GENERAL NOTES

1. ANY DEVIATION FROM THE CONDITIONS SHOWN ON THESE DRAWINGS SHALL BE SUBMITTED TO THE ENGINEER FOR REVIEW AND APPROVAL.
2. THE CONTRACTOR SHALL VERIFY ALL DIMENSIONS AND ELEVATIONS PRIOR TO COMMENCING WORK. REPORT ANY INCONSISTENCIES BEFORE PROCEEDING WITH THE WORK. ALL DIMENSIONS ARE IN MILLIMETERS (mm) UNLESS NOTED OTHERWISE. DO NOT SCALE THESE DRAWINGS.
3. THESE DRAWINGS SHALL BE READ IN CONJUNCTION WITH DRAWING NO. 23034-GR1 TITLED "GRADING PLAN" FOR PROJECT NAME "1319 JOHNSTON ROAD CITY OF OTTAWA", DATED MARCH, 2024, PREPARED BY "ROBINSON LAND DEVELOPMENT".
4. STRUCTURAL DESIGN COMPLETED IN CONFORMANCE WITH THE 2012 ONTARIO BUILDING CODE [2022 AMD.]. THESE DRAWINGS HAVE BEEN COMPLETED WITH RESPECT TO STRUCTURAL REQUIREMENTS ONLY. NON-STRUCTURAL DETAILS ARE SHOWN FOR REFERENCE ONLY AND SHALL BE CONFIRMED BY OTHERS.
5. RETAINING WALL HAS BEEN DESIGNED FOR A MINIMUM ALLOWABLE BEARING CAPACITY OF 150 kPa (SLS) AND MINIMUM FACTORED ULTIMATE BEARING CAPACITY OF 300 kPa (ULS). THE SOILD BEARING SURFACE SHALL BE VERIFIED BY A GEOTECHNICAL ENGINEER PRIOR TO CONSTRUCTION.
6. THESE DRAWINGS SHOW THE COMPLETED STRUCTURE. TEMPORARY BRACING SHALL BE EMPLOYED WHENEVER NECESSARY TO WITHSTAND ALL LOADS TO WHICH THE STRUCTURE MAY BE SUBJECT TO DURING ERECTION AND SUBSEQUENT CONSTRUCTION. TEMPORARY BRACING SHALL REMAIN IN PLACE AS LONG AS REQUIRED FOR THE SAFETY AND INTEGRITY OF THE STRUCTURE. THE CONTRACTOR SHALL HAVE THE SOLE RESPONSIBILITY FOR THE DESIGN, ERECTION, OPERATION, MAINTENANCE, AND REMOVAL OF TEMPORARY SUPPORTS, EXCAVATION SHORING, STRUCTURES, AND FACILITIES, AND THE DESIGN AND EXECUTION OF CONSTRUCTION METHODS REQUIRED IN THEIR USE.
7. ALL WORK TO BE COMPLETED IN ACCORDANCE WITH THE ONTARIO HEALTH AND SAFETY ACT (OHSA) AND ITS REGULATIONS.

DESIGN LOADS

1. DESIGN LOADS ARE IN ACCORDANCE WITH PART 4 OF THE 2012 ONTARIO BUILDING CODE [2023 AMD.] AND THE CANADIAN FOUNDATION ENGINEERING MANUAL (CFEM), FOURTH EDITION.
2. DEAD LOAD:
   CONCRETE UNIT WEIGHT = 24 kN/m^3;
   RETAINED SOIL UNIT WEIGHT = 22 kN/m^3;
   WATER UNIT WEIGHT = 9.81 kN/m^3.
3. LIVE LOAD:
   SURCHARGE = 12 kN/m^2.
4. LATERAL EARTH PRESSURE:
   MAXIMUM ACTIVE EARTH PRESSURE = $(Y_{soil}-Y_{water})*ha*Ka$;
   Φ = 34°;
   $\delta = (2/3)*\Phi$ = 22.67°;
   ha = VARIES;
   Ka = 0.28;
   MAXIMUM PASSIVE EARTH PRESSURE = $(Y_{soil}-Y_{water})*hp*Kp$;
   Φ = 34°;
   $\delta = (2/3)*\Phi$ = 22.67°;
   hp = VARIES;
   Kp = 3.69;
5. SEISMIC (MONONOBE-OKABE METHOD) - (kh = PGA = 0.285, kv = 0 (BY GEMTEC)):
   ACTIVE EARTH PRESSURE (SEISMIC) = $(Y_{soil}-Y_{water})*ha*Kae$;
   Kae = 0.357;
   PASSIVE EARTH PRESSURE (SEISMIC) = $(Y_{soil}-Y_{water})*hp*Kpe$;
   Kpe = 5.0.

LOADING BASED ON GEMTEC GEOTECHNICAL INVESTIGATION, PROJECT NO.101481.008, DATED AUGUST 18, 2023.

CONCRETE

1. GENERAL:
   1.1. CONCRETE DESIGN COMPLETED IN ACCORDANCE WITH CSA A23.3 "DESIGN OF CONCRETE STRUCTURES".
   1.2. CONCRETE MATERIALS AND PLACEMENT PROCEDURES ARE TO BE COMPLETED IN ACCORDANCE WITH CSA A23.1 "CONCRETE MATERIALS AND METHODS OF CONCRETE CONSTRUCTION".
   1.3. CONCRETE TESTING IS TO BE COMPLETED IN ACCORDANCE WITH CSA A23.2 "TEST METHODS AND STANDARD PRACTICES FOR CONCRETE"
   1.4. SUBMIT REINFORCING STEEL SHOP DRAWINGS TO AEI FOR REVIEW AND APPROVAL. SHOP DRAWINGS SHALL BE PREPARED, SIGNED AND SEALED BY A PROFESSIONAL ENGINEER LICENSED IN THE PROVINCE OF ONTARIO PRIOR TO FABRICATION. SHOP DRAWING REVIEWS WILL BE CONDUCTED FOR GENERAL CONFORMANCE WITH THE CONTRACT DOCUMENTS ONLY.
2. MATERIALS:
   2.1. CONCRETE PROPERTIES:
   2.1.1. IN ACCORDANCE WITH CSA A23.1/A23.2/A23.3.
   2.1.2. MAXIMUM NOMINAL AGGREGATE SIZE SHALL BE 20mm.
   2.1.3. CONCRETE MIX DESIGN SHALL CONFORM THE THE FOLLOWING REQUIREMENTS:

ELEMENT	MINIMUM 28 DAY COMPRESSIVE STRENGTH	EXPOSURE CLASS	NOTES
WALLS & FOOTINGS	35 MPa	C1	

   2.1.4. THE CONTRACTOR AND CONCRETE SUPPLIER SHALL ENSURE THAT THE PLASTIC AND HARDENED MIX PROPERTIES MEET SITE REQUIREMENTS FOR PLACING, FINISHING AND OBTAINING THE SPECIFIED PERFORMANCE LEVELS.
   2.1.5. THE CONCRETE SUPPLIER SHALL BE CERTIFIED BY THE READY MIXED CONCRETE ASSOCIATION OF ONTARIO.
   2.1.6. ALL CONCRETE SHALL BE NORMAL DENSITY (2300 kg/m^3) UNLESS NOTED OTHERWISE.
3. EXECUTION:
   3.1. FORMWORK DESIGN, FABRICATION, ERECTION AND MATERIAL TO CSA S269.1 AND A23.1.
   3.2. CONCRETE SHALL BE MIXED, PLACED, AND CURED IN ACCORDANCE WITH CSA A23.1 AND CSA A23.3. MAINTAIN RECORDS OF POURED CONCRETE ITEMS. RECORD DATE, LOCATION OF POUR, QUANTITY, AIR TEMPERATURE AND TEST SAMPLES TAKEN.
   3.3. WHEN THE AIR TEMPERATURE IS BELOW 10°C, CONCRETE SHALL BE KEPT AT A TEMPERATURE OF NOT LESS THAN 10°C OR MORE THAN 25° C WHILE BEING MIXED OR PLACED, AND MAINTAINED AT A TEMPERATURE OF NOT LESS THAN 10°C FOR 72 HOURS AFTER PLACING.
   3.4. DO NOT POUR CONCRETE OVER A FROZEN SUBGRADE.
   3.5. ALL CONCRETE SHALL BE CONSOLIDATED WITH INTERNAL VIBRATORS AND FINISHED TO THE ARCHITECT'S REQUIREMENTS.
   3.6. DO NOT INCORPORATE CALCIUM CHLORIDE INTO THE CONCRETE MIX.
   3.7. SLAG REPLACEMENT RATIOS UP TO 60% ARE PERMITTED IN THE MIX DESIGN, AND SHALL BE PROPORTIONED BASED ON THE CONCRETE APPLICATION.
   3.8. EDGES OF CONCRETE THAT ARE TO BE PERMANENTLY EXPOSED SHALL INCLUDE A 12 mm CHAMFER.
   3.9. CONTROL JOINTS TO BE MADE AT 6m INTERVALS.
4. QUALITY CONTROL:
   4.1. THE CONTRACTOR SHALL ENSURE THAT ALL REINFORCING STEEL IS INSPECTED AND APPROVED BY THE ENGINEER UPON COMPLETION AND BEFORE PLACING OF CONCRETE. DO NOT CLOSE FORMS UNTIL REINFORCEMENT HAS BEEN APPROVED BY THE ENGINEER.

REINFORCING STEEL

1. REINFORCING STEEL SHALL CONFORM TO THE FOLLOWING STANDARDS:
   1.1. DEFORMED BARS - CSA G30.18, GRADE 400W
2. BARS MARKED CONTINUOUS SHALL BE TERMINATED USING STANDARD HOOKS AT THE ENDS AND SPLICED USING CLASS 'B' LAP SPLICES.
3. ALL REBAR HOOKS SHALL BE STANDARD LENGTH 90° OR 180° HOOKS.
4. ALL STIRRUPS SHALL BE CLOSED HOOPS UNLESS NOTED OTHERWISE.
5. WHERE BARS OF DIFFERENT SIZES ARE LAPPED IN TENSION, SPLICE LENGTH MAY BE EQUAL TO THE LARGER OF THE SMALLER BAR'S TENSION LAP SPLICE, OR THE LARGER BAR'S DEVELOPMENT LENGTH.
6. ALL REINFORCING STEEL SHALL BE CLEAN, FREE OF LOOSE SCALE, OIL, DIRT OR ANY OTHER DELETERIOUS MATERIAL.
7. MINIMUM REINFORCING STEEL CLEAR SPACING SHALL BE IN ACCORDANCE WITH CSA A23.3 AND SHALL BE THE LARGER OF 1.4 x (DIAMETER OF BAR OR NOMINAL MAXIMUM AGGREGATE SIZE). THIS ALSO APPLIES TO PARALLEL REINFORCEMENT PLACED IN TWO OR MORE LAYERS.
8. CONCRETE REINFORCING WORK, PLACEMENT, TOLERANCES TO CSA A23.1/A23.3.
9. THE MINIMUM CLEAR COVER TO REINFORCING STEEL SHALL BE AS FOLLOWS:

ELEMENT	CLEAR COVER (mm)
WALLS & FOOTINGS	CAST AGAINST EARTH: 75 ± 25 OTHERWISE: 60 ± 20

10. REINFORCING STEEL TENSION TAP SPLICES SHALL HAVE THE MINIMUM LAP LENGTHS AS FOLLOWS:

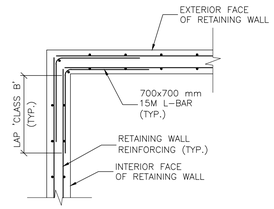
TENSION LAP SPLICE LENGTHS (mm) [CLASS B]		
BAR SIZE	f'c=30 MPa	
	BOTTOM	TOP
10M	350	450
15M	520	670
20M	690	890
25M	1070	1390

EARTHWORK & FOUNDATIONS

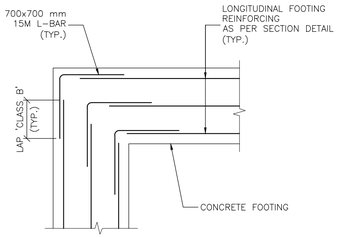
1. GENERAL:
   1.1. ALL EXCAVATIONS AND EARTHWORK SHALL BE COMPLETED IN CONFORMANCE WITH THE FOLLOWING:
   1.1.1. ONTARIO OCCUPATIONAL HEALTH AND SAFETY ACT (OHSA) AND ITS REGULATIONS;
   1.2. RETAINING WALL FOOTINGS HAVE BEEN DESIGNED FOR A SOIL BEARING CAPACITY OF 300 kPa (ULS), 150 kPa (SLS) (GEOTECHNICAL INVESTIGATION REPORT, DATED AUGUST, 18th, 2023, PREPARED BY GEMTEC);
   1.3. GEOTECHNICAL TO REVIEW AND CONFIRM THE BEARING CAPACITY;
   1.4. SEEPAGE ANALYSIS TO BE REVIEWED/CONDUCTED BY A GEOTECHNICAL ENGINEER WHERE APPLICABLE;
   1.5. GEOTECHNICAL TO REVIEW AND PROVIDE RIGID INSULATION FOR FROST PROTECTION WHERE REQUIRED. RIGID INSULATION SHALL HAVE MIN. COMPRESSIVE STRENGTH OF 300 kPa.
2. MATERIALS:
   2.1. FOUNDATION WALL BACKFILL MATERIAL TO BE DESIGNED BY A GEOTECHNICAL ENGINEER.
3. EXECUTION:
   3.1. LOCATE ALL PUBLIC AND PRIVATE UTILITIES AND BURIED STRUCTURES PRIOR TO EXCAVATION.
   3.2. SHALLOW TEMPORARY EXCAVATIONS SHALL HAVE THEIR SIDES SLOPED AT 1 HORIZONTAL TO 1 VERTICAL OR FLATTER, AS INDICATED IN THE GEOTECHNICAL REPORT.
   3.3. PROTECT EXPOSED EXCAVATION FROM FREEZING TEMPERATURES USING SUITABLE CONSTRUCTION TECHNIQUES. SUBMIT PROTECTION PLANS TO THE ENGINEER FOR REVIEW AND APPROVAL, AS REQUIRED.
   3.4. ALL FOOTINGS SHALL BEAR ON APPROVED NATIVE SOILS.
   3.5. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PLACING BACKFILL WITHOUT ANY DAMAGE TO THE FOUNDATION WALL. BACKFILL ON EACH SIDE OF THE STRUCTURE SHALL BE COMPLETED SIMULTANEOUSLY. DO NOT BACKFILL AROUND STRUCTURE UNTIL CONCRETE HAS REACHED A MINIMUM OF 75% OF ITS DESIGN STRENGTH.
4. QUALITY CONTROL:
   4.1. THE CONTRACTOR IS RESPONSIBLE FOR HAVING ALL FOOTING SURFACES INSPECTED AND APPROVED BY A GEOTECHNICAL ENGINEER PRIOR TO PLACING CONCRETE.
   4.2. THE CONTRACTOR IS RESPONSIBLE FOR HAVING A GEOTECHNICAL ENGINEER TO CONDUCT/REVIEW SEEPAGE ANALYSIS WHERE REQUIRED.
   4.3. THE CONTRACTOR IS RESPONSIBLE FOR HAVING THE COMPACTION OF GRANULAR FILL TESTED AND APPROVED BY A GEOTECHNICAL ENGINEER.

REDI-ROCK MSE RETAINING WALL SYSTEM

1. MATERIALS:
   - PRECAST CONCRETE BLOCKS AND ACCESSORIES BY REDI-ROCK AS PER CONTRACT DRAWING;
   - MIRAGRID 5XT BY MIRAFI GEOGRID, ULTIMATE TENSILE STRENGTH = 68.1 kN/m (MACHINE DIRECTION): RF/CR = 1.56, RF/ID = 1.25, RF/D = 1.15;
   - MIRAGRID 8XT BY MIRAFI GEOGRID, ULTIMATE TENSILE STRENGTH = 108.0 kN/m MACHINE DIRECTION): RF/CR = 1.56, RF/ID = 1.25, RF/D = 1.15;
   - NON-WOVEN GEOTEXTILE FABRIC IN ACCORDANCE WITH OPSS 1860, CLASS 1;
   - DRAINSTONE STONE (No.57 OR EQUIVALENT);
   - OPEN-GRADED CRUSH STONE WITH 1" OR SMALLER ø;
   - 6 MIL VISQUEEN PLASTIC LAYER;
   - ALL REINFORCING STEEL TO CONFORM TO CSA G30.18, GRADE 400W;
   - CONCRETE MATERIALS AND PLACEMENT PROCEDURES ARE TO BE COMPLETED IN ACCORDANCE WITH CSA A23.1 "CONCRETE MATERIALS AND METHODS OF CONCRETE CONSTRUCTION"
   - FOUNDATION WALL BACKFILL MATERIAL TO BE DESIGNED BY A GEOTECHNICAL ENGINEER.
2. BACKFILL MATERIAL TO BE COMPACTED TO 90% MODIFIED PROCTOR DENSITY IN ACCORDANCE WITH ASTM D1557.
3. ALL REDI-ROCK INTERNATIONAL WALL SYSTEM SPECIFICATION AND INSTALLATION RECOMMENDATIONS SHOULD BE FOLLOWED.
4. GEOGRID SHALL BE INSTALLED WITH THE HIGHEST STRENGTH AXIS PERPENDICULAR TO THE WALL FACE.
5. GEOGRID SHALL BE 12" WIDE STRIPS AND SHALL BE FACTORY CUT AND CERTIFIED FOR WIDTH AND STRENGTH BY TENCATE MIRAFI.
6. GEOGRID MAY NOT BE SPLICED IN THE PRIMARY STRENGTH DIRECTION
7. ENSURE THAT THE GEOGRID IS PULLED TAUT AND FREE OF WRINKLES BEFORE BACKFILLING THE RETAINING WALL. SECURE ENDS WITH THE STAPLES, STAKES, OR BY HAND TENSIONING UNTIL GEOGRID IS COVERED WITH 152 mm OF LOOSE FILL.
8. BACKFILL SHOULD BE PLACED, SPREAD, AND COMPACTED IN SUCH A MANNER THAT PREVENTS DAMAGE TO THE GEOGRID, AND MINIMIZES THE DEVELOPMENT OF WRINKLES AND/OR MOVEMENT OF THE GEOGRID.
9. TRACKED CONSTRUCTION EQUIPMENT SHOULD NOT BE OPERATED DIRECTLY ON THE GEOGRID. A MINIMUM FILL SOIL THICKNESS OF 152 mm IS REQUIRED PRIOR TO OPERATION OF TRACKED VEHICLE OVER THE GEOGRID.
10. THE COMPLETED RETAINING WALL SHALL BE INSPECTED BY THE ENGINEER PRIOR TO INSTALLATION OF THE SECOND LAYER OF GEOGRID.
11. THE REDI-ROCK BLOCKS SHOULD BE INSTALLED AS PER MANUFACTURE AND CONTRACT DRAWINGS.
12. HEAVY COMPACTION EQUIPMENT SHOULD NOT BE USED BEHIND THE RETAINING WALL.
13. PEDESTRIAN TRAFFIC IS ANTICIPATED AT THE TOP OF WALL ELEVATIONS, SUCH AS A GUARD POST (BY OTHERS) SHOWN ON THESE DRAWINGS. WHERE VEHICULAR TRAFFIC IS ANTICIPATED AT THE TOP OF THE WALL AND A GUIDE RAIL (BY OTHERS) IS REQUIRED, ENSURE THE GUIDE RAIL IS SPACED TO AVOID CONFLICT WITH GEOGRID AND IS SPACED NO LESS THAN 1.2 m FROM THE REAR FACE OF THE RETAINING WALL.



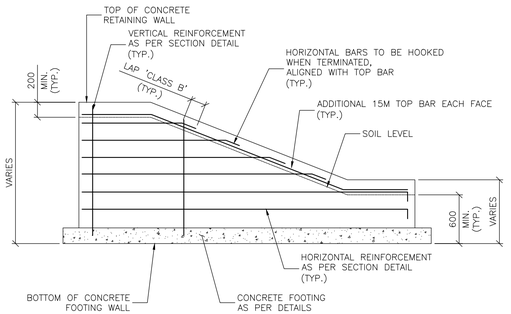
TYPICAL RETAINING WALL REINFORCING DETAIL



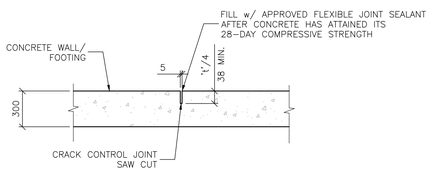
NOTE:

1. VERTICAL DOWELS NOT SHOWN FOR CLARITY. VERTICAL DOWELS SHALL BE AS PER FOOTING SCHEDULE.

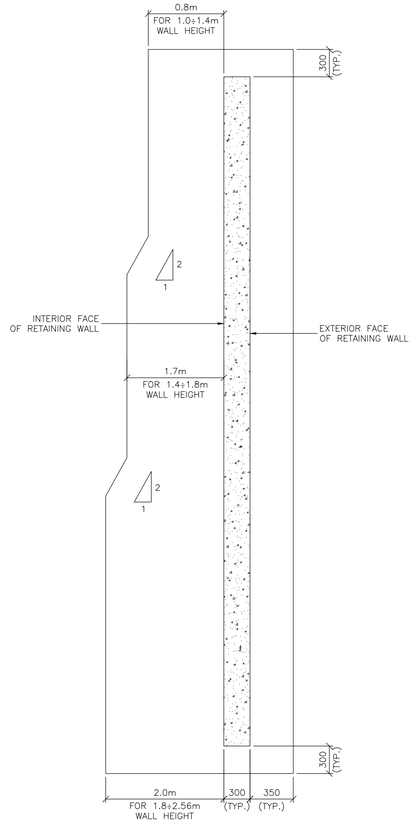
TYPICAL FOOTING REINFORCING DETAIL



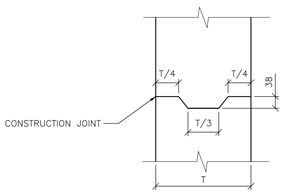
TYPICAL SLOPED TOP OF WALL REINFORCING DETAIL



TYPICAL CRACK CONTROL JOINTS IN CONCRETE WALL AND FOOTING



TYPICAL FOOTING WIDTH TRANSITION DETAIL



TYPICAL CONSTRUCTION JOINT DETAIL

client

JFSA CANADA INC.

project

REDI-ROCK PRECAST
CONCRETE RETAINING WALLS

1319 JOHNSTON ROAD
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A detail no. no. de détail
B location drawing no. sur dessin no.

scale N.T.S.

revisions		date
0	ISSUED FOR CLIENT REVIEW	06-08-2024

drawing

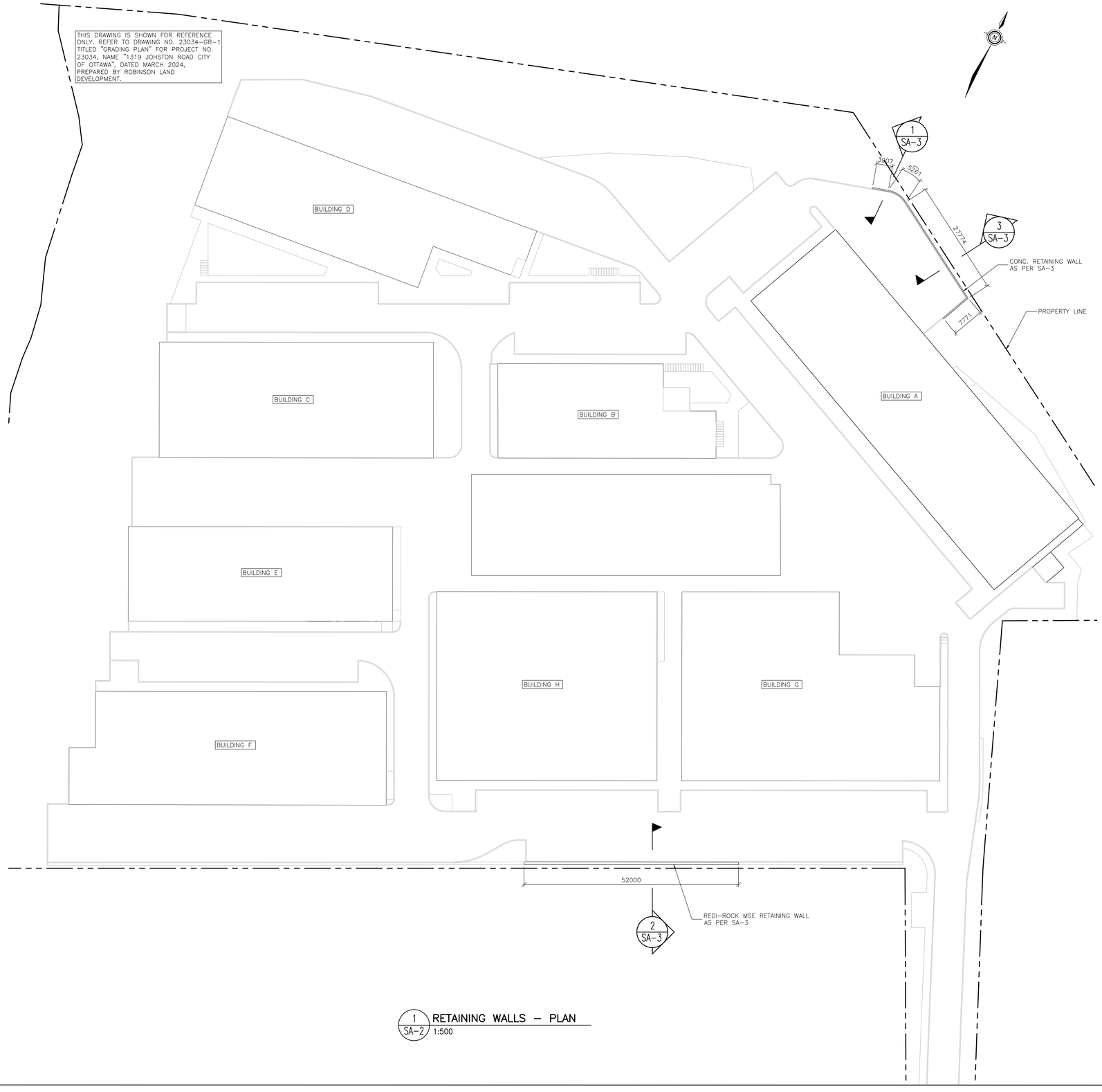
GENERAL NOTES & TYPICAL DETAILS

stamp

LICENSED PROFESSIONAL ENGINEER
N. E. VAN DEN BERG
100531056
07/08/2024
PROVINCE OF ONTARIO

designed	drawn	reviewed	approved
F.S.	V.Y.	N.V.	N.V.
date		project number	drawing number
August 07, 2024		7203	SA-1

ANSI D (22.00" x 34.00")



1 SA-2 RETAINING WALLS – PLAN
1:500

client

JFSA CANADA INC.

project

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A detail no.
no. de détail
B location drawing no.
sur dessin no.

scale 1:500

revisions		date
0	ISSUED FOR CLIENT REVIEW	07-08-2024

drawing

RETAINING WALLS PLAN

stamp

LICENSED PROFESSIONAL ENGINEER
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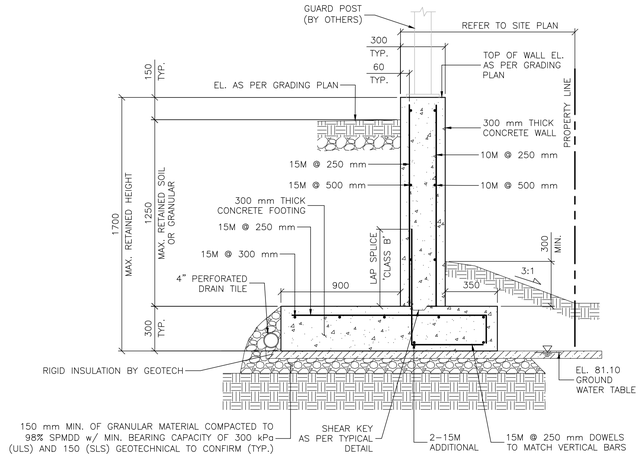
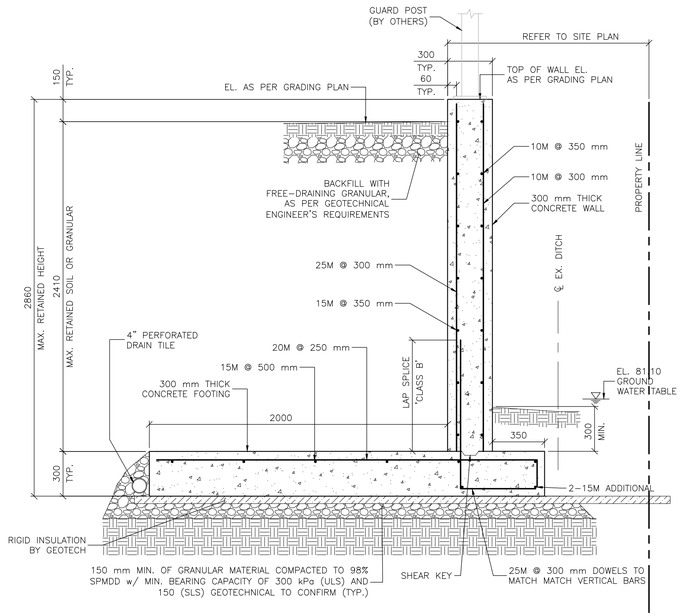
07/08/2024
PROVINCE OF ONTARIO

designed	drawn	reviewed	approved
F.S.	V.Y.	N.V.	N.V.
date		project number	drawing number
August 07, 2024		7203	SA-2

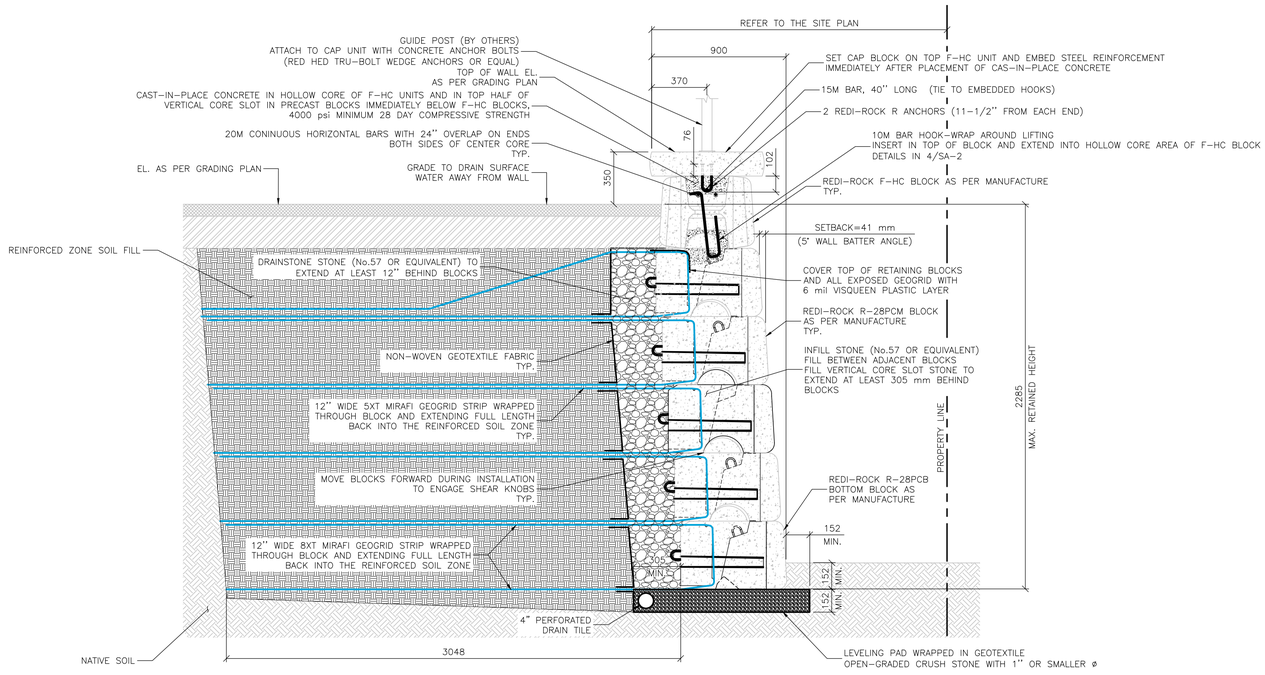
ANSI D (22.00" x 34.00")



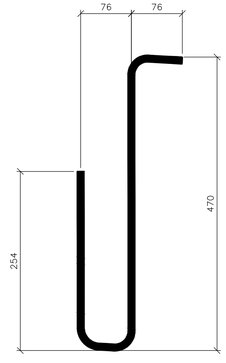
1 / SA-3 SECTION FOR WALL HEIGHTS 1.0 TO 1.4 m
1:20



3 / SA-3 SECTION FOR WALL HEIGHTS 1.8 TO 2.56 m
1:20



2 / SA-3 SECTION FOR WALL HEIGHTS 1.4 TO 1.8 m
1:20



4 / SA-3 TYPICAL 10M BAR HOOK DETAIL
1:5

ANSI D (22.00" x 34.00")

client

JFSA CANADA INC.

project

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A detail no. no. de détail
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scale AS NOTED

revisions		date
0	ISSUED FOR CLIENT REVIEW	06-08-2024

drawing

RETAINING WALLS SECTIONS

stamp

LICENSED PROFESSIONAL ENGINEER
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07/08/2024
PROVINCE OF ONTARIO

designed	drawn	reviewed	approved
F.S.	V.Y.	N.V.	N.V.
date		project number	drawing number
August 07, 2024		7203	SA-3