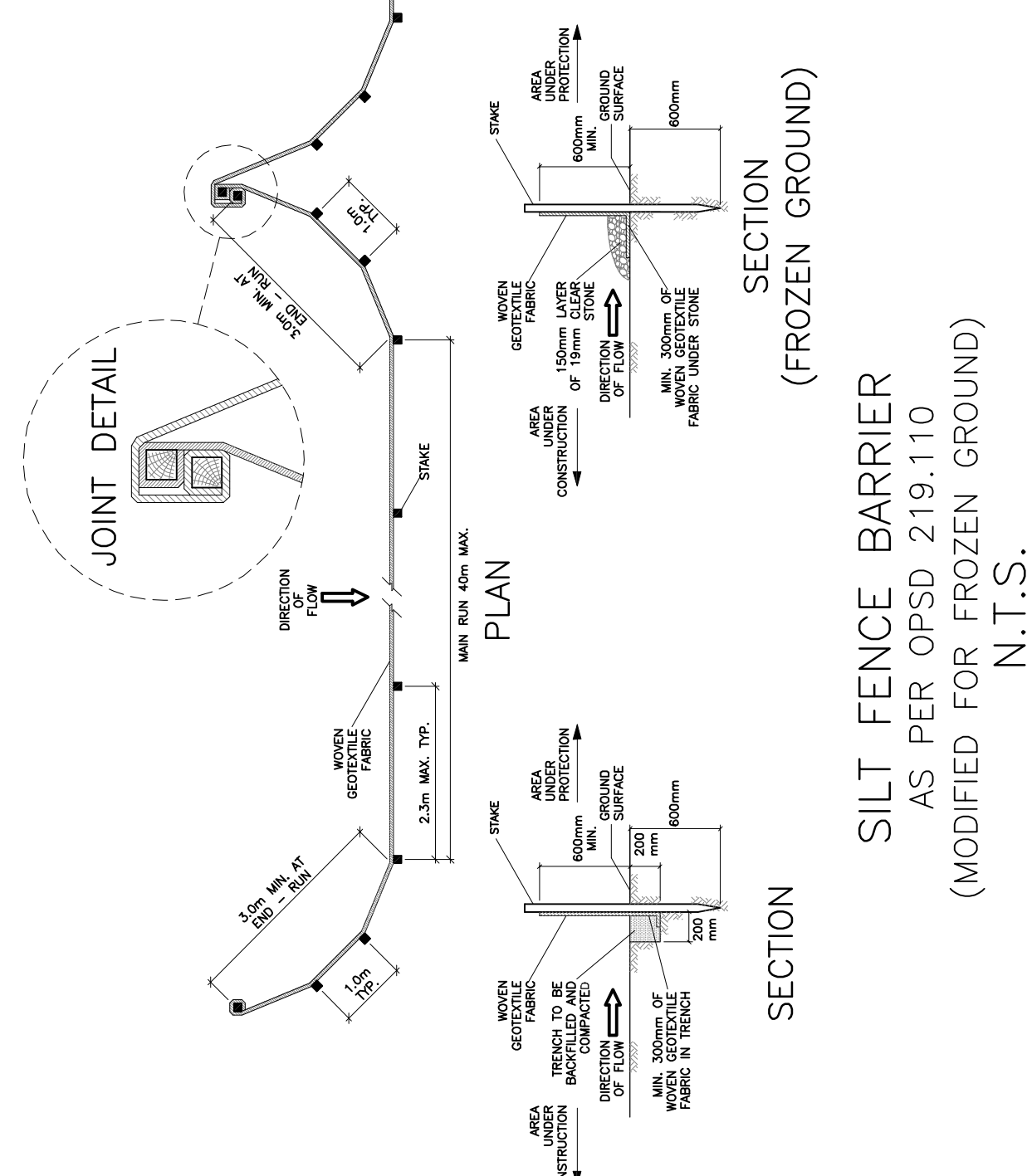
3. GRADING & DRAINAGE
- 3.1. SUB-DRAINAGE TO MATCH EXISTING AT PROPERTY LINE. NO EXCESS RAINWATER WILL BE DIRECTED TOWARDS THE ADJACENT PROPERTIES DURING AND AFTER CONSTRUCTION. THERE WILL BE NO ALTERATION TO EXISTING GRADE AND DRAINAGE PATTERNS ON PROPERTY LINE. FLOODING WILL BE PREVENTED BY THE PROPER DRAINAGE OF ALL DISCHARGE AREAS.
- 3.2. THE GRADING SHALL BE GRADUAL, BETWEEN FINISHED SPOT ELEVATIONS SHOWN ON DRAWINGS TO PREVENT POOLING (OTHER THAN POOLING REQUIRED FOR STORMWATER MANAGEMENT).
- 3.3. THE GRADING SHALL BE GRADUAL, BETWEEN FINISHED SPOT ELEVATIONS SHOWN ON DRAWINGS TO PREVENT POOLING (OTHER THAN POOLING REQUIRED FOR STORMWATER MANAGEMENT).
- 3.4. DAMAGED BY SUCH CORRECTIONS, REPAIR OR DAMAGE. DEFECTIVE GRADING SHALL BE CORRECTED. PROMPTLY MAKE GOOD OTHER CONTRACTOR'S WORK DAMAGED BY SUCH CORRECTIONS, REPAIR OR DAMAGE.
- 3.5. STIFFNESS AT 5% DEFORMATION SHALL BE EQUAL TO OR BETTER THAN BOSS 2000 OR APPROVED EQUIV.
- 3.6. GEOTEXTILE FABRIC TO CROSS 1860. MODULUS SYNTHETIC FIBRE FABRIC SHALL BE USED IN SILT FINE BARRELS.
- 3.7. MODULUS SYNTHETIC FIBRE FABRIC SHALL BE USED IN SILT FINE BARRELS.
- 3.8. DETERIORATION BY ULTRA VIOLET AND HEAT EXPOSURE. PLACE GEOTEXTILE MATERIAL BY UNROLLING OUTON GRADED SURFACE. SMOOTH AND PRESS DOWN TO ELIMINATE AIR BUBBLES. COVER WITH 100MM SAND OR EQUIV. TO PROTECT FROM ULTRA VIOLET AND HEAT EXPOSURE.
- 3.9. SLOPE TO UPPER EXTENT OF GEOTEXTILE OVERLAP EACH SUCCESSIVE STRIP OF GEOTEXTILE DOWNWARD PREVIOUSLY AND SMOOTH IN DIRECTION OF SLOPE.
- 3.10. DOWN-SLOPE DRAINAGE. PROVIDE MINIMUM ONE METER SLOPE OF GEOTEXTILE MATERIAL TOWARDS DRAINAGE LAYERS AT ALL JOINTS AND WITH EXISTING DRAINAGE LAYERS WITHIN 4 HOURS OF PLACEMENT. DURING DELIVERY AND STORAGE, PROTECT GEOTEXTILE MATERIALS FROM DIRECT SUNLIGHT, ULTRAVIOLET RAYS, EXCESSIVE HEAT, AND OTHER ADVERSE WEATHER CONDITIONS. AVOID CUTTING, PUNCTURING, TEARING, OR REMOVAL OF ANY PARTS OF GEOTEXTILE MATERIALS. AVOID CUTTING, PUNCTURING, TEARING, OR REMOVAL OF ANY PARTS OF GEOTEXTILE MATERIALS. AVOID CUTTING, PUNCTURING, TEARING, OR REMOVAL OF ANY PARTS OF GEOTEXTILE MATERIALS.
- 3.11. SEWER MANHOLES SHALL BE PVC SDR-26 OR SHALL CONFORM TO CSA B182.2 AND SHALL HAVE BELL AND SPOT JOINTS WITH RUBBER GASKETS. SEWER MANHOLES SHALL BE PVC SDR-26 OR SHALL CONFORM TO CSA B182.2 AND SHALL HAVE BELL AND SPOT JOINTS WITH RUBBER GASKETS. SEWER MANHOLES SHALL BE PVC SDR-26 OR SHALL CONFORM TO CSA B182.2 AND SHALL HAVE BELL AND SPOT JOINTS WITH RUBBER GASKETS.
- 3.12. INSULATION SHALL BE 100MM THICK POLYURETHANE INSULATION WITH FIBER GLASS INSULATION AS INDICATED AND AS PER DETAIL.
- 3.13. FORMATION SHALL BE 100MM THICK POLYURETHANE INSULATION WITH FIBER GLASS INSULATION AS INDICATED AND AS PER DETAIL.
- 3.14. 150 mm PERFORATED SUB-DRAIN SHALL BE DEPO. SINGLE-WALLED WITH FILTER SOCK. BOSS 2000 OR EQUIV.
- 3.15. 150 mm PERFORATED SUB-DRAIN SHALL BE DEPO. SINGLE-WALLED WITH FILTER SOCK. BOSS 2000 OR EQUIV.
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- 3.87. 1

5. CONSTRUCTION:
 - 5.1. TO COMPLETING WORK:
 - a. NECESSARY PERMITS AND APPROVALS FROM THE AUTHORITIES.
 - b. SIZE, DEPTH AND LOCATION OF EXISTING SERVICES, UTILITIES AND STRUCTURES AS INDICATED ON THE DRAWINGS ARE FOR GUIDANCE ONLY. ALL EXISTING SERVICES, UTILITIES AND STRUCTURES ARE NOT NECESSARILY SHOWN ON THE DRAWINGS. COMPLETENESS AND ACCURACY ARE NOT GUARANTEED. THE CONTRACTOR SHALL VERIFY THE LOCATION, DEPTH AND EXISTENCE OF ALL EXISTING SERVICES, UTILITIES AND STRUCTURES AND SHALL REPORT ANY DISCREPANCIES TO THE ENGINEER. THE CONTRACTOR SHALL BE RESPONSIBLE FOR CLEARING ALL EXISTING SERVICES, UTILITIES AND STRUCTURES ON AND ADJACENT TO THE SITE. UNDERGROUND LOCATIONS INCLUDING CABLES, PIPES, AND STRUCTURES SHALL BE IDENTIFIED BY GROUND PENETRATING RADAR (GPR) TO CONFIRM LOCATIONS OF EXISTING SERVICES AND UTILITIES BY GROUND TEST EXCAVATIONS AND REPORT ANY DISCREPANCIES TO THE ENGINEER.
 - c. EXISTING GRADE ELEVATIONS INDICATED ON THE DRAWINGS ARE FOR GUIDANCE ONLY. COMPLETENESS AND ACCURACY ARE NOT GUARANTEED. THE CONTRACTOR SHALL VERIFY THE EXISTING GRADE ELEVATIONS AND REPORT ANY DISCREPANCIES TO THE ENGINEER.
 - d. COORDINATE AND SCHEDULE WORK WITH THE AUTHORITIES AND OTHER TRUNKS.
 - 5.2. COMMENCE WORK TO PROVIDE THE MINIMUM DISRUPTION TO SERVICES.
 - 5.3. MAINTAIN AND PROTECT FROM DAMAGE SERVICES, UTILITIES AND STRUCTURES ENCOUNTERED.
 - 5.4. PROVIDE ADEQUATE PROTECTION TO EXISTING SERVICES, UTILITIES AND STRUCTURES. DO NOT DISTURB SOIL WITHIN RADIUS OF TREES OR SHRUBS AND OTHER SURFACE FEATURES FROM DAMAGE WHILE WORK IS IN PROGRESS.
 - 5.5. THAT ARE TO REMAIN.
 - 5.6. PROVIDE ADEQUATE PROTECTION AND BARRIERS INCLUDING ANY NECESSARY PERSONNEL AND THE SUPPLY, INSTALLATION, REMOVAL AND REPLACEMENT OF ALL NECESSARY SIGNAGE AND SAFETY MEASURES, AS REQUIRED BY THE AUTHORITIES. IF APPLICABLE, PROVIDE TRAFFIC MANAGEMENT PLAN AS PER CITY OF CHICAGO TRAFFIC CONTROL MANUAL.
 - 5.7. REMOVE OBSTRUCTIONS, ICE AND SNOW, FROM LIMITS TO EXPOSED OBSTRUCTIONS.
 - 5.8. CUT GRASS AND/OR SHRUBS NEARLY ALONG LIMITS OF PROPOSED OBSTRUCTIONS IN ORDER THAT SURFACE MAY BE GRASS EVENLY AND CLEANLY.



- 5.7. COORDINATE AND PAY FOR GEOLOGICAL INSPECTIONS AND COMPACTION TESTS OF SUB-GRADE, PIPE BEDDING AND EACH LAYER OF SURROUND MATERIALS AND COMPACTION RESULTS TO BE FURNISHED TO THE SATISFACTION OF THE GEO TECHNICAL CONSULTANT AND ENGINEER. SUBMIT GEO TECHNICAL REPORT TO THE ENGINEER.
- 5.8. CUT AND FILL AS NECESSARY TO ACHIEVE THE REQUIRED SUB-GRADE ELEVATION. DISPOSE OF SURPLUS AND UNSUITABLE EXCAVATED MATERIAL OFF SITE TO AN APPROPRIATE LOCATION. SUBMIT RECORD DRAWING OF EXCAVATION, ENGINEERED FILL, STOCKPILE MATERIAL AND FILL MATERIALS IN MANNE R TO PREVENT SEGREGATION AND PROTECT FROM CONTAMINATION.
- 5.9. EXCAVATION, ENGINEERED FILL, STOCKPILE MATERIAL & BACKFILL SHALL BE AS PER THE GEO TECHNICAL INVESTIGATION. SUBMIT A RECORD DRAWING OF EXCAVATION, ENGINEERED FILL, STOCKPILE MATERIAL AND FILL MATERIALS IN MANNE R TO PREVENT SEGREGATION AND PROTECT FROM CONTAMINATION.
6. UNDER THE ONVARTO OCCUPATIONAL HEALTH AND SAFETY ACT AND OTHER AUTHORITIES HAVING JURISDICTION, WITH ONTARIO REGULATION 219/91, KEEP EXCAVATIONS FREE OF WATER WHILE WORK IS IN PROGRESS. PROTECT OPEN EXCAVATIONS AGAINST FLOODING AND DAMAGE DUE TO SURFACE EROSION.
7. EXCAVATION MUST NOT INTERFERE WITH BEARING CAPACITY OF ADJACENT FOUNDATIONS.
8. DO NOT DISTURB FLOW OF SURFACE DRAINAGE OR NATURAL WATERSOURCES.
9. EXCAVATION OF EXCAVATIONS TO BE UNDERSIGNED SOIL LEVEL. FREE FROM LOOSE, SOFT OR GRABBY MATERIAL.
10. ALL STRUCTURES WITHIN PAVED AREAS SHALL HAVE 4:1 FIRST TWEERS FROM FIRST LOSE TO SUB-GRADE WATER.
11. SURROUND OF EXCAVATION SHALL BE PROTECTED BY SHIELDING, SHIELDING SHALL BE CORRECTED MAINTAIN DRY DENSITY.
12. EXCAVATION SHALL BE PROTECTED BY SHIELDING, SHIELDING SHALL BE CORRECTED MAINTAIN DRY DENSITY.
13. DO NOT USE BACKFILL MATERIAL WHICH IS FROZEN OR CONTAINS ICE, SNOW OR DEBRIS.
14. PIPE BEDDING AND SURROUND MATERIAL SHALL BE DRESS GRADUAL A. RE-CYCLED GRADUAL MATERIALS ARE NOT PERMITTED.
15. PIPE BEDDING SHALL BE 150mm THICK. SHAPE BED TRUE TO GRADE AND TO PROVIDE CONTINUOUS, UNIFORM BEARING SURFACE FOR PIPE.
16. PLACE SURROUND MATERIAL AROUND PIPES TO FULL WIDTH OF TRENCH AND TO 300mm COMPACTED THICKNESS.
17. MATERIAL IN UNIFORM LAYERS NOT EXCEEDING 300mm COMPACTED THICKNESS.
18. COMPACT EACH LAYER TO 95% OF CORRECTED DRY DENSITY BEFORE PLACING SUCCEEDING LAYER.
19. BACKFILL MATERIALS WITHIN 1.5m OF PROPOSED GRADE SHALL MATCH THE MATERIALS DRESSED ON THE TRENCH WALLS. BACKFILL BELOW 1.5m OF PROPOSED GRADE SHALL BE EITHER ACCEPTABLE FINE MATERIAL, ROCK, OR MIXED OF GRADUAL MATERIALS CONFORMING TO DRESS GRADUAL MATERIALS. BACKFILL SHALL BE WELL SORTED AND GRADED, AND 200mm OR SMALLER IN DIAMETER. TO PREVENT INGRESS OF FINE MATERIAL INTO JOINTS IN THE PIPE, THE JOINTS SHALL BE COVERED WITH 150mm LAYER OF COMPACTED, WELL GRADED CRUSHED STONE PLACED ON GEOTEXTILE FABRIC.
- 5.10. PREPARE PIPE USING METHODS APPROVED BY MANUFACTURER.
6. LAY, CUT AND JOIN PIPES IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS.
7. USE JOINT FITTINGS AS RECOMMENDED BY PIPE MANUFACTURER.
8. FULL LENGTH PIPE OF SIZES OR HIGH POINTS.
9. DO NOT EXCEED MAXIMUM JOINT DEFLECTION. LIMIT REMOVABLE WATERPROOF BULGHEAD AT OPEN END OF LAST PIPE LAD TO PREVENT ENTRY OF FRESH WATER.
10. WHEN STORMAGE OF WORK OCCURS, BLOOD PIPES TO PREVENT CREEP DURING DOWN. MAKE WATERPROOF CONNECTIONS TO MANHOLES.
11. REPAIR OR REPLACE PIPE, PIPE JOINT OR BEDDING FOUND DEFECTIVE.
- 5.12. SEWERS AND SEWER SERVICES:
- A. CONSTRUCT SEWER TRENCHES AS PER CITY DWG 56 & 57.
- B. CONSTRUCT EXISTING SEWER SERVICE TRENCHES TO 1.2m FROM SIDE OF STRUCTURE.
- C. MAINTAIN EXISTING SEWER FLOWS DURING CONSTRUCTION.
- 5.11. MAINTAIN RECORD DRAWINGS AND RECORD ACCURATELY LOCATIONS CAUSED BY SITE CONDITIONS AND CONSTRUCTION RECORD. MARK CHANGES IN RED INK. RECORD DRAWINGS SHALL INCLUDE, BUT NOT NECESSARILY LIMITED TO CHANGES OF DIMENSION, LOCATION, ELEVATION, MATERIALS, AND OTHER INFORMATION. SUBMIT RECORD DRAWING OF EXCAVATION, ENGINEERED FILL, STOCKPILE MATERIAL AND FILL MATERIALS IN MANNE R TO PREVENT SEGREGATION AND PROTECT FROM CONTAMINATION.
- 5.12. CITY OF OTTAWA ENGINEERING, PREPARED BY A SURVEYOR, TO THE ENGINEER AT THE END OF CONSTRUCTION. SUBMIT A RECORD DRAWING OF EXCAVATION, ENGINEERED FILL, STOCKPILE MATERIAL AND FILL MATERIALS IN MANNE R TO PREVENT SEGREGATION AND PROTECT FROM CONTAMINATION.
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6. **PAVEMENT**
- 6.1 **PAVEMENT STRUCTURE:**
- 100 mm OPSR GRANULAR A BASE
- 50 mm H-2.3 OR SUPERPAVE 12.5 ASPHALTIC CONCRETE
- 150 mm OPSR GRANULAR A TYPE 1 SUB-BASE
- 300 mm OPSR GRANULAR B TYPE 1 SUB-BASE
- 50 mm H-2.3 OR SUPERPAVE 12.5 ASPHALTIC CONCRETE
- 40 mm H-4.3 OR SUPERPAVE 19 ASPHALTIC CONCRETE
- 150 mm OPSR GRANULAR A BASE
- 150 mm OPSR GRANULAR A BASE
- 150 mm OPSR GRANULAR A BASE
- RE-CYCLED GRANULAR MATERIALS ARE NOT PERMITTED.
- ASPHALTIC CONCRETE SHALL BE PERFORMANCE GRADE PG58-34.
- HOT MIX ASPHALT MATERIALS SHALL BE ACCORDING TO PSR-110.
- 6.2 **PAVEMENT CONSTRUCTION:** THE CONSTRUCTION OF THE PAVEMENT STRUCTURE SHALL CONFORM TO THE GEOTECHNICAL INVESTIGATION TO THE SATISFACTION OF THE GEOTECHNICAL ENGINEER.
- 6.3 **REMOVAL OF ALL MATERIALS TO THE SUB-DRAINAGE LEVEL:** REMOVE DRIVING OR UNSATURABLE MATERIAL FROM SUB-DRAINAGE WHERE ENCOUNTERED TO THE SUB-DRAINAGE LEVEL. THE SUB-DRAINAGE SHALL BE FREE FROM LEANS, SHAIR, ICE, WATER AND FROZEN GRADING. CONTACT SUB-DRAINAGE TO BSE.
- 6.4 **CONSTRUCTION BETWEEN DIFFERING PAVEMENT STRUCTURES AND BETWEEN PAVEMENTS AND CURBS AND SIDEWALKS:** THE PAVEMENTS SHALL BE CONSTRUCTED TO THE SUB-DRAINAGE SURFACE AS SHOWN ON THE DRAWINGS.
- 6.5 **ENSURE NO FROZEN MATERIAL IS PLACED:** PLACE MATERIAL ONLY ON CLIMATE UNFROZEN SURFACE, FREE FROM SNOW OR ICE.
- 6.6 **PREPARE THE SURFACE TO FILL WITH UNIFORM LAYERS:** NOT EXCEEDING 300mm COMPACTED THICKNESS. SHAPE EACH LAYER TO SMOOTH CONTOUR AND COMPACT TO THE REQUIRED DENSITY.
- 6.7 **COMPACT SUB-BASE MATERIAL TO DENSITY OF NOT LESS THAN 98% CORRECTED MAXIMUM DRY DENSITY:** FILL OVER-EXCAVATED SUB-GRADE WITH SUB-BASE MATERIAL TO THE REQUIRED DENSITY. THE SUB-BASE SHALL BE CORRECTED MAXIMUM DRY DENSITY.
- 6.8 **REPAIR AND ACCESSIBILITY TO THE EQUIPMENT:** MAINTAIN ACCESS TO THE EQUIPMENT THROUGHOUT THE CONSTRUCTION.
- 6.9 **REPLACE NEW ASPHALT DISTURBED BY CONSTRUCTION AND REPLACE WITH PAVEMENT STRUCTURE ABOVE:**
- 6.10 **WHERE NEW ASPHALT COMES IN CONTACT WITH EXISTING PAVEMENT:** SMOOTH EXISTING ASPHALT LAYER TO CREATE A CLEAN STRAIGHT EDGE AND REMOVE ALL WEAK MATERIAL. THE NEW ASPHALT SHALL BE PLACED TO THE STRAIGHT EDGE OF THE EXISTING ASPHALT AND THE EXISTING ASPHALT SHALL BE SMOOTHED TO THE NEW ASPHALT. THE NEW ASPHALT SHALL BE PLACED TO THE STRAIGHT EDGE OF THE EXISTING ASPHALT AND THE EXISTING ASPHALT SHALL BE SMOOTHED TO THE NEW ASPHALT. THE NEW ASPHALT SHALL BE PLACED TO THE STRAIGHT EDGE OF THE EXISTING ASPHALT AND THE EXISTING ASPHALT SHALL BE SMOOTHED TO THE NEW ASPHALT.
- 6.11 **SHAPES BUILT TO SMOOTH CONTOUR AND COMPACT TO NOT LESS THAN 100% CORRECTED MAXIMUM DRY DENSITY BEFORE BEGINNING PAVING OPERATIONS:**
- 6.12 **APPLY ASPHALTIC CONCRETE ONLY WHEN BASE OR PREVIOUS COURSE IS DRY AND AIR TEMPERATURE IS ABOVE 5 DEGREES CELSIUS:** THE ASPHALTIC CONCRETE SHALL BE PLACED TO THE STRAIGHT EDGE OF THE EXISTING ASPHALT AND THE EXISTING ASPHALT SHALL BE SMOOTHED TO THE NEW ASPHALT.
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D. B. GRAY ENGINEERING INC.
Stormwater Management • Grading & Drainage • Storm & Sanitary Sewers • Haze/Algalines

700 Long Point Circle
Ottawa, Ontario

613-425-8044
d.gray@dbgrayengineering.com

Project
PROPOSED ADDITION
135 CARDEVCO ROAD
OTTAWA, ONTARIO

Drawing Title

Drawn	D.B.G.	1:200
H. Scale		
V. Scale		
Date	SEP 12-22	
Job No.	21081	

APPROVED
By Adam Brown at 9:41 am, May 25, 2025

ADAM BROWN
MANAGER, DEVELOPMENT REVIEW - RURAL
PLANNING, REAL ESTATE & ECONOMIC DEVELOPMENT
DEPARTMENT, CITY OF OTTAWA

EROSION & SEDIMENT CONTROL PLAN