Geotechnical Report - MARBLE FALLS FIRE STATION NO. 2

1 message

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GEOTECHNICAL ANALYSIS & REMEDIATION PROPOSAL

MARBLE FALLS FIRE STATION NO. 2

Project: MARBLE FALLS FIRE STATION NO. 2

Location: FLAT ROCK BOULEVARD, MARBLE FALLS, TEXAS

Client: CITY OF MARBLE FALLS, TEXAS

Report No.: 06-15325

Prepared By: Scott Gheen | (512) 430-0973 | scott@vendittillc.com

Date: 2025-06-25

Executive Summary

Site Overview: The property located at FLAT ROCK BOULEVARD, MARBLE FALLS, TEXAS is proposed for development. Our geotechnical investigation identified subsurface conditions that require remediation to support the planned construction.

Key Findings: Soil testing revealed conditions requiring immediate attention. Expansive clay soils with elevated PVR values were identified across multiple test locations, requiring a structured soil modification program prior to construction.

Recommendation: A lime stabilization and moisture conditioning program is recommended. All work should be performed per TxDOT specifications before foundation placement.

Site Investigation Summary

Subsurface Conditions

Boring ID	Depth (ft)	Soil Classification	PVR	LL / PI	Status

FAT CLAY (CH), dark brown, w/ small to medium limestone rocks & outcrops, firm — Depth: 0–3.5 ft | Treatment: Remove clay to 30 in. depth or to limestone; replace with 24 in. minimum of low P.I. Select Fill. | Priority: 1

Boring ID	Depth (ft)	Soil Classification	PVR	LL / PI	Status

LIMESTONE, tan, very hard, w/ thin fractured layers — Depth: 3.5–3.5 ft | Treatment: Seat piers 18 inches into this stratum for heavy loads. | Priority: 2

FAT CLAY (CH), dark brown, w/ small to medium sized limestone rocks, firm — Depth: 0–6 ft | Treatment: Remove clay to 30 in. depth or to limestone; replace with 24 in. minimum of low P.I. Select Fill. | Priority: 1

LIMESTONE, tan, very hard w/ thin fractured layers — Depth: 6–6 ft | Treatment: Bearing stratum for piers. | Priority: 2

FAT CLAY (CH), dark brown, w/ small to large sized limestone rocks & outcrops, firm — Depth: 0–2 ft | Treatment: Remove clay to 30 in. depth or to limestone; replace with 24 in. minimum of low P.I. Select Fill. | Priority: 1

becoming lighter with depth, w/ thin calcarous layers — Depth: 2–4 ft | Treatment: Remove clay to 30 in. depth or to limestone; replace with 24 in. minimum of low P.I. Select Fill. | Priority: 1

LIMESTONE, tan, very hard, w/ thin fractured layers — Depth: 5–5 ft | Treatment: Bearing stratum for piers. | Priority: 2

FAT CLAY (CH), dark brown, w/ small to medium sized limestone rocks & scattered outcrops, firm — Depth: 0–2.5 ft | Treatment: Remove top 8 inches of fat clay; replace with crushed limestone base. | Priority: 2

FAT CLAY (CH), dark brown, w/ small to medium sized limestone rocks, firm — Depth: 0–1.5 ft | Treatment: Remove top 8 inches of fat clay; replace with crushed limestone base. | Priority: 2

FAT CLAY (CH), dark brown, becoming lighter with depth, w/ small to large sized limestone rocks & scattered outcrops, firm — Depth: 0–6 ft | Treatment: Remove an additional 8 inches of fat clay (16 in. total) and replace with low P.I. Select Fill or crushed limestone base. | Priority: 1

LIMESTONE, tan, very hard, w/ few thin fractured layers — Depth: 0–1 ft | Treatment: None required; limestone at surface. | Priority: 4

Identified Problems & Solutions

#	Identified Problem	Location	Severity	Recommended Solution
	Site-wide	High	N/A	
	P-03 area	Medium	N/A	
	Site-wide	High	N/A	
	Foundation Perimeter	High	N/A	
	Building Footprint	Medium	N/A	
	Dumpster Area	Medium	N/A	

PVR Analysis & Soil Modification Program

Critical Zone Identification

Multiple test locations exceeded the maximum acceptable PVR threshold of 1.0. These zones require immediate remediation prior to construction activity.

Soil Modification Phases

FAT CLAY (CH), dark brown, w/ small to medium limestone rocks & outcrops, firm — Depth: 0–3.5 ft | Treatment: Remove clay to 30 in. depth or to limestone; replace with 24 in. minimum of low P.I. Select Fill. | Priority: 1

LIMESTONE, tan, very hard, w/ thin fractured layers — Depth: 3.5–3.5 ft | Treatment: Seat piers 18 inches into this stratum for heavy loads. | Priority: 2

FAT CLAY (CH), dark brown, w/ small to medium sized limestone rocks, firm — Depth: 0–6 ft | Treatment: Remove clay to 30 in. depth or to limestone; replace with 24 in. minimum of low P.I. Select Fill. | Priority: 1

LIMESTONE, tan, very hard w/ thin fractured layers — Depth: 6–6 ft | Treatment: Bearing stratum for piers. | Priority: 2

FAT CLAY (CH), dark brown, w/ small to large sized limestone rocks & outcrops, firm — Depth: 0–2 ft | Treatment: Remove clay to 30 in. depth or to limestone; replace with 24 in. minimum of low P.I. Select Fill. | Priority: 1

becoming lighter with depth, w/ thin calcarous layers — Depth: 2–4 ft | Treatment: Remove clay to 30 in. depth or to limestone; replace with 24 in. minimum of low P.I. Select Fill. | Priority: 1

LIMESTONE, tan, very hard, w/ thin fractured layers — Depth: 5–5 ft | Treatment: Bearing stratum for piers. | Priority: 2

FAT CLAY (CH), dark brown, w/ small to medium sized limestone rocks & scattered outcrops, firm — Depth: 0–2.5 ft | Treatment: Remove top 8 inches of fat clay; replace with crushed limestone base. | Priority: 2

FAT CLAY (CH), dark brown, w/ small to medium sized limestone rocks, firm — Depth: 0–1.5 ft | Treatment: Remove top 8 inches of fat clay; replace with crushed limestone base. | Priority: 2

FAT CLAY (CH), dark brown, becoming lighter with depth, w/ small to large sized limestone rocks & scattered outcrops, firm — Depth: 0–6 ft | Treatment: Remove an additional 8 inches of fat clay (16 in. total) and replace with low P.I. Select Fill or crushed limestone base. | Priority: 1

LIMESTONE, tan, very hard, w/ few thin fractured layers — Depth: 0–1 ft | Treatment: None required; limestone at surface. | Priority: 4

Material Specifications

Material	Specification	Application	Quantity	
Select Fill	Not Specified	95%	pcf	2.5"
Crushed Limestone Base	TxDOT Item 247; Type A; Grade 1-2 or 5	100%	pcf	"

Project Cost Estimate & Timeline

Cost Breakdown

Item	Description	Qty	Unit	Unit Price	Total
Site Preparation	Mobilization, demobilization, and site clearing for undeveloped acreage	1	LS	$15000	**$15000**
Soil Excavation	Excavation and off-site disposal of 30 inches of existing high-plasticity fat clay from building pad area (approx. 6,500 SF)	600	CY	$45	**$27000**
Structural Fill	Furnish, place, and compact 24 inches of low P.I. Select Fill for building pad	500	CY	$55	**$27500**
Pavement Preparation	Excavation and disposal of 8 to 16 inches of fat clay from pavement areas (approx. 20,000 SF)	750	CY	$40	**$30000**
Pavement Materials	Furnish, place, and compact 6 inches of crushed limestone base for all pavement areas	375	CY	$60	**$22500**
Foundation Work	Drilled straight shaft piers (24-in. diameter) seated 18 inches into very hard limestone	120	LF	$250	**$30000**
Compaction and Testing	Quality Control Program including subgrade/fill density testing, concrete testing, and pier inspection	1	LS	$25000	**$25000**
Contingency	Contingency for unforeseen conditions, such as deeper pockets of fat clay or harder than expected rock excavation	1	LS	$17700	**$17700**
				TOTAL PROJECT INVESTMENT	$

Total Project Investment

$

Estimated based on site conditions and Texas market rates. Valid for 30 days.

Data Gaps & Compliance Review

Identified Data Gaps & Limitations

Gap / Limitation	Potential Impact	Recommended Action

Building Code Compliance

Code / Standard Requirement Status

Professional Certification

This report has been prepared in accordance with generally accepted geotechnical engineering practices. The analyses, conclusions, and recommendations are based on site-specific subsurface conditions encountered during the investigation. The soil modification program outlined herein, when executed per specifications, is expected to achieve and maintain a PVR ≥ 1.0 across the building pad area.

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Proposal Terms & Exclusions

• This proposal is valid for 30 days and includes Sales Tax.

• Venditti, LLC is licensed and insured for your protection and will perform all work in accordance with City, State and Federal regulations.

• Thank you for the opportunity! We look forward to working with you on this project.

Demolition & Site Exclusions:

Any Scope Not Detailed in This Document, Bonding, Lab Testing, ACM Abatement or Disposal of Hazardous Material, Permits, Permit Fees, Inspections, Inspection Fees, ROW Permits, ROW Usage Fees, SWPPP of Any Kind, Engineering of Any Kind, After Hours Work, Repairs Indicated By Plans, Demolition Notifications, Gas or Electric Utility Disconnects, Salvage For Owner, Patching, Landscaping of Any Kind, Traffic Control, Traffic Control Plans, Backfill, Topsoil, Water, Water Meters, Shoring, Demolition of Piers More Than 4 Feet Below Existing Grade, Laydown Areas, Temporary Access Roads, Lab Testing, SWPPP Maintenance After Demolition Unless Contracted To Do So, Costs, Fees or Fines From Damage to Trees, Unmarked Underground Utilities, or Any Other Unforeseen Conditions.