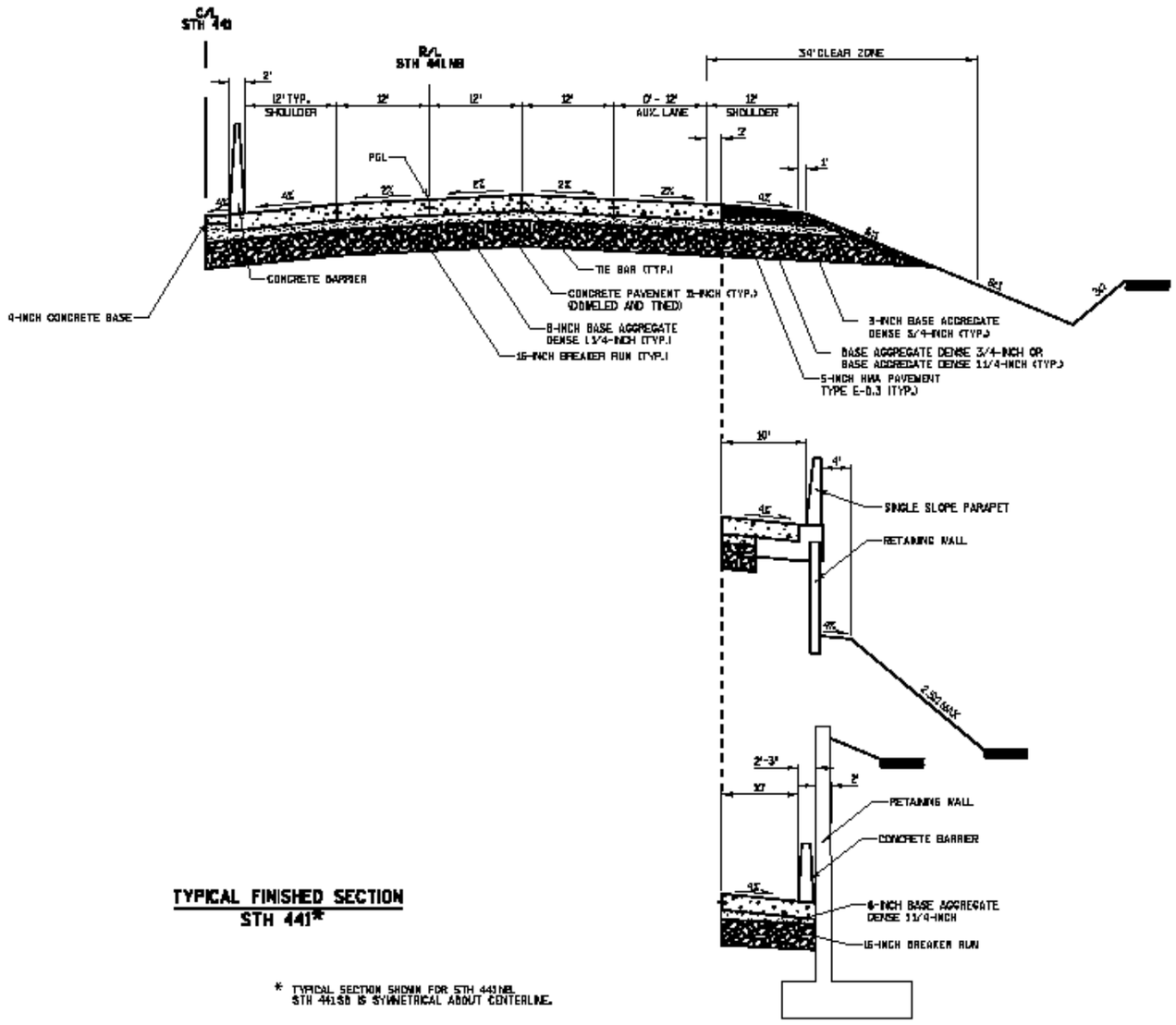
ROADWAY PROPOSED TYPICAL SECTION

The proposed typical section matches the USH10/STH 441 project to the south of B-44-126. There are three (3) thru lanes, up to one auxiliary lane, and twelve foot shoulders, which has a total clear roadway width of 60 to 72 feet. Concrete barrier is located in the median and on the outside where retaining walls are proposed. The pavement structure consists of 11-Inch concrete pavement, 6-Inch base aggregate dense and 16-Inch breaker run. A cut or fill retaining wall can be located on the outside shoulder of the roadway. The retaining wall in the cut condition would be a Cast-In-Place retaining wall. However, the retaining wall for the fill condition will be a MSE retaining wall. The typical section is shown in Figure 14.



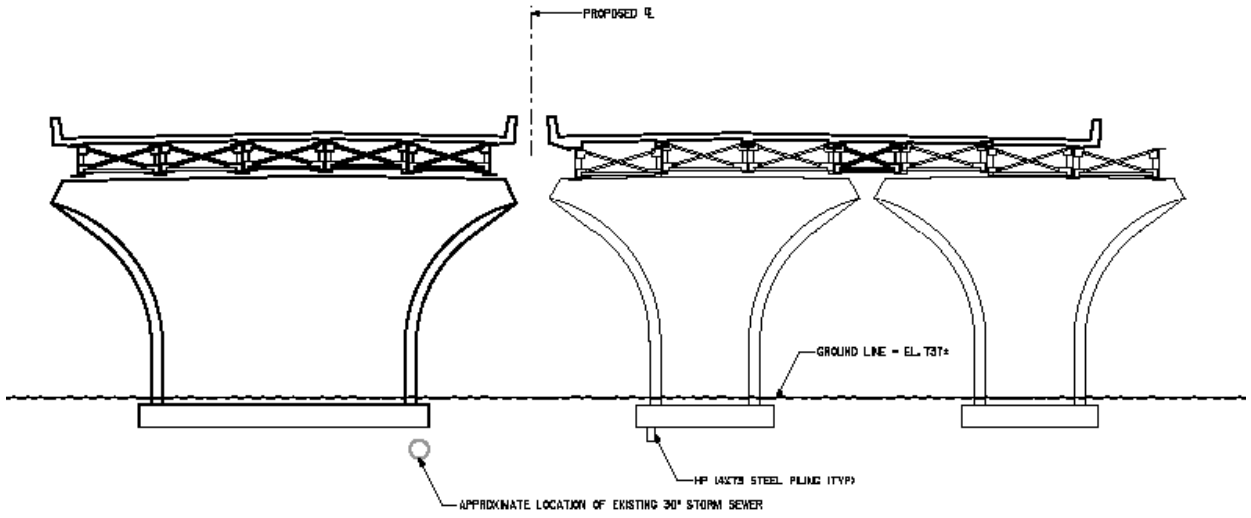
TYPICAL FINISHED SECTION
STH 441*

* TYPICAL SECTION SHOWN FOR STH 441 NB.
STH 441 SB IS SYMMETRICAL ABOUT CENTERLINE.

Figure 14

EXISTING STORM SEWER

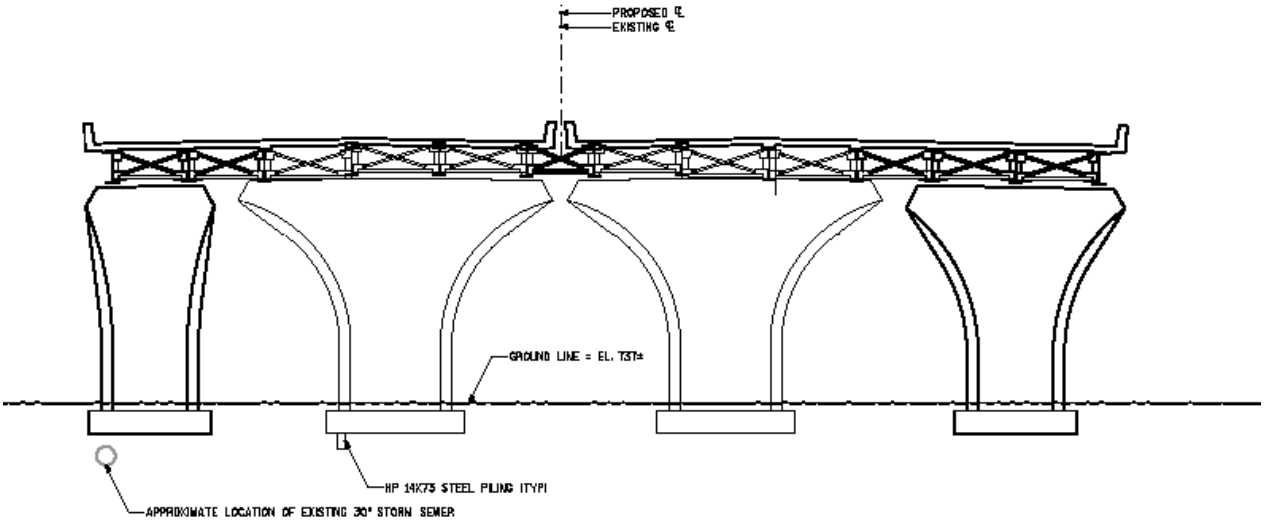
There is existing storm sewer in the northwest and southeast quadrants of the bridge, B-44-126. The existing storm sewer can be adjacent to the pier; however, it cannot go through or underneath the proposed footing or pier and would have to be relocated. In the northwest quadrant, there is a 30" storm sewer that runs parallel to WIS 441. Figures 15, 16, 17 and 18 show the approximate location of the storm sewer relative to the existing and proposed piers for concepts 1, 3, 4, and 6 described above. Based on available information, the approximate location of the storm sewer in the northwest quadrant is in conflict with the proposed pier location and would need to be replaced. In the southeast quadrant, the storm sewer runs at an angle away from WIS 441 and should not create a conflict when the bridge is widened.



B-44-126 PIER 10 - CONCEPT 1

LOOKING NORTH

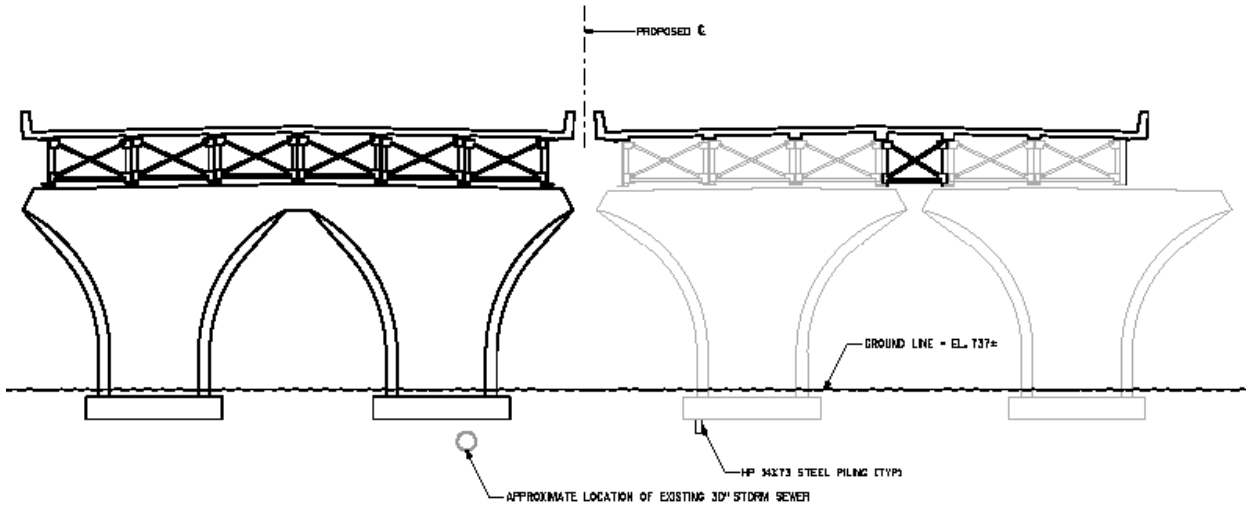
Figure 15



B-44-126 PIER 10 - CONCEPT 3

LOOKING NORTH

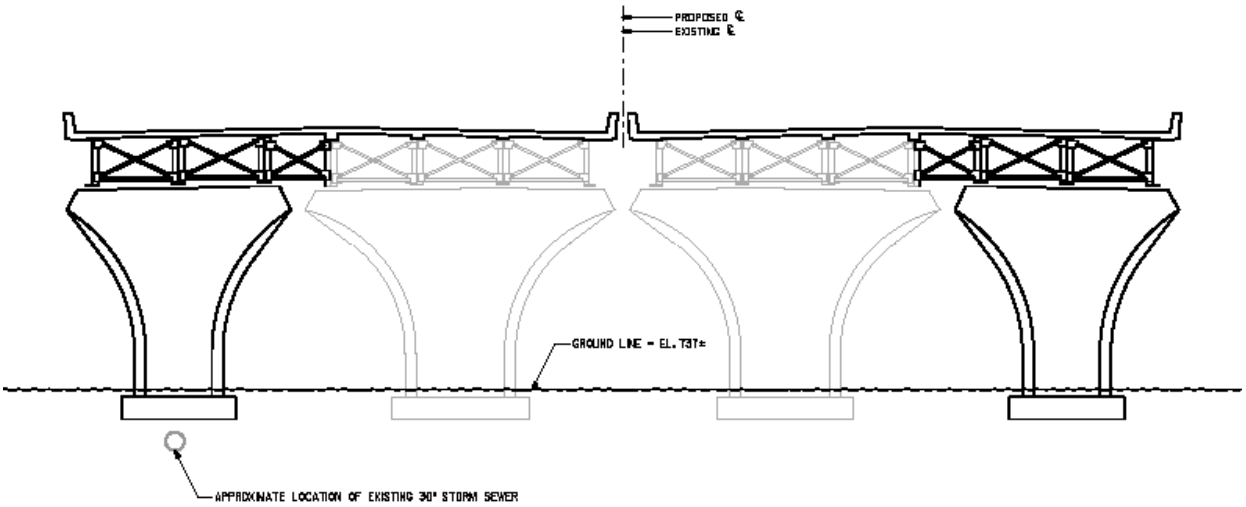
Figure 16



B-44-126 PIER 10 - CONCEPT 4

LOOKING NORTH

Figure 17



B-44-126 TYPICAL SECTION - CONCEPT 6

LOOKING NORTH

Figure 18

FUTURE ANALYSIS

The proposed channel shift in Concepts 1, 2, 4 and 5 will require coordination with the United States Coast Guard, United States Army Corps of Engineers and Wisconsin Department of Natural Resources in the pre-NEPA screening. An alternative to shifting the navigation channel would be to change the individual span lengths of spans 1-4 of the new bridge (southbound lanes for option 1 and the northbound lanes for option 2) to have the new piers clear the existing navigation channel. For concept 4, an alternative to shifting the navigation channel would be to change some of the span lengths to shift pier 3 out of the current navigation channel, such as changing spans 3 and 4 of the new southbound bridge from 162'+162' to 169'+155'. This has the drawback of putting the existing and new piers 3 out of line, a hazard to water craft out of the shipping channel. Concept 5 cannot accommodate a similar shift in the pier 3 location because the new northbound bridge uses part of the existing pier 3 for support

Current WisDOT bridge design policy requires a 10" thick deck on the bridges; the existing bridge decks are 9" thick. The redecked bridges will need a deck thickness less than the 10" standard in order to get a suitable live load rating. The Bridge Manual recognizes using thinner decks in Table 17.5-2. New decks located only on new girders will be the standard 10" thickness.

The deck replacement, new girder lines and new substructure units should be designed using the current AASHTO load and resistance factor bridge design specifications. The existing bridge girders should be load rated using the AASHTO load factor rating methodology, per the Bridge Manual 45.3.3. The existing bearings and piers will be adequate for the live load occurring after the bridge is widened. Per the AASHTO LRFD Bridge Design Specifications section 3.6, the live load on the existing bridge is (3 lanes)(85%)/4 girders = 0.64 lanes per girder. For the four lane configuration, the live load on the widened bridge will be (6 lanes)(65%)/7 girders = 0.56 lanes per girder. For the three lane configuration with an auxiliary lane, the live load on the typical widened bridge section will be (5 lanes)(65%)/6 girders = 0.54 lanes per girder; the live load on the widened northbound bridge section north of WIS 96 is (6 lanes)(65%)/7 girders = 0.56 lanes per girder.

Another item for future analysis would be to consider adding a pedestrian/bike/multi-use path across the bridge to create a crossing over the Fox River. Concepts 1 and 2 would allow for the reuse of existing girders to provide the multi-use path, eliminating girder removal costs, keep a more symmetrical loading on the piers and be more aesthetically pleasing. Any option for pedestrian/bike/mulit-use connections will require additional study to plan, design and cost estimate approximate connections on either end of the bridge and integration into the overall regional pedestrian/bike plan.