# PRELIMINARY ENGINEERING REPORT

## Hornsby Street NE Improvements

## In

COLUMBUS

*Rural Nature. Urban Access.*

BMI Project No. R16.120592

August 7, 2020

BOLTON & MENK

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# Preliminary Engineering Report

## Hornsby Street NE Improvements

## in

## Columbus, Minnesota

I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision, and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota.

By: _____

Kevin Bittner, P.E.
License No. 21814

Date: __August 7, 2020_____

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## I. PROJECT BACKGROUND

This Preliminary Engineering Report, as authorized by the Columbus City Council, provides an updated analysis of the reconstruction of Hornsby Street NE, south of Trunk Highway 97/Lake Drive NE, from just north of 152nd Avenue NE to 145th Avenue NE. The total length of the proposed improvement on Hornsby is 5,200 feet, plus intersection improvements on 145th Avenue. The existing road surface is bituminous pavement in poor condition and requires significant maintenance by City Public Works staff.

The project was initially evaluated by previous City Engineer Dennis Postler of TKDA in a Feasibility Report dated February 27, 2019. The purpose of this current report is to update the scope and cost of the project based on additional information utilizing the geotechnical report by American Engineering Testing (AET), dated April 27, 2020; additional geotechnical evaluation by AET in June of 2020 to determine the extent of swamp deposits and peat; and focusing on the Option B road section as described in the TKDA report.

The section for Option B consists of a 40’ wide road bed with 12’ bituminous paved driving lanes and 8’ shoulders, of which 4’ is paved bituminous and the remaining 4’ is aggregate surfaced.

## II. PROPOSED IMPROVEMENTS

### A. Road Improvements

The 2019 Feasibility Study evaluated three different options for the road bed. Option A was a 32’ wide roadbed consisting of 12’ paved driving lanes and 4’ wide aggregate shoulders. Option B was a 40’ wide road bed, consisting of 12’ paved driving lanes and 8’ wide shoulders, half of the shoulder being paved, and the other half aggregate surfaced. Option C was a 48’ wide road bed consisting of 12’ paved driving lanes and 12’ wide shoulders, of which 8’ is paved and 4’ is aggregate surfaced.

Option B is the recommended option and was selected for further evaluation in this report. The property along Hornsby Street in the project area is zoned as a combination of Community Retail (CR), Light Industrial (LI), and Commercial Showroom (CS). While current traffic counts are relatively low, proximity to a new interchange on I-35 and an improved road will likely spur additional interest in development, increasing the traffic counts and increasing the number of heavy commercial vehicles that are a significant factor in pavement design. The 8’ shoulder in Option B will provide an escape lane and emergency parking area for vehicles. Paving four feet of the shoulder

will provide edge protection for the main driving lanes. Option C was costly and required the acquisition of additional right-of-way and is considered more than what is required for the improvement.

A 10-ton pavement section is recommended for the projected traffic loading. A 20-year traffic forecast yields a section that consists of 6" of bituminous pavement on 8" of aggregate base and 12" of select granular borrow (sand).

The soil borings indicate two areas of peat/swamp deposits which need to be removed and replaced to preserve the long-term integrity of the road. Additional hand probes were acquired to define the limits of these deposits. One deposit area located roughly 600' south of the south driveway of the Bare Home facility, is approximately 100' long and about 2' thick. Another deposit area is approximately 1,600' south of 152nd Avenue and is roughly 250' long and 2' to 5' thick. These peat/swamp deposits will be removed and replaced with select granular fill.

While traffic will be maintained on the roadway to the extent possible, removal of the peat/swamp deposits will require full closure of the road. Therefore, residents and Bare Home employees and deliveries will need to take alternate routes to and from the south, which are primarily gravel roads, during the period of full closure.

Preliminary plan and profile sheets of the proposed design are provided in the Appendix as Figures 1 through 8.

## B. Sanitary Sewer and Watermain

Sanitary sewer and watermain were extended along Hornsby Street in the mid-2000's so extension of these utilities will not be required. However, adjustments of manhole structures and gate valve boxes will be required due to grade changes on the side slopes and ditch bottoms where these structures are located.

## C. Stormwater Management

There are two existing 36" culverts and one 24" culvert that cross under the road. These culverts will be replaced with equal sized culverts. There are also culverts crossing under

many of the driveways and field approaches connected to the roadway, most being 15" in size. These culverts will also be replaced, except for a culvert under the north Bare Home driveway.

The project is in the Rice Creek Watershed District (RCWD) and will require stormwater management measures meeting their permitting criteria. Because the drainage ditches within the right-of-way will be relatively flat, stormwater will be managed through a series of ditch checks and berms that will limit runoff volume and runoff rates.

## D. Wetlands

A wetland delineation report was completed by Bopray Environmental on November 20, 2019. The delineation report documents several wetlands in the road ditches. The RCWD was unable to evaluate the report in 2019 because the growing season had expired but reviewed the delineation and report in June of 2020 and issued a Notice of Decision approving the delineation on July 13, 2020. An incidental determination was not issued but will be requested when final design is completed, and wetland impacts are fully determined.

The existing wetlands will be largely disrupted by the project, either through regrading of the ditches and/or filling due to the wider road bed. If the existing wetlands are not determined to be incidental, mitigation will be required, most likely through the purchase of credits through a wetland bank.

A figure from the report showing the location of the delineated wetlands is attached in the Appendix.

## E. Sidewalks/Trails

No sidewalks or trail are planned as part of this project.

## F. Lighting

The scope of street lighting has not yet been developed but the cost for a system for the full length of the project is included in the cost estimate and will be further developed

during final design.

### G. Right-Of-Way Acquisition

The existing right-of-way for Hornsby Street is 100' wide. Additional right-of-way is not required to construct the proposed improvements.

## III. APPROVALS/PERMITS

Approvals and permits are required from various public agencies for the construction of this project. They include:

- Minnesota Pollution Control Agency (MPCA) - NPDES Stormwater Permit
- Rice Creek Watershed District – Stormwater Management Plan (Rule C), Erosion and Sediment Control Plan (Rule D) and Wetland Alteration (Rule F)

## IV. OPINION OF PROJECT COST

The total project cost is estimated at $2,470,500 and includes construction, contingencies, administrative and engineering costs. A detailed opinion of project cost is provided in the Appendix. The unit prices used in the estimate are based on recent bid results on similar types of projects.

The Engineer has no control over the cost of labor, materials, competitive bidding, weather conditions or other factors affecting the cost of construction. Therefore, all cost estimates are opinions for general information and no warranty or guarantee as to the accuracy of construction cost estimate is made. Financing for the project should be based on actual bid prices with reasonable contingencies.

## V. ASSESSMENTS & FUNDING

Assessments to benefitting properties are currently not planned for this project. However, should they be considered, a common policy for municipalities is to assess somewhere in the range of 20 to 30 percent of applicable project costs over the length of frontage that is benefitted by the improvement. A minimum assessment of 20 percent is required if assessment bonds are utilized to fund the project. Assessing 20 to 30 percent of the project costs would result in an estimated assessment in the range of $50 to $70 per front foot.

Primary project funding will be come from the General Fund, including funds which have already been budgeted for the project.

## VI. PROPOSED SCHEDULE

Following is the proposed schedule for the project for construction of the project in 2021:

| | |
|---|---|
| • Receive Preliminary Engineering Report | August 12, 2020 |
| • Order Improvement & Preparation of Plans & Specifications | August 12, 2020 |
| • Final Design and Permitting | August – Dec 2020 |
| • Project Information Meetings | October 2020 |
| • Approve Plans & Order Advertisement for Bids | December 9, 2020 |
| • Open Bids | January 21, 2021 |
| • Award Bid | January 27, 2021 |
| • Approximate Construction Start | May 2021 |
| • Substantial Completion | October 1, 2021 |

## VII. RECOMMENDATION

Based on the findings presented in this report, the proposed improvements are cost effective, necessary, and feasible from an engineering perspective. I recommend the City Council accept this report and order the improvement and preparation of final plans and specifications.

# APPENDIX

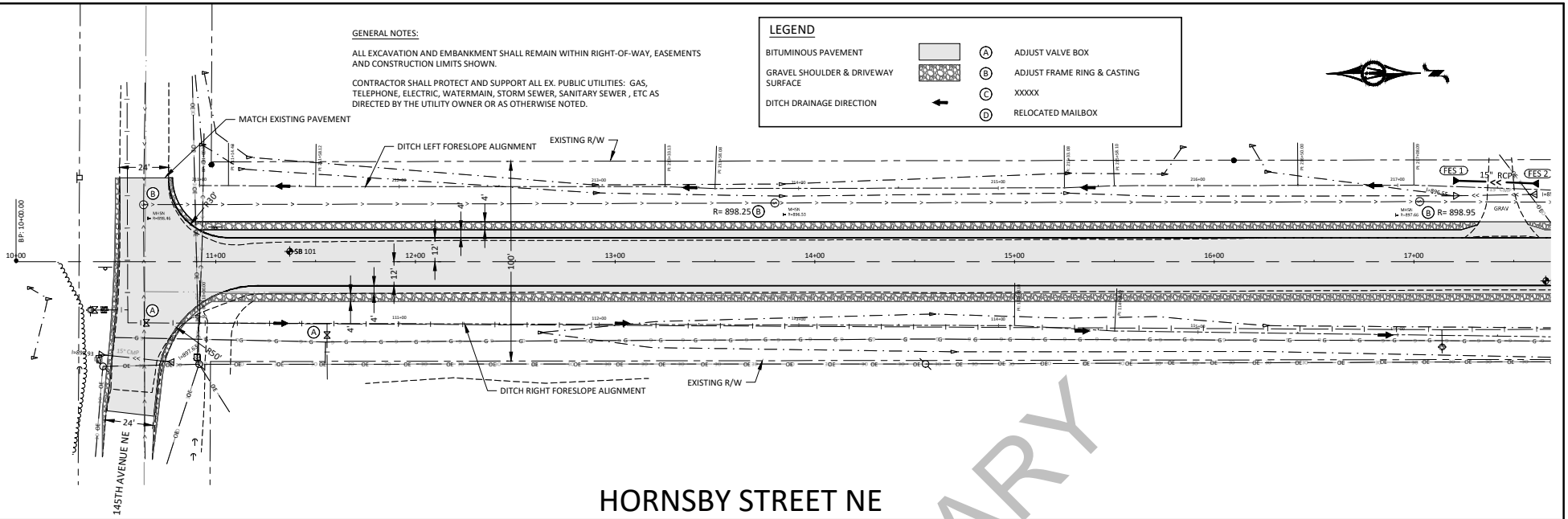
GENERAL NOTES:

ALL EXCAVATION AND EMBANKMENT SHALL REMAIN WITHIN RIGHT-OF-WAY, EASEMENTS AND CONSTRUCTION LIMITS SHOWN.

CONTRACTOR SHALL PROTECT AND SUPPORT ALL EX. PUBLIC UTILITIES: GAS, TELEPHONE, ELECTRIC, WATERMAIN, STORM SEWER, SANITARY SEWER , ETC AS DIRECTED BY THE UTILITY OWNER OR AS OTHERWISE NOTED.

LEGEND

| | |
|---|---|
| BITUMINOUS PAVEMENT | (A) ADJUST VALVE BOX |
| GRAVEL SHOULDER & DRIVEWAY SURFACE | (B) ADJUST FRAME RING & CASTING |
| DITCH DRAINAGE DIRECTION | (C) XXXXX |
| | (D) RELOCATED MAILBOX |

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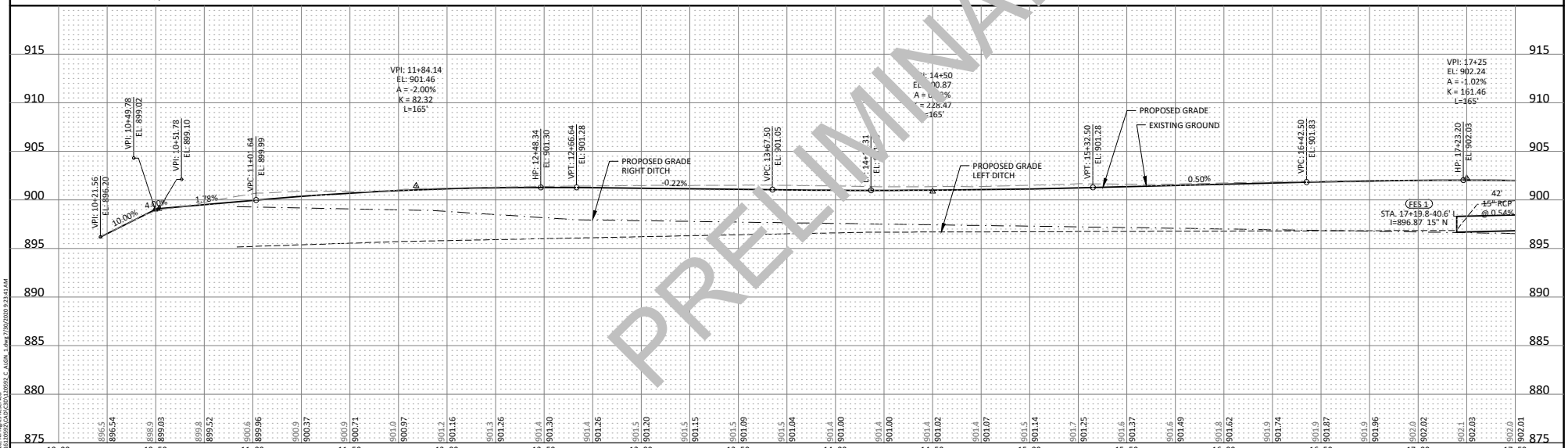


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2020 HORNSBY STREET NE RECONSTRUCTION

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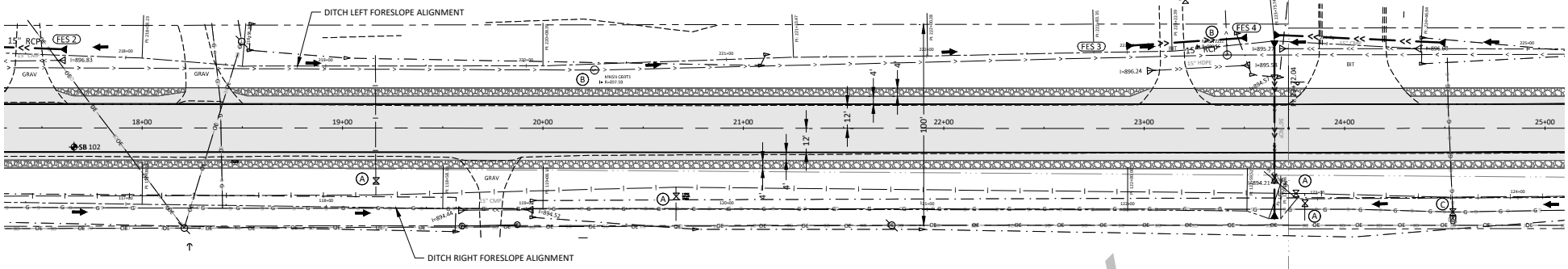


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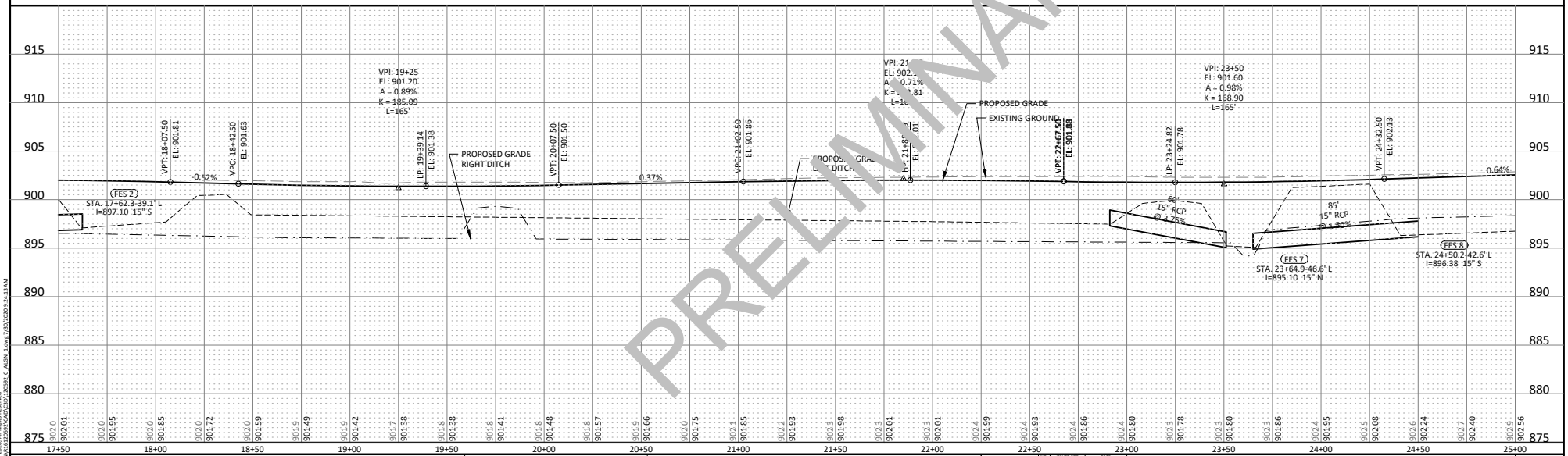


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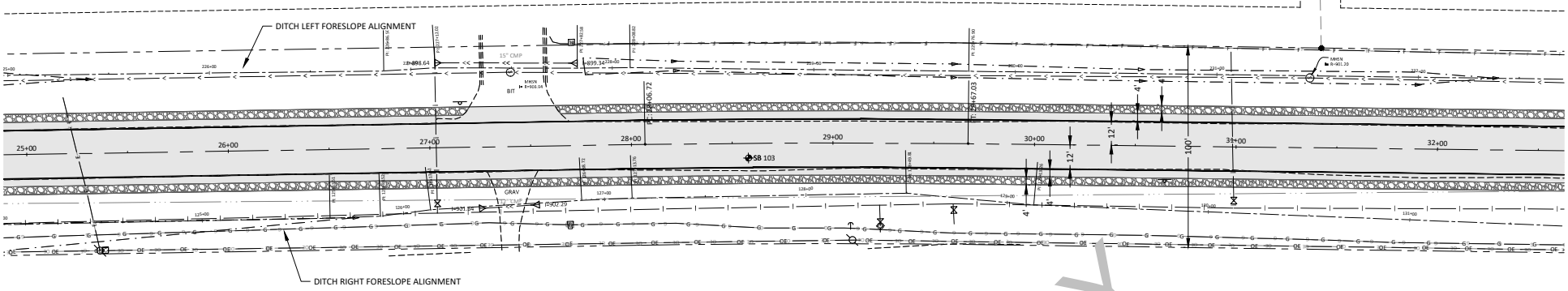


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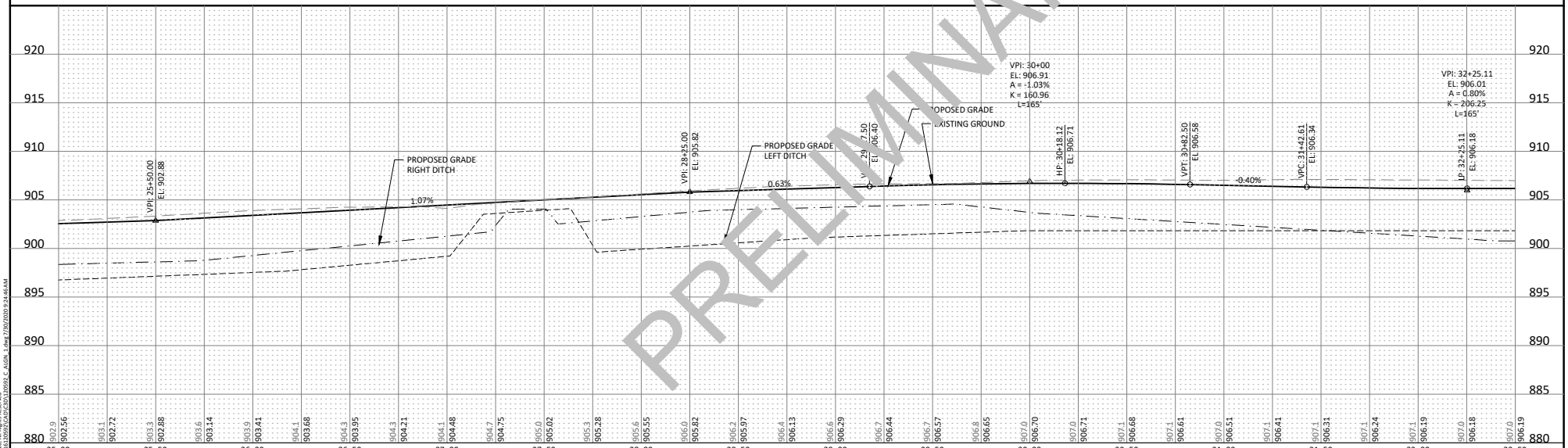


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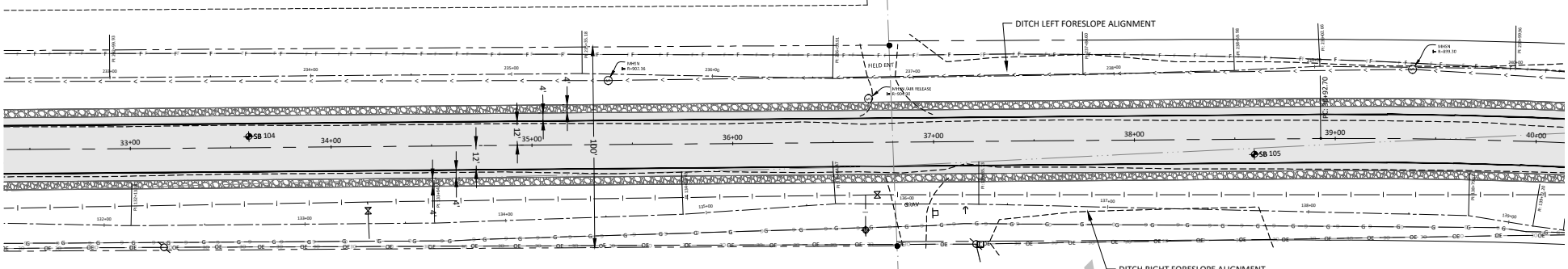


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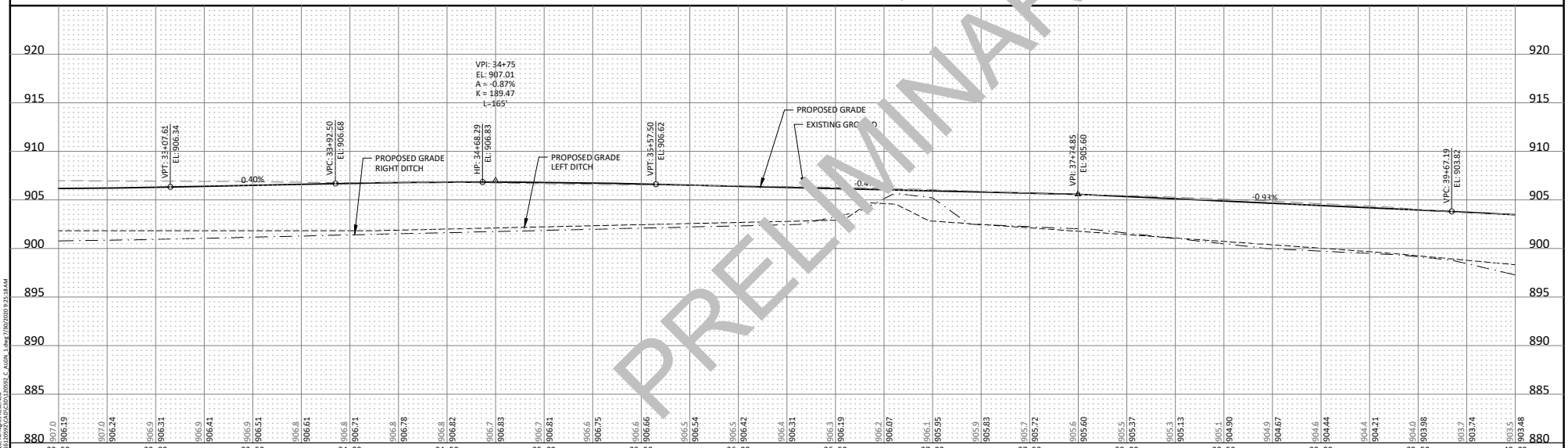


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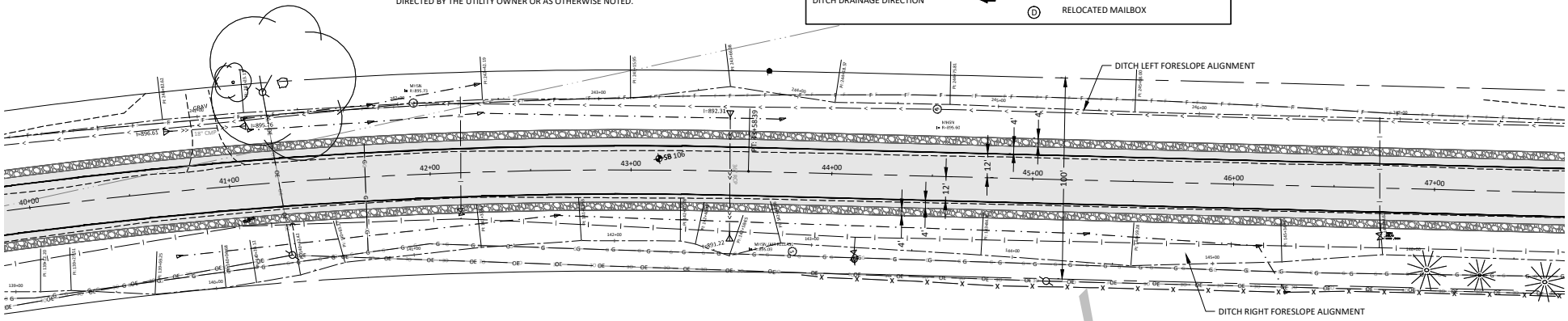


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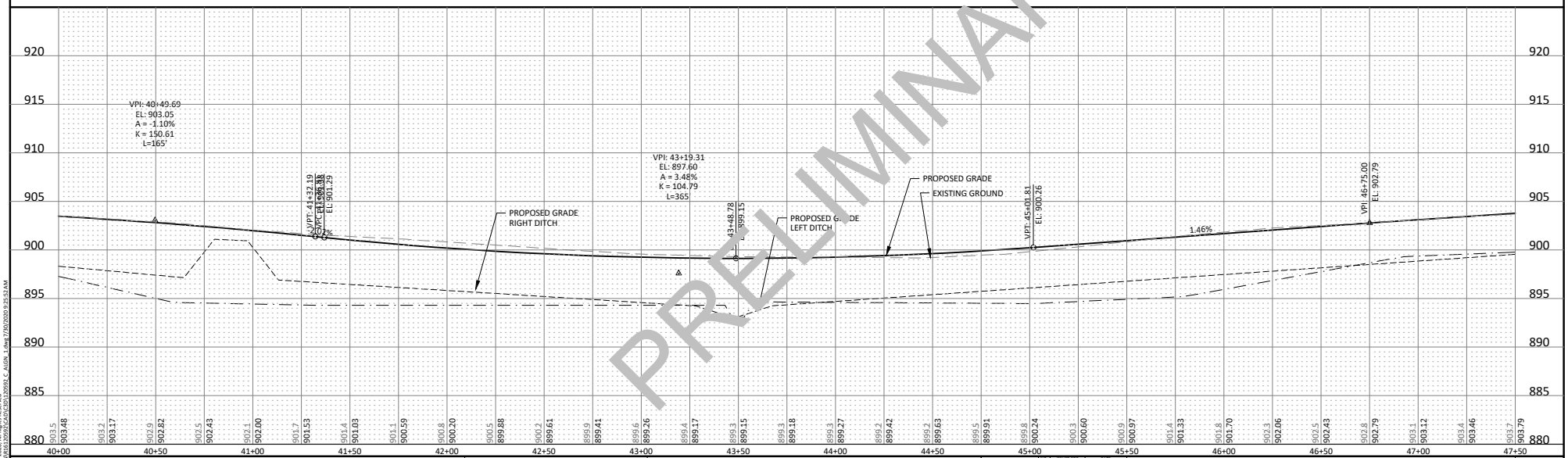


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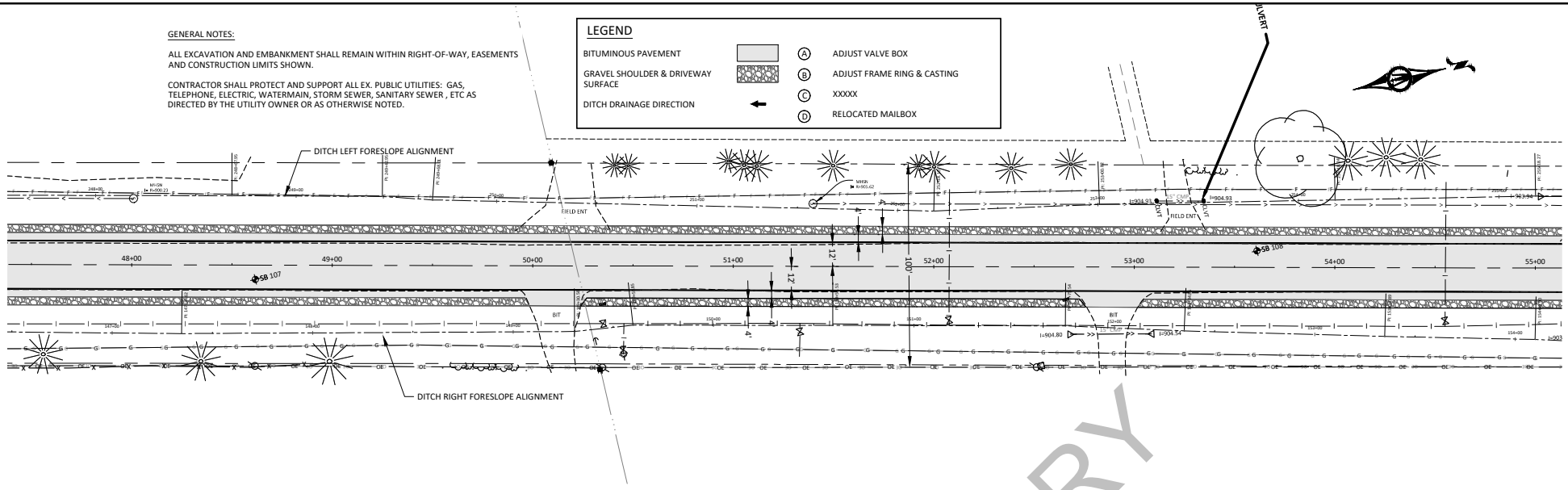


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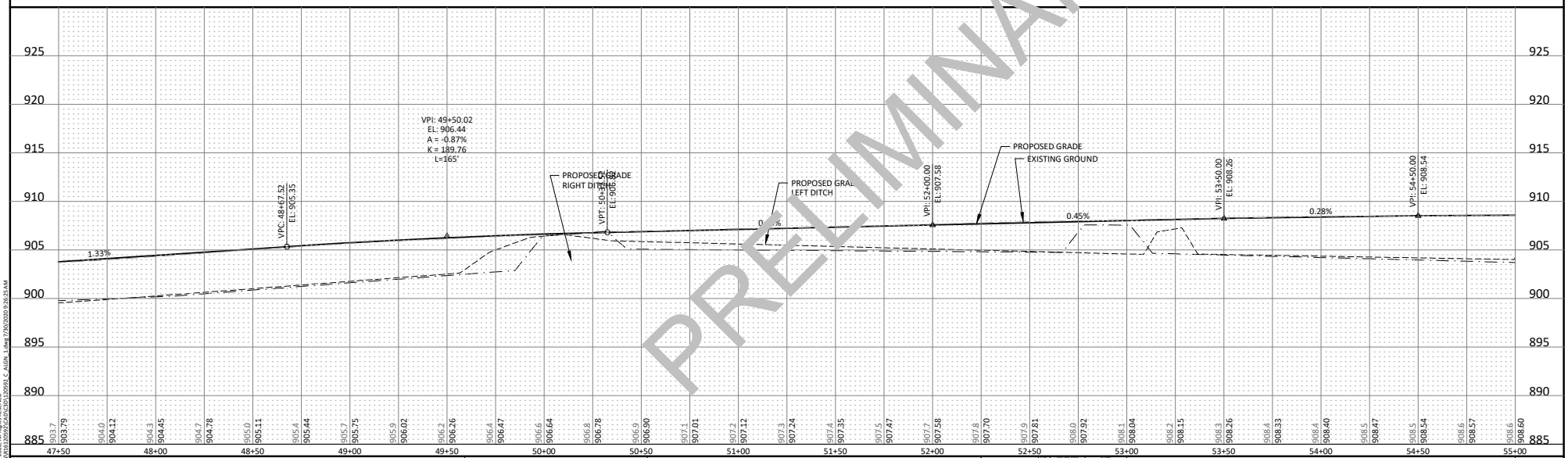


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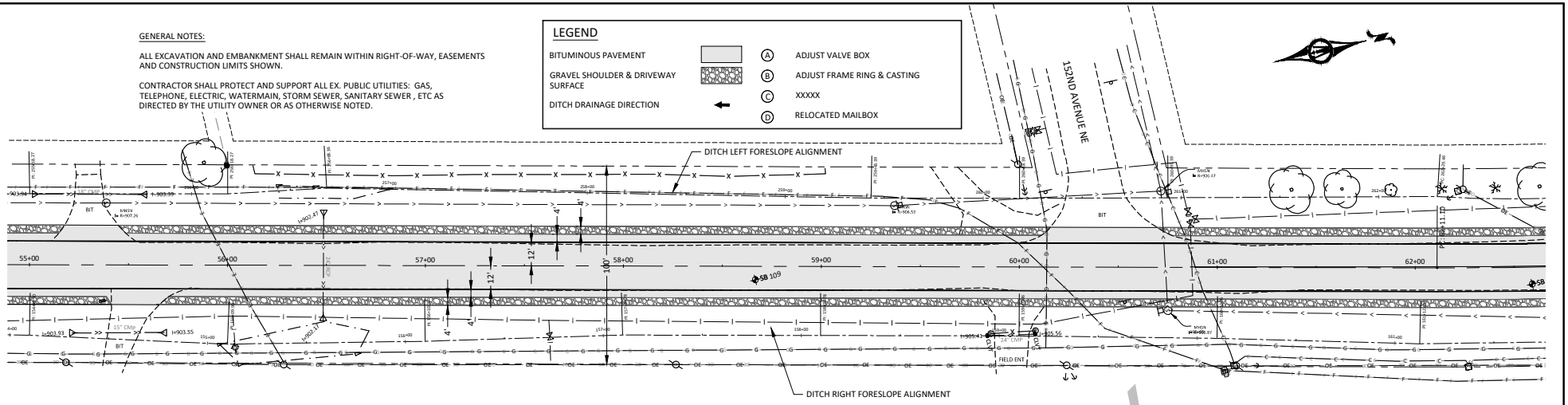


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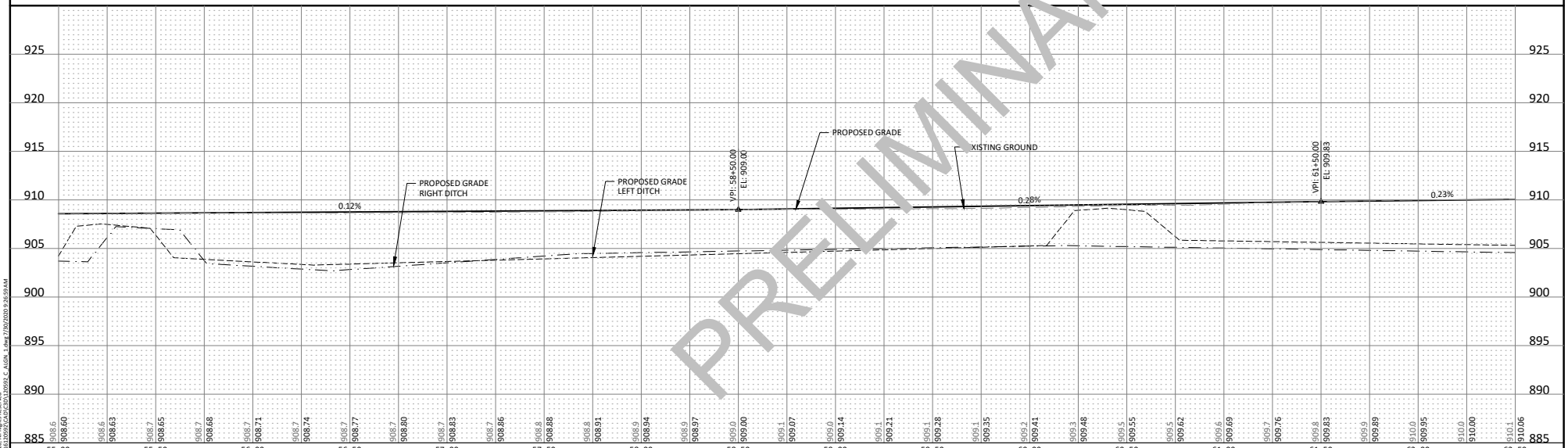


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HORZ. 0 25 50 SCALE FEET

VERT. 0 5 10 SCALE FEET

I HEREBY CERTIFY THAT THIS PLAN, SPECIFICATION, OR REPORT WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.

Kevin F. Bittner

LIC. NO. 21814 DATE 06/30/2020

BOLTON & MENK
7533 SUNWOOD DR NW, SUITE 206
RAMSEY, MINNESOTA 55303
Phone: (763) 433-2851
Email: Ramsey@bolton-menk.com
www.bolton-menk.com

| | | | |
|---|---|---|---|
| DESIGNED | KFB | NO. | ISSUED FOR | DATE |
| DRAWN | KGA | | | |
| CHECKED | KFB | | | |
| CLIENT PROJ. NO. | R16.120592 | | | |

COLUMBUS, MINNESOTA

2020 HORNSBY STREET NE RECONSTRUCTION

PLAN & PROFILE

SHEET 25 OF 50

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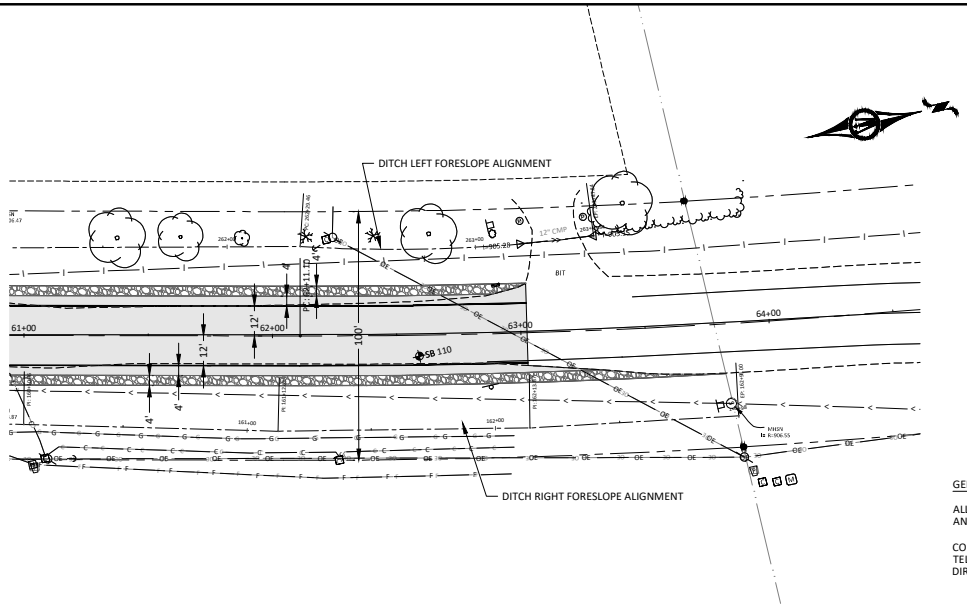



# HORNSBY STREET NE

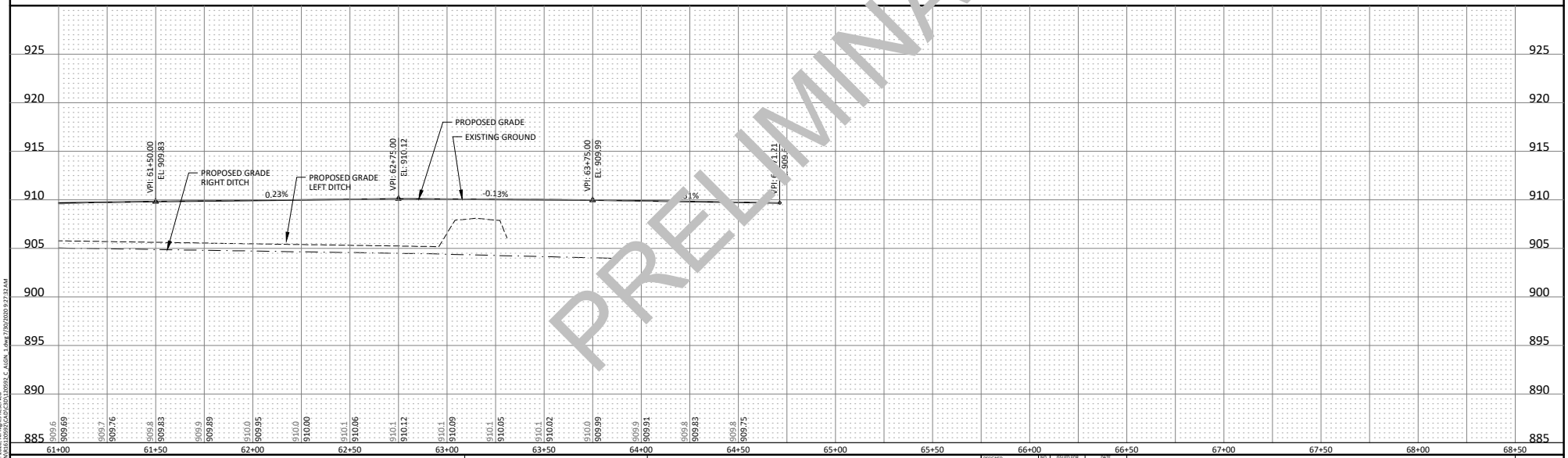
GENERAL NOTES:

ALL EXCAVATION AND EMBANKMENT SHALL REMAIN W... HT-OF-WAY, EASEMENTS AND CONSTRUCTION LIMITS SHOWN.

CONTRACTOR SHALL PROTECT AND SUPPO... ALL EX... UBLIC UTILITIES: GAS, TELEPHONE, ELECTRIC, WATERMAIN, ST... M SEWE... SANITARY SEWER , ETC AS DIRECTED BY THE UTILITY OWNER OR AS ...HERW...

## LEGEND

| | |
|---|---|
| BITUMINOUS PAVEMENT | |
| GRAVEL SHOULDER & DRIVEWAY SURFACE | |
| DITCH DRAINAGE DIRECTION | ← |




PRELIMINARY

HORZ. 0 25 50 SCALE FEET

VERT. 0 5 10 SCALE FEET

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| CHECKED | KFB | | | |
| CLIENT PROJ. NO. | R16.120592 | | | |

COLUMBUS, MINNESOTA

2020 HORNSBY STREET NE RECONSTRUCTION

PLAN & PROFILE

SHEET 26 OF 50

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# *PRELIMINARY OPINION OF PROJECT COST*

2021 - HORNSBY STREET NE RECONSTRUCTION
CITY OF COLUMBUS, MN
BMI PROJECT NO. R16.120592

BOLTON & MENK
Real People. Real Solutions.
Date: 6/29/2020

| Item No. | MnDOT Spec No. | Item | Notes | Estimated Quantity | Unit | Unit Price | Total Amount |
|---|---|---|---|---|---|---|---|
| **BASE BID** | | | | | | | |
| 1 | 2021.501 | MOBILIZATION | | 1 | LS | $100,000.00 | $100,000.00 |
| 2 | 2101.501 | CLEARING AND GRUBBING | | 1 | LS | $20,000.00 | $20,000.00 |
| 3 | 2104.502 | REMOVE MAILBOX | | 5 | EACH | $200.00 | $1,000.00 |
| 4 | 2104.502 | REMOVE SIGN | | 5 | EACH | $200.00 | $1,000.00 |
| 5 | 2104.502 | REMOVE MAILBOX | | 5 | EACH | $200.00 | $1,000.00 |
| 6 | 2104.503 | REMOVE CMP CULVERTS WITH APRONS | | 490 | LF | $12.00 | $5,880.00 |
| 7 | 2104.503 | REMOVE RCP CULVERTS WITH APRONS | | 175 | LF | $25.00 | $4,375.00 |
| 8 | 2104.503 | SAWING BITUMINOUS PAVEMENT (FULL DEPTH) | | 35 | LF | $10.00 | $350.00 |
| 9 | 2104.505 | REMOVE BITUMINOUS PAVEMENT | | 15000 | SY | $4.25 | $63,750.00 |
| 10 | 2105.504 | GEOTEXTILE FABRIC TYPE 5 | | 2450 | SY | $2.50 | $6,125.00 |
| 11 | 2105.507 | COMMON EXCAVATION (P) | | 9000 | CY | $8.00 | $72,000.00 |
| 12 | 2105.507 | MUCK EXCAVATION | | 4000 | CY | $10.00 | $40,000.00 |
| 13 | 2105.522 | SELECT GRANULAR BORROW (CV) (P) | | 6600 | CY | $25.00 | $165,000.00 |
| 14 | 2211.507 | AGGREGATE BASE (CV) CLASS 5 (P) | | 5250 | CY | $32.00 | $168,000.00 |
| 15 | 2221.507 | SHOULDER BASE AGGREGATE (CV) CLASS 2 (P) | | 800 | CY | $100.00 | $80,000.00 |
| 16 | 2360.504 | TYPE SP 9.5 WEARING COURSE MIXTURE 1.5" THICK | | 45000 | SY | $6.30 | $283,500.00 |
| 17 | 2360.504 | TYPE SP 12.5 NON WEAR COURSE MIXTURE 3" THICK | | 22500 | SY | $12.25 | $275,625.00 |
| 18 | 2360.504 | TYPE SP 9.5 WEARING COURSE MIXTURE 1.5" THICK (DVWYS) | | 550 | SY | $7.90 | $4,345.00 |
| 19 | 2360.504 | TYPE SP 12.5 NON WEAR COURSE MIXTURE 2" THICK (DVWYS) | | 550 | SY | $10.50 | $5,775.00 |
| 20 | 2501.502 | 15" CS PIPE APRON | | 24 | EACH | $250.00 | $6,000.00 |
| 21 | 2501.502 | 24" RC PIPE APRON | | 2 | EACH | $1,000.00 | $2,000.00 |
| 22 | 2501.502 | 36" RC PIPE APRON | | 4 | EACH | $2,000.00 | $8,000.00 |
| 23 | 2501.503 | 15" CS PIPE CULVERT | | 535 | LF | $25.00 | $13,375.00 |
| 24 | 2501.503 | 24" RC PIPE CULVERT | | 60 | LF | $50.00 | $3,000.00 |
| 25 | 2501.503 | 36" RC PIPE CULVERT | | 120 | LF | $75.00 | $9,000.00 |
| 26 | 2506.602 | ADJUST FRAME & RING CASTING | | 1 | EA | $250.00 | $250.00 |
| 27 | 2506.602 | ADJUST DRAINAGE STRUCTURE | | 19 | EA | $2,000.00 | $38,000.00 |
| 28 | 2506.602 | ADJUST VALVE BOX | | 22 | EA | $500.00 | $11,000.00 |
| 29 | 2511.507 | RANDOM RIPRAP CLASS 2 | | 350 | CY | $50.00 | $17,500.00 |
| 30 | 2540.602 | MAIL BOX | | 5 | EA | $500.00 | $2,500.00 |
| 31 | 2545.501 | LIGHTING SYSTEM | | 1 | LS | $150,000.00 | $150,000.00 |
| 32 | 2563.601 | TRAFFIC CONTROL | | 1 | LS | $25,000.00 | $25,000.00 |
| 33 | 2564.518 | SIGN PANELS TYPE C | | 30 | SF | $55.00 | $1,650.00 |
| 34 | 2573.501 | STABILIZED CONSTRUCTION EXIT | | 3 | LS | $2,000.00 | $6,000.00 |
| 35 | 2573.502 | SILT FENCE TYPE MACHINE SLICED | | 11000 | LF | $2.00 | $22,000.00 |
| 36 | 2573.503 | SEDIMENT CONTROL LOG | | 500 | LF | $4.00 | $2,000.00 |
| 37 | 2574.507 | COMMON TOPSOIL BORROW | | 1300 | CY | $15.00 | $19,500.00 |
| 38 | 2574.508 | FERTILIZER TYPE 2 | | 3800 | LB | $1.00 | $3,800.00 |
| 39 | 2575.501 | SEEDING | | 7.5 | ACRE | $500.00 | $3,750.00 |
| 40 | 2575.502 | SEED MIXTURE 25-131 | | 750 | LB | $3.00 | $2,250.00 |
| 41 | 2575.504 | EROSION CONTROL BLANKETS CATEGORY 3N | | 500 | SY | $3.00 | $1,500.00 |
| 42 | 2575.508 | HYDRAULIC BONDED FIBER MATRIX | | 20000 | LB | $2.50 | $50,000.00 |
| 43 | 2582.503 | 4" SOLID LINE MULTI COMP (WHITE) | | 10700 | LF | $0.50 | $5,350.00 |
| 44 | 2582.503 | 24" SOLID LINE MULTI COMP (WHITE) | | 12 | LF | $10.00 | $120.00 |
| 45 | 2582.503 | 4" BROKEN LINE MULTI COMP (YELLOW SKIP) | | 840 | LF | $1.00 | $840.00 |
| 46 | 2582.503 | 4" DBLE SOLID LINE MULTI COMP | | 1000 | LF | $1.50 | $1,500.00 |
| 47 | | WETLAND MITIGATION | | 1 | LS | $15,000.00 | $15,000.00 |

| | |
|---|---|
| **SUB-TOTAL CONSTRUCTION** | **$1,718,610.00** |
| **CONTINGENCIES (15%)** | **$257,791.50** |
| **TOTAL ESTIMATED CONSTRUCTION** | **$1,976,401.50** |
| **ENGINEERING AND ADMINISTRATION (25%)** | **$494,100.38** |
| **TOTAL ESTIMATED PROJECT COST** | **$2,470,501.88** |

| NO. | DATE | BY | DESCRIPTION OF REVISIONS |
|---|---|---|---|
| #### | #### | #### | #### |
| #### | #### | #### | #### |
| #### | #### | #### | #### |
| #### | #### | #### | #### |
| #### | #### | #### | #### |

DESIGNED ####
DRAWN ####
CHECKED ####

TKDA
444 Cedar Street, Suite 1500
Saint Paul, MN 55101
651.292.4400
tkda.com

# HORNSBY STREET WETLANDS

PROJ. NO. ####
DRAWING NO. ####

PLOT DATE: Nov 11, 2019 - 1:07pm
FILENAME: K:\a-f\Columbia\171150\00\04_Production\01_CAD\01_Xref\Hornsby S Wetlands.dwg