Table E-10: Combination 1 + 8, Tiny Version: Replace Clipper Cove Culvert, Install Pump Station and Gate Results

Clipper Cove Culvert	Existing	Proposed	Change	Existing	Proposed	Existing	Proposed
Recurrence Interval	Max HGL (ft)	Max HGL (ft)	Reduce HGL (ft)	Velocity (ft/s)	Velocity (ft/s)	Peak Flow (cfs)	Peak Flow (cfs)
1-year	995.9	995.3	0.6	6.1	3.6	171.1	188.9
10-year	997.5	998.2	-0.7	7.9	7.5	224.4	479.7
100-year	998.8	1001.6	-2.8	9.9	12.9	280.3	823.6
Labor Day 2020	999.1	1000.7	-1.6	9.6	10.3	272.0	657.2
East Branch Upstream Cross Section 11	Existing	Proposed	Change	Existing	Proposed	Existing	Proposed
Recurrence Interval	Max HGL (ft)	Max HGL (ft)	Reduce HGL (ft)	Velocity (ft/s)	Velocity (ft/s)	Peak Flow (cfs)	Peak Flow (cfs)
1-year	995.2	995.9	-0.7	1.5	0.3	42.8	2.7
10-year	997.0	996.8	0.3	2.5	0.4	249.0	3.2
100-year	998.4	997.4	1.0	3.6	0.4	601.4	3.6
Labor Day 2020	998.9	997.9	1.0	2.2	1.0	426.4	5.1
North Branch Upstream Cross Section 12	Existing	Proposed	Change	Existing	Proposed	Existing	Proposed
Recurrence Interval	Max HGL (ft)	Max HGL (ft)	Reduce HGL (ft)	Velocity (ft/s)	Velocity (ft/s)	Peak Flow (cfs)	Peak Flow (cfs)
1-year	995.3	995.1	0.2	2.9	3.8	175.7	198.7
10-year	997.2	997.8	-0.5	3.9	4.8	467.8	580.4
100-year	999.1	1000.0	-1.0	4.2	4.6	871.9	851.5
Labor Day 2020	998.9	999.4	-0.5	3.6	4.5	657.6	673.4
Immediately Downstream Cross Section 16	Existing	Proposed	Change	Existing	Proposed	Existing	Proposed
Recurrence Interval	Max HGL (ft)	Max HGL (ft)	Reduce HGL (ft)	Velocity (ft/s)	Velocity (ft/s)	Peak Flow (cfs)	Peak Flow (cfs)
1-year	994.8	994.6	0.2	2.1	2.1	154.9	158.0
10-year	996.0	997.1	-1.1	1.8	2.6	213.5	439.9
100-year	997.3	999.1	-1.8	1.5	2.7	258.6	781.5
Labor Day 2020	997.2	998.7	-1.5	2.3	2.5	272.4	621.5
Further Downstream Cross Section 25	Existing	Proposed	Change	Existing	Proposed	Existing	Proposed
Recurrence Interval	Max HGL (ft)	Max HGL (ft)	Reduce HGL (ft)	Velocity (ft/s)	Velocity (ft/s)	Peak Flow (cfs)	Peak Flow (cfs)
1-year	993.9	993.7	0.2	1.8	1.8	158.3	143.4
10-year	995.2	995.9	-0.7	2.0	2.5	302.3	412.1
100-year	996.2	997.7	-1.5	2.2	2.9	448.1	791.7
Labor Day 2020	996.1	997.4	-1.3	2.2	2.7	437.5	719.4

Challenges

The same challenges for replacing the culvert and installing the gate and larger pump station apply to this alternative. In addition, extra maintenance would be required for the unprotected pump station.

Appendix F

Results

Table F-1 Replace Clipper Cove culvert

Table F-2 Regional storage system (upstream only)

Table F-3 Combination 1 + 3: Regional storage system (upstream only) and replace Clipper Cove culvert

Table F-1: Compare Existing Conditions to Proposed Replace Clipper Cove Culvert Results

Clipper Cove Culvert	Existing	Proposed	Change	Existing	Proposed	Existing	Proposed
Recurrence Interval	Max HGL (ft)	Max HGL (ft)	Reduce HGL (ft)	Velocity (ft/s)	Velocity (ft/s)	Peak Flow (cfs)	Peak Flow (cfs)
1-year	995.9	995.8	0.1	6.1	3.9	171.1	230.7
10-year	997.5	997.8	-0.3	7.9	5.6	224.4	360.3
100-year	998.8	999.2	-0.4	9.9	7.5	280.3	480.1
Labor Day 2020	999.1	998.9	0.2	9.6	6.0	272.0	382.6
East Branch Upstream Cross Section 11	Existing	Proposed	Change	Existing	Proposed	Existing	Proposed
Recurrence Interval	Max HGL (ft)	Max HGL (ft)	Reduce HGL (ft)	Velocity (ft/s)	Velocity (ft/s)	Peak Flow (cfs)	Peak Flow (cfs)
1-year	995.2	994.8	0.4	1.5	1.8	42.8	55.6
10-year	997.0	996.6	0.4	2.5	1.8	249.0	157.5
100-year	998.4	997.9	0.5	3.6	3.2	601.4	456.0
Labor Day 2020	998.9	997.8	1.1	2.2	2.1	426.4	312.7
North Branch Upstream Cross Section 12	Existing	Proposed	Change	Existing	Proposed	Existing	Proposed
Recurrence Interval	Max HGL (ft)	Max HGL (ft)	Reduce HGL (ft)	Velocity (ft/s)	Velocity (ft/s)	Peak Flow (cfs)	Peak Flow (cfs)
1-year	995.3	995.2	0.1	2.9	3.3	175.7	189.0
10-year	997.2	997.1	0.2	3.9	4.6	467.8	507.6
100-year	999.1	998.9	0.2	4.2	5.2	871.9	915.8
Labor Day 2020	998.9	998.5	0.4	3.6	4.5	657.6	678.5
Immediately Downstream Cross Section 16	Existing	Proposed	Change	Existing	Proposed	Existing	Proposed
Recurrence Interval	Max HGL (ft)	Max HGL (ft)	Reduce HGL (ft)	Velocity (ft/s)	Velocity (ft/s)	Peak Flow (cfs)	Peak Flow (cfs)
1-year	994.8	994.9	-0.1	2.1	2.3	154.9	187.0
10-year	996.0	996.6	-0.6	1.8	2.3	213.5	317.2
100-year	997.3	997.9	-0.7	1.5	2.1	258.6	420.3
Labor Day 2020	997.2	997.7	-0.5	2.3	2.5	272.4	354.4
Further Downstream Cross Section 25	Existing	Proposed	Change	Existing	Proposed	Existing	Proposed
Recurrence Interval	Max HGL (ft)	Max HGL (ft)	Reduce HGL (ft)	Velocity (ft/s)	Velocity (ft/s)	Peak Flow (cfs)	Peak Flow (cfs)
1-year	993.9	994.0	-0.1	1.8	1.9	158.3	164.8
10-year	995.2	995.6	-0.4	2.0	2.2	302.3	350.4
100-year	996.2	996.8	-0.5	2.2	2.4	448.1	559.1
Labor Day 2020	996.1	996.6	-0.4	2.2	2.4	437.5	527.7

Table F-2 Compare Existing Conditions to Proposed Regional Storage System (upstream only) Results

Clipper Cove Culvert	Existing	Proposed	Change	Existing	Proposed	Existing	Proposed
Recurrence Interval	Max HGL (ft)	Max HGL (ft)	Reduce HGL (ft)	Velocity (ft/s)	Velocity (ft/s)	Peak Flow (cfs)	Peak Flow (cfs)
1-year	995.9	994.7	1.2	6.1	3.8	171.1	100.0
10-year	997.5	996.3	1.3	7.9	5.3	224.4	150.5
100-year	998.8	997.4	1.5	9.9	6.5	280.3	184.9
Labor Day 2020	999.1	997.4	1.7	9.6	6.6	272.0	185.5
East Branch Upstream Cross Section 11	Existing	Proposed	Change	Existing	Proposed	Existing	Proposed
Recurrence Interval	Max HGL (ft)	Max HGL (ft)	Reduce HGL (ft)	Velocity (ft/s)	Velocity (ft/s)	Peak Flow (cfs)	Peak Flow (cfs)
1-year	995.2	994.1	1.1	1.5	2.0	42.8	43.1
10-year	997.0	995.8	1.2	2.5	2.0	249.0	71.7
100-year	998.4	997.0	1.4	3.6	1.6	601.4	152.8
Labor Day 2020	998.9	997.0	1.9	2.2	2.0	426.4	107.8
North Branch Upstream Cross Section 12	Existing	Proposed	Change	Existing	Proposed	Existing	Proposed
Recurrence Interval	Max HGL (ft)	Max HGL (ft)	Reduce HGL (ft)	Velocity (ft/s)	Velocity (ft/s)	Peak Flow (cfs)	Peak Flow (cfs)
1-year	995.3	994.1	1.2	2.9	1.8	175.7	47.7
10-year	997.2	995.8	1.4	3.9	1.9	467.8	133.4
100-year	999.1	997.0	2.0	4.2	2.5	871.9	274.8
Labor Day 2020	998.9	997.0	1.9	3.6	2.1	657.6	222.6
Immediately Downstream Cross Section 16	Existing	Proposed	Change	Existing	Proposed	Existing	Proposed
Recurrence Interval	Max HGL (ft)	Max HGL (ft)	Reduce HGL (ft)	Velocity (ft/s)	Velocity (ft/s)	Peak Flow (cfs)	Peak Flow (cfs)
1-year	994.8	994.0	0.8	2.1	1.7	154.9	79.9
10-year	996.0	995.4	0.6	1.8	1.7	213.5	130.2
100-year	997.3	996.5	0.8	1.5	1.2	258.6	187.2
Labor Day 2020	997.2	996.4	0.9	2.3	1.9	272.4	187.7
Further Downstream Cross Section 25	Existing	Proposed	Change	Existing	Proposed	Existing	Proposed
Recurrence Interval	Max HGL (ft)	Max HGL (ft)	Reduce HGL (ft)	Velocity (ft/s)	Velocity (ft/s)	Peak Flow (cfs)	Peak Flow (cfs)
1-year	993.9	993.2	0.7	1.8	1.3	158.3	95.2
10-year	995.2	994.6	0.6	2.0	1.8	302.3	224.8
100-year	996.2	995.7	0.6	2.2	2.1	448.1	363.1
Labor Day 2020	996.1	995.5	0.6	2.2	2.1	437.5	353.0

Table F-3: Compare Existing Conditions to Proposed Combination 1 + 3: Regional Storage System (upstream only) and Replace Clipper Cove Culvert Results

Clipper Cove Culvert	Existing	Proposed	Change	Existing	Proposed	Existing	Proposed
Recurrence Interval	Max HGL (ft)	Max HGL (ft)	Reduce HGL (ft)	Velocity (ft/s)	Velocity (ft/s)	Peak Flow (cfs)	Peak Flow (cfs)
1-year	995.9	994.6	1.3	6.1	2.5	171.1	96.1
10-year	997.5	996.5	1.0	7.9	3.4	224.4	200.9
100-year	998.8	997.7	1.1	9.9	3.8	280.3	245.7
Labor Day 2020	999.1	997.5	1.6	9.6	3.5	272.0	224.3
East Branch Upstream Cross Section 11	Existing	Proposed	Change	Existing	Proposed	Existing	Proposed
Recurrence Interval	Max HGL (ft)	Max HGL (ft)	Reduce HGL (ft)	Velocity (ft/s)	Velocity (ft/s)	Peak Flow (cfs)	Peak Flow (cfs)
1-year	995.2	993.9	1.3	1.5	2.2	42.8	44.8
10-year	997.0	995.4	1.6	2.5	2.3	249.0	88.7
100-year	998.4	996.8	1.6	3.6	1.8	601.4	138.6
Labor Day 2020	998.9	996.5	2.3	2.2	2.2	426.4	112.2
North Branch Upstream Cross Section 12	Existing	Proposed	Change	Existing	Proposed	Existing	Proposed
Recurrence Interval	Max HGL (ft)	Max HGL (ft)	Reduce HGL (ft)	Velocity (ft/s)	Velocity (ft/s)	Peak Flow (cfs)	Peak Flow (cfs)
1-year	995.3	994.0	1.3	2.9	2.1	175.7	51.2
10-year	997.2	995.5	1.7	3.9	2.3	467.8	149.0
100-year	999.1	996.8	2.2	4.2	2.9	871.9	294.1
Labor Day 2020	998.9	996.6	2.3	3.6	2.5	657.6	236.7
Immediately Downstream Cross Section 16	Existing	Proposed	Change	Existing	Proposed	Existing	Proposed
Recurrence Interval	Max HGL (ft)	Max HGL (ft)	Reduce HGL (ft)	Velocity (ft/s)	Velocity (ft/s)	Peak Flow (cfs)	Peak Flow (cfs)
1-year	994.8	994.0	0.8	2.1	1.7	154.9	78.3
10-year	996.0	995.5	0.5	1.8	1.8	213.5	155.8
100-year	997.3	996.8	0.5	1.5	1.5	258.6	217.4
Labor Day 2020	997.2	996.5	0.7	2.3	1.9	272.4	201.7
Further Downstream Cross Section 25	Existing	Proposed	Change	Existing	Proposed	Existing	Proposed
Recurrence Interval	Max HGL (ft)	Max HGL (ft)	Reduce HGL (ft)	Velocity (ft/s)	Velocity (ft/s)	Peak Flow (cfs)	Peak Flow (cfs)
1-year	993.9	993.2	0.7	1.8	1.3	158.3	94.5
10-year	995.2	994.7	0.5	2.0	1.8	302.3	235.6
100-year	996.2	995.8	0.4	2.2	2.2	448.1	399.6
Labor Day 2020	996.1	995.6	0.5	2.2	2.2	437.5	379.2

Appendix G

Clipper Cove Culvert

Figure G-1 Clipper Cove Culvert Cost Opinion

Figure G-2 Clipper Cove Culvert Design Sheets

CLIPPER COVE CULVERT REPLACEMENT - ENGINEER'S ESTIMATE

REF. NO.	ODOT ITEM	ITEM DESCRIPTION	TOTAL QNTY	UNIT	TOTAL UNIT PRICE	BID ITEM TOTAL
		ROADWAY				
1	202	PAVEMENT REMOVED, AS PER PLAN	270	SY	$ 12.00	$ 3,240.00
2	202	STRUCTURE REMOVED	1	LS	$ 3,000.00	$ 3,000.00
3	202	MONUMENT ASSEMBLY REMOVED	1	EACH	$ 1,000.00	$ 1,000.00
4	203	EXCAVATION	1	LS	$ 15,000.00	$ 15,000.00
5	203	EMBANKMENT	1	LS	$ 15,000.00	$ 15,000.00
6	623	MONUMENT ASSEMBLY	1	EACH	$ 1,000.00	$ 1,000.00
7	SPECIAL	TIMBER GUARDRAIL	160	FT	$ 175.00	$ 28,000.00
		EROSION CONTROL				
101	209	DITCH CLEANOUT	650	FT	$ 65.00	$ 42,250.00
102	601	ROCK CHANNEL PROTECTION, TYPE B, W/ FABRIC FILTER	320	CY	$ 90.00	$ 28,800.00
103	653	TOPSOIL FURNISHED AND PLACED, AS PER PLAN	2150	SY	$ 14.00	$ 30,100.00
104	SPECIAL	FILTER FABRIC FENCE	760	FT	$ 2.50	$ 1,900.00
		DRAINAGE				
201	503	COFFERDAMS AND EXCAVATION BRACING	1	LS	$ 10,000.00	$ 10,000.00
202	511	CONCRETE WINGWALLS, COMPLETE	1	LS	$ 10,000.00	$ 10,000.00
203	511	CONCRETE FOOTINGS, COMPLETE	1	LS	$ 10,000.00	$ 10,000.00
204	511	CONCRETE HEADWALL, COMPLETE	1	LS	$ 10,000.00	$ 10,000.00
205	512	SEALING OF CONCRETE SURFACES	50	SY	$ 30.00	$ 1,500.00
206	512	TYPE 2 MEMBRANE WATERPROOFING	250	SY	$ 30.00	$ 7,500.00
207	512	TYPE 3 MEMBRANE WATERPROOFING	420	SY	$ 40.00	$ 16,800.00
208	516	1" PREFORMED EXPANSION JOINT FILLER	175	SF	$ 20.00	$ 3,500.00
209	605	6" BASE PIPE UNDERDRAIN	200	FT	$ 12.00	$ 2,400.00

CLIPPER COVE CULVERT REPLACEMENT - ENGINEER'S ESTIMATE

REF. NO.	ODOT ITEM	ITEM DESCRIPTION	TOTAL QNTY	UNIT	TOTAL UNIT PRICE	BID ITEM TOTAL
210	611	16' X 4' CONDUIT, TYPE A, 706.05, AS PER PLAN	192	FT	$ 1,050.00	$ 201,600.00
211	SPECIAL	PUMPING/DEWATERING	1	LS	$ 7,500.00	$ 7,500.00
212	SPECIAL	STRUCTURE DESIGN	1	LS	$ 6,000.00	$ 6,000.00
		PAVEMENT				
301	206	CEMENT	10	TON	$ 160.00	$ 1,600.00
302	206	CEMENT STABILIZED SUBGRADE, 12 INCHES DEEP	270	SY	$ 10.00	$ 2,700.00
303	206	TEST ROLLING	1	HR	$ 250.00	$ 250.00
304	206	MIXTURE DESIGN FOR CHEMICALLY STABILIZED SOILS	1	LS	$ 6,000.00	$ 6,000.00
305	304	AGGREGATE BASE, AS PER PLAN (4" DEPTH)	35	CY	$ 55.00	$ 1,925.00
306	407	TACK COAT, 702.13	25	GAL	$ 4.00	$ 100.00
307	423	CRACK SEALING, TYPE III	250	FT	$ 2.00	$ 500.00
308	441	1.5" ASPHALT CONCRETE SURFACE COURSE, TYPE 1, (448), PG64-22	15	CY	$ 200.00	$ 3,000.00
309	441	1.5" ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE 1, (448)	15	CY	$ 200.00	$ 3,000.00

CLIPPER COVE CULVERT REPLACEMENT - ENGINEER'S ESTIMATE

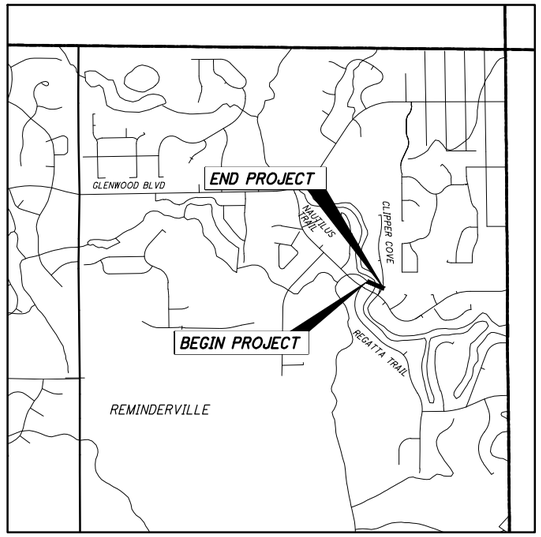
REF. NO.	ODOT ITEM	ITEM DESCRIPTION	TOTAL QNTY	UNIT	TOTAL UNIT PRICE	BID ITEM TOTAL
310	452	NON-REINFORCED CONCRETE PAVEMENT, MISC.:7" FIBER REINFORCED W/ 4" ROLLED INTEGRAL CURB	270	SY	$ 80.00	$ 21,600.00
312	SPECIAL	TEMPORARY PAVEMENT; FOR MAINTENANCE OF TRAFFIC	120	SY	$ 50.00	$ 6,000.00
		WATER WORKS				
401	638	12" WATER MAIN POLYVINYL CHLORIDE PIPE AND FITTINGS	100	FT	$ 200.00	$ 20,000.00
402	638	12" GATE VALVE	2	EACH	$ 1,500.00	$ 3,000.00
403	638	20" STEEL PIPE ENCASEMENT CONDUIT	40	FT	$ 250.00	$ 10,000.00
		MAINTENANCE OF TRAFFIC				
751	614	MAINTAINING TRAFFIC, AS PER PLAN	1	LS	$ 5,000.00	$ 5,000.00
752	614	LAW ENFORCEMENT OFFICER WITH PATROL CAR FOR ASSISTANCE, AS PER PLAN	80	HOUR	$ 65.00	$ 5,200.00
		MISCELLANEOUS				
851	201	CLEARING AND GRUBBING	1	LS	$ 30,000.00	$ 30,000.00
852	624	MOBILIZATION	1	LS	$ 20,000.00	$ 20,000.00
853	SPECIAL	POT-HOLING EXISTING UTILITIES	1	LS	$ 1,500.00	$ 1,500.00
854	SPECIAL	ADJUSTMENT TO UTILITIES	1	LS	$ 1,500.00	$ 1,500.00
855	SPECIAL	UTILITY REPAIRS	1	LS	$ 1,500.00	$ 1,500.00
856	SPECIAL	MISCELLANEOUS REMOVAL/RELOCATION	1	LS	$ 1,500.00	$ 1,500.00
857	SPECIAL	PROJECT VIDEO	1	LS	$ 1,000.00	$ 1,000.00
858	SPECIAL	PROJECT BONDING	1	LS	$ 7,200.00	$ 7,200.00
860	SPECIAL	NOTICE OF INTENT (NOI)	1	LS	$ 500.00	$ 500.00

CONSTRUCTION ESTIMATE =	**$ 610,665.00**
ENGINEERING SERVICES =	**$ 60,900.00**
CONSTRUCTION ADMINISTRATION =	**$ 45,800.00**
PROJECT GRAND TOTAL =	**$ 717,365.00**

CLIPPER COVE CULVERT REPLACEMENT

VILLAGE OF REMINDERVILLE
SUMMIT COUNTY

NOVEMBER, 2020



LOCATION MAP

LATITUDE: N 41°20'13" LONGITUDE: W 81°23'59"

SCALE IN MILES

0 0.25 0.50 0.75 1.00

N

PORTION TO BE IMPROVED . . . . . ━━━
INTERSTATE & DIVIDED HIGHWAY . . . . . ━━━
UNDIVIDED STATE & FEDERAL ROUTES . . . . . ━━━
OTHER ROADS . . . . . ──

DESIGN DESIGNATION

DESIGN SPEED . . . . . 30 MPH
LEGAL SPEED . . . . . 25 MPH
DESIGN FUNCTIONAL CLASSIFICATION . . . . . RESIDENTIAL

INDEX OF SHEETS:

TITLE SHEET 1
LEGEND 2
MAINTENANCE OF TRAFFIC 3
CULVERT DETAIL 4
STRUCTURE DETAILS 5-7

PROJECT DESCRIPTION

CULVERT REPLACEMENT, FULL DEPTH, FULL WIDTH PAVEMENT RECONSTRUCTION.

EARTH DISTURBED AREAS

PROJECT EARTH DISTURBED AREA: 0.60 ACRES
ESTIMATED CONTRACTOR EARTH DISTURBED AREA: 0.25 ACRES
NOTICE OF INTENT EARTH DISTURBED AREA: 0.85 ACRES

2019 SPECIFICATIONS

THE STANDARD SPECIFICATIONS OF THE STATE OF OHIO, DEPARTMENT OF TRANSPORTATION, INCLUDING CHANGES AND SUPPLEMENTAL SPECIFICATIONS LISTED IN THE PROPOSAL SHALL GOVERN THIS IMPROVEMENT.

OHM
ARCHITECTS ENGINEERS PLANNERS
388 S. MAIN ST., SUITE 301
AKRON, OH 44311
330.913.1080
OHM-ADVISORS.COM

STATE OF OHIO
CHAD M. LEWIS
70934
REGISTERED PROFESSIONAL ENGINEER
PRELIMINARY NOT FOR CONSTRUCTION

Chad M Lewis, PE
Ohio Professional Engineer
#70934

UNDERGROUND UTILITIES
CONTACT BOTH SERVICES TWO WORKING DAYS **BEFORE YOU DIG.**
OHIO Utilities Protection SERVICE *Call Before You Dig* 1-800-362-2764 (Non-members must be called directly)
OIL & GAS PRODUCERS UNDERGROUND PROTECTION SERVICE 1-800-925-0988

PLAN PREPARED BY:
OHM ADVISORS, INC.
388 S. MAIN ST., SUITE 301
AKRON, OH 44311
330.913.1080

ODOT STANDARD CONSTRUCTION DRAWINGS								*SUPPLEMENTAL SPECIFICATIONS*	
BP-2.1	7/17/15	DM-1.1	7/17/20	HW-2.1	7/20/18	TC-41.20	10/18/13	800-20197/17/20	
BP-2.2	7/18/08	DM-4.4	1/15/16	HW-2.2	7/20/18	TC-42.20	10/18/13	832	10/19/18
BP-3.1	1/17/20								
BP-5.1	1/18/19			MH-1.2	1/15/16	MT-97.10	4/19/19		
						MT-97.11	1/20/17		
						MT-101.60	1/17/20		
						MT-105.10	1/17/20		
								SPECIAL PROVISIONS	

REVISIONS			

DATE	PROJ NUMBER	ENG	PROJ MGR	COUNTY	CITY/VILLAGE/TOWNSHP	SCALE		HORZ DATUM	VERT DATUM
11/20/2020	30072001.10	ENGINEER	PM	SUMMIT	VILLAGE OF REMINDERVILLE	H: 1"=20'	V: 1"=5'	NAD83 (2011)	NAVD88

VILLAGE OF REMINDERVILLE
CLIPPER COVE CULVERT REPLACEMENT
TITLE SHEET

SHEET 1 of 7

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DRAWING PATH: I:\ohm\efficorporate\Projects\3000_3499\30072001\30_pre-const_culvert\DOT\OH\#2036\Design\Roadway\Sheets\2036TGT001.dwg Oct 26, 2020 - 3:46pm

GENERAL UTILITY LABEL INFO

(***-XX)	DUPLICATE EX STORM/SANITARY
(***-XX)	*DUPLICATE PROP STORM/SANITARY*
(**-###)	*DUPLICATE WATER WORK*

GENERAL LABEL INFO & ABBREVIATIONS

(DV-###)	*℄ DRIVEWAY*
(TBA)	*TO BE ABANDONED*
(TBR)	*TO BE REMOVED*
(ADJ)	*ADJUST TO GRADE*

WATERMAIN LABELS

(WM-###)	*PROP WATERMAIN*
(WS-###)	*PROP WATER SERVICE LINE*
(WH-###)	*PROP WATER HYDRANT*
(WV-###)	*PROP WATER VALVE*
(WW-###)	*PROP WATER WORK ITEM*
(WJ-###)	EX WATER WORK ITEM *(ADJ TO GRADE)*
(WR-###)	EX WATER WORK ITEM *(TO BE REMOVED)*
(AB-###)	EX WATER WORK ITEM *(TO BE ABANDONED)*

STORM LABELS

(EST-XX)	EX STORM SEWER
(ST-XX)	*PROP STORM SEWER*
(ED-XX)	EX STORM STRUCTURE
(D-XX)	*PROP STORM STRUCTURE*
(HW-XX)	*PROP HEADWALL*
(DJ-XX)	EX STORM STRUCTURE *(ADJ TO GRADE)*
(DR-XX)	EX STORM ITEM *(TO BE REMOVED)*
(AB-XX)	EX STORM ITEM *(TO BE ABANDONED)*

SANITARY LABELS

(ESA-XX)	EX SANITARY SEWER
(ECS-XX)	EX COMBINED SEWER
(SA-XX)	*PROP SANITARY SEWER*
(ES-XX)	EX SANITARY STRUCTURE
(S-XX)	*PROP SANITARY STRUCTURE*
(SJ-XX)	EX SANITARY STRUCTURE *(ADJ TO GRADE)*
(SR-XX)	EX SANITARY ITEM *(TO BE REMOVED)*
(AB-XX)	EX SANITARY ITEM *(TO BE ABANDONED)*

LINETYPES

CORPORATION LINE	EX LAKE, RIVER, POND, STREAM, WETLAND, ETC...OUTLINE	PROP LAKE, RIVER, POND, STREAM, WETLAND, ETC...OUTLINE
COUNTY LINE		
PROPERTY LINE	EX LIGHTING CONDUIT	*PROP LIGHTING CONDUIT*
R/W CENTERLINE	EX ELECTRICAL LINE	*PROP ELECTRICAL LINE*
EX R/W	EX FIBER OPTIC LINE	*PROP FIBER OPTIC LINE*
PROP CONSTRUCTION LIMITS	EX TELECOM LINE	*PROP TELECOM LINE*
PROP WORK AGREEMENT LIMITS	EX CABLE TV LINE	EX OVERHEAD ELECTRIC WIRE(S)
EX RAILROAD	EX OVERHEAD CABLE/TV WIRE(S)	EX OVERHEAD FIBER OPTIC WIRE(S)
EX SHRUB LINE	EX OVERHEAD CABLE/TV/FO WIRE(S)	EX OVERHEAD TELECOM WIRE(S)
EX TREE LINE	EX OVERHEAD COMBINED WIRE(S)	EX OVERHEAD TELECOM/FO WIRE(S)
EX FENCE	EX OIL LINE	
EX CABLE GUARDRAIL	EX GAS LINE	*PROP GAS LINE*
EX GUARDRAIL	EX WATER MAIN	*PROP WATER MAIN*
PROP FENCE	EX COMBINED SEWER	EX LEACH BED AREA
PROP CABLE GUARDRAIL	EX SANITARY SEWER	*PROP SANITARY SEWER*
PROP GUARDRAIL	EX STORM SEWER	*PROP STORM SEWER*
EX GUARDRAIL *(TO BE REPLACED)*	EX UNDERDRAIN	*PROP UNDERDRAIN*

SYMBOLS

BENCHMARK	EX TREE	EX LIGHT POLE	EX TELECOM & POWER POLE	EX WATER METER
EX MONUMENT BOX	EX SHRUB	*PROP LIGHT POLE*	*PROP TELECOM & POWER POLE*	*PROP WATER METER*
PROP MONUMENT BOX	EX EVERGREEN TREE	EX LIGHTING PULL BOX	EX UNKNOWN UTILITY POLE	EX WATER GATE VALVE
I.P.F. EX IRON PIN FOUND - NO ID	EX STUMP	*PROP LIGHTING PULL BOX*	EX GUYWIRE ANCHOR	*PROP WATER GATE VALVE*
I.P.F. EX IRON PIN FOUND - WITH ID	EX SIGNAL PEDESTAL POLE	EX POWER POLE	EX GAS VALVE	EX WATER SERVICE STOP
P.F. EX IRON PIPE FOUND	*PROP SIGNAL PEDESTAL POLE*	*PROP POWER POLE*	*PROP GAS VALVE*	*PROP WATER SERVICE STOP*
I.P.S. *PROP IRON PIN SET - WITH ID*	EX SIGNAL STRAIN/SUPPORT POLE	EX POWER & LIGHT POLE	EX GAS SERVICE STOP	EX WATER HYDRANT
P.K.F. EX PK NAIL FOUND	*PROP SIGNAL STRAIN/SUPPORT POLE*	*PROP POWER & LIGHT POLE*	*PROP GAS SERVICE STOP*	*PROP WATER HYDRANT*
EX LARGE ROCK	EX SIGNAL PULL BOX	EX ELECTRIC METER	EX GAS METER	EX WATER MH
EX AIR CONDITIONER	*PROP SIGNAL PULL BOX*	EX ELECTRIC PULL BOX	EX GAS LINE MARKER	EX WATER MH *(ADJ TO GRADE)*
EX STATIONARY BBQ GRILL	EX SIGNAL/TRAFFIC MH	*PROP ELECTRIC PULL BOX*	EX GAS MH	*PROP WATER MH*
EX YARD LIGHT	EX SIGNAL/TRAFFIC MH *(ADJ TO GRADE)*	EX ELECTRIC MH	EX GAS WELL	EX STORM MH
EX FLAG POLE	*PROP SIGNAL/TRAFFIC MH*	*PROP ELECTRIC MH*	EX SEPTIC TANK	EX STORM MH *(ADJ TO GRADE)*
EX MAIL BOX	EX SINGLE POST SIGN(S)	EX TRANSFORMER	EX SANITARY MH	*PROP STORM MH*
EX PAPER BOX	*PROP SINGLE POST SIGN(S)*	EX TELECOM POLE	EX SANITARY MH *(ADJ TO GRADE)*	EX STORM CB
EX PARKING METER	EX DOUBLE POST SIGN(S)	*PROP TELECOM POLE*	*PROP SANITARY MH*	EX STORM CB *(ADJ TO GRADE)*
EX POST	*PROP DOUBLE POST SIGN(S)*	EX TELECOM & LIGHT POLE	EX DRAINAGE FLOW ARROW	*PROP STORM CB*
EX SPRINKLER HEAD	EX POST(S) 4 SIGNS	*PROP TELECOM & LIGHT POLE*	*PROP DRAINAGE FLOW ARROW*	EX STORM INLET
	PROP POST(S) 4 SIGNS	EX TELECOM, LIGHT, & POWER POLE		EX STORM INLET *(ADJ TO GRADE)*
		PROP TELECOM, LIGHT, & POWER POLE		*PROP STORM INLET*

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STATE OF OHIO — CHAD M. LEWIS — REGISTERED PROFESSIONAL ENGINEER — #70934
PRELIMINARY NOT FOR CONSTRUCTION

Chad M Lewis, PE
Ohio Professional Engineer
#70934

REVISIONS:

DATE	PROJ NUMBER	ENG	PROJ MGR	CADD	COUNTY	CITY/VILLAGE/TOWNSHIP	SCALE	HORZ DATUM	VERT DATUM
10/26/2020	3007200130	ENGINEER	PM	CADD	SUMMIT	VILLAGE OF REMINDERVILLE	H: 1"=20' V: 1"=5'	NAD83 (2011)	NAVD88

VILLAGE OF REMINDERVILLE
CLIPPER COVE CULVERT REPLACEMENT
LEGEND

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SHEET 2 of 7

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ITEM 614 - MAINTAINING TRAFFIC, AS PER PLAN

WHEN THIS ITEM IS CALLED FOR ON THE PLANS OR IN THE PROPOSAL, ALL APPLICABLE PROVISIONS OF ODOT ITEM NO. 614, MAINTAINING TRAFFIC, AS SET FORTH IN THE STATE OF OHIO, DEPARTMENT OF TRANSPORTATION, CONSTRUCTION AND MATERIAL SPECIFICATIONS SHALL APPLY EXCEPT AS MODIFIED HEREIN.

THE CONTRACTOR SHALL PREPARE A MAINTENANCE OF TRAFFIC (MOT) PLAN AND SUBMIT TO THE ENGINEER FOR APPROVAL. THE MOT PLAN MUST BE APPROVED BY THE ENGINEER, PRIOR TO THE START OF CONSTRUCTION OPERATIONS. THE FOLLOWING CONDITIONS SHALL BE MET FOR ANY APPROVED MOT PLAN:

ALL TRAFFIC CONTROL DEVICES SHALL BE FURNISHED, ERECTED, MAINTAINED AND REMOVED BY THE CONTRACTOR, IN ACCORDANCE WITH THE "OHIO MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES" (OMUTCD), CURRENT VERSION, PER FIGURE 6H-6. PLAN INSERT (DROP OFFS IN WORK ZONES) SHALL APPLY TO ALL WORK ON THIS PROJECT.

ALL TRENCHES WITHIN THE PAVEMENT, BERM, AND SHOULDER SHALL BE BACKFILLED OR SECURELY PLATED DURING NON-WORKING HOURS.

SAFE "RAMPING" TO ADJACENT TRAFFIC LANES AND ADJACENT PROPERTIES/DRIVEWAYS SHALL BE MAINTAINED AT ALL TIMES. 304 MATERIAL OR OTHER ACCEPTABLE MATERIAL SHALL BE UTILIZED, AS DIRECTED BY THE ENGINEER.

TWO LANE TWO WAY TRAFFIC: SHALL BE MAINTAINED AT ALL TIMES, EXCEPT AS SPECIFICALLY NOTED WITHIN THE PLAN. TRAVELED LANES SHALL BE A MINIMUM OF 10' WIDE.

ONE LANE, TWO WAY TRAFFIC: MAY BE MAINTAINED DURING DAYTIME WORKING HOURS FROM 9AM TO 4PM, IN ACCORDANCE WITH THE OMUTCD (FIGURE C-18) AND STANDARD DRAWINGS. TRAVELED LANE SHALL BE A MINIMUM OF 10' WIDE.

HORIZONTAL AND VERTICAL ALIGNMENTS FOR LANES SHALL MEET 25MPH DESIGN STANDARDS PER THE ODOT L&D MANUAL, VOLUME 1.

ADDITIONAL NOTES: THE ENGINEER SHALL RESERVE THE RIGHT TO MODIFY SIGNAGE TO MEET CURRENT TRAFFIC CONDITIONS AT NO ADDITIONAL COST TO THE VILLAGE OF REMINDERVILLE. IF, IN THE OPINION OF THE ENGINEER, PROPER TRAFFIC CONTROL IS NOT BEING PROVIDED OR MAINTAINED BY THE CONTRACTOR, THE APPROPRIATE TRAFFIC CONTROL DEVICES WILL BE INSTALLED BY THE OWNER. ALL COSTS WILL BE BORNE BY THE CONTRACTOR THROUGH A CHANGE ORDER DEDUCTION FROM THE PROJECT CONTRACT.

LOCAL ACCESS REQUIREMENTS:

- POLICE DEPARTMENT & FIRE DEPARTMENT OPERATIONS: THE CONTRACTOR SHALL AT ALL TIMES, REGARDLESS OF SPECIFIC DETOUR ROUTES, PROVIDE ACCESS TO POLICE AND FIRE PERSONNEL/EQUIPMENT ALONG ALL CONSTRUCTION ZONES WITHIN THE PROJECT. ACCESS SHALL BE A MINIMUM OF 10' IN WIDTH, WITH HARD PAVEMENT SURFACE CAPABLE OF SUPPORTING A 50,000 LB FIRE TRUCK.
- COMMERCIAL PROPERTIES: THE CONTRACTOR SHALL MAINTAIN A MINIMUM OF 50% OF THE ACCESS POINTS TO ALL COMMERCIAL PROPERTIES.
- RESIDENTIAL PROPERTIES: THE CONTRACTOR SHALL COORDINATE CONSTRUCTION ACTIVITIES WITH EACH RESIDENCE, SUCH THAT ACCESS IS MAINTAINED TO EACH DRIVEWAY DURING NORMAL INGRESS/EGRESS TIMES. THESE TIMES WILL VARY PER RESIDENCE, DEPENDING UPON WORK SCHEDULES, BUS SCHEDULES, ETC. THE CONTRACTOR SHALL NOTIFY ALL RESIDENTS INDIVIDUALLY, IN WRITING, PRIOR TO CONSTRUCTION.
- OTHER ACCESS: MAIL DELIVERY, GARBAGE COLLECTION, SCHOOL BUS PICKUP/DROPOFF, RTA SERVICE, AND OTHER NORMAL SERVICES TO PROPERTIES SHALL BE MAINTAINED AT ALL TIMES. SPECIAL AGREEMENTS/CONSIDERATIONS CAN BE MADE BY THE CONTRACTOR PROVIDED IT IS IN WRITING AND APPROVED BY THE ENGINEER PRIOR TO COMMENCING THE CHANGE.

THE CONTRACTOR SHALL BID ITEM 614 MAINTAINING TRAFFIC, AS PER PLAN USING THE PLAN GUIDELINES ALONG WITH THE CONTRACTORS PLANNED CONSTRUCTION SCHEDULE AND PROCESS METHODS NECESSARY TO CONSTRUCT THE PROJECT.

THE LUMP SUM PRICE BID FOR THIS ITEM SHALL INCLUDE ALL LABOR, MATERIAL, AND EQUIPMENT NECESSARY TO COMPLETE THIS ITEM AS SPECIFIED AND REQUIRED HEREIN.

MODIFICATION TO EXISTING CONDITIONS: THE CONTRACTOR SHALL PROVIDE COSTS IN THE BID TO PROVIDE SIGNS, STRIPING, ETC., AS WELL AS THE REMOVAL AND RE-ERECTION OF MAILBOXES, SIGNS, OR OTHER OBJECTS THAT CONFLICT WITH THE CONTRACTOR'S PLAN TO MAINTAIN TRAFFIC. ALL COSTS FOR THIS WORK, WHICH SHALL BE INCLUSIVE OF ALL COSTS TO MEET THE MAINTENANCE OF TRAFFIC REQUIREMENTS, SHALL BE INCLUDED IN ITEM 614 MAINTAINING TRAFFIC, AS PER PLAN.

ITEM 614 - LAW ENFORCEMENT OFFICER WITH PATROL CAR FOR ASSISTANCE, AS PER PLAN

USE OF LAW ENFORCEMENT OFFICERS (LEOS) BY CONTRACTORS OTHER THAN THE USES SPECIFIED BELOW WILL NOT BE PERMITTED AT PROJECT COST. LEOS SHOULD NOT BE USED WHERE THE OMUTCD INTENDS THAT FLAGGERS BE USED. THE COST OF FLAGGERS SHALL BE INCLUDED IN ITEM 614 - MAINTAINING TRAFFIC, AS PER PLAN.

IN ADDITION TO THE REQUIREMENTS OF CMS 614 AND THE OMUTCD, A UNIFORMED LEO WITH AN OFFICIAL PATROL CAR (CAR WITH TOP-MOUNTED EMERGENCY FLASHING LIGHTS AND COMPLETE MARKINGS OF THE APPROPRIATE LAW ENFORCEMENT AGENCY) SHALL BE PROVIDED FOR THE FOLLOWING TRAFFIC CONTROL TASKS:

1. FOR LANE CLOSURES: DURING INITIAL SET-UP PERIODS, TEAR DOWN PERIODS, SUBSTANTIAL SHIFTS OF A CLOSURE POINT OR WHEN NEW LANE CLOSURE ARRANGEMENTS ARE INITIATED FOR LONG-TERM LANE CLOSURES/SHIFTS (FOR THE FIRST AND LAST DAY OF MAJOR CHANGES IN TRAFFIC CONTROL SETUP). THIS INCLUDES ALL PAVEMENT MARKING OPERATIONS, PLACEMENT OF SIGNS, DRUMS, NAVIGATORS, ETC.

2. DURING WORK WITHIN ANY INTERSECTION OF COMMERCIAL DRIVEWAY WHERE TRAFFIC MUST BE MAINTAINED WITH LEO'S.

3. AT THE DIRECTION OF THE ENGINEER WHERE IT HAS BEEN DETERMINED THAT LEO'S ARE REQUIRED TO SAFELY MAINTAIN TRAFFIC.

LEOS SHOULD NOT FORGO THEIR TRAFFIC CONTROL RESPONSIBILITIES TO APPREHEND MOTORISTS FOR ROUTINE TRAFFIC VIOLATIONS. HOWEVER, IF A MOTORIST'S ACTIONS ARE CONSIDERED TO BE RECKLESS, THEN PURSUIT OF THE MOTORIST IS APPROPRIATE.

THE LEOS WORK AT THE DIRECTION OF THE ENGINEER. THE CONTRACTOR IS RESPONSIBLE FOR SECURING THE SERVICES OF THE LEOS WITH THE APPROPRIATE AGENCIES AND COMMUNICATING THE INTENTIONS OF THE PLANS WITH RESPECT TO DUTIES OF THE LEOS. THE ENGINEER SHALL HAVE FINAL CONTROL OVER THE LEOS' DUTIES AND PLACEMENT, AND WILL RESOLVE ANY ISSUES THAT MAY ARISE BETWEEN THE TWO PARTIES.

THE LEO SHALL REPORT IN TO THE CONTRACTOR PRIOR TO THE START OF THE SHIFT, IN ORDER TO RECEIVE INSTRUCTIONS REGARDING SPECIFIC WORK ASSIGNMENTS DURING HIS/HER SHIFT. THE LEO IS EXPECTED TO STAY AT THE PROJECT SITE FOR THE ENTIRE DURATION OF HIS/HER SHIFT. THE LEO SHALL REPORT TO THE CONTRACTOR AT THE END OF HIS/HER SHIFT. ONCE THE LEO HAS COMPLETED THE DUTIES DESCRIBED ABOVE AND STILL HAS TIME REMAINING ON HIS/HER SHIFT, THE LEO MAY BE ASKED TO PATROL THROUGH THE WORK ZONE (WITH FLASHING LIGHTS OFF) OR BE PLACED AT A LOCATION TO DETER MOTORISTS FROM SPEEDING. SHOULD IT BE NECESSARY TO LEAVE THE PROJECT SITE, THE LEO SHALL NOTIFY THE ENGINEER. THE CONTRACTOR SHALL PROVIDE THE LEO WITH A TWO-WAY COMMUNICATION DEVICE WHICH SHALL BE RETURNED TO THE CONTRACTOR AT THE END OF HIS/HER SHIFT.

LEOS (WITH PATROL CAR) REQUIRED BY THE TRAFFIC MAINTENANCE TASKS ABOVE SHALL BE PAID FOR ON A UNIT PRICE (HOURLY) BASIS UNDER ITEM 614, LAW ENFORCEMENT OFFICER WITH PATROL CAR FOR ASSISTANCE. THE FOLLOWING ESTIMATED QUANTITIES HAVE BEEN CARRIED TO THE GENERAL SUMMARY:

ITEM 614 - LAW ENFORCEMENT OFFICER WITH PATROL CAR FOR ASSISTANCE, AS PER PLAN	320 HOURS

THE HOURS PAID SHALL INCLUDE ANY MINIMUM SHOW-UP TIME REQUIRED BY THE LAW ENFORCEMENT AGENCY INVOLVED.

ANY ADDITIONAL COSTS (ADMINISTRATIVE OR OTHERWISE) INCURRED BY THE CONTRACTOR TO OBTAIN THE SERVICES OF AN LEO ARE INCLUDED WITH THE BID UNIT PRICE FOR ITEM 614, LAW ENFORCEMENT OFFICER WITH PATROL CAR FOR ASSISTANCE.

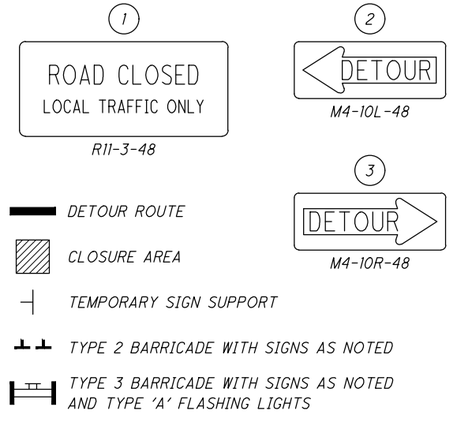
NOTE: THE CONTRACTOR SHALL USE LEO'S FROM THE VILLAGE OF REMINDERVILLE. THIS IS A STRICT REQUIREMENT THAT SHALL BE MET, UNLESS THE VILLAGE OF REMINDERVILLE'S POLICE DEPARTMENT APPROVES A MODIFICATION TO THIS REQUIREMENT.

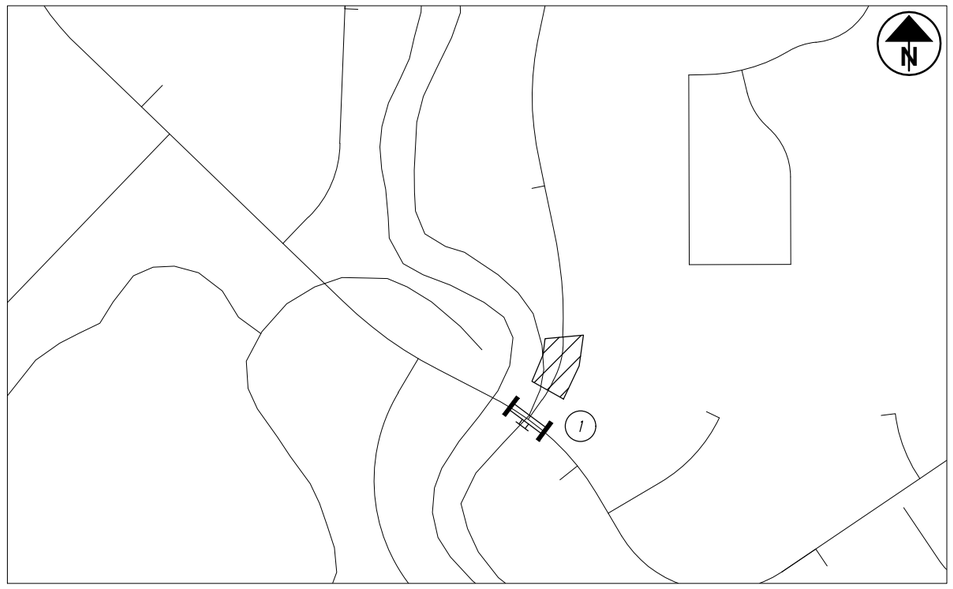
MOT CONCEPT PLAN

THIS PLAN SHOWS THE APPROVED MOT CONCEPT FOR THE PROJECT.

- ROAD CLOSURE FOR THRU TRAFFIC
- DETOURS AS PROVIDED
- LOCAL ACCESS MAINTAINED PER NOTES

THE CONTRACTOR MAY SUBMIT ALTERNATE METHODS FOR APPROVAL BY THE ENGINEER, PRIOR TO COMMENCING ANY CHANGES.





DETOUR SIGNING

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PRELIMINARY
NOT FOR CONSTRUCTION

Chad M Lewis, PE
Ohio Professional Engineer
#70934

REVISIONS

DATE 10/26/2020 | PROJ NUMBER 3007300.10 | ENG# ENGINEER | PROJ MGR PM | CADD CADD | COUNTY SUMMIT | CITY/VIL/AGE/TOWNSHIP VILLAGE OF REMINDERVILLE | SCALE H: 1"=20' V: 1"=5' | HORZ DATUM NAD83/2011 | VERT DATUM NAVD88

VILLAGE OF REMINDERVILLE
CLIPPER COVE CULVERT REPLACEMENT
MAINTENANCE OF TRAFFIC

SHEET 3 of 7

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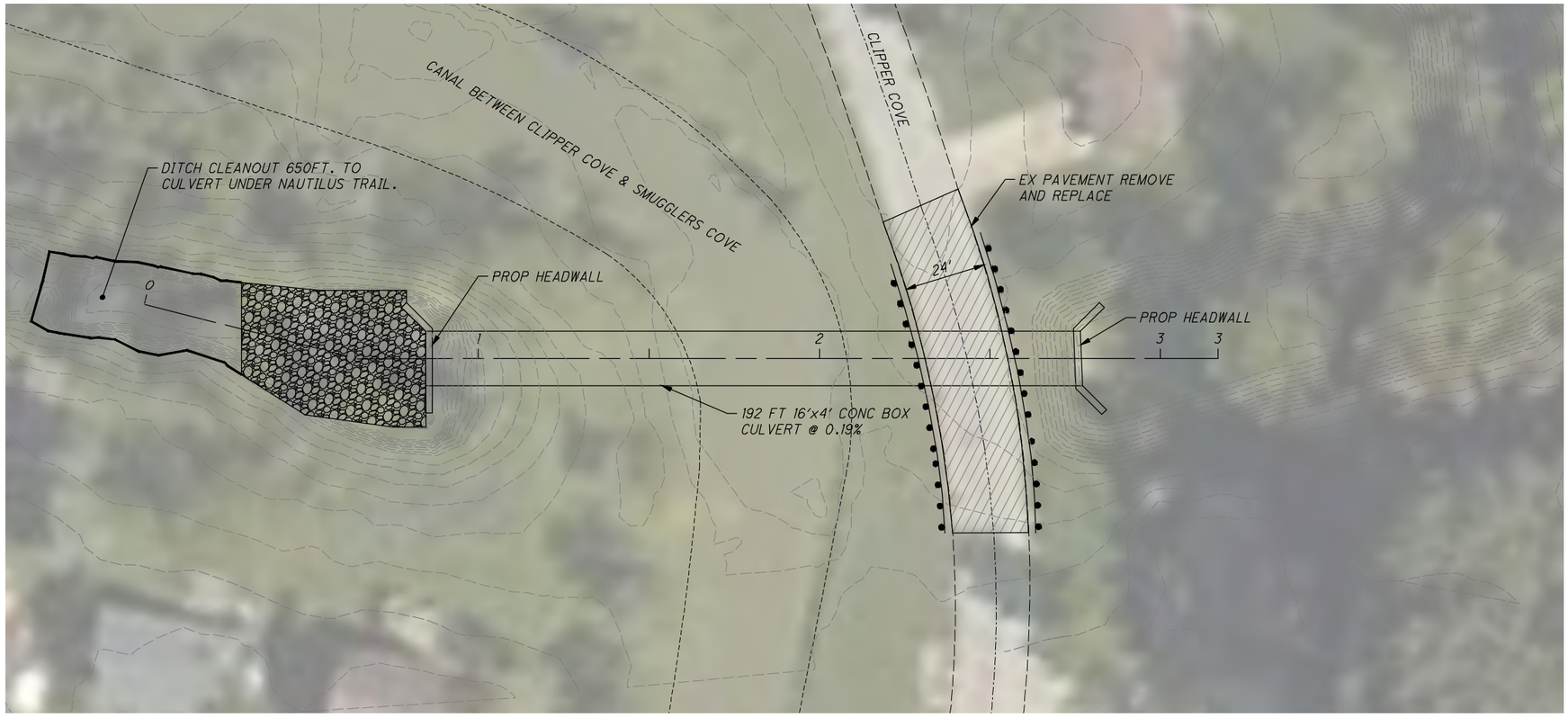


0 20 40

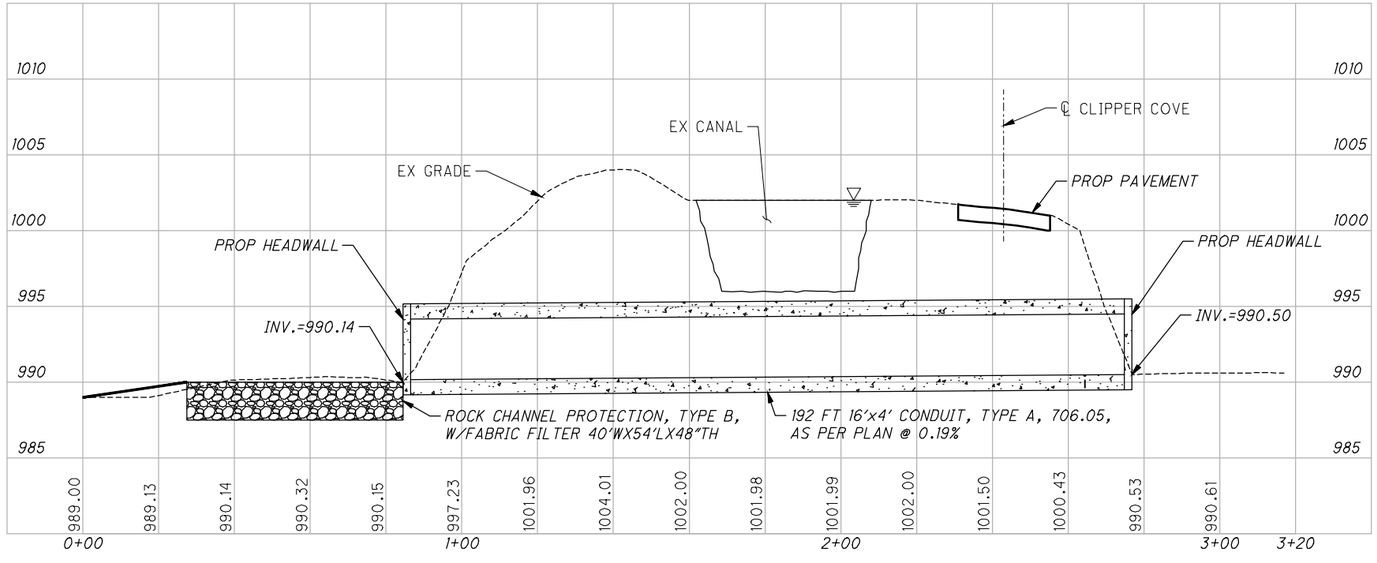
N

NOTES:

1. CONTRACTOR TO VERIFY DEPTH OF EXISTING UTILITIES PRIOR TO CONSTRUCTION OF THE PROPOSED CULVERT.
2. CONTRACTOR SHALL MAINTAIN FLOW IN THE STREAM AT ALL TIMES, USING EXISTING CULVERTS, TEMPORARY PUMPS, ETC. MAJOR STORM FLOWS SHALL BE MAINTAINED AT ALL TIMES, IN CASE OF FLOODING. ALL COSTS TO BE INCLUDED IN COST OF PROJECT.
3. IF GRADING ACTIVITIES IN PROPERTY OWNERS PARCEL(S) ARE NECESSARY, CONTRACTOR IS TO OBTAIN A WORK AGREEMENT WITH SAID PROPERTY OWNER TO BE APPROVED BY THE VILLAGE OF REMINDERVILLE BEFORE WORK CAN PROCEED.
4. CONTRACTOR TO PROVIDE CUT SHEETS FROM MANUFACTURER FOR ANY PRECAST CULVERT SECTIONS, FOOTINGS, WINGWALLS, AND HEADWALLS.

PROPOSED STRUCTURE DATA	
LOADING:	HS-25
TYPE:	CONCRETE BOX CULVERT
SPAN:	16'-0"
RISE:	4'-0"
LENGTH:	192'-0"

CLIPPER COVE CULVERT



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STATE OF OHIO CHAD M LEWIS #70934 REGISTERED PROFESSIONAL ENGINEER

Chad M Lewis, PE
Ohio Professional Engineer
#70934

REVISIONS

DATE 10/26/2020 | PROJ NUMBER 30072013G | ENG | PROJ MGR | CADD | COUNTY | CITY/VILLAGE/TOWNSHIP | SCALE H: 1"=20' V: 1"=5' | HORZ DATUM NAD83 (2011) | VERT DATUM NAVD88
ENGINEER | PM | CADD | SUMMIT | VILLAGE OF REMINDERVILLE

VILLAGE OF REMINDERVILLE
CLIPPER COVE CULVERT REPLACEMENT
CULVERT DETAIL

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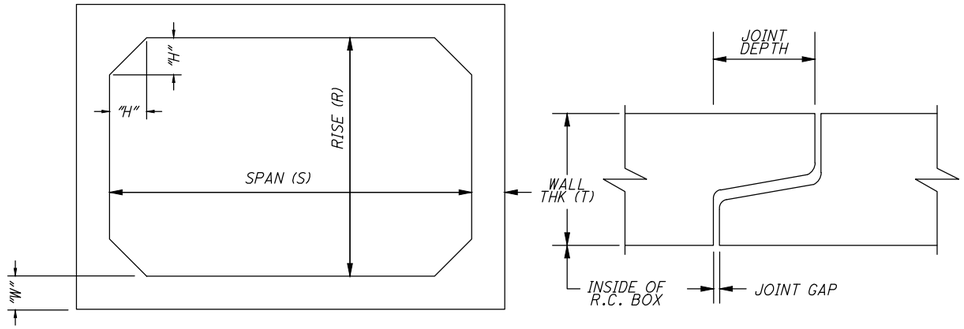


SECTION THRU BOX CULVERT

SECTION THRU BOX JOINT

Standard Box Culvert Weights (lbs.) per Foot

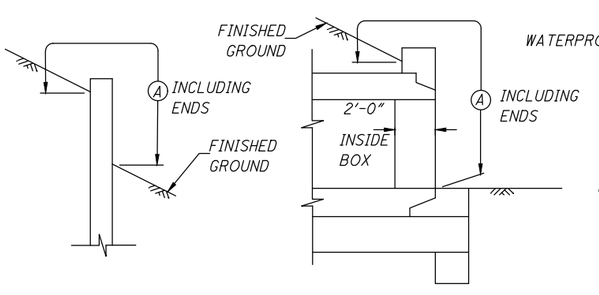
Span (S)		3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Rise (R)	2	605	905																
	3	705	1025	1425	1885	2410													
	4		1155	1575	2060	2600	2800			4880	5700	6000	6300	6600	6900	7700	8000	8900	9200
	5			1725	2235	2800	3000	3655	4375			6300	6600	6900	7200	8000	8300	9200	9500
	6				2410	3000	3200	3885	4625	5430	6300	6600	6900	7200	7500	8300	8600	9500	9800
	7					3200	3400	4105	4875			6900	7200	7500	7800	8600	8900	9800	10100
	8						3600	4335	5125	5980	6900	7200	7500	7800	8100	8900	9200	10100	10400
"T" (inches)		4	5	6	7	8	8	9	10	11	12	12	12	12	12	12	12	12	12
"W" (inches)		4	5	6	7	8	8	9	10	11	12	12	12	12	12	12	13	14	14
"H" (inches)		7	7,8	7,8	7,8,12	8,12	8,12	12	12	12	12	12	12	12	12	12	12	12	12

NOTES:

1. THE PLANS PROVIDE FOR PRECAST, 4-SIDED BOX CULVERTS, ON CAST-IN-PLACE FOOTINGS.
2. THE CONTRACTOR MAY CHOOSE TO MODIFY THE DESIGN TO PROVIDE A 100% CAST-IN-PLACE STRUCTURE OR ANOTHER COMBINATION OF PRECAST AND CAST-IN-PLACE.
3. THE FINAL DESIGN/CONSTRUCTION COMBINATION WILL REQUIRE SHOP DRAWINGS WITH STRUCTURAL CALCULATIONS AND DESIGN PLANS SIGNED AND SEALED BY AN OHIO PROFESSIONAL ENGINEER. THE DESIGN SHALL INCLUDE ALL DIMENSIONS AND REINFORCING STEEL DETAILS NECESSARY FOR REVIEW AND APPROVAL. A LINE ITEM HAS BEEN INCLUDED IN THE BID FOR THIS USE "ITEM SPECIAL - STRUCTURAL DESIGN".

REINFORCED CONCRETE BOX CULVERT DETAILS

NOT TO SCALE

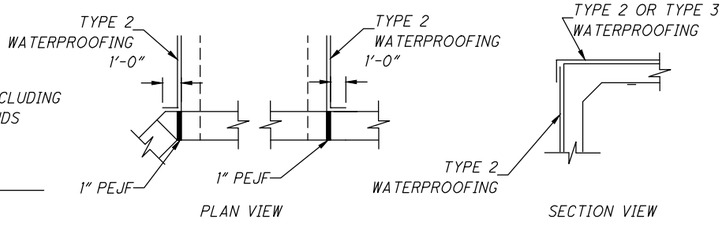


WINGWALL

FORESLOPE WALL AND PRECAST BOX (CULVERT OUTLET BEVEL SHOWN)

LIMITS OF ITEM 512-SEALING CONCRETE SURFACES

(A) - SEAL ENTIRE CONCRETE SURFACE AREA



WATERPROOFING DETAILS

GENERAL NOTES

DESIGN SPECIFICATIONS: THIS STANDARD DRAWING CONFORMS TO THE "LRFD BRIDGE DESIGN SPECIFICATIONS" ADOPTED BY THE AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS, 2014, INCLUDING THE 2015 & 2016 INTERIM SPECIFICATIONS AND THE ODOT BRIDGE DESIGN MANUAL, 2007.

DESIGN DATA: THE FOLLOWING DESIGN DATA IS ASSUMED:
- INTERNAL ANGLE OF FRICTION OF BACKFILL SOIL, ϕ_{bf} = 30°
- TOTAL UNIT WEIGHT OF BACKFILL SOIL = 120 PCF
- INTERNAL ANGLE OF FRICTION (DRAINED), FOUNDATION SOIL, ϕ_f = 28°
- UNDRAINED SHEAR STRENGTH (COHESIVE), FOUNDATION SOIL, S_{uf} = 1500 PSF
- UNIT WEIGHT OF CONCRETE = 150 PCF
- SLOPE OF BACKFILL = 2:1 (TYPE A & B HEADWALLS)
- HEIGHT OF LIVE LOAD SURCHARGE = 2 FT (TYPE C HEADWALLS)

CONCRETE CLASS QC1 - COMPRESSIVE STRENGTH 4000 PSI (FOOTING, WINGWALL AND FORESLOPE WALL)

REINFORCING STEEL - ASTM A615, A616, OR A617 GRADE 60 MINIMUM YIELD STRENGTH 60,000 PSI (ALL REINFORCING SHALL BE EPOXY COATED)

PRECAST CONCRETE: AT THE OPTION OF THE CONTRACTOR, PRECAST WINGWALLS MAY BE USED IN ACCORDANCE WITH CMS 602.03.E.

FORESLOPE WALL ANCHOR DOWELS: ANCHOR PER CMS 510 WITH NONSHRINK, NONMETALLIC GROUT CONFORMING TO CMS 705.20 AND TO A DEPTH SPECIFIED ON SHEET 17. PAYMENT FOR DOWEL HOLES, GROUT AND INSTALLATION SHALL BE INCLUDED WITH ITEM 511.

THREADED INSERTS OR NON-PROTRUDING MECHANICAL CONNECTORS CAPABLE OF DEVELOPING AT LEAST 125 PERCENT OF THE SPECIFIED YIELD STRENGTH OF THE REINFORCEMENT SHOWN ARE AN ACCEPTABLE ALTERNATIVE TO RESIN BONDING. MAINTAIN A MINIMUM COVER OF 3 INCHES AT THE BOTTOM OF THE CULVERT SLAB. MECHANICAL CONNECTORS SHALL HAVE AN "L-SHAPED" BAR INSIDE THE CULVERT WITH A MINIMUM HORIZONTAL LENGTH OF 12 INCHES. THE DEPARTMENT WILL CONSIDER PAYMENT FOR INSERTS OR MECHANICAL CONNECTORS AS INCIDENTAL TO ITEM 611.

BACKFILL LIMITATION: WHEN THE DESIGN HEIGHT IS GREATER THAN 10 FT, THE BACKFILL BEHIND THE WINGWALLS SHALL NOT BE PLACED HIGHER THAN THE ELEVATION OF THE SOIL ABOVE THE TOE. WHEN THE SOIL ABOVE THE TOE IS AT ITS FINISHED ELEVATION, THE REMAINDER OF THE BACKFILL MAY BE PLACED.

POROUS BACKFILL WITH FILTER FABRIC 1'-6" THICK SHALL BE PLACED BEHIND THE WINGWALLS ONLY AND SHALL EXTEND TO 12" BELOW THE EMBANKMENT SURFACE. GEOTEXTILE FABRIC TYPE A SHALL BE PLACED BETWEEN THE POROUS BACKFILL AND REPLACED EXCAVATION ADJACENT TO THE STRUCTURE. IT SHALL TURN UNDER THE BOTTOM OF THE POROUS BACKFILL AND RETURN 6" ABOVE THE TOP ELEVATION OF THE WEEPHOLE.

WEEPHOLES SHALL BE PLACED 6" TO 12" ABOVE THE NORMAL WATER ELEVATION OR GROUND LINE AND SHALL HAVE A MAXIMUM SPACING OF 10'-0". A MINIMUM OF ONE WEEPHOLE SHALL BE PROVIDED PER WINGWALL.

PAYMENT FOR POROUS BACKFILL WITH FILTER FABRIC SHALL BE INCLUDED WITH THE COSTS OF:
- ITEM 511 - CULVERT WINGWALLS, COMPLETE
- ITEM 511 - CONCRETE FOOTINGS, COMPLETE
- ITEM 511 - CONCRETE HEADWALL, COMPLETE
- ITEM 611 - 12'x4' CONDUIT, TYPE A, 706.05, AS PER PLAN

PREFORMED EXPANSION JOINT FILLER: PREFORMED EXPANSION JOINT FILLER (PEJF) CONFORMING TO CMS 705.03, 1 INCH THICK, SHALL BE PLACED ABOVE THE FOOTING BETWEEN THE SIDES OF THE BOX CULVERT AND THE ENDS OF THE WINGWALLS. PAYMENT FOR MATERIALS AND INSTALLATION SHALL BE INCLUDED WITH ITEM 516 - 1" PREFORMED EXPANSION JOINT FILLER.

SEALING OF FORESLOPE WALL AND WINGWALLS: ALL EXPOSED FORESLOPE WALL AND WINGWALL CONCRETE SHALL BE SEALED WITH EPOXY-URETHANE SEALER. THE LIMITS SHALL BE AS SHOWN IN THE DIAGRAMS BELOW. PAYMENT FOR THE EPOXY-URETHANE SEALER SHALL BE PER ITEM 512 - SEALING OF CONCRETE SURFACES.

WATERPROOFING: TYPE 2 WATERPROOFING, PER CMS 512 AND 711.25, SHALL EXTEND VERTICALLY DOWN THE ENTIRE SIDES OF THE PRECAST CULVERT SECTIONS FOR ALL PORTIONS OF THE CULVERT WHICH SHALL BE IN CONTACT WITH THE BACKFILL. PAYMENT FOR THE MEMBRANE WATERPROOFING SHALL BE AT THE CONTRACT PRICE BID PER SQUARE YARD FOR ITEM 512 - TYPE 2 WATERPROOFING.

IF PAVEMENT IS NOT PLACED DIRECTLY ON TOP OF THE CULVERT, TYPE 2 WATERPROOFING, PER CMS 512 AND 711.25 SHALL BE APPLIED TO THE ENTIRE TOP SURFACE OF THE PRECAST CULVERT SECTIONS AND SHALL EXTEND ONE FOOT VERTICALLY DOWN THE SIDES FOR ALL PORTIONS OF THE CULVERT WHICH SHALL BE IN CONTACT WITH THE BACKFILL. PAYMENT FOR THE MEMBRANE WATERPROOFING SHALL BE AT THE CONTRACT PRICE BID PER SQUARE YARD FOR ITEM 512 - TYPE 2 WATERPROOFING.

IF PAVEMENT IS TO BE USED DIRECTLY ON TOP OF THE CULVERT, TYPE 3 WATERPROOFING, PER CMS 512 AND 711.29 SHALL BE APPLIED TO THE ENTIRE TOP SURFACE OF THE PRECAST CULVERT SECTIONS AND SHALL EXTEND ONE FOOT VERTICALLY DOWN THE SIDES FOR ALL PORTIONS OF THE CULVERT WHICH SHALL BE IN CONTACT WITH THE BACKFILL. PAYMENT FOR THE MEMBRANE WATERPROOFING SHALL BE AT THE CONTRACT PRICE BID PER SQUARE YARD FOR ITEM 512 - TYPE 3 WATERPROOFING.

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STATE OF OHIO CHAD M LEWIS 70934 REGISTERED PROFESSIONAL ENGINEER

Chad M Lewis, PE
Ohio Professional Engineer
#70934

REVISIONS:

DATE	PROJ NUMBER	ENG	PROJ MGR	CADD	COUNTY	CITY/VILLAGE/TOWNSHIP	SCALE	HORIZ DATUM	VERT DATUM
10/26/2020	30072001.30	ENGINEER	PM	CADD	SUMMIT	VILLAGE OF REMINDERVILLE	H: 1"=20' V: 1"=5'	NAD83 (2011)	NAVD88

VILLAGE OF REMINDERVILLE
CLIPPER COVE CULVERT REPLACEMENT
STRUCTURE DETAILS

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SHEET 5 of 7

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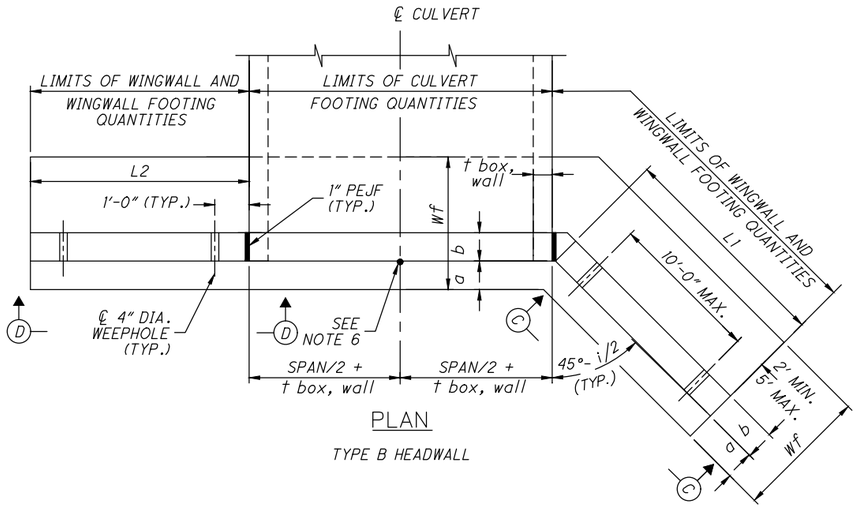
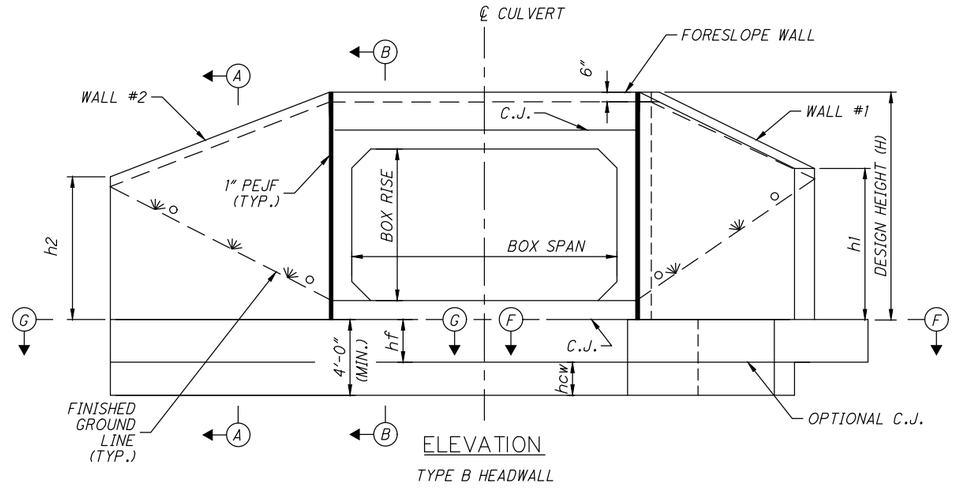


PLAN

TYPE B HEADWALL

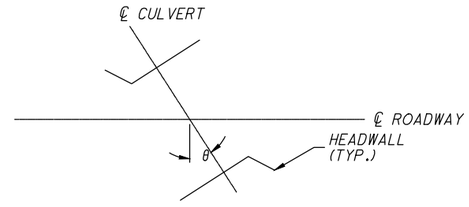


ELEVATION

TYPE B HEADWALL

LEGEND:

C.J.	CONSTRUCTION JOINT	PEJF	PREFORMED EXPANSION JOINT FILLER
℄	CENTER LINE	QTY.	QUANTITY
CLR.	CLEAR	REINF.	REINFORCING
CONC.	CONCRETE	SER.	SERIES
DIA.	DIAMETER	SHT.	SHEET
DIM.	DIMENSION	SPA.	SPACING
EXTEN.	EXTENSION	T&B	TOP AND BOTTOM
E.F.	EACH FACE	TYP.	TYPICAL
F.F.	FAR FACE		
MAX.	MAXIMUM		
MIN.	MINIMUM		
N.F.	NEAR FACE		



GEOMETRIC DIAGRAM

NOTES

1. FOR SECTIONS A-A, B-B AND F-F AND VIEW C-C, SEE SHEET 7.
2. FOR FOOTING DESIGNS, SEE SHEET 7.
3. FOR FORESLOPE WALL REINFORCING AND QUANTITIES, SEE SHEET 7.
4. POROUS BACKFILL NOT SHOWN FOR CLARITY.
5. THESE WALLS SHOULD BE USED ONLY FOR WALL CONFIGURATIONS SHOWN IN THESE STANDARDS.
6. SHOW THE STATION AND OFFSET WITH RESPECT TO THE CENTERLINE OF SURVEY ON THE PLANS.

* INCLUDES FOOTING AND CUTOFF WALL CONCRETE AND REINFORCING WITHIN THE LIMITS OF THE BOX CULVERT PER LINEAR FOOT. TO OBTAIN THE TOTAL QUANTITY, MULTIPLY THIS VALUE/FOOT BY [BOX SPAN + 2x (BOX WALL THICKNESS)].

TYPE B HEADWALL

FOR ALL VALUES OF "θ"												θ = 15° **									
DESIGN HEIGHT H	FOOTING DESIGN	FOOTING DIM.		CUTOFF WALL Ht.	DIMENSIONS		WINGWALL REINFORCING (SEE SHEET 17)					WINGWALL LENGTHS		WINGWALL HEIGHTS		WINGWALL CONC. QTY. (cy)	WINGWALL REINF. QTY. (lbs)	WINGWALL FOOTING CONC. QTY. (cy)	WINGWALL FOOTING REINF. QTY. (lbs)	CULVERT FOOTING CONC. QTY. (cy/ft)*	CULVERT FOOTING REINF. QTY. (lbs/ft)*
							"X" BAR	MAX. SPA.(in)	"Y" BAR	MAX. SPA.(in)	EXTEN. LENGTH										
		Wf	hf	hcw	a	b	SIZE	x	SIZE	y	c	L1	L2	h1	h2						
7'-6"	1	5'-6"	1'-6"	2'-6"	2'-1"	1'-0"	5	15	5	15	2'-5"	9'-11"	7'-11"	4'-6"	5'-6"	4.05	582	7.95	631	0.53	28.77

** SEE "GEOMETRIC DIAGRAM"

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PRELIMINARY NOT FOR CONSTRUCTION

Chad M Lewis, PE
Ohio Professional Engineer
#70934

REVISIONS:

DATE 10/26/2020 | PROJ NUMBER 30072010 | ENG ENGINEER | PROJ MGR PM | CADD CADD | COUNTY SUMMIT | CITY/VIL/AGE/TOWNSHIP VILLAGE OF REMINDERVILLE | H: 1"=20' | SCALE V: 1"=5' | HORIZ DATUM NAD83 (2011) | VERT DATUM NAVD88

VILLAGE OF REMINDERVILLE
CLIPPER COVE CULVERT REPLACEMENT
STRUCTURE DETAILS

SHEET 6 of 7

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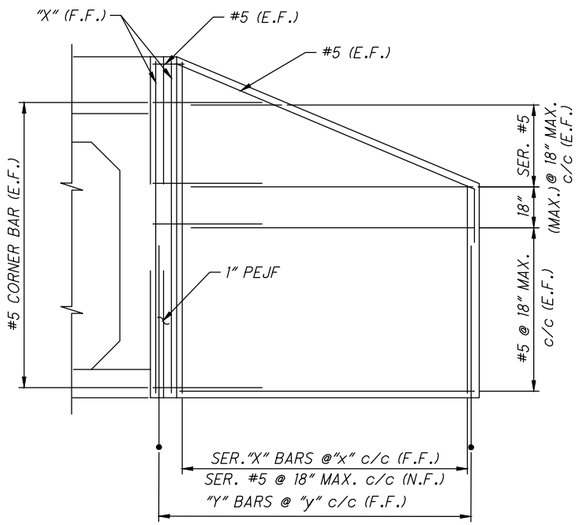
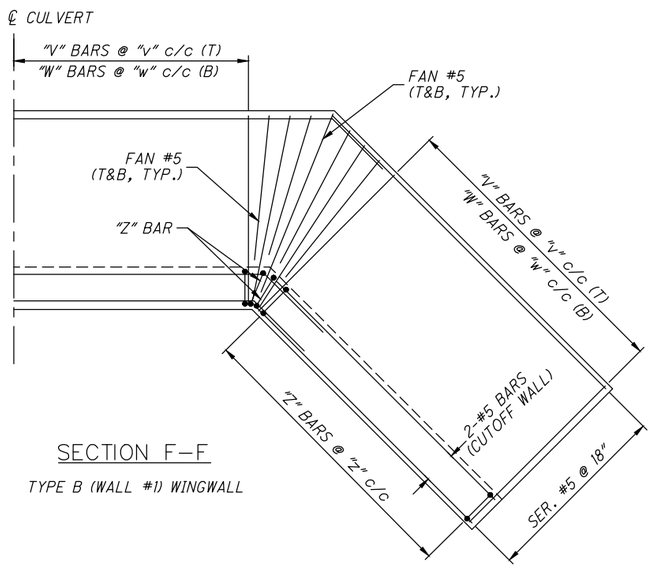


VIEW C–C

TYPE B (WINGWALL #1)



SECTION F–F

TYPE B (WALL #1) WINGWALL

TYPE B HEADWALL REINFORCING SCHEDULE

BAR MARK	NUMBER	LENGTH	WEIGHT (LBS.)	TYPE	BAR TYPE DIMENSIONS A	B	C	D	INC.
					WINGWALLS				
	1	4'- 4"							
X501	SERIES	TO	55	STR.					0'- 4 1/2"
	of 9	7'- 4"							
X502	2	7'- 4"	16	STR.					
	1	5'- 4"							
X503	SERIES	TO	53	STR.					0'- 3 1/2"
	of 8	7'- 4"							
Y501	19	4'- 0"	81	1	0'- 6"	3'- 8"			
	1	4'- 4"							
WW501	SERIES	TO	49	STR.					0'- 5 1/4"
	of 8	7'- 4"							
WW502	6	9'- 7"	60	STR.					
	2	4'- 10"							
WW503	SERIES	TO	31	STR.					4'- 9 "
	of 2	9'- 7"							
WW504	6	3'- 8"	20	2	0'- 7"	0'- 3 "	2'- 4 "	2'- 11 "	
WW505	2	12'- 5"	26	3	2'- 5"	2'- 10"	9'- 7"		
WW506	1	1'- 3"	2	8	0'- 7"	0'- 3 "			
	1	5'- 4"							
WW507	SERIES	TO	47	STR.					0'- 4 "
	of 7	7'- 4"							
WW508	8	7'- 7"	64	STR.					
	2	3'- 10"							
WW509	SERIES	TO	24	STR.					3'- 9 "
	of 2	7'- 7"							
WW510	2	10'- 3"	22	3	2'- 5"	1'- 10"	7'- 7"		
					FOOTING & CUTOFF WALL				
V501	22	5'- 2"	119	STR.					
W501	22	5'- 2"	119	STR.					
Z501	24	8'- 2"	205	5	3'- 7"	1'- 2"			
F501	6	4'- 8"	30	STR.					
F502	8	3'- 8"	31	STR.					
	2	23'- 3"			28'- 9 3/4"				
F503	SERIES	TO	256	3	TO	1'- 5 3/4"	1'- 11 1/4"		0'- 7 3/4"
	of 6	25'- 10"			23'- 4 1/4"				
	2	8'- 9"							
F504	SERIES	TO	105	STR.					0'- 7 3/4"
	of 6	11'- 4"							
	1	23'- 3"			28'- 9 3/4"				
F505	SERIES	TO	50	3	TO	1'- 5 3/4"	1'- 11 1/4"		0'- 7 "
	2	23'- 10"			21'- 4 3/4"				
	1	8'- 9"							
F506	SERIES	TO	19	STR.					0'- 7 1/8"
	2	9'- 4"							
F507	11	4'- 2"	48	1	2'- 1"	2'- 2"			
F508	2	13'- 8"	29	STR.					
					FORESLOPE WALL				
FS501	4	13'- 8"	58	STR.					
FS502	15	2'- 9"	44	5	1'- 2"	0'- 8"			
FS503	15	3'- 8"	58	7	1'- 2"	0'- 8"	2'- 1"		
		TOTAL	1,721						

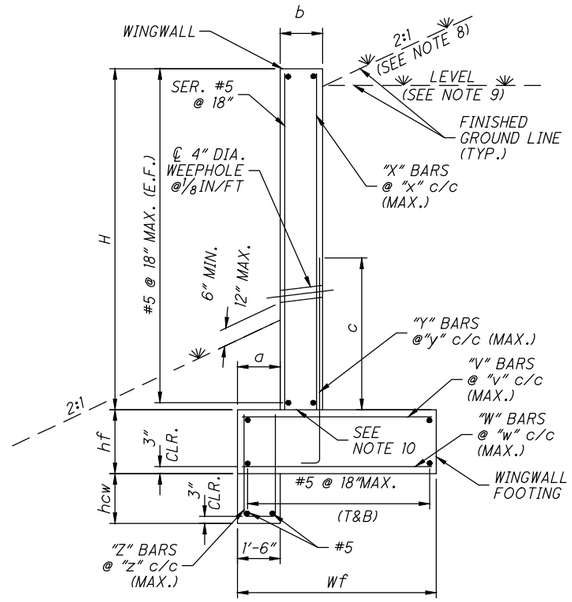
NOTES

1. FOR THE GENERAL NOTES SEE SHEET 15.
2. FOR THE LOCATIONS OF SECTIONS A-A AND B-B, SEE SHEET 16.
3. FOR THE LOCATIONS OF VIEW C-C AND SECTION F-F, SEE SHEET 16.
4. FOR SIZE AND SPACING OF "X" AND "Y" BARS SEE SHEET 16.
5. 2:1 BACKSLOPE IS FOR TYPE A WINGWALLS AND TYPE B WINGWALLS.
6. LEVEL SURFACE WITH 2 FOOT LIVE LOAD SURCHARGE IS FOR TYPE C WINGWALLS.
7. THE INTERFACE BETWEEN THE TOP OF FOOTING AND BASE OF WINGWALL STEM IS INTENTIONALLY ROUGHENED TO A FULL AMPLITUDE OF APPROXIMATELY 1/4" BY MEANS OF A SERRATED TROWEL.
8. WALL THICKNESS (t box, wall) FOR PRECAST BOX CULVERT IS AS FOLLOWS:
   SPAN = 8'-0" WALL THICKNESS = 8"
   SPAN = 10'-0" WALL THICKNESS = 10"
   SPAN > 12'-0" WALL THICKNESS = 12"
9. PAYMENT FOR REINFORCING STEEL SHALL BE INCLUDED WITH THE COSTS OF:
   ITEM 511 - CULVERT WINGWALLS, COMPLETE
   ITEM 511 - CONCRETE FOOTINGS, COMPLETE
   ITEM 511 - CONCRETE HEADWALL, COMPLETE
   ITEM 611 - 16'x4' CONDUIT, TYPE A, 706.05, AS PER PLAN

FOOTING REINFORCING				
FOOTING DESIGN	"V" BAR SIZE	MAX. SPA. (in) v	"W", "Z" BARS SIZE	MAX. SPA. (in) w, z
1	5	18	5	18

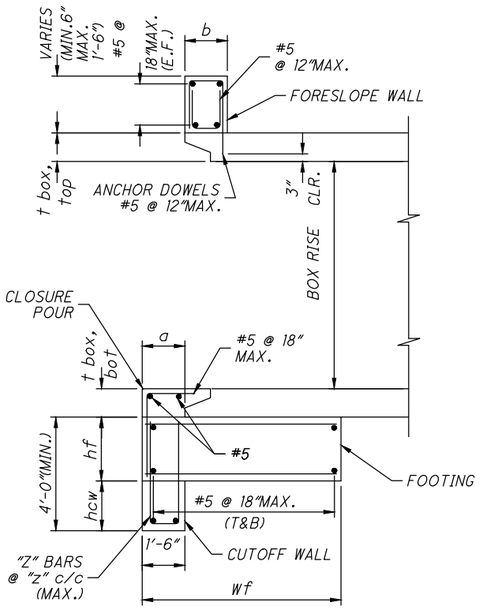
FORESLOPE WALL QUANTITIES			
WIDTH b >	HEIGHT OF FORESLOPE WALL (ft)	FORESLOPE WALL REINF. QTY. (lbs/ft)*	FORESLOPE WALL CONC. QTY. (cy/ft)*
1'-0"	1'-6"	10.87	0.06

* INCLUDES FORESLOPE WALL CONCRETE AND REINFORCING WITHIN THE LIMITS OF THE BOX CULVERT PER LINEAR FOOT. TO OBTAIN THE TOTAL QUANTITY, MULTIPLY THIS VALUE/FOOT BY [BOX SPAN + 2x (BOX WALL THICKNESS)].



SECTION A–A

(POROUS BACKFILL NOT SHOWN FOR CLARITY)



SECTION B–B

(CULVERT INLET BEVEL SHOWN)

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Chad M Lewis, PE
Ohio Professional Engineer
#70934

REVISIONS:

DATE	PROJ NUMBER	ENG	PROJ MGR	CADD	COUNTY	CITY/VILLAGE/TOWNSHIP	SCALE	HORIZ DATUM	VERT DATUM
10/26/2020	30072613	ENGINEER	PM	CADD	SUMMIT	VILLAGE OF REMINDERVILLE	H: 1"=20' V: 1"=5'	NAD83 (2011)	NAVD88

VILLAGE OF REMINDERVILLE
CLIPPER COVE CULVERT REPLACEMENT
STRUCTURE DETAILS

SHEET 7 of 7

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Appendix H

Alternatives Summary

Figure H-1 Alternatives Locations

Figure H-2 Alternatives Table

Figure H-3 Storage Locations

Figure H-4 Storage Table

Reminderville
Proposed Alternatives Overview

- Proposed Alternatives
- Hydrologic Features
- Parcels
- Municipal Boundary

N

0 800 1,600
Feet

1" = 800'

Source: Data provided by Reminderville, State of Ohio, OGRIP, and Summit County. OHM Advisors does not warrant the accuracy of the data and/or the map. This document is intended to depict the approximate spatial location of the mapped features within the Community and all use is strictly at the user's own risk.

Coordinate System: NAD 1983 StatePlane Ohio North FIPS 3401 Feet

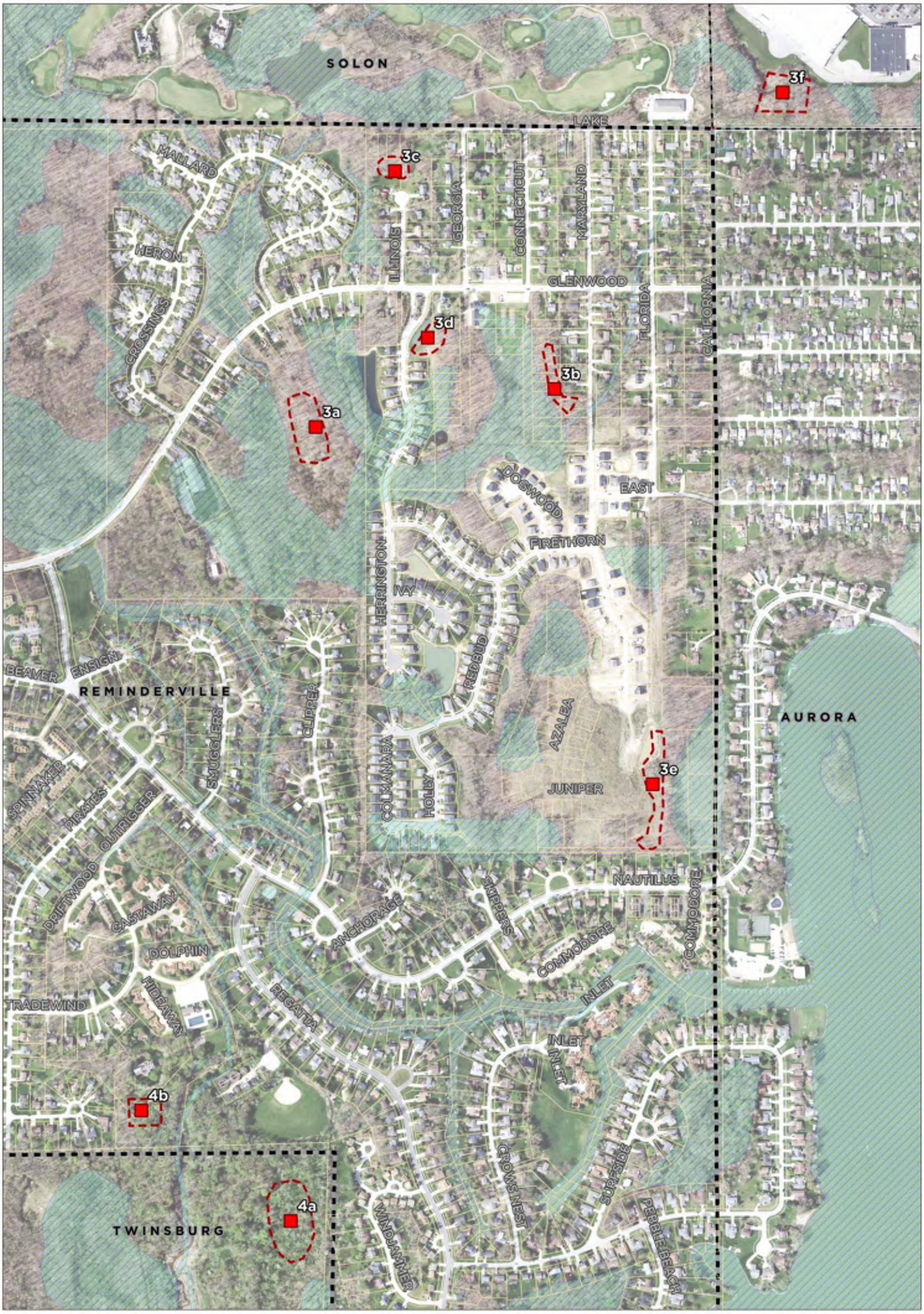
Map Published: July 6, 2021

REMINDERVILLE
A Great Place To Call Home

OHM

ID	Alternative	Description	Challenges	Cost	Level of Service Upstream of Clipper Cove							
					1 year Flood Elevation		10 year Flood		100 year Flood		Labor Day 2020	
					East Branch	North Branch	East Branch	North Branch	East Branch	North Branch	East Branch	North Branch
Quantitative Analysis												
Existing Conditions					**995.2**	**995.3**	**997.00**	**997.2**	**998.4**	**999.1**	**998.9**	**998.9**
1	Replace Clipper Cove Culvert	Replace the existing Clipper Cover Culvert with a 16 ft x 4 ft box culvert.	Shall follow state regulatory review, potential FEMA floodplain study, and permitting process, as necessary.	Preliminary estimate: $720,000	994.8 (0.4)	995.2 (0.1)	996.6 (0.4)	997.1 (0.1)	997.9 (0.5)	998.9 (0.2)	997.8 (1.1)	998.5 (0.4)
2	Regrade Pond Brook Downstream	Straighten and widen the meandering Pond Brook Creek in Liberty Park, roughly 1,500 ft of channel.	Shall contact DNR to determine feasibility if Village decides to pursue this option.	Shall estimate cost if Village decides to pursue this option.	995.2 (0)	995.3 (0)	997 (0)	997.2 (0)	998.4 (0)	999.1 (0)	998.8 (0.1)	998.8 (0.1)
3	Regional Storage Detention System - Upstream of Clipper Cove (with no modifications to Clipper Cove culvert)	Add six regional detention ponds (Herrington, Maryland North, Illinois, Georgia, Maryland, Walmart) to reduce peak flow at Clipper Cove culvert.	Requires tree removal, regulatory permits, land acquisition, significant excavation.	Planning-level cost: $1,900,000*	994.1 (1.1)	994.1 (1.2)	995.8 (1.2)	995.8 (1.4)	997 (1.4)	997 (2.1)	997 (1.9)	997 (1.9)
Combination 1 + 3	Regional Storage Detention System - Upstream of Clipper Cove (with Clipper Cove culvert replaced)	Add six regional detention ponds (#3) and replace the existing Clipper Cove culvert with a 16 ft X 4 ft box culvert (#1).	Requires tree removal, regulatory permits, land acquisition, significant excavation.	Planning-level cost: $2,600,000*	993.9 (1.3)	994 (1.3)	995.4 (1.6)	995.5 (1.7)	996.8 (1.6)	996.8 (2.3)	996.5 (2.4)	996.6 (2.3)
4	Regional Storage Detention System - Upstream and Downstream of Clipper Cove (with no modifications to Clipper Cove culvert)	Add the regional detention ponds above (#3) plus two detention ponds (Pirate and Windjammer) downstream of Clipper Cove to reduce peak flow at Clipper Cove culvert.	Requires tree removal, regulatory permits, land acquisition, significant excavation.	Planning-level cost: $2,400,000*	994 (1.2)	994.1 (1.2)	995.7 (1.3)	995.8 (1.4)	997 (1.4)	997 (2.1)	996.9 (2)	996.9 (2)
Combination 1 + 4	Regional Storage Detention System - Upstream and Downstream of Clipper Cove (with Clipper Cove culvert replaced)	Add eight regional detention ponds (#5) and replace the existing Clipper Cove culvert with a 16 ft X 4 ft box culvert.	Requires tree removal, regulatory permits, land acquisition, significant excavation.	Planning-level cost: $3,100,000*	993.9 (1.3)	994 (1.3)	995.4 (1.6)	995.5 (1.7)	996.7 (1.7)	996.8 (2.3)	996.5 (2.4)	996.5 (2.4)
5	Divert Walmart runoff to Aurora Lake in the City of Aurora	Re-route all runoff from Walmart to Aurora Lake instead of ditch system.	Requires modification to stormwater infrastructure, coordination with Bainbridge, Walmart, Homeowners Association.	Shall estimate cost if Village decides to pursue this option.	995.2 (0)	995.3 (0)	997 (0)	997.2 (0)	998.4 (0)	999.1 (0)	998.8 (0.1)	998.9 (0)
6	Divert Signature of Solon runoff to Aurora Lake in the City of Aurora	Re-route all runoff from Signature of Solon golf course to Aurora Lake instead of ditch system.	Requires modification to stormwater infrastructure, coordination with Solon, golf course, Homeowners Association.	Shall estimate cost if Village decides to pursue this option.	995 (0.2)	995.2 (0.1)	996.8 (0.2)	997 (0.2)	998 (0.4)	998.8 (0.3)	998.3 (0.6)	998.4 (0.5)
7	Install Pump Station	Install a new pump station instead of replacing Clipper Cove culvert. Pump station would be rated for 75 MGD.	Requires land acquisition, electrical service upgrades, and a pump station control facility.	Planning-level cost: $5,200,000*	994.8 (0.4)	995.2 (0.1)	996.6 (0.4)	997.1 (0.1)	997.9 (0.5)	998.9 (0.2)	997.8 (1.1)	998.5 (0.4)
8	Install Pump and Gate at Anchorage Cove	Install 35 MGD pump station and 700-ft-long gate (height at elevation 1004 ft) upstream of Clipper Cove culvert that pumps into Aurora Lake boating channel.	Shall follow state regulatory review, potential FEMA floodplain study, and permitting process, as necessary. Requires land acquisition, electrical service upgrades, and a pump station control facility. Increases flood levels north of Clipper Cove culvert.	Planning-level cost: $3,700,000*	994.6 (0.6)	995.3 (0)	995.7 (1.3)	999.5 (-2.3)	996.5 (1.9)	1003 (-3.9)	996.6 (2.3)	1002.3 (-3.4)
Combination 1 + 7 + 8	Replace Clipper Cove Culvert, Install Pump Station, and Install Gate at Anchorage Cove	Replace the existing Clipper Cover Culvert with a 16 ft x 4 ft box culvert. Install a new 35 MGD pump station and 400-ft-long gate (height at elevation 1001 ft) upstream of Clipper Cove culvert that pumps into Aurora Lake boating channel.	Shall follow state regulatory review, potential FEMA floodplain study, and permitting process, as necessary. Requires land acquisition, electrical service upgrades, and a pump station control facility. Increases flood levels north of Clipper Cove culvert.	Planning-level cost: $4,400,000*	994.6 (0.6)	995.1 (0.2)	995.7 (1.3)	997.8 (-0.6)	996.5 (1.9)	1000 (-0.9)	996.6 (2.3)	999.4 (-0.5)
Qualatitive Analysis												
9	Install Weir on Pirates Trail branch	Install weir upstream of Pirates Trail branch junction.	The FEMA floodplain boundaries would be expanded causing additional homes to be required to obtain FEMA flood plain insurance.	Not estimated.	Impact on downstream peak flows is equivalent to recommended regional detention storage areas. Regional detention storage reduces peak flows without adverse impacts to floodplain elevations.							
10	Install Weir at Liberty Ledges	Install weir in the stream between the shopping center and Liberty Ledges subdivision.	The FEMA floodplain boundaries would be expanded causing additional homes to be required to obtain FEMA flood plain insurance.	Not estimated.	Impact on downstream peak flows is equivalent to recommended regional detention storage areas. Regional detention storage reduces peak flows without adverse impacts to floodplain elevations.							
11	Install Weir at Crossings confluence	Install weir downstream of the confluence of ditches from Crossings Dr. and Signature of Solon golf course.	The FEMA floodplain boundaries would be expanded causing additional homes to be required to obtain FEMA flood plain insurance.	Not estimated.	Impact on downstream peak flows is equivalent to recommended regional detention storage areas. Regional detention storage reduces peak flows without adverse impacts to floodplain elevations.							
12	Install Backflow Gate at Glenwood Blvd.	Install a backflow gate upstream of the Crossings Dr. & Glenwood Blvd. culvert.	The FEMA floodplain boundaries would be expanded causing additional homes to be required to obtain FEMA flood plain insurance.	Not estimated.	Impact on downstream peak flows is equivalent to recommended regional detention storage areas. Regional detention storage reduces peak flows without adverse impacts to floodplain elevations.							
13	Modify Culvert at Glenwood Blvd.	Modify the culverts along Glenwood Blvd. to divert to flow to the boat channel.	The FEMA floodplain boundaries would be expanded causing additional homes to be required to obtain FEMA flood plain insurance.	Not estimated.	Impact on downstream peak flows is equivalent to recommended regional detention storage areas. Regional detention storage reduces peak flows without adverse impacts to floodplain elevations.							
14	Modify Drainage at Glenwood Blvd.	Modify drainage along Glenwood Blvd. to prevent backflow from boat channel.	The FEMA floodplain boundaries would be expanded causing additional homes to be required to obtain FEMA flood plain insurance.	Not estimated.	Impact on downstream peak flows is equivalent to recommended regional detention storage areas. Regional detention storage reduces peak flows without adverse impacts to floodplain elevations.							
15	Property Buy-Out	Purchase five homes in the lowest area near Clipper Cove culvert and regrade the area into flood storage.	Requires purchase agreements with home owners.	Planning-level cost: about $1,200,000 to purchase 5 homes	Flood elevation not modeled because storage area determined by which homes are purchased. Removes those homes from flooding risk.							

*Planning-level costs exclude land acquisition costs and operations & maintenance costs.



Alternatives
Proposed Storage
Parcels
Municipal Boundary
Wetlands

N

Reminderville
Proposed Storage Locations

0 500 1,000
Feet

1" = 500'

Source: Data provided by Reminderville, OGRIP, State of Ohio, and Summit County. OHM Advisors does not warrant the accuracy of the data and/or the map. This document is intended to depict the approximate spatial location of the mapped features within the Community and all use is strictly at the user's own risk.

Coordinate System: NAD 1983 StatePlane Ohio North FIPS 3401 Feet

Map Published: July 6, 2021

OHM

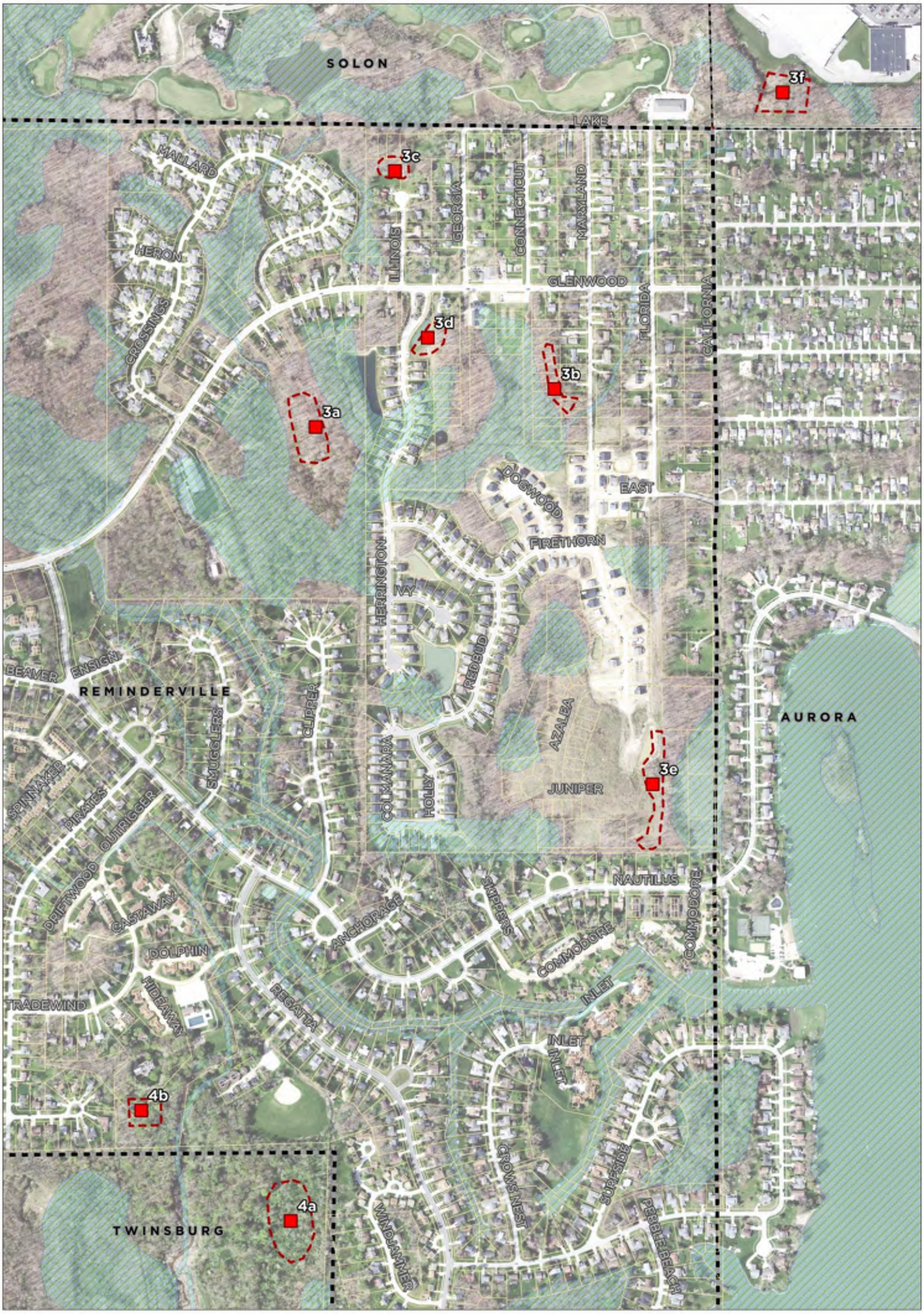
ID	Location	Footprint (ft^2)	Storage Volume (ft^3)	Outlet Elevation (ft)	Excavation Volume (yd^3)	Tree Removal	Property Acquisition
3a	Herrington	63,000	350,000	997	26,000	Significant	No
3b	Maryland North	24,000	100,000	1006	3,000	Significant	Yes
3c	Illinois	18,000	96,000	1007	4,000	Minimal	Yes
3d	Georgia	22,000	97,000	1006	4,000	Moderate	Yes
3e	Maryland	52,000	275,000	997	11,000	Moderate	Yes
3f	WalmartNew	52,000	148,000	1019	1,000	Significant	*
4a	Windjammer	93,000	181,000	992	6,000	Significant	**
4b	Pirates	29,000	115,000	991.7	4,000	Significant	Yes

*Discuss stormwater options with Bainbridge Township

**Discuss stormwater options with City of Twinsburg

ID	Alternative	Description	Challenges	Cost	Level of Service Upstream of Clipper Cove							
					1 year Flood Elevation		10 year Flood		100 year Flood		Labor Day 2020	
					East Branch	North Branch	East Branch	North Branch	East Branch	North Branch	East Branch	North Branch
Quantitative Analysis												
	Existing Conditions				**995.2**	**995.3**	**997.0**	**997.2**	**998.4**	**999.1**	**998.9**	**998.9**
1	Replace Clipper Cove Culvert	Replace the existing Clipper Cover Culvert with a 16 ft x 4 ft box culvert.	Shall follow state regulatory review, potential FEMA floodplain study, and permitting process, as necessary.	Preliminary estimate: $720,000	994.8 (0.4)	995.2 (0.1)	996.6 (0.4)	997.1 (0.1)	997.9 (0.5)	998.9 (0.2)	997.8 (1.1)	998.5 (0.4)
2	Regrade Pond Brook Downstream	Straighten and widen the meandering Pond Brook Creek in Liberty Park, roughly 1,500 ft of channel.	Shall contact DNR to determine feasibility if Village decides to pursue this option.	Shall estimate cost if Village decides to pursue this option.	995.2 (0)	995.3 (0)	997 (0)	997.2 (0)	998.4 (0)	999.1 (0)	998.8 (0.1)	998.8 (0.1)
3	Regional Storage Detention System - Upstream of Clipper Cove (with no modifications to Clipper Cove culvert)	Add six regional detention ponds (Herrington, Maryland North, Illinois, Georgia, Maryland, Walmart) to reduce peak flow at Clipper Cove culvert.	Requires tree removal, regulatory permits, land acquisition, significant excavation.	Planning-level cost: $1,900,000*	994.1 (1.1)	994.1 (1.2)	995.8 (1.2)	995.8 (1.4)	997 (1.4)	997 (2.1)	997 (1.9)	997 (1.9)
Combination 1 + 3	Regional Storage Detention System - Upstream of Clipper Cove (with Clipper Cove culvert replaced)	Add six regional detention ponds (#3) and replace the existing Clipper Cove culvert with a 16 ft X 4 ft box culvert (#1).	Requires tree removal, regulatory permits, land acquisition, significant excavation.	Planning-level cost: $2,600,000*	993.9 (1.3)	994 (1.3)	995.4 (1.6)	995.5 (1.7)	996.8 (1.6)	996.8 (2.3)	996.5 (2.4)	996.6 (2.3)
4	Regional Storage Detention System - Upstream and Downstream of Clipper Cove (with no modifications to Clipper Cove culvert)	Add the regional detention ponds above (#3) plus two detention ponds (Pirate and Windjammer) downstream of Clipper Cove to reduce peak flow at Clipper Cove culvert.	Requires tree removal, regulatory permits, land acquisition, significant excavation.	Planning-level cost: $2,400,000*	994 (1.2)	994.1 (1.2)	995.7 (1.3)	995.8 (1.4)	997 (1.4)	997 (2.1)	996.9 (2)	996.9 (2)
Combination 1 + 4	Regional Storage Detention System - Upstream and Downstream of Clipper Cove (with Clipper Cove culvert replaced)	Add eight regional detention ponds (#5) and replace the existing Clipper Cove culvert with a 16 ft X 4 ft box culvert.	Requires tree removal, regulatory permits, land acquisition, significant excavation.	Planning-level cost: $3,100,000*	993.9 (1.3)	994 (1.3)	995.4 (1.6)	995.5 (1.7)	996.7 (1.7)	996.8 (2.3)	996.5 (2.4)	996.5 (2.4)
5	Divert Walmart runoff to Aurora Lake in the City of Aurora	Re-route all runoff from Walmart to Aurora Lake instead of ditch system.	Requires modification to stormwater infrastructure, coordination with Bainbridge, Walmart, Homeowners Association.	Shall estimate cost if Village decides to pursue this option.	995.2 (0)	995.3 (0)	997 (0)	997.2 (0)	998.4 (0)	999.1 (0)	998.8 (0.1)	998.9 (0)
6	Divert Signature of Solon runoff to Aurora Lake in the City of Aurora	Re-route all runoff from Signature of Solon golf course to Aurora Lake instead of ditch system.	Requires modification to stormwater infrastructure, coordination with Solon, golf course, Homeowners Association.	Shall estimate cost if Village decides to pursue this option.	995 (0.2)	995.2 (0.1)	996.8 (0.2)	997 (0.2)	998 (0.4)	998.8 (0.3)	998.3 (0.6)	998.4 (0.5)
7	Install Pump Station	Install a new pump station instead of replacing Clipper Cove culvert. Pump station would be rated for 75 MGD.	Requires land acquisition, electrical service upgrades, and a pump station control facility.	Planning-level cost: $5,400,000*	994.8 (0.4)	995.2 (0.1)	996.6 (0.4)	997.1 (0.1)	997.9 (0.5)	998.9 (0.2)	997.8 (1.1)	998.5 (0.4)
8	Install Pump and Gate at Anchorage Cove	Install 35 MGD pump station and 700-ft-long gate (height at elevation 1004 ft) upstream of Clipper Cove culvert that pumps into Aurora Lake boating channel.	Shall follow state regulatory review, potential FEMA floodplain study, and permitting process, as necessary. Requires land acquisition, electrical service upgrades, and a pump station control facility. Increases flood levels north of Clipper Cove culvert.	Planning-level cost: $4,200,000*	994.6 (0.6)	995.3 (0)	995.7 (1.3)	999.5 (-2.3)	996.5 (1.9)	1003 (-3.9)	996.6 (2.3)	1002.3 (-3.4)
Combination 1 + 8	Replace Clipper Cove Culvert, Install Pump Station, and Install Gate at Anchorage Cove	Replace the existing Clipper Cover Culvert with a 16 ft x 4 ft box culvert. Install a new 35 MGD pump station and 400-ft-long gate (height at elevation 1001 ft) upstream of Clipper Cove culvert that pumps into Aurora Lake boating channel.	Shall follow state regulatory review, potential FEMA floodplain study, and permitting process, as necessary. Requires land acquisition, electrical service upgrades, and a pump station control facility. Increases flood levels north of Clipper Cove culvert.	Planning-level cost: $5,000,000*	994.6 (0.6)	995.1 (0.2)	995.7 (1.3)	997.8 (-0.6)	996.5 (1.9)	1000 (-0.9)	996.6 (2.3)	999.4 (-0.5)
Combination 1 + 8, small version	Replace Clipper Cove Culvert, Install Small Budget Pump Station Without Superstructure, and Install Gate at Anchorage Cove	Replace the existing Clipper Cover Culvert with a 16 ft x 4 ft box culvert. Install a new 10 MGD pump station and 400-ft-long gate (height at elevation 1001 ft) upstream of Clipper Cove culvert that pumps into Aurora Lake boating channel.	Shall follow state regulatory review, potential FEMA floodplain study, and permitting process, as necessary. Requires land acquisition, electrical service upgrades, and a pump station control facility. Increases flood levels north of Clipper Cove culvert. Extra maintenance for unprotected pump station.	Planning-level cost: $2,900,000*	995.3 (-0.1)	995.1 (0.2)	996.3 (0.7)	997.8 (-0.6)	997 (1.4)	1000 (-0.9)	997.5 (1.4)	999.4 (-0.5)
Combination 1 + 8, tiny version	Replace Clipper Cove Culvert, Install Tiny Budget Pump Station Without Superstructure, and Install Gate at Anchorage Cove	Replace the existing Clipper Cover Culvert with a 16 ft x 4 ft box culvert. Install a new 1 MGD pump station and 400-ft-long gate (height at elevation 1001 ft) upstream of Clipper Cove culvert that pumps into Aurora Lake boating channel.	Shall follow state regulatory review, potential FEMA floodplain study, and permitting process, as necessary. Requires land acquisition, electrical service upgrades, and a pump station control facility. Increases flood levels north of Clipper Cove culvert. Extra maintenance for unprotected pump station.	Planning-level cost: $2,400,000*	995.9 (-0.7)	995.1 (0.2)	996.8 (0.2)	997.8 (-0.6)	997.4 (1)	1000 (-0.9)	997.9 (1)	999.4 (-0.5)
Qualatitive Analysis												
9	Install Weir on Pirates Trail branch	Install weir upstream of Pirates Trail branch junction.	The FEMA floodplain boundaries would be expanded causing additional homes to be required to obtain FEMA flood plain insurance.	Not estimated.	Impact on downstream peak flows is equivalent to recommended regional detention storage areas. Regional detention storage reduces peak flows without adverse impacts to floodplain elevations.							
10	Install Weir at Liberty Ledges	Install weir in the stream between the shopping center and Liberty Ledges subdivision.	The FEMA floodplain boundaries would be expanded causing additional homes to be required to obtain FEMA flood plain insurance.	Not estimated.	Impact on downstream peak flows is equivalent to recommended regional detention storage areas. Regional detention storage reduces peak flows without adverse impacts to floodplain elevations.							
11	Install Weir at Crossings confluence	Install weir downstream of the confluence of ditches from Crossings Dr. and Signature of Solon golf course.	The FEMA floodplain boundaries would be expanded causing additional homes to be required to obtain FEMA flood plain insurance.	Not estimated.	Impact on downstream peak flows is equivalent to recommended regional detention storage areas. Regional detention storage reduces peak flows without adverse impacts to floodplain elevations.							
12	Install Backflow Gate at Glenwood Blvd.	Install a backflow gate upstream of the Crossings Dr. & Glenwood Blvd. culvert.	The FEMA floodplain boundaries would be expanded causing additional homes to be required to obtain FEMA flood plain insurance.	Not estimated.	Impact on downstream peak flows is equivalent to recommended regional detention storage areas. Regional detention storage reduces peak flows without adverse impacts to floodplain elevations.							
13	Modify Culvert at Glenwood Blvd.	Modify the culverts along Glenwood Blvd. to divert to flow to the boat channel.	The FEMA floodplain boundaries would be expanded causing additional homes to be required to obtain FEMA flood plain insurance.	Not estimated.	Impact on downstream peak flows is equivalent to recommended regional detention storage areas. Regional detention storage reduces peak flows without adverse impacts to floodplain elevations.							
14	Modify Drainage at Glenwood Blvd.	Modify drainage along Glenwood Blvd. to prevent backflow from boat channel.	The FEMA floodplain boundaries would be expanded causing additional homes to be required to obtain FEMA flood plain insurance.	Not estimated.	Impact on downstream peak flows is equivalent to recommended regional detention storage areas. Regional detention storage reduces peak flows without adverse impacts to floodplain elevations.							
15	Property Buy-Out	Purchase five homes in the lowest area near Clipper Cove culvert and regrade the area into flood storage.	Requires purchase agreements with home owners.	Planning-level cost: about $1,200,000 to purchase 5 homes	Flood elevation not modeled because storage area determined by which homes are purchased. Removes those homes from flooding risk.							

*Planning-level costs exclude land acquisition costs and operations & maintenance costs.



Alternatives
Proposed Storage
Parcels
Municipal Boundary
Wetlands

N

Reminderville
Proposed Storage Locations

0 500 1,000
Feet

1" = 500'

Source: Data provided by Reminderville, OGRIP, State of Ohio, and Summit County. OHM Advisors does not warrant the accuracy of the data and/or the map. This document is intended to depict the approximate spatial location of the mapped features within the Community and all use is strictly at the user's own risk.

Coordinate System: NAD 1983 StatePlane Ohio North FIPS 3401 Feet

Map Published: July 6, 2021

OHM

ID	Location	Footprint (ft^2)	Storage Volume (ft^3)	Outlet Elevation (ft)	Excavation Volume (yd^3)	Tree Removal	Property Acquisition
3a	Herrington	63,000	350,000	997	26,000	Significant	No
3b	Maryland North	24,000	100,000	1006	3,000	Significant	Yes
3c	Illinois	18,000	96,000	1007	4,000	Minimal	Yes
3d	Georgia	22,000	97,000	1006	4,000	Moderate	Yes
3e	Maryland	52,000	275,000	997	11,000	Moderate	Yes
3f	WalmartNew	52,000	148,000	1019	1,000	Significant	*
4a	Windjammer	93,000	181,000	992	6,000	Significant	**
4b	Pirates	29,000	115,000	991.7	4,000	Significant	Yes

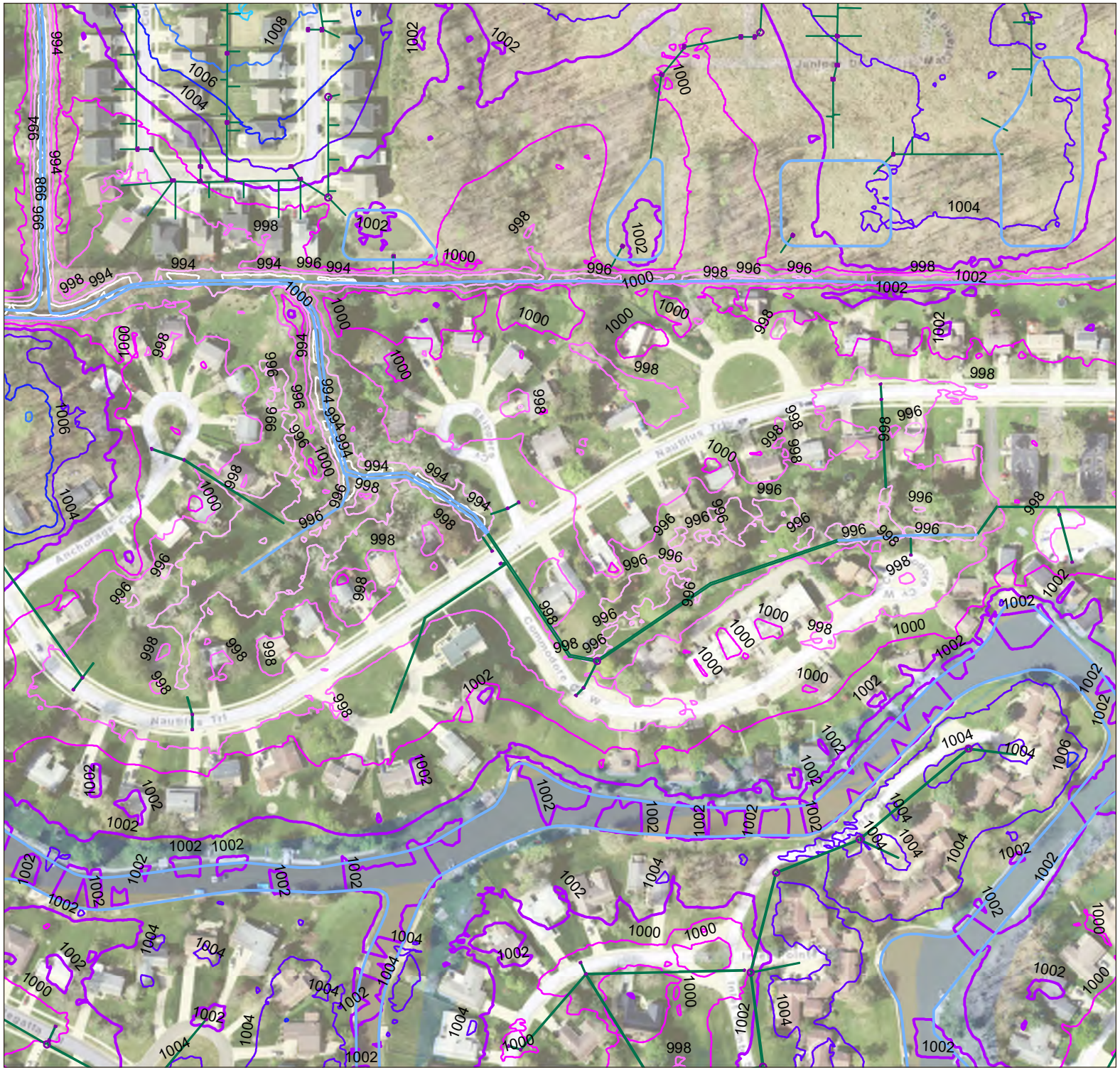
*Discuss stormwater options with Bainbridge Township

**Discuss stormwater options with City of Twinsburg

Appendix I

Properties at Lowest Elevation

Figure I-1 Anchorage Cove and Skippers Cove Elevation Contours



Appendix I
Figure I-1
Reminderville
Anchorage Cove & Skippers Cove
Elevation Contours

- Other Storm Infrastructure
- Hydrologic Features
- Storm Sewer Appurtenances
- Storm Sewer

Contours

- 992 - 994
- 994 - 996
- 996 - 998
- 998 - 1000
- 1000 - 1002
- 1002 - 1004
- 1004 - 1006
- 1006 - 1008
- 1008 - 1010

N

0 100 200

Feet

1" = 216 '

Source: Data provided by /INSERT DATA SOURCE\. OHM Advisors does not warrant the accuracy of the data and/or the map. This document is intended to depict the approximate spatial location of the mapped features within the Community and all use is strictly at the user's own risk.

Coordinate System: NAD 1983 StatePlane Ohio North FIPS 3401 Feet

Map Published: May 25, 2021

OHM

Appendix J

Drainage Maintenance Ordinance

Figure J-1 Codified Ordinances of Reminderville

CODIFIED ORDINANCES

OF

REMINDERVILLE, OHIO

Local legislation current through June 23, 2020
State legislation current through March 27, 2020

DISCLAIMER

The Codified Ordinances and other documents that appear in this FOLIO Infobase may not reflect the most current legislation adopted by the Municipality. The Codified Ordinances are provided for informational purposes only and should not be relied upon as the definitive authority for local legislation. Additionally, the formatting and pagination of the posted documents vary from the formatting and pagination of the official copy. The official printed copy of the Codified Ordinances should be consulted prior to any action being taken.

For further information regarding the official version of any portion of the Codified Ordinances in this FOLIO Infobase, please contact the Municipality directly.

CERTIFICATION

We, Samuel Alonso, Mayor and Deborah Wordell, Fiscal Officer, of Reminderville, Ohio, pursuant to Ohio Revised Code 731.23 and 731.42, hereby certify that the general and permanent ordinances of the Village of Reminderville, Ohio, as revised, rearranged, compiled, renumbered as to sections, codified and printed herewith in component codes are correctly set forth and constitute the Codified Ordinances of Reminderville, Ohio, 1986, as amended to June 23, 2020.

/s/ Samuel Alonso
Mayor

/s/ Deborah Wordell
Fiscal Officer

Codified, edited and prepared for
publication by
THE WALTER H. DRANE COMPANY
Cleveland, Ohio
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The Walter H. Drane Company
REMINDERVILLE, OHIO

521.12 REMOVAL OF WATERCOURSE OBSTRUCTIONS.

(a) Removal of Watercourse Obstruction When Not Within an Easement or Right-of- Way.

(1) Council shall, by resolution, direct property owners to remove obstructions from culverts, drains, or private property, laid in any natural watercourse, creek, brook, branch, or drainage ditch not contained within an easement or right-of-way, and if necessary enlarge such culverts or covered drains to meet the requirements thereof.

(2) Following service of a copy of such resolution, or after publication thereof, in a newspaper of general circulation in the Village, for two consecutive weeks, such owner, or his agent or attorney, shall comply with the direction of the resolution within the time therein specified.

(3) In the event of the failure or refusal of such property owner to comply with the resolution, the work required thereby may, at the discretion of Council, be done at the expense of the Village and the amount of money so expended shall be recovered from the owner before any court of competent jurisdiction. Such expense from the time of the adoption of the resolution shall be a lien on such property, which may be enforced by suit in the Court of Common Pleas, and like proceedings may be had as directed in relation to the improvement of streets.

(b) Removal of Watercourse Obstructions When Within an Easement or Right-of Way.

(1) The Village may, at the discretion of Council, remove all obstructions from culverts, drains, or private property, laid in any natural watercourse, creek, brook, branch, or drainage ditch contained within an easement or right-of-way, which obstructs the water naturally flowing therein, causing it to flow back or become stagnant, in a way prejudicial to the health, welfare or safety of any citizen of the Village.

(2) In the event such culverts, drains, or watercourses are of insufficient capacity, the Village may, at the discretion of Council, make them of such capacity as reasonable to accommodate the flow of such water at all times.

(Ord. 3-2000. Passed 2-22-00.)

Source: https://codelibrary.amlegal.com/codes/reminderville/latest/reminderville_oh/0-0-0-8307

Appendix K

Pump Station Cost Opinion

Figure K-1 Pump Station Cost Opinion, 75 MGD

Figure K-2 Pump Station Cost Opinion, 35 MGD

Figure K-3 Pump Station Cost Opinion, 10 MGD

Figure K-4 Pump Station Cost Opinion, 1 MGD

Project Summary
Engineer's Opinion of Probable Project Costs

Owner:	**Village of Reminderville**	**Date:**	**9/7/2021**
Project:	**Clipper Cove Flooding Study/Preliminary Engineering**	**Project No.**	**3007-21-0040**
Work:	Pump station facility to handle stormwater runoff that includes 3-phase	**Prepared By:**	
	electrical service, a permanent backup power generator, manual screening,	**Reviewer:**	
	VFDs, multiple pumps, a wet well, force main and SCADA.	**Current ENR (July 2021):**	**12,237**

Item No.	Item Description - 75 MGD	Est. Quantity	Unit	Unit Price	Total Cost
1	Vertical Mix Flow Pump and Motor, 18,000 GPM @ 25' TDH	4	EA	$300,000	$1,200,000
2	Force Main, 36-Inch	200	FT	$322	$64,400
3	Process Piping, Fittings, Valves, 30-inch	1	LS	$1,280,000	$1,280,000
4	Manual Bar Screens, 30-inch	1	LS	$300,000	$300,000
5	Pump Station Buiding with Brick Façade	1	LS	$200,000	$200,000
6	20'x15'x20' Concrete Wet Well	1	LS	$90,000	$90,000
7	Supply 3-Phase Electrical Service to Site	1	LS	$30,000	$30,000
8	Electrical Service Panel	1	LS	$35,000	$35,000
9	Permanent Backup Power Generator, 600 KW Diesel	1	LS	$200,000	$200,000
10	150 Hp Pump VFD	4	EA	$30,000	$120,000
12	HVAC Allowance	1	LS	$100,000	$100,000
13	SCADA Allowance	1	LS	$100,000	$100,000
				CONSTRUCTION TOTAL:	**$3,800,000**
	Planning & Contingencies		40%		$1,520,000
				ENGINEER'S OPINION OF TOTAL PROJECT COST:	**$5,400,000.00**

Project Summary
Engineer's Opinion of Probable Project Costs

Owner:	**Village of Reminderville**	**Date:**	**9/7/2021**
Project:	**Clipper Cove Flooding Study/Preliminary Engineering**	**Project No.**	**3007-21-0040**
Work:	Pump station facility to handle stormwater runoff that includes 3-phase	**Prepared By:**	
	electrical service, a permanent backup power generator, manual screening,	**Reviewer:**	
	VFDs, multiple pumps, a wet well, force main and SCADA.	**Current ENR (July 2021):**	**12,237**

Item No.	Item Description - 35 MGD	Est. Quantity	Unit	Unit Price	Total Cost
1	Vertical Mix Flow Pump and Motor, 8,000 GPM @ 25' TDH	4	EA	$148,000	$592,000
2	Force Main, 30-Inch	200	FT	$260	$52,000
3	Process Piping, Fittings, Valves, 30-inch	1	LS	$960,000	$960,000
4	Manual Bar Screens, 30-inch	1	LS	$250,000	$250,000
5	Pump Station Buiding with Brick Façade	1	LS	$200,000	$200,000
6	20'x15'x20' Concrete Wet Well	1	LS	$90,000	$90,000
7	Supply 3-Phase Electrical Service to Site	1	LS	$30,000	$30,000
8	Electrical Service Panel	1	LS	$35,000	$35,000
9	Permanent Backup Power Generator, less power	1	LS	$112,000	$112,000
10	VFD, less power	4	EA	$16,800	$67,200
12	HVAC Allowance	1	LS	$100,000	$100,000
13	SCADA Allowance	1	LS	$100,000	$100,000
				CONSTRUCTION TOTAL:	**$2,600,000**
	Planning & Contingencies		40%		$1,040,000
				ENGINEER'S OPINION OF TOTAL PROJECT COST:	**$3,700,000.00**

Project Summary
Engineer's Opinion of Probable Project Costs

Owner:	**Village of Reminderville**	**Date:**	**9/7/2021**
Project:	**Clipper Cove Flooding Study/Preliminary Engineering**	**Project No.**	**3007-21-0040**
Work:	Small Budget pump station facility to handle stormwater runoff without	**Prepared By:**	
	superstructure that includes 3-phase electrical service, manual screening,	**Reviewer:**	
	VFDs, multiple pumps, a wet well, force main and SCADA.	**Current ENR (July 2021):**	**12,237**

Item No.	Item Description - 10 MGD	Est. Quantity	Unit	Unit Price	Total Cost
1	Vertical Mix Flow Pump and Motor, 2,500 GPM @ 25' TDH	2	EA	$39,000	$78,000
2	Force Main, 18-Inch	200	FT	$162	$32,400
3	Process Piping, Fittings, Valves, 18-inch, half the piping	1	LS	$320,000	$320,000
4	Manual Bar Screens, 18-inch	1	LS	$150,000	$150,000
5	Remove superstructure	1	LS	$140,000	$140,000
6	20'x15'x20' Concrete Wet Well	1	LS	$90,000	$90,000
7	Supply 3-Phase Electrical Service to Site	1	LS	$30,000	$30,000
8	Upgrade MCC	1	LS	$50,000	$50,000
9	Remove Permanent Backup Power Generator	0	LS	$37,333	$0
10	VFD, less power but outside	2	EA	$25,600	$51,200
12	Remove HVAC Allowance	0	LS	$100,000	$0
13	SCADA Allowance	1	LS	$100,000	$100,000
				CONSTRUCTION TOTAL:	**$1,100,000**
	Planning & Contingencies		40%		$440,000
				ENGINEER'S OPINION OF TOTAL PROJECT COST:	**$1,600,000.00**

Project Summary
Engineer's Opinion of Probable Project Costs

Owner:	**Village of Reminderville**	**Date:**	**9/7/2021**
Project:	**Clipper Cove Flooding Study/Preliminary Engineering**	**Project No.**	**3007-21-0040**
Work:	Tiny Budget pump station facility to handle stormwater runoff without superstructure that includes 3-phase electrical service, manual screening, VFDs, multiple pumps, a wet well, force main and SCADA.	**Prepared By:**	
		Reviewer:	
		Current ENR (July 2021):	**12,237**

Item No.	Item Description - 1 MGD	Est. Quantity	Unit	Unit Price	Total Cost
1	Vertical Mix Flow Pump and Motor, 700 GPM @ 25' TDH	2	EA	$10,000	$20,000
2	Force Main, 12-Inch	200	FT	$91	$18,200
3	Process Piping, Fittings, Valves, 12-inch, half the piping	1	LS	$170,000	$170,000
4	Manual Bar Screens, 12-inch	1	LS	$100,000	$100,000
5	Remove superstructure	1	LS	$140,000	$140,000
6	20'x15'x20' Concrete Wet Well	1	LS	$90,000	$90,000
7	Supply 3-Phase Electrical Service to Site	1	LS	$30,000	$30,000
8	Upgrade MCC	1	LS	$50,000	$50,000
9	Remove Permanent Backup Power Generator	0	LS	$10,000	$0
10	Less power but outside	2	EA	$21,500	$43,000
12	Remove HVAC Allowance	0	LS	$100,000	$0
13	SCADA Allowance	1	LS	$100,000	$100,000
				CONSTRUCTION TOTAL:	**$800,000**
	Planning & Contingencies		40%		$320,000
				ENGINEER'S OPINION OF TOTAL PROJECT COST:	**$1,200,000.00**