STORMWATER BASIN AND CHANNEL IMPROVEMENTS

FOR

HINMAN DITCH (DITCH #52) IMPROVEMENTS
PRELIMINARY PLAN ENGINEERING MEMORANDUM

LOCATED IN
COVENTRY TOWNSHIP
SUMMIT COUNTY, OHIO

PREPARED FOR:
SUMMIT COUNTY SURFACE WATER MANAGEMENT DISTRICT &
THE HUC12 WATERSHED

PREPARED
March 2025

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March 25, 2025

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List of Acronyms

AACE - Association for the Advancement of Cost Engineering

AOI – Area of Interest

BRIC – Building Resilient Infrastructure and Communities

CMP – Corrugated Metal Pipe

CFS – Cubic Feet per Second

EDG – Environmental Design Group

EPA – Environmental Protection Agency

FEMA – Federal Emergency Management Agency

FIRM – Flood Insurance Rate Map

H&H – Hydrologic and Hydraulic

HEC – Hydrologic Engineering Center

HMR – Hydrometeorological Report

HOA – Home Owners Association

HUC – Hydrologic Unit Code

LERRD – lands, easements, rights-of-way, relocations and disposal areas

LiDAR – Light Detection and Ranging

MWCD – Muskingum Watershed Conservancy District

NAVD 88 – North American Vertical Datum of 1988

NHD – National Hydrography Dataset

NLCD – National Land Cover Database

NPS-IS – Nonpoint Source Implementation Strategic Plan

NRCS – Natural Resources Conservation Service

NWP – Nationwide Permit

OGRIP – Ohio Geographically Referenced Information Program

OPCC – Opinion of Probably Construction Cost

PCN – Pre-Construction Notification

PWM – Partners in Watershed Management

STREAMSTATS – Web-based GIS application for water-resources engineering created and maintained by USGS

SWCD – Soil & Water Conservation District

USACE – United States Army Corps of Engineers

USGS – United States Geological Survey

USDA – United States Department of Agriculture

WRRSP – Water Resource Restoration Sponsor Program

WSEL – Water Surface Elevation

WQV – Water Quality Volume

Executive Summary

Environmental Design Group was retained to identify the best and most cost-effective solution to mitigate flooding and improve water quality. Environmental Design Group's conceptual basis for design assumed that reducing the flow and frequency of flood events will result in a reduction in the amount of pollutants that are conveyed downstream through Hinman Ditch to the Tuscarawas River. This report takes the concept and improvements selected by Summit County from the Conceptual Engineering Memorandum dated 10/04/2024 and develops them into a Preliminary Engineering Plan. The goal of the preliminary plan is to provide proof of concept calculations on the design and details. This plan can then be used as the basis for final plans, quantities, notes, easements, and permitting. This preliminary plan provides the information necessary for Summit County and its stakeholders to make an informed decision about the costs and benefits of this project.

The project area is located west of Interstate-77 along Hinman Ditch, a tributary to the Tuscarawas River that originates east of the Coventry Crossing Basin and flows west before turning north and confluencing with Brewster Creek. Hinman ditch flows past the Penguin Park Condominiums before going through twin culverts underneath Glenmount Avenue. The ditch then continues west, near other homes along Penguin Avenue. As Hinman Ditch turns north it is conveyed underneath US-224 by a single culvert before flowing through the Holy Cross Cemetery. A vicinity map is provided in ***Figure 1***.

It is important to note that conceptual and preliminary engineering were performed on Hinman Ditch without considering the influence of Brewster Creek in the study. It is known that Brewster Creek flood routes down Glenmount Avenue and potentially backs up the existing 54" culvert under US-224/I-277 during larger storm events. For a more accurate understanding of the interaction between Brewster Creek and Hinman Ditch, an additional drainage study should be performed.

From the concepts presented in the Conceptual Engineering Memorandum, Summit County selected Concept 4 to move forward into preliminary plan engineering. This includes improvements of eastern and western Hinman Ditch, removal of accumulated sediment from within the twin culverts underneath Glenmount Road, the replacement and upsizing of the 54" culvert under US-224, the realignment of Hinman Ditch, and adding detention just north of the realignment. Additionally, Summit County elected to include the reconstruction and improvement of the existing detention basin in the Coventry Crossing Subdivision. This was presented as an option in Concept 3 of the Conceptual Engineering Memorandum. The basin is within the Akron city limits; however, its poor maintenance has resulted in degraded performance. Improving this basin is an integral part of improving the drainage and reducing the severity of flood events along Hinman Ditch.

In summary, the preliminary design of improvements in and along Hinman Ditch do not have major constructability issues. EDG has developed computer models which show a reduction in water surface elevations during flood events. A preliminary Opinion of Probable Construction Cost (OPCC) and range are included, which also contains design and permitting costs.

Figure 1 Vicinity Map

Drainage Study Purpose

The project area, as shown in ***Figure 2***, has experienced frequent flooding. Documents supplied to EDG by the Summit County Engineer on August 3, 2023 have record of incidents dating back to at least 1979. The residences along Penguin Drive and Naomi Drive are experiencing recurrent and substantial flooding. Floods can cause property damage, raise insurance rates, and create dangerous conditions for motorists and residents. To reduce the likelihood of potentially catastrophic flooding, EDG has generated preliminary plans that would reduce the frequency and intensity of flood events. This project also aims to reduce pollutants entering the Tuscarawas River, making it a project that can be incorporated into the NPS-IS Plan for Portage Lakes (currently under development by the Summit County SWCD).

Figure 2 Project Area Map

Existing Drainage Evaluation

Existing Conditions Review

In order to analyze the existing conditions of the project area, EDG collected publicly available information such as: flow and drainage area calculations from USGS StreamStats, aerial photography, topographic data from the Ohio Geographically Referenced Information Program (OGRIP), soil data from United States Department of Agriculture (USDA), land cover data from the National Land Cover Database (NLCD), and performed a search of Federal Emergency Management Agency (FEMA) records for all flood related information.

EDG performed a site investigation on September 10, 2024, to further investigate the condition of the culverts under Glenmount Avenue and US-224/I-277. Below are the discoveries made that day:

- The culverts under Glenmount Avenue are twin 72" corrugated metal pipes.
- The twin 72" culverts had a large amount of sediment inside of them. The sediment varied in thickness, and a survey crew returned later to obtain the culvert invert elevation and measure the sediment thickness at each end of both culverts.
- The culvert under US-224/I-277 was confirmed to be a 54" reinforced concrete pipe which concurs with ODOT files. The culvert was clean of sediment accumulations and had a depth of water of 13 inches of at the inlet.
- The northern 72" culvert has the following invert elevations: outlet (west) = 988.21' and inlet (east) = 988.24'. The sediment elevations in this culvert are as follows: outlet = 989.70'and inlet = 989.56', which is 1.32' of sediment at the outlet and 1.49' of sediment at the inlet.
- The southern 72" culvert has the following invert elevations: outlet (west) = 988.38' and inlet (east)= 988.10'. So, this culvert is inverted in the direction of flow. The top of sediment elevations in this culvert are the following: outlet = 990.03' and inlet = 990.18', which is a 2.08' of sediment at the outlet and 1.65' of sediment thickness at the inlet.
- The 54" culvert has the following invert elevations: outlet (north) = 985.99' and inlet (south) = 987.52'. The inlet elevation is 0.94" lower than the ODOT plan invert of 987.61', and the outlet is approximately 11.3" lower than the ODOT plan.
- The two Hinman Ditch cross sections directly following the culvert outlet are higher than the culvert outlet invert. The first section downstream has a bottom elevation of 987.67', and the second section has a low point elevation of 988.11'. Therefore, Hinman Ditch's channel bed is at least 2.12' higher than the outlet of the 54" culvert before the confluence with Brewster Creek.
- ODOT drawings indicate the confluence with Brewster Creek should occur at 986.54'. The nearest surveyed cross section was 25' up from the confluence with Brewster with a bottom elevation of 988.11'.

Watershed Study and Modelling (Hydrology)

The first step in this process was to delineate drainage areas that are tributaries to the 54" pipe under I-277, the twin 72" pipes under Glenmount Avenue, the east and west sections of Hinman ditch, and the areas draining to the Coventry Crossing detention basin. The drainage map showing these areas, times of concentration and runoff CNs is included in Attachment 1. The determination of drainage area boundaries was performed using a combination of field review, desktop analysis of record plans, review of LIDAR contour data, and data from topographic survey performed on site. Next, EDG staff utilized the HydroCAD program (version 10.10-6a) to create an existing model

to establish a flow data at each step of the drainage path. Below **Table 1** summarizes the drainage areas and rate of runoff of each node, as well as the cumulative area in acres and cumulative runoff. It is noted that these flows do not account for the hydraulics of the structures and channels within the model. The model shows the total area and the total runoff rate possible assuming all areas are uncontrolled.

Table 1 Modeled Existing Drainage Areas (100-Year Storm)

Modeled Existing Drainage Areas (100-year Storm)				
Drainage Node ID	Name	Area	Cumulative Area	Peak Runoff Rate
		Acres	Acres	Cubic Feet Per Second
E6	Ex. Coventry Crossing Tributary	97.445	97.445	187.34
E5	Tributary to Eastern Hinman Ditch	14.481	111.926	28.79
E4B		9.612	121.538	24.70
E4A		7.776	129.314	40.85
E3	Tributary to Ex. Twin 72" Culverts	2.170	131.484	9.74
E2	Tributary to Western Hinman Ditch	7.237	138.721	28.70
E1	Tributary to Ex. 54" Culvert	6.428	145.149	26.15
			Cumulative Runoff	346.27

Existing Channel and Structure Analysis

The next step in the hydraulic and hydrologic analysis was developing a flow (Q) into each existing channel and structure. These flows were used to develop an existing conditions HEC-RAS model, which was used to determine base flood elevations of the 100-year flood event along Hinman Ditch. This information will be used as a baseline for comparison with the proposed condition to quantify the level of improvement expected from this plan. The Existing Conditions Model includes the Coventry Crossing Detention basin, eastern Hinman Ditch, the existing twin 72" culverts under Glenmount Avenue, western Hinman Ditch, and the existing 54" culvert underneath US-224. The modelling shows that the existing Coventry Crossing basin has a peak inflow of 187.34 cfs from the Coventry Crossing tributary area, with a discharge of 105.67 cfs (56% of the inflow). This indicates there is some detainment occurring. The primary outlet discharges 41.64 cfs of the total 105.66 cfs, and the remaining 64.02 cfs overflows from the basin and sheet flows into eastern Hinman Ditch.

Eastern Hinman Ditch has a peak inflow of 143.43 cfs from the existing Coventry Crossing basin and the tributary nodes to Eastern Hinman Ditch, shown in the HydroCAD model as E4A, E4B and E5. Eastern Hinman Ditch reaches a full capacity of 115.50 cfs during the 100-year storm event which is 80.5% of the inflow. The remaining 28.05 cfs comes out of the ditch banks and is stored upstream of the Glenmount Avenue culverts. The twin 72" culverts at Glenmount Avenue have a peak inflow of 142.84 cfs from Eastern Hinman Ditch and the tributary node E3. The existing twin 72" culverts with sedimentation accumulation in place will discharge 136.49 cfs during the 100-year storm event which is 95.5% of the inflow. Western Hinman Ditch has an inflow of 142.12 cfs from the existing twin 72" culverts and overflow and the tributary node to Western Hinman Ditch E2. Western Hinman Ditch has a discharge of 139.93 cfs during the 100-year storm event which is 64.6% of the peak inflow. The 54" culvert at US-

224/I-277 has a peak inflow of 142.94 cfs from Western Hinman Ditch and the tributary node E1. The existing 54" culvert discharges 107.75 cfs during the 100-year storm event which is 75.4% of the inflow.

Eastern Hinman Ditch from behind Penguin Condominiums to Glenmount Avenue is nearly level and overgrown with vegetation, thus limiting its capacity. The drainage structures under Glenmount Avenue are inundated with sediment. The northern 72" CMP culvert is very flat with a slope of 0.08%. The sediment buildup ranges from 15.8" to 17.9" deep. EDG input the inlet sediment depth to assess culvert performance in HydroCAD. The southern 72" CMP culvert is inverted with a negative 0.74% slope. Sediment buildup in this culvert ranges from 25" to 19.5" deep.

The next ditch section, which is upstream of the 54" structure (under US-224/I-277), but downstream of Glenmount Avenue, is relatively clear of sediment accumulations and debris. However, there are trees in the flow line that need to be removed for it to achieve its full flow capacity.

Depths of the channel that starts around 5.5', deepens to 8.3', and then gets shallower prior to the culvert under US-224/I-277. The downstream depth is 4' on average.

The drainage structure under US-224/I-277 is a single 54" single reinforced concrete pipe. EDG re-evaluated this structure on September 17, 2024 and analyzed two cross- sections downstream of the outlet point but upstream of the confluence with Brewster Creek. This analysis found that sediment accumulation in the channel sections downstream of the 54" culvert limit the capacity of the 54" culvert.

Proposed Drainage Improvements

Description of Improvements

Summit County selected Concept 4 from the Conceptual Engineering Memorandum to move forward into preliminary plan engineering. This includes improvements of eastern and western Hinman Ditch, the replacement of the 54" existing culvert under US-224, the realignment of a portion of eastern Hinman Ditch, and adding detention just north of the realignment. Additionally, Summit County elected to include the reconstruction and improvement of existing detention basin in the Coventry Crossing Subdivision. This was presented as an option in Concept 3 of the Conceptual Engineering Memorandum. Please see Attachment 2 (Proposed Drainage Map) for the locations of the proposed improvements.

The Coventry Crossing basin had the greatest potential for improvement. Its contributing drainage area of 97.445 acres makes up 67% of the total drainage area for this study. EDG proposed adding storage to the basin in two ways. By re-grading the bottom of the basin and flattening out the slopes to 0.75% to increase its total storage capacity. The top of the dam was re-graded to make a uniform elevation of 1005.00' as well. The existing basin had some irregularities in the top elevation, and field observations indicated a new emergency overflow point had been created over time in a location not shown on the original plan. This allowed the basin to discharge through this point prematurely. By repairing the top of the dam and installing a new emergency weir at a higher elevation (Elev.=1004.00'), the basin can utilize more of its storage capacity. The existing basin has 284,417 cubic feet of storage at the top of dam spillover point of 1003.40', and a total storage capacity of 363,185 cubic feet at the top of dam elevation of 1005.00'. The modified Coventry Crossing basin will have 477,534 cubic feet of storage at the emergency weir elevation of 1004.00', and a total storage capacity of 557,725 cubic feet at the top of dam elevation of 1005.00'. Modelling of these proposed modifications show a 68% increase in storage volume at the spillover

point in the dam embankment, and a 54% increase of total storage volume to the top of dam elevation. EDG also designed a new multi-stage outlet with the following devices and elevations:

- 3'x3' precast concrete box structure
- 24" diameter outlet pipe at an elevation of 996.00' (bottom of the basin) with a 0.0058 ft/ft slope
- 4" water quality orifice at elevation 996.00'
- (4) four 36" x 6" openings at an elevation of 1002.00'
- Top of grate elevation of 1003.00'

The bottom of the storage combined with the 4" orifice will add 327,841 cubic feet of water quality volume to the basin. EDG has prepared WQv calculations to show how the improved water quality will meet EPA standards, see **Attachment 3** for the calculations. The improved outlet structure lowers the outflow from 105.66 cfs to 38.64 cfs during the 100-year storm event. This is a 173% reduction in outflow to eastern Hinman Ditch. Modelling for the outflows of the modified Coventry Crossing detention basin can be found in **Attachment 6.**

EDG also added in a proposed detention basin to help control some of the roadside drainage from I-277/US 224. The proposed basin receives 9.612 acres of drainage, which is only ~7% of the total drainage area. However, when combined with the area controlled by the existing Coventry crossing basin, the design now controls 74% of the total drainage area. This design maximized the area shown between the overhead powerlines and the sanitary sewer to come up with the greatest potential storage area allowed by the utilities. The eastern area behind Penguin Condominiums is not viable for detention basin storage due to elevation differences. The proposed detention basin includes a water quality outlet to assist in reduction of pollutant loading to the Tuscarawas River. The available area for a proposed detention basin is shown in proposed drainage map (***Attachment 2***) The basin is as a 4.85' deep basin (elevation 995' down to 991.15') with approximately 84,541 cubic feet of detention storage. EDG used a multi-stage outlet with the following devices to estimate outlet flows into Hinman Ditch:

- 3'x3' precast concrete box structure
- 24" diameter outlet pipe at an elevation of 991.15' (bottom of the basin) with a 0.005 ft/ft slope
- 2" water quality orifice at elevation 991.15'
- 24" square top grate at an elevation of 993.50'
- Emergency spillway was designed as a broad-crested rectangular weir at an elevation of 994.50' with a 40' crest length and 8' breadth

By adding this detention basin to control drainage node E4B, the inflow to eastern Hinman Ditch from this node will reduce from 24.70 cfs to 7.63 cfs during the 100-year storm event. The basin does add 48,848 cubic feet of water quality volume, please see **Attachment 4** for these WQV calculations. Outflow modelling for the proposed detention basin can be found in **Attachment 6**.

In conceptual modelling EDG had proposed reshaped ditch sections for both eastern and western Hinman Ditch sections. The eastern section was re-aligned away from the apartment buildings to create some distance from the buildings during flooding events. This was possible because the area to the north did not have physical restrictions that would prevent re-alignment. After developing flow line grades for each ditch section and analyzing the side slopes, it appears as though the enhanced ditch typical sections shown in the Conceptual Engineering Memorandum are not constructible without modifying or removing some building structures and driveways. Therefore, EDG went back to the side slopes shown in the existing modelling. Western Hinman Ditch is modeled having an 8' bottom and 3:1 side slopes. Eastern Hinman Ditch has a 6' bottom width and 2:1 side slopes. There is an improvement achieved here from cleaning up these ditches and making them a uniform typical width and capacity, however. In the existing model,

node D2 (Eastern Hinman), has a capacity of 115.380 cfs. With clean up, vegetation removal, and silt removal, D2 increases in capacity to 210.42 cfs. Node D1 (Western Hinman) has a capacity of 235.36 cfs under existing conditions but improves to 325.83 cfs for the proposed model. Please see **Attachments 5 and 6** for more information.

The twin 72" CMP culverts under Glenmount Avenue will not be modified or replaced. However, they are heavily silted in and need maintenance. Once cleaned out these pipes will have extra flow capacity and storage to help alleviate minor flooding events for the neighborhood. The cleaned-out twin 72" culverts see an increased capacity from 190-203 cfs to 289-304 cfs.

The final improvement made in this study is the replacement of the 54" pipe under I-277/US224 with a 96" reinforced concrete pipe. This pipe will have full height headwalls installed given its proximity to the roadway and the large grade difference from the pipe inverts to the graded shoulders of the roadway. The inlet invert elevation of 987.52' remains from the existing 54" pipe, however the outlet side of the proposed 96" pipe will be raised from 985.99' to 986.95'. This will reduce the slope from 0.0081 ft/ft to 0.003 ft/ft, which should not cause issues. This provides the potential for positive slope in the downstream sections of Hinman and Brewster Creek. Currently the existing 54" pipe outlet point is submerged by the confluence flow line point by 2.12'. The 96" pipe has a higher flow capacity, which increases from 115.39 cfs to 432.96 cfs. Please see **Attachments 5 and 6** for more information.

Modelling Overview

Hydrologic and hydraulic modelling was performed using HydroCAD (version 10.10-6a) and HEC-RAS (version 6.6) for this study. The hydrologic portion of this study utilized HydroCAD to develop the inflows (Q) into each structural component or reach. The hydraulic analysis was performed using HEC-RAS. The HEC-RAS model shows the change in water surface elevations between the existing condition and the proposed condition. The HydroCAD model used the SCS TR-20 runoff method and a dynamic-storage-indication routing and pond routing method. This method of routing allows each node to respond to other conditions, such as varying tailwater. The model utilized HydroCAD's predefined rainfall distribution for a 100-year Type II 24-hour storm for Summit County, Ohio, which results in a 100-year precipitation estimate of 5.53".

HydroCAD Model - Summary of Flow Changes

In this section we compare peak flow rates of the existing to proposed HydroCAD models. These changes in flow rate will be utilized in the HEC-RAS modelling for assessing reductions of flood elevations. The modified Coventry Crossing basin reduces its peak outflow from 105.64 cfs to 38.64 cfs. This combined with the reduction of node E4B from 24.70 cfs to 7.63 cfs through the new proposed detention basin, reduces the inflow into eastern Hinman Ditch from 143.43 to 54.23 cfs. Even though the twin 72" culverts have an increased capacity after being cleaned out the flows will be reduced due to the detention installed upstream. In the modelling these pipes show a change from 142.12 cfs to 80.83 cfs of inflow to western Hinman Ditch. The existing 54" pipe shows a peak outflow of 107.75 cfs in the 100-year storm event and is reduced to 93.60 cfs of outflow in the proposed conditions. **Table 2** summarizes the inflow and outflow performance of each structure and channel in existing conditions. All modelling information for the existing peak flows for this study can be found in **Attachment 5**; Existing HydroCAD Modelling. **Table 3** summarizes the inflow and outflow performance of each structure and channel in proposed conditions. All modelling information for the proposed peak flows for this study can be found in **Attachment 6;** Proposed HydroCAD Modelling.

Table 2 Existing Structures and Channel Flows (100-Year Storm)

Location	HydroCAD Model Node Name	Peak Inflow Cubic Feet Per Second	Peak Outflow Cubic Feet Per Second
Ex. Coventry Crossing Detention Basin	EB1	187.34	105.66
Eastern Hinman Ditch	D2	143.43	115.50
Ex. Twin 72" Culverts	C2	142.84	136.49
Western Hinman Ditch	D1	142.12	139.93
Ex. 54" Pipe	C1	142.94	107.75

Table 3 Proposed Structures and Channel Flows (100-Year Storm)

Location	HydroCAD Model Node Name	Peak Inflow Cubic Feet Per Second	Peak Outflow Cubic Feet Per Second
Pr. Coventry Crossing Detention Basin	P1M	187.34	38.64
Pr. Detention Basin	P2	24.70	7.63
Eastern Hinman Ditch	D2	54.23	54.15
Ex. Twin 72" Culverts	C2	56.72	54.82
Western Hinman Ditch	D1	80.83	78.12
Pr. 96" Pipe	PC1	96.93	93.60

HEC-RAS Model

Utilizing the flow data from the HydroCAD model, LIDAR data from OGRIP, survey data for the culverts and channel bathymetrics, and the proposed improvement plans a HEC-RAS model was generated. This model contains two different plans, one for the existing condition and one for the proposed condition. **Figure 3** shows the layout of the existing conditions model and the generated limits of the 100-year flood. The results of the existing conditions model indicate a backwater condition upstream of US-224 during the 100-year flood event. The proposed conditions model shows an alleviation of this backwater condition, resulting in a substantial drop in the BFE. **Figure 4** shows the layout of the proposed conditions plan and generated limits of the 100-year flood. **Table 4** lists the minimal channel elevation and water surface elevations at each cross-section. Please see **Attachment 7**: HEC-RAS Modelling Report for a more detailed description of the model.

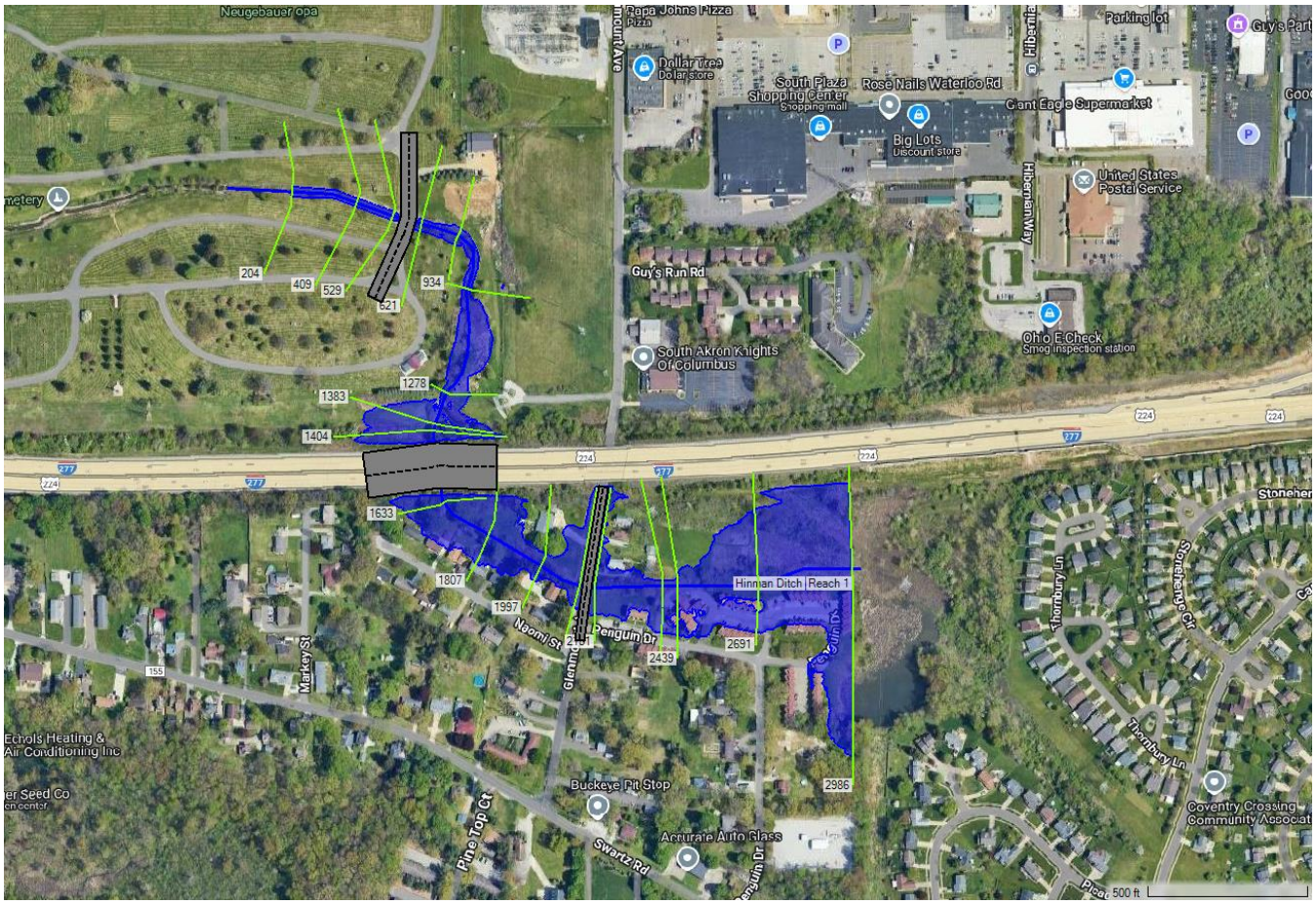


Figure 3 Existing Conditions 100-Year Water Surface - HEC-RAS Model

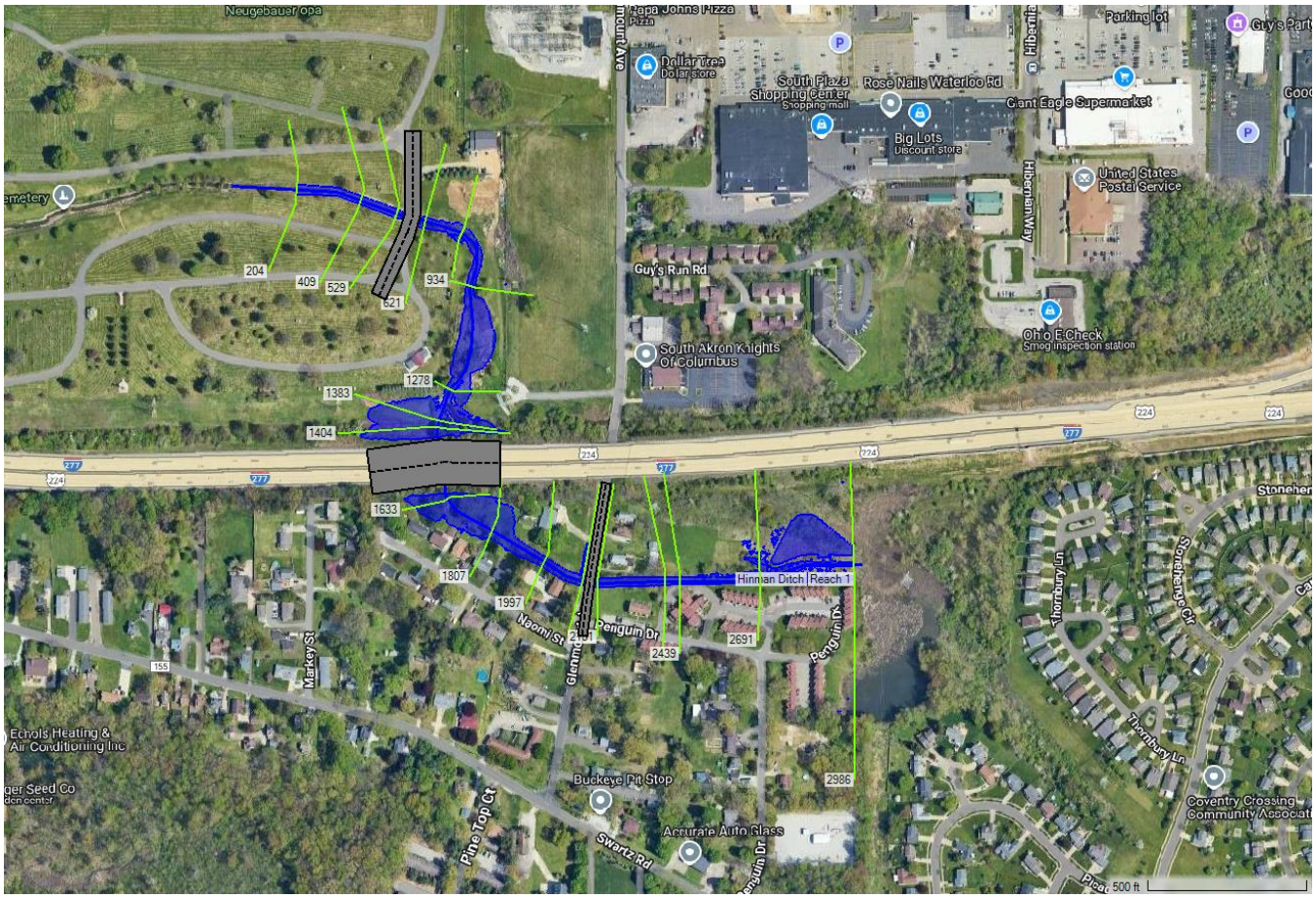


Figure 4 Proposed Conditions 100-Year Water Surface - HEC-RAS Model

Table 4 BFE Comparison Existing-Proposed

Cross Section Station	EX. Min Channel Elevation	PR. Min Channel Elevation	EX. 100- Year Water Surface Elevation	PR. 100- Year Water Surface Elevation	EX. 100- Year Channel Velocity	PR. 100- Year Channel Velocity
	Feet	Feet	Feet	Feet	Feet/Second	Feet/Second
2995	-	992.66	-	994.38	-	1.38
2986	993.06	-	997.78	-	0.16	-
2693	N/A	991.03	-	994.30	-	1.05
2691	991.19	-	997.78	-	0.43	-
2439	989.91	989.66	997.76	994.28	1.06	0.77
2395	989.97	989.43	997.76	994.28	0.82	0.71
2181	988.94	988.28	997.76	994.28	0.56	0.51
Glenmount Avenue	-					
2133	988.97	988.22	997.76	994.25	0.33	0.43
1997	989.09	988.03	997.75	994.24	0.62	0.63
1807	989.28	987.78	997.76	994.24	0.35	0.43
1633	989.00	987.53	997.76	994.24	0.43	0.51
US-224	-					
1404	988.54	986.72	994.39	994.15	1.08	0.34
1383	987.67	986.50	994.40	994.15	0.34	0.18
1278	986.02	986.04	993.87	993.57	5.67	5.93
934	986.10	986.06	992.59	992.31	7.17	7.18
743	985.41	985.41	992.23	991.87	6.07	6.20
621	984.35	984.34	992.10	991.72	5.10	5.26
Box Culvert	-					
529	983.62	983.62	990.64	990.42	6.54	6.43
409	983.21	983.22	989.90	989.69	7.12	7.00
204	981.38	981.38	989.42	989.20	5.13	5.04

Impacts to Properties

This project may have temporary and permanent impacts on properties neighboring Hinman Ditch. To construct this project within the 60' right-of-way for Hinman Ditch it may be necessary to secure a temporary construction easement for the contactor to have decent accessibility to perform necessary operations during the construction phase. Earthmoving will require the removal of material in the form of trucks and temporary road access points. Additional temporary easements may be required to replace the 54" pipe under I-277/US224. Physical temporary impacts may include the restoration of properties within these easement areas to their original condition. This may include temporary driveway removal, seeding and mulching repair. The permanent impact on properties will be in the form of new easement required for the ditch realignment and proposed detention basin. Also, the installation of the proposed detention basin will render that area unusable for any other purposes.

Permitting Analysis

EDG reviewed published mapping including recent aerial photographs, the National Wetland Inventory (NWI) Map prepared by the U.S. Fish and Wildlife Service, and the Ohio Wetlands Inventory Map (OWI) prepared by the Ohio Department of Natural Resources for the project area. The resources reviewed during the desktop evaluation and coordination response from the Ohio Department of Natural Resources (ODNR) Natural Heritage Database request are included in ***Attachment 8***. The obtained information was utilized to inform an internal discussion of ecological permits that may be required as part of the project undertaking. It should be noted that a formal wetland and surface waters delineation must be conducted to identify the extent and quality of on-site features prior to a formal determination of required and type of permits. EDG completed a desktop review of published mapping and resource data. A summary of our findings follows.

Table 5 Desktop Environmental Review

Map Description	Information Pertinent to Surface Waters
ESRI Aerial Photograph	Two streams appear to bisect the Study Area, one on either side of I-277, the north side (Brewster Creek) and on the south side (Hinman Ditch) are both running in the east/west direction. Saturation is visible on the aerial image in the southeast portion of the Study Area, to the south of I-277.
USGS Topographic Map	One stream, Brewster Creek, is depicted to the north of I-277 running in the east/west direction.
National Wetland Inventory (NWI) Map	One riverine, unknown perennial, unconsolidated bottom, permanently (R5UBH) feature is depicted to the north of I-277 running in the east/west direction, consistent with the topographic map. One palustrine, unconsolidated bottom, intermittently exposed (PUBG) feature is depicted in the southeast portion of the Study Area south of I-277.
Ohio Wetland Inventory (OWI) Map	The southeast portion of the Study Area is depicted as woods on hydric soils, shallow marsh, and wet meadow.

The United States Army Corps of Engineers (USACE) and Ohio Environmental Protection Agency (OEPA) regulate impacts to surface waters within the State of Ohio. Jurisdictional waters of the United States are protected under Sections 401 and 404 of the Clean Water Act and Executive Order 11990. The USACE has the primary regulatory

authority for enforcing Section 404 requirements for Waters of the United States. Ohio EPA also has a state program protecting surface waters for both jurisdictional and certain non-jurisdictional (i.e., isolated) wetlands and surface waters.

Section 404 Permit

Section 404 permits are authorized by the USACE. The USACE regulatory process involves two main types of Section 404 permits: Nationwide Permits (NWP) for actions that are similar in nature and will likely have a minor effect on jurisdictional waters and wetlands, and Individual Permits for more significant actions and impacts. It's typical for a project to have to apply for multiple NWPs concurrently. Concept 1 appears to meet the criteria set forth in NWP 3 for Maintenance. Since Concept 2 involves increasing the capacity it will most likely meet the criteria set forth in NWP 43 for Stormwater Management Facilities but may still also require the NWP 3. Concepts 3 and 4 appear to either meet the criteria of the NWP 43 or NWP 27 for Aquatic Habitat Restoration, Enhancement, and Establishment Activities. Concepts 3 and 4 may also require the NWP 3. Certain activities (e.g., those that propose impacts to wetlands or streams, involve tree cutting, and/or that may affect a historic or archaeologic feature) require a Pre-Construction Notification (i.e., Nationwide Permit application package), prior to the proposed activity.

Based on aerial photography, it appears that tree cutting will likely be required at the project site for all four Concepts. Therefore, it is assumed that a Pre-Construction Notification (PCN) under Nationwide Permit 3, 27, and/or 43 would be required. When a Pre-Construction Notification is required, permit issuance should be received from USACE prior to the commencement of work in waterways or wetlands. Generally, when a Pre-Construction Notification is required, authorization from the USACE may take 2-4 months to obtain. There are no fees associated with the Pre-Construction Notification. Mitigation for impacts to wetlands and streams may be required for the Section 404 permit.

Under NWP 27, impacts to streams for the purpose of restoration, enhancement, and/or establishment do not require mitigation, as long as the total linear length of stream restored, enhanced, or established is greater than the linear length of stream impacted. Under NWP 43, impacts to jurisdictional waters greater than 1⁄10-acre (0.1-acre) of wetlands or 3⁄100-acre (0.03-acre) of stream bed typically require compensatory mitigation. If impacts are below these thresholds, mitigation is not typically required. Mitigation credit amounts are calculated by multiplying the total proposed impacts by a multiplier (1.5x, 2x, 2.5x, or 3x), which is determined by the wetland category. Ohio EPA determines a Wetland Category during the ORAM verification process, which is typically initiated during the waterway permitting process. Wetland mitigation typically costs between $50,000 and $70,000 based on credit availability within the project's watershed. Stream mitigation does not require a multiplier, and typically costs around $250 per linear foot (based on availability). If permanent impacts are greater than 1/2-acre to waters of the U.S. a Section 404 Individual Permit may be required.

Section 401 Water Quality Certification

In Ohio, Section 401 Water Quality Certifications are authorized by the Ohio Environmental Protection Agency (EPA). Work in jurisdictional waterways and wetlands requires individual Section 401 certification unless the project meets the Ohio EPA special conditions of applicable NWPs.

With the assumptions made previously, it appears the proposed work is located within an area that could be deemed "Eligible" for 401 coverage under the current NWPs. However, based upon the preliminary scope of work, review of published map data, and current regulatory guidance, the project appears to meet the Ohio EPA special

conditions criteria of Nationwide Permit 3, 27 and/or 43. Therefore, an Individual 401 Water Quality Certification through Ohio EPA is not anticipated for this project. However, the USACE could still make a determination that an Individual 401 Water Quality Certification through Ohio EPA is required. For projects within minimal water quality effects (at the discretion of Ohio EPA), a Director's Authorization for coverage under the NWPs can be sought instead. Fees apply for Individual Water Quality Certifications (based on linear foot of impacted stream or wetland) and for a Director's Authorization ($2,000 flat fee). Ohio EPA has 180 days to respond to a request for an Individual Water Quality Certification, and 365 days to respond to a Director's Authorization, although Director's Authorizations, in practice, are typically received within 90-120 days.

Opinion of Probable Cost (OPCC)

The cost estimate has been updated from the Conceptual Engineering Memorandum. EDG looked further into the constructability and applied some construction management experience to the estimate. This will need to be developed further as this design evolves, but this estimate is a good preliminary estimate of the probable cost. The conceptual engineering phase estimated ~$788,623.55, at this stage we are estimating ~$1,966,690.99. This estimate can be found in **Attachment 9**.

Grant Funding

There are several possible funding mechanisms for restoration of Ohio Streams. From our experience there are ten that could be used for these projects based on the location of the improvement. The list below provides basic information regarding each of these potential funding options.

- County Petition Ditch: This process would start with a formal request or application made by landowners or residents to establish or improve drainage systems, commonly known as ditches. These drainage systems are essential for managing water flow, preventing flooding, and improving agricultural land. The process is often governed by Ohio's laws related to drainage and ditch maintenance. A petition was submitted to Summit County on August 18, 2011. If a solution is selected to move forward, the property owners whose drainage contributes to Hinman Ditch would be assessed for the cost of the flooding solution, this could also include the owners along Brewster Creek.

- MWCD Partners in Watershed Management (PWM): The grant program, Partners in Watershed Management (PWM), provides maintenance assessment funds to assist local organizations to implement water quality projects, flood reduction and mitigation programs, and watershed education efforts throughout the 18 counties within the Muskingum Watershed Conservancy District (MWCD). MWCD PWM grant applications are typically due in September and require detailed drawings, resolution(s), and letters of support.

- FEMA Hazard Mitigation Assistance Grant: FEMA's hazard mitigation assistance provides funding for eligible mitigation measures that reduce disaster losses. "Hazard mitigation" is any sustainable action that reduces or eliminates long-term risk to people and property from future disasters. Mitigation planning breaks the cycle of disaster damage, reconstruction and repeated damage. Hazard mitigation includes long-term solutions that reduce the impact of disasters in the future.

- FEMA Flood Mitigation Assistance Grant: The Flood Mitigation Assistance grant program is a competitive program that provides funding to states, federally recognized Tribal governments, U.S. territories, and local governments. Since the National Flood Insurance Reform Act of 1994 was signed into law, funds are used for projects that reduce or eliminate the risk of repetitive flood damage to buildings insured by the National Flood Insurance Program. FEMA chooses recipients based on the applicant's ranking of the project, eligibility, and cost-effectiveness of the project. FEMA requires state, local, federally recognized Tribal governments, and U.S. territories to develop and adopt hazard mitigation plans as a condition for receiving certain types of non-emergency disaster assistance, including funding for hazard mitigation assistance projects. IN 2023 this grant program was funded with $800 million.

- FEMA Building Resilient Infrastructure and Communities: The Building Resilient Infrastructure and Communities (BRIC) grant program makes federal funds available to states, U.S. territories, federally recognized Tribal governments, and local governments for hazard mitigation activities. It does so with a recognition of the growing hazards associated with climate change, and of the need for natural hazard risk mitigation activities that promote climate adaptation and resilience with respect to those hazards. These include both acute extreme weather events and chronic stressors which have been observed and are expected to increase in intensity and frequency in the future. The BRIC program's guiding principles include supporting communities through capability and capacity-building; encouraging and enabling innovation, including multi-hazard resilience or nature-based solutions; promoting partnerships; enabling large, systems-based projects; maintaining flexibility; and providing consistency. Through these efforts communities are able to better understand disaster risk and vulnerabilities, conduct community-driven resilience, hazard mitigation planning, and design transformational projects and programs.

  Awards made under this funding opportunity will be funded, in whole or in part, with funds appropriated by the Infrastructure Investment and Jobs Act, also more commonly known as the Bipartisan Infrastructure Law (BIL). The BIL is a once-in-a-generation investment in infrastructure, which will grow a more sustainable, resilient, and equitable economy by enhancing U.S. competitiveness, driving the creation of good-paying jobs with the free and fair choice to join a union, and ensuring stronger access to economic and environmental benefits for disadvantaged communities. The BIL appropriates billions of dollars to FEMA to promote resilient infrastructure, respond to the impacts of climate change, and equip our nation with the resources to combat its most pressing threats.

- USACE Section 205 – Flood Damage Reduction: Section 205 of the 1948 Flood Control Act authorizes the Corps of Engineers to plan, design, and construct structural and non-structural flood control projects in partnership with non-Federal government agencies, such as cities, counties, special authorities, or units of state government. Projects are planned and designed under this authority to provide the same complete flood risk management project that would be provided under specific congressional authorizations. The maximum federal cost for planning, design, and construction of any one project is $10.0 million. Each project must be economically justified, environmentally sound, and technically feasible. Flood risk management projects are not limited to any particular type of improvement. Levee and channel modifications are examples of flood risk management projects constructed utilizing Section 205 authority.

The feasibility study is 100% federally funded up to $100,000. Costs over $100,000 are shared equally with the non-federal sponsor. Up to one-half of the non-federal share can be in the form of in-kind services. Costs for preparation of plans and specifications are shared at 65 percent federal/35 percent non-federal (Construction cost-share varies between 50% and 65% Federal, based on the type [structural or non-structural] solution). The non-federal share of construction consists of provision of any necessary lands, easements, rights-of-way, relocations and disposal areas (LERRD), plus a cash contribution of 5% of the total project costs. In the event that the value of LERRD, plus 5% cash, does not equal at least 35% of the total project cost, the non-federal sponsor must contribute additional cash to pay their share. If LERRD plus 5% exceeds 35%, the sponsor is responsible for up to a maximum of 50% of the total project costs.

In response to a written request from a potential non-federal sponsor, the Corps conducts an initial appraisal early in the Feasibility Study to determine whether the project meets program criteria and provides a basis for determining scope and cost of an entire feasibility study. The solution must be economically feasible and environmentally acceptable. If an acceptable solution is identified in the feasibility study, the Corps prepares plans and specifications, then manages construction of the project.

- Ohio EPA Section 319(h): These funds are awarded to projects that restore Ohio streams, reduce nonpoint source pollutants such as nutrients, sediment and bacteria, improve stream and riparian habitat and/or reverse the impacts of stream hydromodification. These funds may provide up to 60% of the total project costs and have a minimum 3-year term. Approximately $2.7 million per year is anticipated for 2024. Applications for 2025 would be expected around October/November 2024. In order to be funded by this program, the project needs to be identified within an approved NPS-IS. This project is located within the Portage Lakes – Tuscarawas River HUC 05040001-01-05, which has an approved NPS-IS plan. The existing NPS-IS plan would need to be modified to include the preferred concept from this Conceptual Engineering Memorandum and inclusion of a critical area, then the plan will need to be resubmitted to Ohio EPA.

- WRRSP - To be eligible for WRRSP funding, project and costs must be directly related to restoring and/or protecting a site's aquatic life use. Eligible projects include stream and wetland protection through fee-simple property acquisition, and stream and wetland restoration that corrects impairments to on-site aquatic resources. To qualify for WRRSP funding, a project must either by itself, or in concert with other past, present, or future projects, result in the full protection or restoration of the aquatic resource. Streams must either be in attainment of, or be fully restored to, at least Warmwater Habitat or greater designated aquatic life use under Ohio Water Quality Standards. Wetlands must achieve, or be restored to, a Category 3 designation. Performance criteria include both habitat and biological assessment methods. The program is transitioning to requiring both pre- and post-implementation biological assessments for all projects. Acquisition and/or restoration of parcels with perpetual leases or severed mineral rights, regardless of when the severance took place, will not be eligible for WRRSP funding. Implementers will be limited to no more than five open WRRSP projects at the time nominations are submitted, and all required annual reports for previous projects awarded to the implementer must have been submitted to DEFA to be considered for funding for any additional projects. Nominations are accepted on an annual basis, with a deadline of July 15, 2024, for the Pre-Nomination Site Review Request Form. The project's water resource assessments must then be completed along with the project nomination form and attachments by August 15, 2024. Projects which are identified as fundable will meet program requirements in the first year

(design/permitting), and then receive their construction assistance award in the second year. There is no match requirement for WRRSP.

- Clean Ohio Conservation Program - Acquire land for public open space; protect or enhance riparian corridors - For projects that seek to restore streams, wetlands, and other water bodies, the applicant must demonstrate ability to secure a NWP (or other appropriate stream restorations permit) from the United States Army Corps of Engineers at time of application. Other applicable permits such as 401 Water Quality Certification from the Ohio Environmental Protection Agency must also be obtained. Applicants must receive permits and all necessary authorizations within one year of receiving Clean Ohio Funding and before commencement of project construction. Round 16 applications were due August 30, 2023, for District 8 (Summit County). Round 17 application process is anticipated to start July 2024. This program requires a minimum 25% local match.

- NFWF Five Star and Urban Waters Restoration Program - On-the-ground wetland, riparian, in-stream and/or coastal habitat restoration; Meaningful education and training activities, either through community outreach, participation and/or integration with K-12 environmental curriculum; Measurable ecological, educational and community benefits; Partnerships: Five Star projects should engage a diverse group of community partners to achieve ecological and educational outcomes. The program is funded at $2.6 million each year. Awards range from $20,000 to $50,000 with an average size of $35,000 and about 50 grants awarded per year. Grants span 12 to 18 months in duration. Typically, NFWF requests a 1:1 financial match. Application dates vary but are typically around the January timeframe.

Conclusion

From the Conceptual Engineering Memorandum dated 10-4-24, Summit County selected Concept 4 and the Coventry Crossing Basin improvement alternative from Concept 3 to move forward into Preliminary Plan Engineering. EDG reviewed the conceptual memorandum prior to starting the preliminary plan. EDG further analyzed its HydroCAD modelling to establish the peak flows for the existing drainage tributary and applied improvement conditions. Using these flows EDG created HEC-RAS models for the existing and proposed conditions to evaluate the flood elevations. Following the evaluation EDG updated the cost estimate (OPCC) to reflect the deeper insight that the preliminary plan engineering process has uncovered. The following is a discussion of the anticipated Pros and Cons of the proposed design.

Pro: By improving the Coventry Crossing Basin and constructing the proposed basin, peak flows entering Hinman Ditch will be reduced. Replacement of the US-224/I-277 54" culvert helps reduce the peak flows in Hinman Ditch by allowing the ditch to more efficiently handle the stormwater draining to it. Velocities have increased in both sections of Hinman Ditch which will allow for the ditch to more efficiently clean out deposited sediment on its own. Re-establishing the outlet elevation of the US-224/I-277 will assist in reducing tailwater/backflow from Brewster Creek.

Con: A potential negative outcome anticipated with this project pertains to the reshaping of Hinman Ditch. By reshaping the ditch to a more stable trapezoidal channel, the county will bring the width of the ditch to the edge of the 60' right of way. This could pose a problem for any future improvements of Hinman Ditch. Additionally, there

are jurisdictional considerations for work on the ODOT culvert under US-224 and the HOA in charge of the Coventry Crossing Basin. All parties should work together to help reduce the flood risk of the subject areas.

Excerpts from the 10/04/2024 Conceptual Engineering Memorandum

Potential Concepts

EDG has developed several concepts to help improve the drainage of Hinman Ditch along with concept planning costs to complete each project. We have organized these by the cost to complete, starting with Concept 1, which has the lowest cost. Concept 3 covers existing Coventry Crossing Basin conditions and how improvements to this basin could improve the drainage of Hinman Ditch. After Summit County reviewed the draft results of this Conceptual Engineering Memorandum, Summit County engaged EDG to perform an additional assessment of the existing Coventry Crossing Basin which has been included as ***Attachment 8.***

Concept 1: Ex. Ditch Cleanup and Restoring Ex Channel Capacity

The first concept considers cleaning up Hinman Ditch and restoring and improving the ditch to handle the 100-year design storm. No changes in alignment are included in Concept 1. The existing Hinman Ditch had been defined as a 4' to 6' wide ditch within a 60' right of way width. The work to restore the ditch would include removal of trees from inside the channel, removal of overgrown vegetation, and regrading the channel to restore capacity. This proposed concept includes restoring channel geometry to a 8' bottom width, 4' depth, and 3H:1V side slopes in the western ditch section down to the confluence with Brewster Creek, while the eastern ditch section will be improved with a 6' bottom width, 3' depth, and 3H:1V side slopes. The twin culverts under Glenmount Avenue would be completely cleaned out to their invert elevations, while Hinman Ditch would be cleaned out to the elevations presented in the table below to provide positive slope and connect to existing culvert elevations.

Table 3 Concept 1 Proposed Hinman Ditch Elevations

Location		Unit	Existing Conditions	Concept 1	Change
Eastern Hinman Ditch	Inlet	feet	993.04	992.79	-0.25
	Outlet		988.93	988.24	-0.69
	Slope	ft/ft	0.0051	0.0057	0.0006
Western Hinman Ditch	Inlet	feet	989.44	988.10	-1.34
	Outlet		988.67	987.52	-1.15
	Slope	ft/ft	0.0015	0.0011	-0.0004

The Concept 1 100-year storm event model results in Eastern Hinman Ditch having stormwater storage occurring on the east side of Glenmount Avenue up to an elevation of 994.86'. The 100-year storm event will not overtop Glenmount Road. Western Hinman Ditch has capacity to convey the 100-year storm event, but the 54" culvert under US-224/I-277 causes the 100-year storm to back up Western Hinman Ditch to an elevation of 993.12'. ***Figure 21*** shows the extents of the 100-year storm event in blue and the following table compares the results to existing conditions.

Table 4 Concept 1 Hinman Ditch Approx. 100-year WSEL

Location	Hydrocad Model Node Name	Existing Conditions	Concept 1	Change
		Feet		
Eastern Hinman Ditch	D2	996.04	994.86	-1.18
Western Hinman Ditch	C1 (US-224/I-277 Culvert)	995.01	993.12	-1.89

Note: Change is the difference from existing conditions.

Concept 1 provides minimal improvements in Eastern Hinman Ditch and moderate improvements in Western Hinman Ditch for reducing potential structural flooding.

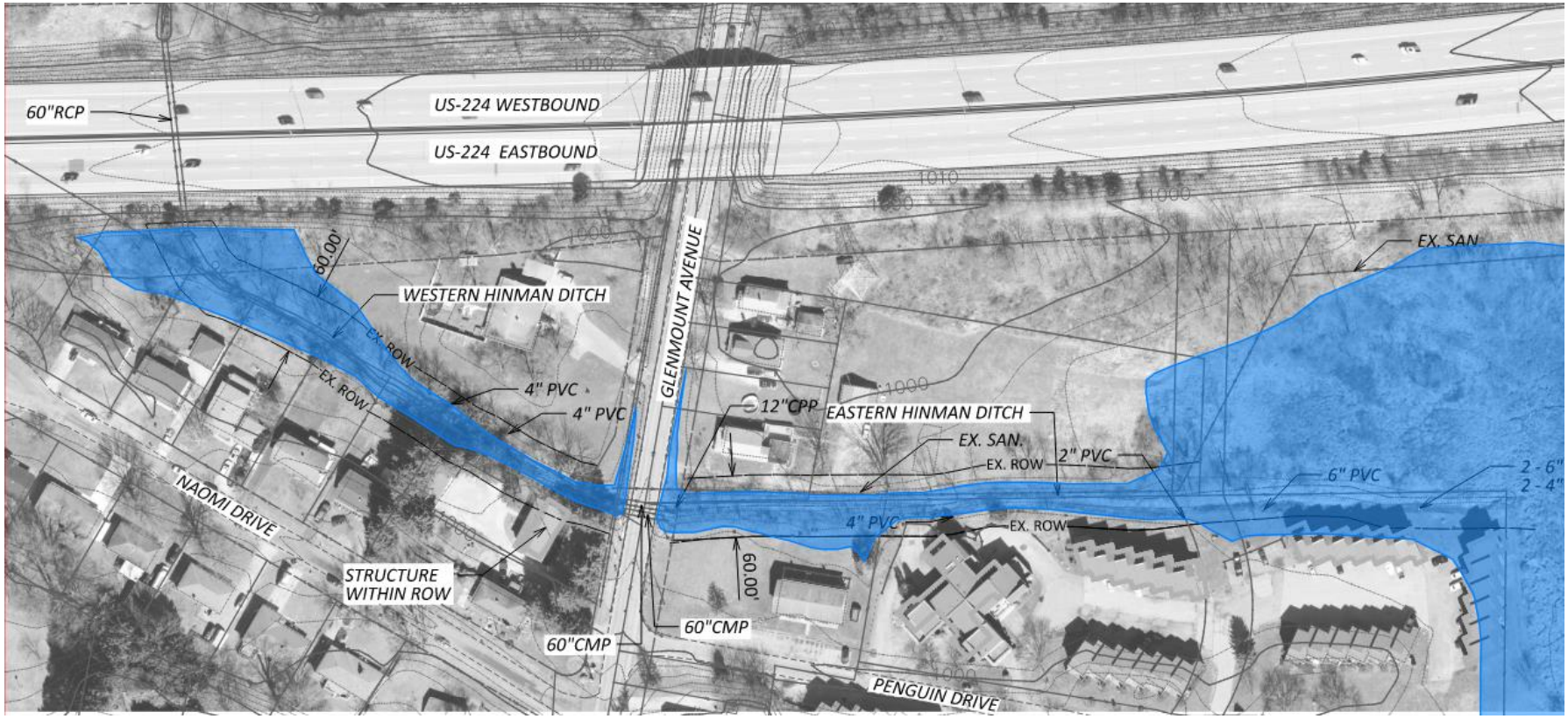


Figure 7 Concept 1: Approximate 100-year Storm Extents

As for the constructibility of the Concept 1 ditch channel section, all areas are constructable at this level of concept planning. There are a couple of building corners of the Peguin Condominiums that may encroach the 60' channel right of way, and minor readjustments of the centerline should be evaluated in the next phase of design. The house located on the northwest corner of Naomi Drive and Glenmount Avenue is the biggest concern. It is shown extending into the channel right of way by appproximately 10-12'. The centerlinee of Hinman Ditch is approximately 17' from the house. This would need to be verified by actual survey and further design, but could possibly be managed. See ***Attachment 4*** for more information.

Pro: This demonstrates an effort by the community to assist in flood reduction and will make a slight improvement in Hinman Ditch drainage.

Con: This does not provide enough of an impact to address flooding issues along Hinman Ditch. Also, this is a short-term improvement and will require more than typical routine maintenance, such as ditching every couple of years. Also, this concept does not prevent Brewster Creek from flood routing directly onto Glenmount Avenue and following the roadway to Hinman Ditch.

The following table provides the performance of Concept 1 compared to the existing conditions for the flows exiting the culverts and within the two sections of Hinman Ditch, and Hinman Ditch's average depth and maximum velocity.

Table 5 Concept 1 Performance Table

Concept 1 Performance Table										
Condition	Ex. 54" Culvert at US-224/I-277**	Western Hinman Ditch **				Ex. Twin 72" Culverts at Glenmount Ave.***	Eastern Hinman Ditch***			
Parameter	Outlet Flow	Outlet Flow	Avg. Depth	Max. Depth	Max. Vel.	Outlet Flow	Outlet Flow	Avg. Depth	Max. Depth	Max. Vel.
	cfs	cfs	ft		fps	cfs	cfs	ft		fps
Ex.100-Year Flow	112.19	151.99	3.26	4.00	2.62	148.52	115.37	3.00	3.00	3.20
Prop.100-Year Flow	137.84	158.59	2.85	4.00	3.36	154.20	154.46	2.07	3.00	6.12
Change	25.65	6.60	-0.41	na	0.74	5.68	39.09	-0.93	na	2.92

- 54" culvert at US-224/I-277 results show increased flows of 25.65 cfs.
- Western Hinman Ditch results show minor change in flow, increase in velocity of 0.74 fps and reduced water surface elevations by 0.41'.
- Minimal changes observed at the twin 72" culverts at Glenmount Ave.
- Eastern Hinman Ditch results show increased flows of 39.09 cfs, increase in velocity of 2.92 fps, and reduced water surface elevations by 0.93'.

Concept 2: Ditch Grading (adding channel capacity) and Realignment

The second concept cleans up both sections of Hinman Ditch as outlined in Concept 1, but in Concept 2 the side slopes on both sides and sections are laid back to a 4H:1V side slope. This concept takes an additional step by realigning part of Eastern Hinman Ditch away from the condominium buildings adding 95' in length to the ditch. The inlet and outlet elevations (***Table 4***) for Hinman Ditch in Concept 1 remain the same as in Concept 2, while the additional length added to Eastern Hinman Ditch will reduce channel slope to 0.0051 ft/ft. The realignment location occurs midway down Hinman Ditch due to property ownership constraints along the north side of the Ditch. A berm should be constructed between Penguin Condominiums and the realigned Eastern Hinman Ditch. Concept 2 should evaluate a two-stage ditch geometry for Eastern Hinman Ditch if it is selected for design.

Concept 2's 100-year storm event model results in Eastern Hinman Ditch storing stormwater on the east side of Glenmount Avenue up to an elevation of 994.78'. The 100-year storm event will not overtop Glenmount Road. Western Hinman Ditch has capacity to convey the 100-year storm event, but the 54" culvert under US-224/I-277 causes the 100-year storm to back up Western Hinman Ditch to an elevation of 993.11'. ***Figure 22*** shows the extents of the 100-year storm event in blue and the following table compares the results to existing conditions.

Table 6 Concept 2 Hinman Ditch Approx. 100-year WSEL

Location	HydroCAD Model Node Name	Existing Conditions	Concept 1	Change	Concept 2	Change
		Feet				
Eastern Hinman Ditch	D2	996.04	994.86	-1.18	994.78	-1.26
Western Hinman Ditch	C1 (US-224/I-277 Culvert)	995.01	993.12	-1.89	993.11	-1.90

Note: Change is the difference from existing conditions.

Concept 2 provides slightly moderate improvements in Eastern and Western Hinman Ditch for reducing potential structural flooding.

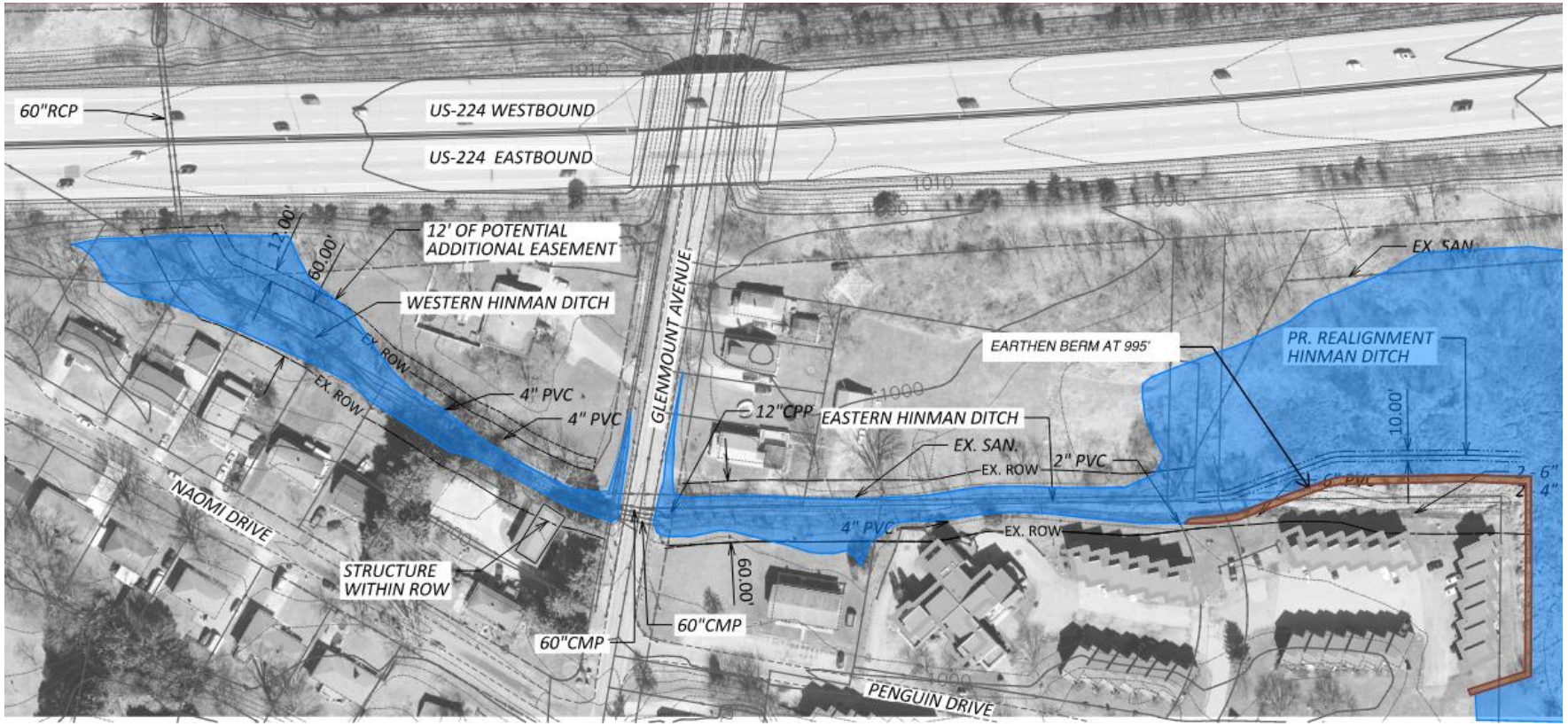


Figure 8 Concept 2: Approximate 100-year Storm Extents

As for constructibility, most ditch channel sections in Concept 2 are constructable at this level of concept planning. To achieve the geometry of Concept 2, Western Hinman Ditch will need to be slighlty re-aligned away from structures on Naomi Drive and additional right of way easements would be required. The structure located on the northwest corner of Naomi Drive and Glenmount Avenue is the biggest concern. It is shown extending into the ditch right of way by approximately 10-12'. The centerline of Hinman Ditch is approximately 17' from the structure creating a conflict with the 4H:1V slopes of the typical section. Either the structure would need removed or the ditch channel would need to be relocated further north. The structure is approximately 40' downstream of the outlets of the twin 72" culverts at Glenmount Avenue, so if the ditch is relocated further north, the re-alignment will need to create curvature in the ditch moving it from the structure and avoiding the need to realign the twin 72" culverts at Glenmount Avenue. All of these possibilities need to be verified by actual survey and further design. See ***Attachment 5*** for more information.

Pro: This will improve stormwater drainage and help prolong the maintenance cycle by making the entire channel at least a 6' wide at its bottom with consistent side slopes. This will help keep flows consistent and reduce the deposition of sediment. This provides improvement over Concept 1 but will likely fall short of providing a major impact on addressing flood issues. This does help move the areas of flooding away from the building structures at Penguin Park Condominiums.

Con: This concept provides a partial solution; it costs more than Concept 1 and provides very minor flood elevation improvements over Concept 1 results. A structure along Naomi Drive will conflict with Concept 2 which will require additional right-of-way easements. Also, this concept does not prevent Brewster Creek from flood routing directly onto Glenmount Avenue and following the roadway to Hinman Ditch.

The following table provides the performance of Concept 2 compared to the existing conditions for the flows exiting the culverts and within the two sections of Hinman Ditch, and Hinman Ditch's average depth and maximum velocity.

Table 7 Concept 2 Performance Table

Concept 2 Performance Table										
Condition	Ex. 54" Culvert at US-224/I-277**	Western Hinman Ditch **				Ex. Twin 72" Culverts at Glenmount Ave.***	Eastern Hinman Ditch***			
Parameter	Outlet Flow	Outlet Flow	Avg. Depth	Max. Depth	Max. Vel.	Outlet Flow	Outlet Flow	Avg. Depth	Max. Depth	Max. Vel.
	cfs	cfs	ft		fps	cfs	cfs	ft		fps
Ex.100-Year Flow	112.19	151.99	3.26	4.00	2.62	148.52	115.37	3.00	3.00	3.20
Prop.100-Year Flow	137.55	157.32	2.66	4.00	3.17	153.53	153.70	1.99	3.00	5.53
Change	25.36	5.33	-0.60	na	0.55	5.01	38.33	-1.01	na	2.33

- 54" culvert at US-224/I-277 results show increased flows of 25.36 cfs.
- Western Hinman Ditch results show minor change in flow, increase in velocity of 0.55 cfs and reduced water surface elevations by 0.60'.
- Minor changes in flow observed at the twin 72" culverts at Glenmount Ave.
- Eastern Hinman Ditch results show increased flows of 38.33 cfs, increase in velocity of 2.33 fps, and reduced water surface elevations by 1.01'.

Concept 3: Additional Detention Storage

The preferred solution for Concept 3 is the Coventry Crossing Basin per "Plan" plus proposed additional detention storage. The following information will discuss the process utilized to determine this combination of options which was the best solution for Concept 3 modeling.

The third concept evaluated proposed detention storage in two different locations. One is proposed in the area north of the beginning of Hinman Ditch, and the other is the Coventry Crossing Basin being restored to 1993 Subdivision Plans ("Plan") conditions. The Coventry Crossing Basin "Plan" conditions are provided in ***Attachment 8***. EDG evaluated several scenarios to include modeling these two proposed detention storage basins individually, separately, and in conjunction with each other. Also, the three additional storage scenarios (individual/combined/separate) were combined with both the existing Hinman Ditch conditions and the Concept 1 Ditch Improvements. Concept 1 Ditch Improvements were selected over Concept 2 because Concept 2 has more obstacles to overcome with structural conflicts and ROW acquisition. Also, the additional benefit Concept 2 provides is not substantial enough to support recommending it to move forward into a future design phase.

For the proposed detention basin storage, EDG maximized the area shown between the overhead powerlines and the sanitary sewer to come up with the greatest potential storage area allowed by the utilities. The eastern area behind Penguin Condominiums is not viable for detention basin storage due to elevation differences. The proposed detention basin includes a water quality outlet to assist in reduction of pollutant loading to the Tuscarawas River.

The available area for a proposed detention basin storage is shown in the Concept 3 exhibit (***Attachment 6***) as a 4.85' deep basin (elevation 996' down to 991.15') with approximately 2.611 ac-ft (113,735 cubic feet) of storage. EDG used a multi-stage outlet with the following devices to estimate outlet flows into Hinman Ditch:

- 2' diameter circular outlet control at an elevation of 991.15' (bottom of the basin) with a 0.004 ft/ft slope
- 6" water quality orifice at elevation 992.0'
- Three 18" wide x 6" high side window openings at an elevation of 993.0'
- 24" square top grate with eight 2" x 23" openings at an elevation of 994.0'
- Emergency spillway was designed as a broad-crested rectangular weir at an elevation of 995.0' with a 40' crest length and 8' breadth

Another consideration in evaluating Concept 3 detention storage alternatives was the flow going into Hinman Ditch from Coventry Crossing Basin. Coventry Crossing Basin per "Plan" conditions will result in a significant reduction of flow and can provide moderate reductions in water surface elevations, whereas proposed additional detention alone will provide moderate reductions in water surface elevations. The Coventry Crossing Basin is within the City of Akron jurisdictional boundary and working through the necessary coordination to return the Coventry Crossing Basin to "Plan" conditions may be a lengthy and time-consuming process. The following table provides the percent reduction of inflow into Hinman Ditch by four scenarios evaluated as part of Concept 3.

Table 8 Concept 3 Potential Flow Reductions for Hinman Ditch

Potential Flow Reductions for Hinman Ditch			
Scenario	Inflow to Hinman Ditch	Percent Reduction from Existing Conditions	Percent of Existing Conditions
	cfs	%	%
Existing Conditions	155.31	0	0
Proposed Detention Basin Storage + Existing Coventry Crossing Basin	115.66	25.5	74.5
Coventry Crossing Basin per "Plan"	87.03	44.0	56.0
Proposed Detention Basin Storage + Coventry Crossing Basin per "Plan"	61.13	60.6	39.4

Ultimately none of the various combination of options for Concept 3's 100-year storm event model results could reach the preferred elevations for Hinman Ditch. The construction of an earthen berm by the Penguin Condominiums allows for the preferred elevation in Eastern Hinman Ditch to be increased, which can produce significant improvement to reduce structural flooding within the study area. Five different scenarios were assessed, as outlined in ***Table 10*** and ***11***, to determine the optimal combination of improvements to present as Concept 3.

Table 9 Concept 3 Potential Hinman Ditch Approx. 100-year WSEL with Additional Detention Only

Location	Existing Conditions	Coventry Crossing Basin per "Plan"	Change	New Proposed Detention	Change
	Feet				
Eastern Hinman Ditch	996.04	995.62	-0.42	996.02	-0.02
Western Hinman Ditch	995.01	993.75	-1.26	994.82	-0.19

Note: Change is the difference from existing conditions. The Western Hinman Ditch results continue to utilize the results from the Hydrocad model node C1 for US-224/I-277 culvert since it is controlling the water surface elevation.

Table 10 results indicate that detention alone would not reach the Preferred Conditions, and that ditch improvements need to be part of the final Concept 3 solution.

It should be noted that restoration of Coventry Crossing Basin alone will provide notable improvements in Eastern and Western Hinman Ditch for reducing potential structural flooding.

Table 10 Concept 3 Hinman Ditch Approx. 100-year WSEL with Add. Detention & Ditch Improvements Only

Location	Existing Conditions	Ditch Improvement + CCB per "Plan"	Change	Ditch Improvement + CCB per "Plan" + New Proposed Detention	Change	Ditch Improvement + Proposed Detention	Change
		Concept 3A		Concept 3B		Concept 3C	
	Feet						
Eastern Hinman Ditch	996.04	*995.15*	-0.89	*994.13*	-1.91	*994.57*	-1.47
Western Hinman Ditch	995.01	991.42	-3.59	991.41	-3.60	992.29	-2.72

Note: Change is the difference from existing conditions. The Western Hinman Ditch results continue to utilize the results from the Hydrocad model node C1 for US-224/I-277 culvert since it is controlling the water surface elevation. Elevations highlighted GREEN meet the Preferred Conditions, elevations highlighted YELLOW are within 0.5' of the Preferred Condition. On Eastern Hinman Ditch elevations *ITALICIZED AND UNDERLINED* are below the proposed earthen berm elevation.

Table 11 results indicate that restoring Coventry Crossing Basin to per "Plan" conditions along with ditch improvements with/without additional detention storage (Concept 3A/3B) would reach the Western Hinman Ditch preferred elevation of 992.00'. None of the potential Concept C options can get the Eastern Hinman Ditch below the preferred elevation of 994.00'. Therefore, the re-alignment of Eastern Hinman Ditch to allow for construction of an earthen berm must be part of Concept 3 solution. The earthen berm can be raised to a sufficient elevation to provide protection to the Penguin Condominiums and reduce flooding to structures in the study area. The next design phase should further evaluate the design berm elevation if Concept 3 is selected to advance.

Figures 23 (Concept 3A) and ***24*** (Concept 3B) shows the extents of the 100-year storm event in blue. A figure for Concept 3C was not prepared since it will be very similar to Concept 3B's flood extents. Concept 3C will have slightly higher WSEL of 0.44' in Eastern Hinman Ditch and 0.88' in Western Hinman Ditch.

It should be noted that both Concept's 3A & B provide significant improvements in Eastern and Western Hinman Ditch for reducing potential flooding to structures. Concept 3B model results have been included in ***Attachment 6*** since these are the results that provide the best hydraulic results.

Ditch Improvements plus Coventry Crossing Basin per "Plan"

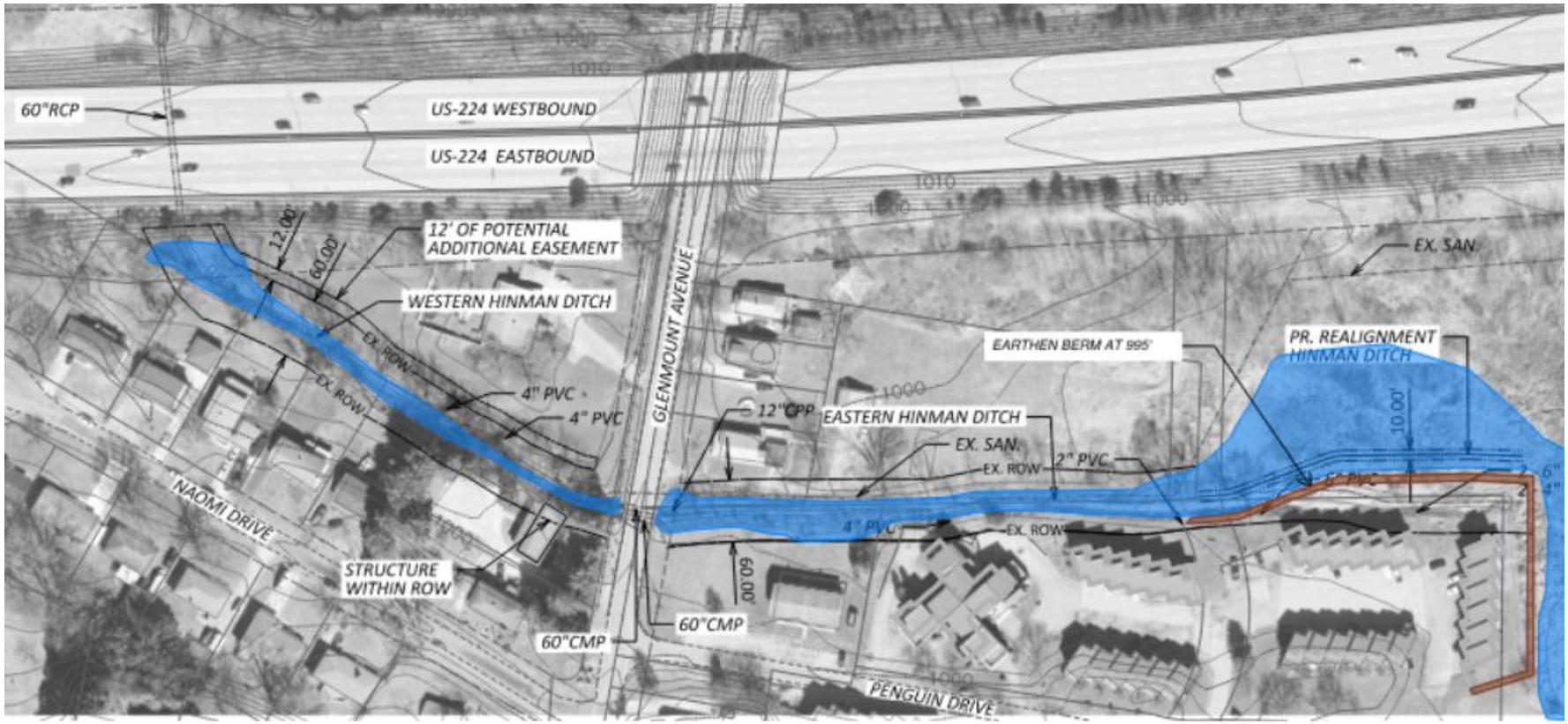


Figure 9 Concept 3A: Approximate 100-year Storm Extents

Ditch Improvements plus new Proposed Detention

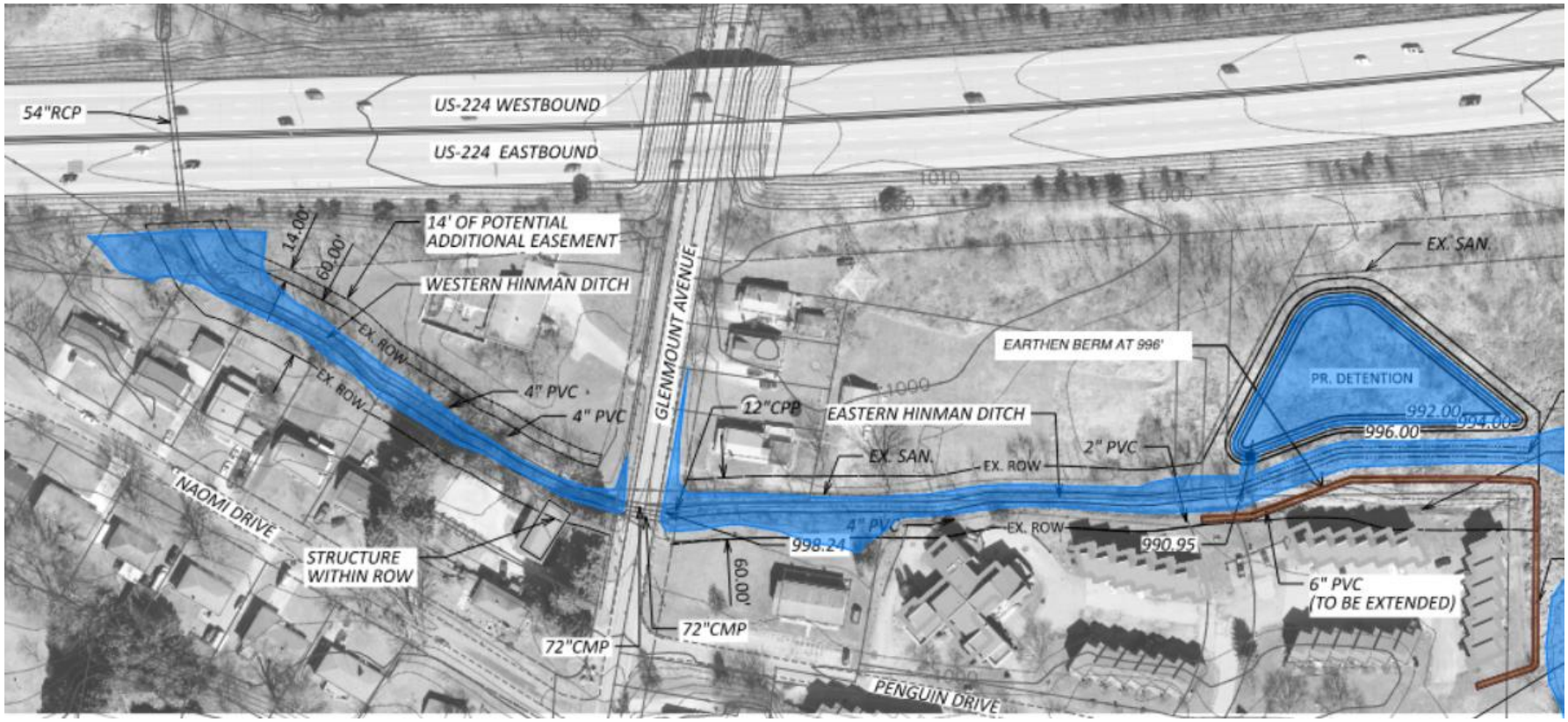


Figure 10 Concept 3B: Approximate 100-year Storm Extents

As for the constructability of Concept 3, all areas appear constructable at this level of concept planning. The house located on the northwest corner of Naomi Drive and Glenmount Avenue is the biggest concern since it is within the right of way. It is shown extending into the channel right of way by approximately 10-12'. This would need to be verified by actual survey and further design, but could possibly be managed. The constructability of the Coventry Crossing Basin per "Plan" is out of Summit County's jurisdication and may prove to be difficult to get restored. The available area for the proposed detention storage should provided limited conflicts for construction and will provide some benefit if advanced.

Tables 12 and ***13*** are both representing Concept 3 as the combination of Concept 1 Ditch Improvements plus Coventry Crossing Basin per "Plan" plus Proposed Detention Storage as the solution that provides the best hydraulic benefit to the study area. It should be noted that Ditch Improvements plus Coventry Crossing Basin per "Plan" provide very similar results and the added expense to construct a second basin may not be worth the minimal advantage it provides. See ***Attachment 6*** for more information.

Table 11 Concept 3 Hinman Ditch Approx. 100-year WSEL

Location	Hydrocad Model Node Name	Existing Conditions	Concept 1	Change	Concept 2	Change	Concept 3	Change
		Feet						
Eastern Hinman Ditch	D2	996.04	994.86	-1.18	994.78	-1.26	994.13	-1.91
Western Hinman Ditch	C1 (US-224/I-277 Culvert)	995.01	993.12	-1.89	993.11	-1.90	991.41	-3.60

Note: Change is the difference from existing conditions.

Pro: Adding storage detention helps reduce peak flows in Hinman Ditch and allows the ditch to handle oncoming stormwater more efficiently. Restoration of the Coventry Crossing Basin will provide more benefit over a new proposed Storage Detention Basin. If the Coventry Crossing Basin can be returned to "Plan" conditions by the HOA or the City of Akron, the County will not incur the cost. If the proposed detention basin is constructed, it should be straightforward to coordinate necessary communication and permitting to be ready for construction.

Con: Adding additional detention will cost more than Concepts 1 & 2. The Coventry Crossing per "Plan" concept will require coordination with the City of Akron and/or the Coventry Crossing HOA to get the Coventry Crossing Basin constructed to "Plan" conditions. It is likely coordination will take a significant amount of time, possibly years. Any new basin will require ongoing maintenance to keep functioning at optimum performance. Also, this concept does not prevent Brewster Creek from flood routing directly onto Glenmount Avenue and following the roadway to Hinman Ditch.

The following table provides the performance of Concept 3 compared to the existing conditions for the flows exiting the culverts and within the two sections of Hinman Ditch, and Hinman Ditch's average depth and maximum velocity.

Table 12 Concept 3 Performance Table

Concept 3 Performance Table										
Condition	Ex. 54" Culvert at US-224/I-277**	Western Hinman Ditch **				Ex. Twin 72" Culverts at Glenmount Ave.***	Eastern Hinman Ditch***			
Parameter	Outlet Flow	Outlet Flow	Avg. Depth	Max. Depth	Max. Vel.	Outlet Flow	Outlet Flow	Avg. Depth	Max. Depth	Max. Vel.
	cfs	cfs	ft		fps	cfs	cfs	ft		fps
Ex.100-Year Flow	112.19	151.99	3.26	4.00	2.62	148.52	115.37	3.00	3.00	3.20
Prop.100-Year Flow	89.78	78.20	2.01	4.00	2.78	61.92	61.01	1.34	3.00	4.56
Change	-22.41	-73.79	-1.25	na	0.16	-86.6	-54.36	-1.66	na	1.36

- 54" culvert at US-224/I-277 results show a decreased flow of 22.41 cfs.
- Western Hinman Ditch results show a decrease in flow of 73.79 cfs, minimal change in velocity, and reduced water surface elevations by 1.25'.
- Existing twin 72" culverts at Glenmount Ave results show a decrease in flow of 86.6 cfs
- Eastern Hinman Ditch results show reduced flows by 54.36 cfs, increased velocity of 1.36 fps, and reduced water surface elevations by 1.66'.

Concept 4: Ditch Grading/Realignment, Detention Storage, and Roadway Structure Replacement

The fourth concept combines the Concept 1 Ditch Improvements plus the Proposed Detention Storage plus Culvert Replacement. This concept makes no changes to the existing conditions of Coventry Crossing Basin.

The proposed detention storage was included as part of Concept 4 as a solution because it was assumed that it can be constructed sooner than restoration of Coventry Crossing Basin. Also, previous concepts indicate that restoration of Coventry Crossing Basin should improve Concept 4 results further. So, if Summit County sees positive momentum in the restoration of Coventry Crossing Basin, and Concept 4 is selected for further design, the proposed new detention storage should likely be eliminated from consideration.

Concept 4 replaces the culverts under US-224/I-277. The structure under US-224/I-277 is a single 54" culvert with twin 72" culverts directly upstream of it. Field visits confirmed that the outlet invert settled nearly one foot from its as-designed elevation. In developing this concept, replacement of the twin structures under Glenmount Ave was evaluated and additional capacity at this location showed minimal to no improvement in outlet flows (< 2.0 cfs) and was not further considered as an alternative.

The Glenmount Avenue twin 72" culverts have an open surface area of 2 x 28.3 sq. ft. or 56.5 sq. ft. A single 96" culvert would have a similar capacity with an open surface area of 50.3 sq. ft. Therefore, this was the final size used in Concept 4. Since the US-224/I-277 culverts would be replaced, Hinman Ditch can be regraded from the Glenmount Avenue culvert outlets down to its confluence with Brewster Creek. The table below uses the elevations used in the hydraulic Concept 4 model for Hinman Ditch and the proposed 96" culvert under US-224/I-277.

Table 13 Concept 4 Proposed Hinman Ditch Elevations

Location		Unit	Existing Conditions	Concept 4	Change
Eastern Hinman Ditch**	Inlet	feet	993.04	992.79	-0.25
	Outlet		988.93	988.24	-0.69
	Slope	ft/ft	0.0051	0.0057	0.006
Western Hinman Ditch	Inlet	feet	989.44	988.24	-0.34
	Outlet		988.67	987.52	-1.15
	Slope	ft/ft	0.0015	0.0014	-0.0001
Ex. 54" / Proposed 96" Culvert (US-224/I-277)	Inlet	feet	987.52	987.52	0.00
	Outlet		985.99	986.95	0.96
	Slope	ft/ft	0.0081	0.0030	-0.005

** Eastern Hinman Ditch is the same as modeled in Concept 1.

Concept 4's 100-year storm event model results with Eastern Hinman Ditch having stormwater storage occurring on the east side of Glenmount Avenue up to an elevation of 994.41'. The 100-year storm event will not overtop Glenmount Road. Western Hinman Ditch has capacity to convey the 100-year storm event, but the proposed 96" culvert under US-224/I-277 still backs up the 100-year storm event in Western Hinman Ditch to an elevation of 991.87'. ***Figure 25*** shows the extents of the 100-year storm event in blue and the following table compares the results to existing conditions.

Table 14 Concept 4 Hinman Ditch Approx. 100-year WSEL

Location	HydroCAD Model Node Name	Existing Conditions	Concept 1	Change	Concept 2	Change	Concept 3	Change	Concept 4	Change
		Feet								
Eastern Hinman Ditch	D2	996.04	994.86	-1.18	994.78	-1.26	994.13	-1.91	994.57	-1.47
Western Hinman Ditch	C1 (US-224/I-277 Culvert)	995.01	993.12	-1.89	993.11	-1.90	991.41	-3.60	991.87	-3.14

Note: Change is the difference from existing conditions.

Concept 4 provides significant improvements in Eastern and Western Hinman Ditch for reducing potential flooding to structures and the results provide comparable WSEL results to Concept 3. Concept 4 model results have been included in ***Attachment 7***.

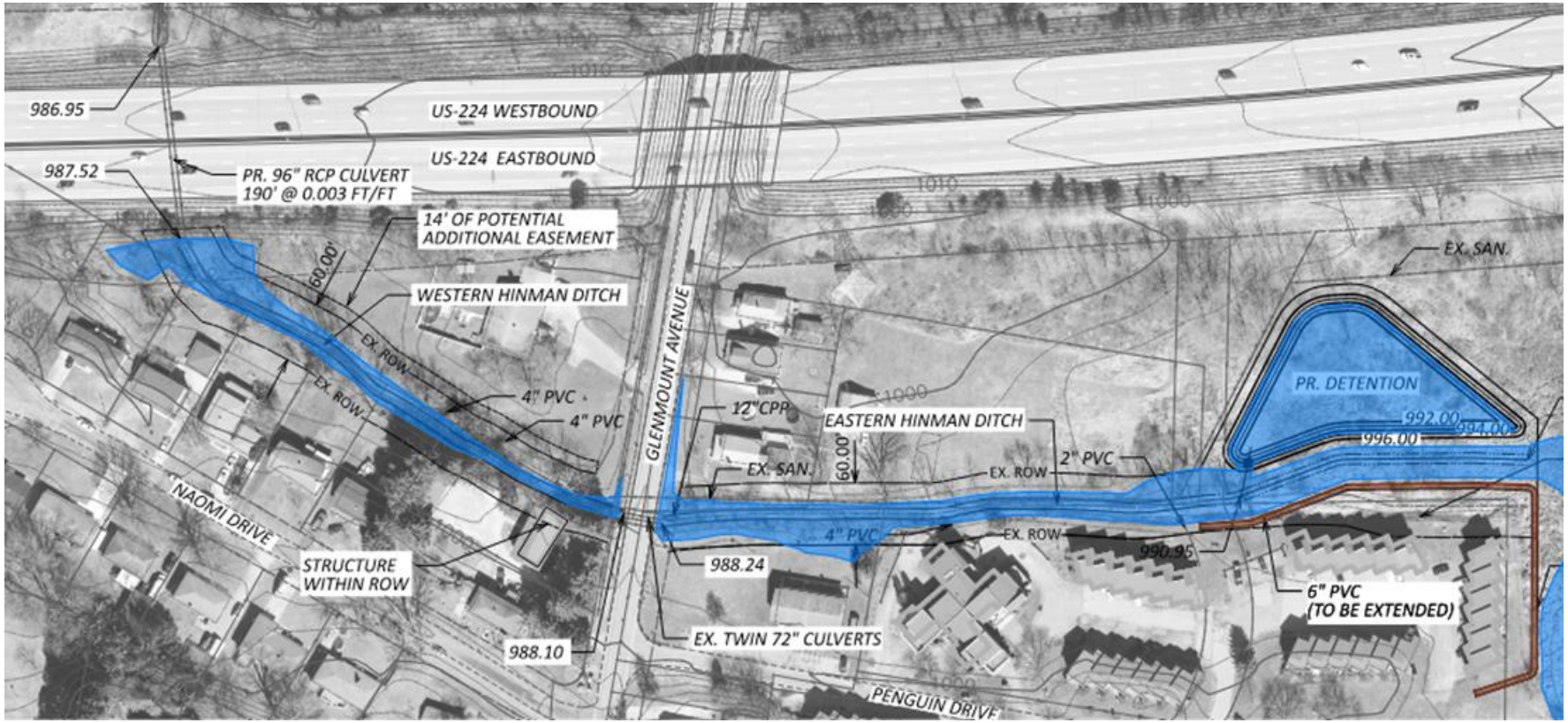


Figure 11 Concept 4: Approximate 100-year Storm Extents

Pro: Replacement of the US-224/I-277 54" culvert helps reduce peak flows in Hinman Ditch by allowing the ditch to more efficiently handle the stormwater draining to it. Velocities have increased in both sections of Hinman Ditch which will allow for the ditch to more efficiently self-clean deposited sediment. Re-establishing the outlet elevation of the US-224/I-277 culvert will assist in reducing tailwater/backflow from Brewster Creek.

Con: This contains all the negatives of Concept 3, but in addition, it is roughly double the cost of Concept 3. A major con is that it will increase flows going to Brewster Creek. The other notable drawback is that even though this greatly improves drainage on Hinman Ditch and will reduce the time needed for flood conditions to recede, it still will not prevent Brewster Creek from flood routing directly onto Glenmount Avenue and following the roadway to Hinman Ditch. To help this situation, detention is needed upstream of Glenmount along Brewster Creek. Concept 4 will be a lengthy project to address the permitting and coordination required to replace the structure under US-244/I-277.

Table 15 Concept 4 Performance Table

Concept 4 Performance Table										
Condition	Ex. 54"/Pr. 96" Culvert at US-224/I-277**	Western Hinman Ditch **				Ex. Twin 72" Culverts at Glenmount Ave.***	Eastern Hinman Ditch***			
Parameter	Outlet Flow	Outlet Flow	Avg. Depth	Max. Depth	Max. Vel.	Outlet Flow	Outlet Flow	Avg. Depth	Max. Depth	Max. Vel.
	cfs	cfs	ft		fps	cfs	cfs	ft		fps
Ex.100-Year Flow	112.19	151.99	3.26	4.00	2.62	148.52	115.37	3.00	3.00	3.20
Prop.100-Year Flow	124.48	126.59	2.42	4.00	3.43	122.48	121.75	1.78	3.00	5.21
Change	12.29	-25.40	-0.84	na	0.81	-26.04	6.31	-1.22	na	2.01

- Proposed 96" culvert at US-224/I-277 results show increased flows of 12.29 cfs.
- Western Hinman Ditch results show reduction in flow of 25.40 cfs, increase in velocity of 0.81 fps, and decreased water surface elevations by 0.84'.
- Twin 72" culverts at Glenmount Ave results show decreased flow of 26.38 cfs.
- Eastern Hinman Ditch results show increased flow of 6.31 cfs, increase in velocity of 2.01 fps, and reduced water surface elevations by 1.22'.

Table 17 below summarizes all concept results into one table to more easily compare results.

Table 16 Concept Comparison Performance Table

Performance Table Concept Comparison								
Concept	Ex. 54" Culvert at US-224/I-277	Western Hinman Ditch			Ex. Twin 72" Culverts at Glenmount Ave.	Eastern Hinman Ditch		
Parameter	Outlet Flow	Outlet Flow	Avg. Depth	Max. Vel.	Outlet Flow	Outlet Flow	Avg. Depth	Max. Vel.
	cfs	cfs	ft	fps	cfs	cfs	ft	fps
Ex. 100-Year Flow	112.19	151.99	3.26	2.62	148.52	115.37	3.00	3.20
Concept 1	137.84	158.59	2.85	3.36	154.20	154.46	2.07	6.12
Concept 2	137.55	157.32	2.66	3.17	153.53	153.70	1.99	5.53
Concept 3	89.78	78.20	2.01	2.78	61.92	61.01	1.34	4.56
Concept 4	124.48	126.59	2.42	3.43	122.48	121.75	1.78	5.21

Note that Concept 3 is the only concept performing with reduced outlet flows and this is primarily due to restoration of Coventry Crossing Basin being included in the Concept 3 solution. It would be expected that Concept 4 could produce similar reduced outlet flows if restoration of Coventry Crossing Basin was added to its solution.

Permitting Analysis

EDG reviewed published mapping including recent aerial photographs, the National Wetland Inventory (NWI) Map prepared by the U.S. Fish and Wildlife Service, and the Ohio Wetlands Inventory Map (OWI) prepared by the Ohio Department of Natural Resources for the project area. The resources reviewed during the desktop evaluation and coordination response from the Ohio Department of Natural Resources (ODNR) Natural Heritage Database request are included in ***Attachment 9***. The obtained information was utilized to inform an internal discussion of ecological permits that may be required as part of the project undertaking. It should be noted that a formal wetland and surface waters delineation must be conducted to identify the extent and quality of on-site features prior to a formal determination of the required and necessary type(s) of permits. EDG completed a desktop review of published mapping and resource data. A summary of our findings follows.

Table 17 Desktop Environmental Review

Map Description	Information Pertinent to Surface Waters
ESRI Aerial Photograph	Two streams appear to bisect the Study Area, one on either side of I-277, the north side (Brewster Creek) and on the south side (Hinman Ditch) both flow in an east/west direction. Saturation is visible on the aerial image in the southeast portion of the Study Area, to the south of I-277.
USGS Topographic Map	One stream, Brewster Creek, is depicted to the north of I-277 flowing in an east/west direction.
National Wetland Inventory (NWI) Map	One riverine, unknown perennial, unconsolidated bottom, permanent (R5UBH) feature is depicted to the north of I-277 flowing in an east/west direction, consistent with the topographic map. One palustrine, unconsolidated bottom, intermittently exposed (PUBG) feature is depicted in the southeast portion of the Study Area south of I-277.
Ohio Wetland Inventory (OWI) Map	The southeast portion of the Study Area is depicted as woods on hydric soils, shallow marsh, and wet meadow.

The United States Army Corps of Engineers (USACE) and Ohio Environmental Protection Agency (OEPA) regulate impacts to surface waters within the State of Ohio. Jurisdictional waters of the United States are protected under Sections 401 and 404 of the Clean Water Act and Executive Order 11990. The USACE has the primary regulatory authority for enforcing Section 404 requirements for Waters of the United States. Ohio EPA also has a state program protecting surface waters for both jurisdictional and certain non-jurisdictional (i.e., isolated) wetlands and surface waters.

Section 404 Permit

Section 404 permits are authorized by USACE. The USACE regulatory process involves two main types of Section 404 permits: Nationwide Permits (NWP) for actions that are similar in nature and will likely have a minor effect on jurisdictional waters and wetlands, and Individual Permits for more significant actions and impacts. It is typical for a project to have to apply for multiple NWP's concurrently. Concept 1 appears to meet the criteria set forth in NWP 3 for Maintenance. Since Concept 2 involves increasing capacity, it will most likely meet the criteria set forth in NWP 43 for Stormwater Management Facilities, but may still also require the NWP 3. Concepts 3 and 4 appear to either meet the criteria of the NWP 43 or NWP 27 for Aquatic Habitat Restoration, Enhancement, and Establishment Activities. Concepts 3 and 4 may also require the NWP 3. Certain activities (e.g., those that propose impacts to wetlands or streams, involve tree cutting, and/or that may affect a historic or archaeologic feature) require a Pre-Construction Notification (i.e., Nationwide Permit application package), prior to the proposed activity.

Based on aerial photography, it appears that tree cutting will likely be required at the project site for all four Concepts. Therefore, it is assumed that a Pre-Construction Notification (PCN) under Nationwide Permit 3, 27, and/or 43 would be required. When a Pre-Construction Notification is required, permit issuance should be received from USACE prior to the commencement of work in waterways or wetlands. Generally, when a Pre-Construction Notification is required, authorization from USACE may take 2-4 months to obtain. There are no fees associated with the Pre-Construction Notification. Mitigation for impacts to wetlands and streams may be required for the Section 404 permit.

Under NWP 27, impacts to streams for the purpose of restoration, enhancement, and/or establishment do not require mitigation, as long as the total linear length of stream restored, enhanced, or established is greater than the linear length of stream impacted. Under NWP 43, impacts to jurisdictional waters greater than 1⁄10-acre (0.1-acre) of wetlands or 3⁄100-acre (0.03-acre) of stream bed typically require compensatory mitigation. If impacts are below these thresholds, mitigation is not typically required. Mitigation credit amounts are calculated by multiplying the total proposed impacts by a multiplier (1.5x, 2x, 2.5x, or 3x), which is determined by the wetland category. Ohio EPA determines a Wetland Category during the ORAM verification process, which is typically initiated during the waterway permitting process. Wetland mitigation typically costs between $50,000 and $70,000 based on credit availability within the project's watershed. Stream mitigation does not require a multiplier, and typically costs around $250 per linear foot (based on availability). If permanent impacts are greater than 1/2-acre to waters of the U.S. a Section 404 Individual Permit may be required.

Section 401 Water Quality Certification

In Ohio, Section 401 Water Quality Certifications are authorized by the Ohio Environmental Protection Agency (EPA). Work in jurisdictional waterways and wetlands requires individual Section 401 certification unless the project meets the Ohio EPA special conditions of applicable NWPs.

With the assumptions made previously, it appears the proposed work is located within an area that could be deemed "Eligible" for 401 coverage under the current NWPs. However, based upon the preliminary scope of work, review of published map data, and current regulatory guidance, the project appears to meet the Ohio EPA special conditions criteria of Nationwide Permit 3, 27 and/or 43. Therefore, an Individual 401 Water Quality Certification through Ohio EPA is not anticipated for this project. However, the USACE could still make a determination that an Individual 401 Water Quality Certification through Ohio EPA is required. For projects within minimal water quality effects (at the discretion of Ohio EPA), a Director's Authorization for coverage under the NWPs can be sought instead. Fees apply for Individual Water Quality Certifications (based on linear foot of impacted stream or wetland) and for a Director's Authorization ($2,000 flat fee). Ohio EPA has 180 days to respond to a request for an Individual Water Quality Certification, and 365 days to respond to a Director's Authorization, although Director's Authorizations, in practice, are typically received within 90-120 days.

Water Quality and Sediment Reduction Benefits

Cleaning vegetation out of a channel can provide sediment reduction benefits through several mechanisms:

- Increased Water Flow: Removing vegetation, such as overhanging plants and submerged vegetation, can improve the flow of water within a channel. Increased water flow helps in carrying sediment downstream, preventing its accumulation in the channel.
- Erosion Control: Vegetation along a channel's banks plays a crucial role in stabilizing the soil and preventing erosion. By maintaining or restoring vegetation on the banks, erosion can be minimized, reducing the sediment load in the water. However, excessive vegetation can impact the flow of water within a channel. A balance is required for erosion control without impacting the flow.
- Floodplain Functionality: Vegetation in and around channels contributes to the overall health of a floodplain. Floodplains are essential for slowing down and spreading floodwaters, allowing sediment to settle before the water returns to the main channel. Restoring vegetation through the corridor will aid in maintaining this natural process.

- Habitat for Sediment-Eating Organisms: Aquatic and riparian vegetation provide habitats for various organisms that play a role in breaking down and consuming sediment. Restoration of vegetation for these organisms will maintain their ability to contribute to natural sediment reduction processes.

It's important to note that while cleaning vegetation out may be necessary for maintaining water flow and preventing blockages, it should be done carefully and considerately. Sustainable and ecologically friendly practices should be employed to allow for the benefits of vegetation removal without the potential negative impacts on sediment dynamics, water quality, and overall ecosystem health. Additionally, implementing erosion control measures and promoting the growth of native vegetation can help offset some of the potential negative effects of vegetation removal.

Alternative Costs

Table 2 presents estimated project costs for each Drainage Improvement Concept. Each OPCC is a Class 5 cost estimate based on AACE International's Cost Estimating process. A Class 5 cost estimate is acceptable for use in a concept level screening purpose. Design and Permitting costs have also been included. An expected low (-20%) and high (+35%) cost ranges are provided as well.

Table 18 Opinion of Probable Construction Cost

Concept	Description	-20%	OPCC	+35%
Concept 1	Ex. Ditch Cleanup and Restoring Existing Channel Capacity	$135,164	$168,955	$228,090
Concept 2	Ditch Grading (adding channel capacity) and Realignment	$187,395	$234,243	$316,228
Concept 3	Ditch Grading/Realignment and Additional Detention Storage	$302,078	$377,600	$509,760
Concept 4	Ditch Grading/Realignment, Detention Storage, and Roadway Structure Replacement	$630,899	$788,624	$1,064,642

Concept 3 cost estimating is for the proposed detention storage node and assumes that restoration of Coventry Crossing Basin would be financed by others. The restoration of Coventry Crossing Basin's Class 5 cost estimate range is $156,838 to $264,664.

Cost 4 includes the cost to perform the structure replacement, the cost could be reduced if ODOT could assist in financing of the replacement.

Grant Funding

There are several possible funding mechanisms for restoration of Ohio Streams. From our experience there are ten that could be used for these projects based on the location of the improvement. The list below provides basic information regarding each of these potential funding options.

- County Petition Ditch: This process would start with a formal request or application made by landowners or residents to establish or improve drainage systems, commonly known as ditches. These drainage systems are essential for managing water flow, preventing flooding, and improving agricultural land. The process is often governed by Ohio's laws related to drainage and ditch maintenance. A petition was submitted to Summit County on August 18, 2011. If a solution is selected to move forward, the property owners whose drainage contributes to Hinman Ditch would be assessed for the cost of the flooding solution, this could also include the owners along Brewster Creek.

- MWCD Partners in Watershed Management (PWM): The grant program, Partners in Watershed Management (PWM), provides maintenance assessment funds to assist local organizations to implement water quality projects, flood reduction and mitigation programs, and watershed education efforts throughout the 18 counties within the Muskingum Watershed Conservancy District (MWCD). MWCD PWM grant applications are typically due in September and require detailed drawings, resolution(s), and letters of support.

- FEMA Hazard Mitigation Assistance Grant: FEMA's hazard mitigation assistance provides funding for eligible mitigation measures that reduce disaster losses. "Hazard mitigation" is any sustainable action that reduces or eliminates long-term risk to people and property from future disasters. Mitigation planning breaks the cycle of disaster damage, reconstruction and repeated damage. Hazard mitigation includes long-term solutions that reduce the impact of disasters in the future.

- FEMA Flood Mitigation Assistance Grant: The Flood Mitigation Assistance grant program is a competitive program that provides funding to states, federally recognized Tribal governments, U.S. territories, and local governments. Since the National Flood Insurance Reform Act of 1994 was signed into law, funds are used for projects that reduce or eliminate the risk of repetitive flood damage to buildings insured by the National Flood Insurance Program. FEMA chooses recipients based on the applicant’s ranking of the project, eligibility, and cost-effectiveness of the project. FEMA requires state, local, federally recognized Tribal governments, and U.S. territories to develop and adopt hazard mitigation plans as a condition for receiving certain types of non-emergency disaster assistance, including funding for hazard mitigation assistance projects. IN 2023 this grant program was funded with $800 million.

- FEMA Building Resilient Infrastructure and Communities: The Building Resilient Infrastructure and Communities (BRIC) grant program makes federal funds available to states, U.S. territories, federally recognized Tribal governments, and local governments for hazard mitigation activities. It does so with a recognition of the growing hazards associated with climate change, and of the need for natural hazard risk mitigation activities that promote climate adaptation and resilience with respect to those hazards. These include both acute extreme weather events and chronic stressors which have been observed and are expected to increase in intensity and frequency in the future. The BRIC program’s guiding principles include supporting communities through capability and capacity-building; encouraging and enabling innovation, including multi-hazard resilience or nature-based solutions; promoting partnerships; enabling large, systems-based projects; maintaining flexibility; and providing consistency. Through these efforts

communities are able to better understand disaster risk and vulnerabilities, conduct community-driven resilience, hazard mitigation planning, and design transformational projects and programs.

Awards made under this funding opportunity will be funded, in whole or in part, with funds appropriated by the Infrastructure Investment and Jobs Act, also more commonly known as the Bipartisan Infrastructure Law (BIL). The BIL is a once-in-a-generation investment in infrastructure, which will grow a more sustainable, resilient, and equitable economy by enhancing U.S. competitiveness, driving the creation of good-paying jobs with the free and fair choice to join a union, and ensuring stronger access to economic and environmental benefits for disadvantaged communities. The BIL appropriates billions of dollars to FEMA to promote resilient infrastructure, respond to the impacts of climate change, and equip our nation with the resources to combat its most pressing threats.

- USACE Section 205 – Flood Damage Reduction: Section 205 of the 1948 Flood Control Act authorizes the Corps of Engineers to plan, design, and construct structural and non-structural flood control projects in partnership with non-Federal government agencies, such as cities, counties, special authorities, or units of state government. Projects are planned and designed under this authority to provide the same complete flood risk management project that would be provided under specific congressional authorizations. The maximum federal cost for planning, design, and construction of any one project is $10.0 million. Each project must be economically justified, environmentally sound, and technically feasible. Flood risk management projects are not limited to any particular type of improvement. Levee and channel modifications are examples of flood risk management projects constructed utilizing Section 205 authority.

  The feasibility study is 100% federally funded up to $100,000. Costs over $100,000 are shared equally with the non-federal sponsor. Up to one-half of the non-federal share can be in the form of in-kind services. Costs for preparation of plans and specifications are shared at 65 percent federal/35 percent non-federal (Construction cost-share varies between 50% and 65% Federal, based on the type [structural or non-structural] solution). The non-federal share of construction consists of provision of any necessary lands, easements, rights-of-way, relocations and disposal areas (LERRD), plus a cash contribution of 5% of the total project costs. In the event that the value of LERRD, plus 5% cash, does not equal at least 35% of the total project cost, the non-federal sponsor must contribute additional cash to pay their share. If LERRD plus 5% exceeds 35%, the sponsor is responsible for up to a maximum of 50% of the total project costs.

  In response to a written request from a potential non-federal sponsor, the Corps conducts an initial appraisal early in the Feasibility Study to determine whether the project meets program criteria and provides a basis for determining scope and cost of an entire feasibility study. The solution must be economically feasible and environmentally acceptable. If an acceptable solution is identified in the feasibility study, the Corps prepares plans and specifications, then manages construction of the project.

- Ohio EPA Section 319(h): These funds are awarded to projects that restore Ohio streams, reduce nonpoint source pollutants such as nutrients, sediment and bacteria, improve stream and riparian habitat and/or reverse the impacts of stream hydromodification. These funds may provide up to 60% of the total project costs and have a minimum 3-year term. Approximately $2.7 million per year is anticipated for 2024. Applications for 2025 would be expected around October/November 2024. In order to be funded by this

program, the project needs to be identified within an approved NPS-IS. This project is located within the Portage Lakes – Tuscarawas River HUC 05040001-01-05, which has an approved NPS-IS plan. The existing NPS-IS plan would need to be modified to include the preferred concept from this Conceptual Engineering Memorandum and inclusion of a critical area, then the plan will need to be resubmitted to Ohio EPA.

- WRRSP - To be eligible for WRRSP funding, project and costs must be directly related to restoring and/or protecting a site's aquatic life use. Eligible projects include stream and wetland protection through fee-simple property acquisition, and stream and wetland restoration that corrects impairments to on-site aquatic resources. To qualify for WRRSP funding, a project must either by itself, or in concert with other past, present, or future projects, result in the full protection or restoration of the aquatic resource. Streams must either be in attainment of, or be fully restored to, at least Warmwater Habitat or greater designated aquatic life use under Ohio Water Quality Standards. Wetlands must achieve, or be restored to, a Category 3 designation. Performance criteria include both habitat and biological assessment methods. The program is transitioning to requiring both pre- and post-implementation biological assessments for all projects. Acquisition and/or restoration of parcels with perpetual leases or severed mineral rights, regardless of when the severance took place, will not be eligible for WRRSP funding. Implementers will be limited to no more than five open WRRSP projects at the time nominations are submitted, and all required annual reports for previous projects awarded to the implementer must have been submitted to DEFA to be considered for funding for any additional projects. Nominations are accepted on an annual basis, with a deadline of July 15, 2024, for the Pre-Nomination Site Review Request Form. The project's water resource assessments must then be completed along with the project nomination form and attachments by August 15, 2024. Projects which are identified as fundable will meet program requirements in the first year (design/permitting), and then receive their construction assistance award in the second year. There is no match requirement for WRRSP.

- Clean Ohio Conservation Program - Acquire land for public open space; protect or enhance riparian corridors - For projects that seek to restore streams, wetlands, and other water bodies, the applicant must demonstrate ability to secure a NWP (or other appropriate stream restorations permit) from the United States Army Corps of Engineers at time of application. Other applicable permits such as 401 Water Quality Certification from the Ohio Environmental Protection Agency must also be obtained. Applicants must receive permits and all necessary authorizations within one year of receiving Clean Ohio Funding and before commencement of project construction. Round 16 applications were due August 30, 2023, for District 8 (Summit County). Round 17 application process is anticipated to start July 2024. This program requires a minimum 25% local match.

- NFWF Five Star and Urban Waters Restoration Program - On-the-ground wetland, riparian, in-stream and/or coastal habitat restoration; Meaningful education and training activities, either through community outreach, participation and/or integration with K-12 environmental curriculum; Measurable ecological, educational and community benefits; Partnerships: Five Star projects should engage a diverse group of community partners to achieve ecological and educational outcomes. The program is funded at $2.6 million each year. Awards range from $20,000 to $50,000 with an average size of $35,000 and about 50

grants awarded per year. Grants span 12 to 18 months in duration. Typically, NFWF requests a 1:1 financial match. Application dates vary but are typically around the January timeframe.

Conclusion

There are several factors affecting flooding issues in this study area. First, the existing 54" culvert under US-224/I-277 significantly limits the ability of Hinman Ditch to effectively drain. The structure under US-224/I-277 is a single 54" which is undersized as it can only pass the 1-year storm event. This culvert alone is acting like a low flow orifice and creating back up/flooding conditions in every storm event above a 1-year storm, essentially turning Hinman Ditch and the areas upstream of it into a detention basin. Upsizing this culvert will require significant coordination and will also create downstream water surface increases which may be difficult to permit. Therefore, Concept 4 is not recommended as a solution that could provide immediate benefit to the study area. Secondly, Glenmount Avenue currently is acting as a flood route for Brewster Creek and brings stormwater flows into Hinman Ditch during large storm events making flooding conditions worse. This was not evaluated in detail as part of this study, but to help with the flooding from Glenmount Avenue, we recommend an evaluation of the area further upstream of Glenmount Avenue along Brewster Creek for a location to provide additional detention volume.

Concepts 1 and 2 evaluated cleaning and improving Hinman Ditch to increase its capacity. However, both Concepts 1 & 2 yield similar results, offering minimal to slightly moderate benefits that are insufficient to significantly reduce flooding in the area. Concept 3 evaluated potential additional detention storage in two locations independently and in conjunction with ditch improvements.

Concept 3 explored the addition of detention storage, identifying two optimal locations: one directly upstream of the beginning of Hinman Ditch, and another as the Coventry Crossing Basin. The Coventry Crossing Basin has deteriorated and is no longer functioning as a stormwater detention facility. Restoring the Coventry Crossing Basin to its "Plan" conditions could reduce flows to Hinman Ditch by 34.1%, which can reduce WSEL in Hinman Ditch by 0.42' to 0.87' which is a substantial improvement worth pursuing. However, this would require coordination with the City of Akron and the HOA for repairs and future maintenance, which may take considerable time.

For more immediate relief, adding detention storage upstream of Hinman Ditch could reduce flows by 11.4%. While this would also require coordination with the overhead electric company and property owners, it is expected to be manageable for a project of this type, but alone will make little impact to WSEL (<0.30').

Combining both solutions could lead to a 38.3% reduction in flows to Hinman Ditch. However, the cost of the proposed detention storage outweighs its additional benefits (4.2%) unless the County requires an immediate solution for the study area. This combined solution was not hydraulically modeled to evaluate the WSEL impacts.

Concept 3 model results are provided for Concept Ditch Improvements, restoration of Coventry Crossing Basin, and addition of proposed detention storage since it provides the best hydraulic solution results and significant improvement.

Concept 4 evaluated the combination of the Concept 1 Ditch Improvements, additional detention storage, and replacement of the 54" US-224/I-277 culvert. The 54" US-224/I-277 culvert's outlet elevation is currently almost one foot lower than it's designed conditions. The replacement of the twin 72" culverts on Glenmount Ave. was reviewed but the results indicated minimal to no additional improvement with the replacement of these structures

and was no longer considered as part of Concept 4's solution. Concept 4 selected to include the proposed detention storage instead of restoration of Coventry Crossing Basin since it was able to provide a more immediate solution, while also knowing from previous concept results that restoration of the Coventry Crossing Basin would just further improve the results of Concept 4.

Concept 4 provides significant improvements in Eastern and Western Hinman Ditch for reducing potential structural flooding and the results are comparable WSEL results to Concept 3. Concept 3 is the only concept providing reduced flows to Brewster Creek and that is primarily due to the restoration of Coventry Crossing Basin. Therefore, it would be anticipated that Concept 4 could produce similar if not more improved results, but the additional cost and time associated with coordination, funding, and permitting of the replacement of the US-224/I-227 should probably be considered in a future phase of design if other potential solutions prove to not be providing adequate reduction in flooding events.

In Concepts 2, 3, and 4, Eastern Hinman Ditch is proposed to be re-aligned further away from Penguin Condominiums and an earthen berm installed to provide additional protection to reduce flooding to structures within the study area. The re-alignment and addition of this earthen berm will provide significant improvements by raising the elevation of protection for some of the Penguin Condominiums.

Following is a table that ranks the benefit, cost, maintenance, and permitting/coordination for each modeled concept for consideration in a final solution selection.

	CONCEPT			
	1	2	3	4
Benefit	SMALL	LITTLE	BEST	GOOD
Cost	$200K	$250K	$400K	$800K
Maintenance	MOST	SOME	LESS	LEAST
Permitting/Coordination	MINIMAL	SOME	MODERATE	MOST

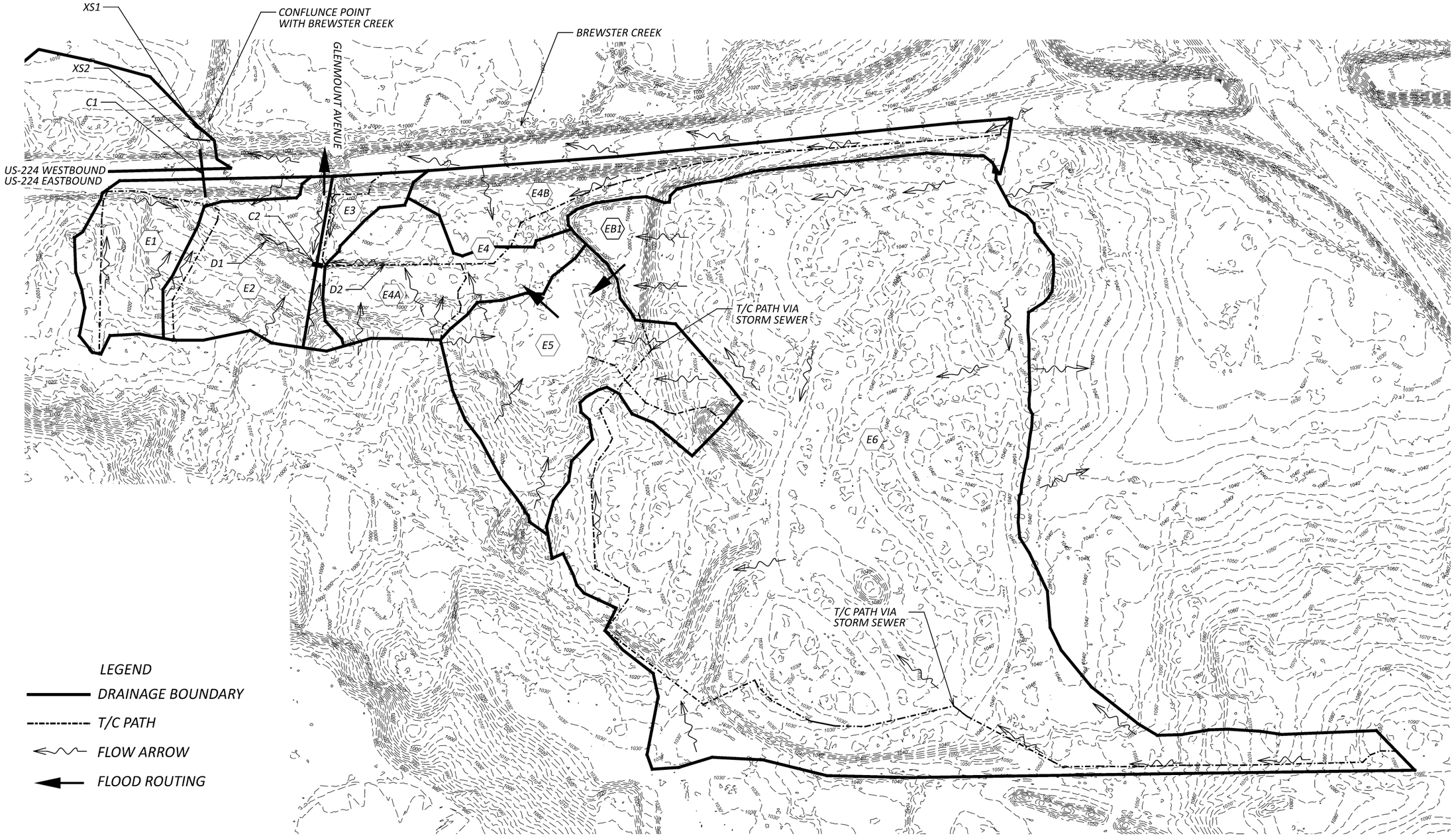
The following is a recommended phased approach for advancing a solution that is financially achievable:

- Additional detention storage alone provides notable improvements by restoring Coventry Crossing Basin.
- Restoration of Coventry Crossing Basin and Concept 1 Ditch Improvements provides further benefit that would provide significant improvements and is recommended as the preferred solution with the most significant improvements and lowest costs.
- Restoration of Coventry Crossing Basin may take substantial time and coordination to accomplish, therefore the proposed detention is recommended as a secondary option if this occurs.
- Concept 1 Ditch improvements are recommended because it would be the least impactful of the two different ditch improvements evaluated and provides similar results to the larger capacity ditch.
    - Concept 1 Ditch improvements may require additional right-of-way acquisition and may be in conflict with an existing structure. This may create significant time delays in providing a solution

for the community. Therefore, at a minimum, a routine cleaning of Hinman Ditch should occur to remove accumulated sediment, and a more manageable routine cleaning schedule established for the future.

- Future design phases should consider evaluating if a typical two-stage channel can be considered in Hinman Ditch.

Attachment 1: Existing Drainage Map



LEGEND

- DRAINAGE BOUNDARY
- T/C PATH
- FLOW ARROW
- FLOOD ROUTING

E1 DRAINAGE AREA 6.428 AC.
CN = 72
T/C = 7.6 MINUTES

E2 DRAINAGE AREA 7.237 AC.
CN = 81
T/C = 9.2 MINUTES

E3 DRAINAGE AREA 2.17 AC.
CN = 75
T/C = 8.4 MINUTES

E4A DRAINAGE AREA 7.776 AC.
CN = 77
T/C = 5.5 MINUTES

EB1 EXISTING COVENTRY BASIN
100-YEAR Qin = 187.34 CFS
100-YEAR Qout = 105.67 CFS

E5 DRAINAGE AREA 14.481 AC.
CN = 67
T/C = 20.3 MINUTES

E6 DRAINAGE AREA 97.445 AC.
CN = 68
T/C = 30.2 MINUTES

E4B DRAINAGE AREA 9.613 AC.
CN = 82
T/C = 41.3 MINUTES

0 200 400
GRAPHIC SCALE IN FEET

Environmental Design Group
AKRON / CLEVELAND / COLUMBUS
HQ 450 GRANT ST., AKRON, OH 44311
P 330.375.1390 / TF 800.835.1390
W ENVDESIGNGROUP.COM

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SUMMIT BASIN-PENGUIN PARK
DRAINAGE ANALYSIS

DATE: _____

REVISIONS

#	DATE	DESCRIPTION
	####	####
	####	####
	####	####
	####	####
	####	####
	####	####
	####	####

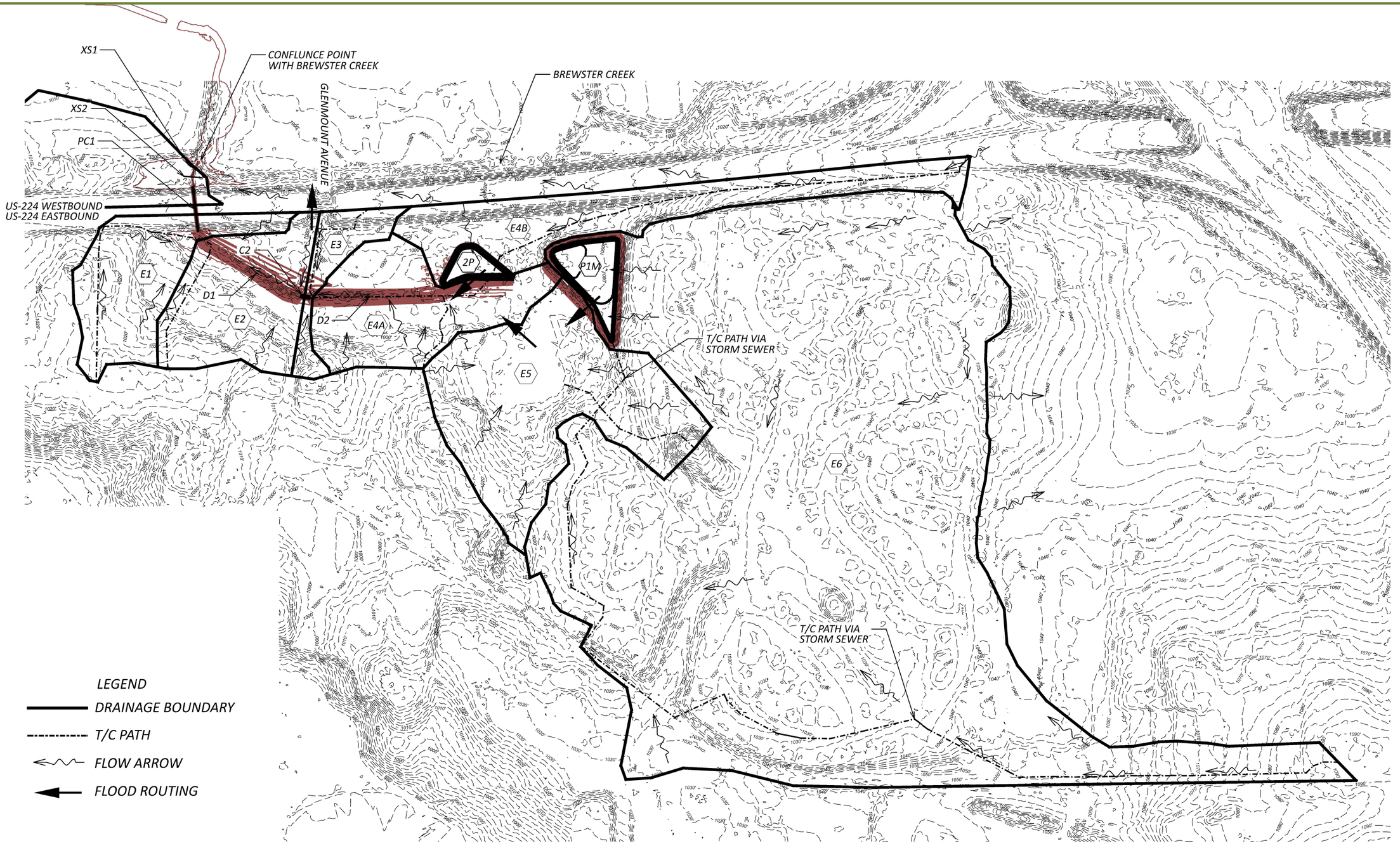
PROJECT NO.:	22-00830-10
DRAWN BY:	JWO
CHECKED BY:	KEP
DATE ISSUED:	01-03-25

EXISTING DRAINAGE MAP

1 OF 1

NOT FOR CONSTRUCTION

Attachment 2: Proposed Drainage Map



LEGEND

- DRAINAGE BOUNDARY
- T/C PATH
- FLOW ARROW
- FLOOD ROUTING

(E1) DRAINAGE AREA 6.428 AC.
CN = 72
T/C = 7.6 MINUTES

(E2) DRAINAGE AREA 7.237 AC.
CN = 81
T/C = 9.2 MINUTES

(E3) DRAINAGE AREA 2.17 AC.
CN = 75
T/C = 8.4 MINUTES

(E4A) DRAINAGE AREA 7.776 AC.
CN = 77
T/C = 5.5 MINUTES

(2P) PR. DETENTION BASIN
100-YEAR Qin = 24.70 CFS
100-YEAR Qout = 7.27 CFS

(E5) DRAINAGE AREA 14.481 AC.
CN = 67
T/C = 20.3 MINUTES

(E6) DRAINAGE AREA 97.445 AC.
CN = 68
T/C = 30.2 MINUTES

(E4B) DRAINAGE AREA 9.613 AC.
CN = 82
T/C = 41.3 MINUTES

(P1M) MODIFIED COVENTRY BASIN
100-YEAR Qin = 187.34 CFS
100-YEAR Qout = 38.64 CFS

N

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GRAPHIC SCALE IN FEET

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HQ 450 GRANT ST., AKRON, OH 44311
P 330.375.1390 / TF 800.835.1390
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SUMMIT BASIN-PENGUIN PARK

DRAINAGE ANALYSIS

DATE: _____

REVISIONS

#	DATE	DESCRIPTION
	####	####
	####	####
	####	####
	####	####
	####	####
	####	####
	####	####

PROJECT NO.:	22-00830-10
DRAWN BY:	JWO
CHECKED BY:	KEP
DATE ISSUED:	01-03-25

PROPOSED IMPROVEMENTS

1 OF 1

NOT FOR CONSTRUCTION

SW BASIN & CHANNEL IMPROVEMENTS

FOR

HINMAN DITCH (DITCH #52)

COVENTRY TOWNSHIP, OHIO

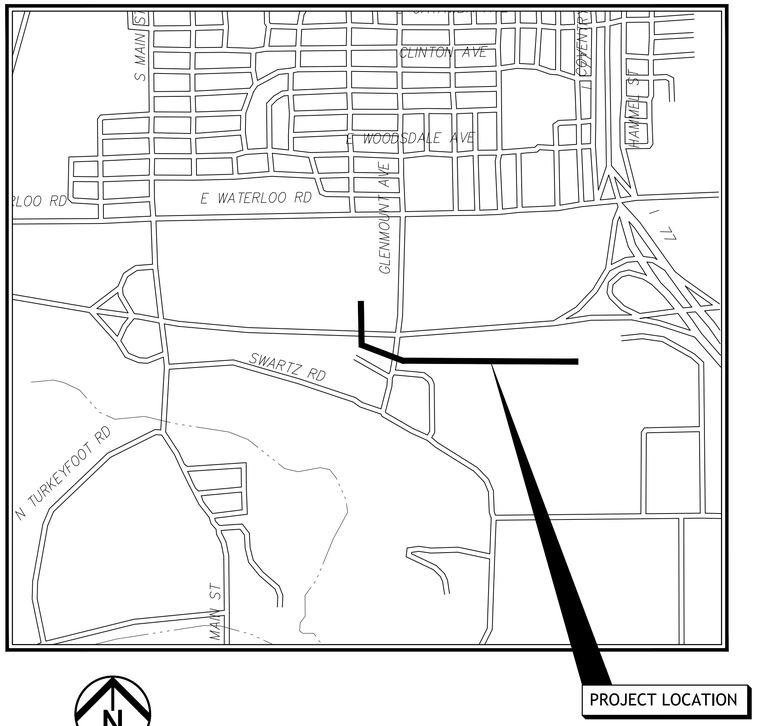
ISSUED: MARCH 2025

SITE PLAN LEGEND

EXISTING	PROPOSED	
	10	CENTERLINE/BASELINE CONSTRUCTION
PL	PL	PROPERTY LINE
Ex R/W	R/W	RIGHT OF WAY
		EASEMENT
	TMP	TEMPORARY RIGHT OF WAY
1000	1000	CONTOUR
		SWALE (EDGE OF WATER)
		FENCELINE
		GUARDRAIL
		RAILROAD TRACKS
X" STM	X" STM	STORM SEWER
X" SAN	X" SAN	SANITARY SEWER
X" SAN	X" SAN	SANITARY SEWER FORCEMAIN
X" WTR	X" WTR	WATER LINE
X" GAS	X" GAS	GAS LINE
COM	COM	GENERIC COMMUNICATIONS LINE
CTV		CABLE TV LINE
E	E	ELECTRIC LINE
FO	FO	FIBER OPTIC LINE
STE	STE	STEAM LINE
T	T	TELEPHONE LINE (UNDERGROUND)
TR	TR	TRAFFIC SIGNAL CONDUIT
TIC	TIC	TRAFFIC INTERCONNECT CONDUIT
ST	ST	STORM MANHOLES, CATCH BASINS, CURB INLETS
SA CO SEP TNK	SA CO	SANITARY MANHOLE, CLEANOUT, MARKER, VENT PIPE, SEPTIC TANK LID
W W	W W	FIRE HYDRANT, HYDRANT ASSEMBLY, WATER VALVE, METER, SERVICE BOX
G G		GAS METER, VALVE, MANHOLE, MARKER, VENT PIPE
E E E EV		GROUND MOUNTED TRANSFORMER, ELECTRIC PULL BOX, METER, MANHOLE, VAULT
TR TR	TR	SIGNAL POLE, TRAFFIC PULL BOX, MANHOLE, CONTROLLER CABINET, PAD MOUNTED CABINET
TV T AC C		CABLE TV BOX, TELEPHONE BOX, AIR CONDITIONER, SATELLITE DISH, CELLPHONE TOWER, GROUND LITE
M WELL G WELL O WELL CIST		MONITORING WELL, GAS WELL, OIL WELL, CISTERN, SOIL BORING
T T U UM		TELEPHONE BOX, TELEPHONE MANHOLE, UNKNOWN UTILITY BOX, UNKNOWN MANHOLE
		POWER POLE, TELEPHONE POLE, LIGHT POLE, COMBINATION POLES, GENERIC/GUY POLE, GUY WIRE
MB		STREET SIGNS, STREE NAME SIGN, POST, MAILBOX, FLAG POLE, FLAG
		DECIDUOUS TREE, EVERGREEN, SHRUB, STUMP, ROCK, TREE REMOVED/PRUNED
M IPF	M IPS	MONUMENT BOX, IRON PIN/PIPE

2023 SPECIFICATIONS

THE STANDARD SPECIFICATIONS OF THE STATE OF OHIO, DEPARTMENT OF TRANSPORTATION, INCLUDING CHANGES AND SUPPLEMENTAL SPECIFICATIONS LISTED IN THESE PLAN BID DOCUMENTS SHALL GOVERN THIS IMPROVEMENT. FOR PURPOSES OF THIS PLAN, REFERENCES TO DIRECTOR OR ENGINEER SHALL BE CONSTRUCTED TO MEAN THE COUNTY ENGINEER AND/OR HIS REPRESENTATIVES.



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GRAPHIC SCALE IN FEET

LOCATION MAP

INDEX OF DRAWINGS

APPROVALS:

Summit County

ALAN BRUBAKER, P.E., P.S. – SUMMIT COUNTY ENGINEER Date

CHARLES HAUBER, P.E., P.S. – SUMMIT COUNTY ENGINEER'S OFFICE Date

PLANS PREPARED AND RECOMMENDED BY:

Environmental Design Group

AKRON/CLEVELAND/COLUMBUS/
MARIETTA/NEWARK/MASON
HQ 450 GRANT ST., AKRON, OH 44311
P 330.375.1390 / TF 800.835.1390
W ENVDESIGNGROUP.COM

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REVISED:

PROJ. NUMBER	22–00830–010	TITLE SHEET	SHEET 1 OF 13
DESIGNED BY:	JO		
DRAWN BY:	SWA		
FILE NO.	ZTitle 22–00830–010.dwg		

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ALL ITEM NUMBERS REFER TO THE 2023 STATE OF OHIO, DEPARTMENT OF TRANSPORTATION CONSTRUCTION AND MATERIAL SPECIFICATIONS. ALL EQUIPMENT, MATERIAL AND WORKMANSHIP SHALL BE PERFORMED ACCORDING TO THESE SPECIFICATIONS AND THE REFERENCED OHIO DEPARTMENT OF TRANSPORTATION STANDARD DRAWINGS NOTED ON THE TITLE SHEET.

MATERIAL STORAGE/EQUIPMENT STORAGE

THE CONTRACTOR IS RESPONSIBLE FOR OBTAINING THE APPROPRIATE EQUIPMENT AND MATERIAL STORAGE AREA TO SUIT THEIR NEEDS.

MATERIAL TESTING AND PERMITS

1. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL PERMITS REQUIRED FOR THIS PROJECT. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE COST OF ALL MATERIAL TESTING. MATERIAL TESTING IS REQUIRED FOR ASPHALT, CONCRETE, AND AGGREGATES FOR TRENCH BEDDING AND BACKFILL.

2. THE CONTRACTOR SHALL INCLUDE IN THE PRICE BID FOR THE NEW PIPE AND FOR TRENCHES WHERE PIPE(S) ARE REMOVED THE COST FOR COMPACTION TESTING OF THE BACKFILL IN ALL TRENCHES. COMPACTION RATES ARE 98% OF THE MAXIMUM DRY DENSITY PER AASHTO T-99 FOR THE VARIOUS LIFTS OF TRENCH BACKFILL AND THEY SHALL BE VERIFIED IN THE FIELD AS CONSTRUCTION PROGRESSES. THE CONTRACTOR WILL PAY FOR THE SERVICES OF AN INDEPENDENT QUALIFIED GEOTECHNICAL ENGINEER TO COMPLETE THIS WORK. THE GEOTECHNICAL ENGINEER SHALL RUN PROCTOR TESTS FOR THE BACKFILL MATERIAL AND BE ON-SITE FULL TIME TO VERIFY THE SPECIFIED COMPACTION RATES. COSTS FOR THIS WORK WILL BE INCLUDED IN THE PRICE OF THE ITEM TO WHICH IT RELATES.

3. THE EXECUTED PROJECT CONTRACT SHALL SERVE TO FULFILL THE SUMMIT COUNTY PERMITTING REQUIREMENTS.

UNDERGROUND UTILITIES

THE LOCATIONS OF THE UNDERGROUND UTILITIES SHOWN ON THE PLANS ARE AS OBTAINED FROM THE OWNERS OF THE UTILITY AS REQUIRED BY SECTION 153.6 ORC.

UTILITY OWNERSHIP

THE FOLLOWING UTILITIES AND OWNERS ARE LOCATED WITHIN THE WORK LIMITS OF THE PROJECT:

CITY OF AKRON
ENGINEERING BUREAU
166 SOUTH HIGH ST.
AKRON, OH 44308
(330) 375-2288

CITY OF AKRON
PUBLIC SERVICE DIVISION
166 S HIGH STREET
AKRON,OH 44308
ATTN: CHUCK HIRSCH
330-375-2355

FIRST ENERGY
1910 W MARKET ST, BLDG 1
AKRON, OH 44313
(330) 436-4055
ATTN: DAVID MILLER

ENBRIDGE GAS OHIO
320 SPRINGSIDE DRIVE, SUITE 320
AKRON, OH 44333
(330) 664-2409
ATTN: KEVIN BIRT

COUNTY OF SUMMIT
DEPT. OF SANITARY SEWER SERVICES
1180 SOUTH MAIN ST., SUITE 201
AKRON, OH 44301
(330) 926-2400
ATTN: RENEE FOX

CITY OF AKRON
PUBLIC UTILITIES BUREAU
WATER DISTRIBUTION DIVISION
166 S HIGH STREET, RM 701
AKRON, OH 44308
(330) 375-2355
ATTN: CHUCK HIRSCH

AT&T
50 W. BOWERY ST., 6TH. FLOOR
AKRON, OH 44308
(330) 384-3048
ATTN: JOHN BOKISA

COVENTRY TOWNSHIP
68 PORTAGE LAKES DRIVE
AKRON, OH 44319
330-644-0785

WORK HOURS

NO NIGHT WORK BETWEEN THE HOURS OF 7:00 P.M. TO 7:00 A.M. SHALL BE PERMITTED UNLESS OTHERWISE SPECIFICALLY APPROVED BY THE ENGINEER AND SUMMIT COUNTY.

CONSTRUCTION SEQUENCE

THE CONTRACTOR SHALL ENGAGE IN THE CONSTRUCTION OF THE PROJECT SUCH THAT ADEQUATE ACCESS TO THE RESIDENCES AND ALL BUSINESSES IS MAINTAINED AT ALL TIMES. INCLUDE COSTS IN THE PRICE BID FOR MAINTENANCE OF TRAFFIC. ONCE THE CONTRACTOR IS ENGAGED IN THE PROJECT, WORK SHALL BE CONTINUOUS USING FULL CREWS.

CONSTRUCTION PHOTOGRAPHS

THE CONTRACTOR SHALL TAKE DIGITAL DAILY PHOTOGRAPHS OF THE CONSTRUCTION PROGRESS THAT PROVIDES FOR THE IMPROVEMENT INSTALLATION PROCESS, THE UTILITY LOCATION, UTILITY CONFLICTS, AND MODIFICATIONS TO ANY STRUCTURES/ PIPING ASSOCIATED WITH THE PROJECT. THE DIGITAL LIBRARY SHALL BE SUBMITTED TO THE OWNER ON A USB DRIVE, PORTABLE HARD DRIVE, ETC. OF SUFFICIENT STORAGE SIZE TO ACCOMMODATE THE PHOTOGRAPHS.

DISCRETIONARY ALLOWANCE

THE BID SCHEDULE INCLUDES A DISCRETIONARY ALLOWANCE FOR USE BY THE OWNER TO PAY FOR CHANGE ORDERS. THERE IS NO GUARANTEE THAT THE OWNER WILL UTILIZE ANY OR ALL OF THE DISCRETIONARY ALLOWANCE.

REMOVAL OF DEBRIS AND SITE CLEANUP

THE PROJECT SITE MUST BE KEPT FREE OF CONSTRUCTION DEBRIS, TRASH, PAPER AND OTHER WASTE ITEMS. COLLECT AND REMOVE THESE ITEMS AT THE END OR EACH WORK DAY.

DUST NUISANCE ORIGINATION

DUST PRODUCED FROM ANY OPERATIONS INSIDE OR OUTSIDE THE RIGHT-OF-WAY SHALL BE CONTROLLED BY THE CONTRACTOR IN ACCORDANCE WITH ITEM 616. WATER AND/OR CALCIUM CHLORIDE SHALL NOT BE APPLIED UNLESS ORDERED BY THE ENGINEER.

PAVEMENT SWEEPING

AS REQUIRED DURING THE COURSE OF EACH WORK DAY, THE CONTRACTOR SHALL SWEEP ALL PAVED AREAS AFFECTED BY THE DAY'S WORK. PAVEMENT SHALL BE SCRAPED AND SWEPT TO REMOVE ALL DIRT, MUD AND DEBRIS. INCLUDE THE COST OF THIS WORK IN THE PRICE BID FOR THE EXCAVATION.

CLEARING AND GRUBBING

ALL TREES, STUMPS, ROOTS, SHRUBS AND DEBRIS REMOVED SHALL BE DISPOSED OF BY THE CONTRACTOR OFF SITE AT A LOCATION LICENSED TO ACCEPT SUCH MATERIAL. REMOVE ALL TREES AND STUMPS SPECIFICALLY MARKED FOR REMOVAL WITHIN THE CONSTRUCTION LIMITS OR AS NOTED ON THE DRAWINGS SHALL BE PAID FOR UNDER THE LUMP SUM BID FOR ITEM 201, CLEARING AND GRUBBING. FOR TREES, REMOVAL INCLUDES THE ROOT MASS. NO ROOT MASS IS PERMITTED WITHIN THE FOOTPRINT OF ANY PAVEMENT (ASPHALT, CONCRETE, AGGREGATE).

CLEARING AND GRUBBING - TREE, LIMB AND ROOT PRUNING

THE DECISION TO PRUNE TREES DESIGNATED ON THE PLAN SHALL BE MADE BY SUMMIT COUNTY AT THE TIME OF CONSTRUCTION. THE COUNTY AND CONTRACTOR SHALL CONDUCT A FIELD REVIEW PRIOR TO BEGINNING WORK. THE PLANS DO NOT ALWAYS ACCURATELY REPRESENT THE TREE CANOPY. PRIOR TO BIDDING ON THIS PROJECT, THE CONTRACTOR SHALL MAKE A SITE VISIT TO ASSESS THE EXTENT OF THIS WORK. IF AN EXISTING TREE THAT IS DESIGNATED TO BE TRIMMED IS OUTSIDE OF THE RIGHT-OF-WAY LIMITS, THE PROPERTY OWNER SHALL BE NOTIFIED PRIOR TO PRUNING THE TREE. A PROFESSIONAL TREE TRIMMER SHALL PERFORM THIS WORK IN ACCORDANCE WITH ODOT ITEM 201.03. WHERE LIMBS ARE PRUNED WITHIN THE LIMITS OF EARTHWORK, PIPE/STORM STRUCTURE INSTALLATION, OR PAVEMENT INSTALLATION, THE ROOTS SHALL ALSO BE PROFESSIONALLY PRUNED. PAYMENT SHALL BE MADE PER EACH TREE PRUNED WHETHER BRANCHES AND/OR ROOTS ARE TRIMMED.

PROTECTION AND RESTORATION OF PROPERTY

1. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE PRESERVATION OF ALL PUBLIC AND PRIVATE PROPERTY.

2. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL DAMAGE OR INJURY TO PROPERTY OF ANY CHARACTER, DURING THE EXECUTION OF THE WORK, RESULTING FROM ANY ACT, OMISSION, NEGLECT, OR MISCONDUCT OF HIS MANNER OR METHOD OF EXECUTING THE WORK, OR AT ANY TIME DUE TO DEFECTIVE WORK OR MATERIALS, AND SAID RESPONSIBILITY WILL NOT BE RELEASED UNTIL THE PROJECT SHALL HAVE BEEN COMPLETED AND ACCEPTED.

3. WHEN OR WHERE ANY DIRECT OR INDIRECT DAMAGE OR INJURY OCCURS TO PUBLIC OR PRIVATE PROPERTY BY OR ON ACCOUNT OF ANY ACT, OMISSION, NEGLECT, OR MISCONDUCT IN THE EXECUTION OF THE WORK, OR IN CONSEQUENCE OF THE NON-EXECUTION THEREOF BY THE CONTRACTOR, HE SHALL RESTORE, AT HIS OWN EXPENSE, SUCH PROPERTY TO A CONDITION SIMILAR OR EQUAL TO THAT EXISTING BEFORE SUCH DAMAGE OR INJURY WAS DONE, BY REPAIRING, REBUILDING OR OTHERWISE RESTORING AS MAY BE DIRECTED, OR SHALL MAKE GOOD SUCH DAMAGE OR INJURY IN AN ACCEPTABLE MANNER.

4. WHEN SIGNS AND SUPPORTS INTERFERE WITH CONSTRUCTION, THE CONTRACTOR SHALL REMOVE AND ERECT THEM IN A TEMPORARY LOCATION DURING CONSTRUCTION IN A MANNER SATISFACTORY TO AND AS DIRECTED BY THE ENGINEER. AFTER COMPLETION OF THE CONSTRUCTION AND BEFORE FINAL ACCEPTANCE OF THE PROJECT, THE CONTRACTOR SHALL ERECT THE SIGNS AND SUPPORTS IN THEIR ORIGINAL LOCATION UNLESS OTHERWISE DIRECTED BY THE ENGINEER.

REMOVAL OF EXISTING STRUCTURES

1. THE CONTRACTOR SHALL REMOVE AND DISPOSE OF ALL EXISTING PIPES, CATCH BASINS, YARD DRAINS, CONCRETE DRAINAGE CHANNELS, GUARDRAILS, LANDSCAPE TIMBERS, AND OTHER ITEMS WITHIN THE LIMITS OF WORK THAT WILL BE ABANDONED OR OTHERWISE NOT USED AS PART OF THE ROADWAY AND STORM SEWER IMPROVEMENTS. ABANDONING PIPES IN PLACE OR FILLING THEM WITH GROUT IS NOT ACCEPTABLE, UNLESS AUTHORIZED BY THE ENGINEER. THE PROPERTY OWNER SHALL HAVE FIRST RIGHT OF REFUSAL FOR ALL LANDSCAPE ITEMS REMOVED.

2. ALL ITEMS REMOVED SHALL BE INCLUDED IN THE LUMP SUM PRICE BID FOR STRUCTURES REMOVED, EXCEPT FOR REMOVAL ITEMS NOTED SEPARATELY. INCLUDE IN PIPE REMOVAL AND CATCH BASIN REMOVAL THE COST OF TRENCH BACKFILL AND COMPACTION. BACKFILL MATERIAL IN TRENCHES UNDER OR WITHIN 3 FEET OF NEW OR EXISTING PAVEMENT SHALL BE TYPE 1 STRUCTURAL BACKFILL PER ODOT ITEM 703.11. BACKFILL MATERIAL ALL OTHER AREAS SHALL BE SUITABLE NATIVE MATERIAL. THERE IS NO SEPARATE PAY ITEM FOR ROADWAY OR DRIVEWAY PAVEMENT REMOVED WHICH IS INCLUDED IN THE EXCAVATION VOLUME.

TOPSOIL

EXISTING TOPSOIL SHALL BE STRIPPED AND STOCKPILED ON SITE IN AN APPROVED LOCATION. THE AREA TO BE STRIPPED SHALL INCLUDE THE AREA WHERE THE PROPOSED WORK WILL BE LOCATED. UPON COMPLETION OF THE WORK, THE STOCKPILED TOPSOIL WILL BE EVENLY DISTRIBUTED OVER THE DISTURBED WORK AREA IN A UNIFORM THICKNESS OF AT LEAST 4 INCHES. STOCKPILED TOPSOIL IN EXCESS OF THE AMOUNT NEEDED FOR THE ABOVE NOTED WORK WILL BE WASTED AT A DISPOSAL AREA AS DETERMINED BY SUMMIT COUNTY.

EXCAVATION / TOPSOIL STOCKPILE

EXCESS EXCAVATION AND TOPSOIL WILL BE STOCKPILED AT A LOCATION DETERMINED BY SUMMIT COUNTY. A CONSTRUCTION ACCESS DRIVE IS REQUIRED ALONG WITH A SILT FENCE FOR SEDIMENT CONTROL. SEEDING AND MULCHING ARE ALSO REQUIRED. THE STOCKPILES SHALL BE GRADED SMOOTH AND COMPACTED TO 90% DENSITY.

PAVEMENT MIX DESIGN AND PAVING TABLE

FOR PAVING ITEMS, THE CONTRACTOR SHALL PROVIDE THE ENGINEER WITH A DESIGN MIX FOR REVIEW AND APPROVAL PRIOR TO THE PRE-CONSTRUCTION MEETING. ALL MATERIALS USED MUST BE OBTAINED FROM A SOURCE APPROVED BY THE OHIO DEPARTMENT OF TRANSPORTATION.

PRIOR TO PAVING, THE CONTRACTOR WILL PROVIDE A PAVING TABLE FOR EACH LIFT OF ASPHALT TO THE RESIDENT PROJECT REPRESENTATIVE. THE TABLE WILL INDICATE THE ANTICIPATED TONNAGE OF THE ASPHALT AT 100 FOOT STATIONS, BASED ON THE CONTRACTOR'S PAVING PLAN.

ASPHALT TESTING

1. QUALITY CONTROL AND ACCEPTANCE TEST REQUIREMENTS SHALL BE AS DESCRIBED IN ITEMS 403, 441, AND 448 WITH THE FOLLOWING MODIFICATIONS.

2. THE CONTRACTOR WILL SUBMIT A COPY OF HIS ODOT APPROVED QCP AND ASPHALT MIX DESIGN TO THE ENGINEER AT LEAST TWO WEEKS PRIOR TO BEGINNING ANY PAVING. FOR ITEM 448, MIX DESIGN SHALL BE TYPE 2 M FOR INTERMEDIATE COURSE AND TYPE 1 M FOR SURFACE COURSE. STANDARD RAP LIMITS WILL BE USED. NO SLAG IS PERMITTED IN ANY OF THE ASPHALT MIXES.

3. RESULTS OF THE CONTRACTOR'S IN PLACE FIELD DENSITY MEASUREMENTS SHALL BE PROVIDED TO THE ENGINEER AT THE END OF EACH DAYS PAVING, ALONG WITH ASPHALT DELIVERY TICKETS. THE CONTRACTOR SHALL MEASURE AND RECORD ASPHALT SURFACE TEMPERATURE ALONG WITH THE FIELD DENSITY MEASUREMENTS, AND PROVIDE COPIES TO THE ENGINEER AT THE END OF EACH DAYS PAVING.

4. QUALITY CONTROL TESTING AND VERIFICATION ACCEPTANCE TESTING IS REQUIRED FOR ITEMS 301 AND 448. SUMMIT COUNTY WILL UTILIZE AN INDEPENDENT LABORATORY FOR THE DOT'S RESPONSIBILITIES LISTED IN THE SPECIFICATIONS. THE CONTRACTOR WILL COORDINATE WITH THE INDEPENDENT LAB'S REPRESENTATIVE. REPORTS WILL BE SUBMITTED BY THE CONTRACTOR TO THE ENGINEER THE DAY AFTER EACH DAY OF PAVING.

5. FOR CHECKING SURFACE TOLERANCES ON THE INTERMEDIATE AND SURFACE COURSES, THE CONTRACTOR WILL PROVIDE EQUIPMENT DESCRIBED IN ITEM 401.19, FOR USE BY THE CITY'S FIELD REPRESENTATIVE. TO ASSIST IN THIS PROCESS, THE CONTRACTOR WILL PROVIDE ONE WORKMAN TO MOVE THE STRAIGHT EDGE AND PERFORM OTHER TASKS WHILE THE FIELD REP CHECKS THE TOLERANCES.

CONCRETE TESTING

1. ALL CONCRETE USED ON THE PROJECT SHALL BE TESTED. THIS INCLUDES CONCRETE FOR ROADS, CURB, DRIVEWAYS, THRUST BLOCKING, FILL INSIDE CATCH BASINS, AND FOR ANY OTHER PURPOSE ON THE PROJECT. A MIX DESIGN SHALL BE SUBMITTED TO THE ENGINEER FOR APPROVAL, PRIOR TO BEGINNING WORK. A TICKET FOR EACH LOAD DELIVERED TO THE PROJECT SHALL BE PROVIDED TO THE FIELD REPRESENTATIVE. TICKET SHALL INCLUDE ALL INFORMATION REQUIRED IN ODOT 499.08. CONCRETE SHALL BE TESTED FOR AIR, SLUMP, AND COMPRESSIVE STRENGTH. EACH LOAD SHALL BE CHECKED FOR AIR AND SLUMP. FOUR (4) TEST SPECIMENS WILL BE MADE FROM EVERY THIRD TRUCK STARTING WITH THE FIRST TRUCK EACH DAY THAT CONCRETE IS DELIVERED TO THE JOBSITE AND/OR EACH TIME THE MIX IS CHANGED. TEST ONE CYLINDER AT 7 DAYS AND ONE AT 28 DAYS, TWO ARE SPARES. SUBMIT A COPY OF EACH REPORT TO THE ENGINEER IMMEDIATELY AFTER THE TEST IS CONDUCTED. ALL TEST REPORTS FOR THE MONTH MUST BE SUBMITTED BY THE TIME OF THE CONTRACTOR'S PAY REQUEST SUBMITTAL, OR THE SUBMITTAL WILL BE CONSIDERED INCOMPLETE AND WILL BE RETURNED TO THE CONTRACTOR.

PAVEMENT RESTORATION FOR PIPE INSTALLATION

1. INSTALL ASPHALT BASE TO THE SURFACE OF EXISTING PAVEMENT FOR PIPE TRENCHES LOCATED WITHIN EXISTING PAVEMENT.

2. ITEM 301, ASPHALT CONCRETE BASE THICKNESS SHALL BE 6 INCHES AND THE PAVEMENT WIDTH SHALL INCLUDE THE TRENCH WIDTH PLUS TWO FEET ON EACH SIDE OF THE TRENCH.

3. PROVIDE MATERIALS OUTSIDE THE LIMITS STATED ABOVE AT NO ADDITIONAL COST.

STORM SEWER

1. STORM SEWER PIPE SHALL BE REINFORCED CONCRETE PIPE, ITEM 706.02, CLASS III, WALL B, WITH GASKET JOINTS; CORRUGATED POLYETHYLENE PIPE WITH A SMOOTH INTERIOR LINER, ITEM 707.33, WITH GASKET JOINTS, OR REINFORCED CONCRETE ELLIPTICAL PIPE ITEM 706.04.

2. ALL STORM SEWER LENGTHS SHOWN ON THE DRAWINGS ARE HORIZONTAL DISTANCES MEASURED FROM CENTER OF STRUCTURE TO CENTER OF STRUCTURE.

3. BEDDING SHALL BE CLASS B PER ITEM 603.04 EXCEPT THAT SLAG AND CRUSHED CONCRETE IS NOT PERMITTED. BEDDING SHALL EXTEND FROM 6" BELOW THE BOTTOM OF PIPE TO THE SPRINGLINE (FOR CONCRETE PIPE) AND TO 12"ABOVE THE THE TOP OF PIPE (FOR POLYETHYLENE PIPE). BACKFILL SHALL BE TYPE 1 STRUCTURAL BACKFILL PER ITEM 703.11 WHERE STORM SEWER IS PLACED BELOW AND/OR BEHIND CURB, PAVEMENT AND/OR DRIVES, OR WHEN THE EDGE OF THE TRENCH IS WITHIN 3 FEET OF SUCH. BACKFILL SHALL BE SUITABLE NATIVE MATERIAL WHERE STORM SEWER IS PLACED BELOW ROADSIDE DITCHES.

4. ROOF DRAINS, FOUNDATION DRAINS AND SEPTIC DRAINS SHALL BE PVC, ASTM D-3034, SDR 35. BEDDING SHALL BE TYPE 2 PER ITEM 603.06 AND BACKFILL SHALL BE NATIVE MATERIAL COMPACTED PER ITEM 603.10, SECTION D.

5. ALL BACKFILL IN TRENCHES SHALL BE PLACED IN 6" LIFTS AND COMPACTED USING MECHANICAL TAMPERS. COMPACTION RATES SHALL BE PER ITEM 603.11.

6. STORM SEWER INSTALLATION SHALL INCLUDE: EXCAVATING FOR PIPE AND FOUNDATIONS FOR SAME, INCLUDING CLEARING AND GRUBBING AND THE REMOVAL OF ALL MATERIALS NECESSARY FOR PLACING THE PIPE EXCEPT REMOVALS LISTED SEPARATELY; FURNISHING AND PLACING OF BEDDING AND BACKFILL AS REQUIRED; CONSTRUCTING AND SUBSEQUENTLY REMOVING ALL NECESSARY COFFERDAMS, CRIBS AND SHEETING; PUMPING AND DEWATERING; SEALING OR BANDING ALL PIPE JOINTS WHERE REQUIRED; FURNISHING AND INSTALLING ALL NECESSARY PIPE BENDS AND BRANCHES OF A TYPE AT LEAST EQUAL TO THE CONDUIT OF WHICH THEY BECOME A PART; JOINING TO THE EXISTING AND PROPOSED APPURTENANCES AS REQUIRED; CORE DRILLING EXISTING STRUCTURES FOR CONNECTING TO NEW STORM SEWERS; PERFORMING LEAKAGE TESTS AS SPECIFIED; RESTORATION OF DISTURBED FACILITIES AND SURFACES; AND PROVIDING EROSION CONTROL PADS AND ANIMAL GUARDS ON UNDERDRAIN AT ALL OUTLETS.

HOUSE CONNECTION

1. EXISTING ROOF DRAINS, YARD DRAINS, OR SEPTIC DRAINS DISTURBED BY THE PROPOSED WORK SHALL BE PROVIDED WITH UNOBSTRUCTED OUTLETS BY CONNECTION TO STORM SEWER MANHOLE, CATCH BASIN, OR AS DIRECTED BY THE ENGINEER. PROVIDE FITTINGS AND CONNECTORS AS REQUIRED FOR ALL CONNECTIONS. THE COST OF WHICH WILL BE INCLUDED IN THE PRICE BID FOR PIPE. CONNECTIONS TO STORM SEWERS SHALL BE MADE USING MANUFACTURED FITTINGS SUCH AS KOR-N-TEE CONNECTORS, OR EQUAL.

2. THE LOCATION, TYPE, SIZE AND GRADE OF REQUIRED REPLACEMENTS WILL BE DETERMINED BY THE ENGINEER DURING CONSTRUCTION. QUANTITIES OF 6" CONDUIT HAVE BEEN INCLUDED IN THE BID SCHEDULE FOR RECONNECTING EXISTING DRAINS. THESE ITEM SHALL NOT BE ORDERED UNTIL AUTHORIZED BY THE ENGINEER.

ITEM 202: DETENTION BASIN STRUCTURE REMOVAL, AS PER PLAN

CONTRACTOR SHALL REMOVE EXISTING OUTLET STRUCTURE AND ASSOCIATED PIPING FROM COVENTRY CROSSING DETENTION BASIN. ALL WORK ASSOCIATED WITH TASK SHALL BE PAID THROUGH ITEM 202 DETENTION BASIN STRUCTURE REMOVAL, AS PER PLAN.

Environmental Design Group
The community impact people.
800.835.1390
envdesigngroup.com

SW Basin & Channel Hinman Ditch (Ditch #52)

SUMMIT COUNTY

PRELIMINARY PLAN

DATE: ______________

REVISIONS

#	DATE	DESCRIPTION
-	-	-
-	-	-
-	-	-
-	-	-
-	-	PRELIMINARY PLAN
-	-	PRELIMINARY PLAN
-	-	-

PROJECT NO.:	22-00830-010
DRAWN BY:	SWA
CHECKED BY:	JO
DATE ISSUED:	MAR 25, 2025

GENERAL NOTES

ITEM 659 – SEEDING AND MULCHING, AS PER PLAN

THE VARIOUS SECTIONS OF ITEM 659, SEEDING AND MULCHING, AS DESCRIBED IN ODOT CMS SHALL APPLY, EXCEPT AS AMENDED BY THE FOLLOWING:

ITEM 659.04 COMMERCIAL FERTILIZER SHALL BE REPLACED BY LAWN FERTILIZER AS FOLLOWS:

659.04 LAWN FERTILIZERS. "STARTER" FERTILIZER FOR LAWNS SHALL BE A DRY TYPE WITH A RATIO AS NOTED IN THE SOIL TEST ANALYSIS RESULTS AND APPLIED AT THE RATE SPECIFIED IN THOSE ANALYSES.

"FOLLOW–UP" FERTILIZER SHALL BE A DRY TYPE FERTILIZER SUCH AS AN 18–5–9 OR 25–5–10 OR SIMILAR RATIO, APPLIED AT THE RATE OF ONE POUND OF ACTUAL NITROGEN PER 1,000 SQUARE FEET UNLESS OTHERWISE DIRECTED BY THE ENGINEER. FIFTY PERCENT OF THE TOTAL NITROGEN SHALL BE WATER INSOLUBLE (W.I.N.). OTHER ANALYSIS REQUIRES APPROVAL OF THE ENGINEER. CONTRACTOR SHALL APPLY THE "FOLLOW–UP" FERTILIZER UPON ACCEPTANCE.

ITEM 659.07 SEED SHALL BE REPLACED BY THE FOLLOWING:

659.07 SEED.

ALL SEED SHALL MEET THE FOLLOWING REQUIREMENTS:

98 PERCENT PURITY
85 PERCENT GERMINATION

THE CONTRACTOR SHALL FURNISH TO THE ENGINEER A LETTER OF CERTIFICATION THAT ALL SEED TO BE USED COMES FROM A SOURCE APPROVED BY THE CITY, AND MEETS THE REQUIREMENTS OF THESE SPECIFICATIONS. SEED WHICH IS WET, MOLDY OR OTHERWISE DAMAGED IN TRANSIT SHALL NOT BE ACCEPTABLE. THE SEED MIX SHALL BE DELIVERED IN CLEAN SEALED BAGS BEARING CERTIFIED ANALYSIS AS FOLLOWS (PERCENTAGES ARE BY WEIGHT):

LAWN SEED MIX:

SUNNY SEED MIX
(RELATIVELY LOW MAINTENANCE)

FAIRLAWN BRAND
35% KENTUCKY BLUEGRASS
10% BARON KENTUCKY BLUEGRASS
15% PENNLAWN RED FESCUE
10% BRIGHTSTAR II PERENNIAL RYEGRASS
10% PIZZAZZ PERENNIAL RYEGRASS
10% SEVILLE II PERENNIAL RYEGRASS

OR AN EQUAL APPROVED BY THE ENGINEER. APPLY SEED AT THE RATE OF 5 POUNDS PER 1,000 SQUARE FEET.

ALTERNATE SUNNY SEED MIX
(LOW MAINTENANCE)

FESCUE PLUS MIXTURE
25% MILLENIUM TALL FESCUE
25% PLANTATION TALL FESCUE
25% CROSSFIRE II TALL FESCUE
15% BRIGHTSTAR II PERENNIAL RYEGRASS
10% KENTUCKY BLUEGRASS

OR AN EQUAL APPROVED BY THE ENGINEER. APPLY SEED AT THE RATE OF 6–7 POUNDS PER 1,000 SQUARE FEET.

SHADY SEED MIX

FAIRLAWN "SHADY"
15% SHADOW CHEWINGS FESCUE
15% PENNLAWN RED FESCUE
15% INTRIGUE CHEWING'S FESCUE
15% CREEPING RED FESCUE
10% SHADEMASTER II RED FESCUE
20% SEVILLE II PERENNIAL RYEGRASS
10% KENTUCKY BLUEGRASS

OR AN EQUAL APPROVED BY THE ENGINEER. APPLY SEED AT THE RATE OF 5 POUNDS PER 1,000 SQUARE FEET.
ALTERNATE SHADY SEED MIX
(LOW MAINTENANCE)

FESCUE "PLUS" MIXTURE
25% MILLENIUM TALL FESCUE
25% PLANTATION TALL FESCUE
25% CROSSFIRE II TALL FESCUE
15% BRIGHTSTAR II PERENNIAL RYEGRASS
10% KENTUCKY BLUEGRASS

OR AN EQUAL APPROVED BY THE ENGINEER. APPLY SEED AT THE RATE OF 6.7 POUNDS PER 1,000 SQUARE FEET.

A DETERMINATION WILL BE MADE DURING CONSTRUCTION REGARDING WHICH TYPE OF SEED MIX BEST FITS THE PROJECT CONDITIONS. IT IS POSSIBLE THAT ONE TYPE OF SEED MIX WILL NOT BE USED FOR THE ENTIRE PROJECT AREA.

ITEM 659.10 SITE PREPARATION SHALL BE REPLACED BY THE FOLLOWING:

659.10 SITE PREPARATION.

PRIOR TO PLACING TOPSOIL, INSPECT THE SURFACE OF THE SUBGRADE. REMOVE ALL STONES, ROOTS, OR OTHER MATERIAL FROM THE SURFACE THAT IS LARGER THAN ONE INCH AS MEASURED IN ANY ONE DIRECTION. THEN PLACE TOPSOIL IN ACCORDANCE WITH ITEM 659.11.

LIME, IF REQUIRED AS A RESULT OF SOIL TEST OR AS REQUIRED BY THE ENGINEER, SHALL BE INCORPORATED INTO THE SOIL BY DISC, HARROW OR TILLER TO A DEPTH OF SIX INCHES OR AS OTHERWISE DIRECTED.

"STARTER" FERTILIZER SHALL BE INCORPORATED INTO THE SOIL TO A DEPTH OF 4 INCHES, UNLESS OTHERWISE DIRECTED BY THE ENGINEER. "STARTER" FERTILIZER SHALL BE INCORPORATED SEPARATELY FROM LIME INCORPORATION.

SEEDBED SHALL THEN BE PREPARED REMOVING ALL ROCK AND FOREIGN MATERIAL GREATER THAN ONE INCH IN ANY DIRECTION AND FINE GRADED BY RAKING TO PLAN GRADE, TO THE SATISFACTION OF THE ENGINEER.

THE CONTRACTOR SHALL PERFORM CORE AERATION TO A MINIMUM DEPTH OF THREE (3) INCHES WITH A MINIMUM OF TWENTY (20) HOLES PER SQUARE FOOT PRIOR TO THE APPLICATION OF A "FOLLOW–UP" FERTILIZER.

A "FOLLOW–UP" FERTILIZER SHALL BE APPLIED TO THE NEWLY ESTABLISHED LAWN AFTER ACCEPTANCE.

ITEM 659 – MAINTENANCE SHALL BE REPLACED BY THE FOLLOWING:

659.18 MAINTENANCE OF LAWN SEED AREAS. ALL SEEDED AND MULCHED AREAS SHALL BE MAINTAINED UNTIL ACCEPTANCE. MAINTENANCE SHALL ALSO INCLUDE FURNISHING AND INSTALLING APPROVED BARRICADES AND SIGNS TO PROTECT NEWLY SEEDED AND MULCHED AREAS. ALL AREAS DAMAGED FOLLOWING SEEDING OR MULCHING OPERATIONS DUE TO WIND, WATER, FIRE, OR OTHER CAUSES SHALL BE REPAIRED. SUCH DAMAGED AREAS SHALL BE REPAIRED TO RE–ESTABLISH THE CONDITION AND GRADE OF THE AREA PRIOR TO SEEDING. IT THEN SHALL BE REFERTILIZED, RESEEDED AND REMULCHED, AS DIRECTED BY THE ENGINEER.

CONTRACTOR SHALL MAINTAIN SEEDED AREAS UNTIL ACCEPTANCE; MINIMUM OF 30 DAYS AFTER A SATISFACTORY STAND OF GRASS IN VIGOROUS AND THRIVING CONDITION IS ESTABLISHED. MAINTENANCE SHALL INCLUDE WATERING, MOWING, WEEDING, AERATING, RESEEDING, FERTILIZING AND DISEASE AND PEST CONTROL, ETC.

WATER SHALL BE APPLIED, UNDER SUFFICIENT PRESSURE, WITH A NOZZLE THAT WILL PRODUCE A SPRAY PATTERN THAT WILL ADEQUATELY WATER BUT NOT DISLODGE THE MULCHING MATERIAL, EVERY SEVEN DAYS DURING THE MAINTENANCE PERIOD UNLESS OTHERWISE DETERMINED BY THE ENGINEER, AT A RATE OF 120 GALLONS PER 1,000 SQUARE FEET.

MOW TO A HEIGHT OF TWO INCHES WHENEVER GRASS BECOMES THREE INCHES HIGH. NOT MORE THAN ONE–THIRD OF THE GRASS HEIGHT SHALL BE REMOVED WITH EACH MOWING.

AREAS WHICH DO NOT SHOW A SATISFACTORY STAND OF GRASS SHALL BE RESEEDED AT INTERVALS OF TEN TO FIFTEEN DAYS UNTIL A SATISFACTORY STAND OF GRASS SHALL BE RESEEDED AT INTERVALS OF TEN TO FIFTEEN DAYS UNTIL A SATISFACTORY TURF IS ESTABLISHED.

IN TURF AREAS THAT HAVE SETTLED, TOPSOIL SHALL BE ADDED AND THE ENTIRE AREA RE–SEEDED AT THE RATE SPECIFIED FOR THAT SEED MIX. IN TURF AREAS THAT HAVE NOT SETTLED, A SLIT SEEDER SHALL BE USED. THIS WILL SALVAGE THE EXISTING TURF AND INCORPORATE THE SEED INTO THE SOIL. THE SEED SHALL BE APPLIED AT HALF THE RATE SPECIFIED FOR THAT SEED MIX. AN ACCEPTABLE LAWN SHALL BE DEFINED AS HAVING A CLOSE STAND OF SPECIFIED GRASS, 6–12 PLANTS PER SQUARE INCH DEPENDING ON THE SPECIFIED VARIETY, IN A VIGOROUS AND THRIVING CONDITION.

TURF AREAS SHALL BE REASONABLY FREE OF WEEDS AND UNDESIRABLE COARSE GRASSES. REASONABLY FREE OF UNDESIRABLE WEEDS AND COARSE GRASSES SHALL MEAN WEEDS AND/OR COARSE GRASSES EXIST IN LESS THAN FIVE PERCENT OF THE TOTAL SEEDED AREA. A WEED CONTROL PROGRAM WILL BE REQUIRED WHEN WEEDS AND/OR COARSE GRASSES SURPASS FIVE PERCENT OF ANY GIVEN AREA, OR FIVE PERCENT OF TOTAL AREA SEEDED. CONTROL MAY BE EXERCISED MANUALLY OR THROUGH CHEMICAL CONTROL. WHEN CHEMICALS ARE USED TO CONTROL UNDESIRABLE GRASSES OR BROADLEAFED WEEDS, INSECTS OR DISEASES, THE CONTRACTOR WILL BE REQUIRED TO POSSESS A COMMERCIAL APPLICATOR'S LICENSE WITH THE STATE OF OHIO AND APPLY CHEMICALS ACCORDING TO MANUFACTURER'S RECOMMENDATIONS. DISEASE AND PEST CONTROL SHALL INCLUDE, BUT NOT BE LIMITED TO, DAMAGE BY FUNGUS, BACTERIA OR INSECTS, ETC., AS IDENTIFIED BY THE ENGINEER.

WATER HOSE, COUPLINGS AND SPRINKLERS SHALL BE PROVIDED TO REACH ALL AREAS OF THE NEWLY SEEDED AREAS TO RECEIVE WATER. NATURAL RAINFALL SHALL BE SUPPLEMENTED TO PROVIDE SUFFICIENT MOISTURE FOR SEED GERMINATION.

NOTE THAT WEED CONTROL IS REQUIRED, BUT IT SHALL NOT BE PAID FOR SEPARATELY. INCLUDE COSTS IN THE PRICE BID FOR SEEDING AND MULCHING.

A DISEASE AND PEST CONTROL PROGRAM SHALL BE DEVELOPED IF NECESSARY, THE COST OF WHICH WILL BE INCLUDED IN A CHANGE ORDER.

RESTORATION IS CRITICAL TO MINIMIZE DISRUPTION AND INCONVENIENCE FOR PROPERTY OWNERS. BASED ON THE SEQUENCE OF CONSTRUCTION DESCRIBED ELSEWHERE I THE GENERAL NOTES AND/OR THE MAINTENANCE OF TRAFFIC NOTES, EARTHWORK WILL BE COMPLETED ON ONE SIDE OF CASTON ROAD AND THEN ON THE OTHER IN ORDER TO CONSTRUCT THE BIKE LANES. FOR THE PURPOSES OF THIS PROJECT, EACH OF THE TWO SIDES (HALVES) WILL BE DIVIDED IN HALF AGAIN, THUS PROVIDING 4 SECTIONS. WITHIN EACH SECTION, WHEN THE EARTHWORK FOR THE BIKE LANE OR THE STORM SEWER INSTALLATION (WHICHEVER TAKES LONGER) IS 90% COMPLETE, THE CONTRACTOR SHALL MOBILIZE THE RESTORATION CREW(S) WITHIN ONE WEEK OF THE 90% POINT. CREW(S) SHALL ENGAGE IN TOPSOILING, FERTILIZING, SEEDING, MULCHING/MATTERING, WATERING AND MAINTENANCE. WORK SHALL BE CONTINUOUS UNTIL COMPLETE. IF DRIVEWAYS ARE NOT COMPLETE, RESTORATION AROUND THEM CAN BE SKIPPED UNTIL THEY ARE COMPLETE. BY ENTERING INTO THIS CONTRACT, THE CONTRACTOR AGREES TO THESE REQUIREMENTS. IF HE DOES NOT MEET THEM, HE FURTHER AGREES TO PAY $750 PER CALENDAR DAY TO THE OWNER UNTIL HE COMPLIES. PAYMENT SHALL BE IN THE FORM OF A DEDUCT CHANGE ORDER. IF RAIN OCCURS WITHIN THE ONE WEEK PERIOD FOR MOBILIZATION, THEN THE ENGINEER AND CONTRACTOR SHALL NEGOTIATE AN EXTENSION BEYOND THE ONE WEEK PERIOD.

CROSSINGS AND CONNECTIONS TO EXISTING PIPES AND UTILITIES

1. WHERE PLANS PROVIDE FOR A PROPOSED WATERLINE TO BE CONNECTED TO OR CROSS OVER OR UNDER AN EXISTING SEWER OR UNDERGROUND UTILITY, THE CONTRACTOR SHALL LOCATE THE EXISTING PIPES OR UTILITIES BOTH AS TO LINE AND GRADE BEFORE STARTING TO LAY THE PROPOSED WATERLINE.
2. IF IT IS DETERMINED THAT THE ELEVATION OF THE EXISTING WATERLINE, OR EXISTING APPURTENANCE TO BE CONNECTED, DIFFERS FROM THE PLAN ELEVATION OR RESULTS IN A CHANGE IN THE PLAN, THE ENGINEER SHALL BE NOTIFIED BEFORE STARTING CONSTRUCTION OF ANY PORTION OF THE PROPOSED WATERLINE WHICH WILL BE AFFECTED BY THE VARIANCE IN THE EXISTING ELEVATIONS.
3. IF IT IS DETERMINED THAT THE PROPOSED WATERLINE WILL INTERSECT AN EXISTING SEWER OR UNDERGROUND UTILITY IF CONSTRUCTED AS SHOWN ON THE PLAN, THE ENGINEER SHALL BE NOTIFIED BEFORE STARTING CONSTRUCTION OF ANY PORTION OF THE PROPOSED CONDUIT WHICH WOULD BE AFFECTED BY THE INTERFERENCE WITH AN EXISTING FACILITY.
4. PAYMENT FOR ALL THE OPERATIONS DESCRIBED ABOVE SHALL BE INCLUDED IN THE CONTRACT PRICE FOR THE PERTINENT WATERLINE ITEM.

S EXCAVATED DURING TRENCHING SHALL BE PILED ON THE UPHILL SIDE OF THE TRENCH.

CLEARANCE REQUIREMENTS

1. A 10' MINIMUM HORIZONTAL CLEARANCE MUST BE MAINTAINED FROM THE OUTSIDE EDGE OF THE PROPOSED WATERLINE TO THE EDGE OF THE EXISTING STORM SEWER AT ALL TIMES.
2. A 10' MINIMUM HORIZONTAL CLEARANCE MUST BE MAINTAINED FROM THE OUTSIDE EDGE OF THE PROPOSED WATERLINE TO THE OUTSIDE EDGE OF THE EXISTING SANITARY SEWER AT ALL TIMES.
3. AN 18" VERTICAL CLEARANCE MUST BE MAINTAINED FROM THE OUTSIDE EDGE OF THE PROPOSED WATER MAIN TO THE OUTSIDE EDGE OF THE EXISTING SANITARY SEWER WHERE THEY CROSS.
4. AN 18" VERTICAL CLEARANCE MUST BE MAINTAINED FROM THE EDGE OF THE PROPOSED WATER MAIN TO THE EDGE OF THE EXISTING STORM SEWER OR INLET LEAD PIPE WHERE THEY CROSS.
5. A 36" MINIMUM HORIZONTAL CLEARANCE FROM ALL DIRECT BURIED CONDUITS, CONCRETE ENCASED ELECTRICAL CONDUITS, LIGHT POLE BASES AND HAND HOLE PULL BOXES.

ENDANGERED SPECIES

1. THE PROJECT WITHIN THE RANGE OF SEVERAL STATE AND FEDERALLY THREATENED AND ENDANGERED BAT SPECIES (INDIANA BAT, NORTHERN LONG–EARED BAT, LITTLE BROWN BAT, AND TRICOLORED BAT) AND MAY IMPACT SUMMER ROOSTING HABITAT FOR THESE SPECIES. THESE SPECIES DEPEND ON TREES WITH PEELING BARK, CAVITIES, CREVICES, AND DEAD AND DYING TREES. PER U.S. FISH AND WILDLIFE SERVICE RECOMMENDATION, THE REMOVAL OF TREES GREATER THAN OR EQUAL TO 3–INCHES DIAMETER AT BREAST HEIGHT SHOULD ONLY OCCUR BETWEEN OCTOBER 1 AND MARCH 31. IF THIS TIMEFRAME CANNOT BE FOLLOWED, THE U.S. FISH AND WILDLIFE SERVICE (614–416–8993) AND OHIO DEPARTMENT OF NATURAL RESOURCES (CONTACT: EILEEN WYZA, EILEEN.WYZA@DNR.OHIO.GOV) MUST BE CONTACTED PRIOR TO CUTTING FOR GUIDANCE ON NECESSARY STEPS TO DOCUMENT THE ABSENCE OR PRESENCE OF THESE SPECIES.

ARCHAEOLOGICAL DISCOVERIES

1. CONTRACTORS AND SUBCONTRACTORS ARE REQUIRED UNDER OHIO REVISED CODE SECTION 149.53 TO NOTIFY THE OHIO HISTORICAL SOCIETY AND THE OHIO HISTORIC SITE PRESERVATION BOARD OF ARCHAEOLOGICAL DISCOVERIES LOCATED IN THE PROJECT AREA AND TO COOPERATE WITH THOSE ENTITIES IN ARCHAEOLOGICAL AND HISTORIC SURVEYS AND SALVAGE EFFORTS IF SUCH DISCOVERIES ARE UNCOVERED WITHIN THE PROJECT AREA.

   CONTACT: STATE HISTORIC PRESERVATION OFFICE
   PHONE: 614–298–2000

ADJACENT PROPERTY OWNER NOTIFICATION

COVENTRY TOWNSHIP AND/OR SUMMIT COUNTY DSSS WILL BE RESPONSIBLE FOR NOTIFYING ADJACENT PROPERTY OWNERS IN ADVANCE OF WORK.

GENERAL CONSTRUCTION NOTES

CONSTRUCTION OF THE SITE WORK AND UTILITIES SHALL BE GOVERNED BY SUMMIT COUNTY ENGINEER'S OFFICE

1. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING AND PAYING FOR ALL PERMITS REQUIRED FOR THE PROJECT.
2. THE CONTRACTOR MUST ALERT THE OHIO UTILITY PROTECTION SERVICES AT 1–800–362–2764 AT LEAST 48 HOURS BEFORE ANY EXCAVATION IS TO BEGIN.
3. ALL EXISTING APPURTENANCES (UTILITY POLES, VALVES, HYDRANTS, MANHOLES, ETC.) ARE TO BE MAINTAINED BY THE CONTRACTOR UNLESS OTHERWISE SHOWN ON THE PLANS.
4. THE DESIGN ENGINEER CERTIFIES THAT ALL UTILITIES ARE SHOWN AS THEY APPEAR ON EXISTING RECORDS OR FIELD LOCATED.
5. ALL KNOWN ABOVE AND UNDERGROUND SERVICES HAVE BEEN NOTED ON THE DRAWINGS. THE CONTRACTOR ACCEPTS FULL RESPONSIBILITY FOR ANY SERVICES DAMAGED DURING THE CONSTRUCTION OF THE PROJECT WHETHER SHOWN OR NOT ON THE DRAWINGS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR RESTORING THE SERVICE AS SOON AS POSSIBLE AT THE CONTRACTOR'S OWN EXPENSE.
6. VIDEO TAPING OF PROJECT SHALL BE DELIVERED AND ACCEPTED BY SUMMIT COUNTY A MINIMUM OF 14 CALENDAR DAYS PRIOR TO START OF CONSTRUCTION ACTIVITIES.
7. NOTIFY SUMMIT COUNTY A MINIMUM OF FORTY–EIGHT HOURS (2 WORKING DAYS) PRIOR TO THE START OF CONSTRUCTION.
8. A PRECONSTRUCTION MEETING SHALL BE SCHEDULED A MINIMUM OF 48 HOURS (2 WORKING DAYS) AFTER SUBMISSION OF A MINIMUM OF 6 APPROVED SETS OF PLANS AND ALL SHOP DRAWINGS APPLICABLE TO THE PROPOSED IMPROVEMENTS. A PRECONSTRUCTION MEETING MUST BE HELD PRIOR TO THE START OF ANY CONSTRUCTION.
9. THE LIMITS OF CLEARING AND GRADING SHALL BE FIELD STAKED AND LINED WITH ORANGE CONSTRUCTION FENCING 48 HOURS (2 WORKING DAYS) PRIOR TO THE PRECONSTRUCTION MEETING. AREAS BEYOND THE LIMITS OF CLEARING AND GRADING SHALL NOT BE DISTURBED INCLUDING THE STOCKPILE OF ANY MATERIALS OR CONSTRUCTION TRAFFIC.
10. ALL ROAD SURFACES, EASEMENTS, OR RIGHT–OF–WAY DISTURBED BY THE CONSTRUCTION OF ANY PART OF THESE IMPROVEMENTS ARE TO BE RESTORED ACCORDING TO THE ENGINEER.
11. THE CONTRACTOR SHALL IMMEDIATELY NOTIFY SUMMIT COUNTY OR ITS REPRESENTATIVE IF SUSPECTED HAZARDOUS MATERIAL OR ANY OTHER MATERIAL THAT MAY CREATE A HEALTH RISK IS DISCOVERED ON SITE.
12. ALL DISTURBED STORM SEWERS AND/OR APPURTENANCES, SIGNS, GUARD RAILING, MAIL AND/OR PAPER BOXES, DRIVE CULVERTS, FENCES, TREES, LANDSCAPING, OR OTHER ITEMS DISTURBED BY THE CONSTRUCTION SHALL BE RESTORED OR REPAIRED TO AT LEAST THE BEFORE–CONSTRUCTION CONDITION.
13. ANY DEFECTS DISCOVERED IN NEW CONSTRUCTION, WORKMANSHIP, EQUIPMENT OR MATERIALS SHALL BE REPAIRED, OR CORRECTED BY APPROVED METHODS AS DIRECTED BY THE SUMMIT COUNTY.
14. NUCLEAR COMPACTION TESTING SHALL BE REQUIRED FOR ALL FILL AREAS OVER TWO FEET (2') IN DEPTH, AT 6" LIFTS PER ASTM A–1557, 95% MODIFIED.
15. APPROVAL BY SUMMIT COUNTY. CONSTITUTES NEITHER EXPRESSED NOR IMPLIED WARRANTIES AS TO THE FITNESS, ACCURACY, OR SUFFICIENCY OF PLANS, DESIGNS OR SPECIFICATIONS.
16. DURING TAPPING OF EXISTING UTILITIES, ANY TRAFFIC CONTROL REQUESTED OR REQUIRED BY THE SUMMIT COUNTY WILL BE PROVIDED BY THE CONTRACTOR AT NO COST TO THE COUNTY.
17. COMPLIANCE WITH THE OCCUPATIONAL AND SAFETY ACT OF 1970 IS REQUIRED BY ALL CONTRACTORS ON THIS PROJECT.
18. ROOF DRAINS, FOUNDATION DRAINS, AND OTHER CLEAN WATER CONNECTIONS TO THE SANITARY SEWER ARE PROHIBITED.
19. ALL DISTRIBUTED AREAS SHALL RECEIVE 4" OF TOPSOIL AND BE SEEDED AND MULCHED.
20. IF MUD, SOIL, OR OTHER DEBRIS IS DEPOSITED ON ADJACENT STREETS, ROADS, OR OTHER PROPERTY, THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE REMOVAL OF SUCH IS DIRECTED BY SUMMIT COUNTY OR ITS ENGINEER AT THE END OF EACH WORK DAY, OR AS REQUIRED DURING THE WORK DAY.
21. ALL PROPOSED SLOPES 3:1 OR STEEPER AND ALL EARTHEN DRAINAGE WAYS SHALL RECEIVE JUTE OF EXCELSIOR MATTING AS PER ODOT 667 OR 668.
22. ALL PIPES SHALL BE PLACED OVER 4" OF BEDDING. BEDDING MATERIAL SHALL BE AS SPECIFIED IN CITY'S "ENGINEERING STANDARDS FOR INFRASTRUCTURE CONSTRUCTION", LATEST EDITION, FOR THE TYPE OF PIPE.
23. CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING AND PROTECTING THE FLOW OF VEHICULAR AND PEDESTRIAN TRAFFIC AROUND THE JOB SITE. TRAFFIC CONTROL SHALL BE COORDINATED WITH SUMMIT COUNTY.
24. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING PLANT TICKETS FOR ALL MATERIALS DELIVERED TO THE SITE. PLANT TICKETS MUST SHOW NET QUANTITY OF DELIVERED MATERIAL. MATERIAL DELIVERED OR PLACED WITHOUT PLANT TICKETS SHALL BE REMOVED AND PROPERLY DISPOSED AT THE EXPENSE OF THE CONTRACTOR.
25. ALL DELIVERED MATERIALS SHALL MEET THE STANDARDS AND SPECIFICATIONS OF THE SUMMIT COUNTY OR OTHER APPLICABLE AGENCIES. SUMMIT COUNTY, OR ITS REPRESENTATIVE, RESERVES THE RIGHT TO REJECT ANY DELIVERED MATERIAL WHICH DOES NOT CONFORM TO THE APPLICABLE STANDARDS AND SPECIFICATIONS.
26. SUMMIT COUNTY OR ITS REPRESENTATIVE, RESERVES THE RIGHT TO HALT ALL CONSTRUCTION ACTIVITY FOR NONCONFORMANCE OF PLANS, SPECIFICATIONS AND OTHER APPLICABLE STANDARDS OF REGULATIONS.
27. ALL CHANGES TO APPROVED DRAWINGS AND/OR SPECIFICATION MUST BE REAPPROVED BY SUMMIT COUNTY PRIOR TO CONSTRUCTION.
28. ALL PAVING MATERIAL MUST BE PROVIDED BY ODOT CERTIFIED SUPPLIER. WRITTEN PROOF SHALL BE REQUIRED UPON DELIVERY OF MATERIALS. THE CERTIFIED MIX DESIGN MUST BE SUBMITTED TO, AND APPROVED BY, SUMMIT COUNTY PRIOR TO SCHEDULING A PRECONSTRUCTION MEETING.
29. CONTRACTOR/DEVELOPER SHALL PROVIDE ALL REQUIRED ROADWAY SIGNAGE AS PER ODOT MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES INCLUDING STREET IDENTIFICATION SIGNAGE PER CITY STANDARDS FOR ALL ASPECTS OF THE IMPROVEMENT.
30. ALL BONDS AND OR LETTERS OF CREDIT SHALL NOT BE RELEASED OR REDUCED AND NO WATER OR SANITARY SEWER CUSTOMERS CAN BE CONNECTED UNTIL ALL RECORD DRAWINGS HAVE BEEN SUBMITTED, REVIEWED AND APPROVED BY SUMMIT COUNTY.
31. ALL WORK, EXCEPT SIDEWALKS, STREET TREES AND STREET LIGHTS, AS PART OF THESE PLANS SHALL BE COMPLETED, INCLUDING PUNCH LIST ITEMS AND DEFICIENCY WORK WITHIN 1 YEAR OF THE DATE OF APPROVAL BY THE CITY ENGINEER. SIDEWALKS, STREET TREES AND STREET LIGHTS SHALL BE COMPLETED WITHIN TWO TEARS OF THE DATE OF APPROVAL BY THE CITY ENGINEER.
32. FAILURE TO COMPLETE THE PROJECT IN ITS ENTIRETY AS APPROVED BY THE PLANNING COMMISSION, INCLUDING PUNCH LIST ITEMS, WILL RESULT IN SUMMIT COUNTY HOLDING ALL FUTURE ZONING CERTIFICATED UNTIL ALL WORK HAS BEEN COMPLETED AND APPROVED.
33. MANUFACTURERS OR SUPPLIERS AFFIDAVIT FOR ALL CONSTRUCTION MATERIALS SHALL BE PROVIDED.
34. SHOP DRAWINGS FOR THE PROPOSED LIGHT FIXTURES SHALL BE ATTACHED TO THE APPROVED LIGHTING PLAN AND SUBMITTED WITH THE SIX SETS OF PLANS AS REQUIRED IN NOTE 8. THE LIGHT FIXTURES SHALL HAVE A RECESSED LAMP, FLAT LENSES AND OPTIONAL HOUSE SHIELDING AVAILABLE. THE CITY MAY REQUIRE HOUSE SHIELDS TO BE ADDED AND OTHER MODIFICATIONS AFTER CONSTRUCTION AT THE EXPENSE OF THE CONSTRUCTION.
35. THE OWNER SHALL SUBMIT A NOTICE OF INTENT (N.O.I.) APPLICATION TO THE OHIO ENVIRONMENTAL PROTECTION AGENCY (E.P.A.) AND OBTAIN AUTHORIZATION FOR STORM WATER DISCHARGES ASSOCIATED WITH CONSTRUCTION ACTIVITY UNDER THE NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (N.P.D.E.S.) OR THE LATEST FEDERAL, STATE AND/OR LOCAL REGULATIONS. THE OWNER SHALL SUBMIT A COPY OF THE N.P.D.E.S. PERMIT TO SUMMIT COUNTY 48 HOURS (2 WORKING DAYS) PRIOR TO SCHEDULING A PRECONSTRUCTION MEETING.

TRAFFIC MAINTENANCE NOTES

1. ALL TRAFFIC CONTROL DEVICES SHALL BE FURNISHED BY THE CONTRACTOR AND SHALL BE ERECTED AND MAINTAINED IN COMPLIANCE WITH THE STATE OF OHIO "MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES" INCLUDING LATEST REVISIONS, ACCORDING TO SIZE, SHAPE, COLOR AND REFLECTORIZATION.
2. THE CONTRACTOR SHALL BE RESPONSIBLE AT ALL TIMES FOR PROVIDING AND MAINTAINING LIGHTS, SIGNS, AND BARRICADES FOR THE MAINTENANCE OF TRAFFIC AND SAFETY OF HIS WORK AT THE LOCATION SHOWN ON THESE PLANS OR AS DIRECTED BY THE ENGINEER.
3. THE CONTRACTOR SHALL GIVE THE COUNTY A MINIMUM OF 7 DAYS NOTICE PRIOR TO STARTING WORK.
4. TRAFFIC MAINTENANCE IS EXPECTED ON ALL STREETS AND PARKING AREAS ON THIS PROJECT.
5. THE CONTRACTOR IS RESPONSIBLE FOR ALL DAMAGES TO SIGNS, SIGN POSTS, SIGN BRACKETS, ETC.. STOP OR YIELD SIGNS SHALL BE MAINTAINED DURING CONSTRUCTION. STREET NAME SIGNS AND ALL OTHER SIGNS AFFECTED DURING CONSTRUCTION SHALL BE CAREFULLY REMOVED, STORED AND RE–INSTALLED BY THE CONTRACTOR IN ACCORDANCE WITH O.M.U.T.C.D. WITHIN FIFTEEN DAYS OF THE COMPLETION OF THE CONSTRUCTION, AND ACCEPTABLE TO THE ENGINEER AND SUMMIT COUNTY. ALL CONSTRUCTION SIGNS SHALL BE REMOVED WITHIN FIFTEEN DAYS OF THE COMPLETION OF CONSTRUCTION.
6. TYPE "C" BURNING WARNING LIGHTS SHALL BE ERECTED ON DRUMS WITHIN 100 FEET OF ALL INTERSECTIONS AND ALL TRANSITION AREAS FOR NIGHT–TIME CHANNELIZING, MAXIMUM SPACING SHALL BE 25 FEET CENTER TO CENTER.
7. ADDITIONAL MAINTENANCE OF TRAFFIC ITEMS MAY BE REQUIRED BY THE COUNTY AT NO ADDITIONAL COSTS TO THE OWNER OR THE COUNTY.
8. THE CONTRACTOR SHALL ASSIGN ONE PERSON TO RESPOND TO ANY EMERGENCY REPAIRS REQUIRED TO THE TRAFFIC CONTROL DEVICES. THIS PERSON SHALL BE ON CALL 24 HOURS PER DAY, SEVEN DAYS PER WEEK, VIA CELL PHONE. CONTRACTOR WILL BE BILLED IF FAILS TO RESPOND WITHIN 2 HOURS.
9. NO ROAD CLOSURES PERMITTED. ANY LANE CLOSURES MUST BE APPROVED BY THE CITY AND TAKE PLACE BETWEEN THE HOURS OF 10:00 PM AND 6:00 AM. ONE LANE OF TRAFFIC WILL BE MAINTAINED DURING THE DAY BY A COMPANY CERTIFIED AND APPROVED TO PERFORM MAINTENANCE OF TRAFFIC. ALL FLAGGERS MUST BE EQUIPPED AND USE NEW REFLECTIVE PADDLES WITH VISIBLE DESIGNATIONS OF "STOP" ON ONE SIDE AND "SLOW" ON THE OTHER SIDE. ONE LANE OF TRAFFIC IN EACH DIRECTION MIST BE OPEN FOR TRAVEL EVERY EVENING.
10. ALL EXISTING PAVEMENT MARKINGS SHALL BE REPAINTED BY THE CONTRACTOR WITHIN 48 HOURS OF PAVEMENT COMPLETION.
11. STEEL PLATES MAY BE USED IN NON WINTER WEATHER TO MAINTAIN TRAFFIC, BUT MUST BE STAKED DOWN AND COLD PATCH TO ELIMINATE SOUND.
12. 4" CONCRETE CAP MAY BE REQUIRED TO MAINTAIN TRAFFIC SURFACE IN THE WINTER MONTHS.
13. WINTER INSTALLATION WILL REQUIRE THE CONTRACTOR TO MAINTAIN THE TRENCH IN COMPACTED 304 LIMESTONE, OR IF DIRECTED BY THE SERVICE DIRECTOR, WITH A 4" CONCRETE CAP OVER VISQUENE BARRIER OVER THE COMPACTED 404 LIMESTONE.

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SW Basin & Channel Hinman Ditch (Ditch #52)

SUMMIT COUNTY

ALAN BRUBAKER, P.E., P.S. 1840 SUMMIT COUNTY ENGINEER

PRELIMINARY PLAN

DATE: _____

REVISIONS

⚠	DATE	DESCRIPTION
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PROJECT NO.:	22-00830-010
DRAWN BY:	SWA
CHECKED BY:	JO
DATE ISSUED:	MAR 25, 2025

GENERAL NOTES

NOT FOR CONSTRUCTION

ITEM 832 – STORM WATER POLLUTION PREVENTION PLAN

THIS ITEM SHALL BE USED AT THE DIRECTION OF THE ENGINEER AND SHALL BE PAID FOR AT THE CONTRACTOR'S LUMP SUM PRICE BID. THE FOLLOWING AREAS OR SITUATIONS SHALL REQUIRE SPECIFIC ITEMS TO REDUCE THE EFFECTS OF WATER DAMAGE:

ALL CATCH BASINS OR STRUCTURES THAT MAY BE DAMAGED OR COULD ALLOW SEDIMENT TO ENTER THE CLOSED PIPE SYSTEMS SHALL BE PROTECTED WITH INLET PROTECTION. STORM WATER POLLUTION PREVENTION PLAN, AS PER PLAN SHALL INCLUDE THE USE OF INLET SEDIMENT CONTROL DEVICES. IN ADDITION, ITEM 832 – STORM WATER POLLUTION PREVENTION PLAN SHALL INCLUDE THE USE OF FILTER FABRIC FENCE AND/ OR CHECK DAMS TO PROTECT HE EXISTING STREAM CROSSINGS AND FILTER FABRIC FENCING TO PROTECT THE UNDISTURBED AREAS ADJACENT TO THE UTILITY INSTALLATION THROUGH THE EASEMENTS AND TREATMENT PLANT DECOMMISSIONING.

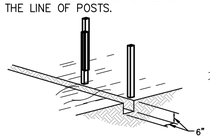
THIS ITEM SHALL ALSO INCLUDE WATER FOR DUST CONTROL AND STREET SWEEPING.

NO STORM WATER POLLUTION PREVENTION MEASURES ARE INCLUDED IN THE PLANS; HOWEVER THE CONTRACTOR IS RESPONSIBLE FOR IMPLEMENTING EROSION CONTROL DEVICES SUCH AS BUT NOT LIMITED TO: INLET PROTECTION, PERIMETER FILTER FABRIC FENCE, TEMPORARY SEDIMENT TRAPS, ETC. TO PREVENT SILT AND DEBRIS FROM ENTERING THE STORM OR SANITARY SEWER SYSTEMS.

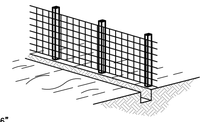
THESE ITEMS SHALL CONSIST OF CONSTRUCTING, AND THEN REMOVING UPON COMPLETION, TEMPORARY SEDIMENT AND EROSION CONTROL ITEMS AS NECESSARY INCLUDING ADDITIONAL ITEMS REQUIRED BY THE COUNTY OR THE ENGINEER DURING CONSTRUCTION IN ACCORDANCE WITH ODOT SUPPLEMENTAL SPECIFICATION 832.

PAYMENT FOR THIS ITEM SHALL BE ON A LUMP SUM BASIS, WHICH PRICE SHALL CONSTITUTE FULL COMPENSATION FOR FURNISHING ALL LABOR, EQUIPMENT, TOOLS, AND INCIDENTALS TO COMPLETE THE WORK INCLUDING ANY ADDITIONS OR ALTERATIONS REQUIRED DURING CONSTRUCTION AND THROUGH PROJECT CLOSEOUT.

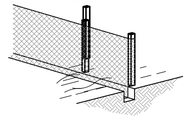
1. SET POSTS AND EXCAVATE A 6"x 6" TRENCH UPSLOPE ALONG THE LINE OF POSTS.



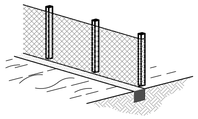
2. STAPLE WIRE FENCING TO THE POST.



3. ATTACH THE FILTER FABRIC TO THE WIRE FENCING AND EXTEND IT INTO THE TRENCH.

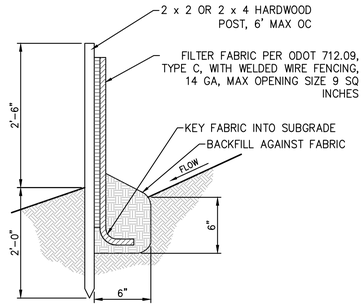


4. BACKFILL AND COMPACT THE EXCAVATED SOIL.



SILT FENCE INSTALLATION DETAIL

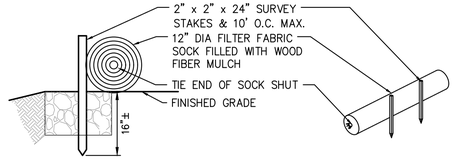
NOT TO SCALE



SILT FENCE DETAIL

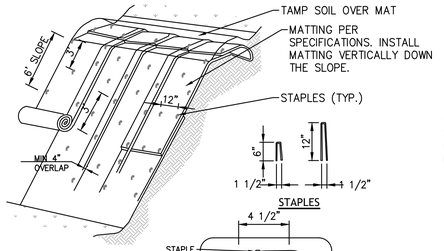
NOT TO SCALE

NOTES:
1. WATTLES SHALL BE PLACED IN A ROW WITH ENDS TIGHTLY ABUTTING
2. EACH BALE SHALL BE PLACED ON PAVEMENT SURFACE. MAINTAIN EROSION CONTROL DEVICE UNTIL PLANTS ARE ESTABLISHED AND THE BIOSWALE SOIL MIX IS STABILIZED.
3. WATTLES SHALL BE SECURELY ANCHORED IN PLACE BY TWO STAKES OR RE BARS DRIVEN THROUGH THE WATTLES. THE FIRST STAKE IN EACH BALE SHALL BE DRIVEN TOWARD THE PREVIOUSLY LAID BALE TO FORCE WATTLES TOGETHER.
4. THE CONTRACTOR SHALL INSPECT THE DIKE AFTER EACH STORM, AND BE RESPONSIBLE FOR REPAIR OR REPLACEMENT OF SILT SOCK, BIOSWALE SOIL MIX AND PLANTINGS. REPAIRS SHALL BE MADE PROMPTLY AS NEEDED.
5. WATTLES SHALL BE REMOVED WHEN THEY HAVE SERVED THEIR PURPOSE SO AS NOT TO BLOCK OR IMPEDE STORM FLOW OR DRAINAGE.



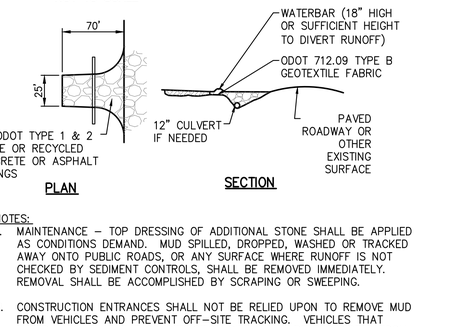
SILT SOCK DETAIL

NOT TO SCALE



SLOPE PROTECTION MATTING DETAIL

NOT TO SCALE

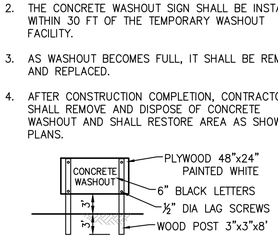


NOTES:
1. MAINTENANCE – TOP DRESSING OF ADDITIONAL STONE SHALL BE APPLIED AS CONDITIONS DEMAND. MUD SPILLED, DROPPED, WASHED OR TRACKED ANY ONTO PUBLIC ROADS, OR ANY SURFACE WHERE RUNOFF IS NOT CHECKED BY SEDIMENT CONTROLS, SHALL BE REMOVED IMMEDIATELY. REMOVAL SHALL BE ACCOMPLISHED BY SCRAPING OR SWEEPING.
2. CONSTRUCTION ENTRANCES SHALL NOT BE RELIED UPON TO REMOVE MUD FROM VEHICLES AND PREVENT OFF–SITE TRACKING. VEHICLES THAT ENTER AND LEAVE THE CONSTRUCTION SITE SHALL BE RESTRICTED FROM MUDDY AREAS.
3. WHEN THE CONSTRUCTION HAUL ROAD IS NO LONGER NEEDED, THE CONTRACTOR SHALL REMOVE THE AGGREGATE AND RESTORE GRADE TO IT'S ORIGINAL ELEVATION OR AS SHOWN ON THE PLANS.

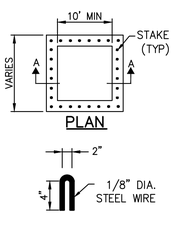
TEMPORARY CONSTRUCTION DRIVE DETAIL

NOT TO SCALE

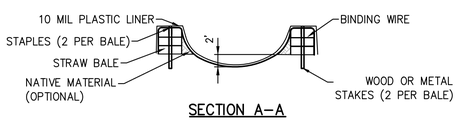
NOTES:
1. ACTUAL LAYOUT AND SIZE DETERMINED IN THE FIELD.
2. THE CONCRETE WASHOUT SIGN SHALL BE INSTALLED WITHIN 30 FT OF THE TEMPORARY WASHOUT FACILITY.
3. AS WASHOUT BECOMES FULL, IT SHALL BE REMOVED AND REPLACED.
4. AFTER CONSTRUCTION COMPLETION, CONTRACTOR SHALL REMOVE AND DISPOSE OF CONCRETE WASHOUT AND SHALL RESTORE AREA AS SHOWN ON PLANS.



SIGN DETAIL



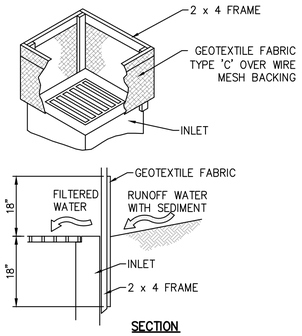
STAPLE DETAIL



CONCRETE WASHOUT STATION DETAIL

NOT TO SCALE

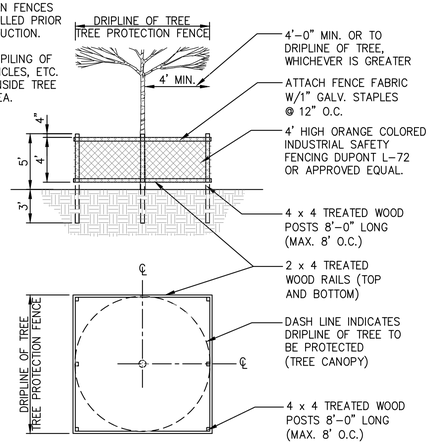
NOTES
1. THIS METHOD OF INLET PROTECTION IS APPLICABLE WHERE THE INLET DRAINS A RELATIVELY FLAT AREA (SLOPES NO GREATER THAN 5 PERCENT) WHERE SHEET OR OVER–LAND FLOWS (NOT EXCEEDING 0.5 CFS) ARE TYPICAL.
2. THIS INLET PROTECTION TO BE USED IN DITCHES. FOR CURB STYLE INLETS, USE "DANDY BAG" OR APPROVED EQUAL.



INLET PROTECTION DETAIL - SILT FENCE

NOT TO SCALE

NOTES:
1. TREE PROTECTION FENCES SHALL BE INSTALLED PRIOR TO ANY CONSTRUCTION.
2. GRADING, STOCKPILING OF MATERIALS, VEHICLES, ETC. NOT ALLOWED INSIDE TREE PROTECTION AREA.



TYPICAL TREE PROTECTION

NOT TO SCALE

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SW Basin & Channel Hinman Ditch (Ditch #52)

SUMMIT COUNTY

ALAN BRUBAKER, P.E., P.S. 1840 SUMMIT COUNTY ENGINEER

PRELIMINARY PLAN

DATE: _____

REVISIONS

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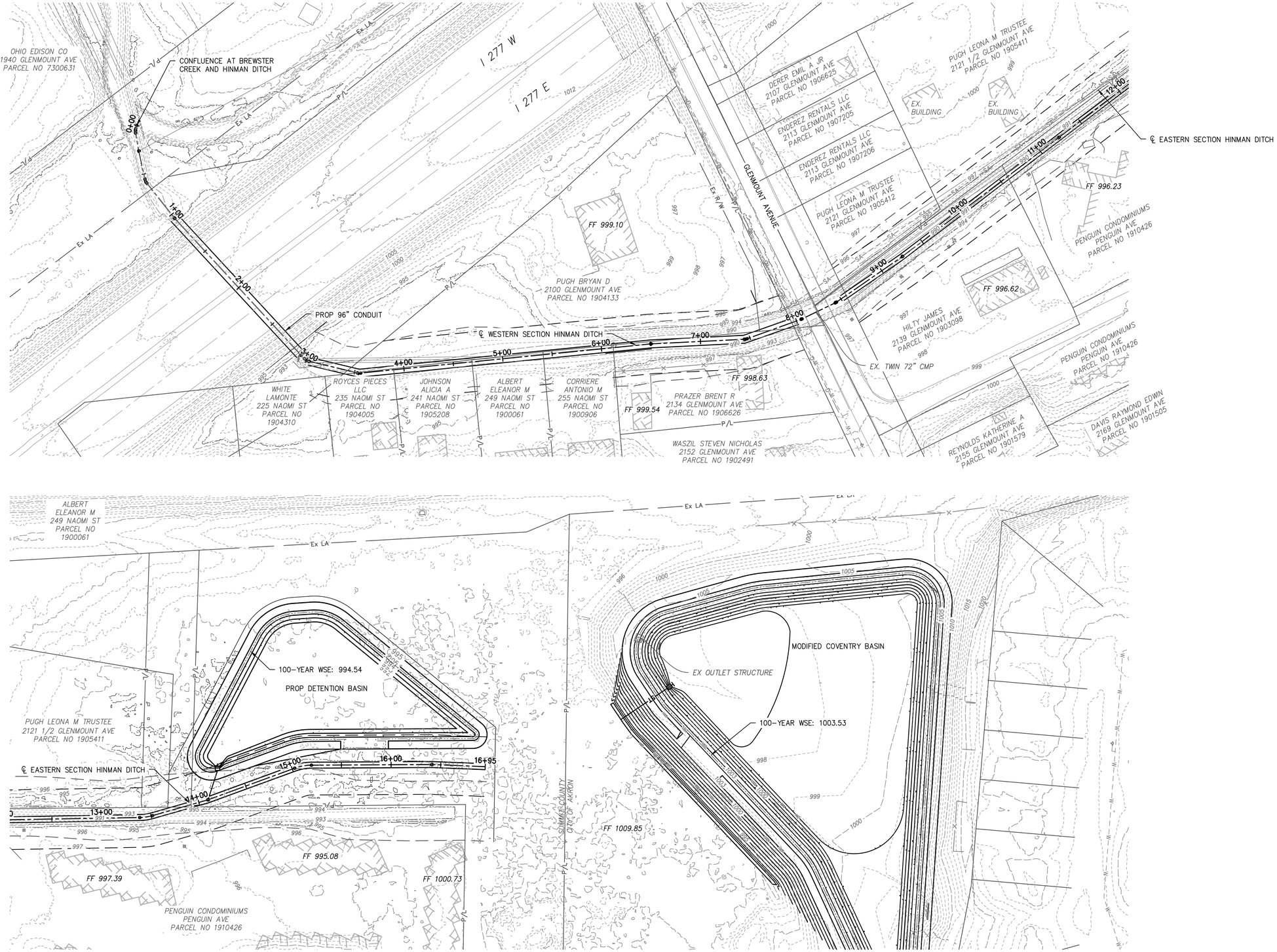
PROJECT NO.:	22-00830-010
DRAWN BY:	SWA
CHECKED BY:	JO
DATE ISSUED:	MAR 25, 2025

EROSION AND SEDIMENT CONTROL DETAILS

NOT FOR CONSTRUCTION



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SW Basin & Channel
Hinman Ditch (Ditch #52)
SUMMIT COUNTY

ALAN BRUBAKER, P.E., P.S.
1840
SUMMIT COUNTY ENGINEER

PRELIMINARY PLAN

DATE: _____

REVISIONS

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PROJECT NO.:	22-00830-010
DRAWN BY:	SWA
CHECKED BY:	JO
DATE ISSUED:	MAR 25, 2025

SCHEMATIC PLAN

5 OF 13

NOT FOR CONSTRUCTION

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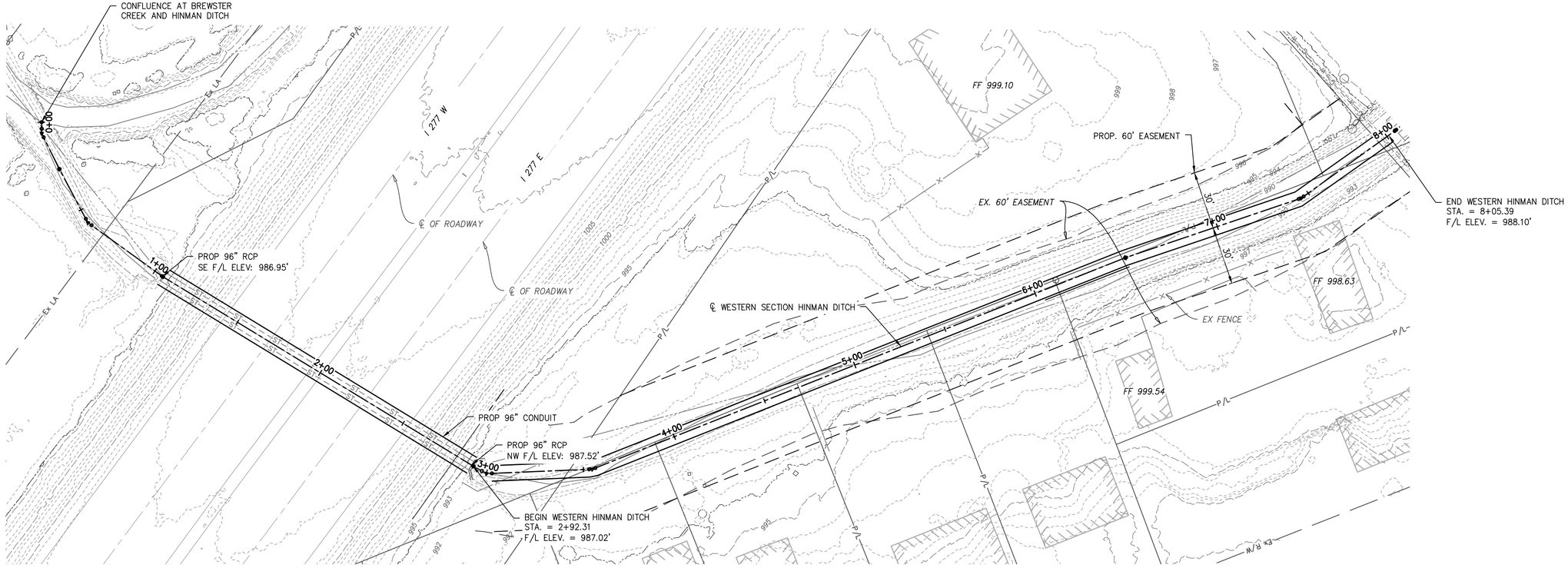
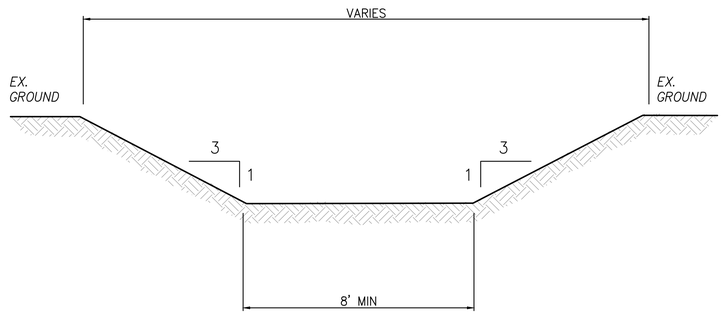


WESTERN HINMAN DITCH F/L DATA	
STATION	F/L ELEV.
2+92.31	987.02
3+00.00	987.04
3+50.00	987.14
4+00.00	987.24
4+50.00	987.34
5+00.00	987.44
5+50.00	987.54
6+00.00	987.64
6+50.00	987.74
7+00.00	987.84
7+50.00	987.94
8+00.00	988.04
8+05.39	988.10



WESTERN HINMAN DITCH SECTION

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SW Basin & Channel Hinman Ditch (Ditch #52)

SUMMIT COUNTY

ALAN BRUBAKER, P.E., P.S. 1840 SUMMIT COUNTY ENGINEER

PRELIMINARY PLAN

DATE: _____

REVISIONS

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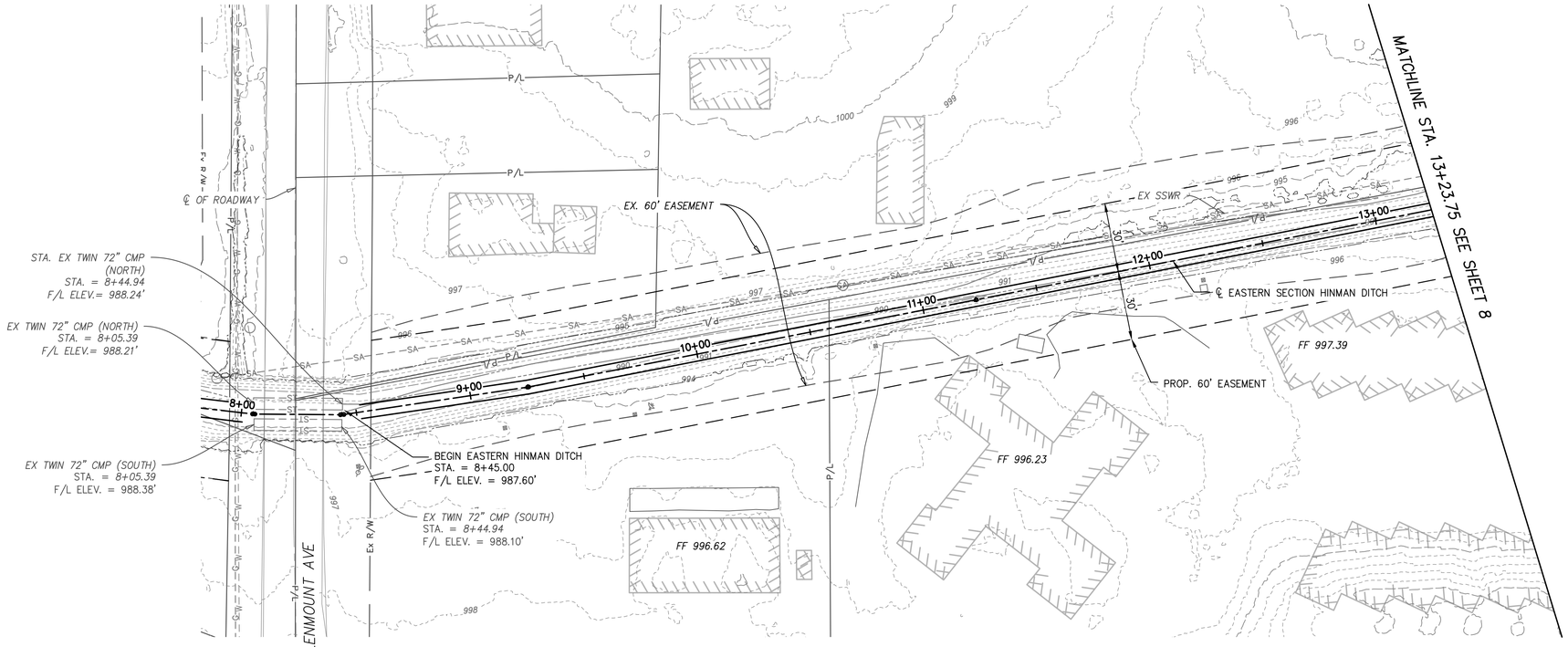
PROJECT NO.:	22-00830-010
DRAWN BY:	SWA
CHECKED BY:	JO
DATE ISSUED:	MAR 25, 2025

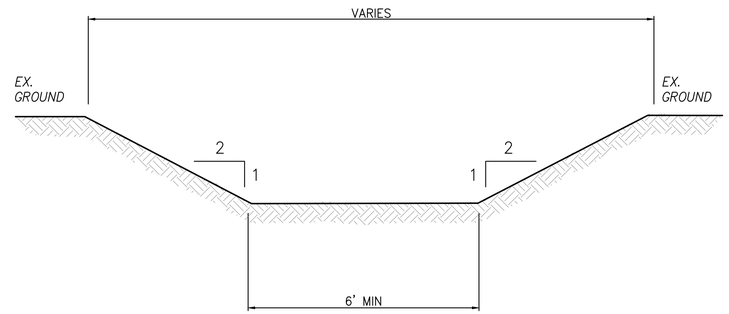
SITE PLAN

NOT FOR CONSTRUCTION



EASTERN HINMAN DITCH F/L DATA	
STATION	F/L ELEV.
8+45.00	987.60
8+50.00	987.64
9+00.00	987.93
9+50.00	988.23
10+00.00	988.53
10+50.00	988.89
11+00.00	989.13
11+50.00	989.43
12+00.00	989.73
12+50.00	990.03
13+00.00	990.33

NOTE: CONTRACTOR TO CLEAN A NORTH & SOUTH EX. 72" CMP CONDUITS UNDER GLENMOUNT AVE. ALL SILT AND SEDIMENT SHALL BE REMOVED AND EXISTING FLOWLINES SHALL BE MAINTAINED. NO MODIFICATIONS TO THE EXISTING CONDUITS SHALL BE MADE.



EASTERN HINMAN DITCH SECTION

NOT TO SCALE

0 30 60
GRAPHIC SCALE IN FEET

Environmental Design Group
The community impact people.
800.835.1390
envdesigngroup.com

Know what's below. Call before you dig.

SW Basin & Channel Hinman Ditch (Ditch #52)

SUMMIT COUNTY

ALAN BRUBAKER, P.E., P.S. SUMMIT COUNTY ENGINEER 1840

PRELIMINARY PLAN

DATE: _____

REVISIONS

⚠	DATE	DESCRIPTION
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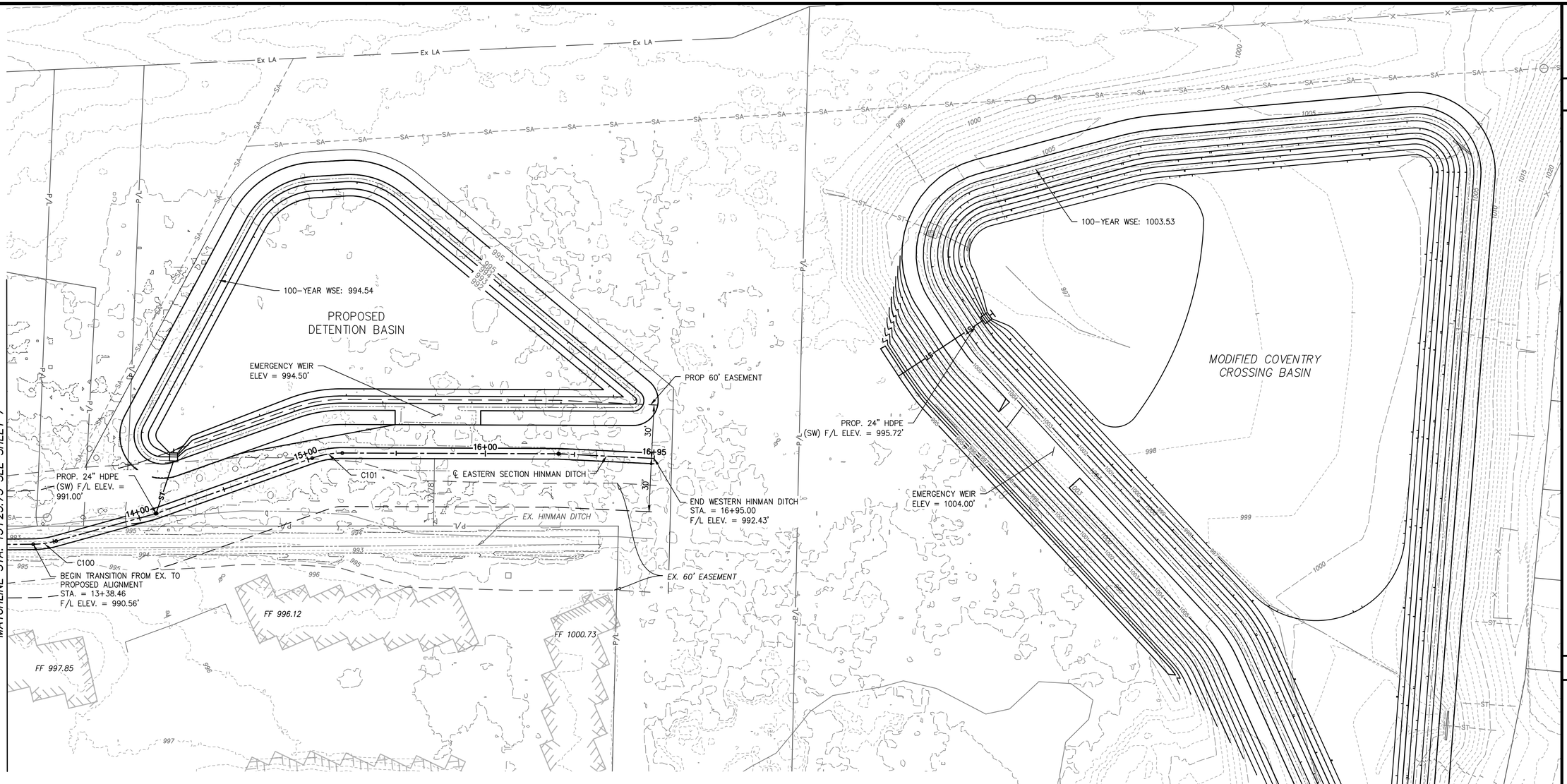
PROJECT NO.:	22-00830-010
DRAWN BY:	SWA
CHECKED BY:	JO
DATE ISSUED:	MAR 25, 2025

SITE PLAN

7 OF 13

NOT FOR CONSTRUCTION

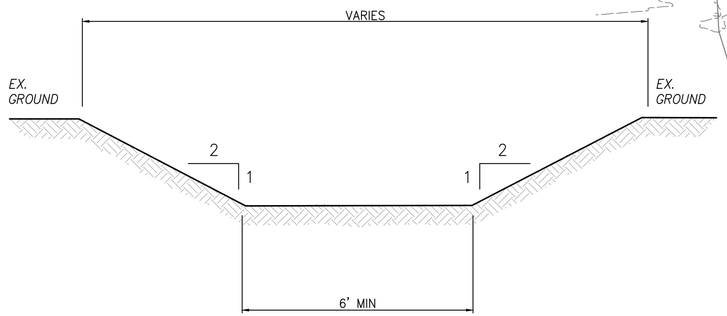
E:\SUMMIT COUNTY\22-00830-010 SW BASIN & CHANNEL IMPROVEMENTS\CAD\DELIVERABLES\SHEET 22-00830-010 - 3/25/2025 3:07:44 PM



EASTERN HINMAN DITCH F/L DATA	
13+50.00	990.33
14+00.00	990.63
14+50.00	990.93
15+00.00	991.23
15+50.00	991.53
16+00.00	991.83
16+50.00	992.13
16+95.00	992.43

CURVE DATA	
C100	
RADIUS	50.00
ARC LENGTH	13.02'
DELTA	N 75d4'43" E
CHORD	12.98'
CHORD BEARING	N 81d13'38" E
C101	
RADIUS	50.00
ARC LENGTH	17.22'
DELTA	19°43'3947"
CHORD	17.14'
CHORD BEARING	N 79d29'51" E

NOTE: CONTRACTOR SHALL REMOVE EXISTING OUTLET STRUCTURE AND ALL ASSOCIATED PIPING FROM COVENTRY CROSSING DETENTION BASIN. ALL WORK ASSOCIATED WITH THIS TASK SHALL BE PAID THROUGH ITEM 202 DETENTION BASIN STRUCTURE REMOVAL AS PER PLAN.



EASTERN HINMAN DITCH SECTION

NOT TO SCALE

0 30 60
GRAPHIC SCALE IN FEET

Environmental Design Group
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envdesigngroup.com

Know what's below. Call before you dig.

SW BASIN & CHANNEL HINMAN DITCH (DITCH #52)

SUMMIT COUNTY

ALAN BRUBAKER, P.E., P.S. 1840 SUMMIT COUNTY ENGINEER

PRELIMINARY PLAN

DATE: _____

REVISIONS

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PROJECT NO.:	22-00830-010
DRAWN BY:	SWA
CHECKED BY:	JO
DATE ISSUED:	MAR 25, 2025

SITE PLAN

8 OF 13

NOT FOR CONSTRUCTION

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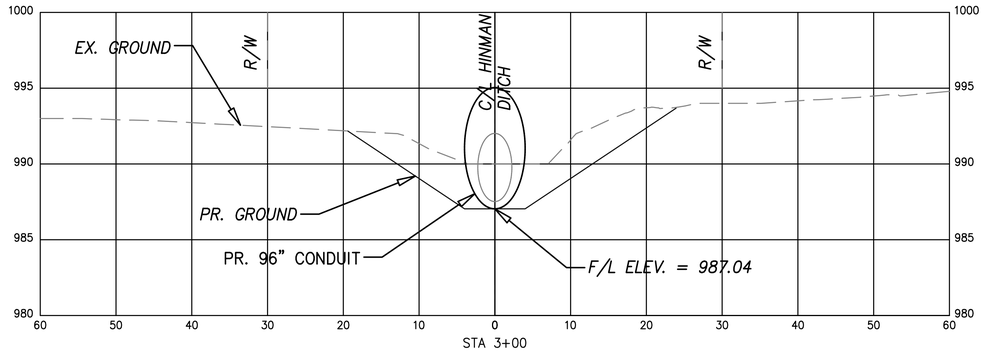

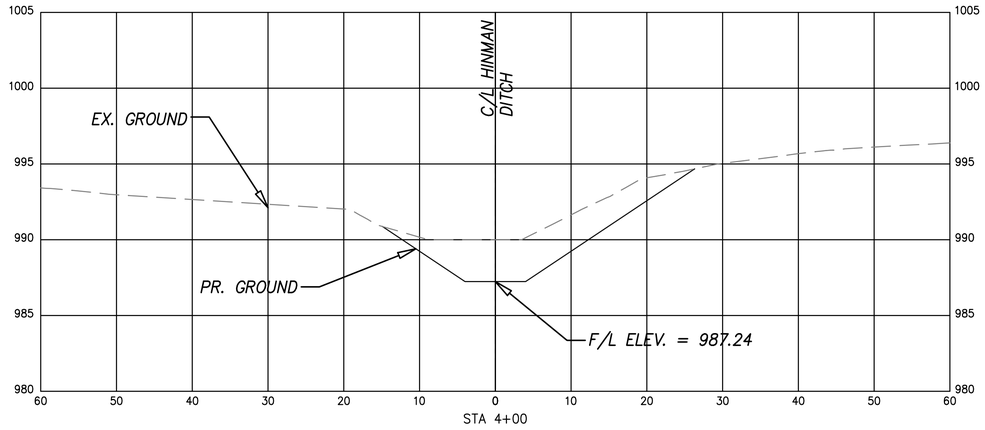

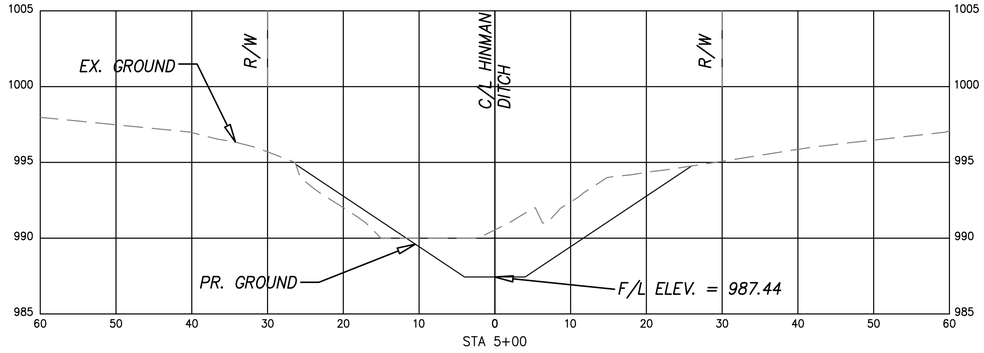

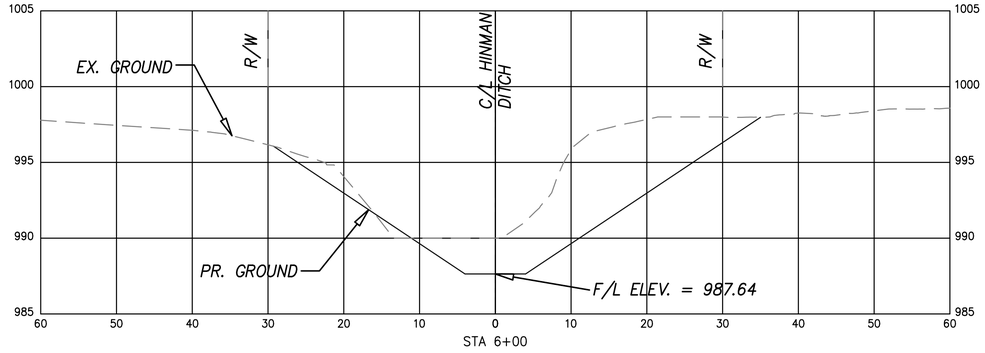

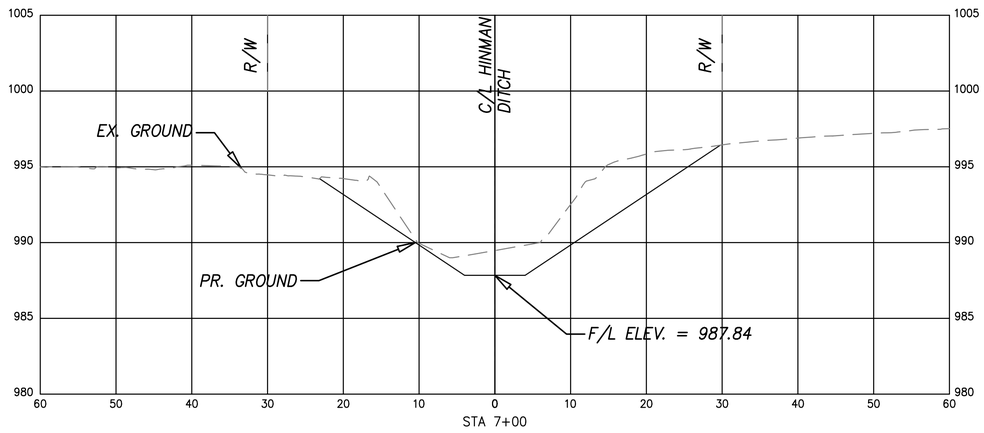

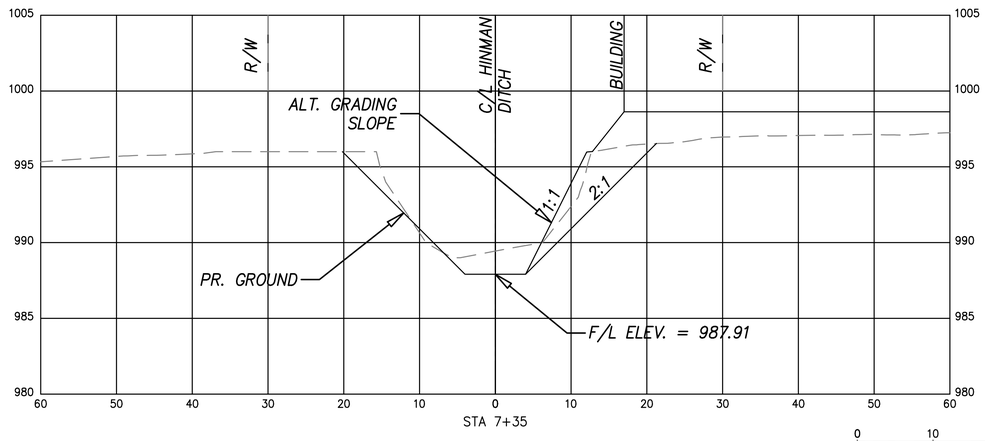

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GRAPHIC SCALE IN FEET

Environmental Design Group
The community impact people.
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envdesigngroup.com

Know what's below. Call before you dig.

SW Basin & Channel Hinman Ditch (Ditch #52)

SUMMIT COUNTY

ALAN BRUBAKER, P.E. #35 — 1840 — SUMMIT COUNTY ENGINEER

PRELIMINARY PLAN

DATE: _____

REVISIONS

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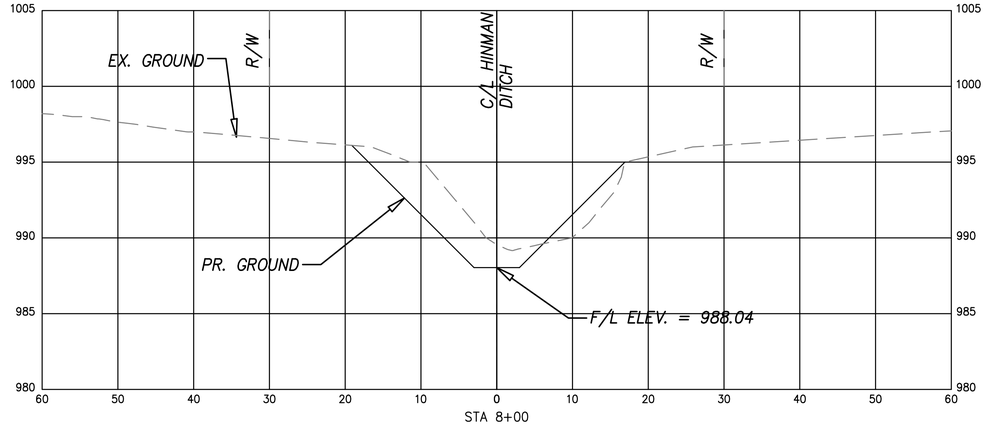
PROJECT NO.:	22-00830-010
DRAWN BY:	SWA
CHECKED BY:	JO
DATE ISSUED:	MAR 25, 2025

CROSS SECTIONS

NOT FOR CONSTRUCTION



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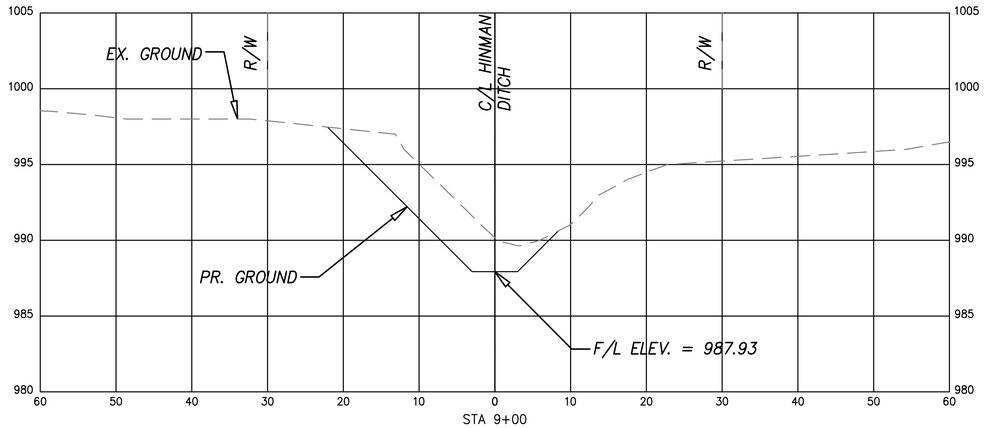

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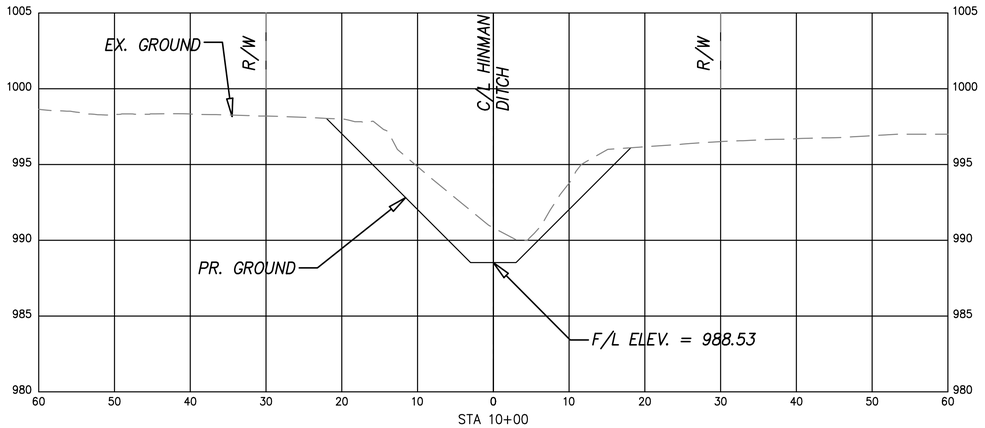

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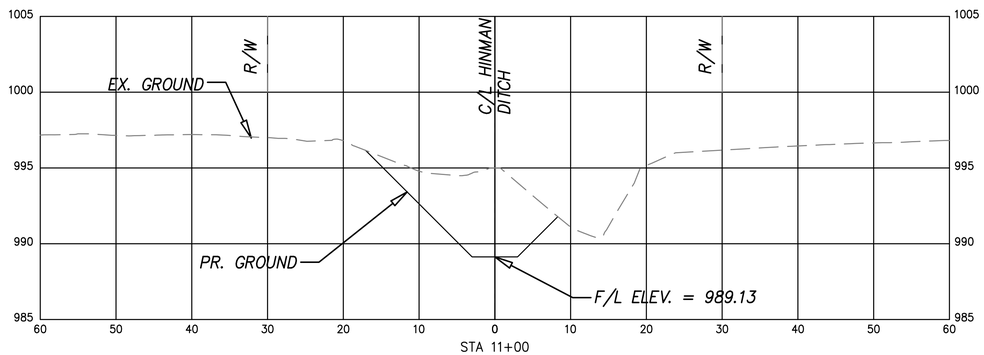

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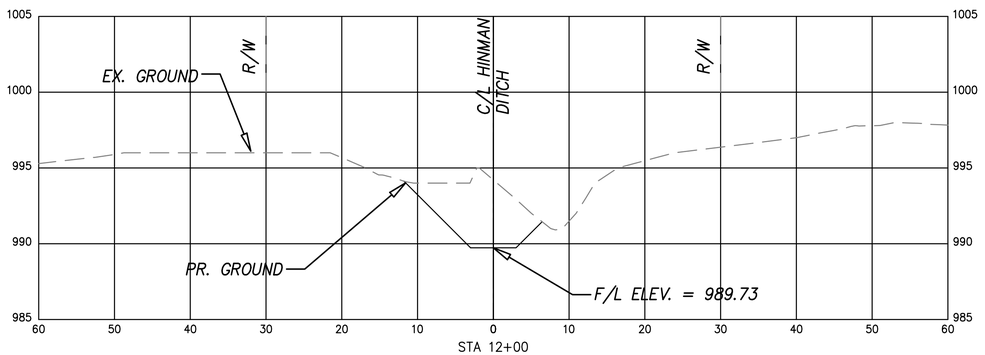

STA 12+00

0 10 20
GRAPHIC SCALE IN FEET

Environmental Design Group
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SW Basin & Channel Hinman Ditch (Ditch #52)

SUMMIT COUNTY

ALAN BRUBAKER, P.E., P.S. 1640 SUMMIT COUNTY ENGINEER

PRELIMINARY PLAN

DATE: _____

REVISIONS

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PROJECT NO.:	22-00830-010
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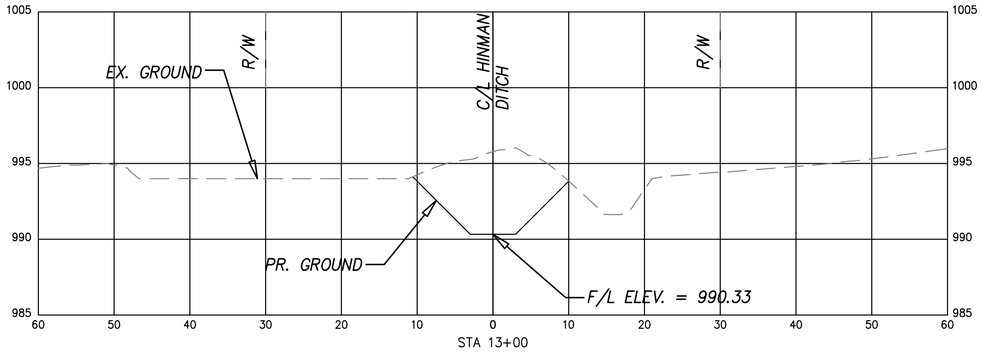
CHECKED BY:	JO
DATE ISSUED:	MAR 25, 2025

CROSS SECTIONS

NOT FOR CONSTRUCTION



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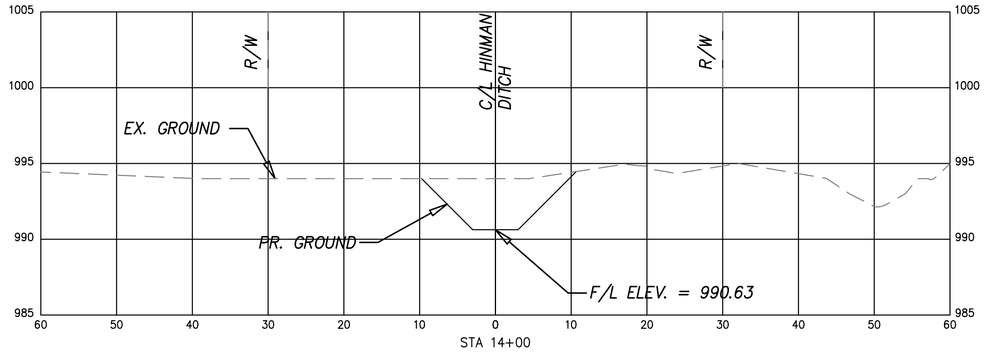

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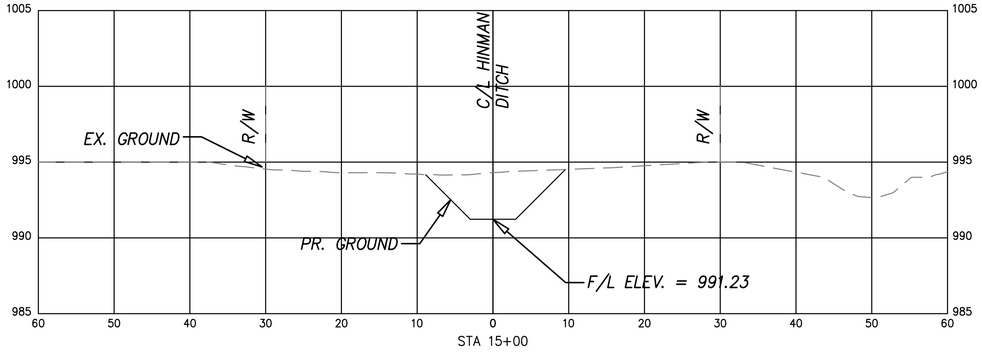

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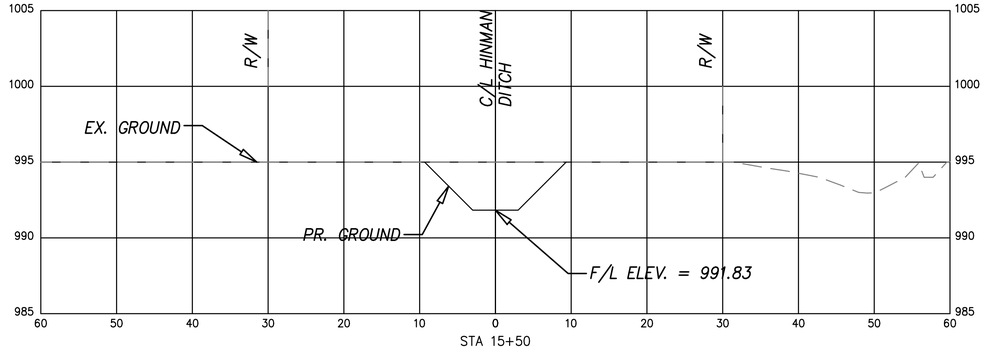

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GRAPHIC SCALE IN FEET

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SW Basin & Channel Hinman Ditch (Ditch #52)

SUMMIT COUNTY

ALAN BRUBAKER, P.E., P.S.
SUMMIT COUNTY ENGINEER
1840

PRELIMINARY PLAN

DATE: _____

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PROJECT NO.:	22-00830-010
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CROSS SECTIONS

11 OF 13

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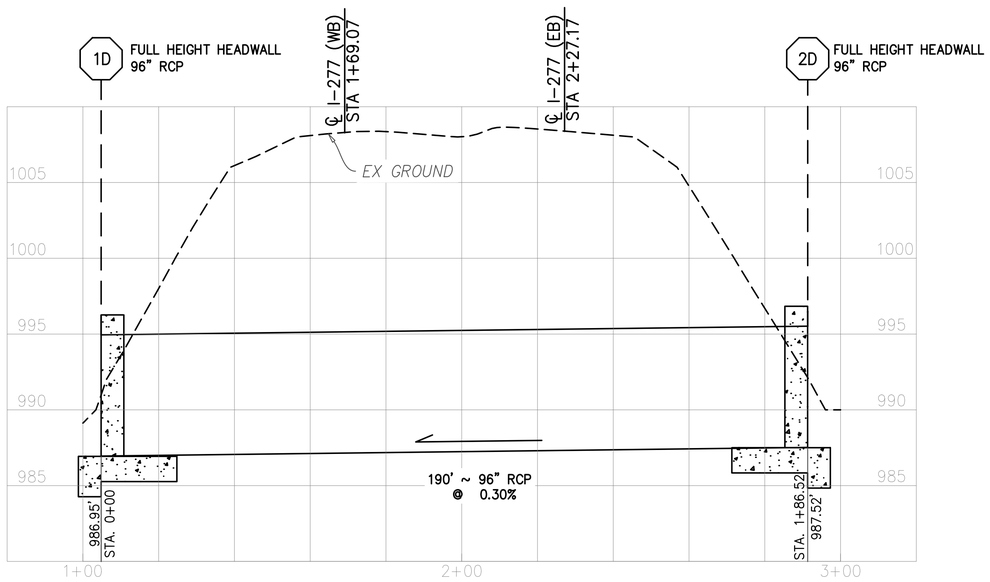

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GRAPHIC SCALE IN FEET

HORIZONTAL SCALLE
0 20 40
GRAPHIC SCALE IN FEET

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Know what's below. Call before you dig.

SW BASIN & CHANNEL
HINMAN DITCH (DITCH #52)
SUMMIT COUNTY

ALAN BRUBAKER, P.E., P.S. SUMMIT COUNTY ENGINEER 1840

PRELIMINARY PLAN

DATE: _____

REVISIONS

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PROJECT NO.:	22-00830-010
DRAWN BY:	SWA
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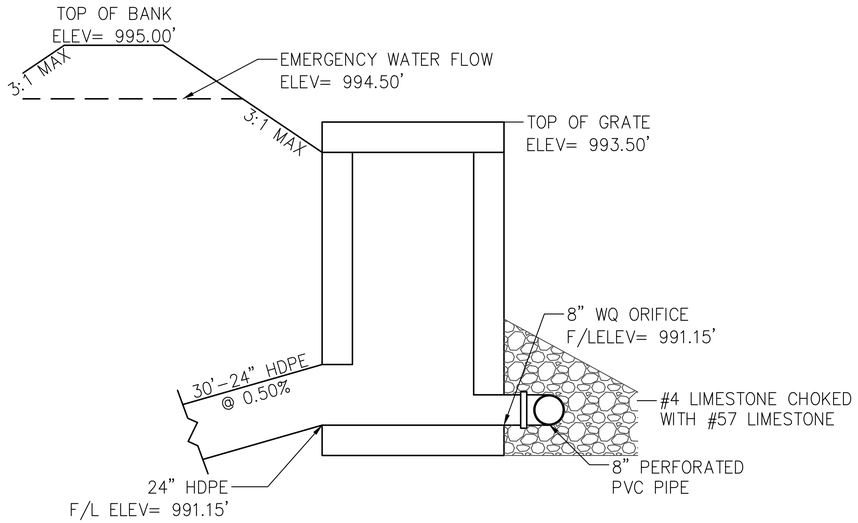
DATE ISSUED:	MAR 25, 2025

CULVERT PROFILE

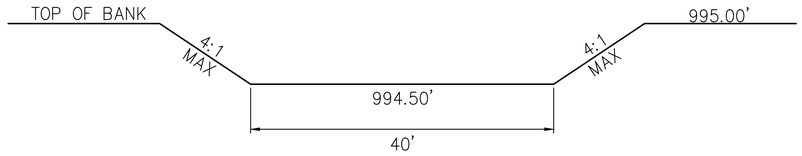
12 OF 13

NOT FOR CONSTRUCTION



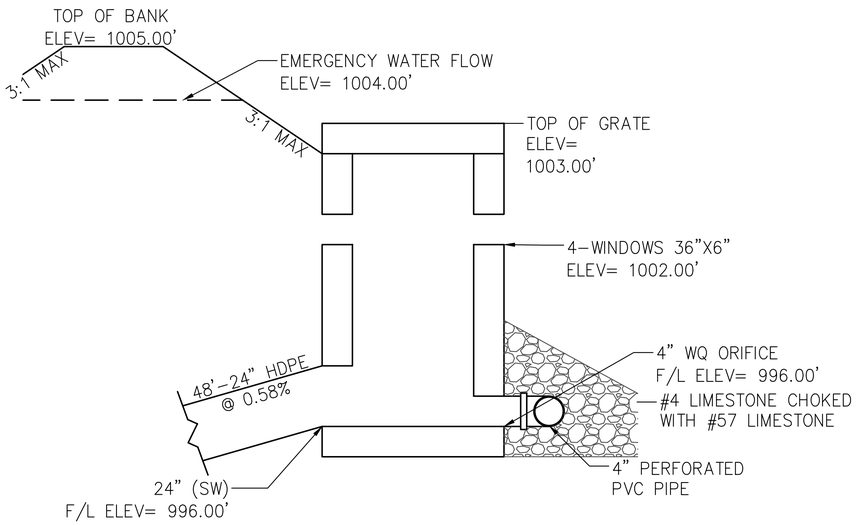
PROPOSED BASIN OUTLET STRUCTURE DETAIL

NOT TO SCALE



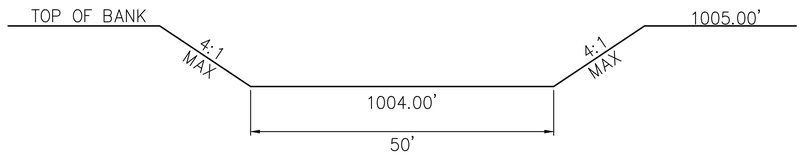
EMERGENCY WEIR SECTION

NOT TO SCALE



MODIFIED COVENTRY BASIN OUTLET STRUCTURE DETAIL

NOT TO SCALE



EMERGENCY WEIR SECTION

NOT TO SCALE

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SW Basin & Channel Hinman Ditch (Ditch #52)

SUMMIT COUNTY

ALAN BRUBAKER, P.E., P.S. 1840 SUMMIT COUNTY ENGINEER

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DETENTION BASIN DETAIL

13 OF 13

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