

**SUPERSEDED BY EI 10-031
EFFECTIVE 5/5/11**



*New York State
Department of
Transportation*
**ENGINEERING
INSTRUCTION**

**EI
96-018**

Title: **SEGMENTAL BLOCK RETAINING WALL SYSTEM**

Distribution:

Manufacturers (18)

Surveyors

Main Office (30)

Consultants

Local Govt. (31)

Contractors

Regions/Agencies (32)

SEE 5/3/96 MEMO
FROM W. MOODY
RE: UPDATED INFO
WHICH FOLLOWS
THIS EI

Clark
Deputy Chief Engineer,

4/9/96
Date

This Engineering Instruction announces the ~~availability~~ of the following information:

1. New Special Specifications for Items 17632.15 and 17632.15 M, Segmental Block Retaining Wall System to replace Special Specification, Item 24608.0386, Precast Concrete Block Retaining Wall.
2. Design Tables of Limiting Wall Heights (English and Metric).
3. Example Wall Layout Sheets for Segmental Block Retaining Wall Typical Section and Segmental Block Retaining Wall Typical Profile. (English and Metric)
4. New Standard Specification Subsection 704-07, Precast Concrete Retaining Wall Blocks. (English and Metric)
5. Segmental Block Retaining Wall System-Guidelines For Use.

This Engineering Instruction becomes effective immediately for any project in the scoping phase of development. Projects currently in the advance detail design phase or beyond may continue to use Item 24608.0386, but designers are encouraged to utilize the information in this Instruction where possible. After the letting date of October 17, 1996 (P.S.&E. July 11, 1996), Item 24608.0386 will be disapproved and deleted from the system.

Metric versions of the Design Tables of Limiting Wall Heights, Example Wall Layout Sheets and Segmental Block Retaining Wall System-Guidelines for Use will be included in Chapter 20, Retaining Walls, of the Highway Design Manual.

The new Special Specifications, Item 17632.15 and 17632.15 M and Standard Specification Subsection 704-07 will be incorporated into the next revision to the Standard Specifications.

Copies of the subject documents are being sent to the Main Office Design Services Bureau, the Main Office Landscape Architecture Bureau and to all Regional Design Engineers, Regional Landscape Architects and Regional Geotechnical Engineers. Additional copies may be obtained through the Main Office Geotechnical Engineering Bureau, Specifications & Standards Section.

BACKGROUND:

The Department is in the process of evaluating proprietary segmental block retaining wall systems (SBRWS) for use on Department projects. A SBRWS is a gravity retaining wall consisting of a compacted granular leveling pad, segmental precast concrete block and cap units, granular backfill, underdrain, and geotextile. Due to ambiguities concerning wall design and design check responsibility in the current specification, Item 24608.0386 - Precast Concrete Block Retaining Wall, the Geotechnical Engineering Bureau has analyzed several SBRWS for various loading conditions, compiled Design Tables of Limiting Wall Heights for each SBRWS which has been evaluated for use, prepared an Example Typical Section and Profile, written a new Special Specification and prepared guidelines on the use of this information. This information, used correctly, allows Designers to identify specific project parameters and to then choose and depict SBRWS that meet these project parameters and have had their designs reviewed and approved for use.

The Materials Bureau will evaluate SBRWS manufacturers to verify the manufacturer is capable of meeting the requirements of the new standard specification subsection 704-07, Precast Concrete Retaining Wall Blocks. Once approved, the name of the precast concrete block manufacturer and the specific SBRWS approved will be placed on the Approved List and a Design Table of Limiting Wall Heights for the SBRWS will be distributed using the same distribution list used for this EI. A SBRWS will not be approved for use until a block manufacturer for the system has been approved. More than one block manufacturer may be approved for each SBRWS.

CONTACTS:

Questions relating to this Engineering Instruction should be referred to Todd Dickson in the Geotechnical Engineering Bureau, 457-4732.

ITEM 17632.15 - SEGMENTAL BLOCK RETAINING WALL SYSTEM

DESCRIPTION:

Construct a Segmental Block Retaining Wall System (SBRWS) where indicated on the contract plans or as ordered by the Engineer.

A SBRWS is a gravity retaining wall consisting of a compacted granular leveling pad, segmental precast concrete block and cap units, granular backfill, underdrain, and geotextile.

The following additional definitions apply within this specification:

- A. Leveling Pad Level surface of select material used to provide a working surface and distribute the weight of the dry-stacked column of segmental precast concrete block units.
- B. Segmental Precast Solid or hollow segmental concrete block units machine cast from Concrete Block Units cement, mineral aggregates, and water.
- C. Backfill Select material placed directly behind the segmental precast concrete block units.
- D. Unit Fill Select material placed within the hollow cores of the segmental precast concrete block units.
- E. Cap Units Segmental precast concrete block units placed on, and attached to, the top of the finished SBRWS.
- F. Underdrain A system for removing water from behind the SBRWS.
- G. Geotextile A permeable textile material used to separate dissimilar granular materials.

MATERIALS:

A. SEGMENTAL PRECAST CONCRETE BLOCK UNITS

Provide segmental precast concrete block units conforming to Subsection 704-07 (Precast Concrete Retaining Wall Blocks).

ITEM 17632.15 - SEGMENTAL BLOCK RETAINING WALL SYSTEM

B. BACKFILL, UNIT FILL, LEVELING PAD

Provide material meeting the requirements of the following:

1. Select Structure Fill - Item 203.21

C. DRAINAGE

Provide underdrain pipe and geotextile material meeting the requirements of the following:

1. Underdrain Pipe - Item 605.1701, Optional Underdrain, 4 inch diameter pipe
2. Geotextile Underdrain - Item 207.03

CONSTRUCTION DETAILS:

A minimum of 30 days prior to beginning work on the SBRWS, submit the following to the Engineer-in-charge for approval:

- A. The name of the SBRWS selected for use from the list of systems shown on the contract plans.
- B. The name of the block manufacturer/supplier who is shown on the Department's Approved List as being approved for producing block for the selected SBRWS.
- C. The SBRWS design and proposed method of construction, stamped by a currently licensed New York State Professional Engineer.
- D. The block manufacturer's installation manual for the selected SBRWS.
- E. A block sample for color and texture approval by the Regional Landscape Architect.

The Engineer-in-charge requires 10 working days to approve the submission after receipt of all pertinent information. Begin work only after receiving the Engineer's written approval.

INSTALLATION:

Excavate, dispose of excavated material and prepare the area on which the SBRWS will rest conforming to Section 203 (Excavation and Embankment), except as modified here:

ITEM 17632.15 - SEGMENTAL BLOCK RETAINING WALL SYSTEM

- A. Excavate the area below the finished grade conforming to Section 206 (Trench, Culvert and Structure Excavation).
- B. Grade and level the area on which the SBRWS will rest. Thoroughly compact this area to the Engineer's satisfaction. Treat all soils found to be unsuitable or incapable of being satisfactorily compacted because of moisture content in a manner directed by the Engineer, in conjunction with recommendations of the Regional Geotechnical Engineer.

Place the leveling pad material to ensure complete contact of the first course of segmental precast concrete block units. Compact the material in conformance with Subsection 203-3.15 (Fill and Backfill at Structures, Culverts, Pipes, Conduits and Direct Burial Cables). Step the leveling pad to conform to grade changes.

Place the geotextile as shown on the contract plans and in accordance with Section 207 (Geotextile).

Place the underdrain as shown on the contract plans and in accordance with Section 605 (Underdrains).

Erect the segmental precast concrete block units a minimum of one block height below the finished grade conforming to the lines, grades, and typical sections shown on the contract plans and in accordance with the designated block manufacturer's installation manual. Place the block units side by side and in full contact with the leveling pad, maintaining the following minimum tolerances:

<u>Vertical Control:</u> ± 1" over a distance of 10 ft.
<u>Horizontal Location Control:</u> ± 1" over a distance of 10 ft.
<u>Rotation from established plan wall batter:</u> ± 1" over 10 ft. in height.
<u>Bulging:</u> ± 1" over a distance of 10 ft.

Adjust block spacing for curved sections according to the block manufacturer's installation recommendations.

ITEM 17632.15 - SEGMENTAL BLOCK RETAINING WALL SYSTEM

Place and compact backfill and unit fill (if applicable) simultaneously with the erection of the segmental precast concrete block units and in accordance with Subsection 203-3.15 (Fill and Backfill at Structures, Culverts, Pipes, Conduits and Direct Burial Cables). A maximum of one foot of wall height is permissible above the backfill level.

Control all operations and procedures to prevent misalignment of the segmental precast concrete block units. Precautionary measures include (but are not limited to) keeping vehicular equipment at least 3 feet behind the back of the segmental precast concrete block units. Compaction equipment used within 3 feet of the back of the units must conform to Subsection 203.12, B.6 (Compaction Equipment for Confined Areas).

Apply the cap unit to the top of the wall using mastic adhesive, in accordance with, and conforming to the block manufacturer's installation recommendations.

METHOD OF MEASUREMENT:

The total number of square feet of segmental precast block retaining wall face area is computed from the payment lines shown on the plans or between payment lines established, in writing, by the Engineer.

Obtain the computed wall face area from the product of the height of the wall (measured as the vertical projection distance from the top of the leveling pad to the top of the wall, including the cap blocks, when utilized) and the horizontal length of the wall (as measured along the bottom of the wall at the top of the leveling pad).

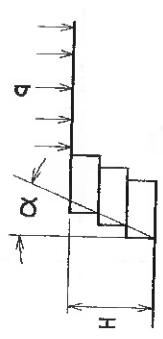
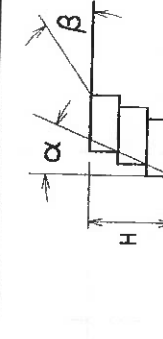
The computations shall take into consideration the possible variation in the elevations of the top of the leveling pad and the top of the wall. No field measurement will be made unless the Engineer specifies, in writing, a change in the payment lines indicated on the plans.

BASIS OF PAYMENT:

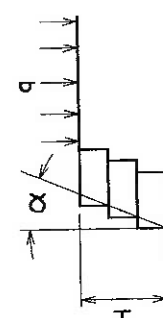
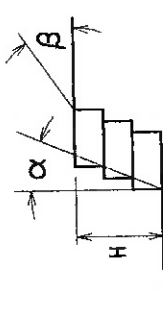
The unit price bid includes the cost of furnishing the leveling pad, segmental precast concrete block units, backfill, unit fill, cap units, underdrain and geotextile and all labor and equipment necessary to complete the work.

Excavation will be paid for under the appropriate excavation item(s).

DESIGN TABLE OF LIMITING WALL HEIGHTS

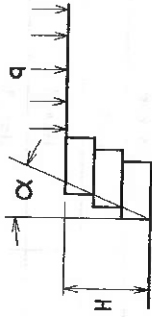
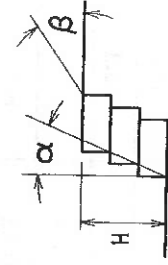
BLOCK MANUFACTURER, DISTRIBUTOR OR SUPPLIER	MAXIMUM VERTICAL WALL HEIGHTS (H) IN FEET FOR EACH DESIGN LOADING CONDITION (q = TRAFFIC SURCHARGE IN PSF ; β = BACKFILL SLOPE ANGLE)			
ANCHOR WALL SYSTEMS 8309 BROOKLYN BLVD. BROOKLYN PARK, MN 55445				
	q = 0 $\beta = 0$ H=3.5	q = 250 $\beta = 0$ H=0	q = 0 $\beta = 9.5^\circ (1:1.6)$ H=3	q = 0 $\beta = 14^\circ (1:4)$ H=3
SEGMENTAL BLOCK SYSTEM NAME ANCHOR DIAMOND 10.6°	WALL BATTER, α			
		$\beta = 26.6^\circ (1:2)$ H=2		

DESIGN TABLE OF LIMITING WALL HEIGHTS

BLOCK MANUFACTURER, DISTRIBUTOR OR SUPPLIER	MAXIMUM VERTICAL WALL HEIGHTS (H) IN FEET FOR EACH DESIGN LOADING CONDITION (q = TRAFFIC SURCHARGE IN PSF ; β = BACKFILL SLOPE ANGLE)					
DUKE CONCRETE PRODUCTS, INC. DUKE INDUSTRIAL PARK GLENS FALLS, NY 12801			$q = 0$			
	$q = 0$	$q = 250$	$\beta = 0$	$\beta = 0$		
SEGMENTAL BLOCK SYSTEM NAME	WALL BATTER, α	$\beta = 9.5^\circ (1:6)$	$\beta = 14^\circ (1:4)$	$\beta = 18.4^\circ (1:3)$	$\beta = 26.6^\circ (1:2)$	
TERRASTOP	0°	H=2.33	H=0	H=2.0	H=2.0	H=1.67
	13°	H=3.33	H=0	H=3.33	H=3.0	H=2.33

DESIGN TABLE OF LIMITING WALL HEIGHTS

MAXIMUM VERTICAL WALL HEIGHTS (H) IN FEET FOR EACH DESIGN LOADING CONDITION
 (q = TRAFFIC SURCHARGE IN PSF ; β = BACKFILL SLOPE ANGLE)



SEGMENTAL BLOCK SYSTEM NAME

WALL BATTER, α

q = 0

q = 250

q = 0

SEGMENTAL BLOCK SYSTEM NAME	WALL BATTER, α	q = 0			
		$\beta = 0$	$\beta = 9.5^\circ (1:6)$	$\beta = 14^\circ (1:4)$	$\beta = 18.4^\circ (1:3)$
STANDARD STRAIGHT FACE	0°	H=4.67	H=4.0	H=4.0	H=4.0
	7.1°	H=5.33	H=5.33	H=4.67	H=4.67
STANDARD SPLIT FACE	0°	H=4.67	H=4.0	H=4.0	H=4.0
	7.1°	H=5.33	H=5.33	H=4.67	H=4.67
COMPAC STRAIGHT FACE	0°	H=2.67	H=2.0	H=2.0	H=2.0
	7.1°	H=3.33	H=2.67	H=2.67	H=2.67
COMPAC SPLIT FACE	0°	H=2.67	H=2.0	H=2.0	H=2.0
	7.1°	H=3.33	H=2.67	H=2.67	H=2.67

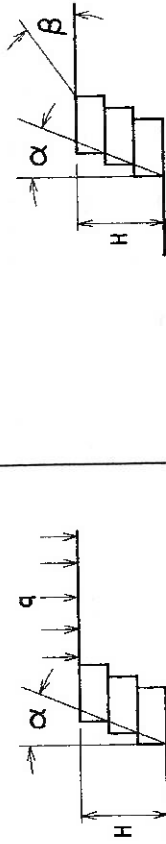
L/10/17/96

DESIGN TABLE OF LIMITING WALL HEIGHTS

BLOCK MANUFACTURER,
DISTRIBUTOR OR SUPPLIER

PAVESTONE PLUS, INC.
PO BOX 20711
ROCHESTER, NY 14602

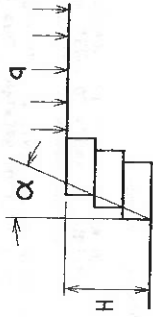
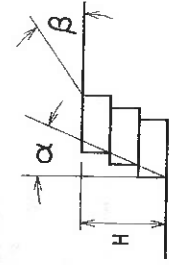
MAXIMUM VERTICAL WALL HEIGHTS (H) IN FEET FOR EACH DESIGN LOADING CONDITION
(q = TRAFFIC SURCHARGE IN PSF ; β = BACKFILL SLOPE ANGLE)



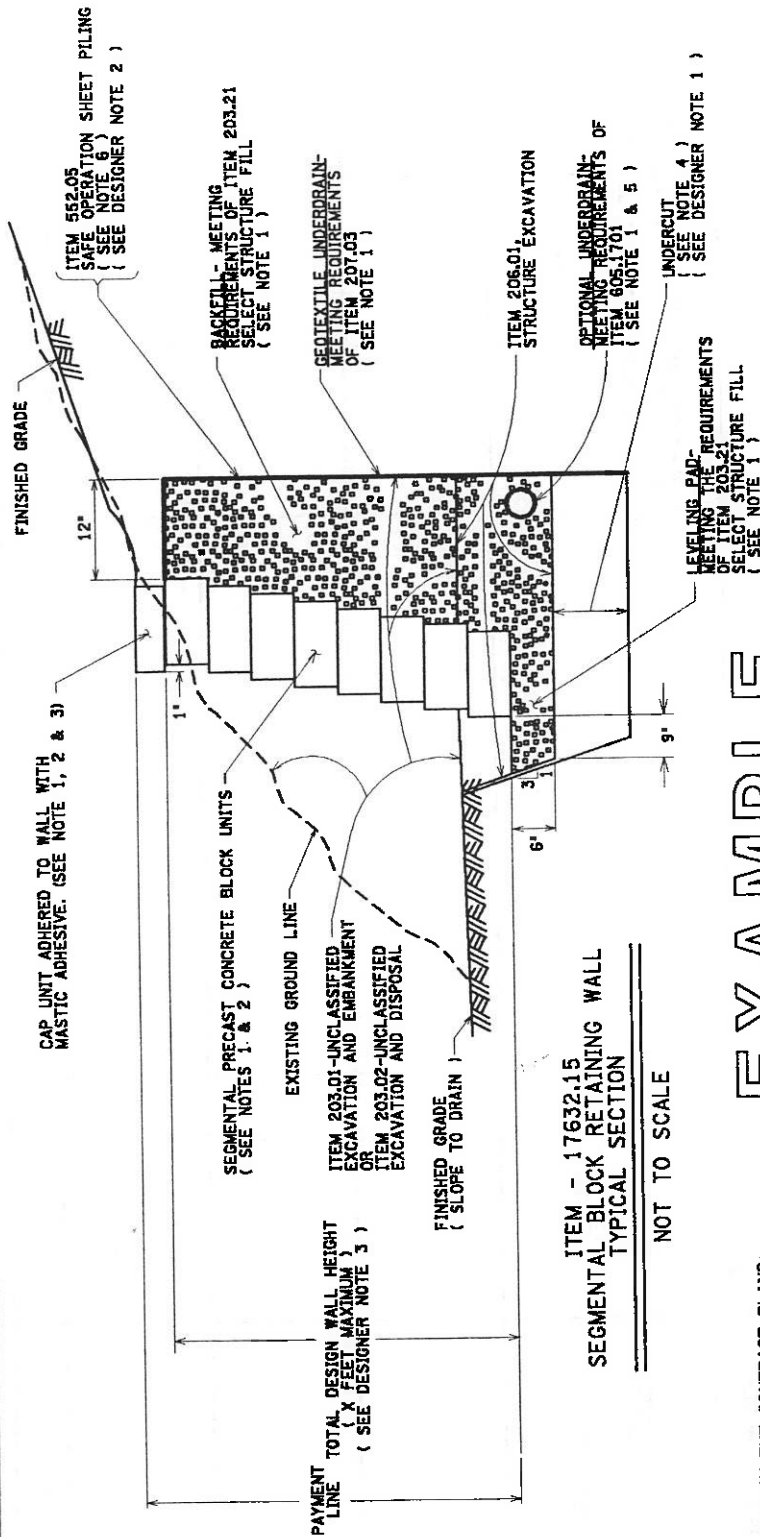
SEGMENTAL BLOCK SYSTEM NAME	WALL BATTER, α	q = 0				q = 250				q = 0					
		$\beta = 0$				$\beta = 0$				$\beta = 18.4^\circ (1:3)$				$\beta = 26.6^\circ (1:2)$	
WALLSTONE GRANDE 250	0°	H=2.0	H=1.3	H=2.0	H=1.3	H=1.3	H=2.0	H=1.3	H=1.3	H=1.3	H=2.0	H=1.3	H=1.3	H=2.0	H=1.3
	9°	H=2.6	H=1.3	H=2.0	H=1.3	H=2.0	H=1.3	H=2.6	H=2.0	H=2.0	H=2.6	H=2.0	H=2.0	H=2.6	H=2.0
	17°	H=3.3	H=1.3	H=3.3	H=1.3	H=3.3	H=1.3	H=3.3	H=2.6	H=3.3	H=2.6	H=3.3	H=2.6	H=3.3	H=2.0
WALLSTONE GRANDE 500	0°	H=4.0	H=1.3	H=4.0	H=1.3	H=4.0	H=1.3	H=4.0	H=3.3	H=4.0	H=3.3	H=4.0	H=3.3	H=4.0	H=2.6
	9°	H=5.3	H=2.6	H=5.3	H=2.6	H=5.3	H=2.6	H=5.3	H=4.6	H=5.3	H=4.6	H=5.3	H=4.6	H=5.3	H=4.0
	17°	H=6.5	H=4.0	H=6.5	H=4.0	H=6.5	H=4.0	H=6.5	H=5.9	H=6.5	H=5.9	H=6.5	H=5.9	H=6.5	H=4.6
WALLSTONE GRANDE 750	0°	H=5.9	H=4.0	H=5.9	H=4.0	H=5.9	H=4.0	H=5.9	H=5.3	H=5.9	H=5.3	H=5.9	H=5.3	H=5.9	H=4.6
	9°	H=7.9	H=5.3	H=7.9	H=5.3	H=7.9	H=5.3	H=7.9	H=7.2	H=7.9	H=7.2	H=7.9	H=7.2	H=7.9	H=5.9
	17°	H=9.2	H=7.2	H=9.2	H=7.2	H=9.2	H=7.2	H=9.2	H=8.6	H=9.2	H=8.6	H=9.2	H=8.6	H=9.2	H=7.2
WALLSTONE GRANDE 1000	0°	H=8.0	H=6.0	H=8.0	H=6.0	H=8.0	H=6.0	H=8.0	H=7.2	H=8.0	H=7.2	H=8.0	H=7.2	H=8.0	H=6.0
	9°	H=10.5	H=7.9	H=10.5	H=7.9	H=10.5	H=7.9	H=10.5	H=8.6	H=10.5	H=8.6	H=10.5	H=8.6	H=10.5	H=7.2
	17°	H=11.2	H=9.2	H=11.2	H=9.2	H=11.2	H=9.2	H=11.2	H=9.9	H=11.2	H=9.9	H=11.2	H=9.9	H=11.2	H=7.9

DESIGN TABLE OF LIMITING WALL HEIGHTS

MAXIMUM VERTICAL WALL HEIGHTS (H) IN FEET FOR EACH DESIGN LOADING CONDITION
 (q = TRAFFIC SURCHARGE IN PSF ; β = BACKFILL SLOPE ANGLE)



BLOCK MANUFACTURER, DISTRIBUTOR OR SUPPLIER					
VERSA-LOK PO BOX 9116 N. ST. PAUL, MN 55109					
SEGMENTAL BLOCK SYSTEM NAME	WALL BATTER, α	q = 0	q = 250	q = 0	
VERSA-LOK	7.125°	$\beta = 0$	H=0	$\beta = 9.5^\circ (1:6)$	$\beta = 14^\circ (1:4)$
				H=3	H=2.5
					H=2.5
					H=2
					$\beta = 18.4^\circ (1:3)$
					$\beta = 26.6^\circ (1:2)$



ITEM - 17632.15
SEGMENTAL BLOCK RETAINING WALL
TYPICAL SECTION

NOT TO SCALE

EXAMPLE

NOTES TO BE INCLUDED ON THE CONTRACT PLANS:

1. MATERIALS TO BE INCLUDED IN THE PRICE BID FOR ITEM 17632.15.
2. BLOCK COLOR SHALL BE OR APPROVED EQUAL.
3. MASTIC ADHESIVE CONFORMS TO THE MANUFACTURER'S RECOMMENDATIONS.
4. A. A MAXIMUM 2 FT. UNDERCUT MAY BE ORDERED BY THE ENGINEER WHERE NECESSARY TO PROVIDE STABLE BEDDING CONDITIONS. UNDERCUTTING SHALL BE PAID FOR UNDER ITEM 206.01, STRUCTURE EXCAVATION.
B. IF UNDERCUTTING IS ORDERED, THE LIFT THICKNESS AND COMPACTION REQUIREMENTS FOR THE SELECT STRUCTURE FILL BACKFILL SHALL BE AS ORDERED BY THE ENGINEER.
C. THE REGIONAL GEOTECHNICAL ENGINEER SHALL BE CONSULTED IF IT APPEARS THAT UNDERCUTTING BEYOND THE TWO FOOT MAXIMUM DEPTH MAY BE NEEDED.
5. THE LOCATION OF THE UNDERDRAIN SHALL BE A. O. B. E.
6. THE VERTICAL LINE IS THE PAYMENT LINE FOR EXCAVATION FOR THE SEGMENTAL BLOCK RETAINING WALL SYSTEM. THE CONTRACTOR MUST DETERMINE THE SAFE EXCAVATION SLOPE FOR ANY EXCAVATION AND PERFORM ALL WORK IN ACCORDANCE WITH SUBSECTION 107-05, SAFETY AND HEALTH REQUIREMENTS. ALL COSTS FOR EXCAVATION AND MAINTENANCE OF SLOPES FLATTER THAN THE PAYMENT LINE WILL BE PAID FOR UNDER ITEM 552.05, SAFE OPERATION SHEET PILING.

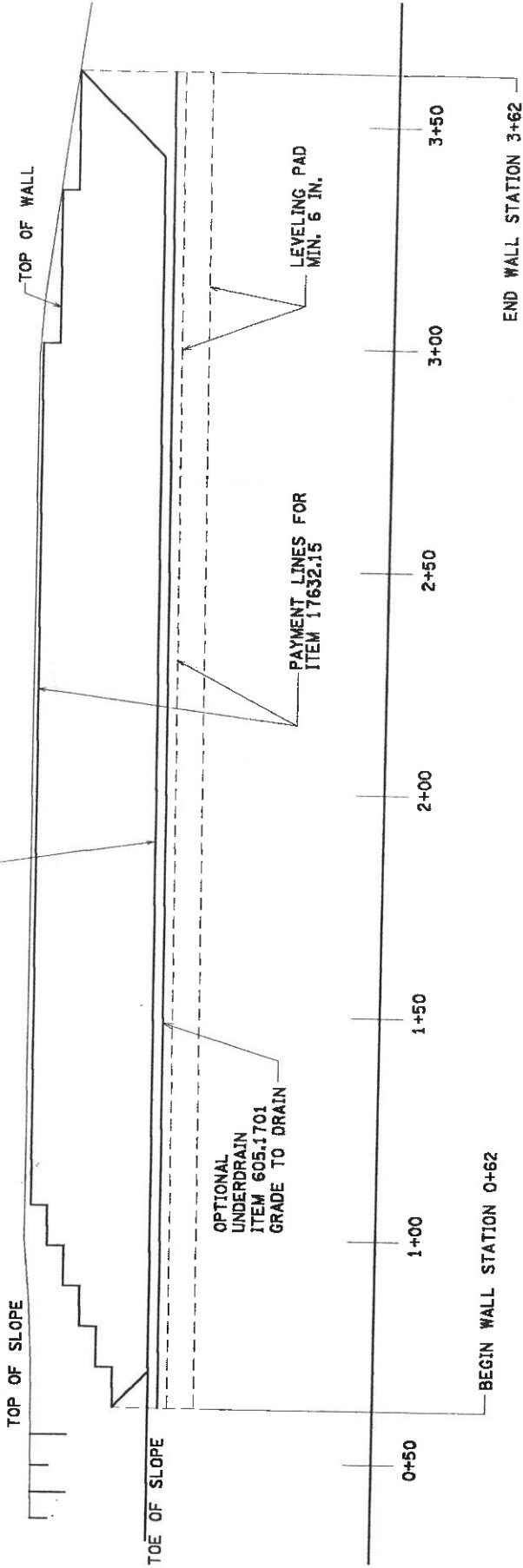
DESIGNER NOTES:

- 1.J) WHEN WALLS ARE TO BE LOCATED IN AREAS WHERE UNSUITABLE OR UNSTABLE MATERIAL IS KNOWN TO EXIST, SPECIAL CONSTRUCTION PROCEDURES AND DETAILS SHALL BE ESTABLISHED AND SHOWN ON THE PLANS.
- 2.J) OSHA REQUIREMENTS DICTATE PROTECTION OF WORKERS FOR EXCAVATIONS OF 5 FEET OR GREATER. THIS PROTECTION CAN BE ACCOMPLISHED BY LAYING THE EXCAVATION SLOPE BACK TO A SAFE INCLINATION OR BY UTILIZING A PROTECTIVE SYSTEM. IF A SAFE EXCAVATION SLOPE IS UNATTAINABLE AND A PROTECTIVE SYSTEM IS REQUIRED, USE OF THE SRBWS MAY NOT BE APPROPRIATE BECAUSE:
 - A.) TOTAL COST OF THE SRBWS PLUS A PROTECTIVE SYSTEM MAY BE MORE EXPENSIVE THAN OTHER RETAINING WALL ALTERNATES.
 - B.) REMOVAL OF THE TEMPORARY SHEET PILING WHEN THE WORK IS COMPLETE WILL RESULT IN DISTURBANCE AND/OR DAMAGE TO THE SRBWS.
 - 3.J) THE TOTAL DESIGN WALL HEIGHT CORRESPONDS TO THE HEIGHTS LISTED ON THE "DESIGN TABLES OF LIMITING WALL HEIGHTS", AND DOES NOT INCLUDE THE CAP UNIT. THE PAYMENT LINE, HOWEVER, DOES INCLUDE THE CAP UNIT AND EXTENDS FROM THE BASE OF THE WALL TO THE TOP OF THE CAP UNIT.

L/110/17/9C

	STATE OF NEW YORK DEPARTMENT OF TRANSPORTATION TECHNICAL SERVICES DIVISION
EXAMPLE WALL LAYOUT SHEET FOR SEGMENTAL BLOCK RETAINING WALL SYSTEM	
DATE: 10/17/90	

LINE OF FINISHED GRADE




ITEM - 17632.15
 SEGMENTAL BLOCK RETAINING WALL
 TYPICAL PROFILE

NOT TO SCALE

EXAMPLE

L/10/17/96

	STATE OF NEW YORK DEPARTMENT OF TRANSPORTATION TECHNICAL SERVICES DIVISION
	EXAMPLE WALL LAYOUT SHEET FOR SEGMENTAL BLOCK RETAINING WALL SYSTEM
GEOTECSB/AGCE1811.DBN	
DRAWING NO.	

THE FOLLOWING BLOCK MANUFACTURERS MEET THE WALL HEIGHT REQUIREMENTS FOR THIS PROJECT	
SEGMENTAL BLOCK SYSTEM NAME	WALL BATTER α

ITEM 17632.15M - SEGMENTAL BLOCK RETAINING WALL SYSTEM

DESCRIPTION:

Construct a Segmental Block Retaining Wall System (SBRWS) where indicated on the contract plans or as ordered by the Engineer.

A SBRWS is a gravity retaining wall consisting of a compacted granular leveling pad, segmental precast concrete block and cap units, granular backfill, underdrain, and geotextile.

The following additional definitions apply within this specification:

- | | |
|---|---|
| A. Leveling Pad | Level surface of select material used to provide a working surface and distribute the weight of the dry-stacked column of segmental precast concrete block units. |
| B. Segmental Precast Concrete Block Units | Solid or hollow segmental concrete block units machine cast from cement, mineral aggregates, and water. |
| C. Backfill | Select material placed directly behind the segmental precast concrete block units. |
| D. Unit Fill | Select material placed within the hollow cores of the segmental precast concrete block units. |
| E. Cap Units | Segmental precast concrete block units placed on, and attached to, the top of the finished SBRWS. |
| F. Underdrain | A system for removing water from behind the SBRWS. |
| G. Geotextile | A permeable textile material used to separate dissimilar granular materials. |

MATERIALS:

A. SEGMENTAL PRECAST CONCRETE BLOCK UNITS

Provide segmental precast concrete block units conforming to Subsection 704-07 (Precast Concrete Retaining Wall Blocks).

ITEM 17632.15M - SEGMENTAL BLOCK RETAINING WALL SYSTEM

B. BACKFILL, UNIT FILL, LEVELING PAD

Provide material meeting the requirements of the following:

1. Select Structure Fill - Item 203.21 M

C. DRAINAGE

Provide underdrain pipe and geotextile material meeting the requirements of the following:

1. Underdrain Pipe - Item 605.1701 M, Optional Underdrain, 4 inch diameter pipe
2. Geotextile Underdrain - Item 207.03 M

CONSTRUCTION DETAILS:

A minimum of 30 days prior to beginning work on the SBRWS, submit the following to the Engineer-in-charge for approval:

- A. The name of the SBRWS selected for use from the list of systems shown on the contract plans.
- B. The name of the block manufacturer/supplier who is shown on the Department's Approved List as being approved for producing block for the selected SBRWS.
- C. The SBRWS design and proposed method of construction, stamped by a currently licensed New York State Professional Engineer.
- D. The block manufacturer's installation manual for the selected SBRWS.
- E. A block sample for color and texture approval by the Regional Landscape Architect.

The Engineer-in-charge requires 10 working days to approve the submission after receipt of all pertinent information. Begin work only after receiving the Engineer's written approval.

INSTALLATION:

Excavate, dispose of excavated material and prepare the area on which the SBRWS will rest conforming to Section 203 (Excavation and Embankment), except as modified here:

ITEM 17632.15M - SEGMENTAL BLOCK RETAINING WALL SYSTEM

- A. Excavate the area below the finished grade conforming to Section 206 (Trench , Culvert and Structure Excavation).
- B. Grade and level the area on which the SBRWS will rest. Thoroughly compact this area to the Engineer's satisfaction. Treat all soils found to be unsuitable or incapable of being satisfactorily compacted because of moisture content in a manner directed by the Engineer, in conjunction with recommendations of the Regional Geotechnical Engineer.

Place the leveling pad material to ensure complete contact of the first course of segmental precast concrete block units. Compact the material in conformance with Subsection 203-3.15 (Fill and Backfill at Structures, Culverts, Pipes, Conduits and Direct Burial Cables). Step the leveling pad to conform to grade changes.

Place the geotextile as shown on the contract plans and in accordance with Section 207 (Geotextile).

Place the underdrain as shown on the contract plans and in accordance with Section 605 (Underdrains).

Erect the segmental precast concrete block units a minimum of one block height below the finished grade conforming to the lines, grades, and typical sections shown on the contract plans and in accordance with the designated block manufacturer's installation manual. Place the block units side by side and in full contact with the leveling pad, maintaining the following minimum tolerances:

<u>Vertical Control:</u> ± 26 mm over a distance of 3 m
<u>Horizontal Location Control:</u> ± 26 mm over a distance of 3 m
<u>Rotation from established plan wall batter:</u> ± 26 mm over 3 m in height.
<u>Bulging:</u> ± 26 mm over a distance of 3 m

Adjust block spacing for curved sections according to the block manufacturer's installation recommendations.

ITEM 17632.15M - SEGMENTAL BLOCK RETAINING WALL SYSTEM

Place and compact backfill and unit fill (if applicable) simultaneously with the erection of the segmental precast concrete block units and in accordance with Subsection 203-3.15 (Fill and Backfill at Structures, Culverts, Pipes, Conduits and Direct Burial Cables). A maximum of 0.30 m of wall height is permissible above the backfill level.

Control all operations and procedures to prevent misalignment of the segmental precast concrete block units. Precautionary measures include (but are not limited to) keeping vehicular equipment at least 1.0 m behind the back of the segmental precast concrete block units. Compaction equipment used within 1.0 m of the back of the units must conform to Subsection 203.12, B.6 (Compaction Equipment for Confined Areas).

Apply the cap unit to the top of the wall using mastic adhesive, in accordance with, and conforming to the block manufacturer's installation recommendations.

METHOD OF MEASUREMENT:

The total number of square meters of segmental precast block retaining wall face area is computed from the payment lines shown on the plans or between payment lines established, in writing, by the Engineer.

Obtain the computed wall face area from the product of the height of the wall (measured as the vertical projection distance from the top of the leveling pad to the top of the wall, including the cap blocks, when utilized) and the horizontal length of the wall (as measured along the bottom of the wall at the top of the leveling pad).

The computations shall take into consideration the possible variation in the elevations of the top of the leveling pad and the top of the wall. No field measurement will be made unless the Engineer specifies, in writing, a change in the payment lines indicated on the plans.

BASIS OF PAYMENT:

The unit price bid includes the cost of furnishing the leveling pad, segmental precast concrete block units, backfill, unit fill, cap units, underdrain and geotextile and all labor and equipment necessary to complete the work.

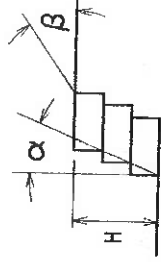
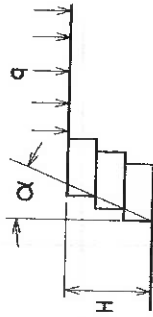
Excavation will be paid for under the appropriate excavation item(s).

DESIGN TABLE OF LIMITING WALL HEIGHTS

BLOCK MANUFACTURER,
DISTRIBUTOR OR SUPPLIER

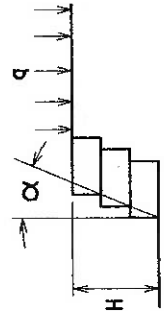
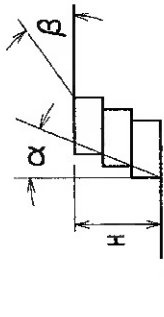
ANCHOR WALL SYSTEMS
8309 BROOKLYN BLVD.
BROOKLYN PARK, MN 55445

MAXIMUM VERTICAL WALL HEIGHTS (H) IN METERS FOR EACH DESIGN LOADING CONDITION
(q = TRAFFIC SURCHARGE IN KN/M²; β = BACKFILL SLOPE ANGLE)



SEGMENTAL BLOCK SYSTEM NAME	WALL BATTER, α	q = 0			q = 12			q = 0						
		β = 0	H=1.07	H=0	β = 0	H=0	β = 9.5° (1:6)	H=0.92	β = 14° (1:4)	H=0.92	β = 18.4° (1:3)	H=0.76	β = 26.6° (1:2)	H=0.61
ANCHOR DIAMOND	10.6°													

DESIGN TABLE OF LIMITING WALL HEIGHTS

BLOCK MANUFACTURER, DISTRIBUTOR OR SUPPLIER	MAXIMUM VERTICAL WALL HEIGHTS (H) IN METERS FOR EACH DESIGN LOADING CONDITION (q = TRAFFIC SURCHARGE IN KN/M ² ; β = BACKFILL SLOPE ANGLE)			
DUKE CONCRETE PRODUCTS, INC. DUKE INDUSTRIAL PARK GLENS FALLS, NY 12801			q = 0	
	q = 0	q = 12	β = 9.5° (1:6)	β = 18.4° (1:3)
WALL BATTER, α	β = 0	β = 0	β = 14° (1:4)	β = 26.6° (1:2)
TERRASTOP	0°	H=0.7	H=0.6	H=0.6
	13°	H=1.0	H=0.9	H=0.7

From: Geoffrey Wood
To: Hodges, George; Lahiri, Pratip
Date: 11/3/2005 12:55:32 PM
Subject: Re: Engineering Instruction 96-18, Segmental Block Retaining Wall Systems

Hi George. Hi Pratip. The first attached pdf file contains the version of EI 96-018 now available on the Department's website (I just downloaded it). Missing from this electronic version are the example typical section, example typical profile, and 5 design tables of limiting wall heights. I've obtained copies of this missing information and created the two other attached pdf's. One of these files contains the example typical section and profile, while the other contains the 5 design tables. The version of EI 96-018 found on the server should, in my opinion, be updated to include this missing information.

Those folks who still have hardcopies of the original EI on file probably still have access to these materials, but those who are now completely reliant on the electronic version (like us in R-1 Design) do not. Designers in other Regions, and our consultant designers, may also have the same problem.

While I agree that EI 96-018 is outdated and in need of updating, it is also incomplete at the moment. Adding the missing information would be a step in the right direction and could be done immediately.

>>> George Hodges 11/3/2005 12:38:31 PM >>>
Pratip,

Good afternoon.

Here in Region 1 we've several projects that required additional design and development of SBRWS, including finding currently approved suppliers. Geoff Wood, one of Design Associates, recently gave a brief presentation at a Designer's Meeting. These wall types are popular in our projects.

During Geoff's research it became apparent that the EI originally written in 1996 needs considerable updating, including suppliers and their specifications.

Has anyone given the update of this EI any consideration?

CC: Bridges, James; Dickson, Todd; R

11/18/2005
DELAY MAKING ANY UPDATES
TO EI 96-018 UNTIL THE
GEOTECH ENGR BUR DETERMINES
WHETHER THEY WILL MOVE
FORWARD W/ A NEW EI.
HGR