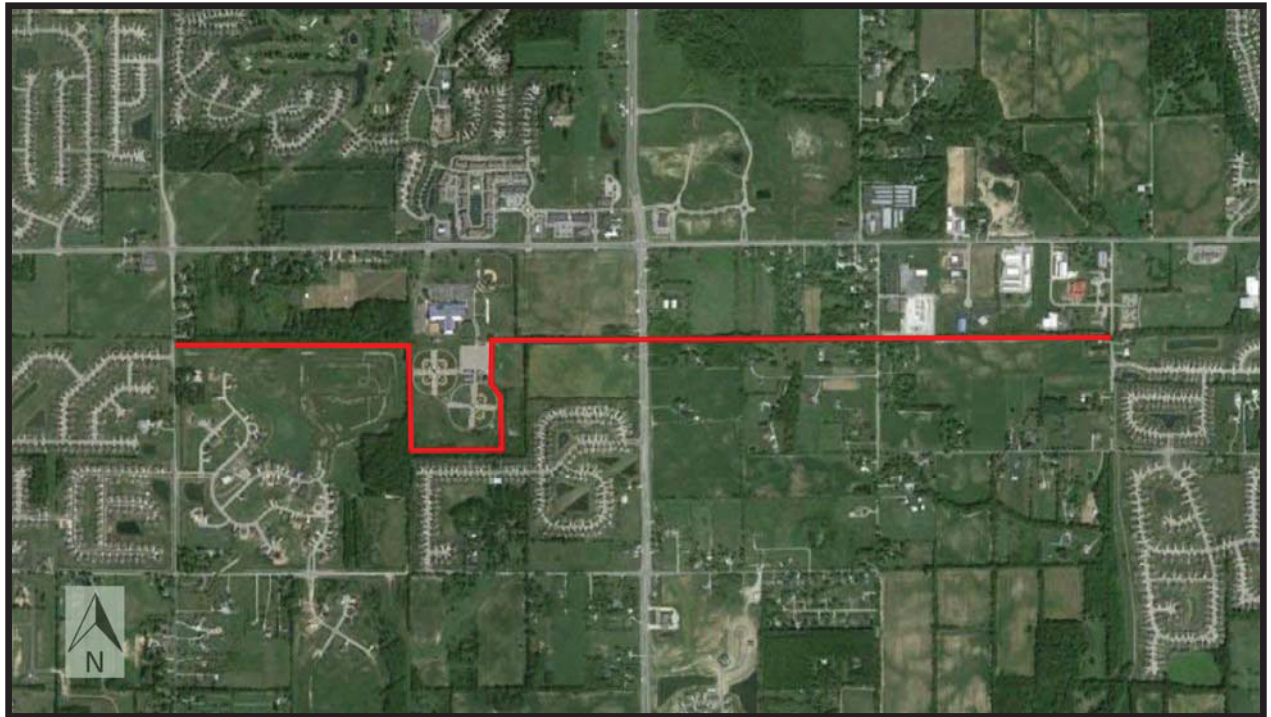


**Engineering Report
Prepared For:**



**Midland Trace Trail
(Gray Road to Willowview Road)**



**Prepared By:
American Structurepoint, Inc.
7260 Shadeland Station
Indianapolis, Indiana 46256**

A handwritten signature in black ink, appearing to read "Phillip A. Sundling".

Phillip A. Sundling, P.E.

March 24, 2014

Date

TABLE OF CONTENTS
Preliminary Engineering Assessment

| | |
|--|---|
| I. PURPOSE OF REPORT..... | 2 |
| II. PROJECT LOCATION | 2 |
| III. PROJECT NEED AND PURPOSE..... | 2 |
| IV. PROJECT HISTORY, PRIOR STUDIES | 2 |
| V. PROJECT INFORMATION..... | 3 |
| A. Existing Features..... | 3 |
| B. Field Check | 5 |
| C. Traffic Data and Capacity Analysis..... | 5 |
| D. Crash Data and Analysis | 5 |
| E. Discussion of Alternatives & Identification of Proposal | 5 |
| F. Recommended Alternate..... | 6 |
| G. Proposed Features..... | 6 |
| VI. COST ESTIMATE..... | 8 |
| VII. ENVIRONMENTAL ISSUES | 9 |
| VIII. SURVEY REQUIREMENTS | 9 |
| IX. COORDINATION..... | 9 |
| X. PROJECT RECOMMENDATIONS & CONCLUSIONS..... | 9 |

Appendix A – Project Location

Appendix B – Hydraulics and Drainage

Appendix C – Typical Cross Section

Appendix D – Crossing Design

Appendix E – Cost Estimate

Preliminary Engineering Assessment

Type of Work: Midland Trace Trail Project
Location: Noblesville, Indiana
County: Hamilton County

I. PURPOSE OF REPORT

The purpose of this report is to document the engineering assessment phase, including an outline of the proposal for improvements for the Midland Trace Trail from Gray Road to Willowview Road in the City of Noblesville in Hamilton County, Indiana. This report includes relevant background data associated with the development of this project's recommended improvements. This report provides recommendations and conclusions that will serve as a guide for succeeding survey and design.

II. PROJECT LOCATION

The project is located in the City of Noblesville, Hamilton County, Indiana approximately one quarter mile south of S.R. 32 and runs between Gray Road and Willowview Road.

Refer to Appendix A for an exhibit further detailing the location of the project.

III. PROJECT NEED AND PURPOSE

The purpose of the project is to convert the old Central Indiana Railway corridor rail bed into a pedestrian multi-use trail. The corridor is located on the Noblesville Alternative Transportation Plan and passes through scenic woodlands linking neighborhoods, schools, and commercial districts throughout the City of Noblesville. This corridor was identified as an area for trail development due to its existing undeveloped linear path. The need for the proposed project is a result of the large gap existing in the Midland Trace Trail corridor, which limits effectiveness and level of use of the trail. In addition, the Midland Trace Trail will connect to the Hazel Dell/Little Chicago Trail and Monon Trail when the Monon is extended to the north. The proposed project will create a new pedestrian way linking Noblesville to Westfield, Zionsville, Carmel, and Indianapolis.

IV. PROJECT HISTORY, PRIOR STUDIES

The project is part of the Noblesville Alternative Transportation Plan. The City has performed a route survey (2013) and preliminary title work, which were reviewed before preparation of this report. Communication with the City of Noblesville indicates that there are no other known studies of this area.

V. PROJECT INFORMATION

A. Existing Features

i. Trail Cross Section

The railroad corridor between Gray Road to Hazel Dell Road and from Mill Creek Road to Willowview Road is overgrown and unmaintained. There is a small existing paved portion along the Hazel Dell Elementary property that runs north-south along the east side of the ball fields and reconnects with the unmaintained railroad corridor just east of the parking lot. The section between Hazel Dell Road and Mill Creek Road has been maintained as a recreational path surrounded by mature trees.

ii. Pavement History & Condition

The railroad corridor between Gray Road to Hazel Dell Road and from Mill Creek Road to Willowview Road is overgrown and unmaintained. The section between Hazel Dell Road and Mill Creek Road has been maintained as a recreational path.

iii. Horizontal Alignment

The alignment of Midland Trace Trail is primarily east-west within the study limits following the old Central Indiana Railway. The corridor extends to the east from Gray Road to the property boundary of Hazel Dell Elementary. Instead of bisecting the school property, the corridor detours south, then east, then north along the east side of the ball fields and reconnects with the railroad corridor on the east side of the ball field parking lot. From here the corridor extends east to Willowview Road, again following the old Central Indiana Railway corridor.

iv. Vertical Alignment

In general, the existing vertical alignment within the project limits is relatively flat with everything sloping gently toward the east.

v. Intersections and Cross Streets

This portion of the Midland Trace Trail will begin at an intersection with Gray Road. The trail will cross Hazel Dell Road, Mill Creek Road, and end at Willowview Road.

vi. Railroad Crossings

There are no railroad crossings along the trail corridor. The trail is utilizing the old Central Indiana Railway.

vii. Land Use

The land use along Midland Trace Trail varies from residential, school, and commercial. The commercial areas are primarily undeveloped.

viii. Utilities

According to the USGS Topographic map of the project area, a refined products pipeline crosses the proposed trail between Hazel Dell Road and Mill Creek Road. Two additional pipelines exist just west of the project limits and will not be affected. Aerial power lines are apparent along Willowview Road at the east end of the project limits and run along the north side of the corridor for roughly 900'. Additional runs of aerial power lines run parallel along the west side of Mill Creek Road, the west side of Hazel Dell Parkway and the east side of Gray Road but none of these should be disturbed by this project. Further research and coordination will be necessary to identify all possible utilities that may conflict with this project.

ix. Bridge Structures

There are no bridges within this project corridor.

x. Hydraulics / Drainage

The drainage of the corridor consists of surface runoff. There are two legal drains located within the project corridor, the Fred Hines Drain and Russell Shugart Drain, both are subsurface tile drains. In addition, Unnamed Tributary 1 to Emily Vestal Drain (UNT1) west of Mill Creek Road flows through the project corridor and eventually draining to the White River. There are several culverts under the existing railroad bed, which convey surface water along various side ditches that parallel the corridor. Refer to Appendix B for maps further detailing the existing hydraulic conditions.

xi. Soils

The predominant soil series in the project area are Brookston silty clay loam (Br), Crosby silt loam (Cr), Miami silt loam (Mm), Miami clay loam (Mo), and Sleeth loam (St). The Brookston soil is a mapped hydric soil. Refer to the Wetland Delineation and Waters Report prepared for this project for additional information.

xii. Right of Way

Detailed Right of Way (ROW) information for existing old Central Indiana Railway corridor is incomplete. Until ROW research is complete it will be assumed that there is minimal existing ROW along this corridor.

B. Field Check

Field inspections were conducted prior to the completion of this report. A formal field check for Midland Trace Trail project has not yet been conducted. The field inspections form a partial basis for the existing conditions of this report.

C. Traffic Data and Capacity Analysis

Traffic counts for the crossing streets within this project area were obtained from the City of Noblesville Engineering Department and are summarized in the table below.

| EXISTING TRAFFIC COUNTS | | | | |
|--------------------------------|-----------------|---------------|---------------|--------------------|
| Street | Type | VPD NB | VPD SB | Speed Limit |
| Gray Road | Major Collector | 2,213 | 2,216 | 40 |
| Hazel Dell Road | Major Collector | 6,545 | 6,243 | 45 |

No information was available for Mill Creek Road or Willowview Road, although it is anticipated that these will be regarded as minor crossings.

D. Crash Data and Analysis

Not applicable to this project type.

E. Discussion of Alternatives & Identification of Proposal

Many options were evaluated in order to find the most effective solution to convert the old Central Indiana Railway corridor rail bed into a pedestrian multi-use trail.

Alternate 1 – Propose the Midland Trace Trail to follow the old Central Indiana Railway corridor

- This alternate will a link between existing and proposed trail sections.
- Pedestrian and multi-modal safety and capacity will be increased by the construction of this multi-use trail.

- This alternative satisfies the purpose and need.

Alternate 2 – Propose the Midland Trace Trail to avoid wetland areas and 4(f) resources, namely Hazel Dell Elementary and Noblesville Youth Baseball fields

- In order to avoid the wetlands, the corridor would have to be less direct, which would increase the cost due to additional right of way acquisitions.
- By avoiding impacts to the 4(f) resources of Hazel Dell Elementary and Noblesville Youth Baseball field, this alternative is not meeting the purpose of connecting these resources.
- This alternate is not practicable and does not meet the purpose and need.

Alternate 3 – No build. This option is not recommended for the following reasons:

- This alternative would cause a disconnection between existing and proposed trail sections.
- This option does nothing to satisfy the purpose and need.

F. Recommended Alternate

After evaluating the information associated with the three alternates studied, **Alternate 1** is the preferred alternate as it satisfies the purpose and need.

G. Proposed Features

i. Design Criteria

| DESIGN CRITERIA | | | | | |
|------------------------|----------------------------------|----------------|-------------------|-----------------------|--------------------|
| Roadway | Functional Classification | Terrain | Lane Width | Shoulder Width | Cross Slope |
| Midland Trace Trail | Trail | Level | 12'-0" | 2'-0" | 2% |

ii. Typical Cross Section

The proposed typical section for the Midland Trace Trail shall be composed of one 12'-0" lane with earth shoulders. Refer to Appendix C for further details.

iii. Pavement Recommendations

Full-depth asphalt is proposed for the path with earth shoulders. The final pavement type and thickness will be determined during the design stage and shall follow the City of Noblesville standards.

iv. Horizontal Alignment Improvements

As documented in the existing conditions, the existing horizontal geometrics are acceptable throughout the project limits although instead of bisecting the school property at Noblesville Elementary School, the corridor detours south, then east, then north along the east side of the ball fields where it connects with an existing paved path that runs north-south to the parking lot. The path will then continue east along the original railroad corridor to Willowview Road. Minor curvature may be required to minimize impacts on ROW and to accommodate drainage.

v. Vertical Alignment Improvements

As documented in the existing conditions, the existing vertical alignment is acceptable.

vi. Utilities

A utility investigation has not yet been completed for this project. The designer shall coordinate with the local utility companies during the design stage for verification of utility locations and potential utility conflicts with any proposed work.

vii. Bridge Structure

There are no proposed bridges within this project corridor.

viii. Hydraulic Recommendations

The proposed trail typical section is uncurbed and will require drainage conveyed through surface runoff, roadside ditches, and culverts. According the Hamilton County Surveyors Office, the Russell Shuggart Drain will require reconstruction under the proposed trail and the Fred Hines Drain is currently pending a reconstruction under the Slater Run,

Section 2 project. All drainage will likely follow the existing drainage patterns toward the east.

ix. Intersection Improvements

The path-roadway crossings are critical design elements. All of the path-roadway crossings for this project are midblock type. According to the Indiana Design Manual (IDM) Figure 51-7O, the treatment for the intersection of the roadway and path is determined by the roadway speed. Based on this figure, a crosswalk and median refuge is acceptable for the Gray Road intersection. However, Gray Road is only a 2-lane roadway with no median and does not meet the criteria for a refuge island according to IDM 51-7.09(03). Therefore, a crosswalk with appropriate pavement markings and signing shall be utilized in accordance with the MUTCD. The Hazel Dell Road intersection, based on Figure 51-7O, shall utilize an acceptable traffic signal. Additional pedestrian safety studies may be necessary to appropriately design the crossing at Hazel Dell Parkway. Refer to Appendix D for further details.

x. Lighting

According to IDM Chapter 51, considerations should be made where nighttime usage is expected and also at all roadway crossings. It is recommended that illuminating the shared-use path for 75' on either side of the roadway crossing is desirable. If no lighting is to be provided along the pathway, considerations shall be made to install empty conduit so future lighting installation will be of minimal disturbance. Any lighting scheme will be determined during the design stage.

xi. Right of Way Impacts

Approximately 14.5 acres of ROW will need to be acquired for the construction. The preliminary proposed ROW corridor width for this project is 40'. See Appendix E for additional cost details.

xii. Maintenance of Traffic

Maintenance of traffic will be required for all cross roads within the project corridor during construction. These roads are Gray Road, Hazel Dell Road, Mill Creek Road, and Willowview Road. Lane closures and lane shifts will be the method of maintaining traffic and will be further developed during the design in accordance with design standards.

VI. COST ESTIMATE

See Appendix E for further details.

VII. ENVIRONMENTAL ISSUES

A more in depth analysis of environmental issues can be found in the Environmental Assessment prepared for this project.

VIII. SURVEY REQUIREMENTS

A full survey will be required for design.

IX. COORDINATION

Coordination of the proposed project has been undertaken with the following entities:

- 1) City of Noblesville
- 2) Greenfield District of the Indiana Department of Transportation
- 3) Noblesville School Corporation
- 4) Hamilton County Parks & Recreation Department

Additional entities will include all potential permitting authorities, which will be determined throughout the design process. In addition to the coordination with these entities, multiple public presentations were given throughout the development of these projects.

X. PROJECT RECOMMENDATIONS & CONCLUSIONS

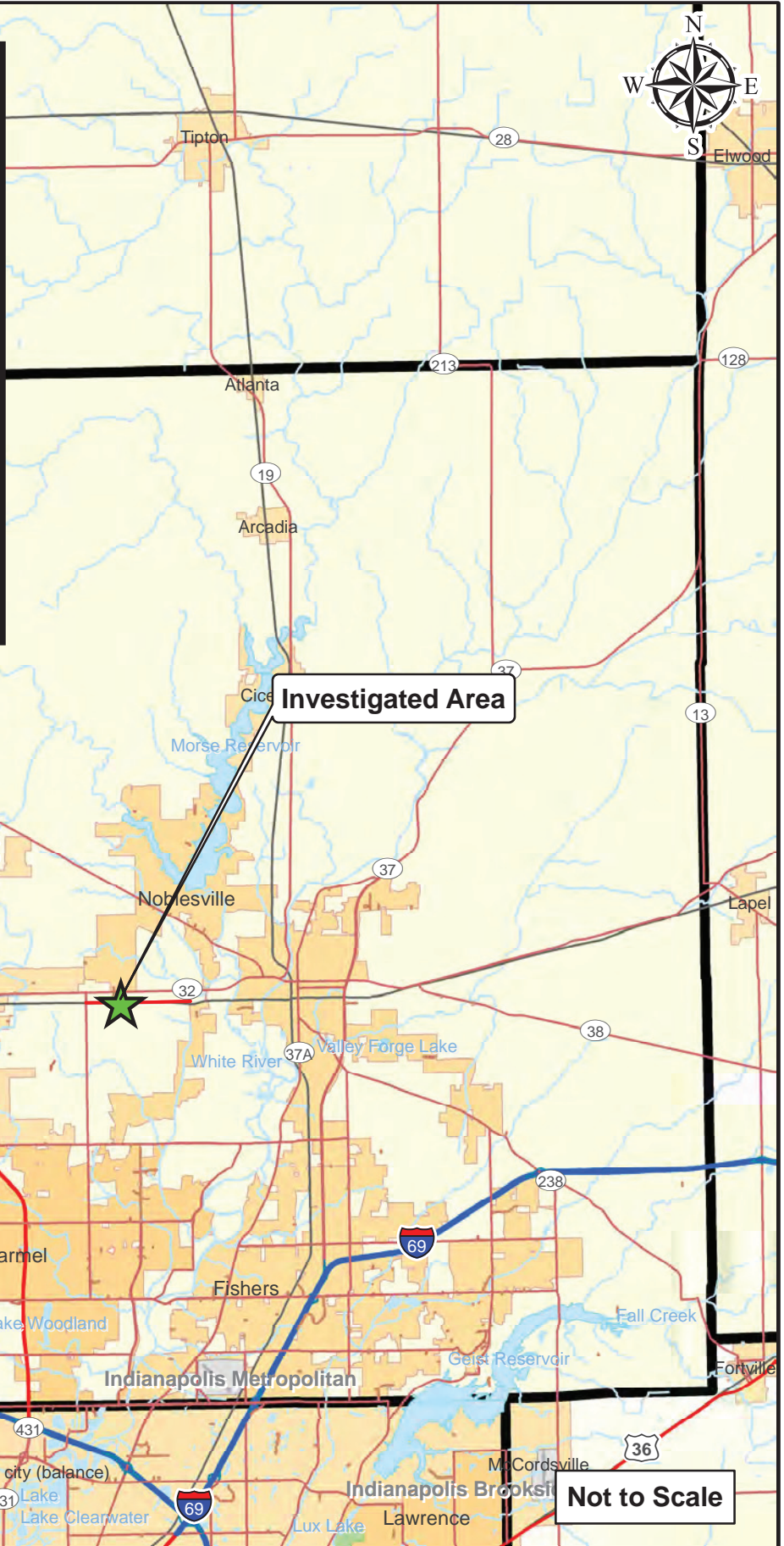
The purpose of this project is to provide recreational infrastructure to allow pedestrians better access to neighborhoods, schools, and businesses. It will also improve pedestrian safety and connect Noblesville with its neighboring communities.

Appendix A

Project Location



Hamilton County, Indiana



Investigated Area

Not to Scale

Path: \\INDYSANP\Projects\2013\01746\Drawings\ArcView\Exhibits\Waters\2013\01746.EV\2013-12-11_Map_Location.AL.M.mxd Date: 1/8/2014 User: Amaniatt



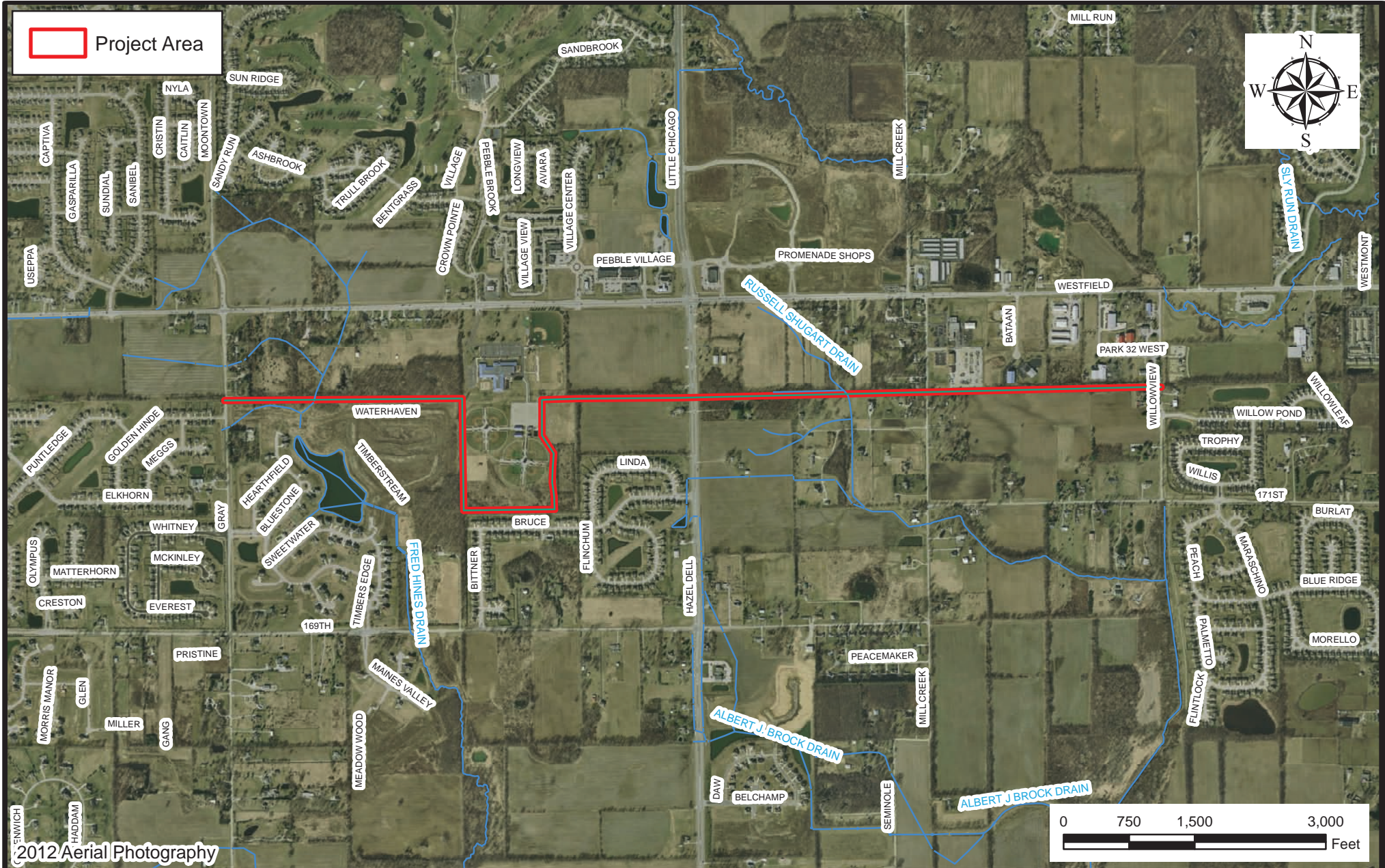
State Location Map

City of Noblesville
16 South 10th Street
Noblesville, Indiana 46060

Midland Trace Trail
Gray Road to Willowview Road

Location: Noblesville
Township: Noblesville
County: Hamilton
State: Indiana

Date: 12/19/2013



Aerial Site Map

City of Noblesville
16 South 10th Street
Noblesville, Indiana 46060

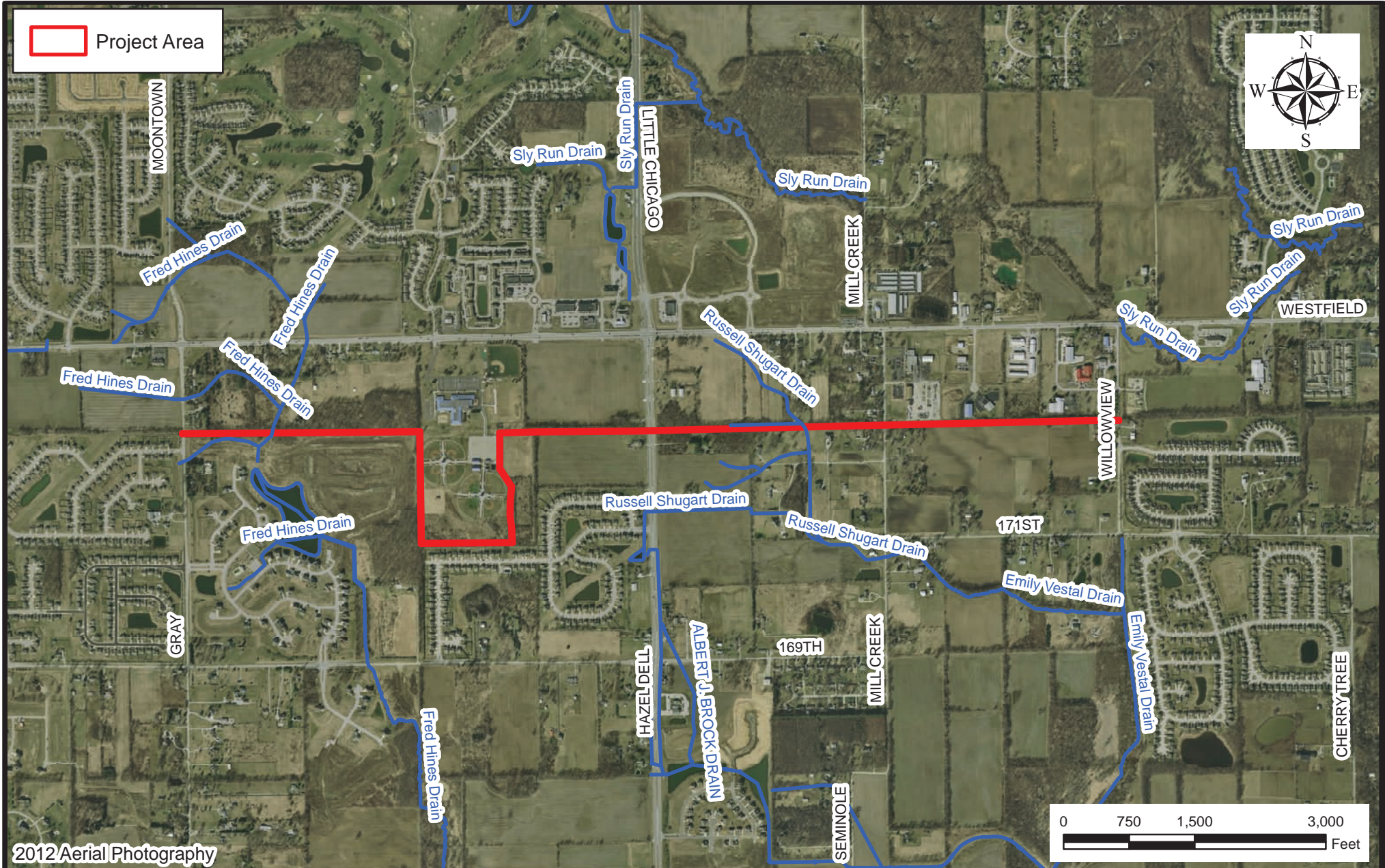
Midland Trace Trail Gray Road to Willowview Road

Location: Noblesville
Township: Noblesville
County: Hamilton
State: Indiana

Date: 11/14/2013

Appendix B

Hydraulics and Drainage



2012 Aerial Photography



Hamilton County Legal Drains

City of Noblesville
16 South 10th Street
Noblesville, Indiana 46060

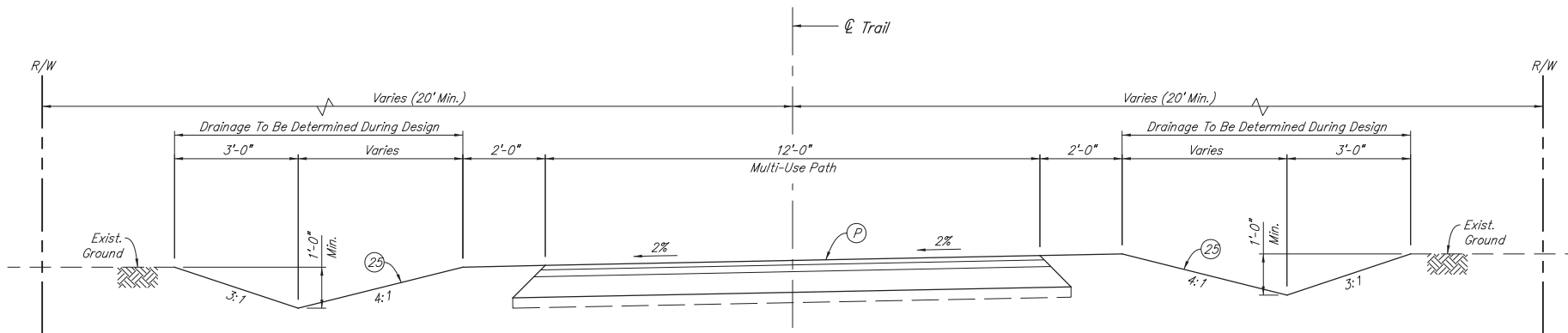
Midland Trace Trail Gray Road to Willowview Road

Location: Noblesville
Township: Noblesville
County: Hamilton
State: Indiana

Date: 12/19/2013

Appendix C

Typical Cross Section



LEGEND

- (29) Seed Mixture, U
- (P) 140 #/SYS HMA Surface, Type A on 220 #/SYS HMA Intermediate, Type A on 6" Compacted Aggregate Base, No.53 on Subgrade Treatment, Type V

| | | | | | |
|--|--|---|--|----------------------------------|-----------------|
| | | RECOMMENDED FOR APPROVAL _____ DESIGN ENGINEER DATE | INDIANA DEPARTMENT OF TRANSPORTATION | HORIZONTAL SCALE 1/4" = 1'-0" | BRIDGE FILE |
| | | DESIGNED: PAS DRAWN: PAS CHECKED: _____ CHECKED: _____ | TYPICAL CROSS SECTION MIDLAND TRACE TRAIL | VERTICAL SCALE N/A | DESIGNATION NO. |
| | | | | SURVEY BOOK | SHEETS of |
| | | | | CONTRACT | PROJECT NO. |

Appendix D

Crossing Design

| Motor-Vehicle Speed | AADT | Intersection Treatment |
|---------------------|----------------------------------|---|
| 50 mph | Any | Grade Separation (Good) |
| | | Traffic Signal and 40-mph Speed Zone (Satisfactory) |
| 45 mph | Any | Grade Separation (Good) |
| | | Traffic Signals (Satisfactory) |
| 40 mph | $\geq 7,000$ | Grade Separation (Good) |
| | | Traffic Signals (Satisfactory) |
| | $< 7,000$ | Traffic Signals (Good) |
| | | Crosswalk and Median Refuge Island (Satisfactory) |
| 30 mph | $\geq 9,000$ | Grade Separation (Good) |
| | | Traffic Signals (Satisfactory) |
| | $5,000 \leq \text{AADT} < 9,000$ | Traffic Signals (Good) |
| | | Crosswalk and Median Refuge Island (Satisfactory) |
| | $< 5,000$ | Crosswalk and Median Refuge Island (Good) |
| | | Crosswalk (Satisfactory) |

**RECOMMENDED TREATMENT OF SHARED-USE
PATH AND ROADWAY INTERSECTION**

Figure 51-7 O

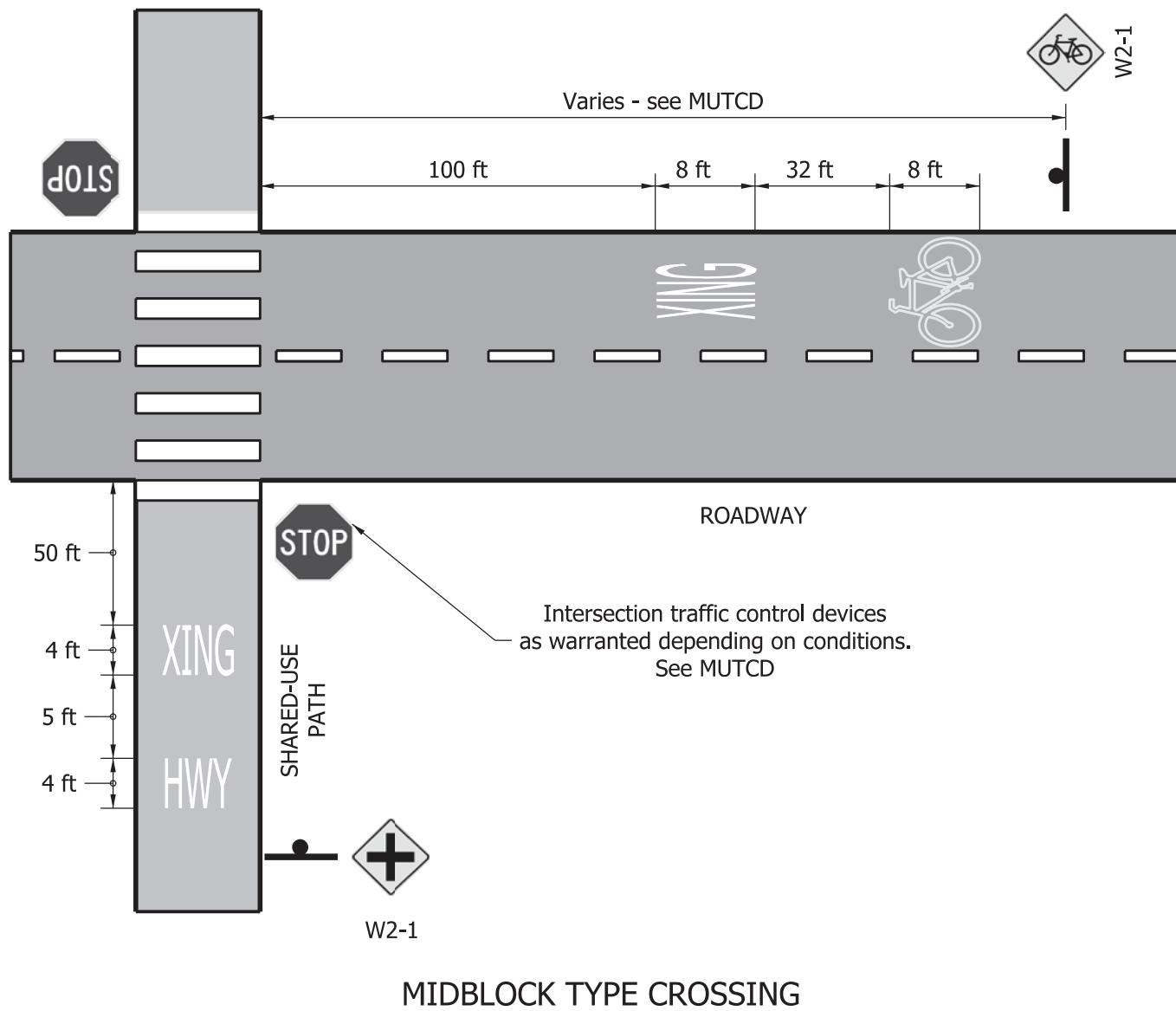


Figure 51-7P

Appendix E

Cost Estimate

Midland Trace Trail - Cost Breakdown

| Description of Service | Cost | Notes |
|----------------------------------|-----------|---------------------------------------|
| <i>PE</i> | \$220,000 | Includes Design, Survey, and R/W Eng. |
| <i>Environmental</i> | \$49,000 | |
| <i>Land Acquisition Services</i> | \$200,000 | |
| <i>Land Acquisition</i> | \$380,000 | Estimated at \$0.60/SFT |
| <i>Construction</i> | \$860,000 | See attached |
| <i>Construction Inspection</i> | \$110,000 | |

Total Project Cost =

\$1,820,000



AMERICAN
STRUCTUREPOINT
INC.

QUANTITY COST ESTIMATE

Midland Trace Trail

Project No.: 2013.01746

Des. No.: EN-180

ESTIMATED PROJECT COST

Total: \$656,756.16

30.0% Contingency: \$197,026.85

ESTIMATED TOTAL: \$860,000.00

| ID | Item No. | Description | Quantity | Unit | Unit Price | Item Total |
|------|-----------|---|-----------|------|-------------|--------------|
| 0001 | 105-06845 | CONSTRUCTION ENGINEERING | 1.00 | LS | \$12,050.57 | \$12,050.57 |
| 0002 | 110-01001 | MOBILIZATION AND DEMOBILIZATION | 1.00 | LS | \$30,126.43 | \$30,126.43 |
| 0003 | 201-52370 | CLEARING RIGHT OF WAY | 1.00 | LS | \$12,050.57 | \$12,050.57 |
| 0004 | 203-02000 | EXCAVATION, COMMON | 2,975.00 | CYS | \$15.00 | \$44,625.00 |
| 0005 | 205-99999 | EROSION CONTROL | 1.00 | LS1 | \$40,000.00 | \$40,000.00 |
| 0006 | 207-09895 | SUBGRADE TREATMENT, TYPE V | 15,510.00 | SYS | \$7.86 | \$121,908.60 |
| 0007 | 301-07448 | COMPACTED AGGREGATE, NO. 53, BASE | 2,491.00 | TON | \$21.24 | \$52,908.84 |
| 0008 | 402-07432 | HMA SURFACE, TYPE A | 999.00 | TON | \$80.17 | \$80,089.83 |
| 0009 | 402-07435 | HMA INTERMEDIATE, TYPE A | 1,598.00 | TON | \$73.84 | \$117,996.32 |
| 0010 | 621-99999 | LANDSCAPING | 1.00 | LS1 | \$40,000.00 | \$40,000.00 |
| 0011 | 720-99999 | STORM SYSTEM | 1.00 | LS1 | \$20,000.00 | \$20,000.00 |
| 0012 | 805-99998 | HAZEL DELL PEDESTRIAN SIGNALIZED CROSSING | 1.00 | LS1 | \$80,000.00 | \$80,000.00 |
| 0013 | 805-99999 | MILL CREEK PEDESTRIAN UNSIGNALIZED CROSSING | 1.00 | LS1 | \$5,000.00 | \$5,000.00 |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |