Application

19835 - 2024 Safe Routes to School Infrastructure
20408 - Arden Hills - Old Highway 10 Trail Improvements
Regional Solicitation - Bicycle and Pedestrian Facilities

Status: Submitted
Submitted Date: 12/15/2023 1:49 PM

Primary Contact

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* Arden Hills (City) Minnesota (State/Province) 55112 (Postal Code/Zip)

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What Grant Programs are you most interested in? Regional Solicitation - Bicycle and Pedestrian Facilities

Organization Information

Name: ARDEN HILLS, CITY OF

Jurisdictional Agency (if different):

Organization Type: City

Organization Website:

Address: 1245 W HWY 96

* ARDEN HILLS (City) Minnesota (State/Province) 55112 (Postal Code/Zip)

County: Ramsey

Phone:* 612-792-7800 (Ext.)

Fax:

PeopleSoft Vendor Number 0000020922A2

Project Information

Project Name Old Highway 10 Trail SRTS Improvements

Primary County where the Project is Located Ramsey

Cities or Townships where the Project is Located: Arden Hills

Jurisdictional Agency (If Different than the Applicant):

Brief Project Description (Include location, road name/functional class, type of improvement, etc.)

The Old Highway 10 Trail Safe Routes to School (SRTS) project will improve bicycle and pedestrian facilities along Old Highway 10 from Lake Valentine Road Highway 96 W. for travelers of all ages and abilities by establishing a safe and comfortable connection to Valentine Elementary School, and Mounds View High School. This project will also provide connections to other sidewalks, trails, parks, Bethel College, and other key destinations in the project area. The primary goal of the proposed project is to improve multimodal safety and access for K-12 students and encourage active transportation for the neighboring community.

This proposed project includes the following improvements:

- Trail: 1.3 miles of paved, ADA-compliant, ten-foot-wide trail along the west side of Old Highway 10 from Lake Valentine Road to Highway 96 W.

- Boardwalk: 500 linear feet of ADA-compliant, 12-foot-wide, structural wood boardwalk.

- Retaining walls: 1,289 linear feet of concrete block retaining walls with a maximum height of 4 feet.

- Curb ramps: 10 new, ADA compliant curb ramps along the west side of Old Highway 10.

(Limit 2,800 characters; approximately 400 words)

TRANSPORTATION IMPROVEMENT PROGRAM (TIP) DESCRIPTION - will be used in TIP if the project is selected for funding. See MnDOT's TIP description guidance.

Old Highway 10 Trail Safe Routes to School (SRTS) along the west side of Old Highway 10 from Lake Valentine Road to Highway 96 W.

Include both the CSAH/MSAS/TH references and their corresponding street names in the TIP Description (see Resources link on Regional Solicitation webpage for examples).

Project Length (Miles)

1.3

to the nearest one-tenth of a mile

Project Funding

Are you applying for competitive funds from another source(s) to implement this project?

Yes

If yes, please identify the source(s)

Minnesota SRTS Infrastructure Grant

Federal Amount

$1,000,000.00

Match Amount

$2,679,000.00

Minimum of 20% of project total

Project Total

$3,679,000.00

For transit projects, the total cost for the application is total cost minus fare revenues.

Match Percentage

72.82%

Minimum of 20%
Compute the match percentage by dividing the match amount by the project total

Source of Match Funds

Arden Hills and Ramsey County

A minimum of 20% of the total project cost must come from non-federal sources; additional match funds over the 20% minimum can come from other federal sources

Preferred Program Year

Select one:

2028, 2029

Select 2026 or 2027 for TDM and Unique projects only. For all other applications, select 2028 or 2029.

Additional Program Years:

2025, 2026, 2027

Select all years that are feasible if funding in an earlier year becomes available.

Project Information

If your project has already been assigned a State Aid Project # (SAP or SP)

Please indicate here SAP/SP#.

Location

County, City, or Lead Agency

City of Arden Hills

Name of Trail/Ped Facility:

Old Highway 10 Trail SRTS Improvements

(example; CEDAR LAKE TRAIL)

IF TRAIL/PED FACILITY IS ADJACENT TO ROADWAY:

Road System

City Street

(TH, CSAH, MSAS, CO. RD., TWP. RD., CITY STREET)

Road/Route No.

(Example: 53 for CSAH 53)

Name of Road Old Highway 10

(Example: 1st ST., Main Ave.)

TERMINI: Termini listed must be within 0.3 miles of any work

From:
Road System City Street

(TH, CSAH, MSAS, CO. RD., TWP. RD., CITY STREET)

Road/Route No.

(Example: 53 for CSAH 53)

Name of Road Lake Valentine Road

(Example: 1st ST., Main Ave.)

To:
Road System Highway 96 W

DO NOT INCLUDE LEGAL DESCRIPTION; INCLUDE NAME OF ROADWAY IF MAJORITY OF FACILITY RUNS ADJACENT TO A SINGLE CORRIDOR

Road/Route No. CSAH 96

(Example: 53 for CSAH 53)

Name of Road Highway 96

(Example: 1st ST., Main Ave.)

In the City/Cities of: Arden Hills

(List all cities within project limits)

IF TRAIL/PED FACILITY IS NOT ADJACENT TO ROADWAY:
Termini: Termini listed must be within 0.3 miles of any work

From:

To:

Or

At:

In the City/Cities of:

(List all cities within project limits)

Primary Types of Work (Check all that apply)

Multi-Use Trail Yes

Reconstruct Trail

Resurface Trail

Bituminous Pavement Yes

Concrete Walk

Pedestrian Bridge

Signal Revision

Landscaping Yes

Other (do not include incidental items) Boardwalk, retaining walls, pedestrian ramps

BRIDGE/CULVERT PROJECTS (IF APPLICABLE)

Old Bridge/Culvert No.:

New Bridge/Culvert No.:

Structure is Over/Under (Bridge or culvert name):

Zip Code where Majority of Work is Being Performed 55112

Approximate Begin Construction Date (MO/YR) 05/01/2025

Approximate End Construction Date (MO/YR) 06/30/2026

Miles of Pedestrian Facility/Trail (nearest 0.1 miles): 1.3

Miles of trail on the Regional Bicycle Transportation Network (nearest 0.1 miles): 0

Is this a new trail? Yes

Requirements - All Projects

All Projects

1. The project must be consistent with the goals and policies in these adopted regional plans: Thrive MSP 2040 (2014), the 2040 Transportation Policy Plan (2018), the 2040 Regional Parks Policy Plan (2018), and the 2040 Water Resources Policy Plan (2015).

Check the box to indicate that the project meets this requirement. Yes

2. The project must be consistent with the 2040 Transportation Policy Plan. Reference the 2040 Transportation Plan goals, objectives, and strategies that relate to the project.

Briefly list the goals, objectives, strategies, and associated pages:

Goal B: Objective A, Strategy B6; 2.8

Goal C: Strategies C1, C2, C15, C16, and C17; p2.10-2.12, 2.22-2.24

Goal E: Objectives C and D; p2.30; Strategy E3 and E6; p2.31-2.32, 2.34

Goal F: Objective C; p2.35

(Limit 2,800 characters; approximately 400 words)

3. The project or the transportation problem/need that the project addresses must be in a local planning or programming document. Reference the name of the appropriate comprehensive plan, regional/statewide plan, capital improvement program, corridor study document [studies on trunk highway must be approved by the Minnesota Department of Transportation and the Metropolitan Council], or other official plan or program of the applicant agency [includes Safe Routes to School Plans] that the project is included in and/or a transportation problem/need that the project addresses.

List the applicable documents and pages: Unique projects are exempt from this qualifying requirement because of their innovative nature.

Ramsey County Pedestrian and Bicycle Plan (Page 2B-36)

(Limit 2,800 characters; approximately 400 words)

4. The project must exclude costs for studies, preliminary engineering, design, or construction engineering. Right-of-way costs are only eligible as part of transit stations/stops, transit terminals, park-and-ride facilities, or pool-and-ride lots. Noise barriers, drainage projects, fences, landscaping, etc., are not eligible for funding as a standalone project, but can be included as part of the larger submitted project, which is otherwise eligible. Unique project costs are limited to those that are federally eligible.

Check the box to indicate that the project meets this requirement. Yes

5. Applicant is a public agency (e.g., county, city, tribal government, transit provider, etc.) or non-profit organization (TDM and Unique Projects applicants only). Applicants that are not State Aid cities or counties in the seven-county metro area with populations over 5,000 must contact the MnDOT Metro State Aid Office prior to submitting their application to determine if a public agency sponsor is required.

Check the box to indicate that the project meets this requirement. Yes

6. Applicants must not submit an application for the same project in more than one funding sub-category.

Check the box to indicate that the project meets this requirement. Yes

7. The requested funding amount must be more than or equal to the minimum award and less than or equal to the maximum award. The cost of preparing a project for funding authorization can be substantial. For that reason, minimum federal amounts apply. Other federal funds may be combined with the requested funds for projects exceeding the maximum award, but the source(s) must be identified in the application. Funding amounts by application category are listed below in Table 1. For unique projects, the minimum award is $500,000 and the maximum award is the total amount available each funding cycle (approximately $4,000,000 for the 2024 funding cycle).

Multiuse Trails and Bicycle Facilities: *$250,000 to $5,500,000*
Pedestrian Facilities (Sidewalks, Streetscaping, and ADA): *$250,000 to $2,000,000*
Safe Routes to School: *$250,000 to $1,000,000*

Check the box to indicate that the project meets this requirement. Yes

8. The project must comply with the Americans with Disabilities Act (ADA).

Check the box to indicate that the project meets this requirement. Yes

9. In order for a selected project to be included in the Transportation Improvement Program (TIP) and approved by USDOT, the public agency sponsor must either have a current Americans with Disabilities Act (ADA) self-evaluation or transition plan that covers the public right of way/transportation, as required under Title II of the ADA. The plan must be completed by the local agency before the Regional Solicitation application deadline. For future Regional Solicitation funding cycles, this requirement may include that the plan has undergone a recent update, e.g., within five years prior to application.

The applicant is a public agency that employs 50 or more people and has a completed ADA transition plan that covers the public right of way/transportation.

Date plan completed:

Link to plan:

The applicant is a public agency that employs fewer than 50 people and has a completed ADA self-evaluation that covers the public right of way/transportation. Yes

Date self-evaluation completed: 08/01/2020

Link to plan: https://srfconsultinggroup-my.sharepoint.com/:b:/g/personal/scrosby_srfconsulting_com/Ea4DGl7qYFpJuMf3bMUlLSQB7OCQ_LfxiLenY5TlFCRTxA?e=A3OnL9

Upload plan or self-evaluation if there is no link

Upload as PDF

10. The project must be accessible and open to the general public.

Check the box to indicate that the project meets this requirement. Yes

11. The owner/operator of the facility must operate and maintain the project year-round for the useful life of the improvement. This includes assurance of year-round use of bicycle, pedestrian, and transit facilities, per FHWA direction established 8/27/2008 and updated 4/15/2019. Unique projects are exempt from this qualifying requirement.

Check the box to indicate that the project meets this requirement. Yes

12. The project must represent a permanent improvement with independent utility. The term ?independent utility? means the project provides benefits described in the application by itself and does not depend on any construction elements of the project being funded from other sources outside the regional solicitation, excluding the required non-federal match.

Projects that include traffic management or transit operating funds as part of a construction project are exempt from this policy.

Check the box to indicate that the project meets this requirement. Yes

13. The project must not be a temporary construction project. A temporary construction project is defined as work that must be replaced within five years and is ineligible for funding. The project must also not be staged construction where the project will be replaced as part of future stages. Staged construction is eligible for funding as long as future stages build on, rather than replace, previous work.

Check the box to indicate that the project meets this requirement. Yes

14. The project applicant must send written notification regarding the proposed project to all affected state and local units of government prior to submitting the application.

Check the box to indicate that the project meets this requirement. Yes

Requirements - Bicycle and Pedestrian Facilities Projects

1. All projects must relate to surface transportation. As an example, for multiuse trail and bicycle facilities, surface transportation is defined as primarily serving a commuting purpose and/or that connect two destination points. A facility may serve both a transportation purpose and a recreational purpose; a facility that connects people to recreational destinations may be considered to have a transportation purpose.

Check the box to indicate that the project meets this requirement. Yes

Multiuse Trails on Active Railroad Right-of-Way:

2. All multiuse trail projects that are located within right-of-way occupied by an active railroad must attach an agreement with the railroad that this right-of-way will be used for trail purposes.

Check the box to indicate that the project meets this requirement.

Upload Agreement PDF

Check the box to indicate that the project is not in active railroad right-of-way. Yes

Multiuse Trails and Bicycle Facilities projects only:

3. All applications must include a letter from the operator of the facility confirming that they will remove snow and ice for year-round bicycle and pedestrian use. The Minnesota Pollution Control Agency has a resource for best practices when using salt. Upload PDF of Agreement in Other Attachments.

Check the box to indicate that the project meets this requirement. Yes

Upload PDF of Agreement in Other Attachments.

Safe Routes to School projects only:

4. All projects must be located within a two-mile radius of the associated primary, middle, or high school site.

Check the box to indicate that the project meets this requirement. Yes

5. All schools benefitting from the SRTS program must conduct after-implementation surveys. These include the student travel tally form and the parent survey available on the National Center for SRTS website. The school(s) must submit the after-evaluation data to the National Center for SRTS within a year of the project completion date. Additional guidance regarding evaluation can be found at the MnDOT SRTS website.

Check the box to indicate that the applicant understands this requirement and will submit data to the National Center for SRTS within one year of project completion. Yes

Requirements - Bicycle and Pedestrian Facilities Projects

Specific Roadway Elements

CONSTRUCTION PROJECT ELEMENTS/COST ESTIMATES	Cost
Mobilization (approx. 5% of total cost)	$170,000.00
Removals (approx. 5% of total cost)	$52,573.00
Roadway (grading, borrow, etc.)	$0.00
Roadway (aggregates and paving)	$0.00
Subgrade Correction (muck)	$0.00
Storm Sewer	$850,000.00
Ponds	$100,000.00
Concrete Items (curb & gutter, sidewalks, median barriers)	$204,508.00
Traffic Control	$90,000.00
Striping	$0.00
Signing	$0.00
Lighting	$0.00
Turf - Erosion & Landscaping	$170,000.00
Bridge	$0.00
Retaining Walls	$511,081.00
Noise Wall (not calculated in cost effectiveness measure)	$0.00
Traffic Signals	$0.00
Wetland Mitigation	$0.00
Other Natural and Cultural Resource Protection	$0.00
RR Crossing	$0.00
Roadway Contingencies	$0.00
Other Roadway Elements	$0.00
Totals	**$2,148,162.00**

Specific Bicycle and Pedestrian Elements

CONSTRUCTION PROJECT ELEMENTS/COST ESTIMATES	Cost
Path/Trail Construction	$153,637.00
Sidewalk Construction	$0.00
On-Street Bicycle Facility Construction	$0.00

Right-of-Way	$0.00
Pedestrian Curb Ramps (ADA)	$0.00
Crossing Aids (e.g., Audible Pedestrian Signals, HAWK)	$0.00
Pedestrian-scale Lighting	$0.00
Streetscaping	$0.00
Wayfinding	$0.00
Bicycle and Pedestrian Contingencies	$0.00
Other Bicycle and Pedestrian Elements	$770,000.00
Totals	**$923,637.00**

Specific Transit and TDM Elements

CONSTRUCTION PROJECT ELEMENTS/COST ESTIMATES	Cost
Fixed Guideway Elements	$0.00
Stations, Stops, and Terminals	$0.00
Support Facilities	$0.00
Transit Systems (e.g. communications, signals, controls, fare collection, etc.)	$0.00
Vehicles	$0.00
Contingencies	$307,201.00
Right-of-Way	$300,000.00
Other Transit and TDM Elements	$0.00
Totals	**$607,201.00**

Transit Operating Costs

Number of Platform hours	0
Cost Per Platform hour (full loaded Cost)	$0.00
Subtotal	$0.00
Other Costs - Administration, Overhead,etc.	$0.00

PROTECT Funds Eligibility

One of the new federal funding sources is Promoting Resilient Operations for Transformative, Efficient, and Cost-Saving Transportation (PROTECT). Please describe which specific elements of your project and associated costs out of the Total TAB-Eligible Costs are eligible to receive PROTECT funds. Examples of potential eligible items may include: storm sewer, ponding, erosion control/landscaping, retaining walls, new bridges over floodplains, and road realignments out of floodplains.

INFORMATION: Promoting Resilient Operations for Transformative, Efficient, and Cost-Saving Transportation (PROTECT) Formula Program Implementation Guidance (dot.gov).

Response:

The Arden Hills Old Highway 10 Trail Improvements project will incorporate elements that will increase the resiliency of local and regional transportation system networks within the project area. The project provides transportation benefits by making Old Highway 10 more resilient to endure current and future severe weather events and natural disasters. The project will reduce long-term, life cycle infrastructure costs by preventing future damage, maintenance, and reconstruction. Project element improvements that are eligible to receive PROTECT funds include the following: Storm sewer systems will be designed to current standards to include high intensity rainfall events and installed to remove rainwater from surface transportation facilities; Flood detention basins will be installed for a 100-year design event to prevent the intrusion of floodwaters into surface transportation systems; Riprap installation at storm sewer and culvert outlets for erosion protection; The number of drainage structures on the roadway surface will be increased to meet current standards; Boardwalk installation over a floodplain to minimize impact to the wetland and floodplain resource; Native seed mixtures will be used following MnDOT standards. Weed control will be used during establishment. These are vegetation management practices in transportation rights-of-way to improve roadway safety, prevent invasive species, and provide wildfire and erosion control.

Totals

Total Cost	$3,679,000.00
Construction Cost Total	$3,679,000.00
Transit Operating Cost Total	$0.00

Measure 1A: Relationship Between Safe Routes to School Program Elements

Response:

Mounds View High School and Valentine Hills Elementary School do not presently have Safe Routes to School Plans in place. However, Arden Hills just a SRTS project just south of this proposed project that includes a new trail connection to Mounds View High School. The project area along Old Highway 10 is included in the Ramsey County All-Abilities Transportation Plan. In accordance with MnDOTs Safe Routes to School program, several suggestions are highlighted for each E. The suggestions below identify those planned as a part of this project, and that can be incorporated into future SRTS plans. The City is supportive of partnering with the schools to implement an SRTS program to increase the daily number of children walking or bicycling to/from school. Both schools enroll over 1,600 students, which equates to over 14 percent of the total enrollment for the Mounds View School District. This demonstrates the significant benefit of the project and corresponding SRTS programmatic improvements will have for students, staff, teachers, and the surrounding community. Additionally, a 2023 trail project connecting to Mounds View High School received State SRTS funding.

Evaluation

- Conduct after project student travel tallies.

- Conduct after project parent surveys.

- Identify other safe route gaps and improvement areas.

Education

- Conduct a public education campaign of SRTS.

- Develop an online presence for the SRTS program on the City and school district websites.

- Incorporate walking, rolling, and bicycling to school into the school districts Wellness Policy.

Encouragement

- Initiate activities (i.e., bike rodeos, bus trains, etc.) to encourage walking and bicycling to school.

- Participate in Walk to School Day and Bike to School Day events.

Equity

- Complete listening sessions with students and parents to combat violence to children walking or bicycling to school.

- Develop a program that considers and meets the needs of students with disabilities.

- Identify service deficiencies among underrepresented and underserved communities.

Engagement

- Implement posters around the schools to advertise the SRTS program.

- Send SRTS program cards to parents to engage them with the program.

Engineering

- Complete the proposed project to enhance the pedestrian network around the schools.

(Limit 2,800 characters; approximately 400 words)

Measure A: Project Location and Impact to Disadvantaged Populations

Select one:

The project, or the issue/barrier being addressed by the project, is specifically named in an adopted Safe Routes to School plan*	
The project, while not specifically named, is consistent with an adopted Safe Routes to School plan highlighting at least one of the school(s) to which it is meant to provide access	
The project is identified in a locally adopted transportation/mobility plan or study and would make a safety improvement, reduce traffic or improve air quality at or near a school	Yes
The school(s) in question do not have Safe Routes to School plan(s)	

Measure A: Average share of student population that bikes or walks

Average Percent of Student Population	18.4%
Documentation Attachment	1702665538061_7_AH SRTS student tally forms.pdf

Please upload attachment in PDF form

Measure B: Student Population

Student population within one mile of the school	369.0

Measure A: Engagement

i. Describe any Black, Indigenous, and People of Color populations, low-income populations, disabled populations, youth, or older adults within a ½ mile of the proposed project. Describe how these populations relate to regional context. Location of affordable housing will be addressed in Measure C.

ii. Describe how Black, Indigenous, and People of Color populations, low-income populations, persons with disabilities, youth, older adults, and residents in affordable housing were engaged, whether through community planning efforts, project needs identification, or during the project development process.

iii. Describe the progression of engagement activities in this project. A full response should answer these questions:

1. What engagement methods and tools were used?
2. How did you engage specific communities and populations likely to be directly impacted by the project?
3. What techniques did you use to reach populations traditionally not involved in community engagement related to transportation projects?
4. How were the project?s purpose and need identified?
5. How was the community engaged as the project was developed and designed?
6. How did you provide multiple opportunities for of Black, Indigenous, and People of Color populations, low-income populations, persons with disabilities, youth, older adults, and residents in affordable housing to engage at different points of project development?
7. How did engagement influence the project plans or recommendations? How did you share back findings with community and re-engage to assess responsiveness of these changes?
8. If applicable, how will NEPA or Title VI regulations will guide engagement activities?

Response:

In 2023 the City of Arden Hills completed online engagement using an online project location map with a clearly defined project area. Included with the map was an online survey using Survey Monkey. There was a total of 35 responses received with over 89 percent indicating the trail would be beneficial to themselves or someone they know.

The City also sent out targeted post cards to residents within ¼ mile of the project guiding them to the projects online map and survey. Based on American Community Survey (ACS) data, 13.8 percent of the population is over age 65, 20.6 percent of the population is under age 18, and 21.4 percent of the population identify as BIPOC within ½ mile of the project. The project is also in a census tract that is identified as a regional environmental justice area.

The project will provide a vital north-south link to employment, schools, health care, places of worship, and critical services for people living in these adjacent areas. It will also increase access to free recreation and natural resources by linking with the broader park and trail network. Most notably the project will provide key linkages for students walking, rolling, or bicycling to Valentine Hills Elementary School or Mounds View High School, which have over 2,500 students enrolled between both schools of which over 40 percent identify as BIPOC

The proposed design also draws from engagement conducted during 2023 that included an open house event at Arden Hills City Hall where 28 residents attended and provided input and ideas on the project. Input from the engagement included a need for an off-road trail or walk for pedestrians and bicyclists who currently use the roadway, and a desire for improved crossings at intersections.

(Limit 2,800 characters; approximately 400 words):

Measure B: Disadvantaged Communities Benefits and Impacts

Describe the project?s benefits to Black, Indigenous, and People of Color populations, low-income populations, children, people with disabilities, youth, and older adults. Benefits could relate to:

? pedestrian and bicycle safety improvements;
? public health benefits;
? direct access improvements for residents or improved access to destinations such as jobs, school, health care, or other;
? travel time improvements;
? gap closures;
? new transportation services or modal options;
? leveraging of other beneficial projects and investments;
? and/or community connection and cohesion improvements.

This is not an exhaustive list. A full response will support the benefits claimed, identify benefits specific to Disadvantaged communities residing or engaged in activities near the project area, identify benefits addressing a transportation issue affecting Disadvantaged communities specifically identified through engagement, and substantiate benefits with data.

Acknowledge and describe any negative project impacts to Black, Indigenous, and People of Color populations, low-income populations, children, people with disabilities, youth, and older adults. Describe measures to mitigate these impacts. Unidentified or unmitigated negative impacts may result in a reduction in points.

Below is a list of potential negative impacts. This is not an exhaustive list.

? Decreased pedestrian access through sidewalk removal / narrowing, placement of barriers along the walking path, increase in auto-oriented curb cuts, etc.
? Increased speed and/or ?cut-through? traffic.
? Removed or diminished safe bicycle access.
? Inclusion of some other barrier to access to jobs and other destinations.

Response:

The proposed project benefits the Citys low-income populations, BIPOC, children, people with disabilities, and the elderly. The project is in a census tract that is identified as a regional environmental justice area. The project will provide a vital north-south link to schools, as well as employment, health care, parks and recreation, Bethel University, and other key services for people living in the surrounding community.

The project will serve the following equity populations (see attached Equity and Affordable Housing map):

- Low-income residents: the project will provide a reliable route to parks, places of worship, and other key services for daily life.

- Seniors and residents with limited mobility: the proposed trail will provide a continuous, accessible facility that is comfortable to navigate with mobility devices, as well as improve connections to a new trail segment to the south of the proposed project. The Round Lake Senior Living facility is less than 1/2 mile from the proposed project, and the Applewood Pointe Senior Living facility is just over ½ mile from the proposed project. In addition, 13.8 percent of residents within the service area of the proposed project are over 65. The project will benefit these senior residents by decreasing their dependence on cars for transportation and providing opportunities for active living.

- People of color: 21.4 percent of the population within 1/2 mile of the proposed project identify as BIPOC per 2021 ACS data. When asked what key improvements they would like to see the response was extending the trail along Old Highway 10. The proposed project will provide free recreation and safe access to parks and green spaces, improving public health.

- Children: 20.6 percent of the population within 1/2 mile of the proposed project identifies as BIPOC per 2021 ACS data. The proposed trail is within the ?walk zone? for children attending the Valentine Hills Elementary School. This project will directly support the previous engagement completed by implementing the final engineering E identified in previous planning efforts. The proposed project improves safety for students living north of the elementary school.

The proposed project will not negatively impact the disadvantaged populations present in the project area by maintaining access, while minimizing noise, dust, and traffic. During construction, current users will be directed towards alternate routes with easy-to-follow detour signing. Road closure is not anticipated.

(Limit 2,800 characters; approximately 400 words):

Measure C: Affordable Housing Access

Describe any affordable housing developments?existing, under construction, or planned?within ½ mile of the proposed project. The applicant should note the number of existing subsidized units, which will be provided on the Socio-Economic Conditions map. Applicants can also describe other types of affordable housing (e.g., naturally-occurring affordable housing, manufactured housing) and under construction or planned affordable housing that is within a half mile of the project. If applicable, the applicant can provide self-generated PDF maps to support these additions. Applicants are encouraged to provide a self-generated PDF map describing how a project connects affordable housing residents to destinations (e.g., childcare, grocery stores, schools, places of worship).

Describe the project?s benefits to current and future affordable housing residents within ½ mile of the project. Benefits must relate to affordable housing residents. Examples may include:

- *? specific direct access improvements for residents*
- *? improved access to destinations such as jobs, school, health care or other;*
- *? new transportation services or modal options;*
- *? and/or community connection and cohesion improvements.*

This is not an exhaustive list. Since residents of affordable housing are more likely not to own a private vehicle, higher points will be provided to roadway projects that include other multimodal access improvements. A full response will support the benefits claimed, identify benefits specific to residents of affordable housing, identify benefits addressing a transportation issue affecting residents of affordable housing specifically identified through engagement, and substantiate benefits with data.

Response:

The Old Highway 10 Trail SRTS Improvements project will help cost-burdened households feel comfortable and safe traveling the Old Highway 10 corridor and beyond without a vehicle. It will connect with a trail segment on the west side of Old Highway 10 that extends south of Lake Valentine Road. The project is also located in a regional environmental justice area. Constructing a trail in the project area will fill a gap in the City?s pedestrian and multimodal system, and will provide another alternative for bicyclists and pedestrians to travel to and from work, school and shopping centers.

Within a half-mile of the project, there are a total of 34 publicly subsidized rental housing units in the census tracts within ½ of the project area. In addition, there is one affordable housing complex, Arden Manor Mobile Home Community, located within ½ mile of the project (see attached map).

While affordable housing residents are less likely to have access to a vehicle, the project neighborhood is classified as car-dependent, meaning most errands require a car. Walking and biking reduce a household?s transportation cost, freeing up budgets for other items. The proposed facility will provide pedestrian and bicycle access numerous services and other amenities.

The project will provide a key link between the existing schools, income-restricted and senior living communities, parks, and places of worship (see attached map).

Local, accessible connections between low-income residents and natural resources fosters health equity, supports community and family development, and promotes active living. By linking to local parks, trails, and community facilities, the project will fulfill those objectives (see attached map). The new trail on the west side of Old Highway 10 will directly benefit households without access to a personal vehicle, who will be able to safely visit natural resources outside of their neighborhoods.

(Limit 2,800 characters; approximately 400 words):

Measure D: BONUS POINTS

Project is located in an Area of Concentrated Poverty:	
Project?s census tracts are above the regional average for population in poverty or population of color (Regional Environmental Justice Area):	Yes
Project located in a census tract that is below the regional average for population in poverty or populations of color (Regional Environmental Justice Area):	
Upload the ?Socio-Economic Conditions? map used for this measure.	1702666980547_2_3_equity maps.pdf

Measure A: Gaps, Barriers, and Continuity/Connections

Response:

The project will create a link between two RBTN Tier 1 Alignments (Lake Valentine Road on the south, and County Road 96 W on the north). The proposed project will create a Critical Transportation Link by:

- Filling gaps in the City of Arden Hills pedestrian and bicycle infrastructure network

- Improving travel across a barrier (I-694)

- Connecting two schools and a university to the broader community

- Leveraging nearby multimodal investments

There is currently no trail or sidewalk on the west side of Old Highway 10, which has a posted speed limit of 45 MPH, but is frequently driven at higher speeds due to the straight alignment. Old Highway 10 is frequently utilized by walkers and bicyclists, including children and families accessing Lake Valentine Elementary School and Mounds View High School. A request for a separated trail was one of the most frequent comments raised during the public engagement process. There will be enhanced crossings at Lake Valentine Road and Valentine Avenue, which will benefit students who are accessing Lake Valentine Elementary School from the north.

Additionally, the project will fill a vital gap in the Citys trail network by connecting to an existing trail on the west side of Old Highway 10 that currently terminates at Lake Valentine Road, and to an existing trail along Highway 96 W (CSAH 96) providing uninterrupted access for pedestrians traveling north or south along Old Highway 10.

(Limit 2,800 characters; approximately 400 words)

Upload Map

1702666615723_5_MetCouncil_Trails.pdf

Please upload attachment in PDF form

Measure B: Deficiencies corrected or safety or security addressed

Response:

Along the Old Highway 10 corridor, the project area is the only segment that does not have a trail or sidewalk, forcing pedestrians and bicyclists to use the roadway shoulder to move through this area. This segment of roadway is frequently used by residents for walking and bicycling, for general exercise, but also for students going to school and college, and for residents going to work. In the last ten years there have been no reported crashes within the project area. The posted speed limit is 45 MPH, but drivers frequently travel at higher speeds, even though this is a two-lane roadway with narrow, two-foot shoulders. Despite the lack of reported crashes, the proposed trail will provide a safe facility for pedestrians and bicyclists to move north-south through the corridor, and to connect to existing trail facilities on both ends. Completing the trail in this gap will provide a safe transportation alternative for students walking or bicycling to school.

(Limit 2,800 characters; approximately 400 words)

Transit Projects Not Requiring Construction

If the applicant is completing a transit application that is operations only, check the box and do not complete the remainder of the form. These projects will receive full points for the Risk Assessment.

Park-and-Ride and other transit construction projects require completion of the Risk Assessment below.

Check Here if Your Transit Project Does Not Require Construction

Measure A: Risk Assessment - Construction Projects

1. Public Involvement (48 Percent of Points)

Projects that have been through a public process with residents and other interested public entities are more likely than others to be successful. The project applicant must indicate that events and/or targeted outreach (e.g., surveys and other web-based input) were held to help identify the transportation problem, how the potential solution was selected instead of other options, and the public involvement completed to date on the project. The focus of this section is on the opportunity for public input as opposed to the quality of input. NOTE: A written response is required and failure to respond will result in zero points.

Multiple types of targeted outreach efforts (such as meetings or online/mail outreach) specific to this project with the general public and partner agencies have been used to help identify the project need.

Yes

100%

At least one meeting specific to this project with the general public has been used to help identify the project need.

50%

At least online/mail outreach effort specific to this project with the general public has been used to help identify the project need.

50%

No meeting or outreach specific to this project was conducted, but the project was identified through meetings and/or outreach related to a larger planning effort.

25%

No outreach has led to the selection of this project.

0%

Describe the type(s) of outreach selected for this project (i.e., online or in-person meetings, surveys, demonstration projects), the method(s) used to announce outreach opportunities, and how many people participated. Include any public website links to outreach opportunities.

Response:

In 2023 the City of Arden Hills completed online engagement using an online project location map with a clearly defined project area, and purpose and need. Included with the map was an online survey using Survey Monkey. There was a total of 35 responses received with over 89 percent indicating the trail would be beneficial to themselves or someone they know.

The City also sent out targeted post cards to residents within ¼ mile of the project guiding them to the project?s online map and survey. Based on American Community Survey (ACS) data, 13.8 percent of the population is over age 65, 20.6 percent of the population is under age 18, and 21.4 percent of the population identify as BIPOC within ½ mile of the project. The project is also in a census tract that is identified as a regional environmental justice area.

The project will provide a vital north-south link to employment, schools, health care, places of worship, and critical services for people living in these adjacent areas. It will also increase access to free recreation and natural resources by linking with the broader park and trail network. Most notably the project will provide key linkages for students walking, rolling, or bicycling to Valentine Hills Elementary School or Mounds View High School, which have over 2,500 students enrolled between both schools of which over 40 percent identify as a BIPOC population.

The proposed design draws from engagement conducted during 2023 that included an open house event at Arden Hills City Hall where 28 residents attended and provided input and ideas on the project.

(Limit 2,800 characters; approximately 400 words)

2. Layout (16 Percent of Points)

Layout includes proposed geometrics and existing and proposed right-of-way boundaries. A basic layout should include a base map (north arrow; scale; legend; city and/or county limits; existing ROW, labeled; existing signals;* and bridge numbers*) and design data (proposed alignments; bike and/or roadway lane widths; shoulder width;* proposed signals;* and proposed ROW). An aerial photograph with a line showing the project?s termini does not suffice and will be awarded zero points. *If applicable*

Layout approved by the applicant and all impacted jurisdictions (i.e., cities/counties/MnDOT. If a MnDOT trunk highway is impacted, approval by MnDOT must have occurred to receive full points. A PDF of the layout must be attached along with letters from each jurisdiction to receive points.

100%

A layout does not apply (signal replacement/signal timing, stand-alone streetscaping, minor intersection improvements). Applicants that are not certain whether a layout is required should contact Colleen Brown at MnDOT Metro State Aid ? colleen.brown@state.mn.us.

100%

For projects where MnDOT trunk highways are impacted and a MnDOT Staff Approved layout is required. Layout approved by the applicant and all impacted local jurisdictions (i.e., cities/counties), and layout review and approval by MnDOT is pending. A PDF of the layout must be attached along with letters from each jurisdiction to receive points.	Yes
75%	
Layout completed but not approved by all jurisdictions. A PDF of the layout must be attached to receive points.	
50%	
Layout has been started but is not complete. A PDF of the layout must be attached to receive points.	
25%	
Layout has not been started	
0%	
Attach Layout	1702666833182_16750-Plans-Draft-231122.pdf
Please upload attachment in PDF form	
Additional Attachments	
Please upload attachment in PDF form	
3. Review of Section 106 Historic Resources (10 Percent of Points)	
No known historic properties eligible for or listed in the National Register of Historic Places are located in the project area, and project is not located on an identified historic bridge	Yes
100%	
There are historical/archeological properties present but determination of ?no historic properties affected? is anticipated.	
100%	
Historic/archeological property impacted; determination of ?no adverse effect? anticipated	
80%	
Historic/archeological property impacted; determination of ?adverse effect? anticipated	
40%	
Unsure if there are any historic/archaeological properties in the project area.	
0%	
Project is located on an identified historic bridge	
4. Right-of-Way (16 Percent of Points)	
Right-of-way, permanent or temporary easements, and MnDOT agreement/limited-use permit either not required or all have been acquired	
100%	
Right-of-way, permanent or temporary easements, and/or MnDOT agreement/limited-use permit required - plat, legal descriptions, or official map complete	
50%	
Right-of-way, permanent or temporary easements, and/or MnDOT agreement/limited-use permit required - parcels identified	Yes
25%	
Right-of-way, permanent or temporary easements, and/or MnDOT agreement/limited-use permit required - parcels not all identified	
0%	
5. Railroad Involvement (10 Percent of Points)	
No railroad involvement on project or railroad Right-of-Way agreement is executed (include signature page, if applicable)	Yes
100%	
Signature Page	
Please upload attachment in PDF form	
Railroad Right-of-Way Agreement required; negotiations have begun	
50%	
Railroad Right-of-Way Agreement required; negotiations have not begun.	
0%	

Measure A: Cost Effectiveness

Total Project Cost (entered in Project Cost Form):	$3,679,000.00
Enter Amount of the Noise Walls:	$0.00
Total Project Cost subtract the amount of the noise walls:	$3,679,000.00

Points Awarded in Previous Criteria

Cost Effectiveness	$0.00

Other Attachments

File Name	Description	File Size
12_Arden Hills Old Hwy 10 Project Sheet.pdf	Arden Hills Old Highway 10 Trail Project Summary Sheet	387 KB
13_Existing conditions photos.pdf	Existing Conditions Photos	6.8 MB
14_Arden Hills regional solicitation resolution.pdf	City of Arden Hills Regional Solicitation Resolution	1.1 MB
15_Mounds View Public Schools Letter of SupportAH_Trail_Old Hwy 10_signed.pdf	Mounds View Public Schools Letter of Support	491 KB
16_Ramsey County_Letter of Support_AH_Trail_Old Hwy 10_signed.pdf	Ramsey County letter of support	39 KB
1_Hwy10_AffordableHousing.pdf	Affordable Housing Map	582 KB
4_MetCouncil_PopEmployment.pdf	Population-Employment Summary Map	3.2 MB
6_MetCouncil_Transit.pdf	Transit Connections Map	2.3 MB

Safe Routes to School Students Arrival and Departure Tally Sheet

CAPITAL LETTERS ONLY – BLUE OR BLACK INK ONLY

School Name: MOUNDS VIEW

Teacher's First Name: STEVE

Teacher's Last Name: MORRISSETTE

Grade: (PK,K,1,2,3...) 02 (11+12)

Monday's Date (Week count was conducted) MM 12 DD 04 YYYY 2023

Number of Students Enrolled in Class: 15 (62)

- Please conduct these counts **on two of the following three days Tuesday, Wednesday, or Thursday. (Three days would provide better data if counted)**
- **Please do not conduct these counts on Mondays or Fridays.**
- Before asking your students to raise their hands, please read through all possible answer choices so they will know their choices. Each Student may only answer once.
- Ask your students as a group the question **"How did you arrive at school today?"**
- Then, reread each answer choice and record the number of students that raised their hands for each. **Place just one character or number in each box.**
- Follow the same procedure for the question **"How do you plan to leave for home after school?"**
- You can conduct the counts once per day but during the count please ask students both the school arrival and departure questions.
- Please conduct this count regardless of weather conditions (i.e., ask these questions on rainy days, too).

Step 1. Fill in the weather conditions and number of students in each class

Step 2.
AM – **"How did you arrive at school today?"** Record the number of hands for each answer.
PM – **"How do you plan to leave for home after school?"** Record the number of hands for each answer.

Key	Weather	Student Tally	Walk	Bike	School Bus	Family Vehicle	Carpool	Transit	Other
	S= sunny R= rainy O=overcast SN=snow	Number in class when count made	-	-	-	Only with Children from your family	Riding with children from other families	City bus, subway, etc.	Skate-board, scooter, etc.
Sample AM	S N	2 0	2	3	8	3		3	1
Sample PM	R	1 9	3	3	8	1	2	2	
Tues. AM	S N	5 1	0	0	1 2	3 1	8	0	0
Tues. PM	S N	5 1	0	0	1 3	3 0	8	0	0
Wed. AM	O	5 2	0	0	7	4 0	5	0	0
Wed. PM	O	5 2	0	0	6	3 6	1 0	0	0
Thurs. AM									
Thurs. PM									

Please list any disruptions to these counts or any unusual travel conditions to/from the school on the days of the tally.

Safe Routes to School Students Arrival and Departure Tally Sheet

CAPITAL LETTERS ONLY – BLUE OR BLACK INK ONLY

School Name: VALENTINE HILLS

Teacher's First Name: SANDRA

Teacher's Last Name: COHEN

Grade: (PK,K,1,2,3...) 05 (0 2)

Monday's Date (Week count was conducted) 12 (M M) 05 (D D) 2023 (Y Y Y Y)

Number of Students Enrolled in Class: 25 (1 5)

- Please conduct these counts **on two of the following three days Tuesday, Wednesday, or Thursday. (Three days would provide better data if counted)**
- **Please do not conduct these counts on Mondays or Fridays.**
- Before asking your students to raise their hands, please read through all possible answer choices so they will know their choices. Each Student may only answer once.
- Ask your students as a group the question **"How did you arrive at school today?"**
- Then, reread each answer choice and record the number of students that raised their hands for each. **Place just one character or number in each box.**
- Follow the same procedure for the question **"How do you plan to leave for home after school?"**
- You can conduct the counts once per day but during the count please ask students both the school arrival and departure questions.
- Please conduct this count regardless of weather conditions (i.e., ask these questions on rainy days, too).

Step 1. Fill in the weather conditions and number of students in each class

Step 2.
AM – "How did you arrive at school today?" Record the number of hands for each answer.
PM – "How do you plan to leave for home after school?" Record the number of hands for each answer.

Key	Weather	Student Tally	Walk	Bike	School Bus	Family Vehicle	Carpool	Transit	Other
	S= sunny R= rainy O=overcast SN=snow	Number in class when count made	-	-	-	Only with Children from your family	Riding with children from other families	City bus, subway, etc.	Skate-board, scooter, etc.
Sample AM	S N	2 0	2	3	8	3		3	1
Sample PM	R	1 9	3	3	8	1	2	2	
Tues. AM	0	22	01	0	14	05	02	00	00
Tues. PM	0	22	01	00	17	03	01	00	00
Wed. AM	0	22	01	00	14	06	01	00	00
Wed. PM	3	21	01	00	16	03	01	00	00
Thurs. AM	0	21	01	00	05	04	01	00	00
Thurs. PM	0	21	01	00	15	04	01	00	00

Please list any disruptions to these counts or any unusual travel conditions to/from the school on the days of the tally.

Tuesday some kids were driven to Highview and took the bus to Valentine Hills. Marked as bus.

Safe Routes to School Students Arrival and Departure Tally Sheet

CAPITAL LETTERS ONLY – BLUE OR BLACK INK ONLY

School Name: Valentine Hills

Teacher's First Name: Patrick

Teacher's Last Name: McCann

Grade: (PK,K,1,2,3...) 04 (0 2)

Monday's Date (Week count was conducted) 12 04 2023 (M M D D Y Y Y Y)

Number of Students Enrolled in Class: 23 (1 5)

- Please conduct these counts **on two of the following three days Tuesday, Wednesday, or Thursday. (Three days would provide better data if counted)**
- **Please do not conduct these counts on Mondays or Fridays.**
- Before asking your students to raise their hands, please read through all possible answer choices so they will know their choices. Each Student may only answer once.
- Ask your students as a group the question **"How did you arrive at school today?"**
- Then, reread each answer choice and record the number of students that raised their hands for each. **Place just one character or number in each box.**
- Follow the same procedure for the question **"How do you plan to leave for home after school?"**
- You can conduct the counts once per day but during the count please ask students both the school arrival and departure questions.
- Please conduct this count regardless of weather conditions (i.e., ask these questions on rainy days, too).

Step 1. Fill in the weather conditions and number of students in each class

Step 2. **AM** – **"How did you arrive at school today?"** Record the number of hands for each answer. **PM** – **"How do you plan to leave for home after school?"** Record the number of hands for each answer.

Key	Weather S= sunny R= rainy O=overcast SN=snow	Student Tally Number in class when count made	Walk -	Bike -	School Bus -	Family Vehicle Only with Children from your family	Carpool Riding with children from other families	Transit City bus, subway, etc.	Other Skate-board, scooter, etc.
Sample AM	S N	20	2	3	8	3		3	1
Sample PM	R	19	3	3	8	1	2	2	
Tues. AM	SN	23	0	0	13	9	1	0	0
Tues. PM	O	21	0	0	13	7	1	0	0
Wed. AM	O	21	0	0	8	12	1	0	0
Wed. PM	O	19	0	0	7	12	1	0	0
Thurs. AM	S	20	2	0	9	9	0	0	0
Thurs. PM	S	20	0	0	14	6	0	0	0

Please list any disruptions to these counts or any unusual travel conditions to/from the school on the days of the tally.

Old Hwy 10 SRTC Trail Improvements

Equity Populations and Destinations

- Regional Environmental Justice Area
- Area of Concentrated Poverty
- Affordable Housing
- Place of Worship
- Medical / Social Services
- Restaurant
- Retail / Grocery
- School / Daycare / Library
- Senior Housing
- Other
- Proposed Project
- 1/2 Mile Project Buffer

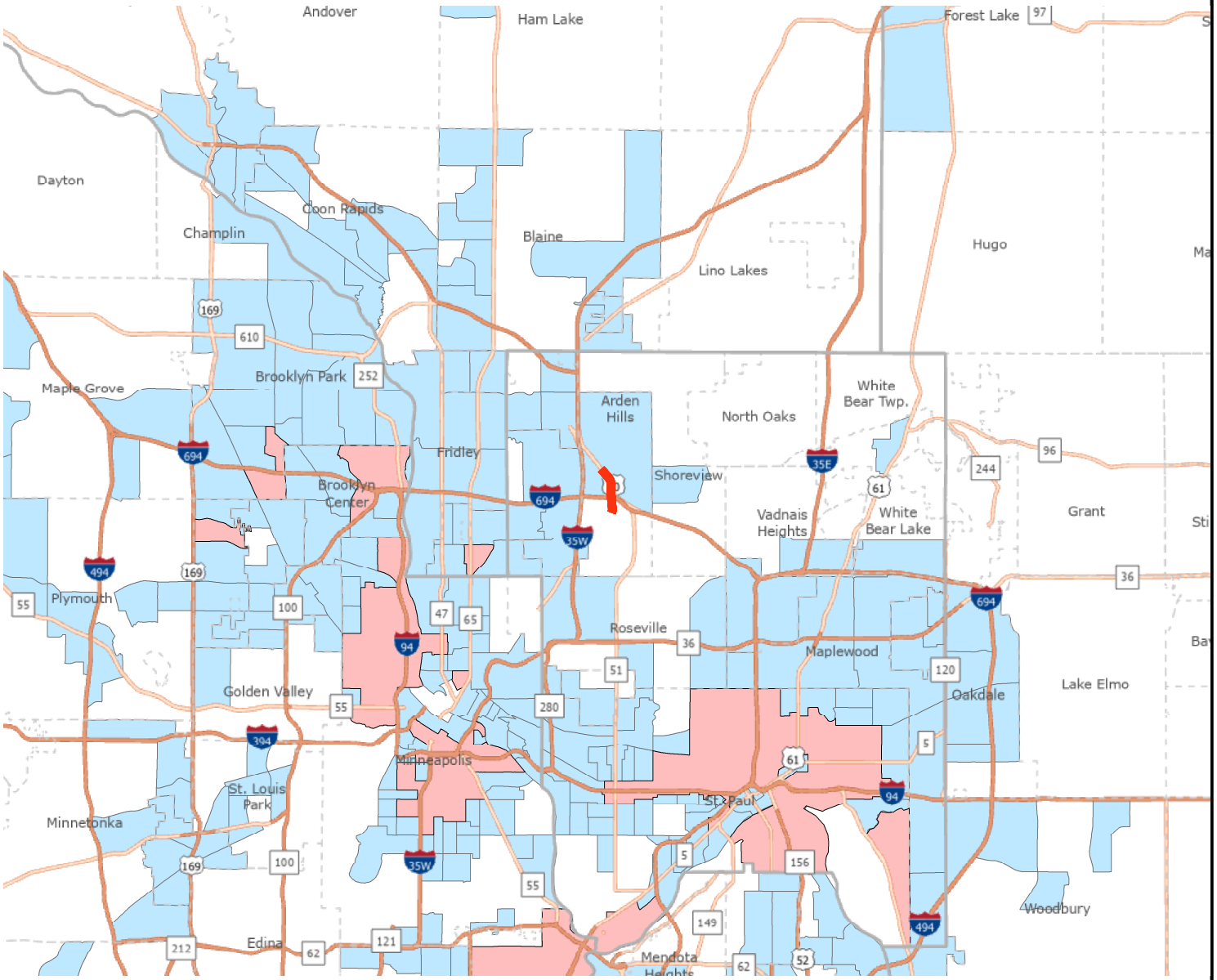
Socio-Economic Conditions

Multiuse Trails and Bicycle Facilities Project: Old Hwy 10 SRTS Trail Improvements | Map ID: 1702318882960

Results

Total of publicly subsidized rental housing units in census tracts within 1/2 mile: 34

Project located in census tract(s) that are ABOVE the regional average for population in poverty or population of color.



Lines

Regional Environmental Justice Area

Area of Concentrated Poverty

0 2.5 5 10 15 20 Miles

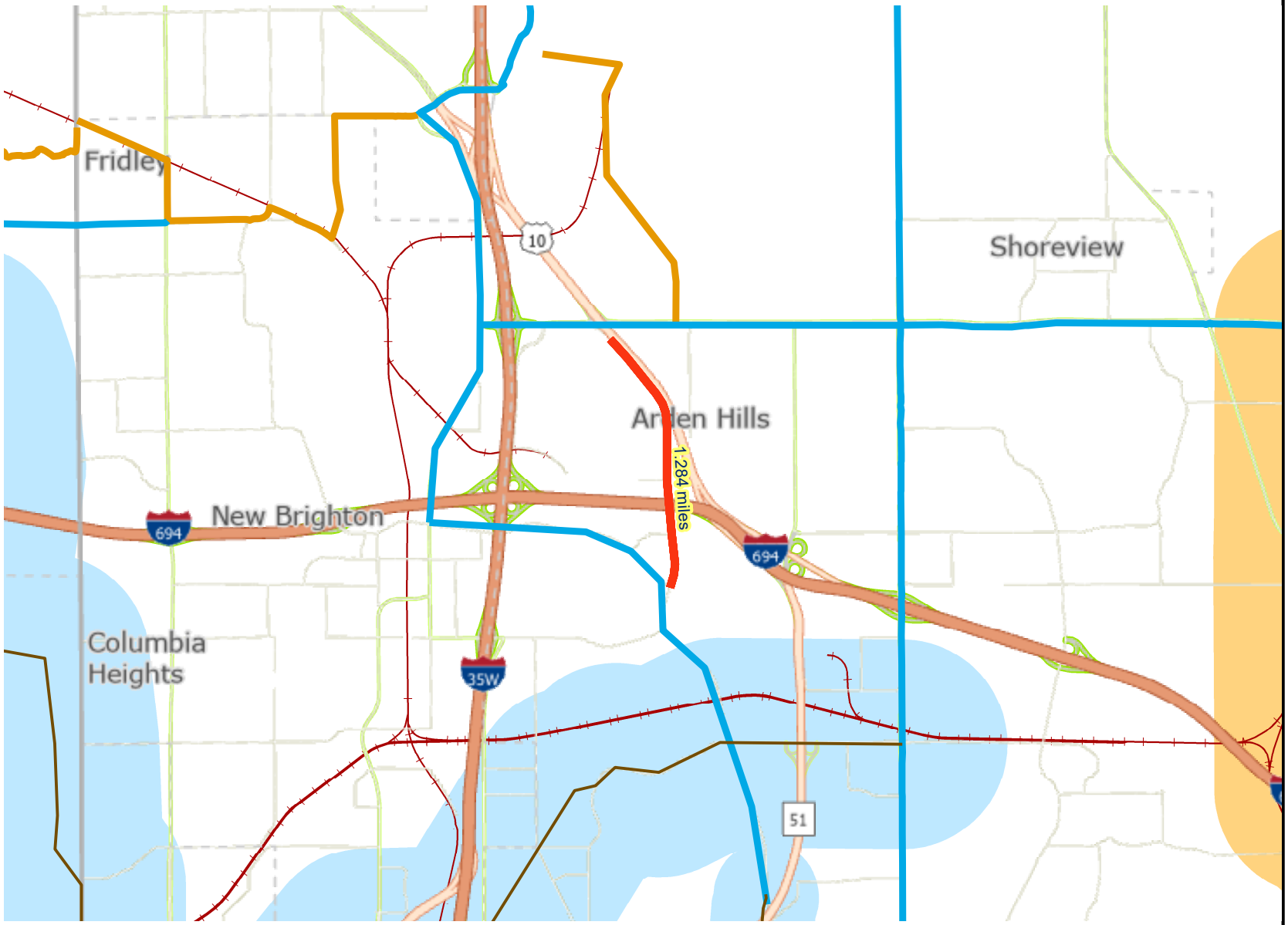
Created: 12/11/2023
LandscapeRSA2

For complete disclaimer of accuracy, please visit http://giswebsite.metc.state.mn.us/gissite/notice.aspx

METROPOLITAN COUNCIL

Project to RBTN Orientation

Multiuse Trails and Bicycle Facilities Project: Old Hwy 10 SRTS Trail Improvements | Map ID: 1702318882960



Project
RBTN Tier 2 Alignment
Railroads
RBTN Corridor Centerlines
Principal Arterials
RBTN Tier 1
RBTN Tier 1 Alignment
Minor Arterials
RBTN Tier 2

0 0.45 0.9 1.8 2.7 3.6 Miles

Created: 12/11/2023
LandscapeRSA6

METROPOLITAN COUNCIL

CITY OF ARDEN HILLS
RAMSEY, COUNTY, MINNESOTA

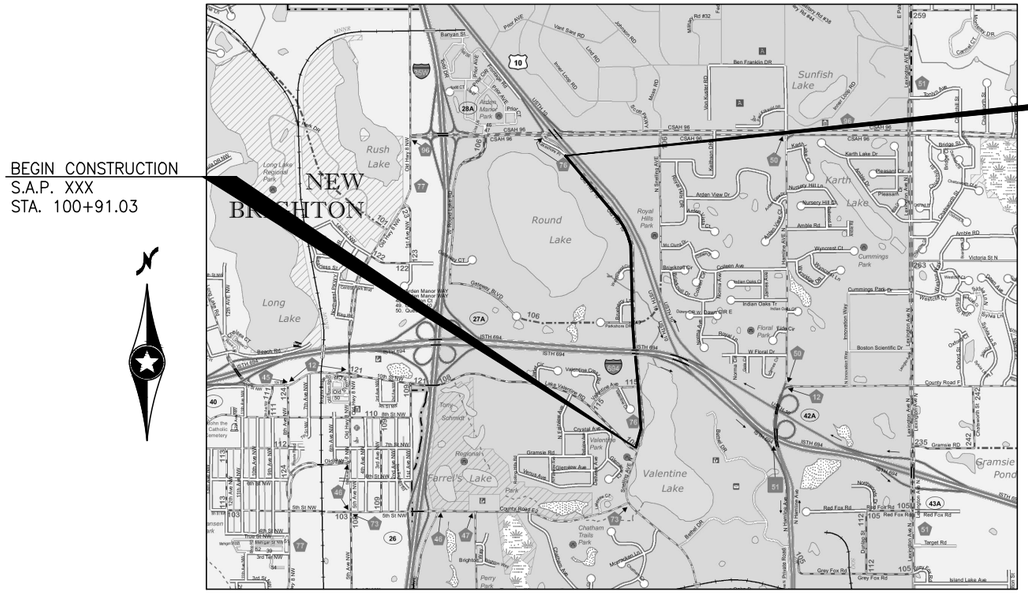
PLANS FOR: GRADING, BITUMINOUS SURFACING, CONCRETE SURFACING,
ADA IMPROVEMENTS, AND EROSION CONTROL

OLD HIGHWAY 10
TRAIL CONSTRUCTION

CITY/COUNTY PROJECT NO. XXXX/XXXX

LOCATED ON OLD HIGHWAY 10 FROM LAKE VALENTINE RD TO 660' SOUTH OF CSAH 96

SEC 28 – TOWN 30 – RANGE 23



PLAN SYMBOLS

EASEMENT LINE
PERMANENT EASEMENT
EXISITNG RIGHT–OF–WAY
PROPOSED RIGHT–OF–WAY
SECTION LINE
QUARTER LINE
SIXTEENTH LINE
CENTERLINE
RETAINING WALL
CULVERT
DRAIN TILE
GUARD RAIL
BARBED WIRE FENCE (BW)
WOVEN WIRE FENCE (XW)
CHAIN LINK FENCE (X)
MAIL BOX (MB)
WETLAND
EXISTING SIGN
TREES
BILLBOARD POLE
EXISTING WEIR (WEIR)
GUY POST (GPO)
HAND HOLE (HH)
SWITCH CROSSING
SPRINKLER HEAD
SPRINKLER VALVE (SP)
TRAFFIC CAMERA (PHOTO)

UTILITY SYMBOLS

POWER POLE LINE (E(OH))
TELEPHONE OR TELEGRAPH POLE LINE (OH–TEL)
ANCHOR
UTILITY POLE
STREET LIGHT
COMMUNICATION PEDESTAL (PED C)
DROP INLET
GAS MAIN (G)
WATER MAIN
OVERHEAD ELECTRIC CABLE (E(OH))
BURIED ELECTRIC CABLE (E(UG))
BURIED TELEPHONE CABLE (T–BUR)
OVERHEAD TELEPHONE CABLE (OH–TEL)
BURIED FIBER OPTICS (F/O(UG))
OVERHEAD FIBER OPTICS (OH–F/O)
SEWER, (SANITARY)
SEWER, (STORM)
SANITARY MANHOLE
STORM MANHOLE
CATCH BASIN
DROP INLET (DI)
APRON
CULVERT END
WATER STOP (W)
WATERMAIN VALVE
FIRE HYDRANT (HH)
HANDHOLE (G)
TELEPHONE MANHOLE (T)
ELECTRICAL MANHOLE (E)
GAS VALVE (G)
GAS MANHOLE (G)
GAS METER (G)
GAS PEDESTAL (G)
NATURAL GAS MARKER POST (G)
NATURAL GAS VENT (G)
COMMUNICATION VAULT (VLT C)
CLEANOUT (C.O.)
FIRE DEPARTMENT CONNECTION
POWER MANHOLE (P)
POWER HAND HOLE (E)
POWER MARKER POST (E)
POWER ELECTRIC PEDESTAL (E)
POWER VAULT (E)
TELECOMMUNICATIONS POST (T)
TELECOMMUNICATIONS MARKER POST (T)

STATE PROJ. NO. XXX

GROSS LENGTH	6711.39	FEET	1.271	MILES
BRIDGE LENGTH	499.91	FEET	0.095	MILES
EXCEPTIONS LENGTH	0	FEET	0	MILES
NET LENGTH	6711.39	FEET	1.271	MILES

DESIGN DESIGNATION FOR:

	OLD HWY 10	ROAD NAME	ROAD NAME
R–VALUE	XXXX	XXXX	XXXX
ADT (Current Year) XXXX =	XXXX	XXXX	XXXX
ADT (Future Year) XXXX =	XXXX	XXXX	XXXX
PAVEMENT DESIGN	XXXX	XXXX	XXXX
FUNCTIONAL CLASSIFICATION	XXXX	XXXX	XXXX
NO. OF TRAFFIC LANES	XXXX	XXXX	XXXX
NO. OF PARKING LANES	XXXX	XXXX	XXXX
ESALS (20)	XXXX	XXXX	XXXX
Design Speed	XXXX	XXXX	XXXX
Based on Sight Distance	XXXX	XXXX	XXXX
Height of eye / Height of Object	XXXX	XXXX	XXXX
Design Speed not achieved at:	XXXX	XXXX	XXXX

PLAN REVISIONS

DATE	SHEET NO.	APPROVED BY

SCALES

INDEX MAP		3,200'
GENERAL LAYOUT		500'
PLAN		100'
PROFILE	10' HORIZ.	4' VERT.
X–SECTION	40' HORIZ.	40' VERT.

PROJECT LOCATION
COUNTY : RAMSEY
DISTRICT : METRO

MINN. PROJ. NO.

GOVERNING SPECIFICATIONS

THE 2022 EDITION OF THE MINNESOTA DEPARTMENT OF TRANSPORTATION "STANDARD SPECIFICATIONS FOR CONSTRUCTION" SHALL GOVERN.

ALL TRAFFIC CONTROL DEVICES SHALL CONFORM AND BE PLACED IN ACCORDANCE WITH THE MOST RECENT EDITION OF "MINNESOTA MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES" (MN MUTCD) AND PART VI, "FIELD MANUAL FOR TEMPORARY TRAFFIC CONTROL ZONE LAYOUTS".

CITY OF ARDEN HILLS STANDARD SPECIFICATION FOR UTILITY AND STREET CONSTRUCTION DATED _____..

INDEX

THIS PLAN CONTAINS 110 SHEETS

SRF

I HEREBY CERTIFY THAT THIS PLAN 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.

SIGNATURE _____

DATE XXX LIC. NO. 58920 PRINT NAME MARTIN JOYCE

APPROVED _____ DATE
CITY ENGINEER, CITY OF XXXX

_____ DATE
DISTRICT STATE AID ENGINEER:
REVIEWED FOR COMPLIANCE WITH STATE AND/OR FEDERAL AID RULES/POLICY

_____ DATE
APPROVED FOR STATE AND/OR FEDERAL AID FUNDING: STATE AID ENGINEER

THE SUBSURFACE UTILITY INFORMATION IN THIS PLAN IS UTILITY QUALITY LEVEL D. THIS QUALITY LEVEL WAS DETERMINED ACCORDING TO GUIDELINES OF CI/ASCE 38–02. ENTITLED "STANDARD GUIDELINES FOR THE COLLECTION AND DEPICTION OF EXISTING SUBSURFACE UTILITY DATA".

HBarry
November 21, 2023 – 10:50:27AM
H:\Projects\16000\16750\TechData\CADDesign\LJ–PlanSheets\16750_TSH01.dwgTSH–01

NO	DATE	BY	CKD	APPR

H:\PROJECTS\16000\16750\TECHDATA\CADDESIGN\L3-PLANSHEETS\16750_GL01.DWG: GL01-01

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.

Print Name: MARTIN JOYCE

Date --/--/-- License # 58920

DRAWN BY HLB
DESIGNED BY MMJ
CHECKED BY MMJ
COMM. NO. 16750

SRF

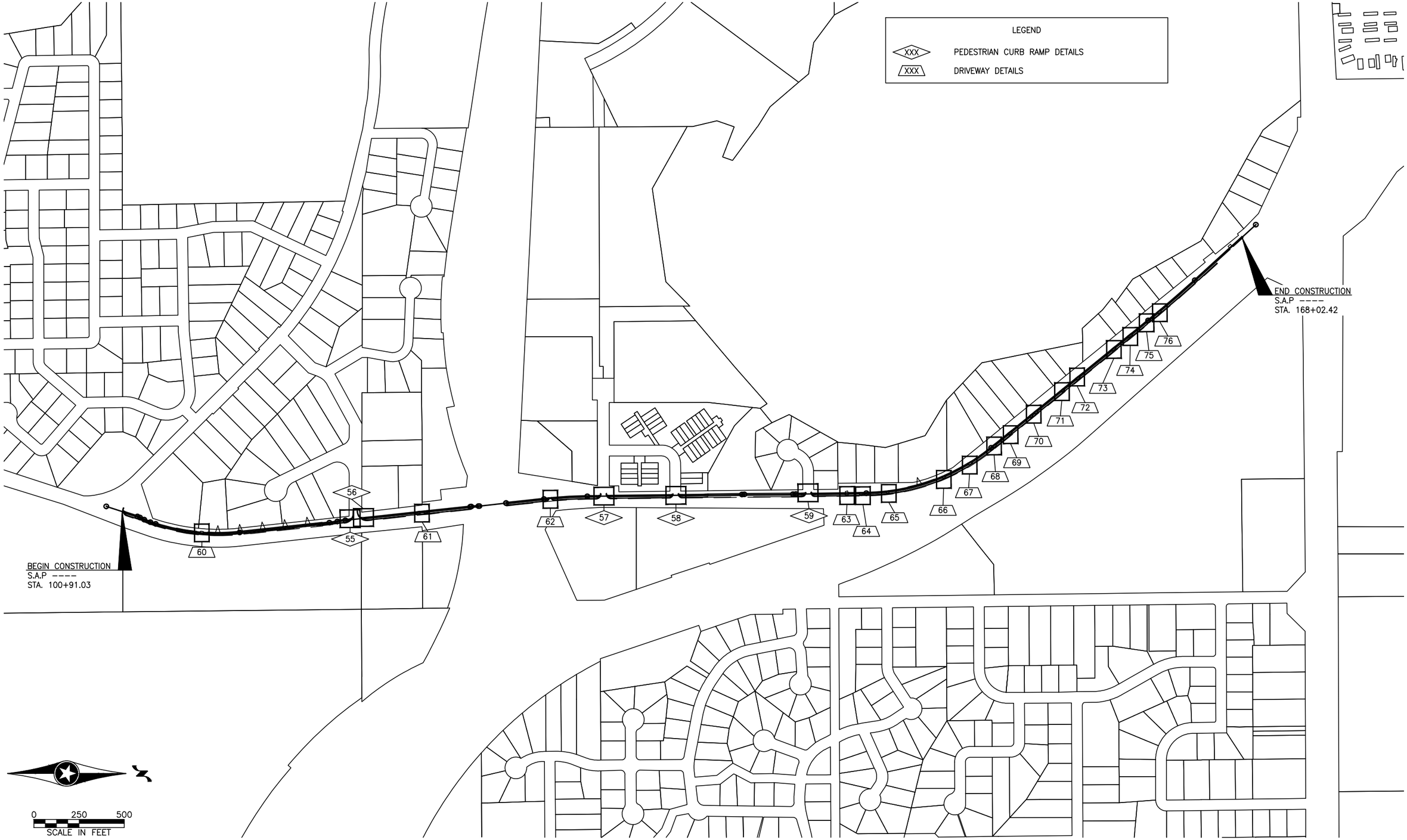
CITY OF ARDEN HILLS

GENERAL LAYOUT

OLD HIGHWAY 10 TRAIL

SHEET 2 OF 110

HAILEY BARRY | 11/7/2023 11:04:48 AM
24:15 (JMS_TECH) | C:\Users\HBarry\AppData\Roaming\Autodesk\C3D 2022\enu\
H:\Projects\16000\16750\TechData\CADDesign\L3-PlanSheets\16750_GL01.dwgGL01-01



NO	DATE	BY	CKD	APPR

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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.

Print Name: MARTIN JOYCE

Date --/--/-- License # 58920

DRAWN BY HLB
DESIGNED BY MMJ
CHECKED BY MMJ
COMM. NO. 16750

SRF

CITY OF ARDEN HILLS

GENERAL LAYOUT

OLD HIGHWAY 10 TRAIL

SHEET 3 OF 110

PLACEHOLDER

NO	DATE	BY	CKD	APPR

H:\PROJECTS\16000\16750\TECHDATA\CADDESIGN\L3-PLANSHEETS\16750_SEQ.DWG: SEQ-01

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.

Print Name: MARTIN JOYCE

Date --/--/-- License # 58920

DRAWN BY HLB

DESIGNED BY MMJ

CHECKED BY MMJ

COMM. NO. 16750

SRF

CITY OF ARDEN HILLS

STATEMENT OF ESTIMATED QUANTITIES

OLD HIGHWAY 10 TRAIL

SHEET 4 OF 110

CONSTRUCTION /SOILS NOTES

GRADING, BASE AND SURFACE

1. STRIP SOD AND TOPSOIL FROM AREAS TO BE DISTURBED BY CONSTRUCTION AND REUSE TOPSOIL. FOR ESTIMATING PURPOSES, THE DEPTH OF TOPSOIL AVAILABLE IS CONSIDERED TO BE ____".

2. COMPACTION OF THE GRADING AND AGGREGATE ITEMS ON BYPASSES AND OTHER TEMPORARY WORK SHALL BE BY THE "QUALITY COMPACTION" METHOD.

3. TEST ROLLING SHALL NOT BE REQUIRED ON THIS PROJECT. *(Test rolling with a TR10 was added to the 2016 spec, verify with client and geotech report whether or not test rolling is r*

4. WHERE CONNECTING TO THE INPLACE ROADWAYS AT THE TERMINI OF PROPOSED CONSTRUCTION, CUT VERTICALLY TO THE BOTTOM OF THE INPLACE SURFACING OR TO THE BOTTOM OF THE NEW SURFACING, WHICHEVER IS DEEPER, THEN 1V:20H TO THE BOTTOM OF THE RECOMMENDED SUBGRADE EXCAVATION, UNLESS OTHERWISE NOTED.

5. PROVIDE 1V:20H LONGITUDINAL TAPERS BETWEEN CHANGES IN SUBGRADE AND SUBCUT DEPTHS.

6. DITCH BOTTOMS, TOE OF FILL, CUT RUNOUTS AND THE TOP EDGE OF THE BACKSLOPES SHALL BE ROUNDED REGARDLESS OF THE SECTION USED ON THE CROSS SECTION SHEETS.

7. STABILIZING AGGREGATE SHALL BE INCORPORATED INTO THE SUBGRADE TO ACHIEVE SATISFACTORY SURFACE STABILITY AT LOCATIONS DEEMED NECESSARY BY THE ENGINEER, IN ACCORDANCE WITH THE PROVISIONS OF SPEC. *2105.2D or 2106.2D*. GRANULAR MATERIAL WHICH IS FURNISHED BY THE CONTRACTOR SHALL BE STABILIZED, IF NECESSARY, AT THE CONTRACTOR'S EXPENSE. WHERE STABILIZING AGGREGATE IS DEEMED NECESSARY, IT SHALL BE APPLIED AT A RATE OF APPROXIMATELY 200 LBS/SY.

REMOVALS

8. THE EXISTING PAVEMENT THICKNESSES ARE ASSUMED TO BE AS FOLLOWS:

   STREET - 10" BITUMINOUS PAVEMENT
   AVENUE - 2" BITUMINOUS PAVEMENT OVER 9" CONCRETE PAVEMENT (NON-REINFORCED)

   THE CONTRACTOR SHALL INVESTIGATE AND MAKE THEIR OWN DETERMINATION.

   (INFORMATION TAKEN FROM THE PROJECT SOIL BORINGS AND/OR RECORD DRAWINGS).

TURF ESTABLISHMENT

9. PLACE A MINIMUM OF ___ INCHES OF TOPSOIL ON ALL AREAS SCHEDULED FOR PERMANENT TURF ESTABLISHMENT.

10. PLACE A MINIMUM OF ___ INCHES OF MUCK REMOVAL MATERIAL ON ALL POND AREAS.

11. SOD ALL AREAS ADJACENT TO RESIDENCES OR BUSINESSES AND AREAS OF HEAVY DRAINAGE RUNOFF, AS INDICATED IN THE TURF ESTABLISHMENT AND EROSION CONTROL PLANS AND DETAILS.

12. SEEDING REQUIREMENTS ON THIS PROJECT ARE AS FOLLOWS:

    A. ON PERMANENT SLOPES FLATTER THAN 1:3 USE SEED MIXTURE XX-XXX @ XX.X POUNDS PER ACRE, FERTILIZER TYPE XX @ XXX POUNDS PER ACRE AND MULCH MATERIAL TYPE XX @ XXX TONS PER ACRE, WITH DISK ANCHOR. SEE EROSION CONTROL AND TURF ESTABLISHMENT PLANS FOR SEED TYPE LOCATIONS.

    OR

    A. ON PERMANENT SLOPES FLATTER THAN 1:3 USE SEED MIXTURE XX-XXX @ XX.X POUNDS PER ACRE, FERTILIZER TYPE XX @ XXX POUNDS PER ACRE AND HYDRAULIC *MULCH* MATRIX @ XXX POUNDS PER ACRE. SEE EROSION CONTROL AND TURF ESTABLISHMENT PLANS FOR SEED TYPE LOCATIONS.

    B. ON PERMANENT SLOPES 1:3 OR STEEPER USE SEED MIXTURE XX-XXX @ XX.X POUNDS PER ACRE, FERTILIZER TYPE XX @ XXX POUNDS PER ACRE AND EROSION CONTROL BLANKET CATEGORY XX. DO NOT DISK ANCHOR.

    C. ON DESIGNATED AREAS IN AND AROUND PONDS, USE SEED MIXTURE XX-XXX @ XX.X POUNDS PER ACRE, FERTILIZER TYPE XX @ XXX POUNDS PER ACRE AND MULCH MATERIAL TYPE XX @ XXX TONS PER ACRE WITH DISK ANCHOR.

    D. PROVIDE FERTILIZER TYPE XX, ANALYSIS XX-X-XX, SLOW RELEASE TYPE, OR EQUIVALENT ON ALL AREAS TO BE SEEDED OR SODDED, UNLESS OTHERWISE NOTED.

MISCELLANEOUS

13. WHERE SEDIMENT DEPOSITS IN WATERS OF THE STATE THE MATERIAL MUST BE REMOVED IN 7 DAYS. *(Can be deleted if project includes an NPDES Permit and/or SWPPP)*

PLACEHOLDER

NO	DATE	BY	CKD	APPR

H:\PROJECTS\16000\16750\TECHDATA\CADDESIGN\L3-PLANSHEETS\16750_CNS01.DWG: CNS01-01

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.
Print Name: MARTIN JOYCE
Date --/--/-- License # 58920

DRAWN BY HLB
DESIGNED BY MMJ
CHECKED BY MMJ
COMM. NO. 16750

SRF

CITY OF ARDEN HILLS
CONSTRUCTION & SOILS NOTES
OLD HIGHWAY 10 TRAIL

SHEET 5 OF 110

PLACEHOLDER

NO	DATE	BY	CKD	APPR

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SRF

CITY OF ARDEN HILLS

INDEX OF TABULATIONS & STANDARD PLATES

OLD HIGHWAY 10 TRAIL

SHEET 6 OF 110

PLACEHOLDER

NO	DATE	BY	CKD	APPR

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CITY OF ARDEN HILLS

EARTHWORK SUMMARY & TABULATIONS

OLD HIGHWAY 10 TRAIL

SHEET 7 OF 110

PLACEHOLDER

NO	DATE	BY	CKD	APPR

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Date --/--/-- License # 58920

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DESIGNED BY MMJ

CHECKED BY MMJ

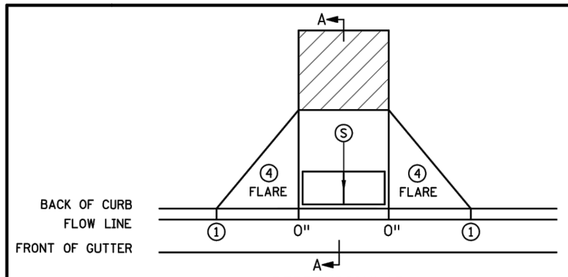
COMM. NO. 16750

CITY OF ARDEN HILLS

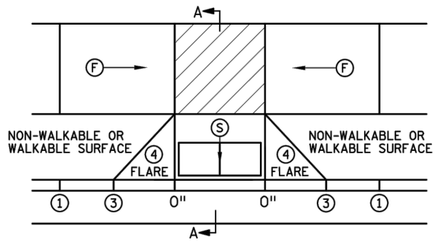
PLAN TABULATIONS

OLD HIGHWAY 10 TRAIL

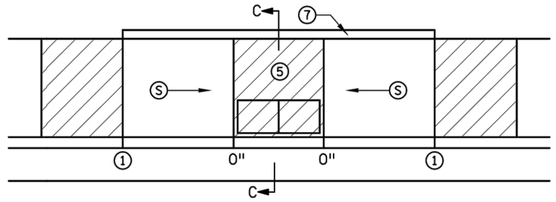
SHEET 8 OF 110



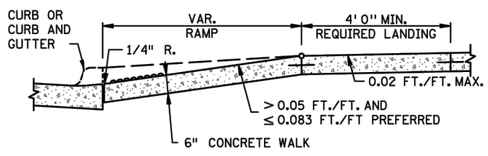
PERPENDICULAR



TIERED PERPENDICULAR

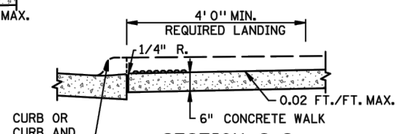


PARALLEL



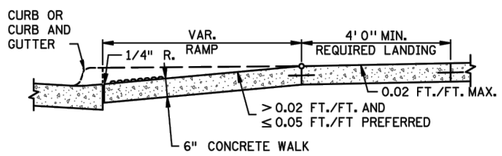
SECTION A-A

PERPENDICULAR/TIERED/DIAGONAL



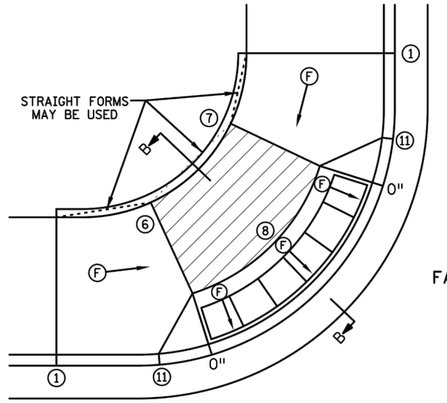
SECTION C-C

PARALLEL/DEPRESSED CORNER

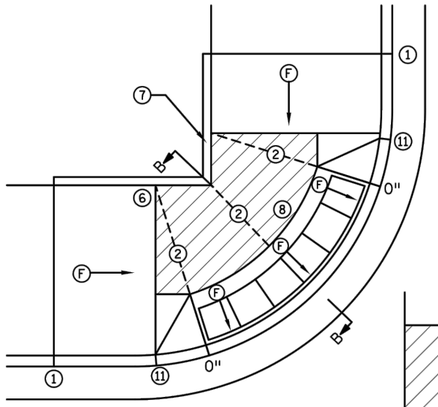


SECTION B-B

FAN

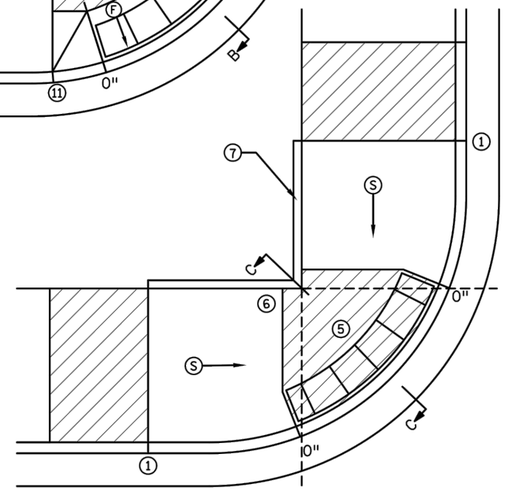


FAN⑩

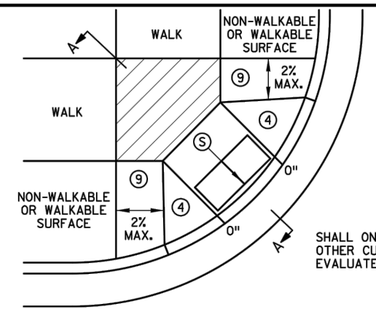


MODIFIED FAN ⑩

USED WHEN RIGHT-OF-WAY IS CONSTRAINED



DEPRESSED CORNER



DIAGONAL

SHALL ONLY BE USED AFTER ALL OTHER CURB RAMP TYPES HAVE BEEN EVALUATED AND DEEMED IMPRACTICAL

NOTES:

LANDINGS SHALL BE LOCATED ANYWHERE THE PEDESTRIAN ACCESS ROUTE (PAR) CHANGES DIRECTION, AT THE TOP OF RAMPS THAT HAVE RUNNING SLOPES GREATER THAN 5.0%, AND IF THE APPROACHING WALK IS INVERSE GRADE GREATER THAN 2%.

INITIAL CURB RAMP LANDINGS SHALL BE CONSTRUCTED WITHIN 15' FROM THE BACK OF CURB, WITH 6' FROM THE BACK OF CURB BEING THE PREFERRED DISTANCE, ONLY APPLICABLE WHEN THE INITIAL RAMP RUNNING SLOPE IS OVER 5.0%.

SECONDARY CURB RAMP LANDINGS ARE REQUIRED FOR EVERY 30" OF VERTICAL RISE WHEN THE LONGITUDINAL RUNNING SLOPE IS GREATER THAN 5.0%.

CONTRACTION JOINTS SHALL BE CONSTRUCTED ALONG ALL GRADE BREAKS WITHIN THE PAR. 1/4" DEEP VISUAL JOINTS SHALL BE USED AT THE TOPS OF CONCRETE FLARES ADJACENT TO WALKABLE SURFACES.

ALL GRADE BREAKS WITHIN THE PAR SHALL BE PERPENDICULAR TO THE PATH OF TRAVEL, THUS BOTH SIDES OF A SLOPED WALKING SURFACE MUST BE EQUAL LENGTH. (EXCEPT AS STATED IN ⑥ BELOW.

TO ENSURE RAMPS AND LANDINGS ARE PROPERLY CONSTRUCTED, ALL INITIAL LANDINGS AT A TOP OF A RAMPED SURFACE (RUNNING SLOPE GREATER THAN 2%) SHALL BE FORMED AND PLACED SEPARATELY IN AN INDEPENDENT CONCRETE POUR. FOLLOW SIDEWALK REINFORCEMENT DETAILS ON SHEET 6 OF 6 FOR ALL SEPARATELY POURED INITIAL LANDINGS.

WHEN SIDEWALK IS AT BACK OF CURB, TOP OF CURB SHALL MATCH PROPOSED ADJACENT WALK GRADE.

MAINTAIN POSITIVE BOULEVARD DRAINAGE TO TOP OF CURB.

ALL RAMP TYPES SHOULD HAVE A MINIMUM 3' LONG RAMP LENGTH.

4' MINIMUM WIDTH OF DETECTABLE WARNING IS REQUIRED FOR ALL RAMPS. DETECTABLE WARNINGS SHALL CONTINUOUSLY EXTEND FOR A MIN. OF 24" IN THE PATH OF TRAVEL. DETECTABLE WARNING TO COVER THE ENTIRE PAR WIDTH OF SHARED-USE PATHS AND THE ENTIRE PAR WIDTH OF THE WALK WITH THE EXCEPTION OF 3" MAXIMUM ON EACH OUTSIDE EDGE WHICH ENSURES THE DETECTABLE WARNINGS ARE ENCASED IN CONCRETE WHEN ADJACENT TO TURF. WHEN ADJACENT TO CONCRETE FLARES 0" - 3" OFFSET IS ALLOWED.

WHEN DESIGNING OR ORDERING RECTANGULAR DETECTABLE WARNING SURFACES SHOULD BE 6" LESS THAN THE INCOMING PAR. ARC LENGTH OF THE RADIAL DETECTABLE WARNINGS SHOULD NOT BE GREATER THAN 20 FEET.

RECTANGULAR DETECTABLE WARNINGS SHALL BE SETBACK 3" FROM THE BACK OF CURB. RADIAL DETECTABLE WARNINGS SHALL BE SETBACK 3" MINIMUM TO 6" MAXIMUM FROM THE BACK OF CURB.

① MATCH FULL HEIGHT CURB.

② 4' MINIMUM DEPTH LANDING REQUIRED ACROSS TOP OF RAMP.

③ 3" HIGH CURB WHEN USING A 3' LONG RAMP, 4" HIGH CURB WHEN USING A 4' LONG RAMP.

④ SEE SHEET 4 OF 6, TYPICAL SIDE TREATMENT OPTIONS, FOR DETAILS ON FLARES AND RETURNED CURBS.

⑤ DETECTABLE WARNINGS MAY BE PART OF THE 4' X 4' MIN. LANDING AREA IF IT IS NOT FEASIBLE TO CONSTRUCT THE LANDING OUTSIDE OF THE DETECTABLE WARNING AREA.

⑥ THE GRADE BREAK SHALL BE PERPENDICULAR TO THE BACK OF WALK. THIS WILL ENSURE THAT THE GRADE BREAK IS PERPENDICULAR TO THE DIRECTION OF TRAVEL. (TYPICAL FOR ALL)

⑦ WHEN ADJACENT TO GRASS, GRADING SHALL ALWAYS BE USED WHEN FEASIBLE. V CURB, IF USED, SHALL BE PLACED OUTSIDE THE SIDEWALK LIMITS WHEN RIGHT OF WAY ALLOWS. WHEN ADJACENT TO PARKING LOTS, CONCRETE OR BITUMINOUS TAPERS LESS THAN 5% RUNNING SLOPE SHOULD BE USED OVER V CURB TO REDUCE TRIPPING HAZARDS AND FACILITATE SNOW & ICE REMOVAL.

⑧ A 7' MIN TOP RADIUS GRADE BREAK IS REQUIRED TO BE CONSTRUCTIBLE.

⑨ PAVE FULL WALK WIDTH.

⑩ "S" SLOPES ON FANS SHALL ONLY BE USED WHEN ALL OTHER FEASIBLE OPTIONS HAVE BEEN EVALUATED AND DEEMED IMPRACTICAL.

⑪ INTERMEDIATE CURB HEIGHTS TAPER SHALL RISE AT 8-10% TO A MINIMUM 3" CURB HEIGHT. REDUCE INTERMEDIATE CURB HEIGHT TO 2+ INCHES IF NECESSARY TO MATCH ADJACENT BOULEVARD OR SIDEWALK GRADES.

LEGEND

THESE LONGITUDINAL SLOPE RANGES SHALL BE THE STARTING POINT. IF SITE CONDITIONS WARRANT, LONGITUDINAL SLOPES UP TO 8.3% OR FLATTER ARE ALLOWED.

Ⓢ INDICATES PEDESTRIAN RAMP - SLOPE SHALL BE BETWEEN 5.0% MINIMUM AND 8.3% MAXIMUM IN THE DIRECTION SHOWN AND THE CROSS SLOPE SHALL NOT EXCEED 2.0%.

Ⓕ INDICATES PEDESTRIAN RAMP - SLOPE SHALL BE GREATER THAN 2.0% AND LESS THAN 5.0% IN THE DIRECTION SHOWN AND CROSS SLOPE SHALL NOT EXCEED 2.0%.

LANDING AREA - 4' X 4' MIN. (5' X 5' MIN. PREFERRED) DIMENSIONS AND MAX 2.0% SLOPE IN ALL DIRECTIONS. LANDING SHALL BE FULL WIDTH OF INCOMING PARS.

X" CURB HEIGHT

REVISION:

APPROVED: 11-04-2021

JEFFREY PERKINS
OPERATIONS DIVISION

MINNESOTA DEPARTMENT OF TRANSPORTATION

STANDARD PLAN 5-297.250 | 1 OF 6

APPROVED: 11-04-2021
REVISED:

THOMAS STYRBICKI
STATE DESIGN ENGINEER

PEDESTRIAN CURB RAMP DETAILS

STATE PROJ. NO. (TH) SHEET NO. OF SHEETS

NO	DATE	BY	CKD	APPR

H:\PROJECTS\16000\16750\TECHDATA\CADDESIGN\L3-PLANSHEETS\16750_SPN01.DWG: SPN01-01

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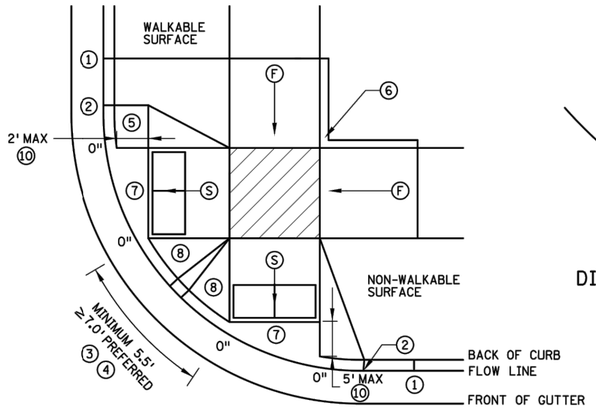
SRF

CITY OF ARDEN HILLS

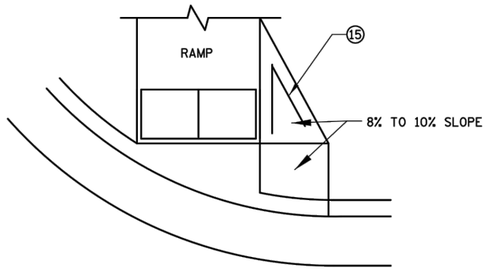
MNDOT STANDARD PLANS

OLD HIGHWAY 10 TRAIL

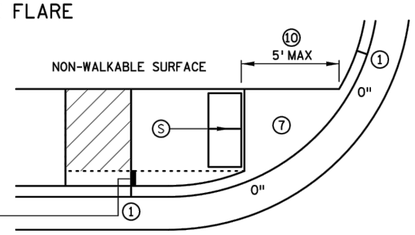
SHEET 9 OF 110



COMBINED DIRECTIONAL

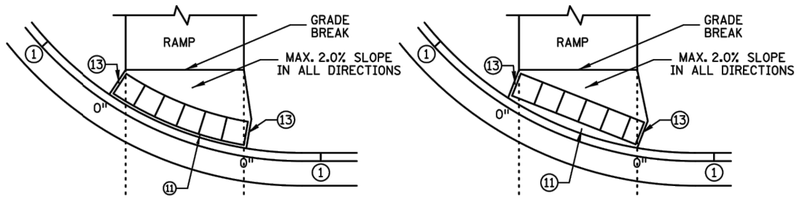


DIRECTIONAL RAMP WALKABLE FLARE



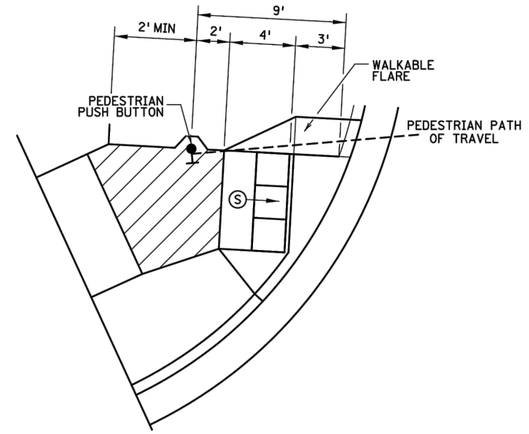
IF NON-CONCRETE BLVD. IS CONSTRUCTED AND IS LESS THAN 2' IN WIDTH AT TOP OF CURB TRANSITION, PAVE CONCRETE RAMP WIDTH TO ADJACENT BACK OF CURB.

STANDARD ONE-WAY DIRECTIONAL ⑨



DETECTABLE WARNING PLACEMENT WHEN SETBACK CRITERIA IS EXCEEDED ⑫

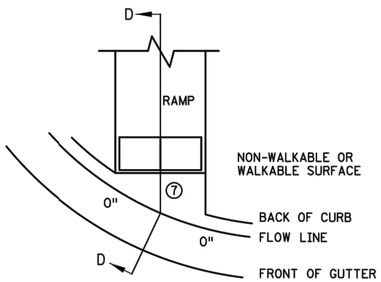
ONE-WAY DIRECTIONAL WITH DETECTABLE WARNING AT BACK OF CURB

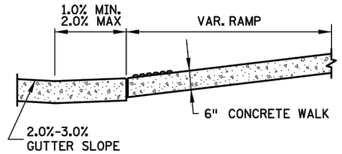


SEMI-DIRECTIONAL RAMP ③④⑨

3' DOME SETBACK, 4' LONG RAMP AND PUSH BUTTON 9' FROM THE BACK OF CURB

PRIMARILY USED FOR APS APPLICATIONS WHERE THE PAR DOES NOT CONTINUE PAST THE PUSH BUTTON (DEAD-END SIDEWALK)





SECTION D-D

CURB FOR DIRECTIONAL RAMPS ⑭

NOTES:

LANDINGS SHALL BE LOCATED ANYWHERE THE PEDESTRIAN ACCESS ROUTE (PAR) CHANGES DIRECTION, AT THE TOP OF RAMPS THAT HAVE RUNNING SLOPES GREATER THAN 5.0%, AND IF THE APPROACHING WALK IS INVERSE GRADE.

INITIAL CURB RAMP LANDINGS SHALL BE CONSTRUCTED WITHIN 15' FROM THE BACK OF CURB, WITH 6' FROM THE BACK OF CURB BEING THE PREFERRED DISTANCE, ONLY APPLICABLE WHEN THE INITIAL RAMP RUNNING SLOPE IS OVER 5.0%.

SECONDARY CURB RAMP LANDINGS ARE REQUIRED FOR EVERY 30" OF VERTICAL RISE WHEN THE LONGITUDINAL SLOPE IS GREATER THAN 5.0%.

CONTRACTION JOINTS SHALL BE CONSTRUCTED ALONG ALL GRADE BREAKS WITHIN THE PAR. 1/4" DEEP VISUAL JOINTS SHALL BE USED AT THE TOP GRADE BREAK OF CONCRETE FLARES ADJACENT TO WALKABLE SURFACES.

ALL GRADE BREAKS WITHIN THE PAR SHALL BE PERPENDICULAR TO THE PATH OF TRAVEL. THUS BOTH SIDES OF A SLOPED WALKING SURFACE MUST BE EQUAL LENGTH.

TO ENSURE INITIAL RAMPS AND INITIAL LANDINGS ARE PROPERLY CONSTRUCTED, LANDINGS SHALL BE CAST SEPARATELY. FOLLOW SIDEWALK REINFORCEMENT DETAILS ON SHEET 6 AND THE ADA SPECIAL PROVISION (PROSECUTION OF WORK).

TOP OF CURB SHALL MATCH PROPOSED ADJACENT WALK GRADE.

WHEN THE BOULEVARD IS 4' WIDE OR LESS, THE TOP OF CURB TAPER SHALL MATCH THE RAMP SLOPES TO REDUCE NEGATIVE BOULEVARD SLOPES FROM THE TOP BACK OF CURB TO THE PAR.

ALL RAMP TYPES SHOULD HAVE A MINIMUM 3' LONG RAMP LENGTH.

4' MINIMUM WIDTH OF DETECTABLE WARNING IS REQUIRED FOR ALL RAMPS. DETECTABLE WARNINGS SHALL CONTINUOUSLY EXTEND FOR A MIN. OF 24" IN THE PATH OF TRAVEL. DETECTABLE WARNING TO COVER THE ENTIRE PAR WIDTH OF SHARED-USE PATHS AND THE ENTIRE PAR WIDTH OF THE WALK WITH THE EXCEPTION OF 3" MAXIMUM ON EACH OUTSIDE EDGE WHICH ENSURES THE DETECTABLE WARNINGS ARE ENCASED IN CONCRETE WHEN ADJACENT TO TURF. WHEN ADJACENT TO CONCRETE FLARES 0" - 3" OFFSET IS ALLOWED.

WHEN DESIGNING OR ORDERING RECTANGULAR DETECTABLE WARNING SURFACES SHOULD BE 6" LESS THAN THE INCOMING PAR. ARC LENGTH OF THE RADIAL DETECTABLE WARNINGS SHOULD NOT BE GREATER THAN 20 FEET.

RADIAL DETECTABLE WARNINGS SHALL BE SETBACK 3" MINIMUM TO 6" MAXIMUM FROM THE BACK OF CURB. SEE NOTES ⑩ & ⑪ FOR INFORMATION REGARDING RECTANGULAR DETECTABLE WARNING PLACEMENT.

① MATCH FULL CURB HEIGHT.

② 3" HIGH CURB WHEN USING A 3' LONG RAMP
4" HIGH CURB WHEN USING A 4' LONG RAMP.

③ 3" MINIMUM CURB HEIGHT (5.5' MIN. DISTANCE REQUIRED BETWEEN DOMES)
4" PREFERRED (7' MIN. DISTANCE REQUIRED BETWEEN DOMES).

④ THE "BUMP" IN BETWEEN THE RAMPS SHOULD NOT BE IN THE PATH OF TRAVEL FOR COMBINED DIRECTIONAL RAMPS. IF THIS OCCURS MODIFY THE RAMP LOCATION OR SWITCH RAMP TO A FAN/DEPRESSED CORNER.

⑤ WHEN USING CONCRETE PAVED FLARES ON THE OUTSIDE OF DIRECTIONAL RAMPS, AND ADJACENT TO A WALKABLE SURFACE, DIRECTIONAL RAMP FLARES SHALL BE USED. SEE THE DETAIL ON THIS SHEET.

⑥ GRADING SHALL ALWAYS BE USED WHEN FEASIBLE. V CURB, IF USED, SHALL BE PLACED OUTSIDE THE SIDEWALK LIMITS WHEN RIGHT OF WAY ALLOWS. WHEN ADJACENT TO PARKING LOTS, CONCRETE OR BITUMINOUS TAPERS SHOULD BE USED OVER V CURB TO REDUCE TRIPPING HAZARDS AND FACILITATE SNOW & ICE REMOVAL.

⑦ MAX. 2.0% SLOPE IN ALL DIRECTIONS IN FRONT OF GRADE BREAK AND DRAIN TO FLOW LINE. SHALL BE CONSTRUCTED INTEGRAL WITH CURB AND GUTTER.

⑧ 8% TO 10% WALKABLE FLARE.

⑨ PLACE DOMES AT THE BACK OF CURB WHEN ALLOWABLE SETBACK CRITERIA IS EXCEEDED.

⑩ FRONT EDGE OF DETECTABLE WARNING SHALL BE SET BACK 2' MAXIMUM WHEN ADJACENT TO WALKABLE SURFACE, AND 5' MAXIMUM WHEN ADJACENT TO NON-WALKABLE SURFACE WITH ONE CORNER SET 3" FROM BACK OF CURB. A WALKABLE SURFACE IS DEFINED AS A PAVED SURFACE ADJACENT TO A CURB RAMP WITHOUT RAISED OBSTACLES THAT COULD MISTAKENLY BE TRAVERSED BY A USER WHO IS VISUALLY IMPAIRED.

⑪ RECTANGULAR DETECTABLE WARNINGS MAY BE SETBACK UP TO 9" FROM THE BACK OF CURB WITH CORNERS SET 3" FROM BACK OF CURB. IF 9" SETBACK IS EXCEEDED USE RADIAL DETECTABLE WARNINGS.

⑫ FOR DIRECTIONAL RAMPS WITH THE DETECTABLE WARNINGS PLACED AT THE BACK OF CURB, THE DETECTABLE WARNINGS SHALL COVER THE ENTIRE WIDTH OF THE WALK/PATH. THIS ENSURES A DETECTABLE EDGE AND HELPS ELIMINATE THE CURB TAPER OBSTRUCTING THE PATH OF PEDESTRIAN TRAVEL.

⑬ THE CONCRETE WALK SHALL BE FORMED AND CONSTRUCTED PERPENDICULAR TO THE BACK OF CURB. MAINTAIN 3" BETWEEN EDGE OF DOMES AND EDGE OF CONCRETE.

⑭ TO BE USED FOR ALL DIRECTIONAL RAMPS, EXCEPT WHERE DOMES ARE PLACED ALONG THE BACK OF CURB.

⑮ PLACE 2 NO. 4 BARS 4 INCHES FROM SIDE OF FORMS WITH A MINIMUM 2 INCHES OF CONCRETE COVER ALONG EACH SIDE OF FLARE (INCIDENTAL).

LEGEND

THESE LONGITUDINAL SLOPE RANGES SHALL BE THE STARTING POINT. IF SITE CONDITIONS WARRANT, LONGITUDINAL SLOPES UP TO 8.3% OR FLATTER ARE ALLOWED.

(S) INDICATES PEDESTRIAN RAMP - SLOPE SHALL BE BETWEEN 5.0% MINIMUM AND 8.3% MAXIMUM IN THE DIRECTION SHOWN AND THE CROSS SLOPE SHALL NOT EXCEED 2.0%.

(F) INDICATES PEDESTRIAN RAMP - SLOPE SHALL BE GREATER THAN 2.0% AND LESS THAN 5.0% IN THE DIRECTION SHOWN AND CROSS SLOPE SHALL NOT EXCEED 2.0%.

LANDING AREA - 4' X 4' MIN. (5' X 5' MIN. PREFERRED) DIMENSIONS AND MAX 2.0% SLOPE IN ALL DIRECTIONS. LANDING SHALL BE FULL WIDTH OF INCOMING PARS.

X" CURB HEIGHT

REVISION:
APPROVED: 11-04-2021

JEFFREY PERKINS
OPERATIONS DIVISION

MINNESOTA DEPARTMENT OF TRANSPORTATION

THOMAS STYBICKI
STATE DESIGN ENGINEER

STANDARD PLAN 5-297.250	2 OF 6
APPROVED: 11-04-2021	
REVISED:	
STATE PROJ. NO.	(T.H.) SHEET NO. OF SHEETS

PEDESTRIAN CURB RAMP DETAILS

NO	DATE	BY	CKD	APPR

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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.
Print Name: MARTIN JOYCE
Date --/--/-- License # 58920

DRAWN BY HLB
DESIGNED BY MMJ
CHECKED BY MMJ
COMM. NO. 16750

SRF

CITY OF ARDEN HILLS
MNDOT STANDARD PLANS
OLD HIGHWAY 10 TRAIL

SHEET 10 OF 110

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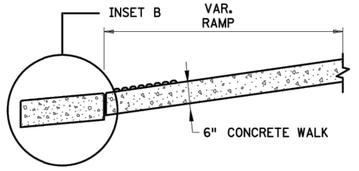
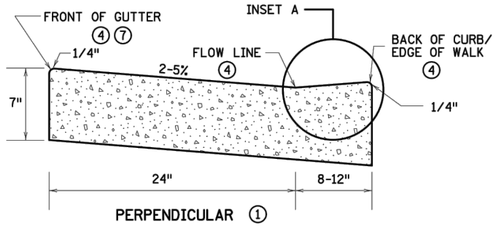
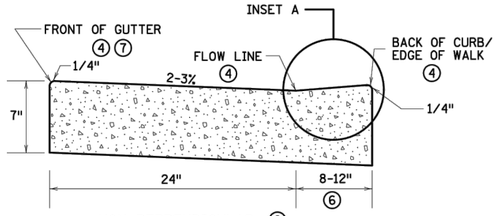
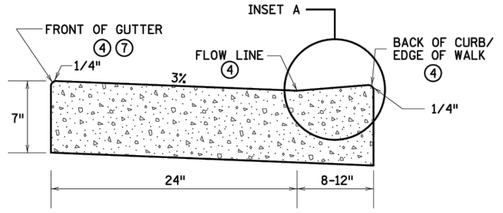




PERPENDICULAR ①

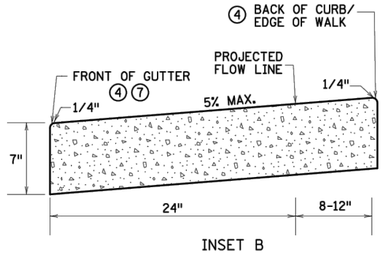


NON PERPENDICULAR ②

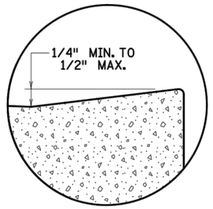


FOR CURB MACHINE PLACEMENT AROUND RADIUS ③
(REGARDLESS OF RAMP TYPE)

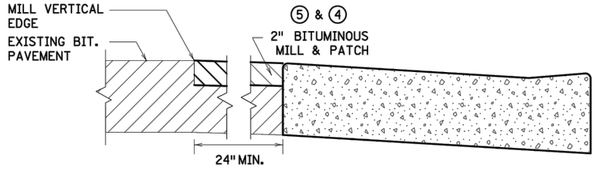
PEDESTRIAN ACCESS ROUTE CURB & GUTTER DETAIL

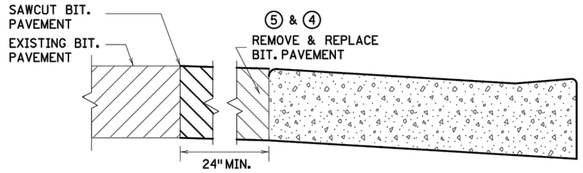


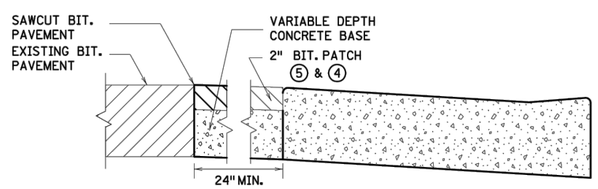
INSET B
OUTFLOW GUTTER ⑧



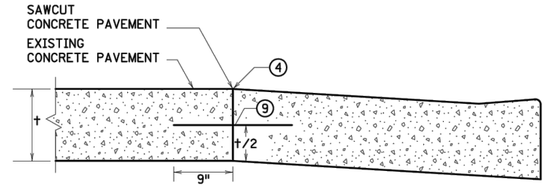
INSET A





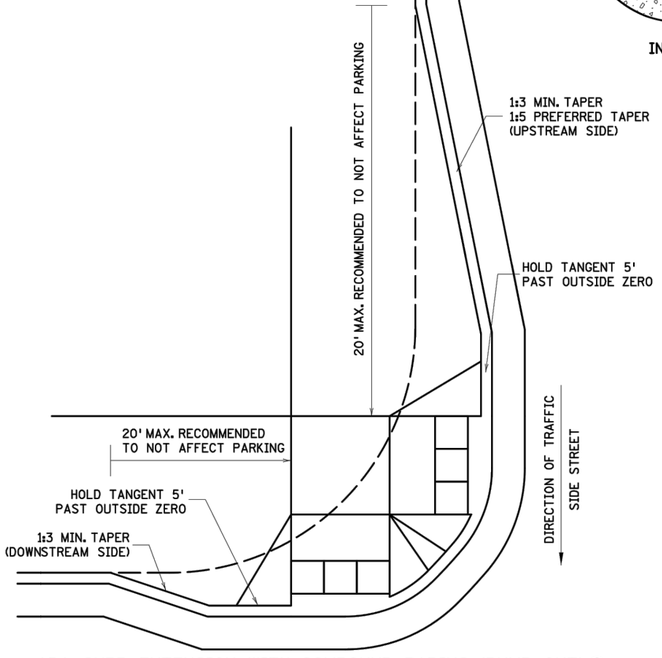


ONLY ALLOWED PER ENGINEER'S APPROVAL

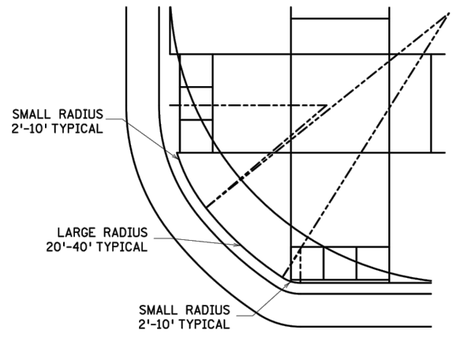


PAVEMENT TREATMENT OPTIONS IN FRONT OF CURB & GUTTER

FOR USE ON CURB RAMP RETROFITS



ADA CURB EXTENSION WITH COMPOUND RADIUS (BUMP OUT) ⑪



COMBINED DIRECTIONAL ⑩
(COMPOUND RADIUS)

NOTES:

POSITIVE FLOW LINE DRAINAGE SHALL BE MAINTAINED THROUGH THE PEDESTRIAN ACCESS ROUTE (PAR) AT A 2% MAXIMUM.

NO PONDING SHALL BE PRESENT IN THE PAR.

ANY VERTICAL LIP THAT OCCURS AT THE FLOW LINE SHALL NOT BE GREATER THAN 1/4 INCH.

① FOR USE AT CURB CUTS WHERE THE PEDESTRIAN'S PATH OF TRAVEL IS ASSUMED PERPENDICULAR TO THE GUTTER FLOW LINE. RAMP TYPES INCLUDE: PERPENDICULAR, TIERED PERPENDICULAR, PARALLEL, AND DIAGONAL RAMPS.

② FOR USE AT CURB RAMPS WHERE THE PEDESTRIAN'S PATH OF TRAVEL IS ASSUMED NON PERPENDICULAR TO THE GUTTER FLOW LINE. RAMP TYPES INCLUDE: FANS & DEPRESSED CORNERS.

③ BEGIN GUTTER SLOPE TRANSITION 10' OUTSIDE OF ALL CURB RAMPS.

④ THERE SHALL BE NO VERTICAL DISCONTINUITIES GREATER THAN 1/4".

⑤ ELEVATION CHANGE TAKES PLACE FROM THE EXISTING TO NEW FRONT OF GUTTER. PATCH IS USED TO MATCH THE NEW GUTTER FACE INTO THE EXISTING ROADWAY.

⑥ VARIABLE WIDTH FOR DIRECTIONAL CURB APPLICATIONS. SEE SHEET 2 FOR DIRECTIONAL CURB SLOPE REQUIREMENTS.

⑦ TOP FRONT OF GUTTER SHALL BE CONSTRUCTED FLUSH WITH PROPOSED ADJACENT PAVEMENT ELEVATION. TOP 1.5" OF THE GUTTER FACE MUST BE A FORMED EDGE. PAR GUTTER SHALL NOT BE OVERLAID.

⑧ SHOULD BE USED AT VERTICALLY CONSTRAINED AREAS WHEN AT A DRAINAGE HIGH POINT OR SUPER ELEVATED ROADWAY SEGMENTS.

⑨ DRILL AND GROUT NO. 4 EPOXY-COATED 18" LONG TIE BARS AT 30" CENTER TO CENTER INTO EXISTING CONCRETE PAVEMENT 1' MINIMUM FROM ALL JOINTS.

⑩ HELPS PROVIDE TWO SEPARATE RAMPS, REDUCES THE DOME SETBACK LENGTH AND MINIMIZES DIRECTIONAL CURB. THIS RADIUS DESIGN CLOSELY FOLLOWS THE TURNING VEHICLE PATH WHILE OPTIMIZING CURB RAMP LENGTH.

⑪ CURB EXTENSIONS SHOULD BE USED IN VERTICALLY CONSTRAINED AREAS, USUALLY IN DOWNTOWN ROADWAY SEGMENTS WHERE ON-STREET PARKING IS AVAILABLE. CURB EXTENSIONS SHOULD BE CONSIDERED FOR APS INTERSECTIONS WHERE SPACE IS LIMITED.
PUSH BUTTONS MUST MEET APS CRITERIA AS DESCRIBED IN THE PUSH BUTTON LOCATION DETAIL SHEET.

REVISION:

APPROVED: 11-04-2021
JEFFREY PERKINS
OPERATIONS DIVISION

MINNESOTA DEPARTMENT OF TRANSPORTATION

STANDARD PLAN 5-297.250 | 3 OF 6

APPROVED: 11-04-2021
REVISED:

THOMAS STYRBICKI
STATE DESIGN ENGINEER

PEDESTRIAN CURB RAMP DETAILS

STATE PROJ. NO. (TH) SHEET NO. OF SHEETS

NO	DATE	BY	CKD	APPR

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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.
Print Name: MARTIN JOYCE
Date --/--/-- License # 58920

DRAWN BY HLB
DESIGNED BY MMJ
CHECKED BY MMJ
COMM. NO. 16750

SRF

CITY OF ARDEN HILLS
MNDOT STANDARD PLANS
OLD HIGHWAY 10 TRAIL

SHEET 11 OF 110

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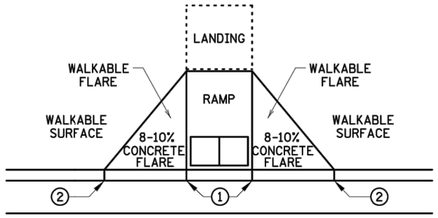
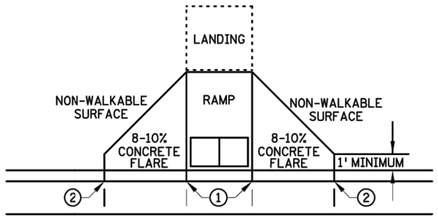
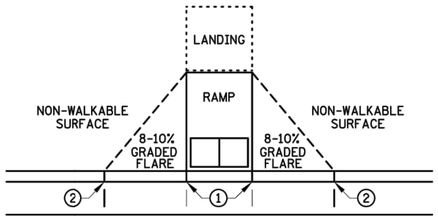


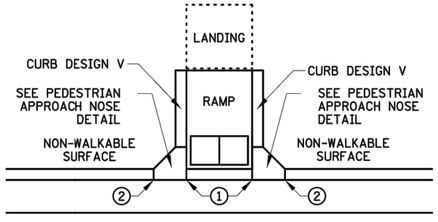
PAVED FLARES
ADJACENT TO WALKABLE SURFACE



PAVED FLARES
ADJACENT TO NON-WALKABLE SURFACE

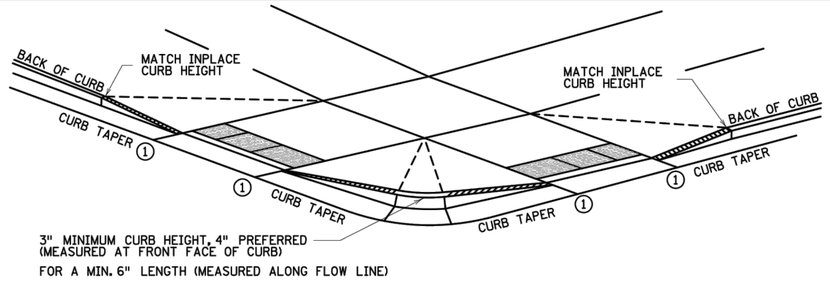


GRADED FLARES

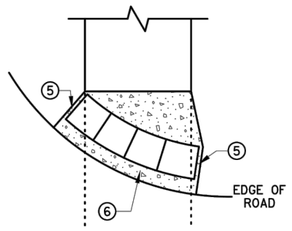


RETURNED CURB ④

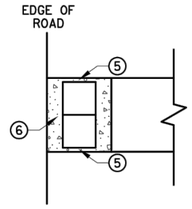
TYPICAL SIDE TREATMENT OPTIONS ③ ⑩



DETECTABLE EDGE WITH ⑦
CURB AND GUTTER

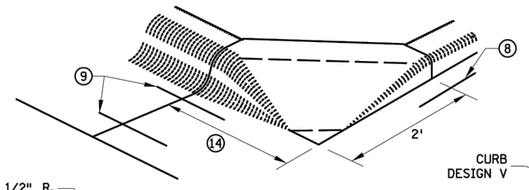


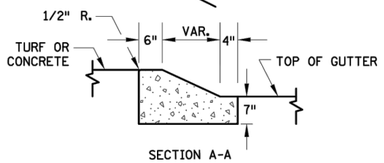
RADIAL DETECTABLE WARNING



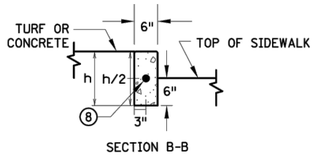
RECTANGULAR DETECTABLE WARNING

DETECTABLE EDGE WITHOUT CURB AND GUTTER





SECTION A-A



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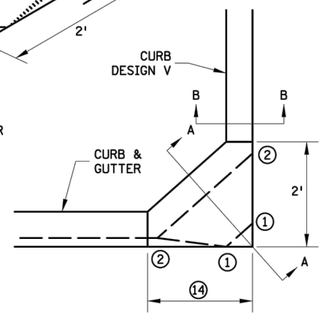
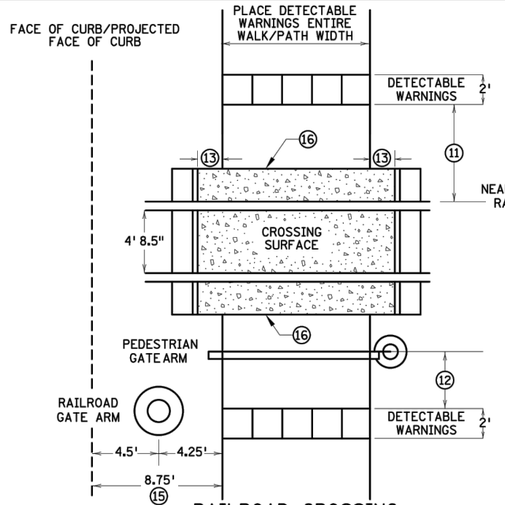


PEDESTRIAN APPROACH
NOSE DETAIL
(FOR RETURNED CURB
SIDE TREATMENT)



RAILROAD CROSSING
PLAN VIEW

NOTES:

INTERMEDIATE CURB HEIGHTS TAPER SHALL RISE AT 8-10% TO A MINIMUM 3 INCH CURB HEIGHT. INCREASE CURB TAPER LENGTH AT LESS THAN 8% OR REDUCE INTERMEDIATE CURB HEIGHT TO 2+ INCHES IF NECESSARY TO MATCH ADJACENT BOULEVARD OR SIDEWALK GRADES.

SEE STANDARD PLATE 7038 AND THIS SHEET FOR ADDITIONAL DETAILS ON DETECTABLE WARNING.

A WALKABLE SURFACE IS DEFINED AS A PAVED SURFACE ADJACENT TO A CURB RAMP WITHOUT RAISED OBSTACLES THAT COULD MISTAKENLY BE TRAVERSED BY A USER WHO IS VISUALLY IMPAIRED.

CONCRETE FLARE LENGTHS ADJACENT TO NON-WALKABLE SURFACES SHOULD BE LESS THAN 8' LONG MEASURED ALONG THE RAMPS FROM THE BACK OF CURB.

① 0" CURB HEIGHT. SEE INSET A ON SHEET 3 OF 6.

② FULL CURB HEIGHT.

③ SIDE TREATMENTS ARE APPLICABLE TO ALL RAMP TYPES AND SHOULD BE IMPLEMENTED AS NEEDED AS FIELD CONDITIONS DICTATE. THE ENGINEER SHALL DETERMINE THE RAMP SIDE TREATMENTS BASED ON MAINTENANCE OF BOTH ROADWAY AND SIDEWALK, ADJACENT PROPERTY CONSIDERATIONS, AND MITIGATING CONSTRUCTION IMPACTS.

④ TYPICALLY USED FOR MEDIANS AND ISLANDS.

⑤ WHEN NO CONCRETE FLARES ARE PROPOSED, THE CONCRETE WALK SHALL BE FORMED AND CONSTRUCTED PERPENDICULAR TO THE EDGE OF ROADWAY. MAINTAIN 3" MAX. BETWEEN EDGE OF DOMES AND EDGE OF CONCRETE.

⑥ IF NO CURB AND GUTTER IS PLACED IN RURAL SECTIONS, DETECTABLE WARNINGS SHALL BE PLACED 1' FROM THE EDGE OF BITUMINOUS ROADWAY AND/OR BITUMINOUS SHARED-USE PATH TO PROVIDE VISUAL CONTRAST.

⑦ ALL CONSTRUCTED CURBS MUST HAVE A CONTINUOUS DETECTABLE EDGE FOR THE VISUALLY IMPAIRED. THIS DETECTABLE EDGE REQUIRES DETECTABLE WARNINGS WHEREVER THERE IS ZERO-INCH HIGH CURB. CURB TAPERS ARE CONSIDERED A DETECTABLE EDGE WHEN THE TAPER STARTS WITHIN 3" OF THE EDGE OF THE DETECTABLE WARNINGS. AND UNIFORMLY RISES TO A 3-INCH MINIMUM CURB HEIGHT. ANY CURB NOT PART OF A CURB TAPER AND LESS THAN 3 INCHES IN HEIGHT IS NOT CONSIDERED A DETECTABLE EDGE AND THEREFORE IS NOT COMPLIANT WITH ACCESSIBILITY STANDARDS.

⑧ DRILL AND GROUT 1 - NO. 4 12" LONG REINFORCEMENT BAR (EPOXY COATED) WITH 3" MIN. COVER. REINFORCEMENT BARS ARE NOT NEEDED IF THE APPROACH NOSE IS POURED INTEGRAL WITH THE V CURB.

⑨ DRILL AND GROUT 2 - NO. 4 12" LONG REINFORCEMENT BARS (EPOXY COATED) WITH 3" MIN. COVER. REINFORCEMENT BARS ARE NOT NEEDED IF THE APPROACH NOSE IS POURED INTEGRAL WITH THE CURB AND GUTTER.

⑩ SIDE TREATMENT EXAMPLES SHOWN ARE WHEN THE INITIAL LANDING IS APPROXIMATELY LEVEL WITH THE FULL HEIGHT CURB (I.E. 6' LONG RAMP FOR 6" HIGH CURB). WHEN THE INITIAL LANDING IS MORE THAN 1" BELOW FULL HEIGHT CURB REFER TO SHEETS 1 & 2 TO MODIFY THE CURB HEIGHT TAPERS AND MAINTAIN POSITIVE BOULEVARD DRAINAGE. CONSTRUCT THESE TAPERS AT 0"-3" AT 8-10%, THEN LESS THAN 5% FROM 3" CURB TO FULL CURB HEIGHT.

⑪ NEAREST EDGE OF DETECTABLE WARNING SURFACES SHALL BE PLACED 12' MINIMUM TO 15' MAXIMUM FROM THE NEAREST RAIL. FOR SKEWED RAILWAYS IN NO INSTANCE SHALL THE DETECTABLE WARNING BE CLOSER THAN 12' MEASURED PERPENDICULAR TO THE NEAREST RAIL.

⑫ WHEN PEDESTRIAN GATES ARE PROVIDED, DETECTABLE WARNING SURFACES SHALL BE PLACED ON THE SIDE OF THE GATES OPPOSITE THE RAIL, 2' FROM THE APPROACHING SIDE OF THE GATE ARM. THIS CRITERIA GOVERNS OVER NOTE ⑪.

⑬ CROSSING SURFACE SHALL EXTEND 2' MINIMUM PAST THE OUTSIDE EDGE OF WALK OR SHARED-USE PATH.

⑭ 3' FOR MEDIANS AND SPLITTER ISLANDS. NOSE CAN BE REDUCED TO 2' ON FREE RIGHT ISLANDS.

⑮ SIDEWALK TO BE PLACED 8.75' MIN. FROM THE FACE OF CURB/PROJECTED FACE OF CURB. THIS ENSURES MIN. CLEARANCE BETWEEN THE SIDEWALK AND GATE ARM COUNTERWEIGHT SUPPORTS.

⑯ CONSTRUCT WITH EXPANSION MATERIAL PER MNDOT SPECIFICATION 3702 TYPES A-E. EXPANSION MATERIAL SHALL MATCH FULL HEIGHT OF ADJACENT CONCRETE.

REVISION:

APPROVED: 11-04-2021
JEFFREY PERKINS
OPERATIONS DIVISION

MINNESOTA DEPARTMENT OF TRANSPORTATION

STANDARD PLAN 5-297.250 | 4 OF 6

APPROVED: 11-04-2021
REVISED:

THOMAS STYRICKI
STATE DESIGN ENGINEER

PEDESTRIAN CURB RAMP DETAILS

STATE PROJ. NO. (TH) SHEET NO. OF SHEETS

NO	DATE	BY	CKD	APPR

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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.
Print Name: MARTIN JOYCE
Date --/--/-- License # 58920

DRAWN BY HLB
DESIGNED BY MMJ
CHECKED BY MMJ
COMM. NO. 16750

SRF

CITY OF ARDEN HILLS
MNDOT STANDARD PLANS
OLD HIGHWAY 10 TRAIL

SHEET 12 OF 110

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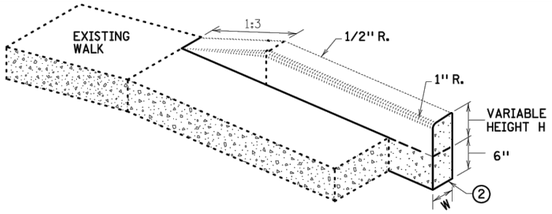
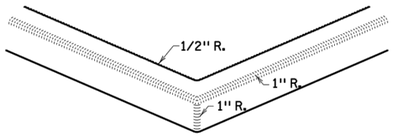
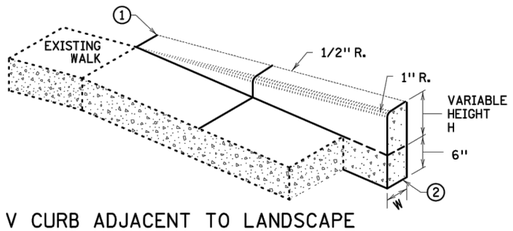


V CURB ADJACENT TO LANDSCAPE
CURB WITHIN SIDEWALK LIMITS

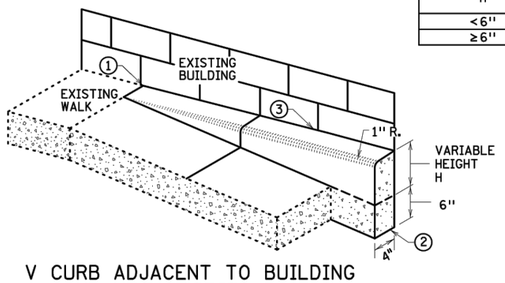


V CURB INTERSECTION

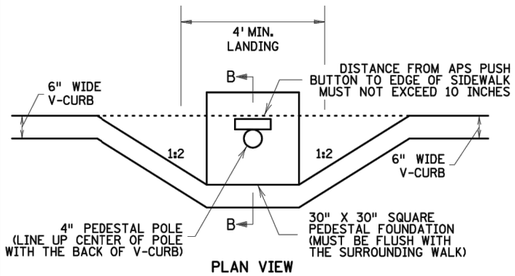
CONCRETE CURB DESIGN V	
CURB HEIGHT H	CURB WIDTH W
<6"	4"
≥6"	6"



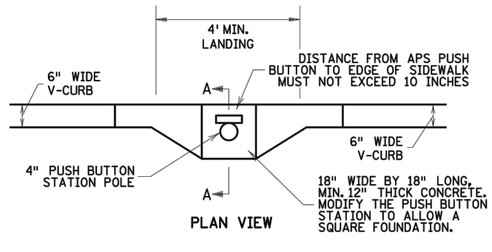
V CURB ADJACENT TO LANDSCAPE
CURB OUTSIDE SIDEWALK LIMITS



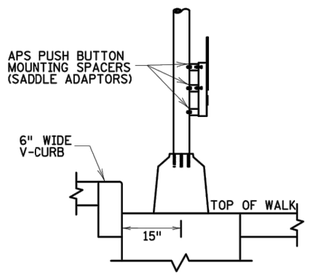
V CURB ADJACENT TO BUILDING OR BARRIER



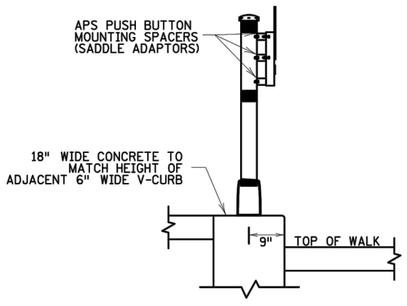
PLAN VIEW



PLAN VIEW



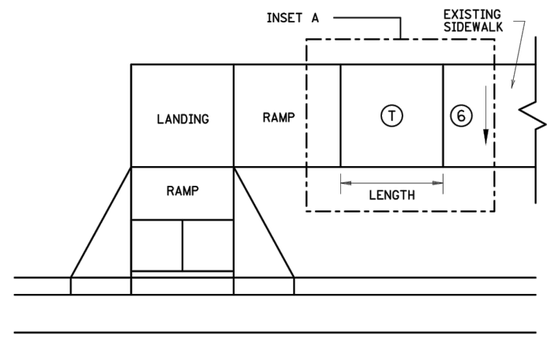
SECTION B-B



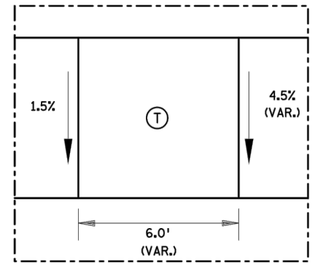
SECTION A-A

SIGNAL PEDESTAL & PUSH BUTTON (V-CURB)

PUSH BUTTON STATION (V-CURB)



TRANSITION PANEL ④⑤



INSET A

NOTES:

A WALKABLE FLARE IS AN 8-10% CONCRETE FLARE THAT IS REQUIRED WHEN THE FLARE IS ADJACENT TO A WALKABLE SURFACE, OR WHEN THE PEDESTRIAN PATH OF TRAVEL OF A PUSH BUTTON TRAVERSES THE FLARE.

ALL V CURB CONTRACTION JOINTS SHALL MATCH CONCRETE WALK JOINTS.

WHERE RIGHT-OF-WAY ALLOWS, USE OF V CURB SHOULD BE MINIMIZED. GRADING ADJACENT TURF OR SLOPING ADJACENT PAVEMENT IS PREFERRED.

V CURB SHALL BE PLACED OUTSIDE THE SIDEWALK LIMITS WHEN RIGHT OF WAY ALLOWS.

V CURB NEXT TO BUILDING SHALL BE A 4" WIDTH AND SHALL MATCH PREVIOUS TOP OF SIDEWALK ELEVATIONS.

① END TAPERS AT TRANSITION SECTION SHALL MATCH INPLACE SIDEWALK GRADES.

② ALL V CURB SHALL MATCH BOTTOM OF ADJACENT WALK.

③ CONSTRUCT USING APPROVED EXPANSION MATERIAL PER MNDOT TYPE A-E EXPANSION. LEAVE A MINIMUM ½" TOP GAP AND SEAL WITH MNDOT APPROVED SILICONE PER MNDOT SPEC 3722.

④ THE MAX. RATE OF CROSS SLOPE TRANSITIONING IS 1' LINEAR FOOT OF SIDEWALK PER HALF PERCENT CROSS SLOPE. WHEN PAR WIDTH IS GREATER THAN 6' OR THE RUNNING SLOPE IS GREATER THAN 5%, DOUBLE THE CALCULATED TRANSITION LENGTH.

⑤ TRANSITION PANELS ARE TO ONLY BE USED AFTER THE RAMP, OR IF NEEDED, LANDING ARE AT THE FULL CURB HEIGHT (TYPICAL SECTION).

⑥ EXISTING CROSS SLOPE GREATER THAN 2.0%.

LEGEND

THESE LONGITUDINAL SLOPE RANGES SHALL BE THE STARTING POINT. IF SITE CONDITIONS WARRANT, LONGITUDINAL SLOPES UP TO 8.3% OR FLATTER ARE ALLOWED.

Ⓢ INDICATES PEDESTRIAN RAMP - SLOPE SHALL BE BETWEEN 5.0% MINIMUM AND 8.3% MAXIMUM IN THE DIRECTION SHOWN AND THE CROSS SLOPE SHALL NOT EXCEED 2.0%.

LANDING AREA - 4' X 4' MIN. (5' X 5' MIN. PREFERRED) DIMENSIONS AND MAX 2.0% SLOPE IN ALL DIRECTIONS. LANDING SHALL BE FULL WIDTH OF INCOMING PARS.

Ⓣ TRANSITION PANEL(S) - TO BE USED FOR TRANSITIONING THE CROSS-SLOPE OF A RAMP TO THE EXISTING WALK CROSS-SLOPE. RATE OF TRANSITION SHOULD BE 0.5% PER 1 LINEAR FOOT OF WALK. SEE THIS SHEET FOR ADDITIONAL INFORMATION.

REVISION:

APPROVED: 11-04-2021
JEFFREY PERKINS
OPERATIONS DIVISION

MINNESOTA DEPARTMENT OF TRANSPORTATION

STANDARD PLAN 5-297.250 | 5 OF 6

APPROVED: 11-04-2021
REVISED:

THOMAS STYRBICKI
STATE DESIGN ENGINEER

PEDESTRIAN CURB RAMP DETAILS

STATE PROJ. NO. (TH) SHEET NO. OF SHEETS

NO	DATE	BY	CKD	APPR

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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.
Print Name: MARTIN JOYCE
Date --/--/-- License # 58920

DRAWN BY HLB
DESIGNED BY MMJ
CHECKED BY MMJ
COMM. NO. 16750

SRF

CITY OF ARDEN HILLS
MNDOT STANDARD PLANS
OLD HIGHWAY 10 TRAIL

SHEET 13 OF 110

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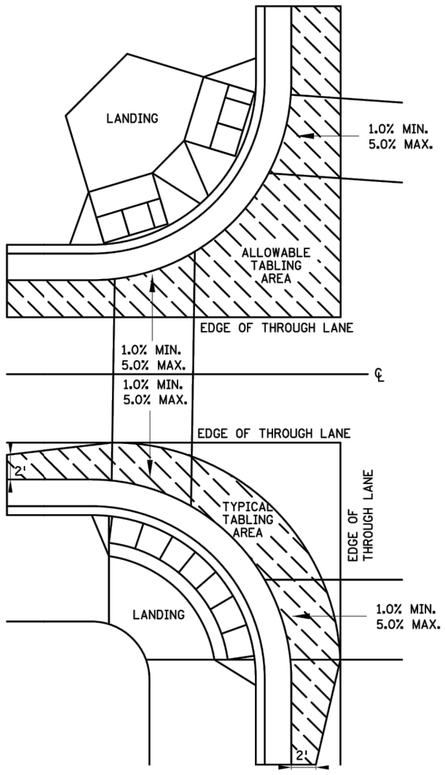
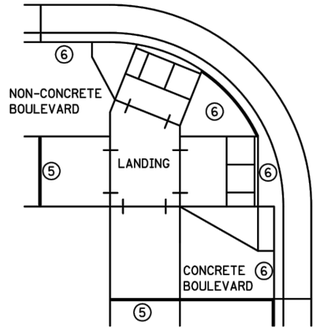
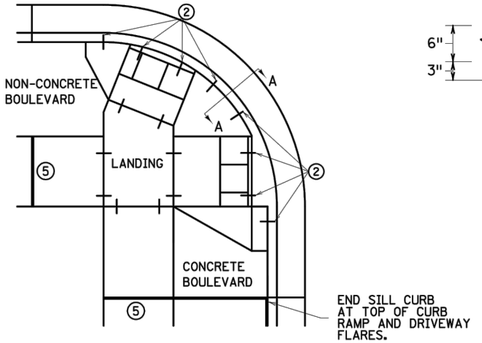


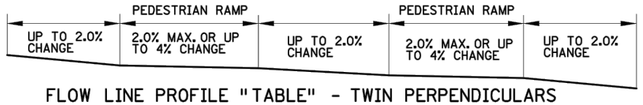
CURB LINE AND ROAD CROSSING ADJUSTMENTS



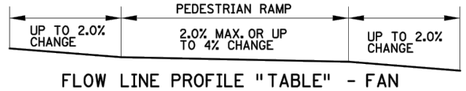
EXPANSION MATERIAL PLACEMENT
FOR CONCRETE ROADWAYS



CURB LINE REINFORCEMENT ④
PLACEMENT ON BITUMINOUS ROADWAYS

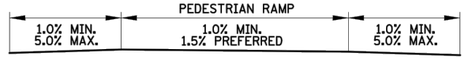


FLOW LINE PROFILE "TABLE" - TWIN PERPENDICULARS

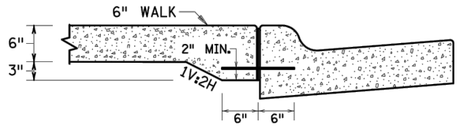


FLOW LINE PROFILE "TABLE" - FAN

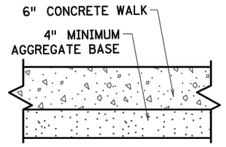
FLOW LINE PROFILE RAISE - TWIN PERPENDICULARS



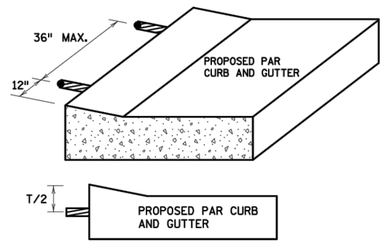
FLOW LINE PROFILE RAISE - FAN

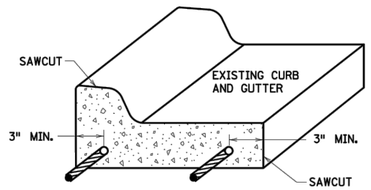


SECTION VIEW A-A
THICKENED SECTION
THROUGH CURB RAMP FLARES



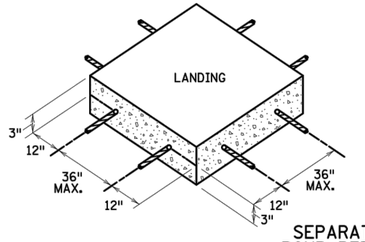
TYPICAL SIDEWALK SECTION
WITHIN INTERSECTION CORNER

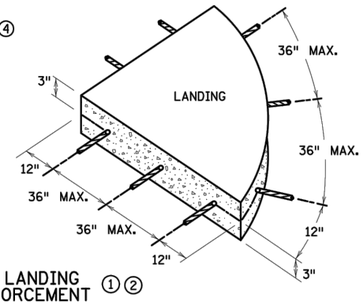




CURB AND GUTTER
REINFORCEMENT ③

CURB RAMP REINFORCEMENT DETAILS ②④





SEPARATE LANDING
POUR REINFORCEMENT ①②

GENERAL NOTES:

"TABLING" OF CROSSWALKS MEANS MAINTAINING LESS THAN 2% CROSS SLOPE WITHIN A CROSSWALK, IS REQUIRED WHEN A ROADWAY IS IN A STOP OR YIELD CONDITION AND THE PROJECT SCOPE ALLOWS.

RECONSTRUCTION PROJECTS: ON FULL PAVEMENT REPLACEMENT PROJECTS "TABLING" OF ENTIRE CROSSWALK SHALL OCCUR WHEN FEASIBLE.

MILL & OVERLAY PROJECTS: "TABLING" OF FLOW LINES, IN FRONT OF THE PEDESTRIAN RAMP, IS REQUIRED WHEN THE EXISTING FLOW LINE IS GREATER THAN 2%. WARPING OF THE BITUMINOUS PAVEMENT CAN NOT EXTEND INTO THE THROUGH LANE. TABLE THE FLOW LINE TO 2% OR AS MUCH AS POSSIBLE WHILE ADHERING TO THE FOLLOWING CRITERIA;
1) 1.0% MIN. CROSS-SLOPE OF THE ROAD
2) 5.0% MAX. CROSS-SLOPE OF THE ROAD
3) "TABLE" FLOW LINE UP TO 4% CHANGE FROM EXISTING SLOPE IN FRONT OF PEDESTRIAN RAMP
4) UP TO 2% CHANGE IN FLOW LINE FROM EXISTING SLOPE BEYOND THE PEDESTRIAN CURB RAMP

STAND-ALONE ADA RETROFITS: FOLLOW MILL & OVERLAY CRITERIA ABOVE HOWEVER ALL PAVEMENT WARPING IS DONE WITH BITUMINOUS PATCHING ON BITUMINOUS ROADWAYS AND FULL-DEPTH APRON REPLACEMENT ON CONCRETE ROADWAYS.

RAISING OF CURB LINES SHOULD OCCUR IN VERTICALLY CONSTRAINED AREAS. RAISE THE CURB LINES ENOUGH TO ALLOW COMPLIANT RAMPS OR AS MUCH AS POSSIBLE WHILE ADHERING TO THE FOLLOWING CRITERIA;
1) 1.0% MIN. AND 5.0% MAXIMUM CROSS-SLOPE OF THE ROAD
2) 1.0% MIN. FLOW LINE (ON EITHER SIDE OF PEDESTRIAN RAMP) TO MAINTAIN POSITIVE DRAINAGE
3) 5.0% RECOMMENDED MAX. FLOW LINE
4) LONGITUDINAL THROUGH LANE ROADWAY TAPERS SHOULD BE 1" VERTICAL PER 15' HORIZONTAL

NOTES:

① TO ENSURE RAMPS AND LANDINGS ARE PROPERLY CONSTRUCTED, ALL INITIAL LANDINGS AT A TOP OF A RAMPED SURFACE (RUNNING SLOPE GREATER THAN 2%) SHALL BE FORMED AND PLACED SEPARATELY IN AN INDEPENDENT CONCRETE POUR. FOLLOW SIDEWALK REINFORCEMENT DETAILS ON THIS SHEET FOR ALL SEPARATELY POURED INITIAL LANDINGS.

② DRILL AND GROUT NO. 4 12" LONG REINFORCEMENT BARS (EPOXY COATED) AT 36" MAXIMUM CENTER TO CENTER MINIMUM 12" SPACING FROM CONSTRUCTION JOINTS. BARS TO BE ADJUSTED TO MATCH RAMP GRADE. BARS TO BE PAID BY EACH.

③ DRILL AND GROUT 2 - NO. 4 X 12'' LONG (6" EMBEDDED) REINFORCEMENT BARS (EPOXY COATED). REINFORCEMENT REQUIRED FOR ALL CONSTRUCTION JOINTS. BARS TO BE PAID BY EACH.

④ THIS CURB LINE REINFORCEMENT DETAIL SHALL BE USED ON BITUMINOUS ROADWAYS. FOR CONCRETE ROADWAYS, SEE NOTE 6.

⑤ CONSTRUCT WITH EXPANSION MATERIAL PER MNDOT SPECIFICATION 3702 TYPES A-E. EXPANSION MATERIAL SHALL MATCH FULL HEIGHT OF ADJACENT CONCRETE.

⑥ USE AN APPROVED TYPE F (1/4 INCH THICK) SEPARATION MATERIAL. SEPARATION MATERIAL SHALL MATCH FULL HEIGHT DIMENSION OF ADJACENT CONCRETE.

REVISION:

APPROVED: 11-04-2021
JEFFREY PERKINS
OPERATIONS DIVISION

MINNESOTA DEPARTMENT OF TRANSPORTATION

STANDARD PLAN 5-297.250 | 6 OF 6

APPROVED: 11-04-2021
REVISED:

THOMAS STYRBICKI
STATE DESIGN ENGINEER

PEDESTRIAN CURB RAMP DETAILS

STATE PROJ. NO. (TH) SHEET NO. OF SHEETS

NO	DATE	BY	CKD	APPR

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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.
Print Name: MARTIN JOYCE
Date --/--/-- License # 58920

DRAWN BY HLB
DESIGNED BY MMJ
CHECKED BY MMJ
COMM. NO. 16750

SRF

CITY OF ARDEN HILLS
MNDOT STANDARD PLANS
OLD HIGHWAY 10 TRAIL

SHEET 14 OF 110

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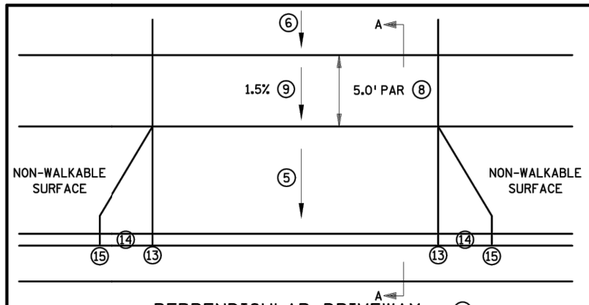
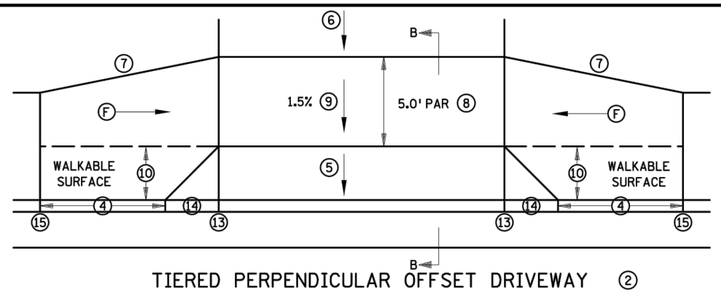
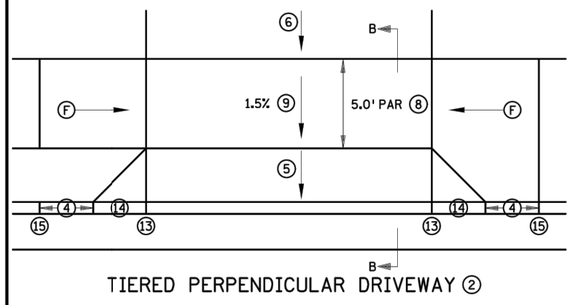


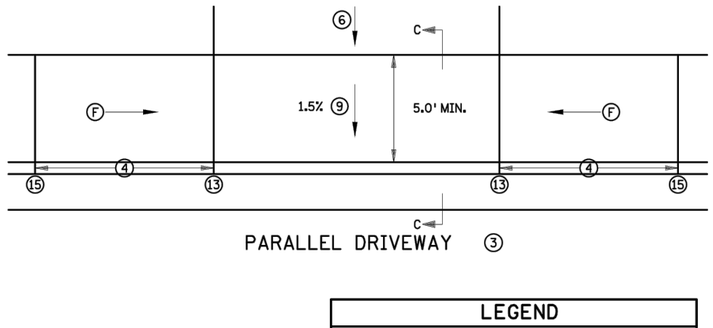
PERPENDICULAR DRIVEWAY ①



TIERED PERPENDICULAR OFFSET DRIVEWAY ②

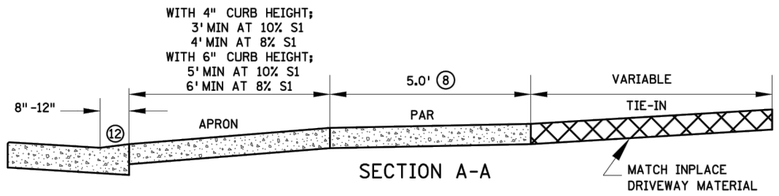


TIERED PERPENDICULAR DRIVEWAY ②

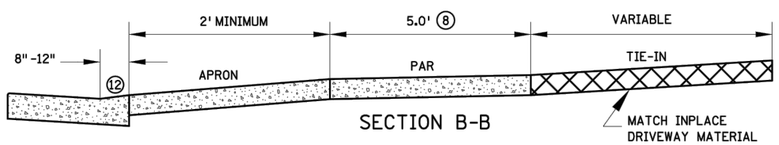


PARALLEL DRIVEWAY ③

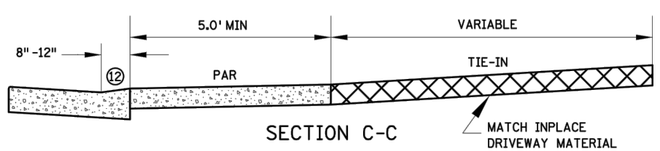
LEGEND	
Ⓕ	INDICATES DRIVEWAY RAMP - SLOPE SHALL BE GREATER THAN 2.0% AND LESS THAN 5.0% IN THE DIRECTION SHOWN AND CROSS SLOPE SHALL NOT EXCEED 2.0%



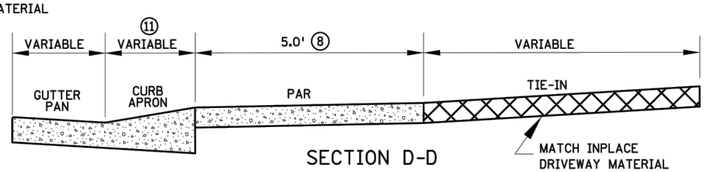
SECTION A-A



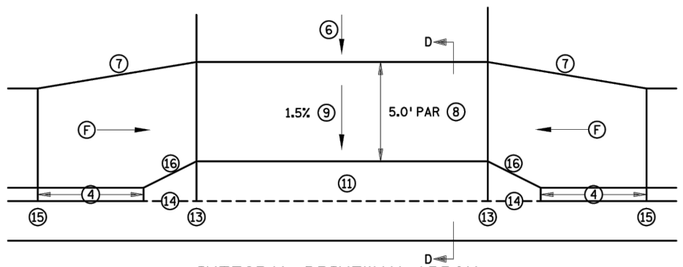
SECTION B-B



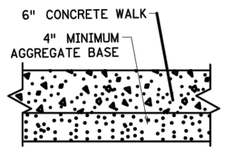
SECTION C-C



SECTION D-D



INTEGRAL DRIVEWAY APRON



TYPICAL SIDEWALK SECTION ⑰

TYPICAL DRIVEWAY SECTIONS

NOTES:

ALL SIDEWALK AND BOULEVARD WIDTHS SHALL BE MEASURE FROM BACK OF CURB.

IN URBAN ROADWAY SECTIONS, 6" CURB HEIGHT SHOULD BE USED WHEN 6' OR GREATER BOULEVARD WIDTH IS PROPOSED. WHEN BOULEVARD IS LESS THAN 6' WIDE, 4" CURB HEIGHT SHOULD BE USED.

MAINTAIN EXISTING DRAINAGE PATTERNS FLOWING TO PUBLIC RIGHT OF WAY.

ACQUIRE ADEQUATE L3 TO ALLOW FOR A CONTINUOUS PAR PROFILE (UNIFORM TYPICAL SIDEWALK SECTION) THROUGH THE DRIVEWAY APRON.

IN NO CASE SHALL SIDEWALK PROFILES EXCEED 5.0%, EXCEPT SIDEWALK PROFILES CAN MATCH ROADWAY GRADE IF ROADWAY GRADE IS GREATER THAN 5.0%. RAMPS FOR DRIVEWAYS ARE REQUIRED TO FOLLOW THE ABOVE SIDEWALK CRITERIA.

CONTRACTION JOINTS SHALL BE CONSTRUCTED ALONG ALL GRADE BREAKS WITHIN THE PEDESTRIAN ACCESS ROUTE (PAR). 1/4" DEEP VISUAL JOINTS SHALL BE USED AT THE TOPS OF CONCRETE FLARES ADJACENT TO WALKABLE SURFACES.

DRIVEWAY TYPES FROM MOST PREFERRED TO LEAST PREFERRED ARE AS FOLLOWS: PERPENDICULAR, TIERED PERPENDICULAR, TIERED PERPENDICULAR OFFSET & PARALLEL.

① PERPENDICULAR DRIVEWAYS ARE THE STANDARD AND STARTING POINT FOR ALL DRIVEWAY DESIGN AND CONSTRUCTION. SHOULD BE USED TO ACHIEVE CONTINUOUS PAR PROFILE THROUGH THE DRIVEWAY. OBTAINING A PERPENDICULAR DRIVEWAY DESIGN BECOMES MORE CRITICAL WITH STEEP ROADWAY PROFILES.

② TO BE USED WHEN PERPENDICULAR DRIVEWAY DESIGN CANNOT BE ACHIEVED, THE DRIVEWAY PAR IS BELOW ROADWAY CURB HEIGHT. THIS DRIVEWAY TYPE CAN BE USED FOR BOTH PAVED (AS SHOWN) AND GRASS BOULEVARDS.

③ TO BE USED WHEN PERPENDICULAR AND TIERED PERPENDICULAR DRIVEWAY DESIGN CANNOT BE ACHIEVED. CAN BE USED FOR STEEP NEGATIVE SLOPED DRIVEWAYS. DW CURB TYPE 2 SHOULD BE USED TO RAISE PAR ABOVE GUTTER AND REDUCE "ROLLER COASTER" EFFECT. 4" HIGH ROADWAY CURB SHOULD BE USED TO REDUCE "ROLLER COASTER" EFFECT ESPECIALLY WHEN MULTIPLE DRIVEWAYS ARE PRESENT.

④ TOP OF CURB SHALL MATCH PROPOSED ADJACENT WALK GRADE.

⑤ 8% STANDARD, 10% MAX. FOR COMMERCIAL AND 12% MAX. FOR RESIDENTIAL. SEE GENERAL NOTES ON SHEET 2 FOR MORE INFORMATION.

⑥ S3 8% MAXIMUM, IF THE SLOPE IS EXCEEDED OR CONTINUED FOR MORE THAN 5', ANALYZE VEHICLE TEMPLATES FOR VERTICAL CLEARANCE. IF EXISTING DRIVEWAY IS NEGATIVELY DRAINING, S3 CAN BECOME SLIGHTLY MORE NEGATIVE TO ACHIEVE PERPENDICULAR DRIVEWAY DESIGN IF THE VERTICAL CLEARANCE IS ACHIEVED IN VEHICLE TEMPLATES.

⑦ 1:3 MIN. 1:5 PREFERRED FOR DRIVEWAY RETROFIT PROJECTS. 1:10 PREFERRED FOR SIDEWALK REPLACEMENT PROJECTS.

⑧ 5.0' MIN. PAR WIDTH IS THE STANDARD THROUGH DRIVEWAYS. IF FEASIBLE WIDEN DRIVEWAY PAR WIDTH TO MATCH APPROACHING SIDEWALK PAR WIDTHS. IN VERTICALLY CONSTRAINED AREAS PAR WIDTHS CAN INCREMENTALLY BE REDUCED TO 4.5' OR 4' MIN AFTER ALL OTHER OPTIONS HAVE BEEN APPLIED.

⑨ THE PEDESTRIAN ACCESS ROUTE, MAY NOT EXCEED 0.02 FT./FT. AS CONSTRUCTED.

⑩ SIDEWALK OFFSET TO BE LESS THAN OR EQUAL TO HALF THE APPROACHING SIDEWALK WIDTH.

⑪ INTEGRAL DRIVEWAY APRON TO BE POURED MONOLITHICALLY/INTEGRAL WITH THE CURB AND GUTTER. SEE SHEET 2 FOR MORE INFORMATION.

⑫ SEE SHEET 2 FOR CURB TYPE INFORMATION.

⑬ 0" CURB IS AT FLOW LINE. SEE DRIVEWAY TABLE FOR BACK OF CURB HEIGHTS.

⑭ 3' LONG AT 8-10% PREFERRED FOR INITIAL CURB TAPER. REDUCE CURB TAPER SLOPE IF NECESSARY TO MATCH ADJACENT SIDEWALK GRADES.

⑮ MATCH FULL CURB HEIGHT.

⑯ 1:2 TAPER RATE ON INTEGRAL DRIVEWAY APRONS.

⑰ SEE SHEET 4 FOR WHEN 6" WALK IS REQUIRED.

REVISION:

APPROVED: 11-04-2021

JEFFREY PERKINS
OPERATIONS DIVISION

MINNESOTA DEPARTMENT OF TRANSPORTATION

THOMAS STYRBICKI
STATE DESIGN ENGINEER

STANDARD PLAN 5-297.254 | 1 OF 4

APPROVED: 11-04-2021
REVISED:

DRIVEWAY AND SIDEWALK DETAILS

STATE PROJ. NO. (TH) SHEET NO. OF SHEETS

NO	DATE	BY	CKD	APPR

H:\PROJECTS\16000\16750\TECHDATA\CADDESIGN\L3-PLANSHEETS\16750_SPN01.DWG: SPN01-07

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.
Print Name: MARTIN JOYCE
Date --/--/-- License # 58920

DRAWN BY HLB
DESIGNED BY MMJ
CHECKED BY MMJ
COMM. NO. 16750

SRF

CITY OF ARDEN HILLS
MNDOT STANDARD PLANS
OLD HIGHWAY 10 TRAIL

SHEET 15 OF 110

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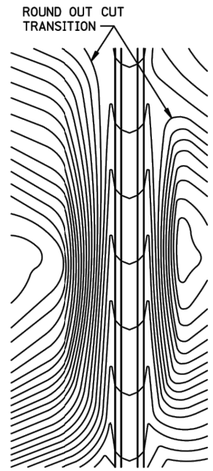
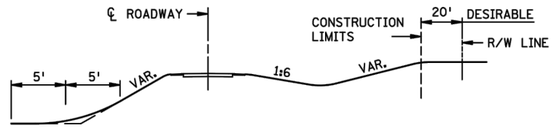
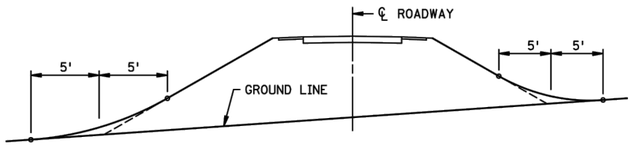


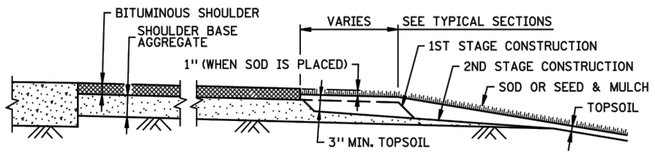
CONTOURING ROAD CUTS



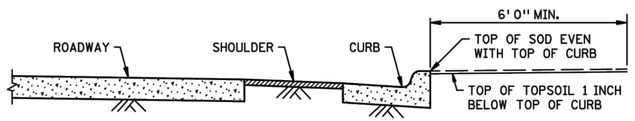
ROUNDING SHOULDERS AND BACKSLOPES



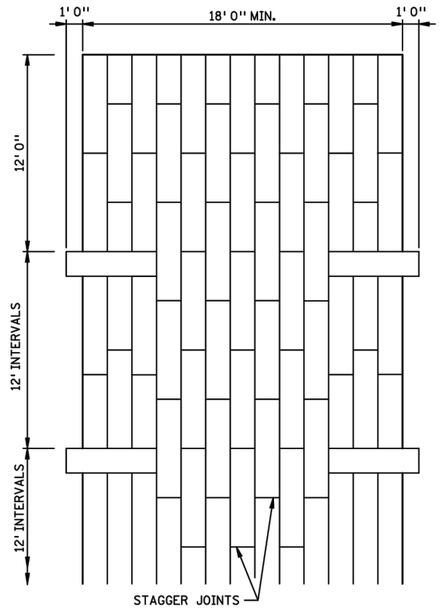
SHAPING FOR DRAINAGE ALONG THE TOE OF FILL SLOPES



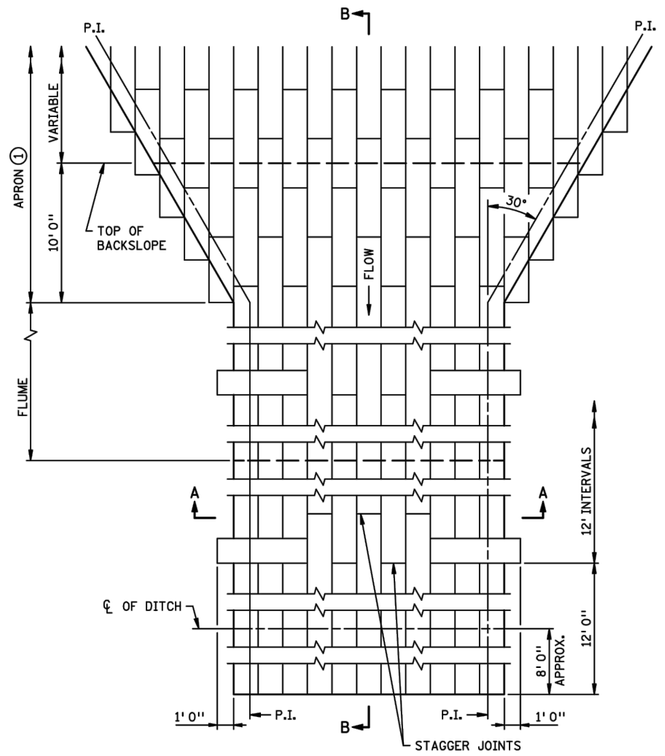
SHAPING AND TOPSOILING INSLOPES



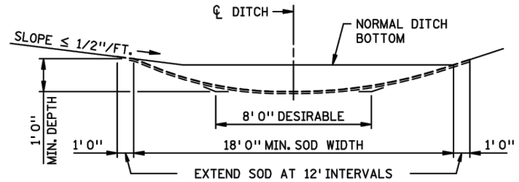
SHAPING ADJACENT TO CURBS WHEN SOD IS PLACED



PLAN VIEW

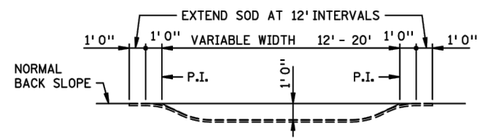


PLAN VIEW

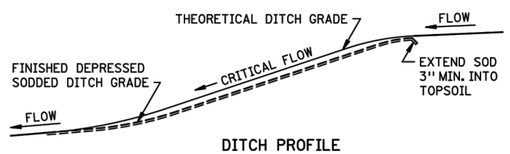


SODDED DITCH CROSS SECTION

WHERE FRONT OR BACK SLOPE IS FLAT (LESS THAN 1/2"/FT.), FIRST NOTCH DITCH AND THEN PROVIDE ROUNDING.

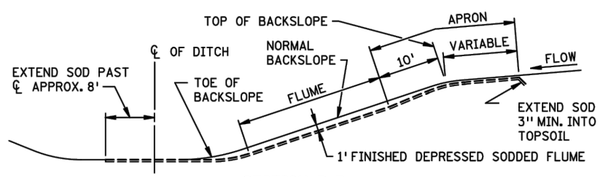


SECTION A-A



DITCH PROFILE

SODDED DITCH DETAILS



SECTION B-B

SODDED FLUME DETAILS

NOTES:

SEE SPEC. 2575.3 FOR ADDITIONAL INFORMATION.

① CONSTRUCT TAPER AS DIRECTED BY THE ENGINEER.

REVISION:

APPROVED: 2-28-2017

CHIEF ENVIRONMENTAL OFFICER

MINNESOTA DEPARTMENT OF TRANSPORTATION

STANDARD PLAN 5-297.404 | 1 OF 3

APPROVED: 2-28-2017

REVISED:

STATE DESIGN ENGINEER

PERMANENT EROSION CONTROL

ALONG ROADWAYS, DITCHES AND FLUMES

STATE PROJ. NO. (T.H.) SHEET NO. OF SHEETS

NO	DATE	BY	CKD	APPR

H:\PROJECTS\16000\16750\TECHDATA\CADDESIGN\L3-PLANSHEETS\16750_SPN01.DWG: SPN01-11

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.

Print Name: MARTIN JOYCE

Date --/--/-- License # 58920

DRAWN BY HLB

DESIGNED BY MMJ

CHECKED BY MMJ

COMM. NO. 16750

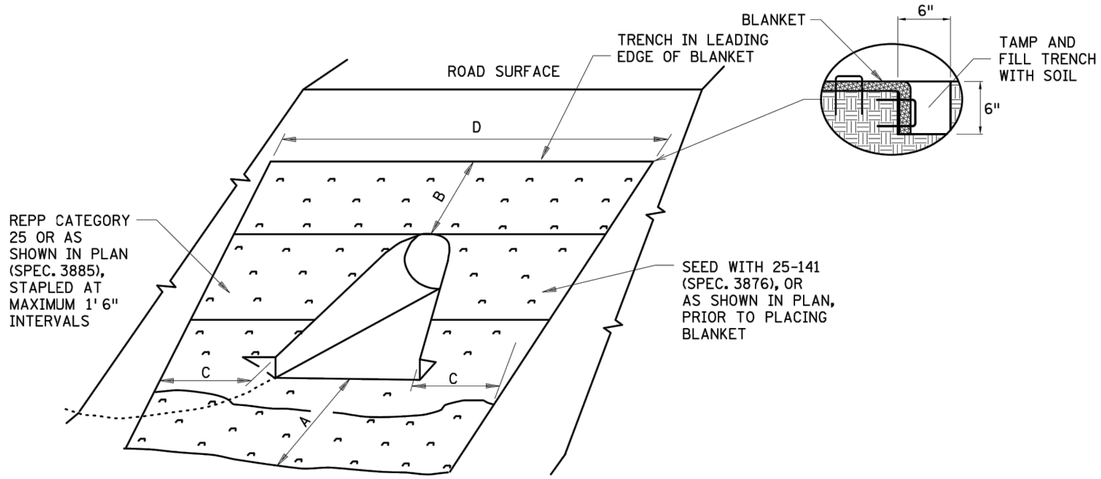
SRF

CITY OF ARDEN HILLS

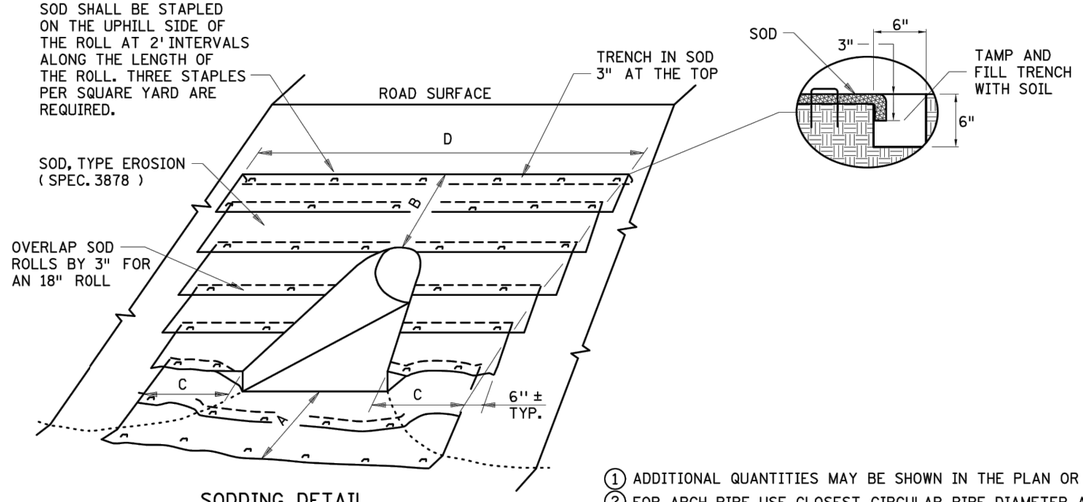
MNDOT STANDARD PLANS

OLD HIGHWAY 10 TRAIL

SHEET 16 OF 110



ROLLED EROSION PREVENTION PRODUCT (BLANKET) & SEED DETAIL



SODDING DETAIL

CULVERT INLET APRON ①										
CULVERT DIAMETER ②	SOD OR REPP (SQ. YDS.)						"A"	"B"	"C"	"D"
	CIRCULAR AND ARCH PIPE METAL APRON (PLATE 3123, PLATE 3122)	CIRCULAR AND ARCH PIPE CONCRETE APRON (PLATE 3100, PLATE 3110)	CIRCULAR AND ARCH PIPE METAL SAFETY APRON 1:4 SLOPE (PLATE 3148)	CIRCULAR AND ARCH PIPE METAL SAFETY APRON 1:6 SLOPE (PLATE 3148)	CIRCULAR CORRUGATED METAL PIPE SAFETY APRON 1:6 SLOPE (PLATE 3128)	CIRCULAR CORRUGATED METAL PIPE SAFETY APRON 1:4 SLOPE (PLATE 3128)				
15"	9	9	8	8	N/A	N/A	3'	1.5'	3'	13'
18"	13	12	12	14	16	N/A	3'	3'	3'	16'
21"	14	14	14	16	18	14	3'	3'	3'	17'
24"	16	15	16	19	21	17	3'	3'	3'	18'
27"	N/A	20	N/A	N/A	N/A	N/A	3'	4.5'	3'	20'
30"	23	22	25	30	32	N/A	3'	4.5'	3'	22'
36"	34	34	39	48	51	37	4.5'	4.5'	4.5'	27'
42"	43	40	51	64	N/A	N/A	4.5'	6'	4.5'	30'
48"	54	50	66	82	N/A	N/A	4.5'	7.5'	4.5'	34'
54"	65	58	81	102	N/A	N/A	4.5'	9'	4.5'	37'
60"	69	59	91	115	N/A	N/A	4.5'	9'	4.5'	39'
66"	69	63	N/A	N/A	N/A	N/A	4.5'	9'	4.5'	39'
72"	78	72	99	122	N/A	N/A	4.5'	10.5'	4.5'	41'

CULVERT OUTLET APRON ①										
CULVERT DIAMETER ②	SOD OR REPP (SQ. YDS.)						"A"	"B"	"C"	"D"
	CIRCULAR AND ARCH PIPE METAL APRON (PLATE 3123, PLATE 3122)	CIRCULAR AND ARCH PIPE CONCRETE APRON (PLATE 3100, PLATE 3110)	CIRCULAR AND ARCH PIPE METAL SAFETY APRON 1:4 SLOPE (PLATE 3148)	CIRCULAR AND ARCH PIPE METAL SAFETY APRON 1:6 SLOPE (PLATE 3148)	CIRCULAR CORRUGATED METAL PIPE SAFETY APRON 1:6 SLOPE (PLATE 3128)	CIRCULAR CORRUGATED METAL PIPE SAFETY APRON 1:4 SLOPE (PLATE 3128)				
15"	10	10	9	10	N/A	N/A	4.5'	1.5'	3'	13'
18"	13	13	12	14	15	N/A	6'	1.5'	3'	14'
21"	16	14	16	18	19	15	6'	1.5'	3'	15'
24"	18	18	18	21	22	18	7.5'	1.5'	3'	16'
27"	N/A	19	N/A	N/A	N/A	N/A	7.5'	1.5'	3'	17'
30"	23	23	24	28	29	N/A	9'	1.5'	3'	18'
36"	36	35	38	47	48	37	10.5'	1.5'	4.5'	23'
42"	43	40	47	58	N/A	N/A	12'	1.5'	4.5'	25'
48"	50	46	57	70	N/A	N/A	13.5'	1.5'	4.5'	27'
54"	57	50	67	84	N/A	N/A	15'	1.5'	4.5'	29'
60"	74	63	90	113	N/A	N/A	16.5'	1.5'	6'	33'
66"	75	67	N/A	N/A	N/A	N/A	16.5'	1.5'	6'	33'
72"	77	70	92	114	N/A	N/A	16.5'	1.5'	6'	34'

NOTES:

REPP = ROLLED EROSION PREVENTION PRODUCT.

AREA SHOWN IN SQUARE YARDS IS FOR ONE CULVERT END.

QUANTITIES ARE CALCULATED TO INCLUDE SOD REQUIRED TO PROVIDE A 3" OVERLAP ON ALL 18" WIDE ROLLS. THIS ALLOWS FOR SHRINKAGE OF THE SOD.

FOR PIPE ARCHES USE EQUIVALENT PIPE DIAMETER TO APPROXIMATE AREA.

FOR CORRUGATED POLYETHYLENE PIPE METAL APRON (PLATE 3129), USE THE METAL APRON COLUMN (PLATE 3123).

AREAS AND DIMENSIONS ARE APPROXIMATE AND ARE BASED ON APRON SIDE SLOPES OF NO STEEPER THAN 1:2, UNLESS INDICATED AS FOR SAFETY APRONS.

CARE SHOULD BE TAKEN IN SELECTING SOD TO STABILIZE THE APRON. RIP-RAP SHOULD BE USED FOR FLOW VELOCITIES GREATER THAN 6 FPS.

① ADDITIONAL QUANTITIES MAY BE SHOWN IN THE PLAN OR REQUIRED BY THE ENGINEER.
② FOR ARCH PIPE USE CLOSEST CIRCULAR PIPE DIAMETER AND APRON SLOPE. DIAMETERS LARGER THAN 72" REQUIRE SPECIAL DESIGNS.

REVISION:
APPROVED: JANUARY 8, 2020
MARNE KARNOWSKI
CHIEF ENVIRONMENTAL OFFICER

MINNESOTA DEPARTMENT OF TRANSPORTATION

STANDARD PLAN 5-297.404 | 2 OF 3

APPROVED: 1-8-2020
REVISED:

THOMAS STYRBICKI
STATE DESIGN ENGINEER

PERMANENT EROSION CONTROL

TURF ESTABLISHMENT DETAIL AT CULVERT ENDS

STATE PROJ. NO. (T.H.) SHEET NO. OF SHEETS

NO	DATE	BY	CKD	APPR

H:\PROJECTS\16000\16750\TECHDATA\CADDESIGN\L3-PLANSHEETS\16750_SPN01.DWG: SPN01-12

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.
Print Name: MARTIN JOYCE
Date --/--/-- License # 58920

DRAWN BY HLB
DESIGNED BY MMJ
CHECKED BY MMJ
COMM. NO. 16750

SRF

CITY OF ARDEN HILLS
MNDOT STANDARD PLANS
OLD HIGHWAY 10 TRAIL

SHEET 17 OF 110

PLOTTED/REVISED: 24-JAN-2020
PLOT NAME: s404_2_spn
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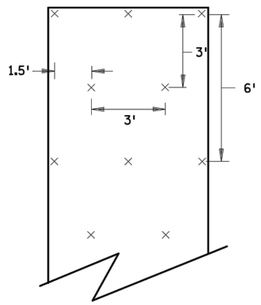
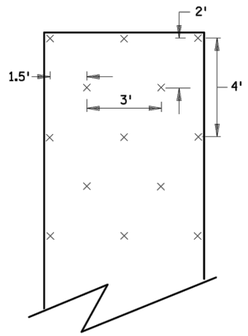
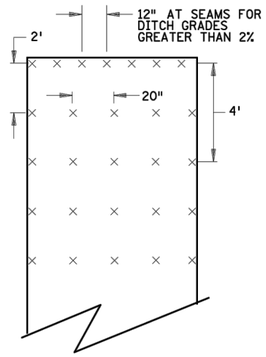


SLOPES FLATTER THAN 1:2
120 STAPLES PER 100 SQ YD

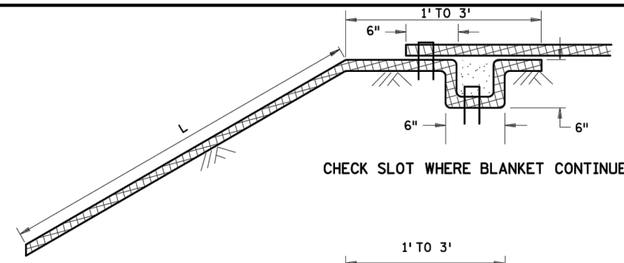


SLOPES 1:2 TO 1:1
170 STAPLES PER 100 SQ YD

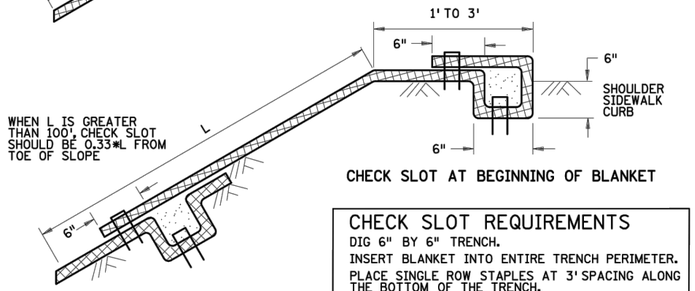


CHANNEL AND DITCH APPLICATIONS
350 STAPLES PER 100 SQ YD

BLANKET STAPLE PATTERN



CHECK SLOT WHERE BLANKET CONTINUES



CHECK SLOT AT BEGINNING OF BLANKET

CHECK SLOT REQUIREMENTS

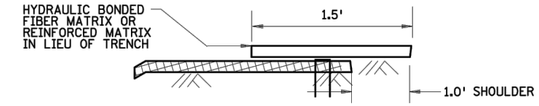
DIG 6" BY 6" TRENCH.

INSERT BLANKET INTO ENTIRE TRENCH PERIMETER.

PLACE SINGLE ROW STAPLES AT 3' SPACING ALONG THE BOTTOM OF THE TRENCH.

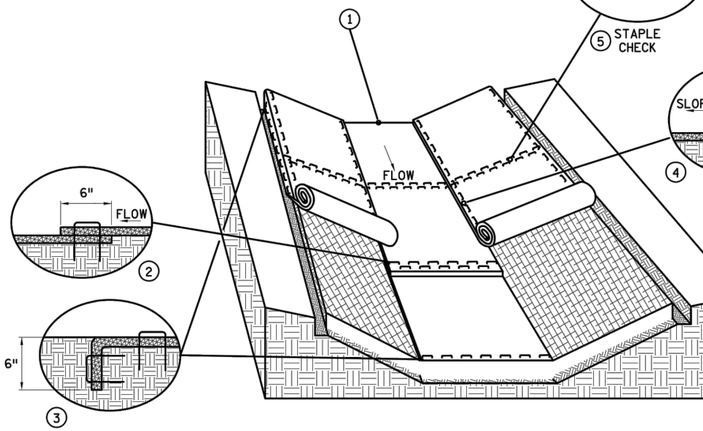
BACKFILL TRENCH WITH SOIL AND TAMP.

PLACE SINGLE ROW STAPLES AT 3' SPACING ON OVERLAP.

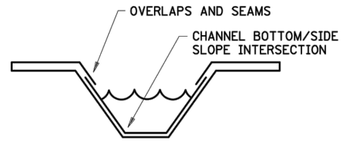


CHECK SLOT ALTERNATIVE
PLACE SINGLE ROW STAPLES AT 12" SPACING

CHECK SLOT DETAILS



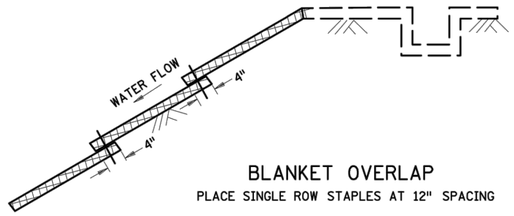
DITCH BLANKET STAPLE DETAIL



DITCH BLANKET CRITICAL POINTS (7)

NOTES:

1. USE CHECK SLOT DETAIL (NO ALTERNATES).
2. PLACE DOUBLE ROW OF STAPLES STAGGERED 4" APART AND 4" ON CENTER.
3. USE 6" X 6" TRENCH TO PLACE BLANKET. PLACE SINGLE ROW OF STAPLES ON TOP AND TRENCH SIDES AT 12" SPACING. BACKFILL TRENCH WITH SOIL AND TAMP.
4. PLACE SINGLE ROW OF STAPLES AT 12" SPACING.
5. USE STAPLE CHECK FOR CHANNEL SLOPES LESS THAN 2.5%. GRADE AT 100' INTERVALS. PLACE DOUBLE ROW OF STAPLES STAGGERED 4" APART AND AT 4" SPACING.
6. USE BLANKET CHECKS FOR THE FOLLOWING SLOPES:
   2.5%-3% 100' INTERVALS
   3%-5% 50' INTERVALS
   5%-7% 25' INTERVALS
7. CRITICAL POINTS SHALL BE SECURED WITH PROPER STAPLE PATTERNS.



BLANKET OVERLAP
PLACE SINGLE ROW STAPLES AT 12" SPACING

GENERAL BLANKET INSTALLATION REQUIREMENTS

REPP = ROLLED EROSION PREVENTION PRODUCT.

PREPARE SOIL AS PER SPECIFICATION 2574.

LAY PARALLEL OR PERPENDICULAR TO THE DIRECTION OF WATER FLOW.

OVERLAP ADJACENT STRIP EDGES A MINIMUM OF 4".

OVERLAP BLANKET 6" (MINIMUM) AT EACH END. OVERLAP BOTTOM END OF UPPER BLANKET OVER TOP END OF LOWER BLANKET. STAPLE ALONG OVERLAP EVERY 1.5'.

THE UPPERMOST BLANKET OF ALL SLOPE APPLICATIONS MUST START IN A CHECK SLOT. IF SLOPE LENGTH (L) IS 100' OR GREATER, INSERT BLANKET INTO A CHECK SLOT ½ FROM THE BOTTOM OF THE SLOPE.

REVISION:

APPROVED: JANUARY 8, 2020
MARNE KARNOWSKI
CHIEF ENVIRONMENTAL OFFICER

MINNESOTA DEPARTMENT OF TRANSPORTATION

STANDARD PLAN 5-297.404 | 3 OF 3

APPROVED: 1-8-2020
REVISED:

THOMAS STYRBICKI
STATE DESIGN ENGINEER

STATE PROJ. NO. (T.H.) SHEET NO. OF SHEETS

PERMANENT EROSION CONTROL

REPP (BLANKET) STAPLE PATTERN FOR SLOPES

NO	DATE	BY	CKD	APPR

H:\PROJECTS\16000\16750\TECHDATA\CADDESIGN\L3-PLANSHEETS\16750_SPN01.DWG: SPN01-13

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.
Print Name: MARTIN JOYCE
Date --/--/-- License # 58920

DRAWN BY HLB
DESIGNED BY MMJ
CHECKED BY MMJ
COMM. NO. 16750

SRF

CITY OF ARDEN HILLS
MNDOT STANDARD PLANS
OLD HIGHWAY 10 TRAIL

SHEET 18 OF 110

PLOTTED/REVISED: 24-JAN-2020
PLOT NAME: s404_3_spn
PATH & FILENAME: OTS\DesignStandards\Development\StandardPlansDEV\400_Series\s404_3_spn.dgn
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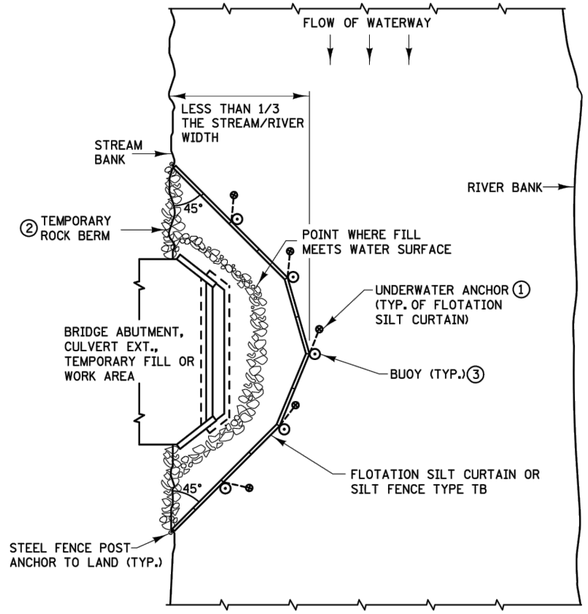
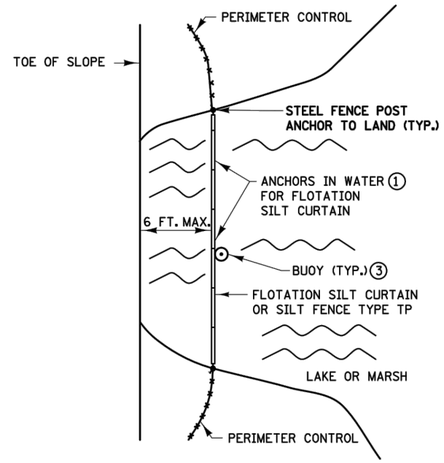
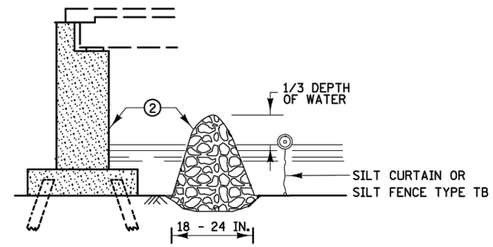


PLAN VIEW FOR STREAM ⑤



PLAN VIEW FOR LAKE OR MARSH ⑤

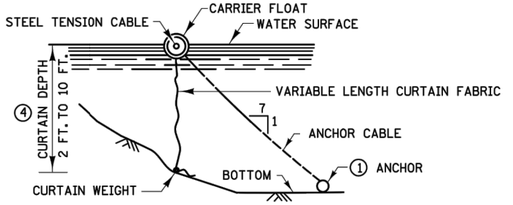


TEMPORARY ROCK BERM
FOR SEDIMENT CONTROL

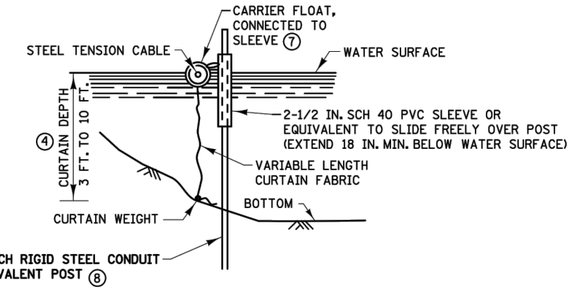
INSTALLATION GUIDELINES
SILT FENCE TYPE TB
MINIMUM WATER DEPTH: 1 FT.
MAXIMUM WATER DEPTH: 3 FT.
MAXIMUM WATER VELOCITY: 5 FT./SEC.

INSTALLATION GUIDELINES ④
FLOTATION SILT CURTAIN
TYPE: STILL WATER
MINIMUM WATER DEPTH: 3 FT.
MAXIMUM WATER DEPTH: 10 FT.
MAXIMUM WATER VELOCITY: 2 FT./SEC.
MAXIMUM WAVE HEIGHT: 1 FT

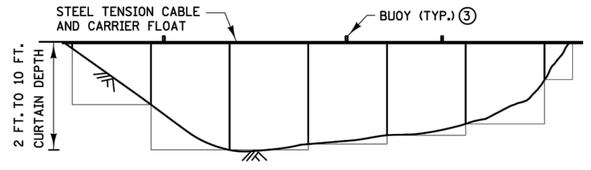
INSTALLATION GUIDELINES ④
FLOTATION SILT CURTAIN
TYPE: MOVING WATER
MINIMUM WATER DEPTH: 3 FT.
MAXIMUM WATER DEPTH: 10 FT.
MAXIMUM WATER VELOCITY: 5 FT./SEC.
MAXIMUM WAVE HEIGHT: 2 FT.



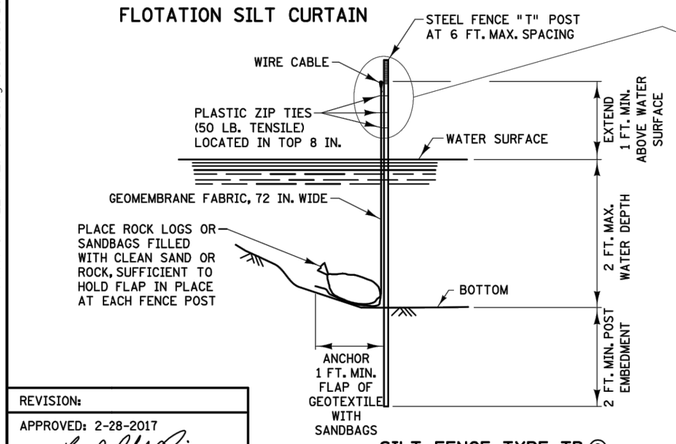
FLOTATION SILT CURTAIN



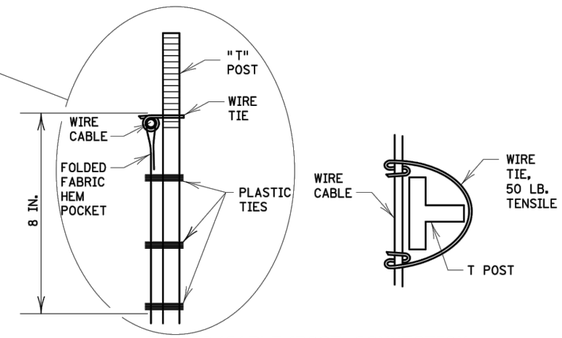
ALTERNATE FLOTATION SILT CURTAIN



FRONT VIEW FOR FLOTATION SILT CURTAIN



SILT FENCE TYPE TB ⑥



FABRIC/CABLE/POST CONNECTION

NOTES:

SEE SPECS. 2573, 3886, 3887 & 3893.

① FOR ANCHOR SPACING AND WEIGHT REQUIREMENTS, SEE SPEC. 2573.

② IN AREAS WHERE THE PLAN CALLS FOR RIPRAP AT A BRIDGE, CULVERT, OR SLOPE, A TEMPORARY ROCK BERM CONSTRUCTED FROM THE RIPRAP CAN BE USED TO PROVIDE ADDITIONAL PROTECTION. WHEN THE WORK IS COMPLETE THE RIPRAP CAN THEN BE MOVED TO THE PERMANENT LOCATION INDICATED IN THE PLANS. THE TEMPORARY ROCK BERM IS INCIDENTAL.

③ ON U.S. COAST GUARD OR OTHER MOTORIZED WATERWAYS, BUOYS ARE REQUIRED TO MARK THE ENDS AND SPECIAL AREAS FOR VISIBILITY. PLACE BUOYS AS REQUIRED FOR NAVIGATIONAL PURPOSES.

④ MINIMUM WATER DEPTH APPLIES TO THE DEEPEST POINT ALONG THE FLOTATION SILT CURTAIN OR SILT FENCE TYPE TB FOR DETERMINING APPLICABILITY OF FLOTATION SILT CURTAIN OR SILT FENCE TYPE TB.

⑤ SILT CURTAIN SHOULD BE REMOVED WHEN THE AREA CONTRIBUTING DIRECT RUNOFF HAS BEEN TEMPORARILY OR PERMANENTLY STABILIZED. SILT CURTAIN SHOULD ALSO BE REMOVED BEFORE WINTER IF ICE UP OR ICE FLOW IS ANTICIPATED.

⑥ EMBED POST INTO BOTTOM A MINIMUM OF 40% OF THE WATER DEPTH (INCLUDING WAVE HEIGHT), BUT IN NO CASE SHALL EMBEDMENT BE LESS THAN 2 FEET.

⑦ ANCHOR FLOAT MUST BE CONNECTED SECURELY TO SLEEVE WITH A MINIMUM TENSILE STRENGTH OF 100 LBS. CONNECTION METHOD MUST ALLOW FOR SLEEVE TO MOVE FREELY ON POST.

⑧ PROVIDE SUFFICIENT NUMBER OF POST ANCHORS TO MAINTAIN SILT CURTAIN POSITION.

REVISION:
APPROVED: 2-28-2017
CHIEF ENVIRONMENTAL OFFICER

MINNESOTA DEPARTMENT OF TRANSPORTATION

STANDARD PLAN 5-297.405 | 1 OF 8

APPROVED: 2-28-2017
REVISED:
STATE DESIGN ENGINEER

STATE PROJ. NO. (T.H.) SHEET NO. OF SHEETS

TEMPORARY SEDIMENT CONTROL
SILT CURTAIN OR SILT FENCE TYPE TB

NO	DATE	BY	CKD	APPR

H:\PROJECTS\16000\16750\TECHDATA\CADDESIGN\L3-PLANSHEETS\16750_SPN01.DWG: SPN01-14

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.
Print Name: MARTIN JOYCE
Date --/--/-- License # 58920

DRAWN BY HLB
DESIGNED BY MMJ
CHECKED BY MMJ
COMM. NO. 16750

SRF

CITY OF ARDEN HILLS
MNDOT STANDARD PLANS
OLD HIGHWAY 10 TRAIL

SHEET 19 OF 110

PLOTTED/REVISED: 4-APR-2018
IPLOT NAME: s405_l_spn
PATH & FILENAME: OTS\DesignStandards\Development\New Border\400_Series\405_l_spn.dgn
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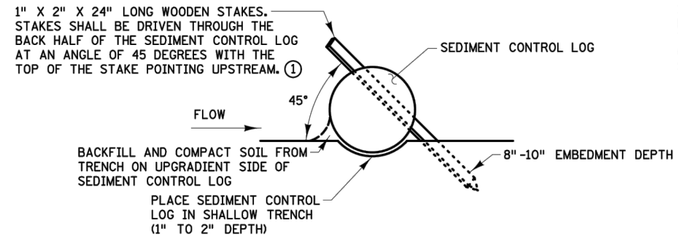
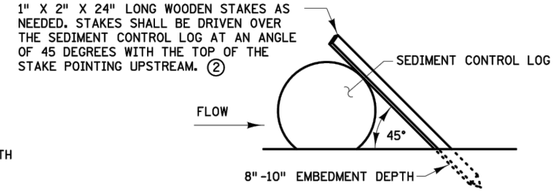
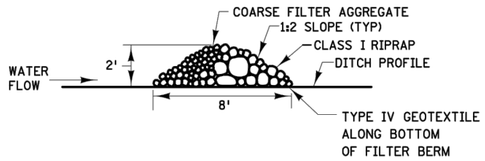


TYPES: STRAW, WOOD FIBER, OR COIR

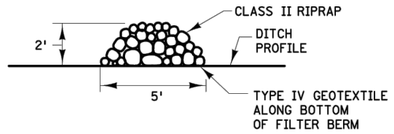


TYPES: WOOD CHIP, COMPOST, OR ROCK

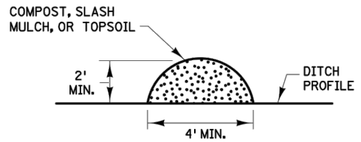
SEDIMENT CONTROL LOGS



TYPE 3 (ROCK WEEPER)

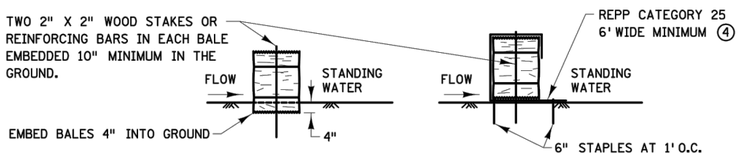


TYPE 5 (ROCK)



TYPE 1 (COMPOST), TYPE 2 (SLASH MULCH), OR TYPE 4 (TOPSOIL)

FILTER BERMS



EMBEDMENT METHOD

REPP (BLANKET) METHOD (ALTERNATE)

BALE BARRIERS (3)

NOTES:

REPP = ROLLED EROSION PREVENTION PRODUCT.

SEE SPECS. 2573, 3149, 3874, 3882, 3885, 3886, AND 3897.

(1) SPACE BETWEEN STAKES SHALL BE A MAXIMUM OF 1' FOR DITCH CHECKS OR 2' FOR OTHER APPLICATIONS.

(2) PLACE STAKES AS NEEDED TO PREVENT MOVEMENT OF SEDIMENT CONTROL LOGS PLACED ON SLOPES OR AS NEEDED DUE TO OTHER FACTORS. STAKES SHALL BE INCIDENTAL.

(3) TO BE USED FOR CRITICAL PERIMETER CONTROL AREAS WHERE STANDING WATER OCCURS (6" MAXIMUM DEPTH). BALES SHALL CONSIST OF TYPE 1 MULCH OF APPROXIMATELY 14" X 18" X 36" LONG. BALES SHALL BE PLACED ON EDGE AND BUTTED TIGHT TO ADJACENT BALES.

(4) INSTEAD OF TRENCHING, PLACE BALE ON THE REPP (BLANKET) AND WRAP BLANKET AROUND THE BALE. PLACE STAKE THROUGH BALE AND BLANKET.

REVISION:

APPROVED: JANUARY 8, 2020
MARNE KARNOWSKI
CHIEF ENVIRONMENTAL OFFICER

MINNESOTA DEPARTMENT OF TRANSPORTATION

STANDARD PLAN 5-297.405 | 2 OF 8

APPROVED: 1-8-2020
REVISED:
THOMAS STYBRICKI
STATE DESIGN ENGINEER

TEMPORARY SEDIMENT CONTROL

FILTER BERMS, SEDIMENT CONTROL LOGS, AND BALE BARRIERS

STATE PROJ. NO. (T.H.) SHEET NO. OF SHEETS

NO	DATE	BY	CKD	APPR

H:\PROJECTS\16000\16750\TECHDATA\CADDESIGN\L3-PLANSHEETS\16750_SPN01.DWG: SPN01-15

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.
Print Name: MARTIN JOYCE
Date --/--/-- License # 58920

DRAWN BY HLB
DESIGNED BY MMJ
CHECKED BY MMJ
COMM. NO. 16750

SRF

CITY OF ARDEN HILLS
MNDOT STANDARD PLANS
OLD HIGHWAY 10 TRAIL

SHEET 20 OF 110

PLOTTED/REVISED: 24-JAN-2020
IPLOT NAME: s405_2_spn
PATH & FILENAME: OTS\DesignStandards\Development\StandardPlansDEV\400_Series\s405_2_spn.dgn
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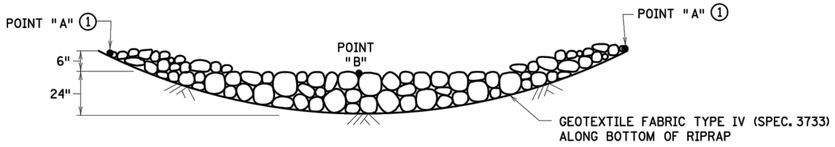
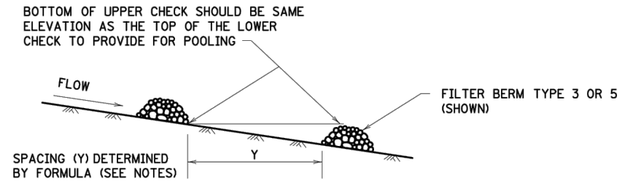
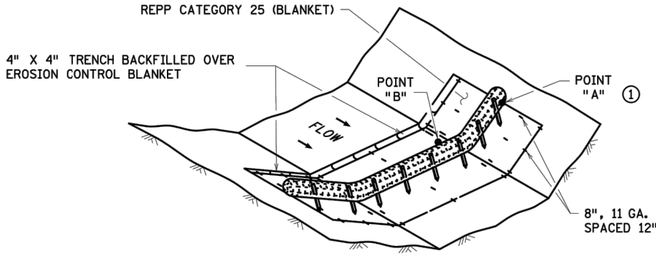
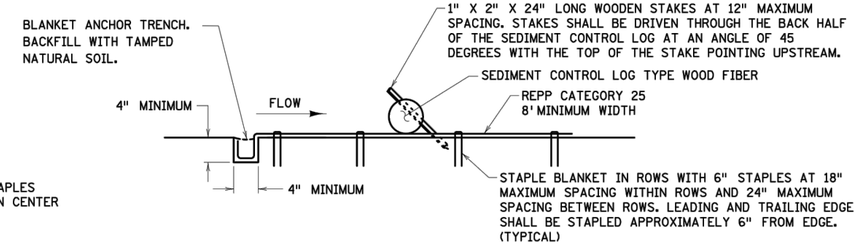


ROCK DITCH CHECKS
FILTER BERMS TYPE 3 (ROCK WEEPER) OR FILTER TYPE 5 (ROCK) ③
FOR USE ON ROUGH-GRADED AREAS
ONLY FOR USE OUTSIDE CLEAR ZONE ②

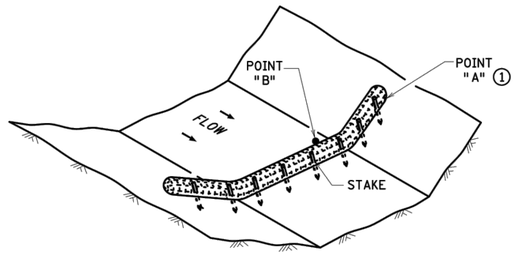


DITCH CHECK SPACING
FOR ALL FILTER BERM TYPES





SEDIMENT CONTROL LOG TYPE REPP (BLANKET) SYSTEM ④



SEDIMENT CONTROL LOG TYPE WOOD FIBER, OR TYPE COMPOST ⑤
FOR USE ON ROUGH GRADED AREAS

NOTES:

REPP = ROLLED EROSION PREVENTION PRODUCT.

SEE SPECS. 2573, 3601, 3733, 3885, 3886 & 3889.

FOR DITCH CHECKS, PLACE SEDIMENT CONTROL LOG PERPENDICULAR TO FLOW AND IN A CRESCENT SHAPE WITH THE ENDS FACING UPSTREAM.

APPROXIMATE SPACING BETWEEN EACH DITCH CHECK SHOULD BE DETERMINED FROM THE FOLLOWING SPACING FORMULA:

APPROXIMATE SPACING OF DITCH CHECKS (FT.) = Y = $\frac{\text{DITCH CHECK HEIGHT (FT.)}}{\text{\% CHANNEL SLOPE}}$ X 100

① POINT "A" MUST BE A MINIMUM OF 6" HIGHER THAN POINT "B" TO ENSURE THAT WATER FLOWS OVER THE DIKE AND NOT AROUND THE ENDS.

② ROCK DITCH CHECKS PLACED WITHIN THE CLEAR ZONE ARE TO BE 18" OR LESS IN HEIGHT. A 1:6 APPROACH AND DEPARTURE SLOPE SHALL BE PROVIDED.

③ DITCH GRADE 3% - 5%, MAX. FLOW VELOCITY 12 FT./SEC.

④ DITCH GRADE 1.5% - 3%, MAX. FLOW VELOCITY 4.5 FT./SEC.

⑤ DITCH GRADE 1.5% - 3%, MAX. FLOW VELOCITY 1.5 FT./SEC.

REVISION:

APPROVED: JANUARY 8, 2020
MARNI KARNOWSKI
CHIEF ENVIRONMENTAL OFFICER

MINNESOTA DEPARTMENT OF TRANSPORTATION

STANDARD PLAN 5-297.405 | 3 OF 8

APPROVED: 1-8-2020
REVISED:
THOMAS STYBRICKI
STATE DESIGN ENGINEER

TEMPORARY SEDIMENT CONTROL
DITCH CHECK

STATE PROJ. NO. (T.H.) SHEET NO. OF SHEETS

NO	DATE	BY	CKD	APPR

H:\PROJECTS\16000\16750\TECHDATA\CADDESIGN\L3-PLANSHEETS\16750_SPN01.DWG: SPN01-16

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.
Print Name: MARTIN JOYCE
Date --/--/-- License # 58920

DRAWN BY HLB
DESIGNED BY MMJ
CHECKED BY MMJ
COMM. NO. 16750

SRF

CITY OF ARDEN HILLS
MNDOT STANDARD PLANS
OLD HIGHWAY 10 TRAIL

SHEET 21 OF 110

PLOTTED/REVISED: 24-JAN-2020
IPLOT NAME: s405_3_spn
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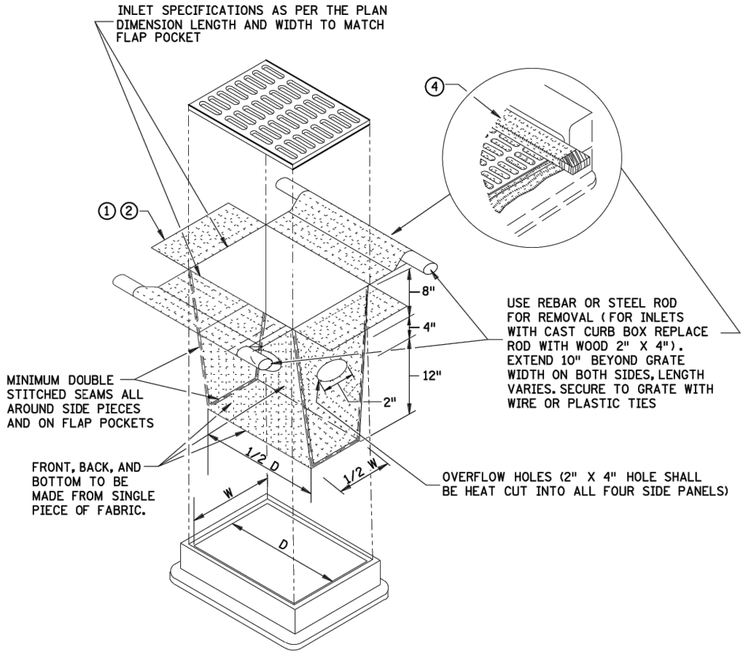
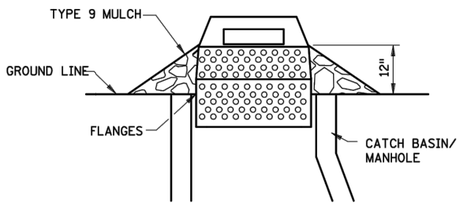


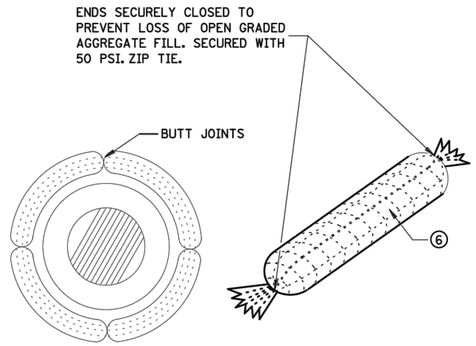
FILTER BAG INSERT ③

(CAN BE INSTALLED IN ANY INLET TYPE WITH OR WITHOUT A CURB BOX)

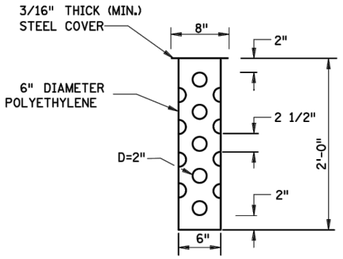


SEDIMENT CONTROL INLET HAT

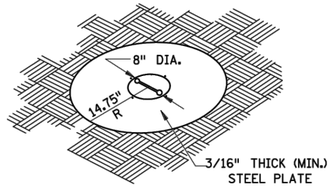
NOTE:
THE SEDIMENT CONTROL BARRIER SHALL BE A METAL OR PLASTIC/POLYETHYLENE RISER SIZED TO FIT INSIDE THE CATCH BASIN/MANHOLE; HAVE PERFORATIONS TO ALLOW FOR WATER INFILTRATION; HAVE AN OVERFLOW OPENING, FLANGES AND A LID/COVER.



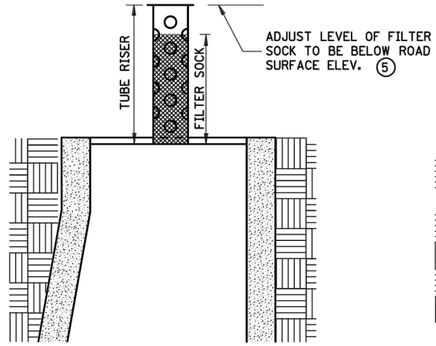
ROCK LOG/COMPOST LOG



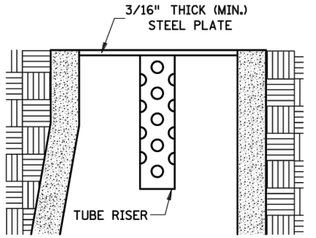
TUBE RISER



PERSPECTIVE VIEW



SECTION (UP POSITION)



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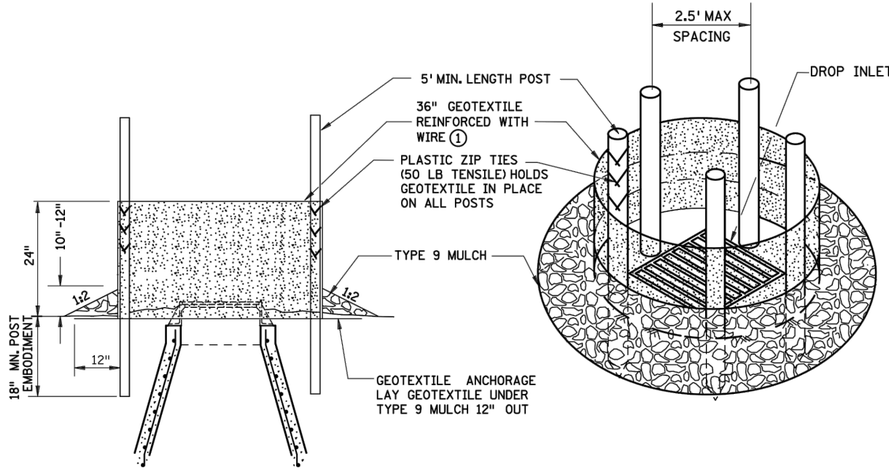

SILT FENCE RING AND ROCK FILTER BERM

USE WHERE INLET DRAINS IN AN AREA WITH SLOPES AT 1:3 or LESS

POP-UP HEAD

NOTES:

SEE SPECS. 2573, 3137, & 3886.

DEVICES MUST BE ADJUSTED ACCORDINGLY AS TO NOT CAUSE FLOODING ON ROADWAY THAT WOULD IMPEED TRAFFIC FLOW.

① ALL GEOTEXTILE USED FOR INLET PROTECTION SHALL BE MONOFILAMENT IN BOTH DIRECTIONS, MEETING SPEC. 3886.

② FINISHED SIZE, INCLUDING POCKETS WHERE REQUIRED SHALL EXTEND A MINIMUM OF 10 INCHES AROUND THE PERIMETER TO FACILITATE MAINTENANCE OR REMOVAL.

③ INSTALLATION NOTES:
DO NOT PLACE FILTER BAG INSERT IN INLETS SHALLOWER THAN 30 INCHES, MEASURED FROM THE BOTTOM OF THE INLET TO THE TOP OF THE GRATE. THE PLACED BAG SHALL HAVE A MINIMUM SIDE CLEARANCE OF 3 INCHES BETWEEN THE INLET WALLS AND THE BAG, MEASURED AT THE BOTTOM OF THE OVERFLOW HOLES. WHERE NECESSARY THE CONTRACTOR SHALL CLINCH THE BAG, USING PLASTIC ZIP TIES, TO ACHIEVE THE 3 INCH SIDE CLEARANCE.

④ FLAP POCKETS SHALL BE LARGE ENOUGH TO ACCEPT WOOD 2 INCH X 4 INCH OR USE A ROCK SOCK OR SAND BAGS IN PLACE OF THE FLAP POCKETS.

⑤ SOCK HEIGHT MUST NOT BE SO HIGH AS TO SLOW DOWN WATER FILTRATION TO CAUSE FLOODING OF THE ROADWAY.

⑥ GEOTEXTILE SOCK BETWEEN 4-10 FEET LONG AND 4-6 INCH DIAMETER. SEAM TO BE JOINED BY TWO ROWS OF STITCHING WITH A PLASTIC MESH BACKING OR PROVIDE A HEAT BONDED SEAM (OR APPROVED EQUIVALENT). FILL ROCK LOG WITH OPEN GRADED AGGREGATE CONSISTING OF SOUND DURABLE PARTICLES OF COARSE AGGREGATE CONFORMING TO SPEC. 3137 TABLE 3137-1; CA-3 GRADATION.

REVISION:

APPROVED: 2-28-2017
CHIEF ENVIRONMENTAL OFFICER

MINNESOTA DEPARTMENT OF TRANSPORTATION

STANDARD PLAN 5-297.405 | 4 OF 8

APPROVED: 2-28-2017
REVISED:
STATE DESIGN ENGINEER

STATE PROJ. NO. (T.H.) SHEET NO. OF SHEETS

TEMPORARY SEDIMENT CONTROL
STORM DRAIN INLET PROTECTION

NO	DATE	BY	CKD	APPR

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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.
Print Name: MARTIN JOYCE
Date --/--/-- License # 58920

DRAWN BY HLB
DESIGNED BY MMJ
CHECKED BY MMJ
COMM. NO. 16750

SRF

CITY OF ARDEN HILLS
MNDOT STANDARD PLANS
OLD HIGHWAY 10 TRAIL

SHEET 22 OF 110

PLOTTED/REVISED: 4-APR-2018
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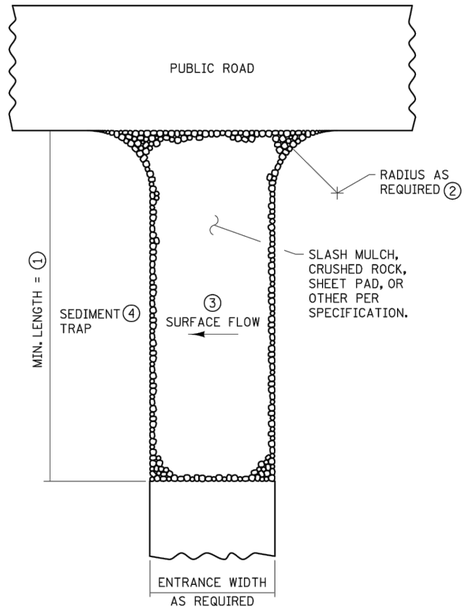
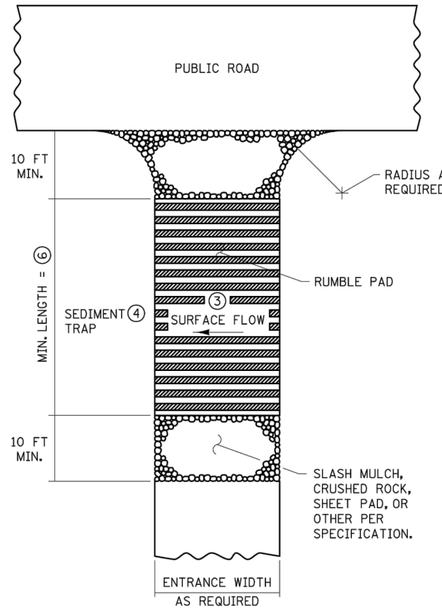
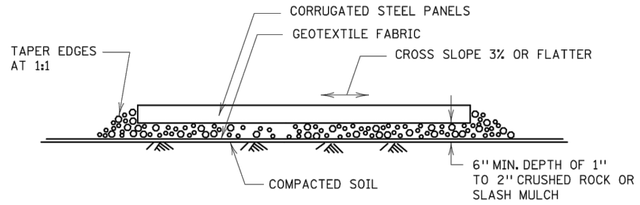


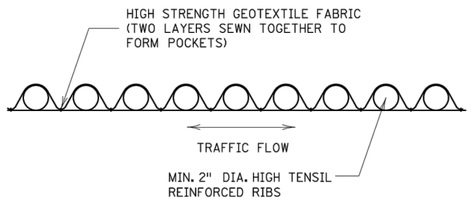
SLASH MULCH, CRUSHED ROCK, OR SHEET PAD CONSTRUCTION EXIT ⑤⑦



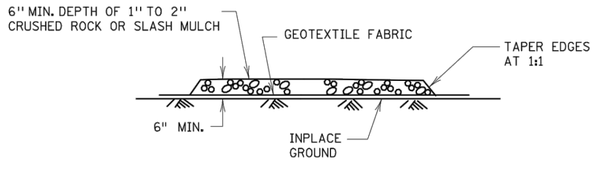
RUMBLE PAD CONSTRUCTION EXIT ⑤⑦



RUMBLE PAD



SHEET PAD



SLASH MULCH OR CRUSHED ROCK

NOTES:

SEE SPECS. 2573 & 3882.

(1) MINIMUM LENGTH SHALL BE THE GREATER OF 50 FEET OR A LENGTH SUFFICIENT TO ALLOW A MINIMUM OF 5 TIRE ROTATIONS ON THE PROVIDED PAD. MINIMUM LENGTH SHALL BE CALCULATED USING THE LARGEST TIRE WHICH WILL BE USED IN TYPICAL OPERATIONS.

(2) PROVIDE RADIUS OR WIDEN PAD SUFFICIENTLY TO PREVENT VEHICLE TIRES FROM TRACKING OFF OF PAD WHEN LEAVING SITE.

(3) IF RUNOFF FROM DISTURBED AREAS FLOWS TOWARD CONSTRUCTION EXITS, PREVENT RUNOFF FROM DRAINING DIRECTLY TO PUBLIC ROAD OVER CONSTRUCTION EXIT BY CROWNING THE EXIT OR SLOPING TO ONE SIDE. IF SURFACE GRADING IS INSUFFICIENT, PROVIDE OTHER MEANS OF INTERCEPTING RUNOFF.

(4) IF RUNOFF FROM CONSTRUCTION EXITS WILL DRAIN OFF OF PROJECT SITE, PROVIDE SEDIMENT TRAP WITH STABILIZED OVERFLOW.

(5) IF A TIRE WASH OFF IS REQUIRED THE CONSTRUCTION EXITS SHALL BE GRADED TO DRAIN THE WASH WATER TO A SEDIMENT TRAP.

(6) MINIMUM LENGTH OF RUMBLE PAD SHALL BE 20 FEET, OR AS REQUIRED TO REMOVE SEDIMENT FROM TIRES. IF SIGNIFICANT SEDIMENT IS TRACKED FROM THE SITE, THE RUMBLE PAD SHALL BE LENGTHENED OR THE DESIGN MODIFIED TO PROVIDE ADDITIONAL VIBRATION. WASH-OFF LENGTH SHALL BE AS REQUIRED TO EFFECTIVELY REMOVE CONSTRUCTION SEDIMENT FROM VEHICLE TIRES.

(7) MAINTENANCE OF CONSTRUCTION EXITS SHALL OCCUR WHEN THE EFFECTIVENESS OF SEDIMENT REMOVAL HAS BEEN REDUCED. MAINTENANCE SHALL CONSIST OF REMOVING SEDIMENT AND CLEANING THE MATERIALS OR PLACING ADDITIONAL MATERIAL (SLASH MULCH OR CRUSHED ROCK) OVER SEDIMENT FILLED MATERIAL TO RESTORE EFFECTIVENESS.

REVISION:

APPROVED: 2-28-2017

MINNESOTA DEPARTMENT OF TRANSPORTATION

STANDARD PLAN 5-297.405 | 5 OF 8

APPROVED: 2-28-2017

REVISED:

STATE PROJ. NO. (T.H.) SHEET NO. OF SHEETS

TEMPORARY SEDIMENT CONTROL

STABILIZED CONSTRUCTION EXIT

NO	DATE	BY	CKD	APPR

H:\PROJECTS\16000\16750\TECHDATA\CADDESIGN\L3-PLANSHEETS\16750_SPN01.DWG: SPN01-18

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.

Print Name: MARTIN JOYCE

Date --/--/-- License # 58920

DRAWN BY HLB

DESIGNED BY MMJ

CHECKED BY MMJ

COMM. NO. 16750

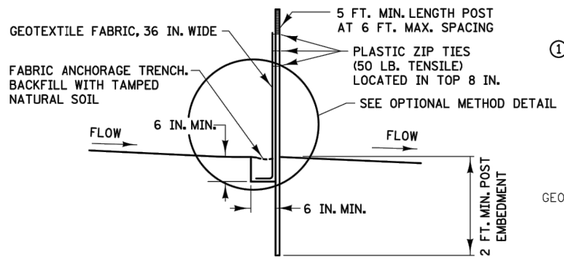
SRF

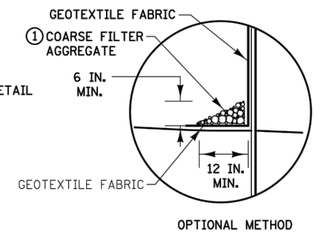
CITY OF ARDEN HILLS

MNDOT STANDARD PLANS

OLD HIGHWAY 10 TRAIL

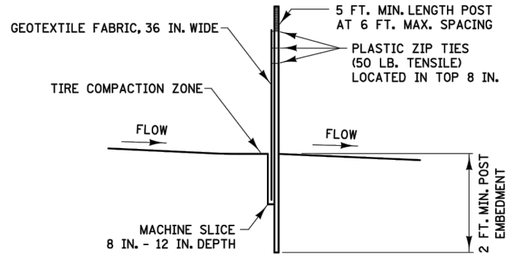
SHEET 23 OF 110



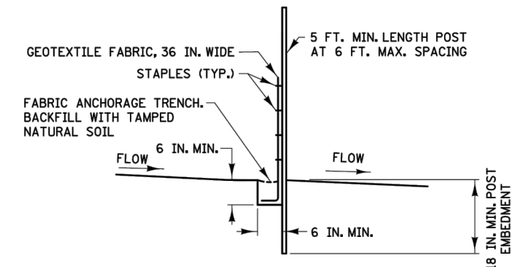


OPTIONAL METHOD

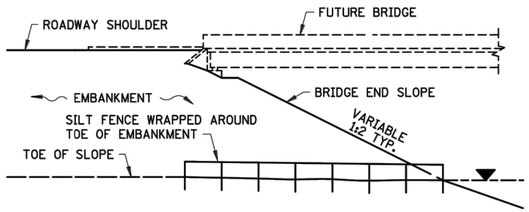
SILT FENCE TYPE HI ②
(HAND INSTALLED)



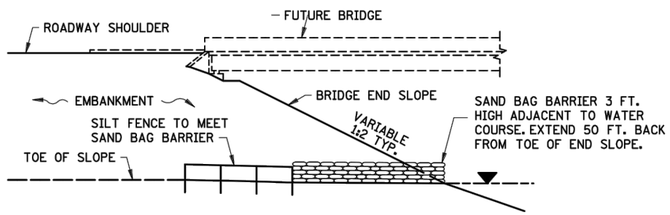
SILT FENCE TYPE MS ②
(MACHINE SLICED)



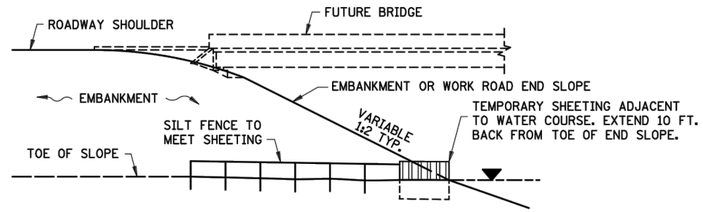
SILT FENCE TYPE PA ③
(PREASSEMBLED)



SILT FENCE ONLY ④

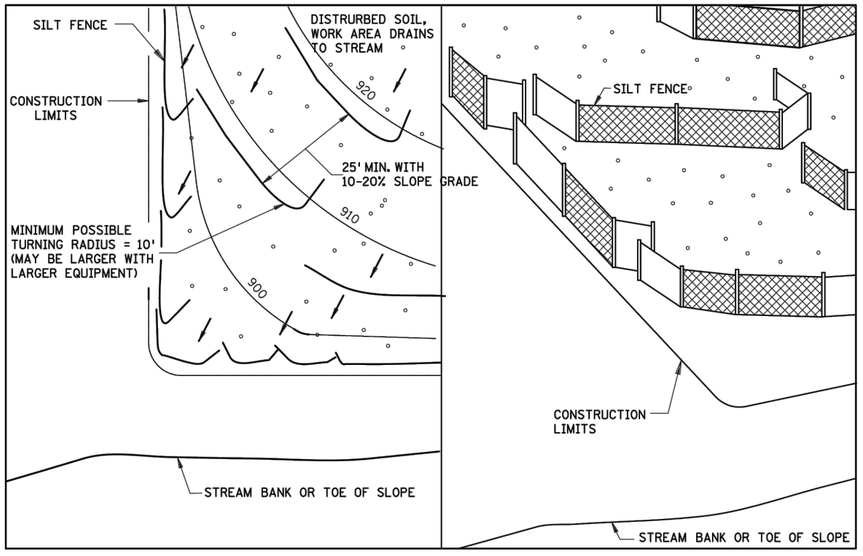


SILT FENCE WITH SAND BAGS ⑤



SILT FENCE WITH SHEETING ⑥

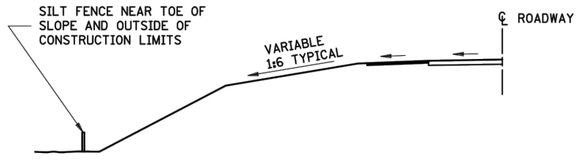
INSTALLATION AT BRIDGE EMBANKMENT ADJACENT TO WATER



PLAN VIEW

PERSPECTIVE VIEW

J-HOOK INSTALLATION



LOCATION AT TOE OF ROADWAY EMBANKMENT

NOTES:

SEE SPECS. 2573, 3149 & 3886.

① COARSE FILTER AGGREGATE (SPEC. 3149) SHALL BE INCIDENTAL.

② TO PROTECT AREAS FROM SHEET FLOW. MAXIMUM CONTRIBUTING AREA: 1 ACRE.

③ TO PROTECT AREAS FROM SHEET FLOW. MAXIMUM CONTRIBUTING AREA: 0.25 ACRE.

④ WATER COURSE FLOW VELOCITY: STANDING. CONTRIBUTING SLOPE AREA: 1./2 ACRE.

⑤ WATER COURSE FLOW VELOCITY: 1 TO 7 FT./SEC. CONTRIBUTING SLOPE AREA: 1. ACRE.

⑥ WATER COURSE FLOW VELOCITY: 8 TO 15 FT./SEC. CONTRIBUTING SLOPE AREA: 3 ACRES.

REVISION:

APPROVED: 2-28-2017

CHIEF ENVIRONMENTAL OFFICER

MINNESOTA DEPARTMENT OF TRANSPORTATION

STATE DESIGN ENGINEER

STANDARD PLAN 5-297.405 | 6 OF 8

APPROVED: 2-28-2017

REVISED:

STATE PROJ. NO. (T.H.) SHEET NO. OF SHEETS

TEMPORARY SEDIMENT CONTROL

SILT FENCE

NO	DATE	BY	CKD	APPR

H:\PROJECTS\16000\16750\TECHDATA\CADDESIGN\L3-PLANSHEETS\16750_SPN01.DWG: SPN01-19

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.

Print Name: MARTIN JOYCE

Date --/--/-- License # 58920

DRAWN BY HLB

DESIGNED BY MMJ

CHECKED BY MMJ

COMM. NO. 16750

SRF

CITY OF ARDEN HILLS

MNDOT STANDARD PLANS

OLD HIGHWAY 10 TRAIL

SHEET 24 OF 110

PLOTTED/REVISED: 4-APR-2018

PLOT NAME: s405_6_spn

PATH & FILENAME: OTS\DesignStandards\Development\New Border\400_Series\s405_6_spn.dgn

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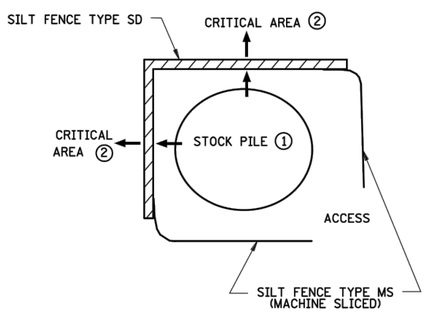
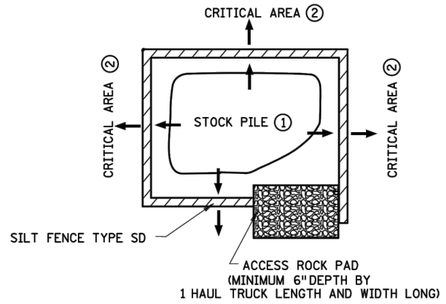
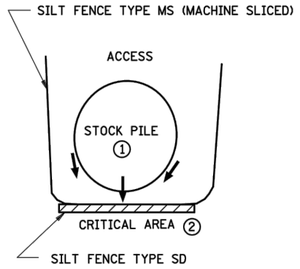
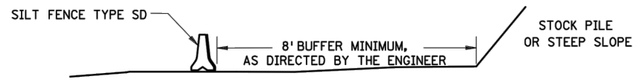


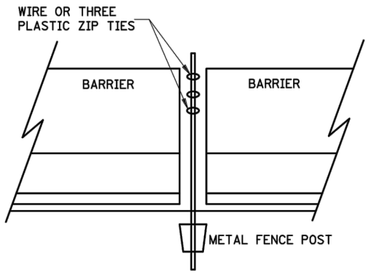




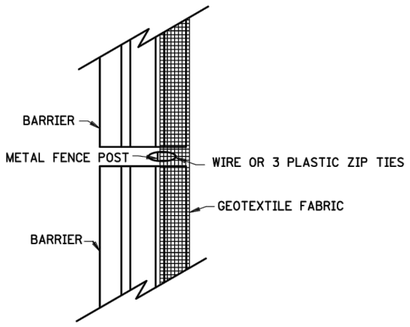
STOCK PILE CONTAINMENT



STOCKPILE SEDIMENT CONTROL

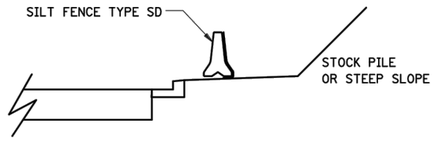


PROFILE VIEW

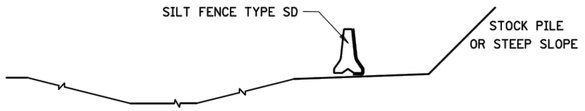


TOP VIEW

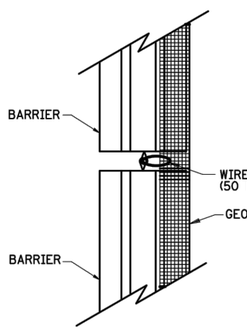
SILT FENCE TYPE SD (SUPER DUTY)
BARRIER WITHOUT LOOP BARS



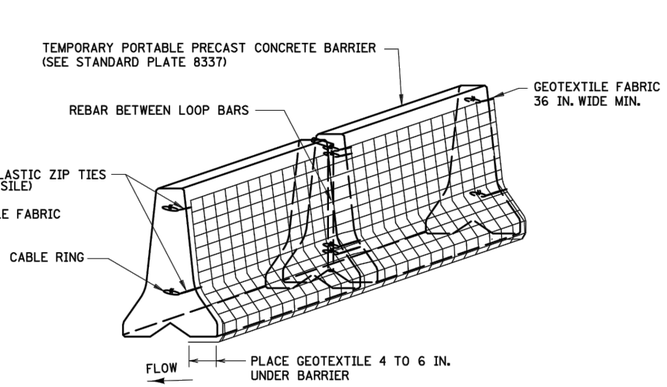
CURB AND GUTTER PROTECTION SYSTEM



DITCH PROTECTION SYSTEM



TOP VIEW



PERSPECTIVE VIEW

SILT FENCE TYPE SD (SUPER DUTY)
BARRIER WITH LOOP BARS

NOTES:

SEE SPECS. 2533, 2573 & 3886.

SILT FENCE TYPE SD USED TO PROTECT CRITICAL AREAS FROM SHEET FLOW, AND AREAS WHERE OTHER SILT FENCES CANNOT BE PLACED. MAXIMUM CONTRIBUTING AREA: 1 ACRE.

PLACE SILT FENCE TYPE SD ALONG A CONSTANT ELEVATION.

SILT FENCE TYPE SD CAN UTILIZE EITHER A CONCRETE, OR WATER FILLED, TEMPORARY MEDIAN BARRIER.

(1) PLACING STOCK PILES NEXT TO AN ENVIRONMENTALLY SENSITIVE AREA IS NOT RECOMMENDED. WHEN THERE ARE NO FEASIBLE ALTERNATIVES, PLACE SILT FENCE SD AS SHOWN OR AS DIRECTED BY THE ENGINEER.

(2) CRITICAL AREAS INCLUDE WETLANDS, JUDICIAL DITCHES, STREAMS, WATER BODIES, AND OTHER AREAS REQUIRING PROTECTION.

REVISION:

APPROVED: 2-28-2017
CHIEF ENVIRONMENTAL OFFICER

MINNESOTA DEPARTMENT OF TRANSPORTATION

STANDARD PLAN 5-297.405 | 7 OF 8

APPROVED: 2-28-2017
REVISED:
STATE DESIGN ENGINEER

STATE PROJ. NO. (T.H.) SHEET NO. OF SHEETS

TEMPORARY SEDIMENT CONTROL
SUPER DUTY SILT FENCE

NO	DATE	BY	CKD	APPR

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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.
Print Name: MARTIN JOYCE
Date --/--/-- License # 58920

DRAWN BY HLB
DESIGNED BY MMJ
CHECKED BY MMJ
COMM. NO. 16750

SRF

CITY OF ARDEN HILLS
MNDOT STANDARD PLANS
OLD HIGHWAY 10 TRAIL

SHEET 25 OF 110

PLOTTED/REVISED: 4-APR-2018
PLOT NAME: s405_7_spn
PATH & FILENAME: OTS\DesignStandards\Development\New Border\400_Series\s405_7_spn.dgn
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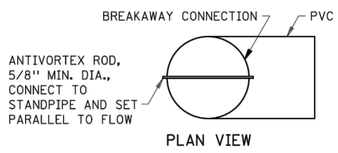
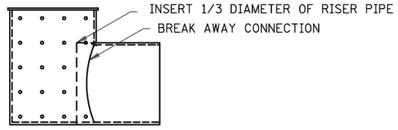
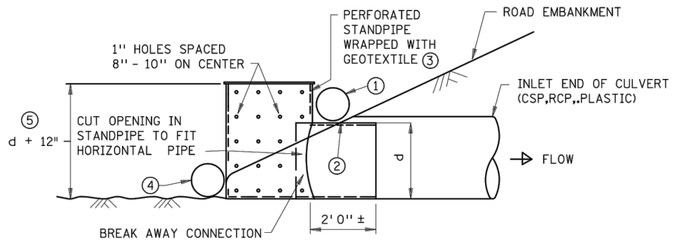


PLAN VIEW



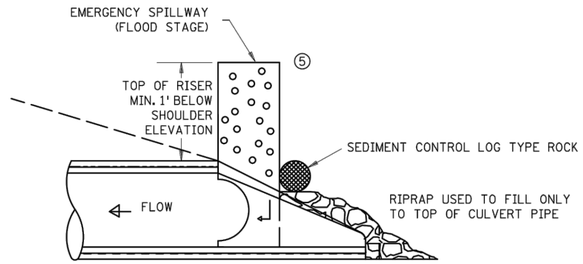
CULVERT STANDPIPE



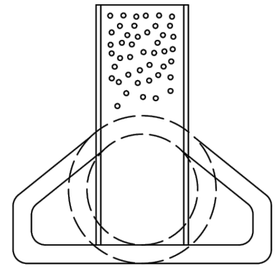
ELEVATION VIEW OF CULVERT INSTALLATION

CULVERT STANDPIPE INSERT (D-RISER)

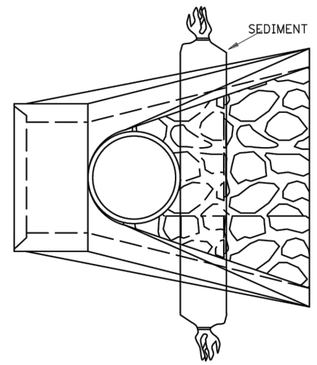
d= CULVERT SIZE: 12" - 36"



LONGITUDINAL SECTION



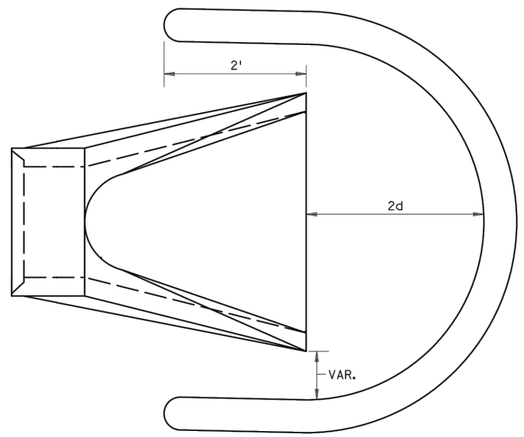
END VIEW



NOTE: SEDIMENT CONTROL LOG TYPE ROCK MAY BE WRAPPED AROUND RISER

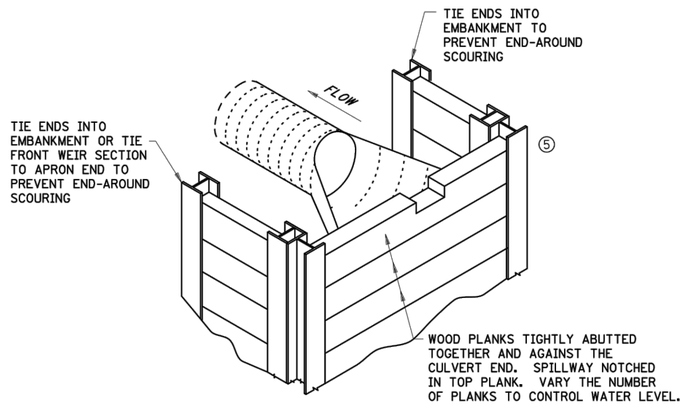
TOP VIEW

CULVERT STANDPIPE INSERT (D-RISER)



SEDIMENT CONTROL LOG WEIR (COMPOST, WOOD CHIP, OR ROCK)

d = CULVERT SIZE: 12"-36"



WOOD PLANK WEIR

NOTES:

SEE SPECS. 2573, 3891 & 3893.

FOR USE WHEN TEMPORARY PONDING IS NEEDED IN DITCH SECTIONS FOR SEDIMENT CONTROL.

MANUFACTURED ALTERNATIVES LISTED ON MnDOT'S APPROVED PRODUCTS LIST MAY BE SUBSTITUTED AT NO ADDITIONAL COST.

① ROCK LOG OR SANDBAG TO HOLD STANDPIPE AND ACT AS A SEAL BETWEEN RISER PIPE AND CULVERT.

② PLACE CULVERT APRON AND SLIDE TEMPORARY STANDPIPE INTO CSP OR RCP CULVERT.

③ ALL GEOTEXTILE USED FOR CULVERT PROTECTION SHALL BE MONOFILAMENT IN BOTH DIRECTIONS, MEETING SPEC. 3886 FOR MACHINE SLICED.

④ ROCK LOG OR RIP RAP TO HOLD STANDPIPE AND ACT AS A FILTER BETWEEN RISER PIPE AND CULVERT.

⑤ HEIGHT OVERFLOW NOT TO CAUSE FLOODING OF ROAD OR ADJACENT PROPERTIES.

REVISION:

APPROVED: 2-28-2017

CHIEF ENVIRONMENTAL OFFICER

MINNESOTA DEPARTMENT OF TRANSPORTATION

STANDARD PLAN 5-297.405 | 8 OF 8

APPROVED: 2-28-2017

REVISED:

STATE DESIGN ENGINEER

TEMPORARY SEDIMENT CONTROL

CULVERT END CONTROLS

STATE PROJ. NO. (T.H.) SHEET NO. OF SHEETS

NO	DATE	BY	CKD	APPR

H:\PROJECTS\16000\16750\TECHDATA\CADDESIGN\L3-PLANSHEETS\16750_SPN01.DWG: SPN01-21

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.

Print Name: MARTIN JOYCE

Date --/--/-- License # 58920

DRAWN BY HLB

DESIGNED BY MMJ

CHECKED BY MMJ

COMM. NO. 16750

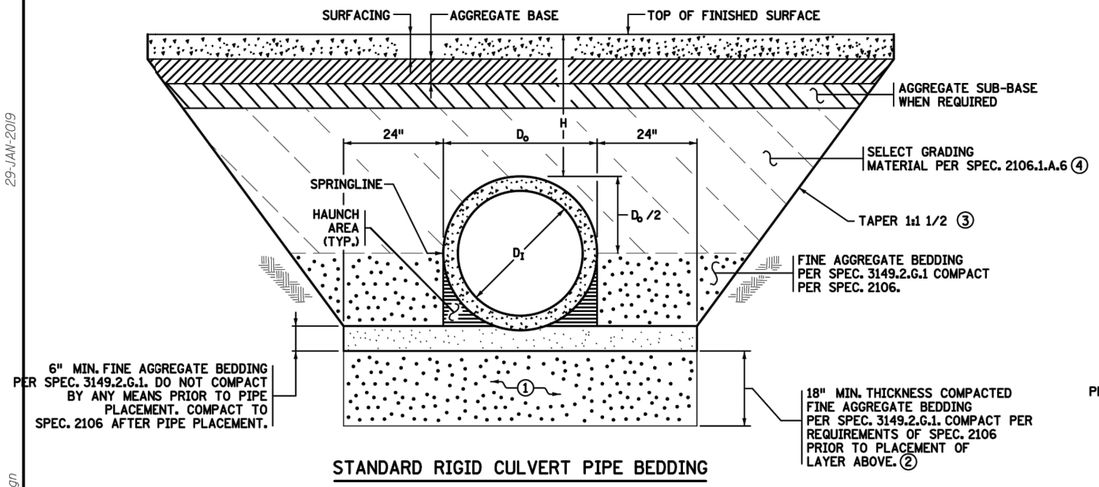
SRF

CITY OF ARDEN HILLS

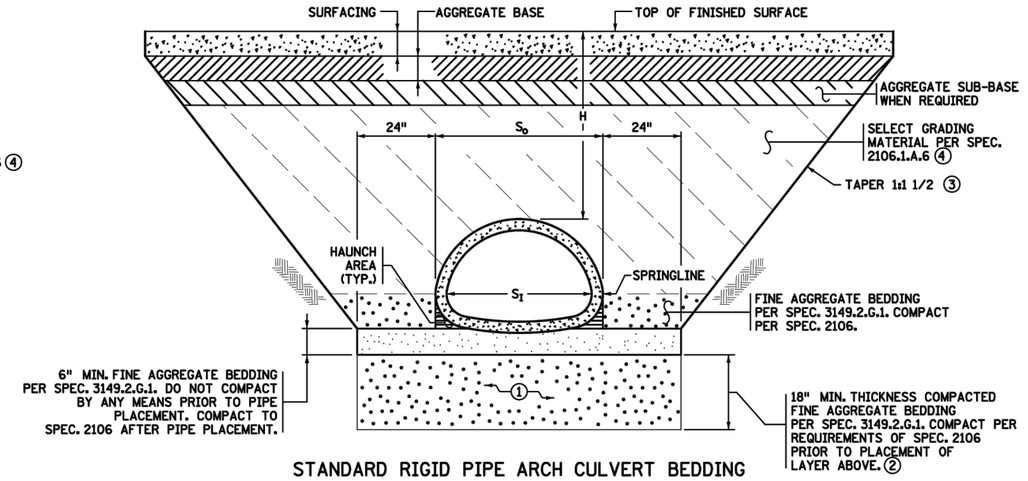
MNDOT STANDARD PLANS

OLD HIGHWAY 10 TRAIL

SHEET 26 OF 110



STANDARD RIGID CULVERT PIPE BEDDING



STANDARD RIGID PIPE ARCH CULVERT BEDDING

-LEGEND-

D_I = INSIDE DIAMETER OF ROUND PIPE (INCHES).
D_o = OUTSIDE DIAMETER OF ROUND PIPE (INCHES).
S_I = INSIDE SPAN OF PIPE-ARCH (INCHES).
S_o = OUTSIDE SPAN OF PIPE-ARCH (INCHES).
H = FILL COVER HEIGHT OVER PIPE (FEET).

= UNDISTURBED SOIL

= COMPACTED BEDDING

= LOOSE BEDDING, COMPACTED AFTER PIPE PLACEMENT

CONSTRUCTION SEQUENCE

1. PLACE AND COMPACT 18" OF FINE AGGREGATE BEDDING TO THE REQUIREMENTS OF SPEC. 2106.
2. LOOSELY PLACE 6" OF FINE AGGREGATE BEDDING MATERIAL (SPEC. 3149.2.G.1) TO GRADE. DO NOT COMPACT PRIOR TO PIPE PLACEMENT.
3. FOR PIPES WITH BELL, REMOVE MATERIAL IN BELL AREA PRIOR TO PLACEMENT.
4. FURNISH AND INSTALL PIPE TO GRADE.
5. AFTER PLACEMENT OF THE PIPE, PLACE ADDITIONAL BEDDING AND COMPACT THE FULL LENGTH ON BOTH SIDES OF THE PIPE UNDERNEATH THE HAUNCH AREA BY FIRST SHOVEL SLICING (MANUALLY SHOVE THE BLADE END OF A SHOVEL AT AN ANGLE DOWN THE ENTIRE LENGTH OF THE PIPE IN THE HAUNCHH AREA) THEN COMPACT THE HAUNCH AT AN ANGLE USING A POWERED MECHANICAL OR PNEUMATIC DEVICE (I.E. POLE TAMPER, JUMPING JACK, OR SIMILAR).
6. COMPACT THE REMAINING MATERIAL OUTSIDE THE HAUNCH AREA TO THE REQUIREMENTS OF SPEC. 2106 ENSURING THAT THE ENTIRE LENGTH OF PIPE IS SUPPORTED UNIFORMLY BY BEDDING.
7. PLACE AND COMPACT BACKFILL EVENLY AND SIMULTANEOUSLY IN 6" LIFTS ON EACH SIDE OF THE PIPE UP TO THE SPRINGLINE WHEN COMPACTED.
8. COMPLETE REMAINING BACKFILL.

NOTES

STANDARD BEDDING FOR RIGID PIPE CULVERTS WITHOUT TREATMENTS.

RIGID PIPE INCLUDES CONCRETE.

ENTRANCE CULVERTS (FIELD AND DRIVEWAY CULVERTS) DO NOT NEED BEDDING UNLESS SPECIFIED IN THE PLANS OR SPECIAL PROVISIONS.

UNLESS OTHERWISE NOTED IN THE PLAN, BEDDING QUANTITIES ARE COMPUTED FOR THE FULL LENGTH OF THE PIPE AND APRON, AND WILL NOT BE ADJUSTED FOR CHANGES TO MEET OSHA REQUIREMENTS.

WHEN RIPRAP IS REQUIRED AT THE APRON END, SEE STANDARD PLATE OR PLAN FOR RIPRAP INSTALLATION AND QUANTITIES. FOR APRONS WITHOUT RIPRAP PLACE 6" MIN. FINE AGGREGATE BEDDING UNDER APRONS. USE A TRENCH WIDTH EQUAL TO THE PIPE TRENCH WIDTH.

CONTRACT PAY ITEM FOR FINE AGGREGATE BEDDING INCLUDES THE COST OF EXCAVATION, PLACEMENT AND COMPACTION.

EXCAVATION AND BACKFILL WITH SELECT GRADING MATERIAL ARE NOT TABULATED SEPARATELY BUT ARE INCLUDED IN THE CONTRACT UNIT PRICE OF THE RELEVANT CULVERT PAY ITEM.

EXCAVATE & CONSTRUCT ALL TRENCHES AND SLOPES PER OSHA REQUIREMENTS.

ALL SLOPES SHOWN AS (V) : (H).

PIPE SIZE IS BASED ON THE NOMINAL INSIDE DIAMETER OR SPAN.

PROTECT ALL PIPE DURING CONSTRUCTION PER SPEC. 2501.

PLACE MULTIPLE PIPE CULVERTS WITH A CLEARANCE OF 24 INCHES OR GREATER BETWEEN STRINGS OF PIPE.

① IF APPROVED BY THE ENGINEER, IN WET CONDITIONS THE CONTRACTOR MAY SUBSTITUTE 18" OF COARSE FILTER AGGREGATE PER SPEC. 3149.2.H COMPACTED TO THE QUALITY COMPACTION REQUIREMENTS OF SPEC. 2106. WRAP WITH GEOTEXTILE FABRIC TYPE IV PER SPEC. 3733. SEAM ALL FABRIC SIDES AND ENDS PER SPEC. TABLE 3733-1 INCLUDING FOOTNOTE (e) OR OVERLAP A MINIMUM OF 3 FT., ALL AT NO ADDITIONAL COST.

② FOR INSTALLATIONS ON INTACT BEDROCK, OMIT THIS LAYER.

③ OVER-EXCAVATION BENEATH TAPERS IS NOT PERMITTED UNLESS REQUIRED BY OSHA. (TYP.)

④ MAXIMUM EMBANKMENT PARTICLE SIZE WITHIN 2 FT. OF RIGID PIPE IS 3".

REVISION:
APPROVED: JANUARY 18, 2019
Kevin Western
STATE BRIDGE ENGINEER

MINNESOTA DEPARTMENT OF TRANSPORTATION

STANDARD PLAN 5-297.441 | 1 OF 1

APPROVED: 01-18-2019
REVISED:

Tom Styrbicki
STATE DESIGN ENGINEER

STATE PROJ. NO. | (T.H.) | SHEET NO. OF SHEETS

STANDARD CULVERT BEDDING FOR RIGID PIPE (WITHOUT TREATMENTS)

NO	DATE	BY	CKD	APPR

H:\PROJECTS\16000\16750\TECHDATA\CADDESIGN\L3-PLANSHEETS\16750_SPN01.DWG: SPN01-22

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.
Print Name: MARTIN JOYCE
Date --/--/-- License # 58920

DRAWN BY HLB
DESIGNED BY MMJ
CHECKED BY MMJ
COMM. NO. 16750

SRF

CITY OF ARDEN HILLS
MNDOT STANDARD PLANS
OLD HIGHWAY 10 TRAIL

SHEET 27 OF 110

PLOTTED/REVISED: 29-JAN-2019
USER NAME: $$USER$NAME@$$
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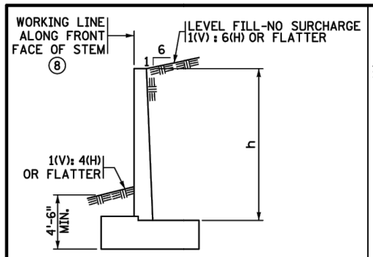
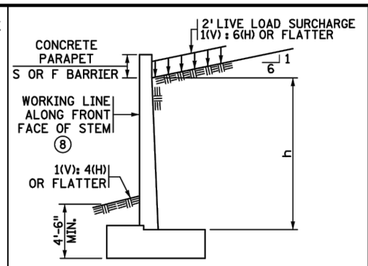
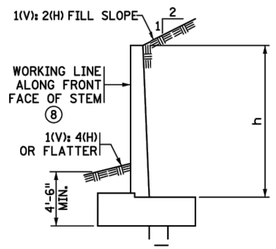


LEVEL FILL
1(V) : 6(H) OR FLATTER



LIVE LOAD SURCHARGE



1(V) : 2(H) SLOPED FILL OR FLATTER

h = STEM HEIGHT. DEFINED AS DISTANCE BETWEEN TOP OF FOOTING TO TOP OF WALL, NOT INCLUDING PARAPET OR BARRIER.

LOAD CASES

DESIGN CRITERIA

THESE LRFD CIP RETAINING WALL STANDARDS HAVE BEEN DEVELOPED BASED ON THE FIFTH EDITION WITH 2010 INTERIMS OF THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, AND MnDOT DESIGN POLICIES AS STATED IN THE MnDOT LRFD BRIDGE DESIGN MANUAL.

f'c = 4 ksi
fy = 60 ksi
n = 8

REFER TO STANDARD FIGURE 5-297.639 FOR ADDITIONAL DESIGN CRITERIA.

BAR LAP

BAR SIZE	PLAIN	EPOXY
5	2'-5"	2'-1"
6	2'-11"	3'-1"
7	3'-7"	3'-10"
8	4'-9"	5'-1"
9	6'-0"	6'-5"
10	7'-7"	8'-2"
11	9'-4"	10'-0"

SUMMARY OF QUANTITIES FOR RETAINING WALLS

PANEL	STRUCTURAL CONCRETE		REINFORCEMENT BARS		STRUCTURE EXCAVATION		STRUCTURAL BACKFILL (CV)①	AGGREGATE BACKFILL (CV)②⑥	ARCHI-TECTURAL CONCRETE TEXTURE						
	FOOTING 1G52 ⑦	STEM 3G52	PLAIN ⑦	EPOXY ⑤	CLASS__	CLASS__									
	CU YD	CU YD	POUND	POUND	CU YD	CU YD	CU YD	CU YD	SQ FT						

NOTES:

① STRUCTURAL BACKFILL SPEC. 3149.2.D.2.

② COMPACT TO 100% DENSITY IN ACCORDANCE WITH SPEC. 2105.3.F.1 UNLESS RECOMMENDED OTHERWISE BY THE SOILS ENGINEER.

③ LIMITING CRITERIA.

④ CURVED FORMS MAY BE USED FOR ANY WALL WITH A RADIUS, BUT MUST BE USED ON WALLS WITH RADIUS LESS THAN 23 FEET.

⑤ DOES NOT INCLUDE DOWELED JOINT/CONSTRUCTION JOINT QUANTITIES, WHICH ARE INCIDENTAL. DOWELED JOINT/CONSTRUCTION JOINT DETAILS ARE SHOWN ON STANDARD PLAN 5-297.624 (3 OF 6).

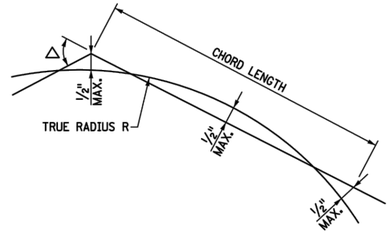
⑥ QUANTITIES FOR THE FOUNDATION WITH AGGREGATE BACKFILL OPTION ONLY.

⑦ DOES NOT INCLUDE ADDITIONAL REINFORCING BARS AND STRUCTURAL CONCRETE (1G52) REQUIRED FOR STEPPED FOOTINGS, WHICH IS INCIDENTAL.

⑧ FOR RETAINING WALLS THAT ABUT A BRIDGE OR BRIDGE WING WALL, NOTE THAT THE DESIGNATION OF "FRONT FACE" MAY VARY FROM THE BRIDGE PLANS TO THE RETAINING WALL PLANS.

CURVED RETAINING WALLS ALLOWABLE CHORD LENGTH ④

MAXIMUM DEGREE OF CURVE	RADIUS	ALLOWABLE CHORD LENGTH	DEVIATION FROM TRUE RADIUS	MAXIMUM DEFLECTION ANGLE △
4°-00'	1432'	30'-6"	± 1/2" ③	1°-15'
8°-00'	716'	21'-10"	± 1/2" ③	1°-45'
16°-30'	347'	15'-3"	± 1/2" ③	2°-30'
23°-00'	249'	12'-11"	± 1/2" ③	2°-57'
65°-30'	87'	7'-7 1/2"	± 1/2"	5°-00' ③
114°-30'	50'	4'-4 5/16"	± 1/4"	5°-00' ③
250°-00'	23'	2'-0"	± 1/8"	5°-00' ③



SHEET INDEX

GENERAL NOTES:

UTILITIES:
EXISTING AND PROPOSED UTILITIES ARE SHOWN IN THE GRADING PLANS. PRIOR TO EXCAVATIION VERIFY THE LOCATION OF EXISTING FACILITIES AND EXERCISE CARE IN ADJACENT CONSTRUCTION.

EXCAVATION AND EARTHWORK:
ALL EXCAVATION AND EMBANKMENT WORK SHALL CONFORM TO SPEC. 2451.

CONCRETE:
ALL CONCRETE SHALL CONFORM TO SPEC. 2461.

TRANSVERSE CONSTRUCTION JOINTS IN FOOTING ARE PERMISSIBLE. KEYWAYS AND CONTINUOUS REINFORCEMENT ARE REQUIRED THROUGH THESE JOINTS.

THE THICKNESS OF THE ARCHITECTURAL CONCRETE TEXTURE VARIES WITH THE TEXTURE RELIEF PATTERN. THE STRUCTURAL CONCRETE 3Y43 QUANTITIES DO NOT INCLUDE THE MATERIAL WITHIN THE ARCHITECTURAL CONCRETE TEXTURE. CONCRETE NEEDED FOR THE TEXTURING IS INCIDENTAL.

POURING SEQUENCE:
THE POURING SEQUENCE SHALL BE AT THE CONTRACTOR'S OPTION. SUBMIT SEQUENCE (WITHIN 7 CALENDAR DAYS) TO THE ENGINEER FOR APPROVAL PRIOR TO BEGINNING THE FIRST POUR.

CONSTRUCTION:
CONSTRUCT IN ACCORDANCE WITH SPEC. 2411, EXCEPT AS NOTED.

REFER TO STANDARD PLAN 5-297.624 (2 OF 6) FOR WALL CORNER DETAILS AND STEPPED FOOTING DETAILS.

REFER TO STANDARD PLAN 5-297.625 FOR WALL SHEAR LUG DETAILS.

APPLY MEMBRANE WATERPROOFING SYSTEM PER SPEC. 2481 TO BACK SIDE OF WALL TO COVER ALL THRU-BOLT FORM HOLES.

FOR WALLS WITH CONDUIT INSIDE THE STEM, PLACE CONDUIT EXPANSION FITTINGS AT 200' MAX. SPACING, AT CORK AND DOWEL JOINT LOCATION.

REINFORCING STEEL:
USE REINFORCEMENT BARS CONFORMING TO SPEC. 3301, GRADE 60.

BARS MARKED WITH THE SUFFIX "E" TO BE EPOXY COATED. ALL BARS WHICH EXTEND OUT OF THE FOOTING AND ALL BARS WHICH ARE ABOVE THE FOOTING TO BE EPOXY COATED.

ALL BENT BAR DIMENSIONS ARE GIVEN OUT-TO-OUT.

MAINTAIN CLEAR DISTANCE BETWEEN REINFORCEMENT BARS AND FACE OF CONCRETE OF 3 INCHES IN FOOTINGS, 5 INCHES IN BOTTOM OF SPREAD FOOTINGS, AND 2 INCHES ELSEWHERE UNLESS OTHERWISE NOTED. REFER TO STANDARD PLAN 5-297.624 (1 OF 6) DETAIL "C" FOR COVER REQUIREMENTS ON WALLS WITH ARCHITECTURAL CONCRETE TEXTURE OR RUSTICATION.

THE CONTRACTOR HAS THE OPTION OF SUBSTITUTING 60'-0" LONG BARS FOR THE LONGITUDINAL FOOTING STEEL SHOWN. CHANGES IN THE BILL OF REINFORCEMENT ARE THE RESPONSIBILITY OF THE CONTRACTOR. PAYMENT WILL BE BASED ON QUANTITIES SHOWN.

THE CONSTRUCTION JOINT FOR CONCRETE PARAPET OR BARRIER MAY BE LOCATED AT TOP OR BOTTOM OF COPING, AT THE CONTRACTOR'S OPTION. PAYMENT WILL BE BASED ON QUANTITIES SHOWN, WHICH IS BASED ON CONSTRUCTION JOINT ABOVE COPING.

FOR VARIABLE STEM HEIGHTS, VARY THE LAP LENGTH OF THE VERTICAL REINFORCEMENT. MINIMUM LAP LENGTHS ARE GIVEN IN THE TABLE ON THIS SHEET. SMALLER BAR GOVERNS LAP LENGTH.

DOWEL BAR ASSEMBLIES:
DOWELED JOINTS/CONSTRUCTION JOINTS ARE SHOWN ON STANDARD PLAN 5-297.624 (3 OF 6). THESE JOINTS ARE INCIDENTAL.

AT THE CONTRACTOR'S OPTION, CONSTRUCTION JOINTS MAY BE SUBSTITUTED IN LIEU OF CORK AND DOWEL JOINTS. REINFORCEMENT QUANTITIES WERE COMPUTED ASSUMING A CORK AND DOWEL JOINT BETWEEN EVERY PANEL. CHANGES IN THE BILL OF REINFORCEMENT ARE THE RESPONSIBILITY OF THE CONTRACTOR, AND NO ADDITIONAL PAYMENT WILL BE MADE. AT A MINIMUM, PLACE CORK AND DOWEL JOINTS EVERY 91'-6". PLACE A CORK AND DOWEL JOINT AT ALL VERTICAL FOOTING STEPS.

GEOMETRICS AND GRADES:
DATA FOR BASELINE GEOMETRY IS TABULATED FOR WALL ALIGNMENT, SEE LAYOUT SHEETS. WALL ALIGNMENT REFERENCE IS ALONG FRONT FACE OF WALL. ⑧

ON UP TO 10% SLOPES, THE CONTRACTOR HAS THE OPTION OF POURING FOOTINGS SLOPED OR STEPPED. ADDITIONAL CONCRETE VOLUMES AND CHANGES TO THE BILL OF REINFORCEMENT WHICH MAY RESULT FROM CONTRACTOR REQUESTED OPTIONS ARE THE RESPONSIBILITY OF THE CONTRACTOR. NO ADDITIONAL PAYMENT WILL BE MADE.

QUANTITIES ARE BASED ON ASSUMED TOP OF ROCK ELEVATION. ACTUAL TOP OF ROCK TO BE DETERMINED BY ENGINEER. SEE SHEET 5-297.624 (4 OF 6) FOR PAY LIMITS.

PILE LOADS:
THE PILE LOADS SHOWN IN THE PLANS AND THE CORRESPONDING NOMINAL PILE BEARING RESISTANCES (Rn) WERE COMPUTED USING LRFD METHODOLOGY.

REVISION: SEPTEMBER 1, 2016

APPROVED: AUGUST 27, 2014
Nancy Daubenberger
STATE BRIDGE ENGINEER

REVISION DATE
9-1-16

STANDARD SHEET NO. 5-297.620
STANDARD APPROVED: AUGUST 27, 2014

TITLE: RETAINING WALL GENERAL NOTES AND SUMMARY OF QUANTITIES

STATE PROJ. NO. (TH) SHEET NO. OF SHEETS

NO	DATE	BY	CKD	APPR

H:\PROJECTS\16000\16750\TECHDATA\CADDESIGN\L3-PLANSHEETS\16750_SPN01.DWG: SPN01-23

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.
Print Name: MARTIN JOYCE
Date --/--/-- License # 58920

DRAWN BY HLB
DESIGNED BY MMJ
CHECKED BY MMJ
COMM. NO. 16750

SRF

CITY OF ARDEN HILLS
MNDOT STANDARD PLANS
OLD HIGHWAY 10 TRAIL

SHEET 28 OF 110

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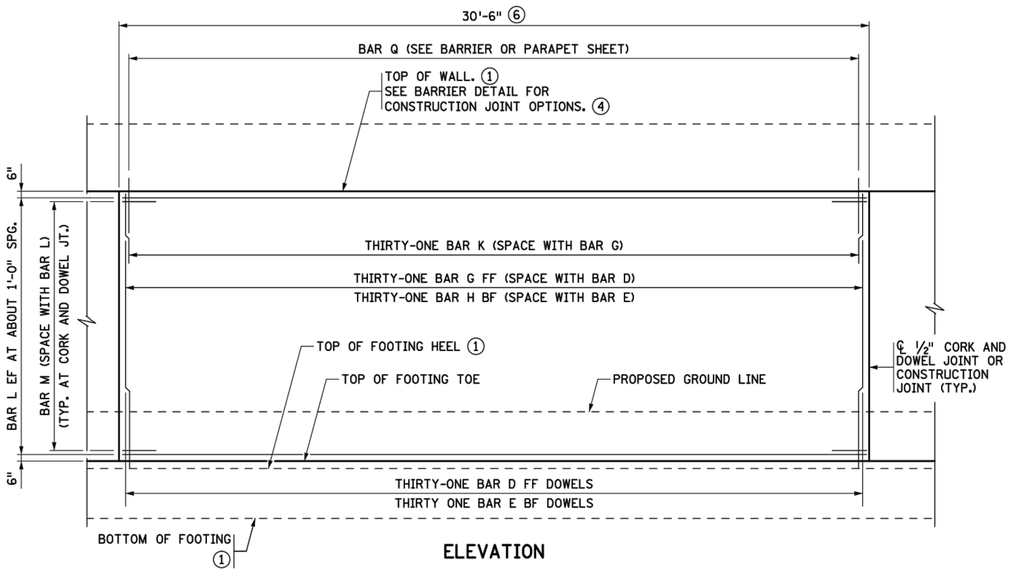
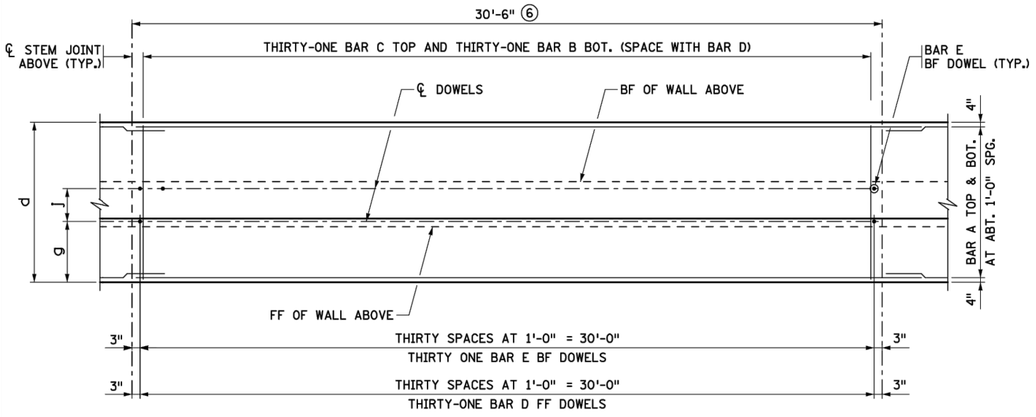
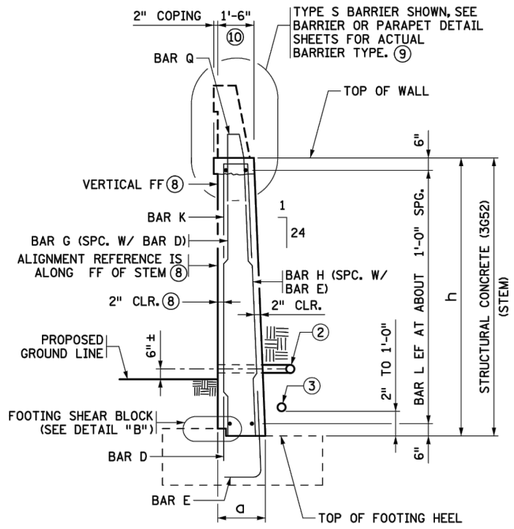


ELEVATION

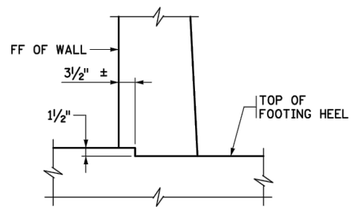


FOOTING PLAN ~ REINFORCEMENT

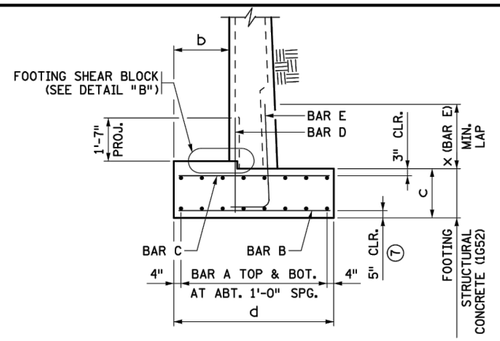


WALL SECTION

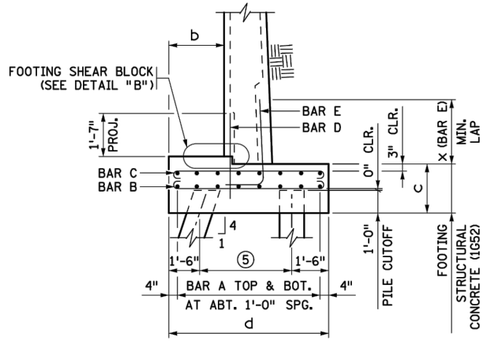
(F BARRIER AND 2" COPING OPTION SHOWN)



DETAIL "B"



TYPICAL SECTION THROUGH
SPREAD FOOTING



TYPICAL SECTION THROUGH
PILE FOOTING

NOTES:

REFER TO RETAINING WALL PANEL TABULATIONS FOR DIMENSIONS "a" THROUGH "x".

STEM REINFORCEMENT IS TO BE SYMMETRICALLY/EQUALLY SPACED BETWEEN STEM JOINTS.

FOOTING REINFORCEMENT SYMMETRICAL ABOUT STEM JOINT ABOVE UNLESS OTHERWISE NOTED. SEE RETAINING WALL TABLES FOR PILE SPACING AND LAYOUT.

BF DENOTES BACK FACE.
FF DENOTES FRONT FACE.
EF DENOTES EACH FACE.

① STRAIGHT LINE BETWEEN ELEVATIONS SHOWN ON WALL ELEVATION (EXCEPT FOR STEPPED CONDITIONS). IF A BARRIER OR PARAPET IS NOT USED, TOPS OF RETAINING WALL COULD BE USED.

② TYPE I DRAINAGE. SEE SECTION A-A ON STANDARD PLAN 5-297.624 (5 OF 6).

③ TYPE II DRAINAGE. SEE SECTION B-B ON STANDARD PLAN 5-297.624 (5 OF 6).

④ SEE STANDARD PLAN 5-297.624 (1 OF 6).

⑤ SEE GENERAL PLAN FOR PILE SPACING.

⑥ AT THE CONTRACTOR'S OPTION, PANEL LENGTH MAY VARY UP TO ± 1'-0". BAR CUTTING LISTS SHALL BE REVISED ACCORDINGLY BY THE CONTRACTOR.

⑦ 5" BOTTOM OF FOOTING CLEARANCE FOR ALL BARS EXCEPT BAR D. BAR D BOTTOM OF FOOTING CLEARANCE VARIES.

⑧ REFER TO DETAIL "C" AND NOTES ON STANDARD PLAN 5-297.624 (1 OF 6).

⑨ REBAR AND CONCRETE ARE INCLUDED IN THE PAY ITEM BY LINEAR FEET FOR THE BARRIER OR PARAPET.

⑩ WALL THICKNESS AT TOP OF STEM, NOT INCLUDING COPING. REFER TO STANDARD FIGURE 5-297.624 (1 OF 6) FOR MODIFIED TOP OF WALL THICKNESS WHEN USING TYPE S BARRIER.

REVISION: SEPTEMBER 1, 2016
APPROVED: AUGUST 27, 2014
NANCY DAUBENBERGER
STATE BRIDGE ENGINEER

MINNESOTA DEPARTMENT OF TRANSPORTATION

STANDARD PLAN 5-297.621 | 1 OF 1

APPROVED: 8-27-2014
REVISED: 9-1-2016

CHRISTOPHER RY
STATE DESIGN ENGINEER

RETAINING WALL REINFORCEMENT DETAILS (SHORT WALLS)

STATE PROJ. NO. (T.H.) SHEET NO. OF SHEETS

NO	DATE	BY	CKD	APPR

H:\PROJECTS\16000\16750\TECHDATA\CADDESIGN\L3-PLANSHEETS\16750_SPN01.DWG: SPN01-24

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.
Print Name: MARTIN JOYCE
Date --/--/-- License # 58920

DRAWN BY HLB
DESIGNED BY MMJ
CHECKED BY MMJ
COMM. NO. 16750

SRF

CITY OF ARDEN HILLS
MNDOT STANDARD PLANS
OLD HIGHWAY 10 TRAIL

SHEET 29 OF 110

PLOTTED/REVISED: 4-APR-2018
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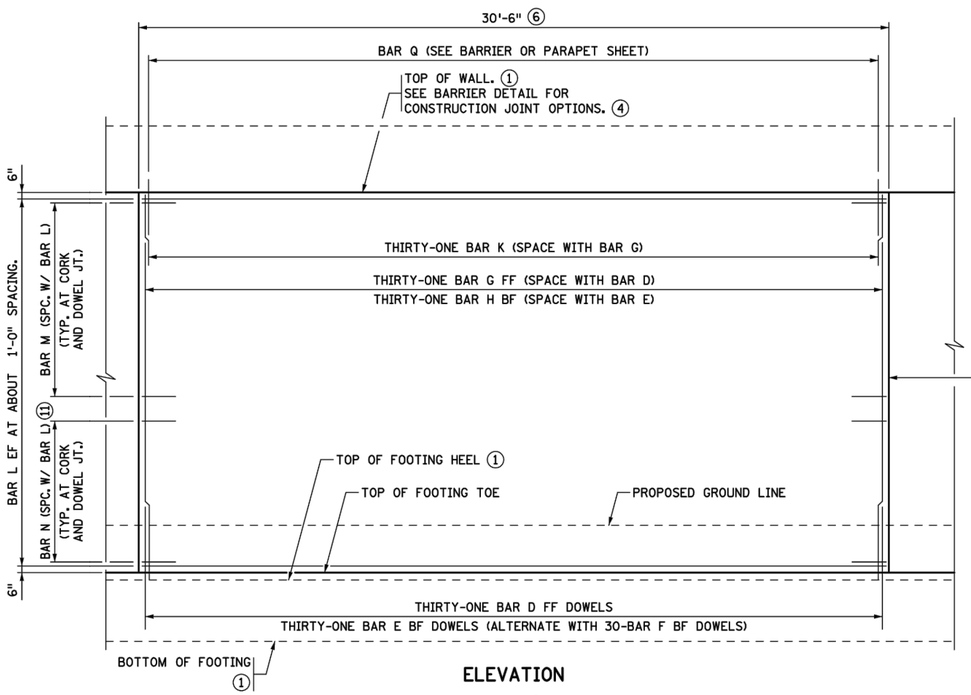
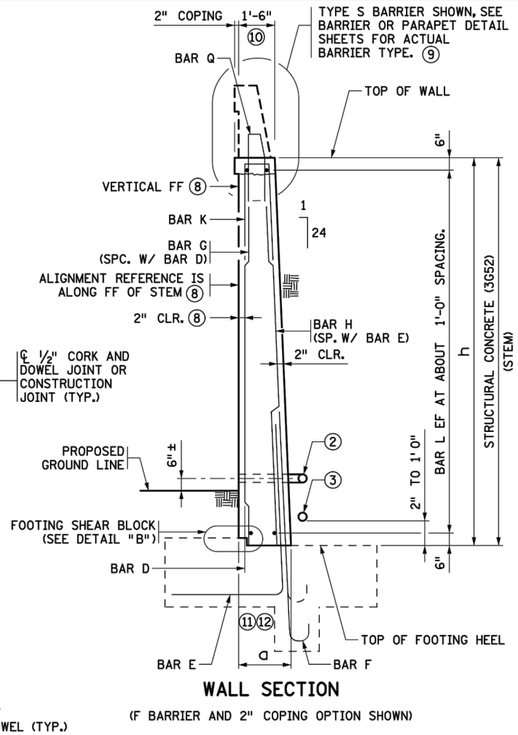
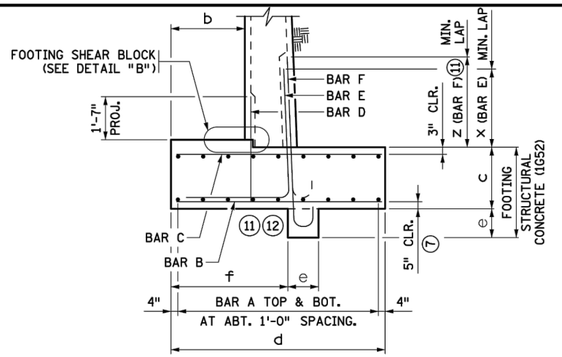


ELEVATION

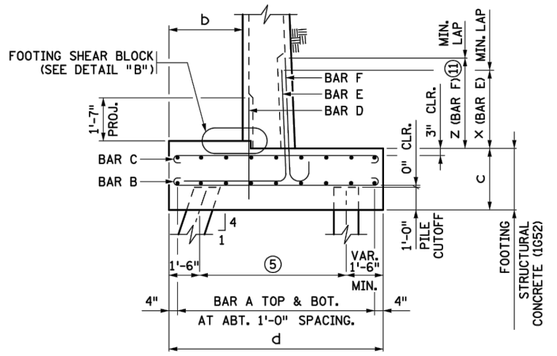


WALL SECTION

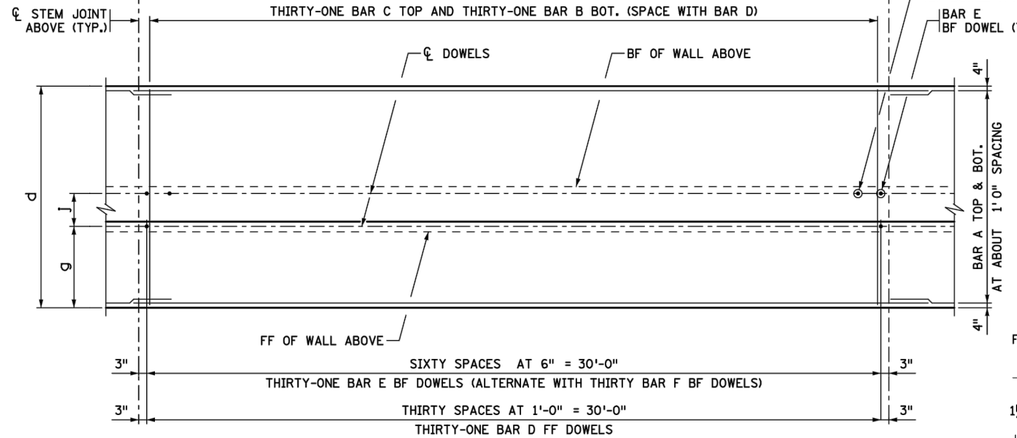
(F BARRIER AND 2" COPING OPTION SHOWN)



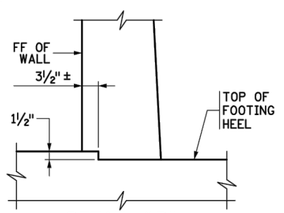
TYPICAL SECTION THROUGH SPREAD FOOTING



TYPICAL SECTION THROUGH PILE FOOTING



FOOTING PLAN ~ REINFORCEMENT



DETAIL "B"

NOTES:

REFER TO RETAINING WALL PANEL TABULATIONS FOR DIMENSIONS "a" THROUGH "x".
STEM REINFORCEMENT IS TO BE SYMMETRICALLY/EQUALLY SPACED BETWEEN STEM JOINTS.
FOOTING REINFORCEMENT SYMMETRICAL ABOUT STEM JOINT ABOVE UNLESS OTHERWISE NOTED.
SEE RETAINING WALL TABLES FOR PILE SPACING AND LAYOUT.

BF DENOTES BACK FACE.
FF DENOTES FRONT FACE.
EF DENOTES EACH FACE.

1. STRAIGHT LINE BETWEEN ELEVATIONS SHOWN ON WALL ELEVATION (EXCEPT FOR STEPPED CONDITIONS). IF A BARRIER OR PARAPET IS NOT USED, TOPS OF RETAINING WALL COULD BE USED.
2. TYPE I DRAINAGE. SEE SECTION A-A ON STANDARD PLAN 5-297.624 (5 OF 6).
3. TYPE II DRAINAGE. SEE SECTION B-B ON STANDARD PLAN 5-297.624 (5 OF 6).
4. SEE STANDARD PLAN 5-297.624 (1 OF 6).
5. SEE GENERAL PLAN FOR PILE SPACING.
6. AT THE CONTRACTOR'S OPTION, PANEL LENGTH MAY VARY UP TO ± 1'-0". BAR CUTTING LISTS SHALL BE REVISED ACCORDINGLY BY THE CONTRACTOR.
7. 5" BOTTOM OF FOOTING CLEARANCE FOR ALL BARS EXCEPT BAR D. BAR D BOTTOM OF FOOTING CLEARANCE VARIES.
8. REFER TO DETAIL "C" AND NOTES ON STANDARD PLAN 5-297.624 (1 OF 6).
9. REBAR AND CONCRETE ARE INCLUDED IN THE PAY ITEM BY LINEAR FEET FOR THE BARRIER OR PARAPET.
10. WALL THICKNESS AT TOP OF STEM, NOT INCLUDING COPING. REFER TO STANDARD FIGURE 5-297.624 (1 OF 6) FOR MODIFIED TOP OF WALL THICKNESS WHEN USING TYPE S BARRIER.
11. THIS FEATURE MAY NOT BE PRESENT ON ALL MEDIUM HEIGHT WALLS.
12. CONTRACTOR MAY CONSTRUCT KEYWAY WITHOUT FORMS, AS APPROVED BY THE ENGINEER.

REVISION: SEPTEMBER 1, 2016
APPROVED: AUGUST 27, 2014
Nancy Daubenberger
STATE BRIDGE ENGINEER

MINNESOTA DEPARTMENT OF TRANSPORTATION

STANDARD PLAN 5-297.622 | 1 OF 1
APPROVED: 8-27-2014
REVISED: 9-1-2016
STATE DESIGN ENGINEER

RETAINING WALL REINFORCEMENT DETAILS (MEDIUM WALLS)

STATE PROJ. NO. (T.H.) SHEET NO. OF SHEETS

NO	DATE	BY	CKD	APPR

H:\PROJECTS\16000\16750\TECHDATA\CADDESIGN\L3-PLANSHEETS\16750_SPN01.DWG: SPN01-25

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.
Print Name: MARTIN JOYCE
Date --/--/-- License # 58920

DRAWN BY HLB
DESIGNED BY MMJ
CHECKED BY MMJ
COMM. NO. 16750

SRF

CITY OF ARDEN HILLS
MNDOT STANDARD PLANS
OLD HIGHWAY 10 TRAIL

SHEET 30 OF 110

PLOTTED/REVISED: 4-APR-2018
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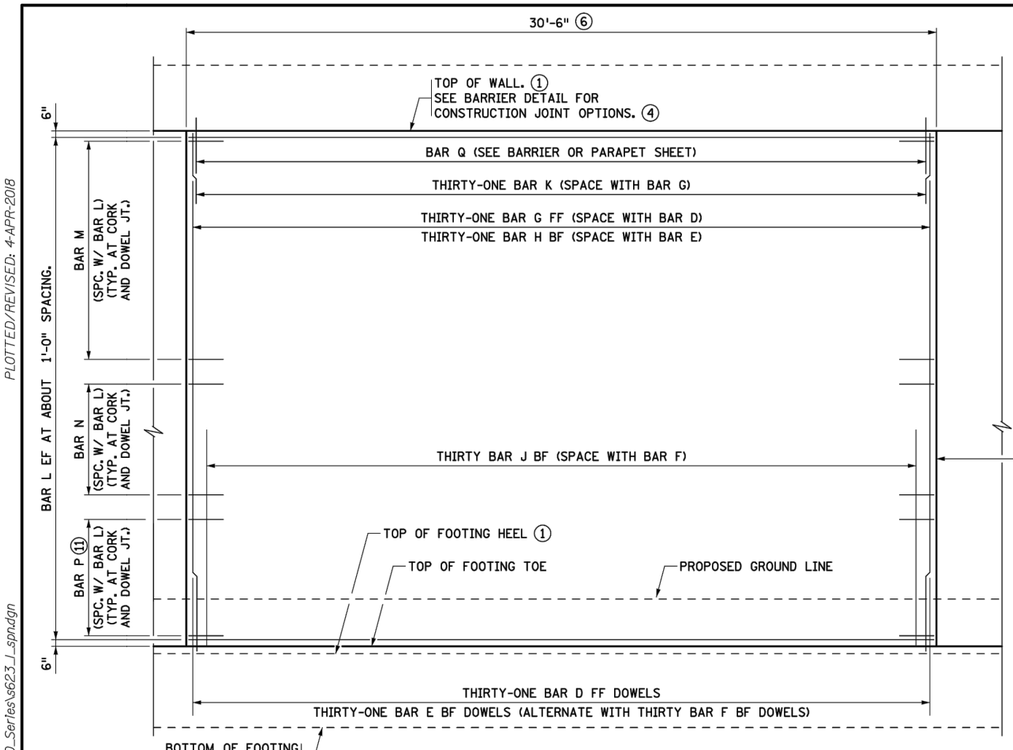
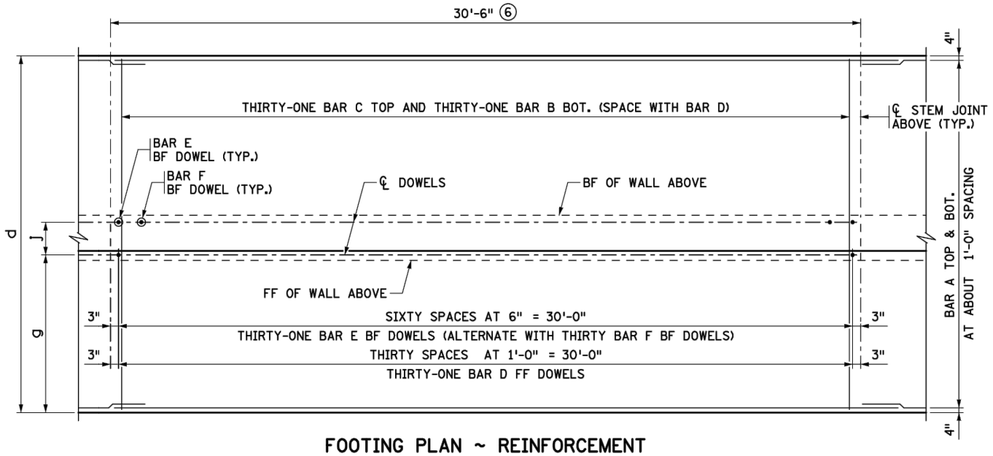
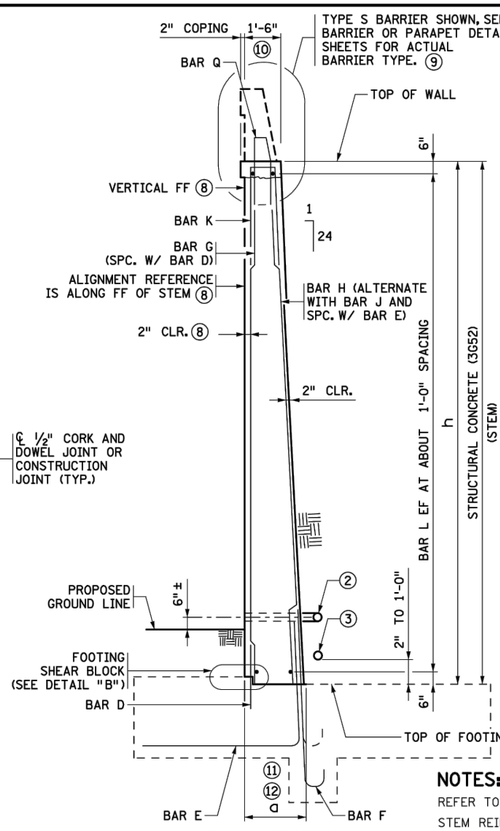


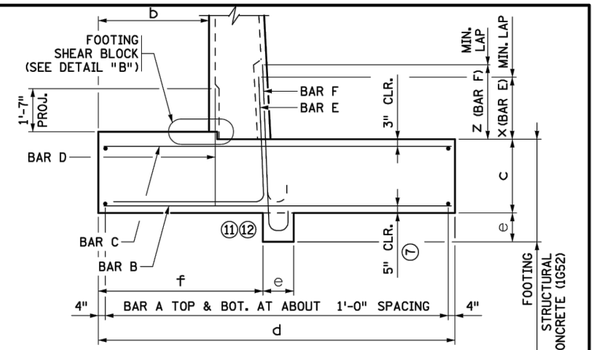
ELEVATION



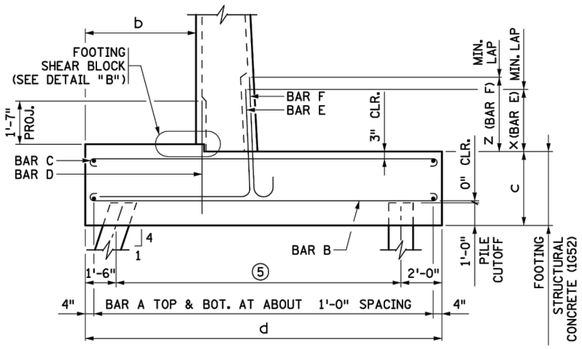
FOOTING PLAN ~ REINFORCEMENT



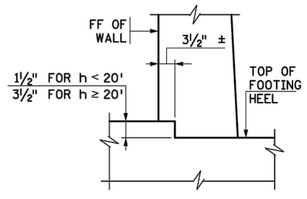
WALL SECTION
(F BARRIER AND 2" COPING OPTION SHOWN)



TYPICAL SECTION THROUGH SPREAD FOOTING



TYPICAL SECTION THROUGH PILE FOOTING



DETAIL "B"

NOTES:

REFER TO RETAINING WALL PANEL TABULATIONS FOR DIMENSIONS "a" THROUGH "x".

STEM REINFORCEMENT IS TO BE SYMMETRICALLY/EQUALLY SPACED BETWEEN STEM JOINTS.

FOOTING REINFORCEMENT SYMMETRICAL ABOUT STEM JOINT ABOVE UNLESS OTHERWISE NOTED. SEE RETAINING WALL TABLES FOR PILE SPACING AND LAYOUT.

BF DENOTES BACK FACE.
FF DENOTES FRONT FACE.
EF DENOTES EACH FACE.

① STRAIGHT LINE BETWEEN ELEVATIONS SHOWN ON WALL ELEVATION (EXCEPT FOR STEPPED CONDITIONS). IF A BARRIER OR PARAPET IS NOT USED, TOPS OF RETAINING WALL COULD BE USED.

② TYPE I DRAINAGE. SEE SECTION A-A ON STANDARD PLAN 5-297.624 (5 OF 6).

③ TYPE II DRAINAGE. SEE SECTION B-B ON STANDARD PLAN 5-297.624 (5 OF 6).

④ SEE STANDARD PLAN 5-297.624 (1 OF 6).

⑤ SEE GENERAL PLAN FOR PILE SPACING.

⑥ AT THE CONTRACTOR'S OPTION, PANEL LENGTH MAY VARY UP TO ± 1'-0". BAR CUTTING LISTS SHALL BE REVISED ACCORDINGLY BY THE CONTRACTOR.

⑦ 5" BOTTOM OF FOOTING CLEARANCE FOR ALL BARS EXCEPT BAR D. BAR D BOTTOM OF FOOTING CLEARANCE VARIES.

⑧ REFER TO DETAIL "C" AND NOTES ON STANDARD PLAN 5-297.624 (1 OF 6).

⑨ REBAR AND CONCRETE ARE INCLUDED IN THE PAY ITEM BY LINEAR FEET FOR THE BARRIER OR PARAPET.

⑩ WALL THICKNESS AT TOP OF STEM, NOT INCLUDING COPING. REFER TO STANDARD FIGURE 5-297.624 (1 OF 6) FOR MODIFIED TOP OF WALL THICKNESS WHEN USING TYPE S BARRIER.

⑪ THIS FEATURE MAY NOT BE PRESENT ON ALL TALL HEIGHT WALLS.

⑫ CONTRACTOR MAY CONSTRUCT KEYWAY WITHOUT FORMS, AS APPROVED BY THE ENGINEER.

REVISION: SEPTEMBER 1, 2016
APPROVED: AUGUST 27, 2014
STATE BRIDGE ENGINEER

MINNESOTA DEPARTMENT OF TRANSPORTATION

STANDARD PLAN 5-297.623 | 1 OF 1
APPROVED: 8-27-2014
REVISED: 9-1-2016
STATE DESIGN ENGINEER

RETAINING WALL REINFORCEMENT DETAILS (TALL WALLS)

STATE PROJ. NO. (T.H.) SHEET NO. OF SHEETS

NO	DATE	BY	CKD	APPR

H:\PROJECTS\16000\16750\TECHDATA\CADDESIGN\L3-PLANSHEETS\16750_SPN01.DWG: SPN01-26

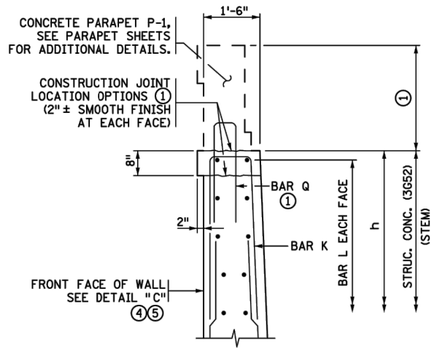
I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota.
Print Name: MARTIN JOYCE
Date --/--/-- License # 58920

DRAWN BY HLB
DESIGNED BY MMJ
CHECKED BY MMJ
COMM. NO. 16750

SRF

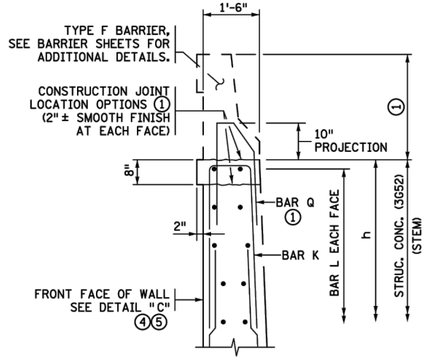
CITY OF ARDEN HILLS
MNDOT STANDARD PLANS
OLD HIGHWAY 10 TRAIL

SHEET 31 OF 110



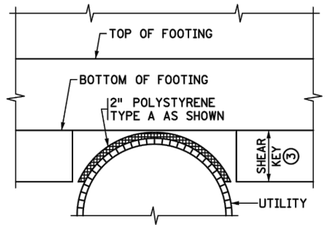
CONCRETE PARAPET P-1 DETAIL

2" COPING OPTION SHOWN

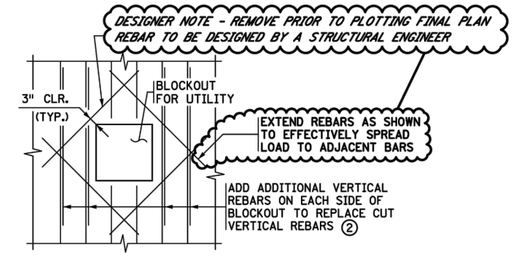


TYPE F BARRIER DETAIL

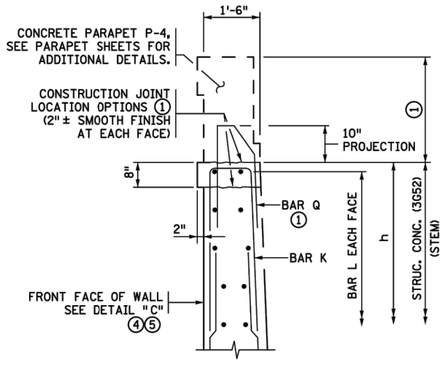
2" COPING OPTION SHOWN



PIPE UNDER SPREAD FOOTING (THROUGH SHEAR KEY)

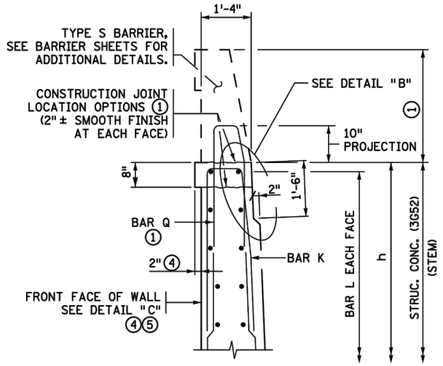


UTILITY BLOCKOUT DETAIL



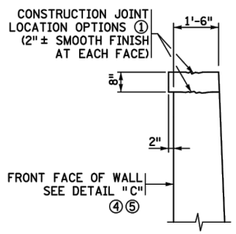
CONCRETE PARAPET P-4 DETAIL

2" COPING OPTION SHOWN

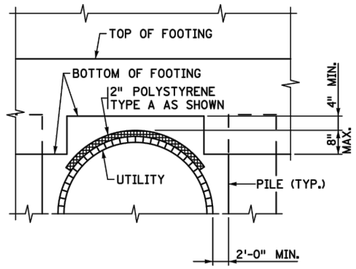


TYPE S BARRIER DETAIL

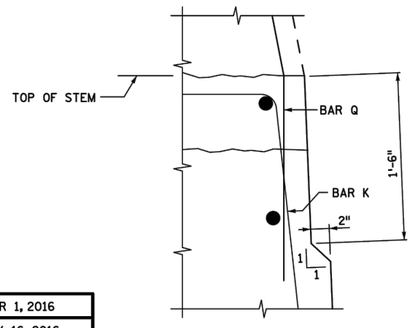
2" COPING OPTION SHOWN



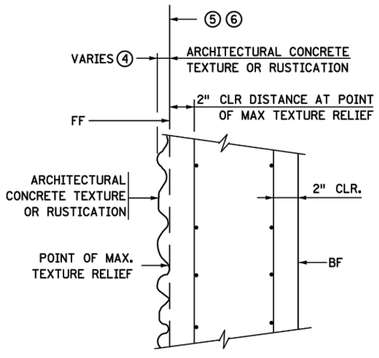
COPING DETAIL



PIPE THROUGH PILE FOOTING



DETAIL "B"



DETAIL "C"

DESIGNER NOTE - REMOVE PRIOR TO PLOTTING FINAL PLAN

CAREFULLY REVIEW THE DIMENSIONS OF THE COPING AT THE TOP OF THE WALL AS IT WILL NEED TO BE MODIFIED DEPENDING ON THE AMOUNT OF TEXTURE RELIEF OF THE FORM LINER. IF THE RETAINING WALL ABUTS A BRIDGE OR BRIDGE WING WALL, BE SURE TO COORDINATE THESE DETAILS WITH THE BRIDGE DESIGNER. SEE NOTES (4) AND (5)

NOTES:

ARCHITECTURAL TREATMENT OPTION ON FRONT FACE OF RETAINING WALL, INCLUDING COPING OR HORIZONTAL REVEL OPTION TO BE DETERMINED BY MnDOT.

(1) REFER TO PARAPET OR BARRIER SHEETS FOR ADDITIONAL INFORMATION INCLUDING Q BAR PLACEMENT DETAILS, AND PAYMENT.

(2) FIELD CUT/ADJUST VERTICAL AND HORIZONTAL REINFORCEMENT AS NECESSARY TO CLEAR BLOCKOUT. PLACE REINFORCEMENT AS SHOWN.

(3) MODIFY AS NEEDED FOR INTERRUPTION.

(4) THE THICKNESS OF THE ARCHITECTURAL CONCRETE TEXTURE VARIES WITH THE TEXTURE RELIEF. THE STRUCTURAL CONCRETE QUANTITIES DO NOT INCLUDE THE MATERIAL WITHIN THE ARCHITECTURAL CONCRETE TEXTURE. MATERIAL NEEDED FOR THE TEXTURING SHALL BE INCIDENTAL. SEE SPECIAL PROVISIONS 2411. TEXTURE RELIEF TO ADHERE TO NCHRP REPORT 554 CRASH BARRIER GUIDANCE WHENEVER THE WALL FACE IS INSIDE OR NEAR THE CLEAR ZONE.

(5) FOR RETAINING WALLS THAT ABUT A BRIDGE OR BRIDGE WING WALL, NOTE THAT THE DESIGNATION OF "FRONT FACE" MAY VARY FROM THE BRIDGE PLANS TO THE RETAINING WALL PLANS.

(6) DATA FOR BASELINE GEOMETRY IS TABULATED FOR WALL ALIGNMENT, SEE LAYOUT SHEETS. WALL ALIGNMENT REFERENCE IS ALONG FRONT FACE OF WALL.

REVISION: SEPTEMBER 1, 2016

APPROVED: FEBRUARY 16, 2016

Kevin Western

STATE BRIDGE ENGINEER

REVISION DATE 9-1-16

STANDARD SHEET NO. 5-297.624 (1 OF 6)

STANDARD APPROVED: FEBRUARY 16, 2016

TITLE: RETAINING WALL MISCELLANEOUS DETAILS

STATE PROJ. NO. (TH) SHEET NO. OF SHEETS

NO	DATE	BY	CKD	APPR

H:\PROJECTS\16000\16750\TECHDATA\CADDESIGN\L3-PLANSHEETS\16750_SPN01.DWG: SPN01-27

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.

Print Name: MARTIN JOYCE

Date --/--/-- License # 58920

DRAWN BY HLB

DESIGNED BY MMJ

CHECKED BY MMJ

COMM. NO. 16750

SRF

CITY OF ARDEN HILLS

MNDOT STANDARD PLANS

OLD HIGHWAY 10 TRAIL

SHEET 32 OF 110

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BILL OF REINFORCEMENT FOR STEPPED FOOTING DETAILS ①②

STATION	STEP TYPE (VAR. OR MIN.)	JOINT	BOT. OF FOOTING EL. LOW END	BOT. OF FOOTING EL. HIGH END	BAR (B, C, V)	MARK	NO.	LENGTH	A- DIMENSION
					B ⑧				N.A.
					C ⑧		4		N.A.
					V ⑦				
					B ⑧				N.A.
					C ⑧		4		N.A.
					V ⑦				
					B ⑧				N.A.
					C ⑧		4		N.A.
					V ⑦				
					B ⑧				N.A.
					C ⑧		4		N.A.
					V ⑦				
					B ⑧				N.A.
					C ⑧		4		N.A.
					V ⑦				
					B ⑧				N.A.
					C ⑧		4		N.A.
					V ⑦				
					B ⑧				N.A.
					C ⑧		4		N.A.
					V ⑦				
					B ⑧				N.A.
					C ⑧		4		N.A.
					V ⑦				
					B ⑧				N.A.
					C ⑧		4		N.A.
					V ⑦				
					B ⑧				N.A.
					C ⑧		4		N.A.
					V ⑦				
					B ⑧				N.A.
					C ⑧		4		N.A.
					V ⑦				

N.A. = NOT APPLICABLE

DESIGNER NOTE
(REMOVE PRIOR TO PLOTTING FINAL PLAN):

FOR STEPPED FOOTINGS, FILL IN THE FIRST 5 COLUMNS OF THE BILL OF REINFORCEMENT, THE CONTRACTOR WILL FILL IN THE LAST 5 COLUMNS.

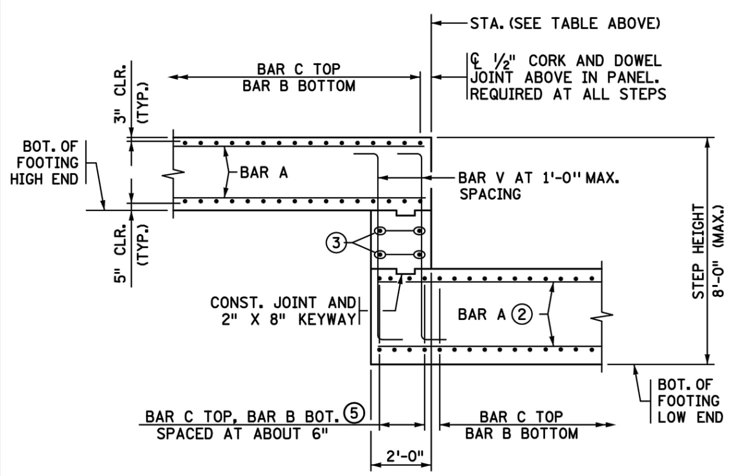
DESIGNER NOTE
(REMOVE PRIOR TO PLOTTING FINAL PLAN):

FOR WALLS WITH CORNERS, FILL IN THE FIRST 3 COLUMNS OF THE BILL OF REINFORCEMENT.

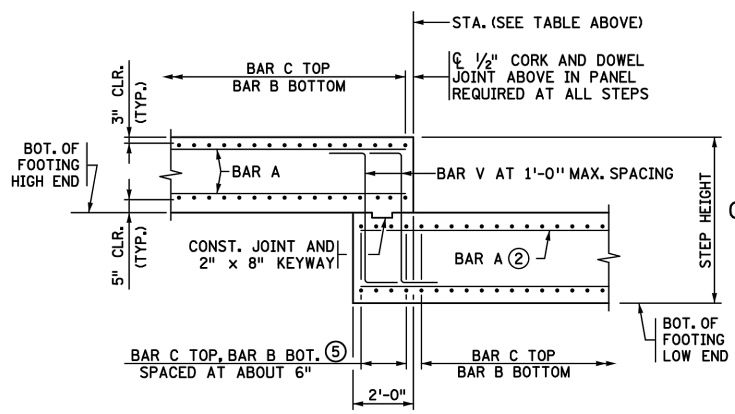
BILL OF REINFORCEMENT FOR CORNER DETAILS ①

STATION	JOINT	INSIDE OR OUTSIDE CORNER	BAR	MARK	NO.	LENGTH	SHAPE	A- DIMENSION
			U	C4 E		8'-8"		N.A.
			W	C4 E		6'-4"		N.A.
			Y	C4 E		4'-11"		2'-11"
			Y	C4 E		5'-9"		3'-9"
			Y	C4 E		7'-5"		5'-5"
			U	C4 E		8'-8"		N.A.
			W	C4 E		6'-4"		N.A.
			Y	C4 E		4'-11"		2'-11"
			Y	C4 E		5'-9"		3'-9"
			Y	C4 E		7'-5"		5'-5"
			U	C4 E		8'-8"		N.A.
			W	C4 E		6'-4"		N.A.
			Y	C4 E		4'-11"		2'-11"
			Y	C4 E		5'-9"		3'-9"
			Y	C4 E		7'-5"		5'-5"
			U	C4 E		8'-8"		N.A.
			W	C4 E		6'-4"		N.A.
			Y	C4 E		4'-11"		2'-11"
			Y	C4 E		5'-9"		3'-9"
			Y	C4 E		7'-5"		5'-5"

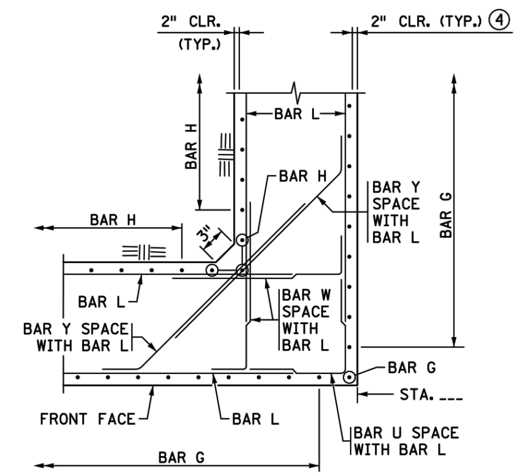
N.A. = NOT APPLICABLE



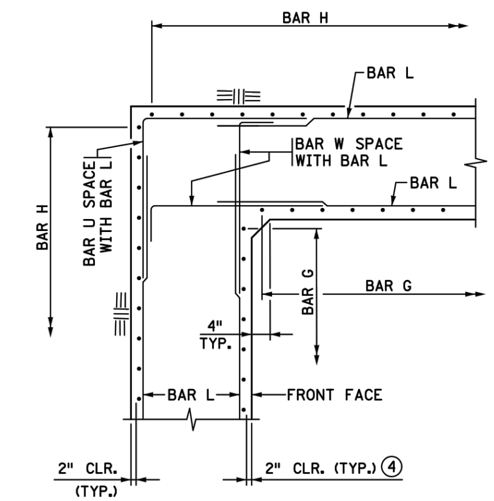
STEPPED FOOTING DETAIL - LONGIT. SECTION ①②
VARIABLE STEP TYPE
(SPREAD FOOTING SHOWN)



STEPPED FOOTING DETAIL - LONGIT. SECTION ①②
MINIMUM STEP TYPE
(SPREAD FOOTING SHOWN)



OUTSIDE 90° CORNER DETAIL - PLAN VIEW ①



INSIDE 90° CORNER DETAIL - PLAN VIEW ①

NOTES:

ADDITIONAL REINFORCING BARS, STRUCTURAL CONCRETE, AND OTHER COMPONENTS REQUIRED TO CONSTRUCT CORNERS AND STEPPED FOOTINGS ARE INCIDENTAL.

① CONTRACTOR IS REQUIRED TO COMPLETE THE BILL OF REINFORCEMENT TABLE AND SUBMIT TO PROJECT ENGINEER AT LEAST 3 WEEKS PRIOR TO REBAR FABRICATION.

② FOR THE LOWER OF THE TWO FOOTINGS AT A STEP, THE CONTRACTOR IS RESPONSIBLE FOR MODIFYING THE LENGTH OF FOOTING BAR A TO EXTEND BENEATH THE STEP OR USE SPLICED BARS.

③ 6 INCH MAX. SPACING. BARS TO BE SAME SIZE AND LENGTH AS BAR B OF THE LOWER FOOTING.

④ REFER TO DETAIL "C" AND NOTES ON STANDARD PLAN 5-297.624 (1 OF 6).

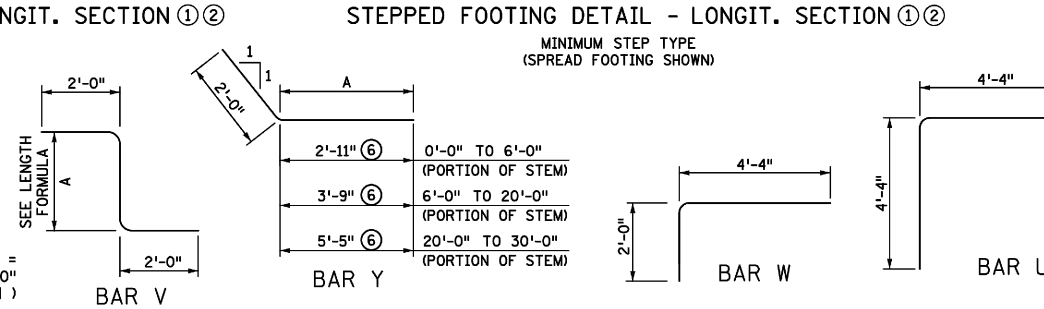
⑤ REFER TO TABLE LABELED "BILL OF REINFORCEMENT FOR STEPPED FOOTING DETAILS" FOR ADDITIONAL B AND C BARS IN LOWER FOOTING.

⑥ USE THE BAR Y LEG DIMENSION FOR THE PORTION OF STEM LOCATION INDICATED IN THE BAR BEND IN DETAIL. (0'-0" REPRESENTS TOP OF THE STEM).

⑦ BAR V SIZE TO MATCH BAR B. SEE PANEL TABULATIONS FOR SIZE.

⑧ SEE PANEL TABULATIONS FOR BAR SIZE AND LENGTH.

BAR V LENGTH FORMULA = STEP HEIGHT MINUS 10" (A-DIMENSION)



BAR BEND DETAILS

REVISION: SEPTEMBER 1, 2016
APPROVED: AUGUST 27, 2014
Nancy Daubenberger
STATE BRIDGE ENGINEER

REVISION DATE 9-1-16

STANDARD SHEET NO. 5-297.624 (2 OF 6)
STANDARD APPROVED: AUGUST 27, 2014
TITLE: RETAINING WALL MISCELLANEOUS DETAILS
STATE PROJ. NO. (TH) SHEET NO. OF SHEETS

NO	DATE	BY	CKD	APPR

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Date --/--/-- License # 58920

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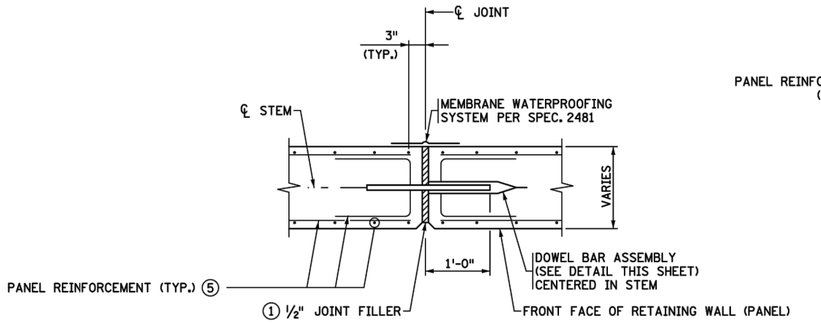
CITY OF ARDEN HILLS
MNDOT STANDARD PLANS
OLD HIGHWAY 10 TRAIL

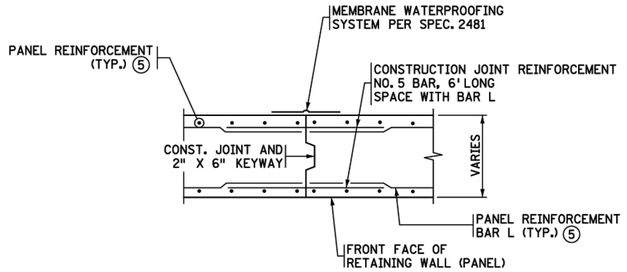
SHEET 33 OF 110



CORK AND DOWELED JOINT DETAIL

(TYPICAL SECTION THROUGH JOINT)

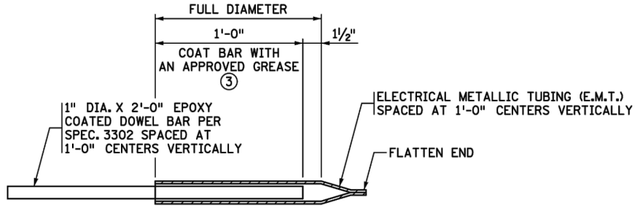
②④



CONSTRUCTION JOINT DETAIL

(TYPICAL SECTION THROUGH JOINT)

②④



DOWEL BAR ASSEMBLY

NOTES:

THE MATERIALS AND PLACEMENT OF THE CORK AND DOWEL JOINT/ CONSTRUCTION JOINT (DOWEL BAR ASSEMBLIES, NO. 5 REINFORCING BARS, JOINT FILLER, AND JOINT WATERPROOFING) ARE INCIDENTAL.

THE CONTRACTOR SHALL ASSIGN TO THE REINFORCING BAR SUPPLIER THE RESPONSIBILITY OF SUPPLYING THE NECESSARY MATERIALS ASSOCIATED WITH THE DETAILS SHOWN ON THIS SHEET.

① JOINT FILLER SHALL BE CORK SPEC. 2401.3.E.3.

② AT THE CONTRACTOR'S OPTION, CONSTRUCTION JOINTS MAY BE SUBSTITUTED IN LIEU OF CORK AND DOWEL JOINTS. REINFORCEMENT QUANTITIES WERE COMPUTED ASSUMING A CORK AND DOWEL JOINT BETWEEN EVERY PANEL. CHANGES IN THE BILL OF REINFORCEMENT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR, AND NO ADDITIONAL PAYMENT WILL BE MADE. AT A MINIMUM, PLACE CORK AND DOWEL JOINTS EVERY 91'-6". A CORK AND DOWEL JOINT IS REQUIRED AT ALL VERTICAL FOOTING STEPS.

③ GREASE SHALL BE AN APPROVED HIGH PRESSURE TYPE THAT IS EFFECTIVE OVER THE FULL RANGE OF EXPECTED TEMPERATURES AND RESISTANT TO CHEMICAL ACTION.

④ DOWEL BAR ASSEMBLY MUST BE PLACED PERPENDICULAR TO JOINT AND PARALLEL TO THE WALL FACE, AND TO EACH OTHER.

⑤ SEE PANEL SHEETS FOR REINFORCING DETAILS.

REVISION: SEPTEMBER 1, 2016

APPROVED: AUGUST 27, 2014

Nancy Daubenberger

STATE BRIDGE ENGINEER

REVISION DATE
9-1-16

STANDARD SHEET NO. 5-297.624 (3 OF 6)	TITLE: RETAINING WALL MISCELLANEOUS DETAILS
STANDARD APPROVED: AUGUST 27, 2014	
STATE PROJ. NO.	(TH) SHEET NO. OF SHEETS

NO	DATE	BY	CKD	APPR

H:\PROJECTS\16000\16750\TECHDATA\CADDESIGN\L3-PLANSHEETS\16750_SPN01.DWG: SPN01-29

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.

Print Name: MARTIN JOYCE

Date --/--/-- License # 58920

DRAWN BY HLB
DESIGNED BY MMJ
CHECKED BY MMJ
COMM. NO. 16750

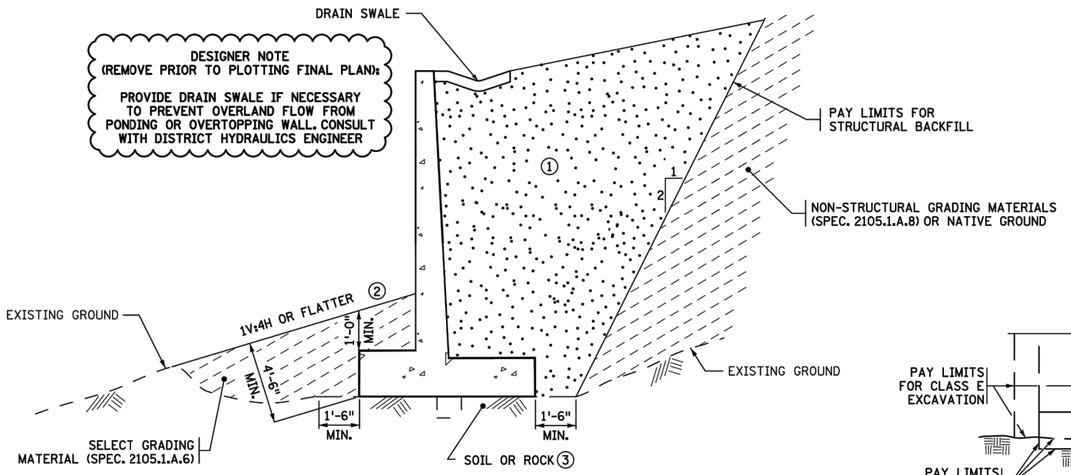
SRF

CITY OF ARDEN HILLS

MNDOT STANDARD PLANS

OLD HIGHWAY 10 TRAIL

SHEET 34 OF 110



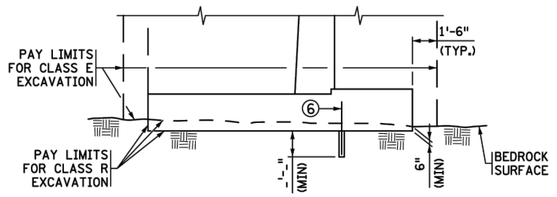
SPREAD FOOTING ON SOIL/ROCK

(NOT DRAWN TO SCALE)

DESIGNER NOTES
(REMOVE PRIOR TO PLOTTING FINAL PLAN):

ALTER BACKFILL AND FINAL GRADE SECTIONS SHOWN IN THIS STANDARD TO MATCH PROJECT SPECIFIC CONDITIONS.

CHECK THE FOUNDATIONS REPORT FOR ADDITIONAL NOTES AND RECOMMENDATIONS THAT SHOULD BE INCLUDED IN PROJECT PLANS.



ROCK EXCAVATION OPTION

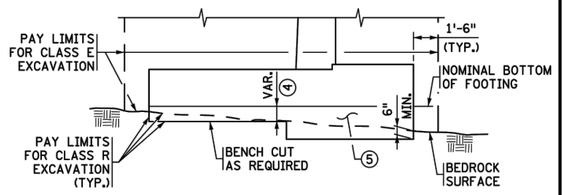
DESIGNER NOTE
(REMOVE PRIOR TO PLOTTING FINAL PLAN):

FILL IN DOWEL DEPTH, DETERMINED FROM FOUNDATION RECOMMENDATION REPORT (1'-6" MIN.)

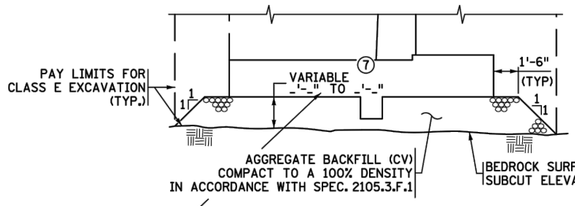
DESIGNER NOTE
(REMOVE PRIOR TO PLOTTING FINAL PLAN):

CONSULT FOUNDATION RECOMMENDATIONS TO DETERMINE WHICH ROCK FOUNDATION OPTION TO USE (IF ANY).

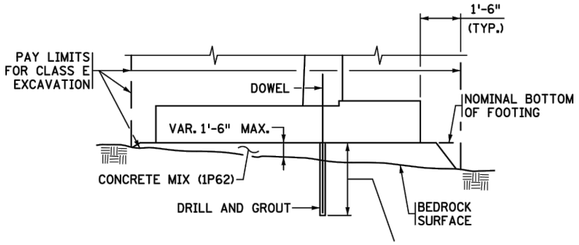
IF ROCK FOUNDATION OPTION IS USED, REMOVE NOTE ③



ROCK SUBCUT WITH CONCRETE BACKFILL OPTION



AGGREGATE BACKFILL OPTION



DOWEL AND LEAN CONCRETE BACKFILL OPTION

ROCK FOUNDATION OPTIONS

DESIGNER NOTE
(REMOVE PRIOR TO PLOTTING FINAL PLAN):

FILL IN DEPTHS BASED ON CONSULTATION WITH FOUNDATIONS UNIT.

MINIMUM DEPTH IS 1'-6" OR DEPTH OF SHEAR KEY. MAXIMUM DEPTH SHOULD NOT EXCEED 6'

DESIGNER NOTE
(REMOVE PRIOR TO PLOTTING FINAL PLAN):

ROCK ANCHOR EMBEDMENT DEPTH SHALL BE DETERMINED BY ENGINEER.

① STRUCTURAL BACKFILL (SPEC. 3149.2.D.2) COMPACT BACKFILL TO SPECIFIED DENSITY METHOD SPEC. 2105.3.F.1

② PROVIDE SLOPE OF 1V:24H TO 1V:4H FOR PROPER DRAINAGE.

③ LEVEL FOUNDATION SURFACE AND CLEAR SURFACE OF LOOSE DEBRIS BEFORE PLACING FOUNDATION DIRECTLY ON SOIL OR ROCK.

④ SEE SPECIAL PROVISIONS FOR PAYMENT OF ADDITIONAL CONCRETE.

⑤ STRUCTURAL CONCRETE (1G52) OR LEAN CONCRETE BACKFILL (1P62), AS APPROVED BY ENGINEER.

⑥ DRILL HOLES FOR ANCHORS TO KEY FOOTING IN ROCK.

⑦ MINIMUM DEPTH 1 FT. 6 INCH OR SHEAR KEY DEPTH.

REVISION:

APPROVED: FEBRUARY 16, 2016

STATE BRIDGE ENGINEER

MODIFIED	
DATE	DESCRIPTION

CERTIFIED BY _____ LICENSED PROFESSIONAL ENGINEER _____ DATE

NAME: _____ LIC. NO.

STANDARD SHEET NO. 5-297.624 (4 OF 6)

STANDARD APPROVED: FEBRUARY 16, 2016

TITLE: RETAINING WALL MISCELLANEOUS DETAILS (GEOTECHNICAL DETAILS)

STATE PROJ. NO. (TH) SHEET NO. OF SHEETS

NO	DATE	BY	CKD	APPR

H:\PROJECTS\16000\16750\TECHDATA\CADDESIGN\L3-PLANSHEETS\16750_SPN01.DWG: SPN01-30

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.

Print Name: MARTIN JOYCE

Date --/--/-- License # 58920

DRAWN BY HLB

DESIGNED BY MMJ

CHECKED BY MMJ

COMM. NO. 16750

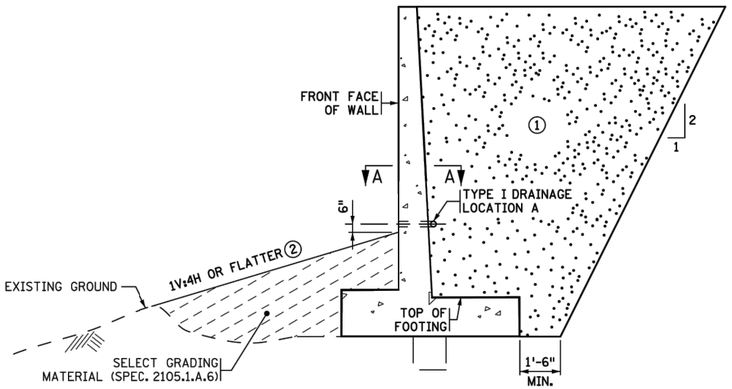
SRF

CITY OF ARDEN HILLS

MNDOT STANDARD PLANS

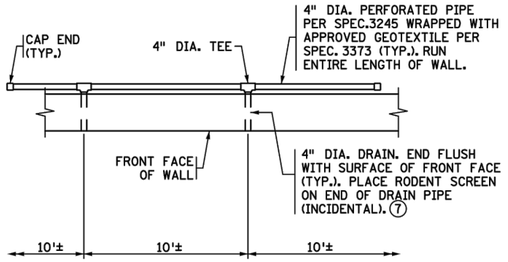
OLD HIGHWAY 10 TRAIL

SHEET 35 OF 110



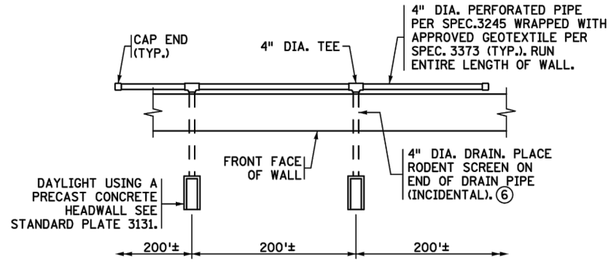
TYPICAL DRAINAGE SYSTEM DETAILS (TYPE I DRAINAGE) ④

(REFER TO SECTION A-A)



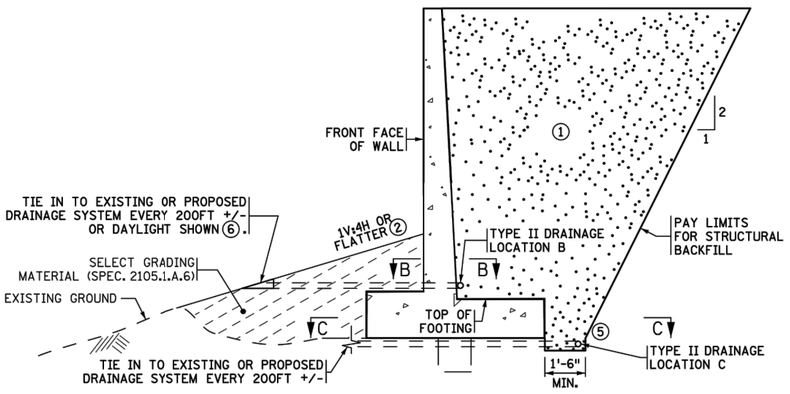
SECTION A-A

TYPE I DRAINAGE DETAIL, LOCATION A



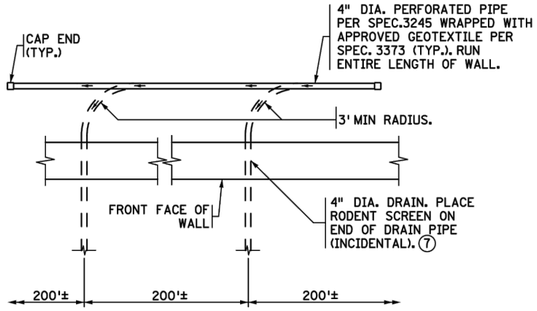
SECTION B-B

TYPE II DRAINAGE DETAIL, LOCATION B



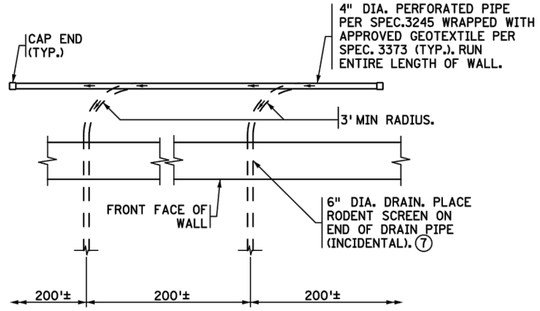
TYPICAL DRAINAGE SYSTEM DETAILS (TYPE II DRAINAGE)

(REFER TO SECTION B-B AND C-C)



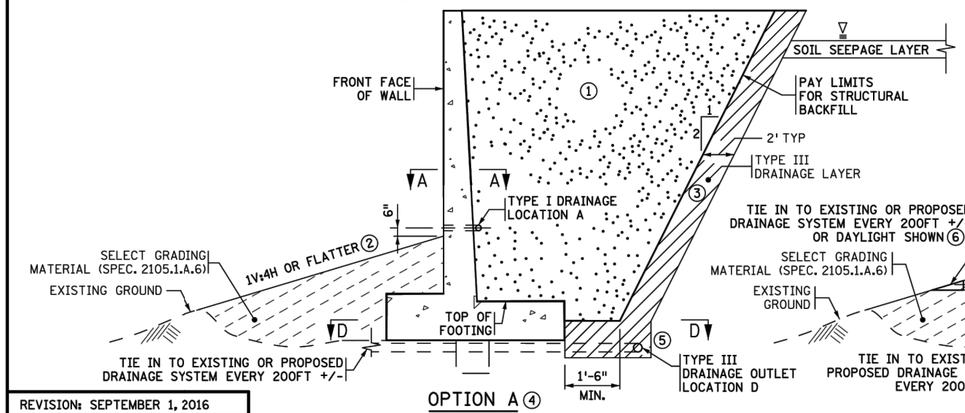
SECTION C-C

TYPE II DRAINAGE DETAIL, LOCATION C



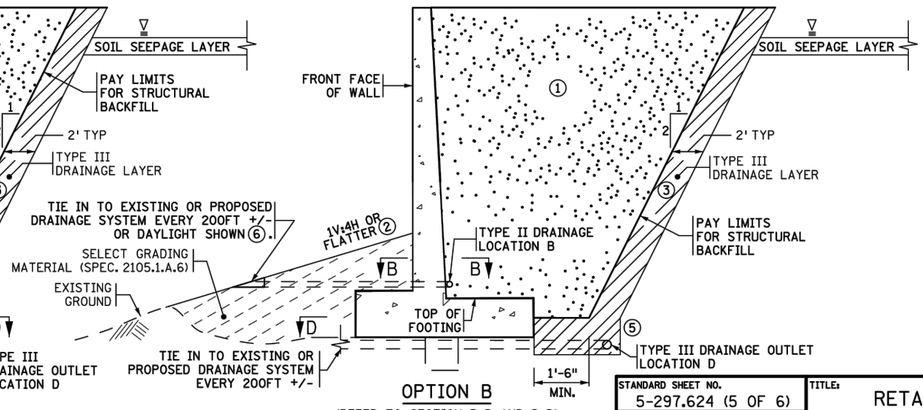
SECTION D-D

TYPE III DRAINAGE DETAIL, LOCATION D



OPTION A ④

(REFER TO SECTION A-A AND D-D)



OPTION B

(REFER TO SECTION B-B AND D-D)

TYPICAL DRAINAGE SYSTEM DETAILS (TYPE III DRAINAGE)

REVISION DATE 9-1-16

NOTES:

BACKFILL MATERIAL SHALL COMPLETELY SURROUND PIPE AT ALL TIMES.

SLOPE PIPE TO ENSURE PROPER DRAINAGE AT ALL TIMES.

DRAINAGE SYSTEM PAID BY LUMP SUM PER SPEC. 2502.

① STRUCTURAL BACKFILL. SEE SHEET 5-297.620. COMPACT BACKFILL TO SPECIFIED DENSITY METHOD SPEC. 2105.3.F.1.

② PROVIDE SLOPE OF 1V:24H TO 1V:4H FOR PROPER DRAINAGE.

③ TYPE III DRAINAGE LAYER TO BE FINE FILTER AGGREGATE PER SPEC. 3149.2.J.2. FINE FILTER AGGREGATE MAY BE REPLACED WITH TYPE VI DRAINAGE GEOCOMPOSITE MATERIAL.

④ DRAINAGE SYSTEMS INSTALLED AT LOCATION A SHALL NOT BE USED WHEN A SIDEWALK, TRAIL, OR ROADWAY IS LOCATED ADJACENT TO THE FRONT FACE OF THE WALL TO PREVENT PONDING OR ICE ACCUMULATION.

⑤ EXTEND STRUCTURAL BACKFILL OR FINE FILTER AGGREGATE 8" BELOW BOTTOM OF FOOTING.

⑥ TYPE II LOCATION B DRAINAGE MAY DAYLIGHT DIRECTLY USING PRECAST CONCRETE HEADWALLS OR BE TIED INTO DRAINAGE SYSTEM.

⑦ THE RODENT SCREEN SHALL BE FABRICATED FROM CARBON STEEL FLATTENED EXPANDED METAL, STYLE 1½" NO. 4F. IT SHALL BE HOT DIPPED GALVANIZED AFTER FABRICATION.

REVISION: SEPTEMBER 1, 2016

APPROVED: AUGUST 27, 2014

Nancy Daubenberger
STATE BRIDGE ENGINEER

STANDARD SHEET NO. 5-297.624 (5 OF 6)

STANDARD APPROVED: AUGUST 27, 2014

TITLE: RETAINING WALL MISCELLANEOUS DETAILS (GEOTECHNICAL DETAILS)

STATE PROJ. NO. (TH) SHEET NO. OF SHEETS

NO	DATE	BY	CKD	APPR

H:\PROJECTS\16000\16750\TECHDATA\CADDESIGN\L3-PLANSHEETS\16750_SPN01.DWG: SPN01-31

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.
Print Name: MARTIN JOYCE
Date --/--/-- License # 58920

DRAWN BY HLB
DESIGNED BY MMJ
CHECKED BY MMJ
COMM. NO. 16750

SRF

CITY OF ARDEN HILLS
MNDOT STANDARD PLANS
OLD HIGHWAY 10 TRAIL

SHEET 36 OF 110

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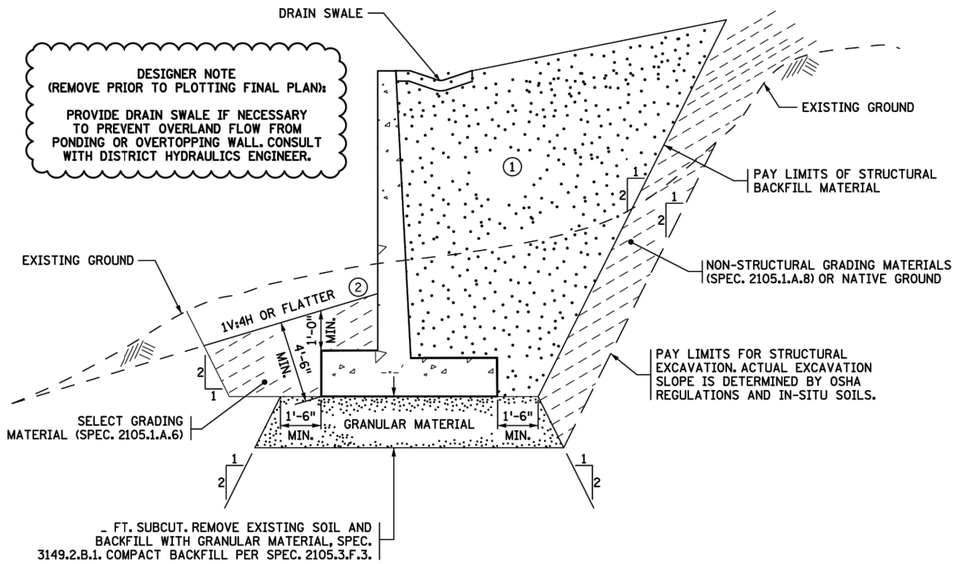
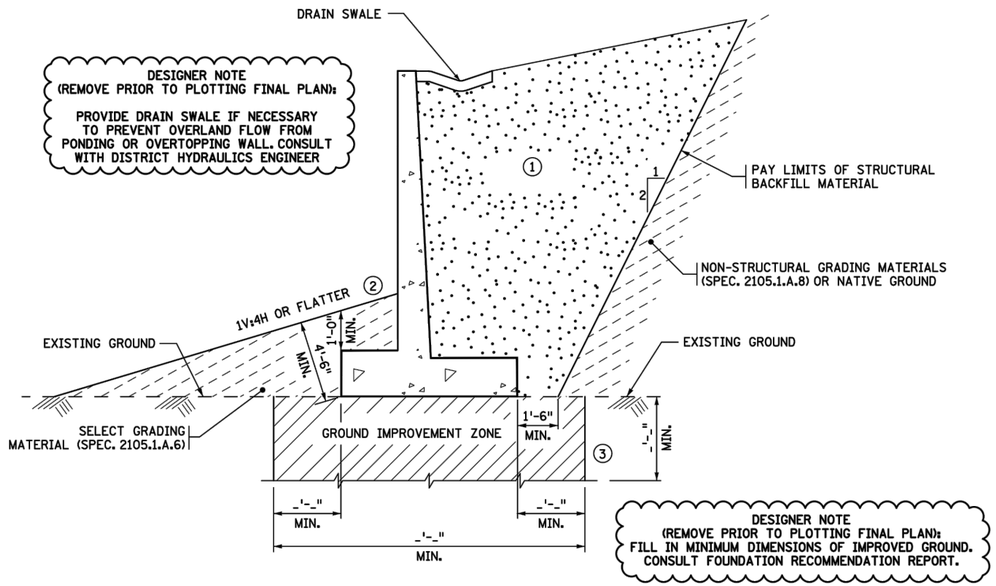
H:\Projects\16000\16750\TechData\CADDesign\L3-PlanSheets\16750_SPN01.dwgSPN01-31

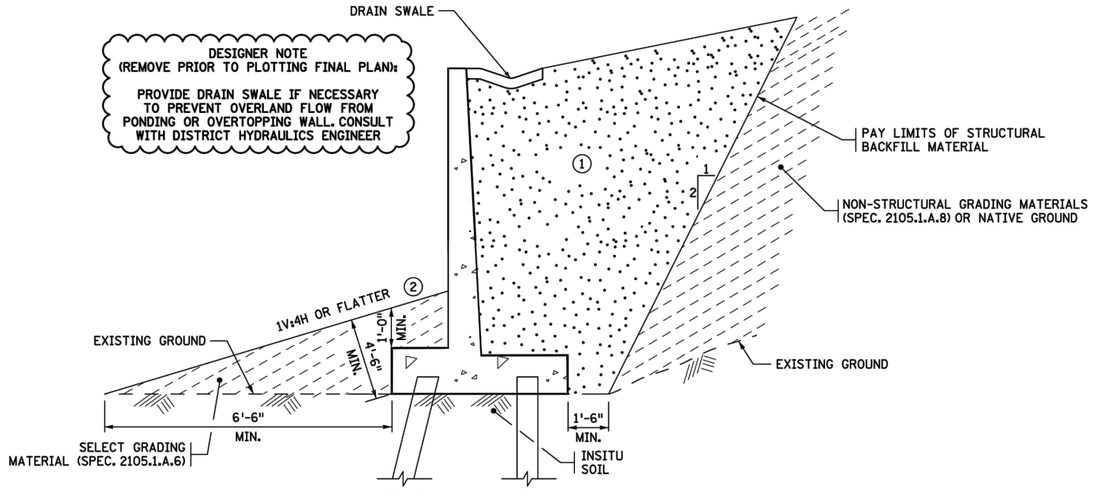


SPREAD FOOTING WITH SOIL SUBCUT
(NOT DRAWN TO SCALE)



SPREAD FOOTING PLACED OVER GROUND IMPROVEMENT
(NOT DRAWN TO SCALE)

DESIGNER NOTE
(REMOVE PRIOR TO PLOTTING FINAL PLAN):
FILL IN SUBCUT DEPTH FROM FOUNDATION RECOMMENDATION REPORT



PILE FOUNDATION
2-PILE SYSTEM SHOWN, OTHER SIMILAR
(NOT DRAWN TO SCALE)

DESIGNER NOTES
(REMOVE PRIOR TO PLOTTING FINAL PLAN):

ALTER BACKFILL AND FINAL GRADE SECTIONS SHOWN IN THIS STANDARD TO MATCH PROJECT SPECIFIC CONDITIONS.

CHECK THE FOUNDATIONS REPORT FOR ADDITIONAL NOTES AND RECOMMENDATIONS THAT SHOULD BE INCLUDED IN PROJECT PLANS.

IF GROUND WATER IS ENCOUNTERED WITHIN TWICE THE FOOTING WIDTH BELOW THE FOOTING, CONTACT THE GEOTECHNICAL ENGINEER TO EVALUATE IF THE STANDARD CAN BE USED OR A REDESIGN IS NEEDED.

1. BACKFILL WITH STRUCTURAL BACKFILL SPEC. 3149.2.D.2 COMPACT BACKFILL PER SPEC. 2105.3.F.3.
2. PROVIDE SLOPE OF 1V:24H TO 1V:4H FOR PROPER DRAINAGE.
3. PROVIDE SUFFICIENT COVERAGE AREA AND TREATMENT VOLUME TO GIVE GENERALLY UNIFORM SUPPORT TO THE FOUNDATION. IMPROVED GROUND OR SURFACE PREPARATIONS PLACED TO IMPROVE GROUND SUPPORT ARE TO BE IN IMMEDIATE CONTACT WITH THE FOOTING AND FOUNDATION MATERIAL.

REVISION: SEPTEMBER 1, 2016
APPROVED: AUGUST 27, 2014
STATE BRIDGE ENGINEER

REVISION DATE 9-1-16

CERTIFIED BY _____ LICENSED PROFESSIONAL ENGINEER _____ DATE
NAME: LIC. NO.

STANDARD SHEET NO. 5-297.624 (6 OF 6)
STANDARD APPROVED: AUGUST 27, 2014

TITLE: RETAINING WALL MISCELLANEOUS DETAILS (GEOTECHNICAL DETAILS)

STATE PROJ. NO. (TH) SHEET NO. OF SHEETS

NO	DATE	BY	CKD	APPR

H:\PROJECTS\16000\16750\TECHDATA\CADDESIGN\L3-PLANSHEETS\16750_SPN01.DWG: SPN01-32

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.
Print Name: MARTIN JOYCE
Date --/--/-- License # 58920

DRAWN BY HLB
DESIGNED BY MMJ
CHECKED BY MMJ
COMM. NO. 16750

CITY OF ARDEN HILLS
MNDOT STANDARD PLANS
OLD HIGHWAY 10 TRAIL

SHEET 37 OF 110

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h = 5' PANELS: — PANEL LENGTH = 30'-6"

SPREAD FOOTING REINFORCEMENT							DIMENSIONS				
A	F501	8	32'-11"	STR.	LONG T & B	275	SPREAD FOOTING				
B	F502	31	2'-9"	STR.	TRANS BOT	89	b	9"	e	----
C	F503	31	2'-9"	STR.	TRANS TOP	89	c	1'-5"	f	----
							d	3'-3"	g	11¼"

PILE FOUNDATION REINFORCEMENT							PILE FOUNDATION			
A	F701	14	34'-2"	STR.	LONG T & B	978	b	1'-9"	d	6'-0"
B	F502	31	6'-8"	5'-6"	TRANS BOT	216	c	2'-0"	g	1'-11¼"
C	F503	31	6'-8"	5'-6"	TRANS TOP	216				

STEM					
a	1'-8½"	x	2'-1"		
j	1'-3⅞"	z	----		

FOOTING DOWELS & STEM REINFORCEMENT							QUANTITIES		
D	F504E	31	3'-0"	STR.	DOWEL FF	97	STRUCTURAL CONCRETE (1G52)		
E	F505E	31	4'-4"	10"	DOWEL BF	140	(FOOTING)		
F	F506E	----	----	----	DOWEL BF	----	SPREAD	5.3	CU YD
G	S401E	31	3'-11"	STR.	VERT FF	81	PILE	13.8	CU YD
H	S502E	31	3'-11"	STR.	VERT BF	127	STRUCTURAL CONCRETE (3G52)		
J	S503E	----	----	STR.	VERT BF	----	(STEM)		
K	S504E	31	7'-2"	3'-0"	TIE	232	9.0		CU YD
L	S405E	10	30'-0"	STR.	HORIZ EF	200	REINFORCEMENT (PLAIN)		
M	S506E	10	7'-4"	1'-4"	EXP JT TIE	76	SPREAD	452	LB
N	S507E	----	7'-9"	1'-9"	EXP JT TIE	----	PILE	1409	LB
P	S508E	----	8'-2"	2'-2"	EXP JT TIE	----	REINFORCEMENT (EPOXY)		
							953		LB

h = 6' PANELS: — PANEL LENGTH = 30'-6"

SPREAD FOOTING REINFORCEMENT							DIMENSIONS				
A	F501	8	32'-11"	STR.	LONG T & B	275	SPREAD FOOTING				
B	F502	31	3'-2"	STR.	TRANS BOT	102	b	11"	e	----
C	F503	31	3'-2"	STR.	TRANS TOP	102	c	1'-5"	f	----
							d	3'-8"	g	1'-1⅛"

PILE FOUNDATION REINFORCEMENT							PILE FOUNDATION			
A	F701	14	34'-2"	STR.	LONG T & B	978	b	1'-9"	d	6'-0"
B	F502	31	6'-8"	5'-6"	TRANS BOT	216	c	2'-0"	g	1'-11¼"
C	F503	31	6'-8"	5'-6"	TRANS TOP	216				

STEM					
a	1'-9"	x	2'-1"		
j	1'-4⅞"	z	----		

FOOTING DOWELS & STEM REINFORCEMENT							QUANTITIES		
D	F504E	31	3'-0"	STR.	DOWEL FF	97	STRUCTURAL CONCRETE (1G52)		
E	F505E	31	4'-4"	10"	DOWEL BF	140	(FOOTING)		
F	F506E	----	----	----	DOWEL BF	----	SPREAD	6.0	CU YD
G	S401E	31	4'-11"	STR.	VERT FF	102	PILE	13.8	CU YD
H	S502E	31	4'-11"	STR.	VERT BF	159	STRUCTURAL CONCRETE (3G52)		
J	S503E	----	----	STR.	VERT BF	----	(STEM)		
K	S504E	31	7'-2"	3'-0"	TIE	232	11.0		CU YD
L	S405E	12	30'-0"	STR.	HORIZ EF	240	REINFORCEMENT (PLAIN)		
M	S506E	12	7'-4"	1'-4"	EXP JT TIE	92	SPREAD	479	LB
N	S507E	----	7'-9"	1'-9"	EXP JT TIE	----	PILE	1409	LB
P	S508E	----	8'-2"	2'-2"	EXP JT TIE	----	REINFORCEMENT (EPOXY)		
							1062		LB

h = 7' PANELS: — PANEL LENGTH = 30'-6"

SPREAD FOOTING REINFORCEMENT							DIMENSIONS				
A	F501	10	32'-11"	STR.	LONG T & B	343	SPREAD FOOTING				
B	F502	31	3'-11"	STR.	TRANS BOT	127	b	1'-1"	e	----
C	F503	31	3'-11"	STR.	TRANS TOP	127	c	1'-5"	f	----
							d	4'-5"	g	1'-3¼"

PILE FOUNDATION REINFORCEMENT							PILE FOUNDATION			
A	F701	14	34'-2"	STR.	LONG T & B	978	b	1'-9"	d	6'-0"
B	F502	31	6'-8"	5'-6"	TRANS BOT	216	c	2'-0"	g	1'-11¼"
C	F503	31	6'-8"	5'-6"	TRANS TOP	216				

STEM					
a	1'-9½"	x	2'-1"		
j	1'-4⅞"	z	----		

FOOTING DOWELS & STEM REINFORCEMENT							QUANTITIES		
D	F504E	31	3'-0"	STR.	DOWEL FF	97	STRUCTURAL CONCRETE (1G52)		
E	F505E	31	4'-4"	10"	DOWEL BF	140	(FOOTING)		
F	F506E	----	----	----	DOWEL BF	----	SPREAD	7.3	CU YD
G	S401E	31	4'-2"	STR.	VERT FF	86	PILE	13.8	CU YD
H	S502E	31	4'-2"	STR.	VERT BF	135	STRUCTURAL CONCRETE (3G52)		
J	S503E	----	----	STR.	VERT BF	----	(STEM)		
K	S504E	31	10'-8"	4'-9"	TIE	345	13.0		CU YD
L	S405E	14	30'-0"	STR.	HORIZ EF	281	REINFORCEMENT (PLAIN)		
M	S506E	14	7'-4"	1'-4"	EXP JT TIE	107	SPREAD	597	LB
N	S507E	----	7'-9"	1'-9"	EXP JT TIE	----	PILE	1409	LB
P	S508E	----	8'-2"	2'-2"	EXP JT TIE	----	REINFORCEMENT (EPOXY)		
							1191		LB

h = 8' PANELS: — PANEL LENGTH = 30'-6"

SPREAD FOOTING REINFORCEMENT							DIMENSIONS				
A	F501	12	32'-11"	STR.	LONG T & B	412	SPREAD FOOTING				
B	F502	31	4'-8"	STR.	TRANS BOT	151	b	1'-3"	e	----
C	F503	31	4'-8"	STR.	TRANS TOP	151	c	1'-5"	f	----
							d	5'-2"	g	1'-5¼"

PILE FOUNDATION REINFORCEMENT							PILE FOUNDATION			
A	F801	14	35'-4"	STR.	LONG T & B	1321	b	1'-9"	d	6'-0"
B	F502	31	6'-8"	5'-6"	TRANS BOT	216	c	2'-0"	g	1'-11¼"
C	F503	31	6'-8"	5'-6"	TRANS TOP	216				

STEM					
a	1'-10"	x	2'-1"		
j	1'-5⅜"	z	----		

FOOTING DOWELS & STEM REINFORCEMENT							QUANTITIES		
D	F504E	31	3'-0"	STR.	DOWEL FF	97	STRUCTURAL CONCRETE (1G52)		
E	F505E	31	4'-4"	10"	DOWEL BF	140	(FOOTING)		
F	F506E	----	----	----	DOWEL BF	----	SPREAD	8.5	CU YD
G	S401E	31	5'-2"	STR.	VERT FF	107	PILE	13.8	CU YD
H	S502E	31	5'-2"	STR.	VERT BF	167	STRUCTURAL CONCRETE (3G52)		
J	S503E	----	----	STR.	VERT BF	----	(STEM)		
K	S504E	31	10'-8"	4'-9"	TIE	345	15.0		CU YD
L	S405E	16	30'-0"	STR.	HORIZ EF	321	REINFORCEMENT (PLAIN)		
M	S506E	16	7'-4"	1'-4"	EXP JT TIE	122	SPREAD	714	LB
N	S507E	----	7'-9"	1'-9"	EXP JT TIE	----	PILE	1752	LB
P	S508E	----	8'-2"	2'-2"	EXP JT TIE	----	REINFORCEMENT (EPOXY)		
							1299		LB

h = 9' PANELS: — PANEL LENGTH = 30'-6"

SPREAD FOOTING REINFORCEMENT							DIMENSIONS				
A	F501	14	32'-11"	STR.	LONG T & B	481	SPREAD FOOTING				
B	F502	31	5'-5"	STR.	TRANS BOT	175	b	1'-5"	e	----
C	F503	31	5'-5"	STR.	TRANS TOP	175	c	1'-5"	f	----
							d	5'-11"	g	1'-7¼"

PILE FOUNDATION REINFORCEMENT							PILE FOUNDATION			
A	F801	14	35'-4"	STR.	LONG T & B	1321	b	1'-9"	d	6'-0"
B	F502	31	6'-8"	5'-6"	TRANS BOT	216	c	2'-0"	g	1'-11¼"
C	F503	31	6'-8"	5'-6"	TRANS TOP	216				

STEM					
a	1'-10½"	x	2'-1"		
j	1'-5⅞"	z	----		

FOOTING DOWELS & STEM REINFORCEMENT							QUANTITIES		
D	F504E	31	3'-0"	STR.	DOWEL FF	97	STRUCTURAL CONCRETE (1G52)		
E	F505E	31	4'-4"	10"	DOWEL BF	140	(FOOTING)		
F	F506E	----	----	----	DOWEL BF	----	SPREAD	9.7	CU YD
G	S401E	31	6'-2"	STR.	VERT FF	128	PILE	13.8	CU YD
H	S502E	31	6'-2"	STR.	VERT BF	199	STRUCTURAL CONCRETE (3G52)		
J	S503E	----	----	STR.	VERT BF	----	(STEM)		
K	S504E	31	10'-8"	4'-9"	TIE	345	17.1		CU YD
L	S405E	18	30'-0"	STR.	HORIZ EF	361	REINFORCEMENT (PLAIN)		
M	S506E	18	7'-4"	1'-4"	EXP JT TIE	138	SPREAD	831	LB
N	S507E	----	7'-9"	1'-9"	EXP JT TIE	----	PILE	1752	LB
P	S508E	----	8'-2"	2'-2"	EXP JT TIE	----	REINFORCEMENT (EPOXY)		
							1407		LB

h = 10' PANELS: — PANEL LENGTH = 30'-6"

SPREAD FOOTING REINFORCEMENT							DIMENSIONS				
A	F501	14	32'-11"	STR.	LONG T & B	481	SPREAD FOOTING				
B	F502	31	6'-2"	STR.	TRANS BOT	199	b	1'-7"	e	----
C	F503	31	6'-2"	STR.	TRANS TOP	199	c	1'-5"	f	----
							d	6'-8"	g	1'-9¼"

PILE FOUNDATION REINFORCEMENT							PILE FOUNDATION			
A	F801	14	35'-4"	STR.	LONG T & B	1321	b	1'-9"	d	6'-0"
B	F502	31	6'-8"	5'-6"	TRANS BOT	216	c	2'-0"	g	1'-11¼"
C	F503	31	6'-8"	5'-6"	TRANS TOP	216				

STEM					
a	1'-11"	x	2'-1"		
j	1'-6⅜"	z	----		

FOOTING DOWELS & STEM REINFORCEMENT							QUANTITIES		
D	F504E	31	3'-0"	STR.	DOWEL FF	97	STRUCTURAL CONCRETE (1G52)		
E	F505E	31	6'-9"	3'-1"	DOWEL BF	218	(FOOTING)		
F	F506E	----	----	----	DOWEL BF	----	SPREAD	10.9	CU YD
G	S401E	31	7'-2"	STR.	VERT FF	148	PILE	13.8	CU YD
H	S502E	31	7'-2"	STR.	VERT BF	232	STRUCTURAL CONCRETE (3G52)		
J	S503E	----	----	STR.	VERT BF	----	(STEM)		
K	S504E	31	10'-8"	4'-9"	TIE	345	19.3		CU YD
L	S405E	20	30'-0"	STR.	HORIZ EF	401	REINFORCEMENT (PLAIN)		
M	S506E	20	7'-4"	1'-4"	EXP JT TIE	153	SPREAD	879	LB
N	S507E	----	7'-9"	1'-9"	EXP JT TIE	----	PILE	1752	LB
P	S508E	----	8'-2"	2'-2"	EXP JT TIE	----	REINFORCEMENT (EPOXY)		
							1594		LB

h = 11' PANELS: — PANEL LENGTH = 30'-6"

SPREAD FOOTING REINFORCEMENT							DIMENSIONS				
A	F501	16	32'-11"	STR.	LONG T & B	549	SPREAD FOOTING				
B	F502	31	6'-11"	STR.	TRANS BOT	224	b	1'-9"	e	----
C	F603	31	6'-11"	STR.	TRANS TOP	322	c	1'-5"	f	----
							d	7'-5"	g	1'-11¼"

PILE FOUNDATION REINFORCEMENT							PILE FOUNDATION			
A	F801	18	35'-4"	STR.	LONG T & B	1698	b	3'-0"	d	8'-6"
B	F602	31	9'-4"	8'-0"	TRANS BOT	435	c	2'-3"	g	3'-2¼"
C	F503	31	9'-2"	8'-0"	TRANS TOP	296				

STEM					
a	1'-11½"	x	2'-1"		
j	1'-6⅞"	z	2'-1"		

FOOTING DOWELS & STEM REINFORCEMENT							QUANTITIES		
D	F504E	31	3'-0"	STR.	DOWEL FF	97	STRUCTURAL CONCRETE (1G52)		
E	F505E	31	8'-3"	3'-4"	DOWEL BF	267	(FOOTING)		
F	F506E	30	4'-1"	3'-0"	DOWEL BF	128	SPREAD	12.2	CU YD
G	S401E	31	8'-2"	STR.	VERT FF	169	PILE	22.1	CU YD
H	S502E	31	8'-2"	STR.	VERT BF	264	STRUCTURAL CONCRETE (3G52)		
J	S503E	----	----	STR.	VERT BF	----	(STEM)		
K	S504E	31	10'-8"	4'-9"	TIE	345	21.4		CU YD
L	S405E	22	30'-0"	STR.	HORIZ EF	441	REINFORCEMENT (PLAIN)		
M	S506E	20	7'-4"	1'-4"	EXP JT TIE	153	SPREAD	1095	LB
N	S507E	2	7'-9"	1'-9"	EXP JT TIE	16	PILE	2429	LB
P	S508E	----	8'-2"	2'-2"	EXP JT TIE	----	REINFORCEMENT (EPOXY)		
							1880		LB

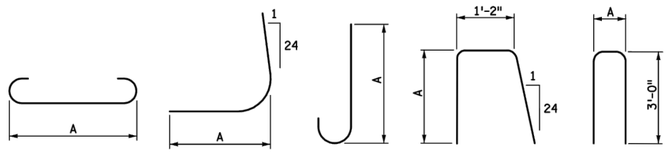
h = 12' PANELS: — PANEL LENGTH = 30'-6"

SPREAD FOOTING REINFORCEMENT							DIMENSIONS				
A	F501	18	32'-11"	STR.	LONG T & B	618	SPREAD FOOTING				
B	F502	31	7'-8"	STR.	TRANS BOT	248	b	1'-11"	e	----
C	F703	31	7'-8"	STR.	TRANS TOP	486	c	1'-5"	f	----
							d	8'-2"	g	2'-1¼"

PILE FOUNDATION REINFORCEMENT							PILE FOUNDATION			
A	F801	18	35'-4"	STR.	LONG T & B	1698	b	3'-0"	d	8'-6"
B	F602	31	9'-4"	8'-0"	TRANS BOT	435	c	2'-3"	g	3'-2¼"
C	F503	31	9'-2"	8'-0"	TRANS TOP	296				

STEM					
a	2'-0"	x	2'-1"		
j	1'-7⅜"	z	2'-1"		

FOOTING DOWELS & STEM REINFORCEMENT							QUANTITIES		
D	F504E	31	3'-0"	STR.	DOWEL FF	97	STRUCTURAL CONCRETE (1G52)		
E	F505E	31	8'-4"	3'-6"	DOWEL BF	269	(FOOTING)		
F	F506E	30	4'-1"	3'-0"	DOWEL BF	128	SPREAD	13.4	CU YD
G	S401E	31	9'-2"	STR.	VERT FF	190	PILE	22.1	CU YD
H	S502E	31	9'-2"	STR.	VERT BF	296	STRUCTURAL CONCRETE (3G52)		
J	S503E	----	----	STR.	VERT BF	----	(STEM)		
K	S504E	31	10'-8"	4'-9"	TIE	345	23.7		CU YD
L	S405E	24	30'-0"	STR.	HORIZ EF	481	REINFORCEMENT (PLAIN)		
M	S506E	20	7'-4"	1'-4"	EXP JT TIE	153	SPREAD	1352	LB
N	S507E	4	7'-9"	1'-9"	EXP JT TIE	32	PILE	2429	LB
P	S508E	----	8'-2"	2'-2"	EXP JT TIE	----	REINFORCEMENT (EPOXY)		
							1992		LB



BAR B,C (FOR PILE FOUNDATION ONLY) — BAR E — BAR F — BAR K — BARS M,N,P

NOTES:
L = DENOTES PANEL LENGTH.
FF = DENOTES FRONT FACE.
BF = DENOTES BACK FACE.
EF = DENOTES EACH FACE.
DWL = DENOTES DOWEL.
BARS MARKED WITH THE SUFFIX "E" ARE EPOXY COATED.
x = PROJECTION OF BAR E INTO STEM.
z = PROJECTION OF BAR F INTO STEM.

REVISION: SEPTEMBER 1, 2016
APPROVED: AUGUST 27, 2014
Nancy Daubenberger
STATE BRIDGE ENGINEER

MINNESOTA DEPARTMENT OF TRANSPORTATION

STANDARD PLAN 5-297.627 | 1 OF 3

APPROVED: 8-27-2014
REVISED: 9-1-2016

STATE DESIGN ENGINEER

RETAINING WALL PANEL TABULATIONS

(1V:2H SLOPED FILL)

STATE PROJ. NO. (T.H.) SHEET NO. OF SHEETS

NO	DATE	BY	CKD	APPR

H:\PROJECTS\16000\16750\TECHDATA\CADDESIGN\L3-PLANSHEETS\16750_SPN01.DWG: SPN01-33

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.
Print Name: MARTIN JOYCE
Date --/--/-- License # 58920

DRAWN BY HLB
DESIGNED BY MMJ
CHECKED BY MMJ
COMM. NO. 16750

SRF

CITY OF ARDEN HILLS
MNDOT STANDARD PLANS
OLD HIGHWAY 10 TRAIL

SHEET 38 OF 110

h = 13' PANELS: — PANEL LENGTH = 30'-6"

SPREAD FOOTING REINFORCEMENT							DIMENSIONS				
A	F501	20	32'-11"	STR.	LONG T & B	687	SPREAD FOOTING				
B	F502	31	8'-5"	STR.	TRANS BOT	272	b	2'-1"	e	----
C	F803	31	8'-5"	STR.	TRANS TOP	697	c	1'-5"	f	----
							d	8'-11"	g	2'-3¼"

PILE FOUNDATION REINFORCEMENT							PILE FOUNDATION			
A	F801	18	35'-4"	STR.	LONG T & B	1698	b	3'-0"	d	8'-6"
B	F602	31	9'-4"	8'-0"	TRANS BOT	435	c	2'-3"	g	3'-2¼"
C	F503	31	9'-2"	8'-0"	TRANS TOP	296				

STEM					
a	2'-0½"	x	2'-1"		
j	1'-7⅞"	z	2'-9"		

FOOTING DOWELS & STEM REINFORCEMENT							QUANTITIES		
D	F504E	31	3'-0"	STR.	DOWEL FF	97	STRUCTURAL CONCRETE (1G52)		
E	F505E	31	8'-4"	3'-8"	DOWEL BF	269	(FOOTING)		
F	F506E	30	4'-9"	3'-8"	DOWEL BF	149	SPREAD	14.6	CU YD
G	S401E	31	10'-2"	STR.	VERT FF	211	PILE	22.1	CU YD
H	S502E	31	10'-2"	STR.	VERT BF	329	STRUCTURAL CONCRETE (3G52)		
J	S503E	----	----	STR.	VERT BF	-----	(STEM)		
K	S504E	31	10'-8"	4'-9"	TIE	345	26.0		CU YD
L	S405E	26	30'-0"	STR.	HORIZ EF	521	REINFORCEMENT (PLAIN)		
M	S506E	20	7'-4"	1'-4"	EXP JT TIE	153	SPREAD	1655	LB
N	S507E	6	7'-9"	1'-9"	EXP JT TIE	48	PILE	2429	LB
P	S508E	----	8'-2"	2'-2"	EXP JT TIE	-----	REINFORCEMENT (EPOXY)		
							2122		LB

h = 14' PANELS: — PANEL LENGTH = 30'-6"

SPREAD FOOTING REINFORCEMENT							DIMENSIONS				
A	F501	20	32'-11"	STR.	LONG T & B	687	SPREAD FOOTING				
B	F502	31	8'-5"	STR.	TRANS BOT	272	b	2'-3"	e	1'-4"
C	F803	31	8'-5"	STR.	TRANS TOP	697	c	1'-5"	f	3'-7½"
							d	8'-11"	g	2'-5¼"

PILE FOUNDATION REINFORCEMENT							PILE FOUNDATION			
A	F801	18	35'-4"	STR.	LONG T & B	1698	b	3'-0"	d	8'-6"
B	F602	31	9'-4"	8'-0"	TRANS BOT	435	c	2'-3"	g	3'-2¼"
C	F503	31	9'-2"	8'-0"	TRANS TOP	296				

STEM					
a	2'-1"	x	2'-1"		
j	1'-8⅜"	z	3'-9"		

FOOTING DOWELS & STEM REINFORCEMENT							QUANTITIES		
D	F504E	31	3'-0"	STR.	DOWEL FF	97	STRUCTURAL CONCRETE (1G52)		
E	F505E	31	8'-5"	3'-11"	DOWEL BF	272	(FOOTING)		
F	F506E	30	7'-3"	6'-1"	DOWEL BF	227	SPREAD	16.6	CU YD
G	S401E	31	11'-2"	STR.	VERT FF	231	PILE	22.1	CU YD
H	S502E	31	11'-2"	STR.	VERT BF	361	STRUCTURAL CONCRETE (3G52)		
J	S503E	----	----	STR.	VERT BF	-----	(STEM)		
K	S504E	31	10'-8"	4'-9"	TIE	345	28.3		CU YD
L	S405E	28	30'-0"	STR.	HORIZ EF	561	REINFORCEMENT (PLAIN)		
M	S506E	20	7'-4"	1'-4"	EXP JT TIE	153	SPREAD	1655	LB
N	S507E	8	7'-9"	1'-9"	EXP JT TIE	65	PILE	2429	LB
P	S508E	----	8'-2"	2'-2"	EXP JT TIE	-----	REINFORCEMENT (EPOXY)		
							2312		LB

h = 15' PANELS: — PANEL LENGTH = 30'-6"

SPREAD FOOTING REINFORCEMENT							DIMENSIONS				
A	F501	20	32'-11"	STR.	LONG T & B	687	SPREAD FOOTING				
B	F502	31	8'-5"	STR.	TRANS BOT	272	b	2'-6"	e	1'-4"
C	F803	31	8'-5"	STR.	TRANS TOP	697	c	1'-5"	f	3'-11"
							d	8'-11"	g	2'-8¼"

PILE FOUNDATION REINFORCEMENT							PILE FOUNDATION			
A	F801	26	35'-4"	STR.	LONG T & B	2453	b	4'-9"	d	12'-0"
B	F802	31	13'-4"	11'-6"	TRANS BOT	1104	c	2'-6"	g	4'-11⅜"
C	F703	31	13'-2"	11'-6"	TRANS TOP	834				

STEM					
a	2'-1½"	x	2'-1"		
j	1'-8⅞"	z	4'-4"		

FOOTING DOWELS & STEM REINFORCEMENT							QUANTITIES		
D	F504E	31	3'-0"	STR.	DOWEL FF	97	STRUCTURAL CONCRETE (1G52)		
E	F505E	31	10'-5"	4'-2"	DOWEL BF	337	(FOOTING)		
F	F606E	30	7'-11"	6'-8"	DOWEL BF	357	SPREAD	16.7	CU YD
G	S401E	31	12'-2"	STR.	VERT FF	252	PILE	34.6	CU YD
H	S502E	31	12'-2"	STR.	VERT BF	393	STRUCTURAL CONCRETE (3G52)		
J	S503E	----	----	STR.	VERT BF	-----	(STEM)		
K	S504E	31	10'-8"	4'-9"	TIE	345	30.7		CU YD
L	S405E	30	30'-0"	STR.	HORIZ EF	601	REINFORCEMENT (PLAIN)		
M	S506E	20	7'-4"	1'-4"	EXP JT TIE	153	SPREAD	1655	LB
N	S507E	10	7'-9"	1'-9"	EXP JT TIE	81	PILE	4391	LB
P	S508E	----	8'-2"	2'-2"	EXP JT TIE	-----	REINFORCEMENT (EPOXY)		
							2616		LB

h = 16' PANELS: — PANEL LENGTH = 30'-6"

SPREAD FOOTING REINFORCEMENT							DIMENSIONS				
A	F501	20	32'-11"	STR.	LONG T & B	687	SPREAD FOOTING				
B	F502	31	8'-5"	STR.	TRANS BOT	272	b	2'-9"	e	1'-4"
C	F803	31	8'-5"	STR.	TRANS TOP	697	c	1'-5"	f	4'-2½"
							d	8'-11"	g	2'-11¼"

PILE FOUNDATION REINFORCEMENT							PILE FOUNDATION			
A	F801	26	35'-4"	STR.	LONG T & B	2453	b	4'-9"	d	12'-0"
B	F802	31	13'-4"	11'-6"	TRANS BOT	1104	c	2'-6"	g	4'-11⅜"
C	F703	31	13'-2"	11'-6"	TRANS TOP	834				

STEM					
a	2'-2"	x	2'-1"		
j	1'-9⅜"	z	5'-3"		

FOOTING DOWELS & STEM REINFORCEMENT							QUANTITIES		
D	F504E	31	3'-0"	STR.	DOWEL FF	97	STRUCTURAL CONCRETE (1G52)		
E	F505E	31	10'-6"	4'-6"	DOWEL BF	339	(FOOTING)		
F	F706E	30	9'-0"	7'-7"	DOWEL BF	552	SPREAD	16.7	CU YD
G	S401E	31	13'-2"	STR.	VERT FF	273	PILE	34.6	CU YD
H	S502E	31	13'-2"	STR.	VERT BF	426	STRUCTURAL CONCRETE (3G52)		
J	S503E	----	----	STR.	VERT BF	-----	(STEM)		
K	S504E	31	10'-8"	4'-9"	TIE	345	33.1		CU YD
L	S405E	32	30'-0"	STR.	HORIZ EF	641	REINFORCEMENT (PLAIN)		
M	S506E	20	7'-4"	1'-4"	EXP JT TIE	153	SPREAD	1655	LB
N	S507E	12	7'-9"	1'-9"	EXP JT TIE	97	PILE	4391	LB
P	S508E	----	8'-2"	2'-2"	EXP JT TIE	-----	REINFORCEMENT (EPOXY)		
							2923		LB

h = 17' PANELS: — PANEL LENGTH = 30'-6"

SPREAD FOOTING REINFORCEMENT							DIMENSIONS				
A	F501	20	32'-11"	STR.	LONG T & B	687	SPREAD FOOTING				
B	F502	31	8'-8"	STR.	TRANS BOT	280	b	3'-0"	e	1'-6"
C	F903	31	8'-8"	STR.	TRANS TOP	913	c	1'-7"	f	4'-6"
							d	9'-2"	g	3'-2¼"

PILE FOUNDATION REINFORCEMENT							PILE FOUNDATION			
A	F801	26	35'-4"	STR.	LONG T & B	2453	b	4'-9"	d	12'-0"
B	F802	31	13'-4"	11'-6"	TRANS BOT	1104	c	2'-6"	g	4'-11⅜"
C	F703	31	13'-2"	11'-6"	TRANS TOP	834				

STEM					
a	2'-2½"	x	2'-10"		
j	1'-9⅞"	z	6'-3"		

FOOTING DOWELS & STEM REINFORCEMENT							QUANTITIES		
D	F504E	31	3'-0"	STR.	DOWEL FF	97	STRUCTURAL CONCRETE (1G52)		
E	F605E	31	11'-3"	4'-10"	DOWEL BF	524	(FOOTING)		
F	F706E	30	10'-4"	8'-11"	DOWEL BF	634	SPREAD	19.4	CU YD
G	S401E	31	14'-2"	STR.	VERT FF	293	PILE	34.6	CU YD
H	S502E	31	14'-2"	STR.	VERT BF	458	STRUCTURAL CONCRETE (3G52)		
J	S503E	----	----	STR.	VERT BF	-----	(STEM)		
K	S504E	31	10'-8"	4'-9"	TIE	345	35.6		CU YD
L	S405E	34	30'-0"	STR.	HORIZ EF	681	REINFORCEMENT (PLAIN)		
M	S506E	20	7'-4"	1'-4"	EXP JT TIE	153	SPREAD	1880	LB
N	S507E	14	7'-9"	1'-9"	EXP JT TIE	113	PILE	4391	LB
P	S508E	----	8'-2"	2'-2"	EXP JT TIE	-----	REINFORCEMENT (EPOXY)		
							3298		LB

h = 18' PANELS: — PANEL LENGTH = 30'-6"

SPREAD FOOTING REINFORCEMENT							DIMENSIONS				
A	F501	20	32'-11"	STR.	LONG T & B	687	SPREAD FOOTING				
B	F602	31	9'-0"	STR.	TRANS BOT	419	b	3'-6"	e	2'-0"
C	F903	31	9'-0"	STR.	TRANS TOP	949	c	1'-7"	f	5'-0½"
							d	9'-6"	g	3'-8¼"

PILE FOUNDATION REINFORCEMENT							PILE FOUNDATION			
A	F801	26	35'-4"	STR.	LONG T & B	2453	b	4'-9"	d	12'-0"
B	F802	31	13'-4"	11'-6"	TRANS BOT	1104	c	2'-6"	g	4'-11⅜"
C	F703	31	13'-2"	11'-6"	TRANS TOP	834				

STEM					
a	2'-3"	x	3'-4"		
j	1'-10⅜"	z	8'-9"		

FOOTING DOWELS & STEM REINFORCEMENT							QUANTITIES		
D	F504E	31	3'-0"	STR.	DOWEL FF	97	STRUCTURAL CONCRETE (1G52)		
E	F605E	31	11'-10"	5'-4"	DOWEL BF	551	(FOOTING)		
F	F706E	30	13'-4"	11'-11"	DOWEL BF	818	SPREAD	22.0	CU YD
G	S401E	31	15'-2"	STR.	VERT FF	314	PILE	34.6	CU YD
H	S502E	31	15'-2"	STR.	VERT BF	490	STRUCTURAL CONCRETE (3G52)		
J	S503E	----	----	STR.	VERT BF	-----	(STEM)		
K	S504E	31	10'-8"	4'-9"	TIE	345	38.1		CU YD
L	S405E	36	30'-0"	STR.	HORIZ EF	721	REINFORCEMENT (PLAIN)		
M	S506E	20	7'-4"	1'-4"	EXP JT TIE	153	SPREAD	2054	LB
N	S507E	16	7'-9"	1'-9"	EXP JT TIE	129	PILE	4391	LB
P	S508E	----	8'-2"	2'-2"	EXP JT TIE	-----	REINFORCEMENT (EPOXY)		
							3619		LB

h = 19' PANELS: — PANEL LENGTH = 30'-6"

SPREAD FOOTING REINFORCEMENT							DIMENSIONS				
A	F501	22	32'-11"	STR.	LONG T & B	755	SPREAD FOOTING				
B	F502	31	9'-7"	STR.	TRANS BOT	310	b	3'-9"	e	2'-2"
C	F903	31	9'-7"	STR.	TRANS TOP	1010	c	1'-9"	f	5'-4"
							d	10'-1"	g	3'-11¼"

PILE FOUNDATION REINFORCEMENT							PILE FOUNDATION			
A	F501	26	32'-11"	STR.	LONG T & B	893	b	4'-9"	d	12'-0"
B	F802	31	13'-4"	11'-6"	TRANS BOT	1104	c	2'-6"	g	4'-11⅜"
C	F703	31	13'-2"	11'-6"	TRANS TOP	834				

STEM					
a	2'-3½"	x	4'-9"		
j	1'-10¾"	z	6'-3"		

FOOTING DOWELS & STEM REINFORCEMENT							QUANTITIES		
D	F504E	31	3'-0"	STR.	DOWEL FF	97	STRUCTURAL CONCRETE (1G52)		
E	F705E	31	13'-3"	5'-8"	DOWEL BF	840	(FOOTING)		
F	F706E	30	11'-2"	9'-9"	DOWEL BF	685	SPREAD	25.8	CU YD
G	S401E	31	16'-2"	STR.	VERT FF	335	PILE	34.6	CU YD
H	S502E	31	16'-2"	STR.	VERT BF	523	STRUCTURAL CONCRETE (3G52)		
J	S503E	30	8'-9"	STR.	VERT BF	274	(STEM)		
K	S504E	31	10'-8"	4'-9"	TIE	345	40.6		CU YD
L	S405E	38	30'-0"	STR.	HORIZ EF	762	REINFORCEMENT (PLAIN)		
M	S506E	20	7'-4"	1'-4"	EXP JT TIE	153	SPREAD	2075	LB
N	S507E	18	7'-9"	1'-9"	EXP JT TIE	145	PILE	2831	LB
P	S508E	----	8'-2"	2'-2"	EXP JT TIE	-----	REINFORCEMENT (EPOXY)		
							4157		LB

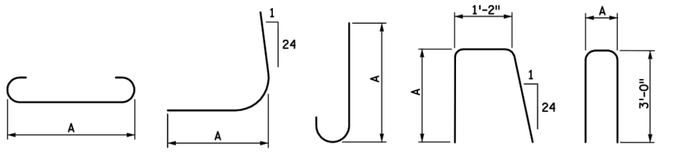
h = 20' PANELS: — PANEL LENGTH = 30'-6"

SPREAD FOOTING REINFORCEMENT							DIMENSIONS				
A	F501	22	32'-11"	STR.	LONG T & B	755	SPREAD FOOTING				
B	F602	31	10'-1"	STR.	TRANS BOT	470	b	4'-0"	e	2'-6"
C	F903	31	10'-1"	STR.	TRANS TOP	1063	c	1'-9"	f	5'-7½"
							d	10'-7"	g	4'-2⅜"

PILE FOUNDATION REINFORCEMENT							PILE FOUNDATION			
A	F501	26	32'-11"	STR.	LONG T & B	893	b	4'-9"	d	12'-0"
B	F802	31	13'-4"	11'-6"	TRANS BOT	1104	c	2'-6"	g	4'-11⅜"
C	F703	31	13'-2"	11'-6"	TRANS TOP	834				

STEM					
a	2'-4"	x	3'-1"		
j	1'-11⅜"	z	6'-1"		

FOOTING DOWELS & STEM REINFORCEMENT							QUANTITIES		
D	F504E	31	3'-0"	STR.	DOWEL FF	97	STRUCTURAL CONCRETE (1G52)		
E	F605E	31	11'-8"	5'-11"	DOWEL BF	543	(FOOTING)		
F	F806E	30	11'-4"	9'-10"	DOWEL BF	908	SPREAD	29.4	CU YD
G	S401E	31	17'-2"	STR.	VERT FF	355	PILE	35.5	CU YD
H	S602E	31	17'-2"	STR.	VERT BF	799	STRUCTURAL CONCRETE (3G52)		
J	S603E	30	10'-4"	STR.	VERT BF	466	(STEM)		
K	S504E	31	10'-8"	4'-9"	TIE	345	43.2		CU YD
L	S405E	40	30'-0"	STR.	HORIZ EF	802	REINFORCEMENT (PLAIN)		
M	S506E	20	7'-4"	1'-4"	EXP JT TIE	153	SPREAD	2288	LB
N	S507E	20	7'-9"	1'-9"	EXP JT TIE	162	PILE	2831	LB
P	S508E	----	8'-2"	2'-2"	EXP JT TIE	-----	REINFORCEMENT (EPOXY)		
							4630		LB



BAR B,C (FOR PILE FOUNDATION ONLY) — BAR E — BAR F — BAR K — BARS M,N,P

NOTES:

L = DENOTES PANEL LENGTH.
FF = DENOTES FRONT FACE.
BF = DENOTES BACK FACE.
EF = DENOTES EACH FACE.
DWL = DENOTES DOWEL.
BARS MARKED WITH THE SUFFIX "E" ARE EPOXY COATED.
x = PROJECTION OF BAR E INTO STEM.
z = PROJECTION OF BAR F INTO STEM.

REVISION: SEPTEMBER 1, 2016

APPROVED: AUGUST 27, 2014
STATE BRIDGE ENGINEER

MINNESOTA DEPARTMENT OF TRANSPORTATION

STANDARD PLAN 5-297.627 | 2 OF 3

APPROVED: 8-27-2014
REVISED: 9-1-2016
STATE DESIGN ENGINEER

RETAINING WALL PANEL TABULATIONS

(1V:2H SLOPED FILL)

STATE PROJ. NO. (T.H.) SHEET NO. OF SHEETS

NO	DATE	BY	CKD	APPR

H:\PROJECTS\16000\16750\TECHDATA\CADDESIGN\L3-PLANSHEETS\16750_SPN01.DWG: SPN01-34

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.
Print Name: MARTIN JOYCE
Date --/--/-- License # 58920

DRAWN BY HLB
DESIGNED BY MMJ
CHECKED BY MMJ
COMM. NO. 16750

SRF

CITY OF ARDEN HILLS
MNDOT STANDARD PLANS
OLD HIGHWAY 10 TRAIL

SHEET 39 OF 110

BAR	MARK	NO.	LENGTH	A	LOCATION	WT-LBS
A	F501	24	32'-11"	STR.	LONG T & B	824
B	F602	31	10'-7"	STR.	TRANS BOT	493
C	F903	31	10'-7"	STR.	TRANS TOP	1115
D	F504E	31	3'-0"	STR.	DOWEL FF	97
E	F705E	31	11'-10"	6'-3"	DOWEL BF	750
F	F806E	30	13'-4"	11'-10"	DOWEL BF	1068
G	S401E	31	18'-2"	STR.	VERT FF	376
H	S502E	31	18'-2"	STR.	VERT BF	587
J	S603E	30	11'-4"	STR.	VERT BF	511
K	S504E	31	10'-8"	4'-9"	TIE	345
L	S405E	42	30'-0"	STR.	HORIZ EF	842
M	S506E	20	7'-4"	1'-4"	EXP JT TIE	153
N	S507E	20	7'-9"	1'-9"	EXP JT TIE	162
P	S508E	2	8'-2"	2'-2"	EXP JT TIE	17

h = 21' PANELS: PANEL LENGTH = 30'-6"

SPREAD FOOTING REINFORCEMENT — DIMENSIONS

SPREAD FOOTING

b	4'-4"	e	2'-6"		
c	1'-9"	f	6'-0"		
d	11'-1"	g	4'-6¼"		

PILE FOUNDATION REINFORCEMENT — PILE FOUNDATION

b	4'-9"	d	12'-0"		
c	2'-6"	g	4'-11⅜"		

STEM

a	2'-4½"	x	3'-3"
j	1'-11¾"	z	8'-0"

FOOTING DOWELS & STEM REINFORCEMENT — QUANTITIES

STRUCTURAL CONCRETE (1G52)			
(FOOTING)			
SPREAD	30.5	CU YD	
PILE	35.5	CU YD	
STRUCTURAL CONCRETE (3G52)			
(STEM)			
	45.9	CU YD	
REINFORCEMENT (PLAIN)			
SPREAD	2432	LB	
PILE	2831	LB	
REINFORCEMENT (EPOXY)			
	4907	LB	

BAR	MARK	NO.	LENGTH	A	LOCATION	WT-LBS
A	F501	24	32'-11"	STR.	LONG T & B	824
B	F602	31	11'-2"	STR.	TRANS BOT	520
C	F903	31	11'-2"	STR.	TRANS TOP	1177
D	F504E	31	3'-0"	STR.	DOWEL FF	97
E	F805E	31	12'-2"	6'-8"	DOWEL BF	1007
F	F806E	30	13'-6"	12'-0"	DOWEL BF	1081
G	S401E	31	19'-2"	STR.	VERT FF	397
H	S602E	31	19'-2"	STR.	VERT BF	892
J	S603E	30	9'-10"	STR.	VERT BF	443
K	S504E	31	10'-8"	4'-9"	TIE	345
L	S405E	44	30'-0"	STR.	HORIZ EF	882
M	S506E	20	7'-4"	1'-4"	EXP JT TIE	153
N	S507E	20	7'-9"	1'-9"	EXP JT TIE	162
P	S508E	4	8'-2"	2'-2"	EXP JT TIE	34

h = 22' PANELS: PANEL LENGTH = 30'-6"

SPREAD FOOTING REINFORCEMENT — DIMENSIONS

SPREAD FOOTING

b	4'-8"	e	2'-6"		
c	1'-11"	f	6'-4½"		
d	11'-8"	g	4'-10¼"		

PILE FOUNDATION REINFORCEMENT — PILE FOUNDATION

b	4'-9"	d	12'-0"		
c	2'-6"	g	4'-11⅜"		

STEM

a	2'-5"	x	3'-6"
j	2'-0¼"	z	8'-0"

FOOTING DOWELS & STEM REINFORCEMENT — QUANTITIES

STRUCTURAL CONCRETE (1G52)			
(FOOTING)			
SPREAD	34.0	CU YD	
PILE	35.5	CU YD	
STRUCTURAL CONCRETE (3G52)			
(STEM)			
	48.6	CU YD	
REINFORCEMENT (PLAIN)			
SPREAD	2521	LB	
PILE	2831	LB	
REINFORCEMENT (EPOXY)			
	5493	LB	

BAR	MARK	NO.	LENGTH	A	LOCATION	WT-LBS
A	F501	26	32'-11"	STR.	LONG T & B	893
B	F602	31	11'-10"	STR.	TRANS BOT	551
C	F1003	31	11'-10"	STR.	TRANS TOP	1578
D	F504E	31	3'-0"	STR.	DOWEL FF	97
E	F805E	31	15'-2"	7'-0"	DOWEL BF	1255
F	F906E	30	14'-2"	12'-4"	DOWEL BF	1445
G	S401E	31	20'-2"	STR.	VERT FF	418
H	S602E	31	20'-2"	STR.	VERT BF	939
J	S703E	30	10'-3"	STR.	VERT BF	629
K	S504E	31	10'-8"	4'-9"	TIE	345
L	S405E	46	30'-0"	STR.	HORIZ EF	922
M	S506E	20	7'-4"	1'-4"	EXP JT TIE	153
N	S507E	20	7'-9"	1'-9"	EXP JT TIE	162
P	S508E	6	8'-2"	2'-2"	EXP JT TIE	51

h = 23' PANELS: PANEL LENGTH = 30'-6"

SPREAD FOOTING REINFORCEMENT — DIMENSIONS

SPREAD FOOTING

b	5'-0"	e	2'-6"		
c	2'-0"	f	6'-9"		
d	12'-4"	g	5'-2⅜"		

PILE FOUNDATION REINFORCEMENT — PILE FOUNDATION

b	6'-6"	d	15'-6"		
c	3'-3"	g	6'-8¼"		

STEM

a	2'-5½"	x	4'-0"
j	2'-0¾"	z	8'-3"

FOOTING DOWELS & STEM REINFORCEMENT — QUANTITIES

STRUCTURAL CONCRETE (1G52)			
(FOOTING)			
SPREAD	36.7	CU YD	
PILE	59.1	CU YD	
STRUCTURAL CONCRETE (3G52)			
(STEM)			
	51.3	CU YD	
REINFORCEMENT (PLAIN)			
SPREAD	3022	LB	
PILE	4788	LB	
REINFORCEMENT (EPOXY)			
	6415	LB	

BAR	MARK	NO.	LENGTH	A	LOCATION	WT-LBS
A	F501	28	32'-11"	STR.	LONG T & B	961
B	F702	31	12'-4"	STR.	TRANS BOT	781
C	F1003	31	12'-4"	STR.	TRANS TOP	1645
D	F504E	31	3'-0"	STR.	DOWEL FF	97
E	F805E	31	17'-9"	7'-5"	DOWEL BF	1469
F	F1006E	30	11'-7"	9'-7"	DOWEL BF	1495
G	S401E	31	21'-2"	STR.	VERT FF	438
H	S602E	31	21'-2"	STR.	VERT BF	986
J	S803E	30	12'-0"	STR.	VERT BF	961
K	S504E	31	10'-8"	4'-9"	TIE	345
L	S405E	48	30'-0"	STR.	HORIZ EF	962
M	S506E	20	7'-4"	1'-4"	EXP JT TIE	153
N	S507E	20	7'-9"	1'-9"	EXP JT TIE	162
P	S508E	8	8'-2"	2'-2"	EXP JT TIE	68

h = 24' PANELS: PANEL LENGTH = 30'-6"

SPREAD FOOTING REINFORCEMENT — DIMENSIONS

SPREAD FOOTING

b	5'-4"	e	2'-6"		
c	2'-2"	f	7'-1½"		
d	12'-10"	g	5'-6¼"		

PILE FOUNDATION REINFORCEMENT — PILE FOUNDATION

b	6'-6"	d	15'-6"		
c	3'-3"	g	6'-8¼"		

STEM

a	2'-6"	x	6'-6"
j	2'-1¼"	z	5'-4"

FOOTING DOWELS & STEM REINFORCEMENT — QUANTITIES

STRUCTURAL CONCRETE (1G52)			
(FOOTING)			
SPREAD	40.3	CU YD	
PILE	59.1	CU YD	
STRUCTURAL CONCRETE (3G52)			
(STEM)			
	54.1	CU YD	
REINFORCEMENT (PLAIN)			
SPREAD	3388	LB	
PILE	4788	LB	
REINFORCEMENT (EPOXY)			
	7136	LB	

BAR	MARK	NO.	LENGTH	A	LOCATION	WT-LBS
A	F501	32	32'-11"	STR.	LONG T & B	1099
B	F902	31	17'-6"	15'-0"	TRANS BOT	1845
C	F903	31	17'-6"	15'-0"	TRANS TOP	1845
D	F504E	31	3'-0"	STR.	DOWEL FF	97
E	F1005E	31	19'-2"	8'-2"	DOWEL BF	2557
F	F1006E	30	11'-10"	9'-10"	DOWEL BF	1528
G	S401E	31	23'-2"	STR.	VERT FF	480
H	S802E	31	23'-2"	STR.	VERT BF	1917
J	S803E	30	10'-6"	STR.	VERT BF	841
K	S504E	31	10'-8"	4'-9"	TIE	345
L	S405E	52	30'-0"	STR.	HORIZ EF	1042
M	S506E	20	7'-4"	1'-4"	EXP JT TIE	153
N	S507E	20	7'-9"	1'-9"	EXP JT TIE	162
P	S508E	12	8'-2"	2'-2"	EXP JT TIE	102

h = 25' PANELS: PANEL LENGTH = 30'-6"

SPREAD FOOTING REINFORCEMENT — DIMENSIONS

SPREAD FOOTING

b	5'-8"	e	2'-6"		
c	2'-3"	f	7'-6"		
d	13'-4"	g	5'-10¼"		

PILE FOUNDATION REINFORCEMENT — PILE FOUNDATION

b	6'-6"	d	15'-6"		
c	3'-3"	g	6'-8¼"		

STEM

a	2'-6½"	x	7'-3"
j	2'-1⅝"	z	5'-4"

FOOTING DOWELS & STEM REINFORCEMENT — QUANTITIES

STRUCTURAL CONCRETE (1G52)			
(FOOTING)			
SPREAD	42.9	CU YD	
PILE	59.1	CU YD	
STRUCTURAL CONCRETE (3G52)			
(STEM)			
	57.0	CU YD	
REINFORCEMENT (PLAIN)			
SPREAD	3486	LB	
PILE	4788	LB	
REINFORCEMENT (EPOXY)			
	8124	LB	

BAR	MARK	NO.	LENGTH	A	LOCATION	WT-LBS
A	F501	30	32'-11"	STR.	LONG T & B	1030
B	F702	31	13'-5"	STR.	TRANS BOT	850
C	F1003	31	13'-5"	STR.	TRANS TOP	1790
D	F504E	31	3'-0"	STR.	DOWEL FF	97
E	F1005E	31	19'-2"	8'-2"	DOWEL BF	2557
F	F1006E	30	11'-10"	9'-10"	DOWEL BF	1528
G	S401E	31	23'-2"	STR.	VERT FF	480
H	S802E	31	23'-2"	STR.	VERT BF	1917
J	S803E	30	10'-6"	STR.	VERT BF	841
K	S504E	31	10'-8"	4'-9"	TIE	345
L	S405E	52	30'-0"	STR.	HORIZ EF	1042
M	S506E	20	7'-4"	1'-4"	EXP JT TIE	153
N	S507E	20	7'-9"	1'-9"	EXP JT TIE	162
P	S508E	12	8'-2"	2'-2"	EXP JT TIE	102

h = 26' PANELS: PANEL LENGTH = 30'-6"

SPREAD FOOTING REINFORCEMENT — DIMENSIONS

SPREAD FOOTING

b	6'-0"	e	2'-6"		
c	2'-5"	f	7'-10½"		
d	13'-11"	g	6'-2¼"		

PILE FOUNDATION REINFORCEMENT — PILE FOUNDATION

b	6'-6"	d	15'-6"		
c	3'-3"	g	6'-8¼"		

STEM

a	2'-7"	x	7'-10"
j	2'-2"	z	5'-4"

FOOTING DOWELS & STEM REINFORCEMENT — QUANTITIES

STRUCTURAL CONCRETE (1G52)			
(FOOTING)			
SPREAD	47.1	CU YD	
PILE	59.1	CU YD	
STRUCTURAL CONCRETE (3G52)			
(STEM)			
	59.9	CU YD	
REINFORCEMENT (PLAIN)			
SPREAD	3670	LB	
PILE	4788	LB	
REINFORCEMENT (EPOXY)			
	9223	LB	

BAR	MARK	NO.	LENGTH	A	LOCATION	WT-LBS
A	F501	30	32'-11"	STR.	LONG T & B	1030
B	F502	31	14'-0"	STR.	TRANS BOT	453
C	F1003	31	14'-0"	STR.	TRANS TOP	1868
D	F504E	31	3'-0"	STR.	DOWEL FF	97
E	F1105E	31	19'-3"	8'-6"	DOWEL BF	3171
F	F1106E	30	13'-2"	11'-0"	DOWEL BF	2099
G	S401E	31	24'-2"	STR.	VERT FF	500
H	S902E	31	24'-2"	STR.	VERT BF	2547
J	S903E	30	10'-3"	STR.	VERT BF	1046
K	S504E	31	10'-8"	4'-9"	TIE	345
L	S405E	54	30'-0"	STR.	HORIZ EF	1082
M	S506E	20	7'-4"	1'-4"	EXP JT TIE	153
N	S507E	20	7'-9"	1'-9"	EXP JT TIE	162
P	S508E	14	8'-2"	2'-2"	EXP JT TIE	119

h = 27' PANELS: PANEL LENGTH = 30'-6"

SPREAD FOOTING REINFORCEMENT — DIMENSIONS

SPREAD FOOTING

b	6'-4"	e	2'-6"		
c	2'-6"	f	8'-3"		
d	14'-6"	g	6'-6¼"		

PILE FOUNDATION REINFORCEMENT — PILE FOUNDATION

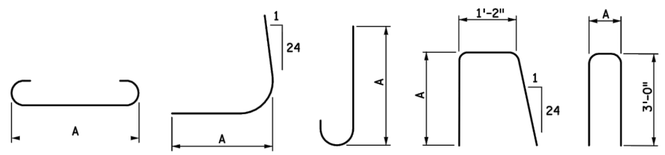
b	6'-6"	d	15'-6"		
c	3'-3"	g	6'-8¼"		

STEM

a	2'-7½"	x	7'-11"
j	2'-2½"	z	6'-5"

FOOTING DOWELS & STEM REINFORCEMENT — QUANTITIES

STRUCTURAL CONCRETE (1G52)			
(FOOTING)			
SPREAD	50.2	CU YD	
PILE	59.1	CU YD	
STRUCTURAL CONCRETE (3G52)			
(STEM)			
	62.8	CU YD	
REINFORCEMENT (PLAIN)			
SPREAD	3350	LB	
PILE	4788	LB	
REINFORCEMENT (EPOXY)			
	11320	LB	



BAR B,C (FOR PILE FOUNDATION ONLY) — BAR E — BAR F — BAR K — BARS M,N,P

NOTES:

L = DENOTES PANEL LENGTH.
FF = DENOTES FRONT FACE.
BF = DENOTES BACK FACE.
EF = DENOTES EACH FACE.
DWL = DENOTES DOWEL.
BARS MARKED WITH THE SUFFIX "E" ARE EPOXY COATED.
x = PROJECTION OF BAR E INTO STEM.
z = PROJECTION OF BAR F INTO STEM.

REVISION: SEPTEMBER 1, 2016

APPROVED: AUGUST 27, 2014
Nancy Daubenberger
STATE BRIDGE ENGINEER

MINNESOTA DEPARTMENT OF TRANSPORTATION

STANDARD PLAN 5-297.627 | 3 OF 3

APPROVED: 8-27-2014
REVISED: 9-1-2016

STATE DESIGN ENGINEER

RETAINING WALL PANEL TABULATIONS

(1V:2H SLOPED FILL)

STATE PROJ. NO. (T.H.) SHEET NO. OF SHEETS

NO	DATE	BY	CKD	APPR

H:\PROJECTS\16000\16750\TECHDATA\CADDESIGN\L3-PLANSHEETS\16750_SPN01.DWG: SPN01-35

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.
Print Name: MARTIN JOYCE
Date --/--/-- License # 58920

DRAWN BY HLB
DESIGNED BY MMJ
CHECKED BY MMJ
COMM. NO. 16750

SRF

CITY OF ARDEN HILLS
MNDOT STANDARD PLANS
OLD HIGHWAY 10 TRAIL

SHEET 40 OF 110

PLOTTED/REVISED: 4-APR-2018
PLOT NAME: s627_3_spn
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PLACEHOLDER

NO	DATE	BY	CKD	APPR

H:\PROJECTS\16000\16750\TECHDATA\CADDESIGN\L3-PLANSHEETS\16750_SPN02.DWG: SPN02-01

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.

Print Name: MARTIN JOYCE

Date --/--/-- License # 58920

DRAWN BY HLB

DESIGNED BY MMJ

CHECKED BY MMJ

COMM. NO. 16750

SRF

CITY OF ARDEN HILLS

ARDEN HILLS STANDARD PLANS

OLD HIGHWAY 10 TRAIL

SHEET **41** OF **110**

PLACEHOLDER

NO	DATE	BY	CKD	APPR

H:\PROJECTS\16000\16750\TECHDATA\CADDESIGN\L3-PLANSHEETS\16750_SPN02.DWG: SPN02-02

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.

Print Name: MARTIN JOYCE

Date --/--/-- License # 58920

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DESIGNED BY MMJ
CHECKED BY MMJ
COMM. NO. 16750

CITY OF ARDEN HILLS

ARDEN HILLS STANDARD PLANS

OLD HIGHWAY 10 TRAIL

SHEET 42 OF 110

PLACEHOLDER

NO	DATE	BY	CKD	APPR

H:\PROJECTS\16000\16750\TECHDATA\CADDESIGN\L3-PLANSHEETS\16750_SPN02.DWG: SPN02-03

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.

Print Name: MARTIN JOYCE

Date --/--/-- License # 58920

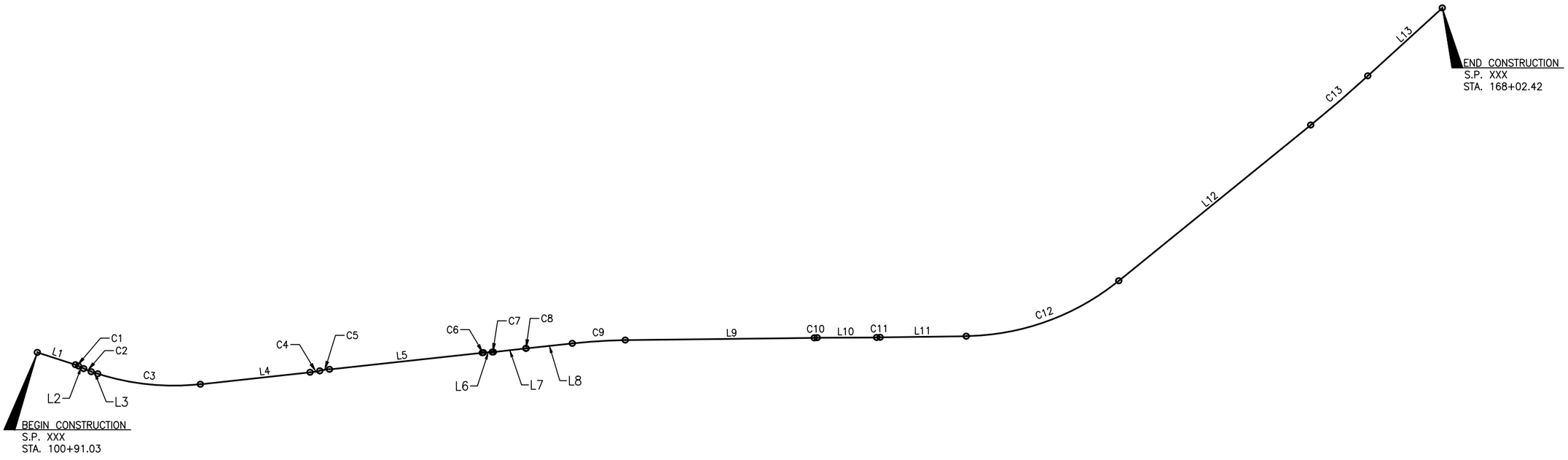
DRAWN BY HLB
DESIGNED BY MMJ
CHECKED BY MMJ
COMM. NO. 16750

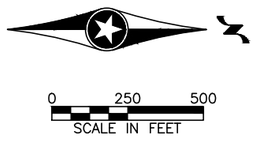
CITY OF ARDEN HILLS

ARDEN HILLS STANDARD PLANS

OLD HIGHWAY 10 TRAIL

SHEET 43 OF 110





NO	DATE	BY	CKD	APPR

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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.

Print Name: MARTIN JOYCE

Date --/--/-- License # 58920

DRAWN BY HLB
DESIGNED BY MMJ
CHECKED BY MMJ
COMM. NO. 16750

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CITY OF ARDEN HILLS

ALIGNMENT PLANS & TABULATIONS

OLD HIGHWAY 10 TRAIL

SHEET 44 OF 110

MARTIN JOYCE | 11/21/2023 10:35:10 PM
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℄ TRAIL										
SEGMENT NUMBER	BEGIN STATION	DELTA	DEGREE	RADIUS	TANGENT	LENGTH	X	Y	AZIMUTH	END STATION
L1	100+00.00						555172.4698	198401.1814	17°49'13.60"	101+80.82
C1	101+80.82	8°45'42.20"	57°17'44.81"	100.000	7.661	15.292	555227.8065	198573.3241	17°49'13.60" 26°34'55.80"	101+96.11
L2	101+96.11						555233.5792	198587.4686	26°34'55.80"	102+22.52
C2	102+22.52	8°45'42.00"	23°47'26.40"	240.833	18.450	36.828	555245.3962	198611.0851	26°34'55.80" 17°49'13.80"	102+59.35
L3	102+59.35						555259.2986	198645.1497	17°49'13.60"	102+89.75
C3	102+89.75	24°00'02.70"	5°05'37.37"	1124.833	239.098	471.184	555268.6034	198674.0951	17°49'13.60" 353°49'10.90"	107+60.93
L4	107+60.93						555316.0351	199139.4302	353°49'10.78"	112+59.93
C4	112+59.93	5°07'35.04"	11°27'32.96"	500.000	22.383	44.736	555262.3141	199635.5262	353°49'10.78" 348°41'35.74"	113+04.67
C5	113+04.67	5°07'35.04"	11°27'32.96"	500.000	22.383	44.736	555255.5159	199679.7278	348°41'35.74" 353°49'10.78"	113+49.40
L5	113+49.40						555248.7177	199723.9295	353°49'10.78"	120+45.77
C6	120+45.77	2°36'01.35"	57°17'44.81"	100.000	2.270	4.539	555173.7482	200416.2479	353°49'10.78" 356°25'12.14"	120+50.31
L6	120+50.31						555173.3622	200420.7696	356°25'12.14"	120+90.42
C7	120+90.42	2°48'08.04"	57°17'44.81"	100.000	2.446	4.891	555170.8573	200460.8062	356°25'12.14" 353°37'04.10"	120+95.31
L7	120+95.31						555170.4327	200465.6781	353°37'04.10"	122+44.25
C8	122+44.25	0°12'06.69"	57°17'44.81"	100.000	0.176	0.352	555153.8774	200613.6874	353°37'04.10" 353°49'10.78"	122+44.60
L8	122+44.60						555153.8388	200614.0376	353°49'10.78"	124+54.77
C9	124+54.77	5°27'45.27"	2°16'00.27"	2527.670	120.585	240.988	555131.2118	200822.9904	353°49'10.78" 359°16'56.05"	126+95.76
L9	126+95.76						555116.7193	201063.4507	359°16'56.05"	135+51.06
C10	135+51.06	0°22'29.05"	2°49'32.50"	2027.670	6.631	13.262	555106.0049	201918.6846	359°16'56.05" 359°39'25.10"	135+64.32
L10	135+64.32						555105.8821	201931.9458	359°39'25.10"	138+34.15

℄ TRAIL										
SEGMENT NUMBER	BEGIN STATION	DELTA	DEGREE	RADIUS	TANGENT	LENGTH	X	Y	AZIMUTH	END STATION
C11	138+34.15	0°27'44.36"	2°54'17.93"	1972.330	7.957	15.915	555104.2667	202201.7712	359°39'25.10" 359°11'40.74"	138+50.07
L11	138+50.07						555104.1072	202217.6852	359°11'40.74"	142+39.33
C12	142+39.33	38°15'16.63"	5°06'18.27"	1122.330	389.241	749.345	555098.6359	202606.9087	359°11'40.74" 320°56'24.11"	149+88.67
L12	149+88.67						554847.8912	203298.3514	320°56'24.11"	161+07.23
C13	161+07.23	3°16'27.76"	0°57'33.67"	5972.330	170.702	341.311	554143.0527	204166.8942	320°56'24.11" 317°39'56.34"	164+48.54
L13	164+48.54						553920.5275	204425.6295	317°39'56.34"	169+04.68

NO	DATE	BY	CKD	APPR	
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Print Name: MARTIN JOYCE
Date --/--/-- License # 58920

DRAWN BY HLB
DESIGNED BY MMJ
CHECKED BY MMJ
COMM. NO. 16750

SRF

CITY OF ARDEN HILLS
ALIGNMENT PLANS & TABULATIONS
OLD HIGHWAY 10 TRAIL

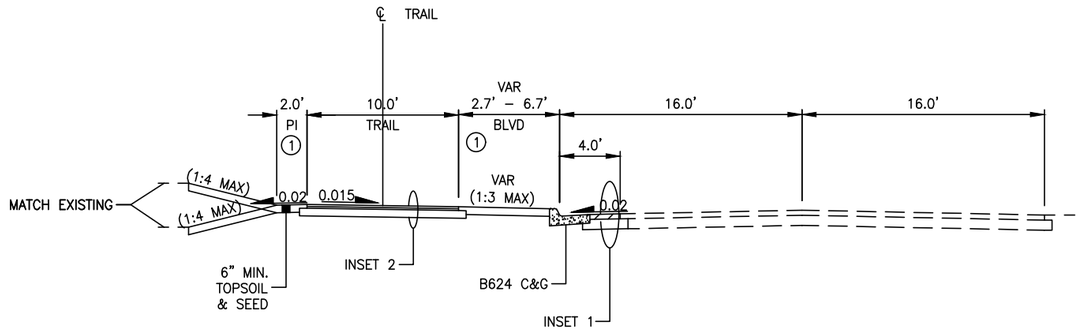
SHEET 45 OF 110

GENERAL NOTES:

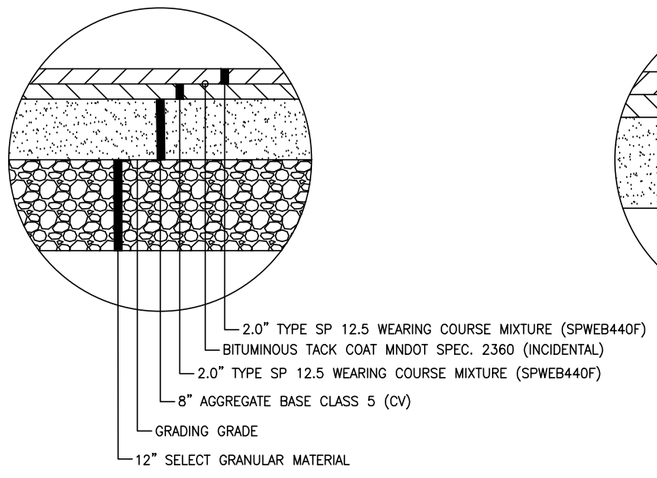
ALL CROSS SLOPES ARE IN FT/FT.
ROADWAY DIMENSIONS ARE FACE OF CURB UNLESS OTHERWISE NOTED.

SPECIFIC NOTES:

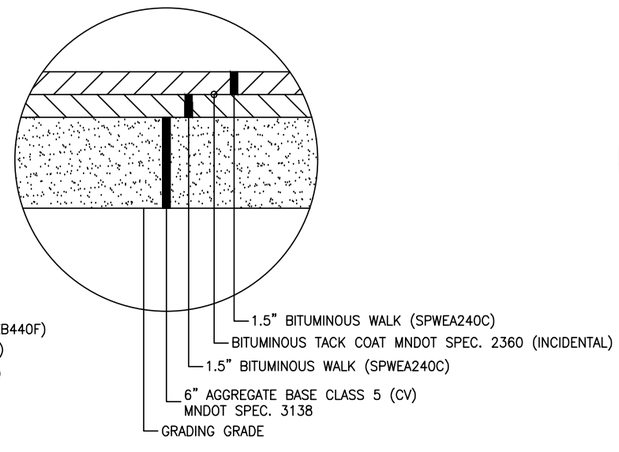
(1) 2.0' OBSTACLE FREE CLEAR ZONE FROM EDGE OF TRAIL/WALK.



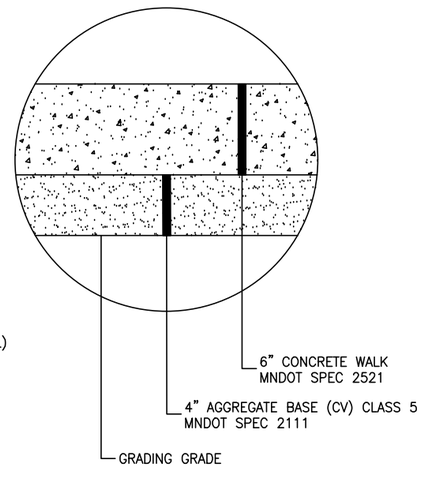
TYPICAL SECTION – TRAIL
TRAIL – STA. XXX+XX.XX TO STA. XXX+XX.XX



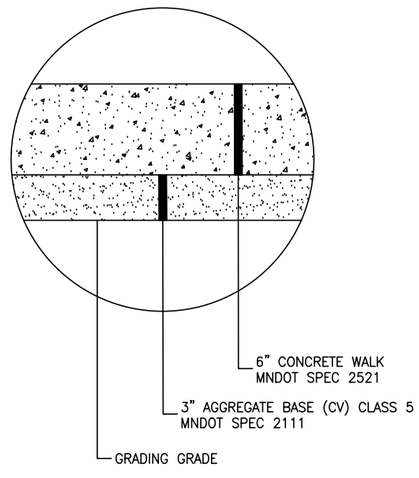
INSET 1 – 4" BITUMINOUS ROADWAY



INSET 2 – 3" BITUMINOUS TRAIL



INSET 3 – 6" CONCRETE DRIVEWAY



INSET 4 – PEDESTRIAN CURB RAMPS

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Print Name: MARTIN JOYCE
Date --/--/-- License # 58920

DRAWN BY HLB
DESIGNED BY MMJ
CHECKED BY MMJ
COMM. NO. 16750

CITY OF ARDEN HILLS
TYPICAL SECTIONS
OLD HIGHWAY 10 TRAIL

SHEET 46 OF 110

HAILEY BARRY | 11/7/2023 11:04:51 AM
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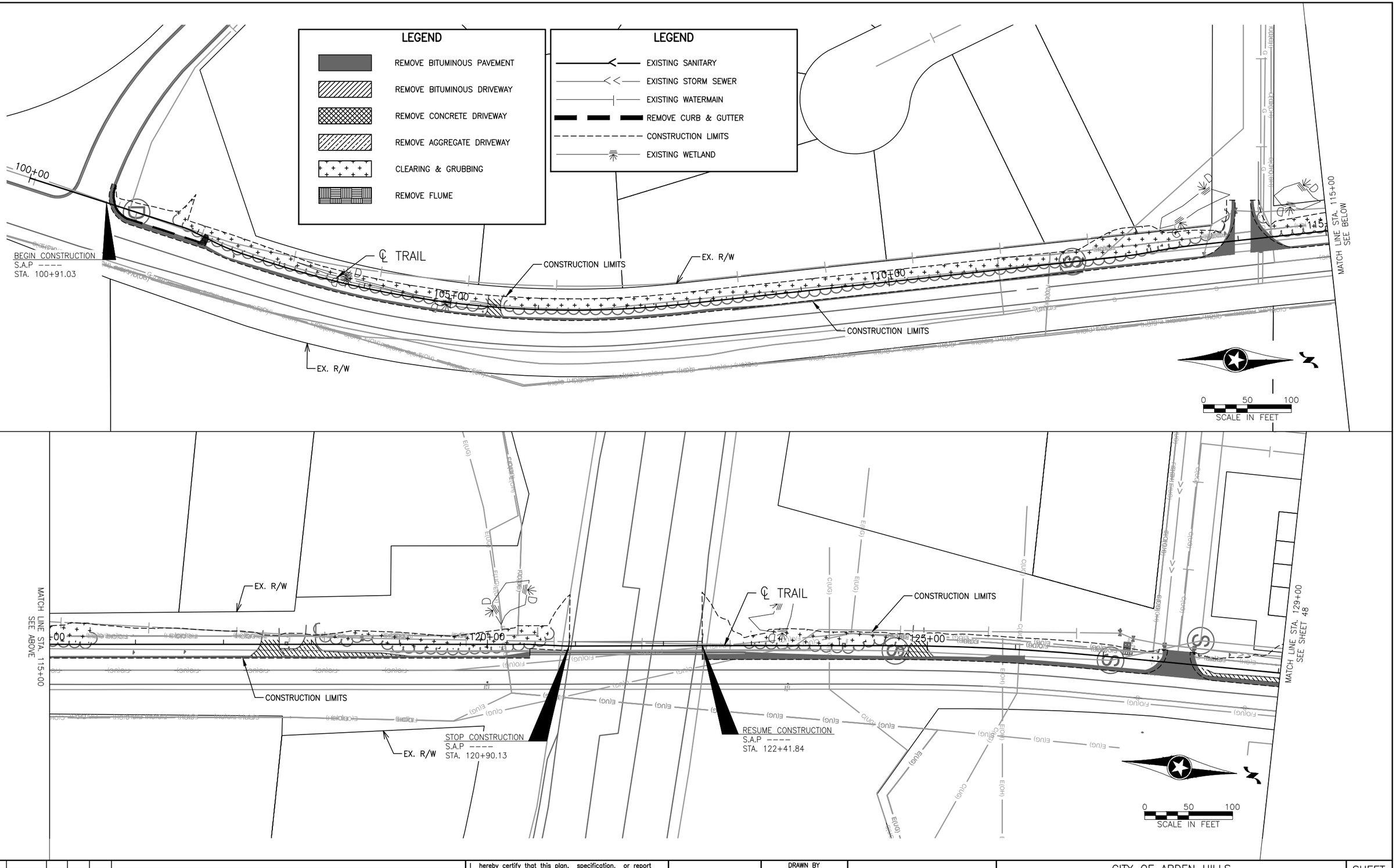

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CHECKED BY MMJ
COMM. NO. 16750

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CITY OF ARDEN HILLS

TOPOGRAPHY & REMOVAL PLANS
OLD HIGHWAY 10 TRAIL

SHEET 47 OF 110

MATCH LINE STA. 129+00
SEE SHEET 47

130+00

℄ TRAIL

135+00

CONSTRUCTION LIMITS

EX. R/W

140+00

CONSTRUCTION LIMITS

EX. R/W

MATCH LINE STA. 143+00
SEE BELOW

0 50 100
SCALE IN FEET

MATCH LINE STA. 143+00
SEE ABOVE

145+00

EX. R/W

CONSTRUCTION LIMITS

150+00

155+00

CONSTRUCTION LIMITS

℄ TRAIL

MATCH LINE STA. 156+00
SEE SHEET 49

0 50 100
SCALE IN FEET

LEGEND

- REMOVE BITUMINOUS PAVEMENT
- REMOVE BITUMINOUS DRIVEWAY
- REMOVE CONCRETE DRIVEWAY
- REMOVE AGGREGATE DRIVEWAY
- CLEARING & GRUBBING
- REMOVE FLUME

LEGEND

- EXISTING SANITARY
- EXISTING STORM SEWER
- EXISTING WATERMAIN
- REMOVE CURB & GUTTER
- CONSTRUCTION LIMITS
- EXISTING WETLAND

NO	DATE	BY	CKD	APPR

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TOPOGRAPHY & REMOVAL PLANS
OLD HIGHWAY 10 TRAIL

SHEET 48 OF 110

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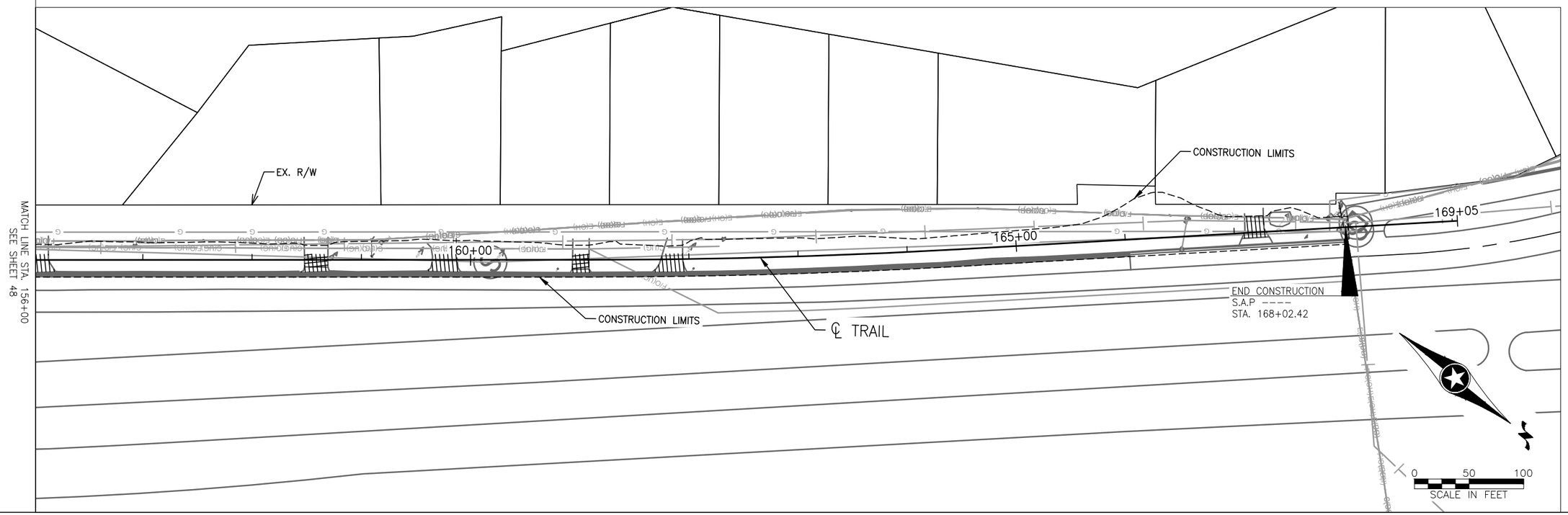

LEGEND

- REMOVE BITUMINOUS PAVEMENT
- REMOVE BITUMINOUS DRIVEWAY
- REMOVE CONCRETE DRIVEWAY
- REMOVE AGGREGATE DRIVEWAY
- CLEARING & GRUBBING
- REMOVE FLUME

LEGEND

- EXISTING SANITARY
- EXISTING STORM SEWER
- EXISTING WATERMAIN
- REMOVE CURB & GUTTER
- CONSTRUCTION LIMITS
- EXISTING WETLAND

NO	DATE	BY	CKD	APPR

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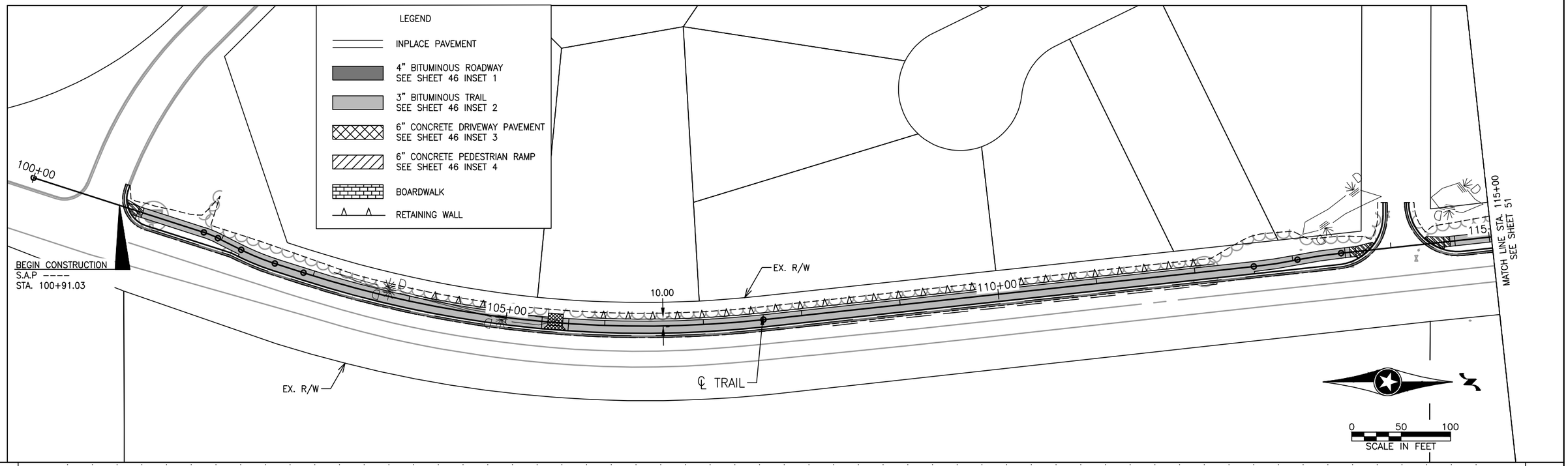
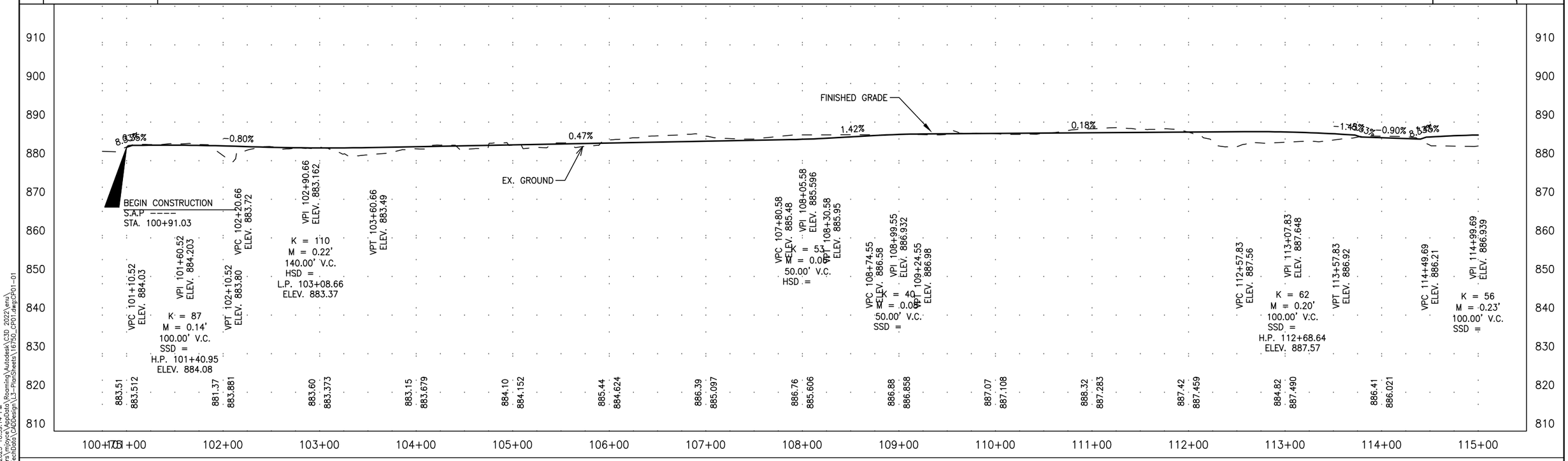
CITY OF ARDEN HILLS

TOPOGRAPHY & REMOVAL PLANS

OLD HIGHWAY 10 TRAIL

SHEET 49 OF 110





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CITY OF ARDEN HILLS

CONSTRUCTION PLANS & PROFILES

OLD HIGHWAY 10 TRAIL

SHEET 50 OF 110

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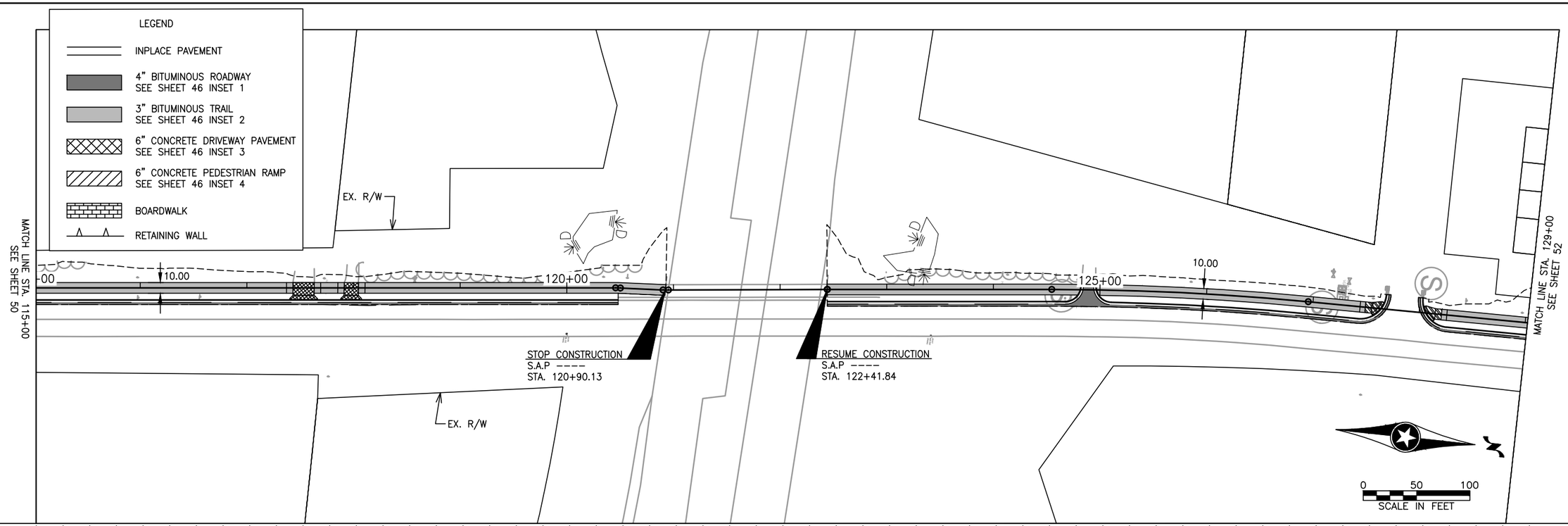

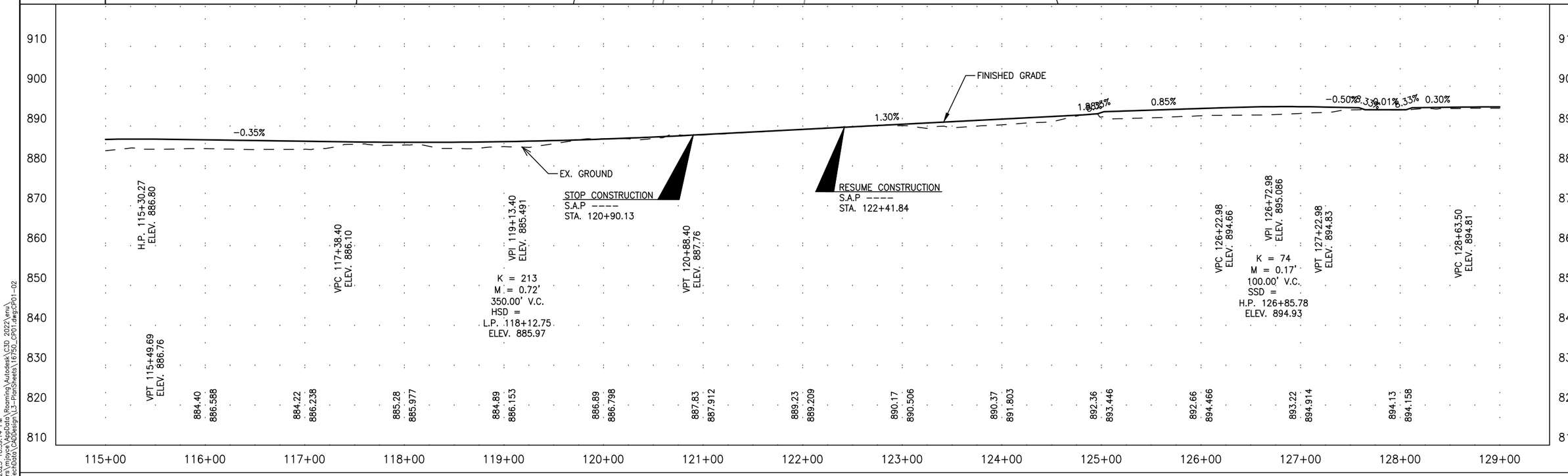

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CHECKED BY MMJ
COMM. NO. 16750

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CITY OF ARDEN HILLS

CONSTRUCTION PLANS & PROFILES

OLD HIGHWAY 10 TRAIL

SHEET 51 OF 110

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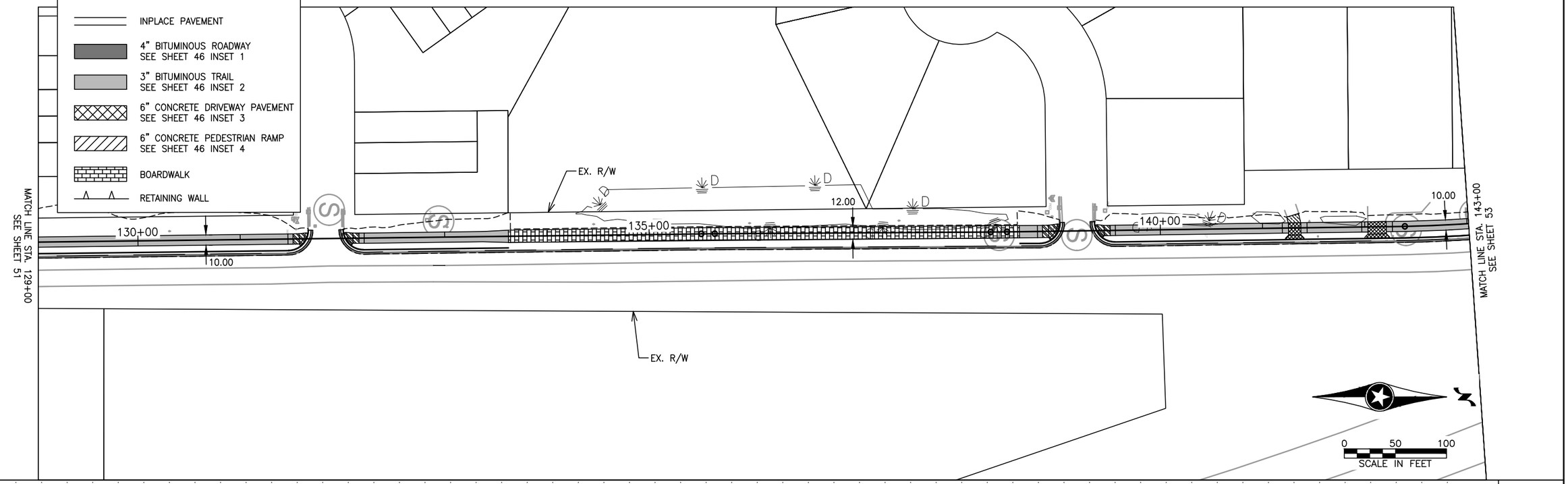
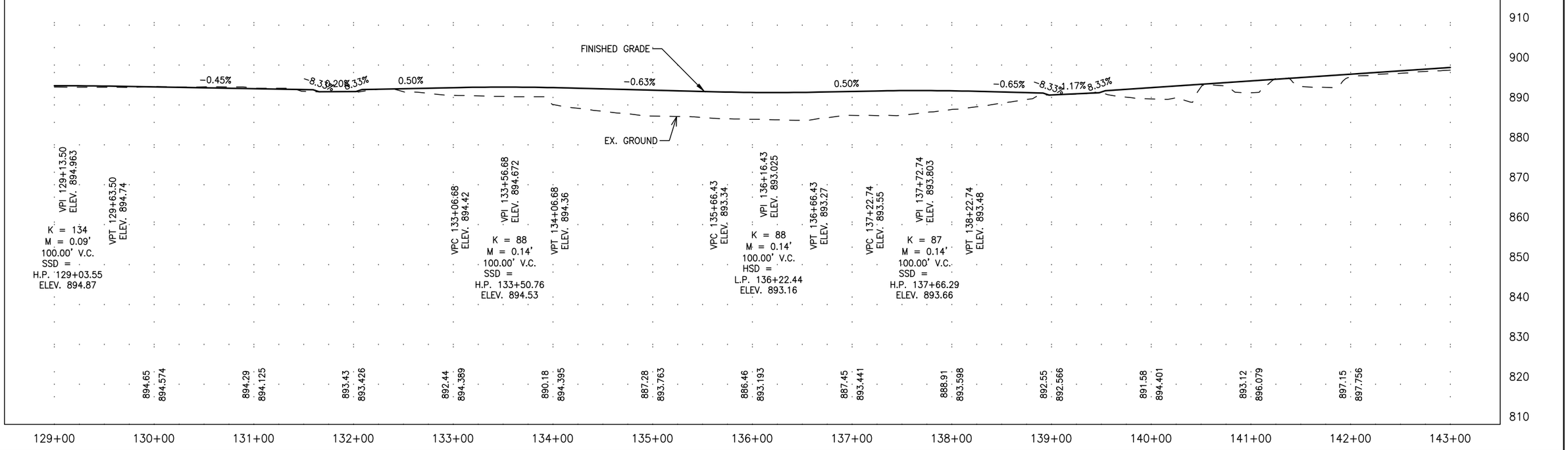
LEGEND

- INPLACE PAVEMENT
- 4" BITUMINOUS ROADWAY SEE SHEET 46 INSET 1
- 3" BITUMINOUS TRAIL SEE SHEET 46 INSET 2
- 6" CONCRETE DRIVEWAY PAVEMENT SEE SHEET 46 INSET 3
- 6" CONCRETE PEDESTRIAN RAMP SEE SHEET 46 INSET 4
- BOARDWALK
- RETAINING WALL





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CITY OF ARDEN HILLS

CONSTRUCTION PLANS & PROFILES

OLD HIGHWAY 10 TRAIL

SHEET 52 OF 110

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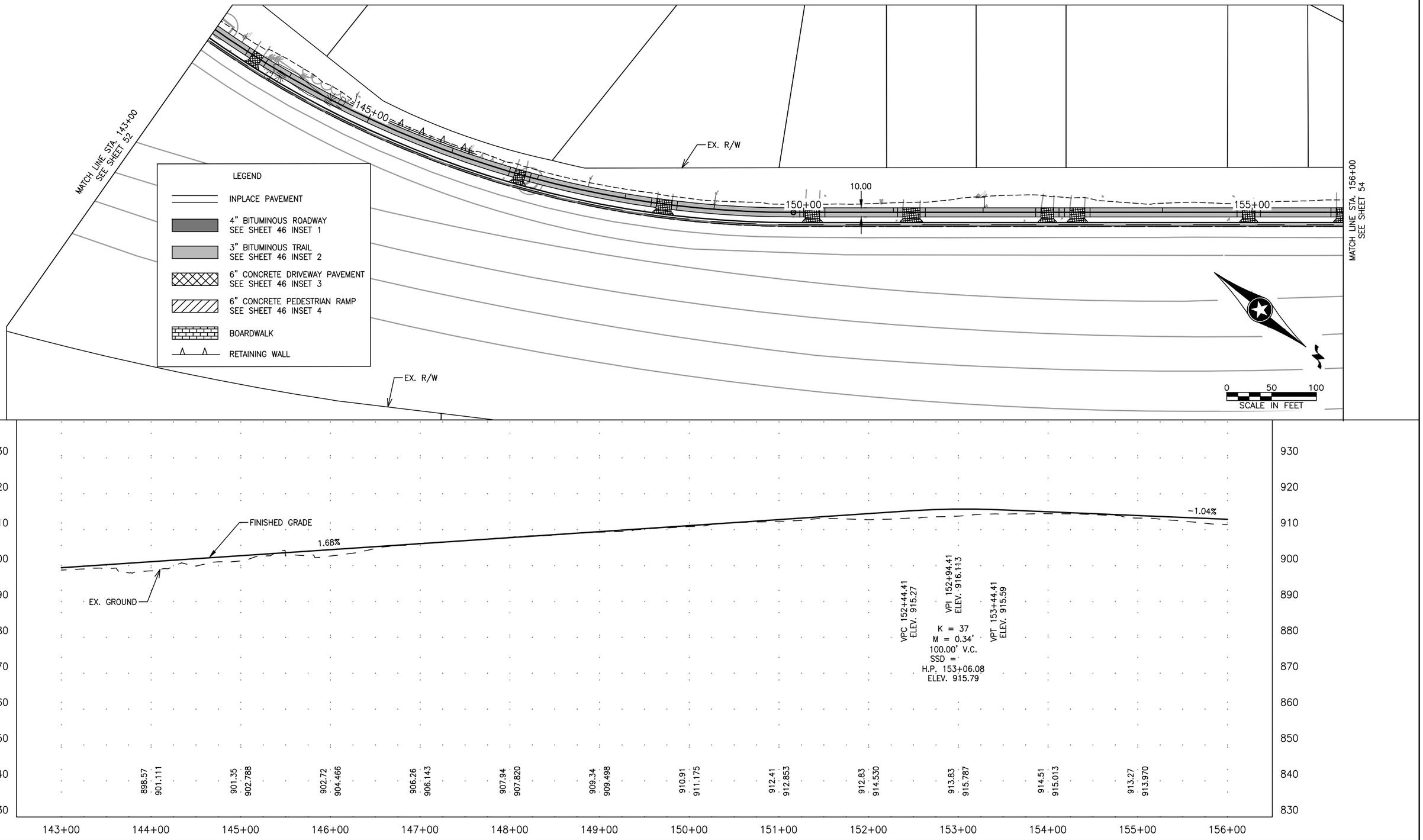

NO	DATE	BY	CKD	APPR

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CITY OF ARDEN HILLS

CONSTRUCTION PLANS & PROFILES

OLD HIGHWAY 10 TRAIL

SHEET 53 OF 110

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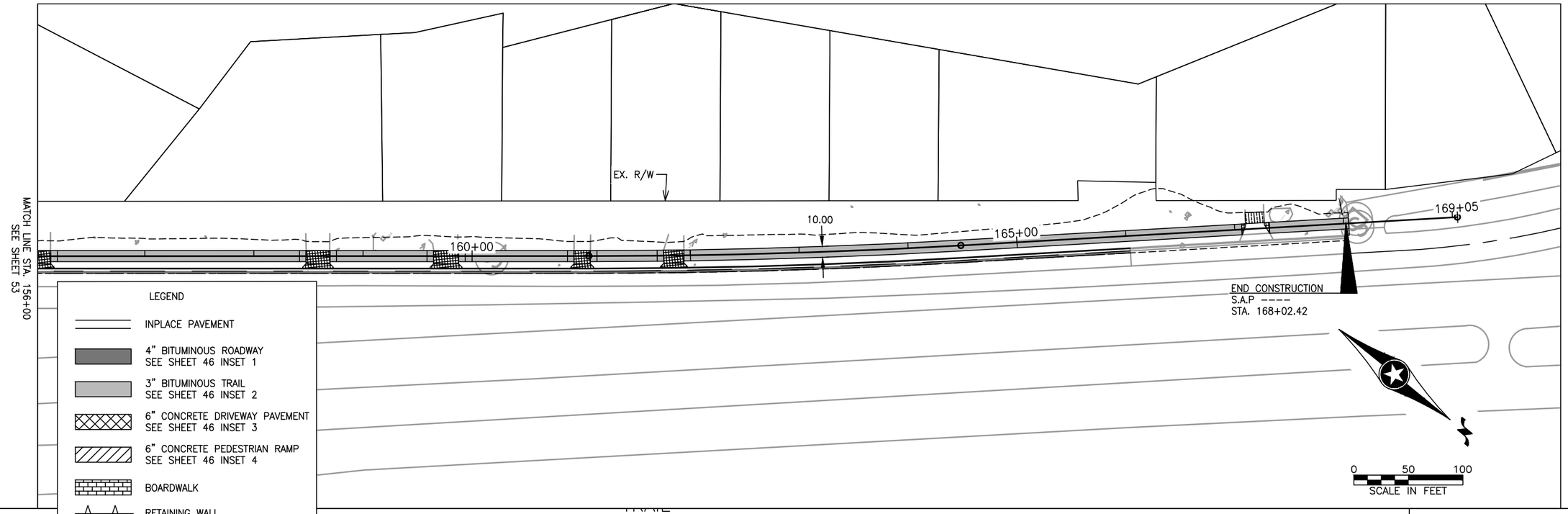

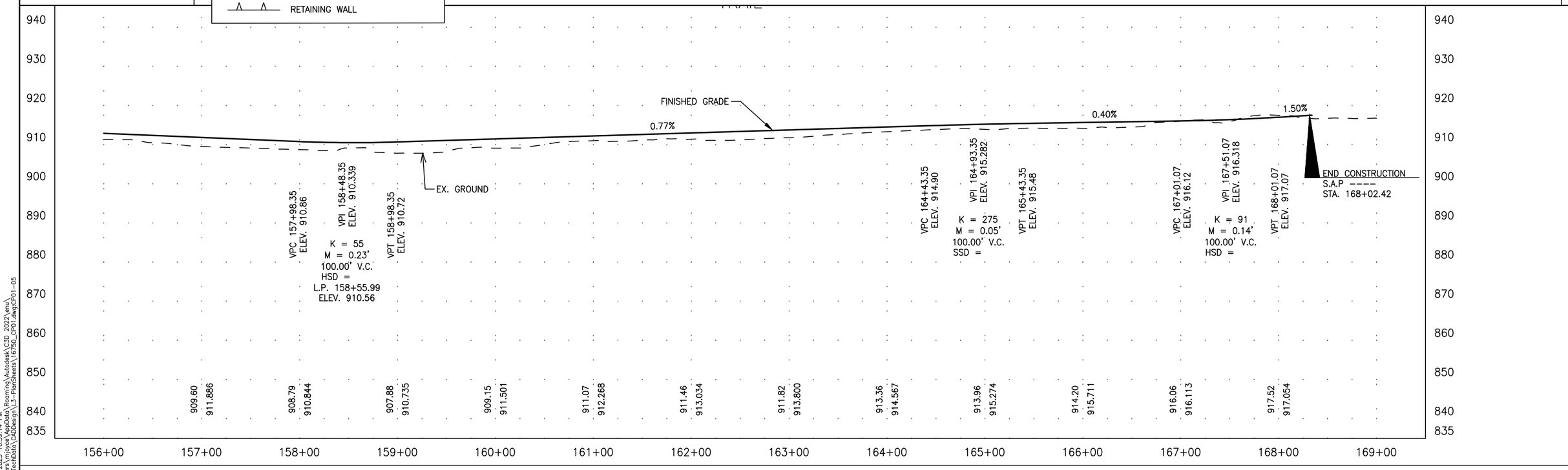

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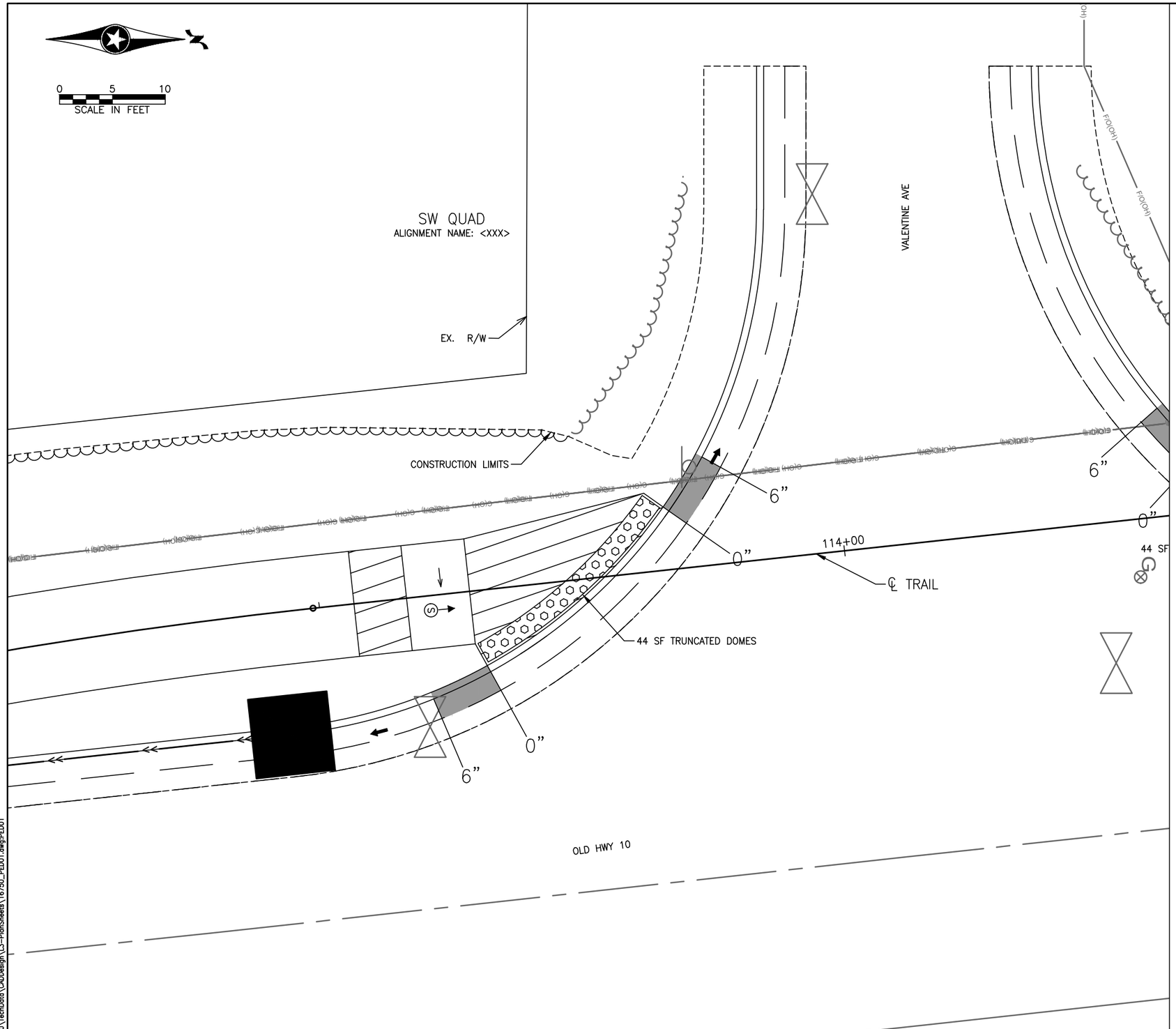
CITY OF ARDEN HILLS
CONSTRUCTION PLANS & PROFILES
OLD HIGHWAY 10 TRAIL

SHEET 54 OF 110



LEGEND

- XXX — CONTROL POINTS
- TRUNCATED DOMES (SEE STANDARD PLATE 7038)
- X" — CURB HEIGHT
- LANDING AREA – 4'X4' MIN. DIMENSIONS AND MAX 2.0% SLOPE IN ALL DIRECTIONS
- (S) — INDICATES PEDESTRIAN RAMP – SLOPE SHALL BE BETWEEN 5.0% MINIMUM AND 8.3% MAXIMUM IN THE DIRECTION SHOWN AND CROSS SLOPE SHALL NOT EXCEED 2.0%
- (F) — INDICATES PEDESTRIAN RAMP – SLOPE SHALL BE GREATER THAN 2.0% AND LESS THAN 5.0% IN THE DIRECTION SHOWN AND CROSS SLOPE SHALL NOT EXCEED 2.0%
- (L) — SLOPE IS EXPECTED TO BE LESS THAN 2.0% IN THE DIRECTION SHOWN AND CROSS SLOPE SHALL NOT EXCEED 2.0%
- DRAINAGE FLOW ARROW
- CROSS SLOPE DIRECTION
- CATCH BASIN
- TRANSITION NOTED GUTTER SLOPE TO NOTED GUTTER SLOPE.

NO	DATE	BY	CKD	APPR

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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.
Print Name: MARTIN JOYCE
Date --/--/-- License # 58920

DRAWN BY HLB
DESIGNED BY MMJ
CHECKED BY MMJ
COMM. NO. 16750

SRF

CITY OF ARDEN HILLS
PEDESTRIAN CURB RAMP DETAILS
OLD HIGHWAY 10 TRAIL

SHEET 55 OF 110

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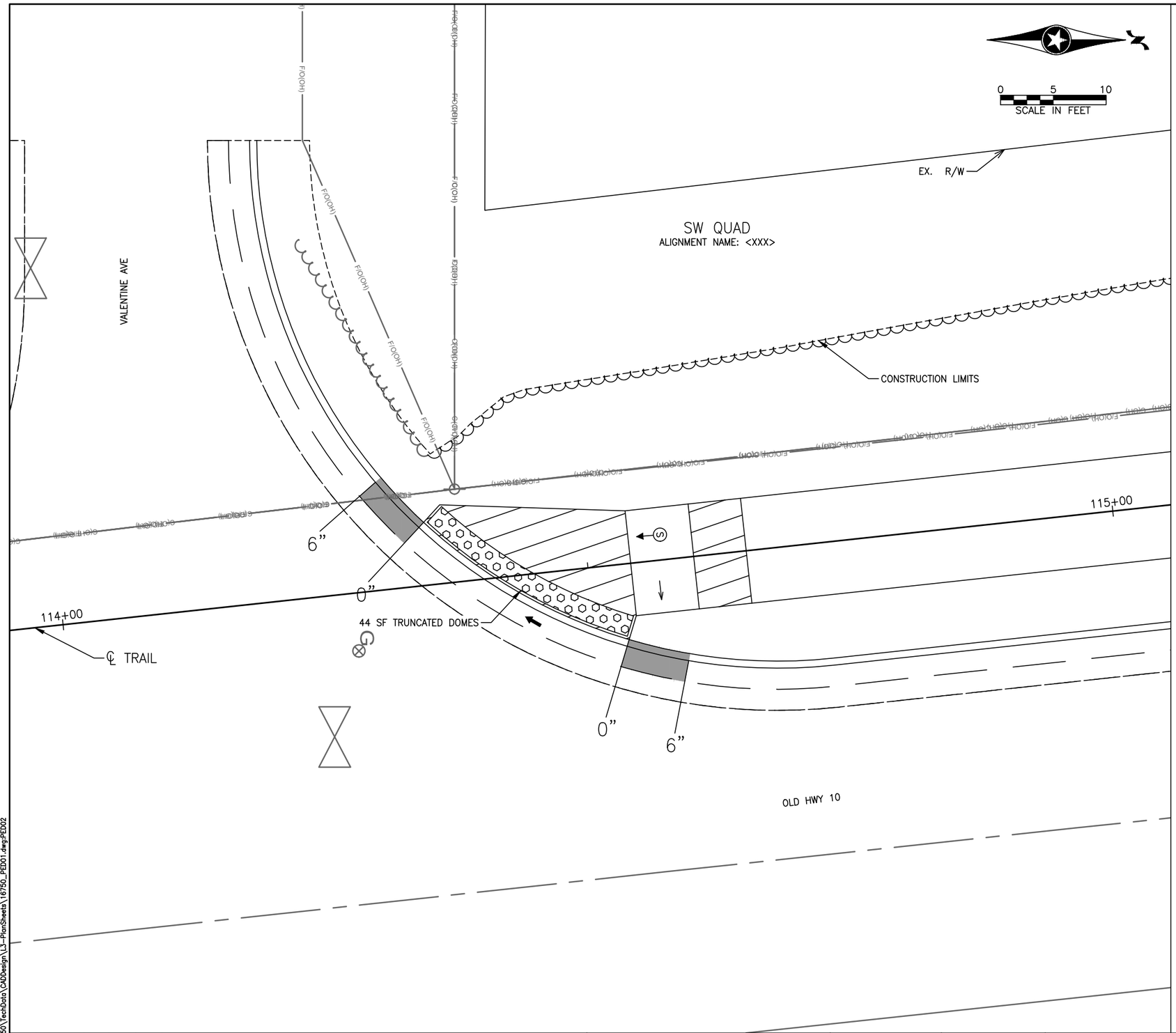

LEGEND

- XXX — CONTROL POINTS
- TRUNCATED DOMES (SEE STANDARD PLATE 7038)
- X" — CURB HEIGHT
- LANDING AREA – 4'X4' MIN. DIMENSIONS AND MAX 2.0% SLOPE IN ALL DIRECTIONS
- (S) — INDICATES PEDESTRIAN RAMP – SLOPE SHALL BE BETWEEN 5.0% MINIMUM AND 8.3% MAXIMUM IN THE DIRECTION SHOWN AND CROSS SLOPE SHALL NOT EXCEED 2.0%
- (F) — INDICATES PEDESTRIAN RAMP – SLOPE SHALL BE GREATER THAN 2.0% AND LESS THAN 5.0% IN THE DIRECTION SHOWN AND CROSS SLOPE SHALL NOT EXCEED 2.0%
- (L) — SLOPE IS EXPECTED TO BE LESS THAN 2.0% IN THE DIRECTION SHOWN AND CROSS SLOPE SHALL NOT EXCEED 2.0%
- DRAINAGE FLOW ARROW
- CROSS SLOPE DIRECTION
- CATCH BASIN
- TRANSITION NOTED GUTTER SLOPE TO NOTED GUTTER SLOPE.

NO	DATE	BY	CKD	APPR

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Print Name: MARTIN JOYCE
Date --/--/-- License # 58920

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DESIGNED BY MMJ
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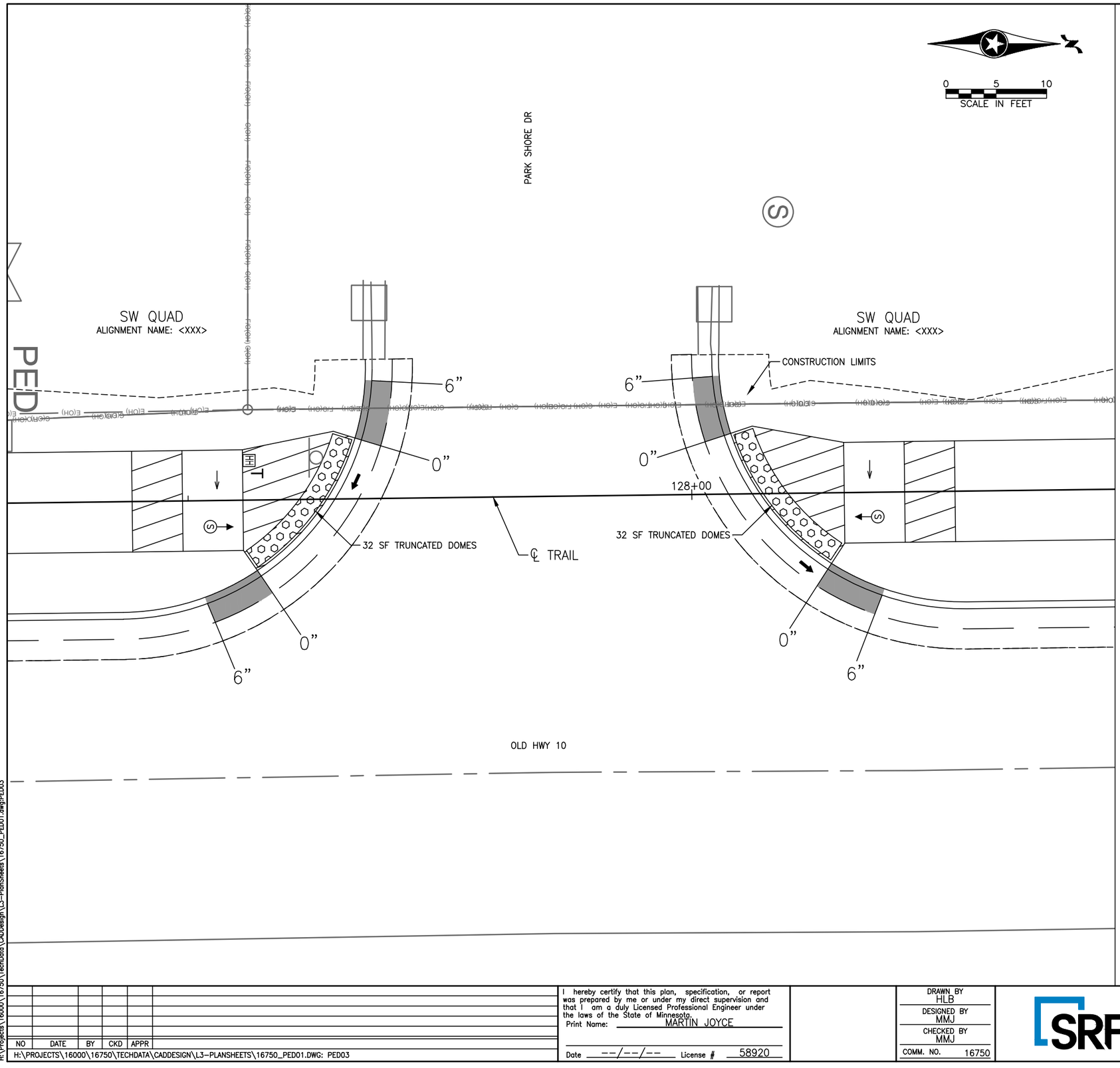
COMM. NO. 16750

SRF

CITY OF ARDEN HILLS
PEDESTRIAN CURB RAMP DETAILS
OLD HIGHWAY 10 TRAIL

SHEET 56 OF 110



LEGEND

XXX	CONTROL POINTS
	TRUNCATED DOMES (SEE STANDARD PLATE 7038)
X"	CURB HEIGHT
	LANDING AREA – 4'X4' MIN. DIMENSIONS AND MAX 2.0% SLOPE IN ALL DIRECTIONS
(S)	INDICATES PEDESTRIAN RAMP – SLOPE SHALL BE BETWEEN 5.0% MINIMUM AND 8.3% MAXIMUM IN THE DIRECTION SHOWN AND CROSS SLOPE SHALL NOT EXCEED 2.0%
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	DRAINAGE FLOW ARROW
	CROSS SLOPE DIRECTION
	CATCH BASIN
	TRANSITION NOTED GUTTER SLOPE TO NOTED GUTTER SLOPE.

NO	DATE	BY	CKD	APPR

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COMM. NO. 16750

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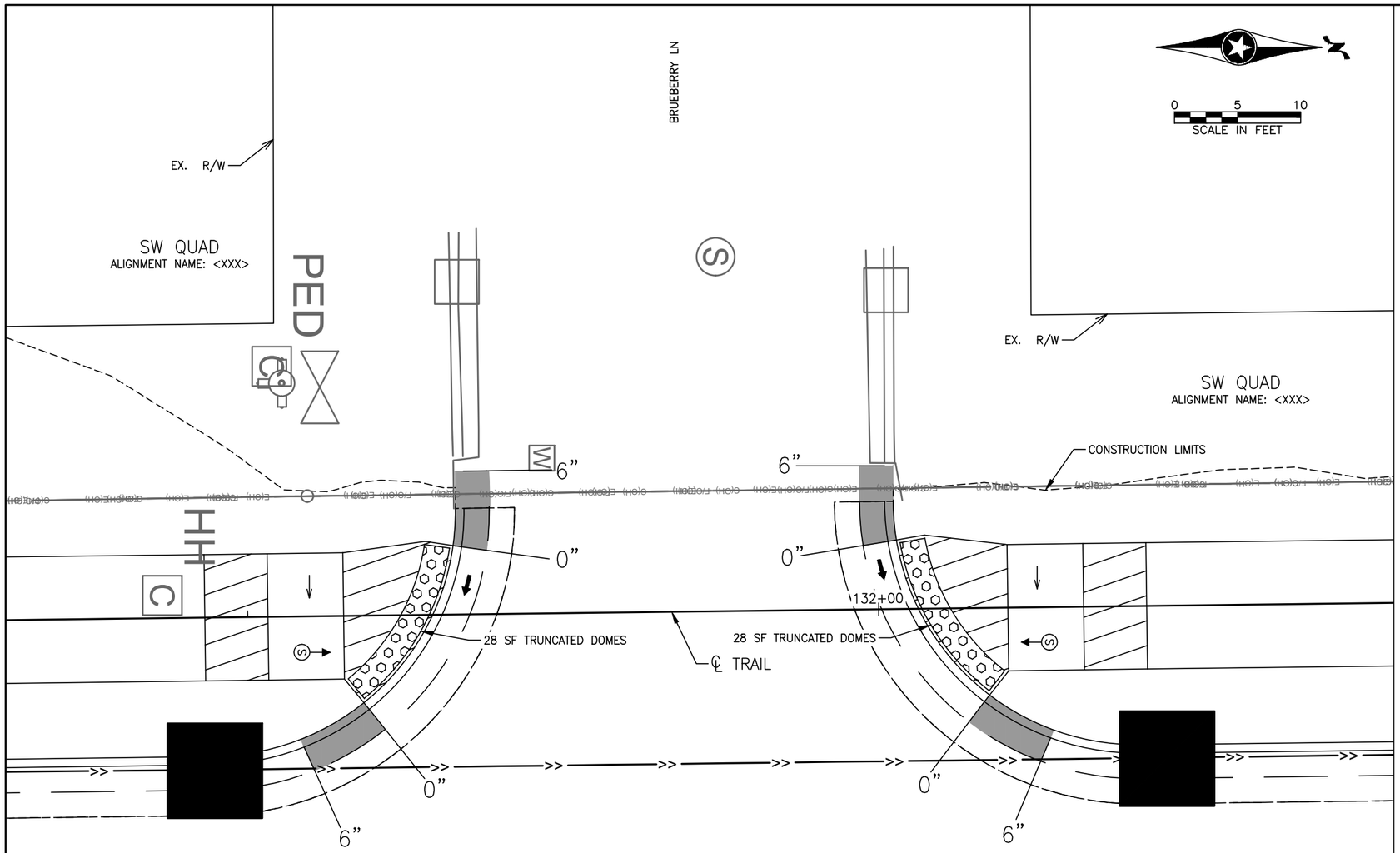
CITY OF ARDEN HILLS
PEDESTRIAN CURB RAMP DETAILS
OLD HIGHWAY 10 TRAIL

SHEET 57 OF 110



LEGEND

XXX	CONTROL POINTS
	TRUNCATED DOMES (SEE STANDARD PLATE 7038)
X"	CURB HEIGHT
	LANDING AREA – 4'X4' MIN. DIMENSIONS AND MAX 2.0% SLOPE IN ALL DIRECTIONS
S	INDICATES PEDESTRIAN RAMP – SLOPE SHALL BE BETWEEN 5.0% MINIMUM AND 8.3% MAXIMUM IN THE DIRECTION SHOWN AND CROSS SLOPE SHALL NOT EXCEED 2.0%
F	INDICATES PEDESTRIAN RAMP – SLOPE SHALL BE GREATER THAN 2.0% AND LESS THAN 5.0% IN THE DIRECTION SHOWN AND CROSS SLOPE SHALL NOT EXCEED 2.0%
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	DRAINAGE FLOW ARROW
	CROSS SLOPE DIRECTION
	CATCH BASIN
	TRANSITION NOTED GUTTER SLOPE TO NOTED GUTTER SLOPE.

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Date --/--/-- License # 58920

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CHECKED BY MMJ
COMM. NO. 16750

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CITY OF ARDEN HILLS

PEDESTRIAN CURB RAMP DETAILS
OLD HIGHWAY 10 TRAIL

SHEET 58 OF 110

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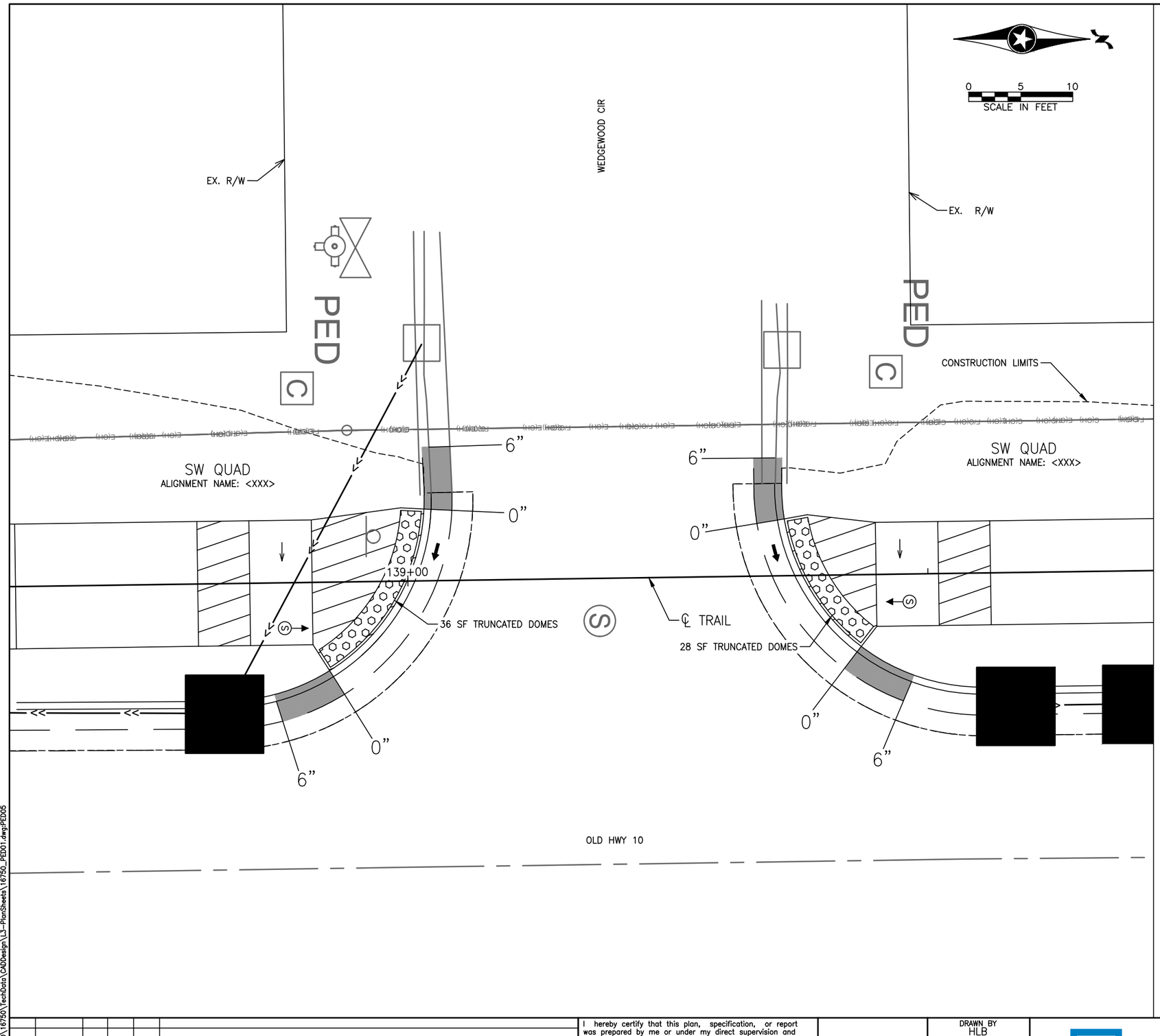

LEGEND

XXX	CONTROL POINTS
	TRUNCATED DOMES (SEE STANDARD PLATE 7038)
X"	CURB HEIGHT
	LANDING AREA – 4'X4' MIN. DIMENSIONS AND MAX 2.0% SLOPE IN ALL DIRECTIONS
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	DRAINAGE FLOW ARROW
	CROSS SLOPE DIRECTION
	CATCH BASIN
	TRANSITION NOTED GUTTER SLOPE TO NOTED GUTTER SLOPE.

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CHECKED BY MMJ
COMM. NO. 16750

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CITY OF ARDEN HILLS
PEDESTRIAN CURB RAMP DETAILS
OLD HIGHWAY 10 TRAIL

SHEET 59 OF 110

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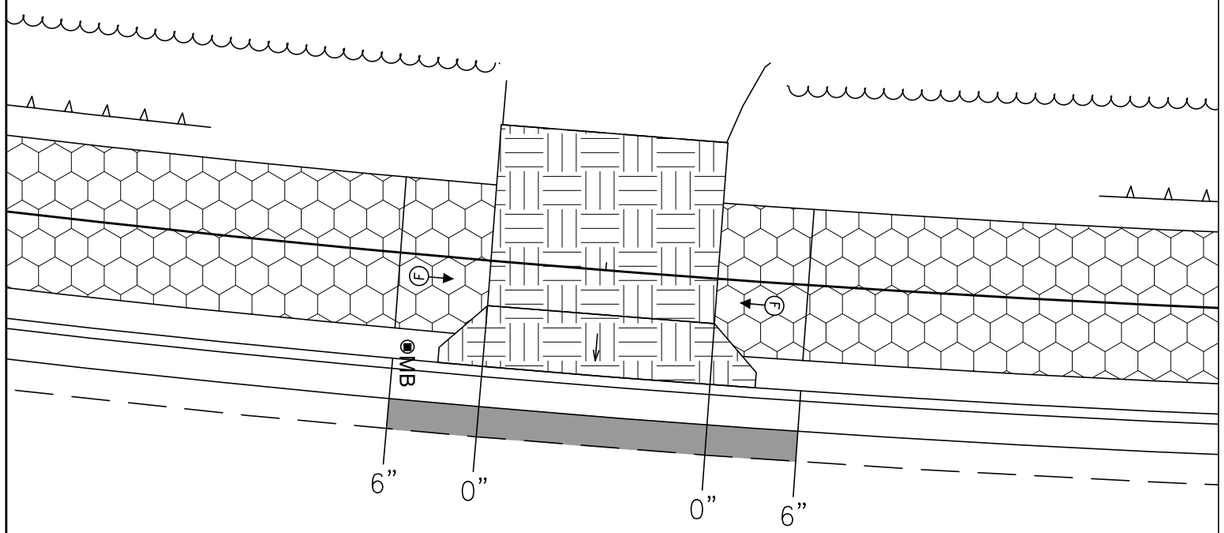

LEGEND	
X”	CURB HEIGHT
Ⓢ	INDICATES PEDESTRIAN RAMP – SLOPE SHALL BE BETWEEN 5.0% MINIMUM AND 8.3% MAXIMUM IN THE DIRECTION SHOWN AND CROSS SLOPE SHALL NOT EXCEED 2.0%
Ⓕ	INDICATES PEDESTRIAN RAMP – SLOPE SHALL BE GREATER THAN 2.0% AND LESS THAN 5.0% IN THE DIRECTION SHOWN AND CROSS SLOPE SHALL NOT EXCEED 2.0%
Ⓛ	SLOPE IS EXPECTED TO BE LESS THAN 2.0% IN THE DIRECTION SHOWN AND CROSS SLOPE SHALL NOT EXCEED 2.0%
	BITUMINOUS PATCHING MIXTURE
	6” CONCRETE PAVEMENT
	3’ BITUMINOUS WALK

NO	DATE	BY	CKD	APPR

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Date --/--/-- License # 58920

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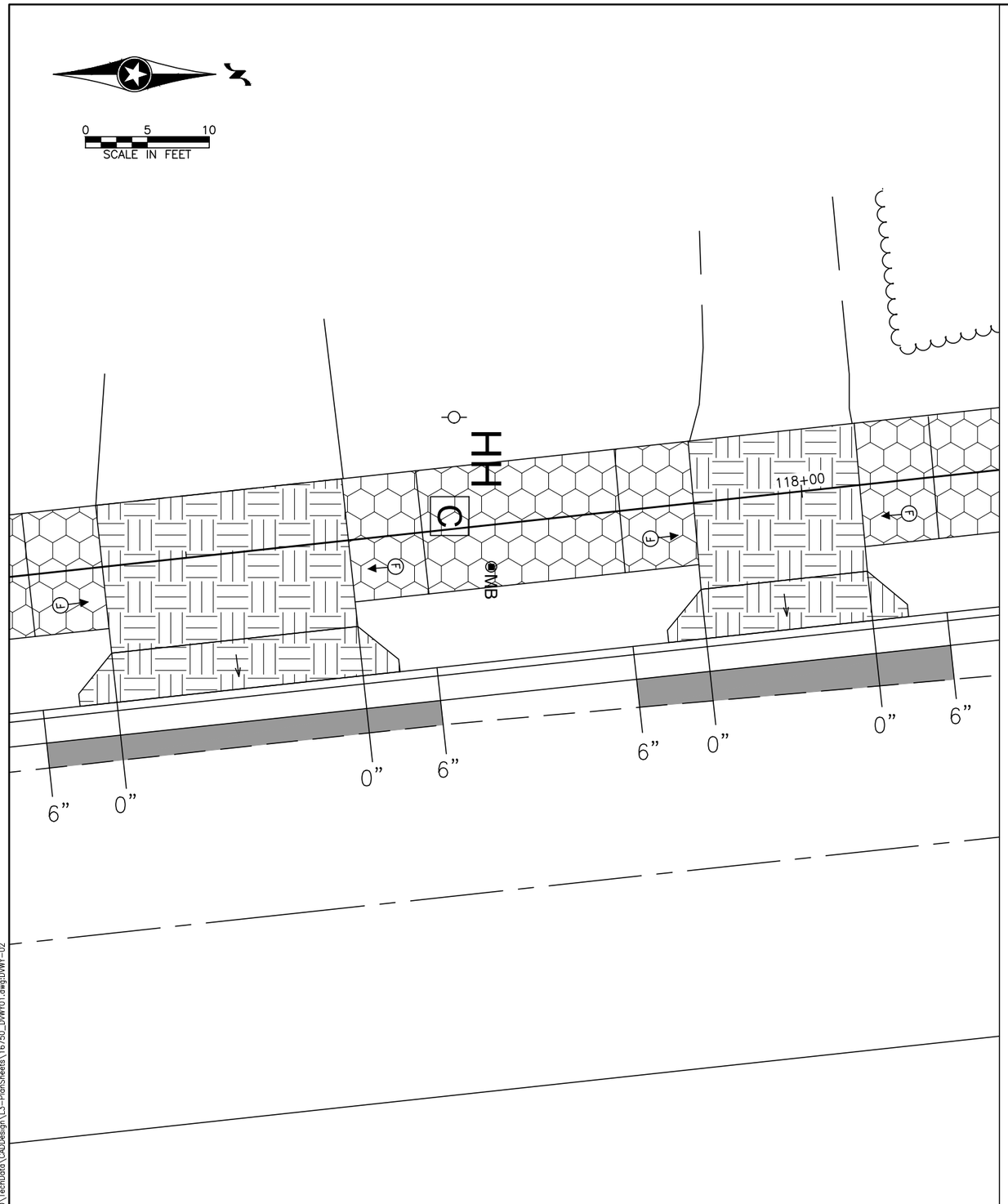
DESIGNED BY MMJ
CHECKED BY MMJ
COMM. NO. 16750

CITY OF ARDEN HILLS

DRIVEWAY DETAILS
OLD HIGHWAY 10 TRAIL

SHEET 60 OF 110



LEGEND	
X"	CURB HEIGHT
(S)	INDICATES PEDESTRIAN RAMP – SLOPE SHALL BE BETWEEN 5.0% MINIMUM AND 8.3% MAXIMUM IN THE DIRECTION SHOWN AND CROSS SLOPE SHALL NOT EXCEED 2.0%
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	BITUMINOUS PATCHING MIXTURE
	6" CONCRETE PAVEMENT
	3' BITUMINOUS WALK

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COMM. NO. 16750

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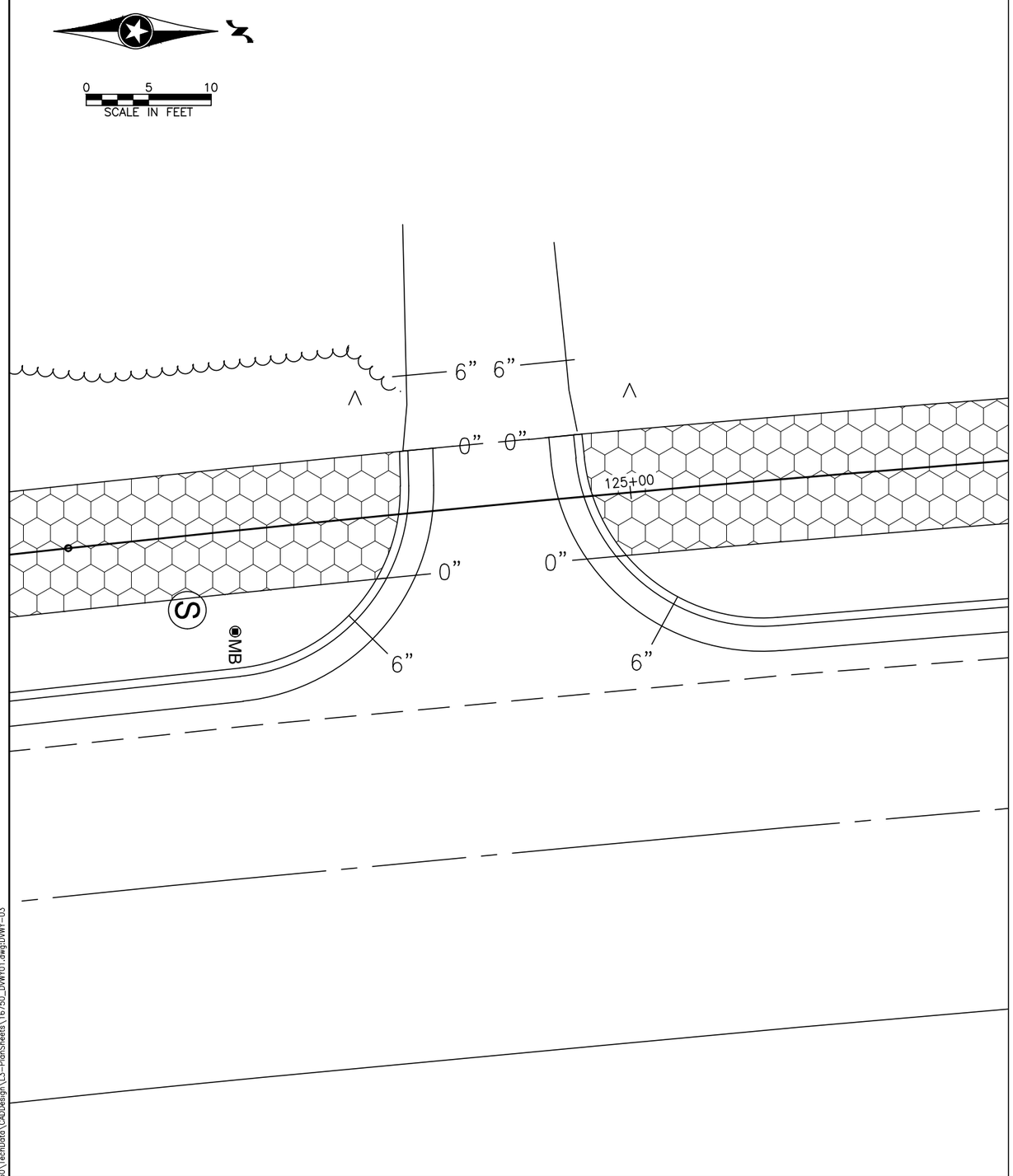
CITY OF ARDEN HILLS

DRIVEWAY DETAILS

OLD HIGHWAY 10 TRAIL

SHEET 61 OF 110



LEGEND	
X"	CURB HEIGHT
(S)	INDICATES PEDESTRIAN RAMP – SLOPE SHALL BE BETWEEN 5.0% MINIMUM AND 8.3% MAXIMUM IN THE DIRECTION SHOWN AND CROSS SLOPE SHALL NOT EXCEED 2.0%
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	BITUMINOUS PATCHING MIXTURE
	6" CONCRETE PAVEMENT
	3' BITUMINOUS WALK

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Date --/--/-- License # 58920

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CHECKED BY MMJ
COMM. NO. 16750

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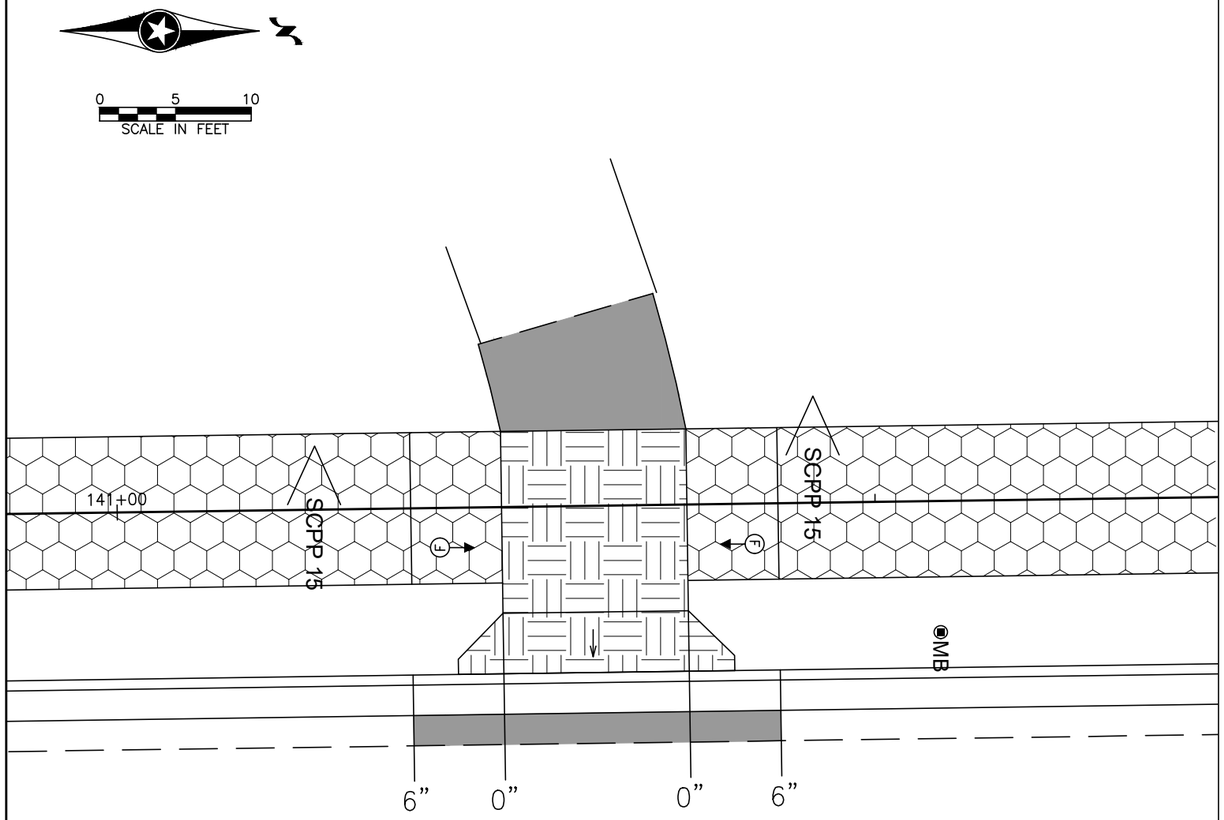
CITY OF ARDEN HILLS

DRIVEWAY DETAILS

OLD HIGHWAY 10 TRAIL

SHEET 62 OF 110



LEGEND	
X”	CURB HEIGHT
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	BITUMINOUS PATCHING MIXTURE
	6” CONCRETE PAVEMENT
	3’ BITUMINOUS WALK

NO	DATE	BY	CKD	APPR

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Print Name: MARTIN JOYCE
Date --/--/-- License # 58920

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CITY OF ARDEN HILLS

DRIVEWAY DETAILS
OLD HIGHWAY 10 TRAIL

SHEET 63 OF 110

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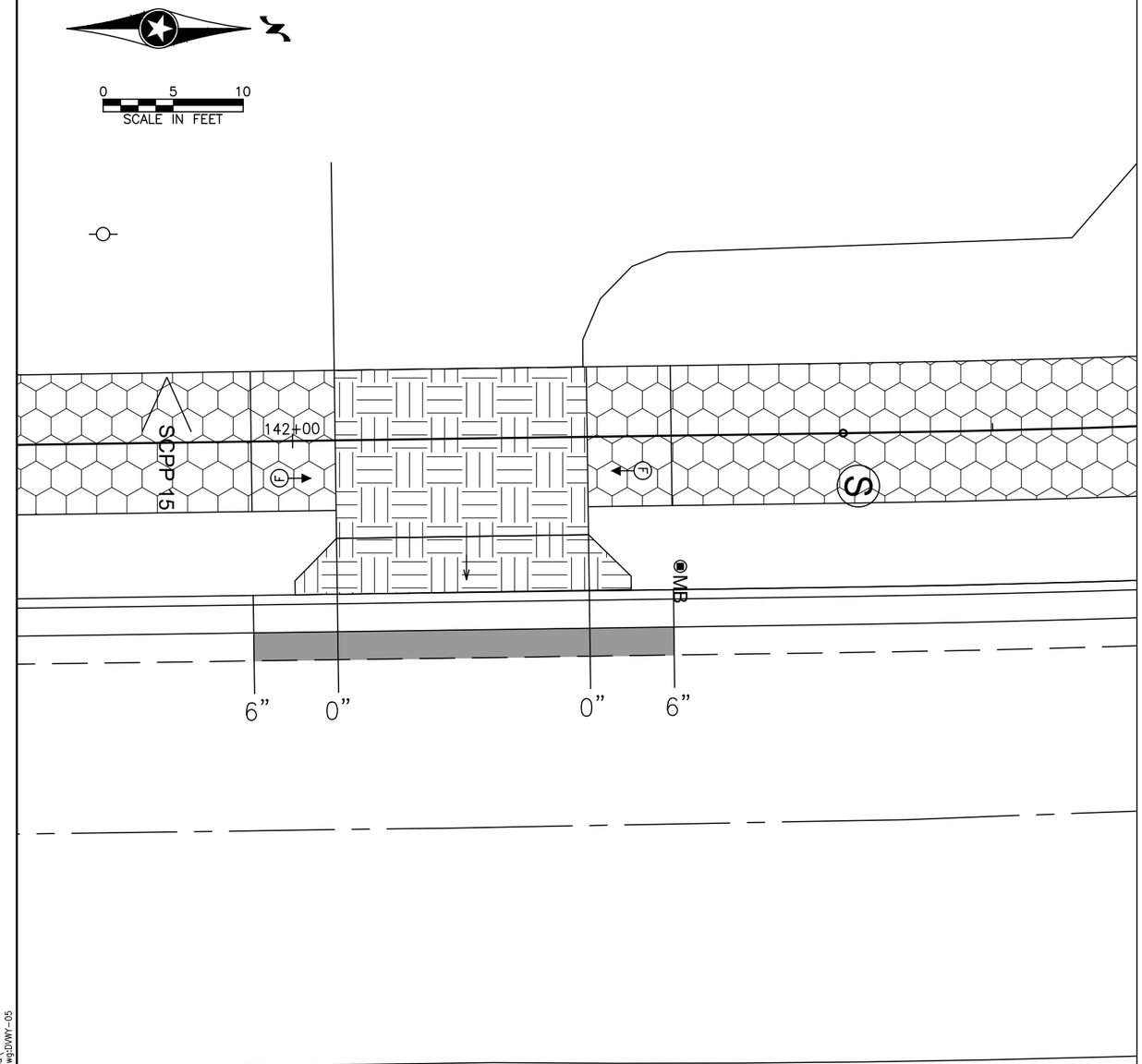

LEGEND	
X"	CURB HEIGHT
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	BITUMINOUS PATCHING MIXTURE
	6" CONCRETE PAVEMENT
	3' BITUMINOUS WALK

NO	DATE	BY	CKD	APPR

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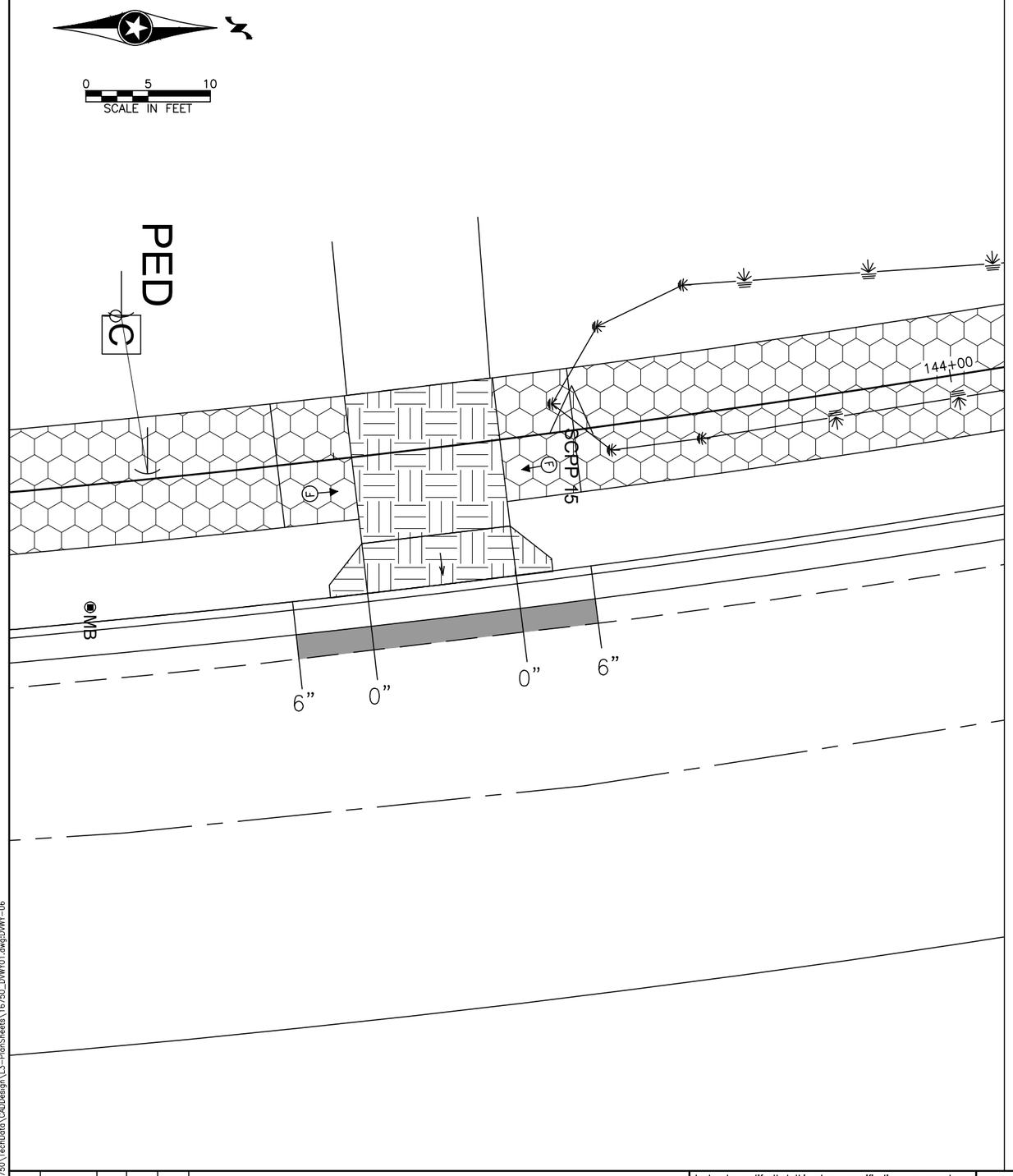
CITY OF ARDEN HILLS

DRIVEWAY DETAILS
OLD HIGHWAY 10 TRAIL

SHEET 64 OF 110



LEGEND	
X"	CURB HEIGHT
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	BITUMINOUS PATCHING MIXTURE
	6" CONCRETE PAVEMENT
	3' BITUMINOUS WALK

NO	DATE	BY	CKD	APPR

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CITY OF ARDEN HILLS

DRIVEWAY DETAILS
OLD HIGHWAY 10 TRAIL

SHEET 65 OF 110

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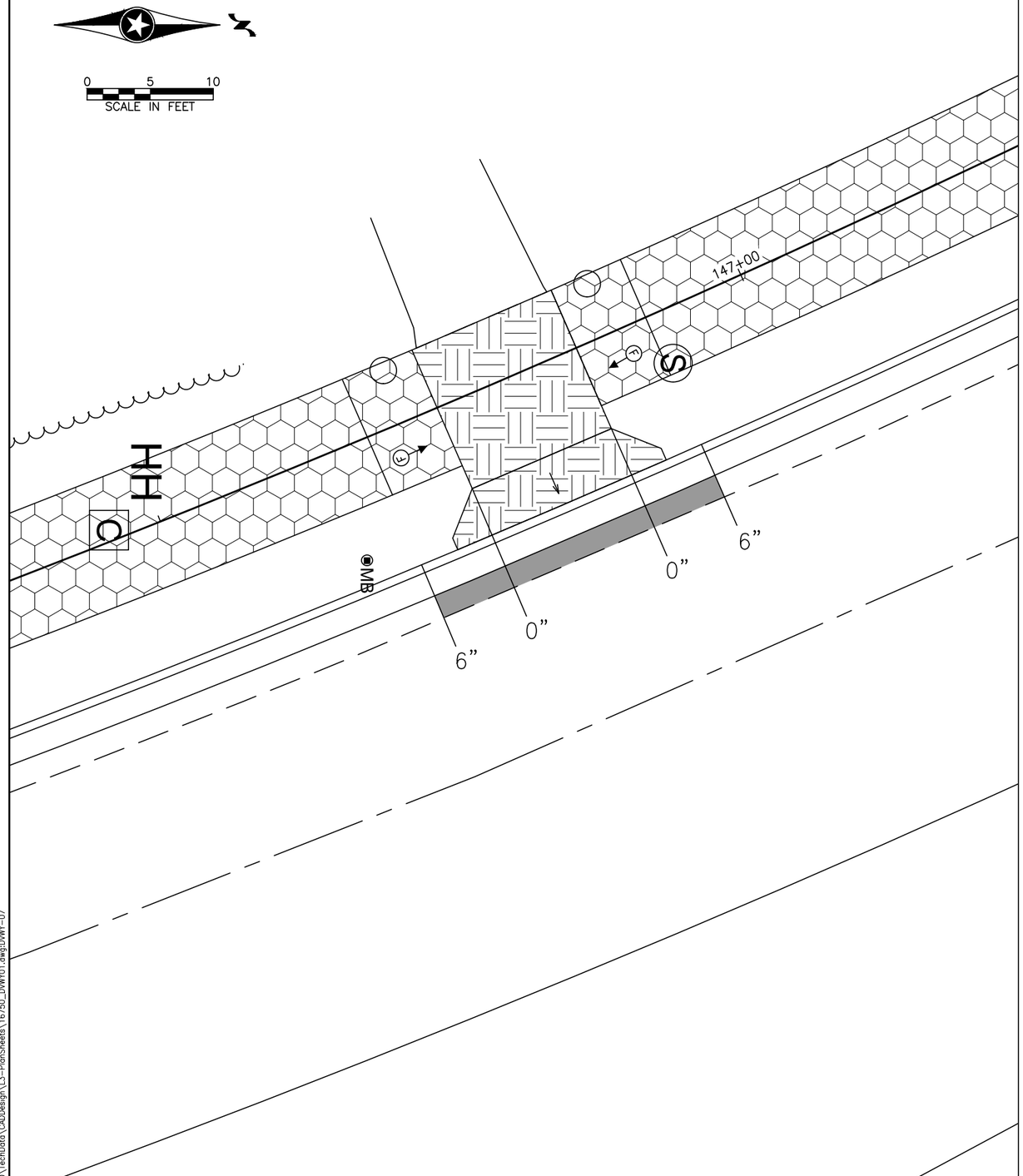

LEGEND	
X"	CURB HEIGHT
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	BITUMINOUS PATCHING MIXTURE
	6" CONCRETE PAVEMENT
	3' BITUMINOUS WALK

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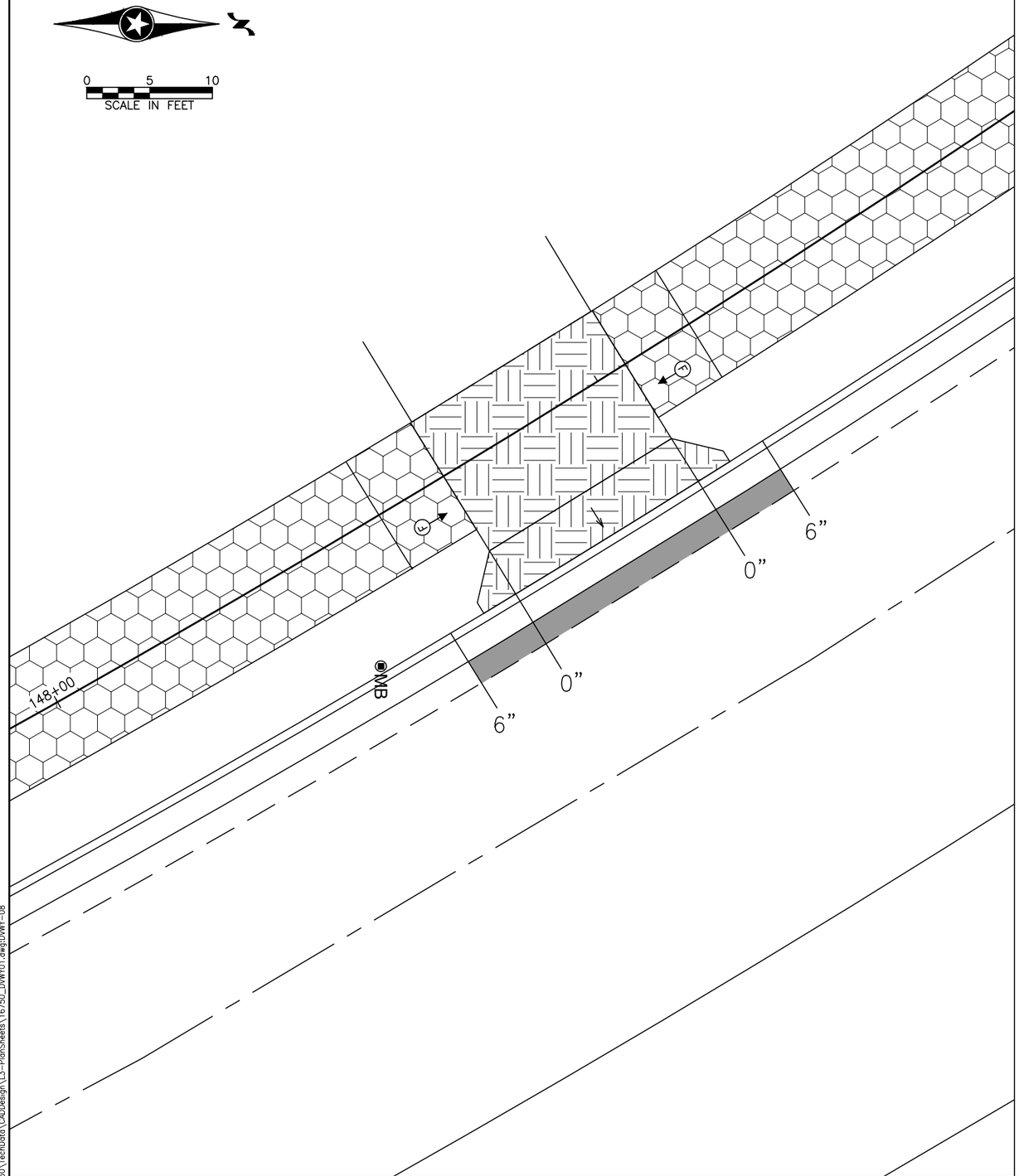
CITY OF ARDEN HILLS

DRIVEWAY DETAILS

OLD HIGHWAY 10 TRAIL

SHEET 66 OF 110



LEGEND	
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	6" CONCRETE PAVEMENT
	3' BITUMINOUS WALK

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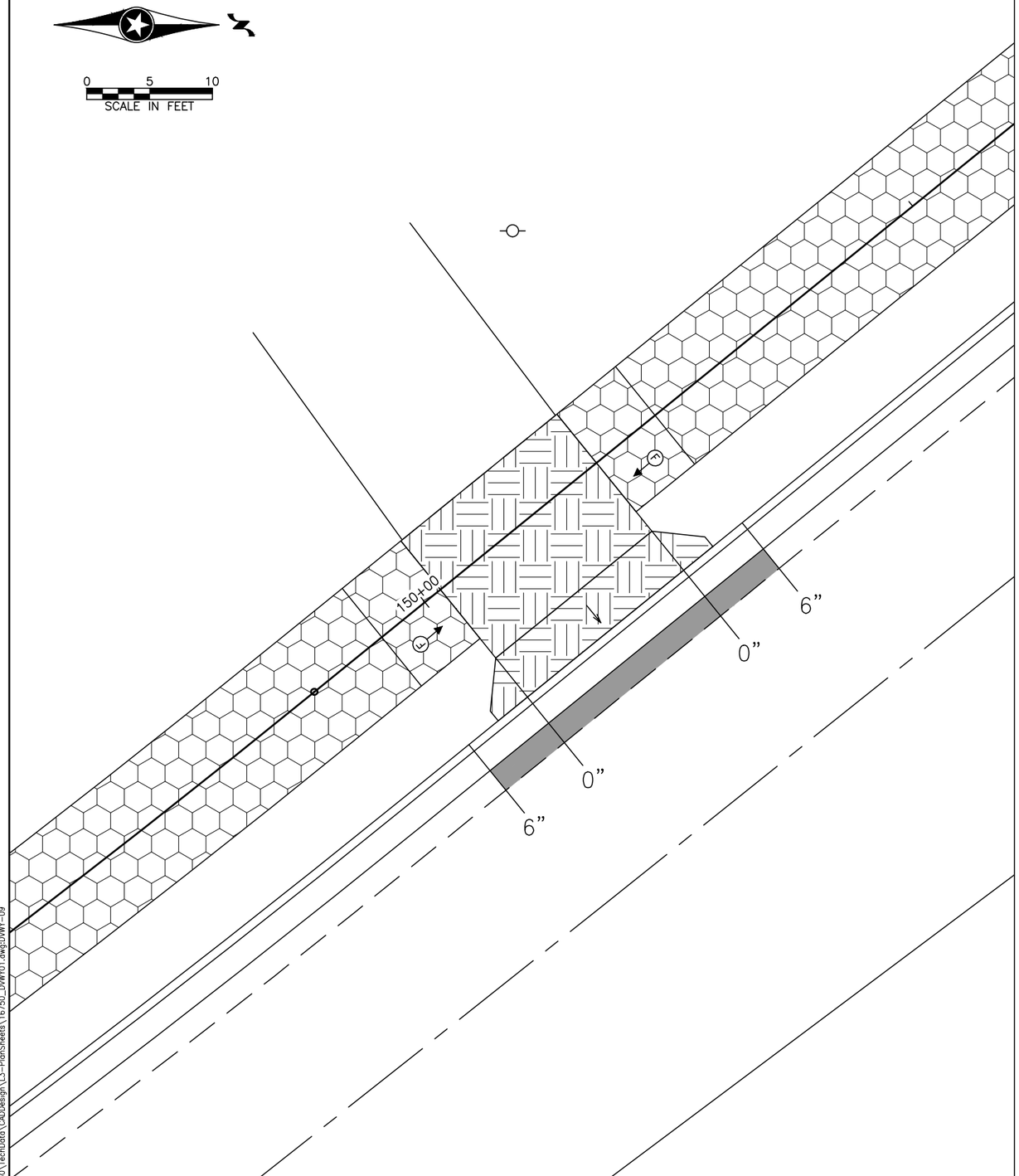
CITY OF ARDEN HILLS
DRIVEWAY DETAILS
OLD HIGHWAY 10 TRAIL

SHEET 67 OF 110



LEGEND

X”	CURB HEIGHT
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	BITUMINOUS PATCHING MIXTURE
	6” CONCRETE PAVEMENT
	3’ BITUMINOUS WALK

NO	DATE	BY	CKD	APPR

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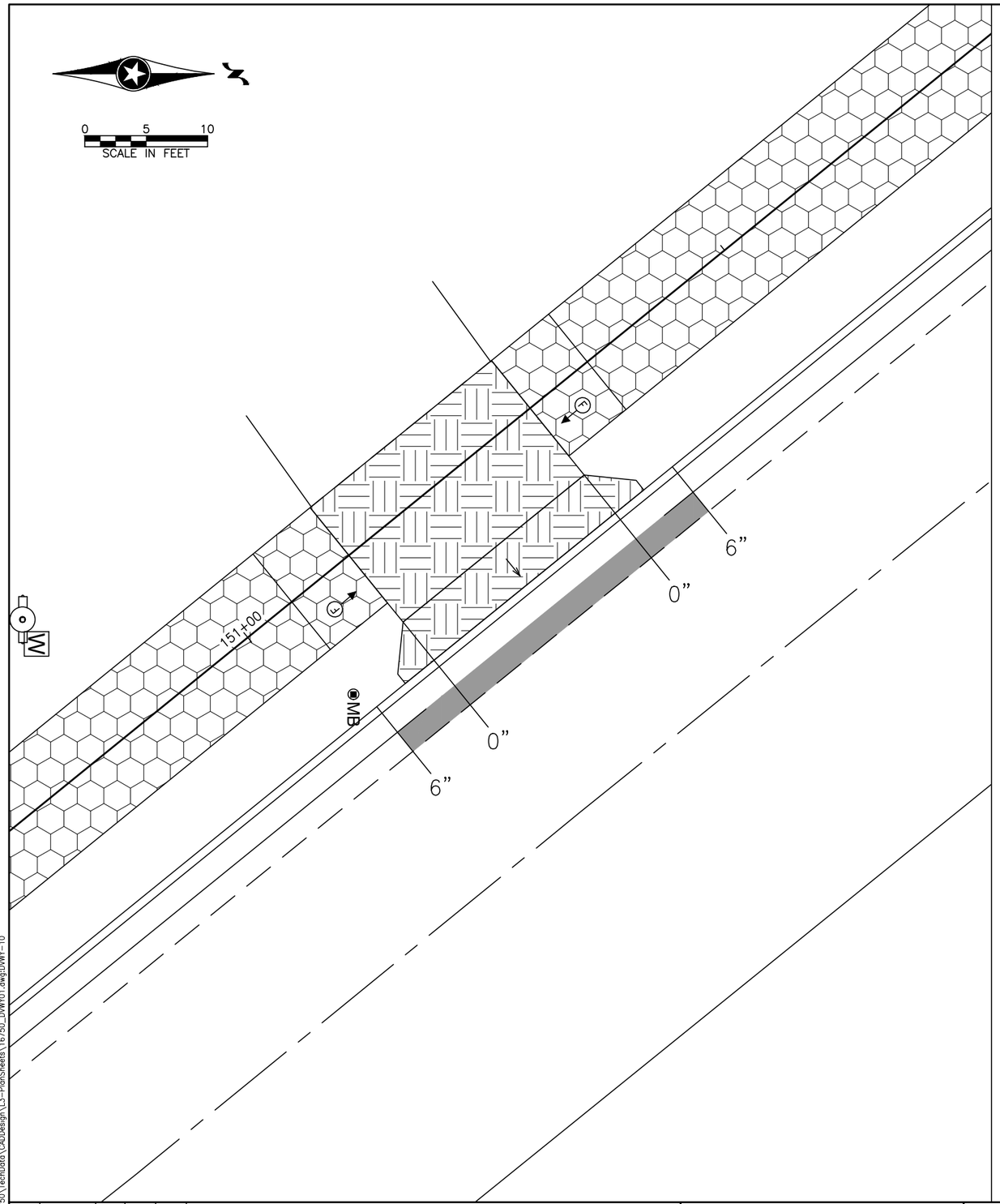
CITY OF ARDEN HILLS

DRIVEWAY DETAILS
OLD HIGHWAY 10 TRAIL

SHEET 68 OF 110



LEGEND	
X"	CURB HEIGHT
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(F)	INDICATES PEDESTRIAN RAMP – SLOPE SHALL BE GREATER THAN 2.0% AND LESS THAN 5.0% IN THE DIRECTION SHOWN AND CROSS SLOPE SHALL NOT EXCEED 2.0%
(L)	SLOPE IS EXPECTED TO BE LESS THAN 2.0% IN THE DIRECTION SHOWN AND CROSS SLOPE SHALL NOT EXCEED 2.0%
	BITUMINOUS PATCHING MIXTURE
	6" CONCRETE PAVEMENT
	3' BITUMINOUS WALK

NO	DATE	BY	CKD	APPR

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Print Name: MARTIN JOYCE
Date --/--/-- License # 58920

DRAWN BY HLB
DESIGNED BY MMJ
CHECKED BY MMJ
COMM. NO. 16750

SRF

CITY OF ARDEN HILLS
DRIVEWAY DETAILS
OLD HIGHWAY 10 TRAIL

SHEET 69 OF 110

HAILEY BARRY | 11/30/2023 4:23:15 PM
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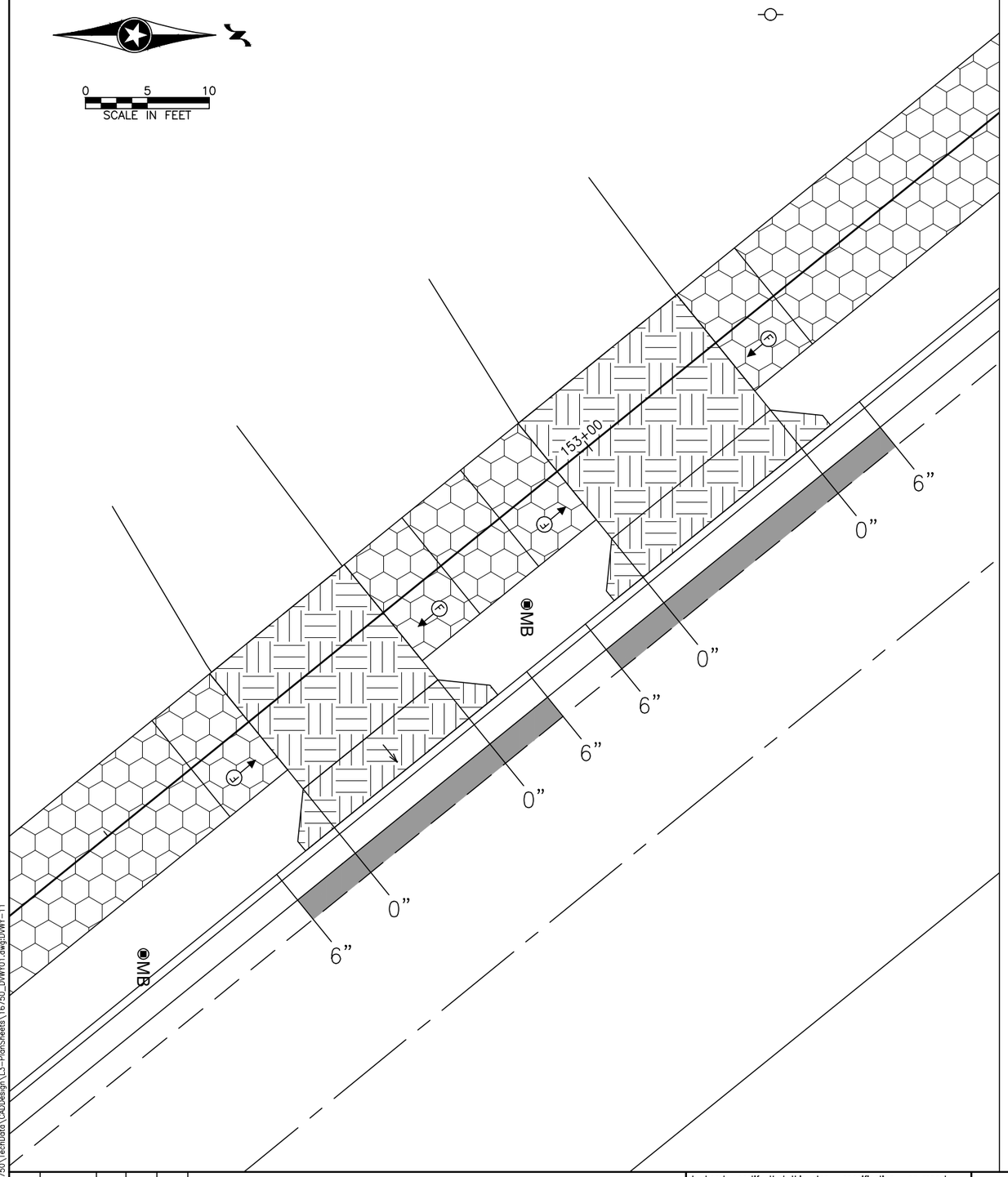

LEGEND	
X”	CURB HEIGHT
(S)	INDICATES PEDESTRIAN RAMP – SLOPE SHALL BE BETWEEN 5.0% MINIMUM AND 8.3% MAXIMUM IN THE DIRECTION SHOWN AND CROSS SLOPE SHALL NOT EXCEED 2.0%
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	3’ BITUMINOUS WALK

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Date --/--/-- License # 58920

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COMM. NO. 16750

CITY OF ARDEN HILLS

DRIVEWAY DETAILS
OLD HIGHWAY 10 TRAIL

SHEET 70 OF 110

HAILEY BARRY | 11/20/2023 4:23:15 PM
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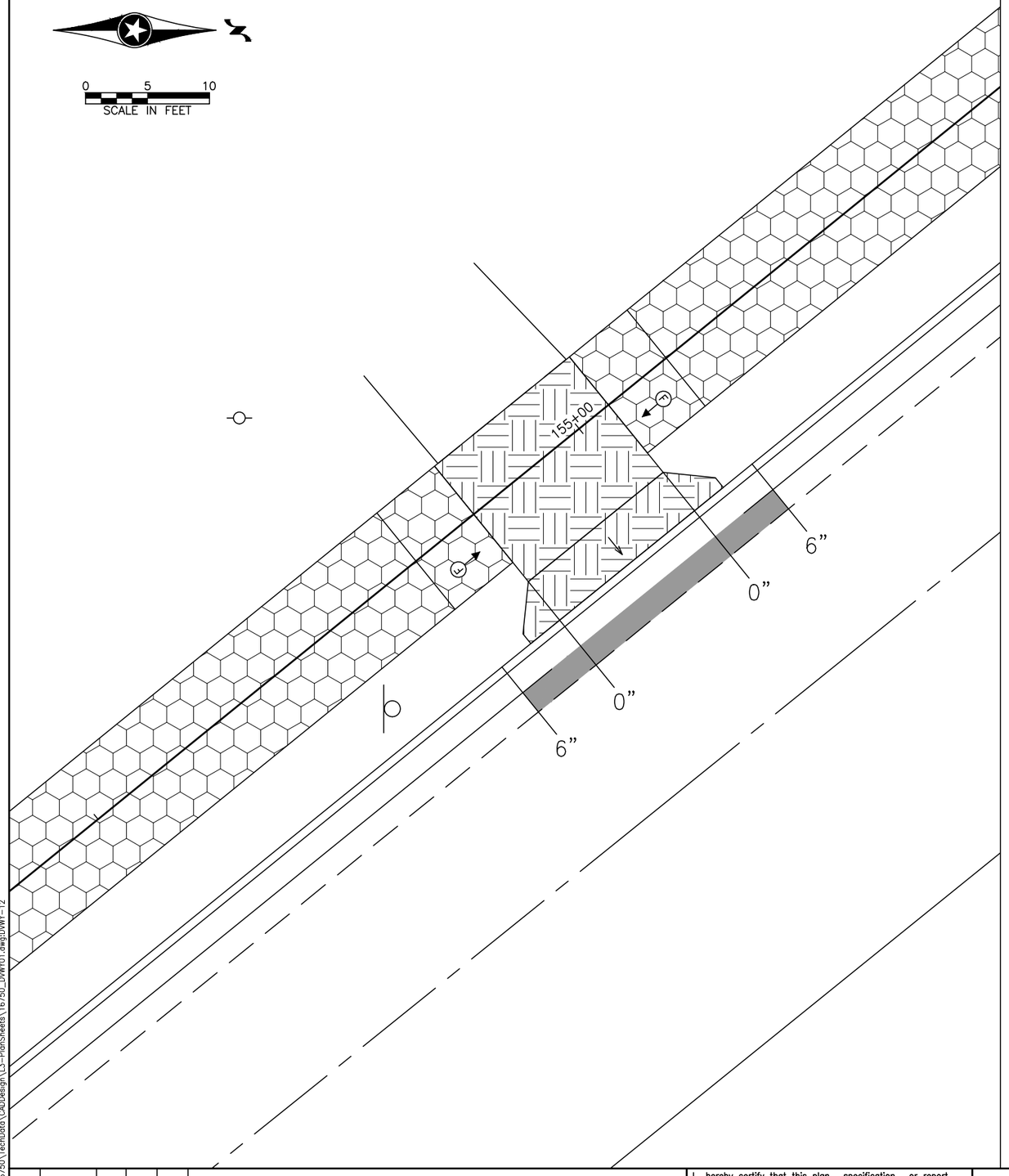

LEGEND	
X"	CURB HEIGHT
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	6" CONCRETE PAVEMENT
	3' BITUMINOUS WALK

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Date --/--/-- License # 58920

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DESIGNED BY MMJ
CHECKED BY MMJ
COMM. NO. 16750

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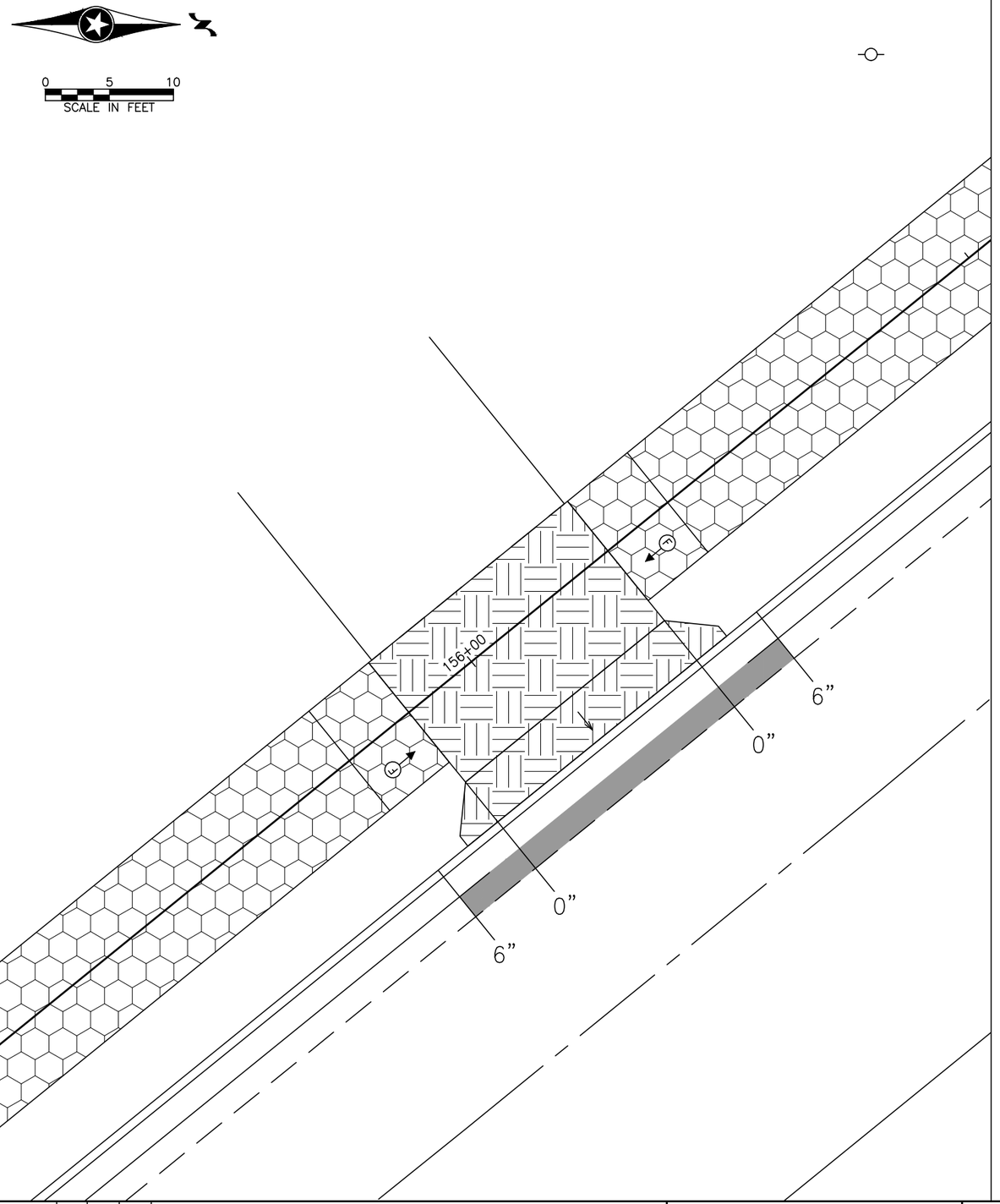
CITY OF ARDEN HILLS

DRIVEWAY DETAILS
OLD HIGHWAY 10 TRAIL

SHEET 71 OF 110



LEGEND	
X"	CURB HEIGHT
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	6" CONCRETE PAVEMENT
	3' BITUMINOUS WALK

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COMM. NO. 16750

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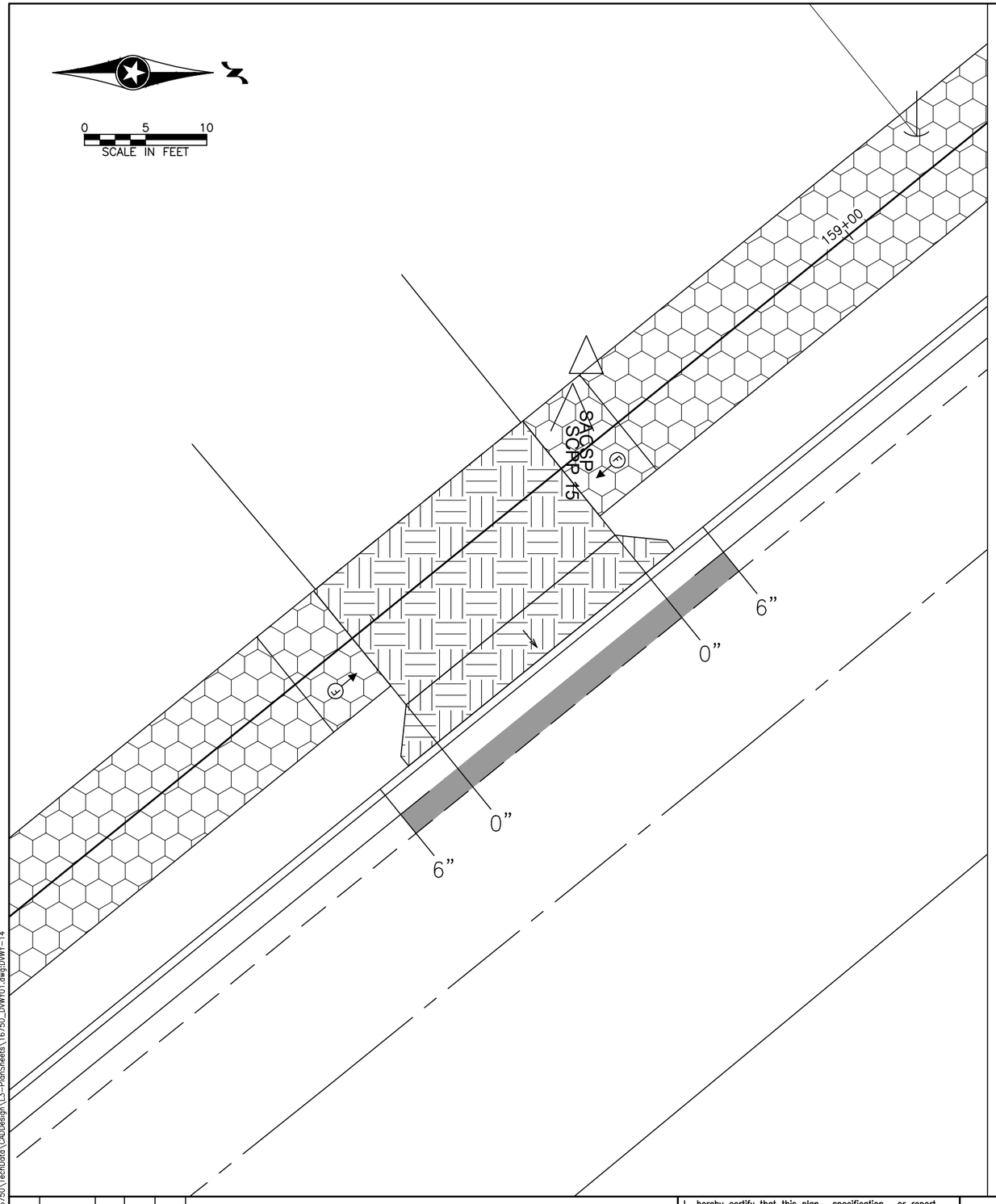
CITY OF ARDEN HILLS

DRIVEWAY DETAILS

OLD HIGHWAY 10 TRAIL

SHEET 72 OF 110



LEGEND	
X”	CURB HEIGHT
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	3’ BITUMINOUS WALK

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Date --/--/-- License # 58920

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COMM. NO. 16750

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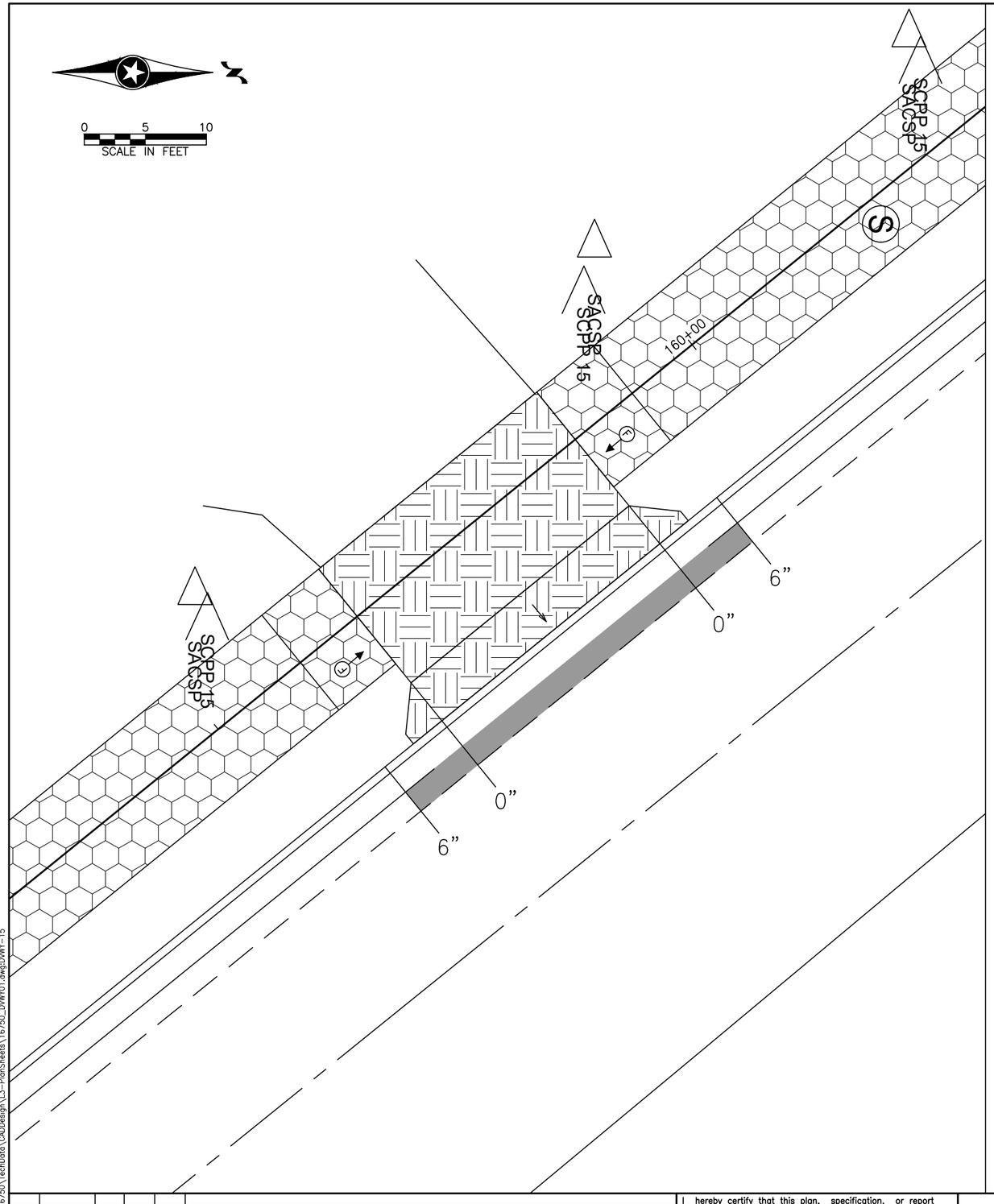
CITY OF ARDEN HILLS
DRIVEWAY DETAILS
OLD HIGHWAY 10 TRAIL

SHEET 73 OF 110



LEGEND	
X"	CURB HEIGHT
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	6" CONCRETE PAVEMENT
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COMM. NO. 16750

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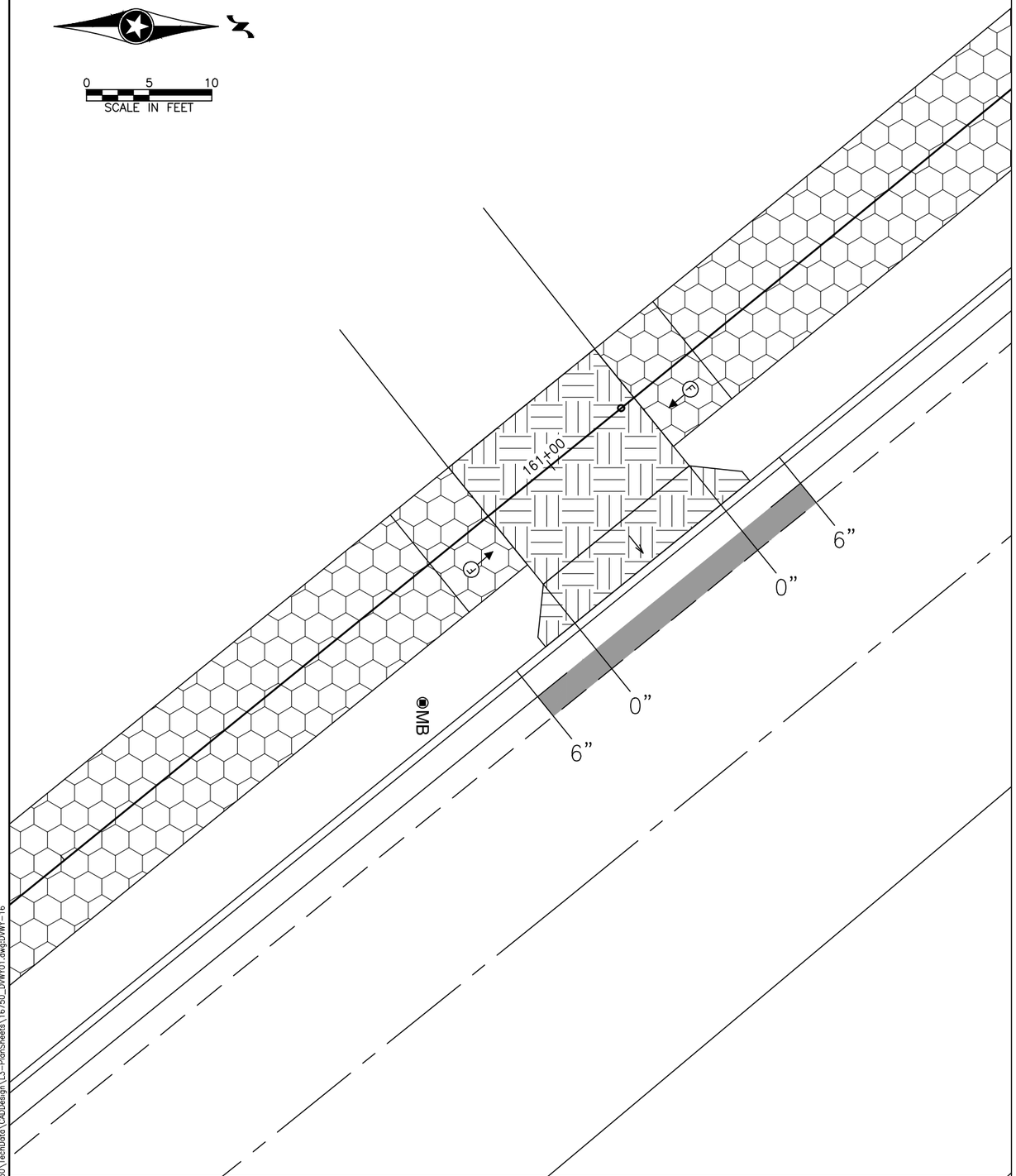
CITY OF ARDEN HILLS
DRIVEWAY DETAILS
OLD HIGHWAY 10 TRAIL

SHEET 74 OF 110



LEGEND

X"	CURB HEIGHT
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CHECKED BY MMJ
COMM. NO. 16750

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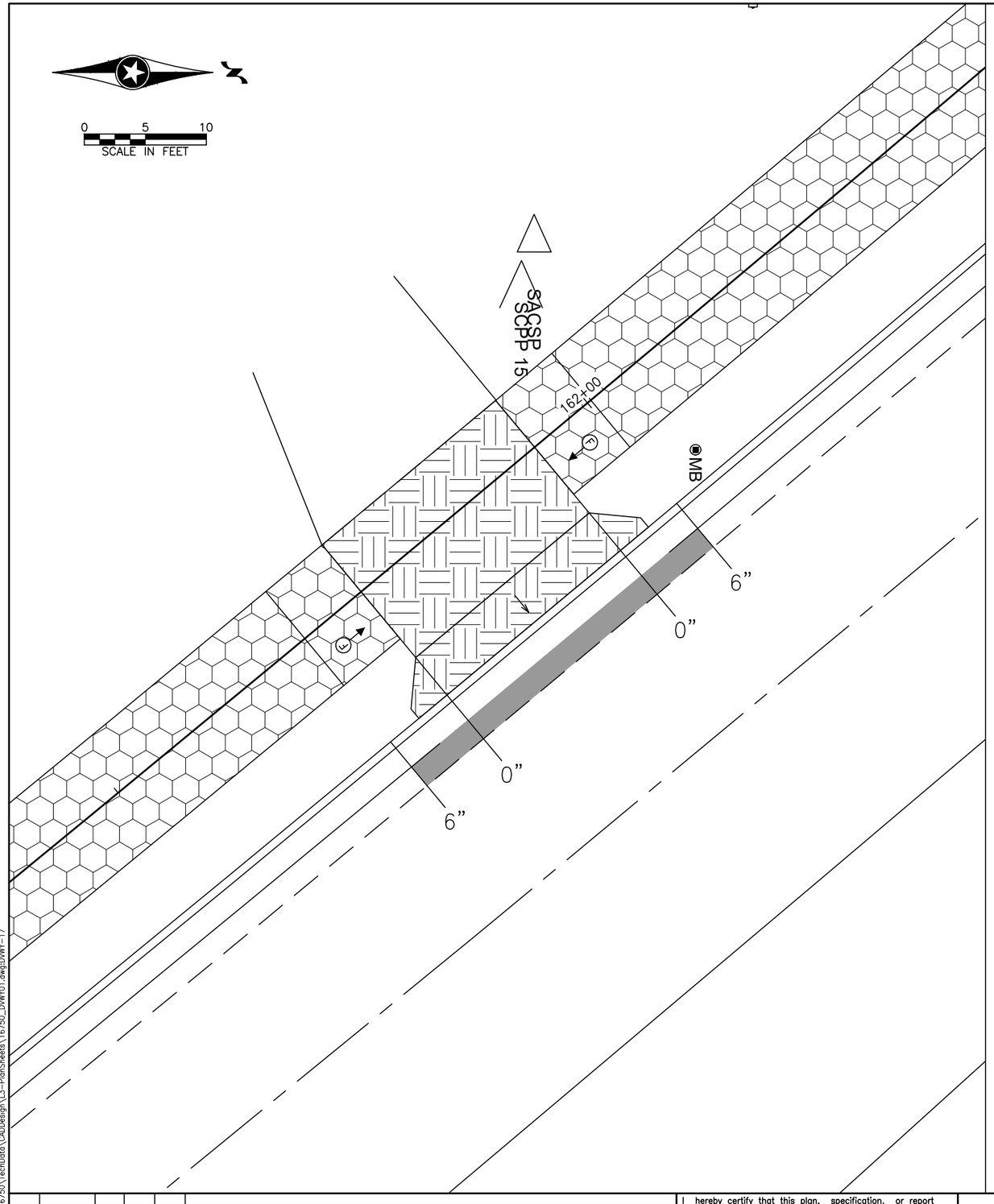
CITY OF ARDEN HILLS

DRIVEWAY DETAILS

OLD HIGHWAY 10 TRAIL

SHEET 75 OF 110



LEGEND	
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CITY OF ARDEN HILLS
DRIVEWAY DETAILS
OLD HIGHWAY 10 TRAIL

SHEET 76 OF 110

HAILEY BARRY | 11/20/2023 4:23:15 PM
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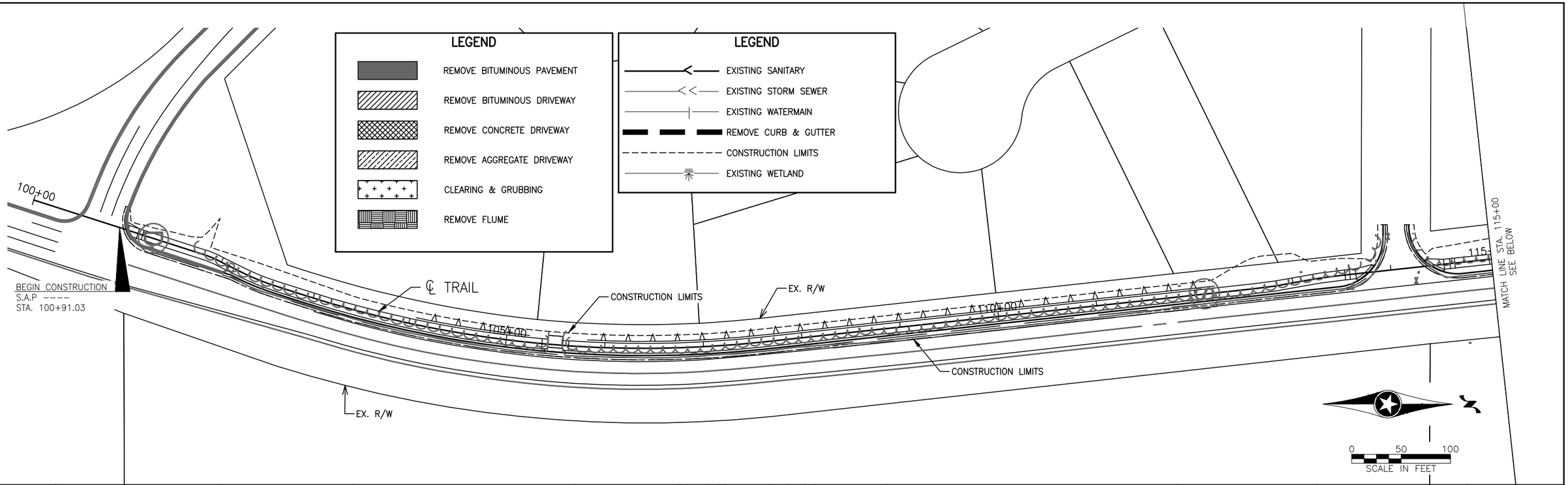

NO	DATE	BY	CKD	APPR

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Print Name: MARTIN JOYCE

Date --/--/-- License # 58920

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DESIGNED BY MMJ
CHECKED BY MMJ
COMM. NO. 16750

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CITY OF ARDEN HILLS

SIGNING AND STRIPING PLANS
OLD HIGHWAY 10 TRAIL

SHEET 77 OF 110

HAILEY BARRY | 11/16/2023 10:32:17 AM
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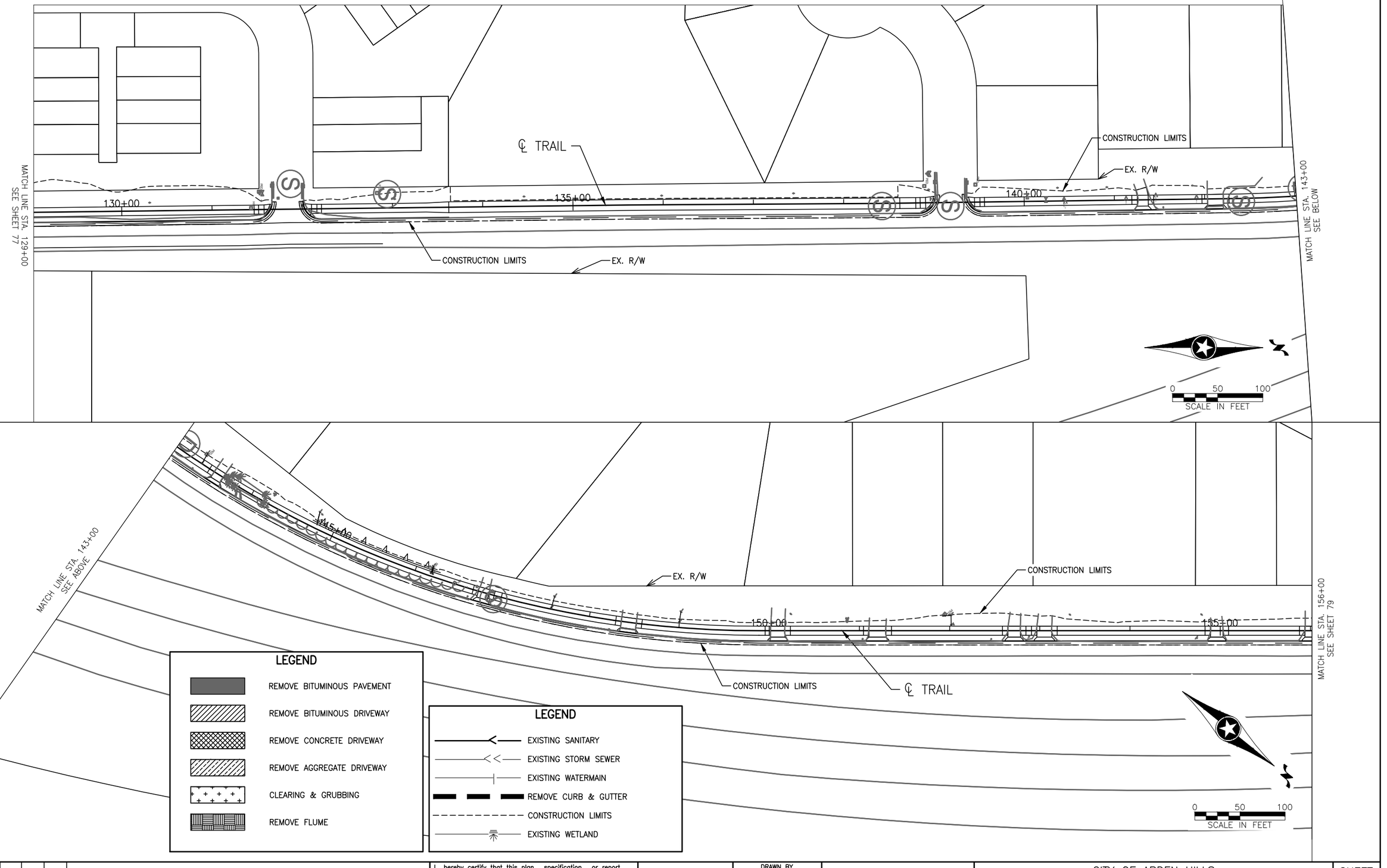

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DESIGNED BY MMJ
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COMM. NO. 16750

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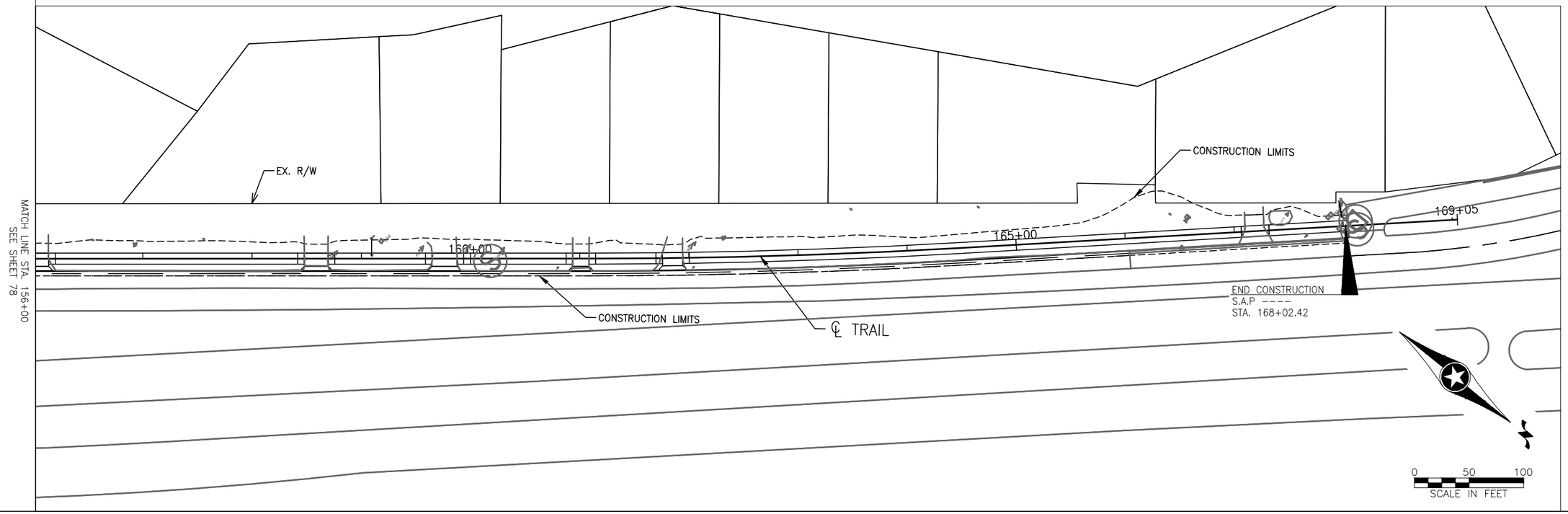
CITY OF ARDEN HILLS

SIGNING AND STRIPING PLANS
OLD HIGHWAY 10 TRAIL

SHEET 78 OF 110



LEGEND

- REMOVE BITUMINOUS PAVEMENT
- REMOVE BITUMINOUS DRIVEWAY
- REMOVE CONCRETE DRIVEWAY
- REMOVE AGGREGATE DRIVEWAY
- CLEARING & GRUBBING
- REMOVE FLUME

LEGEND

- EXISTING SANITARY
- EXISTING STORM SEWER
- EXISTING WATERMAIN
- REMOVE CURB & GUTTER
- CONSTRUCTION LIMITS
- EXISTING WETLAND

NO	DATE	BY	CKD	APPR

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COMM. NO. 16750

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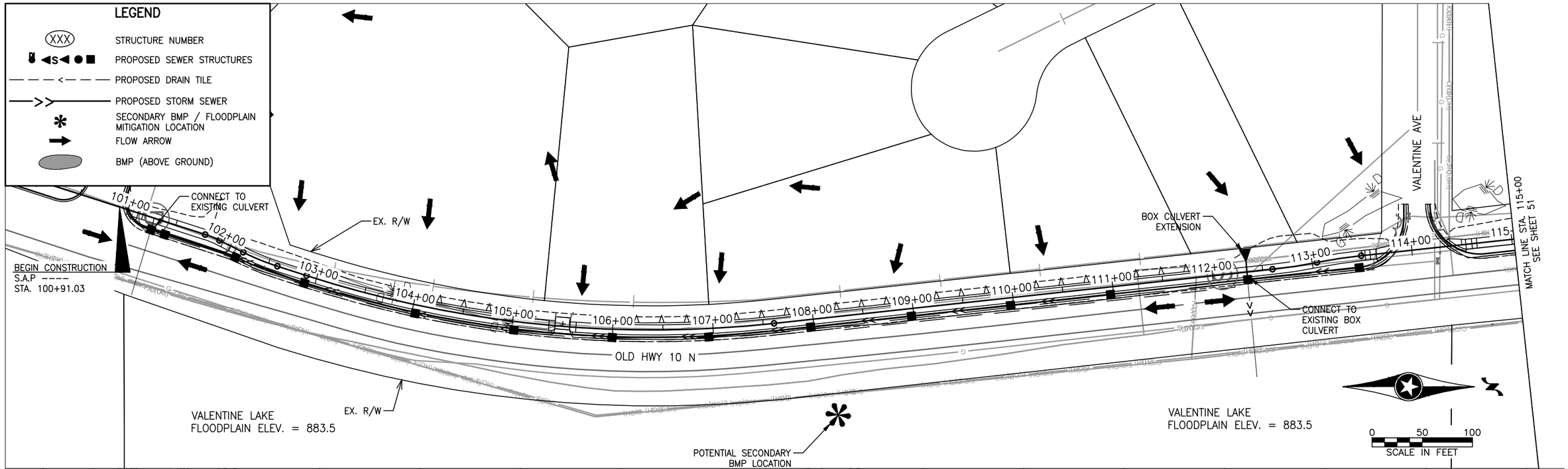
CITY OF ARDEN HILLS

SIGNING AND STRIPING PLANS

OLD HIGHWAY 10 TRAIL

SHEET 79 OF 110



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CITY OF ARDEN HILLS

DRAINAGE & STORM SEWER PLANS

OLD HIGHWAY 10 TRAIL

SHEET 80 OF 110

HANLEY BARRY | 11/21/2023 9:49:37 AM
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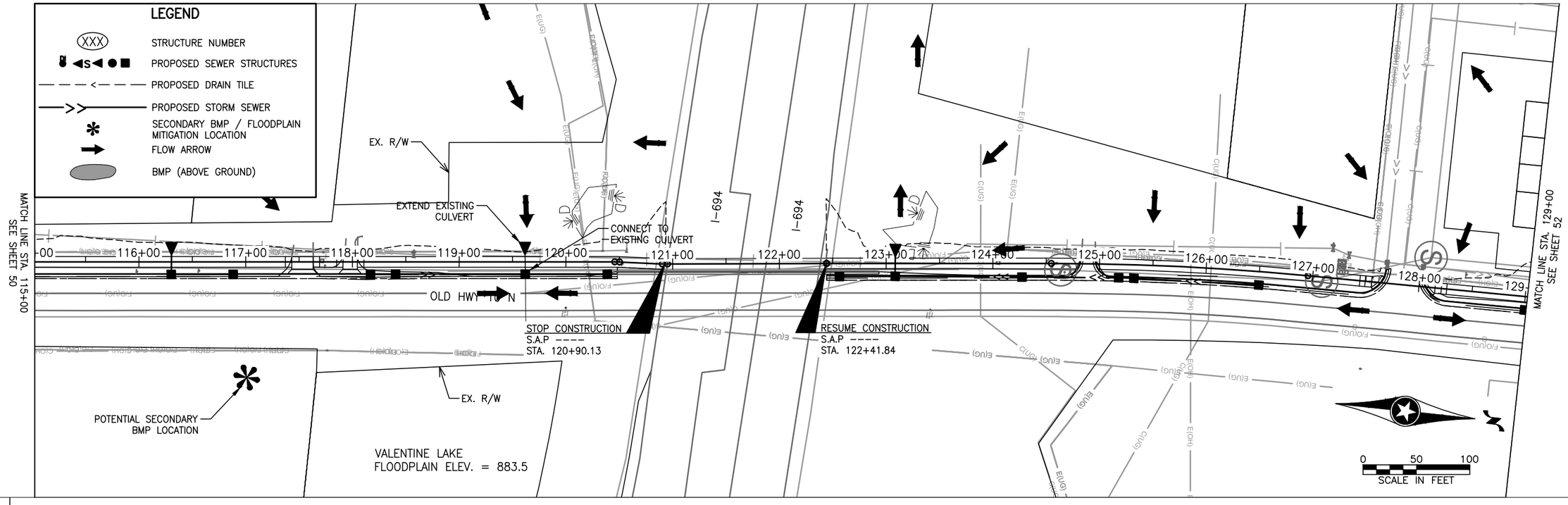

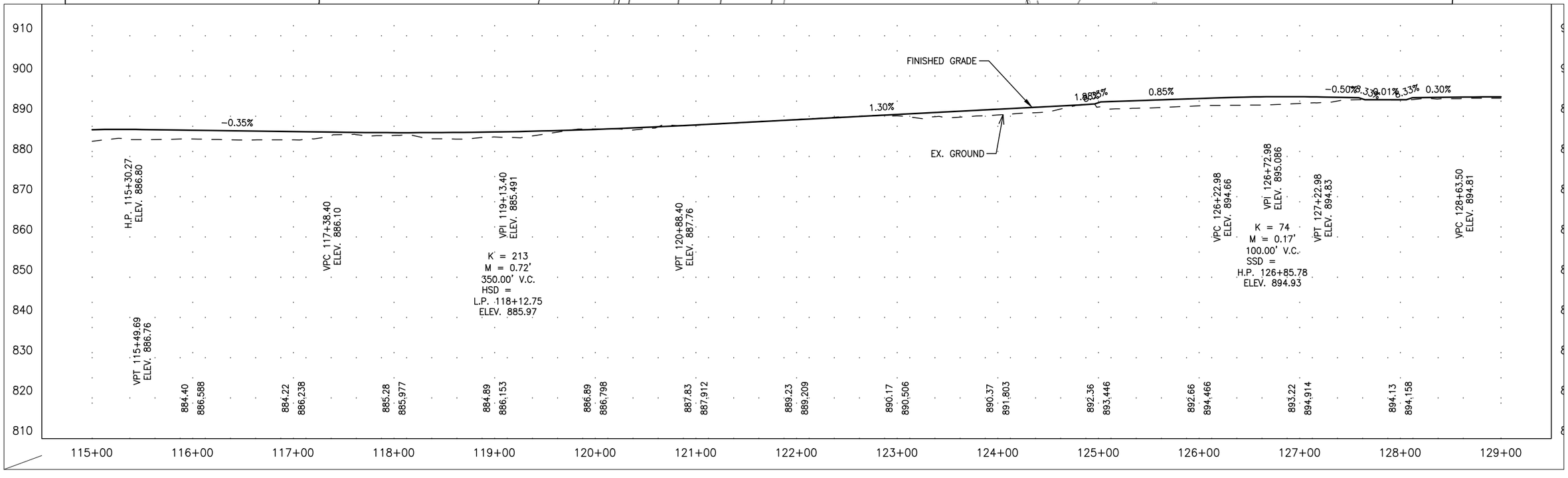

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COMM. NO. 16750

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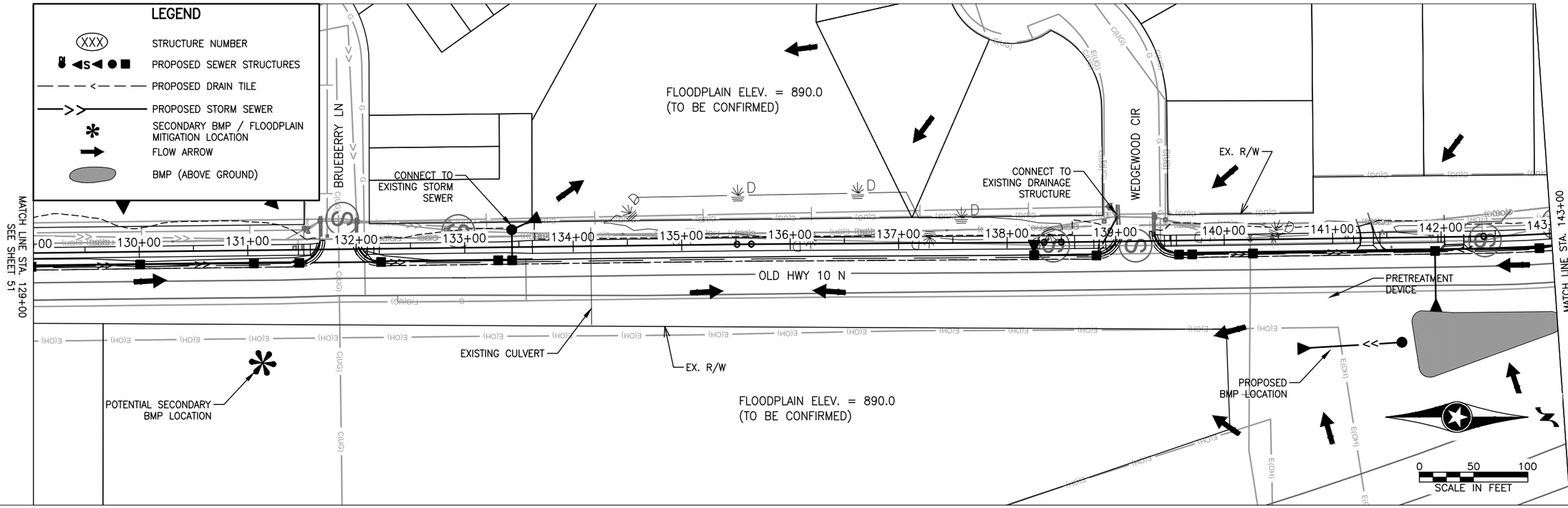
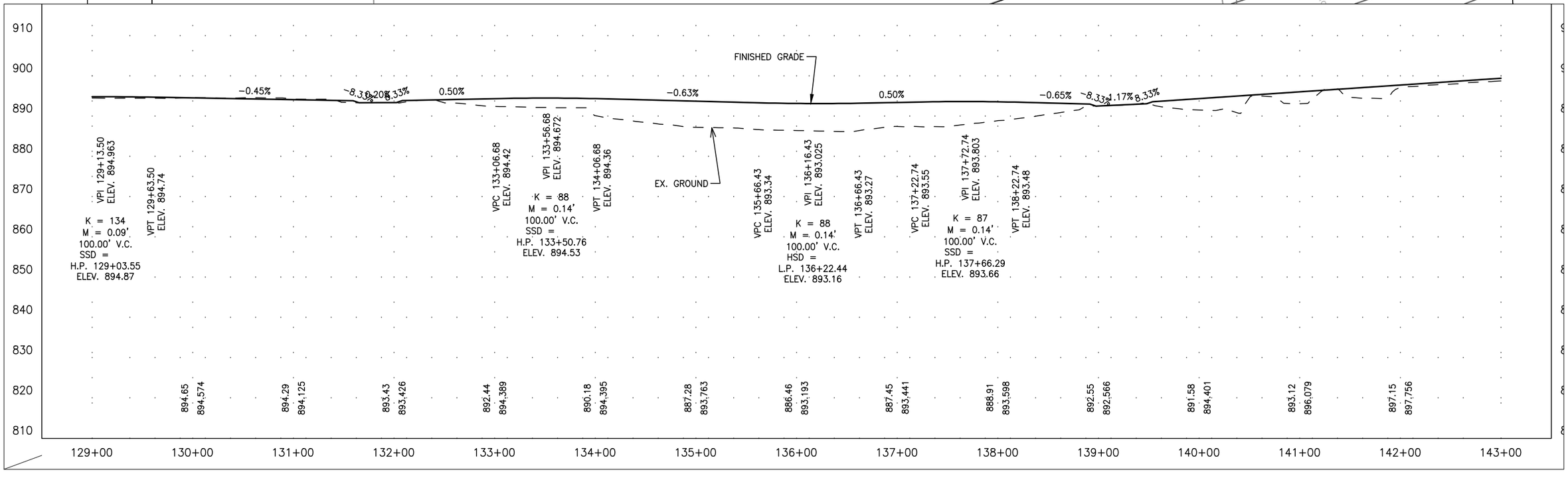
CITY OF ARDEN HILLS
DRAINAGE & STORM SEWER PLANS
OLD HIGHWAY 10 TRAIL

SHEET 81 OF 110





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CITY OF ARDEN HILLS
DRAINAGE & STORM SEWER PLANS
OLD HIGHWAY 10 TRAIL

SHEET 82 OF 110

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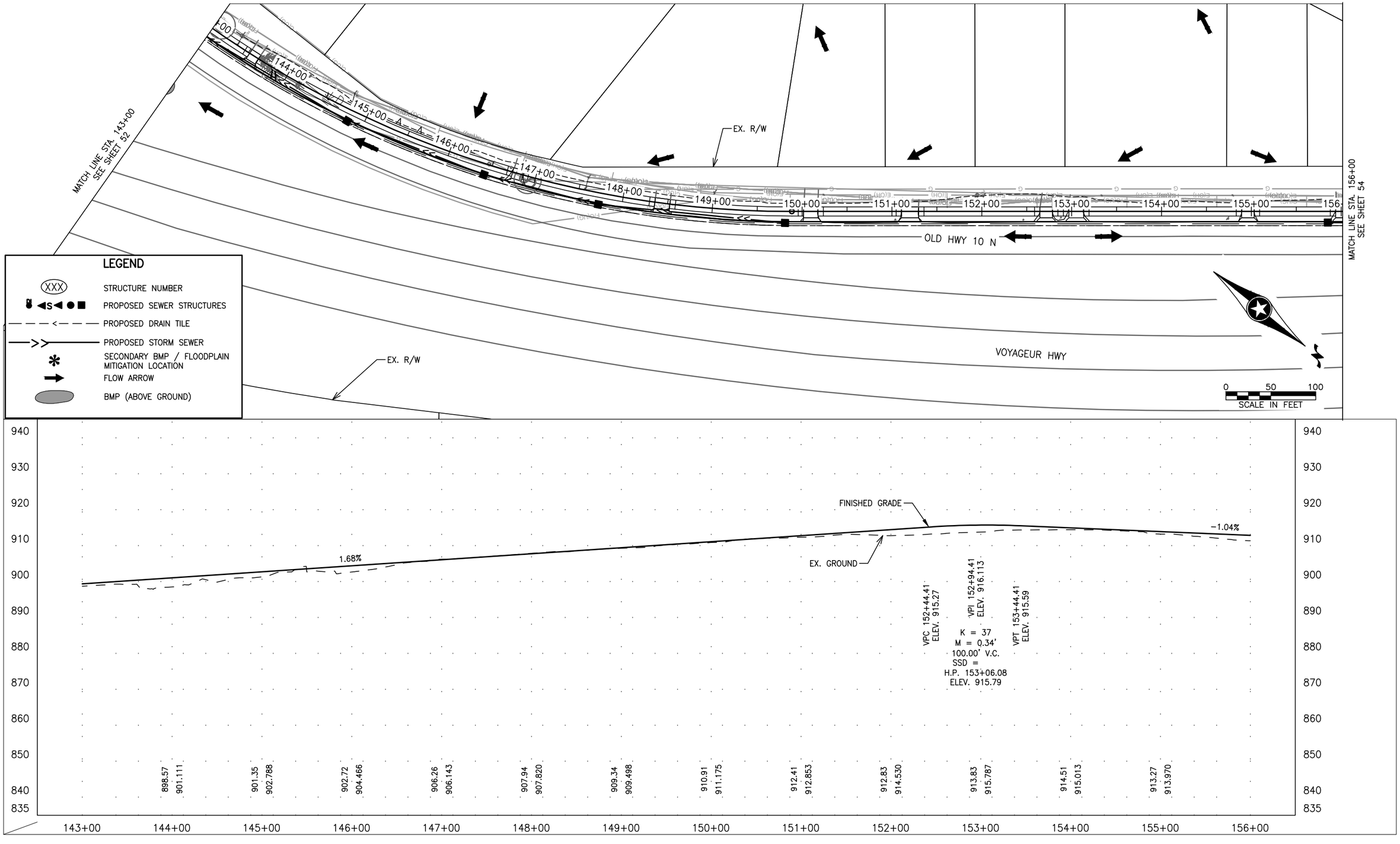

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CHECKED BY MMJ
COMM. NO. 16750

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CITY OF ARDEN HILLS

DRAINAGE & STORM SEWER PLANS

OLD HIGHWAY 10 TRAIL

SHEET 83 OF 110

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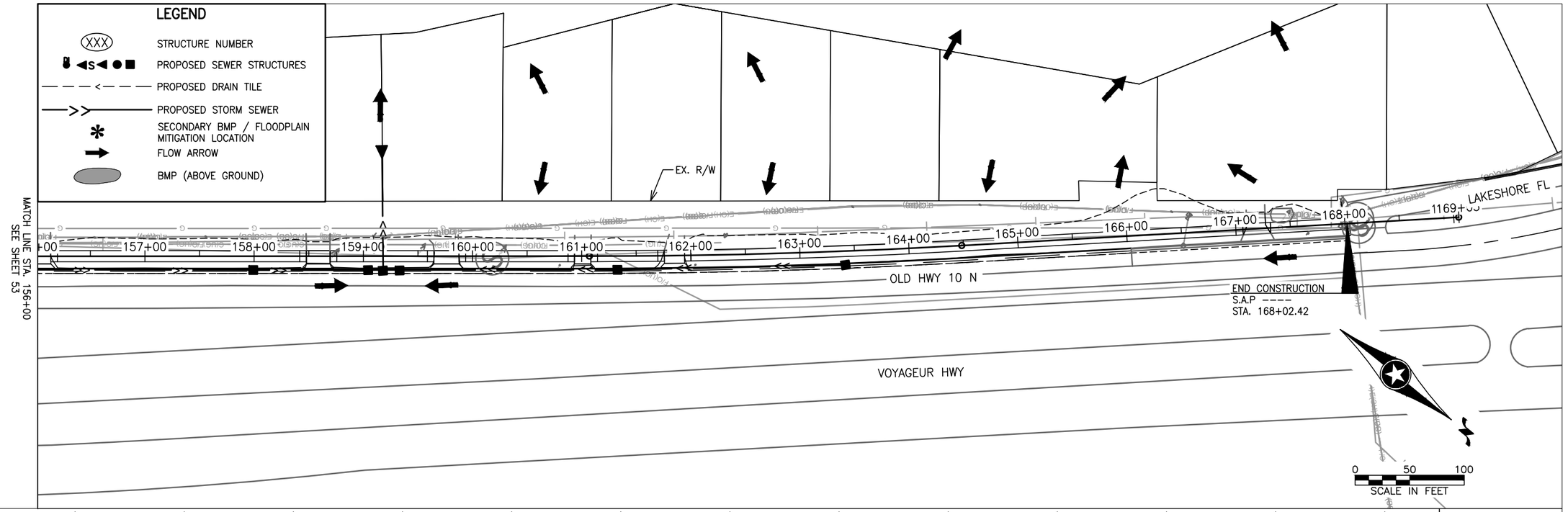

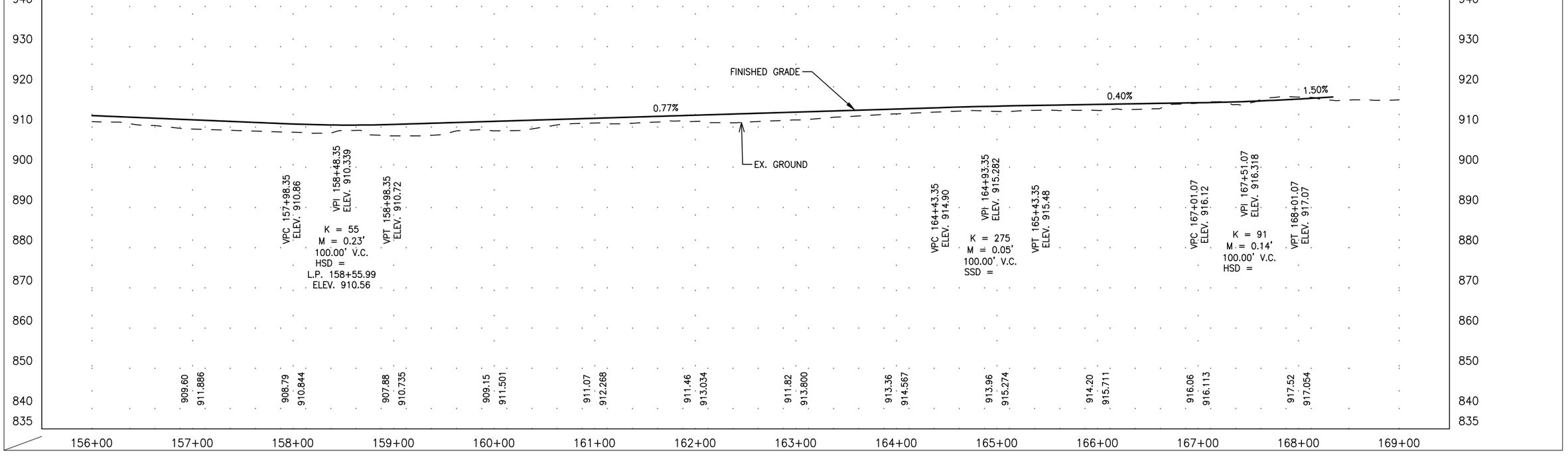

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CITY OF ARDEN HILLS
DRAINAGE & STORM SEWER PLANS
OLD HIGHWAY 10 TRAIL

SHEET 84 OF 110

0 25 50
HORIZONTAL SCALE IN FEET

0 5 10
VERTICAL SCALE IN FEET

NOTES:
A. INVERT ELEVATIONS ARE GIVEN TO CENTER OF STRUCTURE OR END OF APRON (END OF PIPE IF NO APRON).
B. TOP OF CASTING ELEVATIONS ARE TO CENTER OF CASTING ASSEMBLY.
C. APRON LENGTHS INCLUDED IN LENGTH OF PIPE IN PROFILES (SEE DRAINAGE TABULATIONS FOR PAY LENGTH PIPE).
D. ALL RC PIPES 12" AND 15" ARE CL V.
E. SEE DRAINAGE TABULATIONS FOR PIPE CLASSING FOR ALL RC PIPES 18" AND LARGER.
F. FIELD VERIFY ALL UTILITY LOCATIONS AND ELEVATIONS.
G. PRIVATE UTILITIES ARE NOT SHOWN IN PROFILES. SEE DRAINAGE PLANS FOR APPROXIMATE LOCATIONS.

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DRAINAGE TABULATION

X

FLOWS FROM STR. OR APRON	STRUCTURE LOCATION			FLOWS TO STR. OR APRON	CASTING ASSEMBLY TYPE	NEW STRUCTURE CONSTRUCTION								STEPS REQ'D (1)	PIPE SEWER RC (DESIGN 3006)				PIPE CULVERT BOX			APRON (2) FLARED RC				APRON (2) BOX		ROLLED EROS PREVENTION CAT 25 (3)	RANDOM RIPRAP CL III (4)	GEOTEXTILE FILTER TYPE 4 (4)	POLYSTYRENE INSULATION (5)	CONNECT TO EX STORM SEWER (6)	CONNECT INTO EX DRG STRUCT (7)	FINE AGGREGATE BEDDING (CV)	GUIDE POST TYPE B	NOTES
						H	G	F	4020 48	4020 60	SD 48	SD 60	DES SP 1		15" CL V	18" CL III	24" CL III	36" CL II				15"	18"	24"	36"											
INLET POINT NO.	ALIGNMENT NAME	STATION	OFFSET FT	OUTLET POINT NO.		LIN FT	LIN FT	LIN FT	LIN FT	LIN FT	LIN FT	LIN FT	LIN FT		LIN FT	LIN FT	LIN FT	LIN FT	LIN FT	LIN FT	LIN FT	LIN FT	EACH	EACH	EACH	EACH	EACH	SQ YD	CU YD	SQ YD	SQ YD	EACH	EACH	CU YD	EACH	
SP (A) DRAINAGE SUBTOTAL THIS SHEET																																			

GENERAL NOTES:
STA., OFFSETS, AND COORDINATES ARE GIVEN TO THE END OF APRON OR CENTER OF CASTING ASSEMBLY
CASTING SUMP = 0.10 FT FOR CATCH BASIN CASTINGS, AND 0.20 FT FOR DROP INLET CASTINGS. SUMP HAS BEEN INCLUDED IN TOP OF CASTING ELEVATIONS.
ROTATE STRUCTURES SUCH THAT MAJORITY OF STRUCTURE IS BEHIND CURB LINE UNLESS DIRECTED BY THE ENGINEER OR ALTERNATE ROTATION IS REQUIRED TO AVOID CONFLICTS (SEE DRAINAGE DETAILS).

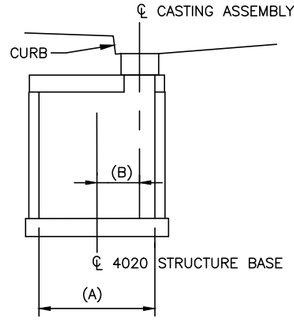
SEE APPLICABLE MNDOT STANDARD PLATES FOR DETAILS OF DRAINAGE STRUCTURE DESIGN, EXCEPT AS NOTED BELOW.
STRUCTURE DESIGN SD-XX SHALL BE CONSTRUCTED IN ACCORDANCE WITH MNDOT STD. PLATE 4024 WITH THE FOLLOWING EXCEPTIONS:
STRUCTURE DIAMETER SHALL BE XX IN. FOR SD-XX AND DEPTH SHALL BE AS REQUIRED IN THE DRAINAGE TABULATION.
WALL AND BASE SLAB THICKNESS AND ALL REINFORCEMENT SHALL BE IN ACCORDANCE WITH MNDOT STD. PLATE 4020.
ALL DESIGN F STRUCTURES SHALL UTILIZE A TYPE B CONE.
DES SP 1 (DESIGN SPECIAL 1) SHALL BE A POND OUTLET CONTROL STRUCTURE. SEE DRAINAGE DETAILS.
SEE DRAINAGE DETAILS FOR DES SP 2 (DESIGN SPECIAL 2).

SEE DRAINAGE DETAILS FOR CASTING KEY AND SUMMARY TABULATION.

PIPE BEDDING SHALL BE PER MNDOT STANDARD PLAN 5-297.442 UNLESS OTHERWISE NOTED.

ITEMS IN EACH ROW ARE PAID UNDER THE SP OR SAP AS INDCATED BY THE NOTES BELOW:
(A) PAID FOR UNDER SP XXXX-XX

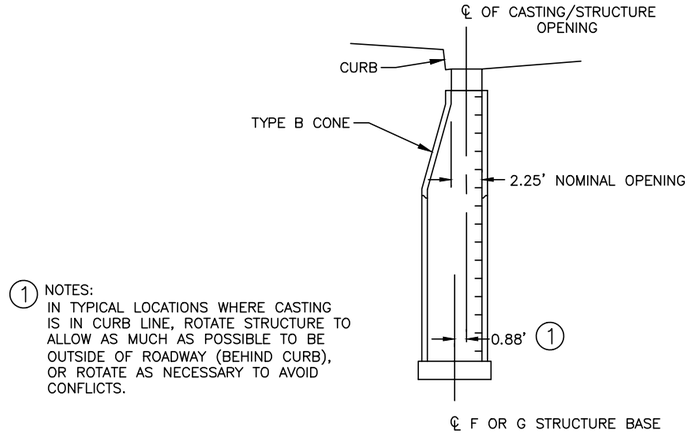
(1) STEPS REQUIRED WHEN DEPTH FROM TOP OF CASTING TO STRUCTURE INVERT IS GREATER THAN 4 FT.
(2) ROLLED EROSION PREVENTION CATEGORY 25 SHALL BE PLACED PER MNDOT STANDARD PLAN 5-297.404 WITH THE SEED MIX SHOWN IN THE EROSION CONTROL PLANS.
(3) TIE ALL JOINTS FOR CULVERTS AND LAST 3 JOINTS FOR STORM SEWER RUNS CONTAINING APRONS. TIED JOINTS SHALL BE INCIDENTAL.
(4) RIPRAP QUANTITY ASSUMES RIPRAP UTILIZED UNDER APRONS (INSTEAD OF GRANULAR FILTER) UNLESS NOTED OTHERWISE. GRANULAR FILTER MAY BE SUBSTITUTED FOR THE RIPRAP UNDER THE APRON PER MNDOT STANDARD PLATE 3133. IF GRANULAR FILTER IS SUBSTITUTED IT SHALL BE PAID FOR AS RIPRAP OF THE CLASS INDICATED AT THAT LOCATION. GEOTEXTILE FILTER SHALL BE TYPE 4 AT ALL RIPRAP LOCATIONS.
(5) INSULATE ALL CROSSINGS HAVING LESS THAN 2 FT OF CLEARANCE TO WATERMAIN OR 1 FT OF CLEARANCE TO SANITARY SEWER OR STORM SEWER WITH 8 FT x 8 FT x 4 IN POLYSTYRENE INSULATION.
(6) BUILD OVER EXISTING PIPE OR CONNECT TO EXISTING PIPE. PIPE TO PIPE CONNECTIONS SHALL BE MADE AT AN EXISTING PIPE JOINT. FIELD VERIFY LOCATION AND ELEVATION.
(7) CONNECT INTO EXISTING DRAINAGE STRUCTURE. FIELD VERIFY LOCATION AND ELEVATION.
(8) FURNISH AND INSTALL TRASH GUARD WITH APRON PER DRAINAGE DETAILS.
(9) PLACE WATER QUALITY BAFFLES (DES SP 2) IN STRUCTURE. WATER QUALITY BAFFLE AND SKIMMER BAFFLE PAID FOR AS DESIGN SPECIAL 2. STRUCTURE AND CASTING PAID FOR SEPARATELY (PAY HEIGHT INCLUDES 4 FT SUMP BELOW LOWEST PIPE INVERT). SEE DRAINAGE DETAILS AND SPECIAL PROVISIONS.



(A)	(B)
4020 DIAMETER (IN.)	OFFSET FOR 27–IN. OPENING (FT.)
48	0.79
54	1.08
60	1.29
66	1.58
72	1.79
78	2.08
84	2.29
90	2.58
96	2.87
102	3.16
108	3.29
120	3.79

STAKING DETAIL: DESIGN XX–4020 OR SD–XX STRUCTURE

NOT TO SCALE

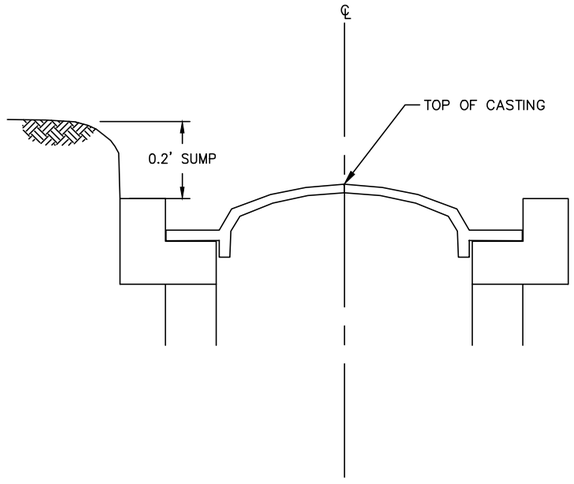


1 NOTES:
IN TYPICAL LOCATIONS WHERE CASTING IS IN CURB LINE, ROTATE STRUCTURE TO ALLOW AS MUCH AS POSSIBLE TO BE OUTSIDE OF ROADWAY (BEHIND CURB), OR ROTATE AS NECESSARY TO AVOID CONFLICTS.

LOCATE CENTER OF STRUCTURE 0.88' FROM CENTER OF STRUCTURE OPENING.

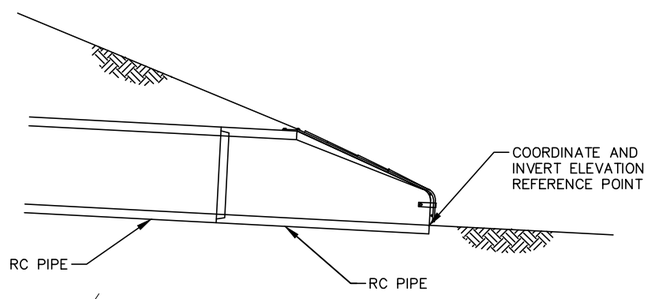
STAKING DETAIL: F OR G STRUCTURE AT CURB AND GUTTER

NOT TO SCALE



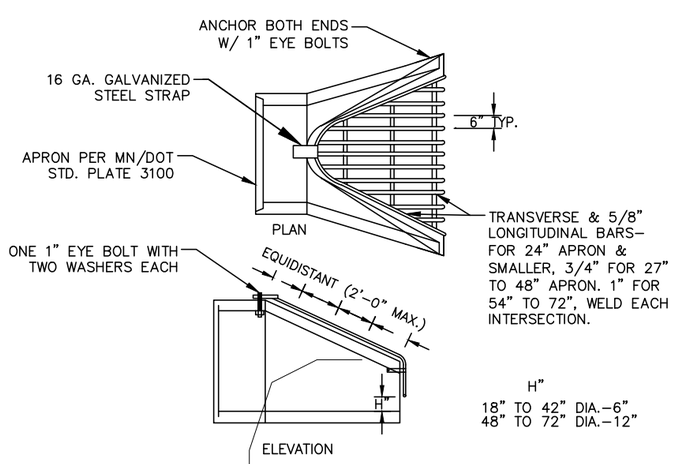
STAKING DETAIL: CASTING ASSEMBLY M–11

NOT TO SCALE



STAKING DETAIL: PIPE APRONS

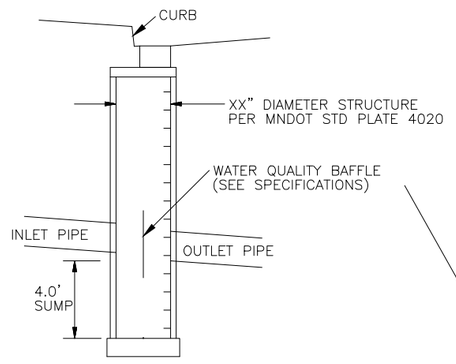
NOT TO SCALE



NOTES:
1. ENTIRE HEAVY DUTY TRASH GUARD ASSEMBLY TO BE HOT–DIP GALVANIZED AFTER FABRICATION.
2. SIZE OF TRASH GUARD VARIABLE DEPENDENT ON SIZE OF FLARED END SECTION.

TRASH GAURD FOR CONCRETE APRON

NOT TO SCALE



DESIGN SPECIAL XX (WATER QUALITY BAFFLE)

NOT TO SCALE

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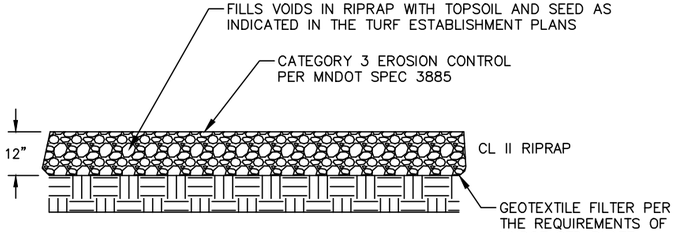

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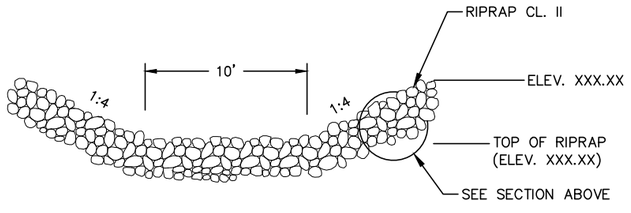
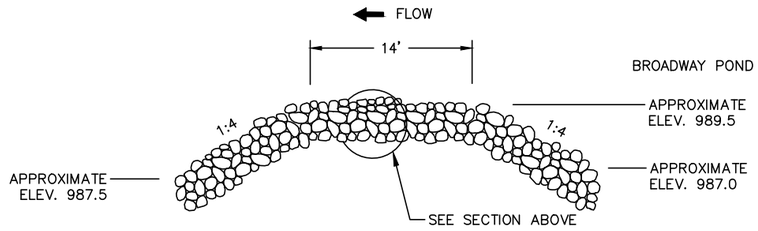


CROSS SECTION AT CREST OF RIPRAP OVERFLOW

NOT TO SCALE



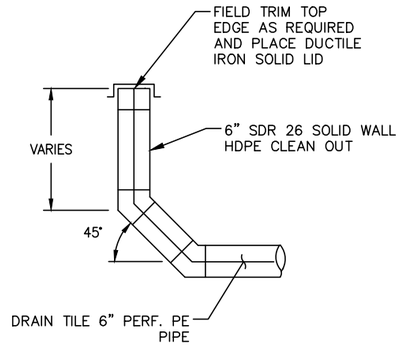
PROFILE OF RIPRAP OVERFLOW AT CENTERLINE

NOT TO SCALE

NOTES:

SEE CONTOUR PLANS FOR LIMITS OF RIPRAP AND RANDOM RIPRAP TABULATION FOR QUANTITY OF RIPRAP.

POND EMERGENCY OVERFLOW



NOTE:

CLEAN OUT (INCLUDING ALL ITEMS IN DETAIL OTHER THAN HORIZONTAL PIPE) SHALL BE INCIDENTAL.

DRAIN TILE CLEAN OUT

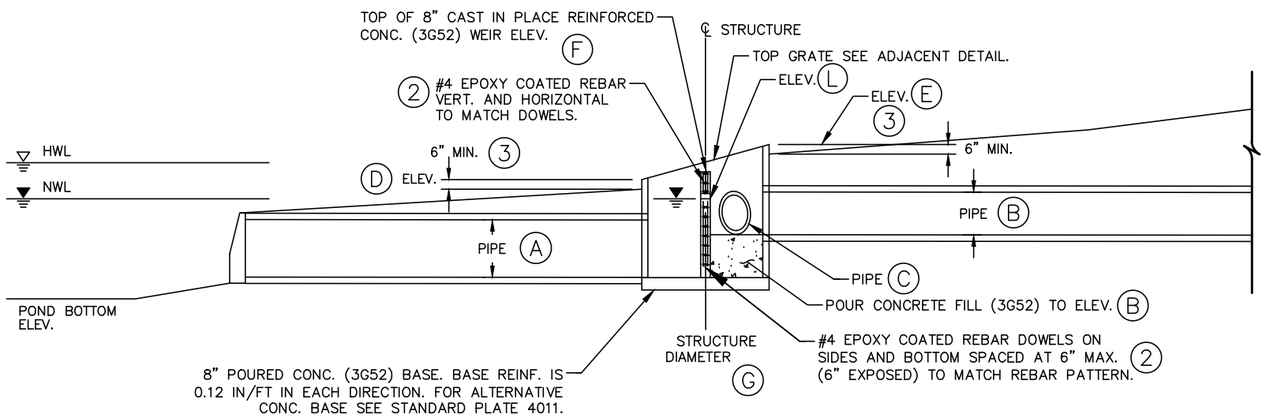
NOT TO SCALE

CASTING ASSEMBLIES SUMMARY						X
ASSEMBLY	RING OR FRAME CASTING	COVER OR GRATE CASTING (A)	CURB BOX	STANDARD PLATE NO.	QUANTITY (EACH)	REMARKS
A - 7D	700-7			4101	0	MANHOLE
		715		4110		
			N/A			
B - 5	802A			4129	0	LOW POINT CATCH BASIN
		816		4154		
			823A	4160		
B - 9	805			4132	0	CATCH BASIN
		816		4154		
			N/A			
M - 11	ROUND CONC			4143	0	DROP INLET
		731		4143		
			N/A			
PROJECT TOTALS:					0	

NOTES:

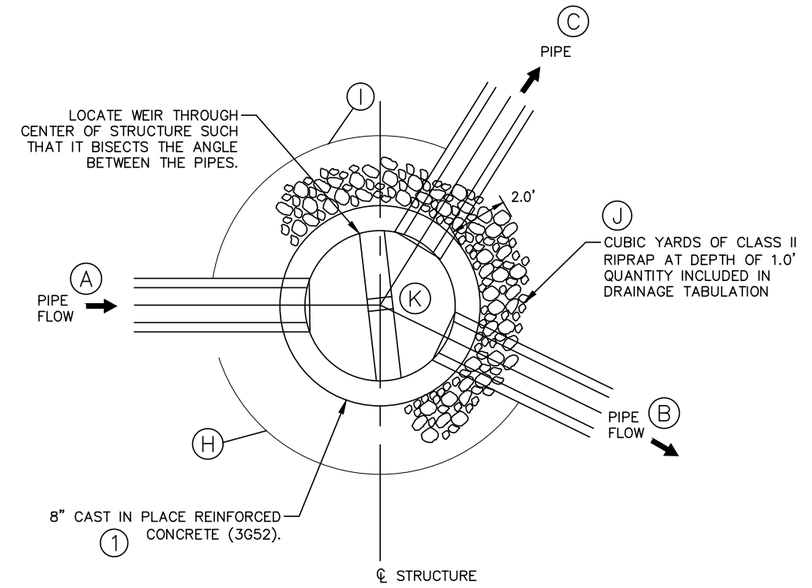
(A) USE BENT BOLT WITH 816 GRATE.

STRUCTURE	DESIGN SPECIAL	POND	NWL	BOTTOM	HWL	PIPE (A)		PIPE (B)		PIPE (C)		(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)
						DIA. (IN)	ELEV.	DIA. (IN)	ELEV.	DIA. (IN)	ELEV.	ELEV.	ELEV.	ELEV.	DIA. (IN)	ANGLE (DEG)	ANGLE (DEG)	VOL. (CY)	ORIFICE DIA. (IN)	ORIFICE ELEV.
5284	DES SP 1	BUTTERCUP	949.0	945.0	951.7	30	945.76	30	947.24	N/A	N/A	951.75	953.25	951.00	72	180	N/A	2.2	6	949.00
5281	DES SP 2	FEZZIK	948.0	944.0	953.7	15	945.52	15	947.99	N/A	N/A	954.00	955.50	953.70	72	180	N/A	2.2	4	948.00
5336	DES SP 3	MIRACLE MAX	942.5	938.5	945.7	51" SPAN	939.26	51" SPAN	942.47	N/A	N/A	945.50	947.50	N/A	72	180	N/A	2.2	N/A	N/A
5496	DES SP 4	DREAD PIRATE ROBERTS	948.0	942.0	952.5	36	944.42	58" SPAN	946.28	N/A	N/A	953.00	955.00	951.00	72	173	N/A	2.2	6	948.00
5581	DES SP 5	ROUS	975.0	971.0	976.8	24	972.36	15	967.89	24	970.99	977.00	979.00	975.00	72	177	108	2.2	N/A	N/A
5634B	DES SP 6	VIZZINI	943.0	936.0	946.0	24	937.40	24	942.99	N/A	N/A	946.50	948.00	944.00	72	180	N/A	2.2	6	943.00
5776C	DES SP 7	HUMPERDINK	939.0	933.0	943.4	30	936.06	30	938.85	N/A	N/A	944.00	945.20	942.00	72	150	N/A	2.2	6	939.00
5906	DES SP 8	VALERIE	907.0	903.0	909.1	18	904.73	18	903.84	N/A	N/A	909.00	910.50	908.10	72	180	N/A	2.2	N/A	N/A



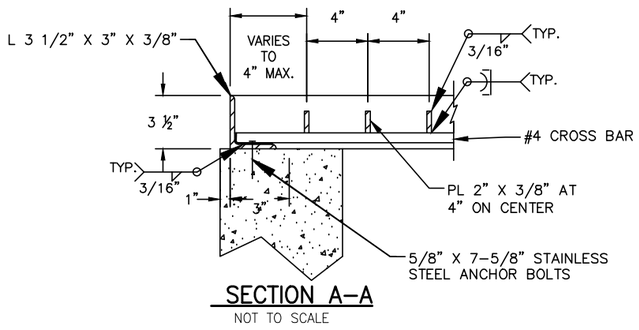
POND OUTLET STRUCTURE – DESIGN SPECIAL

NOT TO SCALE



OUTLET STRUCTURE PLAN VIEW AND RIPRAP DETAIL

NOT TO SCALE



SECTION A–A

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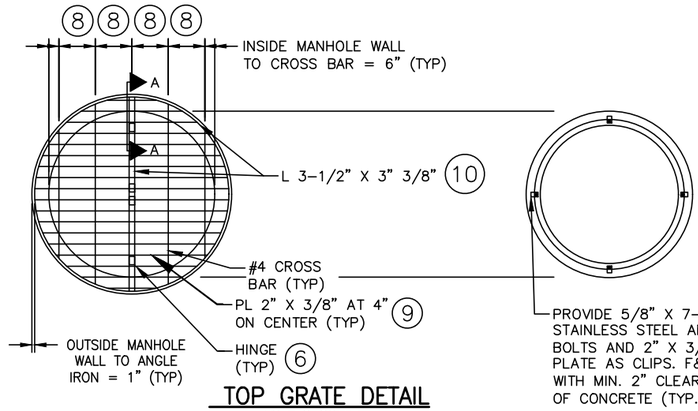
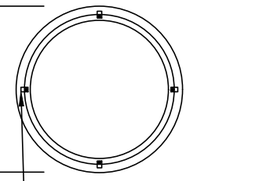
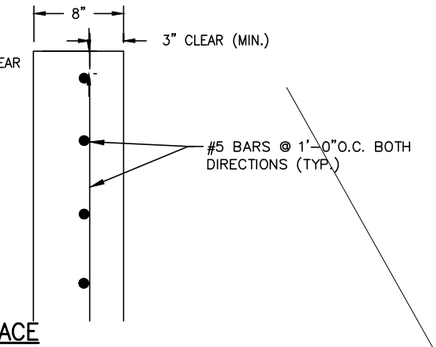


TOP GRATE DETAIL

NOT TO SCALE





CAST IN PLACE WEIR SECTION DETAIL

NOT TO SCALE

NOTES:
SEE SPECIAL PROVISIONS.

(1) WALL CONSTRUCTION MAY BE CLASS II PRECAST RC PIPE. SEE STANDARD PLATE 3000.

(2) ALL REBAR SIZES ARE ENGLISH UNLESS OTHERWISE NOTED.

(3) ELEVATION (D) OCCURS INLINE WITH THE CENTERLINE OF PIPE (A) .ELEVATION E OCCURS DIRECTLY ACROSS STRUCTURE FROM (D) .

(4) BOLTS AND NUTS SHALL MEET THE REQUIREMENTS OF A.S.T.M. A307. MATERIALS FOR BASE PLATES AND ANCHOR BOLTS ASSEMBLIES SHALL CONFORM TO STRUCTURAL STEEL (WELDABLE A36).

(5) PAYMENT FOR DRAINAGE DESIGN SPECIAL PER EACH WILL INCLUDE ALL MATERIALS, DETAILS AND WORK REQUIRED TO CONSTRUCT THE DRAINAGE STRUCTURE AS DETAILED ON THIS SHEET, EXCEPT THE RC PIPE, APRON AND RIPRAP, WHICH WILL BE PAID FOR SEPARATELY.

(6) GRATE SHALL BE CONSTRUCTED IN TWO PIECES, WITH MINIMUM OF THREE HINGES TO PROVIDE ACCESS.

(7) HOT DIP GALVANIZE GRATES AFTER FABRICATION.

(8) 12" MAX., 8" MIN. SPACING BETWEEN CROSS BARS.CROSS BARS MUST BE EVENLY SPACED AND MUST ALLOW FOR PLACEMENT OF HINGES AT CENTER OF GRATE.

(9) CONTRACTOR TO PROVIDE GRATE AS SHOWNOR ENGINEER PRE-APPROVED EQUIVALENT.

(10) ANGLE AROUND CIRCUMFERENCE MAY BE FABRICATEDFROM FLAT BARS RESULTING IN EQUIVALENT SIZE.

(11) FIELD VERIFY SIZE AND ELEVATION OF EXISTING PIPES.

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BOX DETAIL

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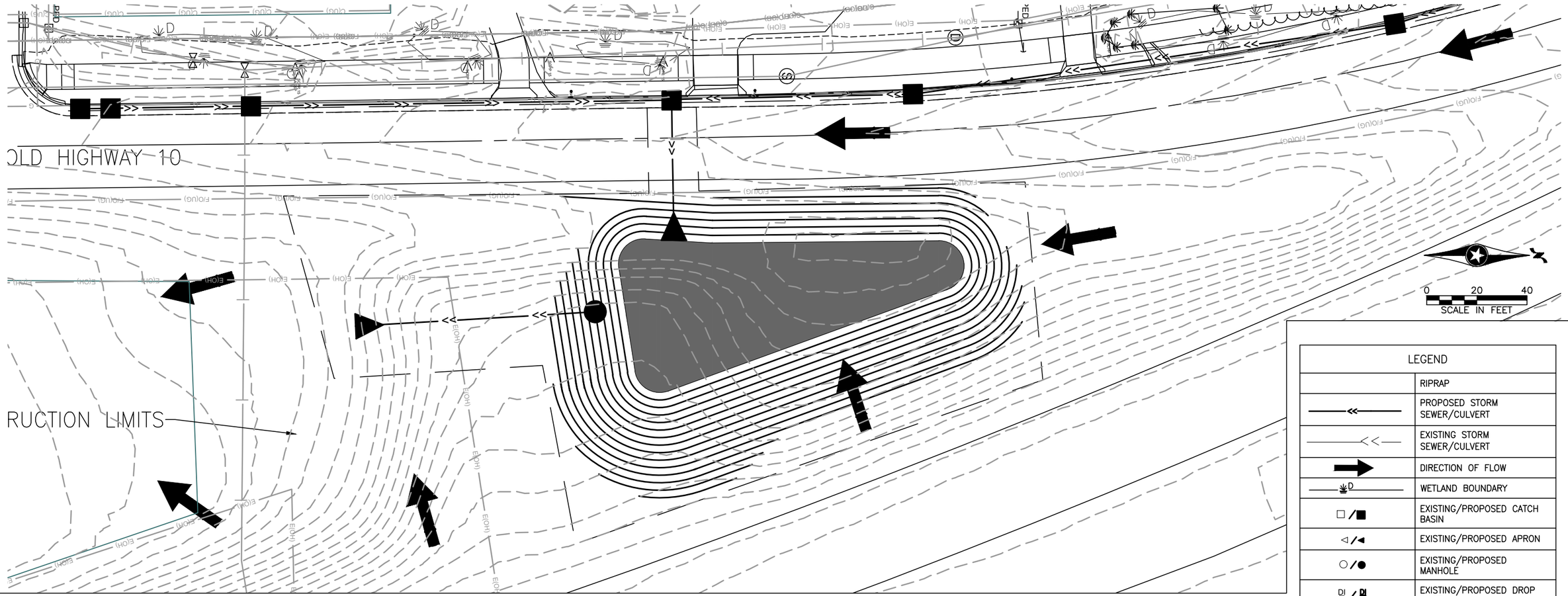

LEGEND	
	RIPRAP
	PROPOSED STORM SEWER/CULVERT
	EXISTING STORM SEWER/CULVERT
	DIRECTION OF FLOW
D	WETLAND BOUNDARY
□ / ■	EXISTING/PROPOSED CATCH BASIN
◁ / ◀	EXISTING/PROPOSED APRON
○ / ●	EXISTING/PROPOSED MANHOLE
DI / DI	EXISTING/PROPOSED DROP INLET
	PROPOSED CONTOUR
	EXISTING CONTOUR
	SOIL BORING

INFILTRATION BASIN NOTES

A. A BASIN SHALL BE CONSTRUCTED AT THE LOCATION INDICATED IN THE PLANS USING THE MATERIALS AS SHOWN IN INSET 1. MATERIALS INCLUDED IN INSET 1 SHALL BE PAID FOR AS INDICATED BELOW. SEE SPECIFICATIONS SECTIONS 2106 AND 2574 FOR ADDITIONAL INFORMATION AND REQUIREMENTS. INSTALL DRAIN TILE TO SUBGRADE AS SHOWN IN INSET 1. RIP REMAINING SUBGRADE PRIOR TO PLACEMENT OF ENGINEERED SOIL. PAID FOR UNDER 2574.505 SUBSOILING.

B. AVOID SOIL COMPACTION TO ALL AREAS IDENTIFIED IN THE PLANS AS INFILTRATION BASIN. INFILTRATION BASIN AREAS SHALL NOT BE USED AS STOCKPILE LOCATIONS AT ANY TIME IN THE PROJECT SCHEDULE.

C. PERFORATED PIPE SHALL BE CONNECTED TO DRAINAGE STRUCTURES AS SHOWN IN THE PLANS.

D. ELEVATIONS OF THE PERFORATED PIPE SHALL BE INSTALLED PER THE DRAINAGE PROFILES. DEPTHS/THICKNESSES AND WIDTHS OF FILTER MATERIALS SHALL BE INSTALLED PER INSET 1 AND SHALL BE PLACED RELATIVE TO THE DRAIN TILE AS INDICATED IN THE PLANS. MAINTAIN MINIMUM OF 0.3% SLOPE IN DRAINTILE.

INFILTRATION BASIN CONSTRUCTION SEQUENCE

A. CONSTRUCTION OF THE INFILTRATION BASIN SHALL NOT PROCEED UNTIL ALL ADJACENT AREAS HAVE BEEN STABILIZED AND THE ENGINEER HAS APPROVED THE INFILTRATION BASIN WORK PLAN. IF POSSIBLE, VEGETATION SHALL BE ESTABLISHED, BUT AT A MINIMUM, ALL SLOPES SHALL BE SEEDED AND BLANKETED AND A MINIMUM OF TWO ROWS OF SEDIMENT CONTROL LOGS SHALL COMPLETELY SURROUND THE BASIN.

B. FOLLOWING EXCAVATION OF THE EXISTING SOILS AS REQUIRED FOR PLACEMENT OF THE INFILTRATION BASIN MATERIALS, PLACE COMPOST AND TILL INTO INSITU SOILS AS INDICATED IN THE SPECIFICATIONS.

C. SEED BASIN FOLLOWING PLACEMENT OF PIPE AND AGGREGATE. MAINTAIN SEDIMENT CONTROL LOGS SURROUNDING BASIN AND PERFORM ANY REPAIRS NEEDED TO SIDE SLOPES AND BOTTOMS UNTIL VEGETATION IN BASIN BOTTOMS IS ESTABLISHED.

GENERAL NOTES:

SEE CONSTRUCTION PLANS FOR BEGIN AND END TAPER STATIONING, LANE AND SHOULDER DIMENSIONS, AND MISCELLANEOUS INFORMATION.

SEE DRAINAGE DETAILS, DRAINAGE PROFILES, AND DRAINAGE TABULATION SHEETS FOR ADDITIONAL STORM SEWER INFORMATION.

FIELD VERIFY ALL EXISTING UTILITY LOCATIONS.

CONTOURS SHOWN ARE TO FINISHED GRADE.

PROPOSED INFILTRATION SWALE/BASIN SHALL BE STAKED OFF AND MARKED DURING CONSTRUCTION. SEE DRAINAGE DETAILS FOR ADDITIONAL CONSTRUCTION NOTES.

NOTIFY NICOLE MARAS, RAMSEY–WASHINGTON METRO WATERSHED DISTRICT, AT 651–792–7976 AT LEAST 48 HOURS PRIOR TO THE CONSTRUCTION OF THE INFILTRATION SWALE/BASIN.

NOTES:

A CONNECT TO EXISTING STORM SEWER

B CONNECT INTO EXISTING DRAINAGE STRUCTURE

NO	DATE	BY	CKD	APPR

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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.

Print Name: MARTIN JOYCE

Date --/--/-- License # 58920

DRAWN BY HLB
DESIGNED BY MMJ
CHECKED BY MMJ
COMM. NO. 16750

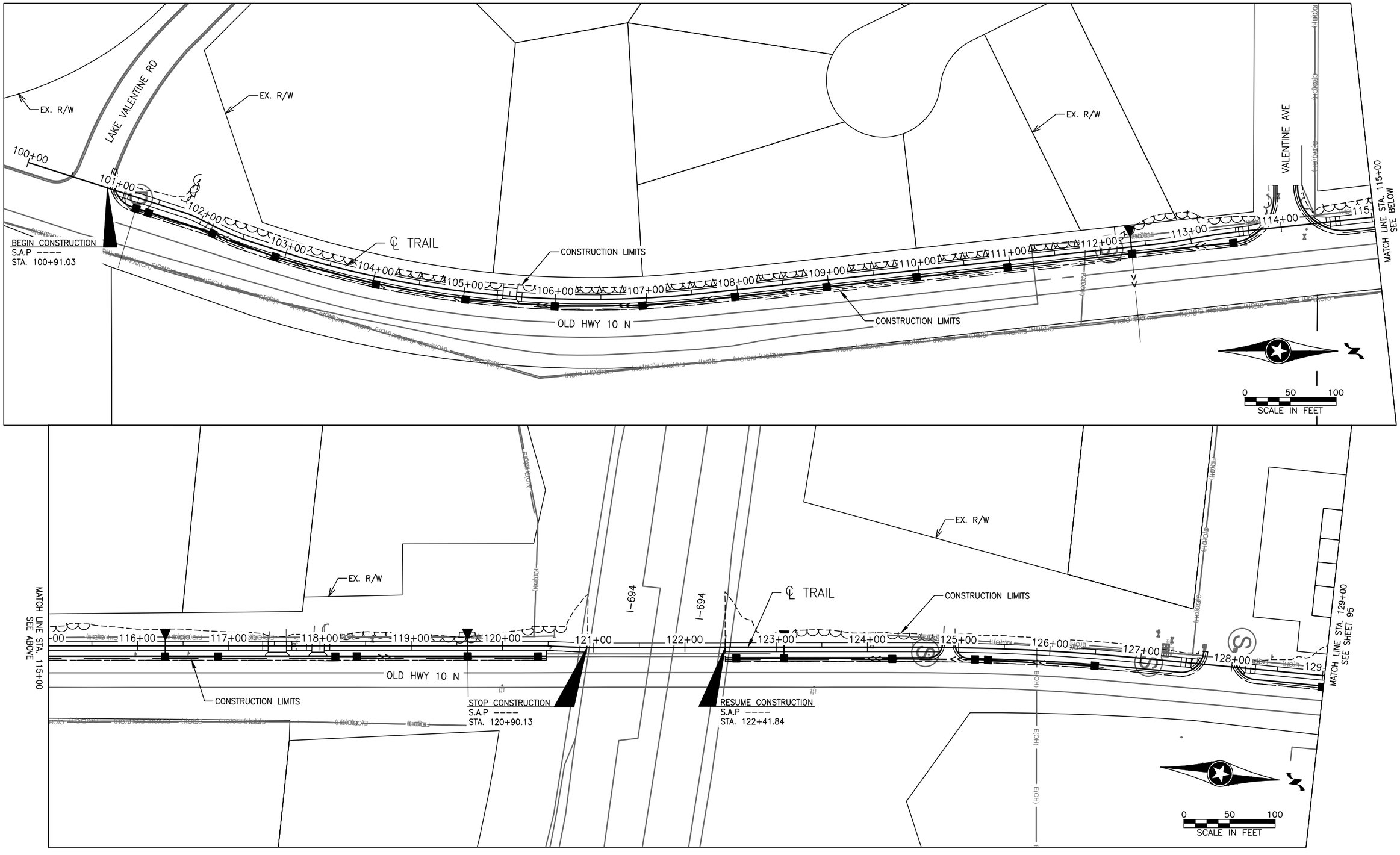
SRF

CITY OF ARDEN HILLS

GRADING PLANS

OLD HIGHWAY 10 TRAIL

SHEET 93 OF 110



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NO	DATE	BY	CKD	APPR

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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.
Print Name: MARTIN JOYCE
Date --/--/-- License # 58920

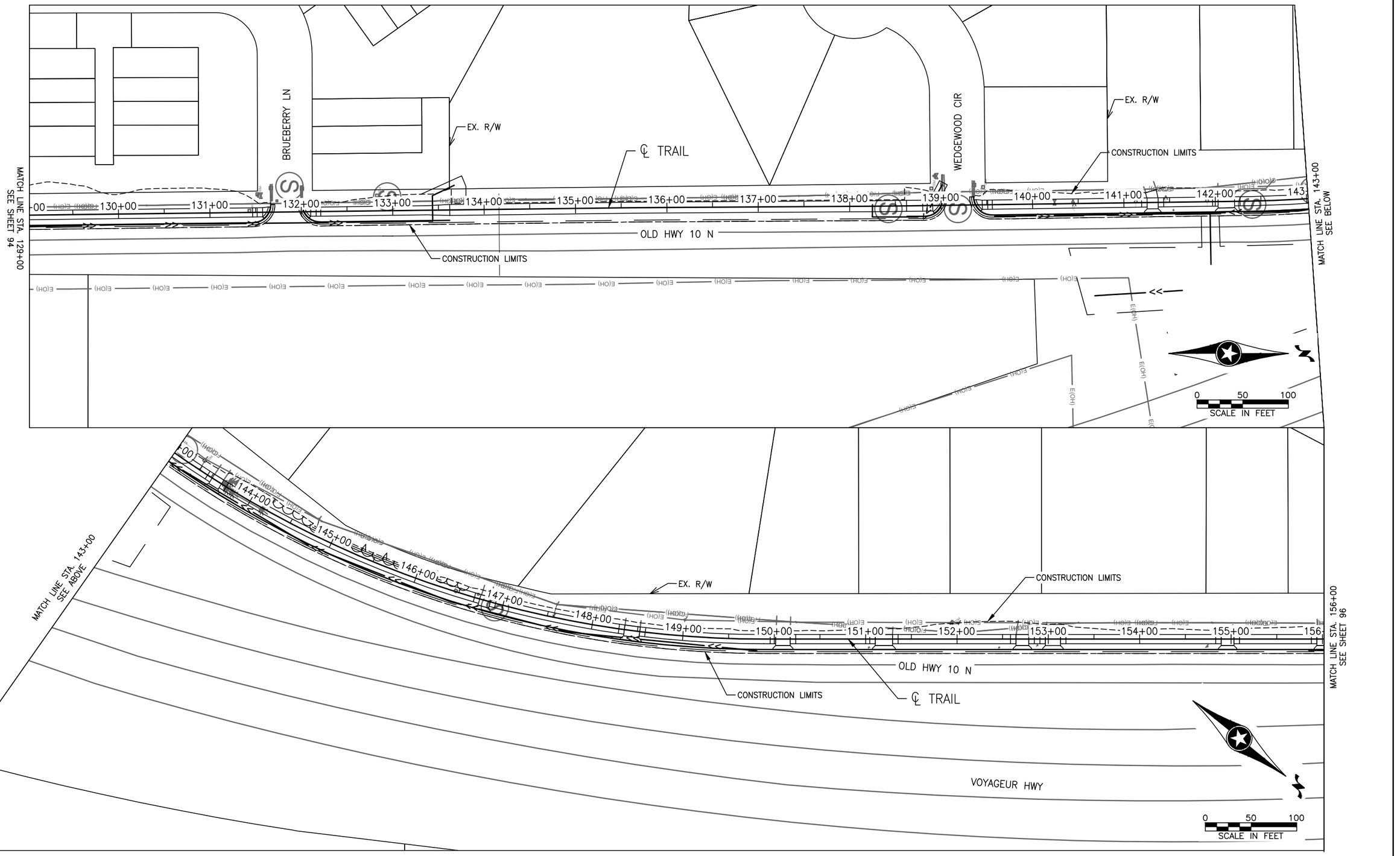
DRAWN BY HLB
DESIGNED BY MMJ
CHECKED BY MMJ
COMM. NO. 16750

SRF

CITY OF ARDEN HILLS

EROSION CONTROL & TURF ESTABLISHMENT
OLD HIGHWAY 10 TRAIL

SHEET 94 OF 110



NO	DATE	BY	CKD	APPR

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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.

Print Name: MARTIN JOYCE

Date --/--/-- License # 58920

DRAWN BY HLB
DESIGNED BY MMJ
CHECKED BY MMJ
COMM. NO. 16750

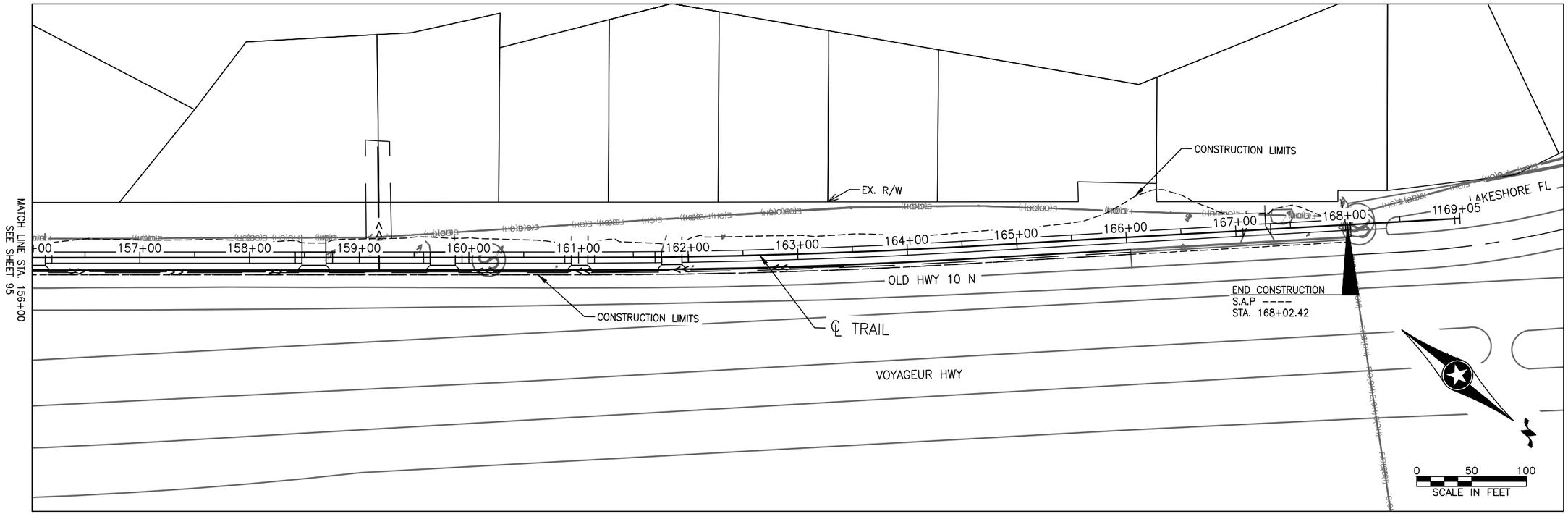
SRF

CITY OF ARDEN HILLS

EROSION CONTROL & TURF ESTABLISHMENT

OLD HIGHWAY 10 TRAIL

SHEET 95 OF 110



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CITY OF ARDEN HILLS

EROSION CONTROL & TURF ESTABLISHMENT

OLD HIGHWAY 10 TRAIL

SHEET 96 OF 110

STORM WATER POLLUTION PREVENTION PLAN (SWPPP) NARRATIVE (SHEET 1 OF 4)

PROJECT DESCRIPTION/LOCATION AND SCOPE
SEE COVER SHEET FOR LOCATION MAP, PROJECT NUMBERS AND DESCRIPTION OF PROJECT SCOPE.
PERMANENT STORMWATER BEST MANAGEMENT PRACTICES (BMPS) UTILIZED ON THE PROJECT INCLUDE INFILTRATION/FILTRATION BASINS AND PROPRIETARY STORMWATER TREATMENT DEVICES.

SPECIAL AND IMPAIRED WATERS
THE FOLLOWING SPECIAL/IMPAIRED WATERS ARE LOCATED WITHIN ONE MILE OF THE PROJECT LIMITS AND RECEIVE RUNOFF FROM THE PROJECT SITE.
VALENTINE LAKE IS IMPAIRED FOR NUTRIENTS/EUTROPHICATION AND CHLORIDES. THE IMPAIRMENTS ARE CONSTRUCTION RELATED

AREAS OF ENVIRONMENTAL SENSITIVITY
ALL AREAS OF ENVIRONMENTAL SENSITIVITY, INCLUDING WETLANDS, ARE LABELED AS "AREAS OF ENVIRONMENTAL SENSITIVITY" IN THE PLANS.

LONG TERM MAINTENANCE AND OPERATION
MAINTENANCE STAFF FROM RAMSEY COUNTY AND THE CITY OF ARDEN HILLS ARE RESPONSIBLE FOR THE LONG TERM MAINTENANCE AND OPERATION OF THE PERMANENT STORMWATER SYSTEMS DIVIDED ACCORDING TO THE OWNERSHIP OF THE RIGHT OF WAY. RAMSEY COUNTY AND THE CITY OF ARDEN HILLS EACH HAVE AN MS4 SWPPP THAT IS AVAILABLE ONLINE OR UPON REQUEST.

SWPPP DEVELOPMENT AND MAINTENANCE
THIS SWPPP WAS PREPARED BY PERSONNEL WHO ARE CERTIFIED IN THE DESIGN OF CONSTRUCTION SWPPPS. COPIES OF THE CERTIFICATIONS ARE AVAILABLE UPON REQUEST.

THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING A CERTIFIED EROSION AND SEDIMENT CONTROL SUPERVISOR WHO SHALL BE RESPONSIBLE FOR FINALIZING, CERTIFYING, AND MAINTAINING THE SWPPP DOCUMENT AND OVERSEEING THE IMPLEMENTATION OF THE SWPPP. SEE PAGE 2 OF THE SWPPP NARRATIVE FOR ADDITIONAL REQUIREMENTS.

IN ADDITION, EACH CONTRACTOR OR SUBCONTRACTOR THAT PLACES EROSION OR SEDIMENT CONTROL DEVICES AS LISTED IN MNDOT SPECIFICATION 2573 SHALL PROVIDE AT LEAST ONE CERTIFIED INSTALLER AS INDICATED IN THE MNDOT SPECIFICATION.

THE SWPPP SHALL BE AMENDED WHEN:
A. THERE IS A CHANGE IN DESIGN, CONSTRUCTION, OPERATION, MAINTENANCE, WEATHER OR SEASON HAVING A SIGNIFICANT EFFECT ON DISCHARGE OF POLLUTANTS.
B. INSPECTIONS INDICATE THE SWPPP IS NOT EFFECTIVE.
C. A WATER QUALITY STANDARD CHANGES AND THE MPCA DETERMINES THE SWPPP SHALL BE AMENDED TO COMPLY.

A DESCRIPTION OF ANY CHANGE TO THE SWPPP, ALONG WITH THE DATE AND NAME OF THE REVISION SHALL BE RECORDED AND INCLUDED WITH THE SWPPP AND RETAINED ON SITE. THE OWNER SHALL RETAIN ALL RECORDS AFTER COMPLETION OF THE PROJECT.

SITE PLANS
THE CONTRACTOR SHALL PREPARE AND SUBMIT A SITE MANAGEMENT PLAN FOR CONCRETE MANAGEMENT, CONCRETE SLURRY APPLICATION AREAS, WORK IN AND NEAR AREAS OF ENVIRONMENTAL SENSITIVITY, DEWATERING AREAS, AREAS IDENTIFIED AS "SITE MANAGEMENT PLAN AREAS" AND AS REQUESTED BY THE PROJECT ENGINEER. SUBMIT ALL SITE MANAGEMENT PLANS IN WRITING AND ALLOW A MINIMUM OF 10 CALENDAR DAYS DAYS FOR REVIEW BY THE PROJECT ENGINEER. WORK SHALL NOT BE ALLOWED TO COMMENCE IF A SITE MANAGEMENT PLAN IS REQUIRED UNTIL ACCEPTANCE HAS BEEN GRANTED BY THE PROJECT ENGINEER.

ENVIRONMENTAL REVIEW
THE REQUIREMENTS OF RICE CREEK WATERSHED DISTRICT AND THE CITY OF ARDEN HILLS ARE SATISFIED BY THE PERMANENT BMPS LISTED ABOVE AND THE TEMPORARY MEASURES INCLUDED. THERE ARE NO ADDITIONAL STORMWATER MITIGATION MEASURES REQUIRED AS A RESULT OF AN ENVIRONMENTAL, ARCHAEOLOGICAL OR AGENCY REVIEW.

DRINKING WATER SUPPLY MANAGEMENT AREA (DWSMA), EMERGENCY RESPONSE AREA (ERA) AND KARST REGIONS
THE PROJECT IS NOT LOCATED IN A DWSMA, ERA OR KARST AREA.

SOIL TYPES
SOIL TYPES FOUND ON THIS PROJECT ARE HIGHLY VARIABLE. SOIL TYPES ENCOUNTERED IMMEDIATELY BENEATH THE TOPSOIL OR ROADWAY SECTIONS CAN PREDOMINANTLY BE CHARACTERIZED AS SILT LOAM OR LOAM. SOIL TYPES ENCOUTERED AT THE BMP LOCATION CAN BE CHARACTERIZED AS SANDY LOAM.
SEE SPECIAL PROVISIONS FOR ADDITIONAL WATER RELATED PERMITS SUCH AS WATERSHED DISTRICT PERMITS, WETLAND PERMITS, ARMY CORPS OF ENGINEERS OR DNR PUBLIC WATERS WORK PERMIT.
FOR PUBLIC WATERS IN WHICH THE DNR HAS PROMULGATED "WORK IN WATER RESTRICTIONS" NO WORK SHALL OCCUR IN LAKES FROM APRIL1 - JUNE 30, IN NON-TROUT STREAMS FROM MARCH 15 - JUNE 15 OR IN TROUT STREAMS FROM SEPTEMBER 1 - APRIL 1. SEE DNR PERMIT FOR ADDITIONAL INFORMATION.

LAND FEATURE CHANGES
TOTAL DISTURBED AREA: X.X ACRES
TOTAL EXISTING IMPERVIOUS SURFACE AREA: X.X ACRES
TOTAL PROPOSED IMPERVIOUS SURFACE AREA: X.X ACRES
TOTAL PROPOSED EXEMPT IMPERVIOUS SURFACE AREA (RCWD RULES): X.X ACRES
TOTAL PROPOSED NET CHANGE IN IMPERVIOUS SURFACE AREA: X.X ACRES

PROJECT CONTACTS
THE OWNER AND CONTRACTOR ARE RESPONSIBLE FOR THE IMPLEMENTATION OF THE SWPPP AND INSTALLATION, INSPECTION, AND MAINTENANCE OF THE EROSION PREVENTION AND SEDIMENT CONTROL BMPS BEFORE, DURING AND AFTER CONSTRUCTION UNTIL THE NOTICE OF TERMINATION HAS BEEN FILED.

ORGANIZATION	CONTACT NAME	PHONE
CITY OF ARDEN HILLS		
RAMSEY COUNTY		
MINNESOTA DEPARTMENT OF NATURAL RESOURCES		
ARMY CORPS OF ENGINEERS		
MINNESOTA POLLUTION CONTROL AGENCY		
RICE CREEK WATERSHED DISTRICT		
MNDOT RESIDENT ENGINEER		
MNDOT WATER RESOURCES		
SRF WATER RESOURCES (OR SWPPP DESIGNER)		

MPCA DUTY OFFICER 24 HOUR EMERGENCY NOTIFICATION: 651-649-5451
800-422-0798

LOCATION OF SWPPP REQUIREMENTS
THE REQUIRED SWPPP ELEMENTS MAY BE LOCATED IN MANY PLACES WITHIN THE PLAN SET AS WELL AS IN THE SPECIAL PROVISIONS, MNDOT SPEC BOOK (2020 EDITION), CONSTRUCTION DIARIES OR ON FILE WITH THE PROJECT OWNER. THE NOTES AND TABLE BELOW ARE INTENDED TO BE A QUICK REFERENCE FOR THE CONTRACTOR AND PROJECT ENGINEER TO USE IN THE FIELD. THERE MAY BE ADDITIONAL REQUIRED SWPPP ELEMENTS INCLUDED ON THE PROJECT THAT ARE NOT LISTED ON THIS SHEET. IN ADDITION, THE MINNESOTA NPDES/SDS CONSTRUCTION STORMWATER GENERAL PERMIT (NPDES PERMIT) SHOULD BE REVIEWED AND CONSULTED BY THE EROSION AND SEDIMENT CONTROL SUPERVISOR.

LOCATION OF SWPPP REQUIREMENTS IN PROJECT PLAN

DESCRIPTION	LOCATION	
TEMPORARY EROSION AND SEDIMENT CONTROL MEASURES AND STAGING	SHEET NOS.	TO
PERMANENT EROSION AND SEDIMENT CONTROL MEASURES	SHEET NOS.	TO
DIRECTION OF FLOW	SHEET NOS.	TO
FINAL STABILIZATION	SHEET NOS.	TO
SOILS AND CONSTRUCTION NOTES	SHEET NOS.	TO
DRAINAGE STRUCTURES	SHEET NOS.	TO
DRAINAGE TABULATION	SHEET NOS.	TO
STORM SEWER PROFILE SHEETS	SHEET NOS.	TO
STORM SEWER TABULATION	SHEET NOS.	TO
EROSION AND SEDIMENT CONTROL DETAILS	SHEET NOS.	TO
EROSION CONTROL TABULATION	SHEET NOS.	
TURF ESTABLISHMENT TABULATION	SHEET NOS.	
STATEMENT OF ESTIMATED QUANTITIES	SHEET NOS.	TO
WATER RESOURCES NOTES	SHEET NOS.	

SITE MAPS AND DESIGN CALCULATIONS
IN ADDITION TO WHAT IS LOCATED WITHIN THIS PLAN, SITE MAPS AND BMP DESIGN CALCULATIONS ARE AVAILABLE UPON REQUEST. PLEASE CONTACT THE PROJECT ENGINEER WITH ANY QUESTIONS REGARDING THE SITE MAPS OR CALCULATIONS.

NO	DATE	BY	CKD	APPR

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Print Name: MARTIN JOYCE
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CHECKED BY MMJ
COMM. NO. 16750

SRF

CITY OF ARDEN HILLS
STORMWATER POLLUTION PREVENTION PLAN
OLD HIGHWAY 10 TRAIL

SHEET 97 OF 110

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STORM WATER POLLUTION PREVENTION PLAN (SWPPP) NARRATIVE (SHEET 2 OF 4)

GENERAL SWPPP NOTES FOR CONSTRUCTION ACTIVITY

1. THE GENERAL CONTRACTOR SHALL BE RESPONSIBLE TO COMPLY WITH ALL ASPECTS OF THE NPDES CONSTRUCTION STORMWATER PERMIT AT ALL TIMES UNTIL THE NOTICE OF TERMINATION (NOT) HAS BEEN FILED WITH THE MPCA (FORM IS AVAILABLE FROM MPCA WEBSITE). THE CONTRACTOR SHALL DEVELOP A CHAIN OF COMMAND WITH ALL OPERATORS ON THE SITE TO ENSURE THAT THE SWPPP SHALL BE IMPLEMENTED AND STAY IN EFFECT UNTIL THE CONSTRUCTION PROJECT IS COMPLETE, THE ENTIRE SITE HAS UNDERGONE FINAL STABILIZATION, AND THE NOTICE OF TERMINATION (NOT) HAS BEEN SUBMITTED TO THE MPCA.

2. THE CONTRACTOR SHALL PREPARE A WRITTEN, NOT ORAL, WEEKLY SCHEDULE OF PROPOSED EROSION CONTROL ACTIVITIES FOR THE PROJECT ENGINEER'S APPROVAL AS PER MNDOT SPEC. 1717.2.

3. BURNING OF ANY MATERIAL IS NOT ALLOWED WITHIN PROJECT BOUNDARY.

4. THE CONTRACTOR SHALL PLACE STABILIZED CONSTRUCTION EXITS, AS NECESSARY, TO PREVENT TRACKING OF SEDIMENT ONTO PAVED SURFACES AND IN COMPLIANCE WITH THE NPDES PERMIT. STABILIZED CONSTRUCTION EXITS SHALL BE SUFFICIENTLY SIZED AND MAINTAINED TO PREVENT TRACK OUT. STABILIZED CONSTRUCTION EXITS SHALL BE INCIDENTAL.

5. ALL TOPSOIL IN DISTURBED AREAS SHALL BE REMOVED AND STOCKPILED FOR LATER PLACEMENT. AVOID COMPACTION AS MUCH AS IS FEASIBLE IN ALL AREAS WHERE COMPACTION IS NOT REQUIRED FOR CONSTRUCTION. COMPACTION SHALL BE AVOIDED IN ALL AREAS DESIGNATED FOR INFILTRATION.

6. DO NOT DISTURB AREAS OUTSIDE OF THE CONSTRUCTION LIMITS. DELINEATE AREAS NOT TO BE DISTURBED PRIOR TO STARTING GROUND DISTURBING ACTIVITIES. IF IT BECOMES NECESSARY TO DISTURB AREAS OUTSIDE OF THE CONSTRUCTION LIMITS OBTAIN WRITTEN PERMISSION PRIOR TO PROCEEDING. PRESERVE ALL BUFFERS (IF ANY) SHOWN ON THE PLANS.

7. DIRECT DISCHARGES FROM BMPS TO VEGETATED AREAS AND ROUTE STORMWATER AROUND UNSTABILIZED AREAS OF THE SITE WHENEVER POSSIBLE. PROVIDE EROSION CONTROL AND VELOCITY DISSIPATION DEVICES AS NEEDED TO PREVENT EROSION AND NUISANCE CONDITIONS.
8. PROVIDE STABILIZATION IN ANY TRENCHES CUT FOR DEWATERING OR SITE DRAINING PURPOSES.

9. TEMPORARY DEWATERING ACTIVITIES MAY BE REQUIRED. THEREFORE, IT IS POSSIBLE THAT A PERMIT FOR THE TEMPORARY APPROPRIATION OF WATERS OF THE STATE FROM MNDNR SHALL BE REQUIRED FOR THIS PROJECT. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING THIS PERMIT IF REQUIRED (FORMS ARE AVAILABLE FROM THE MNDNR WEBSITE). ALL TEMPORARY DEWATERING SHALL BE DISCHARGED TO AN APPROVED LOCATION FOR TREATMENT PRIOR TO DISCHARGE TO THE RECEIVING WATER. THE CONTRACTOR SHALL BE REQUIRED TO SUBMIT SITE MANAGEMENT PLANS TO THE PROJECT ENGINEER FOR APPROVAL PRIOR TO COMMENCING WORK ACCORDING TO SPEC 1717.2. TEMPORARY DEWATERING SHALL BE INCIDENTAL.

10. BASIN DRAINING ACTIVITIES OF TURBID OR SEDIMENT LADEN WATER SHALL BE DISCHARGED TO TEMPORARY SEDIMENT BASINS WHENEVER POSSIBLE. IN THE EVENT THAT IT IS NOT POSSIBLE TO DISCHARGE THE SEDIMENT LADEN WATER TO A TEMPORARY SEDIMENT BASIN THE WATER SHALL BE TREATED SO THAT IT DOES NOT CAUSE A NUISANCE CONDITION IN THE RECEIVING WATERS OR TO DOWNSTREAM LANDOWNERS.
11. IT IS NOT ANTICIPATED THAT POLYMERS, FLOCCULANTS OR OTHER SEDIMENTATION TREATMENT CHEMICALS SHALL BE USED. HOWEVER, IF THE USE OF SUCH CHEMICALS BECOMES NECESSARY TO COMPLY WITH PERMIT REQUIREMENTS, IT SHALL BE IN ACCORDANCE WITH THE NPDES PERMIT.

POLLUTION PREVENTION NOTES

1. THE CONTRACTOR SHALL COMPLY WITH THE REQUIREMENTS REGARDING POLLUTION PREVENTION MANAGEMENT DURING CONSTRUCTION, WHICH SHALL INCLUDE, BUT NOT BE LIMITED TO, PROVIDING THE FOLLOWING (ITEMS LISTED ARE INCIDENTAL):
   A. WASHOUT AREAS FOR CONCRETE, STUCCO, PAINT, FORM RELEASE OILS, CURING COMPOUNDS AND OTHER CONSTRUCTION MATERIALS FOR USE BY ALL SUBCONTRACTORS AND MATERIAL TESTING PERSONNEL. LOCATION OF WASHOUT AREAS SHALL BE IDENTIFIED BY SIGNAGE AND SHALL BE AT LEAST 200 FT FROM SITE MANAGEMENT PLAN REQUIREMENT AREAS (IF APPLICABLE) OR AREAS OF ENVIRONMENTAL SENSITIVITY, AND UTILIZE A LEAK-PROOF CONTAINMENT FACILITY OR IMPERMEABLE LINER THAT PREVENTS RUNOFF ONTO ADJACENT SOILS. AN ENGINEERED COLLECTION SYSTEM CAN ALSO BE USED IF IT IS APPROVED BY THE PROJECT ENGINEER.
   B. THE CONTRACTOR SHALL OBTAIN APPROVAL FROM THE PROJECT ENGINEER FOR A CHEMICAL STORAGE AREA AND SHALL DESIGNATE AN AREA FOR FUELING AND MINOR MAINTENANCE OF CONSTRUCTION VEHICLES (INCLUDING WASHING) WITH MEANS TO CAPTURE ANY FUEL SPILLS. RUNOFF SHALL BE CONTAINED IN A TEMPORARY SEDIMENT BASIN OR OTHER EFFECTIVE CONTROL AND ALL WASTE GENERATED SHALL BE PROPERLY DISPOSED OF. NO ENGINE DEGREASING IS ALLOWED ON SITE.
   C. SOLID WASTE COLLECTION AND REMOVAL
   D. SECONDARY CONTAINMENT FOR STORAGE OF HAZARDOUS MATERIALS
   E. SECURED HAZARDOUS WASTE STORAGE CONTAINERS
   F. CHEMICAL SPILL KITS (SHALL BE PROVIDED AT EACH LOCATION WHERE CHEMICALS ARE USED OR STORED AND ANY LOCATION WHERE VEHICLES ARE FUELED OR MAINTAINED).
   G. PORTABLE RESTROOM FACILITIES THAT ARE ANCHORED TO PREVENT TIPPING

2. CHEMICALS SHALL BE KEPT IN A SECURE STORAGE AREA WITH RESTRICTED ACCESS IN SEALED CONTAINERS WHEN NOT IN USE. RETURN ALL CHEMICALS TO THE DESIGNATED STORAGE AREA BY THE END OF THE DAY UNLESS INFEASIBLE. CHEMICAL STORAGE CONTAINERS SHALL HAVE SECONDARY CONTAINMENT WHEN BEING USED OR STORED ON THE PROJECT SITE, AND PRODUCTS OR CHEMICALS THAT MAY LEACH POLLUTANTS SHALL BE UNDER COVER (PLASTIC SHEETING OR TEMPORARY ROOF). CHEMICAL SPILLS OF ANY KIND (OIL, FUEL, FERTILIZER, ETC.) SHALL BE CLEANED UP AND REMOVED FROM THE SITE IMMEDIATELY. THE CONTRACTOR SHALL HAVE A SPILL KIT ON SITE AT ALL TIMES.

POLLUTION PREVENTION NOTES (CONT.)

3. THE CONTRACTOR SHALL BE RESPONSIBLE FOR CREATING AND FOLLOWING A WRITTEN DISPOSAL PLAN FOR ALL HAZARDOUS WASTE MATERIALS. THE PLAN SHALL INCLUDE HOW THE MATERIAL SHALL BE DISPOSED OF AND THE LOCATION OF THE DISPOSAL SITE AND SHALL BE SUBMITTED TO THE ENGINEER PRIOR TO WORK ON SITE. LEAKS, SPILLS, OR OTHER RELEASES SHALL BE RESPONDED TO IN ACCORDANCE WITH MPCA SPILL CONTAINMENT AND REMEDIAL ACTION PROCEDURES.

4. THE CONTRACTOR SHALL USE METHODS AND OPERATIONAL PROCEDURES THAT PREVENT DISCHARGE OR PLACEMENT OF BITUMINOUS GRINDINGS, CUTTINGS, MILLINGS, AND OTHER BITUMINOUS WASTES FROM AREAS OF EXISTING OR FUTURE VEGETATED SOILS, AND ALL WATER CONVEYANCE SYSTEMS, INCLUDING INLETS, DITCHES AND CURB FLOW LINES.

5. THE CONTRACTOR SHALL USE METHODS AND OPERATIONAL PROCEDURES THAT PREVENT CONCRETE DUST, PARTICLES, SAW CUT SLURRY, PLANING WASTE AND OTHER CONCRETE WASTES FROM LEAVING PUBLIC RIGHT OF WAY, DEPOSITING IN EXISTING OR FUTURE VEGETATED AREAS OR ENTERING STORMWATER CONVEYANCE SYSTEM INCLUDING INLETS AND CURB FLOW LINES. ONSITE RELEASE OF CONCRETE SLURRY IS PERMISSIBLE IF MINNESOTA POLLUTION CONTROL GUIDANCE FOR ROAD CONSTRUCTION CONCRETE SLURRY AND THE REQUIREMENTS OF THE SPECIAL PROVISIONS ARE FOLLOWED.

EROSION CONTROL SUPERVISOR, INSPECTIONS AND MAINTENANCE NOTES

1. IN ACCORDANCE WITH SPEC. 2573.3 A1, THE CONTRACTOR SHALL PROVIDE A CERTIFIED EROSION CONTROL SUPERVISOR IN GOOD STANDING WHO IS KNOWLEDGEABLE AND EXPERIENCED IN THE APPLICATION OF EROSION PREVENTION AND SEDIMENT CONTROL BMPS. PROVIDE PROOF OF CERTIFICATION (UNIVERSITY OF MINNESOTA - CONSTRUCTION SITE MANAGEMENT) AT THE PRECONSTRUCTION MEETING. WORK SHALL NOT BE ALLOWED TO COMMENCE UNTIL PROOF OF CERTIFICATION HAS BEEN PROVIDED. THE EROSION CONTROL SUPERVISOR IS INCIDENTAL.

2. THE EROSION CONTROL SUPERVISOR SHALL WORK WITH THE PROJECT ENGINEER TO OVERSEE THE IMPLEMENTATION OF THE SWPPP AND THE INSTALLATION, INSPECTION, AND MAINTENANCE OF THE EROSION PREVENTION AND SEDIMENT CONTROL BMPS BEFORE, DURING AND AFTER CONSTRUCTION UNTIL THE NOTICE OF TERMINATION (NOT) HAS BEEN FILED WITH THE MPCA.
3. THE EROSION CONTROL SUPERVISOR IS RESPONSIBLE FOR COMPLYING WITH ALL THE INSPECTION AND MAINTENANCE REQUIREMENTS STATED IN THE NPDES PERMIT. INSPECTIONS OF THE ENTIRE CONSTRUCTION SITE SHALL OCCUR A MINIMUM OF ONCE EVERY SEVEN DAYS (3 DAYS FOR PROHIBITED WATERS) DURING ACTIVE CONSTRUCTION AND WITHIN 24 HOURS AFTER A RAINFALL EVENT GREATER THAN 0.5 INCHES IN 24 HOURS (IN NO CASE SHALL THE TIME BETWEEN INSPECTIONS EXCEED 7 DAYS; 3 DAYS FOR PROHIBITED WATERS). RAINFALL AMOUNTS SHALL BE OBTAINED USING A PROPERLY MAINTAINED RAIN GAUGE ONSITE OR BY A WEATHER STATION THAT IS WITHIN ONE MILE. THE EROSION CONTROL SUPERVISOR SHALL THOROUGHLY INSPECT ALL EROSION PREVENTION AND SEDIMENT CONTROL BMPS TO ENSURE INTEGRITY AND EFFECTIVENESS OF EACH BMP.
4. ALL INSPECTIONS AND MAINTENANCE CONDUCTED DURING CONSTRUCTION SHALL BE RECORDED IN WRITING WITHIN 24 HOURS AND THESE RECORDS SHALL BE RETAINED WITH THE SWPPP. INSPECTION REPORTS SHALL BE SUBMITTED TO THE PROJECT ENGINEER AND SWPPP DESIGNER IN A FORMAT APPROVED BY THE ENGINEER. INSPECTION RECORDS SHALL INCLUDE:
   A. DATE AND TIME OF INSPECTIONS;
   B. NAME OF PERSONS CONDUCTING INSPECTIONS;
   C. FINDINGS OF INSPECTIONS, INCLUDING RECOMMENDATIONS FOR CORRECTIVE ACTIONS;
   D. CORRECTIVE ACTIONS TAKEN INCLUDING DATES, TIMES, AND THE PARTY COMPLETING MAINTENANCE ACTIVITIES;
   E. DATE AND AMOUNT OF ALL RAINFALL EVENTS GREATER THAN 0.5 INCH IN 24 HOURS;
   F. LOCATION, DESCRIPTION AND PHOTO OF ANY DISCHARGES OFF THE PROJECT SITE.
   G. DOCUMENTS AND CHANGES MADE TO THE SWPPP.

5. THE CONTRACTOR SHALL COMPLY WITH THE FOLLOWING INSPECTION AND MAINTENANCE REQUIREMENTS (INSPECTIONS MAY BE REDUCED UNDER CERTAIN CONDITIONS AS COVER IS ESTABLISHED AND CONDITIONS CHANGE AS DESCRIBED IN THE NPDES PERMIT):
   A. SILT FENCE SHALL BE REPAIRED, REPLACED OR SUPPLEMENTED WHEN IT BECOMES NONFUNCTIONAL OR SEDIMENT REACHES 1/2 THE HEIGHT OF THE SILT FENCE.
   B. INLET PROTECTION DEVICES SHOULD BE REPAIRED WHEN THEY BECOME NONFUNCTIONAL OR SEDIMENT REACHES 1/2 THE HEIGHT AND/OR DEPTH OF THE DEVICE.
   C. TEMPORARY SEDIMENT BASINS, IF REQUIRED, SHALL HAVE THE SEDIMENT REMOVED ONCE THE SEDIMENT HAS REACHED 1/2 THE STORAGE VOLUME.
   D. REMOVE ANY SEDIMENT DEPOSITED IN SURFACE WATERS. SEDIMENT SHALL BE REMOVED AND ANY AREA DISTURBED BY THE REMOVAL RESTABILIZED WITHIN 7 DAYS OF DISCOVERY. A SITE MANAGEMENT PLAN IS REQUIRED FOR WORK IN ANY SURFACE WATER AND APPROPRIATE AUTHORITIES SHALL BE CONTACTED PRIOR TO COMMENCING WORK.
   E. TRACKED SEDIMENT SHALL BE REMOVED WITHIN 24 HOURS OF DISCOVERY OF TRACKING ONTO PAVED SURFACES.
   F. ALL NONFUNCTIONAL BMPS SHALL BE REPAIRED, REPLACED, OR SUPPLEMENTED BY THE END OF THE NEXT BUSINESS DAY AFTER DISCOVERY (UNLESS NOTED OTHERWISE ABOVE).
   G. REINSTALL AS QUICKLY AS POSSIBLE ANY BMP REMOVED TO ACCOMMODATE SHORT TERM ACTIVITIES.
   H. CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING ALL BMPS UNTIL WORK HAS BEEN COMPLETED, SITE HAS GONE UNDER FINAL STABILIZATION, AND THE NOTICE OF TERMINATION HAS BEEN SUBMITTED TO THE MPCA IN ACCORDANCE WITH THE NPDES PERMIT. SEDIMENT REMOVAL AND MAINTENANCE OF BMPS IS INCIDENTAL.

6. CLEAN OUT ALL PERMANENT STORMWATER BASINS REGARDLESS OF WHETHER USED AS A TEMPORARY SEDIMENT BASIN OR SEDIMENT TRAP TO THE DESIGN CAPACITY AFTER ALL UPGRADIENT LAND DISTURBING ACTIVITY IS COMPLETED.

NO	DATE	BY	CKD	APPR	

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Date --/--/-- License # 58920

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SRF

CITY OF ARDEN HILLS
STORMWATER POLLUTION PREVENTION PLAN
OLD HIGHWAY 10 TRAIL

SHEET 98 OF 110

STORM WATER POLLUTION PREVENTION PLAN (SWPPP) NARRATIVE (SHEET 3 OF 4)

STABILIZATION AND SEDIMENT CONTROL NOTES

1. THE EROSION PREVENTION AND SEDIMENT CONTROL BMPS SHALL BE PLACED AS NECESSARY TO MINIMIZE EROSION FROM DISTURBED SURFACES AND CAPTURE SEDIMENT ONSITE. ALL EROSION CONTROL MEASURES SHALL BE IN PLACE PRIOR TO ANY REMOVAL WORK AND/OR GROUND DISTURBING ACTIVITIES AND SHALL BE MAINTAINED UNTIL THE POTENTIAL FOR EROSION HAS BEEN ELIMINATED. IF SEDIMENT CONTROLS ARE OVERLOADED (BASED ON FREQUENT FAILURE OR EXCESSIVE MAINTENANCE), ADDITIONAL UPGRADIENT OR REDUNDANT BMPS SHALL BE PLACED.

2. SEDIMENT CONTROL DEVICES SHALL BE ESTABLISHED ON ALL DOWN GRADIENT PERIMETERS BEFORE ANY UP GRADIENT LAND DISTURBING ACTIVITIES BEGIN. SEDIMENT CONTROL DEVICES INCLUDE, BUT ARE NOT LIMITED TO THE FOLLOWING:
   A. PERIMETER CONTROL SHALL BE LOCATED ON THE CONTOUR TO CAPTURE OVERLAND, LOW-VELOCITY SHEET FLOWS DOWN GRADIENT OF ALL EXPOSED SOILS AND PRIOR TO DISCHARGING TO SURFACE WATERS. THE BMP SHALL BE J-HOOKED AT A MAXIMUM OF 100 FOOT INTERVALS AND EACH SECTION SHALL CONTAIN NO MORE THAN 1/4 ACRE OF DRAINAGE AREA.
   B. SEDIMENT DAMAGE FROM STOCKPILES SHALL BE MINIMIZED BY PLACING A ROW OF SUPER DUTY SILT FENCE A MINIMUM 5 FEET FROM THE TOE. IF THERE IS NOT ADEQUATE PROJECT AREA TO PLACE THE SILT FENCE MORE THAN 5 FEET FROM THE TOE OF THE SLOPE, THE CONTRACTOR MAY SUBMIT AN ALTERNATIVE TO THE PROJECT ENGINEER FOR APPROVAL.
   C. DITCH CHECKS (IF REQUIRED) SHALL BE PLACED AS INDICATED ON THE PLANS DURING ALL PHASES OF CONSTRUCTION.
      1. TEMPORARY DITCH CHECKS (IF REQUIRED) SHALL CONSIST OF USING ROCK DITCH CHECKS, SEDIMENT CONTROL LOGS AND ROCK WEEPERS IN FRONT OF CULVERT INLETS. IN LIEU OF REMOVING TEMPORARY DITCH CHECKS, THE ROCK MAY BE PUSHED INTO THE GROUND.
      2. FILTER LOGS (IF REQUIRED) SHALL BE PLACED DURING PERMANENT TURF ESTABLISHMENT AT THE INTERVALS IDENTIFIED IN THE PLAN.
   D. FLOTATION SILT CURTAIN MAY BE USED AS PERIMETER CONTROL BUT ONLY FOR WORK ON THE SHORELINE OR BELOW THE WATERLINE. IMMEDIATELY AFTER THE CONSTRUCTION IN THE AREA IS COMPLETE, AN UPLAND BMP SHALL BE PLACED IF EXPOSED SOILS CONTINUE TO DRAIN TO THE SURFACE WATER.
   E. TEMPORARY SEDIMENT BASINS ARE REQUIRED WHERE TEN OR MORE ACRES DRAIN TO A COMMON LOCATION (FIVE IF DRAINING TO A SPECIAL OR IMPAIRED WATER).
      1. BASIN VOLUME SHALL BE A MINIMUM OF 1,800 CUBIC FEET PER ACRE OF DRAINAGE AREA TO THE BASIN (3,600 CUBIC FEET PER ACRE IF NO CALCULATIONS ARE PERFORMED)
      2. OUTLET SHALL ALLOW COMPLETE DRAWDOWN FOR MAINTENANCE AND A STABILIZED OVERFLOW. THE OUTLET SHALL WITHDRAW WATER FROM THE SURFACE EXCEPT DURING FROZEN CONDITIONS. TEMPORARY POND OUTLETS OR TEMPORARY MODIFICATIONS TO PERMANENT POND OUTLETS TO COMPLY WITH NPDES PERMIT REQUIREMENTS FOR TEMPORARY SEDIMENT BASINS SHALL BE INCIDENTAL.
      3. IF A TEMPORARY BASIN OF THE REQUIRED SIZE IS INFEASIBLE THE REASONS SHALL BE DOCUMENTED IN THE SWPPP AND ALTERNATE BMPS SHALL BE PLACED.

3. PRESERVE A NATURAL BUFFER OF AT LEAST 50 FEET (100 FEET IF WITHIN 1 MILE OF AND DRAINS TO A SPECIAL OR IMPAIRED WATER) BETWEEN DISTURBED AREAS AND FLOWS TO A SURFACE WATER (NOT REQUIRED AT DITCHES OR STORMWATER CONVEYANCE CHANNELS, STORM DRAIN INLETS OR SEDIMENT BASINS). IF A BUFFER IS INFEASIBLE, PROVIDE AS LARGE A BUFFER AS POSSIBLE AND REDUNDANT SEDIMENT CONTROLS.

4. STORM SEWER INLETS SHALL BE PROTECTED AT ALL TIMES WITH THE APPROPRIATE INLET PROTECTION FOR EACH SPECIFIC PHASE OF CONSTRUCTION. PROVIDE INLET PROTECTION DEVICES WITH EMERGENCY OVERFLOW CAPABILITIES. SILT FENCE PLACED IN THE INLET GRATE IS NOT AN ACCEPTABLE INLET PROTECTION BMP FOR GRADING OPERATIONS (THIS BMP SHALL BE ACCEPTED ONLY FOR SHORT INTERVALS DURING MILLING OR PAVING OPERATIONS). INLET PROTECTION DEVICES MAY NEED TO BE PLACED MULTIPLE TIMES IN THE SAME LOCATION OVER THE LIFE OF THE CONTRACT. INLET PROTECTION DEVICES SHALL BE PAID FOR ONCE PER INLET REGARDLESS OF THE NUMBER OF TIMES THE BMP IS PLACED. ALL STORM SEWER INLET PROTECTION DEVICES SHALL BE KEPT IN GOOD FUNCTIONAL CONDITION AT ALL TIMES. IF THE PROJECT ENGINEER DEEMS AN INLET PROTECTION DEVICE TO BE NONFUNCTIONAL, IN POOR CONDITION, INEFFECTIVE OR NOT APPROPRIATE FOR THE CURRENT CONSTRUCTION ACTIVITIES IT SHALL BE REPLACED WITH A SUITABLE ALTERNATIVE AT NO COST TO THE OWNER.

STABILIZATION AND SEDIMENT CONTROL NOTES (CONT.)

5. PAVEMENT SURFACES SHALL BE SWEPT WITHIN 24 HOURS OF DISCOVERY OF SEDIMENT OR TRACKING ONTO PAVEMENT THAT DRAINS TO CURB, INLETS, DITCHES OR PONDS. PAVEMENT SHALL BE LIGHTLY WETTED PRIOR TO SWEEPING. THIS WORK IS INCIDENTAL.
6. OUTLETS INTO SURFACE WATERS SHALL BE STABILIZED WITH ENERGY DISSIPATION WITHIN 24 HOURS OF BEING CONSTRUCTED.

7. DITCHES AND EXPOSED SOILS SHALL BE KEPT IN AN EVEN ROUGH GRADED CONDITION IN ORDER TO BE ABLE TO APPLY EROSION CONTROL MULCHES AND BLANKETS.

8. INITIATE STABILIZATION OF ALL EXPOSED SOIL AND STOCKPILE AREAS IMMEDIATELY AFTER CONSTRUCTION ACTIVITY ON THAT PORTION OF THE SITE HAS TEMPORARILY OR PERMANENTLY CEASED. TEMPORARY OR PERMANENT STABILIZATION SHALL BE COMPLETED WITHIN NO MORE THAN 14 DAYS (7 DAYS IF IT IS WITHIN 1 MILE OF AND DRAINS TO A SPECIAL OR IMPAIRED WATER). ALL EXPOSED SOIL WITHIN 200 LINEAL FEET OF AND DRAINING TO A PUBLIC WATER WITH "WORK IN WATER RESTRICTIONS" AND DURING SPECIFIED FISH SPAWNING TIME FRAMES, SHALL BE STABILIZED WITHIN 24 HOURS. IN MANY INSTANCES, THIS SHALL REQUIRE STABILIZATION TO OCCUR MORE THAN ONCE DURING ROUGH GRADING. RAPID STABILIZATION METHOD 3 SHALL BE USED TO PROVIDE TEMPORARY COVER IN THESE AREAS AS APPROPRIATE. SUBSTITUTE SEED MIXTURE 21-112 OR 21-111 FOR THE SPECIFIED SEED MIXTURE AS APPROPRIATE FOR THE SEASON. SEE NPDES PERMIT FOR EXCEPTIONS.

9. THE NORMAL WETTED PERIMETER OF ANY TEMPORARY OR PERMANENT DRAINAGE DITCH THAT DRAINS WATER FROM THE CONSTRUCTION SITE, OR DIVERTS WATER AROUND THE CONSTRUCTION SITE, SHALL BE STABILIZED WITHIN 200 LINEAL FEET FROM THE PROPERTY EDGE OR POINT OF DISCHARGE TO ANY SURFACE WATER. STABILIZATION SHALL OCCUR WITHIN 24 HOURS OF CONNECTION TO A SURFACE WATER, EXISTING GUTTER, STORM SEWER INLET, DRAINAGE DITCH, OR OTHER STORMWATER CONVEYANCE SYSTEM ACCORDING TO SPEC 1717.2. RAPID STABILIZATION METHOD 4 SHALL BE USED TO STABILIZE THESE AREAS (SUBSTITUTE SEED MIXTURE 21-112 OR 21-111 FOR THE SPECIFIED SEED MIXTURE AS APPROPRIATE FOR THE SEASON). THE REMAINDER OF THE DITCH SHALL BE STABILIZED WITHIN 14 DAYS (7 DAYS IF IT IS WITHIN 1 MILE OF AND DRAINS TO A SPECIAL OR IMPAIRED WATER)OF CONNECTING TO THE SURFACE WATER. PERMANENT EROSION CONTROL BLANKET OR RAPID STABILIZATION METHOD 4 (SUBSTITUTE SEED MIXTURE 21-112 OR 21-111 FOR THE SPECIFIED SEED MIXTURE AS APPROPRIATE FOR THE SEASON) SHALL BE USED TO STABILIZE THESE AREAS AS INDICATED IN THE PLANS. IN LOCATIONS WHERE THE DITCH SLOPE IS LESS THAN 2 PERCENT, DISC ANCHORED MULCH AND HYDRAULIC SOIL STABILIZERS MAY BE USED FOR DITCH BOTTOM STABILIZATION AS INDICATED IN THE PLANS OR WITH THE APPROVAL OF THE ENGINEER.

10. ALL EXPOSED SOIL AREAS SHALL BE STABILIZED PRIOR TO THE ONSET OF WINTER. ANY WORK STILL BEING PERFORMED SHALL BE SNOW MULCHED, SEEDED, OR BLANKETED WITHIN THE TIME FRAMES LISTED IN THE NPDES PERMIT.

11. ALL TOPSOIL BERMS SHALL BE STABILIZED AS FOLLOWS:
    A. BETWEEN APRIL 1 - AUGUST 31, SEED WITH SEED MIXTURE 21-111
    B. BETWEEN SEPTEMBER 1 AND MARCH 31, SEED WITH SEED MIXTURE 21-112 AND TOP WITH RAPID STABILIZATION 2.

12. TILLING FOR BEDS OR TREE HOLES SHALL BE PLANTED AND MULCHED WITH WOODCHIP WITHIN 7 DAYS OR STRAW MULCHED UNTIL PLANTING OPERATIONS CAN BE COMPLETED. FILTER LOGS SHALL BE PLACED, AS NEEDED, TO TRAP SEDIMENT ON THE LOWER EDGE OF BEDS OR TREE HOLES. FILTER LOGS SHALL BE LEFT TO PHOTO DEGRADE.

NO	DATE	BY	CKD	APPR

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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.
Print Name: MARTIN JOYCE
Date --/--/-- License # 58920

DRAWN BY HLB
DESIGNED BY MMJ
CHECKED BY MMJ
COMM. NO. 16750

CITY OF ARDEN HILLS
STORMWATER POLLUTION PREVENTION PLAN
OLD HIGHWAY 10 TRAIL

SHEET 99 OF 110

SITE MAP (SHEET 4 OF 4)

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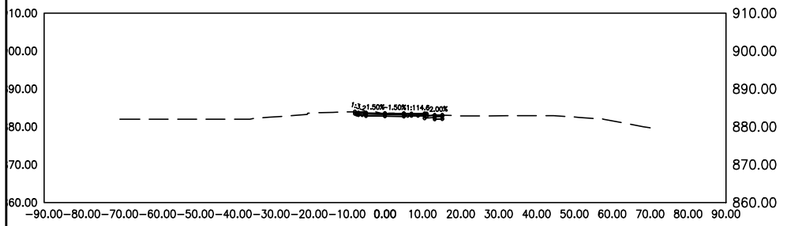

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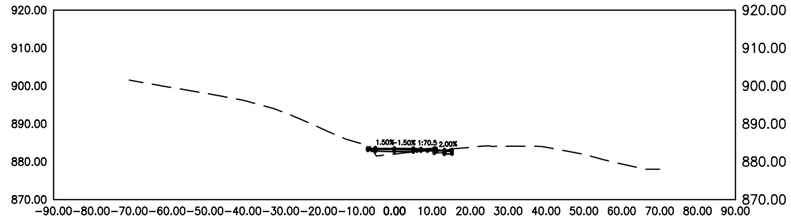

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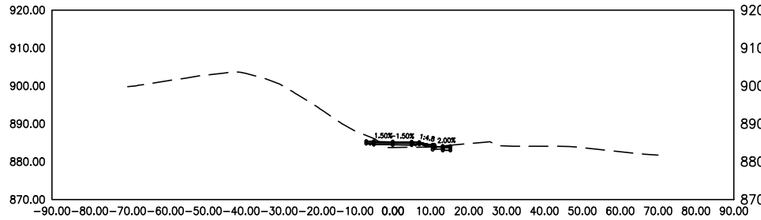

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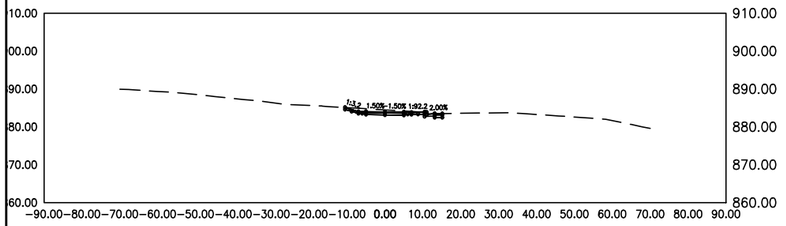

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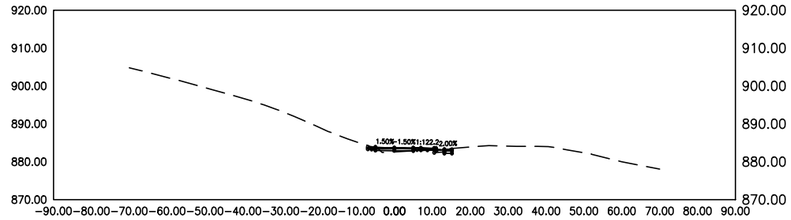

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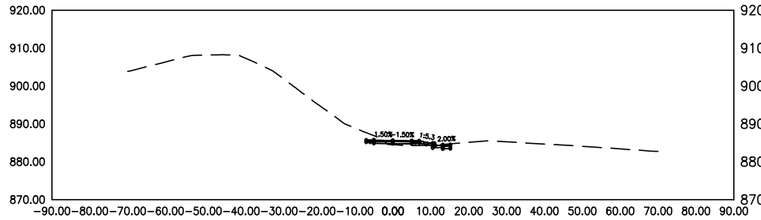

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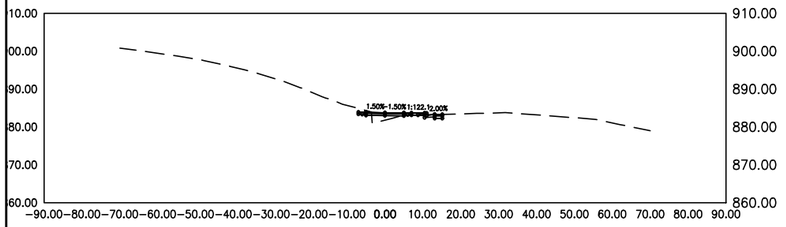

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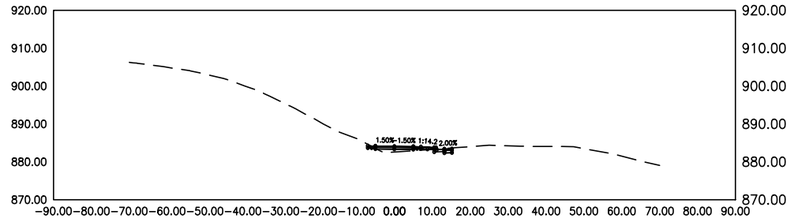

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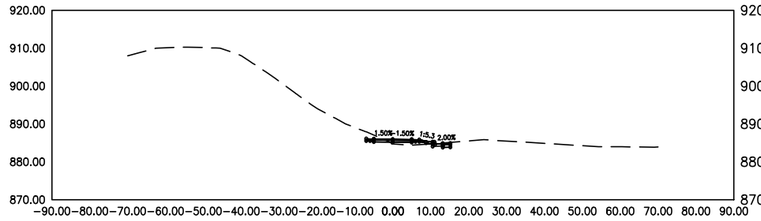

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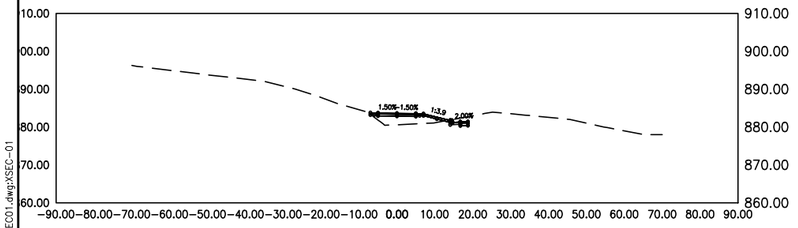

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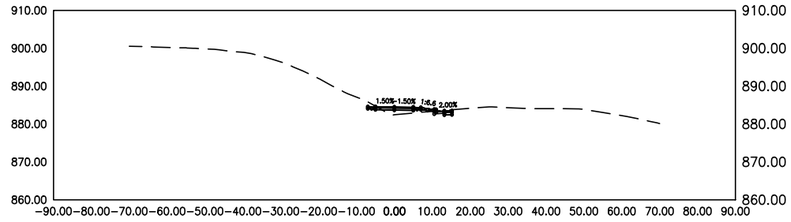

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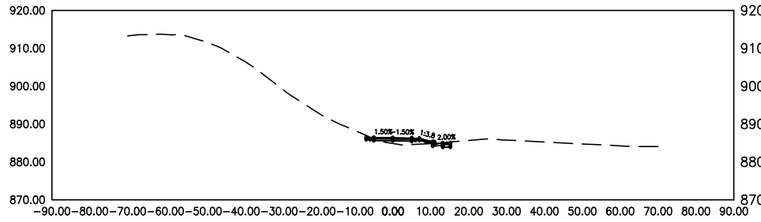

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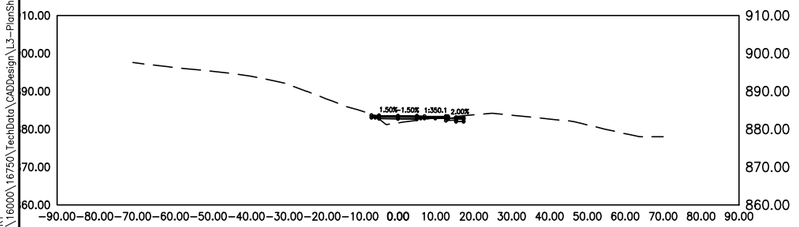

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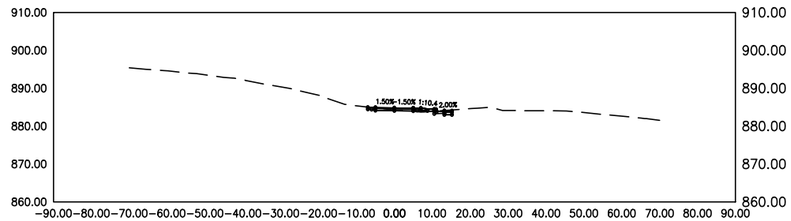

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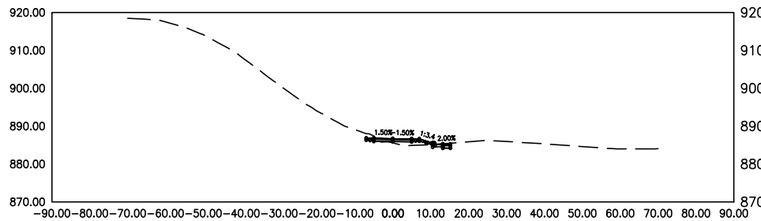

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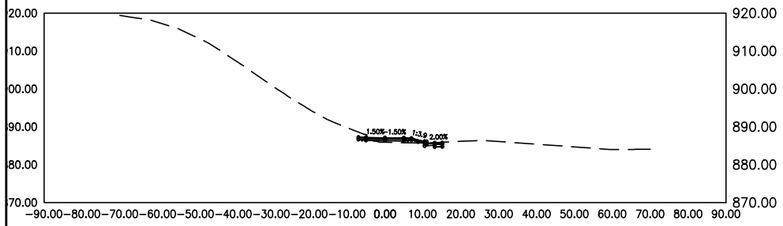

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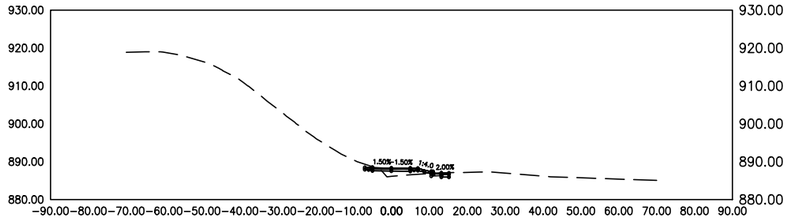

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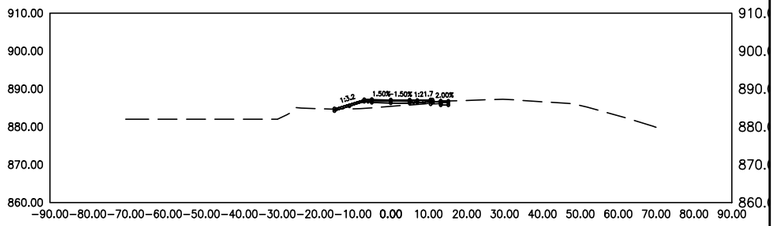

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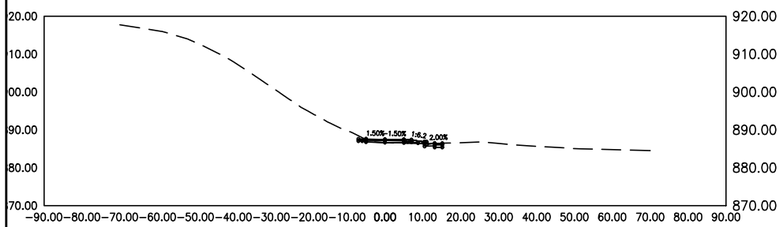

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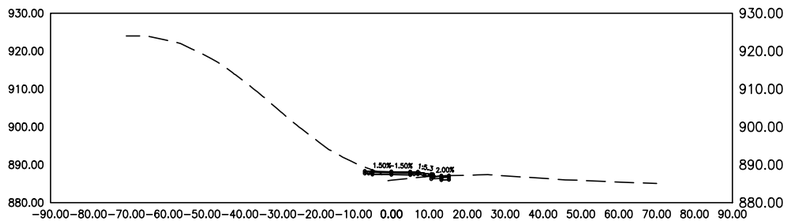

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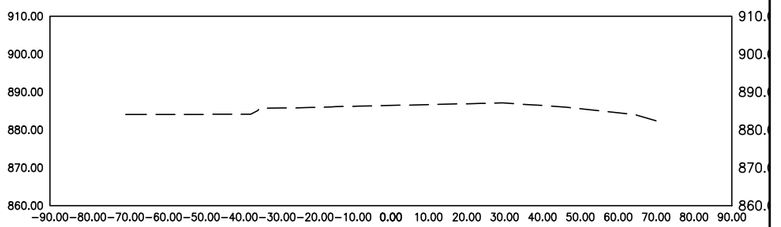

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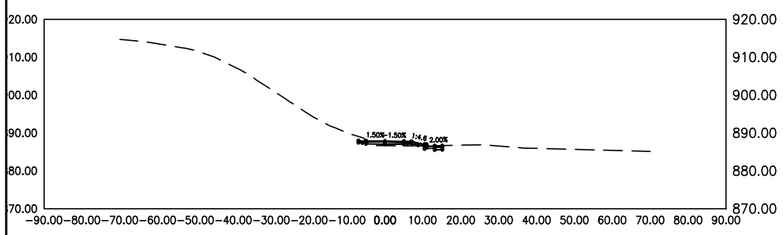

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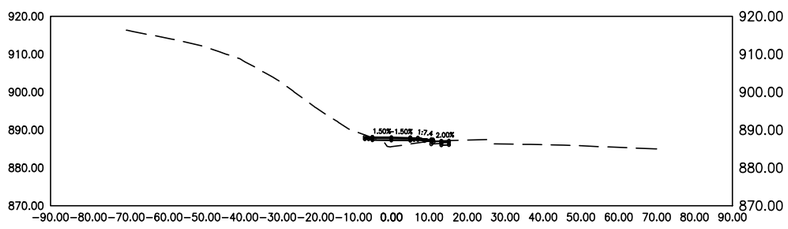

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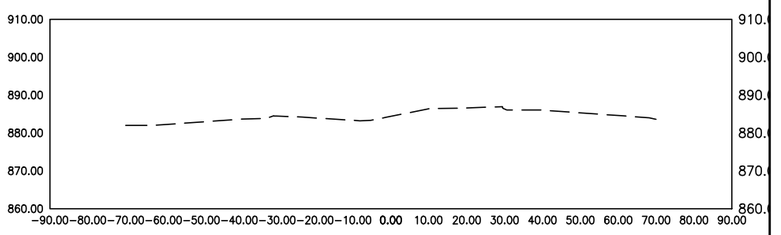

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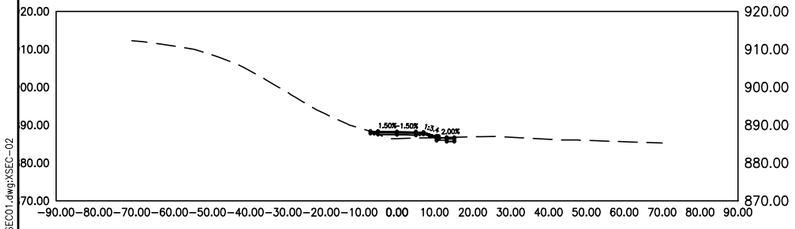

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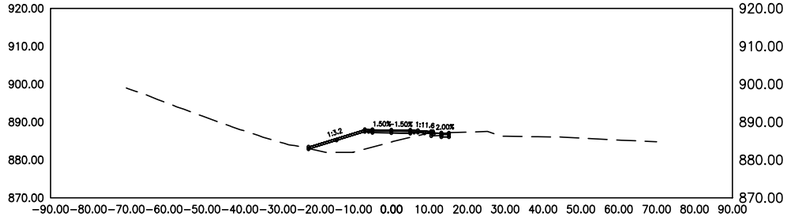

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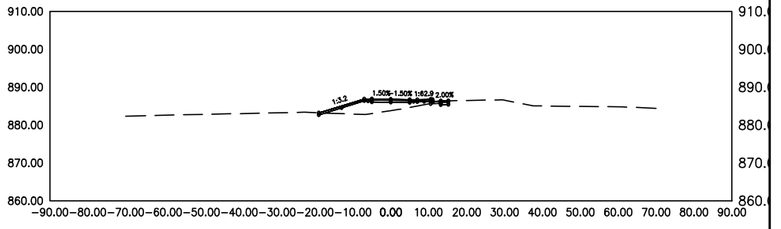

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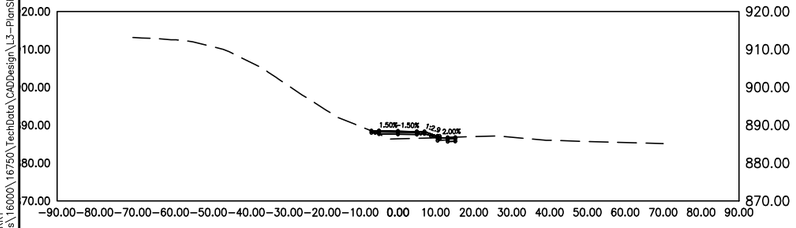

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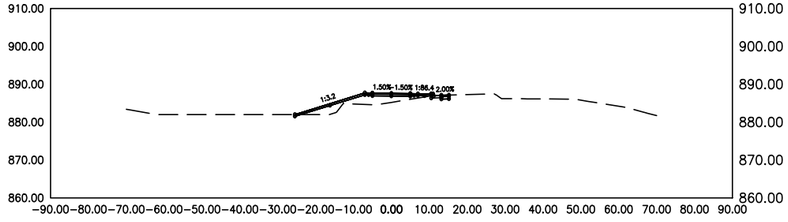

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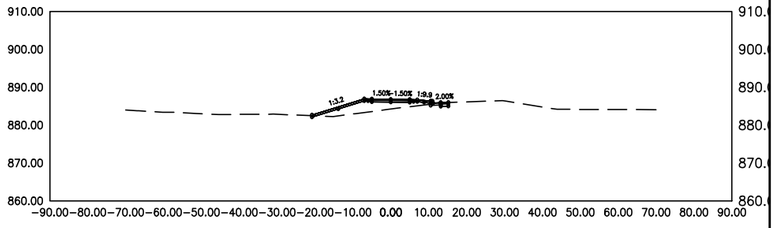

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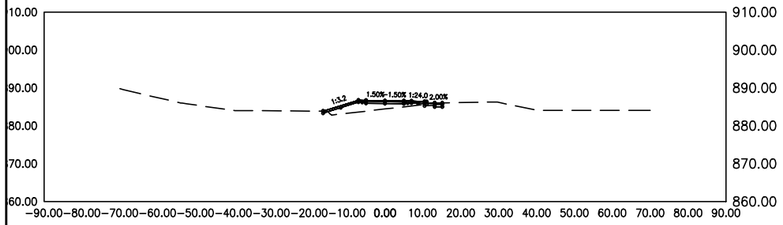

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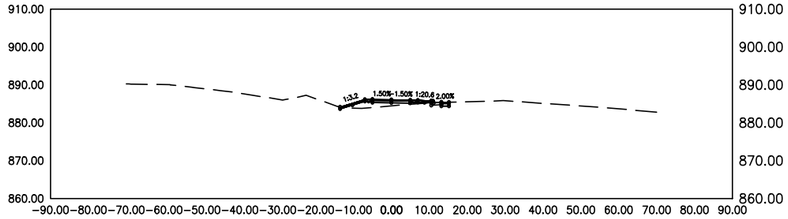

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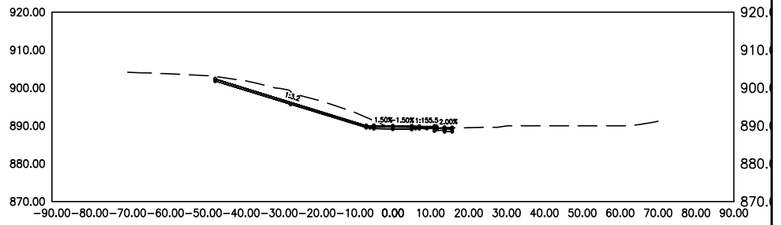

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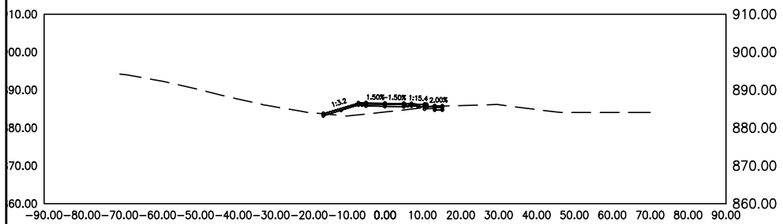

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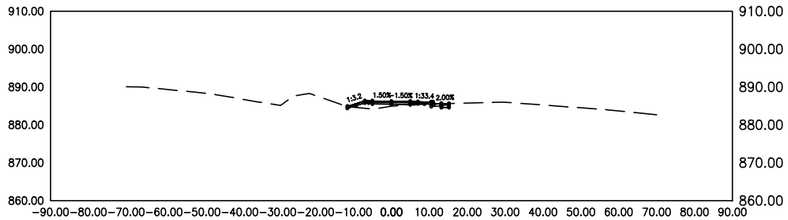

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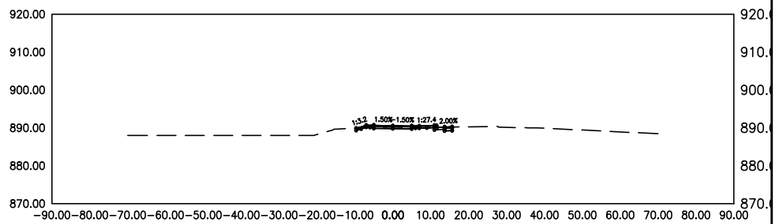

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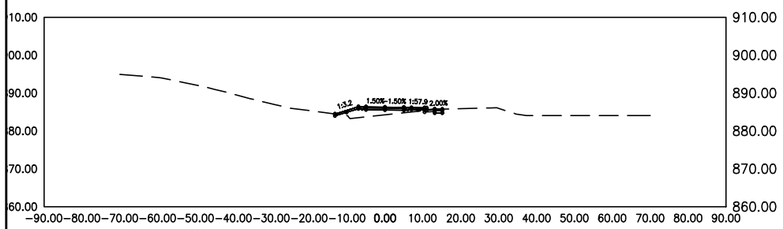

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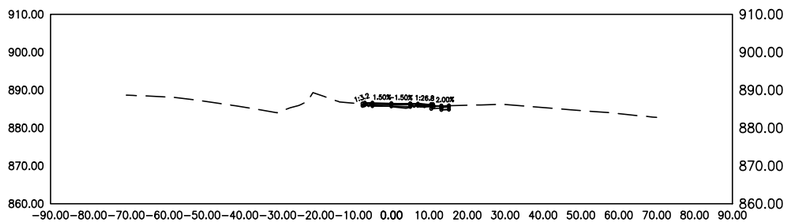

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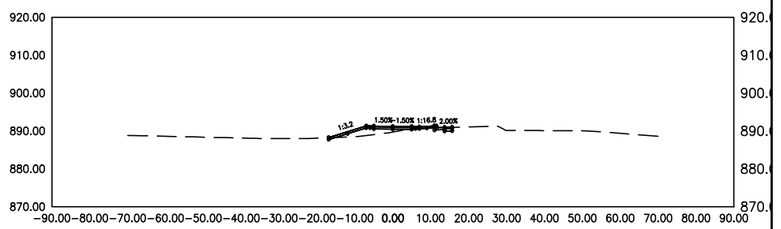

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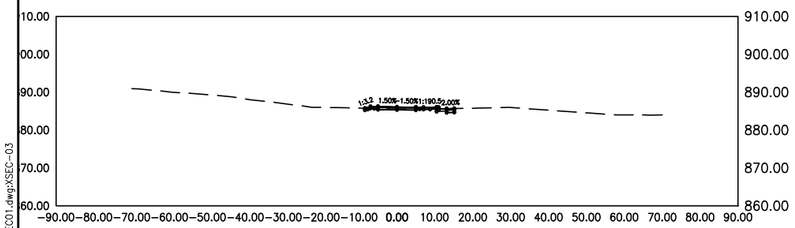

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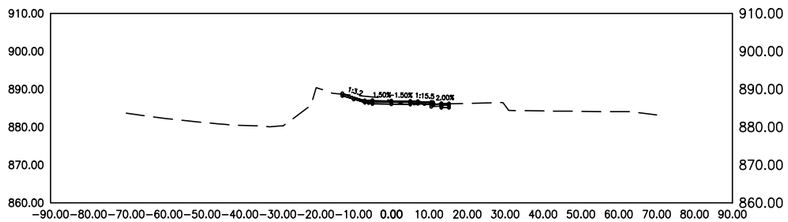

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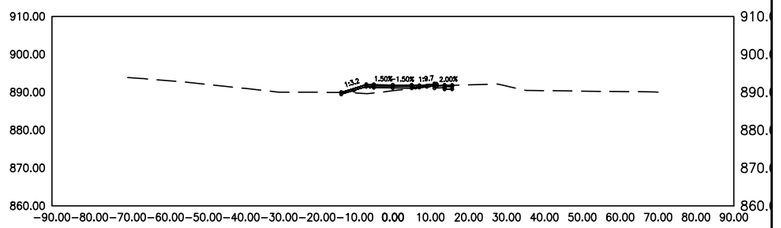

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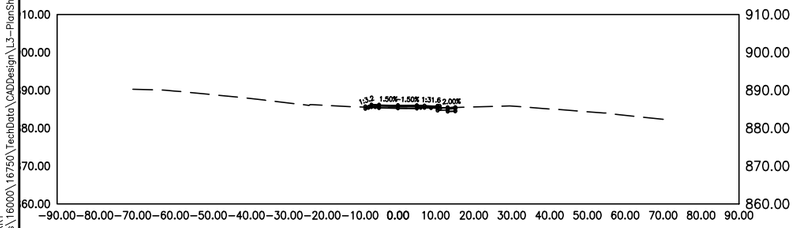

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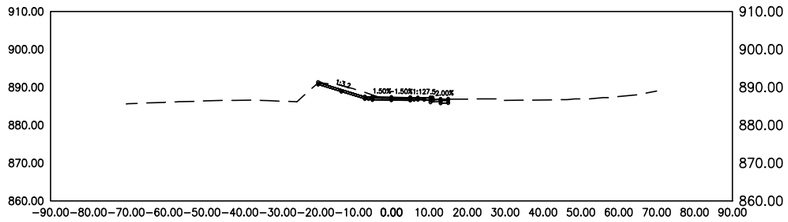

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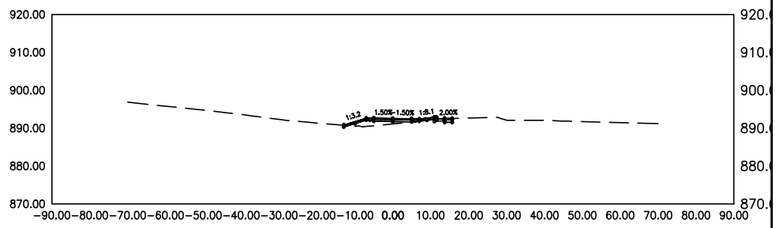

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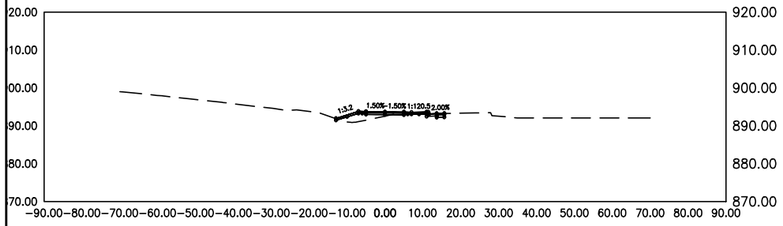

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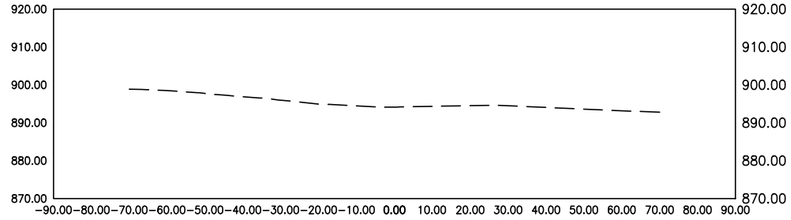

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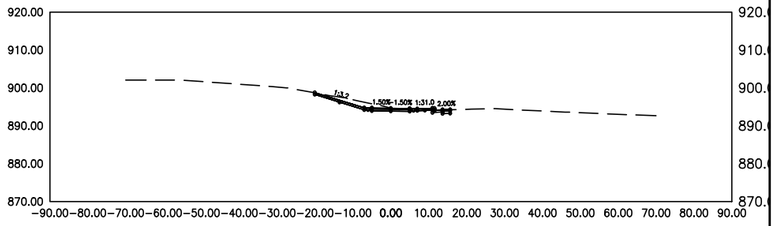

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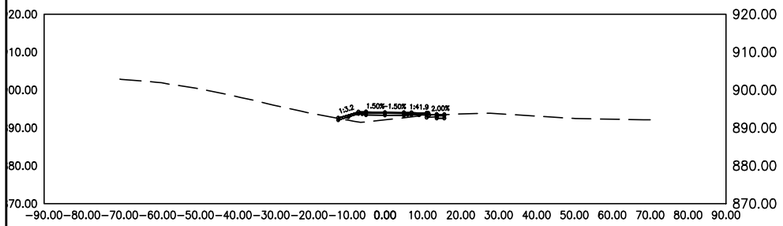

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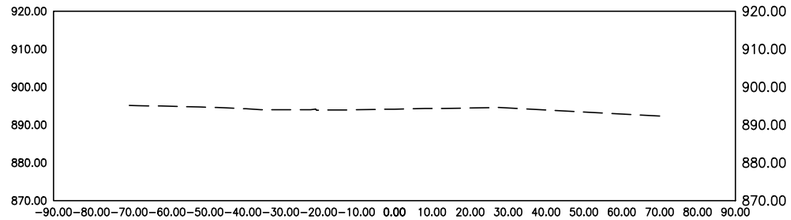

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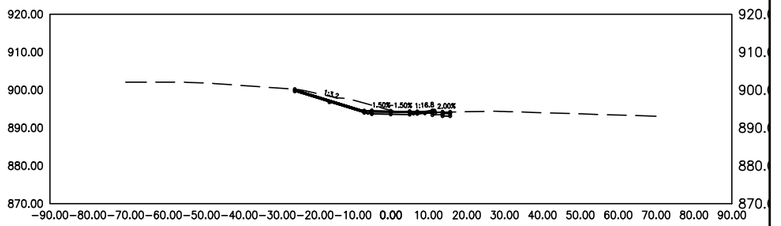

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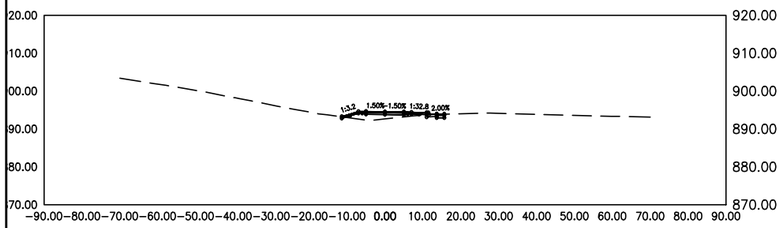

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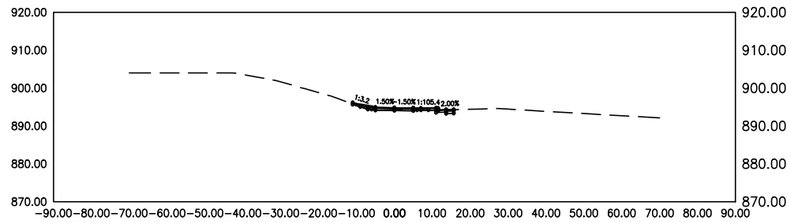

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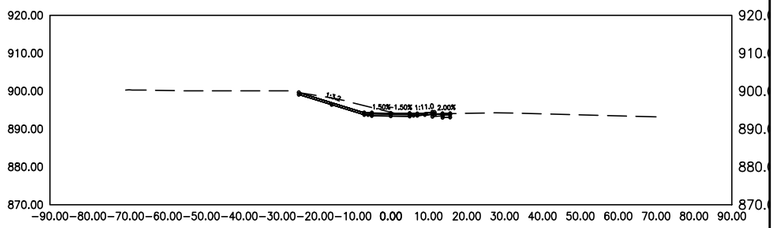

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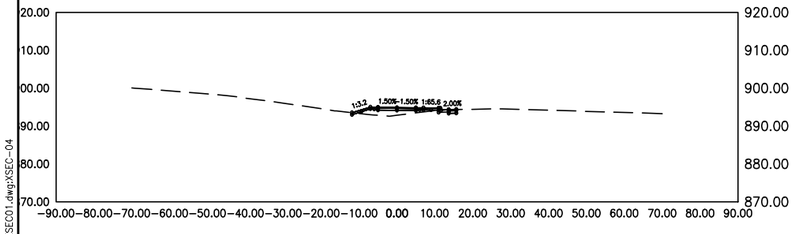

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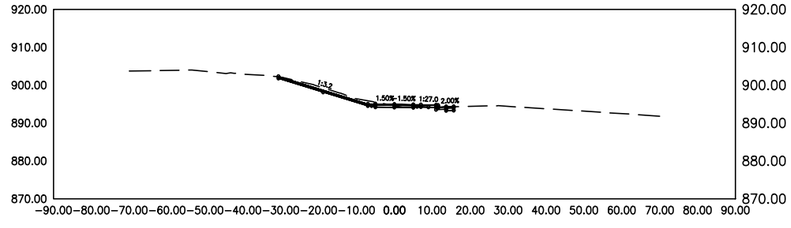

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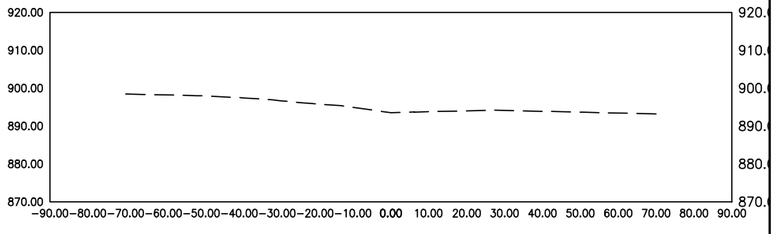

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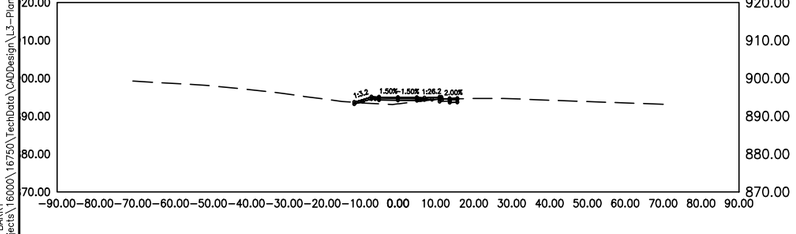

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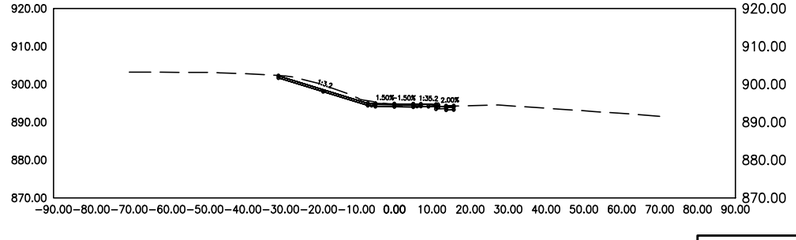

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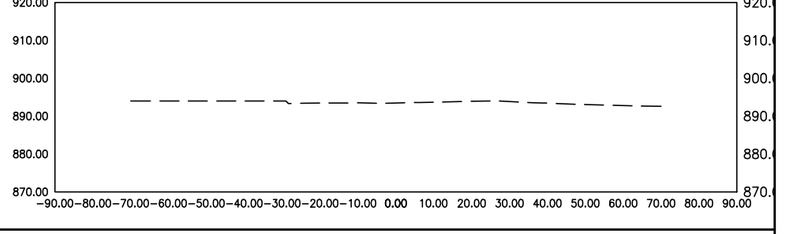

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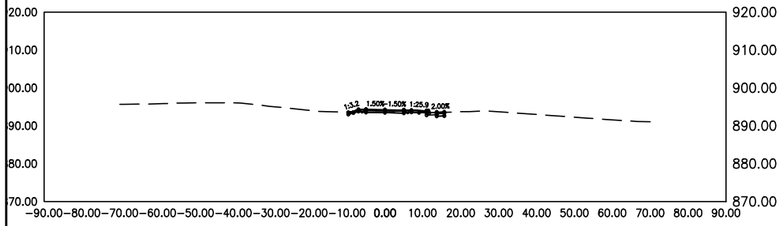

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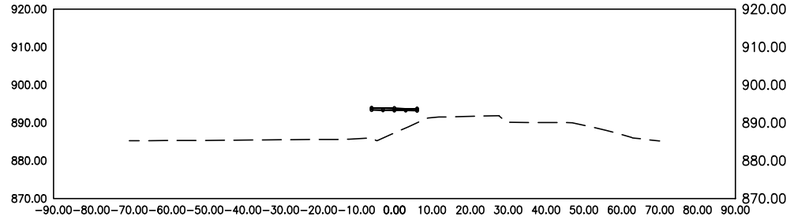

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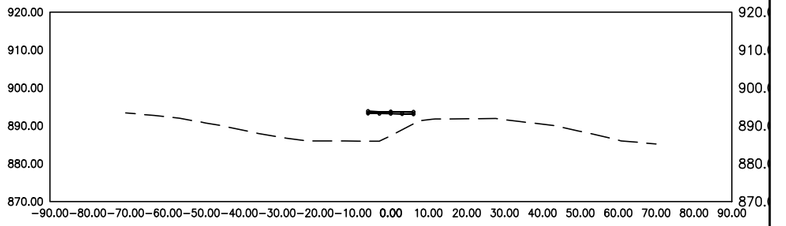

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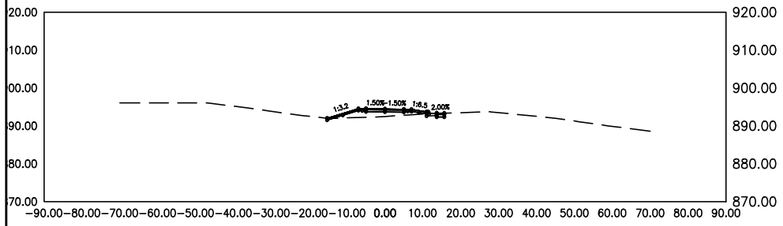

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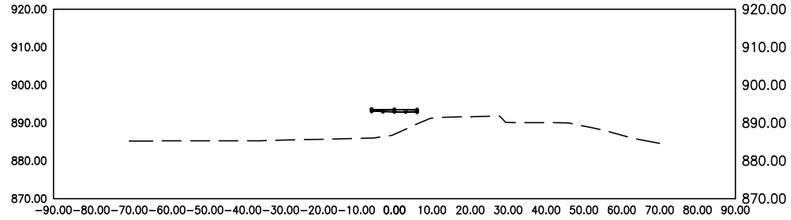

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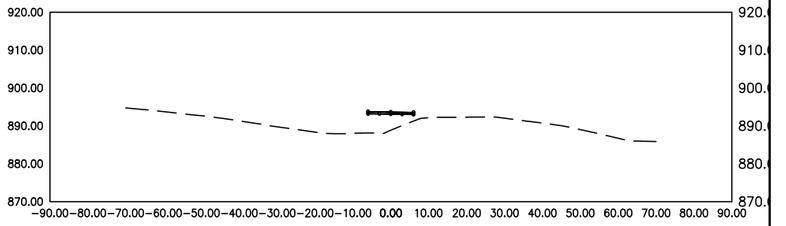

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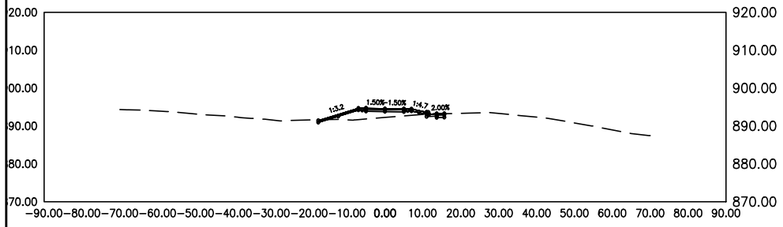

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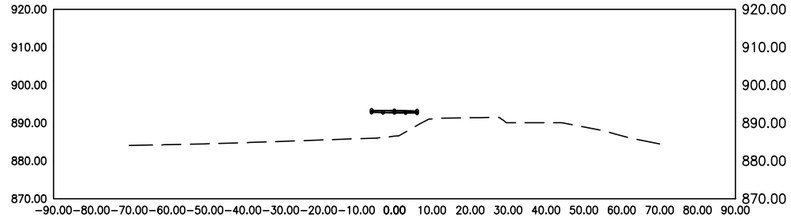

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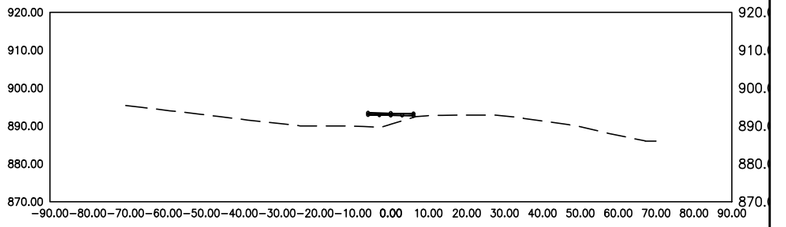

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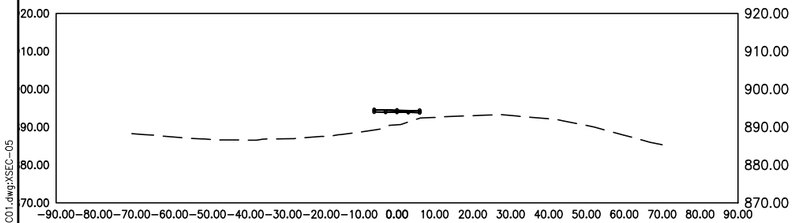

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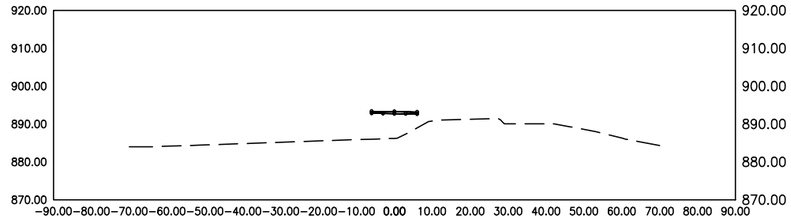

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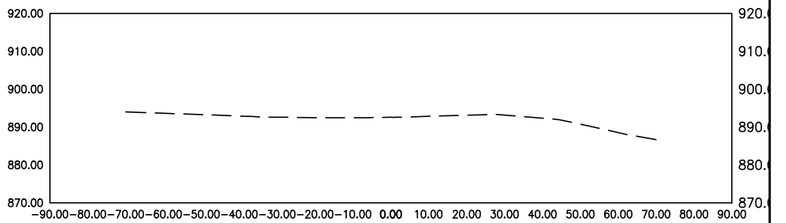

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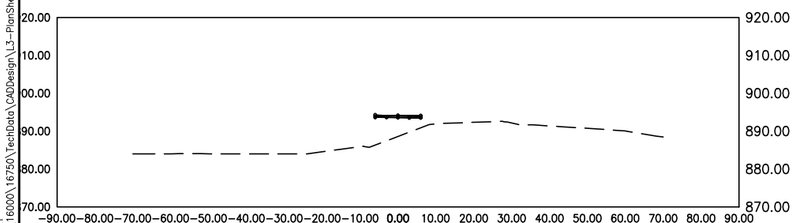

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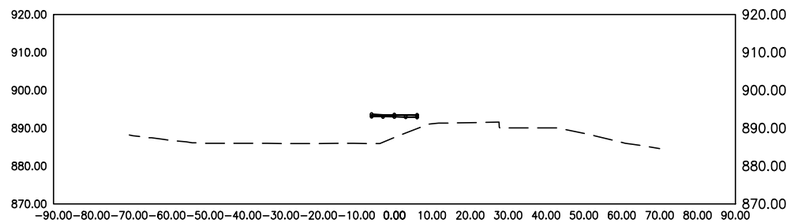

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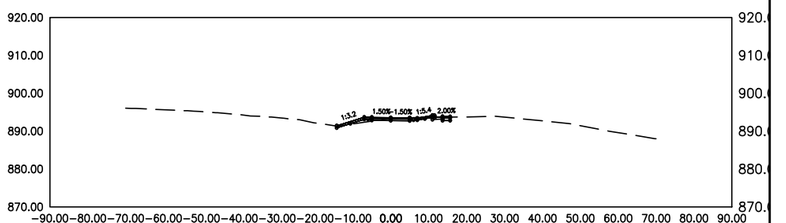

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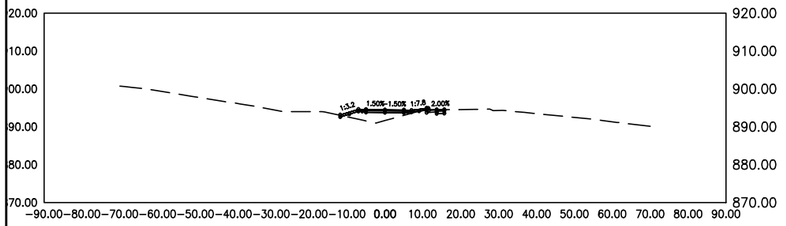

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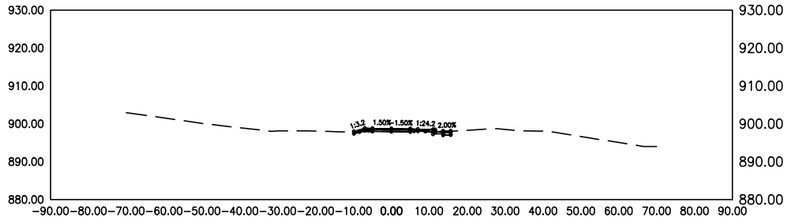

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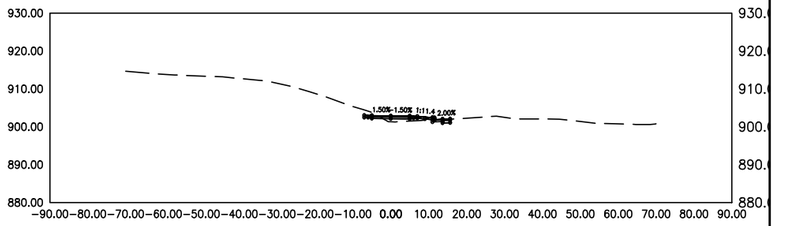

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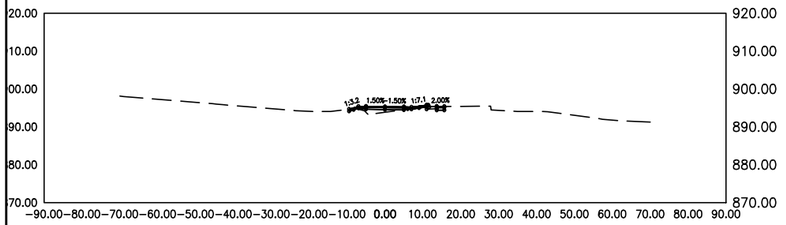

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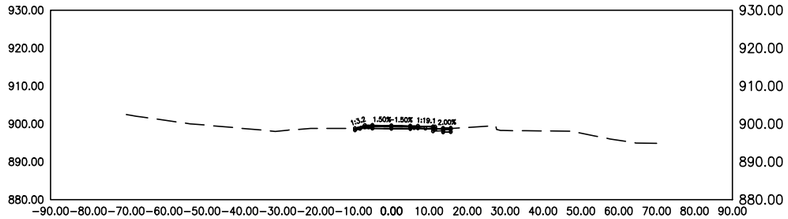

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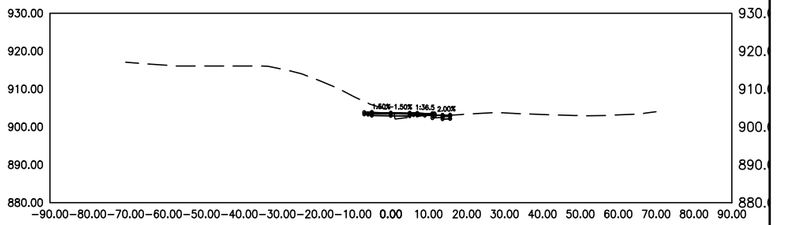

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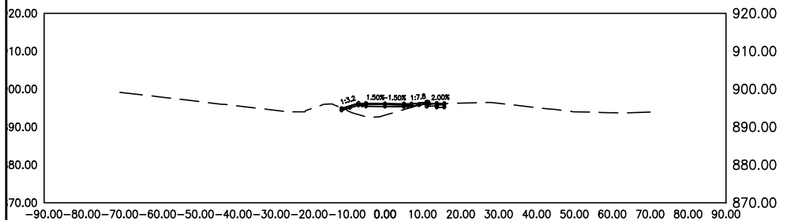

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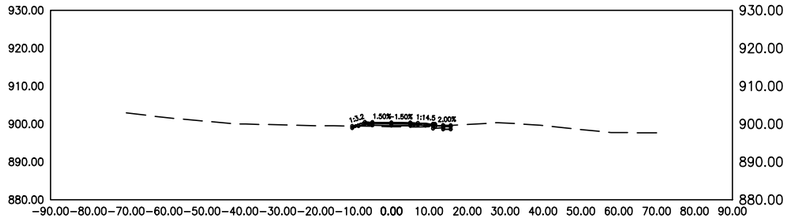

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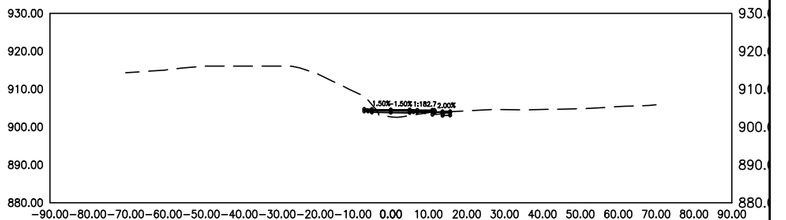

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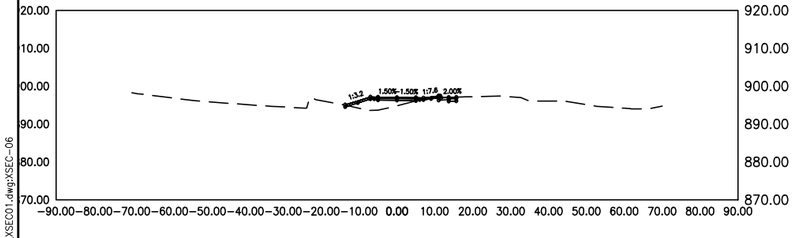

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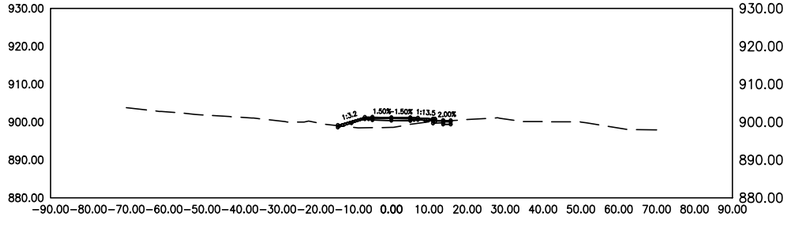

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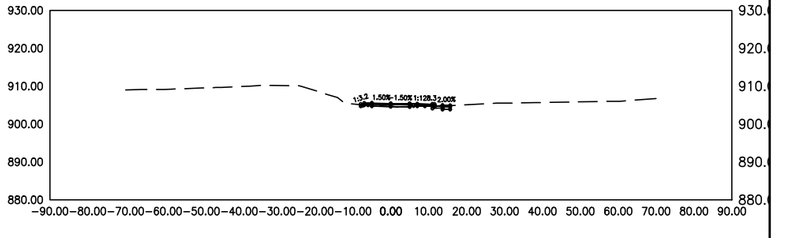

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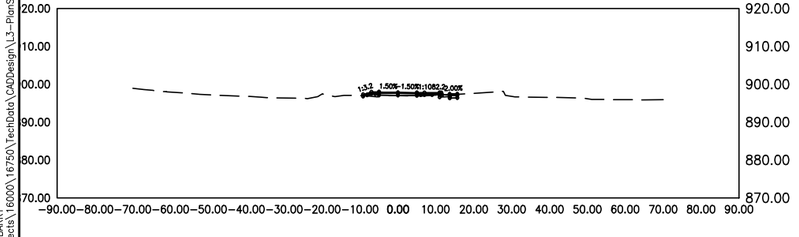

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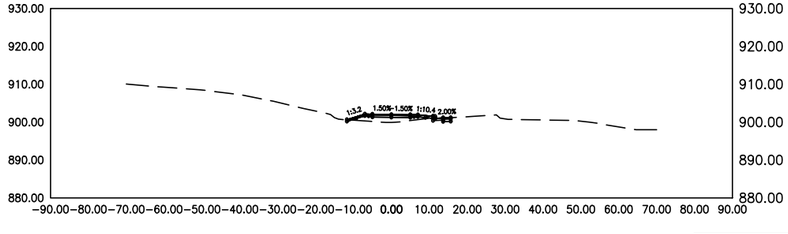

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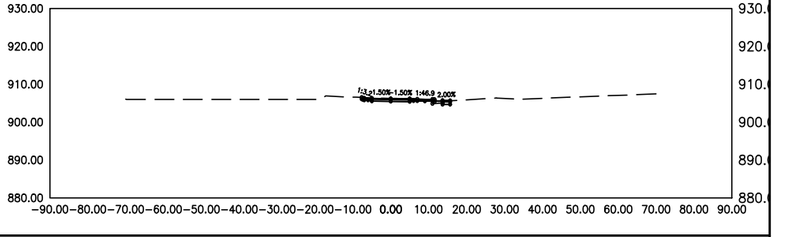

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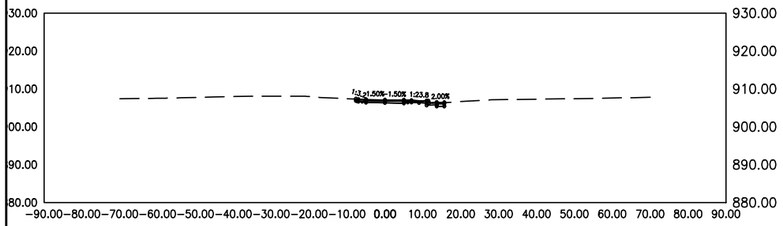

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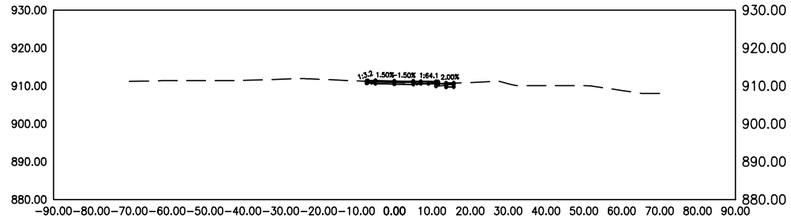

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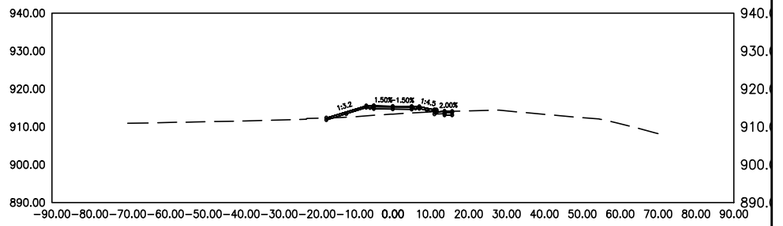

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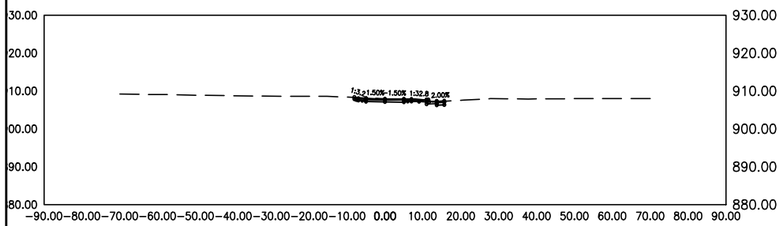

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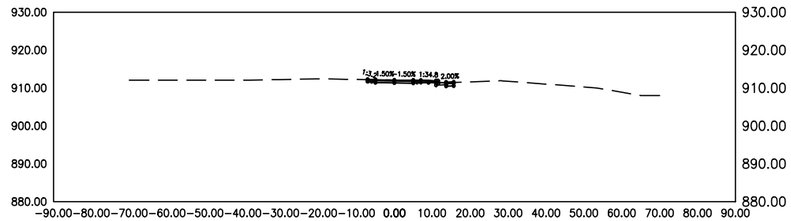

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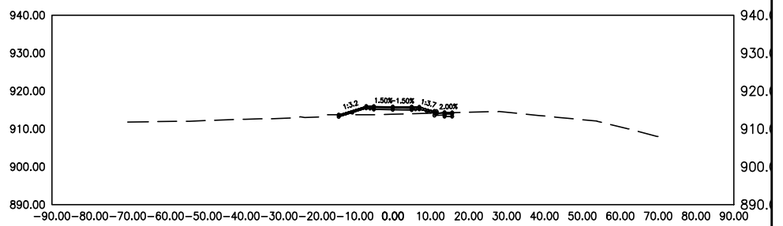

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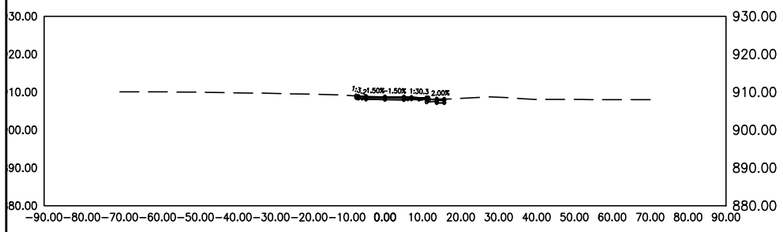

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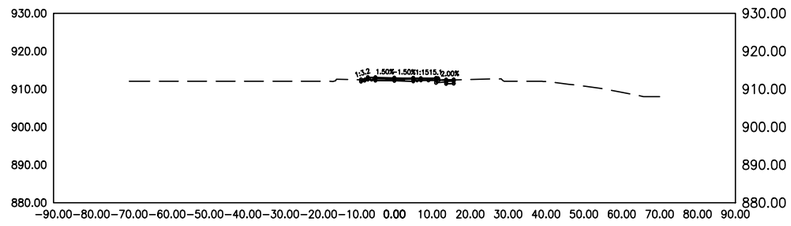

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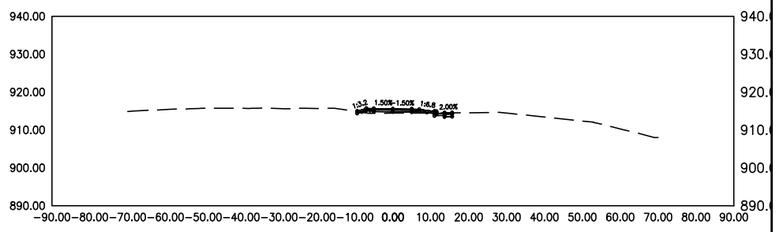

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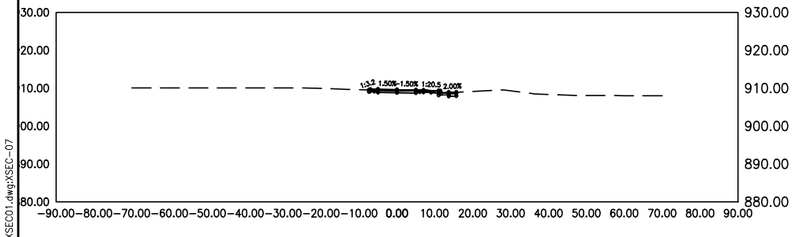

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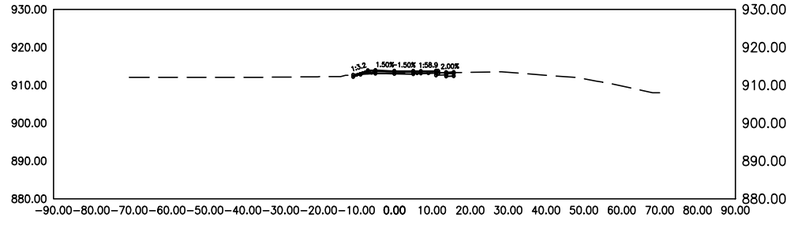

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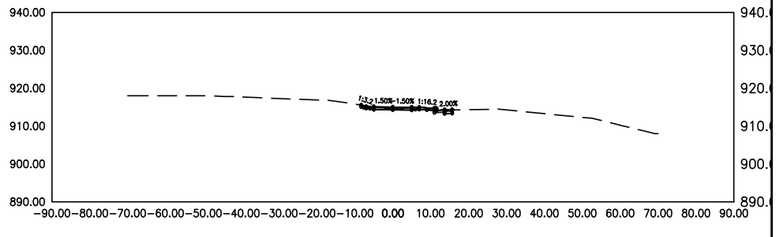

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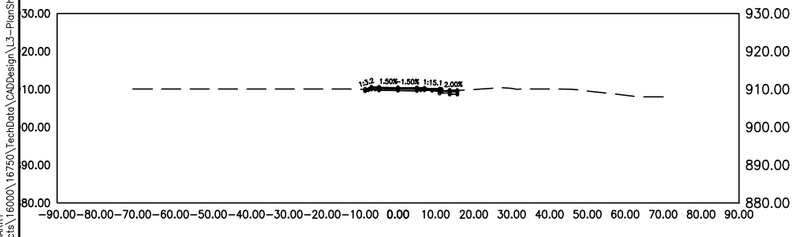

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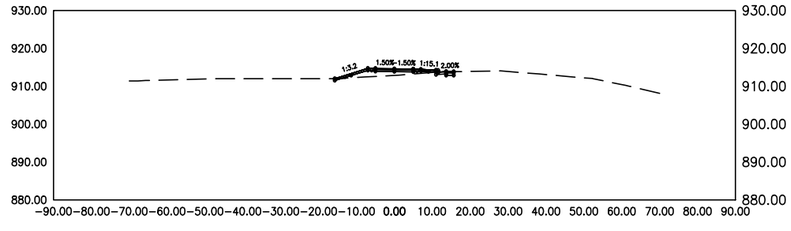

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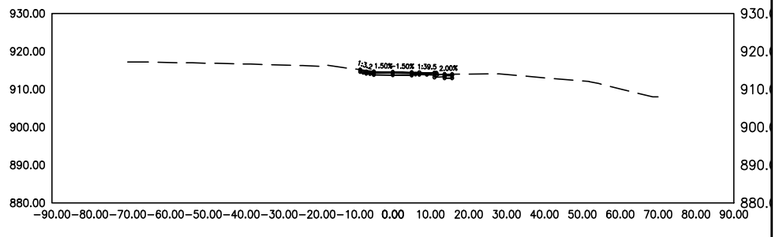

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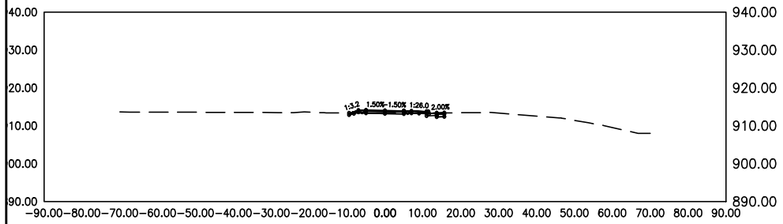

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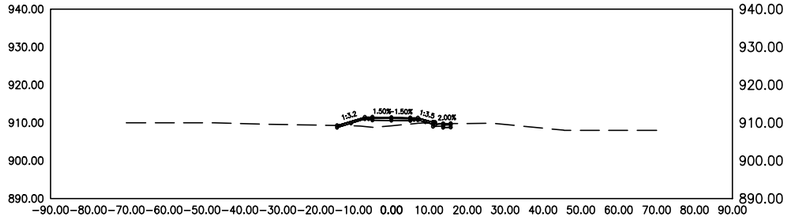

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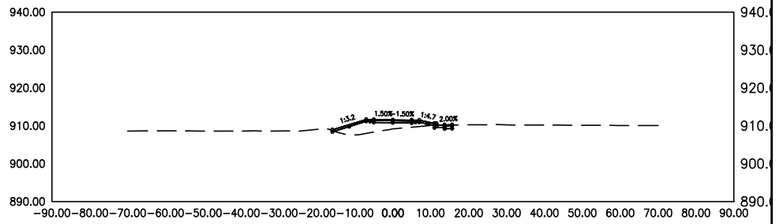

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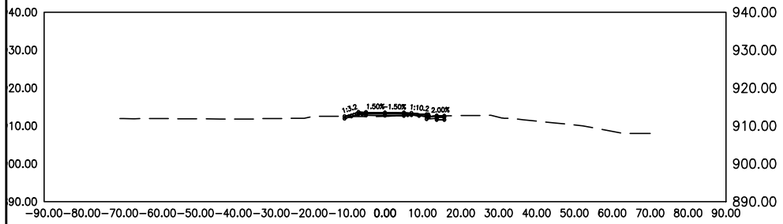

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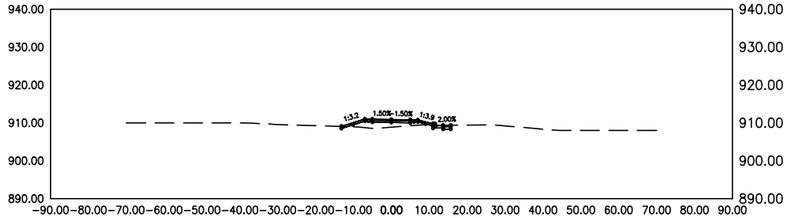

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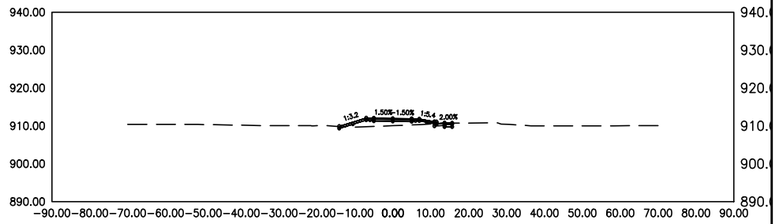

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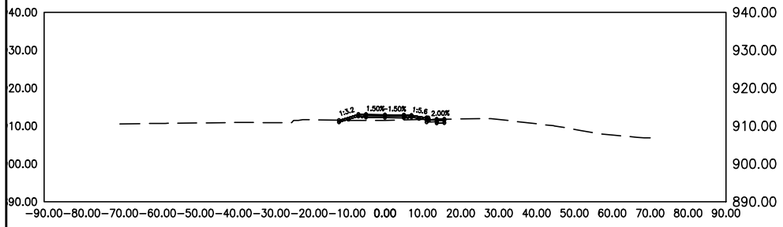

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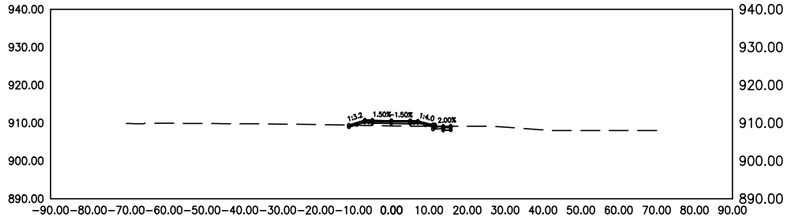

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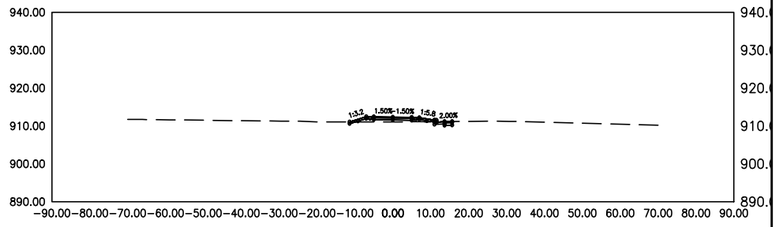

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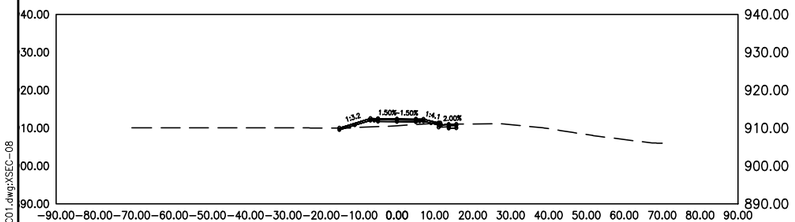

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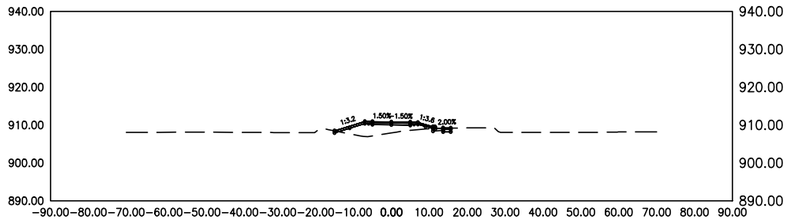

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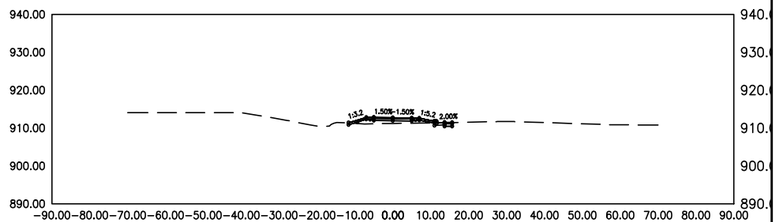

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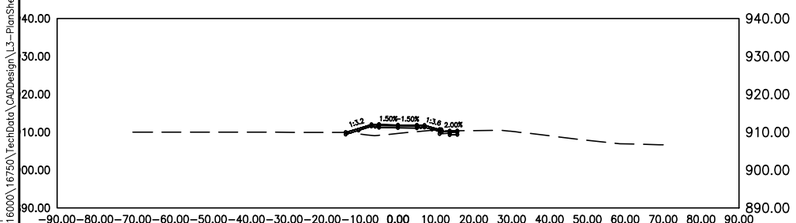

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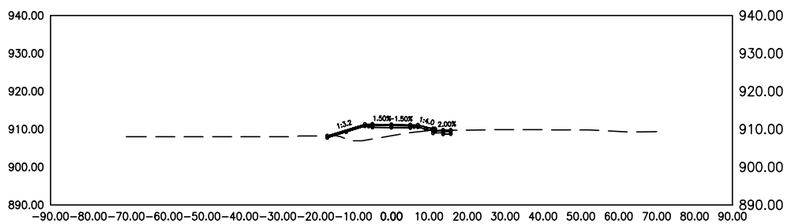

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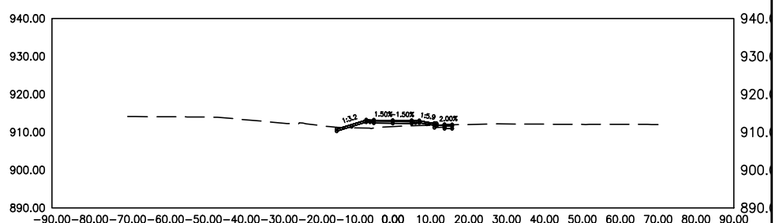

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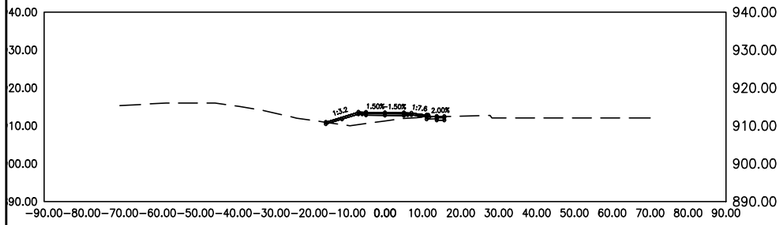

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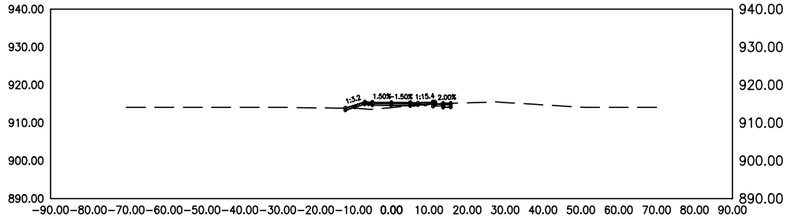

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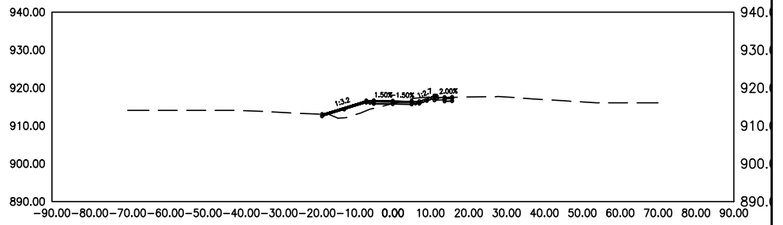

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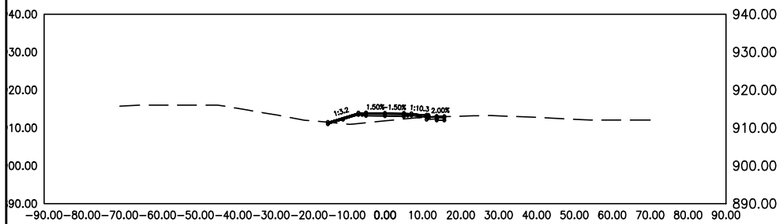

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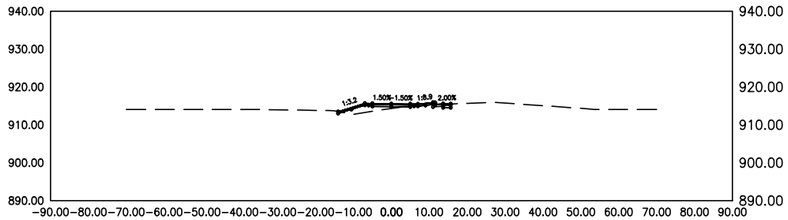

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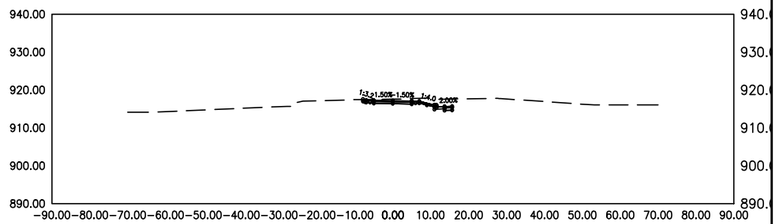

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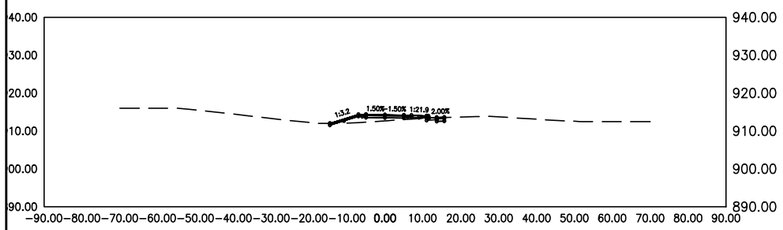

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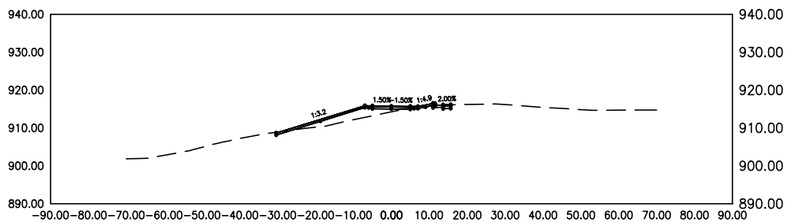

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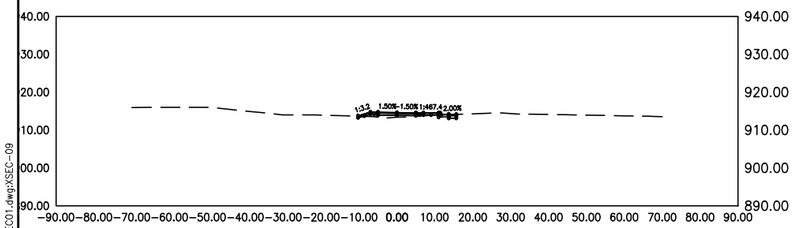

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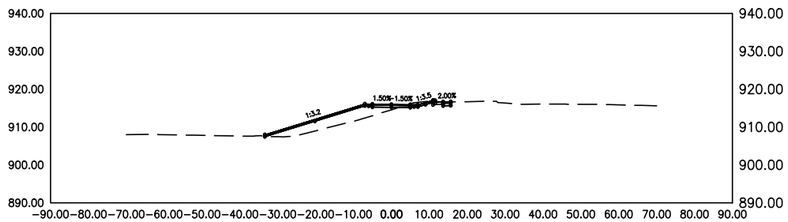

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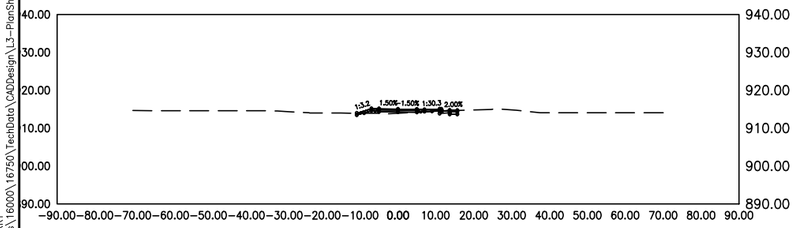

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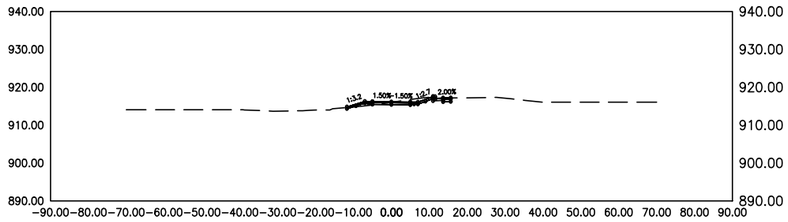
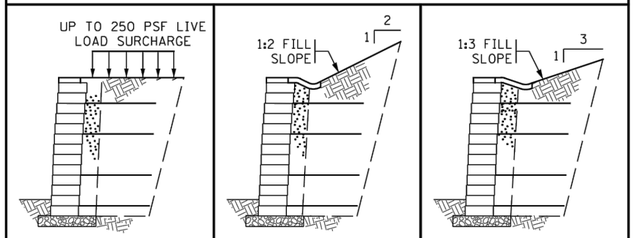


LOADING CASES



250 PSF - LL SURCHARGE	1:2 SLOPED FILL	1:3 SLOPED FILL
CASE 1	CASE 3	CASE 4

DESIGN CRITERIA

SEE SPECIAL PROVISIONS FOR REQUIREMENTS.

CASE 2 IS OMITTED INTENTIONALLY

LIST OF SHEETS - PMBW

SCHEDULE OF QUANTITIES FOR RET. WALL A — RW

	ITEM NO.	ITEM	UNIT	QUANTITY
(1)	2411.618	PREFABRICATED MODULAR BLOCK WALL	SQ FT	(P)
	2411.618	ANTI-GRAFFITI COATING	SQ FT	(P)
	2411.618	ARCHITECTURAL SURFACE FINISH (MULTI COLOR)	SQ FT	(P)
	2451.507	COARSE FILTER AGGREGATE (CV)	CU YD	(P)
	2451.607	STRUCTURAL BACKFILL	CU YD	(P)
(2)	2502.503	4" TP PIPE DRAIN	LIN FT	
	2502.503	4" PERF TP PIPE DRAIN	LIN FT	
	2557.503	WIRE FENCE DESIGN 48V-9322	LIN FT	(P)

(1) ITEM INCLUDES BLOCKS, SOIL REINFORCEMENT, CONNECTION DEVICES, JOINT MATERIALS, LEVELING PAD AND OTHER ITEMS WHICH DO NOT HAVE SEPARATE PAY ITEMS BUT ARE NECESSARY TO COMPLETE THE PMBW. SEE SPECIAL PROVISIONS FOR ADDITIONAL INFORMATION.

(2) PRECAST CONCRETE HEADWALLS AND RODENT SCREENS SHALL BE INCIDENTAL.

SUMMARY OF QUANTITIES: RETAINING WALL A

ITEM	UNIT	QUANTITY
PREFABRICATED MODULAR BLOCK WALL	SQ FT	0
ANTI-GRAFFITI COATING	SQ FT	0
ARCHITECTURAL SURFACE FINISH (MULTI COLOR)	SQ FT	0
COARSE FILTER AGGREGATE (CV)	CU YD	0
STRUCTURAL BACKFILL	CU YD	0
4" TP PIPE DRAIN	LIN FT	0
4" PERF TP PIPE DRAIN	LIN FT	0
WIRE FENCE DESIGN 48V-9322	LIN FT	0

NOTES TO CONTRACTOR:

APPROVED COMBINATIONS OF PREFABRICATED MODULAR BLOCK UNIT AND SOIL REINFORCEMENT PRODUCTS LIST WITH PMBW REINFORCEMENT CLASS NOTED ARE HELD AND MAINTAINED BY THE FOUNDATIONS UNIT, AND POSTED AT www.dot.state.mn.us/products/walls/index.html UNDER FOUNDATIONS UNIT. ONLY APPROVED PRODUCT COMBINATIONS, INCLUDING BLOCK PRODUCED FROM APPROVED SOURCES MEETING DURABILITY AND QUALITY CONTROL REQUIREMENTS, MAY BE USED IN STANDARD DESIGNS.

PROVIDE DETAILED DRAWINGS FOR CONSTRUCTION CONTAINING:

- SUBMIT, WITH THE DETAILED DRAWINGS, A COPY OF Mn/DOT STANDARD SHEETS FOR LOADING CASE(S) USED WITH OPTIONS USED MARKED IN THE TABLE.
- ELEVATION VIEW WITH REINFORCEMENT PLACEMENT REQUIREMENTS, WALL FACING LAYOUT, AND GEOMETRIC INFORMATION. TOP OF WALL MAY EXTEND UP TO 4" ABOVE PLAN TOP OF WALL ELEVATION.
- PLAN VIEW WITH BOTTOM AND TOP OF WALL ALIGNMENT, AND PLAN LIMITS OF WALL ALIGNMENT.
- CROSS SECTIONS DETAILING BATTER, REINFORCEMENT, VERTICAL SPACING, REINFORCEMENT LENGTHS, SUBSURFACE DRAINAGE, SURFACE DRAINAGE, AND WATER RUNOFF COLLECTION ABOVE WALL.
- REINFORCEMENT LAYOUT: REINFORCEMENT SHALL BE PLACED AT 100% COVERAGE RATIO. REINFORCEMENT ELEVATIONS SHALL BE CONSISTENT ACROSS LENGTH OF WALL STRUCTURE.
- NOTE BLOCK, REINFORCEMENT, AND FILL PLACEMENT METHODS AND REQUIREMENTS.
- DETAIL ALL WALL FILL PENETRATIONS AND WALL FACE PENETRATIONS. DETAIL REINFORCEMENT AND/OR WALL FACING UNIT PLACEMENT AROUND PENETRATIONS.
- DETAILS THAT ARE SPECIFIC TO VENDOR PRODUCTS AND THEIR INTERACTION WITH OTHER PROJECT COMPONENTS.
- LIST INFORMATION ON APPROVED COMBINATION OF MBW UNIT AND GEOSYNTHETIC REINFORCEMENT, INCLUDING Mn/DOT CLASSIFICATION CODE, NOMINAL BLOCK WIDTH, PROPERTIES FOR FIELD IDENTIFICATION, AND INSTALLATION INSTRUCTIONS.
- DETAILS OF CAP UNITS AND INSTALLATION/FASTENING INSTRUCTIONS FOR THE CAPS. CAP UNITS SHALL BE SET IN A BED OF ADHESIVE DESIGNED TO WITHSTAND MOISTURE AND TEMPERATURE EXTREMES, REMAIN FLEXIBLE, AND SHALL BE SPECIFICALLY FORMULATED FOR BONDING MASONRY TO MASONRY.
- CERTIFICATION BY PROFESSIONAL ENGINEER THAT THE CONSTRUCTION LAYOUT MEETS THE REQUIREMENTS OF PLANS AND Mn/DOT MSEW STANDARDS. ~~DEVIATION FROM STANDARD DESIGN TABLES ARE PERMITTED BY VALUE ENGINEERING SUBMITTAL ONLY ON PROJECTS WITH OVER 5000 SQ.FT. OF WALL.~~
- SEE SPECIAL PROVISIONS FOR ADDITIONAL REQUIREMENTS.

GENERAL NOTES:

UTILITIES:

EXISTING AND PROPOSED UTILITIES ARE SHOWN IN THE GRADING PLANS. THE CONTRACTOR SHALL VERIFY THE LOCATION OF EXISTING FACILITIES AND SHALL EXERCISE CARE IN ADJACENT CONSTRUCTION.

EXCAVATION AND EARTHWORK:

ALL EXCAVATION AND EMBANKMENT WORK SHALL CONFORM TO Mn/DOT 2451.

CAST-IN-PLACE CONCRETE:

ALL CONCRETE SHALL CONFORM TO Mn/DOT 2461, EXCEPT AS NOTED.

CONSTRUCTION:

CONSTRUCTION SHALL BE IN ACCORDANCE WITH Mn/DOT 2411, EXCEPT AS NOTED.

GEOMETRICS AND GRADES:

DATA FOR BASELINE GEOMETRY IS TABULATED FOR WALL ALIGNMENT, SEE LAYOUT SHEETS. WALL ALIGNMENT REFERENCE IS ALONG FRONT FACE OF WALL.

THE FILL SLOPE CONVENTION OF 1 VERTICAL TO HORIZONTAL IS USED IN THIS PLAN.

COMPACTION REQUIREMENTS:

COMPACT REINFORCED WALL FILL IN ACCORDANCE WITH Mn/DOT SPEC. 2105.3F1 UNLESS RECOMMENDED OTHERWISE BY THE SOILS ENGINEER.

DEFINITION OF TERMS

PMBW	=	PREFABRICATED MODULAR BLOCK WALL
LL	=	LIVE LOAD
C.I.P.	=	CAST-IN-PLACE
H	=	WALL HEIGHT
S	=	VERTICAL REINFORCEMENT SPACING
REINFORCEMENT COVERAGE RATIO	=	WIDTH OF SOIL REINFORCEMENTS TO HORIZONTAL SPACING (100% COVERAGE RATIO REQUIRED)

 # SHEET MODIFIED FROM MBW TO PMBW

REVISION:

APPROVED: ~~DECEMBER 1, 2014~~

DIRECTOR, OFFICE OF MATERIALS AND ROAD RESEARCH

 # INDICATES MODIFICATION FROM STANDARD PLAN

CERTIFIED BY _____ xx-xx-2023
LICENSED ~~PROFESSIONAL~~ ENGINEER — DATE

PRINTED NAME: CASEY E. BLACK — LIC. NO. 49163

MODIFIED

MINNESOTA DEPARTMENT OF TRANSPORTATION

STANDARD PLAN 5-297.640 — ~~1 OF 1~~

APPROVED: 12-1-2014

REVISED:

STATE DESIGN ENGINEER

PMBW

PRECAST MODULAR BLOCK RETAINING WALL

GENERAL NOTES

S.P. NO. xxx-xxx-xxx (OLD HWY 10) SHEET NO. W1 OF W1 SHEETS

NO	DATE	BY	CKD	APPR

H:\PROJECTS\16000\16750\TECHDATA\CADDESIGN\L3-PLANSHEETS\STRUCTURE\16750_RTW01.DWG: RTW-01

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.

Print Name: SPENCER NEFF

Date --/--/-- License # 57758

DRAWN BY HMK
DESIGNED BY SMN
CHECKED BY CEB
COMM. NO. XXXX

SRF

OLD HIGHWAY 10 TRAIL

GENERAL NOTES
OLD HIGHWAY 10 TRAIL

SHEET W1 OF W1

HANLEY BARRY | 11/6/2023 3:18:23 PM
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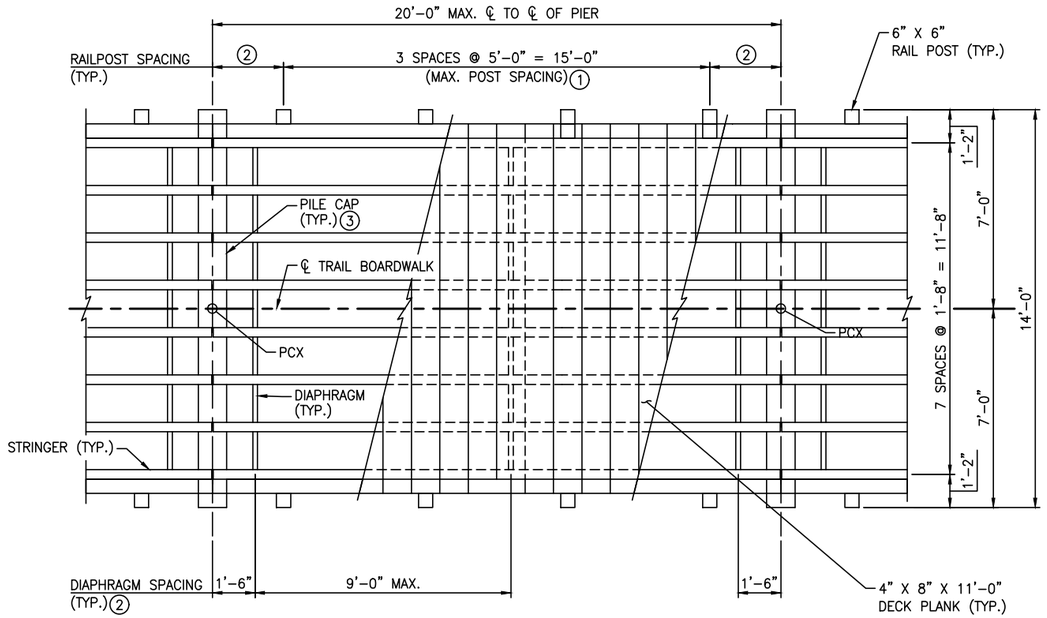
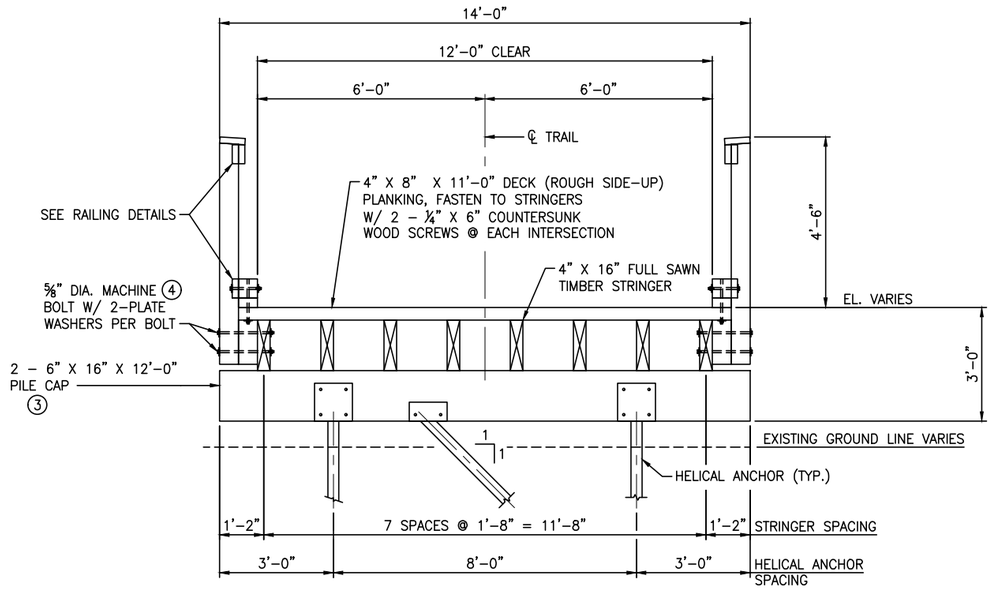


FRAMING PLAN



TYPICAL SECTION

SUMMARY OF QUANTITIES: BOARDWALK

	ITEM	UNIT	QUANTITY
5	SELECT GRANULAR EMBANKMENT MOD 10% (CV)	CU YD	0
7	TREATED WOOD	MBM	0
8	TIMBER RAILING	LIN FT	0
5	STRUCTURE EXCAVATION CLASS E	CU YD	0
6	STRUCTURAL CONCRETE (3B52)	CU YD	0
9	ANCHOR PILING	EACH	0
	TIMBER WALK	SQ FT	0

NOTES:

1. RAILING DIMENSIONS TO BE ADJUSTED AS NECESSARY DUE TO BRIDGE GEOMETRY, WITH APPROVAL BY ENGINEER.
2. COORDINATE RAIL POST AND DIAPHRAGM SPACING. MODIFY AS NECESSARY WITH APPROVAL BY ENGINEER.
3. BOLT 2'–6"x16" TOGETHER TO FORM 1–12"X16" BEAM USE 12–½" DIA. BOLTS W/PLATE WASHERS.
4. PLATE WASHERS TO BE ORIENTED PARALLEL TO TIMBER MEMBER.
5. SELECT GRANULAR EMBANKMENT MOD 10% AND STRUCTURE EXCAVATION ARE DEFINED BY PAY LIMITS SHOWN ON CONCRETE APPROACH SLAB DETAIL FOR THE WIDTH OF THE ABUTMENT (18'–0").
6. STRUCTURAL CONCRETE 3B52 INCLUDES ALL CONCRETE AND REINFORCING FOR RAIL POST FOUNDATIONS AND APPROACH SLABS. ALL REBAR SHALL BE IN ACCORDANCE WITH MnDOT SPEC. 3301 AND SHALL BE EPOXY COATED
7. INCLUDES PIER CAPS, STRINGERS, DIAPHRAGMS, ABUTMENT AND WINGWALL TIMBER.
8. INCLUDES TIMBER RAIL POSTS, POST SUPPORTS, HORIZONTAL RAILS, SLOPED RAILS, CAP RAILS, POST TRIM, WIRE MESH AND HARDWARE. INCLUDES LEAD–IN RAILING ON APPROACHES.
9. INCLUDES PILING FOR BOTH VERTICAL AND LATERAL SUPPORT.

DESIGN DATA

2020 (AND CURRENT INTERIM) A.A.S.H.T.O. LRFD BRIDGE DESIGN SPECIFICATIONS

LRFD GUIDE SPECIFICATIONS FOR DESIGN OF PEDESTRIAN BRIDGES – DECEMBER 2009

BRIDGE HAS BEEN DESIGNED TO MEET THE GREATER OF THE FOLLOWING LIVE LOADING REQUIREMENTS:

1. A MINIMUM UNIFORM LIVE LOAD OF 90 P.S.F. APPLIED TO THE ENTIRE DECK SURFACE. OR
2. A SINGLE H10 TRUCK WITH NO PEDESTRIAN LOAD

TIMBER MATERIALS INSTALLED SHALL COMPLY WITH, OR EXCEED THE FOLLOWING SCHEDULE.

ITEM	DESCRIPTION
STRINGERS, DIAPHRAGMS & PILE CAPS	DOUGLAS FIR, SELECT STRUCTURAL FULL SAWN, Fbo=1,550 P.S.I.
DECK PLANKING	DOUGLAS FIR, NO. 1 & BETTER, S1S2E, Fbo=1,150 P.S.I.
RAIL POST, RAIL & CLEAT, & CAP	SOUTHERN YELLOW PINE, NO. 2 OR BETTER, S4S Fbo=850 P.S.I.
CURB, SCUPPER BLOCK	SOUTHERN YELLOW PINE, NO. 2 OR BETTER, S4S Fbo=850 P.S.I.
ABUTMENT TIMBER	DOUGLAS FIR, NO. 1 & BETTER, FULL SAWN, Fbo=925 P.S.I
WOOD PRESERVATIVE TREATMENT:	UC4C = USAGE E1/F4 PER SPEC. 3491 MODIFY TO USE CuN COPPER NAPHTHENATE. APPLY TO BENTS, JOISTS, STRINGERS, BRACING, DECKING, POSTS, & FRAMES UC4A = USAGE E4 PER SPEC. 3491 APPLY TO RAILING POSTS, RAILING, CLEAT, CAP, CURB & SCUPPER BLOCK
TIMBER CONNECTORS AND HARDWARE	BOLTS & NUTS SHALL BE GALVANIZED AND MEET THE REQUIREMENTS OF MnDOT SPEC. 3391.

STRUCTURAL STEEL (PAINTED):
TUBING – SPEC 3361 TYPE A
Fy = 46ksi

ANGLES, PLATES AND CLIPS – SPEC 3306
Fy = 36ksi

GLAVANIZE ALL STEEL AFTER FABRICATION PER MnDOT SPEC. 3392 OR 3394 AS APPLICABLE

PAINT BLACK TO MATCH COLOR #37038

LIST OF SHEETS

CONSTRUCTION NOTES

THE 2020 EDITION OF THE MINNESOTA DEPARTMENT OF TRANSPORTATION "STANDARD SPECIFICATIONS FOR CONSTRUCTION" SHALL GOVERN.

CONSTRUCTION REQUIREMENTS SHALL CONFORM TO SPEC. 2403 EXCEPT AS NOTED IN SPECIAL PROVISIONS.

ALL HARDWARE, FASTENERS, HELICAL PILES AND CLIPS ARE TO BE GALVANIZED PER MnDOT 3392.

ALL DRILLING AND CUTTING OF TIMBER EXCEEDING 2" IN THICKNESS SHALL BE COMPLETED BEFORE PRESSURE TREATMENT UNLESS OTHERWISE AUTHORIZED BY ENGINEER.

NO	DATE	BY	CKD	APPR

H:\PROJECTS\16000\16750\TECHDATA\CADDESIGN\L3–PLANSHEETS\STRUCTURE\16750_GPE01.DWG: GPE–01

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.
Print Name: SPENCER NEFF
Date --/--/-- License # 57758

DRAWN BY HMK
DESIGNED BY SMN
CHECKED BY CEB
COMM. NO. XXXX

SRF

OLD HIGHWAY 10 TRAIL

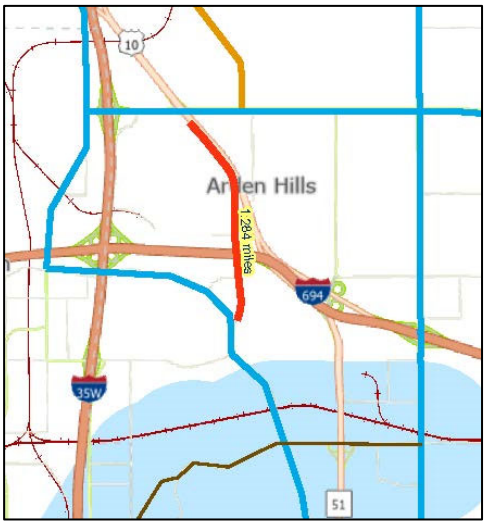
BOARDWALK LAYOUT
OLD HIGHWAY 10 TRAIL

SHEET B1 OF B1

Project Summary

Project Name: Old Highway 10 Trail SRTS Improvements
Applicant: City of Arden Hills
Total Project Cost: $3,679,000
Requested Federal Dollars: $1,00,000
Project Location: Old Highway 10 between Lake Valentine Road and Highway 96 W. (CSAH 96) in Arden Hills

Project Description:
The proposed project will improve bicycle and pedestrian facilities along Old Highway 10, between Lake Valentine Road and Highway 96 W (CSAH 96) for travelers of all ages and abilities by establishing a safe and comfortable connection to Valentine Hills Elementary School and Mounds View High School. This project will also provide connections to other sidewalks and trail facilities, parks, and key destinations within the project area. The primary goal of the proposed project is to improve multimodal safety and access for K-12 students and to encourage active transportation for the neighboring community.



Project Location

The proposed project will upgrade pedestrian facilities along Old Highway 10, improving the safety of the pedestrian environment. The proposed project includes the following elements:

- Trail: 1.28 miles of new, ADA-compliant, ten-foot-wide paved trail from Lake Valentine Road to Highway 96 W (CSAH 96).
- Curb ramps: Ten new, ADA-compliant curb ramps along Old Highway 10.
- Retaining walls: 1,289 linear feet of concrete block retaining walls with a maximum height of 4 feet.
- Boardwalk: 500 linear feet of ADA-compliant, 12-foot-wide structural wood boardwalk.


Existing Conditions

Project Benefits Include:
- Improve access and safety for students walking or biking to Valentine Hills Elementary School, and Mounds View High School, as well as other key destinations in the project area, including Bethel University.
- Strengthen the City's alternative transportation network, support active living, and expand transportation options.
- Improve conditions for users with limited mobility, impaired vision, and other disabilities, families with strollers, and less experienced cyclists.
- Provide last-mile bicycle and pedestrian facilities to schools and key destinations, enabling residents of low-income housing alternative modes of access.

Old Highway 10 Trail SRTS Improvements (Photos)

Old Highway 10 Trail SRTS Improvements (Photos)

Old Highway 10 Trail SRTS Improvements (Photos)

Old Highway 10 Trail SRTS Improvements (Photos)

ARDEN HILLS

CITY OF ARDEN HILLS
COUNTY OF RAMSEY
STATE OF MINNESOTA

RESOLUTION NO. 2023-060

RESOLUTION AUTHORIZING THE CITY TO SUBMIT A 2024 REGIONAL SOLICITATION SAFE ROUTES TO SCHOOL INFRASTRUCTURE GRANT APPLICATION

WHEREAS, the City of Arden Hills supports the application made to the Metropolitan Council for a 2024 Regional Solicitation Safe Routes to School Infrastructure Grant, a part of the Regional Solicitation for Transportation Projects Program, and

WHEREAS, the application is to obtain funding for a project to construct a new 10' paved trail along the west side of Old Highway 10 between Lake Valentine Road, and Highway 96 in Arden Hills; and

WHEREAS, Ramsey County has acknowledged this segment is in alignment with the County's All Abilities Transportation Network, and the County has included the project in its 2025 Transportation Improvement Plan; and

WHEREAS, the City of Arden Hills accepts the responsibility for an amount equal to or greater than 20% of the eligible project construction costs, including design, construction, construction engineering, administration, rights-of-way, and peripheral project costs.

NOW, THEREFORE, BE IT RESOLVED by the City Council of the City of Arden Hills, Minnesota, that if awarded a grant by the Metropolitan Council, the City of Arden Hills agrees to accept the award and may enter into an agreement with the Metropolitan Council for the above-referenced project. The City of Arden Hills will comply with all applicable laws, requirements and regulations as stated in the grant agreement.

BE IT FURTHER RESOLVED that a copy of this Resolution will be provided to the Metropolitan Council Transportation Advisory Board with the Project submittal.

ADOPTED BY THE CITY COUNCIL OF THE CITY OF ARDEN HILLS THIS 11th DAY OF DECEMBER 2023.

David Grant

David Grant, Mayor

ATTEST:

Julie Hanson

Julie Hanson, City Clerk

To view the final document, access adopted Resolutions via Arden Hills Public Laserfiche Weblink by visiting cityofardenhills.org and clicking on Archived Documents under Helpful Links on our main webpage.

Mounds View
PUBLIC SCHOOLS

December 8, 2023

To Whom it May Concern:

On behalf of Mounds View Public Schools, I am writing to express our support for the City of Arden Hills funding request for new paved pedestrian and bike trails along Old Highway 10 from Lake Valentine Road to County Highway 96.

Mounds View Public Schools feels this project would greatly improve safety for our students and the public traveling to and from Valentine Hills Elementary and Mounds View High School. Currently, there is not a trail for our students or community members to safely walk or ride bicycles along Old Highway 10.

Our school district is in strong support of the request from the City of Arden Hills and we encourage you to approve their application. Thank you for your consideration.

Sincerely,

Michael Schwartz
Risk Management Coordinator
Mounds View Public Schools

C: City of Arden Hills

RAMSEY COUNTY
Public Works

December 4, 2023

David Swearingen
Public Works Director / City Engineer
1245 Highway 96 W
Arden Hills, MN 55112

Mr. Swearingen:

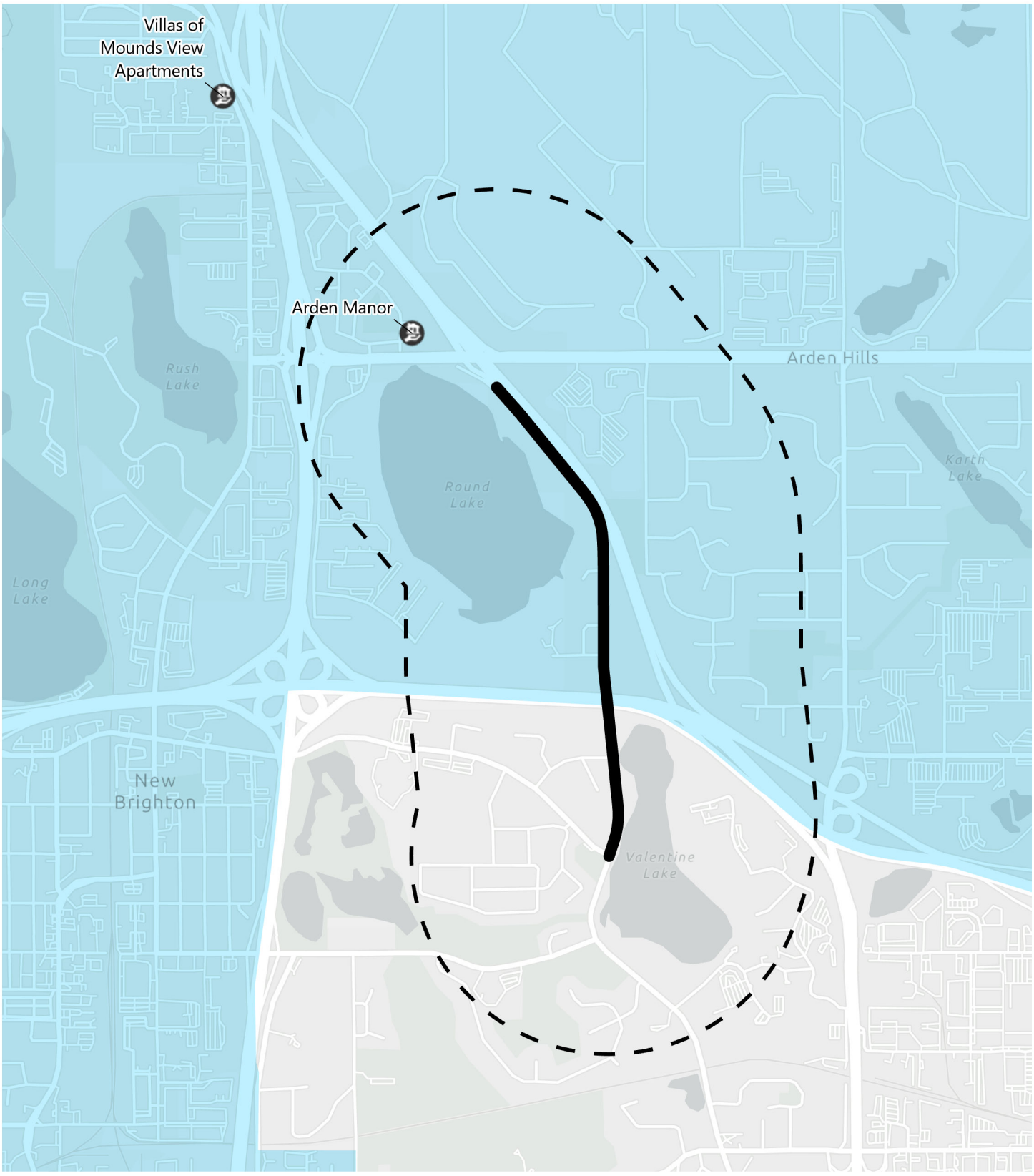
On behalf of the Ramsey County Public Works Department, I am writing to express our support for the City of Arden Hills' funding request for new paved pedestrian and bike trails along Old Highway 10 from Lake Valentine Road to County Highway 96.

The construction of this trail is in alignment with Ramsey County's All Abilities Transportation Network, where pedestrians and bicyclists are prioritized on our transportation system. This trail would provide improved safety for those who walk and bike in the community and provide connections to nearby Valentine Hills Elementary School, Mounds View High school, Bethel College and to the Tony Schmidt Regional Park on Lake Johanna.

Sincerely,

Brian Isaacson
Director of Public Works

1425 Paul Kirkwold Drive
Arden Hills, MN 55112
651-266-7100
www.ramseycounty.us



Old Hwy 10 SRTC Trail Improvements
Affordable Housing

Affordable Housing
Proposed Project
1/2 Mile Project Buffer

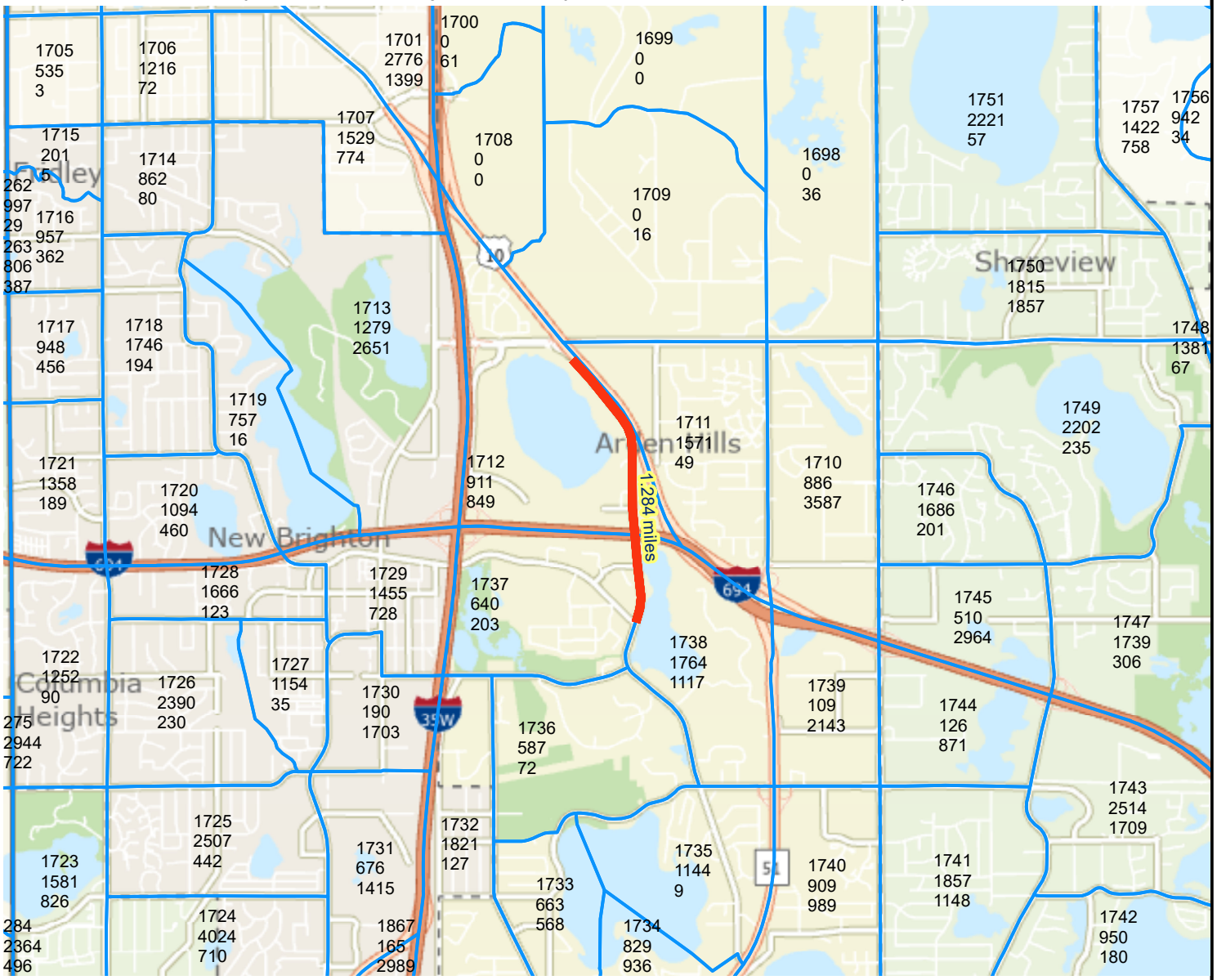
Regional Environmental Justice Area
Area of Concentrated Poverty

Population/Employment Summary

Multiuse Trails and Bicycle Facilities Project: Old Hwy 10 SRTS Trail Improvements | Map ID: 1702318882960

Results

Within ONE Mile of project:
Total Population: 15458
Total Employment: 15621



Project Points
Project
Project Area
2016 TAZ

0 0.45 0.9 1.8 2.7 3.6 Miles

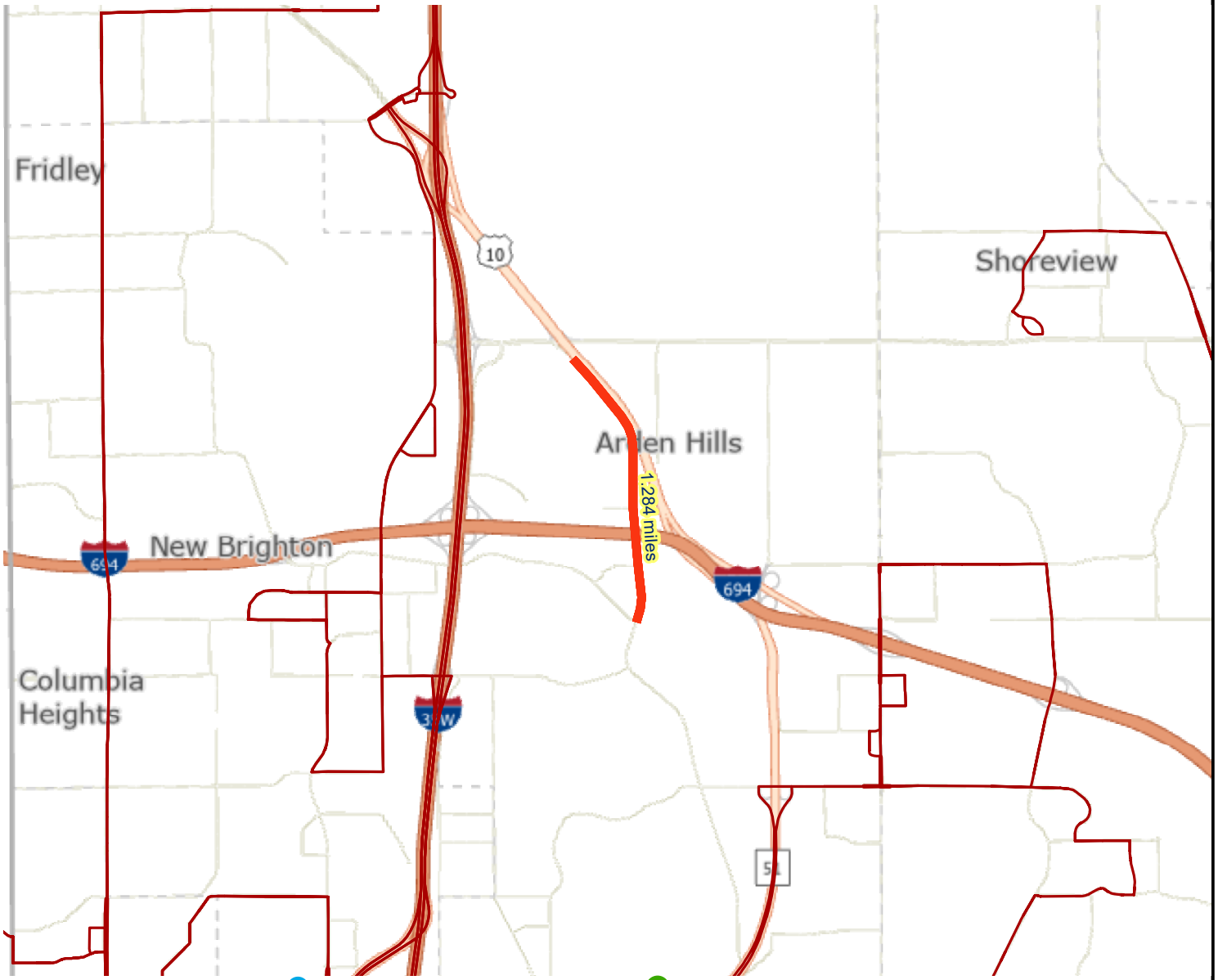
Created: 12/11/2023
LandscapeRSA4

For complete disclaimer of accuracy, please visit https://giswebsite.metc.state.mn.us/gissite/notice.aspx

METROPOLITAN COUNCIL

Transit Connections

Multiuse Trails and Bicycle Facilities Project: Old Hwy 10 SRTS Trail Improvements | Map ID: 1702318882960



Results

Transit with a Direct Connection to project:
-- NONE --

**indicates Planned Alignments*

Transit Market areas: 3

Project Points
Project
Project Area
Arterial Bus Rapid Transit
Commuter Rail
Dedicated Bus Rapid Transit
Highway Bus Rapid Transit
Light Rail
Arterial Bus Rapid Transit
Commuter Rail
Dedicated Bus Rapid Transit
Highway Bus Rapid Transit
Light Rail
Transit Routes

0 0.45 0.9 1.8 2.7 3.6 Miles

Created: 12/11/2023
LandscapeRSA3

METROPOLITAN COUNCIL