DESIGN PROVISIONS:

1. THE FOLLOWING EFFECTIVE STRENGTH PARAMETERS WERE ASSUMED IN THE PREPARATION OF THE STRUCTURAL CALCULATIONS FOR THE RECON RETAINING WALL SYSTEM:

<table>
<thead>
<tr>
<th>Soil Type</th>
<th>φ</th>
<th>c</th>
<th>γ</th>
</tr>
</thead>
<tbody>
<tr>
<td>REINFORCED SOIL</td>
<td>12°</td>
<td>0 PSF</td>
<td>120 PCF</td>
</tr>
<tr>
<td>RETAINED SOIL (WALL 1)</td>
<td>60°</td>
<td>0 PSF</td>
<td>120 PCF</td>
</tr>
<tr>
<td>RETAINED SOIL (WALL 2)</td>
<td>26°</td>
<td>0 PSF</td>
<td>120 PCF</td>
</tr>
<tr>
<td>FOUNDATION SOIL</td>
<td>26°</td>
<td>0 PSF</td>
<td>120 PCF</td>
</tr>
</tbody>
</table>

2. THE WALLS ARE DESIGNED TO MEET THE FOLLOWING DESIGN PARAMETERS AND MAXIMUM SURCHARGE LOADINGS:

- UNIT TYPE: RECON SERIES 50 (24' UNITS)
- REINFORCEMENT: STRATA SG550 (WALL 2 / GRAVITY WALL 1)
- DESIGN METHOD: AASHTO LRFD
- LIVE LOAD: 250 PSF (WALL 1) / 150 PSF (WALL 2)
- DEAD LOAD: NONE
- BACK SLOPE: NONE
- TOE SLOPE: 4H:1V
- SEISMIC: 0.34 g (SEISMIC SITE CLASS B)
- WIND LOAD: 20.7 PSF (PER IBC SECTION 1609)
- HYDROSTATIC: N/A (RAINAGE PROVIDED)

3. THE FOUNDATION SOILS AT THE WALL LOCATIONS SHALL BE CAPABLE OF SAFELY SUPPORTING THE MINIMUM APPLIED REARING PRESSURE AS SHOWN ON THE WALL PROFILES WITHOUT FAILURE OR EXCESSIVE SETTLEMENT. LOCAL BEARING CAPACITY SHALL BE CONFIRMED BY THE SITE GEOTECHNICAL ENGINEER AFTER FOUNDATION EXCAVATION AND PRIOR TO WALL CONSTRUCTION.

SHEET INDEX

1. TITLE SHEET
2. SITE PLAN
3. WALL 1 ELEVATION
4. WALL 2 ELEVATION
5. WALL 3 ELEVATION
6. WALL 4 ELEVATION
7. TYPICAL WALL SECTION A-A
8. TYPICAL WALL SECTION B-B
9. TYPICAL RECON UNIT DETAILS
10. TYPICAL REINFORCEMENT DETAILS
11. TRAFFIC BARRIER DETAILS
12. SPECIFICATIONS

GENERAL NOTES:

SUGGESTED QUALITY ASSURANCE PROVISIONS:

1. MULTIPLE CONTRACTORS (FENCE, WALL, GRADING, ETC.) MAY BE USED TO COMPLETE THE OVERALL PROJECT AS SHOWN ON THESE SHOP DRAWINGS. PLANS DO NOT DEFINE SCOPE OF WORK FOR INDIVIDUAL ENTITIES. SEE CONTRACT DOCUMENTS FOR SPECIFIC DETAILS ON THE SCOPE OF WORK THAT WILL BE PROVIDED BY ALL PARTIES.

2. WALL CONSTRUCTION SHALL BE SUPERVISED BY A QUALIFIED ENGINEER OR TECHNICIAN TO VERIFY FIELD AND SITE SOIL CONDITIONS. IF THIS WORK IS NOT PERFORMED BY THE SITE GEOTECHNICAL ENGINEER, A QUALIFIED GEOTECHNICAL ENGINEER/TECHNICIAN SHALL BE CONSULTED IN THOSE MATTERS PERTAINING TO THE SOIL CONDITIONS AND WALL PERFORMANCE.

3. THE FOUNDATION SOILS AT THE BASE OF THE WALLS SHALL BE INSPECTED BY THE GEOTECHNICAL ENGINEER. ANY UNSUITABLE SOILS OR IMPROPERLY COMPACTED EMBANKMENT MATERIAL SHALL BE REMOVED AND REPLACED AS DIRECTED BY THE ENGINEER PRIOR TO WALL CONSTRUCTION TO PROVIDE ADEQUATE BEARING CAPACITY AND MINIMIZE SETTLEMENT.

4. ALL WALL EXCAVATION AND RETAINED SOILS SHALL BE INSPECTED FOR GROUNDWATER CONDITIONS. ANY ADDITIONAL DRAINAGE PROVISIONS REQUIRED IN THE FIELD SHALL BE INCORPORATED INTO THE WALL CONSTRUCTION AS DIRECTED BY THE GEOTECHNICAL ENGINEER.

5. WALL BACKFILL MATERIAL SHALL BE TESTED AND APPROVED BY THE ENGINEER, MEETING THE MINIMUM REQUIREMENTS OF THE APPROVED DESIGN PLANS OR SPECIFICATIONS.

6. ALL SOIL BACKFILL SHALL BE TESTED BY THE GEOTECHNICAL ENGINEER FOR MOISTURE, DENSITY, AND COMPACTED PERIODICALLY (EVERY 2 VERTICALLY, 10' C/C) MEETING THE MINIMUM REQUIREMENTS OF THE APPROVED DESIGN PLANS OR SPECIFICATIONS.

7. THE CONTRACTOR SHALL ESTABLISH AND MAINTAIN QUALITY CONTROL FOR THE CONSTRUCTION OF THE WALL TO ASSURE COMPLIANCE WITH CONTRACT REQUIREMENTS AND MAINTAIN RECORDS OF ITS QUALITY CONTROL.

8. ALL WALL ELEVATIONS, GRADING, AND BACK SLOPE CONDITIONS SHALL BE VERIFIED BY THE ENGINEER IN THE FIELD FOR COMPLIANCE WITH THE APPROVED DESIGN PLANS, ANY REVISIONS TO THE SPECIFICATIONS OR DESIGN CRITERIA SHALL REQUIRE DESIGN MODIFICATIONS PRIOR TO PROCEEDING WITH CONSTRUCTION.
GENERAL NOTES:

1. THE SITE PLAN SHOWN IS FOR ILLUSTRATIVE PURPOSES ONLY. IT WAS REPRODUCED FROM GRADING AND DRAINAGE PLANS PREPARED BY CTA DATED 07/18/2013.

2. THE APPROXIMATE LOCATION OF UTILITIES KNOWN TO EXIST AS SHOWN ON THE PLANS ARE BASED ON THE BEST INFORMATION AVAILABLE AT THE TIME OF PLAN PREPARATION.

3. THE CONTRACTOR SHALL VERIFY INVERTS OF PROPOSED AND EXISTING UTILITIES TO ENSURE THERE ARE NO CONFLICTS. THE ENGINEER SHALL BE CONTACTED IF CONFLICTS ARISE AND AN ALTERNATIVE DESIGN MAY BE REQUIRED.
GENERAL NOTES:

1. WALL 1 IS DESIGNED AS A GRAVITY WALL AND WALL 2 IS DESIGNED AS A REINFORCED WALL WITH STRATA SG350 AND SG550 GEOCGRID REINFORCEMENT AT THE ELEVATIONS SHOWN.

2. WALL 1 SHALL BE BACKFILLED AT A 1H:1V EXTENDING OFF THE BACK OF THE BOTTOM UNIT WITH 100% FREE DRAINING, WASHED, ANGULAR CRUSHED STONE (SPEC 2.07/SHEET 12).

3. A GEOTEXTILE FABRIC SHALL BE PLACED WHERE RETAINING WALLS ABUT TO WALLS AS SHOWN ON SITE PLAN SHEET 2. OVERLAP ALL ABUTMENT JOINTS 24" WITH A MINIMUM 48" WIDE FABRIC TO PREVENT THE COREFILL AND BACKFILL FROM MIGRATING THROUGH THE ABUTMENT JOINTS.

4. SEE MANUFACTURER INFORMATION FOR ADDITIONAL CONSTRUCTION DETAILS FOR THE RECON RETAINING WALL SYSTEM. THE MANUFACTURER INFORMATION SHALL ACCOMPANY THE CONSTRUCTION PLANS.

RECON BLOCK KEY:

- FHC: FULL HIGH CAPSTONE
- FHCE: FULL HIGH CAPSTONE END
- FE: FENCE END BLOCK
- FEB: FENCE END HALF
- FB: FENCE BLOCK
- RCT: RIGHT CORNER TOP
- LCT: LEFT CORNER TOP
- CB: 24" DEEP MIDDLE CORNER
- T: 24" DEEP TOP BLOCK
- 2H: 24" DEEP HALF MIDDLE
- 2B: 24" DEEP FULL BOTTOM
- 45M: 45" DEEP FULL MIDDLE
- 24B: 24" DEEP FULL BOTTOM
- FEH: FENCE END HALF
- 24M: 24" DEEP FULL MIDDLE

FINISHED GRADE AT TOP OF WALL
FINISHED GRADE AT BOTTOM OF WALL
6" LEVELING PAD

CONTRACTOR SHALL CONFIRM ALL QUANTITIES

WWW.RECONWALLS.COM

GRACE FALLS, MONTANA

TACO BELL - EMBARK CREDIT UNION

WALL 1 ELEVATION

WALL 1 - FRONT FACE ELEVATION

MIN. REINFORCEMENT DEPTH (FEET)
MIN. BEARING CAPACITY (SERIES 50 UNITS: 3.6" BATTERY)
DIST ALONG WALL (FEET)

2,000 PSF GRAVITY
### GENERAL NOTES:

1. WALL 1 is designed as a gravity wall and WALL 2 is designed as a reinforced wall with STRATA SG350 and SG550 geogrid reinforcement at the elevations shown.

2. All units not shown are 24" deep full middle units.

3. A geotextile fabric shall be placed where retaining walls abut to walls as shown on site plan (sheet 2). Overlap all abutment joints 24" with a minimum 48" wide fabric to prevent the corefill and backfill from migrating through the abutment joints.

4. See manufacturer information for additional construction details for the RECON retaining wall system. The manufacturer information shall accompany the construction plans.

### RECON BLOCK KEY:

- **FB**: FENCE BLOCK
- **FE**: FENCE END BLOCK
- **FEH**: FENCE END HALF
- **RCT**: RIGHT CORNER TOP
- **LCT**: LEFT CORNER TOP
- **RCT**: RIGHT CORNER TOP
- **CB**: 24" DEEP MIDDLE CORNER
- **2H**: 24" DEEP HALF MIDDLE
- **2B**: 24" DEEP FULL BOTTOM
- **81**: 24" DEEP FULL MIDDLE

CONTRACTOR SHALL CONFIRM ALL QUANTITIES

### WALL 2 - FRONT FACE ELEVATION

<table>
<thead>
<tr>
<th>Component</th>
<th>Light</th>
<th>Shade</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>REINF DEPTH</strong></td>
<td>9.0</td>
<td>12.0</td>
</tr>
<tr>
<td><strong>BEARING CAPACITY</strong></td>
<td>3,800</td>
<td>2,800</td>
</tr>
<tr>
<td><strong>MIN. REINFORCEMENT</strong></td>
<td>0</td>
<td>10</td>
</tr>
<tr>
<td><strong>MIN. BEARING CAPACITY</strong></td>
<td>2,800</td>
<td>9.0</td>
</tr>
</tbody>
</table>

### PROJECT:

- Project No:
- Registration No:
- Sheet No:
- Designed By:
- Scale:
- Date: SEPT 5, 2013
- TACO BELL - EMBARK CREDIT UNION
- 20003
- 13-510

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GENERAL NOTES:

1. WALL 1 IS DESIGNED AS A GRAVITY WALL AND WALL 2 IS DESIGNED AS A REINFORCED WALL WITH STRATA SG350 AND SG550 GEOLGRID REINFORCEMENT AT THE ELEVATIONS SHOWN.

2. ALL UNITS NOT SHOWN ARE 24" DEEP FULL MIDDLE UNITS.

3. SEE MANUFACTURER INFORMATION FOR ADDITIONAL CONSTRUCTION DETAILS FOR THE RECON RETAINING WALL SYSTEM. THE MANUFACTURER INFORMATION SHALL ACCOMPANY THE CONSTRUCTION PLANS.

RECON BLOCK KEY:

- FHC: FULL HIGH CAPSTONE
- FHEC: FULL HIGH CAPSTONE END
- FE: FENCE END BLOCK
- FEBH: FENCE END HALF
- FB: FENCE BLOCK
- RCT: RIGHT CORNER TOP
- LCT: LEFT CORNER TOP

CONTRACTOR SHALL CONFIRM ALL QUANTITIES

1. WALL 1 IS DESIGNED AS A GRAVITY WALL AND WALL 2 IS DESIGNED AS A REINFORCED WALL WITH STRATA SG350 AND SG550 GEOLGRID REINFORCEMENT AT THE ELEVATIONS SHOWN.

2. ALL UNITS NOT SHOWN ARE 24" DEEP FULL MIDDLE UNITS.

3. SEE MANUFACTURER INFORMATION FOR ADDITIONAL CONSTRUCTION DETAILS FOR THE RECON RETAINING WALL SYSTEM. THE MANUFACTURER INFORMATION SHALL ACCOMPANY THE CONSTRUCTION PLANS.

RECON WALL 2 - FRONT FACE ELEVATION
GENERAL NOTES:

1. WALL 1 IS DESIGNED AS A GRAVITY WALL AND WALL 2 IS DESIGNED AS A REINFORCED WALL WITH STRATA SG350 AND SG550 GEOGRID REINFORCEMENT AT THE ELEVATIONS SHOWN.

2. ALL UNITS NOT SHOWN ARE 24" DEEP FULL MIDDLE UNITS.

3. SEE MANUFACTURER INFORMATION FOR ADDITIONAL CONSTRUCTION DETAILS FOR THE RECON RETAINING WALL SYSTEM. THE MANUFACTURER INFORMATION SHALL ACCOMPANY THE CONSTRUCTION PLANS.

RECON BLOCK KEY:

- CB: 24" Deep Middle Corner
- CR: 24' Deep Middle Top Block
- FE: Fence End Block
- FER: Fence End Half
- FB: Fence Block
- RCT: Right Corner Top
- LCT: Left Corner Top
- FB: Fence Block
- FE: Fence End
- FHC: Full High Capstone
- FHCE: Full High Capstone End
- CB: 24" Deep Middle Corner
- CR: 24' Deep Middle Top Block
- FE: Fence End Block
- FER: Fence End Half
- FB: Fence Block
- RCT: Right Corner Top
- LCT: Left Corner Top

CONTRACTOR SHALL CONFIRM ALL QUANTITIES

RECON WALL 2 - FRONT FACE ELEVATION

MIN. REINFORCEMENT DEPTH (FEET) DIST ALONG WALL (FEET)

FINISHED GRADE AT TOP OF WALL EL = 3415.33

MIN. REARING CAPACITY 3,800 PSI

MIN. REARING CAPACITY 3,800 PSI

(WALL 1) 10.0 7.0

3422.00 3420.00 3418.00 3416.00 3414.00 3412.00 3410.00 3408.00

FINISHED GRADE AT BOTTOM OF WALL EL = 3408.67

6" LEVELING PAD

3,800 PSF 3,800 PSF

(SERIES 50 UNITS - 3.0" BATTER)

284.00 272.00 260.00 250.00 240.00

RECON WALL 2 - FRONT FACE ELEVATION
1. THE SECTION SHOWN IS A REPRESENTATIVE WALL SECTION. THE WALL HEIGHTS, ELEVATIONS, TOE SLOPES, AND BACK SLOPES VARY ACCORDING TO THE ELEVATION PLAN AND SITE PLAN RESPECTIVELY.

2. UPON EXCAVATION, WHERE UNSUITABLE SOILS ARE FOUND, SUBCUT TO DEPTH "D" AS REQUIRED BY THE ONSITE GEOTECHNICAL ENGINEER AND REPLACE WITH SUITABLE COMPACTED STRUCTURAL FILL TO ACHIEVE THE REQUIRED BENDING CAPACITY. THE STRUCTURAL FILL SHALL BE COMPACTED TO A MINIMUM 95% STANDARD PROCTOR DENSITY.

3. APPROXIMATE LIMITS OF EXCAVATION VARIES WHERE SUBCUT IS REQUIRED. ACTUAL LIMITS AND SLOPE SLOPES SHALL BE DETERMINED BY OSHA REGULATIONS AND MATCH FIELD CONDITIONS AS DETERMINED BY THE CONTRACTOR.

4. ALL WORK AND MATERIALS SHALL COMPLY WITH ALL STATE, COUNTY AND CITY REGULATIONS AND CODES AS WELL AS OSHA STANDARDS.

5. WALL 1 IS DESIGNED AS A GRAVITY WALL AND WALL 2 IS DESIGNED AS A REINFORCED WALL WITH STRATA SG350 GEOGRID REINFORCEMENT AT THE ELEVATIONS SHOWN.

6. WALL 1 SHALL BE BACKFILLED AT A 1H:1V EXTENDING OFF THE BACK OF THE BOTTOM UNIT WITH 100% FREE DRAINING, WASHED, ANGULAR CRUSHED STONE (SEE SPEC 2.07).

7. 4" CORRUGATED PERFORATED DRAINPIPE WRAPPED WITH A GEOTEXTILE FABRIC INSTALLED AT BACK OF BOTTOM UNIT (WALL 1). OUTLET INTO SITE DRAINAGE OR LOW END OF WALL.


9. INSPECT EXCAVATION SLOPES FOR ACTIVE SEEPAKE AND PLACE ADDITIONAL DRAINS WHERE SEEPAKE OCCURS.

10. DO NOT BRING HEAVY COMPACTION OR PAVING EQUIPMENT WITHIN 3' OF THE BACK OF THE RECON RETAINING WALL.

11. SEE MANUFACTURER'S INFORMATION FOR ADDITIONAL DETAILS ON THE RECON RETAINING WALL SYSTEM. THE MANUFACTURER INFORMATION SHALL ACCOMPANY THE CONSTRUCTION PLANS.
GENERAL NOTES:

1. THE SECTION SHOWN IS A REPRESENTATIVE WALL SECTION. THE WALL HEIGHTS, ELEVATIONS, Toe SLOPES, AND BACK SLOPES VARY ACCORDINGLY TO THE ELEVATION PLAN AND SITE PLAN RESPECTIVELY.

2. UPON EXCAVATION, WHERE UNSUITABLE SOILS ARE FOUND, SUBCUT TO DEPTH 10' AS REQUIRED BY THE ONSITE GEOTECHNICAL ENGINEER AND REPLACE WITH SUITABLE COMPACTED STRUCTURAL FILL. TO ACHIEVE THE REQUIRED BEARING CAPACITY, THE STRUCTURAL FILL SHALL BE COMPACTED TO A MINIMUM 95% STANDARD PROCTOR DENSITY.

3. APPROXIMATE LIMITS OF EXCAVATION VARIES WHERE SUBCUT IS REQUIRED. ACTUAL LIMITS AND SIDE SLOPES SHALL BE DETERMINED BY OSHA REGULATIONS AND MATCH FIELD CONDITIONS AS DETERMINED BY THE CONTRACTOR.

4. ALL WORK AND MATERIALS SHALL COMPLY WITH ALL STATE, COUNTY AND CITY REGULATIONS AND CODES AS WELL AS OSHA STANDARDS.

5. THE WALLS SHALL BE CONSTRUCTED WITH RECON 24' DEEP UNITS USING 3/6' BATTER. WALL 1 IS DESIGNED AS A GRAVITY WALL AND WALL 2 IS DESIGNED AS A REINFORCED WALL WITH STRATA SG350 GEOGRID REINFORCEMENT AT THE ELEVATIONS SHOWN.

6. 4" CORRUGATED PERFORATED DRAINPIPE WRAPPED WITH A GEOTEXTILE FABRIC INSTALLED AT FINISHED GRADE (WALL 2) ON TOP OF DENSE GRADED AGGREGATE WITH POSITIVE DRAINAGE (1% MIN). OUTLET THROUGH FACE AT 45° O.C. AND/OR ONSITE DRAINAGE AND LOW POINTS OF WALL.

7. CONSTRUCTION ADHESIVE SHALL BE PLACED BETWEEN UNITS TO PREVENT BLOCKS FROM DISELODGING DURING VEHICLE IMPACT. SEE MANUFACTURER'S INFORMATION FOR ADDITIONAL DETAILS.

8. INSPECT EXCAVATION SLOPES FOR ACTIVE SEEPAGE AND PLACE ADDITIONAL DRAINS WHERE SEEPAGE OCCURS.

9. DO NOT BRING HEAVY COMPACTION OR PAVING EQUIPMENT WITHIN 3' OF THE BACK OF THE RECON RETAINING WALL.

10. SEE MANUFACTURER'S INFORMATION FOR ADDITIONAL DETAILS ON THE RECON RETAINING WALL SYSTEM. THE MANUFACTURER INFORMATION SHALL ACCOMPANY THE CONSTRUCTION PLANS.

REINFORCED WALL SECTION B - B

(WALL 2 SECTION SHOWN AT 157')
NOTES:
1. THE LEVELING PAD SHALL BE CONSTRUCTED OF CRUSHED STONE OR LOW-FRIP RIPPED CONCRETE.
2. THE CONTRACTOR SHALL HAVE A QUALIFIED GEOTECHNICAL ENGINEER VERIFY THE FOUNDATION SOILS TO ENSURE THAT IT MEETS OR EXCEEDS THE MINIMUM BEARING CAPACITY REQUIREMENTS.
3. THE BASE FOUNDATION SHALL BE APPROVED PRIOR TO PLACEMENT OF THE LEVELING PAD.

LEVELING PAD
SCALE: N.T.S.

NOTES:
1. IT WILL BE NECESSARY FOR BLOCK STABILITY TO ADD A CONCRETE SHIM BENEATH THE PORTION OF THE TOP CORNER UNIT THAT BEARS ON PART OF ANOTHER UNIT LOCATED BELOW.
2. THE SHIM IS TYPICALLY A STANDARD CONCRETE MASONRY UNIT (CMU). USING ADHESIVE ON THE SHIM WILL RESIST MOVEMENT DURING CONSTRUCTION.

Standard Top of Wall Step
SCALE: N.T.S.

NOTES:
3. A GEOTEXTILE FABRIC SHALL BE PLACED WHERE THE RETAINING WALLS ADJACENT TO EXISTING FOUNDATIONS AS SHOWN ON THE RETAINING WALL SITE PLAN. OVERLAP ALL ABUTMENT JOINTS 24" WITH A MINIMUM 48" WIDE FABRIC.

TYPICAL FENCE POST INSTALLATION
SCALE: N.T.S.

NOTES:
1. PLACE SONOTUBES AT GUARDRAIL POST LOCATIONS.
2. GROUT GUARDRAIL POSTS INTO SONOTUBES.
3. DESIGNED BY OTHERS.

TYPICAL RECON UNIT DETAILS
SCALE: N.T.S.

NOTES:
1. 4" DIAMETER CORRUGATED PERFORATED PLASTIC DRAINPIPE WRAPPED WITH A GEOTEXTILE FABRIC.
2. PROVIDE RODENT SCREEN AND 4" DIAMETER NON-PERFORATED PLASTIC PIPE OUTLET THROUGH WALL.
3. OUTLET INTO ONSITE DRAINAGE SYSTEM, THROUGH FACE OF WALL AT 50" O.C. MAXIMUM, AND/OR LOW POINTS ALONG WALL.

TYPICAL GUARDRAIL INSTALLATION
SCALE: N.T.S.

NOTES:
1. PLACE SONOTUBES AT GUARDRAIL POST LOCATIONS.
2. GROUT GUARDRAIL POSTS INTO SONOTUBES.
3. DESIGNED BY OTHERS.
NOTES:
1. INSTALL GEORGRID IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATION AND CONSTRUCTION DRAWINGS.
2. LEVEL AND COMPACT BACKFILL MATERIAL TO THE LEVEL OF REINFORCEMENT.
3. POSITION GEORGRID OVER THE TONGUE AND GROOVE AND TO WITHIN 2" OF THE FRONT EXPOSED FACE. PLACE NEXT COURSE OF UNITS.
4. PRIOR TO BACKFILLING, PULL GEORGRID TAU TO REMOVE WRINKLES AND FOLDS. STAKE GEORGRID AS REQUIRED.

ADDITIONAL GEORGRID OVERLAP EXTEND (WALL HEIGHT/4)
3" MIN OF SOIL FILL IS REQUIRED BETWEEN OVERLAPPING GEORGRID.

GEORGRID ORIENTATION
SCALE: N.T.S.

NOTES:
1. INSTALL GEORGRID IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATION AND CONSTRUCTION DRAWINGS.
2. 1" IS WALL HEIGHT.

ADDITIONAL GEORGRID OVERLAP EXTEND (WALL HEIGHT/4)
3" MIN OF SOIL FILL IS REQUIRED BETWEEN OVERLAPPING GEORGRID.

GEORGRID INSTALLATION ON CORNERS
SCALE: N.T.S.

NOTES:
1. CONTRACTOR SHALL COORDINATE THE PLACEMENT OF GEORGRID TO AVOID CONFLICT WITH OBSTRUCTION (PAVEMENT). GEORGRID SHALL BE SEPARATED FROM OBSTRUCTION BY A MINIMUM OF 4" (AS SHOWN).
2. PROVIDE 6" MINIMUM OF CRUSHED STONE AROUND UTILITY PIPE.
3. MAINTAIN 3" MINIMUM CLEARANCE BETWEEN GEORGRID AND UTILITY.

MAX DEFLECTION 15°
OBSTRUCTION (DEPTH VARIES)

TYPICAL GEORGRID DEFLECTION
SCALE: N.T.S.

NOTES:
1. INSTALL GEORGRID IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATION AND CONSTRUCTION DRAWINGS.
2. 1" IS WALL HEIGHT.

ADDITIONAL GEORGRID OVERLAP EXTEND (WALL HEIGHT/4)
3" MIN OF SOIL FILL IS REQUIRED BETWEEN OVERLAPPING GEORGRID.

TYPICAL GEORGRID INSTALLATION ON CURVES
SCALE: N.T.S.

NOTES:
1. PLACE SONOTUBES AT GUARDRAIL POST LOCATIONS.
2. HANDCUT GEORGRID AROUND SONOTUBE.
3. GROUT GUARDRAIL POSTS INTO SONOTUBES.
4. DESIGNED BY OTHERS.

REFERENCE
AASHTO 2017 STANDARD SPECIFICATIONS FOR HIGHWAY BRIDGES 17TH EDITION, SECTION 5 - RETAINING WALLS, TRAFFIC LOADS AND BARRIES 5.8.12.2.

1.3' MIN
5' MIN
GROUT FILLED SONOTUBE

TYPICAL GUARDRAIL INSTALLATION
SCALE: N.T.S.

NOTES:
1. INSTALL GEORGRID IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATION AND CONSTRUCTION DRAWINGS.
2. LEVEL AND COMPACT BACKFILL MATERIAL TO THE LEVEL OF REINFORCEMENT.
3. POSITION GEORGRID OVER THE TONGUE AND GROOVE AND TO WITHIN 2" OF THE FRONT EXPOSED FACE. PLACE NEXT COURSE OF UNITS.
4. PRIOR TO BACKFILLING, PULL GEORGRID TAU TO REMOVE WRINKLES AND FOLDS. STAKE GEORGRID AS REQUIRED.

ADDITIONAL GEORGRID OVERLAP EXTEND (WALL HEIGHT/4)
3" MIN OF SOIL FILL IS REQUIRED BETWEEN OVERLAPPING GEORGRID.

GEORGRID INSTALLATION ON CORNERS
SCALE: N.T.S.

NOTES:
1. CONTRACTOR SHALL COORDINATE THE PLACEMENT OF GEORGRID TO AVOID CONFLICT WITH OBSTRUCTION (PAVEMENT). GEORGRID SHALL BE SEPARATED FROM OBSTRUCTION BY A MINIMUM OF 4" (AS SHOWN).
2. PROVIDE 6" MINIMUM OF CRUSHED STONE AROUND UTILITY PIPE.
3. MAINTAIN 3" MINIMUM CLEARANCE BETWEEN GEORGRID AND UTILITY.

MAX DEFLECTION 15°
OBSTRUCTION (DEPTH VARIES)

TYPICAL GEORGRID DEFLECTION
SCALE: N.T.S.

NOTES:
1. INSTALL GEORGRID IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATION AND CONSTRUCTION DRAWINGS.
2. 1" IS WALL HEIGHT.

ADDITIONAL GEORGRID OVERLAP EXTEND (WALL HEIGHT/4)
3" MIN OF SOIL FILL IS REQUIRED BETWEEN OVERLAPPING GEORGRID.

TYPICAL GEORGRID INSTALLATION ON CURVES
SCALE: N.T.S.

NOTES:
1. REINFORCE WALL AT CATCH BASINS AS SHOWN. ALL STEEL PARTS SHALL BE HOT-DIP GALVANIZED.

PLACE ADDITIONAL GEORGRID WHEN ANGLE EXCEEDS 20°

TYPICAL VERTICAL OBSTRUCTION
SCALE: N.T.S.

NOTES:
1. INSTALL GEORGRID IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATION AND CONSTRUCTION DRAWINGS.
2. LEVEL AND COMPACT BACKFILL MATERIAL TO THE LEVEL OF REINFORCEMENT.
3. POSITION GEORGRID OVER THE TONGUE AND GROOVE AND TO WITHIN 2" OF THE FRONT EXPOSED FACE. PLACE NEXT COURSE OF UNITS.
4. PRIOR TO BACKFILLING, PULL GEORGRID TAU TO REMOVE WRINKLES AND FOLDS. STAKE GEORGRID AS REQUIRED.

ADDITIONAL GEORGRID OVERLAP EXTEND (WALL HEIGHT/4)
3" MIN OF SOIL FILL IS REQUIRED BETWEEN OVERLAPPING GEORGRID.

GEORGRID INSTALLATION ON CORNERS
SCALE: N.T.S.

NOTES:
1. CONTRACTOR SHALL COORDINATE THE PLACEMENT OF GEORGRID TO AVOID CONFLICT WITH OBSTRUCTION (PAVEMENT). GEORGRID SHALL BE SEPARATED FROM OBSTRUCTION BY A MINIMUM OF 4" (AS SHOWN).
2. PROVIDE 6" MINIMUM OF CRUSHED STONE AROUND UTILITY PIPE.
3. MAINTAIN 3" MINIMUM CLEARANCE BETWEEN GEORGRID AND UTILITY.

MAX DEFLECTION 15°
OBSTRUCTION (DEPTH VARIES)

TYPICAL GEORGRID DEFLECTION
SCALE: N.T.S.

NOTES:
1. INSTALL GEORGRID IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATION AND CONSTRUCTION DRAWINGS.
2. 1" IS WALL HEIGHT.

ADDITIONAL GEORGRID OVERLAP EXTEND (WALL HEIGHT/4)
3" MIN OF SOIL FILL IS REQUIRED BETWEEN OVERLAPPING GEORGRID.

TYPICAL GEORGRID INSTALLATION ON CURVES
SCALE: N.T.S.

NOTES:
1. REINFORCE WALL AT CATCH BASINS AS SHOWN. ALL STEEL PARTS SHALL BE HOT-DIP GALVANIZED.

PLACE ADDITIONAL GEORGRID WHEN ANGLE EXCEEDS 20°

TYPICAL VERTICAL OBSTRUCTION
SCALE: N.T.S.
1. In general, the vehicle barrier will be constructed on top of a retaining wall built with the Recon block. The retaining wall must be constructed pursuant to retaining wall specifications, as modified to incorporate the vehicle barrier.

2. The vehicle barrier blocks shall be precast with 6” diameter holes or coredrill holes onsite to allow for placement of vertical reinforcing (#5 rebar) to connect blocks down to the second course of 45” deep blocks below top of wall. If contractor opts to coredrill holes onsite, holes may be smaller than 6” as the need to align holes during wall construction is eliminated.

3. Fence blocks shall be placed above two courses of 45” deep blocks on the top portion of the wall. Take care to make sure that the precast holes align through both courses of fence block and the top two courses of 45” deep blocks.

4. Place rebar in holes and fill with non-shrink grout. Hole locations shall be determined by manufacturer and Recon wall systems (typically 24” O.C.).

5. The full high capstone (FHC shall be bonded to the wall barrier with adhesive to prevent FHC from dislodging during vehicle impact. Adhesive shall be designed to withstand moisture and temperature extremes, remain flexible, and shall be specifically formulated for bonding masonry to masonry.

6. During wall construction, an additional freestanding unit may be required to meet the minimum barrier height requirement when the finished grade at top of wall changes in elevation.

7. See manufacturer’s information for additional detailed information and requirements on the Recon Wall System vehicle barrier. The manufacturer information shall accompany the construction plans.

TYPICAL BARRIER ELEVATION DETAIL

ENLARGED BARRIER ELEVATION DETAIL

VEHICLE BARRIER SECTION
PART 1: GENERAL

1.01 DESCRIPTION
A. The work to be performed includes sourcing, providing and installing concrete retaining wall units to the lines and grades shown on the construction drawings.
B. Work includes providing foundation soil, furnishing and installing leveling pad, drainage aggregate, and backfill to the lines and grades shown on the construction drawings.
C. Work includes furnishing and installing all related materials required for construction of the retaining wall as shown on the construction shop drawings.

1.02 REFERENCE STANDARDS
A. ASTM D498: Sizes of Aggregates for Road and Bridge Construction.
B. ASTM D948: Laboratory Compaction Characteristics Using Standard Effort.

1.03 QUALITY ASSURANCE
A. Owner shall be responsible for soil testing and inspection quality control during earthwork operations.

PART 2: MATERIALS

2.01 DEFINITIONS
A. Retaining Wall Unit - A precast concrete segmental facing block that is able to be arranged, stacked, placed, combined, or interchanged easily into an assembled wall system.
B. Drainage Aggregate - Clean 1" crushed angular rock located within and immediately behind the retaining wall units to facilitate drainage.
C. Foundation Soil - Soil zone immediately beneath the retaining wall facing units, the leveling pad, and the reinforced soil zone.
D. GeoGrid - A geosynthetic material manufactured of high tensile materials specifically for the purpose of reinforcing and creating a structural soil mass.
E. Leveling Pad - An un-reinforced cast-in-place or compacted crushed stone pad which serves as a flat surface for placing the initial course of precast units.
F. Reinforced Backfill - Soil zone extending from the drainage aggregate zone to the back of the embedded GeoGrid.
G. Retained Backfill - Soil immediately behind the retaining wall reinforced backfill for a reinforced wall or the soil in the HLV zone up from the back of the bottom block for a gravity wall.
H. Subsurface Drainage System - A system for removing water from behind the wall and channeling it to a point of positive drainage.

2.02 RECON UNITS
A. Recon wall units shall have a minimum 28 day compressive strength of 4,000 psi standard weight concrete shall have a 6% air content by volume. Weight of concrete shall be 145pcf.
B. Texture on the face of the block shall be as specified by owner.

2.03 GEOGRID
A. GeoGrid shall be the type as shown on the drawings having the properties as described within the manufacturer's specifications and required by the designer.

2.04 LEVELING PAD MATERIAL
A. Material shall consist of unreinforced concrete or compacted crushed stone as shown on the construction drawing.

2.05 DRAINAGE AGGREGATE
A. Drainage aggregate shall consist of clean 1" crushed stone or crushed gravel meeting the following gradation:

<table>
<thead>
<tr>
<th>Sieve Size</th>
<th>% Passing</th>
</tr>
</thead>
<tbody>
<tr>
<td>1/4&quot;</td>
<td>100</td>
</tr>
<tr>
<td>3/8&quot;</td>
<td>100 - 75</td>
</tr>
<tr>
<td>NO. 4</td>
<td>0 - 10</td>
</tr>
<tr>
<td>NO. 200</td>
<td>0 - 5</td>
</tr>
</tbody>
</table>

B. The maximum aggregate size shall be limited to 2" unless field tests have been performed to evaluate potential strength reduction to installation.
C. Material can be site excavated material when the above requirements are met. Unsuitable soils for backfill high plastic clays or organic materials shall not be used in the reinforced soil mass.
D. Contractor shall submit reinforced fill sample and test results to the architect/engineer for approval prior to construction.

2.06 REINFORCED BACKFILL
A. Reinforced backfill shall be of free of debris or organic material meeting the following gradation:

<table>
<thead>
<tr>
<th>Sieve Size</th>
<th>% Passing</th>
</tr>
</thead>
<tbody>
<tr>
<td>1/4&quot;</td>
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</tbody>
</table>

B. The maximum aggregate size shall be limited to 2" unless field tests have been performed to evaluate potential strength reduction to installation.
C. Material can be site excavated material when the above requirements are met. Unsuitable soils for backfill high plastic clays or organic materials shall not be used in the reinforced soil mass.
D. Contractor shall submit reinforced fill sample and test results to the architect/engineer for approval prior to construction.

PART 3: EXECUTION

3.01 EXCAVATION
A. Contractor shall excavate to the lines and grades shown on the construction drawings. Contractor shall be careful not to disturb embankment and foundation materials beyond lines shown.

3.02 FOUNDATION SOIL PREPARATION
A. Foundation soil shall be excavated as required for leveling pad dimensions shown on the construction drawings, or as directed by the geotechnical engineer.
B. Unsuitable soils shall be removed and replaced with acceptable material.
C. Over-excavated areas shall be backfilled with approved compacted backfill material.

3.03 BASE LEVELING PAD
A. Leveling pad materials shall be placed upon approved foundation as shown on the construction drawings to a minimum thickness of 6".
B. Aggregate material shall be compacted to provide a dense, level surface on which to place the first course of modular units. Compaction shall be to 95% of standard proctor density as determined in accordance with ASTM D698. Soil compactability shall be determined by visual observation.

3.04 UNIT INSTALLATION
A. The first course of concrete modular wall units shall be carefully placed on the base leveling pad. Each unit shall be checked for level and alignment.
B. Units are placed side by side for full length of wall alignment. Alignment may be done by means of a string line or offset from a base line.
C. Sweep excess material from top of units and install next course. Ensure that each course is completely unit filled, backfilled and compacted prior to proceeding to next course.

3.05 GEOGRID INSTALLATION
A. GeoGrid shall be laid at the proper elevations and orientation as shown on the construction drawings or as directed by the engineer. Embracing the top and bottom edge of the wall shall be with a minimum of 12" of GeoGrid.
B. The GeoGrid shall be pulled taut (sub PE) to eliminate loose folds and prevent the reinforcement stack or back fill edge of the GeoGrid prior to and during backfill and compaction.
C. Correct orientation (roll direction) of the GeoGrid shall be verified by the contractor.

3.06 FILL PLACEMENT
A. Backfill material shall be placed with a maximum of 8" lifts and compacted to 95% of standard proctor density. As determined in accordance with ASTM D698 the in place moisture content shall not exceed the optimum moisture content as determined in accordance with ASTM D421 and be no lower than 2% below optimum moisture content.
B. Only hand-operated compaction equipment shall be allowed within 5' of the back surface of the concrete units.
C. Only hand-operated compaction equipment shall be allowed within 5' of the back surface of the concrete units.

3.07 CAPSTONE / FREE STANDING BLOCK INSTALLATION
A. Clean and apply adhesive to top course of concrete wall units prior to placing capstone.
B. Capstones shall be set in a bed of adhesive designed to withstand moisture and temperature extremes, remain flexible, and be specifically formulated for bonding, maximum 2mm gap.
C. Trim series of interior capstones to insure proper horizontal alignment of capstones. Leave cut surfaces exposed to view in the finished wall.