STRUCTURE GEOTECHNICAL REPORT
ILLINOIS ROUTE 59 RETAINING WALLS
PR SN 022-2998 AND 022-2999
LAKE COUNTY, ILLINOIS

For
Collins Engineers, Inc.
123 North Wacker Drive, Suite 900
Chicago, IL 60606

Submitted by
Wang Engineering, Inc.
1145 North Main Street
Lombard, IL 60148

Original Report: December 28, 2017
Revised Report: March 6, 2018

Technical Report Documentation Page

1. Title and Subtitle		2. Original Date / 3. Report Type
1. Title and Subtitle Structure Geotechnical Report, IL Route 59 Retaining Walls		**2. Original Date:** December 28, 2017 **Revised Date:** March 6, 2018 **3. Report Type** ☒ SGR ☐ RGR ☐ Draft ☐ Final ☒ Revised
4. Route / Section / County/ District/ Region IL59/ NA/ DuPage/ 1/ 1		**5. Job/ Contract**
6. PTB / Item No. 182/ 004	**7. Existing Structure Number(s)** NA	**8. Proposed Structure Number(s)** SN 022-2998 and 022-2999
9. Prepared by Wang Engineering, Inc. 1145 N Main Street Lombard, IL 60148	**Contributor(s)** Author: Mickey L. Snider, PE QA/QC: Corina T. Farez, PE, PG PM: Mickey L. Snider, PE	**Contact Information** (630) 953-9928 ext. 1027 msnider@wangeng.com
10. Prepared for Collins Engineers Inc. 123 North Wacker Drive Suite 900 Chicago, IL, 60606	**Contact(s)** Jason Schneider, PE, SE	**Contact Information** (312) 236-5953 JSchneider@collinsengr.com

11. Abstract

Two new retaining walls are proposed along northbound Illinois Route 59 to support a proposed multi-use path. The south wall will extend from Station 505+00 to Station 507+57 and the north wall from Station 510+80 to 512+80; the face of both walls will be constructed about 15 feet east of the IL59 edge-of-pavement. Total and exposed wall heights have not yet been confirmed, but we understand they will not be taller than 6 feet exposed. Each of the walls will, however, have a noise wall erected on top.

Along the walls, the existing soils consists of stiff to hard silty clay or dense sandy gravel fill overlying natural stiff to hard silty clay. Deeper foundation soils include medium dense to dense fine sand and sandy gravel. Groundwater was not encountered during the investigation.

The proposed retaining walls will be in a fill sections and should be constructed as soldier pile and lagging, mechanically-stabilized earth (MSE), or reinforced-concrete cantilever (RCC) walls. A flexible soldier pile and lagging wall that could be installed either by driving or by installing the solider piles within prebored holes with diameters of 36 inches. The wall should be designed for equilibrium and deflection, with the equilibrium evaluation including a lateral load factor of 1.5 and a passive resistance factor of 0.75.

We estimate the foundation soil has a maximum nominal bearing resistance of 8,200 psf; the maximum factored bearing resistance is 5,300 psf for an MSE resistance factor of 0.65 or 3,700 psf for an RCC resistance factor of 0.45. The foundation soils will undergo long-term settlement of less than 1.0 inch under the applied bearing pressures. The factor of safety in global stability for a wall with a total height less than 10 feet overlying stiff to hard clayey soils will be greater than the IDOT requirement of 1.5.

Dewatering will not be required during construction.

12. Path to archived file

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Wang Engineering

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STRUCTURE GEOTECHNICAL REPORT
ILLINOIS ROUTE 59 RETAINING WALLS
PR SN 022-2998 AND 022-2999
DUPAGE COUNTY, ILLINOIS
FOR
COLLINS ENGINEERS

1.0 INTRODUCTION

The following report presents the results of the subsurface investigation, laboratory testing, and geotechnical engineering evaluations for two new Retaining Walls along northbound Illinois Route 59 just north of Army Trail Road in DuPage County, Illinois. A Site Location Map is presented as Exhibit 1.

1.1 Proposed Structure

Based on the concept information provided by Collins Engineers, Inc., Wang Engineering, Inc. (Wang) understands the south retaining wall runs from Station 505+00 to Station 507+57 and the north wall will run from Station 510+80 to 512+80; the face of both walls will be constructed about 15 feet east of the IL59 edge-of-pavement. Wall heights have not yet been confirmed, but we understand they will not be taller than 6 feet exposed. Each of the walls will, however, support a noise wall. The walls will support a multi-use path to be constructed alongside northbound IL59.

1.2 Existing Structure and Land Use

There is currently a 10- to 18-foot tall noise wall between Stations 505+00 and 512+80. Adjacent to the existing IL59 edge-of-pavement, the ground dips down into a 4-to 6-foot deep drainage ditch before meeting the existing noise wall. The concept plan is to fill the ditch by constructing the retaining wall and moving the noise wall to the top.

The purpose of this investigation was to characterize the site soil and groundwater conditions, perform geotechnical analyses, and provide recommendations for the design and construction of the proposed retaining and noise walls.

2.0 GEOLOGICAL SETTING

The project area is located in northwestern DuPage County, in Wayne Township. On the USGS West Chicago Quadrangle 7.5 Minute Series map, the proposed improvement extends on each side of IL 59 and Army Trail Road intersection in Section 16 of Tier 40 N, Range 9 E of the Third Principal Meridian.

The following review of published geologic data, with emphasis on factors that might influence the design and construction of the proposed engineering works, is meant to place the project area within a geological framework and, thus, to confirm the dependability and consistency of the present subsurface investigation results. For the study of the regional geologic framework, Wang considered northeastern Illinois area in general and DuPage County in particular.

2.1 Physiography

Most of DuPage County is part of the Valparaiso Morainic System with its broad parallel ridges that encircle Lake Michigan. The north south trending West Chicago Moraine dominates the project area (Leighton at al. 1948). The project stretches over ferly flat moraine broad crest and elevation of about 800 feet characterized the area. About 1000 feet east, the surface elevation slopes abruptly to about 750 feet into intermorainic area between West Chicago and Wheaton Moraines. DuPage River flows southward within the low-relief area between the two moraines.

2.2 Surficial Cover

According to the available geological information, the surficial geology of the project area is primarily the result of Wisconsinan-age glacial activity. The over 100-foot thick glacial cover is made up predominantly of diamicton attributed to the Wadsworth Formation that interfingers with outwash of the Henry Formation and silty clay diamicton and loamy diamicton of the Lemont Formation (Hansel and Johnson 1996; Curry 2007). The Wadsworth Formation characterized by fairly uniform, gray till with clay to silty clay matrix, a high content of dolomite and shale clasts and occasional lenses of sorted and stratified silt and sand (Hansel and Johnson 1996, Curry 2007). From a geotechnical viewpoint, the Wadsworth diamicton is characterised by low plasticity, medium to low moisture content, medium to very stiff consistency, poor permeability, and low compressibility (Bauer et al. 1991). The Henry Formation consists of mainly stratified sand and gravel deposits (Hansel and Johnson 1996, Curry 2007). The Lemont Formation clayey and loamy diamictons facieses interfinger with the Henry formation outwash (Curry 2007). The Lemont

Formation diamictons are characterized by low plasticity, low to moderate moisture content, low compressibility (Bauer et al. 1991).

2.3 Bedrock

In DuPage County, the surficial cover rests unconformably on top of Silurian-age dolostone bedrock that dips eastward at a pace of about 15 feet per mile. Within the project limits, the top of the bedrock lies at about 130 feet below the ground surface (bgs) at about 670 feet elevation. Structurally, the site is located on the eastern flank of the Wisconsin Arch (Willman 1971, Nelson 2010). No active faults or underground mines are known in the area (ISGS 2017).

Our subsurface investigation results fit into the local geologic context. The borings drilled in the project area revealed the native sediments consist of clay to silty clay diamicton of the Wadsworth Formation overlying sand and gravel from the Henry Formation. Bedrock was not encountered during this investigation.

3.0 METHODS OF INVESTIGATION

The following sections outline the subsurface and laboratory investigations performed by Wang.

3.1 Field Investigation

The subsurface investigation along the wall alignments includes eight structure borings, designated RW-01 through RW-08 drilled by Wang in November 2017. The borings were drilled from elevations of 795.6 to 805.5 feet to depths of 20 feet below the ground surface (bgs). The as-drilled northings, eastings, and elevations were acquired with a mapping-grade GPS unit. The boring location information is included in the *Boring Logs* (Appendix A) and the as-drilled locations are shown in the *Boring Location Plan* (Exhibit 2).

A truck-mounted drilling rig equipped with hollow stem augers was used to advance and maintain an open borehole. Soil sampling was performed according to AASHTO T 206, "Penetration Test and Split Barrel Sampling of Soils" at 2.5-foot intervals to the boring termination depths.

At each boring location, the boreholes were backfilled upon completion with cuttings and bentonite chips, and the surface was restored as much as possible to its original condition.

Field boring logs, prepared and maintained by a Wang field engineer, included lithological descriptions, visual-manual soil classifications, pocket penetrometer and Rimac unconfined compressive strength tests, and results of field standard penetration test (SPT) results recorded as blows per 6 inches of penetration. Groundwater levels were measured while drilling and at completion of each boring. Samples collected from each sampling interval were placed in sealed glass jars and transported to the laboratory for testing.

3.2 Laboratory Testing

Soil samples were tested in our laboratory for moisture content (AASHTO T 265). Atterberg limit (AASHTO T 89/90) and particle size (AASHTO T 88) analyses was performed on a selected sample. Field visual descriptions of soil samples were verified in the laboratory and index tested soils were classified according to the IDH Soil Classification System. The laboratory test results are shown in the *Boring Logs* (Appendix A) and *Laboratory Test Results* (Appendix B).

4.0 INVESTIGATION RESULTS

Detailed descriptions of the soil conditions encountered during the subsurface investigation are presented in the attached *Boring Logs* (Appendix A) and in the *Soil Profile* (Exhibit 3). Please note that strata contact lines represent approximate boundaries between soil types. The actual transition between soil types in the field may be gradual in horizontal and vertical directions.

4.1 Lithological Profile

The borings were advanced along the edge of IL59 and encountered surface conditions of 9 to 11 inches of concrete pavement over 8 to 13 inches of sandy gravel base. In descending order, the general lithologic succession encountered beneath the topsoil includes 1) man-made ground (fill); 2) stiff to hard silty clay; and 3) medium dense to dense sand and sandy gravel.

(1) Man-made ground (fill)

Below the pavement, the borings encountered 4 to 6 feet of fill materials. The fill consists of either stiff to hard, brown and gray silty clay or dense, brown and gray sandy gravel. The silty clay has unconfined compressive strength (Q_u) values of 1.0 to 4.0 tsf and moisture content values of 12 to 18%. The sandy gravel has an N-value of 35 blows per foot of penetration.

(2) Stiff to hard silty clay

Beneath the fill the borings advanced through stiff to hard, brown and gray silty clay to silty clay loam diamicton. This unit is the predominate foundation soil type beneath the proposed retaining wall with thickness of 15 to 20 feet and was the only soil type revealed in Boring RW-04. The silty clay has Q_u values of 1.6 to greater than 6.0 tsf and moisture content values of 15 to 28%.

Borings RW-04 and RW-05, drilled in the middle portion of the project and at the low point in the IL59 profile, each encountered a single sample with Q_u less than 2.0 and moisture content greater than 25%. These samples likely represent a thin lacustrine deposit overlying the thicker, dryer diamicton. Laboratory testing on these two samples shows liquid limit (L_L) values of 55 to 60% and plastic limit (P_L) values of 19 to 21%; the liquidity index of this unit is between 0.15 and 0.20, indicating soils that will not be prone to excessive deformations despite the slightly higher moisture contents.

(3) Medium dense to dense sand

Deeper soil conditions at both the far north and south ends of the wall limits include medium dense to dense, gray, fine sand and sandy gravel. The granular soils have N-values of 13 to 49 blows per foot of penetration. This unit was first encountered 12 to 18 feet below existing grade and will have minimal impact on the design of the retaining walls.

4.2 Groundwater Conditions

The sand and sandy gravel samples from **Layer 3** were encountered damp to moist. The samples did not indicate the presence of a permanent phreatic surface; however, they do indicate that during certain periods of precipitation, groundwater should be expected at these depths. The boreholes were recorded as dry at the completion of drilling.

5.0 FOUNDATION ANALYSIS AND RECOMMENDATIONS

The proposed 6-foot exposed height walls will support a new multi-use path between Stations 505+00 and 507+57 and Stations 510+80 and 512+80 along IL59. We understand a soldier pile and lagging wall is the preferred wall type, as the soldier piles can be extended up to receive the noise wall panels. As alternatives, the wall could also be constructed as a mechanically-stabilized earth (MSE) or reinforced-concrete cantilever (RCC) wall.

5.1 Seismic Design Considerations

Seismic design is not required for retaining wall structures located in Seismic Performance Zone (SPZ) 1 in accordance with the IDOT *Bridge Manual* (2012).

5.2 Soldier Pile and Lagging Wall

If soldier piles are designed to support the walls, they could be installed either by driving or by setting them within prebored holes. The chosen system should be designed for both lateral earth pressure and lateral deformation. The embedment depth in moment equilibrium for the wall sections should be designed in accordance with the LRFD guidelines (AASHTO 2016), which will require an active lateral earth load factor of 1.5 and a passive lateral earth pressure resistance factor of 0.75. These guidelines have been known to result in deeper embedment depths and larger soldier pile sizes, than those designed under Allowable Stress Design (ASD).

Generally, both granular soils and overconsolidated clayey soils, such as the stiff to hard silty clay encountered in the borings will exhibit lower overall shear strength in the long-term condition. Therefore, in accordance with AASHTO (2016) the lateral earth pressure analysis should be performed for walls in the long-term (drained) condition using the soil parameters shown in Table 1. The earth pressure coefficients provided are for straight backfill behind and in front of the wall.

Table 1: Long-term (Drained) Geotechnical Parameters for Design of Soldier Pile Walls

Soil Description Avg Depth Limit bgs	Unit Weight, γ (pcf)	Drained Shear Strength Properties		Earth Pressure Coefficients (Straight Backfill)	
		Cohesion (psf)	Friction Angle (°)	Active Pressure	Passive Pressure
Stiff to Hard SI CLAY FILL Surface to 5 feet	120	100	30	0.33	3.00
Dense SANDY GRAVEL FILL (RW-05) Surface to 5 feet	120	0	32	0.31	3.26
Stiff to hard SI CLAY From 5 to 17 feet	120	100	30	0.33	3.00
M Dense to Dense SAND and SA GRAVEL From 17 to 20 feet	125	0	32	0.31	3.26

The lateral deformation of the wall should be designed for movement and moment fixity at the base of the pile or prebore. The evaluations should be performed using the parameters shown in Table 2 via p-y curve (COM624) method.

Table 2: Recommended Parameters for Lateral Load Analysis of Soldier Pile Walls

Soil Description Avg Depth Limit bgs	Unit Weight, γ (pcf)	Undrained Shear Strength, c_u (psf)	Estimated Friction Angle, Φ (°)	Estimated Lateral Soil Modulus Parameter, k (pci)	Estimated Soil Strain Parameter, ε_{50} (%)
Stiff to Hard SI CLAY FILL Surface to 5 feet	120	2000	0	1000	0.6
Dense SANDY GRAVEL FILL (RW-05) Surface to 5 feet	120	0	32	60	--
Stiff to hard SI CLAY From 5 to 17 feet	120	2500	0	1000	0.5
M Dense to Dense SAND and SA GRAVEL From 17 to 20 feet	125	0	32	90	--

5.3 MSE and RCC Walls

An MSE retaining wall base should be established a minimum of 3.5 feet below the finished grade at the front face of the wall, while a RCC wall should be established a minimum of 4.0 feet. MSE walls are constructed in accordance with IDOT Section 522 (2016).

5.3.1 Bearing Resistance and Sliding

From the concept geometry we estimate that the MSE wall will have a total height of 9.5 feet and will apply a maximum factored bearing pressure of 2,400 psf, accounting for vertical and lateral load factors (AASHTO 2016). The foundation will be established on stiff to hard silty clay (**Layer 2**) soils. The estimated nominal bearing resistance of the soil is 8,200 psf and the factored bearing resistance is 5,300 psf based on a geotechnical resistance factor of 0.65 (AASHTO 2016). The RCC alternative would apply a maximum factored bearing pressure of 2,200 psf and the foundation soils would have a factored resistance of 3,700 psf with a resistance factor of 0.45.

The foundation soils are sufficient for the support of both the MSE and RCC walls. Depending on the design of the noise wall, however, there may be additional dead and/or wind load that may increase the applied bearing pressure of the wall.

The estimated friction angle between an MSE base and the underlying silty clay is 30°, and the corresponding friction coefficient is 0.58. MSE walls are designed based on an AASTHO soil-to-soil contact geotechnical sliding resistance factor of 1.0 (2016). The friction angle between a cast-in-place RCC wall and the underlying silty clay is 24°, and the corresponding friction coefficient is 0.44. Cast-in-place concrete walls on clay are designed based on an AASHTO resistance factor of 0.85 (2016). We estimate the sliding along the clayey soils has sufficient resistance and the eccentricity lies within the required middle 2/3 of the wall (AASHTO 2016).

5.3.2 Settlement

We estimate the settlement performance of the MSE wall will be approximately 0.5 to 1.0 inch over the mix of cohesive and granular soils. The settlement estimates are acceptable for the construction of both the MSE and RCC wall options.

5.4 Global Stability

The retaining walls along IL59 will have total heights of less than 10 feet, will be founded within competent soils with average Q_u values greater than 2.0, and will retain either stiff to hard existing fill or new compacted backfill. Therefore, the wall designs for each of the MSE, RCC, and soldier pile options will be stable with a factor of safety greater than the IDOT requirement of 1.5.

6.0 CONSTRUCTION CONSIDERATIONS

6.1 Site Preparation

Vegetation, surface topsoil, and any existing ditch sediment encountered should be cleared and stripped where the structure will be placed. If unstable or unsuitable materials are exposed during excavation, they should be removed and replaced with compacted structural fill as described in Section 6.3.

6.2 Excavation, Dewatering, and Utilities

Excavations should be performed in accordance with local, state, and federal regulations. The potential effect of ground movements upon nearby utilities should be considered during construction.

Excavations for the construction of the wall should be sloped at no steeper than 1:1.5 (V:H). The back end of the wall will be relatively close to the edge of pavement along IL59; if the pavement is not proposed for replacement, temporary shoring may be necessary.

The borings were encountered damp to moist within the lowest sand and sandy gravel layers. We do not anticipate groundwater concerns during construction of the wall; however, temporary casing should be considered if soldier piles are to be drilled and set into **Layer 3** during periods of heavy precipitation. Precipitation allowed to enter excavations should be immediately removed via sump pump. Any soils allowed to soften under standing water should be removed and replaced with compacted fill as described in Section 6.3.

6.3 Filling and Backfilling

Fill material used to attain final design elevations should be pre-approved, compacted, cohesive or granular soil conforming to IDOT Section 205 (2016). The fill material should be free of organic matter and debris and should be placed in lifts and compacted according to the Standard.

Backfill materials for the RCC wall must be pre-approved by the Resident Engineer. To backfill the wall, we recommend porous granular material conforming to the requirements specified in the IDOT Supplemental Specification for Section 586, *Granular Backfill for Structures* (2017). Backfill material should be placed and compacted in accordance with the Special Provision.

6.4 Earthwork Operations

The required earthwork can be accomplished with conventional construction equipment. Moisture and traffic will cause deterioration of exposed subgrade soils. Precautions should be taken by the Contractor to prevent water erosion of the exposed subgrade. A compacted subgrade will minimize water runoff erosion.

Earth moving operations should be scheduled to not coincide with excessive cold or wet weather (early spring, late fall or winter). Any soil allowed to freeze or soften due to the standing water should be removed. Wet weather can cause problems with subgrade compaction.

It is recommended that an experienced geotechnical engineer be retained to inspect the exposed subgrade, monitor earthwork operations, and provide material inspection services during the construction phase of this project.

7.0 QUALIFICATIONS

The analysis and recommendations submitted in this report are based upon the data obtained from the borings drilled at the locations shown on the boring logs and in Exhibit 3. This report does not reflect any variations that may occur between the borings or elsewhere on the site, variations whose nature and extent may not become evident until the course of construction. In the event that any changes in the design and/or location of the walls are planned, we should be timely informed so that our recommendations can be adjusted accordingly.

It has been a pleasure to assist Collins Engineers, Inc. and the Illinois Department of Transportation on this project. Please call if there are any questions, or if we can be of further service.

Respectfully Submitted,

WANG ENGINEERING, INC.

Mickey L. Snider, P.E.
Senior Geotechnical Engineer

Corina T. Farez, P.E., P.G.
QA/QC Reviewer

REFERENCES

BAUER, R.A., CURRY, B.B., GRAESE, A.M., VAIDEN, R.C., SU, W.J., and HASEK, M.J., 1991, Geotechnical Properties of Selected Pleistocene, Silurian, and Ordovician Deposits of Northeastern Illinois: Environmental Geology 139, Illinois State Geological Survey, 69 p.

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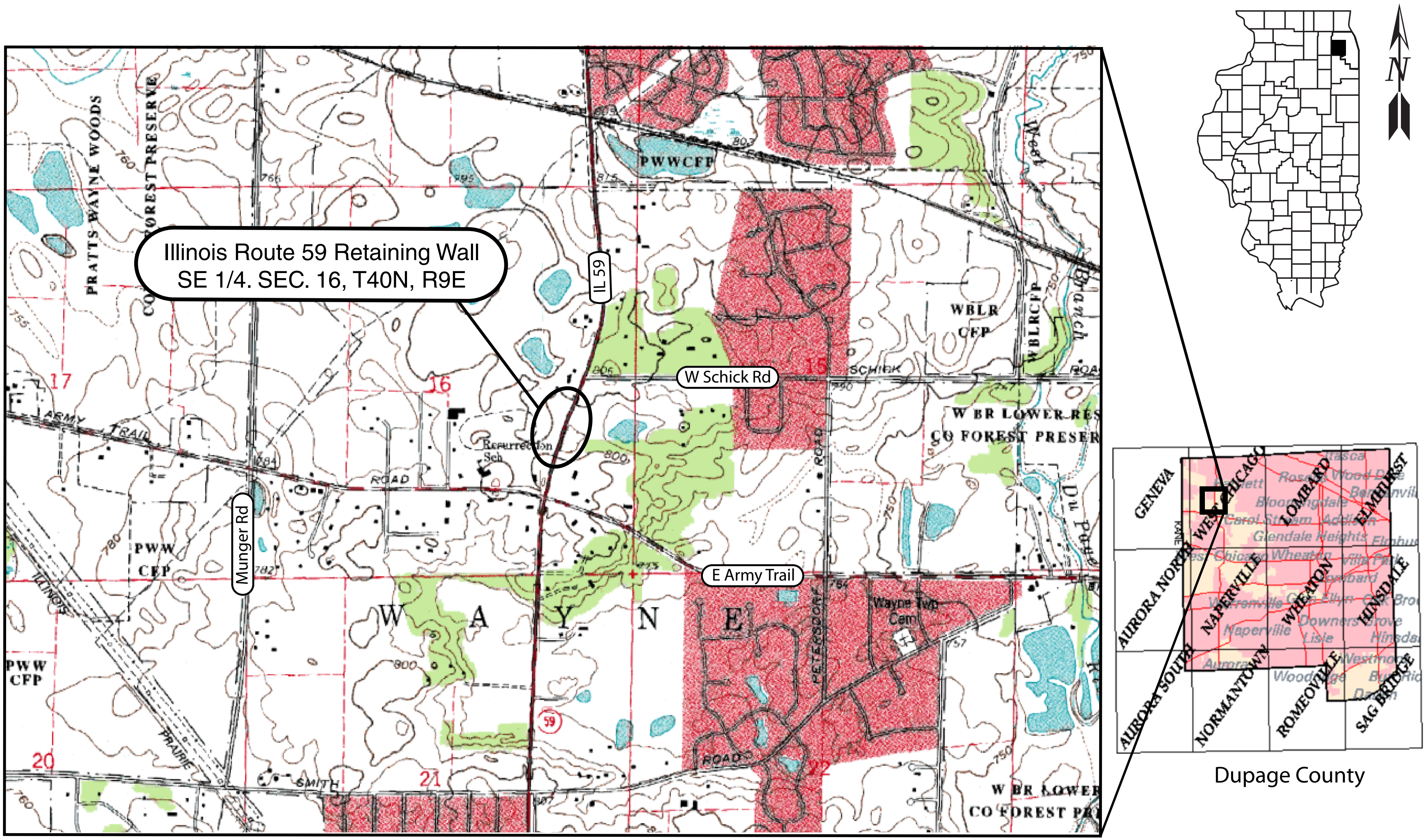
EXHIBITS



Scale

0 0.5 1.0 Mile

SITE LOCATION MAP: ILLINOIS ROUTE 59 RETAINING WALLS
DUPAGE COUNTY, ILLINOIS

SCALE: GRAPHICAL	EXHIBIT 1	DRAWN BY: RKC CHECKED BY: M. Snider

Wang Engineering

1145 N. Main Street
Lombard, IL 60148
www.wangeng.com

FOR COLLINS ENGINEERS, INC.	486-23-03

Bench Mark: Cut square on southwest corner of concrete base of traffic control box on northeast corner of IL 59 and Army Trail Rd. Elevation 807.24.

Existing Structure: The existing noise wall structure consists of HP-Piles spaced at 15'-0" with approximately 13'-0" to 18'-0" tall noise panel wall.

Traffic to be maintained utilizing staged construction.

Salvage: Existing noise wall panels shall be removed, modified as required, and installed on proposed noise wall. Existing noise wall panels not re-utilized shall be delivered to the IDOT maintenance yard.

NOISE WALL DESIGN LOADS

AASHTO LRFD Load Combinations:

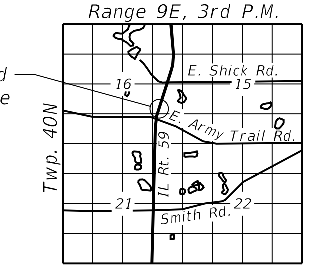
Service I Wind Load = 15 psf
Strength III Wind Load = 35 psf
Strength V Wind Load = 20 psf

HIGHWAY CLASSIFICATION

IL Rte. 59 - F.A.P. Rte. 338
Functional Class: Other Principal Arterial
ADT: 37,700 (2016); 42,000 (2040)
ADTT: 6,032 (2016); 6,720 (2040)
DHV: 4,784 (2015)
Design Speed: 45 m.p.h.
Posted Speed: 45 m.p.h.
Two-Way Traffic
Directional Distribution: 50%/50%

CURVE DATA

P.I. Sta. = 501+67.55
Δ = 18° 17' 04" (RT)
D = 1° 05' 16"
R = 5,267.07'
T = 847.63'
L = 1,680.85'
E = 67.77'
e = 2.00%
T.R. = 40'
S.E. Run = 67'
P.C. Sta. = 493+19.92
P.T. Sta. = 510+00.77



LOCATION SKETCH

DESIGN SPECIFICATIONS

2017 AASHTO LRFD Bridge Design Specifications, 8th Edition

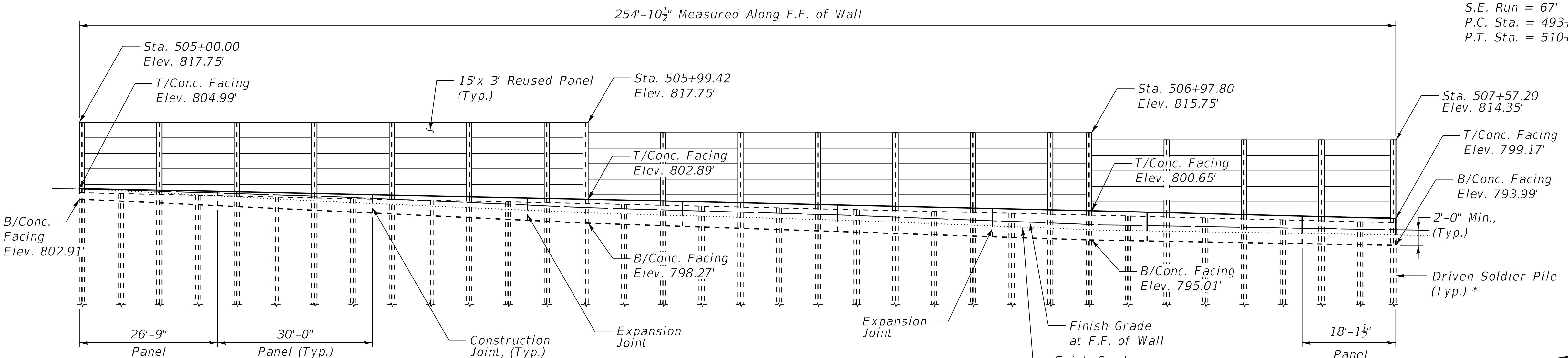
DESIGN STRESSES

FIELD UNITS

f'c = 3,500 psi
fy = 60,000 psi (Reinforcement)

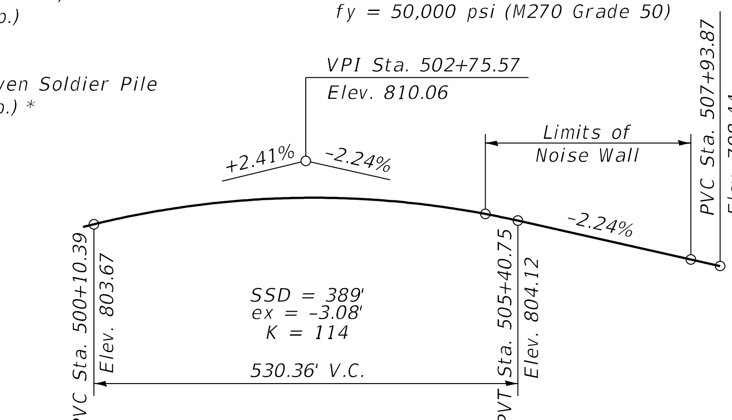
SOLDIER PILES

fy = 50,000 psi (M270 Grade 50)



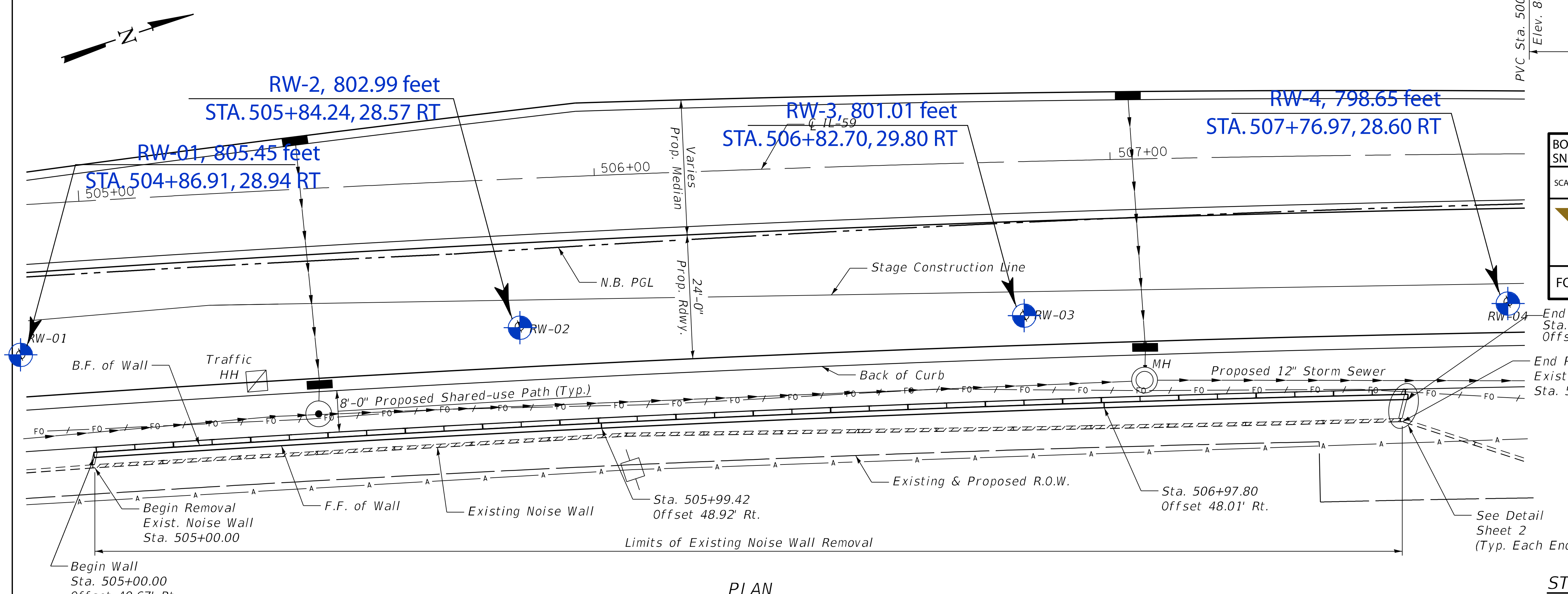
ELEVATION

* Pile section, spacing, & tip elevation to be determined during final design.



PROFILE GRADE

(Along IL 59 N.B. P.G.L.)



PLAN

BORING LOCATION PLAN: IL ROUTE 59 RETAINING WALLS SN 022-2998 AND 022-2999, COOK COUNTY		
SCALE: GRAPHICAL	EXHIBIT 3-1	DRAWN BY: MLS CHECKED BY: LMI
Wang Engineering		1145 N. Main Street Lombard, IL 60148 www.wangeng.com
FOR COLLINS ENGINEERS		486-23-03

GENERAL PLAN AND ELEVATION
RETAINING AND NOISE WALL ALONG
F.A.P. RTE. 59 (S. SUTTON RD.)
SECTION 110TS-N
DUPAGE COUNTY
STATION 505+00.00 TO STATION 507+57.20
STRUCTURE NO. 022-2998

FILE NAME =	USER NAME =	DESIGNED - LY	REVISED -	STATE OF ILLINOIS DEPARTMENT OF TRANSPORTATION	GENERAL PLAN AND ELEVATION STRUCTURE NO. 022-2998
COLLINS ENGINEERS INC. 123 N. Wacker Dr. Suite 900 Chicago, IL 60606 Tele. (312) 704-9300 Fax. (312) 704-9320 www.collinsengr.com		CHECKED - JMS	REVISED -		
	PLOT SCALE =	DRAWN - DR	REVISED -		
ILLINOIS PROFESSIONAL DESIGN FIRM LICENSE NO. 184-000993	PLOT DATE =	CHECKED - JMS	REVISED -		SHEET NO. 1 OF 2 SHEETS

F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
338	110TS-N	DuPAGE	2	1
		CONTRACT NO. 62F19		
	ILLINOIS FED. AID PROJECT			

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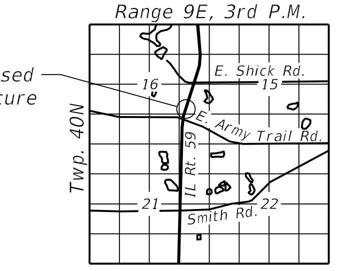
R = 5,267.07'
T = 847.63'
L = 1,680.85'
E = 67.77'
e = 2.00%
T.R. = 40'
S.E. Run = 67'
P.C. Sta. = 493+19.92
P.T. Sta. = 510+00.77



LOCATION SKETCH

DESIGN SPECIFICATIONS

2017 AASHTO LRFD Bridge Design Specifications, 8th Edition

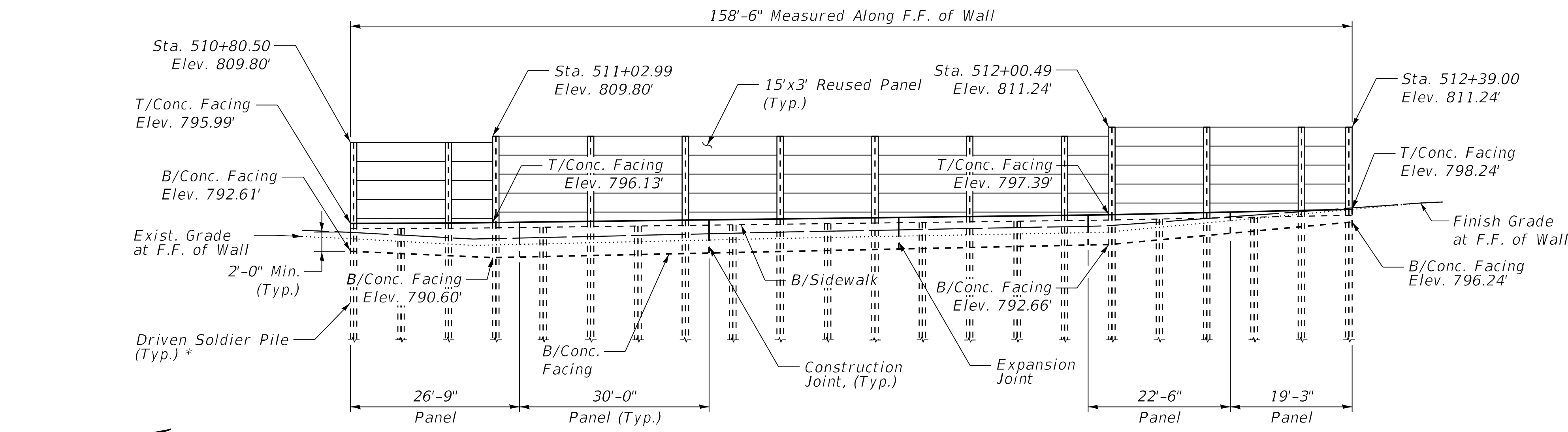
DESIGN STRESSES

FIELD UNITS

f'c = 3,500 psi
fy = 60,000 psi (Reinforcement)

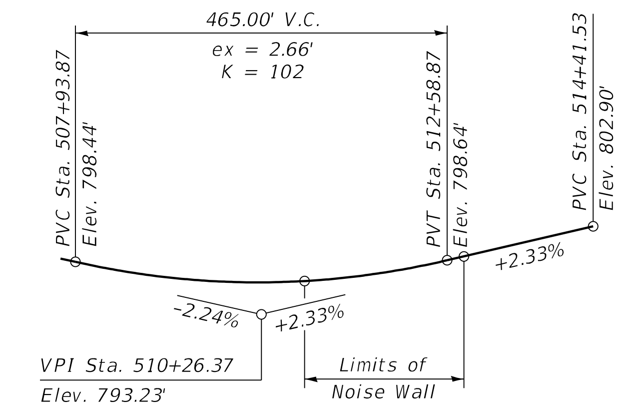
SOLDIER PILES

fy = 50,000 psi (M270 Grade 50)



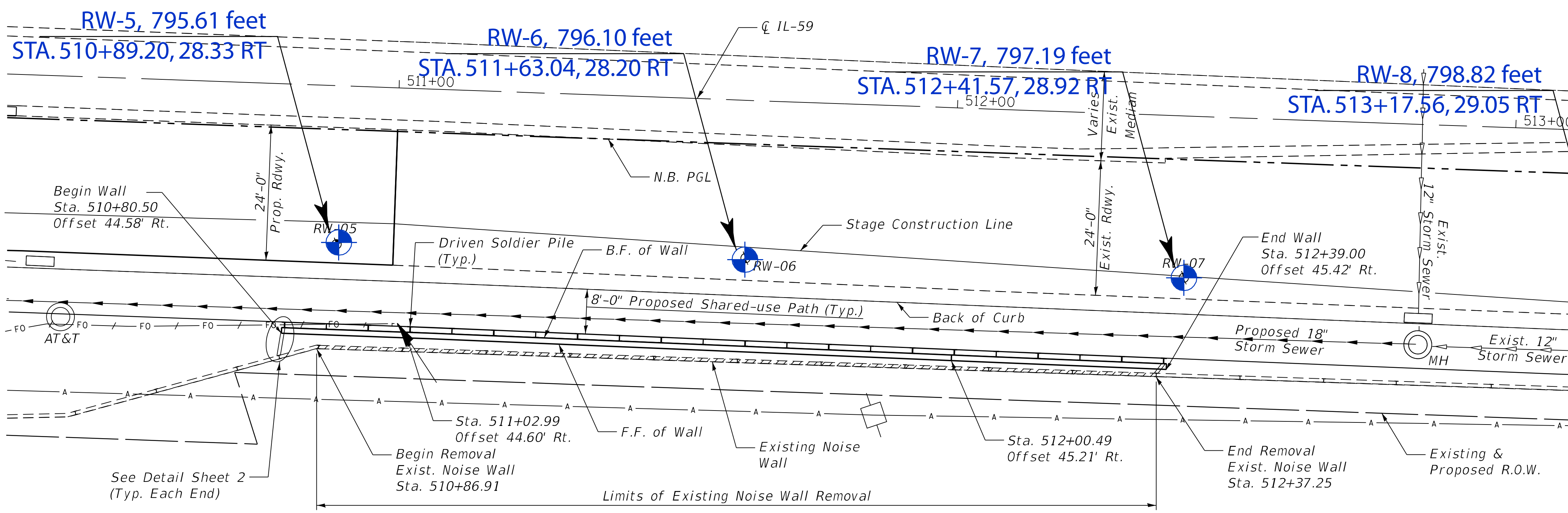
ELEVATION

* Pile section, spacing, & tip elevation to be determined during final design.



PROFILE GRADE

(Along IL 59 N.B. P.G.L.)



PLAN

BORING LOCATION PLAN: IL ROUTE 59 RETAINING WALLS
SN 022-2998 AND 022-2999, COOK COUNTY

SCALE: GRAPHICAL	EXHIBIT 3-2	DRAWN BY: MLS CHECKED BY: LMI

Wang Engineering
1145 N. Main Street
Lombard, IL 60148
www.wangeng.com

FOR COLLINS ENGINEERS — 486-23-03

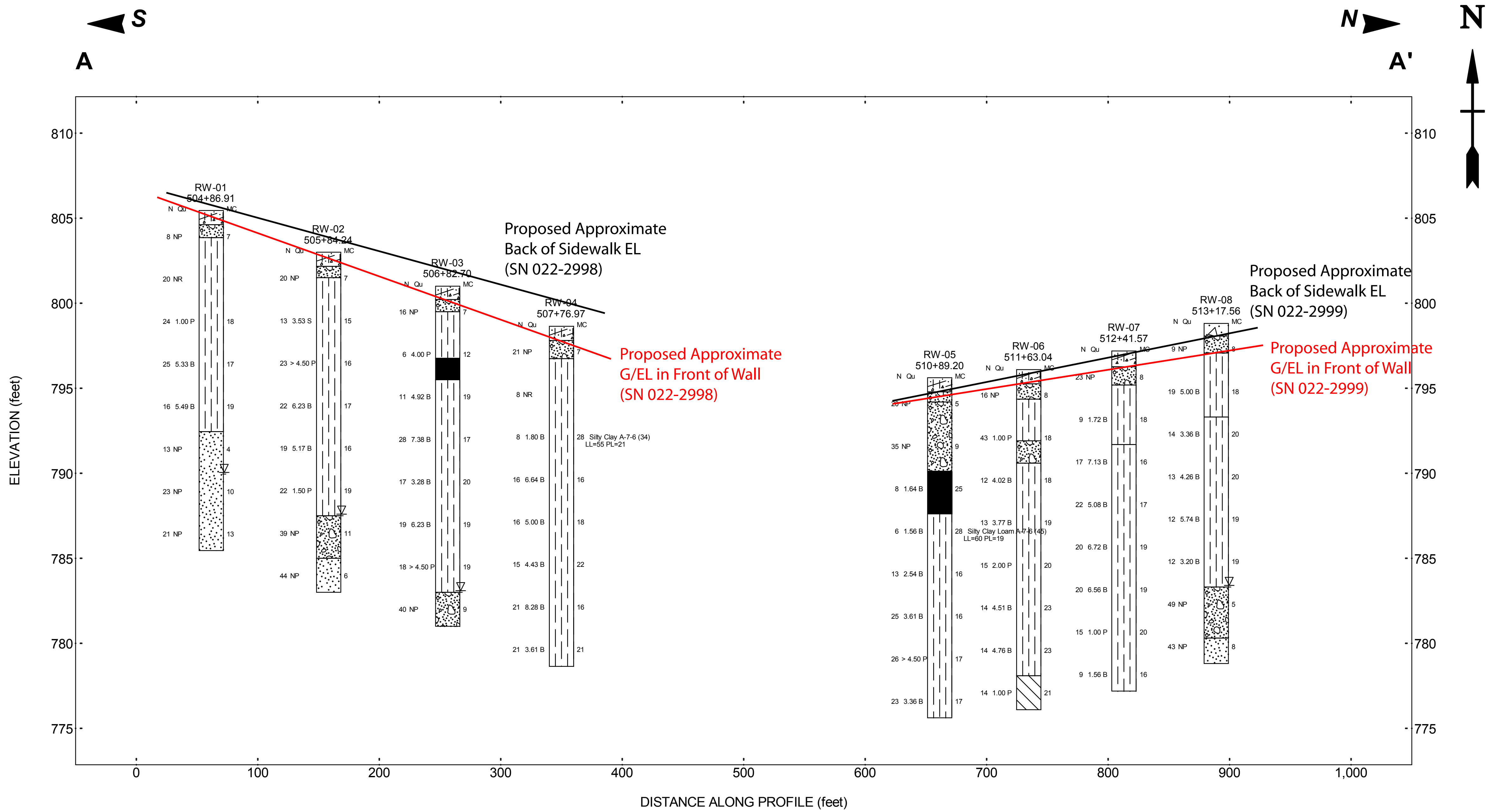
GENERAL PLAN AND ELEVATION
RETAINING AND NOISE WALL ALONG
F.A.P. RTE. 59 (S. SUTTON RD.)
SECTION 110TS-N
DUPAGE COUNTY
STATION 510+80.50 TO STATION 512+39.00
STRUCTURE NO. 022-2999

FILE NAME =	USER NAME =	DESIGNED - LY	REVISED -
COLLINS ENGINEERS INC. 123 N. Wacker Dr. Suite 900 Chicago, IL 60606 Tele. (312) 704-9300 Fax. (312) 704-9320 www.collinsengr.com		CHECKED - JMS	REVISED -
	PLOT SCALE =	DRAWN - DR	REVISED -
ILLINOIS PROFESSIONAL DESIGN FIRM LICENSE NO. 184-000993	PLOT DATE =	CHECKED - JMS	REVISED -

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

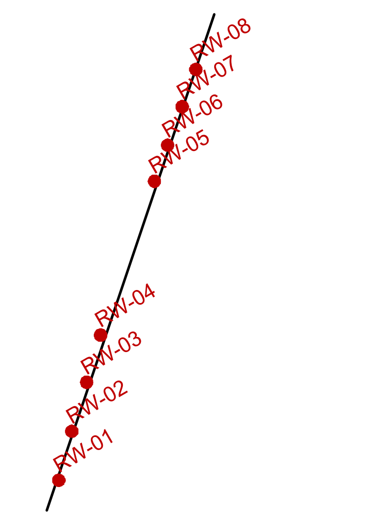
GENERAL PLAN AND ELEVATION
STRUCTURE NO. 022-2999
SHEET NO. 1 OF 2 SHEETS

F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
338	110TS-N	DuPAGE	2	1
		CONTRACT NO. 62F19		
		ILLINOIS FED. AID PROJECT		



Lithology Graphics

- Pavement
- Gravelly sand, sandy gravel
- IDH Silty Clay, Silty Clay Loam
- IDH Sand, Sandy Loam
- Topsoil
- IDH Clay
- Concrete



Site Map Scale 1 inch equals 365 feet

Explanation:

RW-01 504+86.91 — Borehole Number Station

Borehole Lithology

N--N-value, (blw/12 in)
Qu--UC Strength, (tsf)
MC--Moisture Content, (%)

Water Level Reading at time of drilling.

Water Level Reading 24-hr after drilling or at end of drilling

0 100

Horizontal Scale (feet)

Vertical Exaggeration: 14x

Wang Engineering, Inc.
1145 N Main Street
Lombard, IL 60148

Soil Profile A-A'
SNs 022-2998 and 022-2999

WEI SINCE 1982

IL Route 59 Retaining Wall
Bartlett, Illinois

JOB NUMBER	PLATE NUMBER
486-23-03	EXHIBIT 4

WEI 11X17 4862303.GPJ WANGENG.GDT 3/5/18

APPENDIX A

Wang Engineering
wangeng@wangeng.com
1145 N Main Street
Lombard, IL 60148
Telephone: (630) 953-9928
Fax:

BORING LOG RW-01

WEI Job No.: 486-23-03

Client: **Collins Engineers, Inc.**
Project: **IL Route 59 Retaining Wall**
Location: **Bartlett, Illinois**

Datum: NGVD
Elevation: 805.45 ft
North: 1923694.30 ft
East: 1018459.35 ft
Station: 504+86.91
Offset: 28.94 RT

Elevation (ft)	SOIL AND ROCK DESCRIPTION	Depth (ft)
804.6	10-inch thick, CONCRETE --PAVEMENT--	
803.9	9-inch thick, loose, brown SANDY GRAVEL --BASE COURSE--	
792.4	Stiff to hard, brown SILTY CLAY, trace gravel; damp --RDR 2--	5, 10
785.4	Medium dense, yellowish brown, very fine SAND; moist --RDR 2--	15, 20
	Boring terminated at 20.00 ft	

Sample No.	SPT Values (blw/6 in)	Qu (tsf)	Moisture Content (%)
1	5, 5, 3	NP	7
2	11, 9, 11	NR	
3	9, 12, 12	1.00 P	18
4	7, 11, 14	5.33 B	17
5	6, 8, 8	5.49 B	19
6	7, 7, 6	NP	4
7	8, 14, 9	NP	10
8	7, 10, 11	NP	13

GENERAL NOTES

Begin Drilling **11-28-2017** Complete Drilling **11-28-2017**
Drilling Contractor **Wang Testing Services** Drill Rig **D50 TMR [78%]**
Driller **K&N** Logger **RKC** Checked by **M. Snider**
Drilling Method **2.25 IDA HSA; 140 lb autohammer; Boring backfilled upon completion**

WATER LEVEL DATA

While Drilling ∇ **15.50 ft**
At Completion of Drilling ▼ **DRY**
Time After Drilling **NA**
Depth to Water ▼ **NA**

The stratification lines represent the approximate boundary between soil types; the actual transition may be gradual.

BORING LOG RW-02

Wang Engineering
wangeng@wangeng.com
1145 N Main Street
Lombard, IL 60148
Telephone: (630) 953-9928
Fax:

WEI Job No.: 486-23-03

Client: **Collins Engineers, Inc.**
Project: **IL Route 59 Retaining Wall**
Location: **Bartlett, Illinois**

Datum: NGVD
Elevation: 802.99 ft
North: 1923787.83 ft
East: 1018484.30 ft
Station: 505+84.24
Offset: 28.57 RT

Elevation (ft)	SOIL AND ROCK DESCRIPTION	Depth (ft)	Sample No.	SPT Values (blw/6 in)	Qu (tsf)	Moisture Content (%)
802.2	10-inch thick, CONCRETE --PAVEMENT--					
801.5	8-inch thick, medium dense, brown GRAVELLY SAND --BASE COURSE--		1	9 / 10 / 10	NP	7
	Stiff to hard, brown and gray SILTY CLAY to SILTY CLAY LOAM, trace gravel; damp --RDR 2--					
		5	2	6 / 5 / 8	3.53 S	15
			3	6 / 12 / 11	> 4.50 P	16
		10	4	6 / 10 / 12	6.23 B	17
			5	7 / 8 / 11	5.17 B	16
787.5		15	6	6 / 10 / 12	1.50 P	19
785.0	Dense, brown GRAVELLY SAND; moist --RDR 3--		7	15 / 18 / 21	NP	11
783.0	Dense, yellowish brown, very fine SAND; damp --RDR 2--	20	8	11 / 19 / 25	NP	6
	Boring terminated at 20.00 ft					

GENERAL NOTES

Begin Drilling **11-28-2017** Complete Drilling **11-28-2017**
Drilling Contractor **Wang Testing Services** Drill Rig **D50 TMR [78%]**
Driller **K&N** Logger **RKC** Checked by **M. Snider**
Drilling Method **2.25 IDA HSA; 140 lb autohammer; Boring backfilled upon completion**

WATER LEVEL DATA

While Drilling ∇ **15.50 ft**
At Completion of Drilling **DRY**
Time After Drilling **NA**
Depth to Water **NA**

The stratification lines represent the approximate boundary between soil types; the actual transition may be gradual.

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Fax:

BORING LOG RW-03

WEI Job No.: 486-23-03

Client: **Collins Engineers, Inc.**
Project: **IL Route 59 Retaining Wall**
Location: **Bartlett, Illinois**

Datum: NGVD
Elevation: 801.01 ft
North: 1923881.50 ft
East: 1018512.82 ft
Station: 506+82.70
Offset: 29.80 RT

Elevation (ft)	SOIL AND ROCK DESCRIPTION	Depth (ft)	Sample No.	SPT Values (blw/6 in)	Qu (tsf)	Moisture Content (%)
800.2	9.5-inch thick, CONCRETE --PAVEMENT--					
799.5	8.5-inch thick, medium dense, brown SANDY GRAVEL; moist --BASE COURSE--		1	6, 10, 6	NP	7
796.8	Hard, brown SILTY CLAY LOAM; damp --FILL--		2	6, 3, 3	4.00 P	12
795.5	Stiff (1.5P), black SILTY CLAY, some organic --BURIED TOPSOIL--	5				
	Very stiff to hard, brown to gray SILTY CLAY to SILTY CLAY LOAM, trace gravel; damp --RDR 2--		3	4, 5, 6	4.92 B	19
		10	4	7, 9, 19	7.38 B	17
			5	16, 8, 9	3.28 B	20
		15	6	6, 12, 7	6.23 B	19
783.0			7	5, 10, 8	> 4.50 P	19
781.0	Dense, brown to gray SANDY GRAVEL; moist --RDR 3--	20	8	12, 17, 23	NP	9
	Boring terminated at 20.00 ft					

GENERAL NOTES

Begin Drilling **11-28-2017** Complete Drilling **11-28-2017**
Drilling Contractor **Wang Testing Services** Drill Rig **D50 TMR [78%]**
Driller **K&N** Logger **RKC** Checked by **M. Snider**
Drilling Method **2.25 IDA HSA; 140 lb autohammer; Boring backfilled upon completion**

WATER LEVEL DATA

While Drilling ▽ **18.00 ft**
At Completion of Drilling ▼ **DRY**
Time After Drilling **NA**
Depth to Water ▼ **NA**

The stratification lines represent the approximate boundary between soil types; the actual transition may be gradual.

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BORING LOG RW-04

WEI Job No.: 486-23-03

Client **Collins Engineers, Inc.**
Project **IL Route 59 Retaining Wall**
Location **Bartlett, Illinois**

Datum: NGVD
Elevation: 798.65 ft
North: 1923971.38 ft
East: 1018539.49 ft
Station: 507+76.97
Offset: 28.60 RT

Elevation (ft)	SOIL AND ROCK DESCRIPTION	Depth (ft)	Sample No.	SPT Values (blw/6 in)	Qu (tsf)	Moisture Content (%)
797.8	10-inch thick, CONCRETE --PAVEMENT--					
796.7	13-inch thick, medium dense, brown and gray SANDY GRAVEL --BASE COURSE--		1	20 15 6	NP	7
	Stiff to hard, greenish brown to brown SILTY CLAY to SILTY CLAY LOAM, trace to little gravel; damp to moist --RDR 2--	5	2	7 4 4	NR	
	--L_L = 55%, P_L = 21%-- --% Gravel = 0.3-- --% Sand = 7.6-- --% Silt = 56.8-- --% Clay = 35.3--		3	4 4 4	1.80 B	28
		10	4	8 8 8	6.64 B	16
			5	6 6 10	5.00 B	18
		15	6	5 6 9	4.43 B	22
			7	6 9 12	8.28 B	16
778.6		20	8	8 8 13	3.61 B	21

Boring terminated at 20.00 ft

GENERAL NOTES

Begin Drilling **11-28-2017** Complete Drilling **11-28-2017**
Drilling Contractor **Wang Testing Services** Drill Rig **D50 TMR [78%]**
Driller **K&N** Logger **RKC** Checked by **M. Snider**
Drilling Method **2.25 IDA HSA; 140 lb autohammer; Boring backfilled upon completion**

WATER LEVEL DATA

While Drilling **DRY**
At Completion of Drilling **DRY**
Time After Drilling **NA**
Depth to Water **NA**

The stratification lines represent the approximate boundary between soil types; the actual transition may be gradual.

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BORING LOG RW-05

WEI Job No.: 486-23-03

Client: **Collins Engineers, Inc.**
Project: **IL Route 59 Retaining Wall**
Location: **Bartlett, Illinois**

Datum: NGVD
Elevation: 795.61 ft
North: 1924265.47 ft
East: 1018642.44 ft
Station: 510+89.20
Offset: 28.33 RT

Elevation (ft)	SOIL AND ROCK DESCRIPTION	Depth (ft)	Sample No.	SPT Values (blw/6 in)	Qu (tsf)	Moisture Content (%)
	10-inch thick, CONCRETE --PAVEMENT--					
794.8	5-inch thick, medium dense, brown SANDY GRAVEL --BASE COURSE--					
794.2	Dense, reddish brown SANDY GRAVEL; moist --FILL-- --RDR 3--		1	11, 11, 9	NP	5
		5	2	18, 18, 17	NP	9
790.1	Stiff, black SILTY CLAY LOAM, trace organic --BURIED TOPSOIL-- --RDR 2--		3	3, 4, 4	1.64 B	25
787.6	Stiff to hard, light brown to greenish gray SILTY CLAY to SILTY CLAY LOAM, trace gravel; damp --RDR 2-- --L_L = 55%, P_L = 21%-- --% Gravel = 0.0-- --% Sand = 1.4-- --% Silt = 69.2-- --% Clay = 29.5--	10	4	2, 3, 3	1.56 B	28
			5	4, 6, 7	2.54 B	16
		15	6	5, 13, 12	3.61 B	16
			7	18, 13, 13	> 4.50 P	17
775.6		20	8	8, 9, 14	3.36 B	17
	Boring terminated at 20.00 ft					

GENERAL NOTES

Begin Drilling **11-28-2017** Complete Drilling **11-28-2017**
Drilling Contractor **Wang Testing Services** Drill Rig **D50 TMR [78%]**
Driller **K&N** Logger **RKC** Checked by **M. Snider**
Drilling Method **2.25 IDA HSA; 140 lb autohammer; Boring backfilled upon completion**

WATER LEVEL DATA

While Drilling ▽ **DRY**
At Completion of Drilling ▼ **DRY**
Time After Drilling **NA**
Depth to Water ▼ **NA**

The stratification lines represent the approximate boundary between soil types; the actual transition may be gradual.

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Fax:

BORING LOG RW-06

WEI Job No.: 486-23-03

Client: **Collins Engineers, Inc.**
Project: **IL Route 59 Retaining Wall**
Location: **Bartlett, Illinois**

Datum: NGVD
Elevation: 796.10 ft
North: 1924334.25 ft
East: 1018667.62 ft
Station: 511+63.04
Offset: 28.20 RT

Elevation (ft)	SOIL AND ROCK DESCRIPTION	Depth (ft)	Sample No.	SPT Values (blw/6 in)	Qu (tsf)	Moisture Content (%)
795.3	10-inch thick, CONCRETE --PAVEMENT--					
794.3	11-inch thick, medium dense, brown SANDY GRAVEL; moist --BASE COURSE--		1	7, 7, 9	NP	8
791.9	Stiff, brown SILTY CLAY LOAM, trace gravel; moist --FILL-- --RDR 2--					
790.6	Dense, brown GRAVELLY SAND; moist --FILL-- --RDR 2--	5	2	11, 26, 17	1.00 P	18
	Very stiff to hard, brown and gray SILTY CLAY to SILTY CLAY LOAM, trace gravel; damp --RDR 2--		3	5, 5, 7	4.02 B	18
		10	4	3, 6, 7	3.77 B	19
			5	6, 6, 9	2.00 P	20
		15	6	5, 7, 7	4.51 B	23
778.1			7	4, 6, 8	4.76 B	23
776.1	Stiff, brown SILTY CLAY to CLAY; damp --RDR 2--	20	8	4, 6, 8	1.00 P	21
	Boring terminated at 20.00 ft					

GENERAL NOTES

Begin Drilling **11-29-2017** Complete Drilling **11-29-2017**
Drilling Contractor **Wang Testing Services** Drill Rig **D50 TMR [78%]**
Driller **K&N** Logger **RKC** Checked by **M. Snider**
Drilling Method **2.25 IDA HSA; 140 lb autohammer; Boring backfilled upon completion**

WATER LEVEL DATA

While Drilling **DRY**
At Completion of Drilling **DRY**
Time After Drilling **NA**
Depth to Water **NA**

The stratification lines represent the approximate boundary between soil types; the actual transition may be gradual.

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BORING LOG RW-07

WEI Job No.: 486-23-03

Client: **Collins Engineers, Inc.**
Project: **IL Route 59 Retaining Wall**
Location: **Bartlett, Illinois**

Datum: NGVD
Elevation: 797.19 ft
North: 1924407.69 ft
East: 1018695.42 ft
Station: 512+41.57
Offset: 28.92 RT

Elevation (ft)	SOIL AND ROCK DESCRIPTION	Depth (ft)	Sample No.	SPT Values (blw/6 in)	Qu (tsf)	Moisture Content (%)
796.3	11-inch thick, CONCRETE --PAVEMENT--					
795.2	13-inch thick, medium dense, brown SANDY GRAVEL; moist --BASE COURSE--		1	7 / 9 / 14	NP	8
791.7	Stiff, dark gray SILTY CLAY LOAM, trace gravel; damp --FILL-- --RDR 2--	5	2	3 / 4 / 5	1.72 B	18
	Stiff to hard, dark gray and brown SILTY CLAY to SILTY CLAY LOAM, trace gravel --RDR 2--		3	6 / 8 / 9	7.13 B	16
		10	4	6 / 10 / 12	5.08 B	17
			5	5 / 8 / 12	6.72 B	19
		15	6	5 / 9 / 11	6.56 B	19
			7	5 / 7 / 8	1.00 P	20
777.2		20	8	3 / 3 / 6	1.56 B	16

Boring terminated at 20.00 ft

GENERAL NOTES

Begin Drilling **11-29-2017** Complete Drilling **11-29-2017**
Drilling Contractor **Wang Testing Services** Drill Rig **D50 TMR [78%]**
Driller **K&N** Logger **RKC** Checked by **M. Snider**
Drilling Method **2.25 IDA HSA; 140 lb autohammer; Boring backfilled upon completion**

WATER LEVEL DATA

While Drilling **DRY**
At Completion of Drilling **DRY**
Time After Drilling **NA**
Depth to Water **NA**

The stratification lines represent the approximate boundary between soil types; the actual transition may be gradual.

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BORING LOG RW-08

WEI Job No.: 486-23-03

Client: **Collins Engineers, Inc.**
Project: **IL Route 59 Retaining Wall**
Location: **Bartlett, Illinois**

Datum: NGVD
Elevation: 798.82 ft
North: 1924478.96 ft
East: 1018721.80 ft
Station: 513+17.56
Offset: 29.05 RT

Elevation (ft)	SOIL AND ROCK DESCRIPTION	Depth (ft)	Sample No.	SPT Values (blw/6 in)	Qu (tsf)	Moisture Content (%)
798.1	9-inch thick, CONCRETE --PAVEMENT--					
797.1	12-inch thick, loose, brown and gray SANDY GRAVEL --BASE COURSE--		1	5, 4, 5	NP	8
793.3	Hard, brown to gray SILTY CLAY LOAM, trace gravel --FILL--	5	2	6, 8, 11	5.00 B	18
783.3	Very stiff to hard, brown to gray SILTY CLAY LOAM, trace gravel; damp --RDR 2--		3	5, 6, 8	3.36 B	20
		10	4	4, 5, 8	4.26 B	20
			5	4, 5, 7	5.74 B	19
		15	6	4, 6, 6	3.20 B	19
780.3	Very dense, brown SANDY GRAVEL; damp --RDR 3--		7	8, 16, 33	NP	5
778.8	Dense, yellowish brown, medium SAND; damp --RDR 3--	20	8	9, 18, 25	NP	8
	Boring terminated at 20.00 ft					

GENERAL NOTES

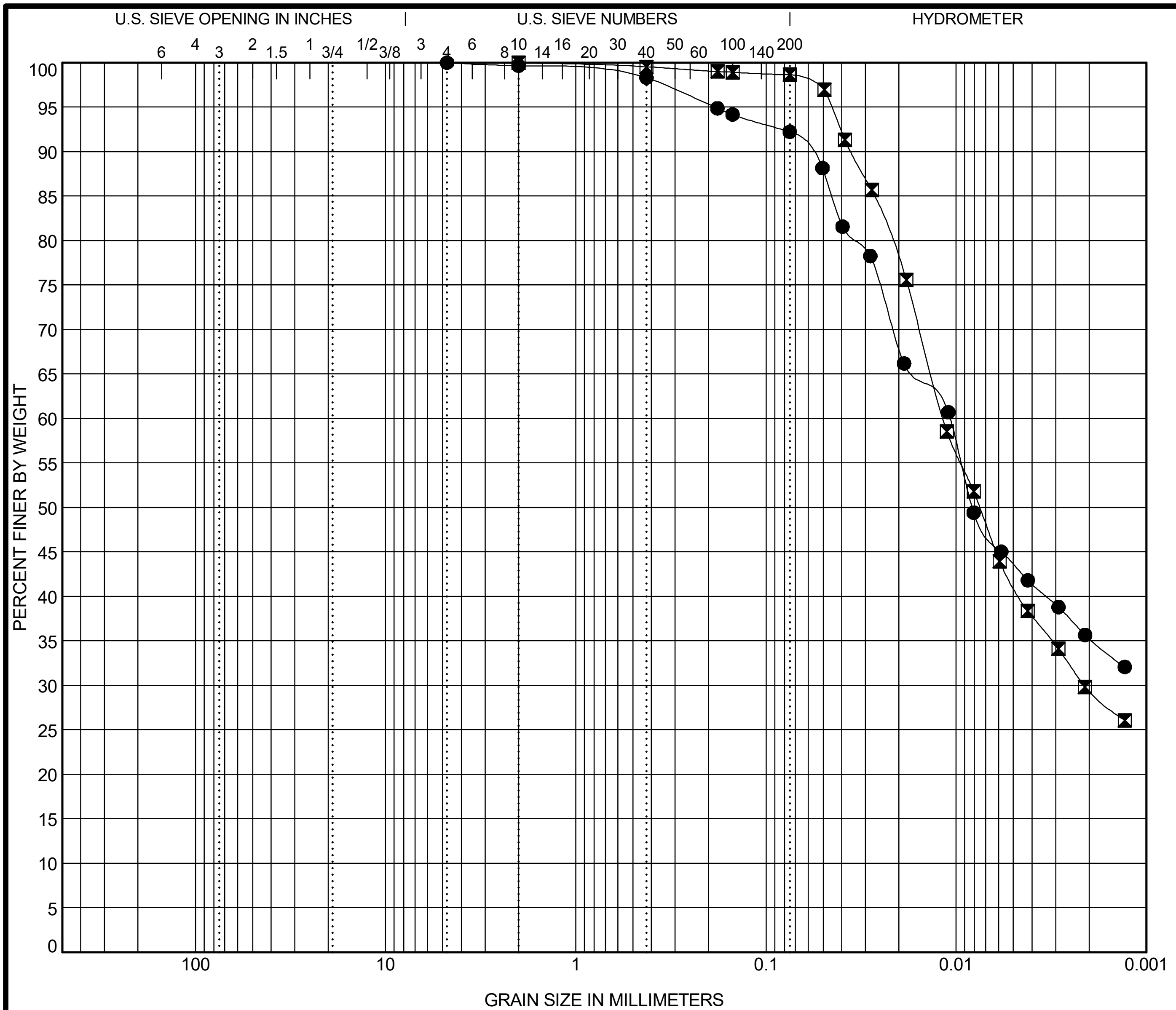
Begin Drilling **11-29-2017** Complete Drilling **11-29-2017**
Drilling Contractor **Wang Testing Services** Drill Rig **D50 TMR [78%]**
Driller **K&N** Logger **RKC** Checked by **M. Snider**
Drilling Method **2.25 IDA HSA; 140 lb autohammer; Boring backfilled upon completion**

WATER LEVEL DATA

While Drilling ▽ **15.50 ft**
At Completion of Drilling ▼ **DRY**
Time After Drilling **NA**
Depth to Water ▼ **NA**

The stratification lines represent the approximate boundary between soil types; the actual transition may be gradual.

APPENDIX B



COBBLES	GRAVEL	SAND		SILT AND CLAY
		coarse	fine	

	Specimen Identification		IDH Classification	LL	PL	PI	Cc	Cu
●	**RW-04#3**	**6.0 ft**	**Silty Clay**	**55**	**21**	**34**		
⊠	**RW-05#4**	**8.5 ft**	**Silty Clay Loam**	**60**	**19**	**41**		

	Specimen Identification		D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	**RW-04#3**	**6.0 ft**	**4.75**	**0.011**			**0.3**	**7.6**	**56.8**	**35.3**
⊠	**RW-05#4**	**8.5 ft**	**2**	**0.012**	**0.002**		**0.0**	**1.4**	**69.2**	**29.5**

WEI GRAIN SIZE IDH 4862303.GPJ US LAB.GDT 12/7/17

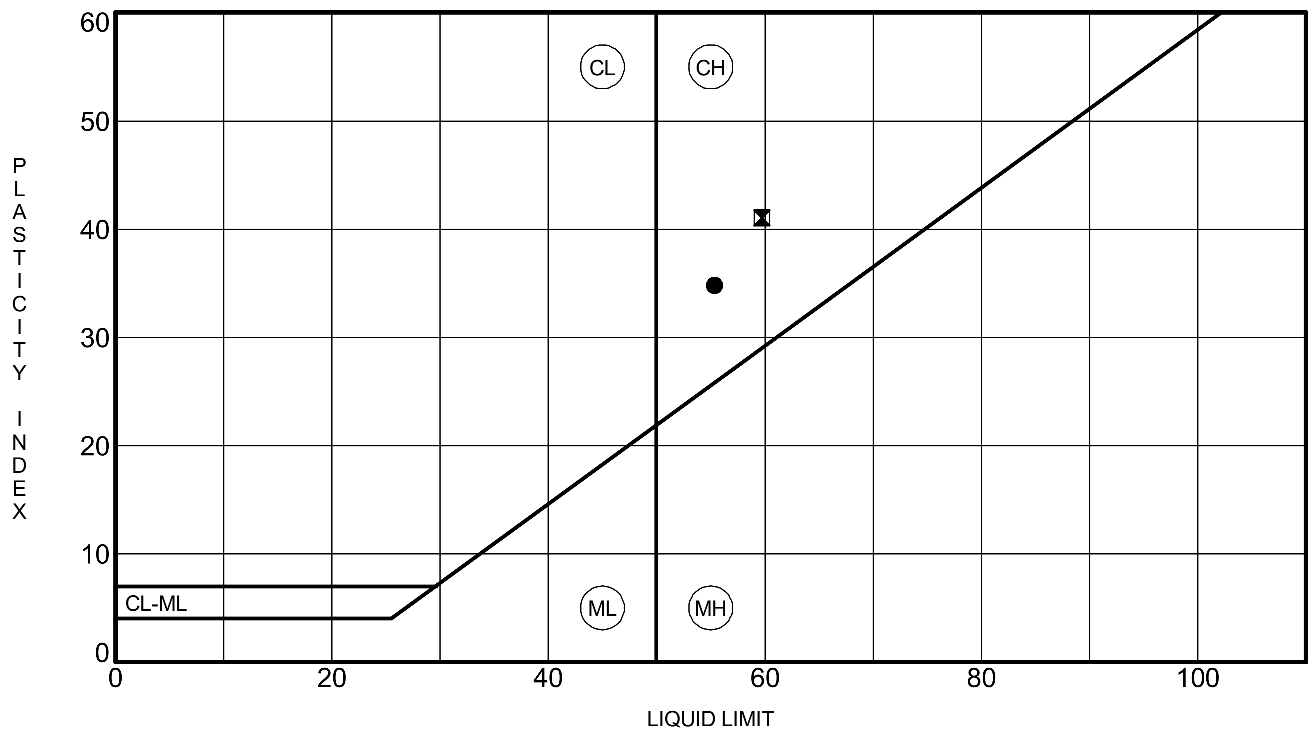
WEI
SINCE 1982
Wang Engineering, Inc.
1145 N Main Street
Lombard, IL 60148
Telephone: (630) 953-9928
Fax:

GRAIN SIZE DISTRIBUTION

Project: IL Route 59 Retaining Wall

Location: Bartlett, Illinois

Number: 486-23-03



	Specimen Identification		LL	PL	PI	Fines	IDH Classification
●	**RW-04#3**	**6.0 ft**	**55**	**21**	**34**	**92**	**Silty Clay**
⊠	**RW-05#4**	**8.5 ft**	**60**	**19**	**41**	**99**	**Silty Clay Loam**

WEI SINCE 1982
Wang Engineering, Inc.
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Lombard, IL 60148
Telephone: (630) 953-9928
Fax:

ATTERBERG LIMITS' RESULTS

Project: IL Route 59 Retaining Wall

Location: Bartlett, Illinois

Number: 486-23-03

Bench Mark: Cut square on southwest corner of concrete base of traffic control box on northeast corner of IL 59 and Army Trail Rd. Elevation 807.24.

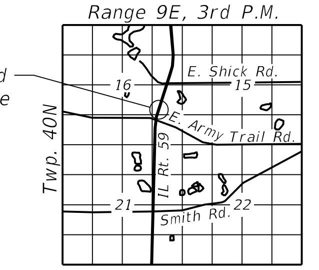
Existing Structure: The existing noise wall structure consists of HP-Piles spaced at 15'-0" with approximately 13'-0" to 18'-0" tall noise panel wall.

Traffic to be maintained utilizing staged construction.

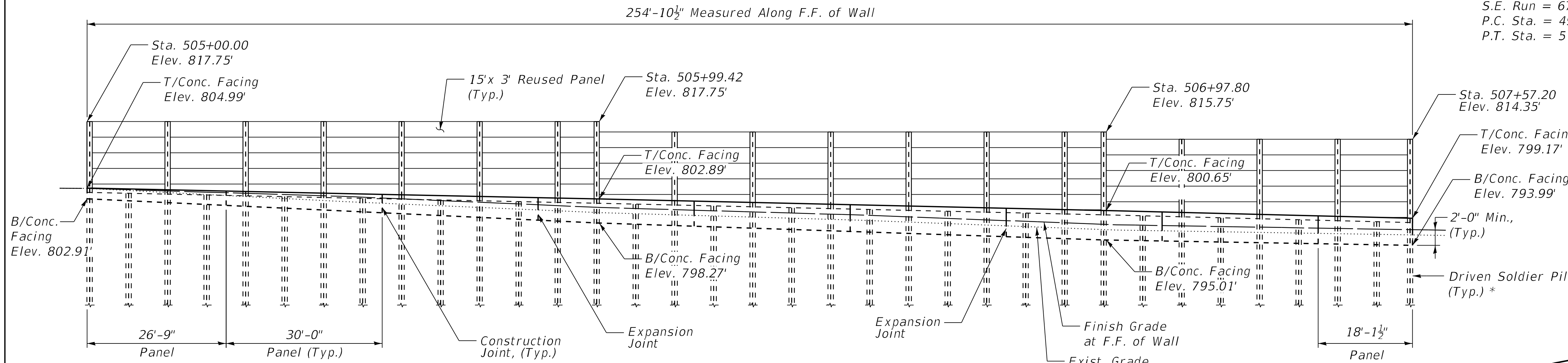
Salvage: Existing noise wall panels shall be removed, modified as required, and installed on proposed noise wall. Existing noise wall panels not re-utilized shall be delivered to the IDOT maintenance yard.

CURVE DATA

P.I. Sta. = 501+67.55
Δ = 18° 17' 04" (RT)
D = 1° 05' 16"
R = 5,267.07'
T = 847.63'
L = 1,680.85'
E = 67.77'
e = 2.00%
T.R. = 40'
S.E. Run = 67'
P.C. Sta. = 493+19.92
P.T. Sta. = 510+00.77



LOCATION SKETCH



ELEVATION

* Pile section, spacing, & tip elevation to be determined during final design.

DESIGN SPECIFICATIONS

2017 AASHTO LRFD Bridge Design Specifications, 8th Edition

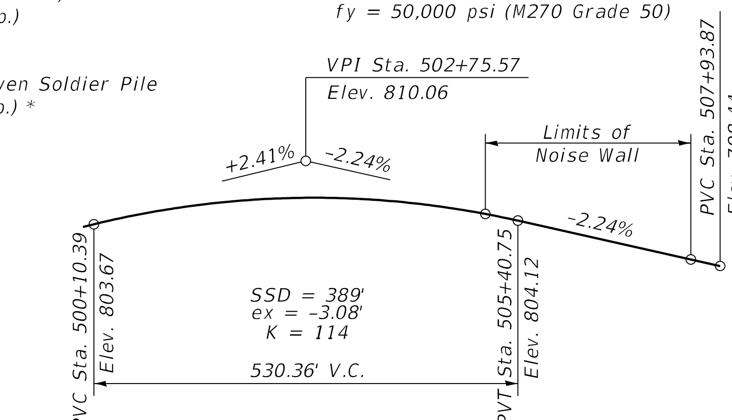
DESIGN STRESSES

FIELD UNITS

f'c = 3,500 psi
fy = 60,000 psi (Reinforcement)

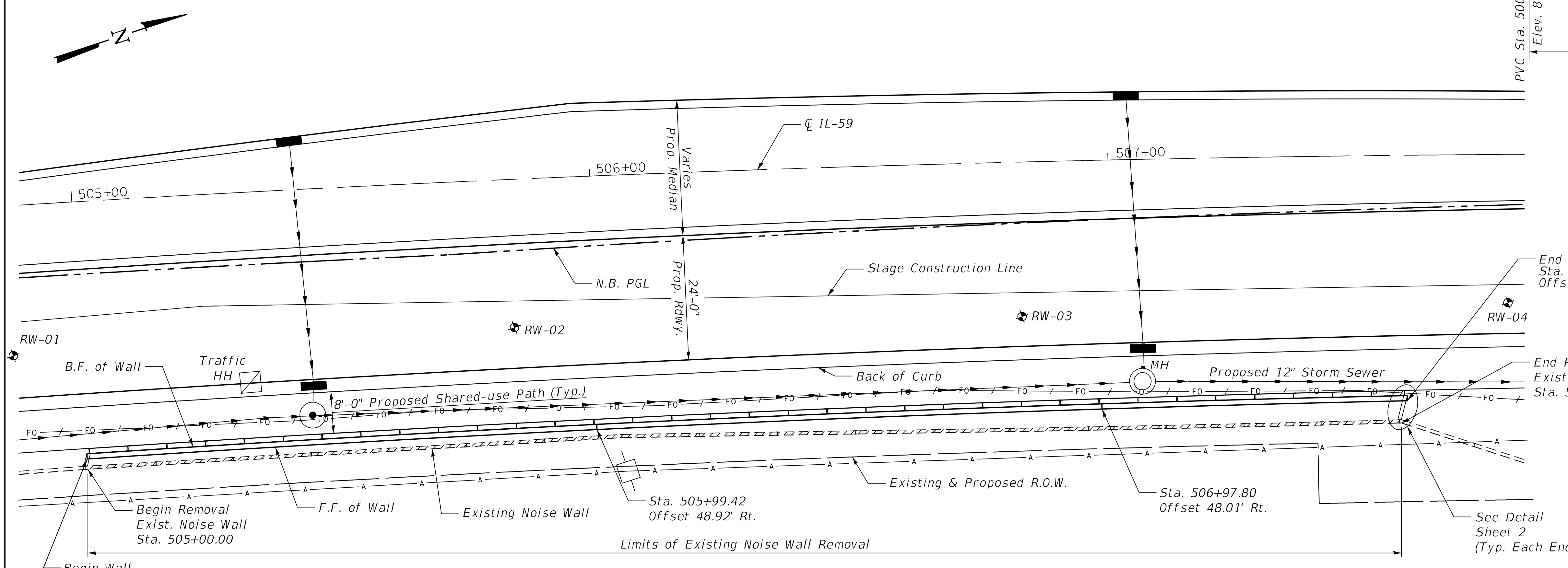
SOLDIER PILES

fy = 50,000 psi (M270 Grade 50)



PROFILE GRADE

(Along IL 59 N.B. P.G.L.)



PLAN

HIGHWAY CLASSIFICATION

IL Rte. 59 - F.A.P. Rte. 338
Functional Class: Other Principal Arterial
ADT: 37,700 (2016); 42,000 (2040)
ADTT: 6,032 (2016); 6,720 (2040)
DHV: 4,784 (2015)
Design Speed: 45 m.p.h.
Posted Speed: 45 m.p.h.
Two-Way Traffic
Directional Distribution: 50%/50%

NOISE WALL DESIGN LOADS

AASHTO LRFD Load Combinations:
Service I Wind Load = 15 psf
Strength III Wind Load = 35 psf
Strength V Wind Load = 20 psf

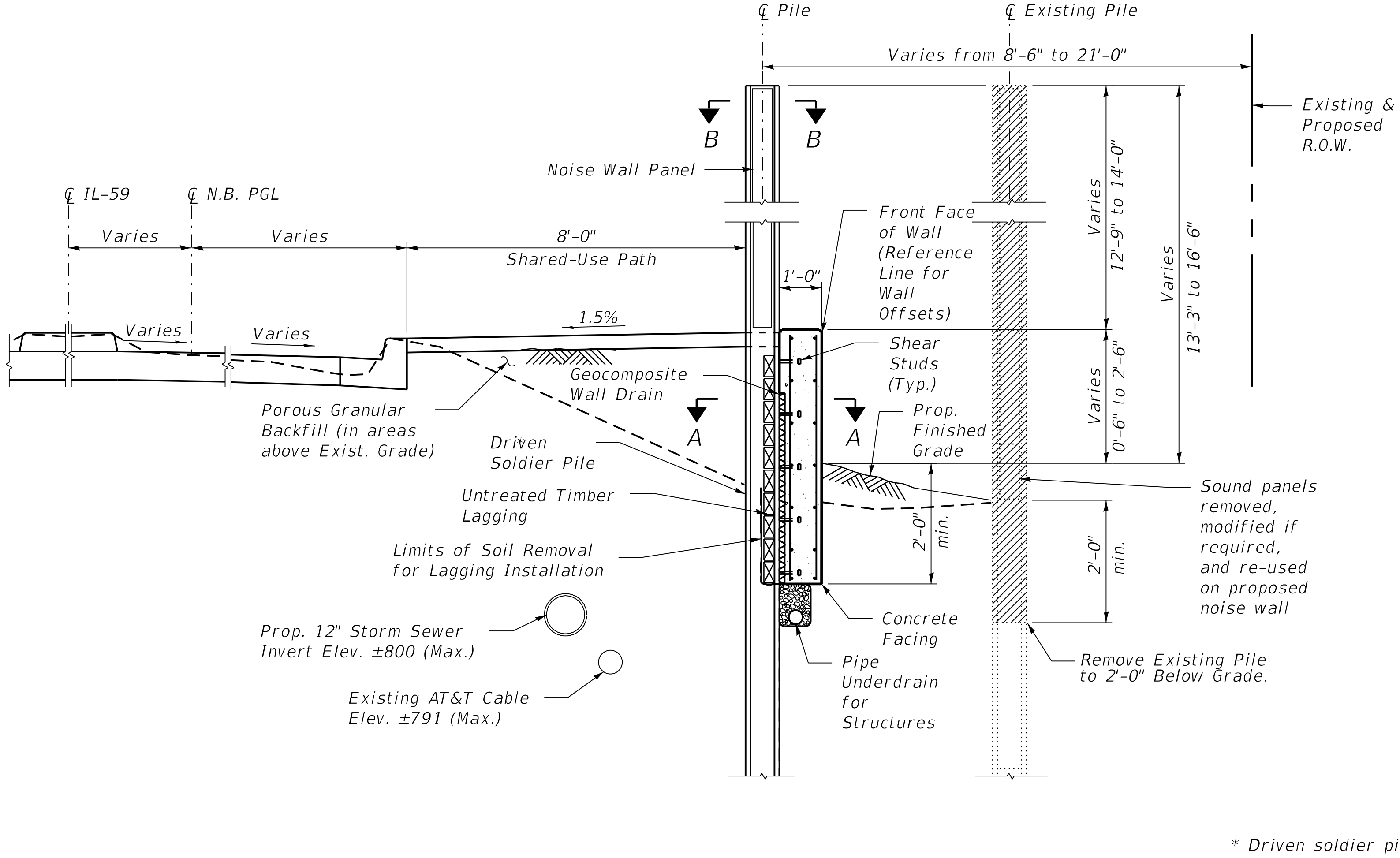
GENERAL PLAN AND ELEVATION RETAINING AND NOISE WALL ALONG F.A.P. RTE. 59 (S. SUTTON RD.) SECTION 110TS-N DUPAGE COUNTY STATION 505+00.00 TO STATION 507+57.20 STRUCTURE NO. 022-2998

FILE NAME =	USER NAME =	DESIGNED - LY	REVISED -
COLLINS ENGINEERS INC. 123 N. Wacker Dr. Suite 900 Chicago, IL 60606 Tele. (312) 704-9300 Fax. (312) 704-9320 www.collinsengr.com		CHECKED - JMS	REVISED -
	PLOT SCALE =	DRAWN - DR	REVISED -
ILLINOIS PROFESSIONAL DESIGN FIRM LICENSE NO. 184-000993	PLOT DATE =	CHECKED - JMS	REVISED -

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

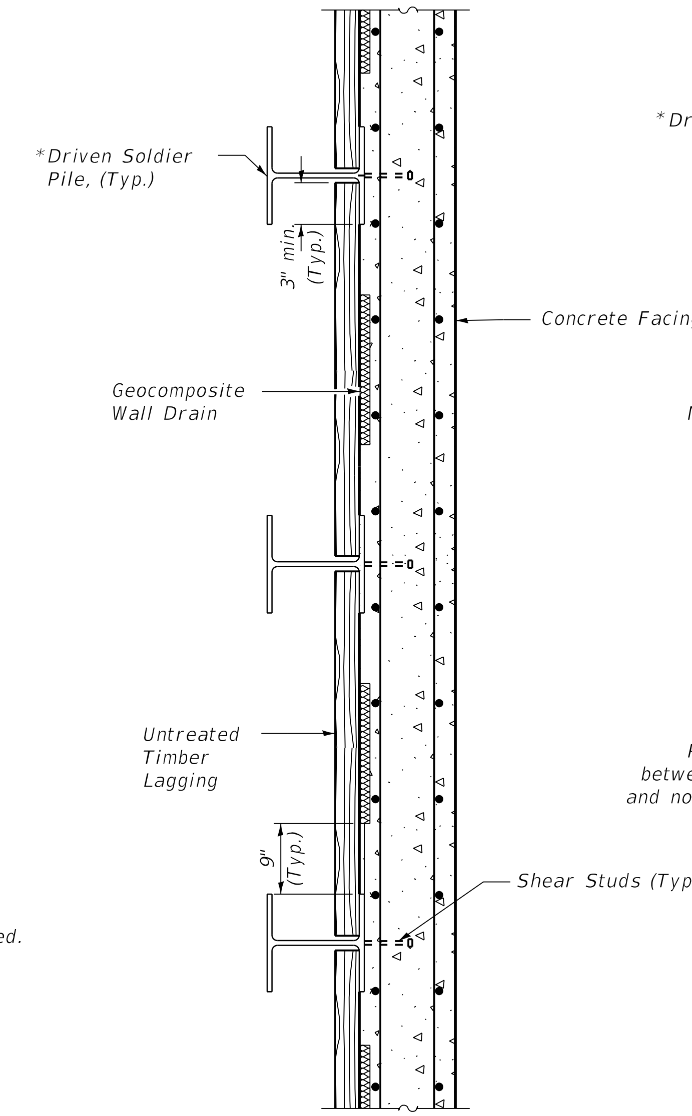
GENERAL PLAN AND ELEVATION
STRUCTURE NO. 022-2998
SHEET NO. 1 OF 2 SHEETS

F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
338	110TS-N	DuPAGE	2	1
		CONTRACT NO. 62F19		
		ILLINOIS FED. AID PROJECT		

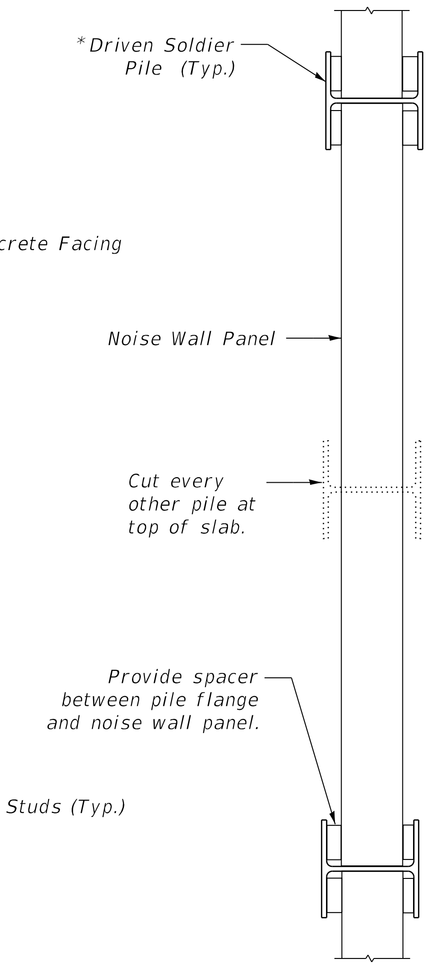


TYPICAL CROSS SECTION

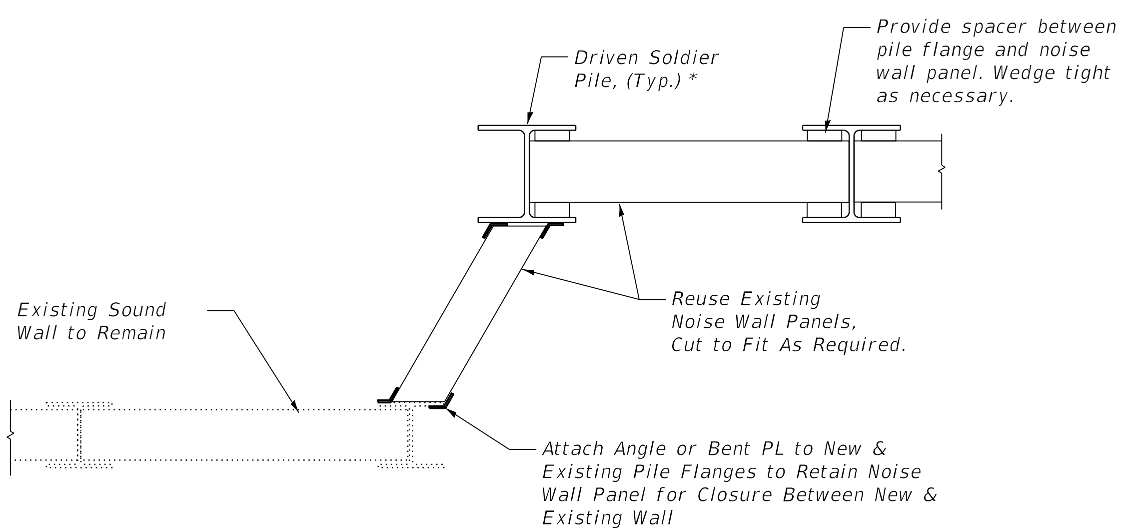
* Driven soldier piles shall be painted.



SECTION A-A



SECTION B-B



TYPICAL CONNECTION TO EXISTING NOISE WALL

FILE NAME =

COLLINS ENGINEERS INC. 123 N. Wacker Dr. Suite 900 Chicago, IL 60606 Tele. (312) 704-9300 Fax. (312) 704-9320 www.collinsengr.com
ILLINOIS PROFESSIONAL DESIGN FIRM LICENSE NO. 184-000993

USER NAME =	DESIGNED - LY	REVISED -
	CHECKED - JMS	REVISED -
PLOT SCALE =	DRAWN - DR	REVISED -
PLOT DATE =	CHECKED - JMS	REVISED -

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

TYPICAL SECTIONS AND DETAILS
STRUCTURE NO. 022-2998

SHEET NO. 2 OF 2 SHEETS

F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
338	110TS-N	DuPAGE	2	2
		CONTRACT NO. 62F19		

ILLINOIS FED. AID PROJECT

Bench Mark: Cut square on southwest corner of concrete base of traffic control box on northeast corner of IL 59 and Army Trail Rd. Elevation 807.24.

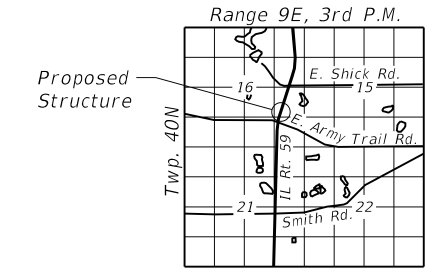
Existing Structure: The existing noise wall structure consists of HP-Piles spaced at 15'-0" with approximately 13'-0" to 18'-0" tall noise panel wall.

Traffic to be maintained utilizing staged construction.

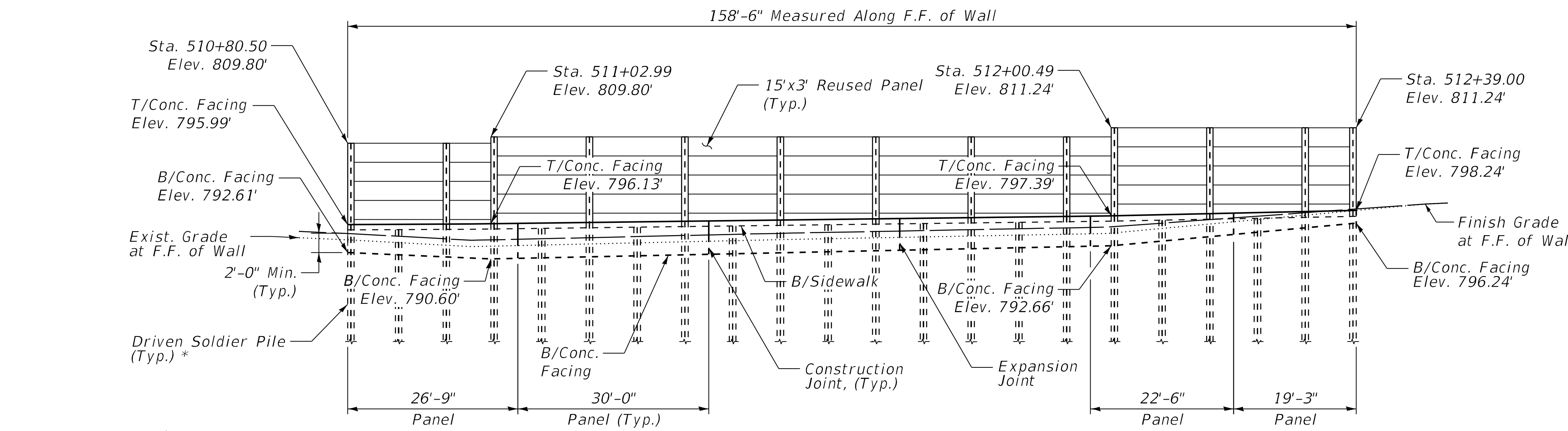
Salvage: Existing noise wall panels shall be removed, modified as required, and installed on proposed noise wall. Existing noise wall panels not re-utilized shall be delivered to the IDOT maintenance yard.

CURVE DATA

P.I. Sta. = 501+67.55
Δ = 18° 17' 04" (RT)
D = 1° 05' 16"
R = 5,267.07'
T = 847.63'
L = 1,680.85'
E = 67.77'
e = 2.00%
T.R. = 40'
S.E. Run = 67'
P.C. Sta. = 493+19.92
P.T. Sta. = 510+00.77



LOCATION SKETCH



ELEVATION

* Pile section, spacing, & tip elevation to be determined during final design.

DESIGN SPECIFICATIONS

2017 AASHTO LRFD Bridge Design Specifications, 8th Edition

DESIGN STRESSES

FIELD UNITS

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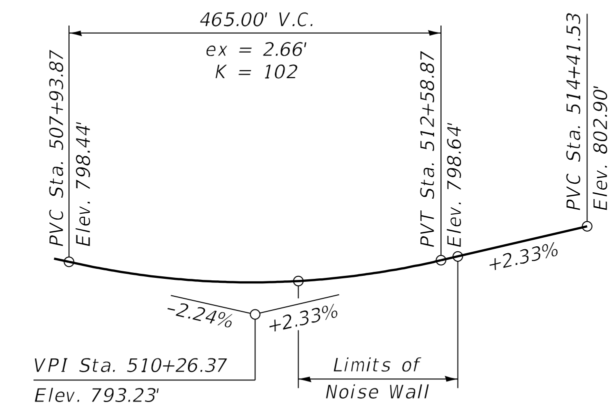
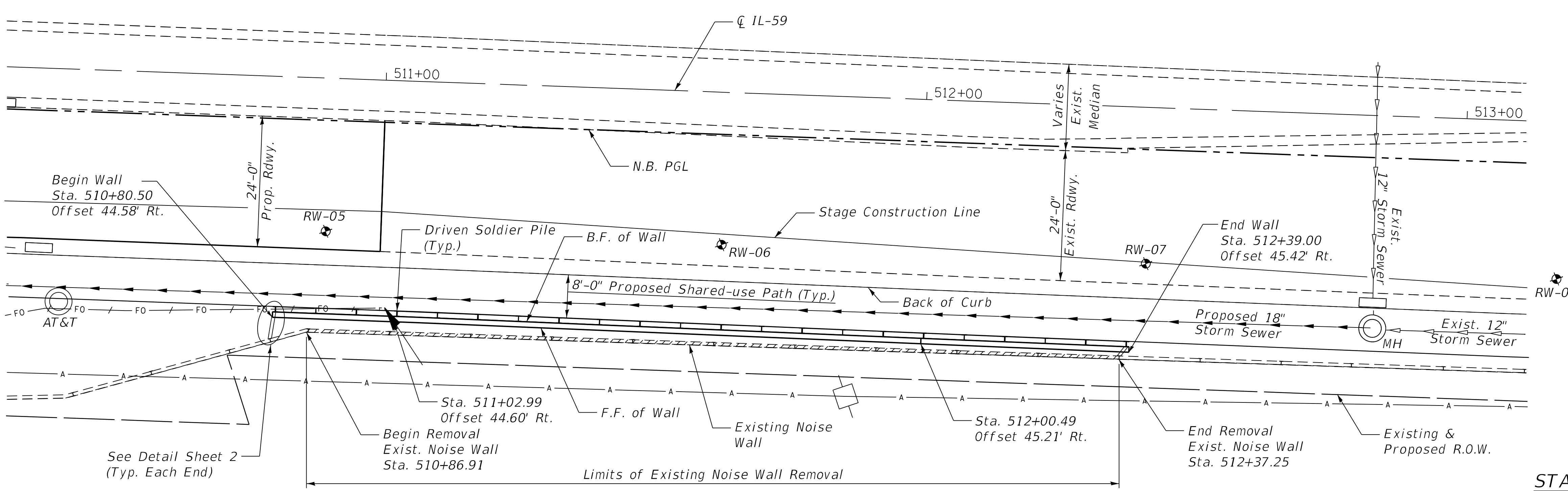


PROFILE GRADE

(Along IL 59 N.B. P.G.L.)



PLAN

HIGHWAY CLASSIFICATION

IL. Rte. 59 - F.A.P. Rte. 338
Functional Class: Other Principal Arterial
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Posted Speed: 45 m.p.h.
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Directional Distribution: 50%/50%

NOISE WALL DESIGN LOADS

AASHTO LRFD Load Combinations:
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Strength III Wind Load = 35 psf
Strength V Wind Load = 20 psf

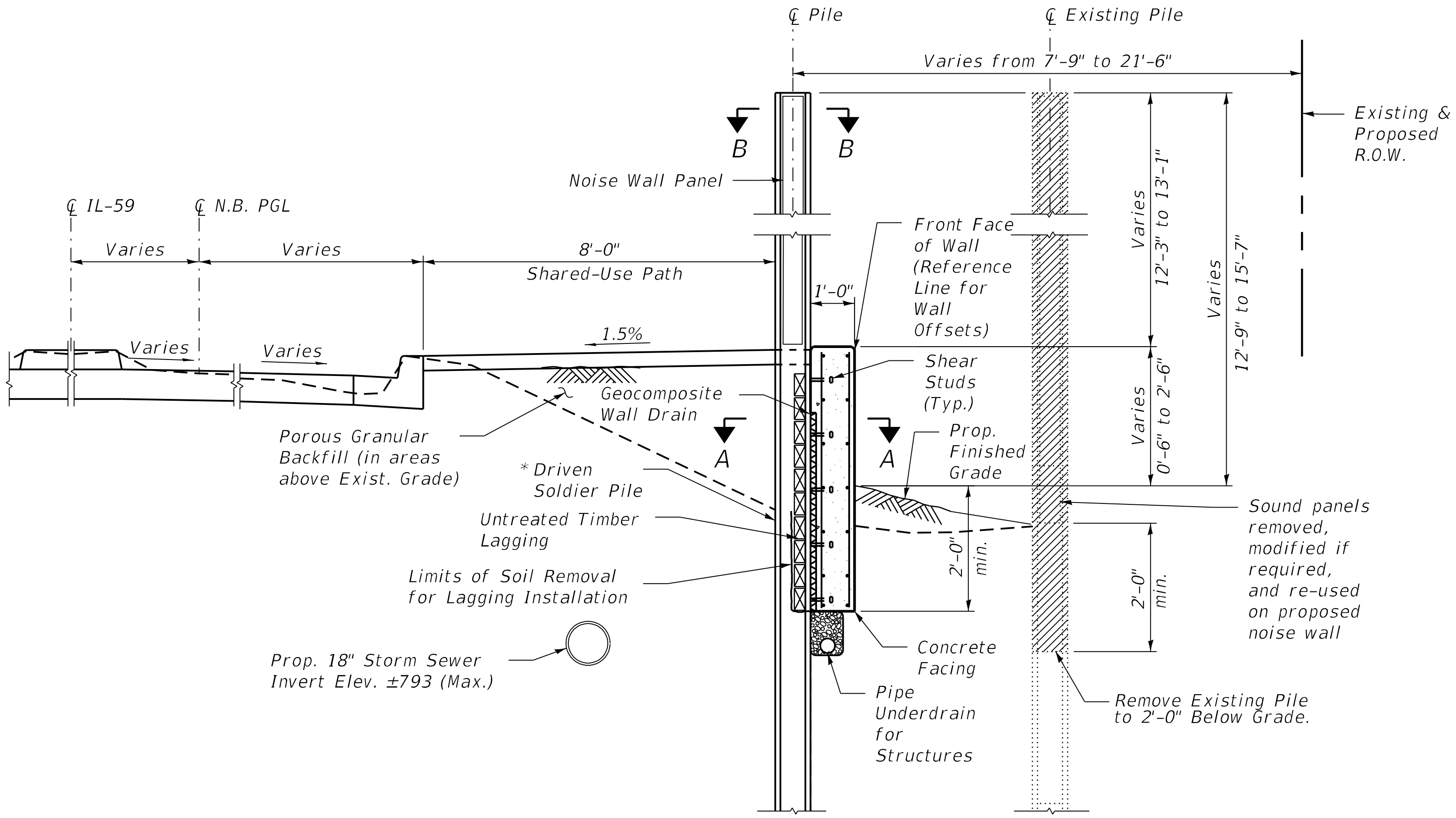
GENERAL PLAN AND ELEVATION
RETAINING AND NOISE WALL ALONG
F.A.P. RTE. 59 (S. SUTTON RD.)
SECTION 110TS-N
DUPAGE COUNTY
STATION 510+80.50 TO STATION 512+39.00
STRUCTURE NO. 022-2999

FILE NAME =	USER NAME =	DESIGNED - LY	REVISED -
COLLINS ENGINEERS INC. 123 N. Wacker Dr. Suite 900 Chicago, IL 60606 Tele. (312) 704-9300 Fax. (312) 704-9320 www.collinsengr.com		CHECKED - JMS	REVISED -
	PLOT SCALE =	DRAWN - DR	REVISED -
ILLINOIS PROFESSIONAL DESIGN FIRM LICENSE NO. 184-000993	PLOT DATE =	CHECKED - JMS	REVISED -

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

GENERAL PLAN AND ELEVATION
STRUCTURE NO. 022-2999
SHEET NO. 1 OF 2 SHEETS

F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
338	110TS-N	DuPAGE	2	1
		CONTRACT NO. 62F19		
		ILLINOIS FED. AID PROJECT		



TYPICAL CROSS SECTION

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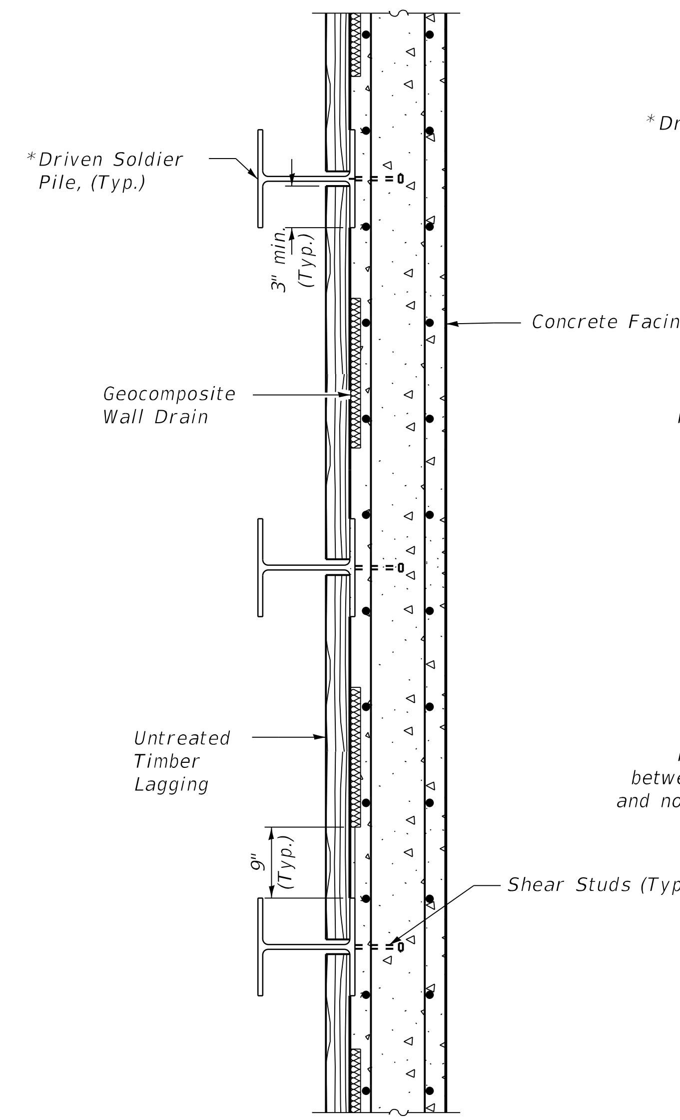
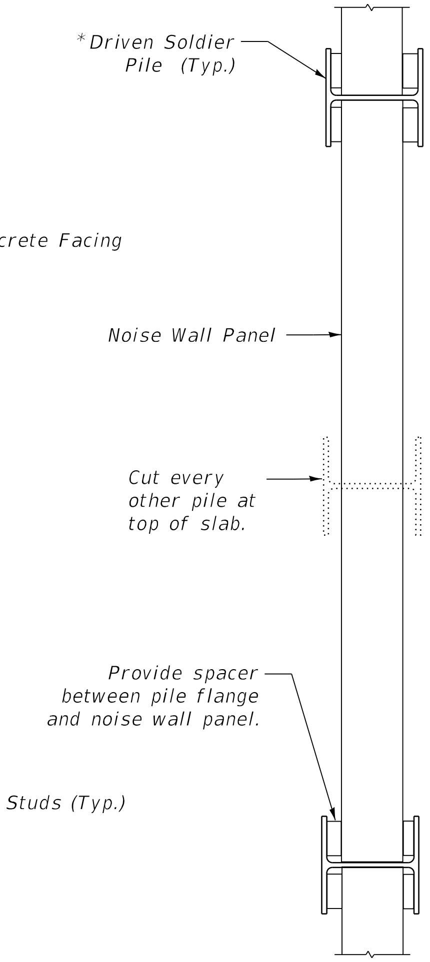
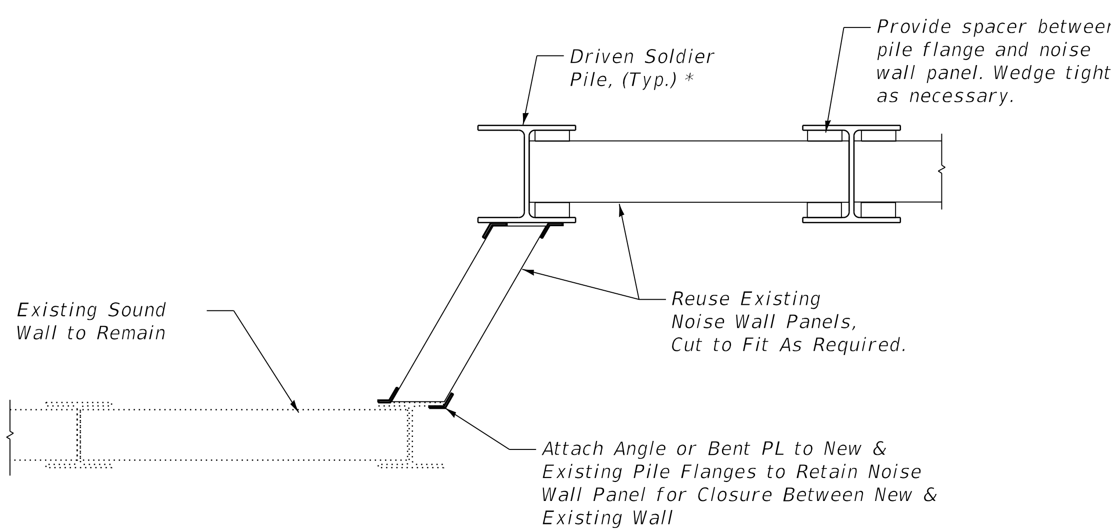


SECTION A-A



SECTION B-B



TYPICAL CONNECTION TO EXISTING NOISE WALL

FILE NAME =	USER NAME =	DESIGNED - LY	REVISED -	STATE OF ILLINOIS DEPARTMENT OF TRANSPORTATION	TYPICAL SECTIONS AND DETAILS STRUCTURE NO. 022-2999
COLLINS ENGINEERS INC. 123 N. Wacker Dr. Suite 900 Chicago, IL 60606 Tele. (312) 704-9300 Fax. (312) 704-9320 www.collinsengr.com		CHECKED - JMS	REVISED -		
	PLOT SCALE =	DRAWN - DR	REVISED -		
ILLINOIS PROFESSIONAL DESIGN FIRM LICENSE NO. 184-000993	PLOT DATE =	CHECKED - JMS	REVISED -		SHEET NO. 2 OF 2 SHEETS

F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
338	110TS-N	DuPAGE	2	2
		CONTRACT NO. 62F19		
		ILLINOIS FED. AID PROJECT		