Crown Enterprises, LLC
12225 Stephens Road
Warren, Michigan 48089

GEOTECHNICAL INVESTIGATION

FOR

West End Rail
312 West End Street
& 8100 Melville Street
Detroit, Michigan

TEC Report: 65933

By:

Testing Engineers & Consultants, Inc.
1343 Rochester Road
P.O. Box 249
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July 1, 2026

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Engineering Client Success

TEC Report: 65933
Date Issued: July 1, 2026

Mr. Andrew Falzarano
Crown Enterprises, LLC
12225 Stephens Road
Warren, Michigan 48089

Re: Geotechnical Investigation For
West End Rail
312 West End Street
& 8100 Melville Street
Detroit, Michigan

Dear Mr. Falzarano:

Please find enclosed the results of a geotechnical investigation performed at the above referenced site. This geotechnical report presents our field and laboratory results; engineering analysis; and our recommendations for design of foundation and slabs, as well as important construction considerations.

As you may know, Testing Engineers & Consultants, Inc. (TEC) has sixty years of experience in Quality Control Testing and Construction Inspection. We would be pleased to provide any of these services on this project.

Should you have any questions regarding this report, please let us know. It has been a pleasure to be of service to you.

Respectfully submitted,

TESTING ENGINEERS & CONSULTANTS, INC.

Carey J. Suhan, P.E.,
Vice President & Principal

CJS/ln
Enclosure

cc: Crown Enterprises, LLC, Mr. James Melstrom, Project Manager

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All services undertaken are subject to the following policy. Reports are submitted for exclusive use of the clients to whom they are addressed. Their significance is subject to the adequacy and representative character of the samples and the comprehensiveness of the tests, examinations and surveys made. No quotation from reports or use of TEC's name is permitted except as expressly authorized by TEC in writing.

Testing Engineers & Consultants, Inc.

Mr. Andrew Falzarano
Crown Enterprises, LLC
July 1, 2026

TEC Report: 65933

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TEST BORING AND TEST PIT LOCATION PLAN

LOGS OF TEST BORINGS AND TEST PITS

SIEVE ANALYSIS RESULTS

GENERAL NOTES FOR SOIL CLASSIFICATION

Mr. Andrew Falzarano
Crown Enterprises, LLC
July 1, 2026

TEC Report: 65933

1.0 INTRODUCTION

This report presents the results of a geotechnical investigation for the proposed buildings at 312 West End Street and 8100 Melville Street in Detroit, Michigan. Authorization to perform this investigation was given by Mr. James Melstrom through Purchase Order 138-0021 dated June 1, 2026 and in accordance with TEC Proposal 060-26-156.

The purpose of this investigation was to obtain information necessary to determine basic engineering properties of soils at the site through a series of test borings and laboratory tests performed on the soil samples obtained during the field investigation. This information has been evaluated to provide the general recommendations for site development preparations, foundation requirements, floor slab designs and other geotechnical information.

2.0 FIELD INVESTIGATION

Four test borings were drilled on the site at the locations shown on the Test Boring and Test Pit Location Plan. The locations are accurate to within a short distance of the locations shown on the location plan included in the appendix. The test borings were drilled on June 19, 2026 with truck-mounted auger equipment to depths of 15 and 20 feet below the existing grade. TEC also performed a geotechnical investigation of the northern portion of the site in February 2023 to provide recommendations for a rail spur. This current investigation narrows the area to the proposed buildings.

Drilling methods and standard penetration tests were performed in general accordance with the current ASTM D1452 and D1586 procedures, respectively. These procedures specify that a standard 2-inch O.D. split-barrel sampler be driven by a 140-pound hammer with a free fall of 30 inches. The number of hammer blows required to drive the split-barrel sampler through three successive 6-inch increments is recorded on the Test Boring Log. The first 6-inch increment is used for setting the sampler firmly in the soil and the sum of the hammer blows for the second and third increments is referred to as the “Standard Penetration Index” (N). N values were obtained with an automatic trip hammer.

From the standard penetration test a soil sample is recovered in the liner sampler tubes that are located inside the split-barrel sampler. Upon recovery of a soil sample, the liner tubes are removed from the split-barrel sampler and placed in a container which is sealed to minimize moisture losses during transportation to the laboratory. Standard penetration tests are usually made at depths of 2 ½, 5, 7 ½ and 10 feet and at 5-foot depth intervals thereafter. These parameters may vary for a given project depending on the nature of the subsoils and the geotechnical information required.

2.0 FIELD INVESTIGATION (Cont'd)

In addition, four test pits were excavated on July 1, 2026, near the boring locations to better define the soil characteristics and to locate any buried structures. A backhoe, supplied by TEC's subcontractor, Holsbeke Construction, was used to excavate the test pits. The test pit logs are included in the appendix.

3.0 LABORATORY TESTING

The laboratory testing consisted of determining the unconfined compressive strength, the natural bulk density and the natural moisture content of the soil samples recovered in the liner sampler tubes. In the unconfined compression tests, the compressive strength of the soil is determined by axially loading a soil sample until failure is observed or 15% strain, whichever occurs first. The above referenced test data are recorded on the boring logs. Some test results may deviate from the norm because of variations in texture, imperfect samples, presence of pebbles and/or sand streaks, etc. The results are still reported although they may not be relevant.

The particle size distribution of three granular soil samples was also determined. The distribution provides soil classification information and estimates of the permeability and permeability-related behavior of the granular soils. The results are included in the appendix.

Samples taken in the field are retained in our laboratory for 60 days and are then destroyed unless special disposition is requested by the client. Samples retained over a long period of time are subject to moisture loss and are then no longer representative of the conditions initially encountered.

4.0 GENERAL SUBSURFACE CONDITIONS

4.1 Subsoil Conditions

The soil conditions encountered in the borings are presented on the individual boring logs. Each log presents the soil types encountered at that location as well as laboratory test data, ground water data, and other pertinent information. Descriptions of the various soil consistencies, relative densities and particle sizes are given in the Appendix. Definitions of the terms and symbols utilized in this report may be found in ASTM D653.

4.1 Subsoil Conditions (Cont'd)

The ground surface was covered with fill that consisted of medium compact sand or loose silty sand. The fill extended to depths ranging from 3 to 4 feet below existing ground surface. Some gravel, crushed concrete and crushed asphalt were encountered in the fill at Boring Nos. 1 through 3 and in the test pits. In addition, some brick and a petroleum type of odor were noted in the fill at Boring No. 1. Wood debris was encountered in the fill at Test Pit Nos. 2 and 3.

The underlying native soils were very loose to medium compact sands and loose to medium compact clayey sands that extended to a depth of 12 feet below existing ground surface at Boring No. 1, to a depth of 17 feet at the other borings and to the terminal depth of the test pits. The very loose sand was encountered at Boring No. 1 between a depth of 3 and 7 feet and at Boring No. 3 between a depth of 3 and 6 feet and again at a depth between 12 and 17 feet. Gravel was encountered in the upper sand layers.

The sand was underlain by plastic clay and silty clay at Boring Nos. 1 through 3 and very soft clay at Boring No. 4. The clay extended to the terminal depth of the borings. Some sand was encountered in the silty clay at Boring No. 1.

Standard penetration values range from 1 blow for a penetration of 24 inches to 30 blows per foot with unconfined compressive strength of 490 to 1,730 pounds per square foot (psf). Bulk densities range from 115 to 141 pounds per cubic foot with moisture contents of 6.4 to 30.1 percent of the dry weight of the soil.

4.2 Ground Water Observations

Water level readings were taken in the bore holes during and after the completion of drilling. These observations are noted on the respective Test Boring Logs. Ground water was first encountered during drilling at depths ranging from 7.5 to 12 feet below ground surface. After completion of drilling and removal of the augers, water was measured at depths ranging from 4.8 to 8 feet at which depths the boreholes caved in.

5.0 ANALYSIS AND RECOMMENDATIONS

5.1 Proposed Development

The proposed development is to consist of the construction of a pre-engineered metal building (PEMB) of unknown size and a semi-permanent trailer building. The site is currently vacant. A former building which was a truck trailer parking center was demolished in 2022.

5.2 Ground Water Conditions

The position of water levels found in test borings may vary somewhat depending on seasonal precipitation. At the level encountered in the borings, it should present no significant problems for design or construction of shallow foundations and utilities. Wet sand and clayey sand layers were encountered at depths ranging from 7.5 to 12 feet below existing ground surface. If excavations need to extend below these depths, ground water will need to be lowered at least 2 feet below bottom of excavation and controlled. Since the depth of the sand layers are extensive, wellpoints may be required.

5.3 Recommended Earthwork Operations

Within the limits of areas to be developed, any surface vegetation and topsoil should be removed prior to the site being graded. No topsoil was noted by the drillers but some vegetation and residual stripping should be budgeted. We assume that the proposed finished grade will be close to the existing grade and the remainder of our report assumes the grade changes will be limited to a foot or two.

It appears that existing sand fill, which ranges from 3 to 4 feet in thickness, has been placed at this site. Some gravel and crushed concrete were encountered in the fill. The sand fill varied from loose to medium compact in relative density. We believe most of the sand fill can be used for support of grade slabs and pavement if it is carefully evaluated and prepared, i.e., compacted during construction. However, in uncontrolled fill, there is always an increased risk of differential settlements associated with support of slabs and pavements on uncontrolled fill materials. Wood debris was encountered in the fill at Test Pit Nos. 2 and 3. The fill should be removed in these areas.

The increased risk can be minimized by careful observation and subgrade preparation during construction, but it cannot be eliminated. If the greater risk of differential settlements is not acceptable, it will be necessary to remove some or all the existing fill and replace it with engineered fill. Because most of the fill encountered in the four borings at this site appears to be fairly uniform and because replacement of 3 to 4 feet of fill would be costly, we recommend that the extra efforts required to carefully evaluate and prepare the existing fill be undertaken. The remainder of this report assumes that this is the case.

All earthwork operations should be performed under adequate specifications and properly monitored in the field.

In addition, a former building and the associated pavement has been removed. No buried structures were encountered in the test pits, but wood debris was in two test pits.

5.3 Recommended Earthwork Operations (Cont'd)

Engineered backfill required for construction excavations or fill required to achieve desired grades should preferably consist of clean and well graded granular soils. On-site granular material with minimal clay and debris contents should be satisfactory, particularly for balancing and grading the site. Fill should be placed in uniform layers not more than 9 inches in thickness with the soils in each layer compacted to a minimum of 95% of the maximum density as determined by ASTM D1557. Fill should be at approximately the optimum moisture content during placement and compaction. Furthermore, frozen material must not be used as fill and fill should not be placed on frozen ground.

Since the soils are primarily very loose to loose sands, lateral support structure or side sloping with a minimum 1 1/2H:1V ratio will be required for anticipated excavations. However, all excavations should comply with the applicable local, state, and federal applications, including the MIOSHA regulations. Trench excavations in the loose to very loose sands may not be feasible. Formed spread footings should be budgeted. Soils exposed in the bases of all satisfactory foundation excavations should be protected against any detrimental change in conditions such as from disturbances, rain or freezing. Surface run-off water should be drained away from the excavations and not be allowed to pond. If possible, all footing concrete should be placed the same day the excavation is made. If this is not possible, the footing excavations should be adequately protected.

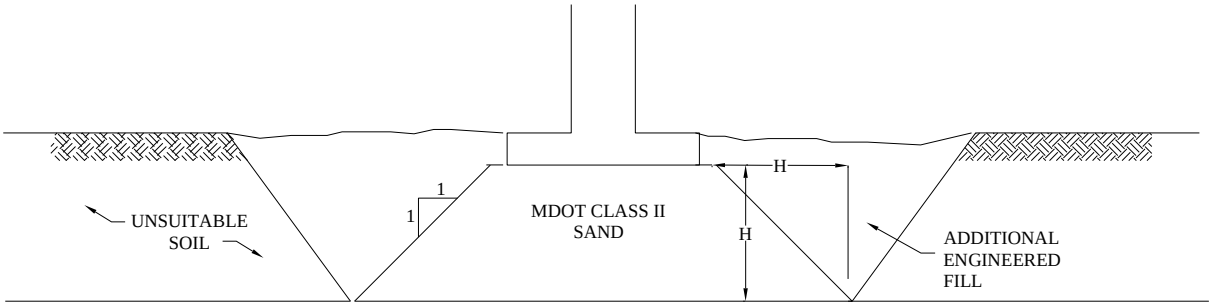
5.4 Foundation Recommendations

Foundations should bear on soil deposits that have adequate strength to develop bearing capacity and sufficient stiffness to limit settlement for reasonably-sized footings with the anticipated loads. Local building codes and climatic conditions require that exterior foundations be placed at a minimum depth of 3.5 feet below finished grade to provide for adequate frost protection. Interior foundations may be below the floor at a lesser depth if not exposed to frost penetration. Regardless of the loads, the foundations must be larger than the superstructure they support along with construction tolerances.

The native site soils are acceptable for support of the proposed structures on shallow foundations with some modifications. The bearing soils are very loose to loose in relative density to depths ranging from 6 to 9.5 feet below existing ground surface. We recommend that a minimum of 2 feet of the sand below footing depth be removed and replaced back as engineered fill. The fill should be placed in lifts and compacted as outlined in the Recommended Earthwork Operations section. The compacted engineered fill must extend wider than the foundation as shown in the sketch below.

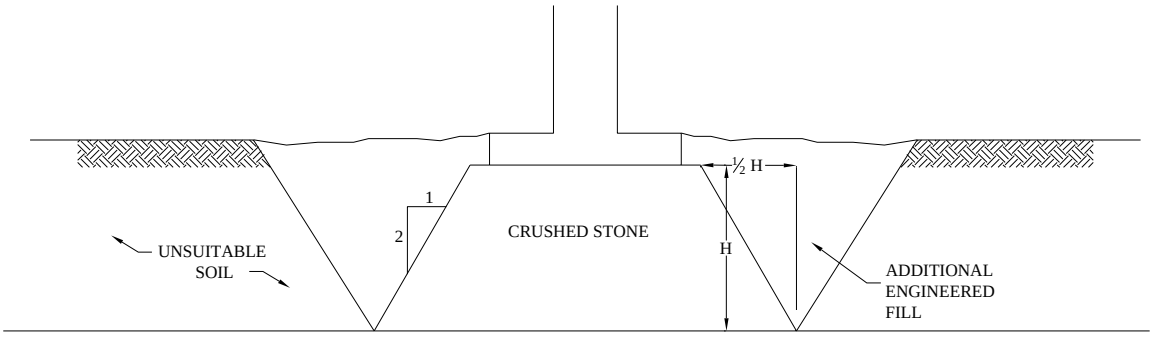
5.4 Foundation Recommendations (Cont'd)

ENGINEERED SAND FILL UNDER FOUNDATIONS



If MDOT 21AA crushed aggregate is used in lieu of sand, the slope of the engineered fill can be increased as shown in the sketch below.

ENGINEERED STONE FILL UNDER FOUNDATIONS



At minimum depths, foundations can be designed for a maximum net allowable bearing pressure of 2,000 psf. The recommended design bearing pressure should provide a factor of safety of about 2.5 to 3 against shear failure and limit differential settlements between adjacent columns to less than ¾ inch.

5.4 Foundation Recommendations (Cont'd)

From a review of the borings and assumptions made about the lower lying soils a seismic site class of D is recommended for design. It is assumed that the lower lying soils below the bottom of the borings have an average N value between 15 and 50 and shear strengths between 1,000 psf and 2,000 psf. This appears to be a reasonable assumption from general geology of the area. This is based off of the Michigan Building Code, which incorporates the International Building Code.

5.5 Floor Slabs and Pavements

The subgrade resulting from the site preparation, as outlined in the recommended earthwork operations section, will provide a fair to good subgrade for support of pavements and floor slabs depending upon the amount of existing fill removal. Key concerns for the design and construction of floor slabs are structural support of the slab, stability of the subgrade during construction, and drainage of the cross-section in service.

Floor slabs and other concrete pavements should be placed on a minimum of 6 inches of clean compacted sand meeting MDOT Class II specifications or MDOT 21AA which will remain more stable during concrete placement.

For automobile drives and minimal truck traffic the following section is recommended:

1 ½ inch hot mix asphalt (HMA) topping course (MDOT 5EL or 4EL)
2 ½ inch topping leveling course (MDOT 4EL)
10 inches untreated aggregate base (MDOT 21AA)

The aggregate base may be reduced to 8 inches in automobile parking areas.

For heavy truck traffic the following section is recommended:

1 ½ inch hot mix asphalt (HMA) topping course (MDOT 5EML or 4EML)
4 ½ inch topping leveling course (MDOT 4EML) (2 lifts)
10 inches untreated aggregate base (MDOT 21AA)

For Portland cement concrete, the following section is recommended:

8 inches PCC
8 inches of untreated aggregate base (MDOT 21AA)

5.5 Floor Slabs and Pavements (Cont'd)

Air entrained MDOT P1 grade concrete with partial slag cement replacement is recommended for new curb and gutter and drive approaches or miscellaneous flatwork. If a high-performance concrete pavement is desired, MDOT P1M concrete is recommended. TEC recommends that the proposed concrete mixes effectively mitigate the potential for ASR reactivity utilizing a combination of methods such as partial slag cement substitution, use of low alkali Portland cement, and verification testing of the ASR expansion potential of the proposed fine aggregates and/or combinations of cementitious materials.

The pavement should be properly crowned and shaped in order to provide effective surface drainage and prevent water ponding. A 1.5 percent minimum slope is recommended. Edge drains along the perimeter of the pavement and finger drains around catch basins are recommended to prevent water from infiltrating the subgrade. All drains should be connected to storm sewer or other outlets.

The pavement recommendations presented above are intended to provide a serviceable pavement for an extended period of time. However, all pavements show deterioration with time and require regular maintenance such as occasional repairs of cracks and pot holes. The need for such maintenance efforts is not necessarily indicative of premature pavement failure. The serviceable life of the pavement can be substantially reduced if maintenance and minor repair is not performed in a timely manner. Note that more frequent maintenance should be expected where floor slabs or pavement bear over undocumented fill.

6.0 DESIGN REVIEW AND FIELD MONITORING

The evaluations and recommendations presented in this report relative to site preparation and building foundations have been formulated on the basis of assumed and provided data relating to the location, type and finished grades for the proposed structure and adjacent areas. Any significant change in this data should be brought to our attention for review and evaluation with respect to the prevailing subsoil conditions.

When the building and foundation plans are finalized, a consultation should be arranged with us for a review to verify that the evaluations and recommendations have been properly interpreted.

6.0 DESIGN REVIEW AND FIELD MONITORING (Cont'd)

Soil conditions at the site could vary from those generalized on the basis of test borings made at specific locations. It is therefore recommended that Testing Engineers & Consultants, Inc. be retained to provide soil engineering services during the site preparation, excavation and foundation phases of the proposed project. This is to observe compliance with the design concepts, specifications and recommendations. Also, this provides opportunity for design changes to be made in the event that subsurface conditions differ from those anticipated prior to the start of construction.

Gary E. Putt, P.E.
Senior Project Engineer

Carey J. Suhan, P.E.
Vice President & Principal

GEP/CJS/ln

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Testing Engineers & Consultants, Inc.

Mr. Andrew Falzarano
Crown Enterprises, LLC
July 1, 2026

TEC Report: 65933

APPENDIX

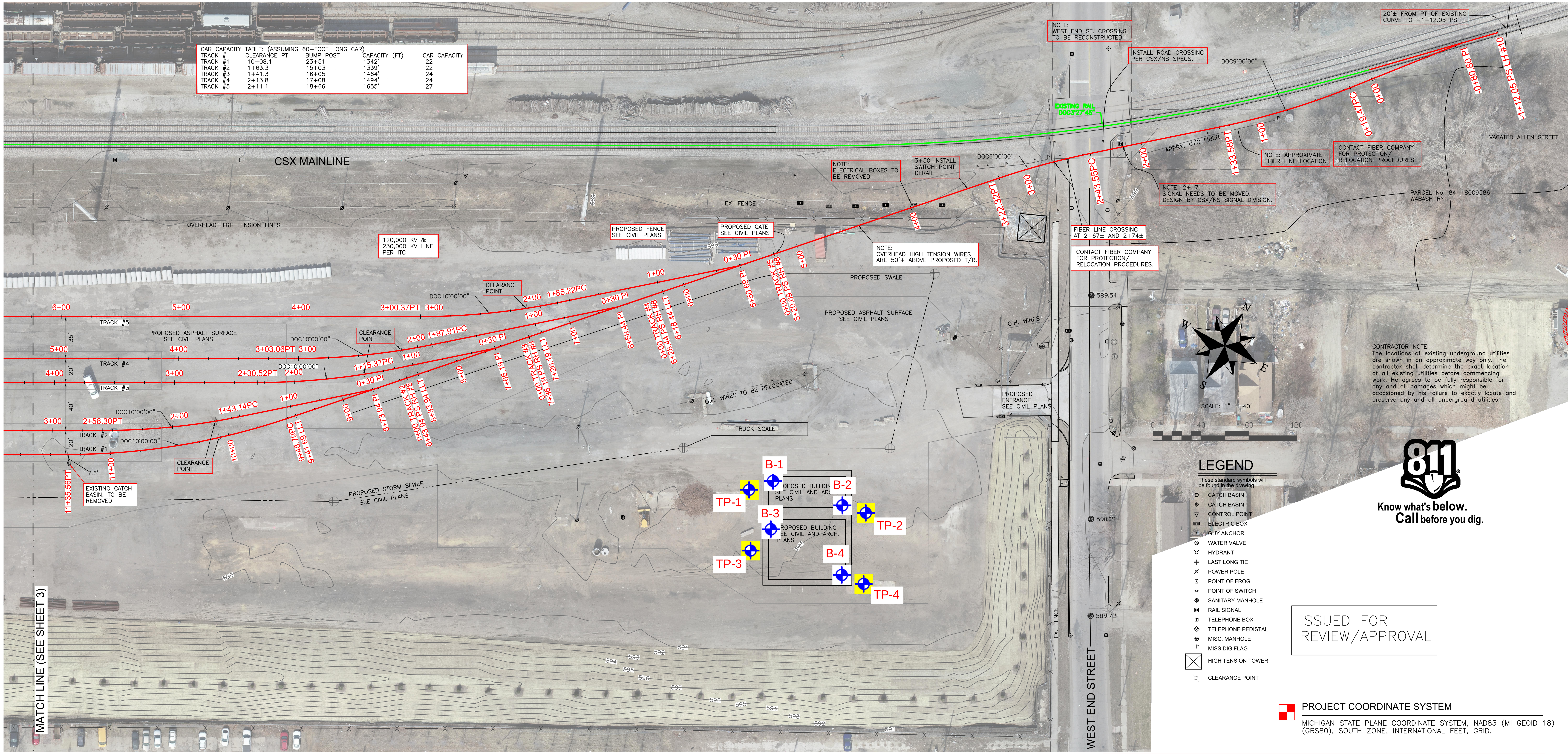
Test Boring and Test Pit Location Plan

Logs Of Test Borings and Test Pits

Sieve Analysis Results

General Notes For Soil Classification

RAIL ADVANCEMENT PROJECT FOR CROWN ENTERPRISES



ISSUED FOR REVIEW/APPROVAL

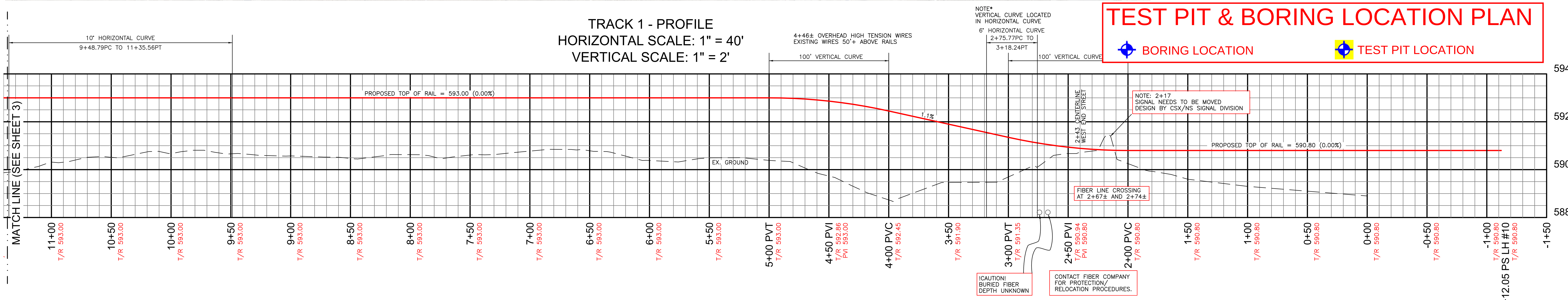
PROJECT COORDINATE SYSTEM

MICHIGAN STATE PLANE COORDINATE SYSTEM, NAD83 (MI GEOID 18) (GRS80), SOUTH ZONE, INTERNATIONAL FEET, GRID.

TEST PIT & BORING LOCATION PLAN

BORING LOCATION   TEST PIT LOCATION

TRACK 1 - PROFILE
HORIZONTAL SCALE: 1" = 40'
VERTICAL SCALE: 1" = 2'



R.A. DUTHLER LAND SURVEYOR
158 E. THIRD STREET
IMLAY CITY, MICHIGAN 48444
PH. (810) 724-6532
FAX. (810) 724-1551

R.A. DUTHLER LAND SURVEYOR 810-724-6532 IMLAY CITY, MI DUTHLERLANDSURVEYOR.COM

STATE OF MICHIGAN ★ RICHARD ALAN DUTHLER, JR PROFESSIONAL SURVEYOR No. 4001047200 ★ LICENSED PROFESSIONAL SURVEYOR

RICHARD A. DUTHLER P.S.
No. 47200

RAIL ADVANCEMENT PROJECT
DESIGN 6
-1+12 TO 11+50
RAIL SPUR DESIGN FOR CROWN ENTERPRISES LLC LOCATED AT
8100 MELVILLE STREET
DETROIT, MI 48209

PREPARED FOR:
CROWN ENTERPRISES LLC
12225 STEPHENS ROAD
WARREN, MI 48089
JOB No. 220712_RR_DESIGN 6

DRAWN BY: RICHARD DUTHLER/A.H.
DATE: FEBRUARY 23, 2026
HORIZONTAL SCALE: 1" = 40'
VERTICAL SCALE:
SHEET 2 OF 7
REVISION DATES:

Testing Engineers & Consultants, Inc.

1343 Rochester Road - PO Box 249 - Troy, Michigan - 48099-0249
(248) 588-6200 or (313) T-E-S-T-I-N-G
Fax (248) 588-6232

Boring No.: 1 **Job No.:** 65933

Client: Crown Enterprises, LLC

Type of Rig: Truck

Drilling Method: Solid Stem Augers

Ground Surface Elevation:

Project: West End Rail, 312 West End Street/8100 Melville

Location: Detroit, Michigan

Drilled By: T. Nahas

Started: 6/19/2026

Completed: 6/19/2026

Depth (ft)	Sample Type	N	Strata Change	Soil Classification	w	d	qu
2.5	LS	17 19 9	3	Medium Compact Moist Black & Dark Brown Sand With Some Gravel, Crushed Concrete, Red Brick & Petroleum Odor-FILL	9.2	141	
5.0	LS	2 2 2		Very Loose Moist Dark Brown Well Graded SAND & Gravel With Trace Of Clay	12.0	128	
7.5	LS	2 2 3	7		18.9	116	
10.0	LS	3 11 11	9.5	Loose Moist To Wet Brown Clayey Fine SAND	11.7	137	
12.5			12	Medium Compact Wet Brown Medium To Coarse SAND With Trace Of Gravel			
15.0	LS	2 2 3	15	Plastic Wet Gray Silty CLAY With Some Sand	21.8	117	
17.5				Bottom of Boring at 15'			
20.0							
22.5							

"N" - Standard Penetration Resistance
SS - 2" I.D. Split Spoon Sample
LS - Sectional Liner Sample
ST - Shelby Tube Sample
AS - Auger Sample

w - H2O, % of dry weight
d - Bulk Density, pcf
qu - Unconfined Compression, psf
DP - Direct Push
RC - Rock Core

Water Encountered: 7'6"

At Completion: Caved In 4'9"

Boring No. 1

Testing Engineers & Consultants, Inc.

1343 Rochester Road - PO Box 249 - Troy, Michigan - 48099-0249
(248) 588-6200 or (313) T-E-S-T-I-N-G
Fax (248) 588-6232

Boring No.: 2 **Job No.:** 65933

Client: Crown Enterprises, LLC

Type of Rig: Truck

Drilling Method: Solid Stem Augers

Ground Surface Elevation:

Project: West End Rail, 312 West End Street/8100 Melville

Location: Detroit, Michigan

Drilled By: T. Nahas

Started: 6/19/2026

Completed: 6/19/2026

Depth (ft)	Sample Type	N	Strata Change	Soil Classification	w	d	qu
2.5	LS	7 11 6	3	Medium Compact Moist Black & Dark Brown Sand With Some Gravel & Crushed Concrete-FILL	9.9	140	
5.0	LS	4 5 4	6	Loose Moist Dark Brown Well Graded SAND & Gravel With Some Silt	14.6	125	
7.5	LS	8 10 12	9	Medium Compact Moist Brown Medium To Coarse SAND With Trace Of Gravel	6.5	137	
10.0	LS	4 9 8	12	Medium Compact Wet Brown Medium To Coarse Clayey SAND Wuith Trace Of Gravel & Silt	8.7	135	1650
12.5				Loose Wet Gray Medium To Fine SAND			
15.0	LS	2 3 5	17		20.5	119	
17.5				Plastic Wet Gray CLAY With Some Silt			
20.0	LS	3 2 2	20		27.8	115	1650
22.5				Bottom of Boring at 20'			

"N" - Standard Penetration Resistance
SS - 2" I.D. Split Spoon Sample
LS - Sectional Liner Sample
ST - Shelby Tube Sample
AS - Auger Sample

w - H2O, % of dry weight
d - Bulk Density, pcf
qu - Unconfined Compression, psf
DP - Direct Push
RC - Rock Core

Water Encountered: 9'0"

At Completion: Caved In 7'0"

Boring No. 2

Testing Engineers & Consultants, Inc.

1343 Rochester Road - PO Box 249 - Troy, Michigan - 48099-0249
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Boring No.: 3 **Job No.:** 65933

Client: Crown Enterprises, LLC

Type of Rig: Truck

Drilling Method: Solid Stem Augers

Ground Surface Elevation:

Project: West End Rail, 312 West End Street/8100 Melville

Location: Detroit, Michigan

Drilled By: T. Nahas

Started: 6/19/2026

Completed: 6/19/2026

Depth (ft)	Sample Type	N	Strata Change	Soil Classification	w	d	qu
2.5	LS	26 17 13	3	Medium Compact Moist Black & Dark Brown Sand With Some Crushed Concrete-FILL	9.1	141	
5.0	LS	2 1 2	6	Very Loose Moist Dark Brown & Brown Well Graded SAND & Gravel With Some Silt	12.1	128	
7.5	LS	2 3 4	8	Loose Moist Brown Well Graded SAND With Some Gravel & Silt	10.4	130	
10.0	LS	5 11 9	12	Medium Compact Moist Gray Medium To Coarse SAND	7.6	135	
12.5				Very Loose Wet Gray Fine SAND			
15.0	LS	2 2 2	17		20.0	119	
17.5				Plastic Wet Gray CLAY With Some Silt			
20.0	LS	2 1 2	20		26.6	120	1730
22.5				Bottom of Boring at 20'			

"N" - Standard Penetration Resistance
SS - 2" I.D. Split Spoon Sample
LS - Sectional Liner Sample
ST - Shelby Tube Sample
AS - Auger Sample

w - H2O, % of dry weight
d - Bulk Density, pcf
qu - Unconfined Compression, psf
DP - Direct Push
RC - Rock Core

Water Encountered: 12'0"

At Completion: Caved In 8'0"

Boring No. 3

Testing Engineers & Consultants, Inc.

1343 Rochester Road - PO Box 249 - Troy, Michigan - 48099-0249
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Fax (248) 588-6232

Boring No.: 4 **Job No.:** 65933

Client: Crown Enterprises, LLC

Type of Rig: Truck

Drilling Method: Solid Stem Augers

Ground Surface Elevation:

Project: West End Rail, 312 West End Street/8100 Melville

Location: Detroit, Michigan

Drilled By: T. Nahas

Started: 6/19/2026

Completed: 6/19/2026

Depth (ft)	Sample Type	N	Strata Change	Soil Classification	w	d	qu
2.5	LS	3 4 4	4	Loose Moist Black & Dark Brown Silty Sand With Trace Of Gravel-FILL	11.7	129	
5.0	LS	5 5 3	6	Loose Moist Brown Well Graded SAND & Gravel With Trace Of Silt	17.9	121	
7.5	LS	8 11 11	8	Medium Compact Moist Brown Medium To Coarse SAND With Trace Of Gravel	6.4	135	
10.0	LS	4 5 6	12	Medium Compact Wet Brown Medium To Coarse SAND	18.2	130	
12.5							
15.0	LS	4 4 3	17	Loose Wet Gray Fine SAND	17.8	121	
17.5							
20.0	LS	1/24"	20	Very Soft Wet Gray CLAY With Some Silt	30.1	123	490
22.5				Bottom of Boring at 20'			

"N" - Standard Penetration Resistance
SS - 2" I.D. Split Spoon Sample
LS - Sectional Liner Sample
ST - Shelby Tube Sample
AS - Auger Sample

w - H2O, % of dry weight
d - Bulk Density, pcf
qu - Unconfined Compression, psf
DP - Direct Push
RC - Rock Core

Water Encountered: 8'0"

At Completion: Caved In 6'6"

Boring No. 4

Testing Engineers & Consultants, Inc.

1343 Rochester Road - PO Box 249 - Troy, Michigan - 48099-0249
(248) 588-6200 or (313) T-E-S-T-I-N-G
Fax (248) 588-6232

Test Pit No.: TP-1 **Job No.:** 65933

Client: Crown Enterprises, LLC

Type of Rig: Backhoe

Drilling Method: Test Pit

Ground Surface Elevation:

Project: West End Rail, 312 West End Street/8100 Melville

Location: Detroit, Michigan

Logged By: O. Al Duiais

Started: 7/1/2026

Completed: 7/1/2026

Depth (ft)	Sample Type	N	Strata Change	Soil Classification	w	d	qu
2.5			3	Dark Brown & Gray Sand & Crushed Gravel With Some Broken Concrete & Crushed Asphalt-FILL			
5.0			7	Brown SAND With Some Silt & Gravel			
7.5				Bottom of Test Pit at 7'			
10.0							
12.5							
15.0							
17.5							
20.0							
22.5							

"N" - Standard Penetration Resistance
SS - 2" I.D. Split Spoon Sample
LS - Sectional Liner Sample
ST - Shelby Tube Sample
AS - Auger Sample

w - H2O, % of dry weight
d - Bulk Density, pcf
qu - Unconfined Compression, psf
DP - Direct Push
RC - Rock Core

Water Encountered: None

At Completion: None

Test Pit No. TP-1

Testing Engineers & Consultants, Inc.

1343 Rochester Road - PO Box 249 - Troy, Michigan - 48099-0249
(248) 588-6200 or (313) T-E-S-T-I-N-G
Fax (248) 588-6232

Test Pit No.: TP-2 **Job No.:** 65933

Client: Crown Enterprises, LLC

Type of Rig: Backhoe

Drilling Method: Test Pit

Ground Surface Elevation:

Project: West End Rail, 312 West End Street/8100 Melville

Location: Detroit, Michigan

Logged By: O. Al Duiais

Started: 7/1/2026

Completed: 7/1/2026

Depth (ft)	Sample Type	N	Strata Change	Soil Classification	w	d	qu
			1.33	Dark Brown Sand & Crushed Gravel-FILL			
2.5				Dark Brown & Black Sand With Some Crushed Gravel, Crushed Asphalt & Pieces Of Large Wood Debris-FILL			
			4				
5.0			5	Brown SAND With Trace Of Silt			
			6				
			7	Dark Brown CLAY & Sand			
7.5				Brown SAND With Some Gravel			
				Bottom of Test Pit at 7'			
10.0							
12.5							
15.0							
17.5							
20.0							
22.5							

"N" - Standard Penetration Resistance
SS - 2" I.D. Split Spoon Sample
LS - Sectional Liner Sample
ST - Shelby Tube Sample
AS - Auger Sample

w - H2O, % of dry weight
d - Bulk Density, pcf
qu - Unconfined Compression, psf
DP - Direct Push
RC - Rock Core

Water Encountered: None

At Completion: None

Test Pit No. TP-2

Testing Engineers & Consultants, Inc.

1343 Rochester Road - PO Box 249 - Troy, Michigan - 48099-0249
(248) 588-6200 or (313) T-E-S-T-I-N-G
Fax (248) 588-6232

Test Pit No.: TP-3 **Job No.:** 65933

Client: Crown Enterprises, LLC

Type of Rig: Backhoe

Drilling Method: Test Pit

Ground Surface Elevation:

Project: West End Rail, 312 West End Street/8100 Melville

Location: Detroit, Michigan

Logged By: O. Al Duiais

Started: 7/1/2026

Completed: 7/1/2026

Depth (ft)	Sample Type	N	Strata Change	Soil Classification	w	d	qu
			1	Gray Sand & Crushed Gravel-FILL			
2.5				Brown Sand With Some Broken Concrete & Wood Debris-FILL			
			4.5				
5.0			6	Brown SAND With Trace Of Silt			
			7	Brown SAND With Some Gravel			
7.5				Bottom of Test Pit at 7'			
10.0							
12.5							
15.0							
17.5							
20.0							
22.5							

"N" - Standard Penetration Resistance
SS - 2" I.D. Split Spoon Sample
LS - Sectional Liner Sample
ST - Shelby Tube Sample
AS - Auger Sample

w - H2O, % of dry weight
d - Bulk Density, pcf
qu - Unconfined Compression, psf
DP - Direct Push
RC - Rock Core

Water Encountered: None

At Completion: None

Test Pit No. TP-3

Testing Engineers & Consultants, Inc.

1343 Rochester Road - PO Box 249 - Troy, Michigan - 48099-0249
(248) 588-6200 or (313) T-E-S-T-I-N-G
Fax (248) 588-6232

Test Pit No.: TP-4 **Job No.:** 65933

Client: Crown Enterprises, LLC

Type of Rig: Backhoe

Drilling Method: Test Pit

Ground Surface Elevation:

Project: West End Rail, 312 West End Street/8100 Melville

Location: Detroit, Michigan

Logged By: O. Al Duiais

Started: 7/1/2026

Completed: 7/1/2026

Depth (ft)	Sample Type	N	Strata Change	Soil Classification	w	d	qu
				Gray SAND With Some Crushed Gravel & Crushed Asphalt			
			2.33				
2.5				Brown SAND With Trace Of Silt			
5.0			5.5				
			7	Brown SAND With Some Gravel			
7.5				Bottom of Test Pit at 7'			
10.0							
12.5							
15.0							
17.5							
20.0							
22.5							

"N" - Standard Penetration Resistance
SS - 2" I.D. Split Spoon Sample
LS - Sectional Liner Sample
ST - Shelby Tube Sample
AS - Auger Sample

w - H2O, % of dry weight
d - Bulk Density, pcf
qu - Unconfined Compression, psf
DP - Direct Push
RC - Rock Core

Water Encountered: None

At Completion: None

Test Pit No. TP-4

Testing Engineers and Consultants, Inc.

1343 Rochester Road PO Box 249 Troy, Michigan 48099-0249
248-588-6200 or 313 T-E-S-T-I-N-G
Fax 248-588-6232

SIEVE ANALYSIS RESULTS

PROJECT: West End Rail
312 West End Street/8100 Melville Street
LOCATION: Detroit, Wayne County, Michigan
CLIENT: Crown Enterprises LLC

TEC REPORT NUMBER: 65933
DATE: 6/30/2026

Material Description: Dark Brown Well Graded Sand & Gravel With Trace of Clay
Sample Source / Depth: Boring No. B-1 @ 2.5'
Sample Location:
Intended Use:

Date Sampled: 6/19/26
Sampled By: T. Nahas
TEC Lab Sample Number: 10785
Remarks:

AGGREGATE ANALYSIS

Sieve No.	Total Weight Retained	Total Percent Retained	Total Percent Passing	Specification Range
3"				
2-1/2"				
1-1/2"				
1"		0.0	100.0	
3/4"	17.5	17.3	82.7	
1/2"	26.6	26.3	73.7	
3/8"	33.2	32.9	67.1	
#4	44.5	44.1	55.9	
#10	56.4	55.8	44.2	
#20	66.7	66.0	34.0	
#30	71.2	70.5	29.5	
#40	75.6	74.9	25.1	
#100	88.4	87.5	12.5	
#200	95.5	94.6	5.4	
Total Sample	101.0	100.0	0.0	

SAMPLE DATA

Initial Sample Weight (g)	101.0
Weight After Wash (g)	95.5
Loss in Weight (g)	5.5
Loss by Wash (%)	5.4%

Tested By: Kyle Tobin
Reviewed By:

Test Method: ASTM C117/C136 X AASHTO T11/T27 _____ MTM 108/109 _____

Remarks:

Respectfully Submitted:
Testing Engineers and Consultants, Inc.

Testing Engineers and Consultants, Inc.

1343 Rochester Road PO Box 249 Troy, Michigan 48099-0249
248-588-6200 or 313 T-E-S-T-I-N-G
Fax 248-588-6232

SIEVE ANALYSIS RESULTS

PROJECT: West End Rail
312 West End Street/8100 Melville Street
LOCATION: Detroit, Wayne County, Michigan
CLIENT: Crown Enterprises LLC

TEC REPORT NUMBER: 65933
DATE: 6/30/2026

Material Description: Dark Brown Well Graded Sand & Gravel With Some Silt
Date Sampled: 6/19/26

Sample Source / Depth: Boring No. B-2 @ 5'
Sampled By: T. Nahas

Sample Location:
TEC Lab Sample Number: 10786

Intended Use:
Remarks:

AGGREGATE ANALYSIS

Sieve No.	Total Weight Retained	Total Percent Retained	Total Percent Passing	Specification Range
3"				
2-1/2"				
1-1/2"		0.0	100.0	
1"	22.7	17.5	82.5	
3/4"	22.7	17.5	82.5	
1/2"	28.7	22.2	77.8	
3/8"	36.4	28.1	71.9	
#4	53.9	41.7	58.3	
#10	70.2	54.3	45.7	
#20	79.8	61.7	38.3	
#30	83.5	64.5	35.5	
#40	87.4	67.5	32.5	
#100	102.9	79.5	20.5	
#200	114.8	88.7	11.3	
Total Sample	129.4	100.0	0.0	

SAMPLE DATA

Initial Sample Weight (g)	129.4
Weight After Wash (g)	114.8
Loss in Weight (g)	14.6
Loss by Wash (%)	11.3%

Tested By: Kyle Tobin
Reviewed By:

Test Method: ASTM C117/C136 X AASHTO T11/T27 _____ MTM 108/109 _____

Remarks:

Respectfully Submitted:
Testing Engineers and Consultants, Inc.

Testing Engineers and Consultants, Inc.

1343 Rochester Road PO Box 249 Troy, Michigan 48099-0249
248-588-6200 or 313 T-E-S-T-I-N-G
Fax 248-588-6232

SIEVE ANALYSIS RESULTS

PROJECT: West End Rail
312 West End Street/8100 Melville Street
LOCATION: Detroit, Wayne County, Michigan
CLIENT: Crown Enterprises LLC

TEC REPORT NUMBER: 65933
DATE: 6/30/2026

Material Description: Brown Well Graded Sand With Some Gravel & Silt
Sample Source / Depth: Boring No. B-3 @ 7.5'
Sample Location:
Intended Use:

Date Sampled: 6/19/26
Sampled By: T. Nahas
TEC Lab Sample Number: 10787
Remarks:

AGGREGATE ANALYSIS

Sieve No.	Total Weight Retained	Total Percent Retained	Total Percent Passing	Specification Range
3"				
2-1/2"				
1-1/2"				
1"				
3/4"				
1/2"		0.0	100.0	
3/8"	1.8	0.7	99.3	
#4	30.8	11.2	88.8	
#10	104.4	37.9	62.1	
#20	141.5	51.3	48.7	
#30	151.7	55.0	45.0	
#40	163.7	59.4	40.6	
#100	217.4	78.9	21.1	
#200	231.2	83.9	16.1	
Total Sample	275.6	100.0	0.0	

SAMPLE DATA

Initial Sample Weight (g)	275.6
Weight After Wash (g)	231.2
Loss in Weight (g)	44.4
Loss by Wash (%)	16.1%

Tested By: Kyle Tobin
Reviewed By:

Test Method: ASTM C117/C136 X AASHTO T11/T27 _____ MTM 108/109 _____

Remarks:

Respectfully Submitted:
Testing Engineers and Consultants, Inc.

Testing Engineers & Consultants, Inc.

Mr. Andrew Falzarano
Crown Enterprises, LLC
July 1, 2026

TEC Report: 65933

SOIL DESCRIPTIONS

In order to provide uniformity throughout our projects, the following nomenclature has been adopted to describe soil characteristics:

CONSISTENCY AND RELATIVE DENSITY

COHESIVE SOILS			GRANULAR SOILS	
UNCONFINED COMPRESSIVE STRENGTH, PSF	**"N" VALUES**	**CONSISTENCY**	**"N" VALUES**	**RELATIVE DENSITY**
Below 500	0 – 2	Very Soft	0 – 4	Very Loose
500 – 1,000	3 – 4	Soft	5 – 10	Loose
1,000 – 2,000	5 – 8	Plastic	11 – 30	Medium Compact
2,000 – 4,000	9 – 15	Firm	31 – 50	Compact
4,000 – 8,000	16 – 30	Stiff	50+	Dense
8,000 – 16,000	31 – 50	Ex. Stiff		
Over 16,000	51+	Hard		

Material Types By Particle Size	**ASTM D2487**
BOULDERS	Stones Over 12" In Diameter
COBBLES	Stones 3" To 12" In Diameter
GRAVEL	#4 To 3" Diameter
COARSE SAND	#10 To #4 Sieves
MEDIUM SAND	#40 To #10 Sieves

Mr. Andrew Falzarano
Crown Enterprises, LLC
July 1, 2026

TEC Report: 65933

SOIL DESCRIPTIONS (Cont'd)

Material Types By Particle Size	ASTM D2487
FINE SAND	#200 To #40 Sieves
SILT	Minus #200 Sieve Material, Fairly Non-Plastic, Falls Below "A"-Line
CLAY	Minus #200 Sieve Material Plastic Material That Has A Tendency To Stick Together, Can Be Rolled Into Fine Rods When Moistened; Falls Above "A"-Line
PEAT	Black Organic Material Containing Partially Decayed Vegetable Matter
MARL	Fresh Water Deposits Of Calcium Carbonate, Often Containing Percentages Of Peat, Clay & Fine Sand
SWAMP BOTTOM DEPOSITS	Mixtures Of Peat, Marl, Vegetation & Fine Sand Containing Large Amounts Of Decayable Organic Material