City of Medicine Lake

City Council Design Update for the Capital Improvement Project (CIP)

December 7, 2021

SEH
Building a Better World for All of Us®

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Partnership Slide

(from the June 7, 2021, initial Council meeting kicking off design phase)

SEH

Building a Better World for All of Us®

City of Medicine Lake

Our scope – design all CIP improvements for potential bidding and construction in 2022 dependent on funding

Design Topics to Cover

The following design items will be discussed:

1. Street and Drainage Design Elements
2. Pedestrian and Bicyclist Safety Features
3. Water Main
4. Sanitary Sewer and Inflow/Infiltration (I/I)
5. Trail Replacement on South Shore Drive
6. Public Engagement
7. Phasing

Project goals

Why are we even doing this project?

1. Safety concerns – inadequate water for fire protection (water hauled in now)
2. Aging street and other infrastructure
3. Enhance road safety for all users, including walkers and bikers
4. Provide residents with opportunity to connect to a public water supply in lieu of maintaining private wells
5. Sewer pipes cracked and leaking and 50+ year old lift station is beyond normal maintenance

Design Process

The following process was followed during design to give SEH guidance:

1. Initial Council presentation for residents on 6/7/21 to kick off the design
2. Direct input from City – Chris Heim and Chris Klar
3. CIP Citizen Committee input
4. Extensive Public Engagement process through individual property owner packets, one on one meetings, feedback comment cards, 3 open houses and numerous pages of note and markings on plans.
5. City of Plymouth and Medicine Lake Fire Chief input on watermain design

Street Design Topics

- Street geometrics and profile
- Pavement strength and thickness
- Drainage design
- Soil remediation
- Driveway connections

Street Design Summary

Geometric layout design – i.e., plan view

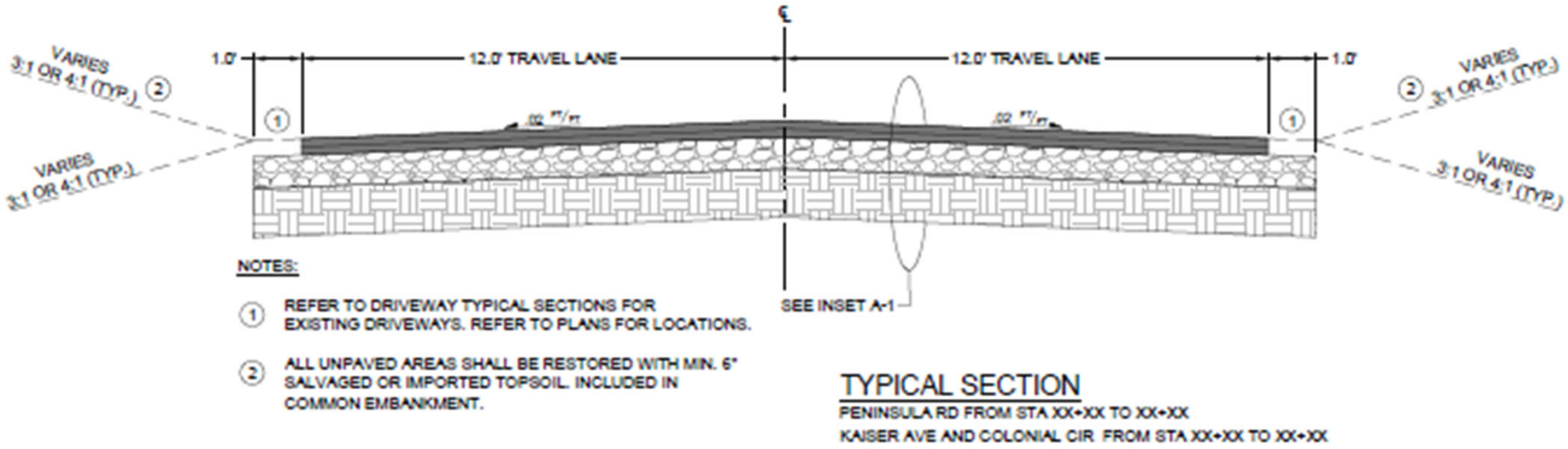
- 24 feet wide: Two 9-foot driving lanes and 3-foot shoulders. Generally same width as today.
- Follows existing alignment so edges match driveways. Any grass or landscaping along street that is damaged will be restored by contractor.
- There are a few minor deviations from current street to maintain a consistent roadway footprint.
- Added a cross slope – 2% crown from center to edge to prevent ponding water. Edges will be 3” lower than centerline.

Street Design Summary (cont'd)

Profile design (side view through street)

- Rolling topography. Centerline grades range from a minimum of 0.5% to 5%. Some flatter slopes in the area adjacent to Jevne Park.
- The grades generally match current street profile (within 0.1 – 0.5 feet of existing elevation).
- Some profile grades adjusted slightly to match driveway match points and improve drainage – i.e., lowered or raised street.
- Goal was to maintain existing driveway slopes or improve them.

Typical Section for Street



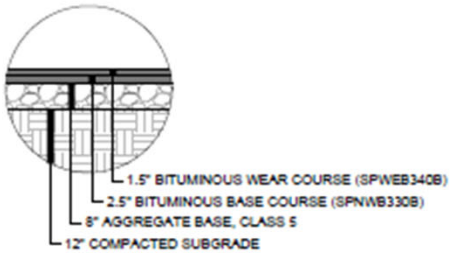
NOTES:

1. REFER TO DRIVEWAY TYPICAL SECTIONS FOR EXISTING DRIVEWAYS. REFER TO PLANS FOR LOCATIONS.
2. ALL UNPAVED AREAS SHALL BE RESTORED WITH MIN. 6" SALVAGED OR IMPORTED TOPSOIL. INCLUDED IN COMMON EMBANKMENT.

TYPICAL SECTION

PENINSULA RD FROM STA XX+XX TO XX+XX
KAISER AVE AND COLONIAL CIR FROM STA XX+XX TO XX+XX

INSET A-1



Street Design – Pavement Strength

The structural street design consists of 12” of gravel and 4” of asphalt, based on the soil study recommendations. This is a typical design for residential street structural design standards.

Poor soils will require subgrade correction in several areas consisting of these options:

- Using structural fabric to separate gravel base from subgrade in soft areas.
- Removing an additional 1 foot of subgrade material and bringing in clean sand fill.
- Minimizing the disruption to subgrade soils for utility work especially around Jevne Park.

Street Design – Subgrade Correction Areas

Street Design - Drainage

Two general engineering methods are used to provide storm water management for any street design:

1. Curb/gutter and storm sewers. This is not a viable option due to lack of downstream drainage facilities and it does not fit the character of the City.
2. Roadside ditches and culverts under driveways. Eliminated due to large negative impacts to adjacent properties and lack of downstream facilities

Street Design - Drainage

Final drainage design guidelines for project:

- Drainage will essentially follow current patterns of flow.
- Road elevations modified where possible to improve overall drainage flow.
- Minimize or eliminate street flow onto driveways
- Maintain longitudinally flow along street edge until it can spill off into a grassy area.
- Small rain gardens may be used to help manage flow of water on private property. A policy on the installation and maintenance of any rain gardens has not yet been determined.

Street Design – Life Expectancy

In Minnesota, asphalt pavements can expect to last 40-50 years with proper maintenance

- Seal Coating or crack sealing every 5-7 years
- Thin mill and overlay every 12 years
- Full depth overlays every 25 years.
- Repeat maintenance cycle twice if funding available.

Without proper maintenance, the expected life of asphalts streets is approximately 25 years.

Street Design – Driveway Match Points

Minimizing driveway impacts was a key element of the design.

Three types of driveway situations:

1. Driveways that slope down to the street at less than 10%, the maximum accepted slope for a driveway.
2. Driveways that slope down to street greater than 10%.
3. Driveways that slope away from street toward garage (back pitched).

Overall guidelines for each situation are…….

Street Design – Driveway Guidelines

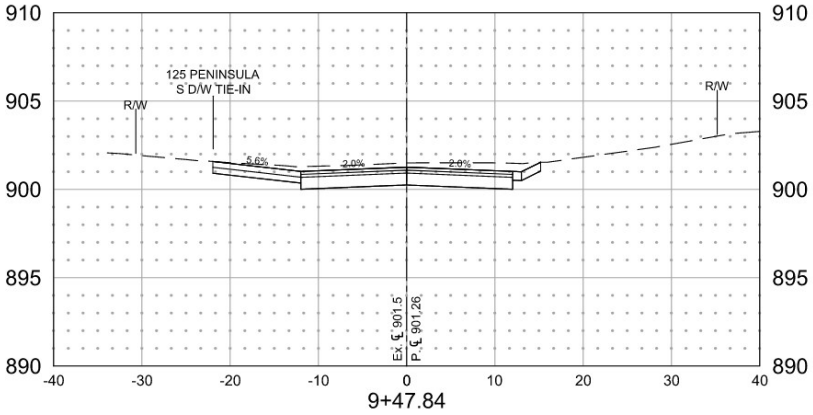
Design guidelines that were followed:

1. Match existing driveway grades as possible. If any increase, keep under 10%.
2. No increase to driveway slopes currently over 10% grade.
3. For the back pitched driveways, a “high point” was added about 5 feet from the street to create a “v” to minimize water moving down the driveway.

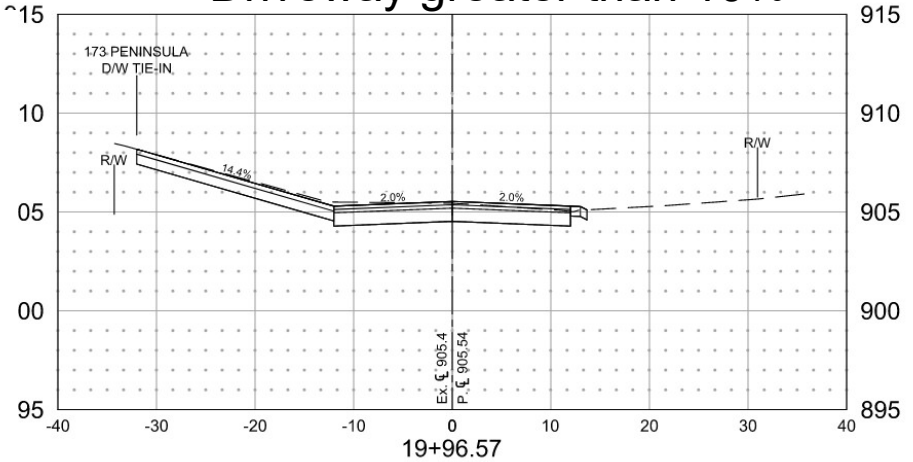
Examples…

Street Design – Driveway Examples

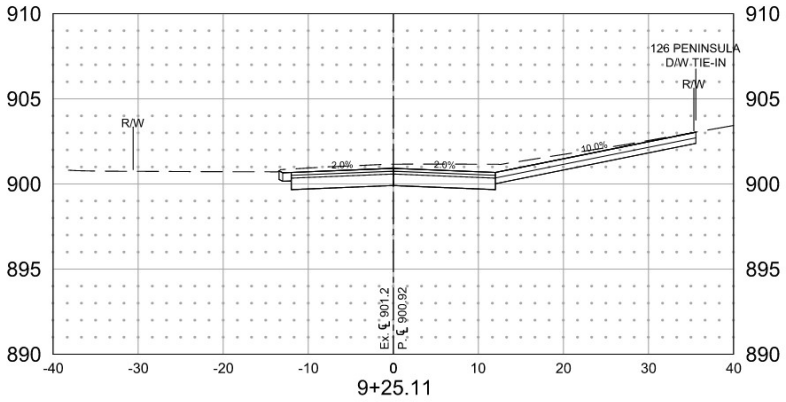
Standard driveway less than 10%



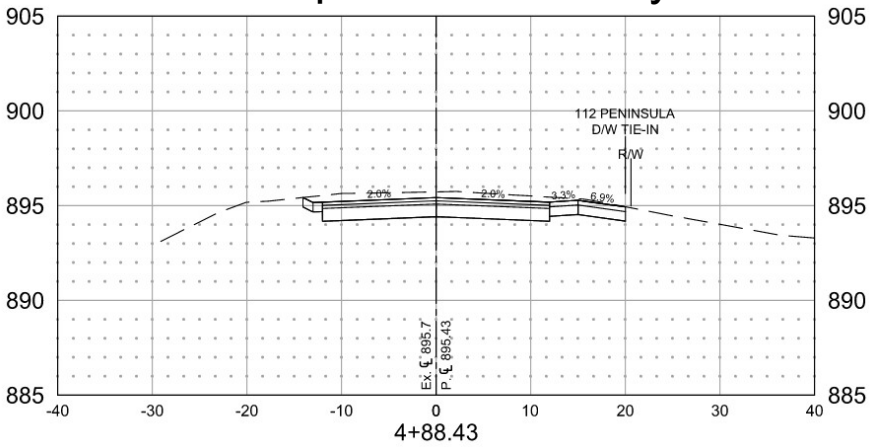
Driveway greater than 10%



Driveway at 10% grade

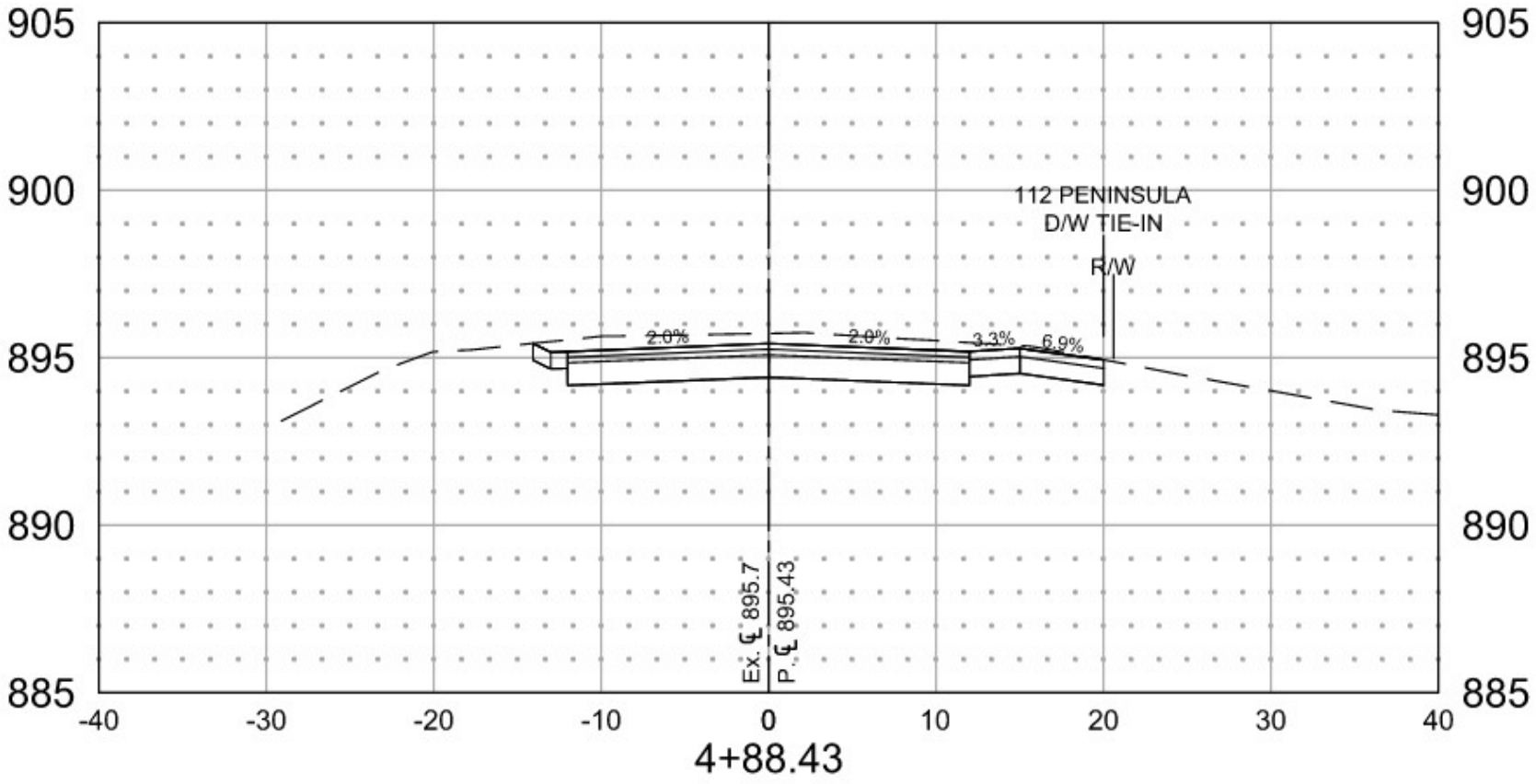


Back pitched driveway



Street Design – Driveway Examples

Back pitched driveway



Street Design – Driveway Guidelines

Other driveway design guidelines:

- Match current materials – asphalt to asphalt, concrete to concrete, etc.
- Special driveways – colored/stamped, pavers, etc.
  - We will try and match the color and pattern of these, but it will be difficult to match exactly due to age and weathering
  - Consider a concrete approach to avoid matching exact colors
  - Would work with property owners to resolve on a case-by-case basis
- Match the existing driveway width at street unless property owner requests modifications

Other Design Elements along street

1. Mailboxes:

- Contractor will remove, salvage and reinstall. Property owner may want to assist on any special mailboxes
- Post office will generally not deliver in construction zones.
- Temporary mailboxes will be set up in a central location outside of project limits.
- Security was a concern brought up at the neighborhood meetings – final resolution TBD
- Possible central lock box for parcel deliveries?

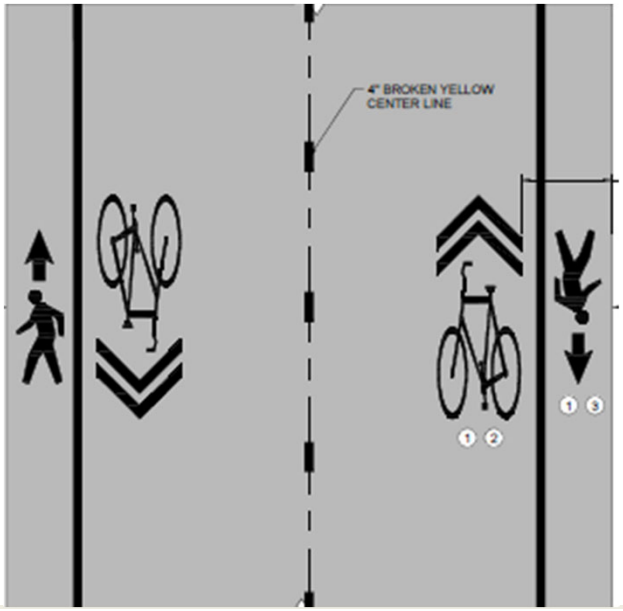
2. Private parking areas along streets:

- Maintain current size and location unless property owner requests modifications.

Pedestrians and Bicyclists' Safety

Complete Streets concepts incorporated into design

- Reduced driving lanes(9 feet wide) with center dashed yellow stripe for traffic calming.
- 30" space along shoulder with white stripe for pedestrian walking area.
- Vehicles notified to share road with bicyclists.
- Stencils on pavement for walkers and bicyclists.



Safety – Driver Feedback Signs

Traffic calming devices - effective for speed control

4 locations established by accepted traffic engineering standards i.e., sight lines, spacing, driver behavior, etc.

- 2 northbound
- 2 southbound

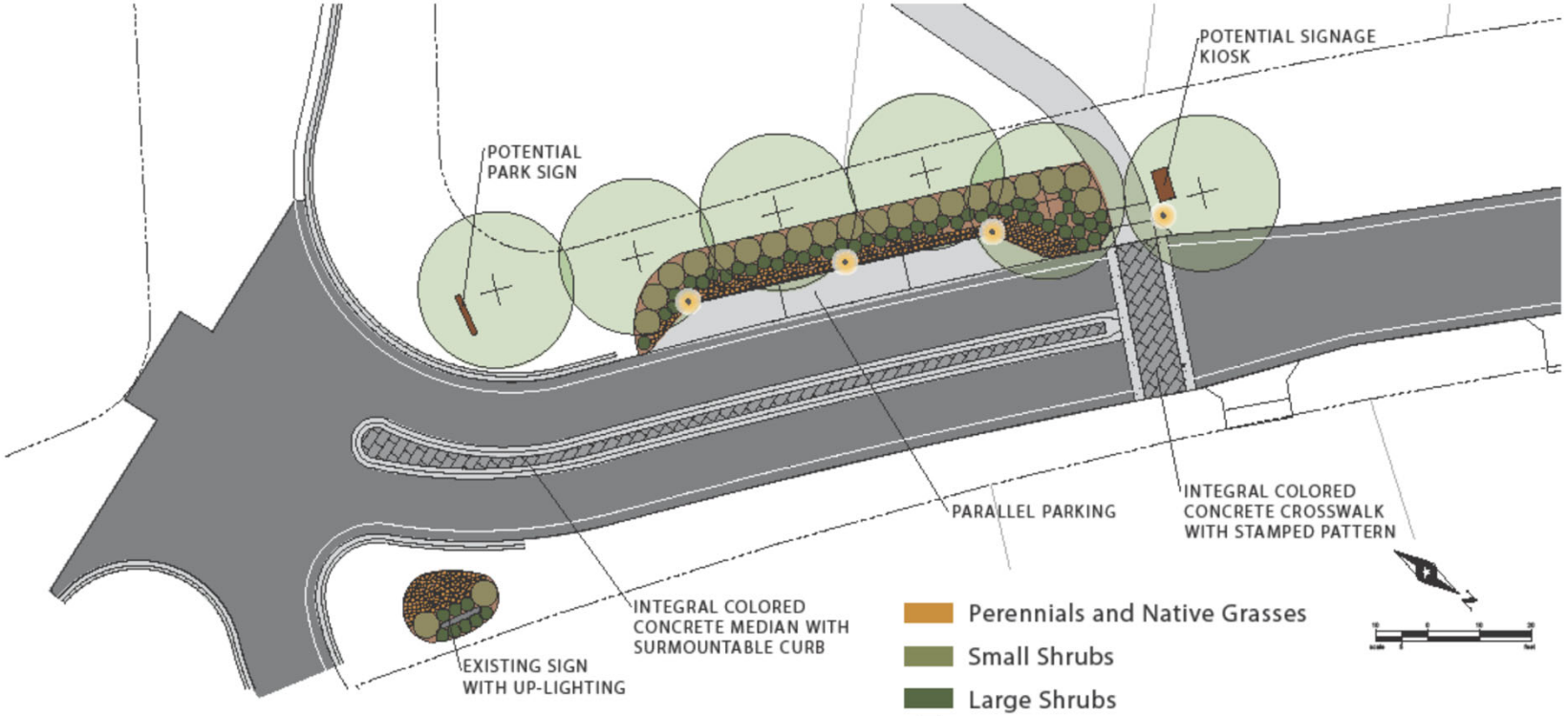
Driver Feedback Signs - Locations

Street Design – Entrance Feature

Goal: To create a unique entrance feature that informs motorists that they are entering a unique neighborhood and that the safety of all users is important.

- Reinforce community gateway
- Guide turning movements
- Reduce vehicle speed
- Inform and educate safety measures incorporating complete streets concepts
- Delineate trail crossing
- Future landscaping and lighting

Street Design – Entrance Feature Concept Plan

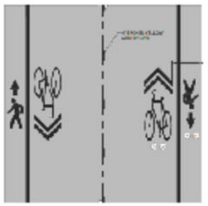


Additional Features


Bollard Light


Decorated Light Fixtures


Feature Poles


Pavement Markings

Water Main Design

Key elements:

- Extension of City of Plymouth system – they will maintain the system. Designed to meet their design standards.
- 8” PVC (plastic) pipe planned due to the corrosive soils
- Hydraulic modeling determined that adequate pressure exists for fire flow at the end of the line.
- Hydrant locations approximately 400 feet apart (200-foot radius required for NFPA fire coverage). Medicine Lake Fire Chief has reviewed.
- Trench boxes will be required of the contractor to minimize the width of watermain trenches and avoid unnecessary tree loss and impacts to private property

Proposed Water Main

Large watermain maps showing the final hydrant and service line locations are available to review after the presentation.

City of Plymouth will maintain the water main, so the design must meet their standards

Water Main Design (cont'd)

Other key watermain elements consist of:

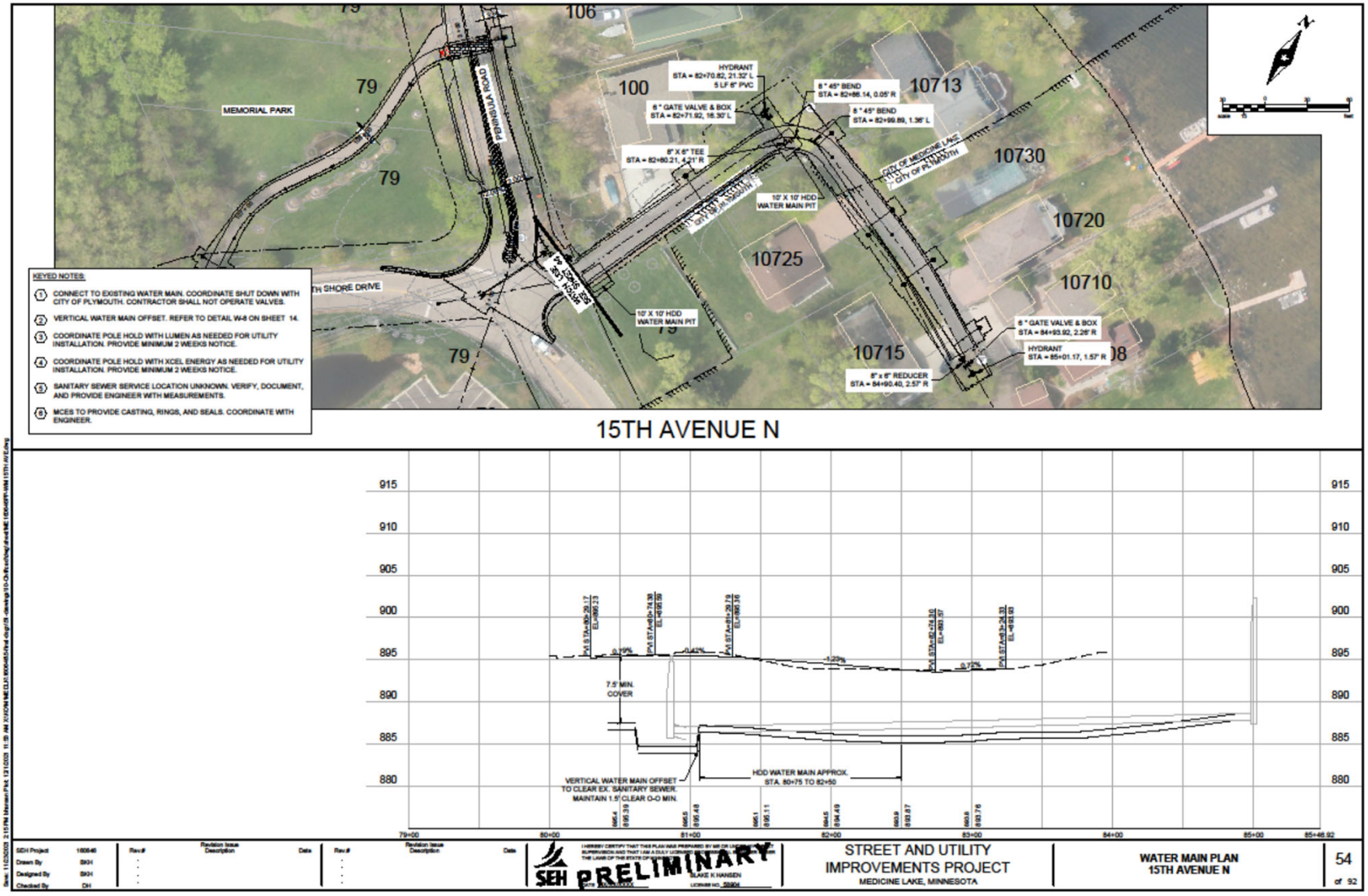
- 15th Ave to be included for both Medicine Lake and Plymouth residents.
- Four areas proposed for Horizontal Directional Drilling (HDD) to avoid exposing poor soils:
  - Connection from Colonial Circle to South Shore Drive through the swamp to complete loop.
  - Colonial Circle due to private utility conflicts and need to maintain proper distance from sanitary sewer.
  - On the west loop of Jevne Park due to poor soils prohibiting open cut trenching.
  - 15th Ave within the Medicine Lake portion to avoid digging up street.

Horizontal Directional Drilling Areas

15th Ave

- Extends water main to end of Medicine Lake city limits via directional drilling (HDD).
- Install new services to both properties.
- Minimal street work.
- City of Plymouth portion:
  - New watermain and services to their 5 homes.
  - Street reconstruction to include curb and gutter (city standard) minimum 21 feet wide.
  - Relocate street into existing right-of-way which moves street slightly south at east end.

15th Ave Water Main



Water Main Design – Private Services

- All property owners will get a new private 1” service line installed from the main to the right-of-way/property line (approx. 30 feet).
- New curb stop (shut off valve) will be installed.
- Final curb stop locations were determined by property owners through the public input process.
- No requirement to connect to City water within any specified time frame.
- Fire hydrants will be available immediately for fire department use.

Sanitary Sewer Design

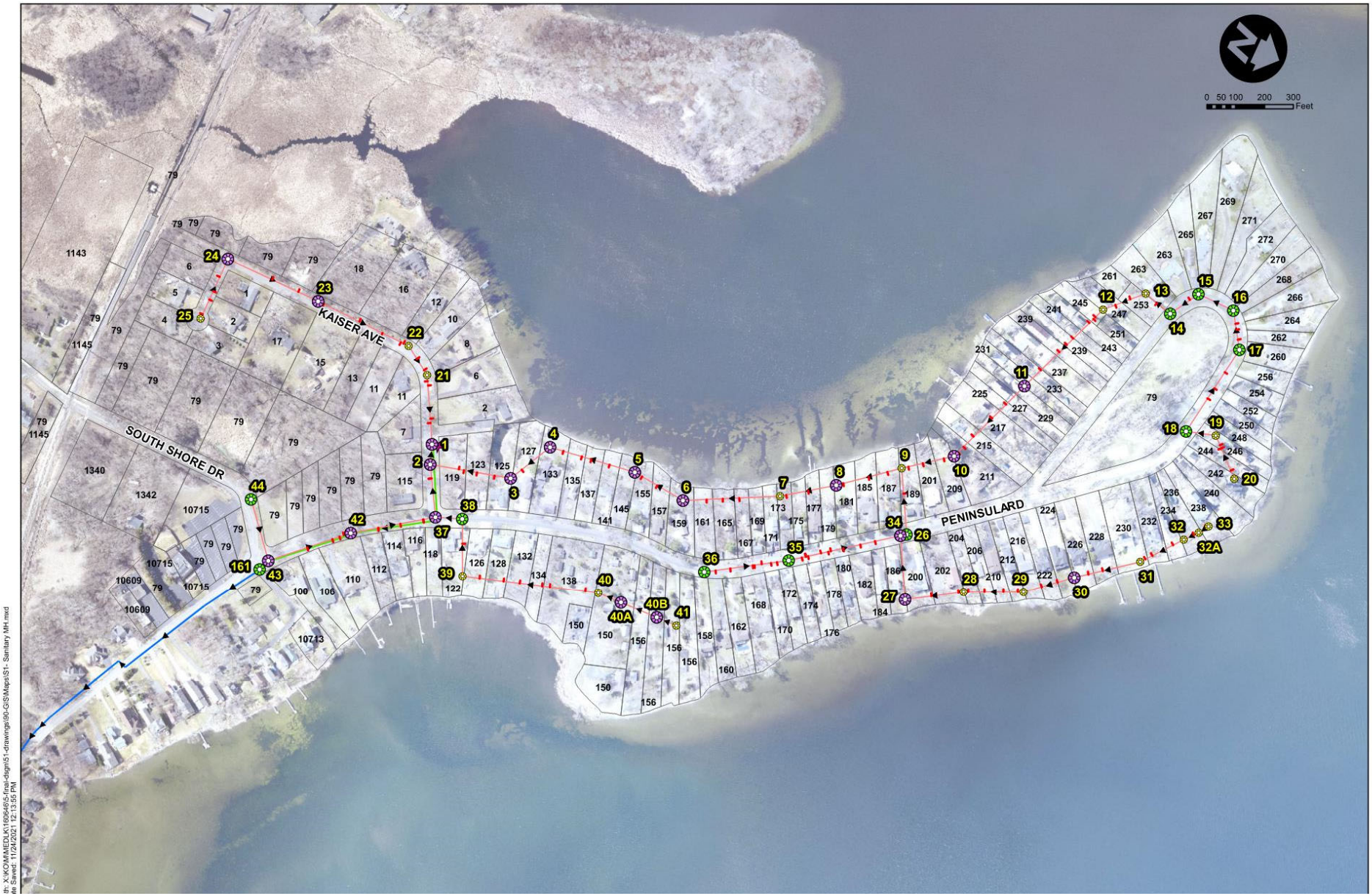
Needed to limit sanitary sewage leakage.

Two Components:

1. Private laterals:
   - 58 laterals within the street. Will be lined to outside of pavement areas (20 feet).
   - 72 laterals in rear yards. Will line 10 feet out.
2. Manhole rehabilitation:
   - 19 manholes to be grouted to seal cracks from infiltration.
   - 30 manholes to receive chimney seals to prevent inflow.

Met Council funding 50% of costs up to $100,000 as part of their sewage grant program

Sanitary Sewer System

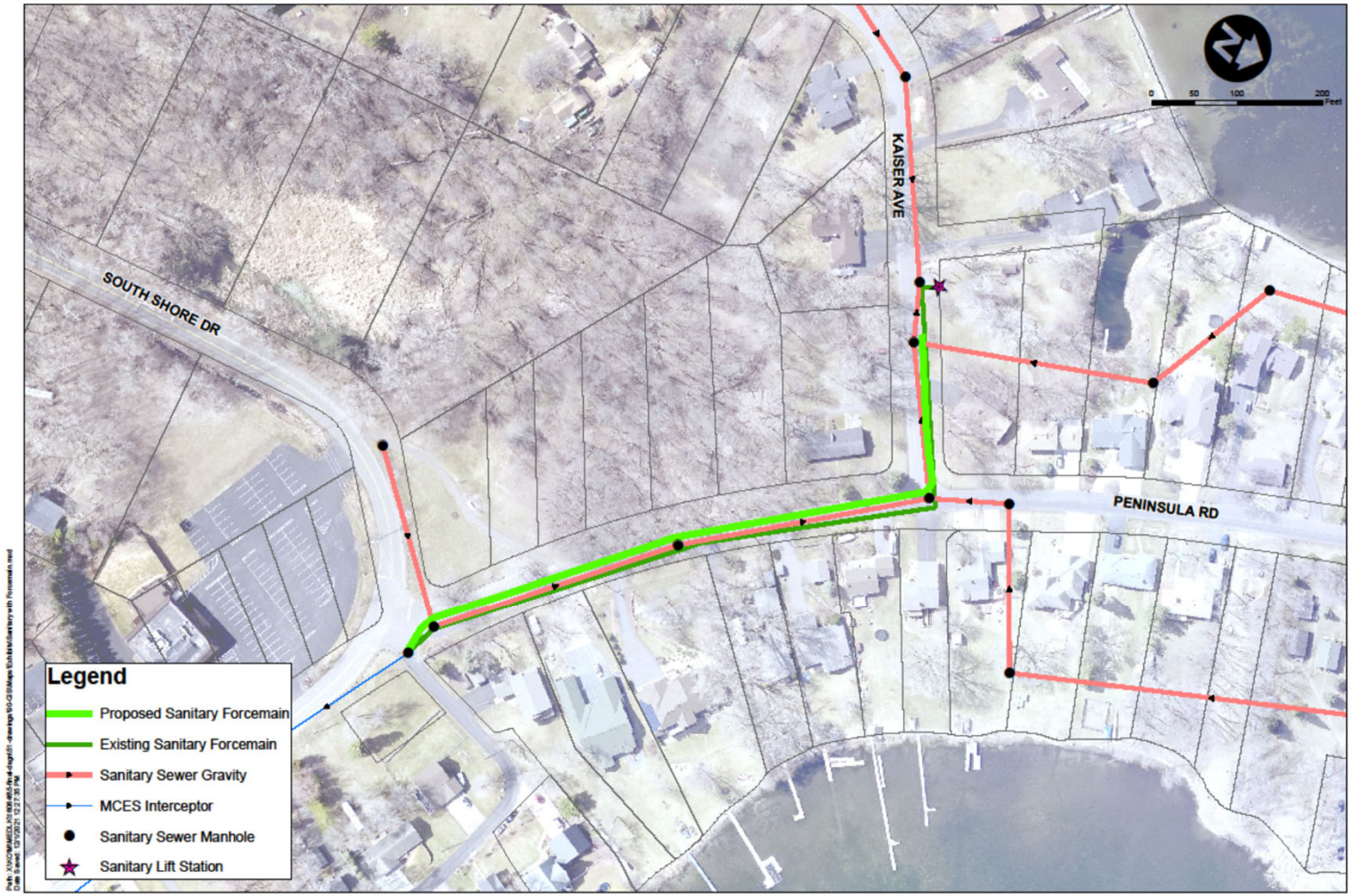


Sanitary Sewer - Replace lift Station

Separate project:

- Was bid and awarded to Minger Construction for $547,500 in October
- Construction to occur in 2022
- Supply issues may delay equipment delivery.
- Force main from Lift Station to MCES manhole will be done with street project.

Sanitary Force Main Layout

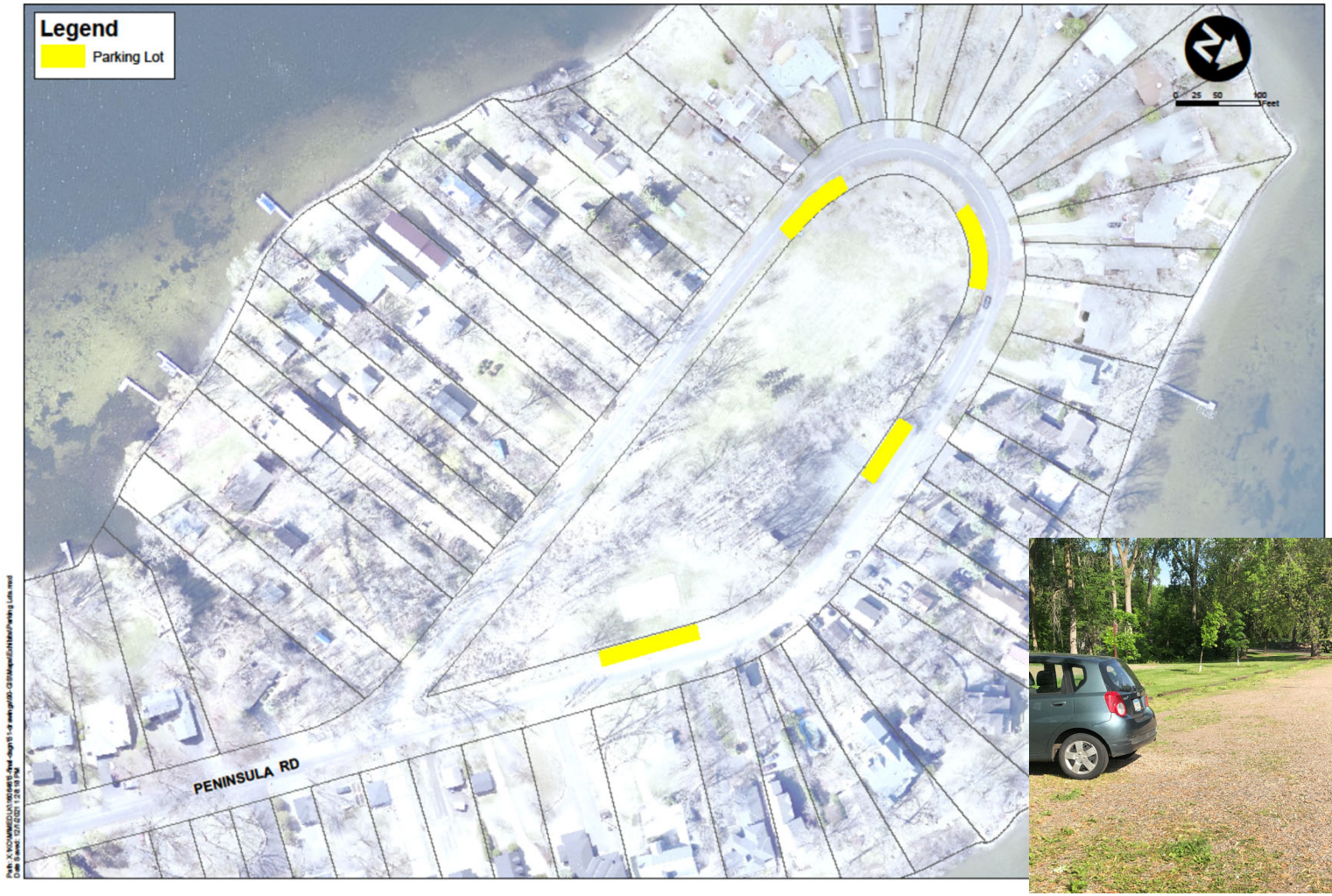


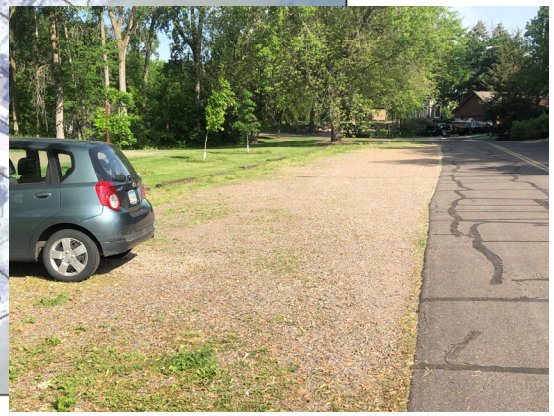
Jevne Park

Jevne Park elements:

- All 4 parking lots to be redone and paved.
  - Currently grass or gravel parking areas
  - Will be paved with asphalt.
  - Permeable pavers will not function properly due to soils – no watershed benefit to use
- Total cumulative parking area will be adjusted to about 2/3 current area.
- No major drainage improvements or larger wetland/stormwater management project included with this project

Parking Lot Locations

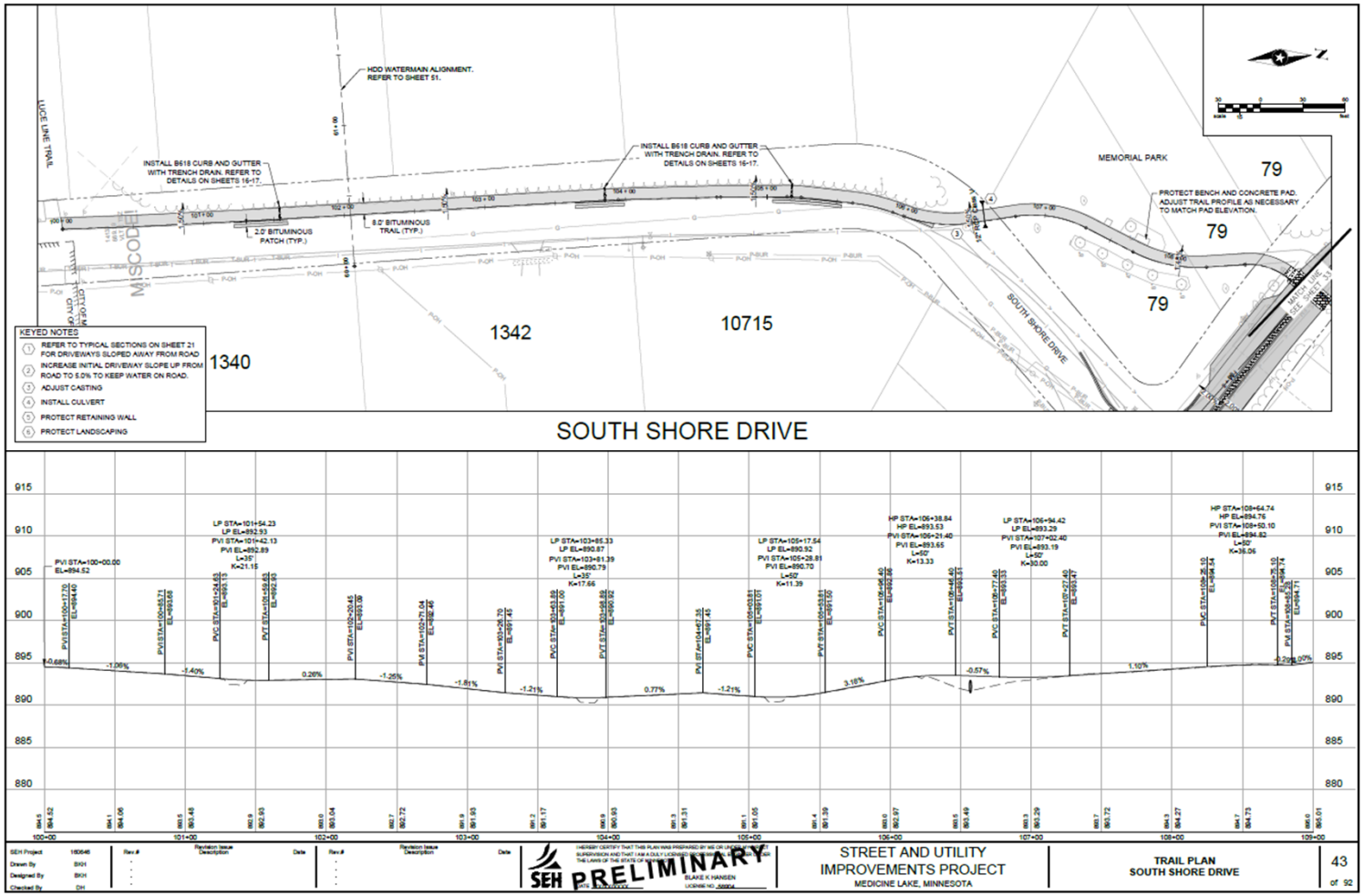




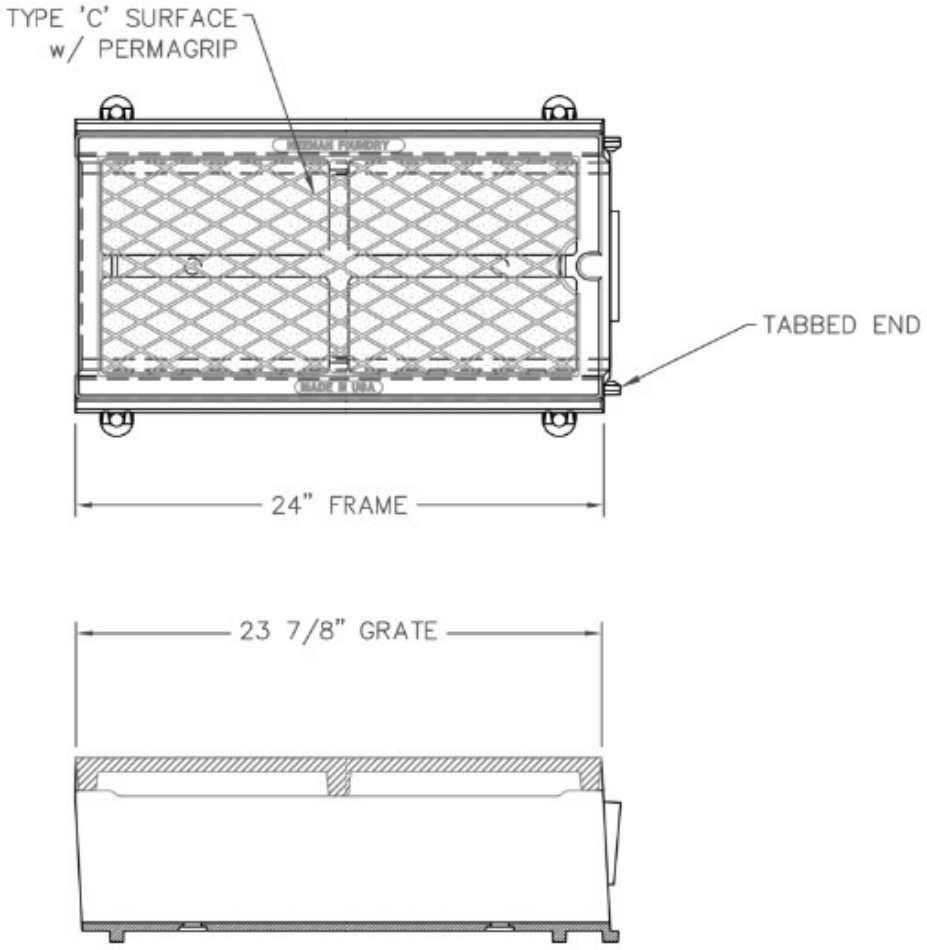
South Shore Trail Reconstruction

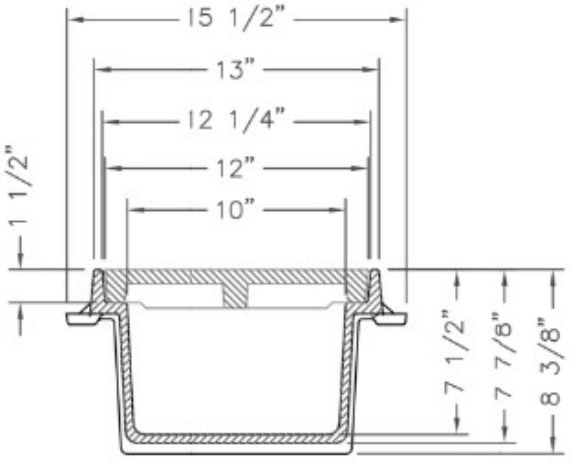
- Improve aging surface and user safety
- Reduce maintenance costs and extend life
- Address drainage concerns

South Shore Trail Detailed Design



South Shore Trail Trench Drain Details – Used at Low Spots Across Trail





Items not Included in Project

- Landscaping and lighting at entrance feature (separate City contract after project).
- Rain gardens – will provide design details and educational materials to residents that want to install rain gardens on property.
- Security cameras
  - Beyond project scope. Would need to be a separate initiative working with Hennepin County sheriff's office to resolve privacy and data management issues.
- New or revised street lighting
- Burying of overhead power lines

Staging Options

Given the timing of state bonding funds – July 1,2022, the following staging options are being considered:

1. Construct a smaller portion of the project in the 4 months of 2022 and the remainder in the 8 months of 2023.
2. Delay the entire project until 2023.
3. Install the water main in 2022 via directional drilling to enable street access all year, avoid the poor soils and replace the streets in 2023.

Final staging plan will be outlined in project specifications. Greater flexibility given to contractors will generally reduce overall bid prices.

Public Engagement Process - Design

- Individualized property owner packets provided to all properties.
- Used to solicit input into design, concerns and final water service location.
- 3 neighborhood meetings held to review overall design, answer questions and solicit feedback.
- Comment cards provided to return to design team.
- Formal CIP committee met several times with SEH to provide design review and oversight.

Costs/Funding

Project Costs

- Current estimates came from CIP study done in December 2020
- Approximately $5.5 - 6M
- Will generate a final engineer's estimate once design completed and all quantities and bid items identified – 12/31/2021

Costs/Financing

Financing plan

- Aggressively pursuing State bonding = 50% match.
- If unsuccessful, City will sell bonds on own. Repayment amount built into property taxes
- Pursuing other federal funding (i.e., new infrastructure bill) if available for this project.
- Met Council grant for 50% of sanitary costs
- City of Plymouth to pay 100% of their portion of 15th Street

Next Steps – Timeline for completion of design phase

Proposed Schedule/ Next Steps for design:

a) 95% plans provided to design team for final review on 12/8.

b) Final plans and bidding documents completed by 12/31/21. Bid documents consist of:

- 100% plans with all City revisions made.
- Project manual and bid specifications.
- Final engineer's estimate.

Next Steps – Timeline for bidding and construction

Bidding and final construction schedule for the street and utility project is still not yet determined.

a) State bonding requirements restricts construction until July 1, 2022.

b) Proposed to bid and award the contract this Spring (2022)

c) Final staging option and contractor input will determine the exact start date.

Next Steps – Community Coordination

Public engagement process during construction will consist of the following activities:

- Initial neighborhood meeting to review construction schedule and other concerns – access, property impacts, etc. Contractor to attend
- Weekly updates, project web site, emails, etc.
- Full time construction inspector available daily for questions and concerns
- Weekly ongoing construction meetings will be held, and key schedule items will be provided to residents

Open House tonight

Plans and large layouts available to review after tonight's presentation.

Design team members will be available to answer specific questions.

Thank you !!

Additional questions and
Project contacts.

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