



ADDENDUM #A

PROJECT:	OWNER:	DATE: 04-24-19
Rooms To Go – Customer Service	Rooms To Go	ADDENDUM NUMBER: A
11540 US Hwy 92 East	11540 US Hwy 92 East	PROJECT NUMBER: 2180377
Seffner, Florida 33584	Seffner, Florida 33584	

THIS ADDENDUM INCLUDES REVISIONS AND/OR ADDITIONS TO THE BID DOCUMENTS. THE FOLLOWING CHANGES BECOME EFFECTIVE IMMEDIATELY AND WILL FORM AN INTEGRAL PART OF THE BID DOCUMENTS.

ATTACHMENTS:

A. Pre-Bid Meeting Notes

B. Project Manual

List of Drawings

- Sheet M002 'Mechanical Commissioning Plan' was added to List of Drawings

Specification Table of Contents

- Section 01500 Construction Facilities and Temporary Controls was added to Specification Table of Contents.
- Section 01630 Substitutions was relabeled as 01631.
- Section 02281 Termite Control was relabeled as 02280.
- Section 00700 General Conditions was deleted.

Section 02834 Modular Concrete Retaining Wall

- Section 02834 Modular Concrete Retaining Wall was relabeled from 02871 to 02834.

END OF ADDENDUM #A

ROOMS TO GO

Construction Department
111 7th Avenue South, Suite 100, Franklin, TN 37064
PO Box 1247, Franklin, TN 37065
Telephone 615-595-5881 Fax 615/595-9995

PRE-BID MEETING NOTES

Project: Rooms To Go Customer Service Build-out, 11540 Highway 92 East, Seffner, FL 33584

Date: Thursday, April 18, 2019

1. ATTENDANCE

Construction Technology Group – C. Rick Baldwin
W. E. Dentmon Construction, Inc. – Billy Dentmon

2. INTRODUCTION

Harmon H. Jones, Vice President, Rooms To Go, 615-595-5881, 615/595-9995 (Fax)
Bruce P. Wallick, Sr. Construction Manager, 615-218-4222 (Cell), bwallick@roomstogo.com
Dawn Hetzer, Cuhaci & Peterson, Design Professionals, 407-661-9100, dawn.hetzer@c-p.com
Mike Flowers, McNeal Engineering, Civil Engineer, 813-968-1081, mflowers@mcnealengineering.com

CONFIRMATION of Bid Proposal due Date, Place and Time. Bids are due on **Tuesday, May 7, 2019** prior to 2:00 PM ET via email pparks@roomstogo.com All bids must be followed-up by a hard copy within three (3) business days to Rooms To Go, 111 7th Avenue South, Suite 100, Franklin, TN 37064 (*Overnight/Physical Address*) or PO Box 1247, Franklin, TN 37065 (*US Postal*), attention Harmon H. Jones, telephone 615-595-5881. Late bids will not be accepted.

Bid to include:

- Base bid total dollar amount (lump sum due 2:00 PM ET)
- Cost breakdown per Specification Section 00300 (due prior to 4:00 PM ET)

All bids shall conform to Specification Section 00011. Deviation from the Section 00011 shall invalidate the bid.

Bid results to be issued to bidders within ten (10) business days.

4. BONDING REQUIREMENTS

A bid bond is not required.

A performance and payment bond is not required.

The Contractor's bonding company information must be provided in the proposal, including the company name, address, phone number and contact person.

5. SPECIFIED MANUFACTURERS, SUBSTITUTIONS AND ALTERNATES

One brand name specified - no substitutions are allowed.

Two or more brand names specified - Bid documents are based on first named brand. Bidder must verify the compatibility of other specified brands.

Voluntary substitutions are to be clearly identified on the proposal form.

Substitutions after the time of award - Refer to Specification Section 00011 and 01631.

6. SUBMITTALS Refer to Specification Section 01021

Submittals must be reviewed by Contractor prior to submission to Cuhaci & Peterson or the Owner.

Submittals must be accompanied by a letter of transmittal. Transmittal cannot be used as the only source of identifying deviations from the contract documents. Submittals may be electronic. Deviations from the Contract documents require formal Change Order approval.

If overnight delivery is required, Contractor to give reviewer his overnight carrier's account number.

7. PERMITS

The building permit will be paid for by the Owner. The Contractor shall expedite the permit if it is not available at the time of contract award.

Contractor will provide all other required permits (e.g. subcontractor/trade, demo, etc.).

8. TEMPORARY UTILITIES AND CONNECTION FEES

Impact fees, meter fees, tap fees and connection fees for permanent utilities shall be paid for by the Owner. The Contractor is responsible for all utility work not normally performed by the local Utility.

All temporary utility connection fees are to be included in the Contractor's bid.

The reasonable cost of utilities consumed during construction will be paid for by the Owner.

9. OWNER-FURNISHED ITEMS. Refer to drawings and specifications for all Owner supplied items. The Contractor is responsible to receive, unload, store, insure, protect and inventory all Owner supplied items until incorporated into work. Any shortage or damage shall be reported to the Owner. Items include but are not limited to:

Materials supplied and installed by Owner –

- interior signage
- exterior wall and site signage
- audio/video systems excluding conduit and boxes as noted on the plans
- telephone and computer systems excluding conduit and boxes as noted on the plans
- system/modular work stations
- other items as noted on plans

Materials supplied by Owner and installed by Contractor – Contractor is responsible for material until incorporated into the work.

- toilet room signage
- other items as noted on the plans

10. DESIGN REVIEW COMMENTS:

Direct all questions/comments concerning any design related items to the Architect. The Architect will solicit responses as needed and reply to all Bidders.

Applicable Building Codes and referenced product manufacturer standards are minimum requirements. The plans and specifications for this project may exceed these minimum requirements.

The drawings and the project specification manuals are both considered part of the contract documents. The Contractor is responsible for the review and conformance to all contract documents. In the case of apparent conflicts and discrepancies between the drawings and project specification manuals and within the drawings and project manual documents themselves, the Contractor is to notify Architect in writing of such apparent conflicts and request clarification from the Architect. No additional costs or delays in schedule will be accepted due to Contractor's misinterpretations and failures to request clarifications.

11. CONTRACT REVIEW COMMENTS:

Direct all questions/comments concerning contract contents to Harmon Jones.

The Contractor controls its means and methods unless the Contract dictates a particular means or method. The Contractor shall provide all items necessary for performance and completion of the Work including items inferred as being necessary to provide a complete system with indicated results consistent with the Contract Documents.

The Contractor's general conditions, overhead and profit mark up of claims for extra work shall not exceed eight percent (8%) for changes less than \$50,000 or five percent (5%) for changes greater than \$50,000. General conditions shall include printing, copies and postage for Change Bulletins. All contract alternate and unit pricing shall include Contractor's site Supervision, general conditions, insurance, overhead and profit mark-up.

Fixturing/stocking and merchandising work will be performed by the Owner's employees immediately upon receipt of governing building department approvals.

Claims for additional time resulting from adverse weather conditions shall be submitted at substantial completion of the project.

12. PAYMENT- Refer to the Owner/Contractor Agreement.

Three original, notarized copies of pay requests of AIA Form G702 must be submitted.

One (1) notarized copy of lien waivers covering the previous month payment from each subcontractor and current month lien waivers from the Contractor equal to the total current month payment must be submitted.

Payment for stored material will be made only if materials are satisfactorily stored on job site. The materials must be clearly identified as the project's materials and will require a Bill of Sale.

Notarized form (AIA FormG702) stating work in place is in compliance with plans and specification must be submitted each month.

Submit current jobsite photographs and a current critical path Project Schedule with each monthly application for progress payment.

13. TESTING AND INSPECTIONS -

Quality Assurance Testing will be provided by the Owner through an independent testing agency. The Contractor is responsible for coordination and scheduling of all testing and inspections per the RTG "Testing and Inspection Requirements" outline provided by Owner. The Contractor is responsible for the cost of re-testing test failures, excessive stand-by time and cancellation without notice. Refer to Specification Section 02011. In addition to the Owner, Civil, Landscape, Structural, Architectural, Electrical and Fire Protection Consultants will perform final building inspections for the Owner. Unauthorized changes, alternates, and/or substitutions will require correction. Do not deviate from the plans and specifications without prior approval.

14. CLARIFICATIONS AND QUESTIONS

Division 1

1. Builders Risk insurance will be provided by Owner.
2. The Contractor shall coordinate with TECO as needed for the new electrical service.
3. Provide a proposed temporary fencing plan for any requested staging areas, on-site or within the building.
4. Work excludes removal of any existing hazardous materials. None are known to be present.
5. The Contractor shall provide an interior dust barrier enclosing the work area.
6. The Contractor is requested to provide value engineering cost savings alternates for consideration.
7. There are currently no restrictions for work hours other than work in occupied office areas shall be performed after hours.
8. The project will be open/available for Subcontractor inspection visits on Thursday, April 25, 2019 from 1:00 PM to 5:00 PM and on Friday, April 26, 2019 from 9:00 AM to 12:00 Noon. Visitors shall proceed as directed by Security personnel at the entry Guardhouse.

Division 2

1. The Contractor is responsible for restoration of all on-site and offsite areas disturbed in performance of the Contract Work.
2. Work includes re-striping existing parking spaces, etc. as needed to accommodate the new Work.
3. Work includes salvage of dock doors, high bay lighting and circulation fan(s), deliver/turnover to the Owner at the project site.
4. Work includes removal/demo of all abandoned exposed electrical, mechanical, plumbing, fire protection and appurtenances, unless specifically noted otherwise.
5. Exterior concrete joint filler shall be flexible polyurethane.
6. The new chainlink fencing finish at the main entry drive shall be galvanized to match existing.
7. The existing lawn irrigation system is being maintained by Sunset Bay Landscaping, Jeremy Rodriguez, General Manager, telephone 813-784-8743, email: jeremy@sunsetbaylandscaping.com.

Division 3

1. Specification Section 03255, "Interior Floor Joint Filler", pertains to exposed construction and control joints only.

Division 5

1. The existing Girder bearing: a. Column line intersection A/30 is 26'-4"; b. Column line intersection D/30 is 30'-6".
2. Joist welds do not require painting.

Division 9

1. The Contractor shall provide 5% of each carpet type for Owner's attic stock.

Division 10

2. Work excludes "optional covered walkway/canopy" as noted on C-4.2.
3. Work excludes a "Knox" box.

Division 15

1. The HVAC RTU manufacturer used for the basis of design is Trane. Equivalent equipment manufacturer by Carrier or Lennox is acceptable.
2. Work includes modification to the existing fire protection sprinkler and alarm systems as required to accommodate the new work. The Contractor is not responsible for any existing Code violations or maintenance items unless specifically noted otherwise. The Contractor may assume the existing fire alarm control panel is sufficient to accommodate the new Work.

Division 16

1. Work includes electrical power connection to items supplied and installed by the Owner (e.g. signage, system/modular workstations).

ROOMS TO GO
Customer Service

Seffner, Florida

April 24, 2019 – Addendum A

LIST OF DRAWINGS

CIVIL

	Survey
C-1.0	Notes
C-2.0	Overall Site Plan
C-3.0	Demolition & Erosion Control Plan
C-4.1	Dimension Control Plan (Sheet 1 of 2)
C-4.2	Dimension Control Plan (Sheet 2 of 2)
C-5.1	Grading & Drainage Plan (Sheet 1 of 2)
C-5.2	Grading & Drainage Plan (Sheet 2 of 2)
C-6.0	Tables & Sections
C-7.0	Utility Plan
C-8.0	Details
C-9.0	Water & Sewer Details
L-1.0	Code Landscape Plan
IR-1.0	Code Irrigation Plan
PE-1.0	Site Lighting Modification

ARCHITECTURAL

G100	Cover Sheet
D101	Demolition
LS101	Life Safety Plan
A101	Floor Plan – Customer Service
A101A	Floor Plan – Customer Service - Systems Furniture
A102	Roof Plan – Customer Service
A201	Reflected Ceiling Plan - Sections
A301	Enlarged Plan & Elevations
A302	Doors & Windows Schedules, Door Frames & Windows Elevations
A501	Wall Section & Details
ID101	Interior Wall Finish Plan
ID102	Floor Finish
ID103	Breakroom Enlarged Plan, Millwork Details and Finish Schedule

STRUCTURAL

S001	General Notes and Wind Criteria
S002	Specifications
S101	Partial Foundation Plan
S102	Partial Foundation Plan
S103	Stair Details
S104	Partial Roof Framing Plan
S105	Framing Details

MECHANICAL

M001	Mechanical General Information
M002	Mechanical Commissioning Plan
M101	Mechanical Overall Floor Plan
M201	Mechanical Overall Roof Plan
M501	Mechanical Details

PLUMBING

P001	Plumbing General Information
P101	Plumbing Sanitary Overall Floor Plan West
P102	Plumbing Sanitary Overall Floor Plan East
P103	Plumbing Sanitary Enlarged Floor Plan
P201	Plumbing Water Overall Floor Plan West
P202	Plumbing Water Overall Floor Plan East
P203	Plumbing Water Enlarged Floor Plan
P401	Plumbing Sanitary Plans
P402	Plumbing Water Riser
P501	Plumbing Details

FIRE PROTECTION

FP001	Fire Protection General Information
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ELECTRICAL

E001	Electrical General Information
E002	Electrical Specifications
E101	Electrical Power Plan – Customer Service Area
E201	Electrical Lighting Plan
E301	Electrical Roof Power Plan – Customer Service Area
E501	Electrical Riser Diagram & Details
E601	Electrical Panel Schedules
E602	Electrical Panel Schedules
E603	Electrical Panel Schedules

Rooms To Go
CUSTOMER SERVICE
April 24, 2019 Addendum A

SPECIFICATION TABLE OF CONTENTS

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	00100	Instructions To Bidders
	00300	Proposal Form
	01100	Summary of Work
	01310	Project Coordination
	01320	Project Meetings
	01330	Submittals
	01400	Quality Control
	01500	Construction Facilities and Temporary Controls
	01600	Materials and Equipment
	01631	Substitutions
	01730	Cutting And Patching
	01770	Contract Closeout
	01771	Project Record Documents
	01772	Final Cleaning
	01780	Warranties
	01781	Contractor Warranty Form
	01782	Subcontractor warranty Form

DIVISION 2 – SITE WORK

Section	02011	Testing
	02050	Demolition
	02070	Selective Demolition
	02114	Protection Underground Utilities
	02211	Site Grading
	02270	Site Retaining Walls
	02280	Soil Treatment
	02280	Termite Control
	02511	Asphalt Paving
	02521	Concrete Pavement
	02526	Precast Concrete Wheel Stops
	02668	Water Piping
	02711	Site Drainage
	02730	Sanitary Sewers
	02770	Asphalt Seal Coat
	02811	Underground Sprinkler System
	02834	Modular Concrete Retaining Wall
	02871	Fencing and Gates
	02900	Landscaping

See Civil Drawings

DIVISION 3 - CONCRETE

Section	03255	Interior Floor Joint Filler
See Structural Drawings		

DIVISION 4 - MASONRY

See Structural Drawings

DIVISION 5 - METALS

See Structural Drawings

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	07900	Joint Sealers, Fillers & Gaskets

DIVISION 8 – DOORS WINDOWS AND HARDWARE

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DIVISION 10 - SPECIALTIES

Section	10170	Solid Plastic Toilet Compartments
	10440	Identification Signage
	10520	Fire Protection Specialties
	10530	Aluminum Walkway Covers
	10800	Toilet Accessories

See Structural, Mechanical, Plumbing, Fire Protection, Electrical Drawings Re: Specifications

DIVISION 2 - SITE WORK

PART 1: GENERAL

1.01 Description

- A. Work shall consist of furnishing and construction of a modular concrete block retaining wall system in accordance with these specifications and in reasonably close conformity with the lines, grades, design, and dimensions shown on the plans.
- B. Work includes preparing foundation soil, furnishing and installing leveling pad, unit drainage fill and backfill to the lines and grades shown on the construction drawings.
- C. Work includes furnishing and installing geogrid soil reinforcement of the type, size, location, and lengths designated on the construction drawings.
- D. Coordinate design & installation with landscaping, guard rail, fencing and direct burial site lighting.

1.02 Related Sections

- A. Section 02221- Excavation and Backfill

1.03 Reference Documents

- A. American Society for Testing and Materials (ASTM)
 - 1. ASTM C140 Sampling and Testing Concrete Masonry Units
 - 2. ASTM C1372 Specification for Dry-Cast Segmental Retaining Wall Units
 - 3. ASTM D422 Particle-Size Analysis of Soils
 - 4. ASTM D698 Laboratory Compaction Characteristics of Soil - Standard Effort
 - 5. ASTM D1557 Laboratory Compaction Characteristics of Soil - Modified Effort
 - 6. ASTM D3034 Polyvinyl Chloride Pipe (PVC)
 - 7. ASTM D4318 Liquid Limit, Plastic Limit and Plasticity Index of Soils
 - 8. ASTM D4475 Horizontal Shear Strength of Pultruded Reinforced Plastic Rods
 - 9. ASTM D4476 Flexural Properties of Fiber Reinforced Pultruded Plastic Rods
 - 10. ASTM D4595 Tensile Properties of Geotextiles - Wide Width Strip
 - 11. ASTM D5262 Unconfined Tension Creep Behavior of Geosynthetics
 - 12. ASTM D5818 Evaluate Installation Damage of Geosynthetics
 - 13. ASTM D6637 Tensile Properties of Geogrids – Single or Multi-Rib
 - 14. ASTM D6638 Connection Strength - Reinforcement/Segmental Units
 - 15. ASTM D6706 Geosynthetic Pullout Resistance in Soil
 - 16. ASTM D6916 Shear Strength Between Segmental Concrete Units
- B. American Association of State Highway and Transportation Officials (AASHTO)
 - 1. AASHTO M 252 Corrugated Polyethylene Drainage Pipe

- C. Geosynthetic Research Institute (GRI)
 - 1. GRI-GG4 Determination of Long Term Design Strength of Geogrids
 - 2. GRI-GG5 Determination of Geogrid (soil) Pullout
- D. National Concrete Masonry Association (NCMA)
 - 1. NCMA SRWU-1 Test Method for Determining Connection Strength of SRW
 - 2. NCMA SRWU-2 Test Method for Determining Shear Strength of SRW

1.04 Submittals/Certification

- A. Contractor shall submit a Manufacturer's certification, prior to start of work, that the retaining wall system components meet the requirements of this specification and the structure design.
- B. Contractor shall submit construction drawings and design calculations for the retaining wall system prepared and stamped by a Professional Engineer registered in the state of the project. The engineering designs, techniques, and material evaluations shall be in accordance with the Manufacturer's Design Manual, NCMA Design Guidelines For Segmental Retaining Walls, or the AASHTO Standard Specifications for Highway Bridges (whichever is applicable to designer).
- C. Contractor shall submit a test report documenting strength of specific modular concrete unit and geogrid reinforcement connection. The maximum design tensile load of the geogrid shall be equal to the laboratory tested ultimate strength of geogrid / facing unit connection at a maximum normal force limited by the "Hinge Height" of the structure divided by a safety factor of 1.5. The connection strength evaluation shall be performed in accordance with ASTM D6638 (NCMA SRWU-1).

1.05 Quality Assurance

- A. Contractor shall submit a list of five (5) previously constructed projects of similar size and magnitude by the wall installer where the specific retaining wall system has been constructed successfully. Contact names and telephone numbers shall be listed for each project.
- C. Contractor shall provide evidence that the design engineer has a minimum of five years of documentable experience in the design for reinforced soil structures. The design engineer shall provide proof of current professional liability insurance with an aggregate coverage limit of not less than \$2,000,000.
- D. Owner shall provide soil testing and quality assurance inspection during earthwork and wall construction operations. Contractor shall provide any quality control testing or inspection not provided by the Owner. Owner's quality assurance program does not relieve the contractor of responsibility for quality control and wall performance.

1.06 Delivery, Storage and Handling

- A. Contractor shall check all materials upon delivery to assure that the proper type, grade, color, and certification has been received.

- B. Contractor shall protect all materials from damage due to jobsite conditions and in accordance with manufacturer's recommendations. Damaged materials shall not be incorporated into the work.

PART 2: PRODUCTS

2.01 Definitions

- A. Modular Unit - a concrete retaining wall element machine made from Portland cement, water, and aggregates.
- B. Structural Geogrid - a structural element formed by a regular network of integrally connected tensile elements with apertures of sufficient size to allow interlocking with surrounding soil, rock, or earth and function primarily as reinforcement.
- C. Unit Drainage Fill - drainage aggregate, which is placed within and immediately behind the modular concrete units.
- D. Reinforced Backfill - compacted soil, which is placed within the reinforced soil volume as outlined on the plans.

2.02 Modular Concrete Retaining Wall Units

- A. Modular concrete units shall conform to the following architectural requirements:
 - 1. Face color - concrete gray, unless otherwise specified.
 - 2. Face finish - sculptured rock face in angular tri-planer configuration. Other face finishes may be allowed with approval of Owner.
 - 3. Bond configuration - running with bonds nominally located at midpoint vertically adjacent units, in both straight and curved alignments.
 - 4. Exposed surfaces of units shall be free of chips, cracks or other imperfections when viewed from a distance of 10 feet under diffused lighting.
- B. Modular concrete materials shall conform to the requirements of ASTM C1372 - Standard Specifications for Segmental Retaining Wall Units.
- C. Modular concrete units shall conform to the following structural and geometric requirements measured in accordance with ASTM C140 Sampling and Testing Concrete Masonry Units:
 - 1. Compressive strength: \geq 3000 psi (21 MPa);
 - 2. Absorption: 8 % (6% in northern states) for standard weight aggregates;
 - 3. Dimensional tolerances: \pm 1/8" (3 mm) from nominal unit dimensions not including rough split face, \pm 1/16" (1.5 mm) unit height - top and bottom planes;
 - 4. Unit size: 8" (203 mm) (H) x 18" (457 mm)(W) x 18" (457 mm)(D) minimum;
 - 5. Unit weight: 100 lbs/unit (45 kg) minimum for standard weight aggregates.

- D. Modular concrete units shall conform to the following performance testing:
 - 1. Inter -unit shear strength in accordance with ASTM D6916 (NCMA SRWU-2): 1500 plf (21 kN/m) minimum at 2 psi (13 MPa) normal pressure;
 - 2. Geogrid/unit peak connection strength in accordance with ASTM D6638 (NCMA SRWU-1): 900 plf (13 kN/m) minimum at 2-psi (13 MPa) normal force.
- E. Modular concrete units shall conform to the following constructability requirements:
 - 1. Vertical setback: 1/8" (3 mm) ± per course (near vertical) or 1" (25 mm) + per course – TO BE SPECIFIED ON THE CONSTRUCTION DRAWINGS SUBMITTED BY THE CONTRACTOR;
 - 2. Alignment and grid positioning mechanism - fiberglass pins, two per unit minimum;
 - 3. Maximum horizontal gap between erected units shall be ≤ 1/2 inch (13 mm).

2.03 Shear Connectors

- A. Shear connectors shall be 1/2-inch (12 mm) diameter thermoset isophthalic polyester resin-pultruded fiberglass reinforcement rods or equivalent to provide connection between vertically and horizontally adjacent units with the following requirements:
 - 1. Flexural Strength in accordance with ASTM D4476: 128,000 psi (882 MPa) minimum;
 - 2. Short Beam Shear in accordance with ASTM D4475: 6,400 psi (44 MPa) minimum.
- B. Shear connectors shall be capable of holding the geogrid in the proper design position during grid pre-tensioning and backfilling.

2.04 Base Leveling Pad Material

- A. Material shall consist of a compacted crushed stone base or non-reinforced concrete as shown on the construction drawings.

2.05 Unit Drainage Fill

- A. Unit drainage fill shall consist of clean 1" (25 mm) minus crushed stone or crushed gravel meeting the following gradation tested in accordance with ASTM D-422:

<u>Sieve Size</u>	<u>Percent Passing</u>
1 inch (25 mm)	100
3/4-inch (19 mm)	75-100
No. 4	0 - 10
No. 50	0 - 5

- B. One cubic foot (0.028 m³), minimum, of drainage fill shall be used for each square foot (0.093 m²) of wall face. Drainage fill shall be placed within cores of, between, and behind units to meet this requirement.

2.06 Reinforced Backfill

- A. Reinforced backfill shall be free of debris and meet the following gradation tested in accordance with ASTM D-422:

<u>Sieve Size</u>	<u>Percent Passing</u>
2-inch (50 mm)	100
3/4-inch (19 mm)	100-75
No. 40	0-60
No. 200	0-35

Plasticity Index (PI) <15 and Liquid Limit <40 per ASTM D-4318.

- B. The maximum aggregate size shall be limited to 3/4 inch (19 mm) unless field tests have been performed to evaluate potential strength reductions to the geogrid design due to damage during construction.
- C. Material can be site-excavated soils where the above requirements can be met. Unsuitable soils for backfill (high plastic clays or organic soils) shall not be used in the backfill or in the reinforced soil mass.
- D. Contractor shall submit reinforced fill sample and laboratory test results to the Architect/Engineer for approval prior to the use of any proposed reinforced fill material.

2.07 Geogrid Soil Reinforcement

- A. Geosynthetic reinforcement shall consist of geogrids manufactured specifically for soil reinforcement applications and shall be manufactured from high tenacity polyester yarn or high-density polyethylene. Polyester geogrid shall be knitted from high tenacity polyester filament yarn with a molecular weight exceeding 25,000 Meg/m and a carboxyl end group values less than 30. Polyester geogrid shall be coated with an impregnated PVC coating that resists peeling, cracking, and stripping.
- B. T_a , Long Term Allowable Tensile Design Load, of the geogrid material shall be determined as follows:

$$T_a = T_{ult} / (RF_{cr} * RF_d * RF_{id} * FS)$$

T_a shall be evaluated based on a 75-year design life.

1. T_{ult} , Short Term Ultimate Tensile Strength shall be determined in accordance with ASTM D4595 or ASTM D6637.
 T_{ult} is based on the minimum average roll values (MARV).
2. RF_{cr} , Reduction Factor for Long Term Tension Creep
 RF_{cr} shall be determined from 10,000-hour creep testing performed in accordance with ASTM D5262. Reduction value = 1.45 minimum.
3. RF_d , Reduction Factor for Durability
 RF_d shall be determined from polymer specific durability testing covering the range of expected soil environments. $RF_d = 1.10$ minimum.

- 4. RFid, Reduction Factor for Installation Damage
RFid shall be determined from product specific construction damage testing performed in accordance with ASTM D5818 (GRI-GG4). Test results shall be provided for each product to be used with project specific or more severe soil type. RFid = 1.05 minimum.
- 5. FS, Overall Design Factor of Safety
FS shall be 1.5 unless otherwise noted for the maximum allowable working stress calculation.
- C. The maximum design tensile load of the geogrid shall not exceed the laboratory tested ultimate strength of the geogrid/facing unit connection as limited by the "Hinge Height" divided by a factor of safety of 1.5. The connection strength testing and computation procedures shall be in accordance with ASTM D6638 Connection Strength between Geosynthetic Reinforcement and Segmental Concrete Units (NCMA SRWU-1).
- D. Soil Interaction Coefficient, Ci
Ci values shall be determined per ASTM D6706 (GRI:GG5) at a maximum 0.75-inch (19 mm) displacement.
- E. Manufacturing Quality Control
The geogrid manufacturer shall have a manufacturing quality control program that includes QC testing by an independent laboratory.
The QC testing shall include: Tensile
Strength Testing Melt Flow Index
(HDPE) Molecular Weight
(Polyester)

2.08 Drainage Pipe

- A. If required, the drainage pipe shall be perforated or slotted PVC pipe manufactured in accordance with ASTM D-3034 or corrugated HDPE pipe manufactured in accordance with AASHTO M252.

2.09 Geotextile Filter Fabric

- A. When required, Geotextile filter fabric shall be 4.0 oz/sy, polypropylene, needle-punched nonwoven fabric.

PART 3: EXECUTION

3.01 Excavation

- A. Contractor shall excavate to the lines and grades shown on the construction drawings. Owner's representative shall inspect the excavation and approve prior to placement of leveling material or fillsoils. Proof roll foundation area as directed to determine if remedial work is required.
- B. Over-excavation and replacement of unsuitable foundation soils and replacement with approved compacted fill will be compensated as agreed upon with the Owner.

3.02 Base Leveling Pad

- A. Leveling pad material shall be placed to the lines and grades shown on the construction drawings, to a minimum thickness of 6 inches (150 mm) and extend laterally a minimum of 6" (150 mm) in front and behind the modular wall unit.
- B. Soil leveling pad materials shall be compacted to a minimum of 95% Standard Proctor density per ASTM D-698 or 92% Modified Proctor Density per ASTM D1557.
- C. Leveling pad shall be prepared to insure full contact to the base surface of the concrete units.

3.03 Modular Unit Installation

- A. First course of units shall be placed on the leveling pad at the appropriate line and grade. Alignment and level shall be checked in all directions and insure that all units are in full contact with the base and properly seated.
- B. Place the front of units side-by-side. Do not leave gaps between adjacent units. Layout of corners and curves shall be in accordance with manufacturer's recommendations.
- C. Install shear/connecting devices per manufacturer's recommendations.
- D. Place and compact drainage fill within and behind wall units. Place and compact backfill soil behind drainage fill. Follow wall erection and drainage fill closely with structure backfill.
- E. Maximum stacked vertical height of wall units, prior to unit drainage fill and backfill placement and compaction, shall not exceed two courses.

3.04 Structural Geogrid Installation

- A. Geogrid shall be oriented with the highest strength axis perpendicular to the wall alignment.
- B. Geogrid reinforcement shall be placed at the strengths, lengths, and elevations shown on the construction design drawings or as directed by the Engineer.
- C. The geogrid shall be laid horizontally on compacted backfill and attached to the modular wall units. Place the next course of modular concrete units over the geogrid. The geogrid shall be pulled taut, and anchored prior to backfill placement on the geogrid.
- D. Geogrid reinforcements shall be continuous throughout their embedment lengths and placed side-by-side to provide 100% coverage at each level. Spliced connections between shorter pieces of geogrid or gaps between adjacent pieces of geogrid are not permitted.

3.05 Reinforced Backfill Placement

- A. Reinforced backfill shall be placed, spread, and compacted in such a manner that minimizes the development of slack in the geogrid and installation damage.
- B. Reinforced backfill shall be placed and compacted in lifts not to exceed 6 inches (150

mm) where hand compaction is used, or 8 - 10 inches (200 to 250 mm) where heavy compaction equipment is used. Lift thickness shall be decreased to achieve the required density as required.

- C. Reinforced backfill shall be compacted to a minimum of 95 % Standard Proctor density per ASTM D-698 or 92% Modified Proctor Density per ASTM D1557. The moisture content of the backfill material prior to and during compaction shall be uniformly distributed throughout each layer and shall be dry of optimum, + 0%, - 3%.
- D. Only lightweight hand-operated equipment shall be allowed within 3feet (1m) from the tail of the modular concrete unit.
- E. Tracked construction equipment shall not be operated directly upon the geogrid reinforcement. A minimum fill thickness of 6 inches (150 mm) is required prior to operation of tracked vehicles over the geogrid. Tracked vehicle turning should be kept to a minimum to prevent tracks from displacing the fill and damaging the geogrid.
- F. Rubber tired equipment may pass over geogrid reinforcement at slow speeds, less than 10 MPH (15 KPH). Sudden braking and sharp turning shall be avoided.
- G. At the end of each day's operation, the Contractor shall slope the last lift of reinforced backfill away from the wall units to direct runoff away from wall face. The Contractor shall not allow surface runoff from adjacent areas to enter the wall construction site.

3.06 Cap Installation

- A. Cap units shall be glued to underlying units with an all-weather adhesive recommended by the manufacturer.

3.07 As-built Construction Tolerances

- A. Vertical alignment: $\pm 1.5"$ (40 mm) over any 10' (3 m) distance.
- B. Wall Batter: within 2 degrees of design batter.
- C. Horizontal alignment: $\pm 1.5"$ (40 mm) over any 10' (3 m) distance. Corners, bends & curves: ± 1 ft (300 mm) to theoretical location.
- D. Maximum horizontal gap between erected units shall be $\square 1/2$ inch (13 mm).

3.08 Field Quality Control

- A. Quality Assurance - The Owner shall/may engage inspection and testing services, including independent laboratories, to provide quality assurance and testing services during construction. This does not relieve the Contractor from securing the necessary construction control testing.
- B. Quality assurance should include foundation soil inspection. Verification of geotechnical design parameters, and verification that the contractor's quality control testing is adequate as a minimum. Quality assurance shall also include observation of construction for general compliance with design drawings and project specifications. Quality assurance is best performed by the site geotechnical engineer.

- C. Quality Control – The Contractor shall engage inspection and testing services to perform the minimum quality control testing described in the retaining wall design plans and specifications. Only qualified and experienced technicians and engineers shall perform testing and inspection services.
- D. Quality control testing shall include soil and backfill testing to verify soil types and compaction and verification that the retaining wall is being constructed in accordance with the design plans and project specifications.

END OF SECTION