September 5, 2025

Texas DOT LRFD Retaining Walls Approved System List and LRFD Standard Sheets

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TxDOT Bridge Division

Field Ops / Geotechnical Branch

TxDOT Bridge Geotech Branch

- Standards, Specifications, Contracts, Review, Recommendations, Research
- Bridge Foundation Design
- Retaining Wall Management & Design
- Slopes and Embankments
- Culverts and Scour
- Preliminary design, construction, monitoring, maintenance, and repair
- Drilling, Testing and incorp. into Statewide Geotechnical Digital Data Management

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BACKGROUND

Retaining Walls in Texas

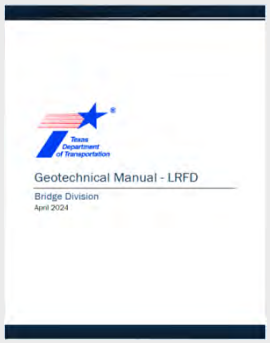
Often overlooked..

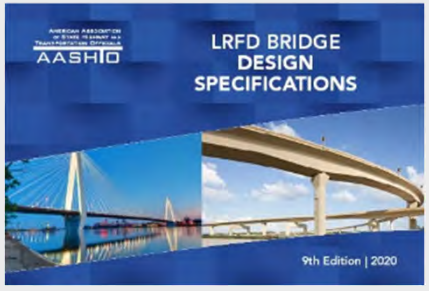
Often undervalued..

Critical piece of infrastructure functioning to conserve space, provide grade separation, protect roadways and bridges, etc.

Agency ensures sound, stable and safe installation from design, to system selection, to construction installation and inspection.

- Specifications
  - DMS – Approved Systems List
- Geotechnical Manual
- Standards



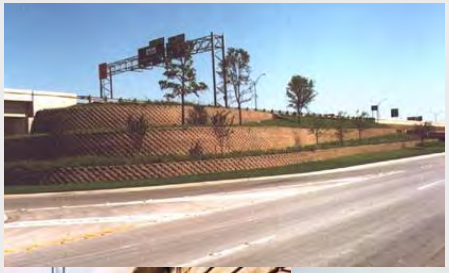


Types Used in Texas

- **MSE (Mechanically Stabilized Earth Walls) with Precast Panel**
  - BRG Standards: RW(MSE) and RW(MSE)DD, Item 423 (Retaining Walls).
- Soil Nail Wall/Rock Nail Wall
  - Item 410 (Soil Nail Anchors), 411 (Rock Nail Anchors), also 403 (TSS)
- CIP Retaining Wall (or Spread-footing Retaining Wall)
  - BRG Standards: RW (SFA/B/C), Item 423 (RWs)
- Sheet Pile Wall
  - BRG Standards: SSPC (Corner Details), Item 407 (Steel Piling)
- Drilled Shaft Wall
  - Item 423 (fascia)
  - Item 416 (shafts)

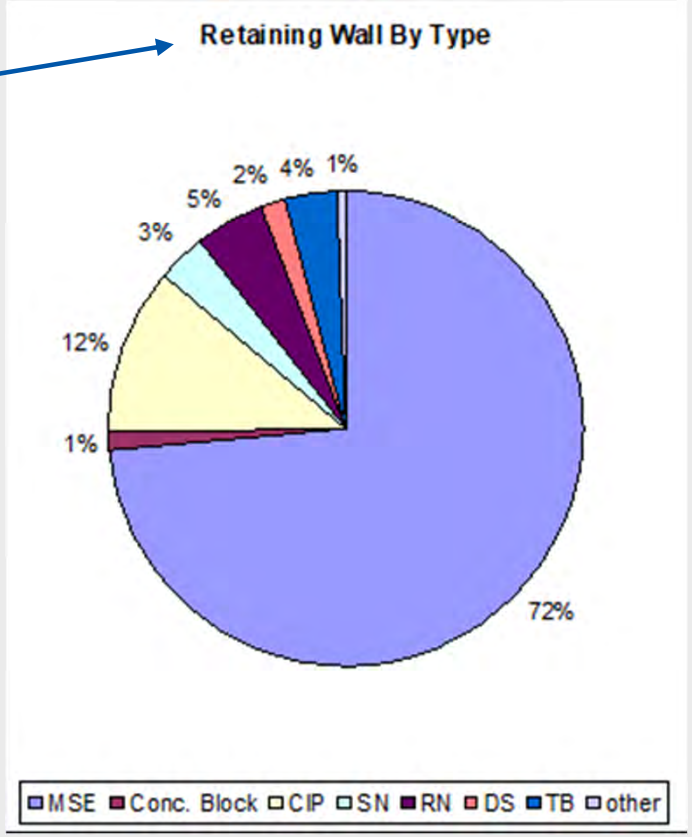
Types Used in Texas

- **Concrete Block Retaining Wall (w/ or w/out reinforcement)**
  - BRG Standards: RW(CB), RW(CB) DD and Item 423 (RWs)
- Tie-back Anchored Wall
  - Typically used for Retrofit, Repairs, etc.
- Gabion Basket Wall
  - Item 423 (RWs) and Item 459 (Gabions)
- Soldier Pile Lagging Wall
  - Typically, Temporary Special Shoring, Item 403
- Temporary Earth Retaining Wall
  - BRG Standards: RW(TEW), Item 423 (RWs)



Texas DOT Retaining Walls

- By ft^2 of Exposed Wall (perm. Walls)..
- MSE (panel type) most dominant
- Pending formal inventory
- Temp. Special Shoring (mostly), Item 403
  - TEW
  - Soil Nail
  - Sheet Pile
  - Solider Pile w/ Lagging



Responsibility

- The Project Engineer (Designer of Record) must ensure that the retaining wall system (design) selected for a given location is appropriate.

2024 Specifications – Item 423 MSE

Item 423
Retaining Walls

1. DESCRIPTION

Furnish, construct, and install retaining walls.

2. MATERIALS

2.1. **General**. Furnish materials in accordance with the following.

- Item 420, "Concrete Substructures"
- Item 421, "Hydraulic Cement Concrete"
- Item 440, "Reinforcement for Concrete"
- Item 445, "Galvanizing"
- Item 458, "Waterproofing Membranes for Structures"
- Item 556, "Pipe Underdrains"

Use concrete for retaining walls that conforms to the requirements of Table 1 unless otherwise shown on the plans.

Table 1
Concrete for Retaining Walls

Application	Concrete
Cast-in-place, non-reinforced	Class A
Cast-in-place, reinforced	Class C
Precast	Class H, f'_c = 4,000 psi

Furnish concrete for machine-made concrete block units in accordance with ASTM C90, Class 1, Type II, except the minimum 28-day compressive strength must be 4,000 psi with maximum moisture absorption of 7%.

Provide Type 1 filter fabric in accordance with DMS-6200, "Filter Fabric." Provide filter fabric rated as UV-resistant when used as part of the exposed facing for a temporary wall.

Joint fillers, pads, waterstops, and other incidental materials must be as shown on the plans or approved by the Engineer.

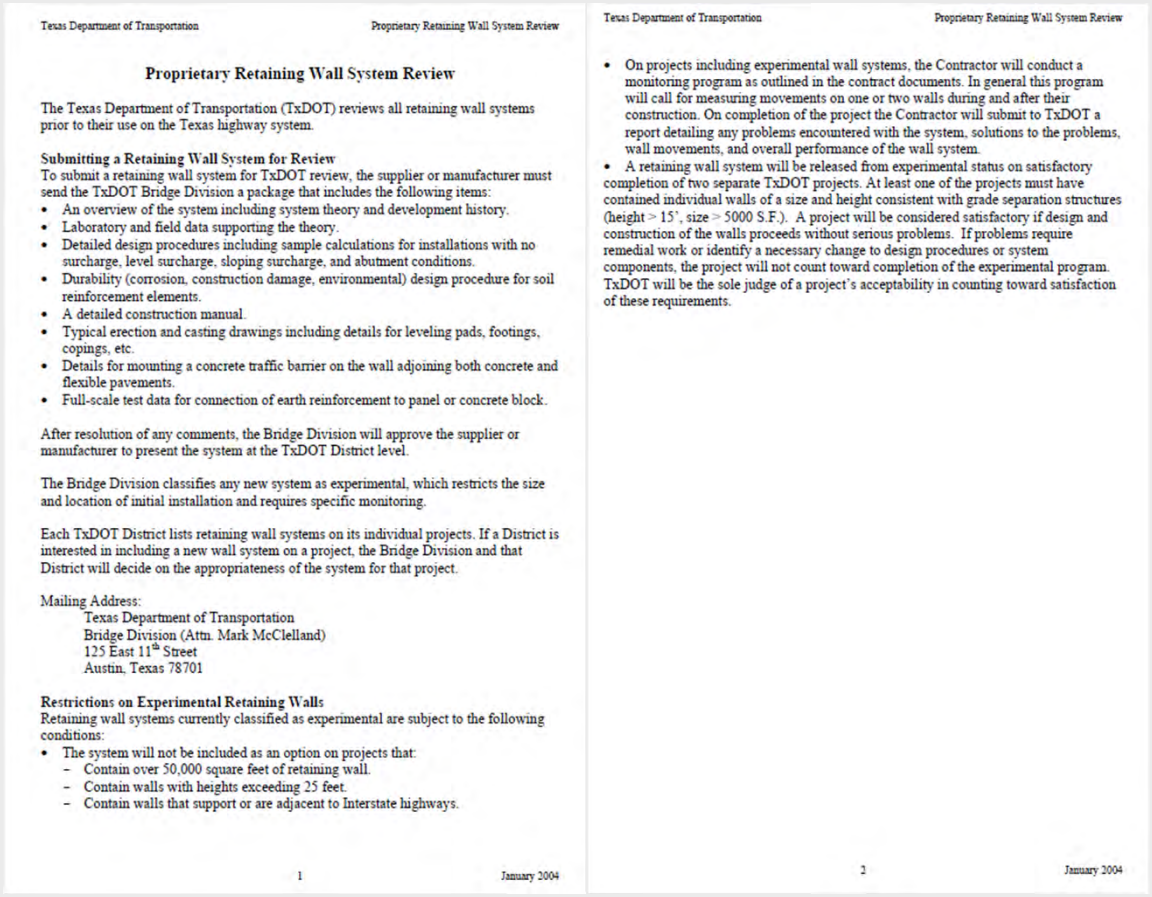
Epoxy coat all steel used in concrete panels and coping including connectors, dowels, stirrups, and reinforcing steel when the plans call for epoxy coating of steel earth reinforcements.

Construct permanent retaining walls approved for use in accordance with DMS-4800, "Proprietary Earth Retaining Wall System," and on the Approved System List for Concrete Block Retaining Walls Systems and Mechanically Stabilized Earth Panel Type Systems.

2.2. **Definitions**. This Item uses the following terms.

- **Permanent Wall**. A retaining wall with a design service life of 75 yr. All walls are presumed to be permanent walls unless otherwise shown on the plans.
- **Temporary Wall**. A retaining wall so designated by description, with a design service life of 3 yr.
- **Mechanically Stabilized Earth (MSE) Wall**. A wall consisting of a volume of select backfill with tensile earth reinforcement elements distributed throughout. Permanent MSE walls use a precast concrete

TxDOT System Reviews Start 2004



Proprietary Retaining Wall System Review

The Texas Department of Transportation (TxDOT) reviews all retaining wall systems prior to their use on the Texas highway system.

Submitting a Retaining Wall System for Review
To submit a retaining wall system for TxDOT review, the supplier or manufacturer must send the TxDOT Bridge Division a package that includes the following items:

- An overview of the system including system theory and development history.
- Laboratory and field data supporting the theory.
- Detailed design procedures including sample calculations for installations with no surcharge, level surcharge, sloping surcharge, and abutment conditions.
- Durability (corrosion, construction damage, environmental) design procedure for soil reinforcement elements.
- A detailed construction manual.
- Typical erection and casting drawings including details for leveling pads, footings, copings, etc.
- Details for mounting a concrete traffic barrier on the wall adjoining both concrete and flexible pavements.
- Full-scale test data for connection of earth reinforcement to panel or concrete block.

After resolution of any comments, the Bridge Division will approve the supplier or manufacturer to present the system at the TxDOT District level.

The Bridge Division classifies any new system as experimental, which restricts the size and location of initial installation and requires specific monitoring.

Each TxDOT District lists retaining wall systems on its individual projects. If a District is interested in including a new wall system on a project, the Bridge Division and that District will decide on the appropriateness of the system for that project.

Mailing Address:
Texas Department of Transportation
Bridge Division (Attn. Mark McClelland)
125 East 11th Street
Austin, Texas 78701

Restrictions on Experimental Retaining Walls
Retaining wall systems currently classified as experimental are subject to the following conditions:

- The system will not be included as an option on projects that:
  - Contain over 50,000 square feet of retaining wall.
  - Contain walls with heights exceeding 25 feet.
  - Contain walls that support or are adjacent to Interstate highways.

- On projects including experimental wall systems, the Contractor will conduct a monitoring program as outlined in the contract documents. In general this program will call for measuring movements on one or two walls during and after their construction. On completion of the project the Contractor will submit to TxDOT a report detailing any problems encountered with the system, solutions to the problems, wall movements, and overall performance of the wall system.
- A retaining wall system will be released from experimental status on satisfactory completion of two separate TxDOT projects. At least one of the projects must have contained individual walls of a size and height consistent with grade separation structures (height > 15', size > 5000 S.F.). A project will be considered satisfactory if design and construction of the walls proceeds without serious problems. If problems require remedial work or identify a necessary change to design procedures or system components, the project will not count toward completion of the experimental program. TxDOT will be the sole judge of a project's acceptability in counting toward satisfaction of these requirements.

MSE Panel and CB List in Contract Plan Notes - 2019

Updated Memo

September 2019

Proprietary Retaining Wall System Review

The Texas Department of Transportation (TxDOT) reviews all retaining wall systems prior to their use on the Texas highway system.

Submitting a Retaining Wall System for Review

To submit a retaining wall system for TxDOT review, the supplier or manufacturer must send the TxDOT Bridge Division a package that includes the following items:

- An overview of the system including system theory and development history.
- Laboratory and field data supporting the theory.
- Detailed design procedures including sample calculations for installations with no surcharge, level surcharge, sloping surcharge, and abutment conditions.
- Durability (corrosion, construction damage, environmental) design procedure for soil reinforcement elements.
- A detailed construction manual.
- Typical erection and casting drawings including details for leveling pads, footings, copings, etc.
- Details for mounting a concrete traffic barrier on the wall adjoining both concrete and flexible pavements.
- Typical obstruction details for both vertical and horizontal obstructions.
- Full-scale test data for connection of earth reinforcement to panel or concrete block

Item 423 - Retaining Walls

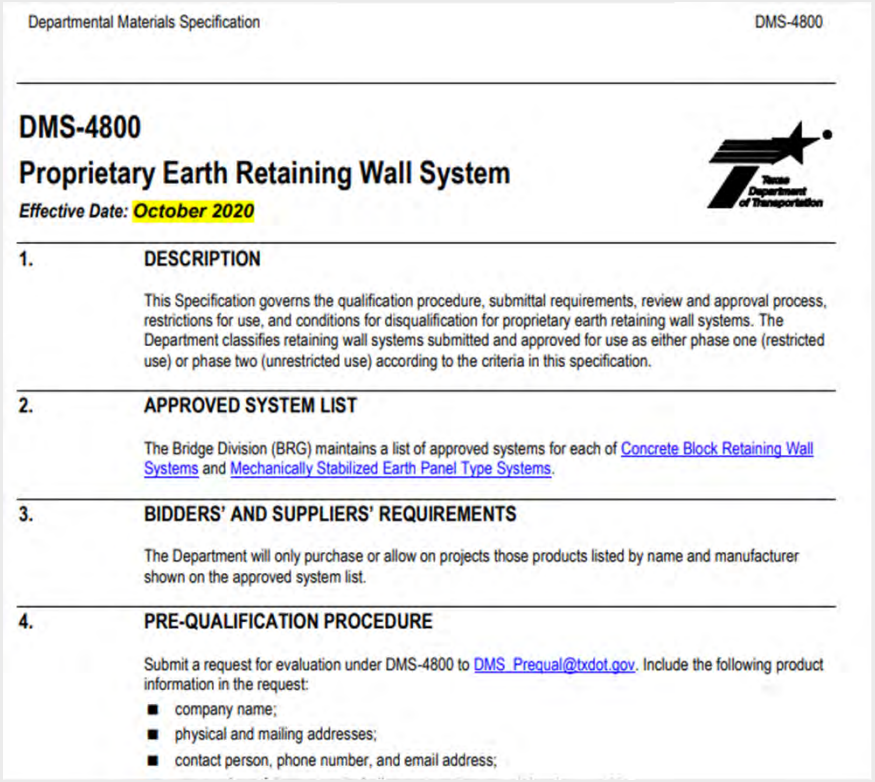
Type AS material shall be used. No cement stabilized backfill will be allowed for MSE walls on this project. A minimum of 90% mechanically induced crushed-face aggregate will be used as per Tex 460-A

For MSE walls, provide a system from one of the following approved suppliers:

Reinforced Earth Walls	The Reinforced Earth Company 1331 Airport Freeway, Suite 302 Euless, TX 76040-4150	(817) 283-5503
Reinforced Soil Embankment Walls	Texas Welded Wire, Inc. 645 W. Hurst Blvd. Hurst, TX 76053	(817) 282-4560
Retained Earth Walls	Foster Geotechnical 901 North Highway 77 Hillsboro, TX 76645	(254) 580-9100
Stabilized Earth Wall	Vist-A-Wall Systems,LLC 650 Justice Lane Mansfield, TX 76063	(817) 507-0200
Strengthened Soil Walls	Shaw Technologies, Inc. 6101 Long Prairie Road Suite 744-126 Flower Mound, TX 75028	(817) 247-4301
Structural Embankment, LLC	Structural Embankment Systems, LLC P.O. Box 2200 Weatherford, TX 76086	(817) 599-5700

General Notes Sheet E

DMS-4800 Certification and Approval - 2020



Departmental Materials Specification DMS-4800

DMS-4800

Proprietary Earth Retaining Wall System

Effective Date: October 2020

1. DESCRIPTION

This Specification governs the qualification procedure, submittal requirements, review and approval process, restrictions for use, and conditions for disqualification for proprietary earth retaining wall systems. The Department classifies retaining wall systems submitted and approved for use as either phase one (restricted use) or phase two (unrestricted use) according to the criteria in this specification.

2. APPROVED SYSTEM LIST

The Bridge Division (BRG) maintains a list of approved systems for each of Concrete Block Retaining Wall Systems and Mechanically Stabilized Earth Panel Type Systems.

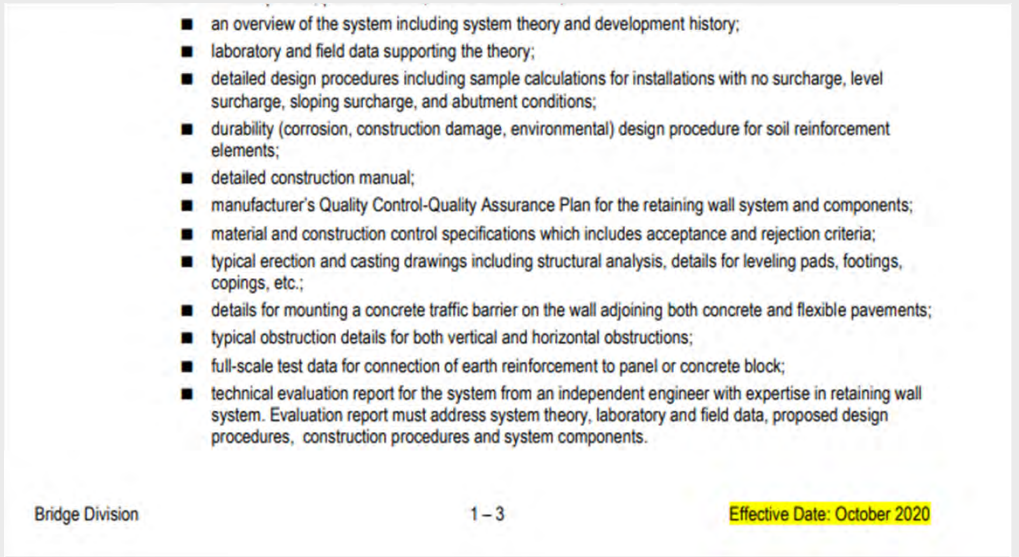
3. BIDDERS' AND SUPPLIERS' REQUIREMENTS

The Department will only purchase or allow on projects those products listed by name and manufacturer shown on the approved system list.

4. PRE-QUALIFICATION PROCEDURE

Submit a request for evaluation under DMS-4800 to DMS_Prequal@txdot.gov. Include the following product information in the request:

- company name;
- physical and mailing addresses;
- contact person, phone number, and email address;



- an overview of the system including system theory and development history;
- laboratory and field data supporting the theory;
- detailed design procedures including sample calculations for installations with no surcharge, level surcharge, sloping surcharge, and abutment conditions;
- durability (corrosion, construction damage, environmental) design procedure for soil reinforcement elements;
- detailed construction manual;
- manufacturer's Quality Control-Quality Assurance Plan for the retaining wall system and components;
- material and construction control specifications which includes acceptance and rejection criteria;
- typical erection and casting drawings including structural analysis, details for leveling pads, footings, copings, etc.;
- details for mounting a concrete traffic barrier on the wall adjoining both concrete and flexible pavements;
- typical obstruction details for both vertical and horizontal obstructions;
- full-scale test data for connection of earth reinforcement to panel or concrete block;
- technical evaluation report for the system from an independent engineer with expertise in retaining wall system. Evaluation report must address system theory, laboratory and field data, proposed design procedures, construction procedures and system components.

Bridge Division 1 – 3 Effective Date: October 2020

- Phase One = Experimental
- Phase Two = Unrestricted

Approved Proprietary Systems Website Lists - 2020

https://www.txdot.gov/business/resources/highway/bridge/approved-systems/mechanically-stabilized-earth.html

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Home / ... / Bridge design, construction, maintenance, inspection, and management / Approved systems

Mechanically stabilized earth

Approved systems

- Expansion joints
- Concrete block retaining wall systems
- Mechanically stabilized earth

Unrestricted status; phase two

The following mechanically stabilized earth (MSE) panel type systems are approved for unrestricted use on TxDOT projects:

Name	Manufacturer	Phone
Reinforced Earth Walls	Geoquest USA, Inc 9001 Airport Frwy., Ste. 800 North Richland Hills, TX 76180 (prior to March 2025) The Reinforced Earth Company 1331 Airport Freeway, Suite 302 Eules	817-283-5503
Vist-A-Wall Precast MSE Walls (Grid-Strip, Wide Mesh)	Cont 650 Mans	
Strengthened Soil Walls	ROS 1839 Ches	

Restricted status; phase one

The following MSE panel type systems are on restricted status*:

Name	Manufacturer	Phone
EarthTec	Ground Improvement Systems, LLC 114 South Collins Street Arlington, TX 76024	817-223-0969
MSE Plus	SSL Construction Products 4740 Scotts Valley Drive, Suite E Scotts Valley, CA 95066	831-430-9300

*Systems on restricted status have been reviewed and approved by TxDOT, but have not yet been approved for unrestricted status according to DMS-4800. These systems are expected to perform acceptably and should be considered for inclusionon projects.

Note: TxDOT policy does not allow the use of restricted systems on projects with the following:

- Over 50,000 square feet of MSE wall.
- Walls over 25 feet tall.
- Walls supporting or immediately adjacent to interstate highways.

Questions?Contact the Bridge Division.

oved-systems/concrete-block-retaining-wall.html

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Concrete block retaining wall systems

Approved systems

- Expansion joints
- Concrete block retaining wall systems
- Mechanically stabilized earth

Unrestricted status; phase two

The following concrete block retaining wall systems are approved for unrestricted use on TxDOT projects:

Name	Manufacturer	Phone
Allan Block Retaining Walls	Jewell Concrete 400 Jewell Drive Waco, TX 76712	254-772-3440
Anchor Wall System (Diamond Pro, Diamond Pro PS, Vertica)	Jewell Concrete Products, Inc 2561 Southwest Grapevine Parkway, #200 Grapevine, TX 75061	817-235-2914
Keystone Hardscapes (Compac III, Regal Stone Pro)	Pavestone Company	817-481-5802
Mesa Retaining Wall System		

Restricted status; phase one

The following concrete block retaining wall systems are on restricted status*:

Name	Manufacturer	Phone
ReCon Wall Systems	ReCon Wall Systems, Inc. 7600 W. 27th St., #229 St. Louis Park, MN 55426	952-922-0027

*Systems on restricted status have been reviewed and approved by TxDOT, but have not yet been for unrestricted status according to DMS-4800. These systems are expected to perform accept should be considered for use on projects.

Note: TxDOT policy does not allow the use of restricted systems on projects with:

- over 50,000 square feet of retaining wall

More Information about DMS and Approved Systems

Approved System Lists only for MSE/panel and CB

- Proprietary connections, reinforcement, and panel design
- Other RW types are also proprietary, and new lists can be created depending on volume of project demand
  - Soundwalls, Wire mesh facing, full height panel fascia, block or bin, gabion, etc.

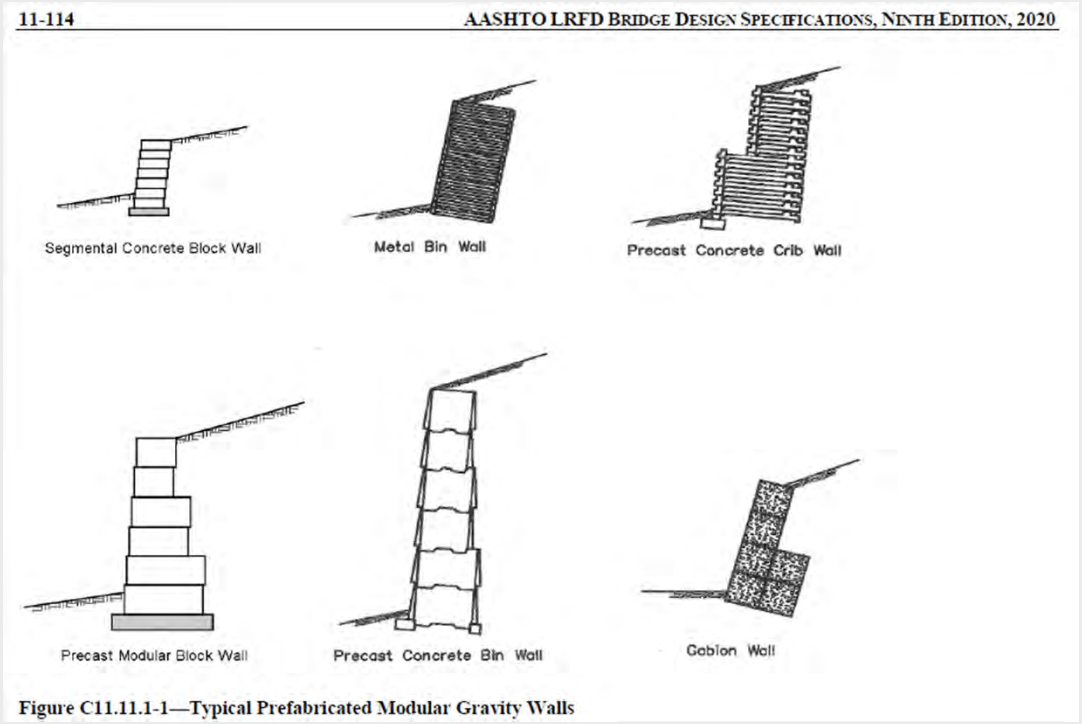


Figure C11.11.1-1—Typical Prefabricated Modular Gravity Walls

Restrictions on Phase One Systems

5.1.1. The system cannot be used on projects that:

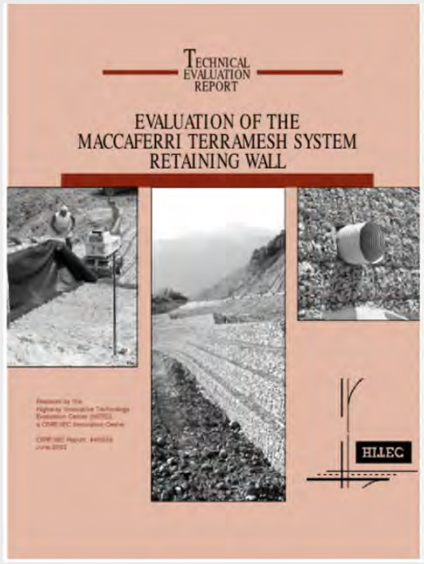
- contain over 50,000 sq. ft. of retaining wall,
- contain walls over 25 ft. tall,
- contain walls that support or are adjacent to interstate, or
- contain walls that support or are adjacent to US highways unless otherwise permitted on plans or general notes.

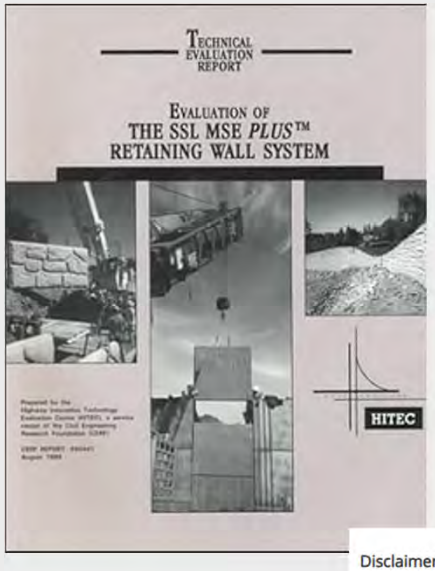
- Phase One to Phase Two Consideration

5.2. A retaining wall system will be reviewed for approval for phase two (unrestricted) use after satisfactory construction and monitoring of walls on three separate Department projects. At least two of the projects must have individual walls of height and square footage consistent with grade separation structures (height equal to or greater than 15 ft., wall square footage equal to or greater than 5,000 sq. ft.

HITEC and IDEA

- ASCE, 1994, Highway Innovative Technology Evaluation Center
- FHWA/ASCE Geo-Institute, starting 2018, IDEA Reports



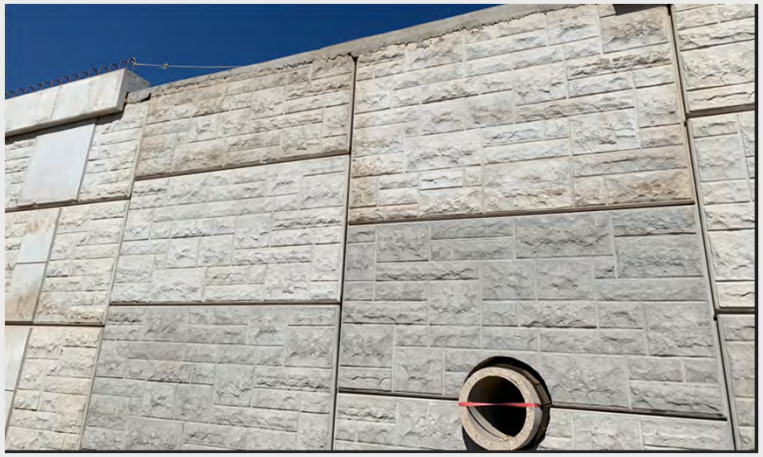


Title	Publication Date	
SSL MSEPlus Mechanically Stabilized Earth With Precast Concrete Facing Panels And Inextensible Soil Reinforcements	October 2023	Download
Greensteep Reinforced Soil Slope Facing System	August, 2023	Download
Reinforced Earth MSE with Precast Concrete Facing Panels and Inextensible Soil Reinforcements	October 2022	Download
Redi-Rock Precast Modular Retaining Wall System	August 2022	Download
MSE Plus Wall System	October 2021	Download
EarthTec Reinforced Soil Wall System	April 2021	Download
Stone Strong Precast Modular Retaining Wall System	January 2021	Download
LOCK+LOAD Retaining Wall System with Tencate Geosynthetic Geogrid Reinforcement	November 2020	Download
KeySystem Compac III Retaining Wall System, Keystone Retaining Wall Systems LLC	June 2020	Download
Anchor Diamond Pro PS Wall System, Anchor Wall Systems	August 2019	Download
Vistawall Stabilized Earth Wall	August 2018	Download

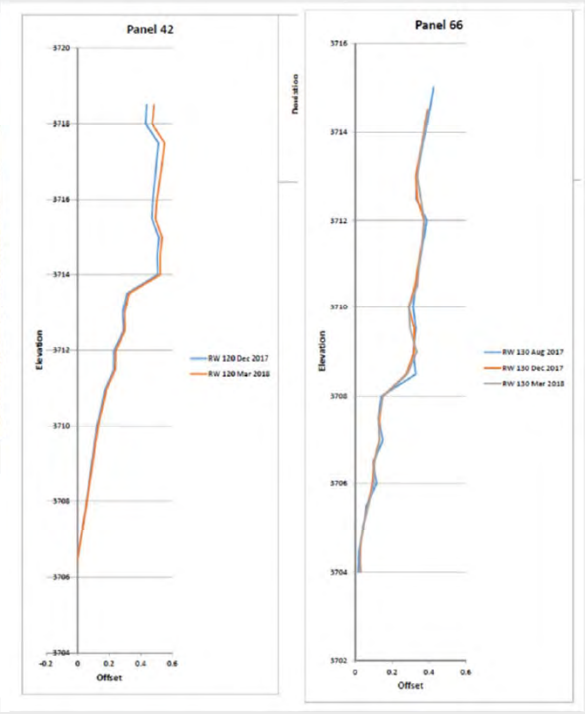
Disclaimer: The information found in these evaluation reports is neither an endorsement nor an approval of a technology. Instead, the information is intended to provide the reader with accurate information and/or credible analysis.

Approvals and Rejections based on research and performance

- State puts a lot of time and energy into balancing best feasible systems compliant with AASHTO and state guidance w/ promoting innovation and ‘new’ products
- Extensible Reinforcement within MSE Panel systems



Performance failures call for action and evaluation



Tolerance = +/- 1.5 inches per 10 ft of Wall

Distance from Bottom Face Block to Top Block
Wall 1-1 and Wall 1-2

Wall	Station	# of Blocks (Each)	Height of Wall (Feet)	Design Offset (Inches)	Actual Offset (Inches)	Tolerance Plus or Minus (Inches)	Design Minus the Tolerance (Inches)	Design Plus the Tolerance (Inches)	In Tolerance Yes or No
Wal 1-1	10+00	15	10.00	15	17.52	1.5	13.5	16.5	No
Wal 1-1	11+00	16	10.67	16	20.76	1.6	14.4	17.6	No
Wal 1-1	11+50	18	12.00	18	16.92	1.8	16.2	19.8	Yes
Wal 1-1	11+70	19	12.67	19	13.32	1.9	17.1	20.9	No
Wal 1-1	11+90	20	13.33	20	8.4	2	18.0	22.0	No
Wal 1-1	12+00	21	14.00	21	13.2	2.1	18.9	23.1	No
Wal 1-1	12+05	21	14.00	21	16.2	2.1	18.9	23.1	No
Wal 1-1	12+10	20	13.33	20	16.44	2	18.0	22.0	No
Wal 1-1	12+30	17	11.33	17	7.56	1.7	15.3	18.7	No
Wal 1-1	12+50	15	10.00	15	11.52	1.5	13.5	16.5	No
Wal 1-1	13+00	11	7.33	11	14.64	1.1	9.9	12.1	No
Wall 1-2	14+00	14	9.33	14	11.6	1.4	12.6	15.4	No

Problems in System, Construction and Inspection, and/or <u>wall designer design..</u>

2025 Buy America Certification

- 2025 changes to MPLs and potential 'systems' to be buy America compliant

For questions pertaining to Buy America, contact CST_Buy_America@txdot.gov.

Product Certifications					
Material Producer	Buy America Material Classification	Product/Model/Part/Material	Build America, Buy America Compliant Y/N	+	-
				+	-

Certification Statement

I certify:

- the above products meet the requirements for Build America Buy America as stated in 2 CFR 184 and 23 CFR 635.410 and as stated in this document.
- to inform the TxDOT contact listed in this document/respective material producers list as well contracted contractors of domestic Status changes at any point.
- the listed products are subject to random audits.
- to maintain documentation for 7 years.
- to only submit materials and products meeting BABA requirements as stated in the respective contract.
- to store and clearly label Buy America compliant materials separately from non-compliant materials.

I will comply with the above listed requirements, conformance with respective governing specification(s) and certification requirements found above. Failure to abide by the requirements of this form may result in action by the Department, which includes but is not limited to removal from TxDOT's material producers list, and sanctions under the Texas Administrative Code Chapter 10.
I understand and agree that this certification may be publicly available.

DEPARTMENT OF TRANSPORTATION

Federal Highway Administration

23 CFR Part 635

[Docket No. FHWA–2023–0037]

RIN 2125–AG13

Buy America Requirements for Manufactured Products

AGENCY: Federal Highway Administration (FHWA), U.S. Department of Transportation (DOT).

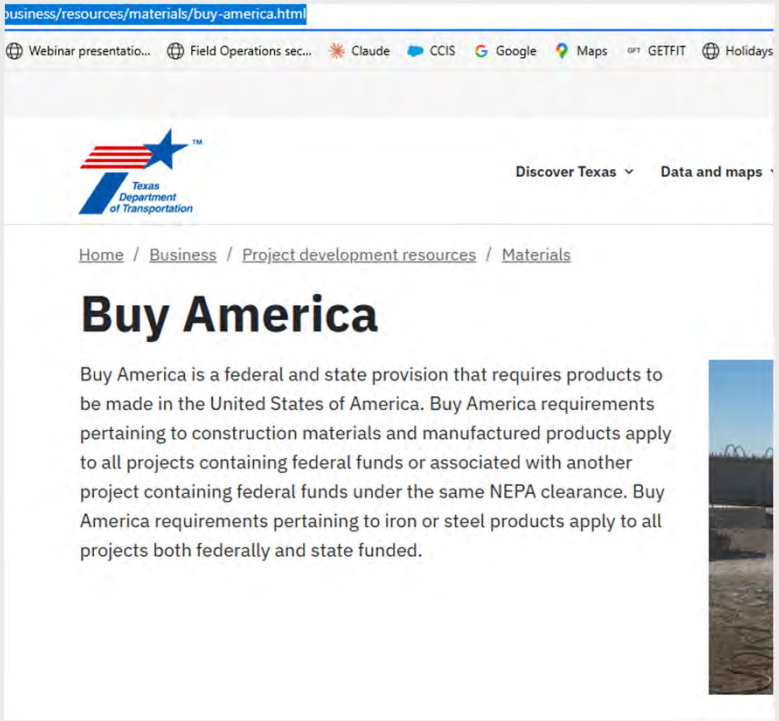
ACTION: Final rule.

SUMMARY: This final rule amends FHWA's Buy America regulation to terminate FHWA's general waiver for manufactured products and establish Buy America requirements for manufactured products with respect to Federal-aid highway projects. The standards for applying Buy America to manufactured products are generally consistent with the Office of Management and Budget's (OMB) guidance implementing the Build America, Buy America Act (BABA) provisions of the Infrastructure Investment and Jobs Act (also known as the Bipartisan Infrastructure Law (BIL)).

DATES: This final rule is effective March 17, 2025.

Buy America Certification – RW Systems

- https://www.txdot.gov/business/resources/materials/buy-america.html




occurred in the United States.
Glass (including optic glass): certification requires all manufacturing processes, from initi materials through annealing, cooling, and cutting, occurred in the United States.
Fiber optic cable (including drop cable): certification requires all manufacturing process applicable), through buffering, fiber stranding and jacking, occurred in the United states. All include the standards for glass and optical fiber, but not for non-ferrous metals, plastics and any others.
Optical fiber: certification requires all manufacturing processes, from the initial preform fab completion of the draw, occurred in the United States
Lumber: certification requires all manufacturing processes, from initial debarking through tr in the United States.
Drywall: certification requires all manufacturing processes, from initial blending of mined or additives through cutting and drying of sandwiched panels, occurred in the United States.
Manufactured products: certification requires the product was manufactured in the United
Precast Concrete products: classified as a manufactured product must comply with both t manufactured product certification requirements as stated above.
Intelligent Transportation Systems and other electronic hardware systems: classifie must comply with the iron and steel product certification requirements for their iron or steel manufacturing certification requirements as stated above.

For questions pertaining to Buy America, contact CST_Buy_America@txdot.gov.

Product Certifications		
Material Producer	Buy America Material Classification	Product/Model/Part/Materia
	Manufactured Product	

Buy America Certification – RW Systems Component Tracking

Date: 7/14/2025

Manufacturer or Proprietary System Owner: [redacted]

Retaining Wall System Name: [redacted]nt

Classification (Concrete Panel MSE, or Modular Concrete Block): Segemental Concrete Panel

	Primary Components: (use registered names, and include major items that would be delivered to project and used in the retaining wall, *fill excluded*)	Manufactured in-house: (Yes / No)	Precaster Fabricated: (Yes / No)	Manufactured or Purchased Elsewhere: (Yes / No)	List Precasters or other manufacturers of component: (As they would appear on TxDOT MPL lists)
1	[redacted]steel strip A1011 Grade-60			Yes	[redacted]
2	Bolt Set 1/2" Grade 325 ASTM F3125			Yes	
3	Bearing pad 3x6x3/4 80 Duro SRB			Yes	
4	Filter Fabric 12" N06 Terratex			Yes	
5	Panel Anchor A1011 Grade-50			Yes	
6	Panel Standard 5x10		Yes		TxDOT Approved Precaster Varies by location

- Supplies submitting lists of components and fabricators for TxDOT to track if all are Buy America compliant

LRFD and Transition And Geotechnical Manual

TxDOT Geotech Manual

- Investigation, Foundation and Retaining Wall Guidance

Texas Department of Transportation

Geotechnical Manual - LRFD

Bridge Division

April 2024

Chapter 6 — Retaining Walls and Reinforced Soil Slopes Section 1 — Retaining Wall Selection

Section 1

Retaining Wall Selection

Overview

The project engineer who seals the plans is responsible for ensuring that the retaining wall selected for a given location is appropriate. Use the following criteria to choose a retaining wall:

- Geometry. Determine applicability of wall type—cut, cut/fill, or fill—based on geometry, site

Section 2

Retaining Wall Layouts

Chapter 6 — Retaining Walls and Reinforced Soil Slopes Section 3 — Design Considerations

Section 3

Design Considerations

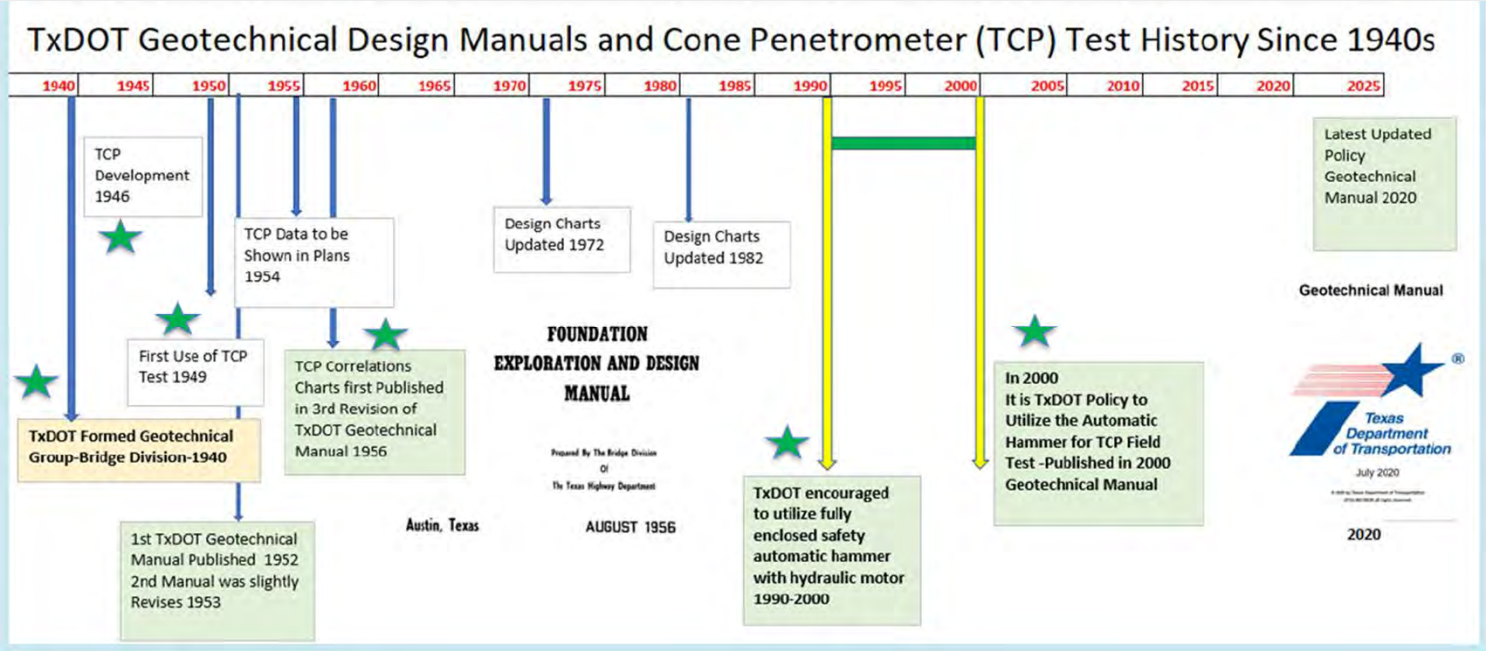
Chapter 6 — Retaining Walls and Reinforced Soil Slopes

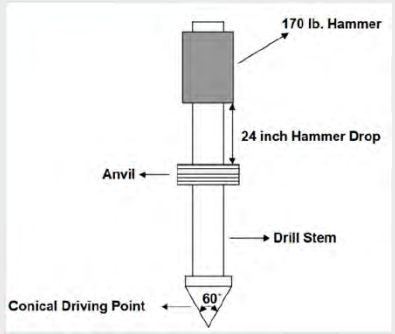
Section 4

Excavation Support

TxDOT Legacy Geotech Information

- Borings collected with TCP cone since 1949, AASHTO Transition needed transition to SPT borings

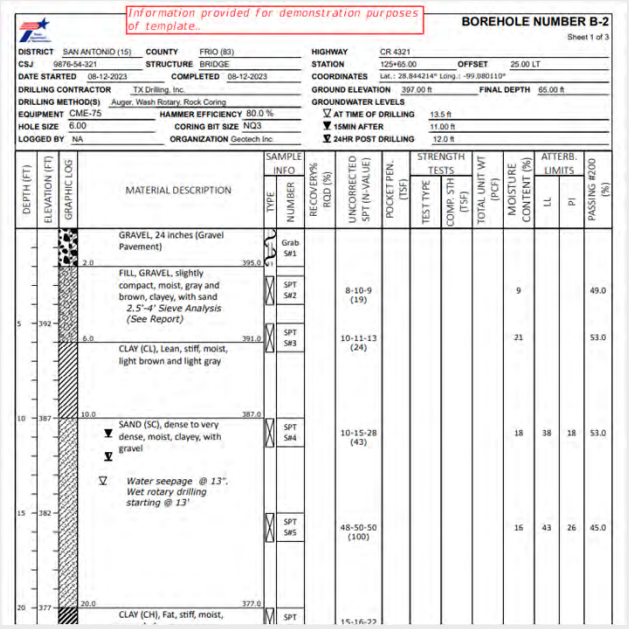




Salman, 2021

Geotechnical Data Collection (Logs and Labs)

- Data Report and Log/Lab requirements in Manual and/or (past data webinar)
- https://www.txdot.gov/business/resources/highway/bridge/webinar-presentations.html



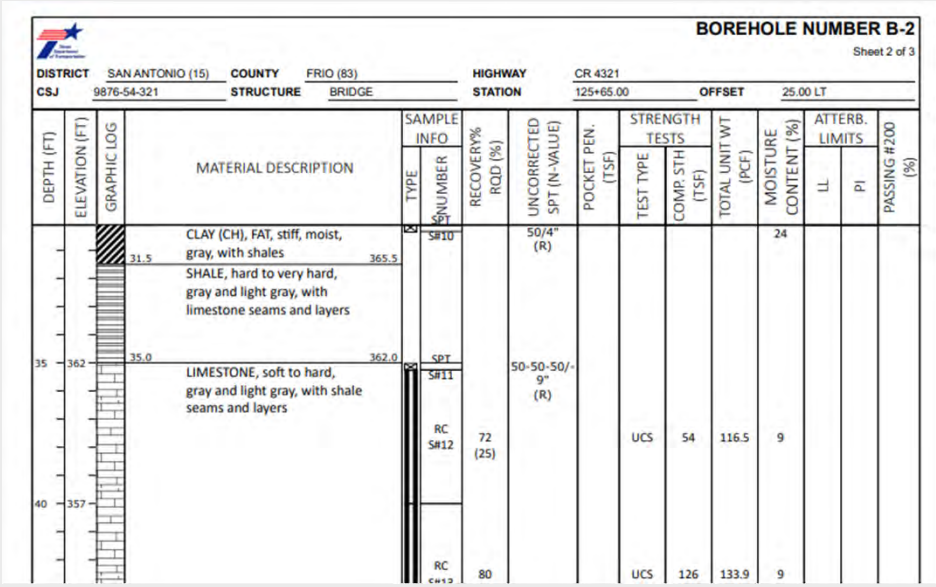
Information provided for demonstration purposes of template.

BOREHOLE NUMBER B-2

Sheet 1 of 3

DISTRICT SAN ANTONIO (15) COUNTY FRIO (83) HIGHWAY CR 4321
CSJ 9876-54-321 STRUCTURE BRIDGE STATION 125+65.00 OFFSET 25.00 LT
DATE STARTED 08-12-2023 COMPLETED 08-12-2023 COORDINATES Lat.: 28.844214° Long.: -99.880110°
DRILLING CONTRACTOR TX Drilling, Inc. GROUND ELEVATION 397.00 ft FINAL DEPTH 65.00 ft
DRILLING METHOD(S) Auger, Wash Rotary, Rock Coring GROUNDWATER LEVELS
EQUIPMENT CME-75 HAMMER EFFICIENCY 80.0 % ▽ AT TIME OF DRILLING 13.5 ft
HOLE SIZE 6.00 CORING BIT SIZE NQ3 ▼ 15MIN AFTER 11.00 ft
LOGGED BY NA ORGANIZATION Geotech Inc. ⧗ 24HR POST DRILLING 12.0 ft

DEPTH (FT)	ELEVATION (FT)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE INFO TYPE	SAMPLE INFO NUMBER	RECOVERY% ROD (%)	UNCORRECTED SPT (N-VALUE)	POCKET PEN. (TSF)	STRENGTH TESTS TEST TYPE	STRENGTH TESTS COMP. STH (TSF)	TOTAL UNIT WT (PCF)	MOISTURE CONTENT (%)	ATTERB. LIMITS LL	ATTERB. LIMITS PI	PASSING #200 (%)
			GRAVEL, 24 inches (Gravel Pavement)	Grab	S#1										
	395.0		2.0												
			FILL, GRAVEL, slightly compact, moist, gray and brown, clayey, with sand *2.5"-4" Sieve Analysis (See Report)*	SPT	S#2		8-10-9 (19)					9			49.0
5	392		6.0												
	391.0		CLAY (CL), Lean, stiff, moist, light brown and light gray	SPT	S#3		10-11-13 (24)					21			53.0
10	387		10.0												
	387.0		SAND (SC), dense to very dense, moist, clayey, with gravel	SPT	S#4		10-15-28 (43)					18	38	18	53.0
			▽ *Water seepage @ 13'. Wet rotary drilling starting @ 13'*												
15	382			SPT	S#5		48-50-50 (100)					16	43	26	45.0
	377.0		20.0												
20	377		CLAY (CH), Fat, stiff, moist,	SPT			15-16-22								



BOREHOLE NUMBER B-2

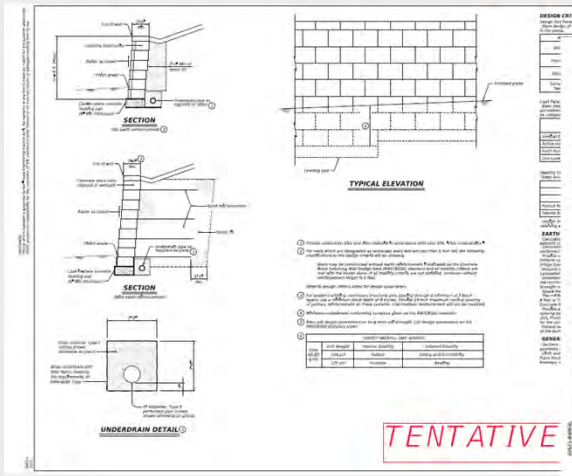
Sheet 2 of 3

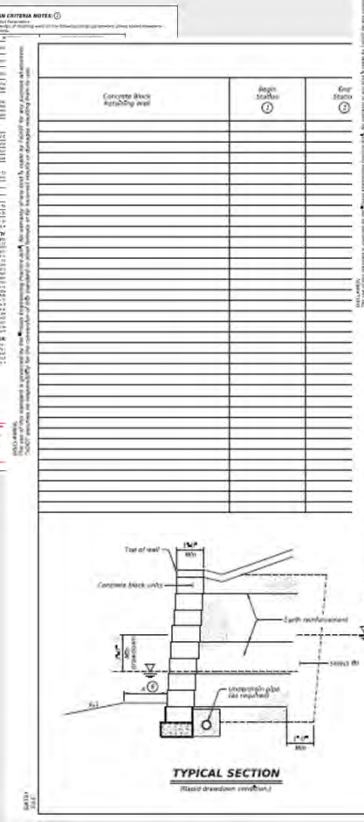
DISTRICT SAN ANTONIO (15) COUNTY FRIO (83) HIGHWAY CR 4321
CSJ 9876-54-321 STRUCTURE BRIDGE STATION 125+65.00 OFFSET 25.00 LT

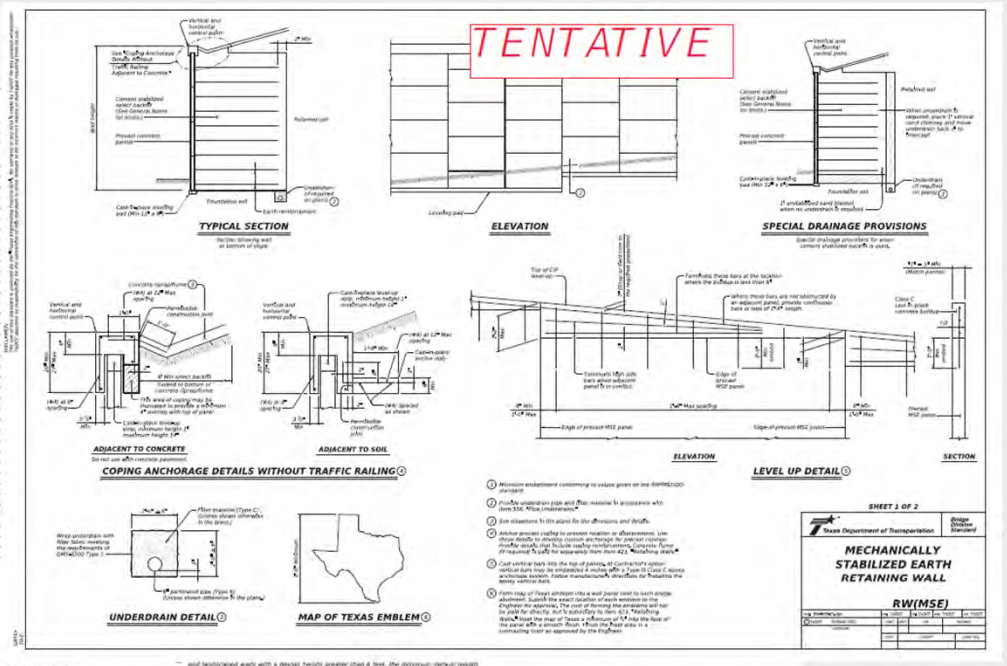
DEPTH (FT)	ELEVATION (FT)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE INFO TYPE	SAMPLE INFO NUMBER	RECOVERY% ROD (%)	UNCORRECTED SPT (N-VALUE)	POCKET PEN. (TSF)	STRENGTH TESTS TEST TYPE	STRENGTH TESTS COMP. STH (TSF)	TOTAL UNIT WT (PCF)	MOISTURE CONTENT (%)	ATTERB. LIMITS LL	ATTERB. LIMITS PI	PASSING #200 (%)
			CLAY (CH), FAT, stiff, moist, gray, with shales	SPT	S#10		50/4" (R)					24			
	31.5		365.5												
			SHALE, hard to very hard, gray and light gray, with limestone seams and layers												
35	362		35.0												
	362.0		LIMESTONE, soft to hard, gray and light gray, with shale seams and layers	SPT	S#11		50-50-50/-9" (R)								
				RC	S#12	72 (25)			UCS	54	116.5	9			
40	357														
				RC		80			UCS	126	133.9	9			

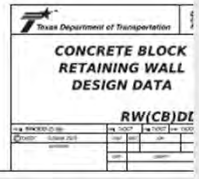
LRFD New Standard Sheets

New Standards (6)









- RW(MSE), RW (MSE)DD
- RW(CB), RW(CB)DD
- RW(TEW), RW(TEW)DD

DD Sheets as Standards for MSE and CB

WALL SUMMARY

MSE Retaining Wall	Begin Station ①	End Station ①	Retained Soil Friction Angle ②	Foundation Soil Friction Angle ②	Ground Improvement ③	Min Earth Reinforcement Length ④	Min Wall Embedment ⑦	Underdrain Required ⑤	Drawdown Analysis ⑥	Bench Width ⑧
RETAINING WALL 1	835+00.00	838+00.00	30 deg.	30 deg.	SEE NOTE	8' OR 70% OF H	2.0' to 1.0'	YES	N/A	3.0'
RETAINING WALL 1	838+00.00	843+00.00	30 deg.	30 deg.	SEE NOTE	8' OR 70% OF H	1.0'	YES	N/A	3.0'
RETAINING WALL 1	843+00.00	845+00.00	30 deg.	27 deg.	SEE NOTE	10' OR 80% OF H	1.0'	YES	N/A	3.0'
RETAINING WALL 1	845+00.00	847+32.20	30 deg.	27 deg.	SEE NOTE	10' OR 80% OF H	1.0' to 2.0'	YES	N/A	3.0'
RETAINING WALL 2	834+00.00	837+00.00	30 deg.	30 deg.	SEE NOTE	8' OR 70% OF H	2.0' to 1.0'	YES	N/A	3.0'
RETAINING WALL 2	837+00.00	846+50.00	30 deg.	30 deg.	SEE NOTE	8' OR 70% OF H	1.0'	YES	N/A	3.0'
RETAINING WALL 2	846+50.00	848+12.35	30 deg.	30 deg.	SEE NOTE	8' OR 70% OF H	1.0' to 2.0'	YES	N/A	3.0'
RETAINING WALL 3	849+25.38	854+00.00	30 deg.	27 deg.	SEE NOTE	10' OR 80% OF H	2.0+ to 1.0'	YES	N/A	3.0'
RETAINING WALL 3	854+00.00	858+00.00	30 deg.	30 deg.	SEE NOTE	8' OR 70% OF H	1.0'	YES	N/A	3.0'
RETAINING WALL 3	858+00.00	860+99.71	30 deg.	30 deg.	SEE NOTE	8' OR 70% OF H	1.0+ to 2.0'	YES	N/A	3.0'
RETAINING WALL 4	850+05.53	851+84.27	30 deg.	27 deg.	SEE NOTE	10' OR 80% OF H	2.0+ to 1.0'	YES	N/A	3.0'
RETAINING WALL 4	851+84.27	859+00.00	30 deg.	30 deg.	SEE NOTE	8' OR 70% OF H	1.0'	YES	N/A	3.0'
RETAINING WALL 4	859+00.00	861+07.21	30 deg.	30 deg.	SEE NOTE	8' OR 70% OF H	1.0+ to 2.0'	YES	N/A	3.0'

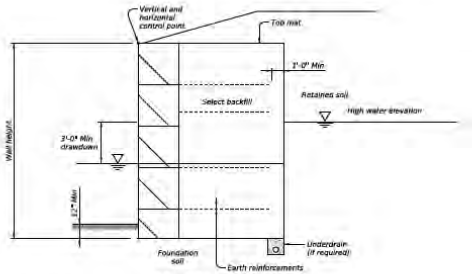
- Wall Designer responsible for global, external
- Indicate minimum parameters for wall supplier
- Shop Drawings eventually submitted during construction based on internal and external stability and final grade adjustments

NEW RW(TEW)DD

WALL SUMMARY

TEW Retaining Wall	Begin Station (1)	End Station (1)	Retained Soil Friction Angle (2)	Foundation Soil Friction Angle (2)	Select Backfill Friction Angle (3)	Min Earth Reinf. Length (4)	Min Wall Embedment (5)	Underdrain Required (6)	Drawdown Analysis (7)	TEW/MSE Fill Conflict (8)	Ground Improvement (9)	Face Basket Backfill (10)	Design Life (11)

TENTATIVE



TYPICAL SECTION

Section shows rapid drawdown condition.

(1) Indicate limits for which the stated soil design requirements and assumptions are applicable.

(2) Base the listed retained and foundation friction angle on local experience or measured/correlated long term strength values.

(3) Indicate design friction angle for select fill.

SELECT BACKFILL FRICTION ANGLES	
Backfill Type	Friction Angle
CS	30 deg.
A5, B5, D5	34 deg.

(4) Indicate on table both the minimum length and length ratio required. The minimum default length of earth reinforcements is either 8 feet or 70% of the wall height, whichever is greater. Wall height and design wall height may differ depending on project geometry and loading conditions. Note: Wall height at bridge abutments is equal to the distance between the top of leveling pad and finished grade at the bridge abutment backwall.

(5) Provide minimum wall embedment requirement. Typical design details show wall built on top of existing ground/pavement, however, walls on soft soil or stream channels may require additional embedment.

(6) Indicate if underdrain is required or not required. When crushed concrete, cement stabilized sand or fill with fines >15% is used as select fill underdrain is required.

(7) Indicate if rapid drawdown analysis is required.

(8) Indicate if portions of the proposed TEW reinforced volume conflict with proposed MSE reinforced volume. If yes provide geosynthetic or galvanized earth reinforcements for the TEW.

(9) Indicate if ground improvement is required or not required. If shown as required, refer to ground improvement detail(s) shown elsewhere in the plans for additional information.

(10) Indicate type of fill to be used for face basket (crushed gravel or cement stabilized).

(11) Indicate the design life of TEW, default value is 3 years.

SPECIAL NOTES:

This sheet is to be filled out by the wall designer of record at time of plan preparation to provide soil strength parameters for the design of the specified walls.

The completed sheet must be signed, sealed, and dated by a licensed Professional Engineer.

Texas Department of Transportation — Bridge Division Standard

TEMPORARY EARTH RETAINING WALL DESIGN DATA

RW(TEW)DD

FILE:	dn: TxDOT	ck: TxDOT	dw: TxDOT	ck: TxDOT
©TxDOT October 2025	CONT	SECT	JOB	HIGHWAY
REVISIONS				
DIST	COUNTY		SHEET NO.	

RW(MSE) & RW (CB)

RW (MSE)

DESIGN CRITERIA NOTES:

Design Soil Parameters:
Base design of retaining walls on the following design parameters unless stated elsewhere in the plans:

Retained Soil	Unit Weight = 125 pcf ϕ = (7) C = 0 psf
Foundation Soil	ϕ = (7) C = 0 psf
Select Backfill	Unit Weight = See Table (8) ϕ = 34° C = 0 psf
Cement Stabilized Select Backfill	Unit Weight = 125 pcf ϕ = 45° C = 0 psf

Limit stress in steel and concrete in accordance with with AASHTO LRFD Bridge Design Specifications.
The minimum length of earth reinforcement are as shown on the Mechanically Stabilized Earth Retaining Wall Design Data (RW[MSE]DD) standard.

Load Parameters:
Base design of retaining walls on the following load combinations and load factors in accordance with AASHTO LRFD Bridge Design Specifications. All required checks should be complete as per the Strength Limit State.

LOAD TYPE	SYMBOL	STRENGTH I	
		MAX	MIN
Vertical Earth Load (EV)	γ_{ev}	1.35	1.00
Active Horizontal Earth Pressure (EH)	γ_{eh}	1.50	0.90
Earth Surcharge (ES)	γ_{es}	1.50	0.75
Live Load Surcharge (LS)	γ_{ls}	1.75	

Stability Criteria:
Stability criteria applies to both dry and drawdown analysis. Investigate MSE wall stability in accordance with AASHTO LRFD Bridge Design Specifications and the TxDOT Geotechnical Manual - LRFD.
Perform external stability checks at the Strength Limit State.
Perform internal stability including soil reinforcement pullout resistance, soil reinforcement tensile resistance, and face elements structural resistance at Strength Limit States.
Base design on the following resistance factors.

STABILITY MODE	RESISTANCE FACTOR
Sliding	1.00
Bearing	0.65
Pullout Resistance (Steel reinforcement)	0.90
Tensile Resistance (Steel strips reinforcement)	0.75
Tensile Resistance (Steel grid reinforcement)	0.65

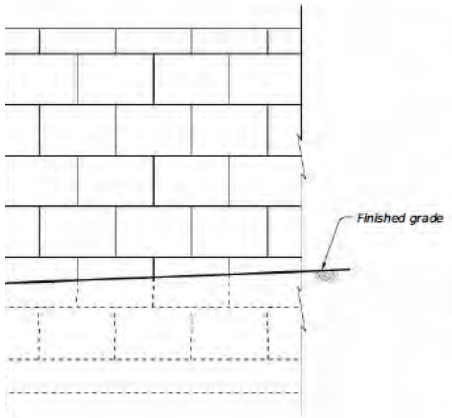
Check maximum, minimum, and total extremes for the walls to identify critical loading.
Neglect soil passive resistance from in front of the wall for sliding stability.
Determine Capacity / Demand (C/D) against sliding, limiting eccentricity, bearing, and internal stability. If C/D is not greater than 1, revise the reinforcement length or other design parameters and repeat the process.
Design the wall such that the base pressure resultant falls within the middle half of the retaining wall where emax = L/4.
Determine pullout resistance from test data evaluated as per AASHTO LRFD Bridge Design Specifications.

Corrosion Criteria:
Design the earth reinforcement elements to have a minimum design life of 75 years, using current AASHTO corrosion rates.
Perform stress calculations (rupture) on the calculated earth reinforcement section remaining after 75 years. Pullout calculations may be based on non-corroded section.

(7) Soil design parameters must be based on long term soil strength. Design parameters must be listed on the RW(MSE)DD standard.

(8)

SELECT BACKFILL UNIT WEIGHT			
Type AS, BS & DS	Unit Weight	Internal Stability	External Stability
	105 PCF	Pullout	Sliding and Eccentricity
	125 PCF	Rupture	Bearing



ELEVATION

RW (CB)

DESIGN CRITERIA NOTES: (2)

Design Soil Parameters:
Base design of retaining walls on the following design parameters unless stated elsewhere in the plans:

MATERIAL	DESIGN PARAMETERS
Retained Soil	Unit Weight = 125 pcf ϕ = (5) C = 0 psf
Foundation Soil	ϕ = (5) C = 0 psf
Select Backfill	Unit Weight = See Table (6) ϕ = 34° C = 0 psf
Cement Stabilized Select Backfill	Unit Weight = 125 pcf ϕ = 45° C = 0 psf

Load Parameters:
Base design of retaining walls on the following load combinations and load factors in accordance with AASHTO LRFD Bridge Design Specifications. All required checks should be complete as per the Strength Limit State.

LOAD TYPE	SYMBOL	STRENGTH I	
		MAX	MIN
Vertical Earth Load (EV)	γ_{ev}	1.35	1.00
Active Horizontal Earth Pressure (EH)	γ_{eh}	1.50	0.90
Earth Surcharge (ES)	γ_{es}	1.50	0.75
Live Load Surcharge (LS)	γ_{ls}	1.75	

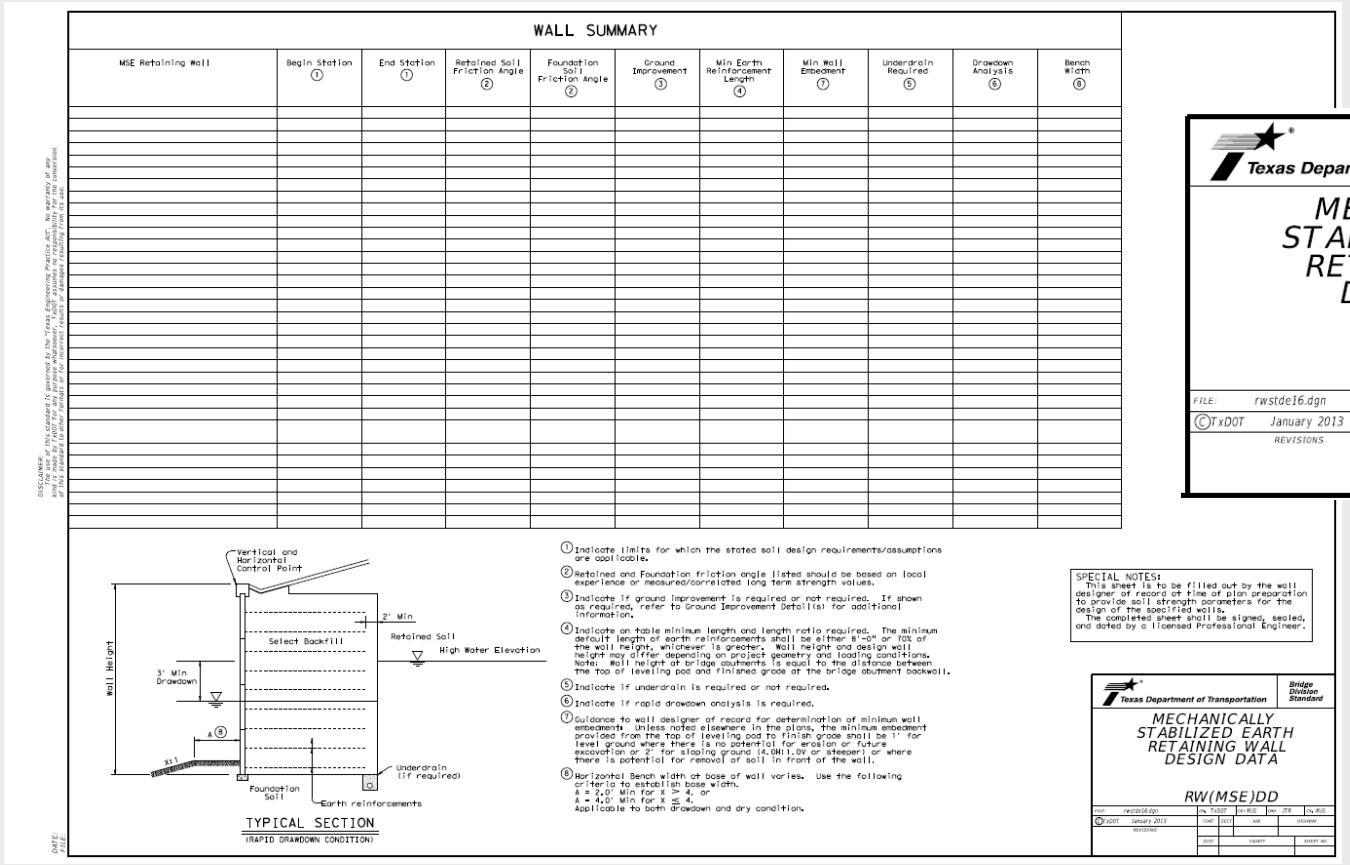
Stability Criteria:
Base design on the following resistance factors:

STABILITY MODE	RESISTANCE FACTOR
Sliding	1.00
Bearing	0.65
Pullout Resistance (Geosynthetic reinforcement)	0.70
Tensile Resistance (Geosynthetic reinforcement)	0.80

Design the wall such that the base pressure resultant falls within the middle half of the retaining wall

Expected Standards, and comparison to the old

DD Sheets as Standards for MSE and CB (no change)



WALL SUMMARY

MSE Retaining Wall	Begin Station (1)	End Station (1)	Retained Soil Friction Angle (2)	Foundation Soil Friction Angle (2)	Ground Improvement (3)	Min Earth Reinforcement Length (4)	Min Wall Embedment (7)	Underdrain Required (5)	Drawdown Analysis (6)	Bench Width (8)

DISCLAIMER:
The use of this standard is governed by the Texas Engineering Practice Act. No warranty of any kind is made by the Texas Department of Transportation for any purpose whatsoever. The Texas Department of Transportation shall not be responsible for the conversion of this standard to other formats or for incorrect results of damages resulting from its use.

DATE:
FILE:

TYPICAL SECTION
(RAPID DRAWDOWN CONDITION)

(1) Indicate limits for which the stated soil design requirements/assumptions are applicable.

(2) Retained and Foundation friction angle listed should be based on local experience or measured/correlated long term strength values.

(3) Indicate if ground improvement is required or not required. If shown as required, refer to Ground Improvement Detail(s) for additional information.

(4) Indicate on table minimum length and length ratio required. The minimum default length of earth reinforcements shall be either 8'-0" or 70% of the wall height, whichever is greater. Wall height and design wall height may differ depending on project geometry and loading conditions. Note: Wall height at bridge abutments is equal to the distance between the top of leveling pad and finished grade at the bridge abutment backwall.

(5) Indicate if underdrain is required or not required.

(6) Indicate if rapid drawdown analysis is required.

(7) Guidance to wall designer of record for determination of minimum wall embedment. Unless noted elsewhere in the plans, the minimum embedment provided from the top of leveling pad to finish grade shall be 1' for level ground where there is no potential for erosion or future excavation or 2' for sloping ground (4.0H:1.0V or steeper) or where there is potential for removal of soil in front of the wall.

(8) Horizontal Bench width at base of wall varies. Use the following criteria to establish base width.
A = 2.0' Min for X > 4, or
A = 4.0' Min for X ≤ 4.
Applicable to both drawdown and dry condition.

SPECIAL NOTES:
This sheet is to be filled out by the wall designer of record at time of plan preparation to provide soil strength parameters for the design of the specified walls.
The completed sheet shall be signed, sealed, and dated by a licensed Professional Engineer.

Texas Department of Transportation
Bridge Division Standard

MECHANICALLY STABILIZED EARTH RETAINING WALL DESIGN DATA

RW(MSE)DD

FILE: rwstde16.dgn	DN: TxDOT	CK: MJG	DW: JTR	CK: MJG
©TxDOT January 2013	CONT	SECT	JOB	HIGHWAY
REVISIONS	DIST	COUNTY		SHEET NO.

Texas Department of Transportation
Bridge Division Standard
MECHANICALLY STABILIZED EARTH RETAINING WALL DESIGN DATA
RW(MSE)DD

RW(MSE)

DESIGN CRITERIA NOTES:

Design Parameters:

Base design of retaining walls on the following design parameters unless stated elsewhere in the plans:

Retained Soil	Unit Weight = 125 pcf ϕ = (6) C = 0 psf
Foundation Soil	ϕ = (6) C = 0 psf
Select Backfill	Unit Weight = See Table (7) ϕ = 34° C = 0 psf
Cement Stabilized Select Backfill	Unit Weight = 125 pcf ϕ = 45° C = 0 psf

Limit stress in steel and concrete in accordance with current AASHTO Standard Specifications for Highway Bridges and Interim Specifications.

The minimum length of earth reinforcement are as shown on the Mechanically Stabilized Earth Retaining Wall Design Data (RW[MSE]DD) standard.

Stability Criteria:

Stability criteria applies to both dry and drawdown analysis. Base design on the following factors of safety.

Sliding along the base of the structure	Factor of Safety ≥ 1.5
Overturning	Factor of Safety ≥ 2.0
Pullout of Earth Reinforcement at each level	Factor of Safety ≥ 1.5

Design the wall such that the base pressure resultant falls within the middle third of the retaining wall.

Determine pullout resistance from test data evaluated at ¾ inch strain.

Corrosion Criteria:

Design the earth reinforcement elements to have a minimum design life of 75 years, using current AASHTO corrosion rates.

Perform stress calculations (rupture) on the calculated earth reinforcement section remaining after 75 years. Pullout calculations may be based on non-corroded section.

ASD

(7)

SELECT BACKFILL UNIT WEIGHT			
Type AS, BS & DS	Unit Weight	Internal Stability	External Stability
	105 PCF	Pullout	Sliding, Overturning, Eccentricity
	125 PCF	Rupture	Bearing

Load Parameters:

Base design of retaining walls on the following load combinations and load factors in accordance with AASHTO LRFD Bridge Design Specifications. All required checks should be complete as per the Strength Limit State.

LOAD TYPE	SYMBOL	STRENGTH I	
		MAX	MIN
Vertical Earth Load (EV)	γ_{EV}	1.35	1.00
Active Horizontal Earth Pressure (EH)	γ_{EH}	1.50	0.90
Earth Surcharge (ES)	γ_{ES}	1.50	0.75
Live Load Surcharge (LS)	γ_{LS}	1.75	

Stability Criteria:

Stability criteria applies to both dry and drawdown analysis. Investigate MSE wall stability in accordance with AASHTO LRFD Bridge Design Specifications and the TxDOT Geotechnical Manual - LRFD.

Perform external stability checks at the Strength Limit State.

Perform internal stability including soil reinforcement pullout resistance, soil reinforcement tensile resistance, and face elements structural resistance at Strength Limit States.

Base design on the following resistance factors.

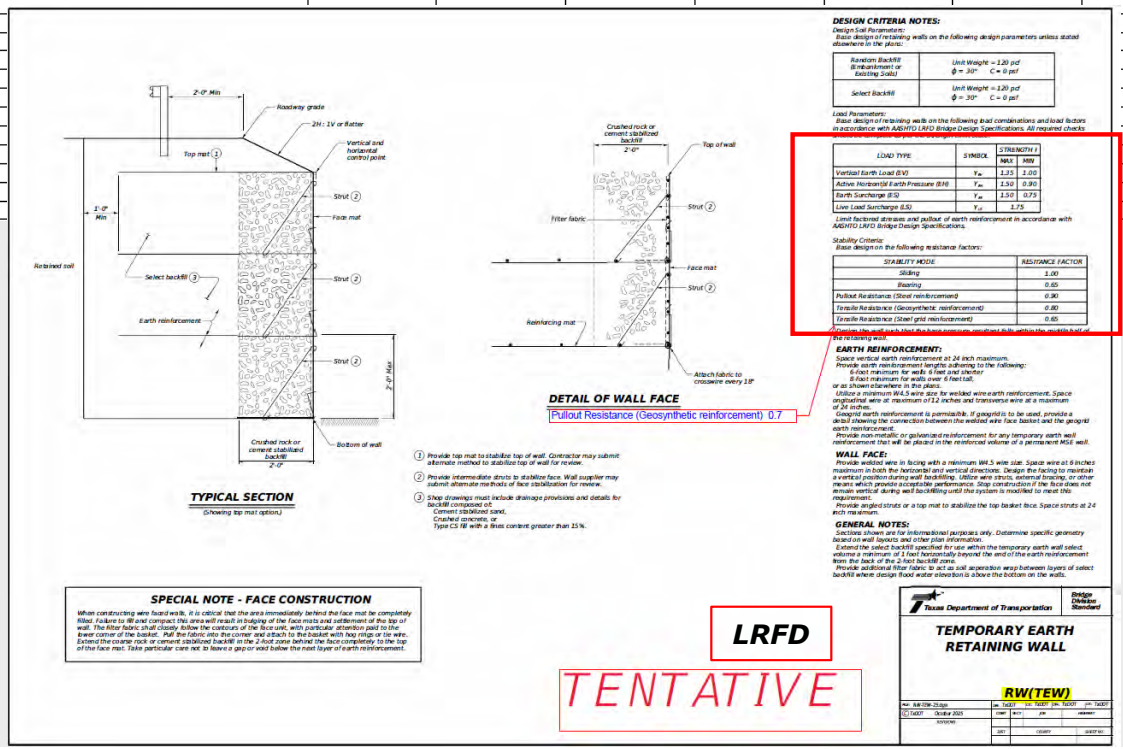
STABILITY MODE	RESISTANCE FACTOR
Sliding	1.00
Bearing	0.65
Pullout Resistance (Steel reinforcement)	0.90
Tensile Resistance (Steel strips reinforcement)	0.75
Tensile Resistance (Steel grid reinforcement)	0.65

LRFD

NEW RW(TEW)

WALL SUMMARY

TEW Retaining Wall	Begin Station (1)	End Station (1)	Retained Soil Friction Angle (2)	Foundation Soil Friction Angle (2)	Select Backfill Friction Angle (3)	Min Earth Reinf. Length (4)	Min Wall Embedment (5)	Underdrain Required (6)	Drawdown Analysis (7)	TEW/MSE Fill Conflict (8)	Ground Improvement (9)	Face Basket Backfill (10)	Design Life (11)



DESIGN CRITERIA NOTES:

Design Parameters:

Base design of retaining walls on the following design parameters unless stated elsewhere in the plans:

Random Backfill (Embankment or Existing Soils)	Unit Weight = 120 pcf, ϕ = 30° C = 0 psf
Select Backfill	Unit Weight = 120 pcf, ϕ = 30° C = 0 psf

Limit allowable stresses and pullout of earth reinforcement in accordance with current AASHTO Standard Specifications for Highway Bridges and Interim Specifications.

Stability Criteria:

Base design on the following factors of safety:

Sliding along the base of the structure	Factor of Safety ≥ 1.5
Overturning	Factor of Safety ≥ 2.0
Pullout of Earth Reinforcement	Factor of Safety ≥ 1.5

Design the wall such that the base pressure resultant falls within the middle third of the retaining wall.

EARTH REINFORCEMENT:

Space vertical earth reinforcement at 24 inch maximum.
Provide earth reinforcement lengths adhering to the following:
6-foot minimum for walls 6 feet and shorter
8-foot minimum for walls over 6 feet tall,
or as shown elsewhere in the plans.
Utilize a minimum W4.5 wire size for welded wire earth reinforcement. Space longitudinal wire at maximum of 12 inches and transverse wire at a maximum of 24 inches.
Geogrid earth reinforcement is permissible. If geogrid is to be used, provide a detail showing the connection between the welded wire face basket and the geogrid earth reinforcement.
Provide non-metallic or galvanized reinforcement for any temporary earth wall reinforcement that will be placed in the reinforced volume of a permanent MSE wall.

Older - ASD

NEW RW(TEW) (now falling under) SPEC ITEM 423

2014

Item 403
Temporary Special Shoring

1. DESCRIPTION

Furnish and install temporary shoring to hold the surrounding earth, water, or both out of the work area.

2. MATERIALS

Furnish new or used materials. Furnish materials that meet the requirements of Item 423, "Retaining Walls," when using temporary Mechanically Stabilized Earth (MSE) walls. Furnish materials that meet the requirements of Item 410, "Soil Nail Anchors," or Item 411, "Rock Nail Anchors," when using temporary nailed walls (rock or soil).

2024

Item 403
Temporary Special Shoring

1. DESCRIPTION

Furnish and install temporary shoring to hold the surrounding earth, water, or both out of the work area.

2. MATERIALS

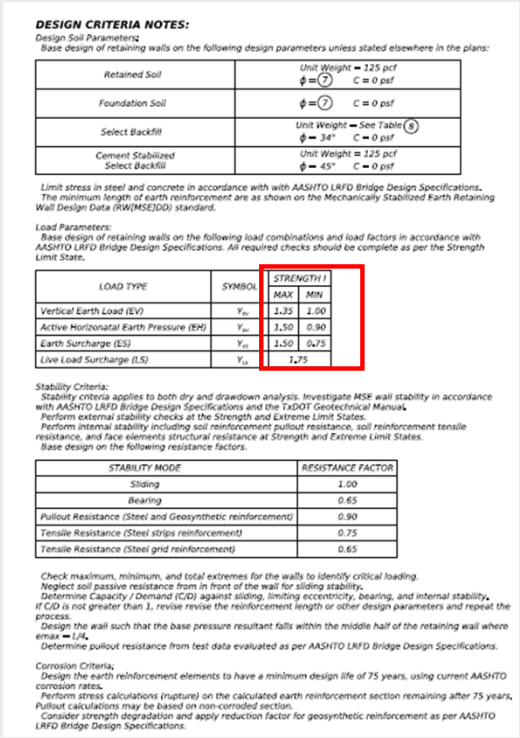
Furnish new or used materials. Furnish materials that meet the requirements of Item 410, "Soil Nail Anchors," or Item 411, "Rock Nail Anchors," when using temporary nailed walls (rock or soil).

2024 Specifications

Item 423
Retaining Walls

(Almost Complete) Retaining Wall Standard Revisions for LRFD Methods

- Approved system vendors to submit new calculations to show compliance
- Few common issue we had seen in calc
- 1) Missing critical combination
- 2) Unit weight (105/125 pcf)
- 3) LL in internal calculation



DESIGN CRITERIA NOTES:

Design Soil Parameters:
Base design of retaining walls on the following design parameters unless stated elsewhere in the plans:

Retained Soil	Unit Weight = 125 pcf ϕ = (7) C = 0 psf
Foundation Soil	ϕ = (7) C = 0 psf
Select Backfill	Unit Weight = See Table (8) ϕ = 34° C = 0 psf
Cement Stabilized Select Backfill	Unit Weight = 125 pcf ϕ = 45° C = 0 psf

Limit stress in steel and concrete in accordance with with AASHTO LRFD Bridge Design Specifications.
The minimum length of earth reinforcement are as shown on the Mechanically Stabilized Earth Retaining Wall Design Data (RW[MSE]DD) standard.

Load Parameters:
Base design of retaining walls on the following load combinations and load factors in accordance with AASHTO LRFD Bridge Design Specifications. All required checks should be complete as per the Strength Limit State.

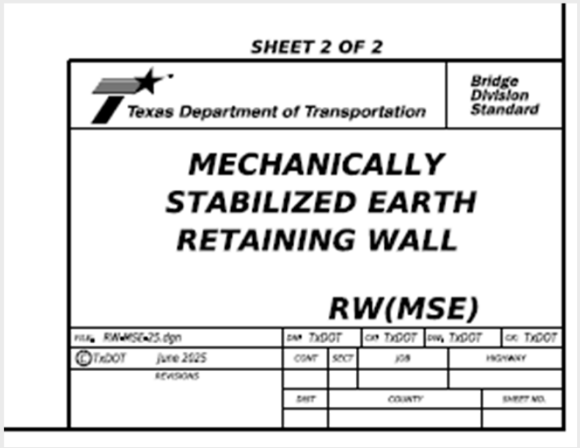
LOAD TYPE	SYMBOL	STRENGTH I MAX	STRENGTH I MIN
Vertical Earth Load (EV)	γ_{EV}	1.35	1.00
Active Horizonatal Earth Pressure (EH)	γ_{EH}	1.50	0.90
Earth Surcharge (ES)	γ_{ES}	1.50	0.75
Live Load Surcharge (LS)	γ_{LS}	1.75	

Stability Criteria:
Stability criteria applies to both dry and drawdown analysis. Investigate MSE wall stability in accordance with AASHTO LRFD Bridge Design Specifications and the TxDOT Geotechnical Manual.
Perform external stability checks at the Strength and Extreme Limit States.
Perform internal stability including soil reinforcement pullout resistance, soil reinforcement tensile resistance, and face elements structural resistance at Strength and Extreme Limit States.
Base design on the following resistance factors:

STABILITY MODE	RESISTANCE FACTOR
Sliding	1.00
Bearing	0.65
Pullout Resistance (Steel and Geosynthetic reinforcement)	0.90
Tensile Resistance (Steel strips reinforcement)	0.75
Tensile Resistance (Steel grid reinforcement)	0.65

Check maximum, minimum, and total extremes for the walls to identify critical loading.
Neglect soil passive resistance from in front of the wall for sliding stability.
Determine Capacity / Demand (C/D) against sliding, limiting eccentricity, bearing, and internal stability. If C/D is not greater than 1, revise revise the reinforcement length or other design parameters and repeat the process.
Design the wall such that the base pressure resultant falls within the middle half of the retaining wall where emax = L/4.
Determine pullout resistance from test data evaluated as per AASHTO LRFD Bridge Design Specifications.

Corrosion Criteria:
Design the earth reinforcement elements to have a minimum design life of 75 years, using current AASHTO corrosion rates.
Perform stress calculations (rupture) on the calculated earth reinforcement section remaining after 75 years. Pullout calculations may be based on non-corroded section.
Consider strength degradation and apply reduction factor for geosynthetic reinforcement as per AASHTO LRFD Bridge Design Specifications.



SHEET 2 OF 2

Texas Department of Transportation

Bridge Division Standard

MECHANICALLY STABILIZED EARTH RETAINING WALL

RW(MSE)

FILE: RWMSE-25.dgn | DW: TxDOT | CK: TxDOT | DW: TxDOT | CK: TxDOT
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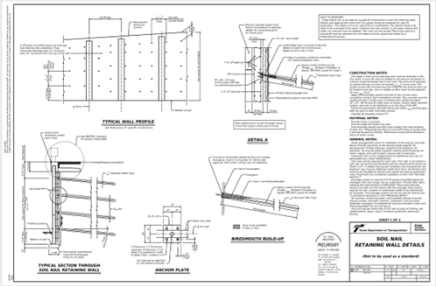
REVISIONS | DIST | COUNTY | SHEET NO.

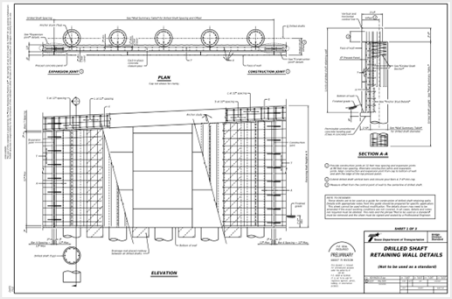
Publication Timeline

- Publication on Standards Website: Expected First Week Oct. 2025
- Older / Legacy ASD RW Standards to remain on website for limited time..

Summary

- Specifications, Lists, Manual, and Standards ensure great RW
- RW New Standards Mandated at Future Date
- RW New Standards in compliance with AASHTO LRFD BDM
- Future shop drawings to be in compliance with new standard/plan, check for external and internal stability





Websites

- (Bridge and RW Standards)
  - https://www.dot.state.tx.us/insdtdot/orgchart/cmd/cserve/standard/bridge-e.htm
- (TxDOT RW Info, **Lists** and DMS-4800)
  - https://www.txdot.gov/business/resources/highway/bridge/geotechnical/retaining-walls.html
- (2024 Geotechnical Manual – LRFD)
  - https://onlinemanuals.txdot.gov/txdotonlinemanuals/txdotmanuals/geo/geo_lrfd.pdf