Raceway and Packard Roads Paving Study Jericho, Vermont

Final Report and Recommendations

Prepared for:
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RACEWAY AND PACKARD ROADS
PAVING STUDY
JERICHO, VERMONT

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Table of Contents

1.0 INTRODUCTION 1
1.1 STUDY AREA 1

2.0 STUDY PROCESS 4
2.1 ROADWAY BASELINE SURVEY 4
2.2 ROADWAY PERFORMANCE REVIEW 4
2.3 ROADBED SOIL SAMPLING AND TESTING 5
2.4 TYPICAL SECTIONS FOR HMA PAVING 5

3.0 FINDINGS 6
3.1 SEGMENTAL PAVING ANALYSIS 6
3.2 PHASED PAVING PLAN STRATEGIES 8

4.0 RECOMMENDATIONS 8

LIST OF FIGURES

FIGURE 1 PACKARD RD MAP 2
FIGURE 2 RACEWAY RD MAP 3

LIST OF APPENDICES

APPENDIX A ROUTE LOGS A.1
APPENDIX B HIGHWAY & AADT DATA (VTRANS MS2 OUTPUT) B.2
APPENDIX C EXISTING ROADWAY WIDTH DATA & ANALYSIS C.3
APPENDIX D TYPICAL SECTIONS & ASSOCIATED COST DATA D.4
APPENDIX E PAVING PLAN COST ANALYSES E.5
APPENDIX F PHASED PAVING PLAN STRATEGIES F.6
APPENDIX G ATLANTIC TESTING LABORATORIES REPORT G.7

1.0 INTRODUCTION

In the interest of improving a portion of their highway network, the Town of Jericho applied for the creation of a project under the Chittenden County Regional Planning Commission (CCRPC) FY2020 Unified Planning Work Program. This request was successful, and a project was granted to perform a planning level study for analyzing the concept of paving existing gravel surface roads, and develop an implementation plan including cost estimates for Packard Road and Raceway Road in Jericho.

1.1 STUDY AREA

The project study includes two segments which are principally unpaved roads with some short Hot Mix Asphalt (HMA) paved sections within their respective corridors. The study road locations are shown in Figures 1 and 2 with attributes listed below.

1. Packard RD – Intersections: Browns Trace RD to VT 15
    - approx. overall length = 1.68 miles
    - gravel surface length = 1.28 miles
    - average surface width = 24.5 feet
    - Classification: Local – Class 3
    - 2019 average annual daily traffic (AADT) = 745
        - See APPENDIX B for details
2. Raceway RD – Intersections: VT 15 West to VT 15 East
    - approx. overall length = 1.44 miles
    - gravel surface length = 1.35 miles
    - average surface width = 23.2 feet
    - Classification: Local – Class 3
    - 2019 average annual daily traffic (AADT) = 821
        - See APPPENDIX B for details

Based on an August 2, 2019 drive through visual inspection, each of these roads could be characterized as being generally in fair to good condition with some existing ditching in-service and numerous segments overlain with tree canopy. It is noted that ditching needs and shading of the roadways may create issues for surface and subsurface drainage.

FIGURE 1

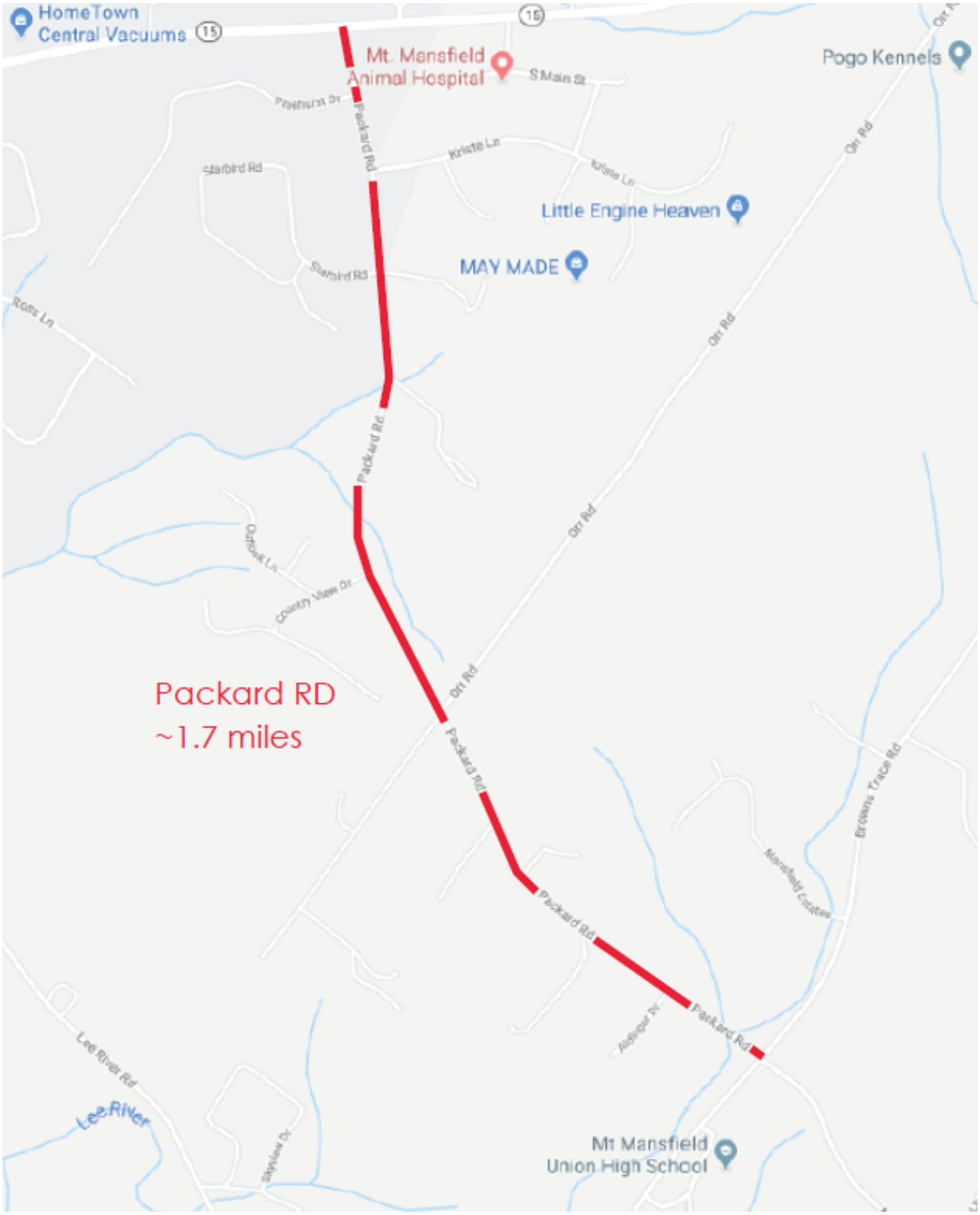

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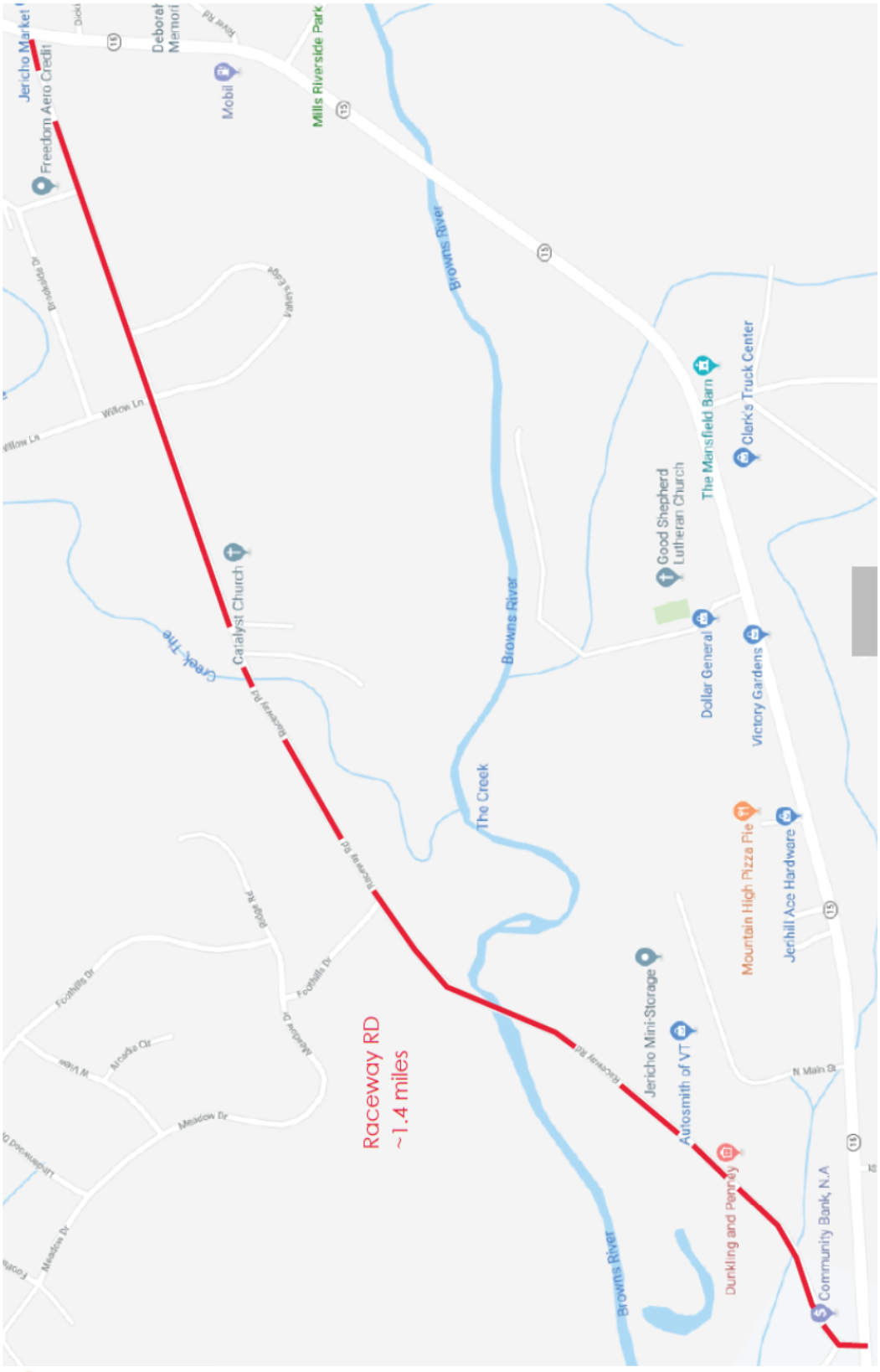
FIGURE 2



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2.0 STUDY PROCESS

With the analysis being the ultimate objective of the paving study, critical data must be collected to form the foundation of the investigation and fundamental parameters assigned as appropriate. Data collection begins the effort and the analysis completes the workflow.

Each of the major steps in the study process are described below.

2.1 ROADWAY BASELINE SURVEY

The first step in the process involved physical measurement of the length of the respective roads to establish the basis for linear referencing (aka stationing). This provides the means for developing a graphical representation of the road in the form of a straight-line diagram. These diagrams are known as a route log system and facilitate the collection and recording of roadway attributes. With that system in place other features or information of interest can be plotted with respect to the roadway centerline and spatially located on the route log. Ultimately, these simple graphics can aid in decision support for planning level studies such as the one being undertaken here.

It is noted that for this project a measuring wheel was used to complete the centerline survey and collect any other survey points of interest. While accuracy of the survey is adequate for this type of project, it is not intended for broader use in 3-dimensional detailed design.

See APPENDIX A for Packard RD and Raceway RD route logs.

2.2 ROADWAY PERFORMANCE REVIEW

A meeting was held on-site with Town public works officials who are known to be experienced with the care and maintenance of the respective roadway corridors throughout the year. The objective was to gain empirical knowledge on how these roadbeds perform in general and in particular during the winter/spring freeze-thaw periods. Even more specifically was the intent of identifying areas with a chronic history of being structurally unstable so these sites could be recognized as candidate locations for full depth improvements. Concise summaries of the information provided are plotted on the route logs at the locations where the review occurred.

Some existing culvert drainage features with potential issues were also reviewed to capture the information for inclusion within the route logs. Areas where it was thought to be possible underdrain could be beneficial were noted as well.

2.3 ROADBED SOIL SAMPLING AND TESTING

Based on the information collected through the site review with the Town, a plan was developed for soil sampling at locations believed to be of greatest interest and concern from a structural standpoint. The intent was to create a plan that would allow for completion of all necessary testing for both road segments in 1 day. Sampling and laboratory testing were completed by subconsultant Atlantic Testing Laboratories (ATL). ATL completed the field investigation on January 30, 2020 and submitted a data report of the results on February 21, 2020. Data provided in the report has been used to identify areas which may benefit from full-depth improvement and/or the installation of underdrain. This has been noted on the route logs and simplified soil characterizations (Good/Fair/Poor) have been included as well.

See APPENDIX G for the ATL data report.

2.4 TYPICAL SECTIONS FOR HMA PAVING

To support the development of sound roadway improvement budget cost estimates, simply knowing the width and depth of pavement treatment can provide the means for developing an estimate. With a given width and depth of proposed material layers a graphical representation or cross section of the treatment can be drawn. These are referred to as standard, or typical sections. Once established calculating material quantities on a unitary basis (i.e. per foot of roadway) becomes straightforward. Unit prices can then be applied to the respective material components and collectively generate a cost per foot of construction.

For this study two different typical sections were developed. The primary typical section is adding a 4" HMA surface with fine grading before paving. The more comprehensive treatment involves a full-depth improvement where past performance of a segment of the pavement structure and/or soil testing suggest its application could be warranted. For budgeting purposes and based on assessment of available information an estimated length of need is 400 linear feet for each of the respective roads.

Overall attributes for the typical sections are as follows.

- Proposed roadway total width of 24 feet: 2' shoulders (1' gravel, 1' HMA), 10' lanes
    - Available average width determined from field measurements
        - See APPENDIX C for dataset and analysis.
- 22' HMA paved width
- 4" HMA structure (VTrans standard minimum thickness for local low volume roads)

- Specific to Resurfacing typical section
    - 3" crushed gravel leveling course for fine grading all existing gravel surfaces prior to paving
- Specific to Full-Depth Improvement typical section
    - 24" deep full width roadbed excavation replaced with 24" deep new crushed gravel layer over new subgrade separator geotextile

See APPENDIX D for typical section graphics and associated cost data.

3.0 FINDINGS

This study considers planning horizons of one-year, two-years, and four-years for the evaluation of multiple budgeting scenarios. The intent of this approach is to provide an understanding on the magnitude of annual commitment of funds to complete the work of paving Packard RD and Raceway RD over various timeframes beginning with Year 1.

3.1 SEGMENTAL PAVING ANALYSIS

From a practical standpoint each of these roadways were analyzed in terms of cost as either a single segment project (full length of paving need) or a two-segment project providing the opportunity to be completed in different years. The Packard RD and Raceway RD cost analyses and associated segment attributes are summarized in the following list. Additionally, it is noted that for budgeting purposes an estimate per roadway of $15,000 for underdrain and $5,000 for culvert replacement is warranted based on topography, empirical feedback by the Town, and soil conditions encountered,

- **Packard RD**
    - *Single segment project*
        - Length = 6,767 feet (1.28 miles)
          [STA 0+00 (Browns Trace RD) – STA 67+67 (HMA joint near VT 15)]
        - Current estimated cost = **$412,066**

- *Two segment project*

  - ***Segment 1*** Length = 3,467 feet (0.66 miles)
    [STA 33+00 (south of Orr RD) – STA 67+67 (HMA joint near VT 15)]

  - Current ***Segment 1*** estimated cost = **$210,482**

  - ***Segment 2*** Length = 3,300 feet (0.63 miles)
    [STA 0+00 (Browns Trace RD) – STA 33+00 (south of Orr RD)]

  - Current ***Segment 2*** estimated cost = **$201,584**

- **Raceway RD**

  - *Single segment project*

    - Length = 7,127 feet (1.35 miles)
      [STA 0+00 (VT 15) – STA 22+80 (bridge approach West)], and
      [(STA 25+68 (bridge approach East) – STA 30+83 (Foothills DR West)], and [(STA 32+50 (Foothills DR East) – STA 75+82 (VT 15)]

    - Current estimated cost = **$431,248**

  - *Two segment project*

    - ***Segment 1*** Length = 4,332 feet (0.82 miles)
      [(STA 32+50 (Foothills DR East) – STA 75+82 (VT 15)]

    - Current ***Segment 1*** estimated cost = **$256,573**

    - ***Segment 2*** Length = 2,795 feet (0.53 miles)
      [STA 0+00 (VT 15) – STA 22+80 (bridge approach West)], and
      [(STA 25+68 (bridge approach East) – STA 30+83 (Foothills DR West)]

    - Current ***Segment 2*** estimated cost = **$174,675**

See APPENDIX E for details on the paving plan cost analyses summarized here.

3.2 PHASED PAVING PLAN STRATEGIES

With viable potential projects and their respective costs understood various strategies can be developed which illustrate budgetary requirements for phasing the implementation of the projects in different combinations, or packages. Ultimately that will provide the Town of Jericho with the tools needed to determine the most reasonable timeframe for funding construction. A summary of the strategies developed for consideration are listed below. It is noted that for any project proposed for construction after the current year, or Year 1, the cost is subject to a 5% escalation for each year beyond Year 1.

- **Strategy 1 (1 Year Plan)**
  - Complete all necessary paving for Packard RD and Raceway RD in Year 1
  - Approximate total cost = **$850,000**
  - Average annual budget cost = **$850,000**
- **Strategy 2 (2 Year Plan)**
  - Complete all necessary paving for Packard RD Year 1 and Raceway RD Year 2
  - Approximate total cost = **$875,000**
  - Average annual budget cost = **$437,500**
- **Strategy 3 (4 Year Plan A)**
  - Complete Packard RD Year 1 and Year 2, Raceway RD Year 3 and Year 4
  - Approximate total cost = **$925,000**
  - Average annual budget cost = **$231,250**
- **Strategy 4 (4 Year Plan B)**
  - Complete Raceway RD Year 1 and Year 2, Packard RD Year 3 and Year 4
  - Approximate total cost = **$925,000**
  - Average annual budget cost = **$231,250**

See APPENDIX F for additional information on the phased paving plan strategies.

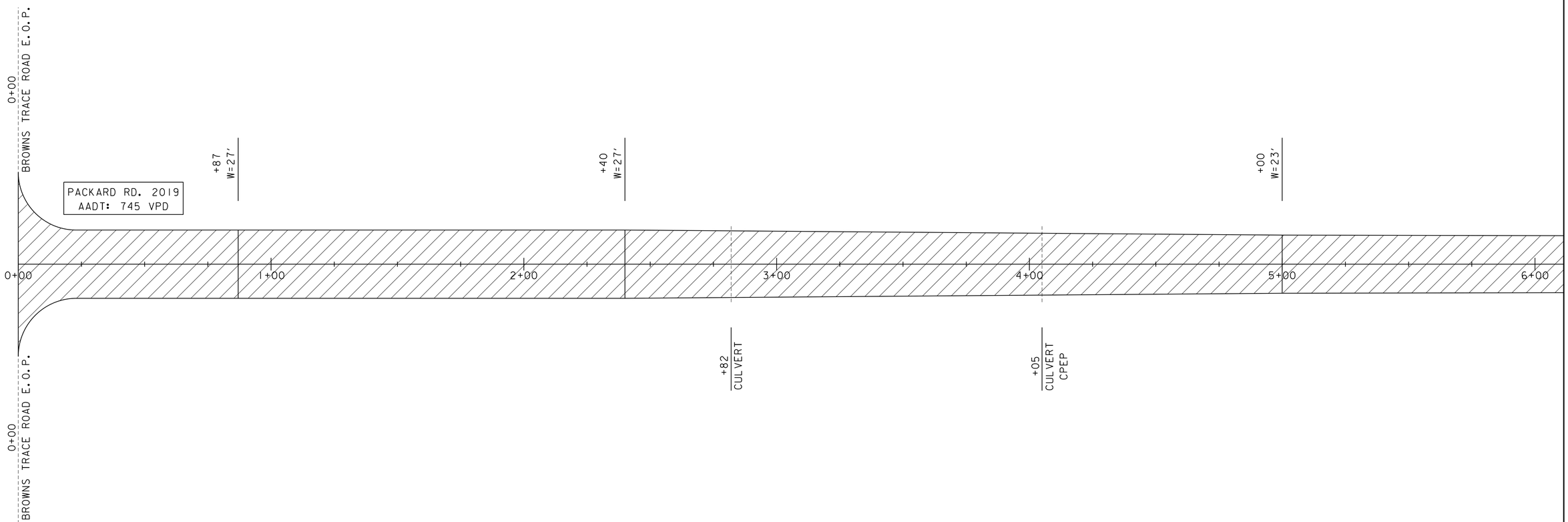
4.0 RECOMMENDATIONS

As expected, any of the phased plans with proposed construction closer to the current year (Year 1) should come at a lower total cost with less exposure to cost escalation. Based on that and recognizing it could take multiple budget cycles to fund the improvements it is recommended to commence the budgetary process as soon as possible. Ideally the plan that comes with the lowest total cost should be the most desirable at face value. However, to secure local support earlier in the process it may be best to target the strategy that is believed to be more reasonably affordable on an annual cost basis. If that is the case pursuit of a 4 Year Plan is clearly a legitimate strategy. It is worth noting that if implementation is deferred more than 2 to 3 years from today then it is recommended that budget provisions be made to revise the scope to include wearing course resurfacing of the existing paved segments within the Packard RD and Raceway RD corridors.

Appendix A ROUTE LOGS

PACKARD ROAD
TOTAL EXISTING
GRAVEL AREA (SF) = 164447

STA. 0+00 TO 67+67 (GRAVEL AREA)



GENERAL LEGEND

B-# = STANDARD PENETRATION BORING (APPROXIMATE STATIONS SHOWN)

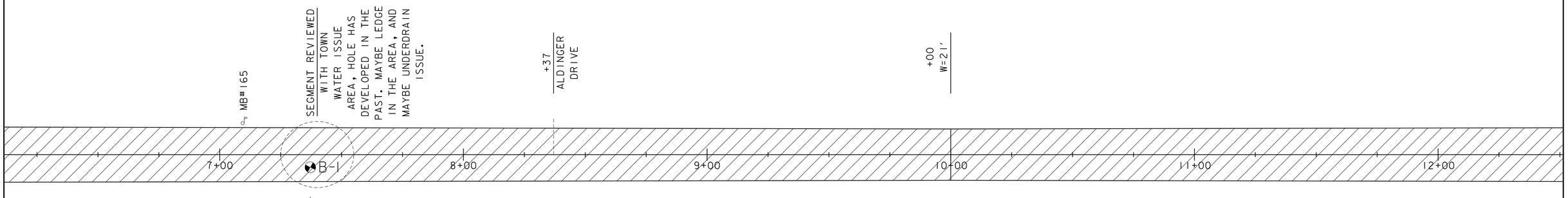
------ = EXISTING CULVERT

= EXISTING UTILITY POLE

Stantec

PROJECT NAME:	JERICHO PAVING
PROJECT NUMBER:	N/A
FILE NAME: Packard Road.dgn	PLOT DATE: 4/8/2020
PROJECT LEADER: G. EDWARDS	DRAWN BY: D. DRAPER
DESIGNED BY: D. DRAPER	CHECKED BY: M. FOWLER
PACKARD ROAD ROAD ROUTE LOG PLAN SHEETS	SHEET 3 OF 28

PACKARD ROAD



+37
BORING
LOG

B-1
SOIL CONDITIONS AT DEPTH
0'-2' FAIR
2'-4' FAIR/POOR
4'-6' FAIR
UNDERDRAIN POTENTIAL
FULL-DEPTH SEGMENT CANDIDATE

Stantec

PROJECT NAME:	JERICHO PAVING
PROJECT NUMBER:	N/A
FILE NAME: Packard Road.dgn	PLOT DATE: 4/8/2020
PROJECT LEADER: G. EDWARDS	DRAWN BY: D. DRAPER
DESIGNED BY: D. DRAPER	CHECKED BY: M. FOWLER
PACKARD ROAD ROUTE LOG PLAN SHEET 2	SHEET 4 OF 28

PACKARD ROAD

SEGMENT REVIEWED WITH TOWN 15" CMP HAS CLOGGING ISSUES, COULD BE TOO SMALL FOR HANDLING WATER COMING OFF THE HILL

+00
W=23'

13+00 14+00 15+00 16+00 17+00 18+00

+77
CULVERT
15" CMP

PROJECT NAME:	JERICHO PAVING
PROJECT NUMBER:	N/A
FILE NAME: Packard Road.dgn	PLOT DATE: 4/8/2020
PROJECT LEADER: G. EDWARDS	DRAWN BY: D. DRAPER
DESIGNED BY: D. DRAPER	CHECKED BY: M. FOWLER
PACKARD ROAD ROUTE LOG PLAN SHEET 3	SHEET 5 OF 28

Stantec

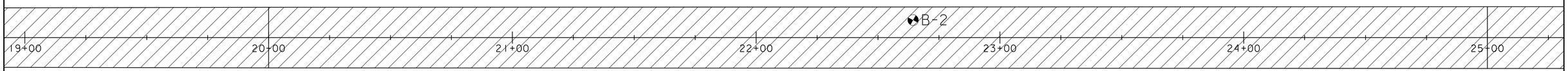
PACKARD ROAD

B-2
SOIL CONDITIONS AT DEPTH
0'-2' GOOD/FAIR
2'-4' FAIR/POOR
4'-6' FAIR/POOR
UNDERDRAIN POTENTIAL

+00
W=25'

+64
BORING
LOG

+00
W=25.5'



Stantec

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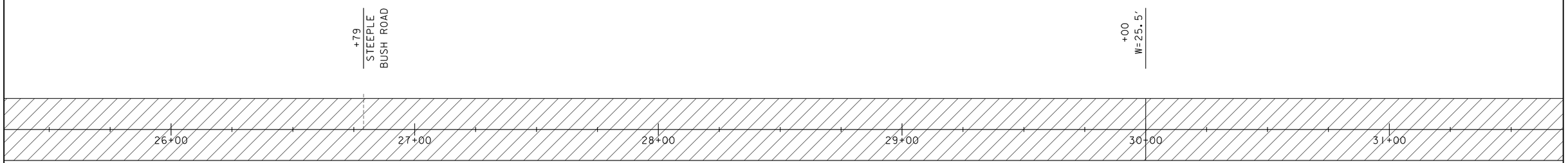
FILE NAME: Packard Road.dgn	PLOT DATE: 4/8/2020
PROJECT LEADER: G. EDWARDS	DRAWN BY: D. DRAPER
DESIGNED BY: D. DRAPER	CHECKED BY: M. FOWLER
PACKARD ROAD ROUTE LOG PLAN SHEET 4	SHEET 6 OF 28

PACKARD ROAD



Stantec

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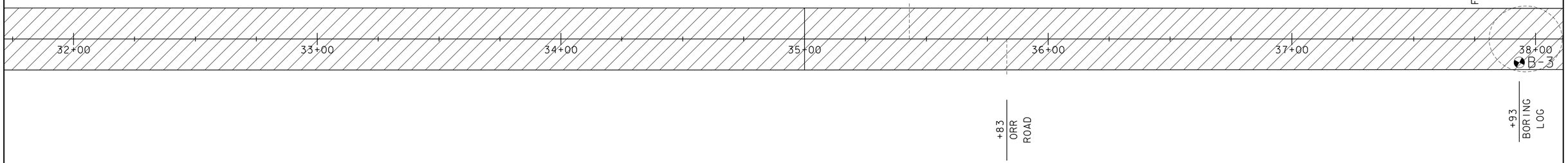
PROJECT NUMBER:	N/A
FILE NAME: Packard Road.dgn	PLOT DATE: 4/8/2020
PROJECT LEADER: G. EDWARDS	DRAWN BY: D. DRAPER
DESIGNED BY: D. DRAPER	CHECKED BY: M. FOWLER
PACKARD ROAD ROUTE LOG PLAN SHEET 5	SHEET 7 OF 28

PACKARD ROAD



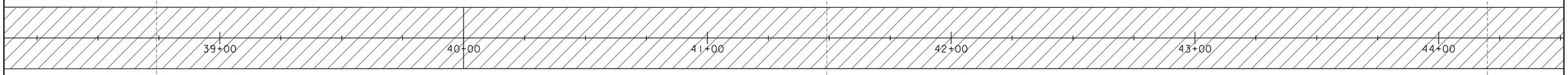
B-3
SOIL CONDITIONS AT DEPTH
0'-2' FAIR
2'-4' FAIR
4'-6' FAIR/POOR
UNDERDRAIN POTENTIAL
FULL-DEPTH SEGMENT CANDIDATE

Stantec

PROJECT NAME:	JERICHO PAVING
PROJECT NUMBER:	N/A
FILE NAME: Packard Road.dgn	PLOT DATE: 4/8/2020
PROJECT LEADER: G. EDWARDS	DRAWN BY: D. DRAPER
DESIGNED BY: D. DRAPER	CHECKED BY: M. FOWLER
PACKARD ROAD ROUTE LOG PLAN SHEET 6	SHEET 8 OF 28

PACKARD ROAD

+00
W=25'



+74
CULVERT
24" CPEP

+49
CULVERT
CPEP

+20
CULVERT

Stantec

PROJECT NAME: JERICHO PAVING	
PROJECT NUMBER: N/A	
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PROJECT LEADER: G. EDWARDS	DRAWN BY: D. DRAPER
DESIGNED BY: D. DRAPER	CHECKED BY: M. FOWLER
PACKARD ROAD ROUTE LOG PLAN SHEET 7	SHEET 9 OF 28

PACKARD ROAD

+00
W=25'

+45
COUNTRY
VIEW DRIVE

+00
W=25'

45+00 46+00 47+00 48+00 49+00 50+00

Stantec

PROJECT NAME:	JERICHO PAVING
PROJECT NUMBER:	N/A

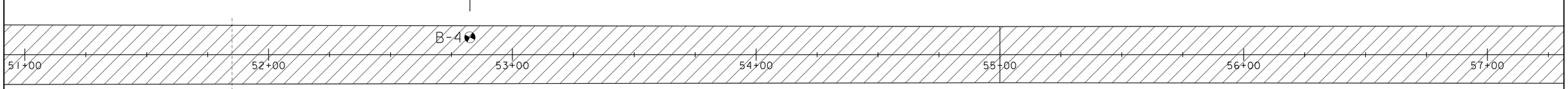
FILE NAME: Packard Road.dgn	PLOT DATE: 4/8/2020
PROJECT LEADER: G. EDWARDS	DRAWN BY: D. DRAPER
DESIGNED BY: D. DRAPER	CHECKED BY: M. FOWLER
PACKARD ROAD ROUTE LOG PLAN SHEET 8	SHEET 10 OF 28

PACKARD ROAD

B-4
SOIL CONDITIONS AT DEPTH
0'-2' GOOD/FAIR
2'-4' POOR
4'-6' FAIR
UNDERDRAIN POTENTIAL
FULL-DEPTH SEGMENT CANDIDATE

+82
BORING
LOG

+00
W=23'



+85
CULVERT

Stantec

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PROJECT LEADER: G. EDWARDS	DRAWN BY: D. DRAPER
DESIGNED BY: D. DRAPER	CHECKED BY: M. FOWLER
PACKARD ROAD ROUTE LOG PLAN SHEET 9	SHEET 11 OF 28

PACKARD ROAD

SEGMENT REVIEWED WITH TOWN
15" CULVERT FREEZES UP THEN OVERFLOWS ONTO THE ROAD

+00
W=24'

+33
JULIAN LANE (PRIVATE)

58+00 | 59+00 | 60+00 | 61+00 | 62+00 | 63+00

+58
CULVERT 15" CMP

+80
CULVERT

+40
PONDVIEW DRIVE (PRIVATE)

Stantec

PROJECT NAME:	JERICHO PAVING
PROJECT NUMBER:	N/A
FILE NAME: Packard Road.dgn	PLOT DATE: 4/8/2020
PROJECT LEADER: G. EDWARDS	DRAWN BY: D. DRAPER
DESIGNED BY: D. DRAPER	CHECKED BY: M. FOWLER
PACKARD ROAD ROUTE LOG PLAN SHEET 10	SHEET 12 OF 28

PACKARD ROAD
TOTAL EXISTING
PAVED AREA (SF) = 52723
STA. 67+67 TO 88+96 (PAVED AREA)

+00
W=22'

+67
W=25.5'
BEGIN
PVT. JOINT

+00
W=25'
STARBIRD

64+00 65+00 66+00 67+00 68+00 69+00 70+00

+00
BLACK WALNUT
ROAD

Stantec

PROJECT NAME: JERICHO PAVING	
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FILE NAME: Packard Road.dgn	PLOT DATE: 4/8/2020
PROJECT LEADER: G. EDWARDS	DRAWN BY: D. DRAPER
DESIGNED BY: D. DRAPER	CHECKED BY: M. FOWLER
PACKARD ROAD ROUTE LOG PLAN SHEET II	SHEET 13 OF 28

PACKARD ROAD

ROAD

+00
W=23'

71+00 72+00 73+00 74+00 75+00 76+00

Stantec

PROJECT NAME: JERICHO PAVING	
PROJECT NUMBER: N/A	
FILE NAME: Packard Road.dgn	PLOT DATE: 4/8/2020
PROJECT LEADER: G. EDWARDS	DRAWN BY: D. DRAPER
DESIGNED BY: D. DRAPER	CHECKED BY: M. FOWLER
PACKARD ROAD ROUTE LOG PLAN SHEET 12	SHEET 14 OF 28

PACKARD ROAD

+00
W=24.5'

77+00 78+00 79+00 80+00 81+00 82+00

+07
KRISTE
LANE

Stantec

PROJECT NAME:	JERICHO PAVING
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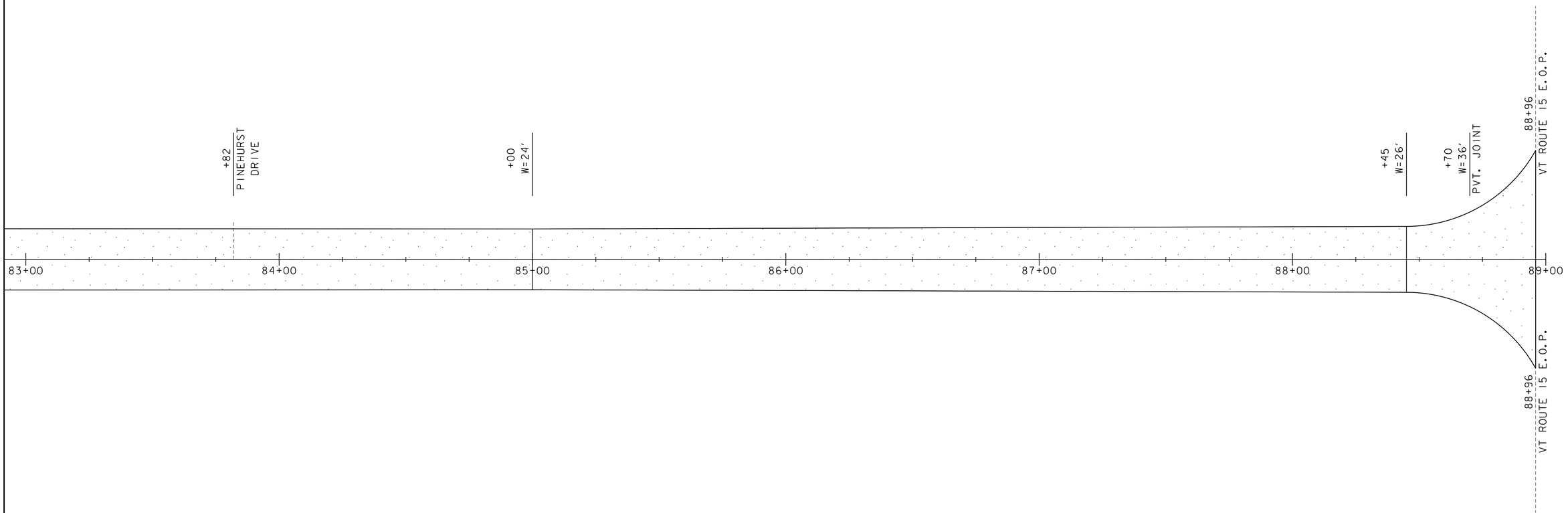
PROJECT LEADER: G. EDWARDS	DRAWN BY: D. DRAPER
DESIGNED BY: D. DRAPER	CHECKED BY: M. FOWLER
PACKARD ROAD ROUTE LOG PLAN SHEET 13	SHEET 15 OF 28

PACKARD ROAD



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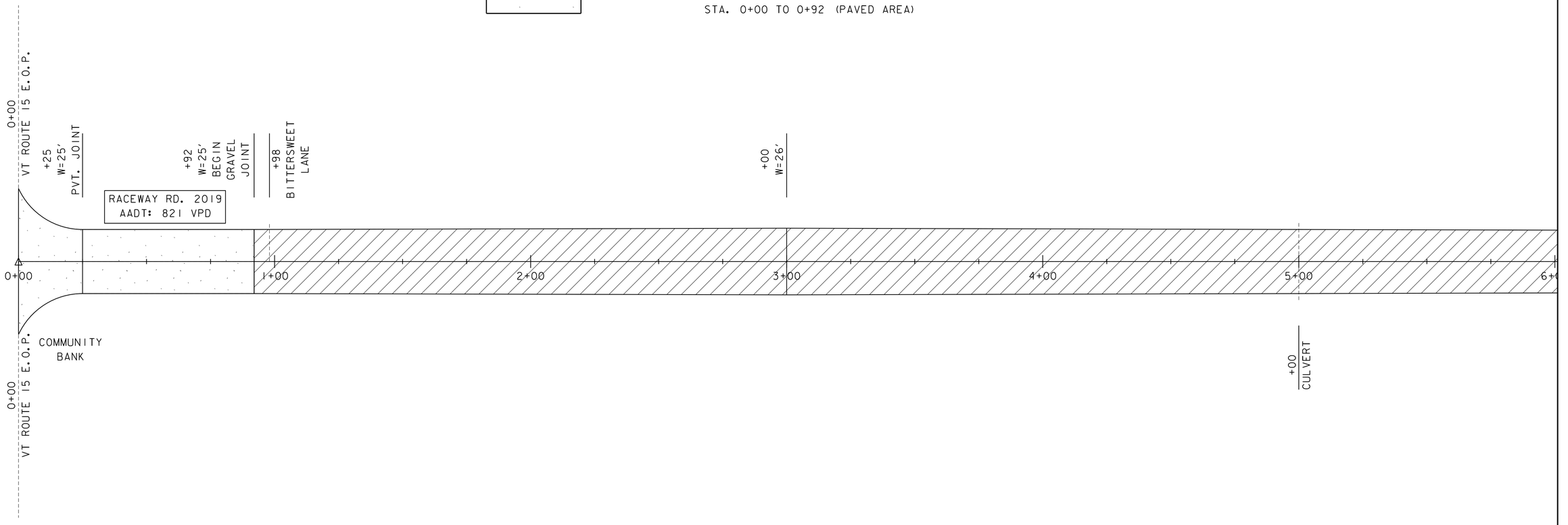
DESIGNED BY: D. DRAPER	CHECKED BY: M. FOWLER
PACKARD ROAD ROUTE LOG PLAN SHEET 14	SHEET 16 OF 28

RACEWAY ROAD
TOTAL EXISITNG
GRAVEL AREA (SF) = 157989
STA. 0+92 TO 22+80 (GRAVEL AREA)

RACEWAY ROAD
EXISTING PAVED AREA (SF) = 2525
STA. 0+00 TO 0+92 (PAVED AREA)



GENERAL LEGEND

B-# = STANDARD PENETRATION BORING (APPROXIMATE STATIONS SHOWN)

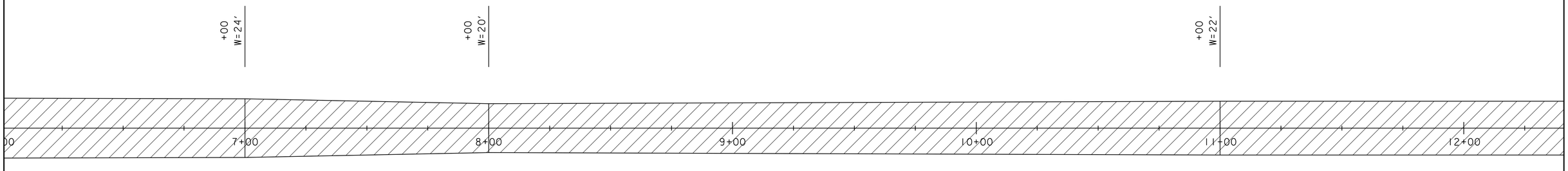
------ = EXISTING CULVERT

= EXISTING UTILITY POLE

Stantec

PROJECT NAME:	JERICHO PAVING
PROJECT NUMBER:	N/A
FILE NAME: Raceway Road.dgn	PLOT DATE: 4/8/2020
PROJECT LEADER: G. EDWARDS	DRAWN BY: D. DRAPER
DESIGNED BY: D. DRAPER	CHECKED BY: M. FOWLER
RACEWAY ROAD ROUTE LOG PLAN SHEET 1	SHEET 17 OF 28

RACEWAY ROAD



Stantec

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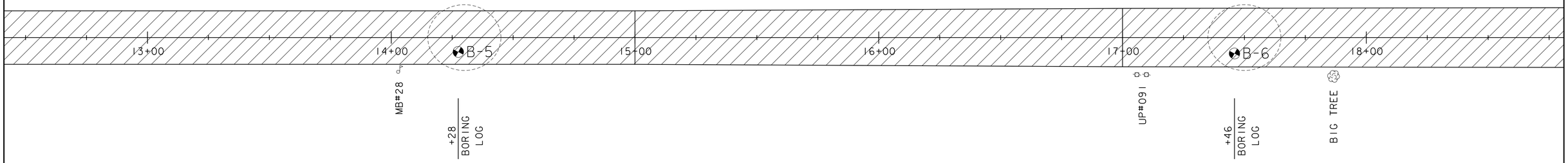
PROJECT LEADER: G. EDWARDS	DRAWN BY: D. DRAPER
DESIGNED BY: D. DRAPER	CHECKED BY: M. FOWLER
RACEWAY ROAD ROUTE LOG PLAN SHEET 2	SHEET 18 OF 28

RACEWAY ROAD



B-5
SOIL CONDITIONS AT DEPTH
0'-2' GOOD/FAIR
2'-4' GOOD/FAIR
4'-6' GOOD/POOR
UNDERDRAIN POTENTIAL
POSSIBLE MATERIAL DISPARITY

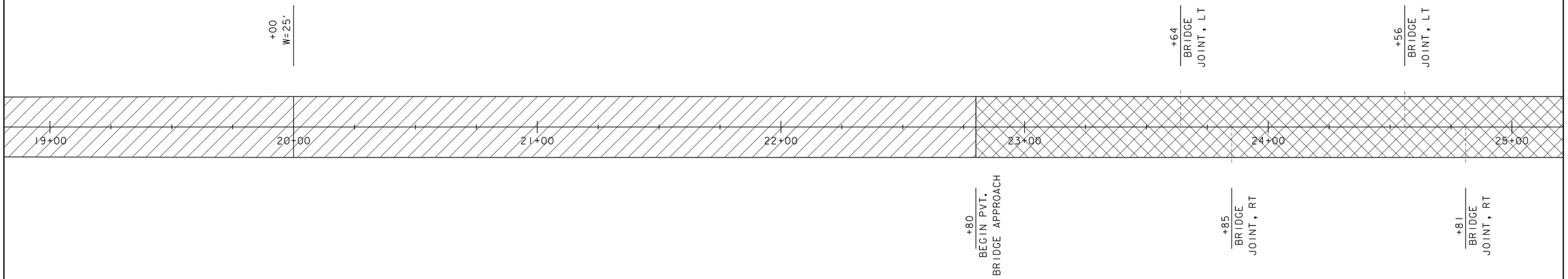
B-6
SOIL CONDITIONS AT DEPTH
0'-2' GOOD/FAIR
2'-4' POOR
4'-6' GOOD/FAIR
UNDERDRAIN POTENTIAL
FULL-DEPTH SEGMENT CANDIDATE

Stantec

PROJECT NAME:	JERICHO PAVING
PROJECT NUMBER:	N/A
FILE NAME: Raceway Road.dgn	PLOT DATE: 4/8/2020
PROJECT LEADER: G. EDWARDS	DRAWN BY: D. DRAPER
DESIGNED BY: D. DRAPER	CHECKED BY: M. FOWLER
RACEWAY ROAD ROUTE LOG PLAN SHEET 3	SHEET 19 OF 28

RACEWAY ROAD
TOTAL EXISITNG
GRAVEL AREA (SF) = 157989
STA. 0+92 TO 22+80 (GRAVEL AREA)

RACEWAY ROAD
EXISTING BRIDGE
AREA (SF) = 7200
STA. 22+80 TO 25+68 (EXISTING CONCRETE BRIDGE DECK AND PAVED APPROACH)



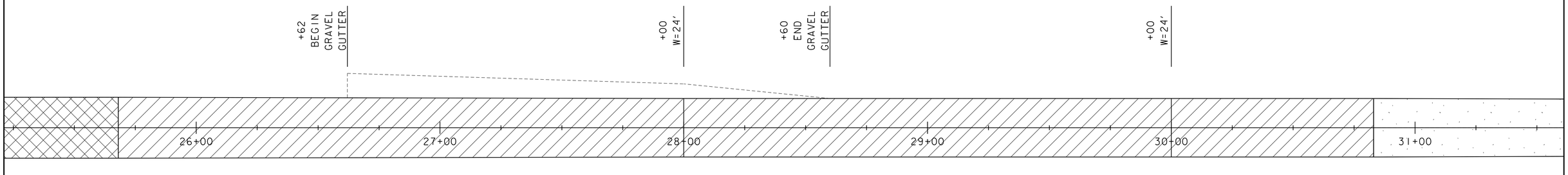
Stantec

PROJECT NAME: JERICHO PAVING	
PROJECT NUMBER: N/A	
FILE NAME: Raceway Road.dgn	PLOT DATE: 4/8/2020
PROJECT LEADER: G. EDWARDS	DRAWN BY: D. DRAPER
DESIGNED BY: D. DRAPER	CHECKED BY: M. FOWLER
RACEWAY ROAD ROUTE LOG PLAN SHEET 4	SHEET 20 OF 28

RACEWAY ROAD
TOTAL EXISITNG
GRAVEL AREA (SF) = 157989
STA. 25+68 TO 30+83 (GRAVEL AREA)

RACEWAY ROAD
EXISTING FOOTHILLS DRIVE
PAVED AREA (SF) = 3925
STA. 30+83 TO 32+50 (PAVED AREA)

RACEWAY ROAD
EXISTING BRIDGE
AREA (SF) = 7200
STA. 22+80 TO 25+68 (EXISTING CONCRETE BRIDGE DECK AND PAVED APPROACH)

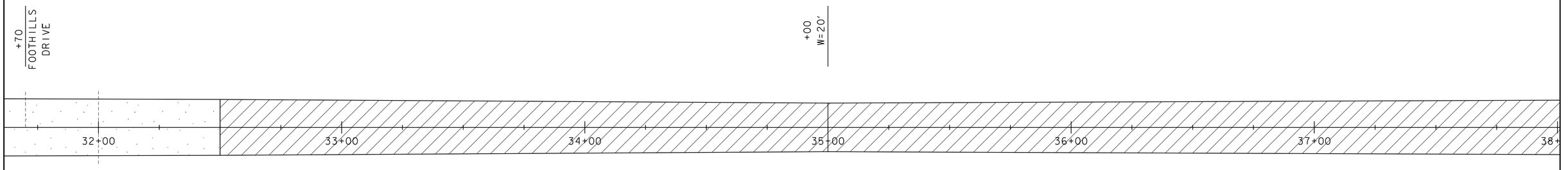


Stantec

PROJECT NAME: JERICHO PAVING	
PROJECT NUMBER: N/A	
FILE NAME: Raceway Road.dgn	PLOT DATE: 4/8/2020
PROJECT LEADER: G. EDWARDS	DRAWN BY: D. DRAPER
DESIGNED BY: D. DRAPER	CHECKED BY: M. FOWLER
RACEWAY ROAD ROUTE LOG PLAN SHEET 5	SHEET 21 OF 28

RACEWAY ROAD
TOTAL EXISITNG
GRAVEL AREA (SF) = 157989
STA. 32+50 TO 75+40 (GRAVEL AREA)

RACEWAY ROAD
EXISTING FOOTHILLS DRIVE
PAVED AREA (SF) = 3925
STA. 30+83 TO 32+50 (PAVED AREA)



Stantec

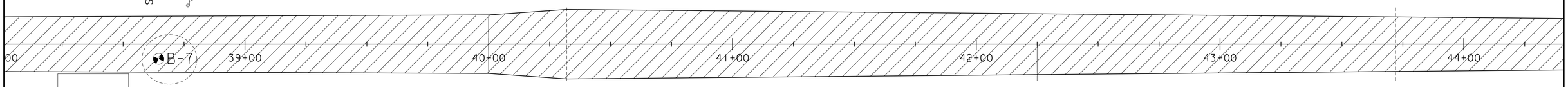
PROJECT NAME: JERICHO PAVING	
PROJECT NUMBER: N/A	
FILE NAME: Raceway Road.dgn	PLOT DATE: 4/8/2020
PROJECT LEADER: G. EDWARDS	DRAWN BY: D. DRAPER
DESIGNED BY: D. DRAPER	CHECKED BY: M. FOWLER
RACEWAY ROAD ROUTE LOG PLAN SHEET 6	SHEET 22 OF 28

RACEWAY ROAD

SEGMENT REVIEWED WITH TOWN APPROX. WIDTGH 10'-0" RIGHT SIDE SOFT SPOT, AND MOUND FORMS IN THE SPRING, THEN TURNS REALLY HARD.

MB#79

+00
W=20'



OLD BARN

+65
BORING LOG

+32
W=28.5'
RCP
CULVERT

+25
GAS VALVES

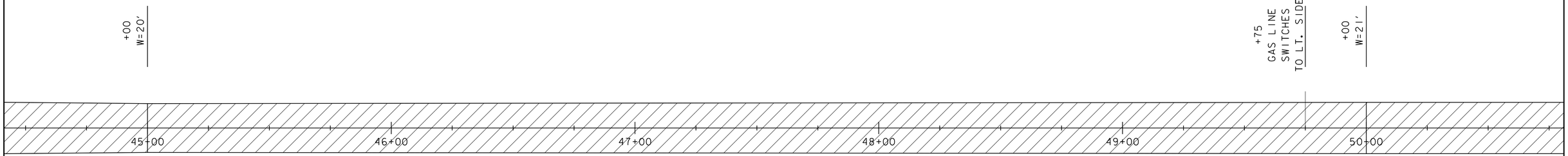
+72
CENTER OF BRIDGE
CONC. RCP

B-7
SOIL CONDITIONS AT DEPTH
0'-2' FAIR
2'-4' GOOD/FAIR
4'-6' FAIR
UNDERDRAIN POTENTIAL
POSSIBLE MATERIAL DISPARITY

Stantec

PROJECT NAME:	JERICHO PAVING
PROJECT NUMBER:	N/A
FILE NAME: Raceway Road.dgn	PLOT DATE: 4/8/2020
PROJECT LEADER: G. EDWARDS	DRAWN BY: D. DRAPER
DESIGNED BY: D. DRAPER	CHECKED BY: M. FOWLER
RACEWAY ROAD ROUTE LOG PLAN SHEET 7	SHEET 23 OF 28

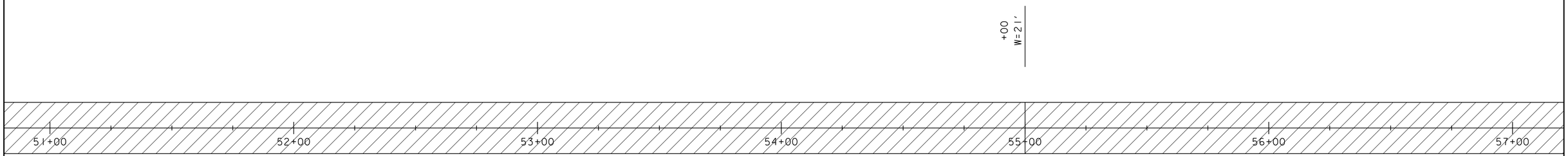
RACEWAY ROAD



Stantec

PROJECT NAME: JERICHO PAVING	
PROJECT NUMBER: N/A	
FILE NAME: Raceway Road.dgn	PLOT DATE: 4/8/2020
PROJECT LEADER: G. EDWARDS	DRAWN BY: D. DRAPER
DESIGNED BY: D. DRAPER	CHECKED BY: M. FOWLER
RACEWAY ROAD ROUTE LOG PLAN SHEET 8	SHEET 24 OF 28

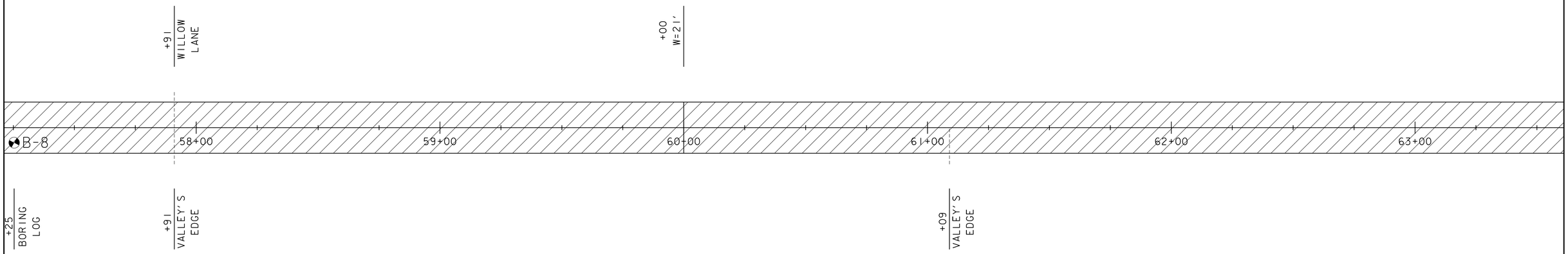
RACEWAY ROAD



Stantec

PROJECT NAME: JERICHO PAVING	
PROJECT NUMBER: N/A	
FILE NAME: Raceway Road.dgn	PLOT DATE: 4/8/2020
PROJECT LEADER: G. EDWARDS	DRAWN BY: D. DRAPER
DESIGNED BY: D. DRAPER	CHECKED BY: M. FOWLER
RACEWAY ROAD ROUTE LOG PLAN SHEET 9	SHEET 25 OF 28

RACEWAY ROAD

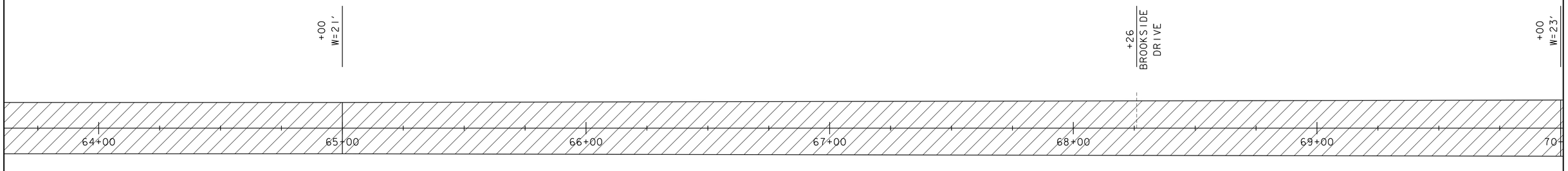


B-8
SOIL CONDITIONS AT DEPTH
0'-2' GOOD/FAIR
2'-4' FAIR/POOR
4'-6' FAIR/POOR
UNDERDRAIN POTENTIAL

Stantec

PROJECT NAME:	JERICHO PAVING
PROJECT NUMBER:	N/A
FILE NAME: Raceway Road.dgn	PLOT DATE: 4/8/2020
PROJECT LEADER: G. EDWARDS	DRAWN BY: D. DRAPER
DESIGNED BY: D. DRAPER	CHECKED BY: M. FOWLER
RACEWAY ROAD ROUTE LOG PLAN SHEET 10	SHEET 26 OF 28

RACEWAY ROAD

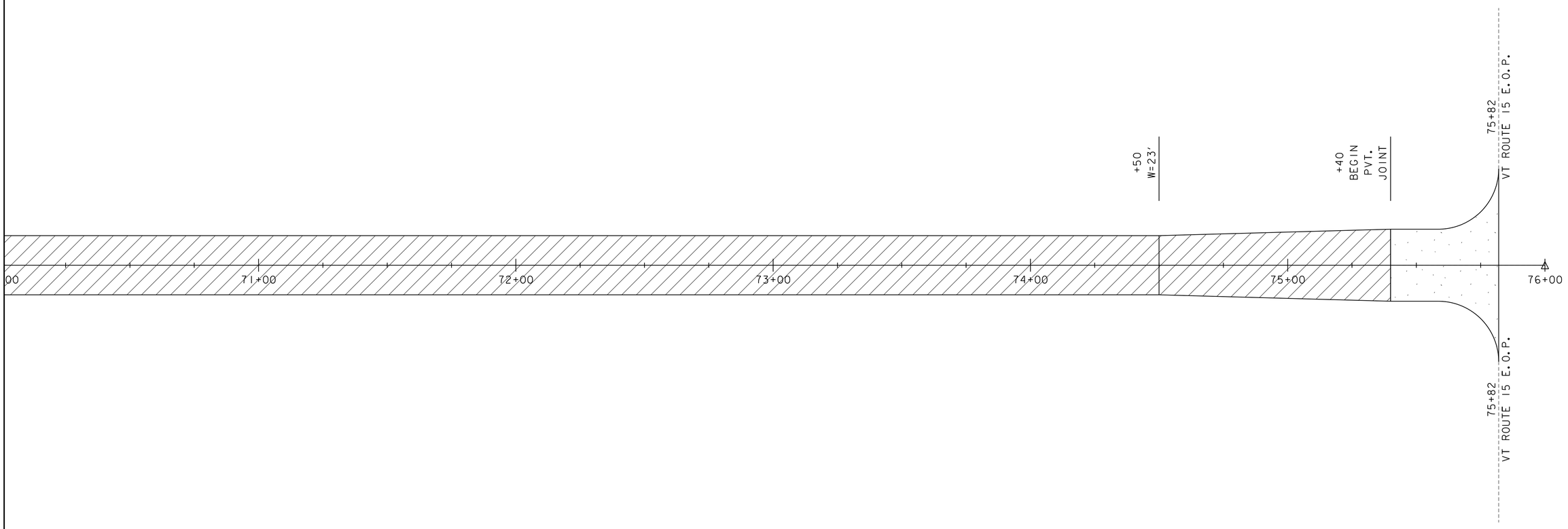


Stantec

PROJECT NAME: JERICHO PAVING	
PROJECT NUMBER: N/A	
FILE NAME: Raceway Road.dgn	PLOT DATE: 4/8/2020
PROJECT LEADER: G. EDWARDS	DRAWN BY: D. DRAPER
DESIGNED BY: D. DRAPER	CHECKED BY: M. FOWLER
RACEWAY ROAD ROUTE LOG PLAN SHEET II	SHEET 27 OF 28

RACEWAY ROAD
TOTAL EXISITNG
GRAVEL AREA (SF) = 157989
STA. 32+50 TO 75+40 (GRAVEL AREA)

RACEWAY ROAD
EXISTING PAVED AREA (SF) = 1413
STA. 75+40 TO 75+82 (PAVED AREA)



Stantec

PROJECT NAME: JERICHO PAVING	
PROJECT NUMBER: N/A	
FILE NAME: Raceway Road.dgn	PLOT DATE: 4/8/2020
PROJECT LEADER: G. EDWARDS	DRAWN BY: D. DRAPER
DESIGNED BY: D. DRAPER	CHECKED BY: M. FOWLER
RACEWAY ROAD ROUTE LOG PLAN SHEET 12	SHEET 28 OF 28

Appendix B HIGHWAY & AADT DATA (VTRANS MS2 OUTPUT)

Location ID	DZCB	MPO ID	JERI07
Type	SPOT	HPMS ID	
On NHS	No	On HPMS	No
LRS ID	L0409003015	LRS Loc Pt.	0.6
SF Group	3	Route Type	
AF Group	U7	Route	
GF Group		Active	Yes
Class Dist Grp		Category	
Seas Clss Grp			
WIM Group			
QC Group	Default		
Fnct'l Class	Local	Milepost	
Located On	PACKARD RD		
Loc On Alias	TH15		
BETWEEN	STARBIRD RD AND COUNTRY VIEW DR		

More Detail

STATION DATA

Directions: 2-WAY | EB | WB

AADT

	Year	AADT	DHV-30	K %	D %	PA	BC	Src
	2019	745						

Travel Demand Model

	Model Year	Model AADT	AM PHV	AM PPV	MD PHV	MD PPV	PM PHV	PM PPV	NT PHV	NT PPV

VOLUME COUNT

	Date	Int	Total
	Tue 8/6/2019	60	625
	Mon 8/5/2019	60	794
	Sun 8/4/2019	60	548
	Sat 8/3/2019	60	587
	Fri 8/2/2019	60	905
	Thu 8/1/2019	60	971
	Wed 7/31/2019	60	819
	Tue 7/30/2019	60	844
	Mon 7/29/2019	60	967
	Sun 7/28/2019	60	595

|<< < > >>| 1-10 of 12

mm/dd/yyyy To Date

VOLUME TREND

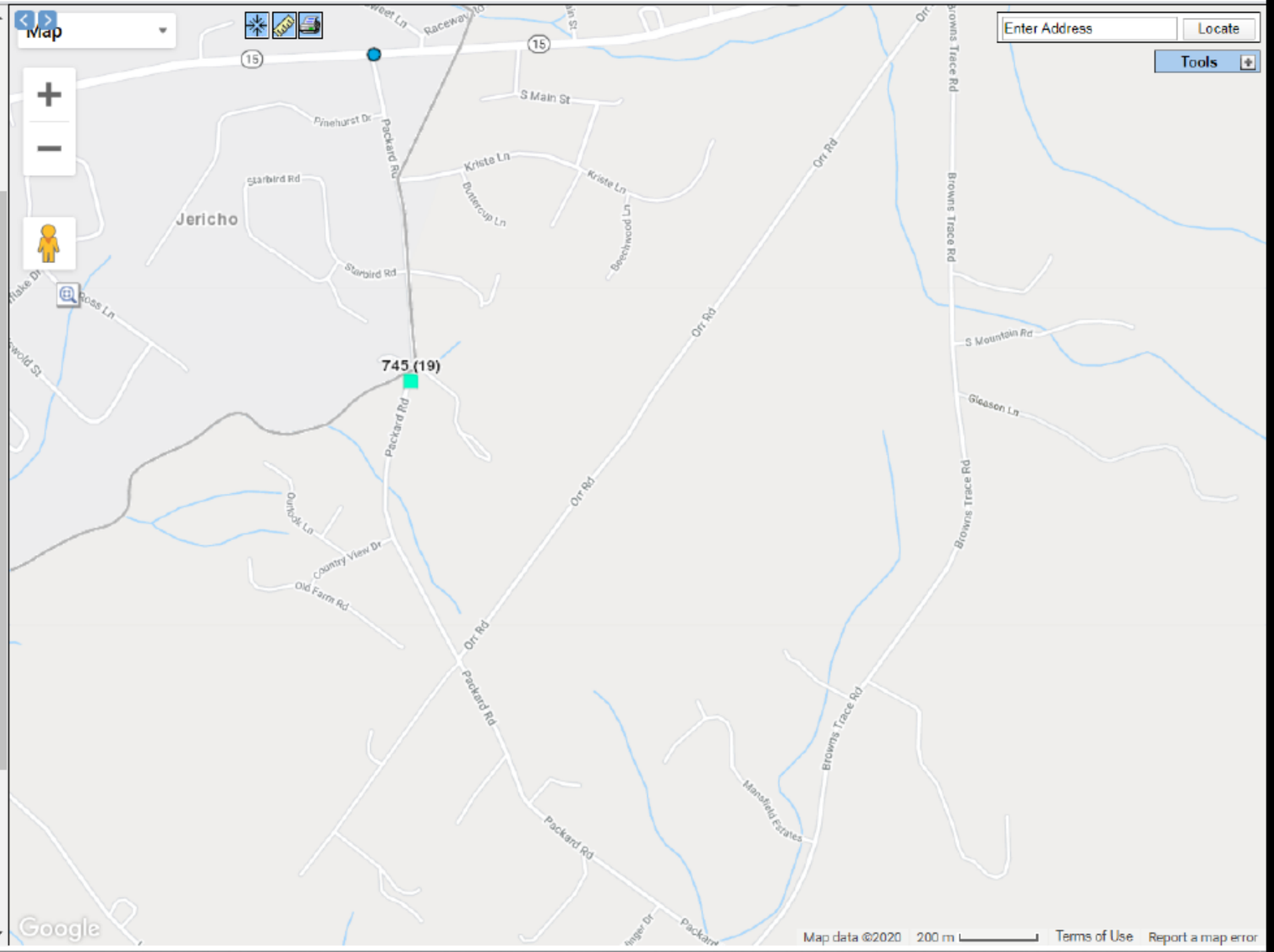
Year	Annual Growth

SPEED

	Date	Int	Pace	85th	Total
No Data					

CLASSIFICATION

	Date	Int	Total
No Data			



Location ID	DZBU	MPO ID	JERI06
Type	SPOT	HPMS ID	
On NHS	No	On HPMS	No
LRS ID	L0409003013	LRS Loc Pt.	0.75
SF Group	3	Route Type	
AF Group	U7	Route	
GF Group	2	Active	Yes
Class Dist Grp		Category	
Seas Clss Grp			
WIM Group			
QC Group	Default		
Fnct'l Class	Local	Milepost	
Located On	RACEWAY RD		
Loc On Alias	TH59		
BETWEEN	FOOTHILLS DR AND WILLOW LN		
More Detail			

STATION DATA

Directions: 2-WAY | EB | WB

AADT

	Year	AADT	DHV-30	K %	D %	PA	BC	Src
	2019	821						

Travel Demand Model

	Model Year	Model AADT	AM PHV	AM PPV	MD PHV	MD PPV	PM PHV	PM PPV	NT PHV	NT PPV

VOLUME COUNT

	Date	Int	Total
	Mon 7/15/2019	60	802
	Sun 7/14/2019	60	521
	Sat 7/13/2019	60	507
	Fri 7/12/2019	60	788
	Thu 7/11/2019	60	1,009
	Wed 7/10/2019	60	1,802
	Tue 7/9/2019	60	708

VOLUME TREND

Year	Annual Growth

SPEED

	Date	Int	Pace	85th	Total
No Data					

CLASSIFICATION

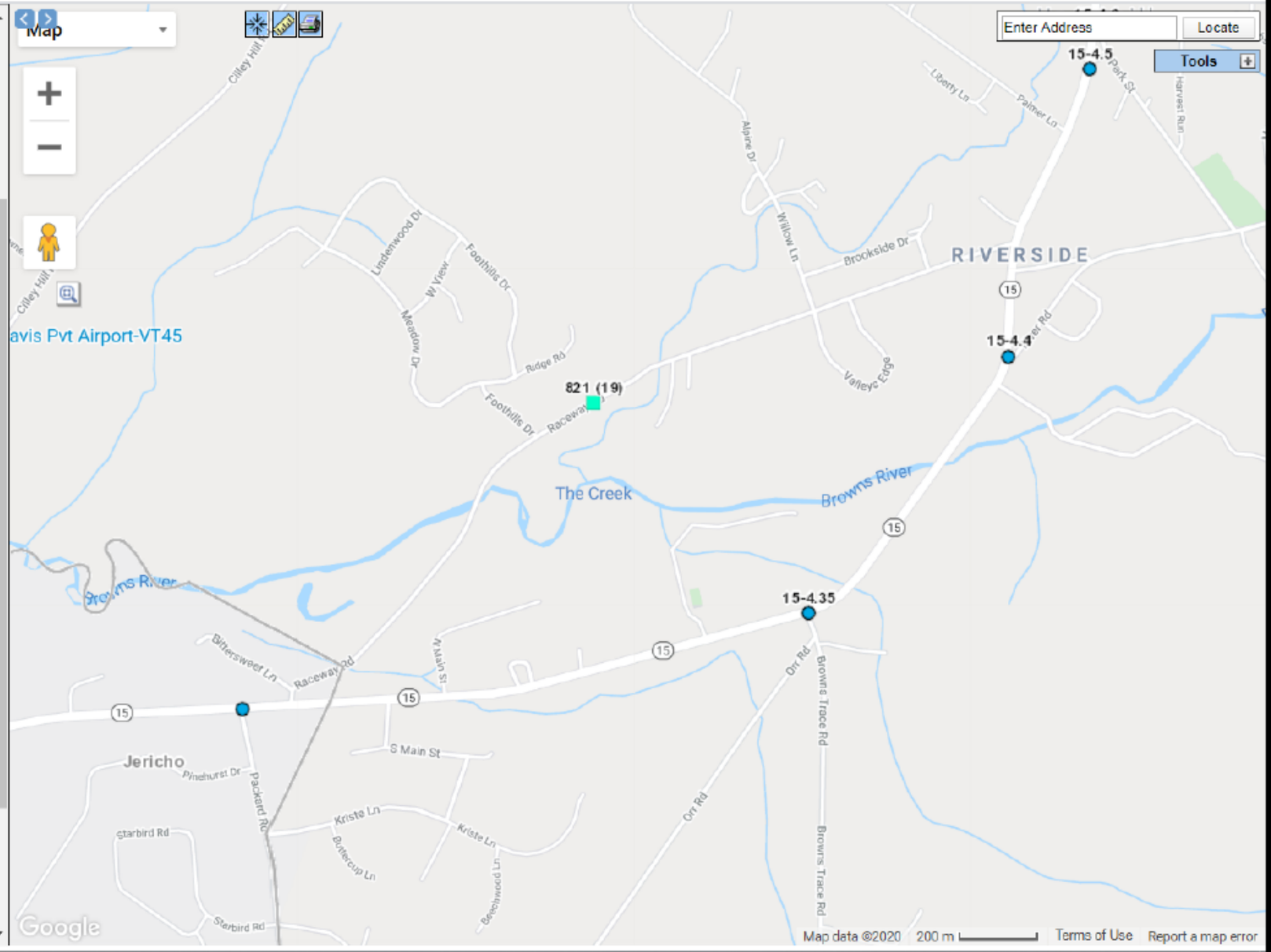
	Date	Int	Total
No Data			

WEIGH-IN-MOTION

	Date	Axles	Avg GVW	Total
No Data				

PER VEHICLE

	Date	Axles	85th	Total
No Data				



Appendix C EXISTING ROADWAY WIDTH DATA & ANALYSIS

Jericho Paving Analysis

Existing Roadway Widths

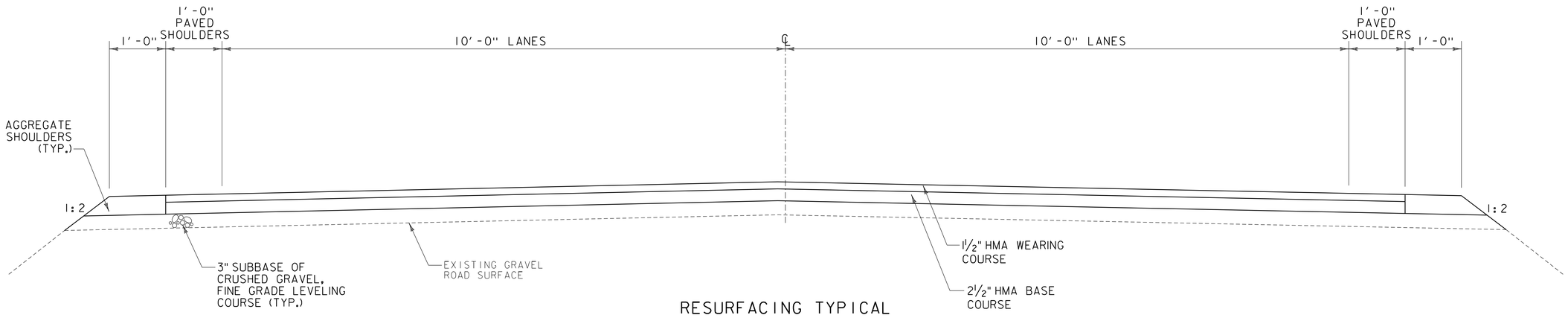
Packard Road			Raceway Road		
Station	Width (ft.)	Notes	Station	Width (ft.)	Notes
0+87	27		0+25	25	(pvt. Joint)
2+40	27		0+92	25	(Begin gravel)
5+00	23		3+00	26	
10+00	21		7+00	24	
15+00	23		8+00	20	
20+00	25		11+00	22	
25+00	25.5		15+00	22	
30+00	25.5		17+00	24	
35+00	25.5		20+00	25	
40+00	25		25+68	25	
45+00	25		28+00	24	
49+00	25		30+00	24	
55+00	23		30+83	24	(Begin pvt.)
60+00	24		32+50	24	(End pvt.)
65+00	22		35+00	20	
67+67	25.5	(Begin pvt.)	40+00	20	
70+00	25		40+32	28.5	
75+00	23		45+00	20	
80+00	24.5		50+00	21	
85+00	24		55+00	21	
88+45	26		60+00	21	
			65+00	21	
			70+00	23	
			74+50	23	
			75+40	28	(Begin pvt.)

Average Width = 24.5 feet

Average Width = 23.22 feet

Note: Based on the average results of the measured widths of the respective existing roadway surfaces, a typical roadway surface width of 24 feet will be used for the analysis: 1' gravel shldr., 1' paved shldr., 10' travel lanes.

Appendix D TYPICAL SECTIONS & ASSOCIATED COST DATA



RESURFACING TYPICAL

QUANTITIES AND COST PER FOOT OF ROADWAY					
ITEM	QUANTITY	UNIT		$/UNIT	COST
3" SUBBASE CRUSHED GRAVEL	0.431	TONS		$20.00	$8.62
4" AGGREGATE SHOULDERS	0.063	TONS		$30.00	$1.89
4" HOT MIX ASPHALT	0.570	TONS		$75.00	$42.78

TOTAL = $53.28 PER FOOT

OR = $281,000 PER MILE

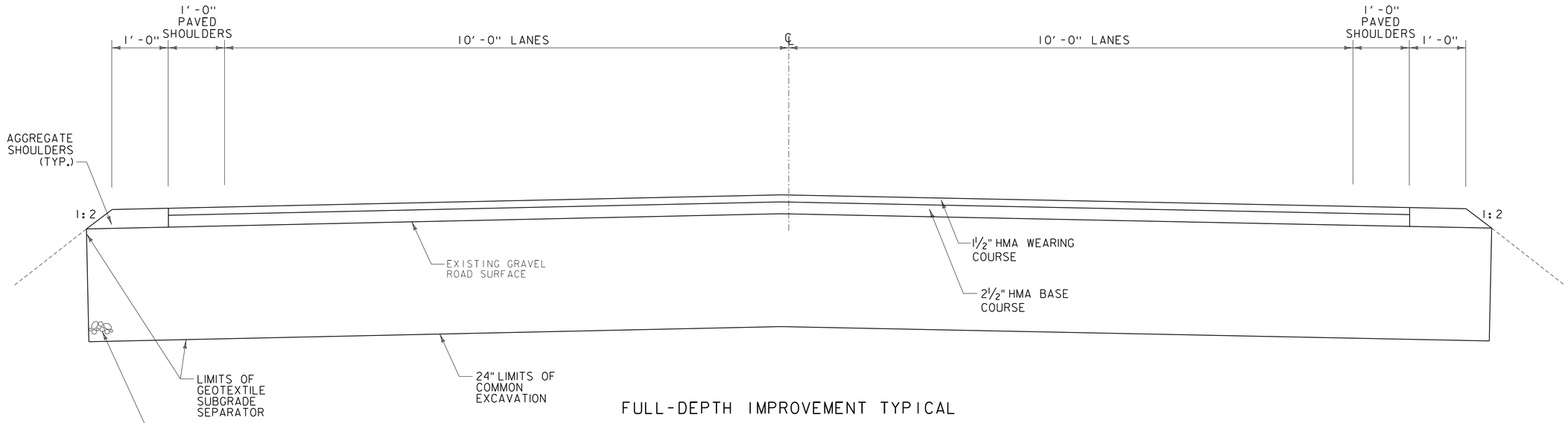
NOT TO SCALE

PROJECT NAME: JERICHO PAVING
PROJECT NUMBER: N/A

FILE NAME: Typicals.dgn
PROJECT LEADER: G. EDWARDS
DESIGNED BY: D. DRAPER
TYPICAL SECTION SHEET 1

PLOT DATE: 4/8/2020
DRAWN BY: D. DRAPER
CHECKED BY: M. FOWLER
SHEET 1 OF 28

Stantec



FULL-DEPTH IMPROVEMENT TYPICAL

QUANTITIES AND COST PER FOOT OF ROADWAY					
ITEM	QUANTITY	UNIT		$/UNIT	COST
24" COMMON EXCAVATION	1.778	CY		$5.00	$8.89
24" SUBBASE CRUSHED GRAVEL	3.448	TONS		$20.00	$68.96
4" AGGREGATE SHOULDERS	0.063	TONS		$30.00	$1.89
4" HOT MIX ASPHALT	0.570	TONS		$75.00	$42.78
GEO-TEXTILE, SUBGRADE SEPARATOR	3.167	SY		$3.00	$9.50

TOTAL = $132.02 PER FOOT

OR = $697,000 PER MILE

NOT TO SCALE

Stantec

PROJECT NAME: JERICHO PAVING
PROJECT NUMBER: N/A

FILE NAME: Typicals.dgn
PROJECT LEADER: G. EDWARDS
DESIGNED BY: D. DRAPER
TYPICAL SECTION SHEET 2

PLOT DATE: 4/8/2020
DRAWN BY: D. DRAPER
CHECKED BY: M. FOWLER
SHEET 2 OF 28

Appendix E PAVING PLAN COST ANALYSES

PACKARD ROAD ANALYSIS AND PAVING PLAN

ASSUMPTIONS:

1) ROAD WILL NEED 400 FEET OF FULL-DEPTH IMPROVEMENT BASED ON EXISTING ROADBED SOIL CONDITIONS.
2) $15,000 ALLOTMENT WILL BE CARRIED FOR THE INSTALLATION OF UNDERDRAIN.
3) $5,000 ALLOTMENT WILL BE CARRIED FOR CULVERT REPLACEMENT.
4) FOR MULTI-YEAR PHASED PLANS, A 5% COST ESCALATION FACTOR WILL BE APPLIED TO EACH YEAR AFTER YEAR 1.

---

1 YEAR PLAN:

SEGMENT: STA 0+00 (BROWNS TRACE) TO STA 67+67 (EXISTING HMA PAVEMENT JOINT)

BEGIN STA =	0	FEET
END STA =	6767	FEET
LENGTH =	6767	FEET
OR =	1.28	MILES

COMPLETE ALL WORK FOR PACKARD (6767 FEET) IN ONE PHASE IN YEAR 1.

	LENGTH (FEET)	COST PER FOOT	COST
FULL-DEPTH IMPROVEMENT LENGTH (FEET) =	400	$132.02	$52,806
RESURFACING LENGTH (FEET) =	6367	$53.28	$339,260
ALLOTMENT FOR UNDERDRAIN =	-	-	$15,000
ALLOTMENT FOR CULVERT REPLACEMENT =	-	-	$5,000

TOTAL ESTIMATE FOR ONE PHASE PLAN = **$412,066**

PACKARD ROAD ANALYSIS AND PAVING PLAN (continued)

2 YEAR PLAN:

YEAR 1 SEGMENT: STA 33+00 (SOUTH OF ORR RD) TO STA 67+67 (EXISTING HMA PAVEMENT JOINT)

BEGIN STA =	3300	FEET
END STA =	6767	FEET
LENGTH =	3467	FEET
OR =	0.66	MILES

COMPLETE ALL YEAR 1 SEGMENT WORK FOR PACKARD (3467 FEET) AS PHASE 1.

	LENGTH (FEET)	COST PER FOOT	COST
FULL-DEPTH IMPROVEMENT LENGTH (FEET) =	200	$132.02	$26,403
RESURFACING LENGTH (FEET) =	3267	$53.28	$174,079
ALLOTMENT FOR UNDERDRAIN =	-	-	$7,500
ALLOTMENT FOR CULVERT REPLACEMENT =	-	-	$2,500

TOTAL ESIMATE FOR 2 YEAR PLAN, PHASE 1 = **$210,482**

YEAR 2 SEGMENT: STA 0+00 (BROWNS TRACE) TO STA 33+00 (SOUTH OF ORR RD)

BEGIN STA =	0	FEET
END STA =	3300	FEET
LENGTH =	3300	FEET
OR =	0.63	MILES

COMPLETE ALL YEAR 2 SEGMENT WORK FOR PACKARD (3300 FEET) AS PHASE 2.

	LENGTH (FEET)	COST PER FOOT	COST
FULL-DEPTH IMPROVEMENT LENGTH (FEET) =	200	$132.02	$26,403
RESURFACING LENGTH (FEET) =	3100	$53.28	$165,181
ALLOTMENT FOR UNDERDRAIN =	-	-	$7,500
ALLOTMENT FOR CULVERT REPLACEMENT =	-	-	$2,500
5% PER YEAR COST ESCALATION FACTOR =	APPLIED TO SUBTOTAL FIGURE IN STRATEGY SUMMARY TABLES AS APPLICABLE		

SUBTOTAL ESIMATE FOR 2 YEAR PLAN, PHASE 2 = **$201,584**

RACEWAY ROAD PAVING PLAN

ASSUMPTIONS:
1) ROAD WILL NEED 400 FEET OF FULL-DEPTH IMPROVEMENT BASED ON EXISTING ROADBED SOIL CONDITIONS.
2) $15,000 ALLOTMENT WILL BE CARRIED FOR THE INSTALLATION OF UNDERDRAIN.
3) $5,000 ALLOTMENT WILL BE CARRIED FOR CULVERT REPLACEMENT.
4) FOR MULTI-YEAR PHASED PLANS, A 5% COST ESCALATION FACTOR WILL BE APPLIED TO EACH YEAR AFTER YEAR 1.
5) PAVING WILL BEGIN AND END AT VT 15 AND WILL NOT EXCLUDE EXISTING PAVED APPROACHES

---

1 YEAR PLAN:

SEGMENT(S): STA 0+00 (VT ROUTE 15) TO STA 22+80 (EXISTING HMA PAVEMENT JOINT AT BRIDGE APPROACH)

BEGIN STA =	0	FEET
END STA =	2280	FEET
LENGTH =	**2280**	FEET
OR =	0.43	MILES

STA 25+68 (EXISTING HMA PAVEMENT JOINT AT BRIDGE APPROACH) TO STA 30+83 (EXISTING HMA JOINT)

BEGIN STA =	2568	FEET
END STA =	3083	FEET
LENGTH =	**515**	FEET
OR =	0.10	MILES

STA 32+50 (EXISTING HMA PAVEMENT JOINT) TO STA 75+82 (VT ROUTE 15)

BEGIN STA =	3250	FEET
END STA =	7582	FEET
LENGTH =	**4332**	FEET
OR =	0.82	MILES
TOTAL LENGTH OF SEGMENTS =	7127	FEET
	1.35	MILES

COMPLETE ALL WORK FOR RACEWAY (7127 FEET) IN ONE PHASE IN YEAR 1.

	LENGTH (FEET)	COST PER FOOT	COST
FULL-DEPTH IMPROVEMENT LENGTH (FEET) =	400	$132.02	$52,806
RESURFACING LENGTH (FEET) =	6727	$53.28	$358,442
ALLOTMENT FOR UNDERDRAIN =	-	-	$15,000
ALLOTMENT FOR CULVERT REPLACEMENT =	-	-	$5,000

TOTAL ESTIMATE FOR ONE PHASE PLAN = **$431,248**

RACEWAY ROAD PAVING PLAN (continued)

2 YEAR PLAN:

YEAR 1 SEGMENT: STA 32+50 (EXISTING HMA PAVEMENT JOINT) TO STA 75+82 (VT ROUTE 15)

BEGIN STA =	3250	FEET
END STA =	7582	FEET
LENGTH =	4332	FEET
OR =	0.82	MILES

COMPLETE ALL YEAR 1 SEGMENT WORK FOR RACEWAY (4332 FEET) AS PHASE 1.

	LENGTH (FEET)	COST PER FOOT	COST
FULL-DEPTH IMPROVEMENT LENGTH (FEET) =	200	$132.02	$26,403
RESURFACING LENGTH (FEET) =	4132	$53.28	$220,170
ALLOTMENT FOR UNDERDRAIN =	-	-	$7,500
ALLOTMENT FOR CULVERT REPLACEMENT =	-	-	$2,500

TOTAL ESTIMATE FOR 2 YEAR PLAN, PHASE 1 = **$256,573**

YEAR 2 SEGMENT(S): STA 0+00 (VT ROUTE 15) TO STA 22+80 (EXISTING HMA PAVEMENT JOINT AT BRIDGE APPROACH)

BEGIN STA =	0	FEET
END STA =	2280	FEET
LENGTH =	**2280**	FEET
OR =	0.43	MILES

STA 25+68 (EXISTING HMA PAVEMENT JOINT AT BRIDGE APPROACH) TO STA 30+83 (EXISTING HMA JOINT)

BEGIN STA =	2568	FEET
END STA =	3083	FEET
LENGTH =	**515**	FEET
OR =	0.10	MILES

TOTAL LENGTH OF SEGMENTS =	2795	FEET
	0.53	MILES

COMPLETE ALL YEAR 2 SEGMENT WORK FOR RACEWAY (2795 FEET) AS PHASE 2.

	LENGTH (FEET)	COST PER FOOT	COST
FULL-DEPTH IMPROVEMENT LENGTH (FEET) =	200	$132.02	$26,403
RESURFACING LENGTH (FEET) =	2595	$53.28	$138,272
ALLOTMENT FOR UNDERDRAIN =	-	-	$7,500
ALLOTMENT FOR CULVERT REPLACEMENT =	-	-	$2,500

5% PER YEAR COST ESCALATION FACTOR = APPLIED TO SUBTOTAL FIGURE IN STRATEGY SUMMARY TABLES AS APPLICABLE

SUBTOTAL ESTIMATE FOR 2 YEAR PLAN, PHASE 2 = **$174,675**

Appendix F PHASED PAVING PLAN STRATEGIES

PHASED PAVING PLAN STRATEGIES

**FOR MULTI-YEAR PHASED PLANS, A 5% COST ESCALATION FACTOR WILL BE APPLIED TO EACH YEAR AFTER YEAR 1.*

STRATEGY 1

1 YEAR PLAN (COMPLETE ALL NECESSARY PAVING FOR PACKARD AND RACEWAY IN YEAR 1)

	PACKARD (LENGTH = 1.28 MILES)	RACEWAY (LENGTH = 1.35 MILES)	COST/YEAR*
YEAR 1 COST	$412,066	$431,248	$843,314
YEAR 2 COST	-	-	-
YEAR 3 COST	-	-	-
YEAR 4 COST	-	-	-

TOTAL COST FOR STRATEGY 1 = **$843,314**

AVERAGE ANNUAL COST FOR STRATEGY 1 = **$843,314**

STRATEGY 2

2 YEAR PLAN (COMPLETE ALL NECESSARY PAVING FOR PACKARD YEAR 1 AND RACEWAY YEAR 2)

	PACKARD (LENGTH = 1.28 MILES)	RACEWAY (LENGTH = 1.35 MILES)	COST/YEAR*
YEAR 1 COST	$412,066	-	$412,066
YEAR 2 COST	-	$452,811	$452,811
YEAR 3 COST	-	-	-
YEAR 4 COST	-	-	-

TOTAL COST FOR STRATEGY 2 = **$864,877**

AVERAGE ANNUAL COST FOR STRATEGY 2 = **$432,438**

PHASED PAVING PLAN STRATEGIES (continued)

STRATEGY 3

4 YEAR PLAN "A" (COMPLETE PAVING FOR PACKARD, YEAR 1 AND YEAR 2, AND RACEWAY, YEAR 3 AND YEAR 4)

	PACKARD1 (LENGTH = 0.66 MILES)	PACKARD2 (LENGTH = 0.63 MILES)	RACEWAY1 (LENGTH = 0.82 MILES)	RACEWAY2 (LENGTH = 0.53 MILES)	COST/YEAR*
YEAR 1 COST	$210,482	-	-	-	$210,482
YEAR 2 COST	-	$211,663	-	-	$211,663
YEAR 3 COST	-	-	$282,230	-	$282,230
YEAR 4 COST	-	-	-	$200,877	$200,877

TOTAL COST FOR STRATEGY 3 = **$905,252**

AVERAGE ANNUAL COST FOR STRATEGY 3 = **$226,313**

STRATEGY 4

4 YEAR PLAN "B" (COMPLETE PAVING FOR RACEWAY, YEAR 1 AND YEAR 2, AND PACKARD, YEAR 3 AND YEAR 4)

	PACKARD1 (LENGTH = 0.66 MILES)	PACKARD2 (LENGTH = 0.63 MILES)	RACEWAY1 (LENGTH = 0.82 MILES)	RACEWAY2 (LENGTH = 0.53 MILES)	COST/YEAR*
YEAR 1 COST	-	-	$256,573	-	$256,573
YEAR 2 COST	-	-	-	$183,409	$183,409
YEAR 3 COST	$231,530	-	-	-	$231,530
YEAR 4 COST	-	$231,821	-	-	$231,821

TOTAL COST FOR STRATEGY 4 = **$903,334**

AVERAGE ANNUAL COST FOR STRATEGY 4 = **$225,833**

Appendix G ATLANTIC TESTING LABORATORIES REPORT

ATLANTIC TESTING LABORATORIES

Canton
6431 U.S. Highway 11
P.O. Box 29
Canton, NY 13617
315-386-4578 (T)
atlantictesting.com

WBE certified company

February 21, 2020

Stantec
55 Green Mountain Drive
South Burlington, Vermont 05403

Attn: Mr. Michael J. Fowler, PE
Senior Transportation Engineer

Re: Subsurface Investigation Services
Proposed Road Improvements
Jericho, Chittenden County, New York
ATL No. CD7397D-01-02-20

Ladies and Gentleman:

At the request of Mr. Michael J. Fowler, PE, representing Stantec, and in accordance with our proposal (ATL No. CD998-2231-09-19, dated September 23, 2019), Atlantic Testing Laboratories, Limited (ATL) performed a Subsurface Investigation for the referenced project. The field investigation was performed on January 30, 2020.

The proposed boring locations were selected and staked by representatives of Stantec. A **Boring Location Plan** is included in **Attachment A**.

Eight borings were advanced utilizing 3-inch and 2-inch split spoon samplers to a depth of approximately 6 feet below ground surface. Soil sampling and standard penetration testing was performed utilizing 3-inch and 2-inch outside diameter split spoon sampler in accordance with ASTM D 1586. Soil sampling was generally performed continuously to boring termination at a depth of approximately 6 feet.

The 3-inch and 2-inch split spoon samplers do not recover material larger than 2⅜-inch and 1⅜-inch in nominal dimension, respectively. Therefore, the recovered samples may not be representative of the entire soil matrix. The visual soil classifications contained in the subsurface investigation logs were performed in the laboratory and are presented on the **Subsurface Investigation Logs** included in **Attachment B**.

The borings were backfilled with on-site soils upon completion. It is important that the backfilled boreholes be monitored for settlement or subsidence. This will be the responsibility of Stantec and/or their Client. ATL assumes no liability for loss or damage resulting from borehole settlement.

Select soil samples were submitted to ATL's geotechnical laboratory for physical analyses. Water Content Determination of Soil (ASTM D 2216) and Particle Size Analysis without Hydrometer (ASTM D 422) was performed on eight soil samples. The test results are located on the Subsurface Investigation Logs included in **Laboratory Test Results, Attachment C**.

Please contact our office if you have any questions or if we may be of further service. We look forward to our continued association to obtain a successful completion of the project.

Sincerely,
ATLANTIC TESTING LABORATORIES, Limited

Adam J. Schneider, PE
Project Engineer

AJS/ADW/ajs
Enclosures

ATTACHMENT A

BORING LOCATION PLAN

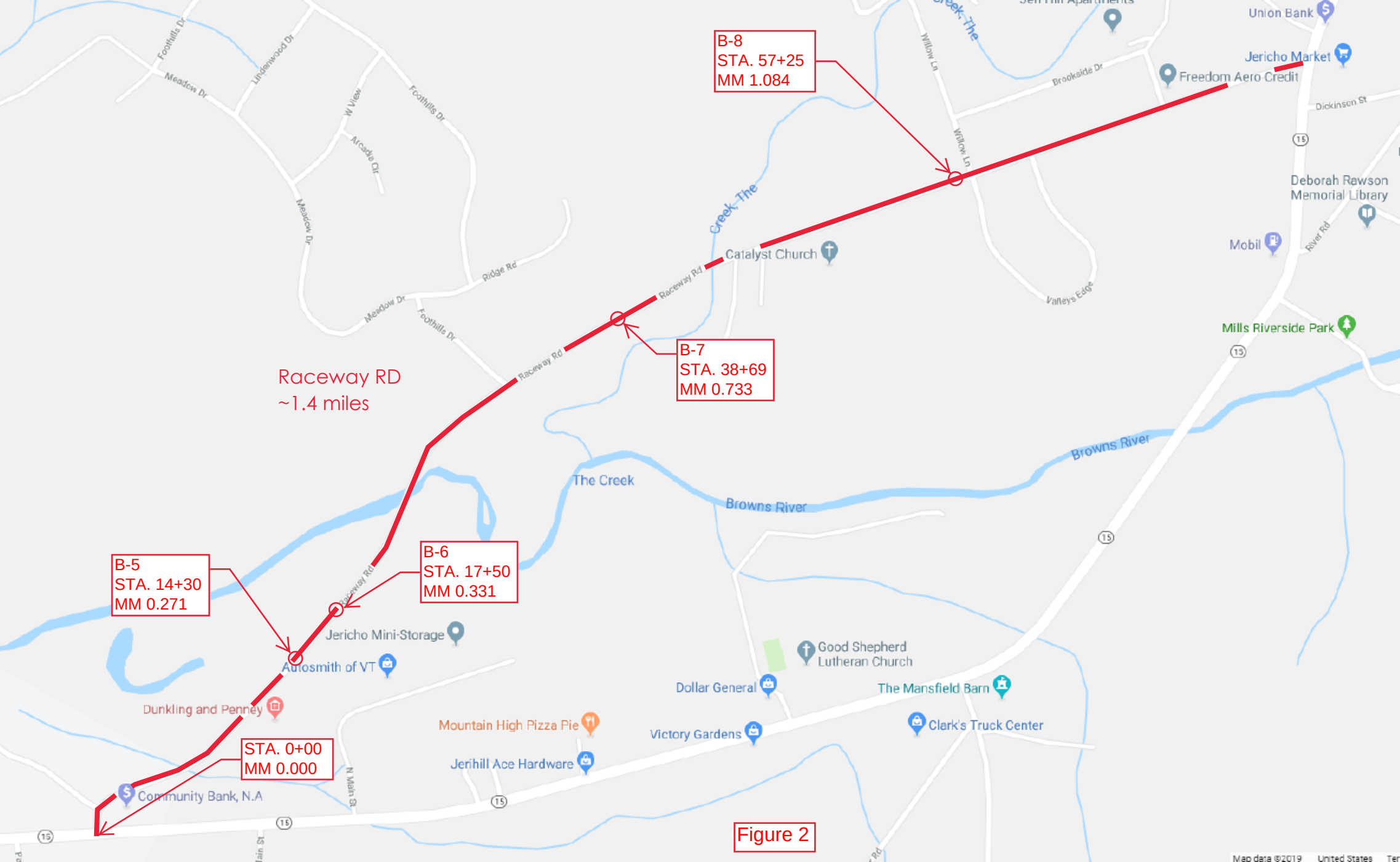

B-8
STA. 57+25
MM 1.084
B-7
STA. 38+69
MM 0.733
B-6
STA. 17+50
MM 0.331
B-5
STA. 14+30
MM 0.271
STA. 0+00
MM 0.000
Raceway RD
~1.4 miles
Raceway Rd
Creek, The
Catalyst Church
Valley's Edge
Union Bank
Jericho Market
Freedom Aero Credit
Brookside Dr
Dickinson St
Deborah Rawson Memorial Library
River Rd
Mobil
Mills Riverside Park
Browns River
The Creek
Jericho Mini-Storage
Autosmith of VT
Dunkling and Penney
Good Shepherd Lutheran Church
Dollar General
The Mansfield Barn
Clark's Truck Center
Victory Gardens
Mountain High Pizza Pie
Jerihill Ace Hardware
Community Bank, N.A
N Main St
Foothills Dr
Meadow Dr
Underwood Dr
W View
Arcadia Ct
Ridge Rd
Willow Ln
Map data ©2019
United States

Figure 2

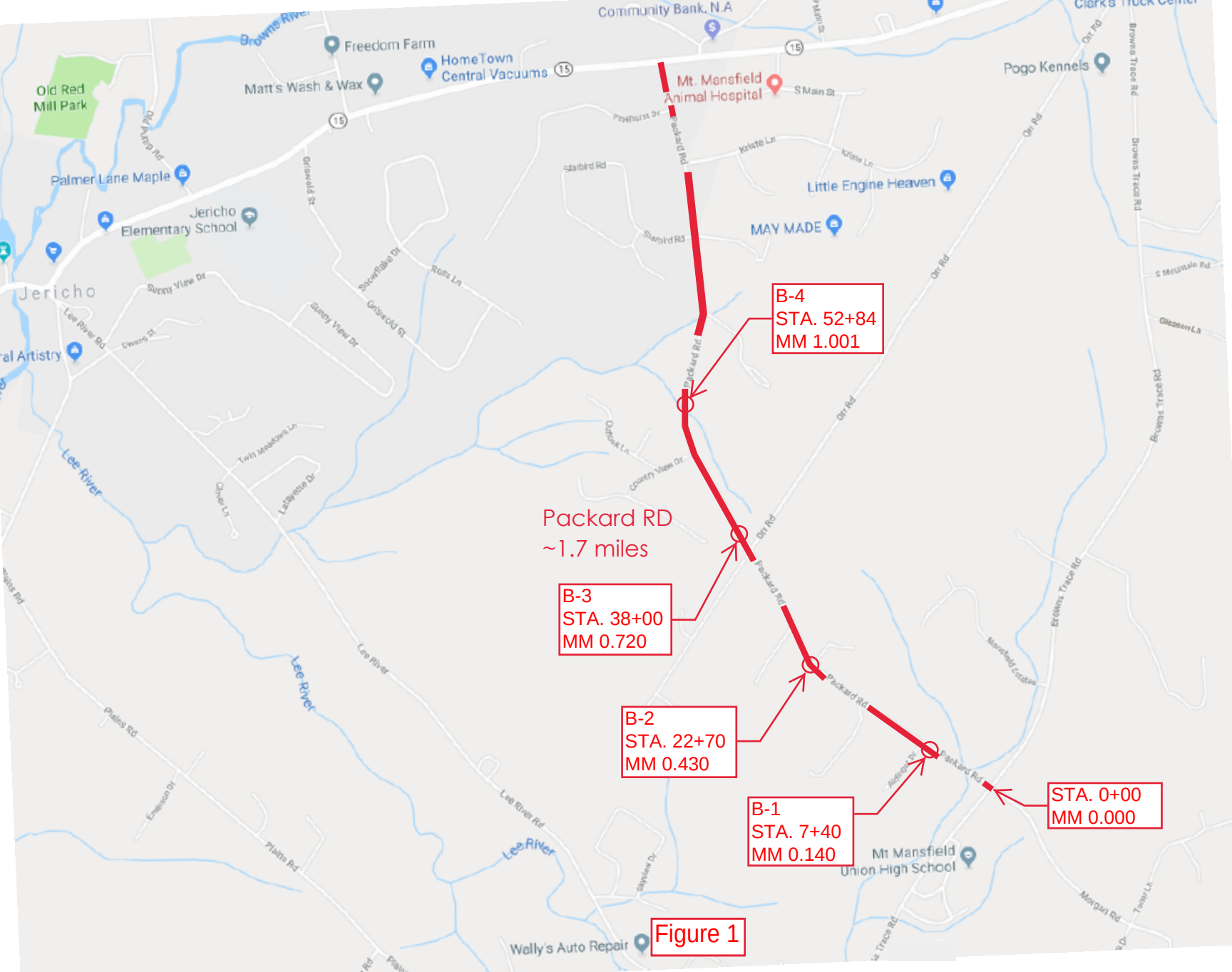

Packard RD
~1.7 miles
B-4
STA. 52+84
MM 1.001
B-3
STA. 38+00
MM 0.720
B-2
STA. 22+70
MM 0.430
B-1
STA. 7+40
MM 0.140
STA. 0+00
MM 0.000
Community Bank, N.A
Freedom Farm
HomeTown Central Vacuums
Matt's Wash & Wax
Old Red Mill Park
Palmer Lane Maple
Jericho Elementary School
Jericho
Mt. Mansfield Animal Hospital
Pogo Kennels
Little Engine Heaven
MAY MADE
Lee River
Mt Mansfield Union High School
Wally's Auto Repair

Figure 1

ATTACHMENT B

SUBSURFACE INVESTIGATION LOGS

ATLANTIC TESTING LABORATORIES, Limited

Subsurface Investigation

Report No.: **CD7397E-01-02-20**

Client: **Stantec**

Boring Location: **See Boring Location Plan**

Project: **Subsurface Investigation**
Jericho VT Soil Sampling
Jericho, Vermont

Start Date: **1/30/2020** Finish Date: **1/30/2020**

Boring No.: **B-1** Sheet **1** of **1**

Groundwater Observations

Date	Time	Depth	Casing
1/30/2020	**AM**	**DRY**	**OPEN**

Coordinates
Latitude _____
Longitude _____

Sampler Hammer
Weight: **140** lbs.
Fall: **30** in.
Hammer Type: **Automatic**

Ground Elev.: _____

Boring Advance By:
3" & 2" Split Spoon

DEPTH	METHOD OF ADVANCE	SAMPLE NO.	DEPTH OF SAMPLE From	DEPTH OF SAMPLE To	SAMPLE TYPE	BLOWS ON SAMPLER PER 6" 2" O.D. SAMPLER	DEPTH OF CHANGE	CLASSIFICATION OF MATERIAL	Recovery (Inches)
								f - fine; m - medium; c - coarse; and - 35-50%; some - 20-35%; little - 10-20%; trace - 0-10%	
1	SPLIT SPOON	1	0.0	2.0	SS	181 213 144 83		Brown cmf SAND; some mf+ GRAVEL; little SILT (moist, non-plastic) w = 6.1%	20
2							2.0		
3		2	2.0	4.0	SS	16 19 19 17		Greyish-Brown cmf SAND; little cmf GRAVEL; trace CLAY; trace SILT (moist, very slightly plastic)	12
4		3	4.0	6.0	SS	18 17 12 18		Greyish-Brown cmf+ SAND; little mf GRAVEL; trace SILT (moist, non-plastic)	18
5									
6							6.0	Boring terminated at 6.0 feet.	
7								Notes:	
8								1. Borehole backfilled with on-site soils.	
9								2. A 3" split spoon sampler was utilized to obtain sample S-1. A 2" split spoon sampler was utilized to obtain samples S-2 and S-3.	
10									
11									
12									
13									
14									
15									

SS Split Spoon Sample
NX Rock Core
SH Undisturbed Sample (Shelby Tube)
Estimated Groundwater

Drillers: **Brad Perry; Jake Crary**

Inspector: _____

ATL-LOG1 LL CD7397 STANTEC - JERICHO, VT.GPJ ATL4-08.GDT 2/21/20

ATLANTIC TESTING LABORATORIES, Limited

Subsurface Investigation

Report No.: **CD7397E-01-02-20**

Client: **Stantec**

Boring Location: **See Boring Location Plan**

Project: **Subsurface Investigation**
Jericho VT Soil Sampling
Jericho, Vermont

Start Date: **1/30/2020** Finish Date: **1/30/2020**

Boring No.: **B-2** Sheet **1** of **1**

Groundwater Observations

Date	Time	Depth	Casing
1/30/2020	**AM**	**DRY**	**OPEN**

Coordinates
Latitude _____
Longitude _____

Sampler Hammer
Weight: **140** lbs.
Fall: **30** in.
Hammer Type: **Automatic**

Ground Elev.: _____

Boring Advance By:
3" & 2" Split Spoon

DEPTH	METHOD OF ADVANCE	SAMPLE NO.	DEPTH OF SAMPLE From	DEPTH OF SAMPLE To	SAMPLE TYPE	BLOWS ON SAMPLER PER 6" 2" O.D. SAMPLER	DEPTH OF CHANGE	CLASSIFICATION OF MATERIAL	Recovery (Inches)
								f - fine; m - medium; c - coarse; and - 35-50%; some - 20-35%; little - 10-20%; trace - 0-10%	
1	SPLIT SPOON	1	0.0	2.0	SS	141 157 93 67		Brown cmf SAND; and cmf GRAVEL; trace SILT (moist, non-plastic)	22
2							2.0		
2	SPLIT SPOON	2	2.0	4.0	SS	14 8 7 6		Brown c-m+f SAND; little SILT; little f GRAVEL (moist, non-plastic) w = 8.7%	19
3									
4		3	4.0	6.0	SS	8 8 8 10		Brownish-Grey cmf SAND; little cmf GRAVEL; trace SILT; trace CLAY (moist, very slightly plastic)	13
5									
6							6.0	Boring terminated at 6.0 feet.	
7								Notes: 1. Borehole backfilled with on-site soils. 2. A 3" split spoon sampler was utilized to obtain sample S-1. A 2" split spoon sampler was utilized to obtain samples S-2 and S-3.	
8									
9									
10									
11									
12									
13									
14									
15									

SS Split Spoon Sample
NX Rock Core
SH Undisturbed Sample (Shelby Tube)
Estimated Groundwater

Drillers: **Brad Perry; Jake Crary**

Inspector: _____

ATL-LOG1 LL CD7397 STANTEC - JERICHO, VT.GPJ ATL4-08.GDT 2/21/20

ATLANTIC TESTING LABORATORIES, Limited

Subsurface Investigation

Report No.: **CD7397E-01-02-20**

Client: **Stantec**

Boring Location: **See Boring Location Plan**

Project: **Subsurface Investigation**
Jericho VT Soil Sampling
Jericho, Vermont

Start Date: **1/30/2020** Finish Date: **1/30/2020**

Boring No.: **B-3** Sheet **1** of **1**

Groundwater Observations

Date	Time	Depth	Casing

Coordinates
Latitude
Longitude

Sampler Hammer
Weight: **140** lbs.
Fall: **30** in.
Hammer Type: **Automatic**

Ground Elev.:

Boring Advance By:
3" & 2" Split Spoon

DEPTH	METHOD OF ADVANCE	SAMPLE NO.	DEPTH OF SAMPLE From	DEPTH OF SAMPLE To	SAMPLE TYPE	BLOWS ON SAMPLER PER 6" 2" O.D. SAMPLER	DEPTH OF CHANGE	CLASSIFICATION OF MATERIAL	Recovery (Inches)
								f - fine; m - medium; c - coarse; and - 35-50%; some - 20-35%; little - 10-20%; trace - 0-10%	
1	SPLIT SPOON	1	0.0	2.0	SS	150 155 103 61		Brownish-Grey cmf SAND; some mf GRAVEL; little SILT (moist, non-plastic) w = 6.0%	22
2							2.0		
3		2	2.0	4.0	SS	13 6 4 4		Brown c-mf+ SAND; little mf GRAVEL; trace SILT (moist, non-plastic)	18
4		3	4.0	6.0	SS	5 11 27 31		Dark Brown cmf SAND; little mf GRAVEL; trace SILT; trace ORGANIC MATERIAL (root hairs) (moist, non-plastic) COBBLE Fragments	18
6							6.0		
7								Boring terminated at 6.0 feet.	
8								Notes: 1. Borehole backfilled with on-site soils. 2. A 3" split spoon sampler was utilized to obtain sample S-1. A 2" split spoon sampler was utilized to obtain samples S-2 and S-3.	
9									
10									
11									
12									
13									
14									
15									

SS Split Spoon Sample
NX Rock Core
SH Undisturbed Sample (Shelby Tube)
Estimated Groundwater

Drillers: **Brad Perry; Jake Crary**

Inspector:

ATL-LOG1 LL CD7397 STANTEC - JERICHO, VT.GPJ ATL4-08.GDT 2/21/20

ATLANTIC TESTING LABORATORIES, Limited

Subsurface Investigation

Report No.: **CD7397E-01-02-20**

Client: **Stantec**

Boring Location: **See Boring Location Plan**

Project: **Subsurface Investigation**
Jericho VT Soil Sampling
Jericho, Vermont

Start Date: **1/30/2020** Finish Date: **1/30/2020**

Boring No.: **B-4** Sheet **1** of **1**

Groundwater Observations

Date	Time	Depth	Casing

Coordinates
Latitude
Longitude

Sampler Hammer
Weight: **140** lbs.
Fall: **30** in.
Hammer Type: **Automatic**

Ground Elev.:

Boring Advance By:
3" & 2" Split Spoon

DEPTH	METHOD OF ADVANCE	SAMPLE NO.	DEPTH OF SAMPLE From	DEPTH OF SAMPLE To	SAMPLE TYPE	BLOWS ON SAMPLER PER 6" 2" O.D. SAMPLER	DEPTH OF CHANGE	CLASSIFICATION OF MATERIAL	Recovery (Inches)
								f - fine; m - medium; c - coarse; and - 35-50%; some - 20-35%; little - 10-20%; trace - 0-10%	
1	SPLIT SPOON	1	0.0	2.0	SS	164 197 89 74		Brownish-Grey cmf SAND; and cmf GRAVEL; trace SILT (moist, non-plastic)	17
2							2.0		
3		2	2.0	4.0	SS	13 9 8 6		Brown cmf+ SAND; and SILT; little f GRAVEL (moist, non-plastic) w = 19.3%	18
4		3	4.0	6.0	SS	6 6 14 3		Greyish-Brown cmf SAND; some cmf GRAVEL; little SILT (moist, non-plastic)	24
5									
6							6.0	Boring terminated at 6.0 feet.	
7								Notes:	
8								1. Borehole backfilled with on-site soils.	
9								2. A 3" split spoon sampler was utilized to obtain sample S-1. A 2" split spoon sampler was utilized to obtain samples S-2 and S-3.	
10									
11									
12									
13									
14									
15									

SS Split Spoon Sample
NX Rock Core
SH Undisturbed Sample (Shelby Tube)
Estimated Groundwater

Drillers: **Brad Perry; Jake Crary**

Inspector:

ATL-LOG1 LL CD7397 STANTEC - JERICHO, VT.GPJ ATL4-08.GDT 2/21/20

ATLANTIC TESTING LABORATORIES, Limited

Subsurface Investigation

Report No.: **CD7397E-01-02-20**

Client: **Stantec**

Boring Location: **See Boring Location Plan**

Project: **Subsurface Investigation**
Jericho VT Soil Sampling
Jericho, Vermont

Start Date: **1/30/2020** Finish Date: **1/30/2020**

Boring No.: **B-5** Sheet **1** of **1**

Groundwater Observations

Date	Time	Depth	Casing

Coordinates
Latitude
Longitude

Sampler Hammer
Weight: **140** lbs.
Fall: **30** in.
Hammer Type: **Automatic**

Ground Elev.:

Boring Advance By:
3" & 2" Split Spoon

DEPTH	METHOD OF ADVANCE	SAMPLE NO.	DEPTH OF SAMPLE From	DEPTH OF SAMPLE To	SAMPLE TYPE	BLOWS ON SAMPLER PER 6" 2" O.D. SAMPLER	DEPTH OF CHANGE	CLASSIFICATION OF MATERIAL (f - fine; m - medium; c - coarse; and - 35-50%; some - 20-35%; little - 10-20%; trace - 0-10%)	Recovery (Inches)
1	SPLIT SPOON	1	0.0	2.0	SS	170 263 184 53		Brown c-mf GRAVEL; and cmf SAND; trace SILT (moist, non-plastic) w = 2.4%	20
2							2.0		
3		2	2.0	4.0	SS	17 2 9 10		Brown cmf SAND; and cmf GRAVEL; trace SILT (moist, non-plastic)	12
4		3	4.0	6.0	SS	13 10 10 10		Similar Soil (moist, non-plastic)	9
5									
6							6.0	Boring terminated at 6.0 feet.	
7								Notes:	
8								1. Borehole backfilled with on-site soils.	
9								2. A 3" split spoon sampler was utilized to obtain sample S-1. A 2" split spoon sampler was utilized to obtain samples S-2 and S-3.	
10									
11									
12									
13									
14									
15									

SS Split Spoon Sample
NX Rock Core
SH Undisturbed Sample (Shelby Tube)
Estimated Groundwater

Drillers: **Brad Perry; Jake Crary**

Inspector:

ATL-LOG1 LL CD7397 STANTEC - JERICHO, VT.GPJ ATL4-08.GDT 2/21/20

ATLANTIC TESTING LABORATORIES, Limited

Subsurface Investigation

Report No.: **CD7397E-01-02-20**

Client: **Stantec**

Boring Location: **See Boring Location Plan**

Project: **Subsurface Investigation**
Jericho VT Soil Sampling
Jericho, Vermont

Start Date: **1/30/2020** Finish Date: **1/30/2020**

Boring No.: **B-6** Sheet **1** of **1**

Groundwater Observations

Date	Time	Depth	Casing

Coordinates
Latitude
Longitude

Sampler Hammer
Weight: **140** lbs.
Fall: **30** in.
Hammer Type: **Automatic**

Ground Elev.:

Boring Advance By:
3" & 2" Split Spoon

DEPTH	METHOD OF ADVANCE	SAMPLE NO.	DEPTH OF SAMPLE From	DEPTH OF SAMPLE To	SAMPLE TYPE	BLOWS ON SAMPLER PER 6" 2" O.D. SAMPLER	DEPTH OF CHANGE	CLASSIFICATION OF MATERIAL	Recovery (Inches)
								f - fine; m - medium; c - coarse; and - 35-50%; some - 20-35%; little - 10-20%; trace - 0-10%	
1	SPLIT SPOON	1	0.0	2.0	SS	146 222 163 98		Brown cmf SAND; and cmf GRAVEL; trace SILT (moist, non-plastic)	23
2							2.0		
2		2	2.0	4.0	SS	44 62 31 7		Greyish-Brown SILT; and c+mf GRAVEL; some cmf SAND (moist, non-plastic) COBBLE Fragments w = 15.1%	23
3									
4		3	4.0	6.0	SS	10 28 28 16		Greyish-Brown cmf SAND; and cmf GRAVEL; trace SILT (moist, non-plastic)	12
5									
6							6.0	Boring terminated at 6.0 feet.	
7								Notes: 1. Borehole backfilled with on-site soils. 2. A 3" split spoon sampler was utilized to obtain sample S-1. A 2" split spoon sampler was utilized to obtain samples S-2 and S-3.	
8									
9									
10									
11									
12									
13									
14									
15									

SS Split Spoon Sample
NX Rock Core
SH Undisturbed Sample (Shelby Tube)
Estimated Groundwater

Drillers: **Brad Perry; Jake Crary**

Inspector:

ATL-LOG1 LL CD7397 STANTEC - JERICHO, VT.GPJ ATL4-08.GDT 2/21/20

ATLANTIC TESTING LABORATORIES, Limited

Subsurface Investigation

Report No.: **CD7397E-01-02-20**

Client: **Stantec**

Boring Location: **See Boring Location Plan**

Project: **Subsurface Investigation**
Jericho VT Soil Sampling
Jericho, Vermont

Start Date: **1/30/2020** Finish Date: **1/30/2020**

Boring No.: **B-7** Sheet **1** of **1**

Groundwater Observations

Date	Time	Depth	Casing

Coordinates
Latitude
Longitude

Sampler Hammer
Weight: **140** lbs.
Fall: **30** in.
Hammer Type: **Automatic**

Ground Elev.:

Boring Advance By:
3" & 2" Split Spoon

DEPTH	METHOD OF ADVANCE	SAMPLE NO.	DEPTH OF SAMPLE From	DEPTH OF SAMPLE To	SAMPLE TYPE	BLOWS ON SAMPLER PER 6" 2" O.D. SAMPLER	DEPTH OF CHANGE	CLASSIFICATION OF MATERIAL	Recovery (Inches)
								f - fine; m - medium; c - coarse; and - 35-50%; some - 20-35%; little - 10-20%; trace - 0-10%	
1	SPLIT SPOON	1	0.0	2.0	SS	76 104 173 168		Greyish-Brown cmf SAND; and mf GRAVEL; little SILT (wet, non-plastic) w = 9.6%	22
2							2.0		
3		2	2.0	4.0	SS	21 27 17 11		Greyish-Brown cmf SAND; and cmf GRAVEL; trace SILT (moist, non-plastic)	19
4		3	4.0	6.0	SS	9 15 18 12		Brownish-Grey cmf+ SAND; little cmf GRAVEL; little SILT (moist, non-plastic)	11
5									
6							6.0	Boring terminated at 6.0 feet.	
7								Notes:	
8								1. Borehole backfilled with on-site soils.	
9								2. A 3" split spoon sampler was utilized to obtain sample S-1. A 2" split spoon sampler was utilized to obtain samples S-2 and S-3.	
10									
11									
12									
13									
14									
15									

SS Split Spoon Sample
NX Rock Core
SH Undisturbed Sample (Shelby Tube)
Estimated Groundwater

Drillers: **Brad Perry; Jake Crary**

Inspector:

ATL-LOG1 LL CD7397 STANTEC - JERICHO, VT.GPJ ATL4-08.GDT 2/21/20

ATLANTIC TESTING LABORATORIES, Limited

Subsurface Investigation

Report No.: **CD7397E-01-02-20**

Client: **Stantec**

Boring Location: **See Boring Location Plan**

Project: **Subsurface Investigation**
Jericho VT Soil Sampling
Jericho, Vermont

Start Date: **1/30/2020** Finish Date: **1/30/2020**

Boring No.: **B-8** Sheet **1** of **1**

Groundwater Observations

Date	Time	Depth	Casing

Coordinates
Latitude
Longitude

Sampler Hammer
Weight: **140** lbs.
Fall: **30** in.
Hammer Type: **Automatic**

Ground Elev.:

Boring Advance By:
3" & 2" Split Spoon

DEPTH	METHOD OF ADVANCE	SAMPLE NO.	DEPTH OF SAMPLE From	DEPTH OF SAMPLE To	SAMPLE TYPE	BLOWS ON SAMPLER PER 6" 2" O.D. SAMPLER	DEPTH OF CHANGE	CLASSIFICATION OF MATERIAL	Recovery (Inches)
								f - fine; m - medium; c - coarse; and - 35-50%; some - 20-35%; little - 10-20%; trace - 0-10%	
1	SPLIT SPOON	1	0.0	2.0	SS	78 95 191 148		Greyish-Brown cmf SAND; and cmf GRAVEL; trace SILT (moist, non-plastic)	20
2							2.0		
3		2	2.0	4.0	SS	31 13 11 8		Greyish-Brown c-mf+ SAND; some SILT; little mf+ GRAVEL (moist, non-plastic) w = 8.0%	23
4									
5		3	4.0	6.0	SS	11 10 7 5		Similar Soil (moist, non-plastic)	12
6							6.0	Boring terminated at 6.0 feet.	
7								Notes:	
8								1. Borehole backfilled with on-site soils.	
9								2. A 3" split spoon sampler was utilized to obtain sample S-1. A 2" split spoon sampler was utilized to obtain samples S-2 and S-3.	
10									
11									
12									
13									
14									
15									

SS Split Spoon Sample
NX Rock Core
SH Undisturbed Sample (Shelby Tube)
Estimated Groundwater

Drillers: **Brad Perry; Jake Crary**

Inspector:

ATL-LOG1 LL CD7397 STANTEC - JERICHO, VT.GPJ ATL4-08.GDT 2/21/20

ATTACHMENT C

LABORATORY TEST RESULTS

ATLANTIC TESTING LABORATORIES

WBE certified company

LABORATORY DETERMINATION OF MOISTURE CONTENT OF SOILS

ASTM D 2216

PROJECT INFORMATION

Client:	Stantec Consulting Services, Inc.	**ATL Report No.:**	CD7397SL-01-02-20
Project:	Packard and Raceway Roads	**Report Date:**	February 21, 2020
	Jericho, Vermont	**Date Received:**	February 19, 2020

TEST DATA

Boring No.	Sample No.	Depth (ft)	Moisture Content (%)
B-1	S-1 [1]	0-2	6.1
B-2	S-2 [1]	2-4	8.7
B-3	S-1 [1]	0-2	6.0
B-4	S-2 [1]	2-4	19.3
B-5	S-1 [1]	0-2	2.4
B-6	S-2 [1]	2-4	15.1
B-7	S-1 [1]	0-2	9.6
B-8	S-2 [1]	2-4	8.0

REMARKS

1. Sample mass was less than the minimum mass outlined in the referenced test method.

Reviewed By: Judy Ames Date: 2/21/20

ATLANTIC TESTING LABORATORIES

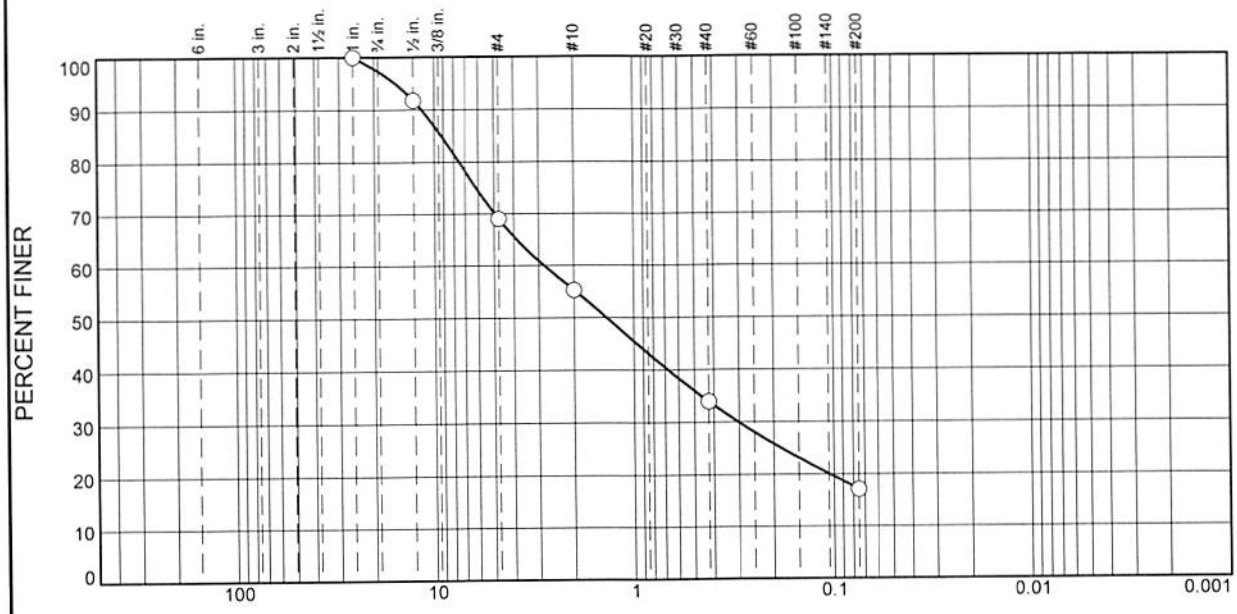
Particle Size Distribution Report

Project: Packard and Raceway Roads, Jericho, Vermont **Report No.:** CD7397SL-01-02-20

Client: Stantec Consulting Services, Inc. **Date:** 02/21/20

Sample No: B-1, S-1 **Source of Sample:** Boring Sample

Location: In-place **Elev./Depth:** 0-2'



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0	3	28	14	21	17	17	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	OUT OF SPEC. (X)
1"	100		
1/2"	92		
#4	69		
#10	55		
#40	34		
#200	17		

* (no specification provided)

Soil Description

Brown cmf SAND; some mf+ GRAVEL; little SILT

Atterberg Limits

PL= -- LL= -- PI= --

Coefficients

D_{85}= 9.2074 D_{60}= 2.8174 D_{50}= 1.3757

D_{30}= 0.3003 D_{15}= D_{10}=

C_u= C_c=

Classification

USCS= AASHTO=

Remarks

Moisture Content =6.1 %

Figure

ATLANTIC TESTING LABORATORIES, LIMITED

Reviewed by: Judy Ames Date: 2/21/20

ATLANTIC TESTING LABORATORIES

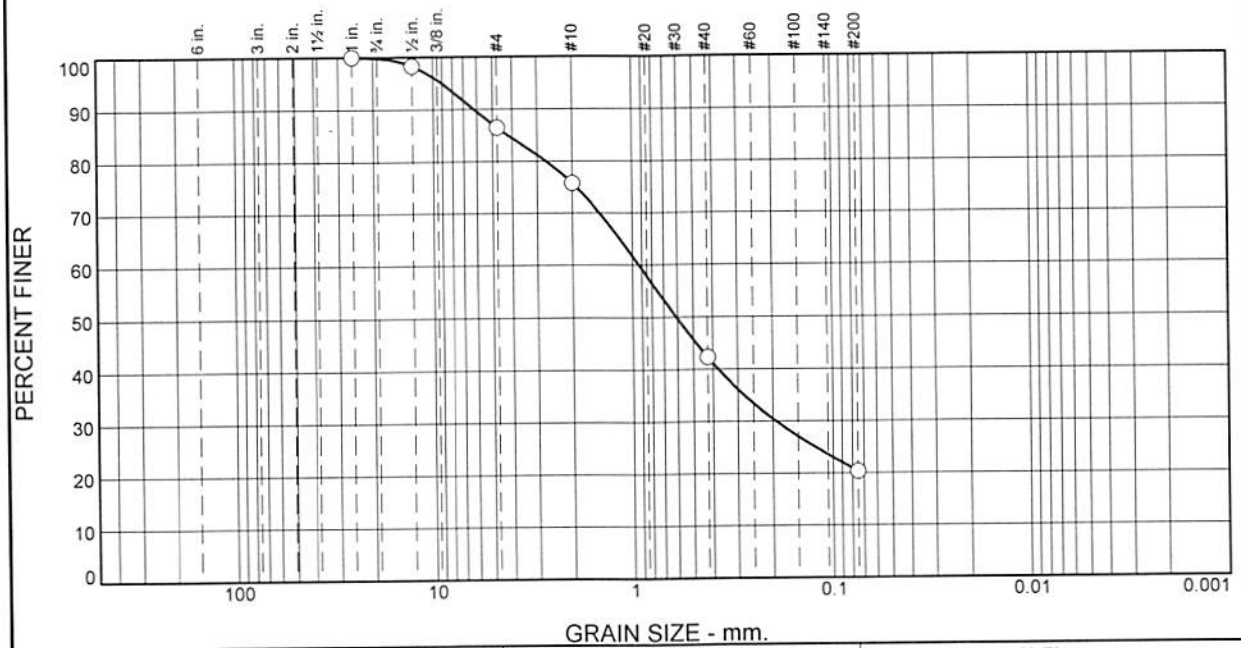
Particle Size Distribution Report

Project: Packard and Raceway Roads, Jericho, Vermont **Report No.:** CD7397SL-01-02-20

Client: Stantec Consulting Services, Inc. **Date:** 02/21/20

Sample No: B-2, S-2 **Source of Sample:** Boring Sample

Location: In-place **Elev./Depth:** 2-4'



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0	0	13	11	34	22	20	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	OUT OF SPEC. (X)
1"	100		
1/2"	98		
#4	87		
#10	76		
#40	42		
#200	20		

* (no specification provided)

Soil Description

Brown c-m+f SAND; little SILT; little f GRAVEL

Atterberg Limits

PL= -- LL= -- PI= --

Coefficients

D_{85}= 4.1843 D_{60}= 0.9319 D_{50}= 0.6078

D_{30}= 0.1931 D_{15}= D_{10}=

C_u= C_c=

Classification

USCS= AASHTO=

Remarks

Moisture Content = 8.7%

Figure

ATLANTIC TESTING LABORATORIES, LIMITED

Reviewed by: Judy Ames Date: 2/21/20

ATLANTIC TESTING LABORATORIES

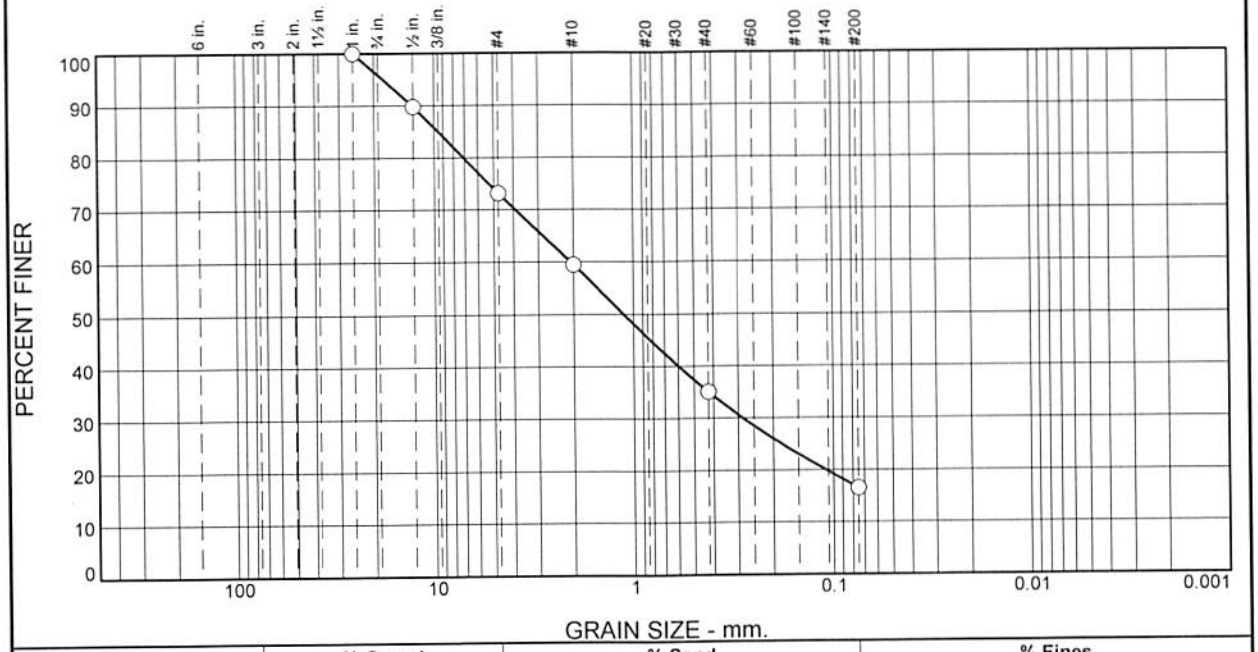
Particle Size Distribution Report

Project: Packard and Raceway Roads, Jericho, Vermont **Report No.:** CD7397SL-01-02-20

Client: Stantec Consulting Services, Inc. **Date:** 02/21/20

Sample No: B-3, S-1 **Source of Sample:** Boring Sample

Location: In-place **Elev./Depth:** 0-2'



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0	4	23	14	24	18	17	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	OUT OF SPEC. (X)
1"	100		
1/2"	90		
#4	73		
#10	59		
#40	35		
#200	17		

* (no specification provided)

Soil Description

Brownish-Grey cmf SAND; some mf GRAVEL; little SILT

Atterberg Limits

PL= -- LL= -- PI= --

Coefficients

D_{85}= 9.5147 D_{60}= 2.0699 D_{50}= 1.1205

D_{30}= 0.2852 D_{15}= D_{10}=

C_u= C_c=

Classification

USCS= AASHTO=

Remarks

Moisture Content = 6.0%

Figure

ATLANTIC TESTING LABORATORIES, LIMITED

Reviewed by: Judy Ames Date: 2/21/20

ATLANTIC TESTING LABORATORIES

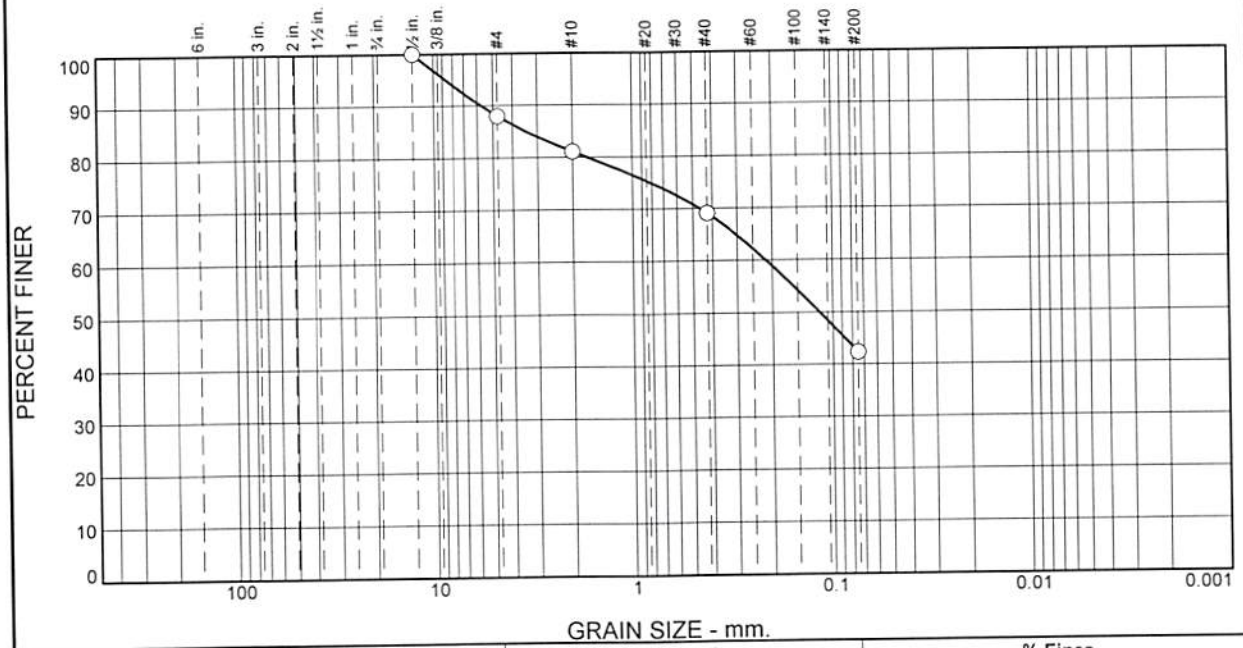
Particle Size Distribution Report

Project: Packard and Raceway Roads, Jericho, Vermont **Report No.:** CD7397SL-01-02-20

Client: Stantec Consulting Services, Inc. **Date:** 02/21/20

Sample No: B-4, S-2 **Source of Sample:** Boring Sample **Elev./Depth:** 2-4'

Location: In-place



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0	0	12	7	12	27	42	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	OUT OF SPEC. (X)
1/2"	100		
#4	88		
#10	81		
#40	69		
#200	42		

* (no specification provided)

Soil Description

Brown cmf+ SAND; and SILT; little f GRAVEL

Atterberg Limits

PL= -- LL= -- PI= --

Coefficients

D_{85}= 3.4148 D_{60}= 0.2153 D_{50}= 0.1164

D_{30}= D_{15}= D_{10}=

C_u= C_c=

Classification

USCS= AASHTO=

Remarks

Moisture Content = 19.3%

Figure

ATLANTIC TESTING LABORATORIES, LIMITED

Reviewed by: Judy Ames Date: 2/21/20

ATLANTIC TESTING LABORATORIES

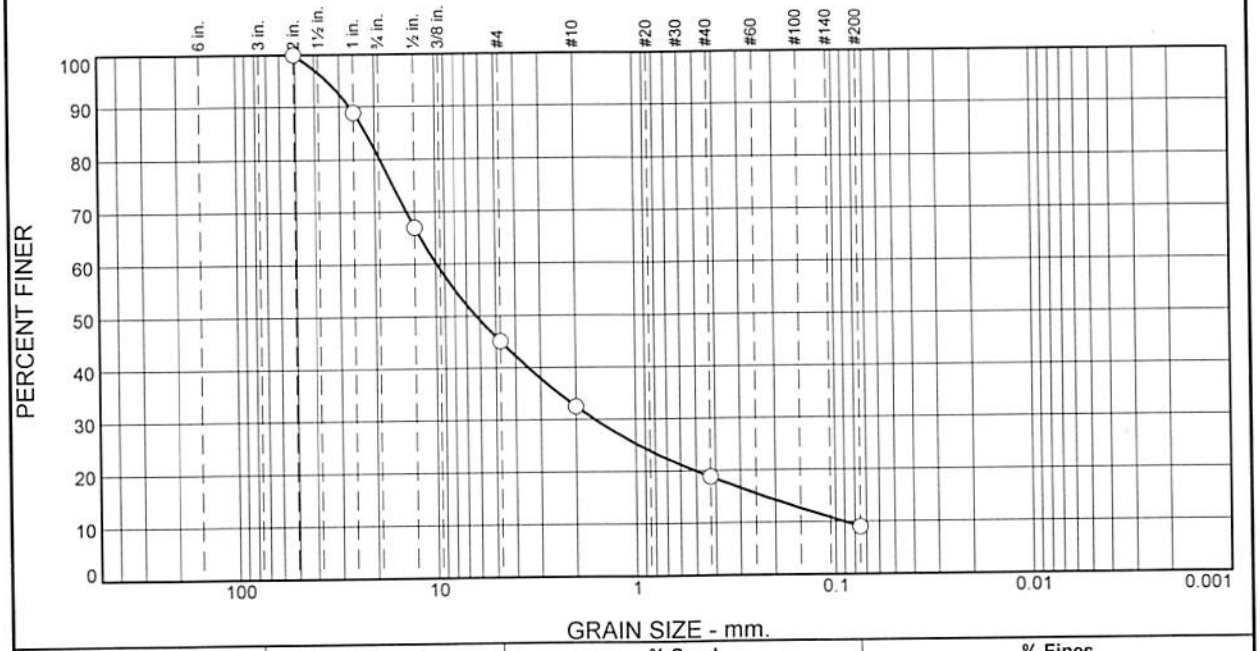
Particle Size Distribution Report

Project: Packard and Raceway Roads, Jericho, Vermont **Report No.:** CD7397SL-01-02-20

Client: Stantec Consulting Services, Inc. **Date:** 02/21/20

Sample No: B-5, S-1 **Source of Sample:** Boring Sample

Location: In-place **Elev./Depth:** 0-2'



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0	20	35	12	14	10	9	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	OUT OF SPEC. (X)
2"	100		
1"	89		
1/2"	67		
#4	45		
#10	33		
#40	19		
#200	9.0		

* (no specification provided)

Soil Description

Brown c-mf GRAVEL; and cmf SAND; trace SILT

Atterberg Limits

PL= -- LL= -- PI= --

Coefficients

D_{85}= 22.0761 D_{60}= 9.8970 D_{50}= 6.2653

D_{30}= 1.6099 D_{15}= 0.2289 D_{10}= 0.0905

C_u= 109.40 C_c= 2.89

Classification

USCS= AASHTO=

Remarks

Moisture Content = 2.4%

Figure

ATLANTIC TESTING LABORATORIES, LIMITED

Reviewed by: Judy Ames Date: 2/21/20

ATLANTIC TESTING LABORATORIES

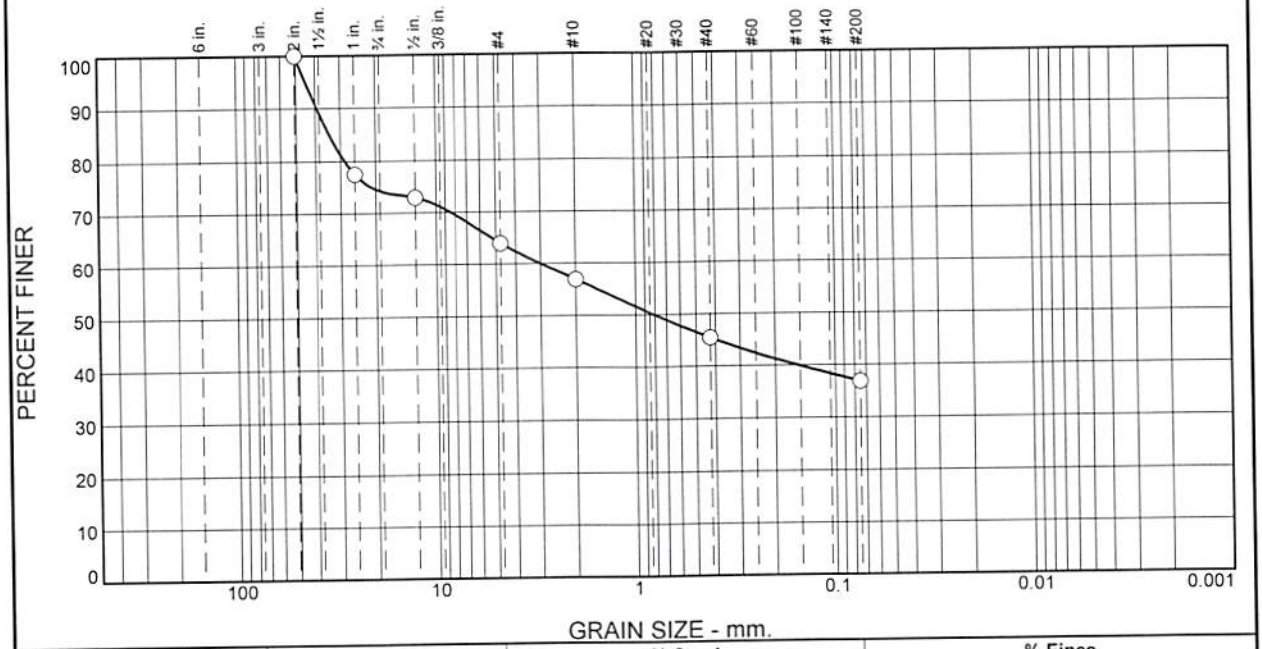
Particle Size Distribution Report

Project: Packard and Raceway Roads, Jericho, Vermont **Report No.:** CD7397SL-01-02-20

Client: Stantec Consulting Services, Inc. **Date:** 02/21/20

Sample No: B-6, S-2 **Source of Sample:** Boring Sample **Elev./Depth:** 2-4'

Location: In-place



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0	26	10	7	12	8	37	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	OUT OF SPEC. (X)
2"	100		
1"	77		
1/2"	73		
#4	64		
#10	57		
#40	45		
#200	37		

* (no specification provided)

Soil Description

Greyish-Brown SILT; and c+m-f GRAVEL; some cmf SAND

Atterberg Limits

PL= -- LL= -- PI= --

Coefficients

D_{85}= 33.9658 D_{60}= 3.0136 D_{50}= 0.8141
D_{30}= D_{15}= D_{10}=
C_u= C_c=

Classification

USCS= AASHTO=

Remarks

Moisture Content = 15.1%

Figure

ATLANTIC TESTING LABORATORIES, LIMITED

Reviewed by: Judy Ames Date: 2/21/20

ATLANTIC TESTING LABORATORIES

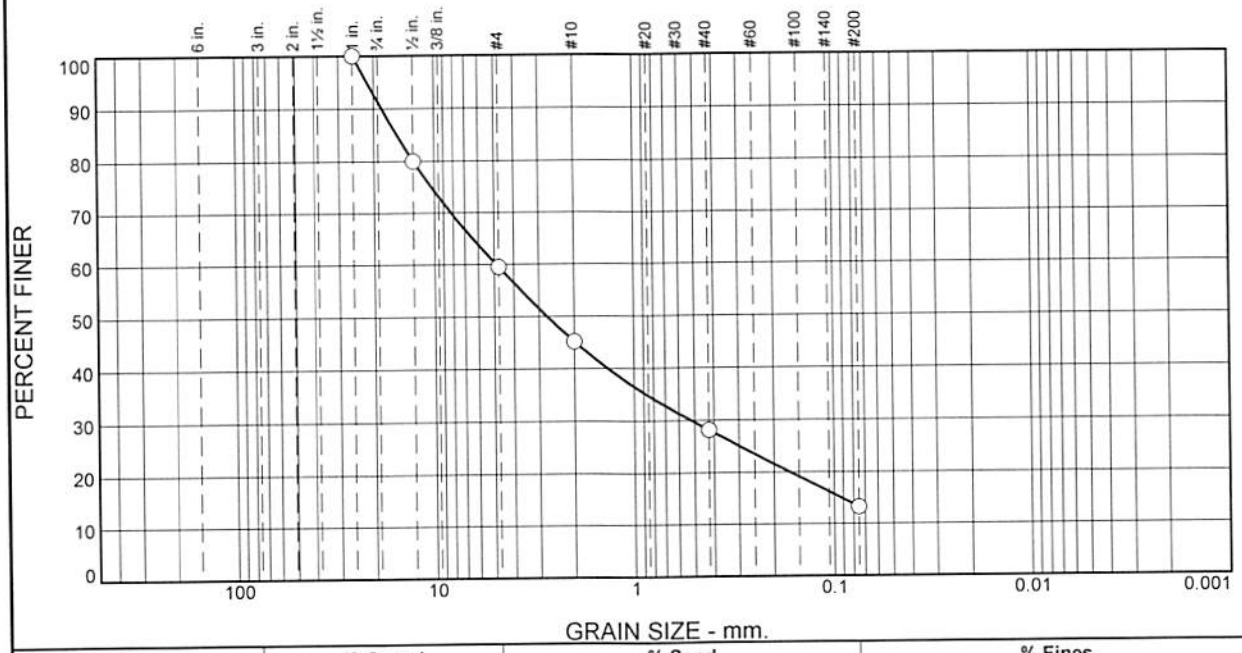
Particle Size Distribution Report

Project: Packard and Raceway Roads, Jericho, Vermont **Report No.:** CD7397SL-01-02-20

Client: Stantec Consulting Services, Inc. **Date:** 02/21/20

Sample No: B-7, S-1 **Source of Sample:** Boring Sample

Location: In-place **Elev./Depth:** 0-2'



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0	9	32	14	17	15	13	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	OUT OF SPEC. (X)
1"	100		
1/2"	80		
#4	59		
#10	45		
#40	28		
#200	13		

* (no specification provided)

Soil Description

Greyish-Brown cmf SAND; and mf GRAVEL; little SILT

Atterberg Limits

PL= -- LL= -- PI= --

Coefficients

D_{85}= 15.3023 D_{60}= 4.8842 D_{50}= 2.7389

D_{30}= 0.5201 D_{15}= 0.0920 D_{10}=

C_u= C_c=

Classification

USCS= AASHTO=

Remarks

Moisture Content = 9.6%

Figure

ATLANTIC TESTING LABORATORIES, LIMITED

Reviewed by: Judy Ames Date: 2/21/20

ATLANTIC TESTING LABORATORIES

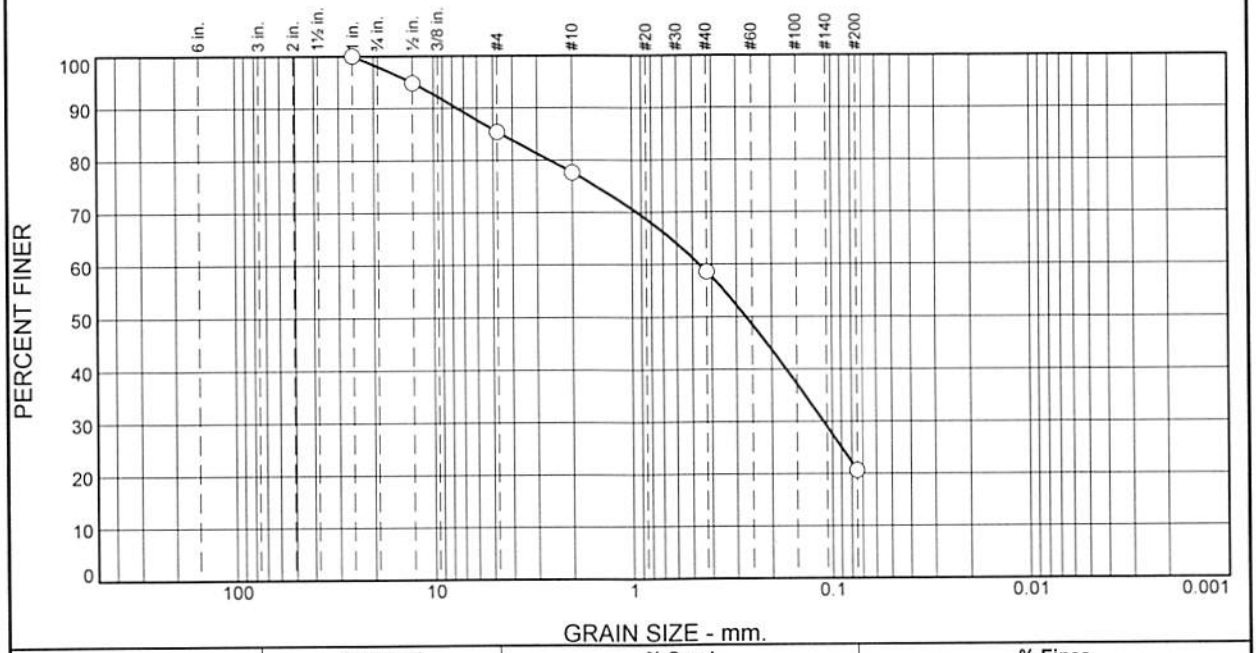
Particle Size Distribution Report

Project: Packard and Raceway Roads, Jericho, Vermont **Report No.:** CD7397SL-01-02-20

Client: Stantec Consulting Services, Inc. **Date:** 02/21/20

Sample No: B-8, S-2 **Source of Sample:** Boring Sample

Location: In-place **Elev./Depth:** 2-4'



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0	2	13	7	19	38	21	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	OUT OF SPEC. (X)
1"	100		
1/2"	95		
#4	85		
#10	78		
#40	59		
#200	21		

* (no specification provided)

Soil Description

Greyish-Brown c-mf+ SAND; some SILT; little mf+ GRAVEL

Atterberg Limits

PL= -- LL= -- PI= --

Coefficients

D_{85}= 4.5437 D_{60}= 0.4617 D_{50}= 0.2689
D_{30}= 0.1104 D_{15}= D_{10}=
C_u= C_c=

Classification

USCS= AASHTO=

Remarks

Moisture Content = 8.0%

Figure

ATLANTIC TESTING LABORATORIES, LIMITED

Reviewed by: Judy Ames Date: 2/21/20