



October 1, 2019

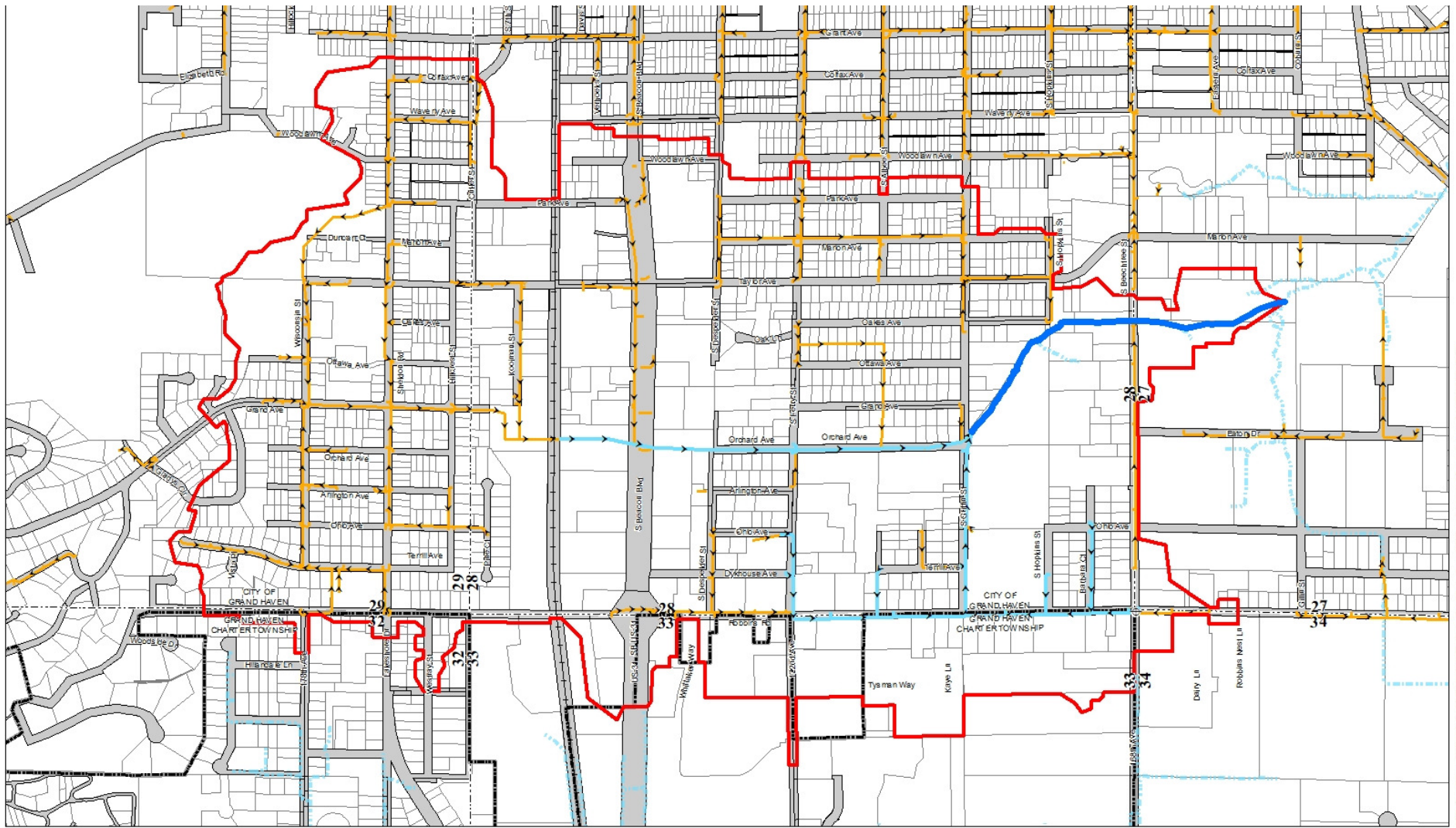
Warber Drain Board of Determination

Prein & Newhof

Warber Drain

- Petitioned by Grand Haven Township on March 25, 2019 under Chapter 8 of the Michigan Drain Code of 1956.
- Michigan Drain Code requires a Board of Determination Meeting





J:\GIS_Cover\Ottawa\GD70\GD_Cover\WarberDrain\WarberDrain_SDDP\Warber_Drain_1x17.mxd - 11/12/19 12:17:32 PM

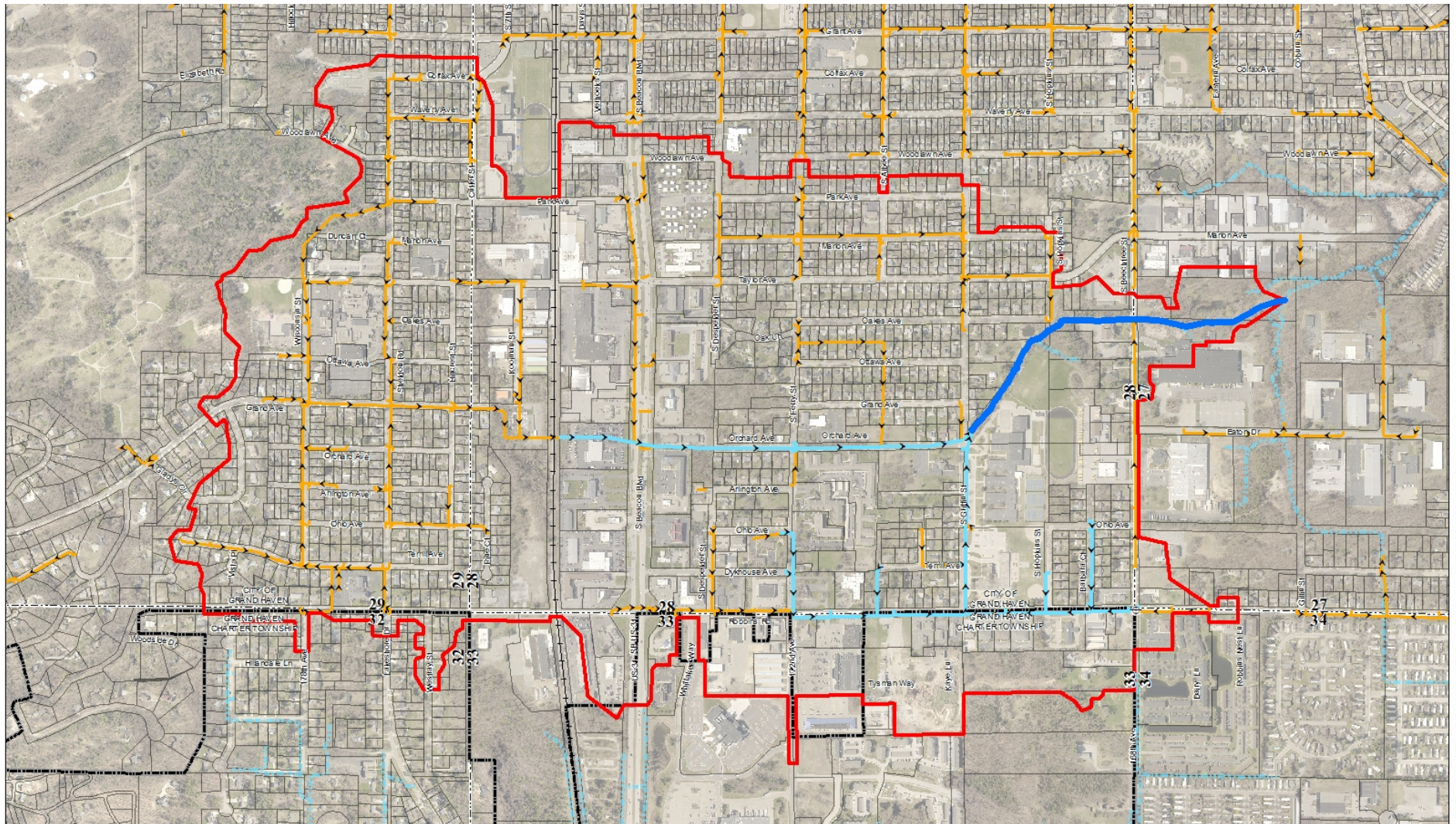
SCALE: 1" = 700'

- LEGEND**
- ▭ WARBER DRAIN DRAINAGE DISTRICT
 - WARBER DRAIN - STORM SEWER
 - WARBER DRAIN - OPEN DRAIN
 - STORM SEWER
 - NATURAL WATERCOURSES
 - ▭ JURISDICTIONAL BOUNDARIES
 - ▭ SECTION LINE

OTTAWA COUNTY WATER RESOURCES COMMISSIONER
 SECTIONS 27, 28, 29, 32, AND 34
 CITY OF GRAND HAVEN AND GRAND HAVEN CHARTER TOWNSHIP
WARBER DRAIN DRAINAGE DISTRICT
 SEPTEMBER 2019
 Prein & Newhof

Current Drainage District and Route and Course

Prein & Newhof



J:\66_CoverOttawa\6076\00_Proj\190209_OCWARC_WarberDrain\WarberDrain_300Pne_Extant_1x17.mxd - 11/20/19 12:17:32 PM

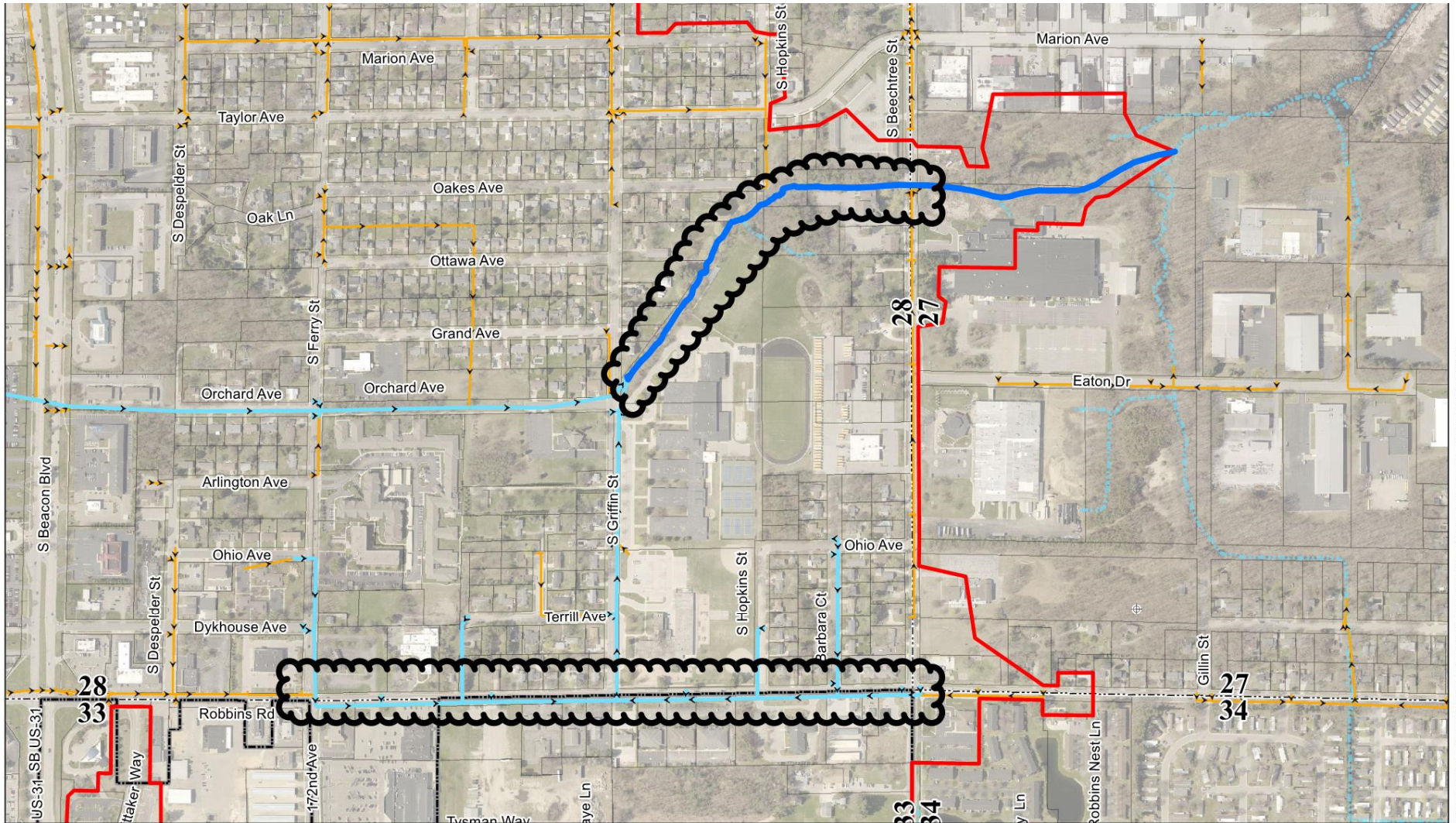


- LEGEND**
- ▭ WARBER DRAIN DRAINAGE DISTRICT
 - ▭ NATURAL WATERCOURSES
 - ▭ WARBER DRAIN - STORM SEWER
 - ▭ JURISDICTIONAL BOUNDARIES
 - ▭ WARBER DRAIN - OPEN DRAIN
 - ▭ SECTION LINE
 - ▭ STORM SEWER

OTTAWA COUNTY WATER RESOURCES COMMISSIONER
 SECTIONS 27, 28, 29, 32, 33 AND 34
 CITY OF GRAND HAVEN AND GRAND HAVEN CHARTER TOWNSHIP
WARBER DRAIN DRAINAGE DISTRICT
 SEPTEMBER 2019
 Prein & Newhof

Current Drainage District and Route and Course





J:\GIS_Client\Ottawa\GD00\COI_Proj\160339_CO\WRC_WarberDrain\WarberDrain_BODPrep_Exhibit_11x17.mxd - lmmar - 9/11/2019 12:17:32 PM

SCALE: 1" = 400'

- LEGEND**
- ▬ WARBER DRAIN DRAINAGE DISTRICT
 - - - NATURAL WATERCOURSES
 - ▬ WARBER DRAIN - STORM SEWER
 - ▬ WARBER DRAIN - OPEN DRAIN
 - ▬ STORM SEWER
 - JURISDICTIONAL BOUNDARIES
 - SECTION LINE

OTTAWA COUNTY WATER RESOURCES COMMISSIONER
 SECTIONS 27, 28, 29, 32, 33, AND 34
 CITY OF GRAND HAVEN AND GRAND HAVEN CHARTER TOWNSHIP
WARBER DRAIN DRAINAGE DISTRICT
 SEPTEMBER 2019
 Prein&Newhof

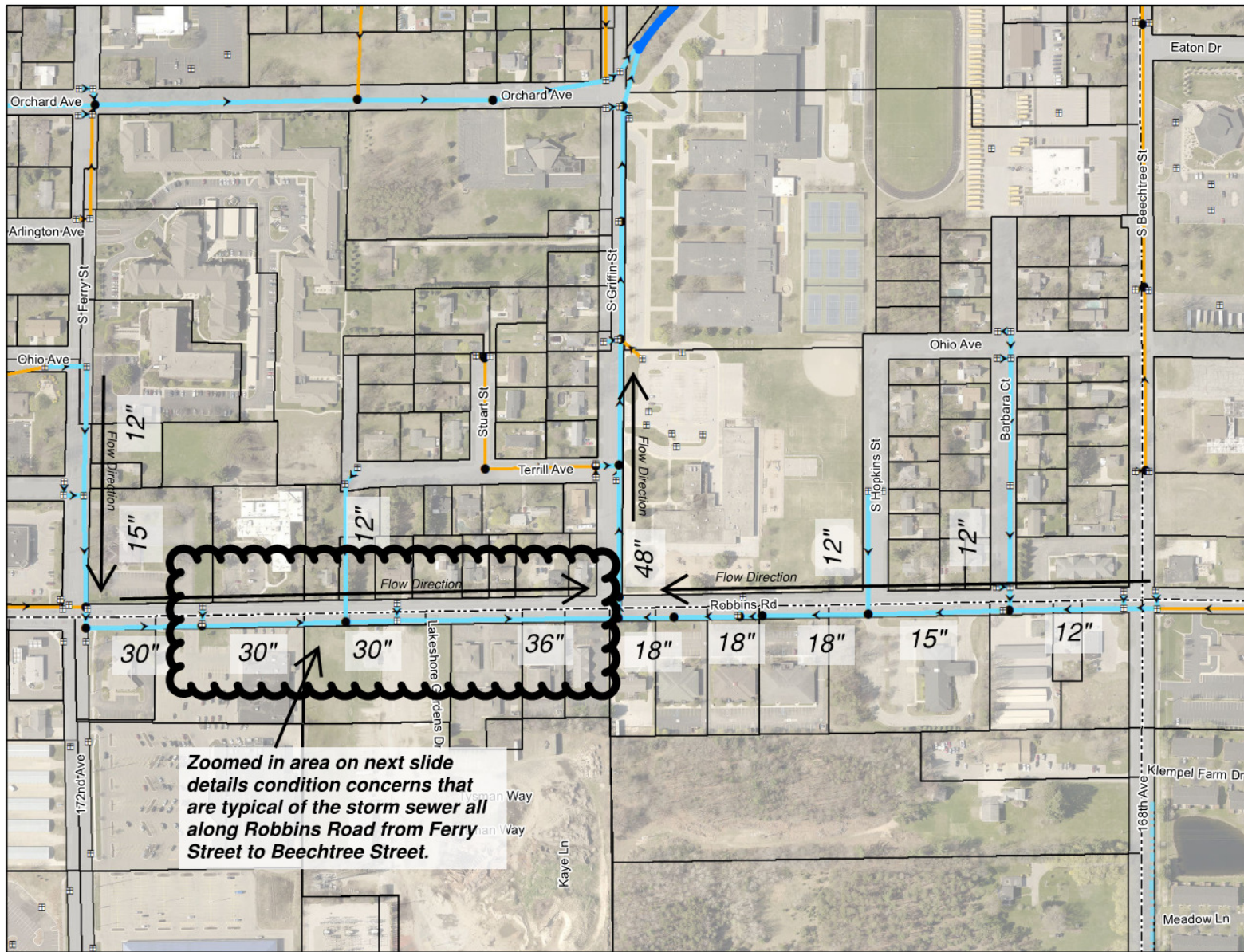
Current Known Issue Areas of the Warber Drain – Robbins Road between Ferry Street and Beechtree Street and the open drain from Griffin Street to Beechtree Street



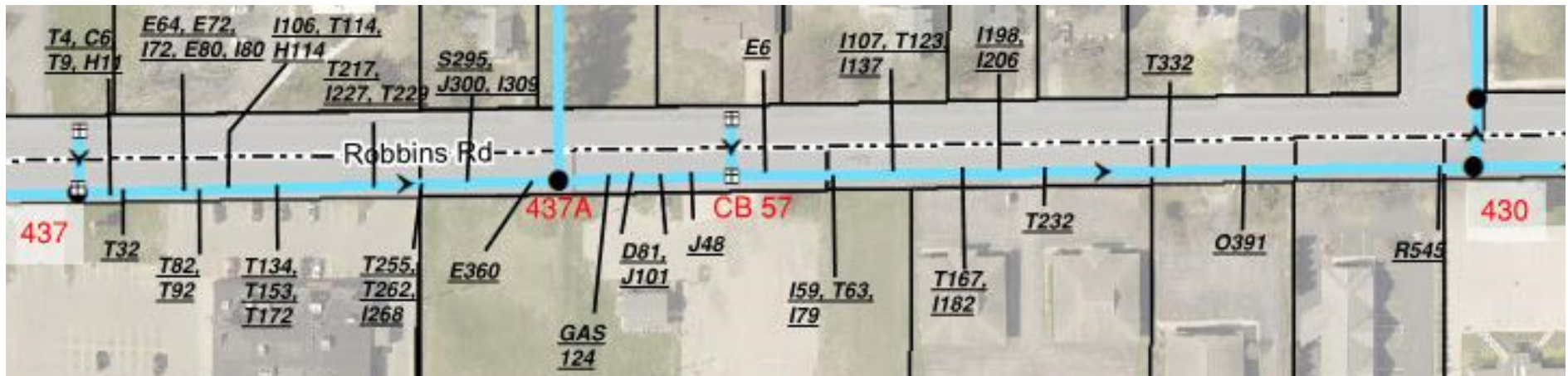
Warber Drain – Robbins Road

- From the surface, signs of failure and deterioration of the storm sewer have been shown, including sinkholes and settlement.
- To investigate these surface issues (sinkholes/settlement), the City of Grand Haven and OCWRC had the storm sewer televised
 - May 2017 – from Ferry Street to Beechtree Street
 - August 2018 – (2) sections of storm sewer closer to Ferry
- Engineering firm ENG reviewed condition of the storm sewer for OCWRC and created a report regarding the condition in February 2019





Warber Drain – Robbins Road Storm Sewer Diameter



- | | |
|------------------------------------|-------------------------|
| C - Longitudinal Crack | J - Joint Offset |
| D - Sand deposit | O - Obstruction in pipe |
| E - Mineral Encrustation on Joints | R - Roots |
| Gas - Gas line through pipe | S - Water Level Sag |
| H - Hole | T - Tap Break In |
| I - Infiltration | |

Warber Drain – Televising Notes between Ferry Street and Griffin Street

Prein&Newhof



Protruding tap and mineral deposit buildup (encrustation) at joint.



Cracked/Crushed/Collapsed Blind Taps are common in the Robbins Road Warber Drain storm sewer.



Collapsed protruding tap. These taps are located nearly entirely on the south side of the road and do not appear to have been properly sealed, and thus allow sediment to enter the storm sewer.



Cracking around lift hole of the 30 inch storm sewer.



12 inch (left) and 15 inch (right) non-reinforced concrete storm sewer has numerous sections with cracking, which deteriorates the structural strength of the pipe. This storm sewer is between Hopkins Street and Beechtree Street.



Roots in the joints of the 12 inch and 15 inch sections of non-reinforced concrete storm sewer between Hopkins Street and Beechtree Street. Roots impact the flow capacity of the storm sewer and indicate joint issues with the pipe.



Mineral deposit buildups in the storm sewer can restrict flow in the storm sewer.



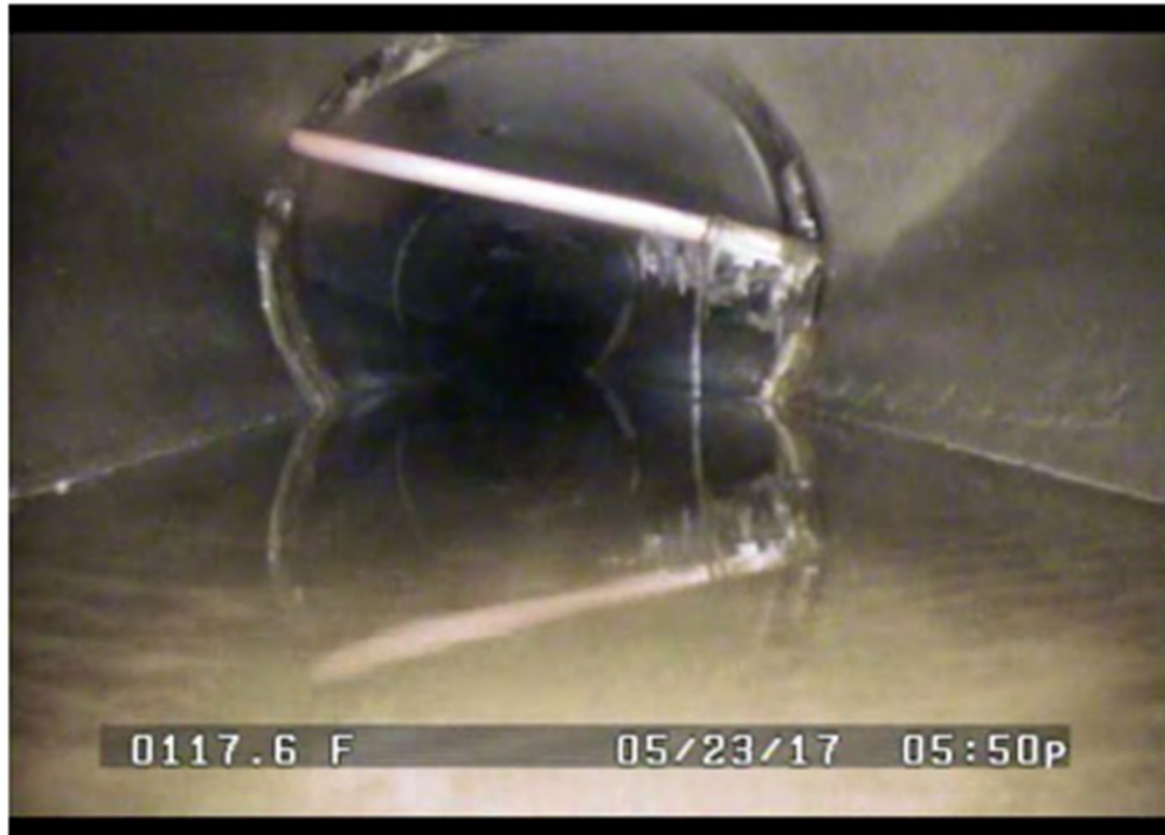
Infiltration through joints (photo on the left) and infiltration through a hole (photo on the right) in the 36 inch storm sewer.



Mortar blocking inlet of pipe in manhole.



Block manhole structures are beginning to deteriorate.



Gas line drilled through 30 inch storm sewer.

Warber Drain – Open Drain between Griffin Street and Beechtree Street

- OCWRC had Prein&Newhof inspect the Warber Drain from Griffin Street to Beechtree Street to review the condition of the drain on August 2, 2019





D - Miscellaneous Debris in Drain
L - Log Jam/Branches/Other Woody Debris in Drain
E/S - Erosion and/or sedimentation along drain banks

SCALE: 1" = 200'

- LEGEND**
- WARBER DRAIN - STORM SEWER
 - WARBER DRAIN - OPEN DRAIN
 - STORM SEWER
 - NATURAL WATERCOURSES
 - JURISDICTIONAL BOUNDARIES
 - SECTION LINE

OTTAWA COUNTY WATER RESOURCES COMMISSIONER
 SECTIONS 27, 28, 29, 30, 31, AND 34
 CITY OF GRAND HAVEN AND GRAND HAVEN CHARTER TOWNSHIP
WARBER DRAIN
OPEN DRAIN MAINTENANCE REVIEW
 SEPTEMBER 2019
 Prein&Newhof
 2190339

Current Known Issue Areas of the Warber Drain – Robbins Road between Ferry Street and Beechtree Street and the open drain from Griffin Street to Beechtree Street

Prein&Newhof



Debris (riprap) in drain and log jam downstream. Location is where school parking lot drains west towards Warber Drain.



Fallen trees in drain near northwestern-most corner of parking lot



Log jam in drain near southwestern edge of soccer field fence



Bank sloughing



Log jam from fallen branches in river (see map).
Branches appear to have fallen from willow tree on
west bank.



Woody debris near south bank of Warber Drain

Warber Drain – Next Steps

- Board of Determination to hear public and municipal comments about the petition
- Next Steps:
 - If a petition is deemed necessary:
 - Project Design
 - Easement Acquisition
 - Project Bid and Construction
 - Day of Review
 - If petition is deemed not necessary:
 - No further action will occur

