South Bar Lake Drain
Informational Meeting

Engineering Presentation
Brian J. Cenci, P.E. – Sr. Project Mngr.
Director of MI County Drain Services
GEI Consultants of Michigan, P.C.

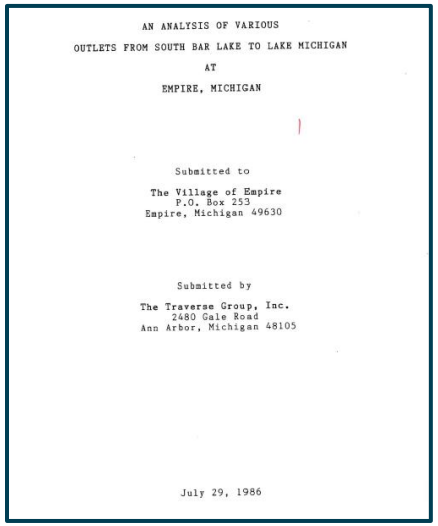
South Bar Lake Drain
Scope Meeting

April 14, 2022
7:00 p.m.

Leelanau County Board Mtg. Room
8527 E. Government Center Drive
Suttons Bay, MI 49682

Leelanau County Drain Commissioner
Steve Christensen

South Bar Lake Drain Informational Meeting



AN ANALYSIS OF VARIOUS
OUTLETS FROM SOUTH BAR LAKE TO LAKE MICHIGAN
AT
EMPIRE, MICHIGAN

Submitted to
The Village of Empire
P.O. Box 253
Empire, Michigan 49630

Submitted by
The Traverse Group, Inc.
2480 Gale Road
Ann Arbor, Michigan 48105

July 29, 1986

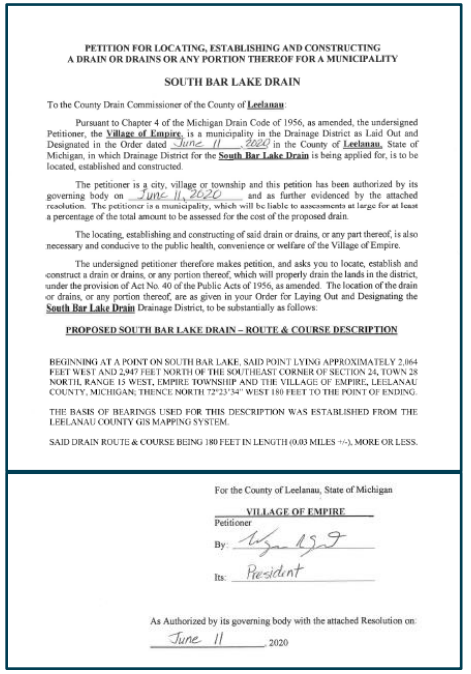
PURPOSE OF INFORMATIONAL/SCOPE MEETING:

- Why are we here and explain Drain Code process to this point?
- Provide an overview of the 'problem'
- Provide an overview of the work that has been completed to date since the B.O.D. in October 2020
- Discuss the various design options/alternatives for fixing the problem
- Review the approximate projects and construction costs for the various design alternatives
- Get feedback regarding the different design options
- Get feedback to make sure that we are addressing all the drainage 'problems' that need to be fixed or looked at within the Drainage District as part of this current Drain petition
- Review 'What's Next?' for the project. Where do we go from here? What could the remaining schedule look like to get us to Construction & a Day of Review
- Answer questions

South Bar Lake Drain Informational Meeting

PROJECT TIMELINE TO-DATE WITH SUMMARY OF WORK COMPLETED:

- June 11, 2020: The Village of Empire filed an Application (under Ch. 3 of the Drain Code) and then a Petition (Ch. 4) to the Leelanau County Drain Commissioner for purposes of locating, establishing and constructing a new County Drain District (Ch. 3) and a new County Drain (Ch. 4) to locate, establish and construct a County Drain.
- June to October 2020: Drain Commissioner hired Brian Cenci, P.E. a Licensed Professional Engineer (as required by the Drain Code) to determine the District Boundary (i.e. the drainage area / watershed) and the proposed Drain Route & Course
- October 22, 2020: Board of Determination (3 disinterested landowners of the County) determined the petition necessary and conducive to public health, convenience and welfare
- November 2020 to March 2022:
  - Surveyed potential drain route areas, put together an entire watershed modeling program to determine outlet and control structure design characteristics, met with EGLE and DNR to discuss permitting issues and outlet considerations, prepared exhibits and cost estimates for the 4 different alternatives that were developed and review those alternatives with representatives of the Village of Empire and the DC
- Present preliminary analysis and findings at an Informational Project Scope Meeting



PETITION FOR LOCATING, ESTABLISHING AND CONSTRUCTING
A DRAIN OR DRAINS OR ANY PORTION THEREOF FOR A MUNICIPALITY

SOUTH BAR LAKE DRAIN

To the County Drain Commissioner of the County of **Leelanau**:

Pursuant to Chapter 4 of the Michigan Drain Code of 1956, as amended, the undersigned Petitioner, the **Village of Empire**, is a municipality in the Drainage District as Laid Out and Designated in the Order dated June 11, 2020 in the County of **Leelanau**, State of Michigan, in which Drainage District for the **South Bar Lake Drain** is being applied for, is to be located, established and constructed.

The petitioner is a city, village or township and this petition has been authorized by its governing body on June 11, 2020 and as further evidenced by the attached resolution. The petitioner is a municipality, which will be liable to assessments at large for at least a percentage of the total amount to be assessed for the cost of the proposed drain.

The locating, establishing and constructing of said drain or drains, or any part thereof, is also necessary and conducive to the public health, convenience or welfare of the Village of Empire.

The undersigned petitioner therefore makes petition, and asks you to locate, establish and construct a drain or drains, or any portion thereof, which will properly drain the lands in the district, under the provision of Act No. 40 of the Public Acts of 1956, as amended. The location of the drain or drains, or any portion thereof, are as given in your Order for Laying Out and Designating the **South Bar Lake Drain** Drainage District, to be substantially as follows:

PROPOSED SOUTH BAR LAKE DRAIN – ROUTE & COURSE DESCRIPTION

BEGINNING AT A POINT ON SOUTH BAR LAKE, SAID POINT LYING APPROXIMATELY 2,064 FEET WEST AND 2,947 FEET NORTH OF THE SOUTHEAST CORNER OF SECTION 24, TOWN 28 NORTH, RANGE 15 WEST, EMPIRE TOWNSHIP AND THE VILLAGE OF EMPIRE, LEELANAU COUNTY, MICHIGAN; THENCE NORTH 72°23'34" WEST 180 FEET TO THE POINT OF ENDING.

THE BASIS OF BEARINGS USED FOR THIS DESCRIPTION WAS ESTABLISHED FROM THE LEELANAU COUNTY GIS MAPPING SYSTEM.

SAID DRAIN ROUTE & COURSE BEING 180 FEET IN LENGTH (0.03 MILES +/-), MORE OR LESS.

For the County of Leelanau, State of Michigan

VILLAGE OF EMPIRE
Petitioner

By: [signature]

Its: President

As Authorized by its governing body with the attached Resolution on:

June 11 2020

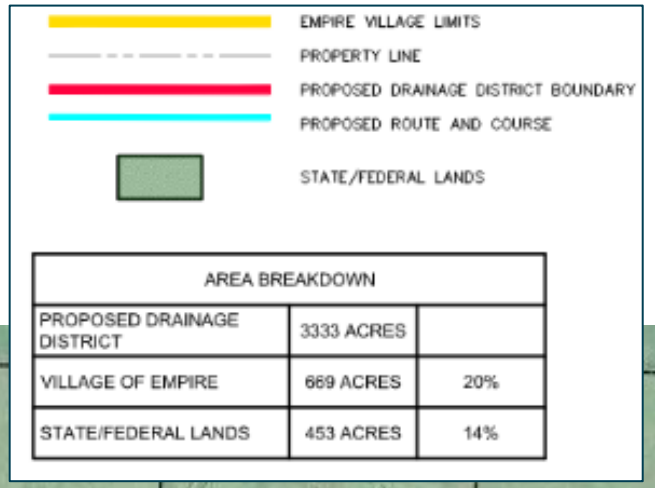
Resolution from Village of Empire to petition for new County Drain

South Bar Lake Drain Informational Meeting

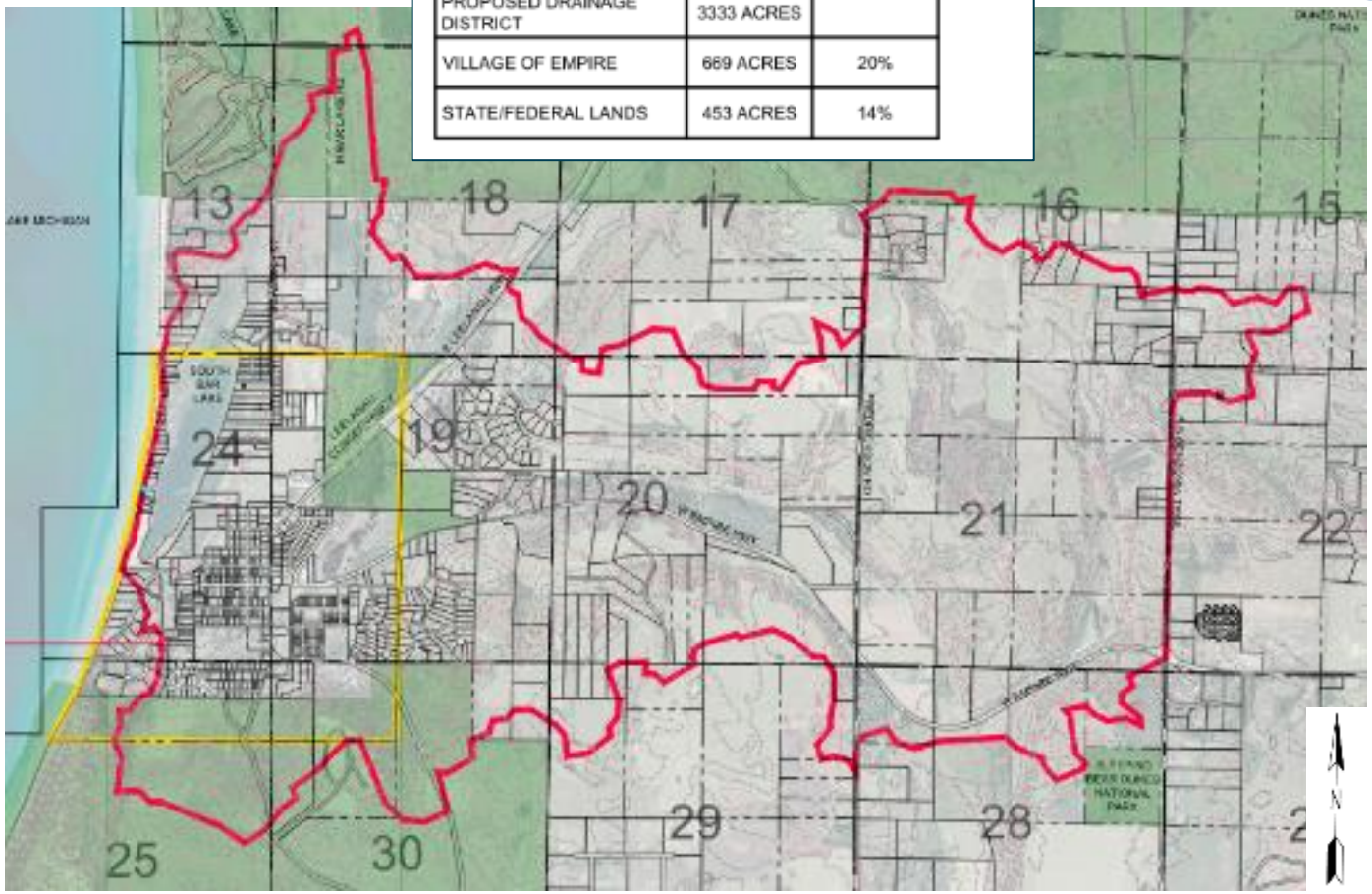
SOUTH BAR LAKE DRAIN – DRAINAGE DISTRICT BOUNDARY:

- Drainage District Boundary is determined based on 1’ topographic Lidar data & field surveying for verification
  - *Total Size = 3,333 acres*
  - *# properties = +/- 820*
  - *Acres in Village = 689 acres*
  - *Acres in Twp. = 2,644 acres*
- At-Large Entities (4):

Village of Empire, Empire Twp, County for County Roads, MDOT



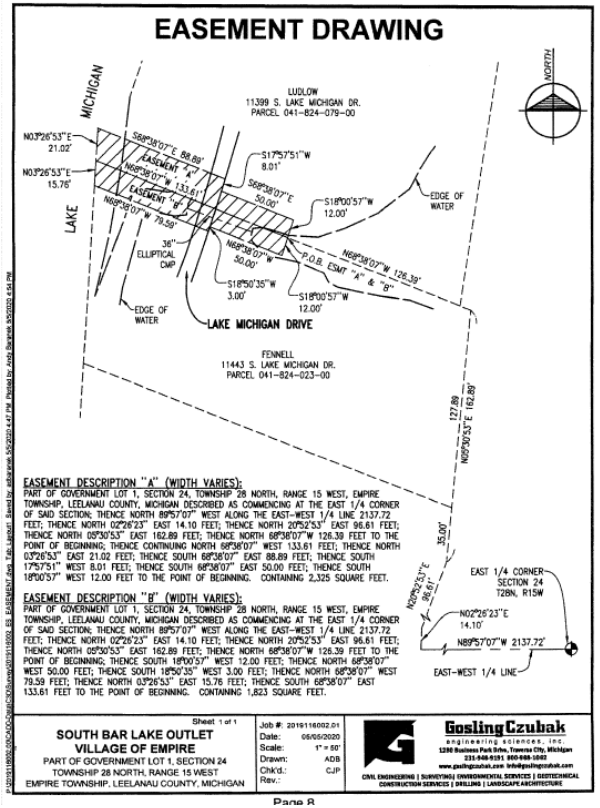
AREA BREAKDOWN		
PROPOSED DRAINAGE DISTRICT	3333 ACRES	
VILLAGE OF EMPIRE	669 ACRES	20%
STATE/FEDERAL LANDS	453 ACRES	14%



South Bar Lake Drain Informational Meeting

SOUTH BAR LAKE DRAIN – ROUTE & COURSE:

- Proposed Drain route in petition is existing South Bar Lake ditch outlet and culvert under S. Lake Michigan Drive
- Drain route can change and will be determined through engineering analysis and scope of work determined by the Drain Commissioner (if Drain project proceeds)
- Initial Drain Route = 180 feet +/-



South Bar Lake Drain Informational Meeting

EXISTING INFRASTRUCTURE:

The outlet from South Bar Lake is currently a small creek/ditch from South Bar Lake running between 11399 & 11443 S. Lake Michigan Drive westerly to a 58”x36” Elliptical Corrugated Metal Pipe (CMP) culvert under S. Lake Michigan Drive. Small creek/ditch extending from west side of the culvert to Lake Michigan.

South Bar Lake Drain Informational Meeting

DRAINAGE ISSUE, PURPOSE OF PETITION:

Outlet ditch and culvert experiences frequent sedimentation due to increased lake levels on Lake Michigan and associated wave action results in a blockage of the outlet (filling in of ditch and filling of culvert) and causes subsequent flooding of properties along South Bar Lake.

South Bar Lake Drain Informational Meeting

DRAINAGE ISSUE, PURPOSE OF PETITION:

To date, cleaning out and maintenance of this outlet from the significant amounts of sediment has been done by and paid for solely by the Village of Empire. The jurisdictional requirement for the Village to have to perform this work is unknown.

South Bar Lake Drain Informational Meeting

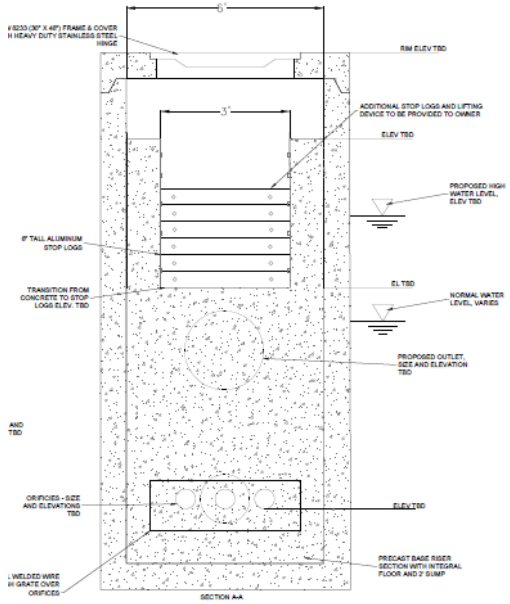
PROPOSED DESIGN ALTERNATIVES & OPTIONS

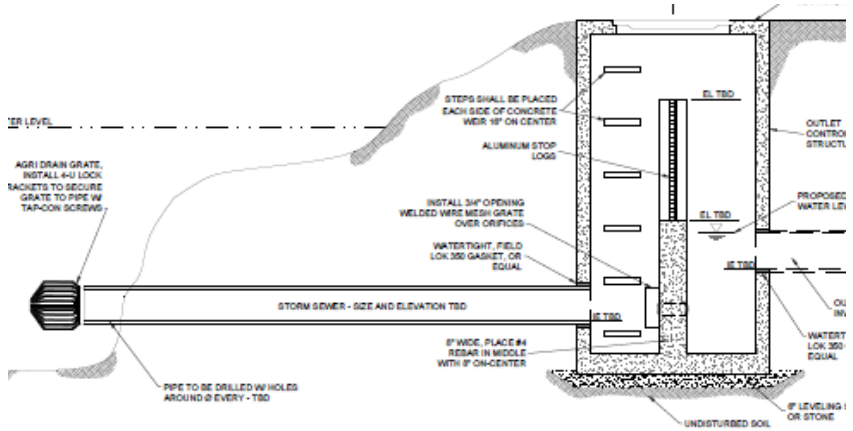
Option #1 – Move the new outlet / control structure to the Beach Park and install a new 'deep-water' Lake level Control Structure near boat launch of South Bar Lake with gravity outlet to existing rip rap shoreline on Lake Michigan.

Option #2 – Move the new outlet / control structure to the Beach Park and install a new 'deep-water' Lake Level Control Structure near boat launch of South Bar Lake with Stormwater Pumping Station to outlet to same rip rap shoreline on Lake Michigan.

Option #3 – Deep-water discharge in location of current outlet to get discharge pipe to gravity flow and daylight at the bottom of Lake Michigan past the influence of the Littoral Drift zone along the shoreline.

Option #4 – Keep outlet / control structure in its current location. Remove the existing CSP culvert and replace it with a new 36" x 24" ARCH RCP culvert. Install an overflow pump and pump station that will work on a float system to only turn on and pass flow from South Bar Lake to Lake Michigan if the culvert becomes clogged with sediment, causing the Lake to flood with high water levels.



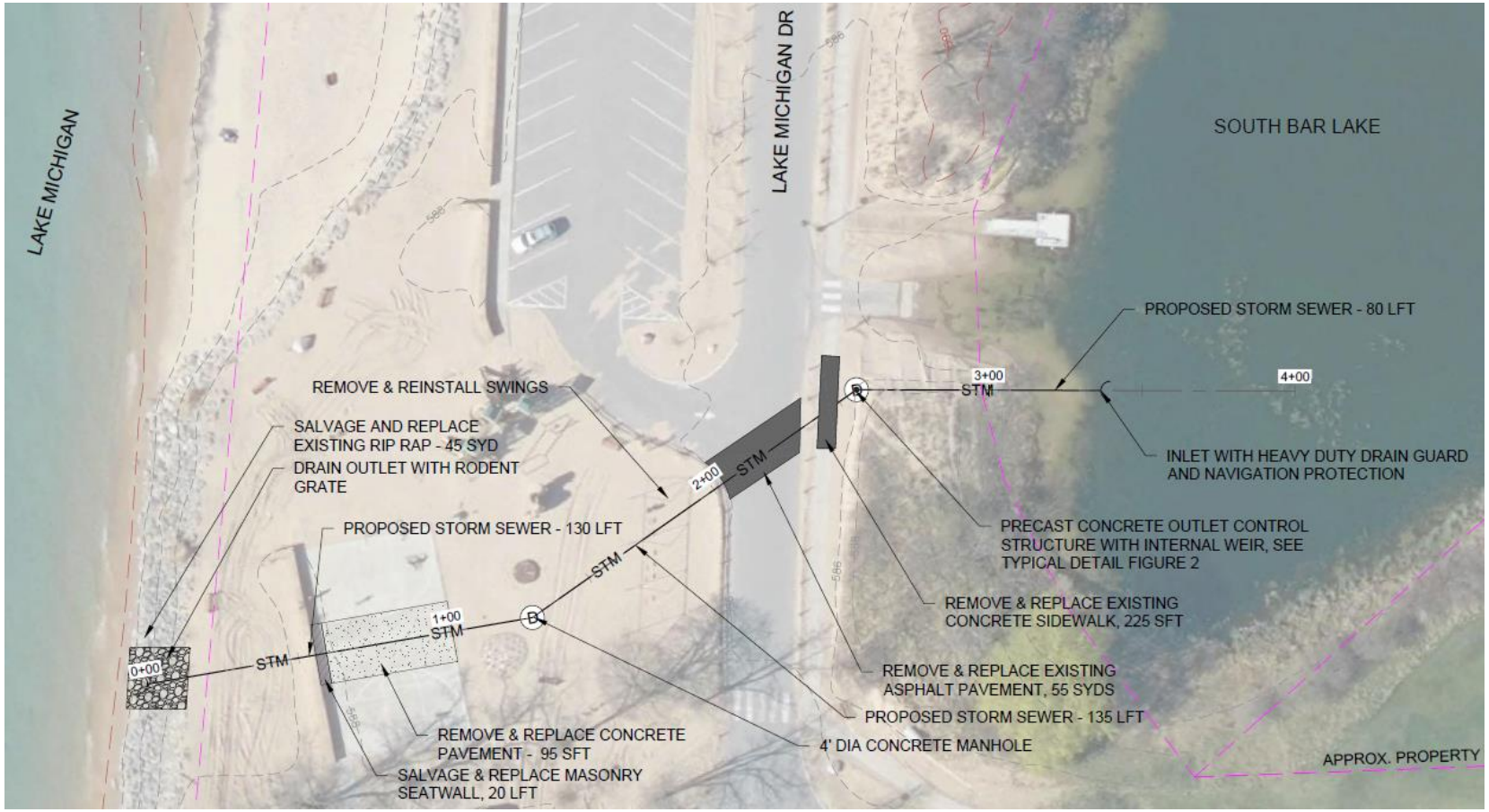


South Bar Lake Drain Informational Meeting

PROPOSED DESIGN ALTERNATIVES & OPTIONS

Option #1 – Move the new outlet / control structure to the Beach Park and install a new 'deep-water' Lake level Control Structure near boat launch of South Bar Lake with gravity outlet to existing rip rap shoreline on Lake Michigan.

Approx. Construction Cost = $264,400

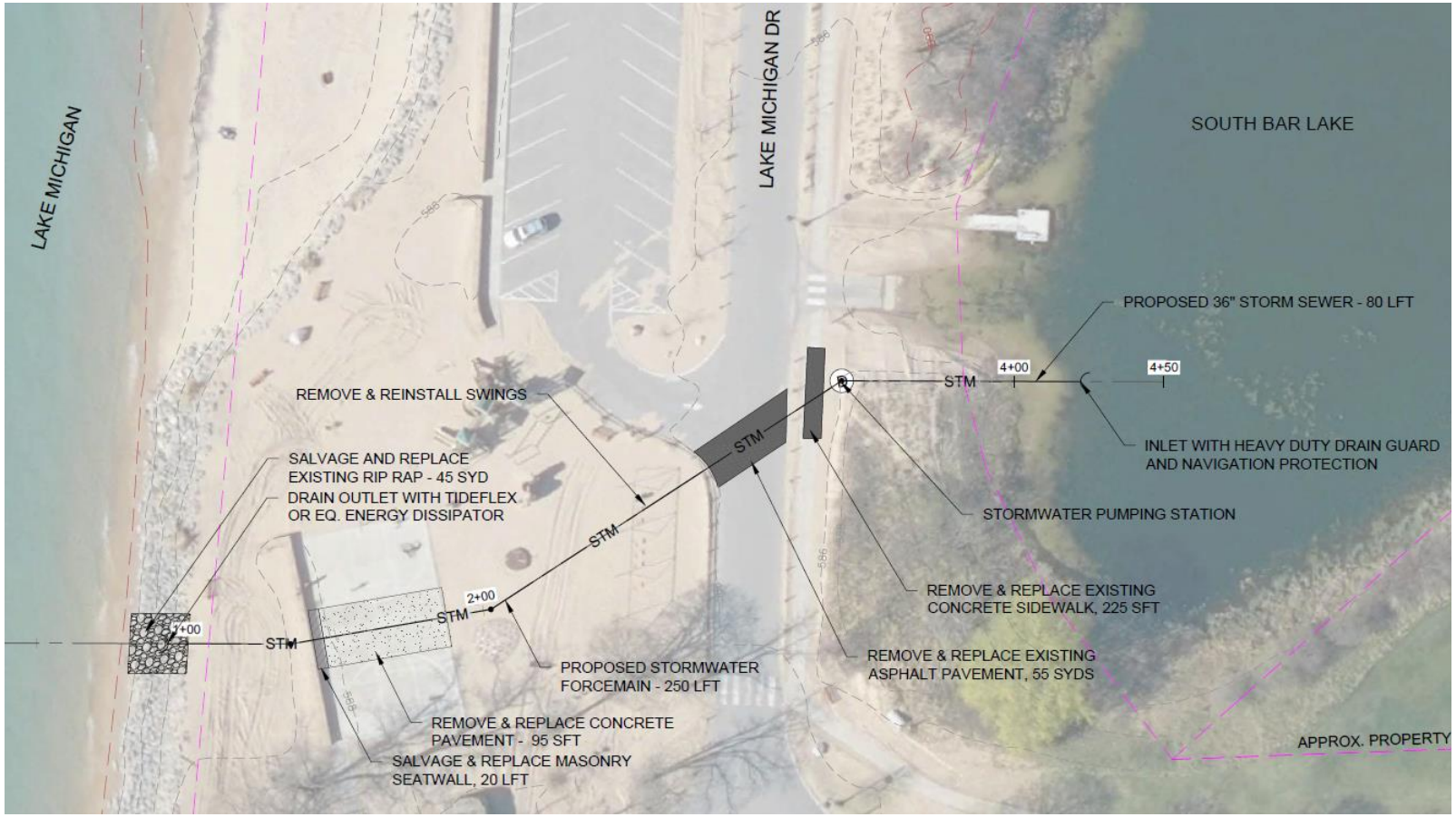


South Bar Lake Drain Informational Meeting

PROPOSED DESIGN ALTERNATIVES & OPTIONS

Option #2 – Move the new outlet / control structure to the Beach Park and install a new 'deep-water' Lake Level Control Structure near boat launch of South Bar Lake with Stormwater Pumping Station to then pump water from South Bar Lake and outlet it to the same rip rap shoreline on Lake Michigan.

Approx. Construction Cost = $345,500

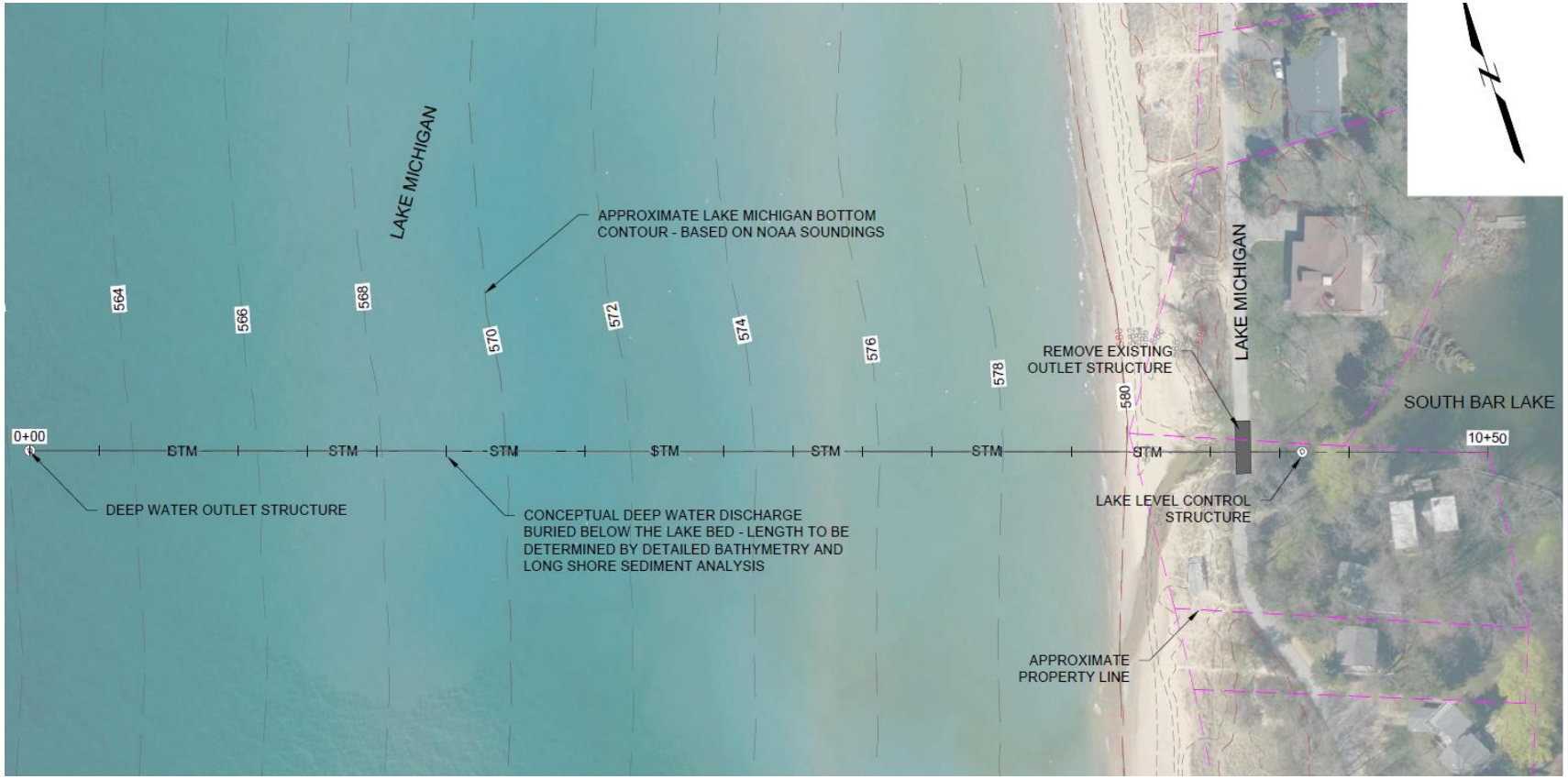


South Bar Lake Drain Informational Meeting

PROPOSED DESIGN ALTERNATIVES & OPTIONS

Option #3 – Deep-water discharge in location of current outlet to get discharge pipe to gravity flow and daylight at the bottom of Lake Michigan past the influence of the Littoral Drift zone along the shoreline.

Approx. Construction Cost = $477,900

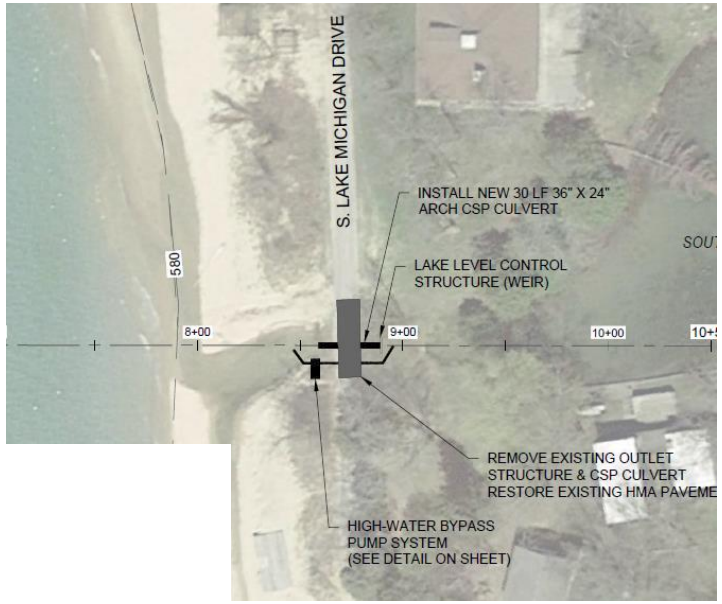


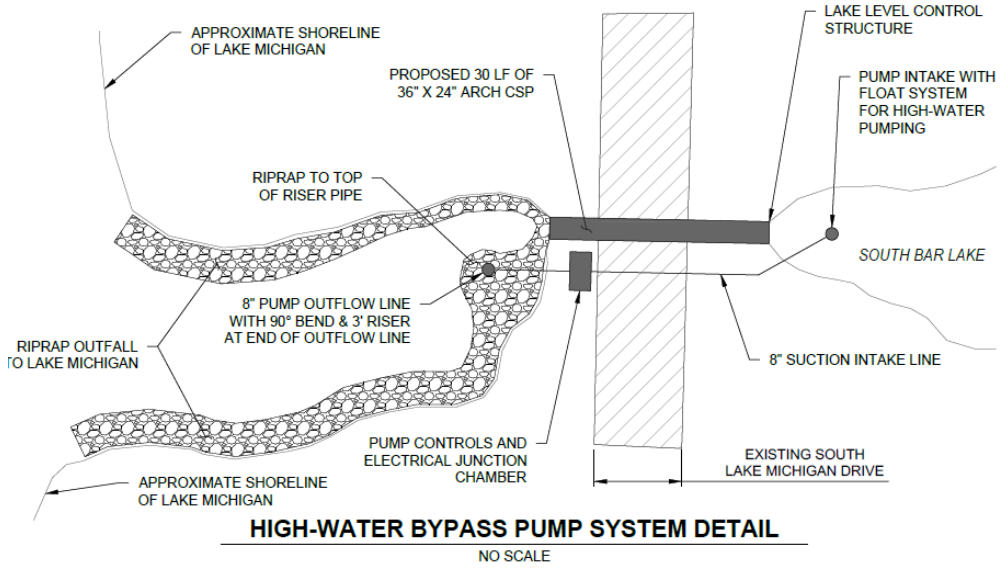
South Bar Lake Drain Informational Meeting

PROPOSED DESIGN ALTERNATIVES & OPTIONS

Option #4 – Keep outlet / control structure in its current location. Remove the existing CSP culvert and replace it with a new 36” x 24” ARCH RCP culvert. Install an overflow pump and pump station that will work on a float system to only turn on and pass flow from South Bar Lake to Lake Michigan if the culvert becomes clogged with sediment, causing the Lake to flood with high water levels. Install new curb and gutter along road, each side of the crossing pipe.

Approx. Construction Cost = $309,200





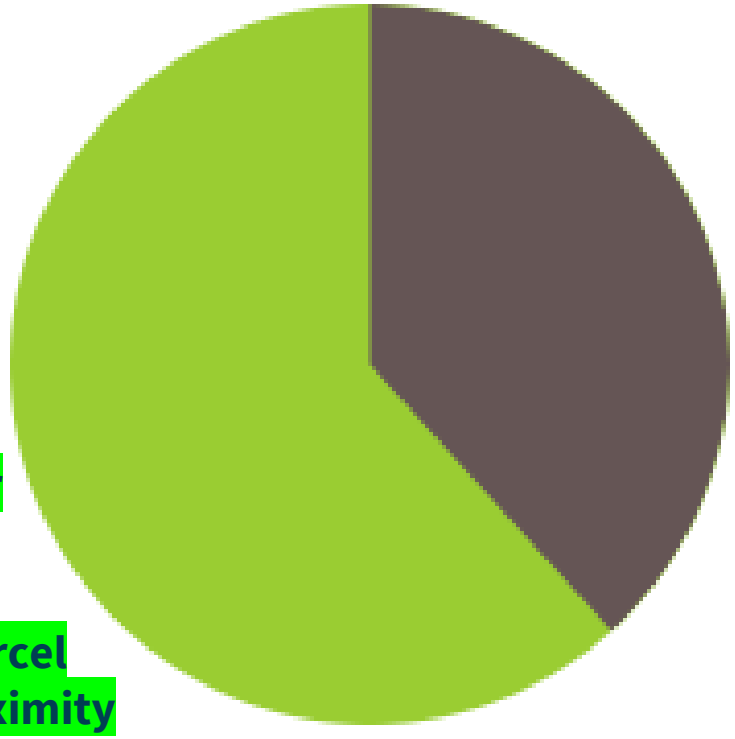
HIGH-WATER BYPASS PUMP SYSTEM DETAIL

NO SCALE

South Bar Lake Drain
Informational Meeting

PROJECT COSTS AND APPORTIONMENTS

AT-LARGE ENTITIES – approx. 35% to 40%
* Village of Empire
* Empire Township
* MDOT
* Leelanau County (LCRC benefit to County Roads)



PARCELS – approx. 60% to 65%
* Approx. 820 parcels
* Approx. 2,880 assessable acres
  - Can't assess Federal or State lands
  - Can't assess Twp. or County lands used for 'public purpose'
  - Churches can be assessed
* Assessments will minimally be based on Parcel size, Co-efficient of Runoff (land use) & Proximity to work & South Bar Lake

South Bar Lake Drain
Informational Meeting

GEI Consultants

QUESTIONS ?????