

## THE MEADOWS

### AT HAWTHORNE MILL

A SINGLE FAMILY DEVELOPMENT
SUPERIOR TOWNSHIP, WASHTENAW COUNTY, MICHIGAN
PRELIMINARY SITE PLAN

# VREELAND RD VREELAND RD GEDDES RD GEDDES RD GEDDES RD GEDDES RD GEDDES RD GEDDES RD CLARK RD MI-17 VICINITY MAP NOT TO SCALE

# VICINITY MAP NOT TO SCALE VICINITY MAP SHEET SHEET LIST PERSONS. COPYRIGHT © 2020 ATWELL REPRODUCTION SHALL BE WITHOUT THE PRIOR WE CONSENT OF ATWELL ON THE PRIOR WE CONSENT OF ATWELL

#### PROJECT CONTACTS

#### OWNER/DEVELOPER / APPLICANT

EYDE COMPANY
2947 EYDE PARKWAY, SUITE 200
EAST LANSING, MICHIGAN 48823
CONTACT: SAMUAL EYDE
PHONE: (517) 351-2480

#### CIVIL ENGINEER

ATWELL, LLC TWO TOWNE SQUARE, SUITE 700 SOUTHFIELD, MICHIGAN 48076 CONTACT: JARED KIME PHONE: (248) 447-2000

#### LEGAL DESCRIPTION

EXHIBIT "A" PROPERTY DESCRIPTION PER COMMITMENT FOR TITLE INSURANCE ISSUED BY WFG NATIONAL TITLE INSURANCE COMPANY, ISSUING AGENT: DIVERSIFIED NATIONAL TITLE AGENCY, LLC, COMMITMENT NUMBER: 19-4464, COMMITMENT DATE: 12/11/2019:

#### PROPERTY 17

A PART OF THE NORTHWEST 114 OF SECTION 33, TOWN 2 SOUTH, RANGE 7 EAST, SUPERIOR TOWNSHIP, WASHTENAW COUNTY, MICHIGAN, BEING MORE PARTICULARLY DESCRIBED AS: COMMENCING AT THE NORTH 1/4 CORNER OF SAID SECTION 33 FOR A POINT OF BEGINNING; THENCE SOUTH 00 DEGREES 19 MINUTES 48 SECONDS EAST 2659.09 FEET ALONG THE NORTH AND SOUTH 1/4 LINE TO THE CENTER OF SAID SECTION 33; THENCE NORTH 89 DEGREES 55 MINUTES 54 SECONDS WEST 1344. 77 FEET ALONG THE EAST AND WEST 1/4 LINE OF SAID SECTION 33; THENCE NORTH 00 DEGREES 01 MINUTE 27 SECONDS WEST 2657.44 FEET ALONG THE WEST LINE OF THE EAST 112 OF THE NORTHWEST 114 TO THE NORTH LINE OF SAID SECTION 33; THENCE EAST 326.30 FEET ALONG THE NORTH LINE OF SAID SECTION 33; THENCE EAST 326.30 FEET ALONG THE NORTH LINE OF SAID SECTION 30 DEGREES 00 MINUTES 29 SECONDS EAST 725.92 FEET; THENCE NORTH 89 DEGREES 59 MINUTES 45 SECONDS EAST 599.99 FEET; THENCE NORTH 00 DEGREES 00 MINUTES 10 SECONDS WEST 725.88 FEET (PREVIOUSLY RECORDED NORTH 726.00 FEET) TO THE NORTH LINE OF SAID SECTION 33; THENCE EAST 404.20 FEET ALONG THE NORTH LINE OF SAID SECTION 33 TO THE POINT OF BEGINNING.

#### ALSO DESCRIBED BY SURVEY AS FOLLOWS:

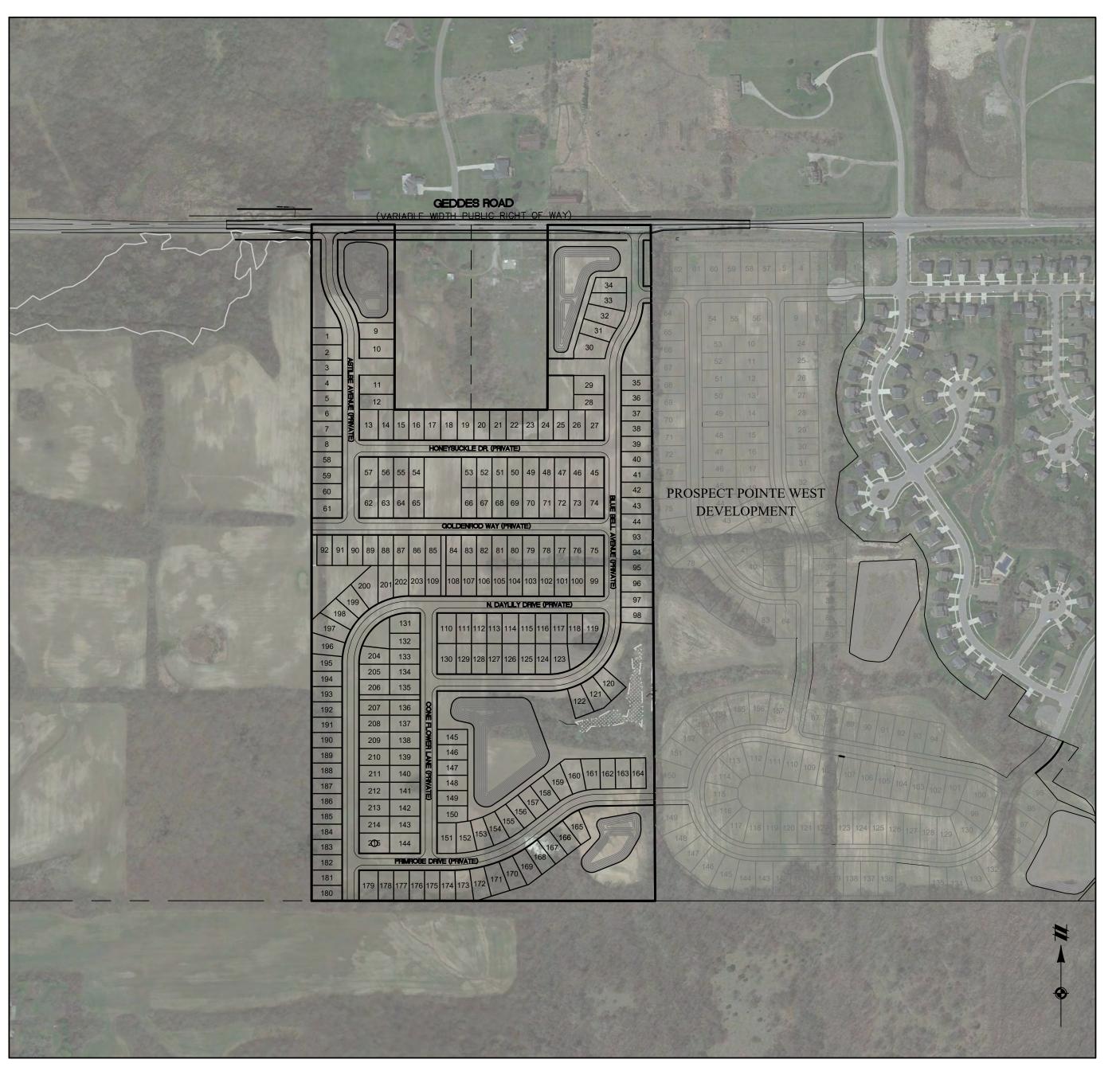
BEGINNING AT THE NORTH 114 CORNER OF SECTION 33, TOWN 2 SOUTH, RANGE 7 EAST, SUPERIOR TOWNSHIP, WASHTENAW COUNTY, MICHIGAN; THENCE SOUTH 02 DEGREES 42 MINUTES 24 SECONDS EAST 2652.38 FEET (RECORDED AS SOUTH OO DEGREES 19 MINUTES 48 SECONDS EAST 2659.09 FEET) ALONG THE NORTH-SOUTH 1/4 LINE OF SAID SECTION; THENCE SOUTH 87 DEGREES 41 MINUTES 15 SECONDS WEST 1348.00 FEET (RECORDED AS SOUTH 89 DEGREES 55 MINUTES 54 SECONDS WEST 1344, 77 FEET) ALONG THE EASTWEST 114 LINE OF SAID SECTION 33; THENCE NORTH 02 DEGREES 19 MINUTES 48 SECONDS WEST 2654.07 FEET (RECORDED AS NORTH 00 DEGREES 01 MINUTE 27 SECONDS WEST 2657.44 FEET) ALONG THE WEST LINE OF THE EAST 112 OF THE NORTHWEST 114 OF SAID SECTION 33; THENCE NORTH 87 DEGREES 45 MINUTES 47 SECONDS EAST 326.37 FEET (RECORDED AS EAST 326.30 FEET) ALONG THE NORTH LINE OF SAID SECTION 33 AND THE CENTERLINE OF GEDDES ROAD (66.00 FEET WIDE); THENCE SOUTH 02 DEGREES 14 MINUTES 13 SECONDS EAST 726.00 FEET (RECORDED AS SOUTH OO DEGREES 00 MINUTES 29 SECONDS EAST 725.92 FEET); THENCE NORTH 87 DEGREES 45 MINUTES 47 SECONDS EAST 600.00 FEET (RECORDED AS NORTH 89 DEGREES 59 MINUTES 45 SECONDS EAST 599.99 FEET); THENCE NORTH 02 DEGREES 14 MINUTES 13 SECONDS WEST 726.00 FEET (RECORDED AS NORTH 00 DEGREES 00 MINUTES 10 SECONDS WEST 725.88 FEET); THENCE NORTH 87 DEGREES 45 MINUTES 47 SECONDS EAST 404.20 FEET (RECORDED AS EAST) ALONG THE NORTH SECTION LINE OF SAID SECTION 33 AND THE CENTERLINE OF SAID GEDDES ROAD TO THE POINT OF BEGINNING.

#### PROJECT NARRATIVE

THE MEADOWS AT HAWTHORNE MILL IS A PROPOSED RESIDENTIAL SITE CONDOMINIUM CONSISTING OF 215 SINGLE FAMILY HOMES ON APPROXIMATELY 71 ACRES OF LAND. THIS PARCEL OF LAND WAS PREVIOUSLY APPROVED FOR A VERY SIMILAR RESIDENTIAL DEVELOPMENT IN 2004 BUT CONSTRUCTION NEVER COMMENCED BECAUSE OF THE RECESSION AND ALL OF THE PREVIOUS ENTITLEMENTS AND PERMITS HAVE SINCE EXPIRED. EYDE DEVELOPMENT, A MICHIGAN FAMILY OWNED DEVELOPMENT COMPANY, IS AIMING TO COMMENCE CONSTRUCTION ON THE MEADOWS IN THE SPRING OF 2021. THE SITE IS BEING DESIGNED WITH PRIVATE ROADS THAT WILL PROVIDE MULTIPLE ACCESS POINTS TO GEDDES ROAD, CONNECT TO THE CURRENTLY PROPOSED PROSPECT POINTE WEST DEVELOPMENT AND PROVIDE STUBS FOR FUTURE DEVELOPMENT TO THE SOUTH AND EAST.

THE SITE DOES CONTAIN NATURAL FEATURES WITH TWO EGLE REGULATED STREAM BEDS AND 0.49 ACRES OF REGULATED WETLANDS PROPOSED TO BE PRESERVED AS PART OF THE DEVELOPMENT. 17.09 ACRES OF OPEN SPACE IS PROPOSED THAT INCLUDE PRESERVATION OF 155 REGULATED TREES. A PASSIVE TRAIL SYSTEM IS DESIGNED TO MEANDER THROUGHOUT THE NATURAL OPEN AREAS AND CONNECT INTO THE DEVELOPMENTS SIDEWALK SYSTEM AS WELL AS 4 POCKET PARKS LOCATED THROUGHOUT THE DEVELOPMENT.

THE PROPOSED DEVELOPMENT WILL BE SERVICED WITH PUBLIC UTILITIES. SEWER WILL CONNECT FROM LEFORGE ROAD AND THE PROSPECT POINTE DEVELOPMENT AND WATER WILL BE LOOPED THROUGHOUT THE DEVELOPMENT FROM GEDDES ROAD. STORMWATER MANAGEMENT WILL BE HANDLED WITH 4 PROPOSED DETENTION PONDS LOCATED THROUGHOUT THE DEVELOPMENT.



OVERALL DEVELOPMENT MAP

SCALE: 1" = 300'

Sheet Number	Sheet Title
1	COVER SHEET
2	OVERALL EXISTING CONDITIONS
3	EXISTING CONDITIONS - NORTH
4	EXISTING CONDITIONS - SOUTH
5	NATURAL FEATURES PLAN
6	OVERALL LAYOUT PLAN
7	LAYOUT PLAN - NORTH
8	LAYOUT PLAN - SOUTH
9	OVERALL UTILITY PLAN
10	UTILITY PLAN - NORTH
11	UTILITY PLAN - SOUTH
12	STORM WATER MANAGEMENT PLAN
13	STORM WATER MANAGEMENT CALCULATIONS
14	LANDSCAPE PLAN
15	DETAILS

#### SITE DATA

GROSS AREA: GEDDES ROAD ROW: NET AREA:

EXISTING ZONING: PROPOSED ZONING:

NUMBER OF PROPOSED LOTS:

PROPOSED DENSITY (GROSS):
PROPOSED DENSITY (NET):
MIN. LOT AREA PER DWELLING UNIT:

MINIMUM LOT WIDTH:

LOT SETBACKS: FRONT-SIDE-REAR-

PROPOSED GENERAL COMMON ELEMENT (G.C.E.):

WETLAND IMPACTS: REGULATED NON-REGULATED 25' 6' MIN. (16' TOTAL)

**71.57 ACRES** 

0.55 ACRES

215 LOTS

3.00

3.03

60'

71.02 ACRES

PC (PLANNED COMMUNITY)

PC (PLANNED COMMUNITY)

 $60' \times 120' = 7,200 \text{ SF (TYPICAL)}$ 

17.09 ACRES

0.44 ACRES 0.36 ACRES

REVISIONS

N/A

DRAWN BY: KS

CHECKED BY: JK

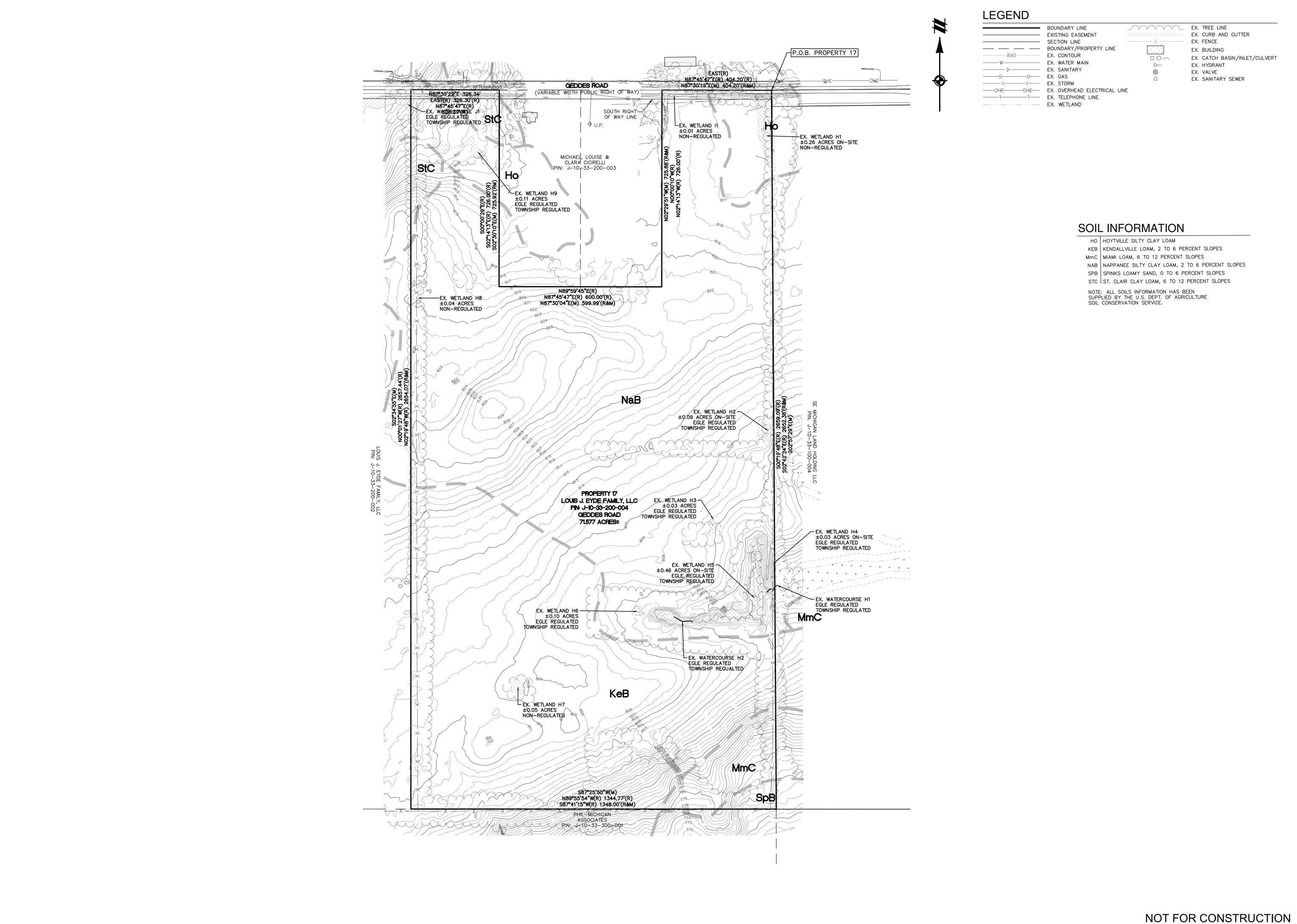
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JOB #: 19004443

FILE CODE: -

NOT FOR CONSTRUCTION

AUG. 26, 2020 2020-09-29 PER TWP



\_\_\_\_\_ EX. TREE LINE EX. CURB AND GUTTER EX. FENCE EX. BUILDING EX. CATCH BASIN/INLET/CULVERT EX. HYDRANT EX. VALVE EX. SANITARY SEWER

- KEB KENDALLVILLE LOAM, 2 TO 6 PERCENT SLOPES
- MmC MIAMI LOAM, 6 TO 12 PERCENT SLOPES
- NAB NAPPANEE SILTY CLAY LOAM, 2 TO 6 PERCENT SLOPES
- SPB SPINKS LOAMY SAND, 0 TO 6 PERCENT SLOPES
- STC ST. CLAIR CLAY LOAM, 6 TO 12 PERCENT SLOPES

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EYDE COMPANY

: MEADOWS AT HAWTHORNE I

PRELIMINARY SITE PLAN

OVERALL EXISTING

CONDITIONS

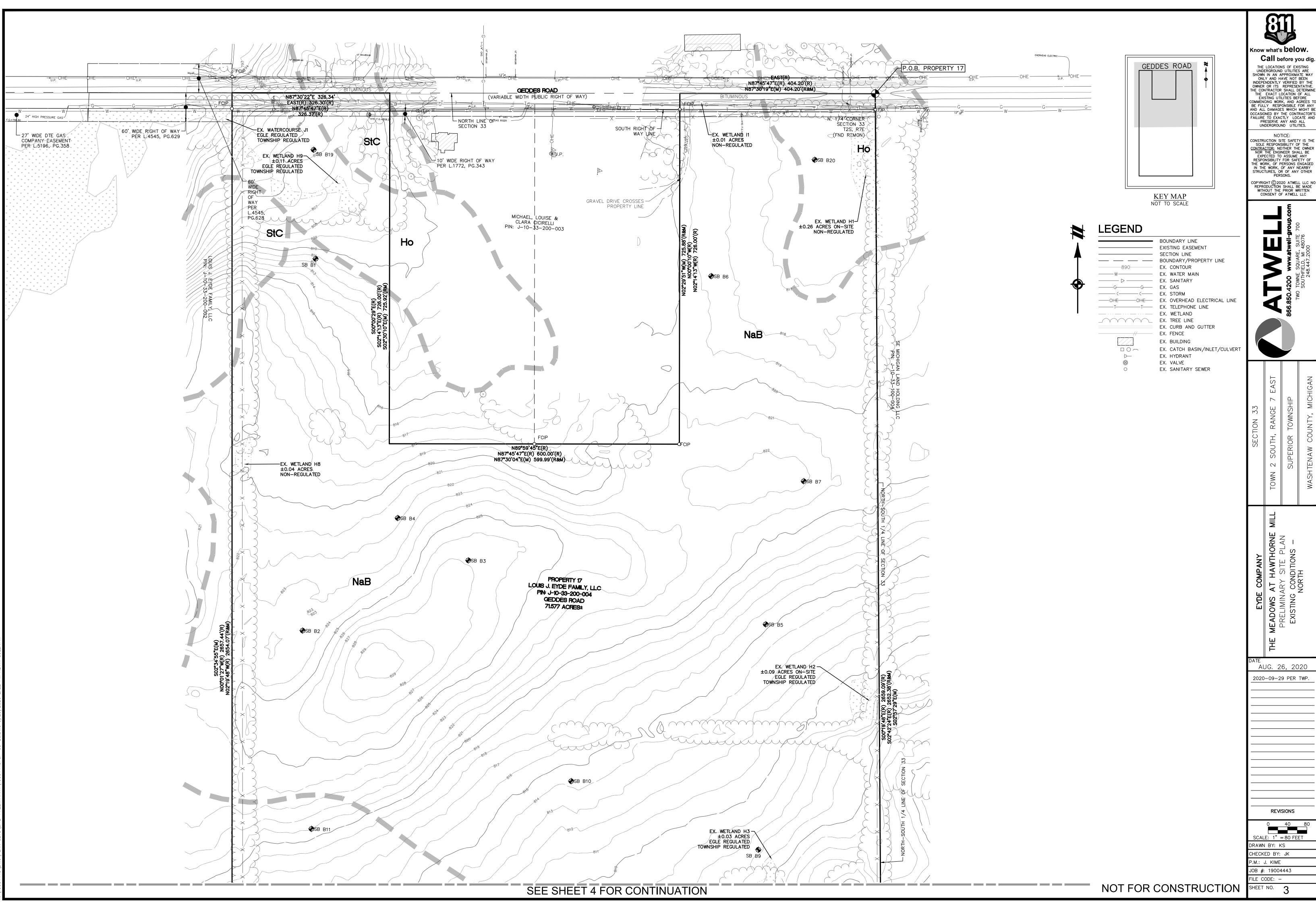
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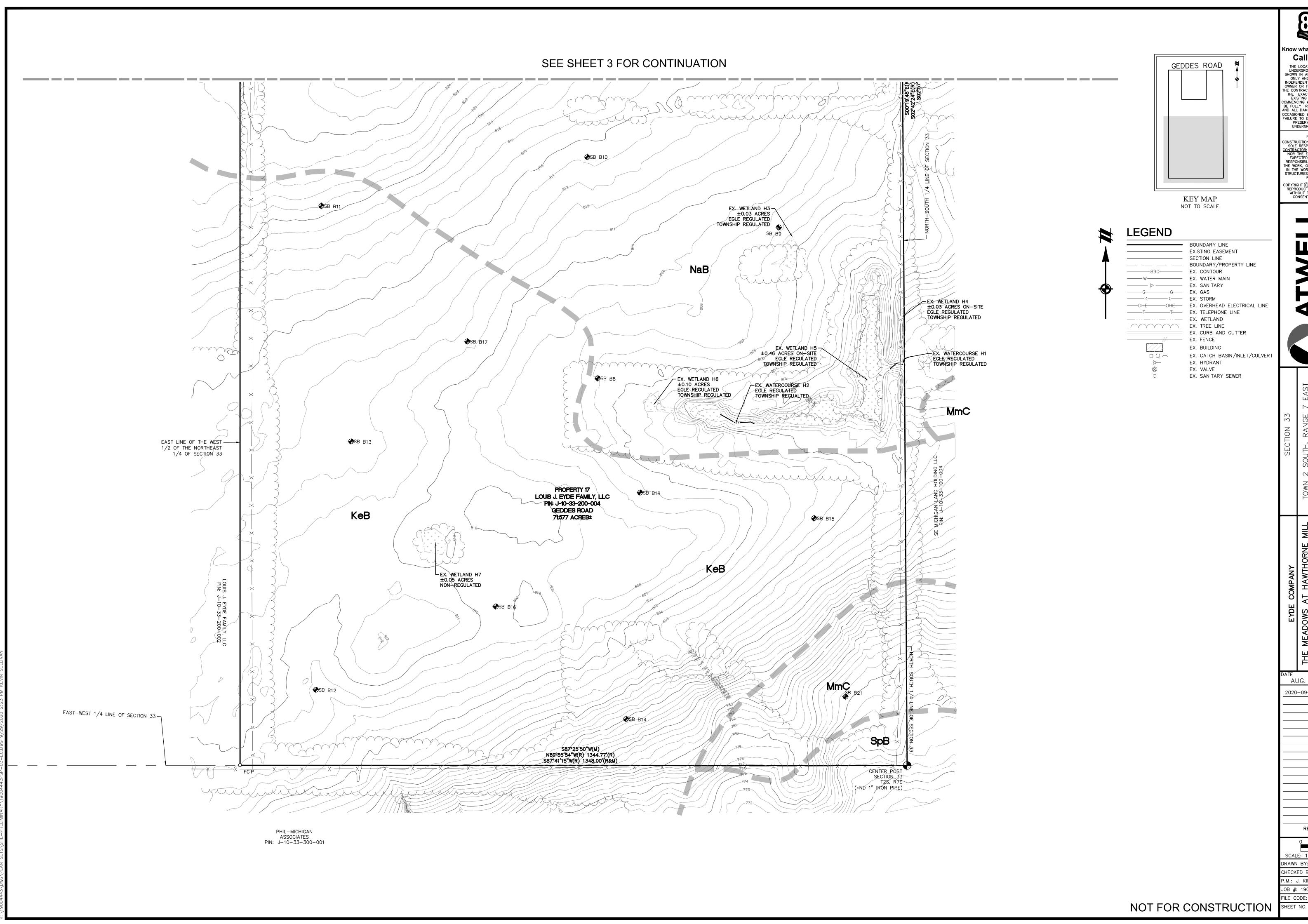
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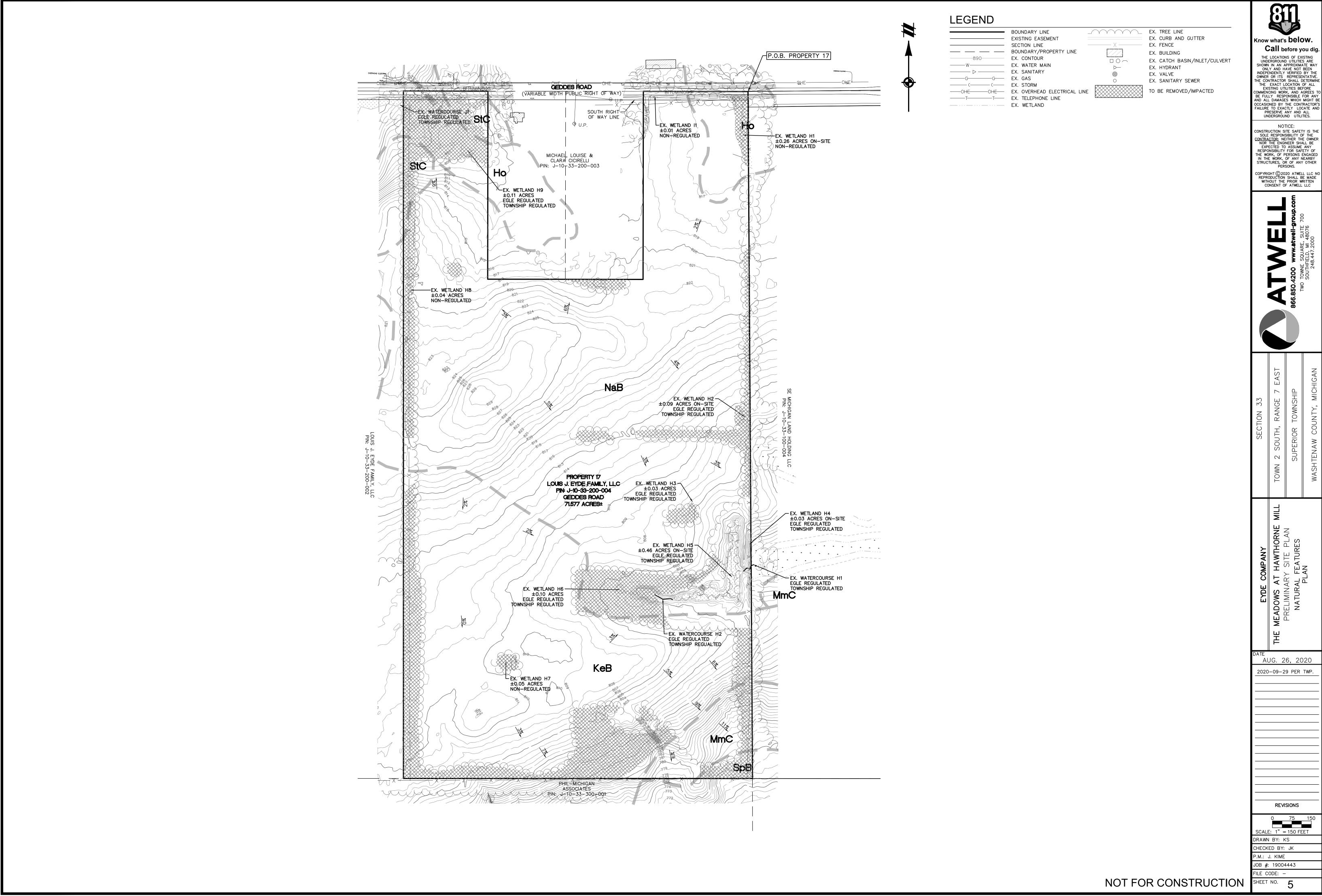


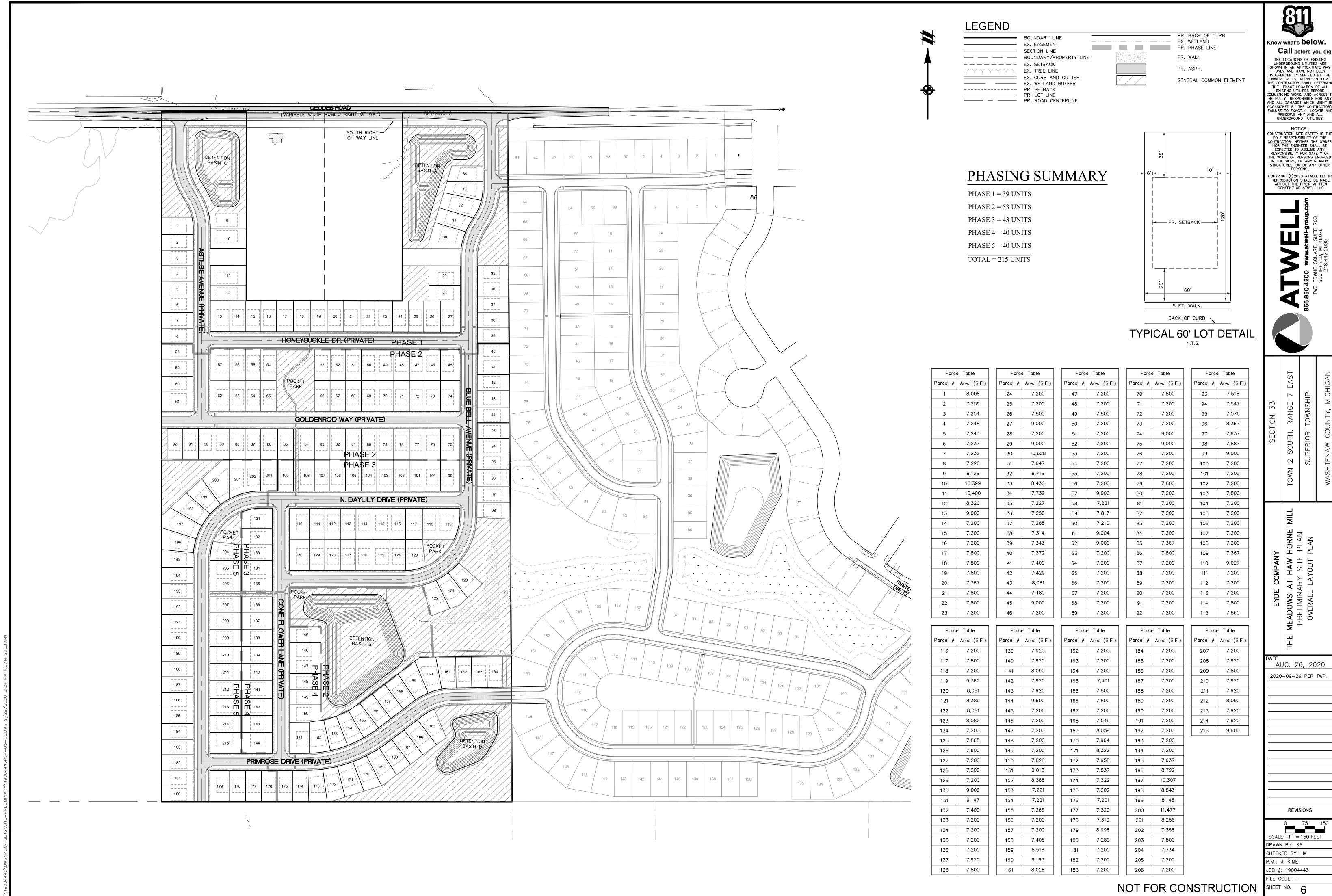
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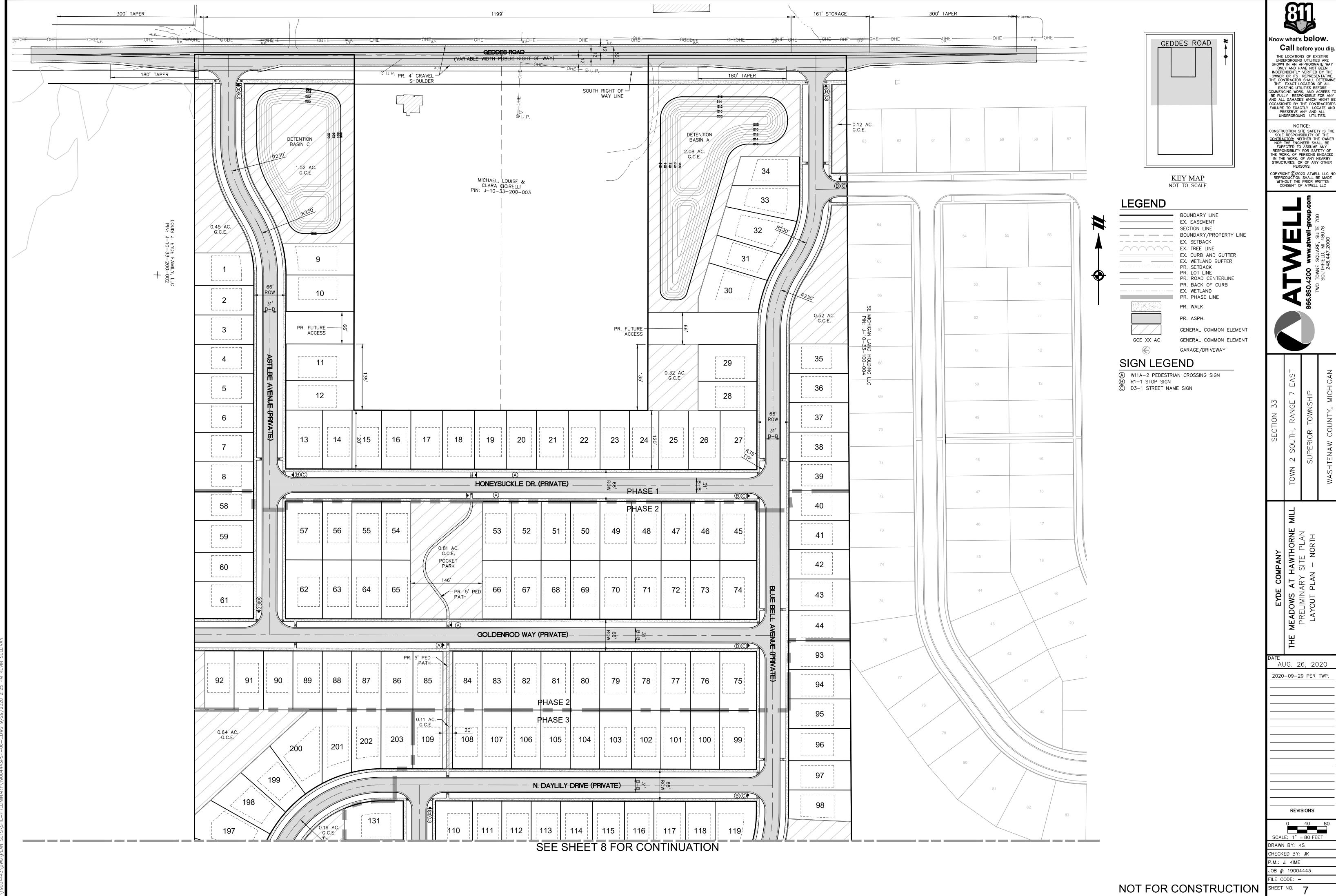
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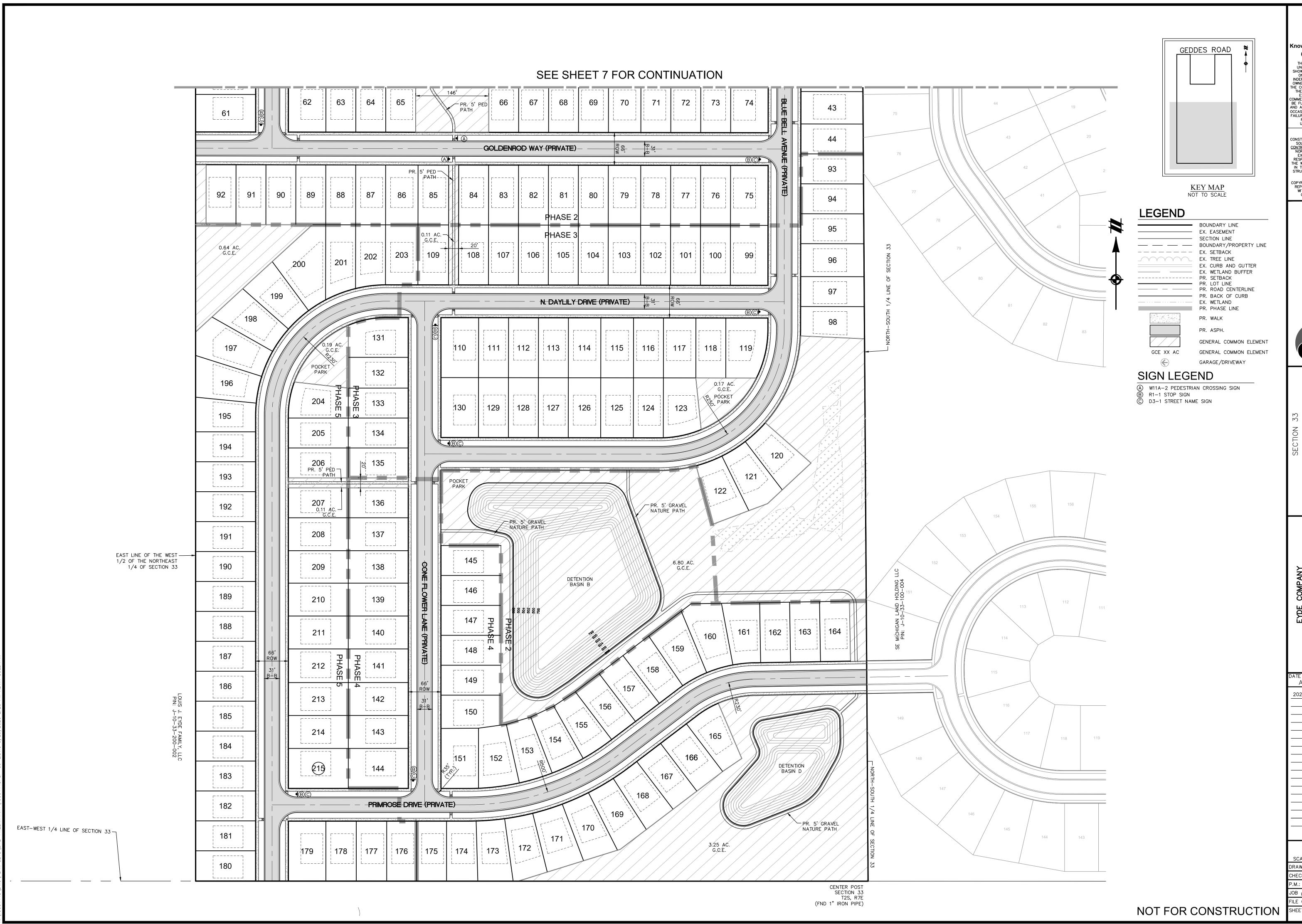


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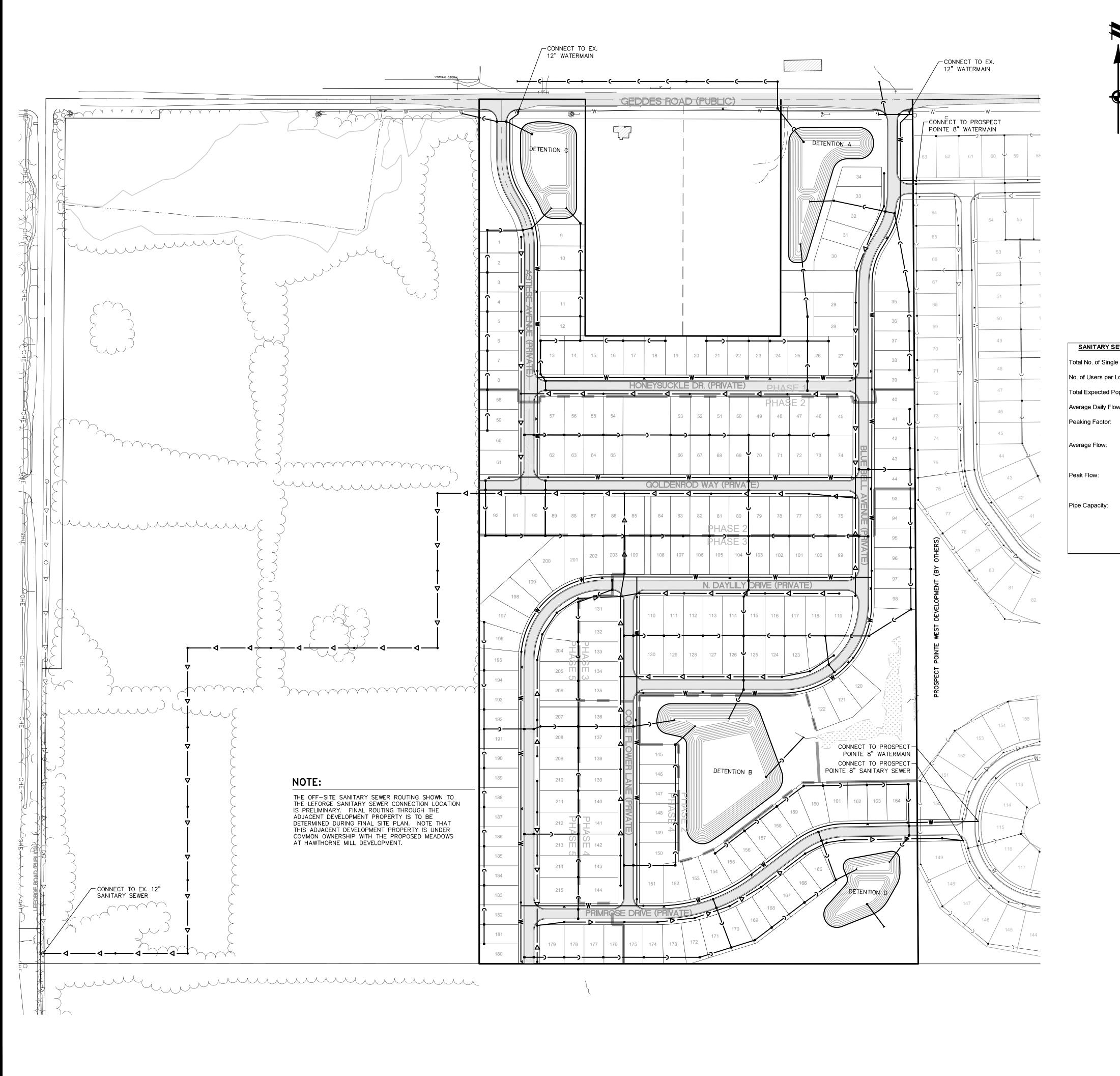
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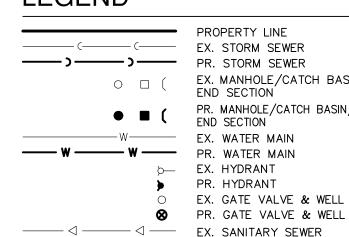
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— ▶ — PR. SANITARY SEWER

EX. MANHOLE/CATCH BASIN/ PR. MANHOLE/CATCH BASIN/ EX. GATE VALVE & WELL

WATER MAIN BASIS OF DESIGN No. of Single Family Lots: 215 Lots No. of Users per Lot: 3.5 Persons Total Expected Population Served: 753 Persons 100 G.P.D. Average Daily Flow (per capita): Peaking Factor:  $18+\sqrt{(POP/1000)} =$ 3.88 4+√( POP/1000) Average Demand: POP \* 100 = 75,300 G.P.D. 52.3 G.P.M. = 0.117 C.F.S.

\* 3.88 = **291,868 G.P.D.** 

= 202.7 G.P.M. = 0.452 C.F.S.

75,300

Peak Demand:

SANITARY SE	WER BASI	S OF DESIGN -	LEFORGE ROAL	D SERVIC	E AREA
Гotal No. of Single	Family Lots	:	166 Lots		
No. of Users per L	.ot:		3.5 Person	ns	
Total Expected Po	pulation Ser	ved:	581 Person	ns	
Average Daily Flow	w (per capita	):	100 G.P.D		
Peaking Factor:		POP/1000) = POP/1000)	3.94		
Average Flow:		POP * 100 = = =	<b>58,100 G.P.D</b> 40.3 G.P.M 0.090 C.F.S.	l.	
Peak Flow:	58,100	* 3.94 = = =	<b>228,902 G.P.D</b> 159.0 G.P.M 0.354 C.F.S.	l.	
Pipe Capacity:	0.30%	in. diameter slope Manning's 'n'		A= R=	0.545 sf 0.208 ft
	Manning	s Capacity =	1.203 C.F.S.		
	Velocity	Flowing Full =	2.21 F.P.S.		

<u>A</u>	SANITARY SEV	VER BASIS OF DESIGN - P	ROSPECT POINTE	SERVICE AREA		
	Total No. of Single	Family Lots:	49 Lots			
	No. of Users per L	ot:	3.5 Persons			
	Total Expected Po	pulation Served:	172 Persons			
	Average Daily Flow	w (per capita):	100 G.P.D.			
	Peaking Factor:	$18+\sqrt{(POP/1000)} = 4+\sqrt{(POP/1000)}$	4.17			
	Average Flow:	POP * 100 = = =	<b>17,200 G.P.D.</b> 11.9 G.P.M. 0.027 C.F.S.			
	Peak Flow:	17,200 * 4.17 = = =	<b>71,745 G.P.D.</b> 49.8 G.P.M. 0.111 C.F.S.			
.5 sf 8 ft	Pipe Capacity:	8 in. diameter 0.40% slope 0.013 Manning's 'n'		A= 0.349 sf R= 0.167 ft		
		Manning's Capacity =	0.766 C.F.S.			
		Velocity Flowing Full =	2.20 F.P.S.			

			Prospect F	Pointe Pum	p Station Se	ewer Flows Su	ımmary			
6/9/2020										
Existing Flows to date:										
				Base	Flow			Peak Flow		Peak Factor
	Acres	REU's	Population	GPD	CFS	GPM	GPD	CFS	GPM	(total service area
Fairfax		41	143.5	14350	0.02	9.97	55522.35	0.09	38.56	3.87
PP I		86	301	30100	0.05	20.90	116461.51	0.18	80.88	3.87
PP II		94	329	32900	0.05	22.85	127295.14	0.20	88.40	3.87
Totals		221	773.5	77350	0.12	53.72	299279.00	0.46	207.83	3.87
			Ex	isting Pum	p Sta. capa	city 382 GPM	or	0.85	cfs	
Proposed Future Flows:										
				Base	Flow			Peak Flow		Peak Factor
	Acres	REU"s	Population	GPD	CFS	GPM	GPD	CFS	GPM	(total service area
Fairfax		41	143.5	14350	0.02	9.97	52818.19	0.08	36.68	3.68
PPI		86	301	30100	0.05	20.90	110789.36	0.17	76.94	3.68
PP II		94	329	32900	0.05	22.85	121095.35	0.19	84.09	3.68
PP West (Future)		157	549.5	54950	0.09	38.16	202255.00	0.31	140.45	3.68
Meadows		49	171.5	17150	0.03	11.91	63124.17	0.10	43.84	3.68
Totals		427	1494.5	149450	0.23	103.78	550082.08	0.85	382.00	3.68

#### UTILITY NARRATIVE

SEWER: THE SITE WILL BE SERVICED WITH PUBLIC SANITARY SEWER VIA CONNECTION POINTS TO TWO SEPARATE SEWER DISTRICTS. SOME CAPACITY REMAINS IN THE PROSPECT POINTE PUMP STATION FOR SANITARY SEWER. THE SOUTHERN-MOST UNITS WILL BE SERVICED BY A CONNECTION THROUGH PROSPECT POINTE WEST TO MAKE USE OF THIS REMAINING CAPACITY. IT IS ANTICIPATED THAT UP TO 49 UNITS CAN BE ACCOMMODATED IN THE AVAILABLE CAPACITY. ALL UNITS NOT SERVICED THROUGH PROSPECT POINTE WILL BE SERVICED BY CONNECTING TO EXISTING SEWER IN LEFORGE ROAD.

WATER: THE SITE WILL BE SERVICED WITH PUBLIC WATER BY CONNECTING TO AN EXISTING 12" MAIN IN GEDDES ROAD ROW AS WELL AS CONNECTING INTO TWO 8" MAINS FROM PROSPECT POINTE WEST.

STORMWATER: ATWELL HAS COORDINATED WITH THE WASHTENAW COUNTY WATER RESOURCE COMMISSION RELATED TO PRELIMINARY DESIGN REQUIREMENTS AND SOILS ANALYSIS. THIS IS DISCUSSED IN MORE DETAIL ON SHEET 12.

<u>UTILITY PHASING</u>: DURING THE INITIAL PHASE, ALL UTILITIES NEEDED TO SERVICE LOTS 1-39 SHALL BE INSTALLED ALONG WITH THE TWO NORTH DETENTION BASINS AND OUTLETS TO THE SNIDECAR DRAIN. THE SANITARY SEWER WILL BE EXTENDED THOUGH THE ADJACENT PARCEL OUT TO LEFORGE ROAD AND WATER MAIN WILL CONNECT TO THE EXISTING 12" MAIN ALONG GEDDES AS WELL AS THE NORTHERN CONNECTION TO THE 8" MAIN IN PROSPECT POINTE TO ENSURE A LOOPING SYSTEM. THE LATER PHASES OF THE DEVELOPMENT WILL ADD ADDITIONAL STORMWATER BASINS THAT FOLLOW EXISTING DRAINAGE PATTERNS TO THE SUPERIOR NO. 1 DRAIN. WATER AND SANITARY SEWER SERVICE WILL BE EXTENDED AS REQUIRED FROM THE PREVIOUS PHASES.

- 1. ALL STORM SEWER SHALL BE PLACED IN 20' WIDE DRAINAGE EASEMENTS. CROSS LOT AND REAR LOT SWALES WILL BE PLACE IN 30' WIDE DRAINAGE EASEMENTS.
- 2. ALL SANITARY SEWER WILL BE PLACED IN 20' WIDE EASEMENTS UNLESS WIDER EASEMENTS ARE DETERMINED TO BE NECESSARY DURING DETAILED ENGINEERING IN THE FINAL SITE PLAN PROCESS.
- 3. ALL WATER MAIN WILL BE PLACED IN 20' WIDE EASEMENTS. 4. AT THIS TIME, 25 LOTS ARE ANTICIPATED TO BE SERVICED BY HUNG PLUMBING.
- THIS WILL BE VERIFIED DURING DETAILED DESIGN IN THE FINAL SITE PLAN STAGE. • LOTS: 1, 2, 9, 10, 124–131, 142–148, 151–156

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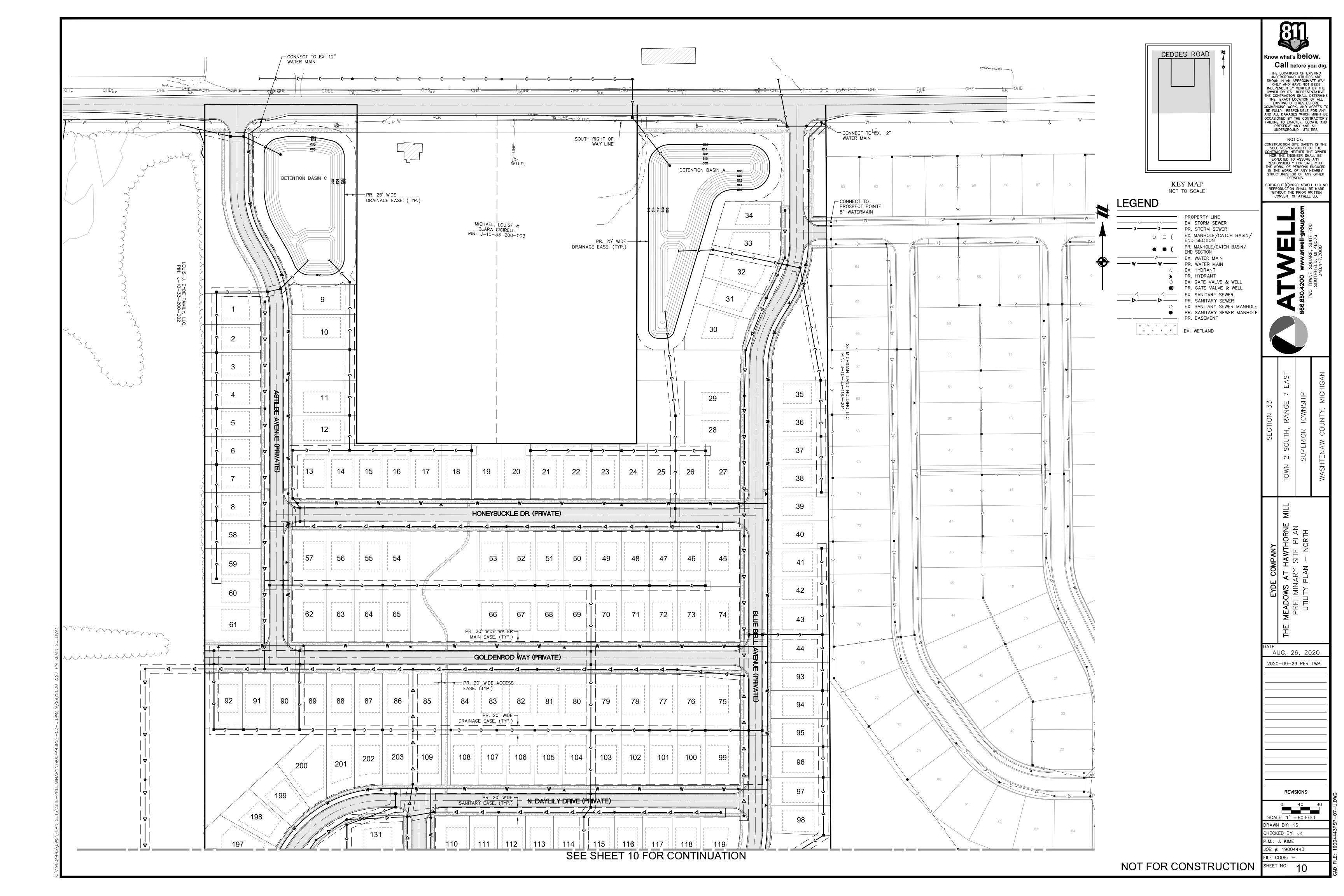
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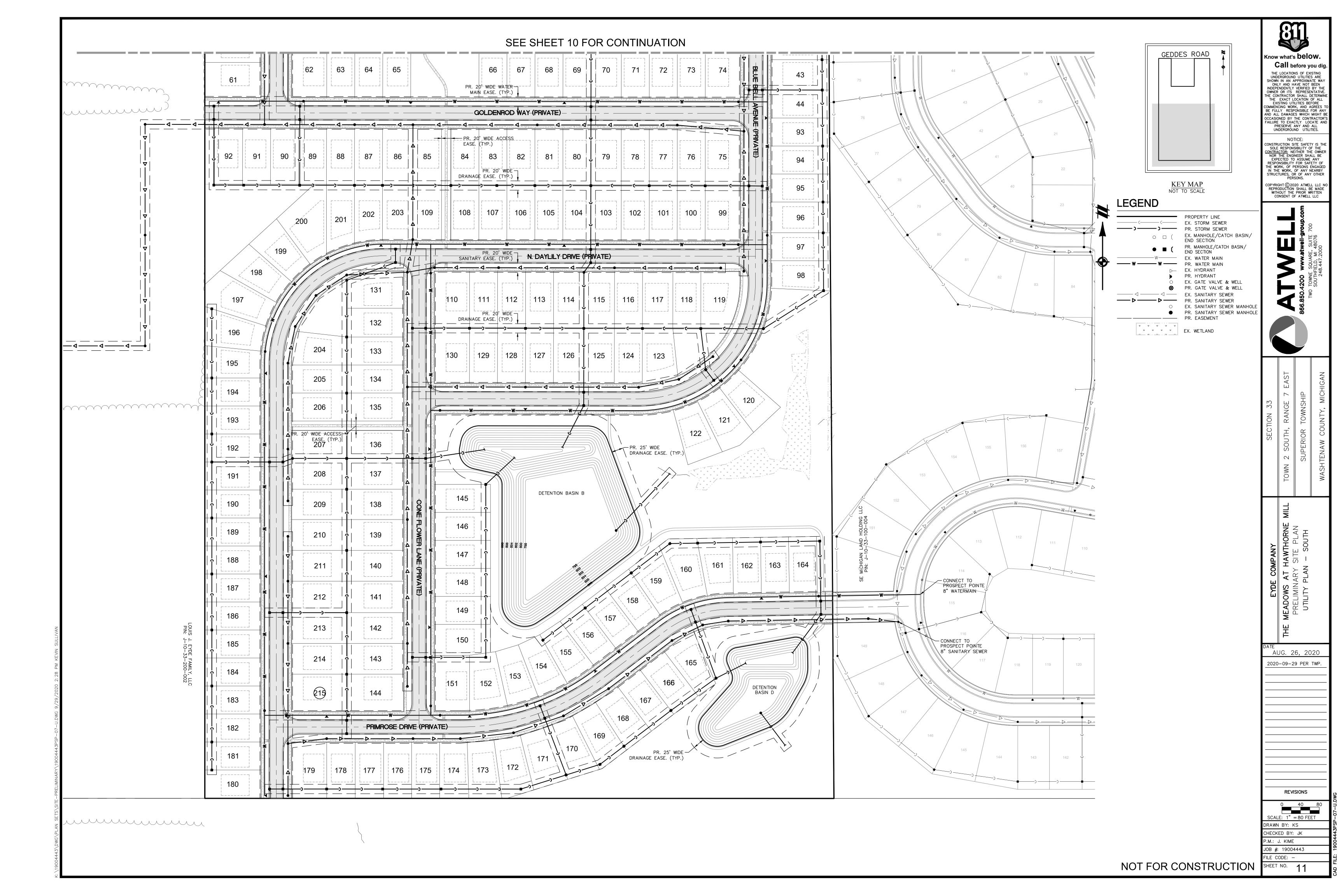
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SCALE: 1" = 150 FEET DRAWN BY: KS CHECKED BY: JK P.M.: J. KIME JOB #: 19004443

FILE CODE: -

REVISIONS





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INSPECT FOR SEDIMENT ACCUMULATION	+		X	X	×	X		X	X		SEMI-ANUALLY/AS NEEDED*	\$100	KEEP RECORDS OF ALL INSPECTIONS AND MA
REMOVAL OF SEDIMENT ACCUMULATION	X		$\times$	X	×	X		X	X		ANUALLY/AS NEEDED*	\$300	KEEP RECORDS OF ALL COSTS FOR INSPECTION
INSPECT FOR FLOATABLES AND DEBRIS	T			X	X		X	X	X		ANNUALLY	\$50	OWNER
CLEANING FOR FLOATABLES AND DEBRIS				×	×		X	X	X		ANNUALLY	\$100	PROPERTY OWNER REVIEWS COST EFFECTIVE AND MAKES NECESSARY ADJUSTMENTS
INSPECTION FOR EROSION		×	X					×	X	X	SEMI-ANNUALLY	\$50	OWNER TO HAVE A PROFESSIONAL ENGINE
REESTABLISH PERMANENT VEGETATION ON ERODED SLOPES		X						×	×	X	AS NEEDED	\$200	IDENTIFICATION OF SEVERE PROBLEMS
CLEAN DRIVES AND PARKING LOTS	X										ANNUALLY	\$300	* "AS NEEDED" MEANS WHEN SEDIMENT H
INSPECT PRIVATE ROADS	X										ANNUALLY	\$100	** DETENTION BASIN AND FOREBAY SHALL
CRACK SEALING / PAVEMENT REPAIR	X										AS NEEDED	\$200	NOTE: NO CHEMICALS ARE ALLOWED IN STO SPECIES MAY BE TREATED WITH CHEMICALS
MOWING		X						×	X		AS NEEDED, 0-2 TIMES/YEAR	\$200	of Zoleo III/II BE THE III STILLINGTED
INSPECT STRUCTURAL ELEMENTS DURING WET WEATHER AND COMPARE TO AS-BUILT PLANS (BY A PROFESSIONAL ENGINEER REPORTING TO THE OWNER)			×	×			×	X	X	×	ANNUALLY/AS NEEDED**	\$100	
MAKE ADJUSTMENTS OR REPLACEMENTS AS DETERMINED			X	X			X	X	X	X	AS NEEDED**	\$100	

BY ANNUAL WET WEATHER INSPECTION

TASKS	SCHEDULE	ESTIMATED ANNUAL COST
KEEP RECORDS OF ALL INSPECTIONS AND MAINTENANCE ACTIVITIES AND REPORT TO PROPERTY OWNER	ANNUALLY	\$50
KEEP RECORDS OF ALL COSTS FOR INSPECTIONS, MAINTENANCE AND REPAIRS. REPORT TO PROPERTY OWNER	ANNUALLY	\$50
PROPERTY OWNER REVIEWS COST EFFECTIVENESS OF THE PREVENTATIVE MAINTENANCE PROGRAM AND MAKES NECESSARY ADJUSTMENTS	ANNUALLY	\$50
OWNER TO HAVE A PROFESSIONAL ENGINEER CARRY OUT EMERGENCY INSPECTIONS UPON IDENTIFICATION OF SEVERE PROBLEMS	AS NEEDED	\$100

\* "AS NEEDED" MEANS WHEN SEDIMENT HAS ACCUMULATED TO A DEPTH OF 6 INCHES OR GREATER

SPECIES MAY BE TREATED WITH CHEMICALS BY A CERTIFIED APPLICATOR.

\*\* DETENTION BASIN AND FOREBAY SHALL BE INSPECTED AND REPAIRED AS NEEDED FOLLOWING STORMS OF 1 INCH OR MORE. NOTE: NO CHEMICALS ARE ALLOWED IN STORMWATER FEATURES OR BUFFER ZONES WITH THE FOLLOWING EXCEPTION: INVASIVE

#### NOTES

1. TEST PITS FOR SOIL INFILTRATION TESTING WERE PERFORMED IN MAY, 2020. OF THE TWELVE TEST LOCATIONS, ONLY TP-10 CONTAINED SOILS SUITABLE FOR INFILTRATION TESTING. DUE TO THE SHALLOW DEPTH OF THE CLAYEY SAND/GRAVEL LAYER AND RELATIVELY HIGH ELEVATION OF THIS TEST LOCATION IN RELATION TO THE SURROUNDING SITE AREAS, IT WAS DETERMINED THAT THIS LOCATION WAS NOT VIABLE TO SERVE THE INFILTRATION REQUIREMENTS OF THE SITE. THEREFORE, THE PROPOSED BASINS HAVE BEEN DESIGNED WITH A TWENTY PERCENT

(20%) VOLUME PENALTY, IN ACCORDANCE WITH WCWRC RULES. 2. AN MDEQ PERMIT IS ANTICIPATED TO BE REQUIRED FOR THE REGULATED WETLAND IMPACTS AND FOR THE STORM WATER CONNECTIONS TO THE SNIDECAR DRAIN.

3. THE DETENTION BASIN OUTLETS WILL ULTIMATELY DISCHARGE TO THE SNIDECAR DRAIN AND THE SUPERIOR NO. 1 DRAIN, WHICH FLOW SOUTH AND ULTIMATELY DISCHARGES INTO THE HURON RIVER, APPROXIMATELY 1.5 MILES SOUTHWEST OF THE PROJECT.



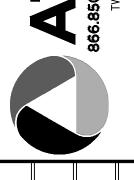
PROPERTY LINE PROPOSED STORM SEWER PROPOSED MANHOLE/CATCH BASIN/END SECTION PROPOSED DRAINAGE AREA

Know what's **below.** Call before you dig.

THE LOCATIONS OF EXISTING
UNDERGROUND UTILITIES ARE
SHOWN IN AN APPROXIMATE WAY
ONLY AND HAVE NOT BEEN
INDEPENDENTLY VERIFIED BY THE
OWNER OR ITS REPRESENTATIVE.
THE CONTRACTOR SHALL DETERMINE
THE EXACT LOCATION OF ALL
EXISTING UTILITIES BEFORE
COMMENCING WORK, AND AGREES TO
BE FULLY RESPONSIBLE FOR ANY
AND ALL DAMAGES WHICH MIGHT BE
OCCASIONED BY THE CONTRACTOR'S AND ALL DAMAGES WHICH MIGHT BE OCCASIONED BY THE CONTRACTOR'S FAILURE TO EXACTLY LOCATE AND PRESERVE ANY AND ALL UNDERGROUND UTILITIES.

NOTICE: CONSTRUCTION SITE SAFETY IS THE SOLE RESPONSIBILITY OF THE CONTRACTOR; NEITHER THE OWNER NOR THE ENGINEER SHALL BE EXPECTED TO ASSUME ANY RESPONSIBILITY FOR SAFETY OF THE WORK, OF PERSONS ENGAGED IN THE WORK, OF ANY NEARBY STRUCTURES, OR OF ANY OTHER PERSONS.

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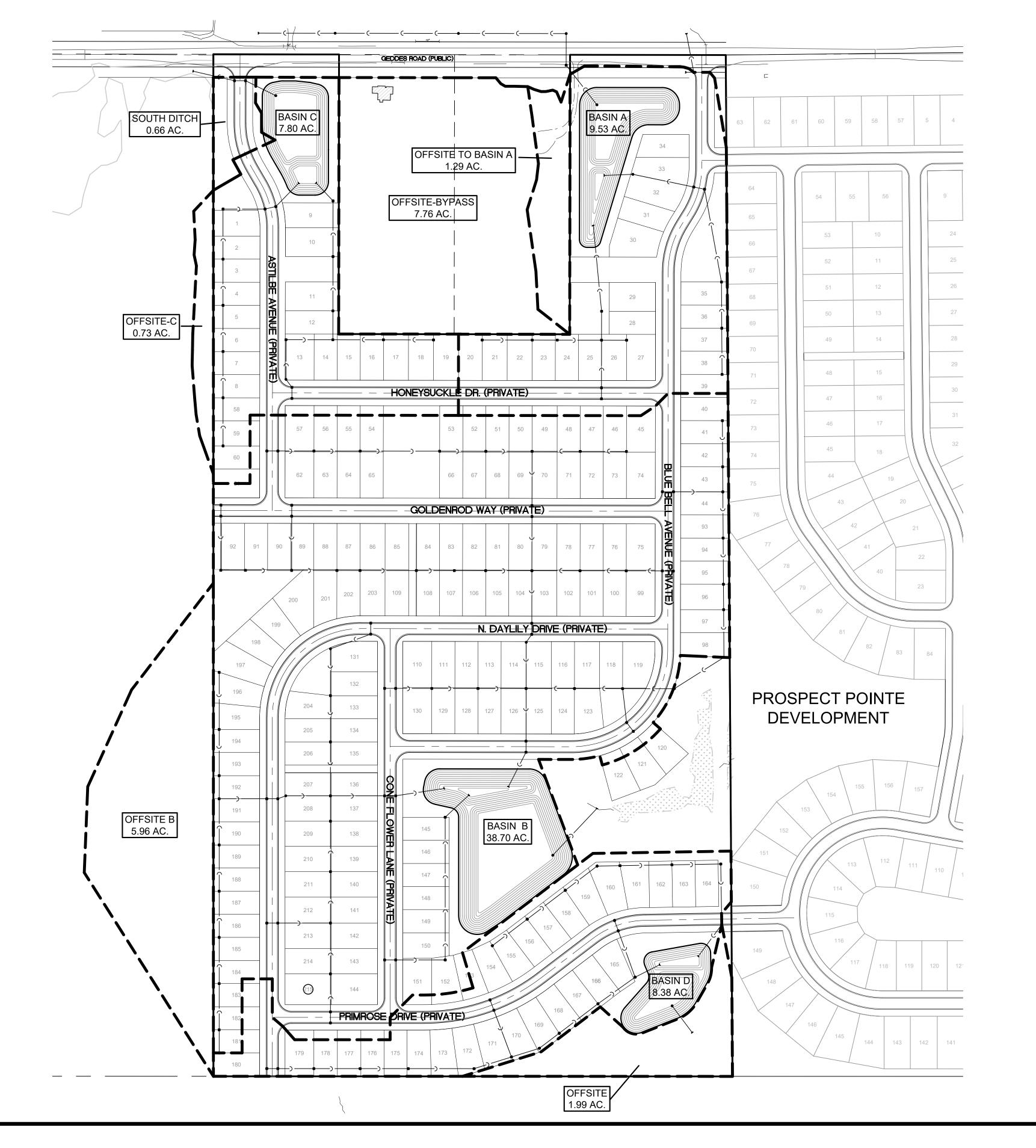
AUG. 26, 2020

2020-09-29 PER TWP.

REVISIONS

DRAWN BY: KS CHECKED BY: JK

JOB #: 19004443 FILE CODE: -SHEET NO. 12



			Total Co		rainage Area =		Acres Acres
	Cove	Туре	Soil Type	Area (sf)	Area (ac)	Runoff Coef	(c)(Area)
Rational Method Variables	Paved Parking Lots Water S Developed Open Spa	s, roofs, driveways Surfaces ace, Good Condition ributing Area	D D D	114,780 54,500 244,934 56,234	2.63 1.25 5.62 1.29	0.95 1.00 0.45 0.45	109,041 54,500 110,220 25,305
onal Metl	On-site cont	Trouting Area		30,234		Sum (c )(Area) =	299,067
Ratic			Weig	hted C-Sum	(c)(Area)/Sum	Area Total (sf)= (ac) or Sum(sf)=	
		Cover Type ace, Good Condition	Soil Type D	Area (sf) 244,934	Area (ac) 5.62	Curve Number	(CN)(Area) 19,594,720
NRCS Variables	Off-site Cont	ributing Area	D	56,234	1.29 0.00	80	4,498,720 0
NRCS V			Total - Sum	(CN)(Area) = ea Total (sf)=			24,093,440
					Area)/Sum(ac)	or Sum(sf)=	301,168 <b>80</b>
S	Paved Parking Lot	Cover Type s, roofs, driveways	Soil Type D	Area (sf) 114,780	Area (ac) 2.63	Curve Number 98	(CN)(Area) 11,248,440
NRCS Variables	Impervio	us, Ponds	D	54,500	1.25 0.00	98	5,341,000 0
NRCS			Total - Sum Area Total -				16,589,440 169,280
					Area)/Sum(ac)	or Sum(sf)=	98
W2	Vff = (1") (1/12) (43					25,091	cf
W3		ankfull Runoff Calcu	ulations (Vbf	-pre)		25,091	CI
A.	2 year/24 hour stor	m event			P =	2.35	in
B. C.	S = (1000/CN)-10	(pasture, grassland	d or range, fa	ir)	CN = S =	2.82	in
D. E. F.	Q = (P-0.2S)^2/(P+0 Pervious Cover Are	a			Q = Area =	470,448	in sf cf
W4	V <sub>bf-pre</sub> = Q(1/12)Area	a st-development Ban	kfull Runoff	Calculations	V <sub>bf-pre</sub> =		СТ
A.	2 year/24 hour stor				P =		in
B. C.	Pervious Cover CN S = (1000/CN)-10				CN = S =	80 2.50	in
D. E.	Q = (P-0.2S)^2/(P+0 Pervious Cover Are	a			Q = Area =	301,168	in sf
F. W5	V <sub>bf-per-post</sub> = Q(1/12)	Area Post-development B	Sankfull Por	off Calculati	V <sub>bf-per-post</sub> =		cf
A.	2 year/24 hour stor		WINTER KUNC	calculatio	ons (Vbf-Imp-p P =		in
B. C.	Impervious Cover ( S = (1000/CN )-10	CN			CN = S =	98 0.20	in
D. E.	Q = (P-0.2S)^2/(P+0 Pervious Cover Are	a			Q = Area =	169,280	in sf
F. W6	V <sub>bf-imp-post</sub> = Q(1/12)		Character and	D	V <sub>bf-imp-post</sub> =		cf
A.	100 year storm eve	st-development 100 nt	-year Storm	Kunom Calcu	P =		in
B. C.	Pervious Cover CN S = (1000/CN)-10				CN = S =	80	in
D. E.	Q = (P-0.2S)^2/(P+0 Pervious Cover Are	a			Q = Area =	301,168	in sf
F.	V <sub>100-imp-post</sub> = Q(1/12				V <sub>100-imp-post</sub> =		cf
W7	100 year storm eve	Post-development 1	100-year Stor	m Runoff Ca	Iculations (V10		in
B. C.	Pervious Cover CN S = (1000/CN)-10				CN =	98	in
D. E.	Q = (P-0.2S)^2/(P+0 Pervious Cover Are				Q = Area =		in sf
E.	V <sub>100-imp-post</sub> = Q(1/12	)Area			V <sub>100-imp-post</sub> =	68,742	cf
W8	Determine Time of	Concentration (Tc-	hrs)				
	User specified; ass	ume 30 minutes		Total	Time of Conce	entration (hrs) =	0.50
W9	Runoff Summary &	Onsite Infiltration I	Requirement				
Α.	Runoff Summary fr	om Previous Works V <sub>ff</sub> =		ef#			
		V <sub>bf-pre</sub> = V <sub>bf-pre-post</sub> =	27,144	cf	Total BF Volu	me (V <sub>hf-met</sub> )	
		V <sub>bf-mp-past</sub> =				49,676	cf
		V <sub>100-per-post</sub> = V <sub>100-imp-post</sub> =			Total 100-yea	r Volume (V <sub>100</sub> ) 143,759	
В.	Determine Onsite	Infiltration Require					
	Bankfull V	$V_{bf-post} = V_{bf-pre} = 0$	27,144	cf			
					rement (V <sub>inf</sub> ) =	25,091	cf
W10	Detention / Retent	ion Requirement					
A. B.	Q <sub>e</sub> = 238.6 (T <sub>c</sub> ) ^ -0.8 Total Site Area	32				421.23 10.8	cfs/in-mi^2
В. С. D.	Total Site Area $Q_{100} = Q_{100 \text{ per}} + Q_{100}$ Peak Flow (PF) = (0	44				7.86 55.885	in cfs
E. F.	Delta = PF - 0.15A V <sub>det</sub> = (Delta/PF) x V					54.265 139,592	cfs cf
V <sub>inf</sub> refers to	total infiltration prov	ided per worksheet	W11				
W11	Determine Applica	ble BMPs and Assoc	iated Volum	e Credits			
Prop	posed BMP	Average Area (ft²)	Storage Depth (ft)	Storage Volume (ft³)	Ave. Design Infil. Rate (in/hr)*	Infil. During Storm (ft <sup>3</sup> )	Total Volume Reduction (ft <sup>3</sup>
	Total Volu	ume Reduction Cred	lit by Propos	ed Structura	BMPs (Vinf) =	0	cf
W12	Infiltration / Deten						
	Total Infiltration Pr	equired per WCWRC ovided:	Rules:			cf	
	Difference: % Deficiency: Pro-Rated 20% Det	ention Penalty			(25,091) 100.0% <b>20.0</b> %	cı	
	Total Detention Re		nalty, if appl	icable	139,592 167,510		
	Basin Stage-Storage		Ave A	Donal	Volum		
	815.0 814.0	Area 49,000 43,400	Avg. Area 46,200 40,600	1.0 1.0	Volume 195,300 149,100		
	813.0 812.0	37,800 32,400	35,100 26,450	1.0	108,500 73,400		
	811.0 810.0	20,500 17,200	18,850 15,600	1.0 1.0	46,950 28,100		
	809.0 808.0	14,000 11,000	12,500 11,000	1.0	12,500	ď	
	Total Volume Provi	ded:		Vff Elev.=	195,300 809.81 811.10		
			-	ided Elev.= reeboard=	811.10 814.40 815.40		816
	Forebay Sizing				- 20.70		
	Required Volume (				7,188	cf	
	Forebay Stage-Stor	<u>Area</u>	Avg. Area	Depth	Volume		
	811.0 810.0	5,800 3,800	4,800 3,000	1.0	9,400 4,600		
	809.0	2,200	1,600	1.0	1,600		

W1	Determining Post-I			ntributing Dr	rainage Area = tal Site Area =	44.7	Acres Acres
8		Туре	Soil Type	Area (sf)	Area (ac)	Runoff Coef	(c)(Area)
Rational Method Variables	Paved Parking Lots Water S Developed Open Spa	Surfaces	D B	654,660 110,000 407,720	15.03 2.53 9.36	0.95 1.00 0.25	621,927 110,000 101,930
ethod \	Developed Open Spa Off-site Cont	ce, Good Condition	D B	515,134 259,618	11.83	0.45 0.25	231,810 64,905
onal Me	On site cont	, iodanig i iod	, i	233,010		o.25 oum (c)(Area) =	
Ratio			Weig	ghted C-Sum		Area Total (sf)= (ac) or Sum(sf)=	1,947,132
	Pervious C Developed Open Spa		Soil Type B	Area (sf) 407,720	Area (ac) 9.36	Curve Number	(CN)(Area) 24,870,920
NRCS Variables	Developed Open Spa Off-site Cont	ace, Good Condition	D B	515,134 259,618	11.83	80 58	41,210,720 15,057,844
RCS Va	3.65.65.65	7.	Total - Sum	(CN)(Area) =			81,139,484
2				ea Total (sf)= N-Sum(CN)(	: Area)/Sum(ac)	or Sum(sf)=	1,182,472 <b>69</b>
80	Impervious Paved Parking Lots		Soil Type D	Area (sf) 654,660	Area (ac) 15.03	Curve Number	(CN)(Area) 64,156,680
NRCS Variables	Impervio		В	110,000	2.53	98	10,780,000
NRCS			Area Total -	(CN)(Area) = Sum(ac) of S	ium(sf)=		74,936,680 764,660
W2	First Flush Runoff C	Calculations (Vff)	Weighted C	N-Sum(CN)(	Area)/Sum(ac)	or Sum(st)=	98
Α.	Vff = (1") (1/12) (43					94,111	cf
W3	Predevelopment B	ankfull Runoff Calc	ulations (Vbf	-pre)			
Α.	2 year/24 hour stor		(	ć.)	P =	2.35	in
B. C.	Pervious Cover CN S = (1000/CN)-10		or range, fo	nir)	CN = S =	7/35	in
D. E. F.	Q = (P-0.2S)^2/(P+0 Pervious Cover Are V <sub>bf-pre</sub> = Q(1/12)Area	а			Q = Area = V <sub>bf-pre</sub> =	1,947,132	sf cf
W4	Pervious Cover Pos		kfull Runoff	Calculations			CI
A.	2 year/24 hour stor			- Educions	P =		in
B. C.	Pervious Cover CN S = (1000/CN)-10				CN = S =	69	in
D. E.	Q = (P-0.2S)^2/(P+0 Pervious Cover Are	а			Q = Area =	0.34 1,182,472	in sf
F.	V <sub>bf-per-post</sub> = Q(1/12)A				V <sub>bf-per-post</sub> =	33,791	cf
W5	Impervious Cover F		ankfull Run	off Calculation			i.
A. B.	2 year/24 hour stor Impervious Cover ( S = (1000/CN)-10				P = CN = c -		in
C. D. E.	S = (1000/CN)-10 Q = (P-0.2S)^2/(P+0 Pervious Cover Are	0.17			S = Q = Area =	0.20 2.12 764,660	in in sf
F.	V <sub>bf-imp-post</sub> = Q(1/12)				V <sub>bf-imp-post</sub> =	135,197	cf
W6	Pervious Cover Pos	t-development 100	-year Storm	Runoff Calcu	lations (V100-p	er-post)	
A. B.	100 year storm eve Pervious Cover CN	nt			P = CN =		in
C. D.	S = (1000/CN )-10 Q = (P-0.2S)^2/(P+0				S = Q =	2.01	in in
E. F.	Pervious Cover Are V <sub>100-imp-post</sub> = Q(1/12				Area = V <sub>100-imp-post</sub> =	1,182,472 197,804	sf cf
W7	Impervious Cover F	Post-development 1	.00-year Stor	m Runoff Cal	Iculations (V10	0-imp-post)	
A. B.	100 year storm ever	nt			P = CN =	5.11 98	in
В. С. D.	S = (1000/CN )-10 Q = (P-0.2S)^2/(P+0	0.85)			CN = S = Q =		in in
E. F.	Pervious Cover Are V <sub>100-imp-post</sub> = Q(1/12)	a			Area = V <sub>100-imp-post</sub> =	764,660	sf cf
W8	Determine Time of		hrs)				
	User specified; assu	ume 30 minutes		Total	Time of Conce	ntration (hrs) =	0.50
W9	Runoff Summary &	Onsite Infiltration	Requiremen	t			
A.	Runoff Summary fr	om Previous Works V <sub>ff</sub> =		cf*			
		V <sub>bf-pre</sub> = V <sub>bf-per-post</sub> =	112,348	cf	Total BF Volum	me (V <sub>bf-post</sub> )	
		V <sub>bf-imp-post</sub> =				168,987	cf
		V <sub>100-per-post</sub> = V <sub>100-imp-post</sub> =			Total 100-year	Volume (V <sub>100</sub> ) 508,320	cf
В.	Determine Onsite I	nfiltration Require		cf			
	Rankfull V	V <sub>bf-post</sub> = V <sub>bf-pre</sub> = olume Difference =	112,348	cf			
	Dankidii V	ordine binerence -			rement (V <sub>inf</sub> ) =	94,111	cf
W10	Detention / Retent	ion Requirement		qui	1 - (11)		
Α.	Q <sub>o</sub> = 238.6 (T <sub>c</sub> ) ^ -0.8	32				421.23	cfs/in-mi^2
B. C.	Total Site Area  Q <sub>100</sub> = Q <sub>100-per</sub> + Q <sub>100</sub>					44.7 6.88	in
D. E. F.	Peak Flow (PF) = (O Delta = PF - 0.15A V <sub>det</sub> = (Delta/PF) x V					202.420 195.715	cfs cfs
	V <sub>det</sub> = (Delta/PF) x V		W11			491,482	cf
W11	Determine Applica			e Credits			
			Storage	Storage	Ave. Design	Infil. During	Total Volume
Prop	osed BMP	Average Area (ft²)	Depth (ft)	Volume (ft <sup>3</sup> )	Infil. Rate (in/hr)*	Storm (ft <sup>3</sup> )	Reduction (ft <sup>3</sup>
	Total Volu	ume Reduction Cred	lit by Propos	ed Structural	BMPs (Vinf) =	0	cf
	Infiltration / Deten	tion Summan					
W12	minitiation / Deten	Cion Summary			94,111	cf cf	
W12	Total Infiltration Re	equired per WCWRC	Rules:		n		
W12	Total Infiltration Re	equired per WCWRC	Rules:		(94,111) 100.0%		
W12	Total Infiltration Re Total Infiltration Pr Difference: % Deficiency: Pro-Rated 20% Deta Total Detention Re	equired per WCWRC ovided: ention Penalty: quired			(94,111) 100.0% <b>20.0%</b> 491,482	cf	
W12	Total Infiltration Re Total Infiltration Pr Difference: % Deficiency: Pro-Rated 20% Deta Total Detention Re Total Detention Re	equired per WCWRC ovided: ention Penalty: quired quired including Pe		icable	(94,111) 100.0% <b>20.0</b> %	cf	
W12	Total Infiltration Re Total Infiltration Pr Difference: % Deficiency: Pro-Rated 20% Deti Total Detention Re Total Detention Re Basin Stage-Storage	equired per WCWRC ovided: ention Penalty: quired quired including Pe e Summary: <u>Area</u>	nalty, if appl	Depth	(94,111) 100.0% <b>20.0%</b> 491,482 <b>589,778</b>	cf	
W12	Total Infiltration Re Total Infiltration Pr Difference: % Deficiency: Pro-Rated 20% Detr Total Detention Re Total Detention Re Basin Stage-Storage Elev. 807.0 806.0	equired per WCWRC ovided:  ention Penalty: quired quired including Pe e Summary: Area 98,900 92,300	Avg. Area 95,600 89,100	Depth 1.0 1.0	(94,111) 100.0% <b>20.0%</b> 491,482 <b>589,778</b> Volume 589,950 494,350	cf	
W12	Total Infiltration Re Total Infiltration Pr Difference: % Deficiency: Pro-Rated 20% Detr Total Detention Re Total Detention Re Basin Stage-Storage Elev. 807.0	equired per WCWRO ovided:  ention Penalty: quired quired including Pe e Summary: Area 98,900 92,300 85,900 79,600	Avg. Area 95,600 89,100 82,750 76,550	Depth 1.0	(94,111) 100.0% 20.0% 491,482 589,778 Volume 589,950 494,350 405,250 322,500	cf	
W12	Total Infiltration Re Total Infiltration Pr Difference: % Deficiency: Pro-Rated 20% Detr Total Detention Re: Total Detention Re: Basin Stage-Storage Elev. 807.0 806.0 805.0 804.0	equired per WCWRC ovided: ention Penalty: quired quired including Pe e Summary: Area 98,900 92,300 85,900	Avg. Area 95,600 89,100 82,750	Depth 1.0 1.0 1.0 1.0	(94,111) 100.0% <b>20.0%</b> 491,482 <b>589,778</b> Volume 589,950 494,350 405,250	cf	
W12	Total Infiltration Re Total Infiltration Pr Difference: % Deficiency: Pro-Rated 20% Det Total Detention Re Total Detention Re Basin Stage-Storage Elev. 807.0 806.0 805.0 804.0 803.0 802.0	equired per WCWRO ovided:  ention Penalty: quired quired including Pe e Summary: Area 98,900 92,300 85,900 79,600 73,500 54,400	Avg. Area 95,600 89,100 82,750 76,550 63,950 52,100	Depth 1.0 1.0 1.0 1.0 1.0	(94,111) 100.0% 20.0% 491,482 589,778 Volume 589,950 494,350 405,250 322,500 245,950 182,000	cf	
W12	Total Infiltration Re Total Infiltration Pr Difference: % Deficiency: Pro-Rated 20% Deterior Total Detention Re Total Detention Re Basin Stage-Storage Elev. 807.0 806.0 805.0 804.0 803.0 802.0 801.0 800.0	equired per WCWRO ovided:  ention Penalty: quired quired including Pe e Summary: Area 98,900 92,300 85,900 79,600 73,500 54,400 49,800 45,400	Avg. Area 95,600 89,100 82,750 76,550 63,950 52,100 47,600 43,250	Depth 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0	(94,111) 100.0% 20.0% 491,482 589,778 Volume 589,950 494,350 405,250 322,500 245,950 182,000 129,900 82,300	cf	
W12	Total Infiltration Re Total Infiltration Pr Difference: % Deficiency: Pro-Rated 20% Detr Total Detention Re Total Detention Re Basin Stage-Storage Elev. 807.0 806.0 805.0 804.0 803.0 802.0 801.0 800.0 799.0 798.0	equired per WCWRO ovided:  ention Penalty: quired quired including Pe e Summary: Area 98,900 92,300 85,900 79,600 73,500 54,400 49,800 45,400 41,100 37,000	Avg. Area 95,600 89,100 82,750 76,550 63,950 52,100 47,600 43,250 39,050	Depth 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0	(94,111) 100.0% 20.0% 491,482 589,778 Volume 589,950 494,350 405,250 322,500 245,950 182,000 129,900 82,300 39,050 0	cf cf	
W12	Total Infiltration Re Total Infiltration Pr Difference: % Deficiency: Pro-Rated 20% Deterion Re Total Detention Re Total Detention Re Basin Stage-Storage Elev. 807.0 806.0 805.0 804.0 803.0 802.0 801.0 800.0 799.0	equired per WCWRO ovided:  ention Penalty: quired quired including Pe e Summary: Area 98,900 92,300 85,900 79,600 73,500 54,400 49,800 45,400 41,100 37,000	Avg. Area 95,600 89,100 82,750 76,550 63,950 52,100 47,600 43,250 39,050	Depth 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0	(94,111) 100.0% 20.0% 491,482 589,778 Volume 589,950 494,350 405,250 322,500 245,950 182,000 129,900 82,300 0 589,950 0	cf cf	
W12	Total Infiltration Re Total Infiltration Pr Difference: % Deficiency: Pro-Rated 20% Detr Total Detention Re Total Detention Re Basin Stage-Storage Elev. 807.0 806.0 805.0 804.0 803.0 802.0 801.0 800.0 799.0 798.0	equired per WCWRO ovided:  ention Penalty: quired quired including Pe e Summary: Area 98,900 92,300 85,900 79,600 73,500 54,400 49,800 45,400 41,100 37,000	Avg. Area 95,600 89,100 82,750 76,550 63,950 52,100 47,600 43,250 39,050 37,000	Depth 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 Vff Elev.= Vbf Elev.= rided Elev.=	(94,111) 100.0% 20.0% 491,482 589,778 Volume 589,950 494,350 405,250 322,500 245,950 182,000 129,900 82,300 39,050 0 589,950 800.27 801.75 807.00	cf cf	
W12	Total Infiltration Re Total Infiltration Pr Difference: % Deficiency: Pro-Rated 20% Detr Total Detention Re Total Detention Re Basin Stage-Storage Elev. 807.0 806.0 805.0 804.0 803.0 802.0 801.0 800.0 799.0 798.0	equired per WCWRO ovided:  ention Penalty: quired quired including Pe e Summary: Area 98,900 92,300 85,900 79,600 73,500 54,400 49,800 45,400 41,100 37,000	Avg. Area 95,600 89,100 82,750 76,550 63,950 52,100 47,600 43,250 39,050 37,000	Depth 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 Vff Elev.=	(94,111) 100.0% 20.0% 491,482 589,778 Volume 589,950 494,350 405,250 322,500 245,950 182,000 129,900 82,300 39,050 0	cf cf	808.0
W12	Total Infiltration Re Total Infiltration Pr Difference: % Deficiency: Pro-Rated 20% Detr Total Detention Re Total Detention Re Basin Stage-Storage Elev. 807.0 806.0 805.0 804.0 803.0 802.0 801.0 800.0 799.0 798.0	equired per WCWRO ovided:  ention Penalty: quired quired including Pe  e Summary:  Area 98,900 92,300 85,900 79,600 73,500 54,400 49,800 45,400 41,100 37,000  ded:	Avg. Area 95,600 89,100 82,750 76,550 63,950 52,100 47,600 43,250 39,050 37,000	Depth 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 Vff Elev.= Vbf Elev.= rided Elev.=	(94,111) 100.0% 20.0% 491,482 589,778 Volume 589,950 494,350 405,250 322,500 245,950 182,000 129,900 82,300 39,050 0 589,950 800.27 801.75 807.00	cf cf Actual=	808.0
W12	Total Infiltration Re Total Infiltration Pr Difference: % Deficiency: Pro-Rated 20% Detr Total Detention Re Total Detention Re Basin Stage-Storage Elev. 807.0 806.0 805.0 804.0 803.0 802.0 801.0 800.0 799.0 798.0  Total Volume Provi	equired per WCWRO ovided:  ention Penalty: quired quired including Pe  e Summary:  Area 98,900 92,300 85,900 79,600 73,500 54,400 49,800 45,400 41,100 37,000  ded:  Vfb)=0.05*V100  age Summary:	Avg. Area 95,600 89,100 82,750 76,550 63,950 52,100 47,600 43,250 39,050 37,000	Depth 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0	(94,111) 100.0% 20.0% 491,482 589,778  Volume 589,950 494,350 405,250 322,500 245,950 182,000 129,900 82,300 39,050 0  589,950 800.27 801.75 807.00 808.00	cf cf Actual=	808.0
W12	Total Infiltration Re Total Infiltration Pr Difference: % Deficiency: Pro-Rated 20% Detr Total Detention Re Total Detention Re Basin Stage-Storage Flev. 807.0 806.0 805.0 804.0 803.0 802.0 801.0 800.0 799.0 798.0  Total Volume Provi	equired per WCWRO ovided:  ention Penalty: quired quired including Pe e Summary: Area 98,900 92,300 85,900 79,600 73,500 54,400 49,800 45,400 41,100 37,000  ded:  Vfb)=0.05*V100  age Summary: Area 11,700	Avg. Area 95,600 89,100 82,750 76,550 63,950 52,100 47,600 43,250 39,050 37,000	Depth   1.0   1.	(94,111) 100.0% 20.0% 491,482 589,778  Volume 589,950 494,350 405,250 322,500 245,950 182,000 129,900 82,300 39,050 0  589,950 0  589,950 0  Volume 25,416	cf cf Actual=	808.0
W12	Total Infiltration Re Total Infiltration Pr Difference: % Deficiency: Pro-Rated 20% Detr Total Detention Re Total Detention Re Basin Stage-Storage Flev. 807.0 806.0 805.0 804.0 803.0 802.0 801.0 800.0 799.0 798.0  Total Volume Provi	equired per WCWRO ovided:  ention Penalty: quired quired including Pe e Summary:	Avg. Area  Avg. Area  Avg. Area  Avg. Area  Avg. Area	Depth   1.0   1.	(94,111) 100.0% 20.0% 491,482 589,778  Volume 589,950 494,350 495,250 322,500 245,950 182,000 129,900 82,300 39,050 0  589,950 0  589,950 0  25,416	cf cf Actual=	808.0

NRCS Variables Rational Method Variables (Pariables Rational Method Variables (Pariables Rational Method Variables (Pariables Pariables (Pariables Pariables Pariables Pariables Pariables Pariables (Pariables Pariables Pariable	Paved Parking Lots Water S Developed Open Spi Off-site Cont  Pervious C Developed Open Spi Off-site Cont  Impervious Paved Parking Lots Impervio	cover Type ace, Good Condition Cover Type ace, Good Condition ributing Area	Soil Type D D D D	Area (sf) 117,660 43,500 178,607 31,800  hted C-Sumi			
NRCS Variables NRCS Variables Or D.	Paved Parking Lots Water S Developed Open Spi Off-site Cont  Pervious C Developed Open Spi Off-site Cont  Impervious Paved Parking Lots Impervio	s, roofs, driveways Gurfaces ace, Good Condition ributing Area  Cover Type ace, Good Condition ributing Area	D D D Weig	117,660 43,500 178,607 31,800 thted C-Sum Area (sf)	2.70 1.00 4.10 0.73	0.95 1.00 0.45 0.45 Sum (c)(Area) = Area Total (sf)=	111,777 43,500 80,373 14,310 249,960
NRCS Variables NRCS Variables O D	Pervious C Developed Open Spi Off-site Cont  Developed Open Spi Off-site Cont  Impervious Paved Parking Lot Impervio	cover Type ace, Good Condition Cover Type ace, Good Condition ributing Area	D D Weig	178,607 31,800 shted C-Sumi	4.10 0.73 Total - S	0.45 0.45 Sum (c)(Area) = Area Total (sf)=	80,373 14,310 249,960
NRCS Variables NRCS Variables O D	Pervious C Developed Open Sp. Off-site Cont  Impervious Paved Parking Lot Impervio	Cover Type ace, Good Condition ributing Area	Weig Soil Type D	hted C-Sum Area (sf)	Total - S	Sum (c)(Area) = Area Total (sf)=	249,960
NRCS Variables NRCS Variables O D	Developed Open Sp. Off-site Cont  Impervious Paved Parking Lot Impervio	ace, Good Condition ributing Area	Soil Type D	Area (sf)		Area Total (sf)=	
NRCS Variables NRCS Variables O D	Developed Open Sp. Off-site Cont  Impervious Paved Parking Lot Impervio	ace, Good Condition ributing Area	Soil Type D	Area (sf)	(c)(Area)/Sum	(ac) or Sum(sf)-	371,567
W2 A. B. C. D.	Developed Open Sp. Off-site Cont  Impervious Paved Parking Lot Impervio	ace, Good Condition ributing Area	D			- paintal J=	0.67
W2 A. B. C. D.	Impervious Paved Parking Lot Impervio		D	178,607	Area (ac) 4.10	Curve Number 80	(CN)(Area) 14,288,544
W2 A. B. C. D.	Paved Parking Lot Impervio	C		31,800	0.73 0.00	71	2,257,800 0
W2 A. B. C. D.	Paved Parking Lot Impervio	Community of the Commun	Total - Sum	(CN)(Area) =			16,546,344
W2 A. W3 A. B. C. D.	Paved Parking Lot Impervio			ea Total (sf)= N-Sum(CN)(	= Area)/Sum(ac)	or Sum(sf)=	210,407 <b>79</b>
W2 A. W3 A. B. C. D.	Impervio		Soil Type	Area (sf)	Area (ac)	Curve Number	
W2 A. W3 A. B. C. D.	Circle Print	s, roofs, driveways us, Ponds	D	117,660 43,500	2.70 1.00	98 98	11,530,680 4,263,000
W2 A. W3 A. B. C. D.	Circle File 1				0.00		0
A. W3 A. B. C. D.	Circle Fil. 1		Area Total -	Sum(ac) of S	Sum(sf)=		15,793,680 161,160
A. W3 A. B. C. D.	First Flush Runoff C	alculations (Vff)	weighted Ci	N-Sum(CN)(	Area)/Sum(ac)	or sum(si)=	98
W3 A. B. C. D.	Vff = (1") (1/12) (43					20,746	cf
A. B. C. D.		ankfull Runoff Calc	ulations (Vbf.	-nre)		20,740	
B. C. D.	2 year/24 hour stor		alations (voi-	piej	P =	2.35	in
D.	the property of the second	(pasture, grassland	d or range, fa	ir)	CN =	78	in
E.	Q = (P-0.2S)^2/(P+0				Q = Area =	0.69	in
F.	Pervious Cover Are V <sub>bf-pre</sub> = Q(1/12)Area				V <sub>bf-pre</sub> =		sf cf
W4	Pervious Cover Pos	st-development Bar	kfull Runoff	Calculations	(Vbf-per-post)		
A.	2 year/24 hour stor	m event			P =		in
B. C.	Pervious Cover CN S = (1000/CN )-10	1 90'			CN = S =	2.72	in
D. E.	Q = (P-0.2S)^2/(P+0 Pervious Cover Are	а			Q = Area =	210,407	in sf
F.	V <sub>bf-per-post</sub> = Q(1/12)		Omel C. II.		V <sub>bf-per-post</sub> =		cf
W5		Post-development E	anktull Rund	m Calculatio			tu.
A. B.	2 year/24 hour stor Impervious Cover (				P = CN =	98	in
C. D.	S = (1000/CN )-10 Q = (P-0.2S)^2/(P+0				S = Q =	2.12	in in
E.	Pervious Cover Are Vbf-imp-post = Q(1/12)				Area = V <sub>bf-imp-post</sub> =		sf cf
W6	Pervious Cover Pos	st-development 100	-year Storm I	Runoff Calcu	lations (V100-p	per-post)	
Α.	100 year storm eve	nt			P =		in
B. C.	Pervious Cover CN S = (1000/CN )-10				CN = S =	2.72	in
D. E.	Q = (P-0.2S)^2/(P+0 Pervious Cover Are	a			Q = Area =		in sf
F.	V <sub>100-imp-post</sub> = Q(1/12	)Area			V <sub>100-imp-post</sub> =	50,210	cf
W7	Impervious Cover I	Post-development 1	100-year Stori	m Runoff Ca	culations (V10	0-imp-post)	
A. B.	100 year storm eve Pervious Cover CN	nt			P = CN =		in
C. D.	S = (1000/CN )-10 Q = (P-0.2S)^2/(P+0	).8S)			S = Q =		in in
E.	Pervious Cover Are V <sub>100-imp-post</sub> = Q(1/12				Area = V <sub>100-imp-post</sub> =		sf cf
W8	Determine Time of	Concentration (Tc-	hrs)				
	User specified; ass	ume 30 minutes		Total	Time of Conce	entration (hrs) =	0.50
W9	Runoff Summary &	Onsite Infiltration	Requirement				
A.	Runoff Summary fr	om Previous Works					
		V <sub>ff</sub> = V <sub>bf-pre</sub> =		1			
		V <sub>bf-per-post</sub> = V <sub>bf-imp-post</sub> =			Total BF Volum	me (V <sub>bf-post</sub> ) 41,149	cf
		V <sub>100-per-post</sub> =	50,210	cf	Total 100-year	r Volume (V <sub>100</sub> )	
		V <sub>100-imp-post</sub> =	65,444	cf		115,654	cf
В.	Determine Onsite	nfiltration Require		cf			
	Bankfull V	V <sub>bf-pre</sub> = olume Difference =					
					rement (V <sub>inf</sub> ) =	20,746	cf
W10	Detention / Retent	ion Requirement					
Α.	$Q_p = 238.6 (T_c) ^-0.8$					421.23	cfs/in-mi^2
B. C.	Total Site Area Q <sub>100</sub> = Q <sub>100-per</sub> + Q <sub>100</sub>					8.53 7.74	ac in
D. E.	Peak Flow (PF) = (C Delta = PF - 0.15A					43.434 42.155	cfs cfs
F.	V <sub>det</sub> = (Delta/PF) x \					112,247	cf
V <sub>inf</sub> refers to to	otal infiltration prov	ided per worksheet	W11				
W11	Determine Applica	ble BMPs and Assoc	iated Volum	e Credits			
Prope	osed BMP	Average Area (ft²)	Storage	Storage Volume	Ave. Design Infil. Rate	Infil. During	Total Volume
			Depth (ft)	(ft <sup>3</sup> )	(in/hr)*	Storm (ft <sup>3</sup> )	Reduction (ft
	Total Volu	ume Reduction Cred	lit by Propose	ed Structural	BMPs (Vinf) =	0	cf
W12	Infiltration / Deten	tion Summary					
	Total Infiltration Re Total Infiltration Pr	equired per WCWRC ovided:	Rules:		20,746 0		
	Difference: % Deficiency:				(20,746) 100.0%		
	Pro-Rated 20% Det Total Detention Re				<b>20.0%</b> 112,247		
		quired including Pe	nalty, if appl	icable	134,697	1	
	Basin Stage-Storage	e Summary:	Avg. Area	Depth	Volume		
	804.0 803.0	39,500 35,500	37,500 33,750	1.0	138,850 101,350		
	802.0 801.0	32,000 23,000	27,500 21,500	1.0	67,600 40,100		
	800.0 799.0	20,000 17,200	18,600 17,200	1.0	18,600 0		
		17,200 meVolume Provide		Vff Elev.=	138,850 800.10	10.0	
				Vbf Elev.=	801.04		
			44	ided FI			
				ided Elev.= reeboard=	803.89 804.89		805
	Forebay Sizing				804.89	Actual=	805
	Required Volume (					Actual=	805
	The state of the s				804.89	Actual=	805

	Determining Post-		Total Co.		rainage Area =		Acres	
			Total Col		tal Site Area =		Acres	
ъ		гТуре	Soil Type	Area (sf)	Area (ac)	Runoff Coef	(c)(Area)	
Rational Method Variables	The second secon	s, roofs, driveways Surfaces	B	117,100 40,000	0.92	1.00	111,245 40,000	
ional Metl Variables	Developed Open Sp	ace, Good Condition	В	208,804	4.79	0.25	52,201	
Ratio					Total - :	Sum (c)(Area) = Area Total (sf)=		
			Weig	ghted C-Sum	(c)(Area)/Sum	n(ac) or Sum(sf)=	0.56	
5.		Cover Type	Soil Type	Area (sf)	Area (ac)	Curve Number		
NRCS Variables	Developed Open Sp	ace, Good Condition	В	208,804	0.00	61	12,737,044	
S Var			Tatal Com	(CN)//A1			12 727 044	
NRC			Total - Sum (	(CN)(Area) = ea Total (sf)=			12,737,044 208,804	
			Weighted C	N-Sum(CN)(	Area)/Sum(ac)	or Sum(sf)=	61	
		Cover Type	Soil Type	Area (sf)	Area (ac)	Curve Number		
ples		s, roofs, driveways us, Ponds	В	117,100 40,000	0.92	98 98	11,475,800 3,920,000	
N RCS Variables	ė-				0.00		0	
NRCS			Total - Sum				15,395,800	
			Area Total - Weighted C		Sum(st)= Area)/Sum(ac)	orSum(sf)=	157,100 98	
W2	First Flush Runoff (	Calculations (Vff)						-
VVZ	FIRST Flush Kunoff (	calculations (VII)						
A.	Vff = (1") (1/12) (43	3560/1) (C) AC =		-		17,076	cf	
W3	Predevelopment B	Bankfull Runoff Calcu	lations (Vbf-	-pre)				
A.	2 year/24 hour stor	rm event			P =	2.35	in	
B.	Pervious Cover CN	(pasture, grassland	or range, fa	nir)	CN =		14	
C. D.	S = (1000/CN)-10 Q = (P-0.2S)^2/(P+0	0.85)			S = Q =		in in	
E.	Pervious Cover Are				Area =		sf	
F.	V <sub>bf-pre</sub> = Q(1/12)Are				V <sub>bf-pre</sub> =		cf	
W4	Pervious Cover Pos	st-development Ban	kfull Runoff	Calculations	(Vbf-per-post	1		
Α.	2 year/24 hour stor				P =		in	
B. C.	Pervious Cover CN S = (1000/CN )-10				CN = S =		in	
D.	Q = (P-0.2S)^2/(P+0				Q=	0.15	in	
E. F.	Pervious Cover Are V <sub>bf-per-post</sub> = Q(1/12)				Area = V <sub>bf-per-post</sub> =		sf cf	E
			0.12.4					
W5	Impervious Cover I	Post-development B	ankfull Runo	off Calculation	ons (Vbf-imp-p	ost)		
Α.	2 year/24 hour stor				P =	4	in	
B. C.	S = (1000/CN)-10	UN			CN = S =		in	
D.	Q = (P-0.2S)^2/(P+0				Q=	2.12	in	
E. F.	Pervious Cover Are V <sub>bf-mp-post</sub> = Q(1/12)				Area = V <sub>bf-imp-post</sub> =		sf cf	
W6		st-development 100	VA2+CI-	Runoff				
Wb	Pervious Cover Pos	st-development 100	year Storm I	Runoff Calcu	liations (V100-)	per-post)		
A. B.	100 year storm eve Pervious Cover CN				P = CN =		in	
C.	S = (1000/CN )-10				S =		in	
D. E.	Q = (P-0.2S)^2/(P+0 Pervious Cover Are				Q = Area =		in sf	
F.	V <sub>100-imp-post</sub> = Q(1/12				V <sub>100-imp-post</sub> =		cf	
W7	Impervious Cover I	Post-development 1	00-year Ston	m Runoff Ca	Iculations (V10	O-imp-post)		
***	impervious coverr	ost development 1	oo year stori	in nation ca				
A. B.	100 year storm eve Pervious Cover CN				P = CN =		in	
c.	S = (1000/CN )-10				S =		in	
D. E.	Q = (P-0.2S)^2/(P+0 Pervious Cover Are				Q = Area =		in sf	
F.	V <sub>100-imp-post</sub> = Q(1/12	?)Area			V <sub>100-imp-post</sub> =	63,796	ď	
W8	Determine Time of	f Concentration (Tc-l	nrs)					
	User specified; ass	ume 30 minutes						
				Total	Time of Conce	entration (hrs) =	0.50	
W9	Runoff Summary &	Onsite Infiltration F	Requirement	t				
Α.	Runoff Summary fr	rom Previous Works	neets					
		V <sub>ff</sub> =						
		V <sub>bf-pre</sub> = V <sub>bf-per-post</sub> =			Total BF Volu	me (V <sub>bf-post</sub> )		
		V <sub>bf-imp-post</sub> =	27,776	cf		30,452	cf	
		V <sub>100-per-post</sub> =	24,980	cf	Total 100-yea	r Volume (V <sub>100</sub> )		
		V <sub>100-imp-post</sub> =	63,796	cf		88,776	cf	
В.	Determine Onsite	Infiltration Requirer	nent					
		V <sub>bf-post</sub> =						
		V <sub>bf-pre</sub> =						
	Bankfull V	olume Difference =	9,339					
	Bankfull V			cf*	rement ()	17.076	let	
1000				cf*	irement (V <sub>nr</sub> ) =	17,076	ď	
W10	Bankfull V  Detention / Retent			cf*	irement (V <sub>rr</sub> ) =	17,076	ď	
Α.	Detention / Retention $Q_0 = 238.6 (T_c) ^-0.3$	tion Requirement		cf*	irement (V <sub>rd</sub> ) =	421.23	cfs/in-mi^2	
A. B.	Detention / Retent Q <sub>o</sub> = 238.6 (T <sub>c</sub> ) ^ - 0.1 Total Site Area	tion Requirement		cf*	irement (V <sub>rr</sub> ) =			
A. B. C. D.	Detention / Retent $Q_{o} = 238.6 (T_{c}) ^{\circ} - 0.1$ Total Site Area $Q_{100} = Q_{100 \text{-per}} + Q_{100}$ Peak Flow (PF) = (C	tion Requirement		cf*	irement (V <sub>rd</sub> ) =	421.23 8.4 6.31 34.878	cfs/in-mi^2 ac in cfs	
A. B. C.	Detention / Retent $Q_{cs} = 238.6 (T_c) ^ - 0.1$ Total Site Area $Q_{100} = Q_{100-per} + Q_{100}$ Peak Flow (PF) = (C Delta = PF - 0.15A	tion Requirement 82		cf*	irement (V <sub>rr</sub> ) =	421.23 8.4 6.31	cfs/in-mi^2 ac in	
A. B. C. D. E.	Detention / Retent $Q_{cs} = 238.6 (T_c)^{-0.1}$ Total Site Area $Q_{100} = Q_{100-per} + Q_{100}$ Peak Flow (PF) = (C Delta = PF - 0.15A $V_{det} = (Delta/PF) \times V_{det}$	tion Requirement  82 imp  2 <sub>0</sub> -Q <sub>100</sub> -A)/640  V <sub>100</sub> - V <sub>int</sub> *	Onsite Infilt	cf*	rement (V <sub>vt</sub> ) =	421.23 8.4 6.31 34.878 33.618	cfs/in-mi^2 ac in cfs cfs	
A. B. C. D. E.	Detention / Retent $Q_{cs} = 238.6 (T_c) ^ - 0.1$ Total Site Area $Q_{100} = Q_{100-per} + Q_{100}$ Peak Flow (PF) = (C Delta = PF - 0.15A	tion Requirement  82 imp  2 <sub>0</sub> -Q <sub>100</sub> -A)/640  V <sub>100</sub> - V <sub>int</sub> *	Onsite Infilt	cf*	rement (V <sub>rr</sub> ) =	421.23 8.4 6.31 34.878 33.618	cfs/in-mi^2 ac in cfs cfs	
A. B. C. D. E.	Detention / Retent  Q <sub>o</sub> = 238.6 (T <sub>c</sub> ) ^ - 0.1  Total Site Area  Q <sub>100</sub> = Q <sub>100-per</sub> + Q <sub>100</sub> Peak Flow (PF) = (C  Delta = PF - 0.15A  V <sub>det</sub> = (Delta/PF) × V  total infiltration prov	tion Requirement  82 imp  2 <sub>0</sub> -Q <sub>100</sub> -A)/640  V <sub>100</sub> - V <sub>int</sub> *	Onsite Infilt	cf* ration Requi	irement (V <sub>rt</sub> ) =	421.23 8.4 6.31 34.878 33.618	cfs/in-mi^2 ac in cfs cfs	
A. B. C. D. E. F.	Detention / Retent  Q <sub>o</sub> = 238.6 (T <sub>c</sub> ) ^ - 0.1  Total Site Area  Q <sub>100</sub> = Q <sub>100-per</sub> + Q <sub>100</sub> Peak Flow (PF) = (C  Delta = PF - 0.15A  V <sub>det</sub> = (Delta/PF) × V  total infiltration prov	tion Requirement  82	Onsite Infilt	cf* ration Requi	rement (V <sub>rt</sub> ) =	421.23 8.4 6.31 34.878 33.618 <b>85,569</b>	cfs/in-mi^2 ac in cfs cfs cfs	
A. B. C. D. E. F. W11	Detention / Retent  Q <sub>o</sub> = 238.6 (T <sub>c</sub> ) ^ - 0.1  Total Site Area  Q <sub>100</sub> = Q <sub>100-per</sub> + Q <sub>100</sub> Peak Flow (PF) = (C  Delta = PF - 0.15A  V <sub>det</sub> = (Delta/PF) × V  total infiltration prov	tion Requirement  82	Onsite Infilt	cf* ration Requi	Ave. Design Infil. Rate	421.23 8.4 6.31 34.878 33.618	cfs/in-mi^2 ac in cfs cfs	
A. B. C. D. E. F. W11	Detention / Retent Q <sub>o</sub> = 238.6 (T <sub>c</sub> ) ^ -0.3 Total Site Area Q <sub>100</sub> = Q <sub>100-per</sub> + Q <sub>100</sub> Peak Flow (PF) = (C Delta = PF - 0.15A V <sub>det</sub> = (Delta/PF) x \tag{1} total infiltration prov	tion Requirement  82  200-400-A)/640  V100-V100-V101*  rided per worksheet  able BMPs and Assoc	Onsite Infilt W11 iated Volum Storage	cf* ration Requi	Ave. Design	421.23 8.4 6.31 34.878 33.618 <b>85,569</b>	cfs/in-mi^2 ac in cfs cfs cfs cf	
A. B. C. D. E. F. W11	Detention / Retent  Q <sub>o</sub> = 238.6 (T <sub>c</sub> ) ^ - 0.1  Total Site Area  Q <sub>100</sub> = Q <sub>100-per</sub> + Q <sub>100</sub> Peak Flow (PF) = (C  Delta = PF - 0.15A  V <sub>det</sub> = (Delta/PF) x V  total infiltration prov  Determine Applica	tion Requirement  82  200-400-A)/640  V100-V100-V101*  rided per worksheet  able BMPs and Assoc	Onsite Infilt W11 iated Volum Storage Depth (ft)	ration Requi	Ave. Design Infil. Rate (in/hr)*	421.23 8.4 6.31 34.878 33.618 <b>85,569</b> Infil. During Storm (ft <sup>3</sup> )	cfs/in-mi^2 ac in cfs cfs cfs cf	
A. B. C. D. E. F. W11	Detention / Retent  Q <sub>o</sub> = 238.6 (T <sub>c</sub> ) ^ - 0.1  Total Site Area  Q <sub>100</sub> = Q <sub>100-per</sub> + Q <sub>100</sub> Peak Flow (PF) = (C  Delta = PF - 0.15A  V <sub>det</sub> = (Delta/PF) x V  total infiltration prov  Determine Applica	tion Requirement  82  -Imp.  20-Q100-A)/640  V100-V101*  rided per worksheet  uble BMPs and Associ	Onsite Infilt W11 iated Volum Storage Depth (ft)	ration Requi	Ave. Design Infil. Rate (in/hr)*	421.23 8.4 6.31 34.878 33.618 <b>85,569</b> Infil. During Storm (ft <sup>3</sup> )	cfs/in-mi^2 ac in cfs cfs cf f	
A. B. C. D. E. F. W11	Detention / Retent  Q <sub>o</sub> = 238.6 (T <sub>c</sub> ) ^ -0.2  Total Site Area  Q <sub>100</sub> = Q <sub>100-per</sub> + Q <sub>100</sub> Peak Flow (PF) = (C  Delta = PF - 0.15A  V <sub>det</sub> = (Delta/PF) x \times total infiltration prov  Determine Applica  posed BMP  Total Volume Infiltration / Determine	tion Requirement  82  20-Q-Q100-A)/640  V100-V101*  rided per worksheet  able BMPs and Assoc  Average Area (ft²)  ume Reduction Creduction Summary	W11 Storage Depth (ft)	ration Requi	Ave. Design Infil. Rate (in/hr)* I BMPs (Vinf) =	421.23 8.4 6.31 34.878 33.618 85,569	cfs/in-mi^2 ac in cfs cfs cf f	
A. B. C. D. E. F. W11	Detention / Retent  Q <sub>o</sub> = 238.6 (T <sub>c</sub> ) ^ -0.1  Total Site Area  Q <sub>100</sub> = Q <sub>100-per</sub> + Q <sub>100</sub> Peak Flow (PF) = (C  Delta = PF - 0.15A  V <sub>det</sub> = (Delta/PF) x \tag{1}  total infiltration prov  Determine Applica  posed BMP  Total Volu  Infiltration / Determine Applica  Total Infiltration Retent  Total Infiltration Prove	tion Requirement  82  20-Q-Q100-A)/640  V100-V101*  vided per worksheet tible BMPs and Associate Average Area (ft <sup>2</sup> )  ume Reduction Creduction Summary	W11 Storage Depth (ft)	ration Requi	Ave. Design Infil. Rate (in/hr)*  I BMPs (Vinf) =	421.23 8.4 6.31 34.878 33.618 85,569 Infil. During Storm (ft <sup>3</sup> )	cfs/in-mi^2 ac in cfs cfs cf f	
A. B. C. D. E. F. W11	Detention / Retent  Q <sub>o</sub> = 238.6 (T <sub>c</sub> ) ^ - 0.4  Total Site Area  Q <sub>100</sub> = Q <sub>100-per</sub> + Q <sub>100</sub> Peak Flow (PF) = (C  Delta = PF - 0.15A  V <sub>det</sub> = (Delta/PF) x \( \)  total infiltration prov  Determine Applica  posed BMP  Total Volu  Infiltration / Determine Applica  Total Infiltration Retent  Total Infiltration Provided Infiltration Infil	tion Requirement  82  20-Q-Q100-A)/640  V100-V101*  vided per worksheet tible BMPs and Associate Average Area (ft <sup>2</sup> )  ume Reduction Creduction Summary	W11 Storage Depth (ft)	ration Requi	Ave. Design Infil. Rate (in/hr)* I BMPs (Vinf) =	421.23 8.4 6.31 34.878 33.618 85,569	cfs/in-mi^2 ac in cfs cfs cf f	
A. B. C. D. E. F. W11	Detention / Retent  Q <sub>o</sub> = 238.6 (T <sub>c</sub> ) ^ - 0.3  Total Site Area  Q <sub>100</sub> = Q <sub>100-per</sub> + Q <sub>100</sub> Peak Flow (PF) = (C  Delta = PF - 0.15A  V <sub>det</sub> = (Delta/PF) × V  total infiltration prov  Determine Applica  posed BMP  Total Volu  Infiltration / Determine Applica  Total Infiltration Provided Infiltration Infilt	tion Requirement  82  -Imp  Op-Q100-A)/640  V100- V101*  rided per worksheet  able BMPs and Associ  Average Area (ft²)  ume Reduction Cred  ation Summary  equired per WCWRC  rovided:	W11 Storage Depth (ft)	ration Requi	Ave. Design Infil. Rate (in/hr)*  I BMPs (Vinf) =  17,076 0 (17,076) 100.0% 20.0%	421.23 8.4 6.31 34.878 33.618 85,569	cfs/in-mi^2 ac in cfs cfs cf f	
A. B. C. D. E. F. W11	Detention / Retent  Q <sub>o</sub> = 238.6 (T <sub>c</sub> ) ^ - 0.1  Total Site Area  Q <sub>100</sub> = Q <sub>100-per</sub> + Q <sub>100</sub> Peak Flow (PF) = (C  Delta = PF - 0.15A  V <sub>det</sub> = (Delta/PF) × 1  total infiltration prov  Determine Applica  posed BMP  Total Volu  Infiltration / Detent  Total Infiltration Provided Infiltration I	tion Requirement  82	W11 iated Volum Storage Depth (ft) it by Propose	ration Requi	Ave. Design Infil. Rate (in/hr)*  I BMPs (Vinf) =  17,076 0 (17,076) 100.0%	421.23 8.4 6.31 34.878 33.618 85,569 Infil. During Storm (ft <sup>3</sup> )	cfs/in-mi^2 ac in cfs cfs cf f	
A. B. C. D. E. F. W11	Detention / Retent  Q <sub>o</sub> = 238.6 (T <sub>c</sub> ) ^ -0.3  Total Site Area  Q <sub>100</sub> = Q <sub>100-per</sub> + Q <sub>100</sub> Peak Flow (PF) = (C  Delta = PF - 0.15A  V <sub>det</sub> = (Delta/PF) x \times total infiltration prov  Determine Applica  posed BMP  Total Volume Total Infiltration Province Infiltration Retention Retention Retention Retention Retention Retention Retention Retention Retention Province Infiltration Retention	tion Requirement  82  20-Q-Q-Q-A)/640  V100-V <sub>Inf</sub> *  rided per worksheet  able BMPs and Associ  Average Area (ft²)  ume Reduction Cred  ation Summary  equired per WCWRC  rovided:  ention Penalty: equired quired including Pe	W11 iated Volum Storage Depth (ft) it by Propose	ration Requi	Ave. Design Infil. Rate (in/hr)*  I BMPs (Vinf) =  17,076 0 (17,076) 100.0% 20.0%	421.23 8.4 6.31 34.878 33.618 85,569 Infil. During Storm (ft <sup>3</sup> )	cfs/in-mi^2 ac in cfs cfs cf f	
A. B. C. D. E. F. W11	Detention / Retent  Q <sub>o</sub> = 238.6 (T <sub>c</sub> ) ^ - 0.1  Total Site Area  Q <sub>100</sub> = Q <sub>100-per</sub> + Q <sub>100</sub> Peak Flow (PF) = (C  Delta = PF - 0.15A  V <sub>det</sub> = (Delta/PF) × 1  total infiltration prov  Determine Applica  posed BMP  Total Volu  Infiltration / Detent  Total Infiltration Provided Infiltration I	tion Requirement  82  20-Q-Q-Q-A)/640  V100-V <sub>Inf</sub> *  rided per worksheet  able BMPs and Associ  Average Area (ft²)  ume Reduction Cred  ation Summary  equired per WCWRC  rovided:  ention Penalty: equired quired including Pe	W11 iated Volum Storage Depth (ft) iit by Propose	ration Requi	Ave. Design Infil. Rate (in/hr)*  I BMPs (Vinf) =  17,076 0 (17,076) 100.0% 20.0%	421.23 8.4 6.31 34.878 33.618 85,569 Infil. During Storm (ft <sup>3</sup> )	cfs/in-mi^2 ac in cfs cfs cf f	
A. B. C. D. E. F. W11	Detention / Retent  Q <sub>o</sub> = 238.6 (T <sub>c</sub> ) ^ - 0.3  Total Site Area  Q <sub>100</sub> = Q <sub>100-per</sub> + Q <sub>100</sub> Peak Flow (PF) = (C  Delta = PF - 0.15A  V <sub>det</sub> = (Delta/PF) × V  total infiltration prov  Determine Applica  posed BMP  Total Volu  Infiltration / Detent  Total Infiltration Provided Infiltration Infi	tion Requirement  82  -Imp  Op Q100-A)/640  V100- V101*  rided per worksheet  tible BMPs and Associ  Average Area (ft²)  ume Reduction Cred  ation Summary  equired per WCWRC  rovided:  ention Penalty: quired quired including Pe  e Summary:  Area 30,100	W11 iated Volum Storage Depth (ft) it by Propose Rules: nalty, if appl	ration Requi	Ave. Design Infil. Rate (in/hr)*  I BMPs (Vinf) =  17,076 0 (17,076) 100.0% 20.0% 85,569 102,683	421.23 8.4 6.31 34.878 33.618 85,569 Infil. During Storm (ft <sup>3</sup> )	cfs/in-mi^2 ac in cfs cfs cf f	
A. B. C. D. E. F. W11	Detention / Retent  Q <sub>o</sub> = 238.6 (T <sub>c</sub> ) ^ - 0.3  Total Site Area  Q <sub>100</sub> = Q <sub>100-per</sub> + Q <sub>100</sub> Peak Flow (PF) = (C  Delta = PF - 0.15A  V <sub>det</sub> = (Delta/PF) x \times \tim	tion Requirement  82	W11 iated Volum Storage Depth (ft) iit by Propose Rules: nalty, if appl	ration Requi	Ave. Design Infil. Rate (in/hr)*  I BMPs (Vinf) =  17,076 0 (17,076) 100.0% 20.0% 85,569 102,683	421.23 8.4 6.31 34.878 33.618 85,569 Infil. During Storm (ft <sup>3</sup> )	cfs/in-mi^2 ac in cfs cfs cf f	
A. B. C. D. E. F. W11	Detention / Retent  Q <sub>o</sub> = 238.6 (T <sub>c</sub> ) ^ - 0.1  Total Site Area  Q <sub>100</sub> = Q <sub>100-per</sub> + Q <sub>100</sub> Peak Flow (PF) = (C  Delta = PF - 0.15A  V <sub>det</sub> = (Delta/PF) x \times total infiltration prov  Determine Application  posed BMP  Total Volume  Total Infiltration Proving Infiltration Research  Total Detention Res	tion Requirement  82  20-Q-Q-Q-100-A)/640  V-100-V-M-*  rided per worksheet  able BMPs and Associ  Average Area (ft²)  ume Reduction Cred  ation Summary  equired per WCWRC  rovided:  cention Penalty: equired including Per  e Summary: Area 30,100 26,500 23,200 14,100	W11 iated Volum Storage Depth (ft) iit by Propose Rules:  Avg. Area 28,300 24,850 18,650 12,850	ration Requi	Ave. Design Infil. Rate (in/hr)*  I BMPs (Vinf) =  17,076 0 (17,076) 100.0% 85,569 102,683  Volume 103,250 74,950 50,100 31,450	421.23 8.4 6.31 34.878 33.618 85,569 Infil. During Storm (ft <sup>3</sup> )	cfs/in-mi^2 ac in cfs cfs cf f	
A. B. C. D. E. F. W11	Detention / Retent  Q <sub>o</sub> = 238.6 (T <sub>c</sub> ) ^ - 0.4  Total Site Area  Q <sub>100</sub> = Q <sub>100-per</sub> + Q <sub>100</sub> Peak Flow (PF) = (C  Delta = PF - 0.15A  V <sub>det</sub> = (Delta/PF) x \( \)  total infiltration prov  Determine Applica  posed BMP  Total Volu  Infiltration / Detent  Total Infiltration Province  W Deficiency: Pro-Rated 20% Det  Total Detention Re  Total Detention Re  Total Detention Re  Basin Stage-Storag  Elev.  783.0  782.0  781.0  780.0  779.0	tion Requirement  82	W11 Storage Depth (ft) lit by Propose Rules: Avg. Area 28,300 24,850 18,650 12,850 10,450	ration Requi	Ave. Design Infil. Rate (in/hr)*  I BMPs (Vinf) =  17,076 0 (17,076) 100.0% 85,569 102,683  Volume 103,250 74,950 50,100 31,450 18,600	421.23 8.4 6.31 34.878 33.618 85,569 Infil. During Storm (ft <sup>3</sup> )	cfs/in-mi^2 ac in cfs cfs cf f	
A. B. C. D. E. F. W11	Detention / Retent  Q <sub>o</sub> = 238.6 (T <sub>c</sub> ) ^ - 0.3  Total Site Area  Q <sub>100</sub> = Q <sub>100-per</sub> + Q <sub>100</sub> Peak Flow (PF) = (C  Delta = PF - 0.15A  V <sub>det</sub> = (Delta/PF) x \times total infiltration prov  Determine Applica  posed BMP  Total Volu  Infiltration / Detent  Total Infiltration Province  When total infiltration Province  Total Infiltration Province  When total Infiltration Province  Total Detention Retent  Total De	tion Requirement 82  Jon Quo, A)/640  Value Value Value Value Value BMPs and Associated BMPs and Associated Reduction Credition Summary  equired per WCWRC rovided:  Lention Penalty: Lention Pen	W11 Storage Depth (ft) lit by Propose Rules: Avg. Area 28,300 24,850 12,850 12,850 10,450 8,150 7,000	ration Requi	Ave. Design Infil. Rate (in/hr)*  17,076 0 (17,076) 100.0% 20.0% 85,569 102,683  Volume 103,250 74,950 50,100 31,450 18,600 8,150 0	421.23 8.4 6.31 34.878 33.618 85,569  Infil. During Storm (ft <sup>3</sup> )  0  cf cf cf cf	cfs/in-mi^2 ac in cfs cfs cf f	
A. B. C. D. E. F. W11	Detention / Retent  Q <sub>o</sub> = 238.6 (T <sub>c</sub> ) ^ - 0.3  Total Site Area  Q <sub>100</sub> = Q <sub>100-per</sub> + Q <sub>100</sub> Peak Flow (PF) = (C  Delta = PF - 0.15A  V <sub>det</sub> = (Delta/PF) x \times total infiltration prov  Determine Applica  posed BMP  Total Volu  Infiltration / Detent  Total Infiltration Province  When total infiltration Province  Total Infiltration Province  When total Infiltration Province  Total Detention Retent  Total De	tion Requirement  82	W11 Storage Depth (ft) lit by Propose Rules: Avg. Area 28,300 24,850 12,850 12,850 10,450 8,150 7,000	ration Requi	Ave. Design Infil. Rate (in/hr)*  17,076  0  (17,076) 100.0% 20.0% 85,569  102,683  Volume 103,250 74,950 50,100 31,450 18,600 8,150 0 103,250	421.23 8.4 6.31 34.878 33.618 85,569  Infil. During Storm (ft <sup>3</sup> )  0  cf cf cf cf	cfs/in-mi^2 ac in cfs cfs cf f	
A. B. C. D. E. F. W11	Detention / Retent  Q <sub>o</sub> = 238.6 (T <sub>c</sub> ) ^ - 0.3  Total Site Area  Q <sub>100</sub> = Q <sub>100-per</sub> + Q <sub>100</sub> Peak Flow (PF) = (C  Delta = PF - 0.15A  V <sub>det</sub> = (Delta/PF) x \times total infiltration prov  Determine Applica  posed BMP  Total Volu  Infiltration / Detent  Total Infiltration Province  When total infiltration Province  Total Infiltration Province  When total Infiltration Province  Total Detention Retent  Total De	tion Requirement 82  Jon Quo, A)/640  Value Value Value Value Value BMPs and Associated BMPs and Associated Reduction Credition Summary  equired per WCWRC rovided:  Lention Penalty: Lention Pen	W11 Storage Depth (ft) lit by Propose Rules: Avg. Area 28,300 24,850 12,850 12,850 10,450 8,150 7,000	ration Requi	Ave. Design Infil. Rate (in/hr)*  17,076 0 (17,076) 100.0% 20.0% 85,569 102,683  Volume 103,250 74,950 50,100 31,450 18,600 8,150 0	421.23 8.4 6.31 34.878 33.618 85,569  Infil. During Storm (ft <sup>3</sup> )  o	cfs/in-mi^2 ac in cfs cfs cf f	
A. B. C. D. E. F. W11	Detention / Retent  Q <sub>o</sub> = 238.6 (T <sub>c</sub> ) ^ - 0.3  Total Site Area  Q <sub>100</sub> = Q <sub>100-per</sub> + Q <sub>100</sub> Peak Flow (PF) = (C  Delta = PF - 0.15A  V <sub>det</sub> = (Delta/PF) x \times total infiltration prov  Determine Applica  posed BMP  Total Volu  Infiltration / Detent  Total Infiltration Province  When total infiltration Province  Total Infiltration Province  When total Infiltration Province  Total Detention Retent  Total De	tion Requirement 82  Jon Quo, A)/640  Value Value Value Value Value BMPs and Associated BMPs and Associated Reduction Credition Summary  equired per WCWRC rovided:  Lention Penalty: Lention Pen	W11 Storage Depth (ft) lit by Propose Rules: Avg. Area 28,300 24,850 18,650 12,850 10,450 8,150 7,000 d:	ration Requi	Ave. Design Infil. Rate (in/hr)*  I BMPs (Vinf) =   17,076	421.23 8.4 6.31 34.878 33.618 85,569  Infil. During Storm (ft <sup>3</sup> )  o	cfs/in-mi^2 ac in cfs cfs cfs cf  Total Volume Reduction (ft³)	1
A. B. C. D. E. F. W11	Detention / Retent  Q <sub>o</sub> = 238.6 (T <sub>c</sub> ) ^ - 0.3  Total Site Area  Q <sub>100</sub> = Q <sub>100-per</sub> + Q <sub>100</sub> Peak Flow (PF) = (C  Delta = PF - 0.15A  V <sub>det</sub> = (Delta/PF) x \times total infiltration prov  Determine Applica  posed BMP  Total Volu  Infiltration / Detent  Total Infiltration Province  When total infiltration Province  Total Infiltration Province  When total Infiltration Province  Total Detention Retent  Total De	tion Requirement 82  Jon Quo, A)/640  Value Value Value Value Value BMPs and Associated BMPs and Associated Reduction Credition Summary  equired per WCWRC rovided:  Lention Penalty: Lention Pen	W11 Storage Depth (ft) lit by Propose Rules: Avg. Area 28,300 24,850 18,650 12,850 10,450 8,150 7,000 d:	ration Requi	Ave. Design Infil. Rate (in/hr)*  I BMPs (Vinf) =  17,076 0 (17,076) 20,0% 85,569 102,683  Volume 103,250 74,950 50,100 31,450 18,600 8,150 0 103,250 778.38 780.21	421.23 8.4 6.31 34.878 33.618 85,569  Infil. During Storm (ft <sup>3</sup> )  o	cfs/in-mi^2 ac in cfs cfs cfs cf  Total Volume Reduction (ft³)	1
A. B. C. D. E. F. W11	Detention / Retent  Q <sub>o</sub> = 238.6 (T <sub>c</sub> ) ^ - 0.4  Total Site Area  Q <sub>100</sub> = Q <sub>100-per</sub> + Q <sub>100</sub> Peak Flow (PF) = (C  Delta = PF - 0.15A  V <sub>det</sub> = (Delta/PF) x \times \tim	tion Requirement 82	W11 Storage Depth (ft) lit by Propose Rules: Avg. Area 28,300 24,850 18,650 12,850 10,450 8,150 7,000 d:	ration Requi	Ave. Design Infil. Rate (in/hr)*  17,076 0 (17,076) 100.0% 85,569 102,683  Volume 103,250 74,950 50,100 31,450 18,600 8,150 0 103,250 778.38 780.21 782.98 783.98	421.23 8.4 6.31 34.878 33.618 85,569  Infil. During Storm (ft <sup>3</sup> )  o  cf cf cf cf cf cf	cfs/in-mi^2 ac in cfs cfs cfs cf  Total Volume Reduction (ft³)	1
A. B. C. D. E. F. W11	Detention / Retent  Q <sub>o</sub> = 238.6 (T <sub>c</sub> ) ^ - 0.4  Total Site Area  Q <sub>100</sub> = Q <sub>100-per</sub> + Q <sub>100</sub> Peak Flow (PF) = (C  Delta = PF - 0.15A  V <sub>det</sub> = (Delta/PF) x \times \tim	tion Requirement 82	W11 Storage Depth (ft) lit by Propose Rules: Avg. Area 28,300 24,850 18,650 12,850 10,450 8,150 7,000 d:	ration Requi	Ave. Design Infil. Rate (in/hr)*  I BMPs (Vinf) =   17,076	421.23 8.4 6.31 34.878 33.618 85,569  Infil. During Storm (ft <sup>3</sup> )  o  cf cf cf cf cf cf	cfs/in-mi^2 ac in cfs cfs cfs cf  Total Volume Reduction (ft³)	1
A. B. C. D. E. F. W11	Detention / Retent  Q <sub>o</sub> = 238.6 (T <sub>c</sub> ) ^ - 0.3  Total Site Area  Q <sub>100</sub> = Q <sub>100-per</sub> + Q <sub>100</sub> Peak Flow (PF) = (C  Delta = PF - 0.15A  V <sub>det</sub> = (Delta/PF) × V  total infiltration prov  Determine Applica  posed BMP  Total Volu  Infiltration / Determine Applica  posed BMP  Total Infiltration Retermine Applica  posed BMP  Total Infiltration Province  posed BMP  Total Infiltration Province  posed BMP  Total Determine Applica  posed BMP  Total Determine Applica  posed BMP  Total Determine Applica  posed BMP  Total Infiltration Province  posed BMP  Total Storage Storage  Forebay Sizing  Required Volume (Forebay Stage-Storage)  Forebay Stage-Storage  Forebay Stage-Storage	tion Requirement  82  -Imp. 20, Q100, A)/640  V100- V101*  rided per worksheet  while BMPs and Associate  Average Area (ft²)  ume Reduction Creduction Summary  equired per WCWRC  rovided:  ention Penalty: quired quired including Pe  e Summary:  Area 30,100 26,500 23,200 14,100 11,600 9,300 7,000  meVolume Provided  (Vfb)=0.05*V100  rage Summary:	W11 iated Volum Storage Depth (ft) iit by Propose Rules: Avg. Area 28,300 24,850 18,650 12,850 10,450 8,150 7,000 d: Vprov	ration Requi	Ave. Design Infil. Rate (in/hr)*  17,076 0 0 (17,076) 100.0% 20.0% 85,569 102,683  Volume 103,250 74,950 50,100 31,450 18,600 8,150 0 103,250 778.38 780.21 782.98 783.98	421.23 8.4 6.31 34.878 33.618 85,569  Infil. During Storm (ft <sup>3</sup> )  o  cf cf cf cf cf cf	cfs/in-mi^2 ac in cfs cfs cfs cf  Total Volume Reduction (ft³)	3
A. B. C. D. E. F. W11	Detention / Retent  Q <sub>o</sub> = 238.6 (T <sub>c</sub> ) ^ - 0.3  Total Site Area  Q <sub>100</sub> = Q <sub>100-per</sub> + Q <sub>100</sub> Peak Flow (PF) = (C  Delta = PF - 0.15A  V <sub>det</sub> = (Delta/PF) × V  total infiltration prov  Determine Applica  posed BMP  Total Volu  Infiltration / Detent  Total Infiltration Province  W Deficiency: Pro-Rated 20% Det  Total Detention Ret  Total Dete	tion Requirement  82	W11 iated Volum Storage Depth (ft) iit by Propose Rules: Avg. Area 28,300 24,850 12,850 10,450 8,150 7,000 i: Vprov 1' i	ration Requi	Ave. Design Infil. Rate (in/hr)*  17,076 0 0 (17,076) 100.0% 85,569 102,683  Volume 103,250 74,950 50,100 31,450 18,600 8,150 0 103,250 778.38 780.21 782.98 783.98	421.23 8.4 6.31 34.878 33.618 85,569  Infil. During Storm (ft <sup>3</sup> )  o  cf cf cf cf cf cf	cfs/in-mi^2 ac in cfs cfs cfs cf  Total Volume Reduction (ft³)	3
A. B. C. D. E. F. W11	Detention / Retent  Q <sub>o</sub> = 238.6 (T <sub>c</sub> ) ^ - 0.1  Total Site Area  Q <sub>100</sub> = Q <sub>100-per</sub> + Q <sub>100</sub> Peak Flow (PF) = (C  Delta = PF - 0.15A  V <sub>det</sub> = (Delta/PF) × \(^1\)  total infiltration prov  Determine Applica  posed BMP  Total Volume  Total Infiltration Provided Infiltration Infiltration Provided Infiltration Provided Infiltration Provided Infiltration Infiltr	tion Requirement  82  -Imp. 20, Q100, A)/640  V100- V101*  rided per worksheet  while BMPs and Associate  Average Area (ft²)  ume Reduction Creduction Summary  equired per WCWRC  rovided:  ention Penalty: quired quired including Pe  e Summary:  Area 30,100 26,500 23,200 14,100 11,600 9,300 7,000  meVolume Provided  (Vfb)=0.05*V100  rage Summary:	W11 iated Volum Storage Depth (ft) iit by Propose Rules: Avg. Area 28,300 24,850 18,650 12,850 10,450 8,150 7,000 d: Vprov	ration Requirements of the Credits  Storage Volume (ft³) ed Structura  Lo 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0	Ave. Design Infil. Rate (in/hr)*  17,076 0 0 (17,076) 100.0% 20.0% 85,569 102,683  Volume 103,250 74,950 50,100 31,450 18,600 8,150 0 103,250 778.38 780.21 782.98 783.98	421.23 8.4 6.31 34.878 33.618 85,569  Infil. During Storm (ft <sup>3</sup> )  o  cf cf cf cf cf cf	cfs/in-mi^2 ac in cfs cfs cfs cf  Total Volume Reduction (ft³)	1 3 30

	Determining Post-D			ntributing D	rainage Area =	8.4	Acres	
		Tues		То	tal Site Area =	8.4	Acres	
	Cover Paved Parking Lots Water St	, roofs, driveways	Soil Type B B	Area (sf) 117,100 40,000	2.69 0.92	Runoff Coef 0.95 1.00	(c)(Area) 111,245 40,000	
	Developed Open Spa		В	208,804	4.79	0.25 Sum (c)(Area) =	52,201	
			Weig	hted C-Sum		Area Total (sf)= (ac) or Sum(sf)=	365,904	
	Pervious C	over Type	Soil Type	Area (sf)	Area (ac)	Curve Number		
	Developed Open Spa		В	208,804	4.79	61	12,737,044	
			Total - Sum	(CN)(Area) =			12,737,044	
			Are	ea Total (sf)=		or Sum(sf)=	208,804 <b>61</b>	
	Impervious	Cover Type	Soil Type	Area (sf)	Area (ac)	Curve Number	(CN)(Area)	
	Paved Parking Lots Imperviou	, roofs, driveways	B B	117,100 40,000	2.69 0.92	98 98	11,475,800 3,920,000	
					0.00		0	
			Total - Sum Area Total -	Mary State and State of the Sta			15,395,800 157,100	
_					Area)/Sum(ac)	orSum(sf)=	98	
	First Flush Runoff Co	alculations (Vff)						
	Vff = (1") (1/12) (435	560/1) (C) AC =				17,076	cf	
	Predevelopment Ba	ankfull Runoff Calcu	lations (Vbf	pre)				
	2 year/24 hour storn Pervious Cover CN		or range, fo	ir)	P = CN =		in	
	S = (1000/CN )-10 Q = (P-0.2S)^2/(P+0.		or runge, ju	",	S = Q =	2.82	in in	
	Pervious Cover Area	a			Area =	365,904	sf	
	V <sub>bf-pre</sub> = Q(1/12)Area		kfull Dunger	Calculation	V <sub>bf-pre</sub> =		ď	
	Pervious Cover Post		KIUII KUNOff	carculations		114	16	
	2 year/24 hour storr Pervious Cover CN	mevent			P = CN =	61	in	
	S = (1000/CN )-10 Q = (P-0.2S)^2/(P+0.				S = Q =	0.15	in in	
	Pervious Cover Area V <sub>bf-per-post</sub> = Q(1/12)A				Area = V <sub>bf-per-post</sub> =		sf cf	
	Impervious Cover P		ankfull Runo	off Calculation				
	2 year/24 hour storn				P =		in	
	Impervious Cover C S = (1000/CN )-10				CN = S =	98	in	
	Q = (P-0.2S)^2/(P+0. Pervious Cover Area				Q = Area =		in sf	
	$V_{bf-mp-post} = Q(1/12)A$	Area			V <sub>bf-imp-post</sub> =	40.00	cf	
	Pervious Cover Post	t-development 100	year Storm	Runoff Calcu	lations (V100-	per-post)		
	100 year storm ever Pervious Cover CN	nt			P = CN =		in	
	S = (1000/CN )-10	00)			S =	6.39	in in	
	Q = (P-0.2S)^2/(P+0. Pervious Cover Area	à			Q = Area =	208,804	sf	
	V <sub>100-imp-post</sub> = Q(1/12)			n	V <sub>100-Imp-post</sub> =		cf	
	Impervious Cover P		00-year Ston	m Runott Ca				
	100 year storm ever Pervious Cover CN	nt			P = CN =	98	in	
	S = (1000/CN )-10 Q = (P-0.2S)^2/(P+0.	.8S)			S = Q =		in in	
	Pervious Cover Area V <sub>100-imp-post</sub> = Q(1/12)				Area = V <sub>100-imp-post</sub> =		sf cf	
	Determine Time of	Concentration (Tc-l	nrs)					
	User specified; assu	ime 30 minutes		Total	Time of Conce	entration (hrs) =	0.50	
	Runoff Summary &	Onsite Infiltration (	Requirement					
	Runoff Summary fro							
	nanon sammary me	V <sub>ff</sub> = V <sub>bf-pre</sub> =	17,076					
		V <sub>bf-per-post</sub> =	2,675	cf	Total BF Volu	me (V <sub>bf-post</sub> ) 30,452	at .	
		V <sub>bf-imp-post</sub> =	27,776		T		G .	
		V <sub>100-per-post</sub> = V <sub>100-mp-post</sub> =			Total 100-yea	r Volume (V <sub>100</sub> ) 88,776	cf	
	Determine Onsite I	nfiltration Requirer						
		$V_{bf-post} = V_{bf-pre} =$		cf				
	Bankfull Vo	olume Difference =						
			Onsite Infilt	ration Requi	rement (V <sub>rd</sub> ) =	17,076	cf	
	Detention / Retenti	ion Requirement						
	Q <sub>o</sub> = 238.6 (T <sub>c</sub> ) ^ -0.8 Total Site Area	2				421.23 8.4	cfs/in-mi^2 ac	
	Q <sub>100</sub> = Q <sub>100-per</sub> + Q <sub>100-per</sub>					6.31 34.878	in cfs	
	Delta = PF - 0.15A V <sub>det</sub> = (Delta/PF) x V					33.618 <b>85,569</b>	cfs cf	
to	total infiltration provi		W11					
1	Determine Applicat			e Credite				
	эеленине мурисал	Sinc 3 and ASSOC	Janua Volum		Aug Dest		3,000	
rop	posed BMP	Average Area (ft <sup>2</sup> )	Storage Depth (ft)	Storage Volume	Ave. Design Infil. Rate	Infil. During Storm (ft <sup>3</sup> )	Total Volume Reduction (ft <sup>3</sup> )	
				(ft³)	(in/hr)*		100000000000000000000000000000000000000	
		me Reduction Cred	it by Propos	o Structura	= (Vinf) s (Vinf)	0	ď	
	Infiltration / Detent							
	Total Infiltration Re Total Infiltration Pro	The same of the sa	Rules:			cf		
	Difference: % Deficiency:				(17,076) 100.0%			
	Pro-Rated 20% Dete Total Detention Rec				<b>20.0</b> % 85,569			
	Total Detention Rec	A	nalty, if appl	icable	102,683			
		Summary: Area	Avg. Area	Depth	Volume			
	Basin Stage-Storage		28,300 24,850	1.0	103,250			
	783.0	30,100	Z4.850	1.0	74,950 50,100			
	783.0 782.0 781.0	26,500 23,200	18,650		***			
	783.0 782.0 781.0 780.0 779.0	26,500 23,200 14,100 11,600	18,650 12,850 10,450	1.0 1.0	31,450 18,600			
	783.0 782.0 781.0 780.0 779.0 778.0 777.0	26,500 23,200 14,100 11,600 9,300 7,000	18,650 12,850 10,450 8,150 7,000	1.0	18,600 8,150 0			
	783.0 782.0 781.0 780.0 779.0 778.0	26,500 23,200 14,100 11,600 9,300 7,000	18,650 12,850 10,450 8,150 7,000	1.0 1.0	18,600 8,150	****		17,076
	783.0 782.0 781.0 780.0 779.0 778.0 777.0	26,500 23,200 14,100 11,600 9,300 7,000	18,650 12,850 10,450 8,150 7,000	1.0 1.0 1.0	18,600 8,150 0 103,250			17,076 30,452 102,683
	783.0 782.0 781.0 780.0 779.0 778.0 777.0	26,500 23,200 14,100 11,600 9,300 7,000	18,650 12,850 10,450 8,150 7,000 d:	1.0 1.0 1.0 Vff Elev.= Vbf Elev.=	18,600 8,150 0 103,250 778.38 780.21		784.0	30,452
	Elev. 783.0 782.0 781.0 780.0 779.0 778.0 777.0 Total Storage Volum	26,500 23,200 14,100 11,600 9,300 7,000 neVolume Provided	18,650 12,850 10,450 8,150 7,000 d:	1.0 1.0 1.0 Vff Elev.= Vbf Elev.= ided Elev.=	18,600 8,150 0 103,250 778.38 780.21 782.98 783.98	Actual=	784.0	30,452
	Elev. 783.0 782.0 781.0 780.0 779.0 778.0 777.0 Total Storage Volum Forebay Sizing Required Volume (N	26,500 23,200 14,100 11,600 9,300 7,000 neVolume Provided	18,650 12,850 10,450 8,150 7,000 d:	1.0 1.0 1.0 Vff Elev.= Vbf Elev.= ided Elev.=	18,600 8,150 0 103,250 778.38 780.21 782.98	Actual=	784.0	30,452
	Elev. 783.0 782.0 781.0 780.0 779.0 778.0 777.0 Total Storage Volum	26,500 23,200 14,100 11,600 9,300 7,000 neVolume Provided	18,650 12,850 10,450 8,150 7,000 d:	1.0 1.0 1.0 Vff Elev.= Vbf Elev.= ided Elev.=	18,600 8,150 0 103,250 778.38 780.21 782.98 783.98	Actual=	784.0	30,452

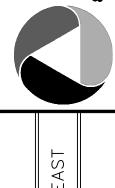


THE LOCATIONS OF EXISTING UNDERGROUND UTILITIES ARE SHOWN IN AN APPROXIMATE WAY ONLY AND HAVE NOT BEEN INDEPENDENTLY VERIFIED BY THE OWNER OR ITS REPRESENTATIVE. THE CONTRACTOR SHALL DETERMINE THE EXACT LOCATION OF ALL EXISTING UTILITIES BEFORE COMMENCING WORK, AND AGREES TO BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGES WHICH MIGHT BE OCCASIONED BY THE CONTRACTOR'S FAILURE TO EXACTLY LOCATE AND PRESERVE ANY AND ALL UNDERGROUND UTILITIES.

NOTICE: NOTICE:

CONSTRUCTION SITE SAFETY IS THE SOLE RESPONSIBILITY OF THE CONTRACTOR; NEITHER THE OWNER NOR THE ENGINEER SHALL BE EXPECTED TO ASSUME ANY RESPONSIBILITY FOR SAFETY OF THE WORK, OF PERSONS ENGAGED IN THE WORK, OF ANY NEARBY STRUCTURES, OR OF ANY OTHER PERSONS.

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SECTION 33
WN 2 SOUTH, RANGE 7 EAST
SUPERIOR TOWNSHIP
SHTENAW COUNTY, MICHIGAN

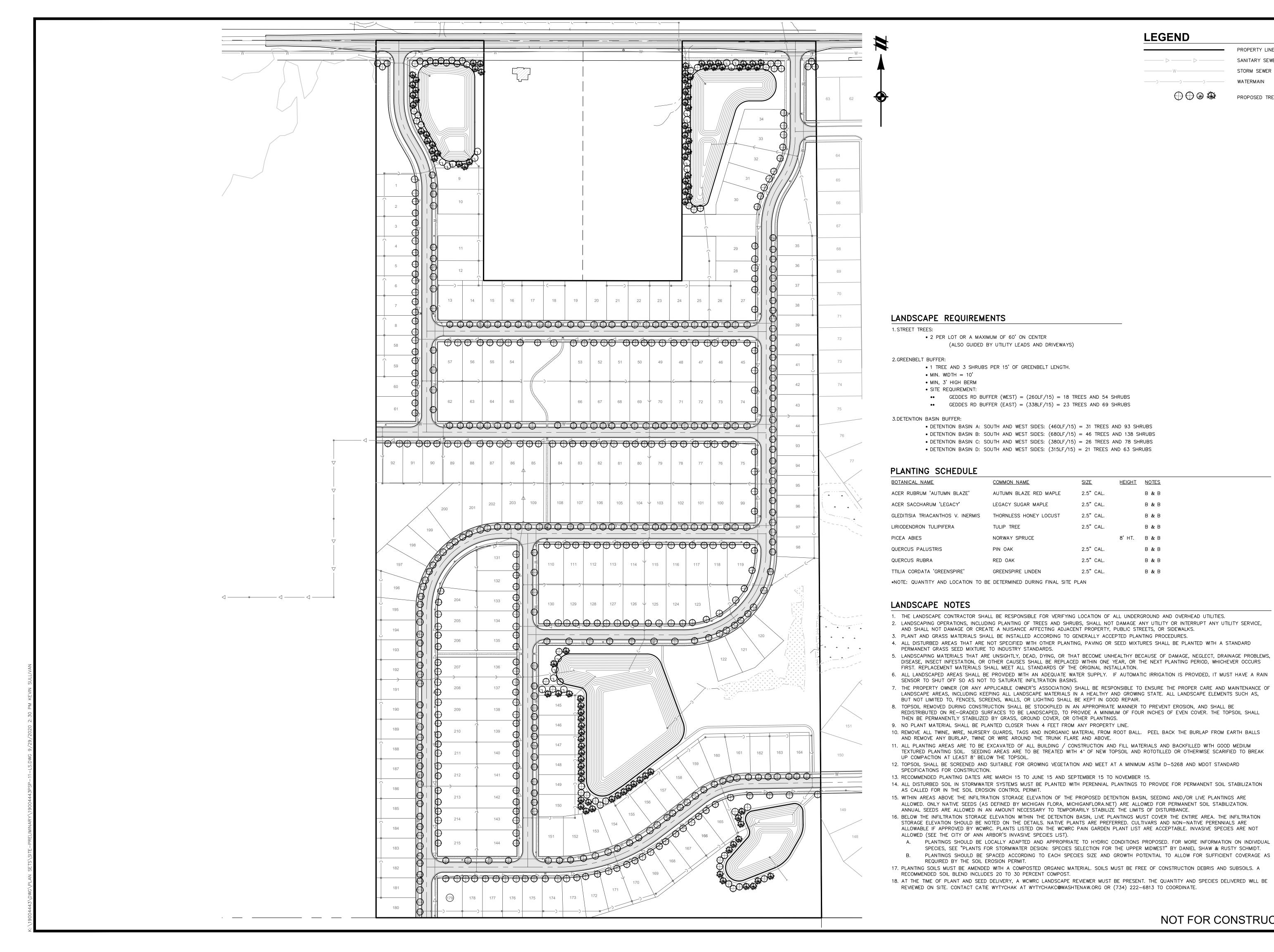
AUG. 26, 2020 2020-09-29 PER TWP.

REVISIONS

NA NA NA

N/A

DRAWN BY: KS CHECKED BY: JK
P.M.: J. KIME
JOB #: 19004443
FILE CODE: SHEET NO. 13



#### **LEGEND**

<u>HEIGHT</u> <u>NOTES</u>

8' HT. B & B

B & B

B & B

В & В

B & B

B & B

В & В

2.5" CAL.

COMMON NAME

TULIP TREE

PIN OAK

NORWAY SPRUCE

GREENSPIRE LINDEN

AUTUMN BLAZE RED MAPLE

THORNLESS HONEY LOCUST

LEGACY SUGAR MAPLE

WATERMAIN

 $\oplus \oplus \otimes \circledast$ 

PROPERTY LINE SANITARY SEWER STORM SEWER

PROPOSED TREE

THE LOCATIONS OF EXISTING UNDERGROUND UTILITIES ARE SHOWN IN AN APPROXIMATE WA SHOWN IN AN APPROXIMATE WAY ONLY AND HAVE NOT BEEN INDEPENDENTLY VERIFIED BY THE OWNER OR ITS REPRESENTATIVE. THE CONTRACTOR SHALL DETERMIN THE EXACT LOCATION OF ALL EXISTING UTILITIES BEFORE COMMENCING WORK, AND AGREES THE FILLY PESPONSIBLE FOR AND BE FULLY RESPONSIBLE FOR AN IND ALL DAMAGES WHICH MIGHT OCCASIONED BY THE CONTRACTOR FAILURE TO EXACTLY LOCATE A PRESERVE ANY AND ALL UNDERGROUND UTILITIES

(now what's **below.** 

Call before you dig

CONSTRUCTION SITE SAFETY IS TO SOLE RESPONSIBILITY OF THE CONTRACTOR: NEITHER THE OWNER NOR THE ENGINEER SHALL BE EXPECTED TO ASSUME ANY RESPONSIBILITY FOR SAFETY OF THE WORLD OF THE PROPERTY OF THE PROPERT THE WORK, OF PERSONS ENGAGI IN THE WORK, OF ANY NEARBY STRUCTURES, OR OF ANY OTHER PERSONS.

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COMPANY AT HAWTH RRY SITE F CAPE PLAN

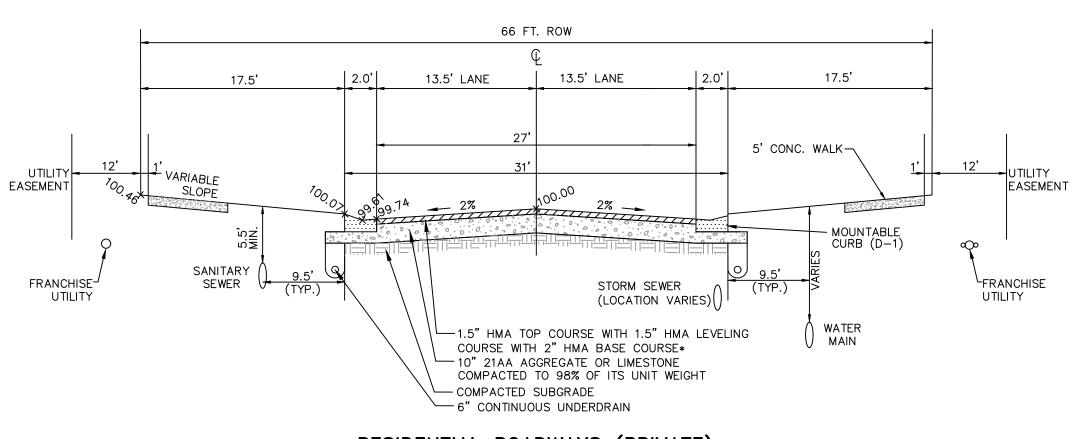
AUG. 26, 2020 2020-09-29 PER TWP

REVISIONS

SCALE: 1" = 120 FEETDRAWN BY: KS

CHECKED BY: JK P.M.: J. KIME JOB #: 19004443 FILE CODE: -

NOT FOR CONSTRUCTION SHEET NO. 14



#### **RESIDENTIAL ROADWAYS (PRIVATE)**

1. REFER TO CURRENTLY APPROVED WCRC HMA MIX DESIGNS AND BINDER REQUIREMENTS PRIOR TO CONSTRUCTION.

2. ALL PROPOSED UTILITIES SHALL BE WITHIN THE RIGHT-OF-WAY OR WITHIN AN EASEMENT OUTSIDE OF THE RIGHT-OF-WAY.

ASSUMED SECTION:

1.5" LVSP WEARING COURSE with 3% max air voids 1.5" LVSP LEVELING COURSE

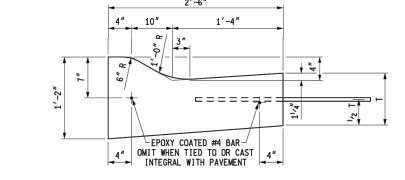
2" 4E1 BASE COURSE All HMA shall limit RAP to 25%

4" CONCRETE ¬ 2% MAX 4" MDOT CL II SAND LEVELING LAYER COMPACTED TO 95% MIN.

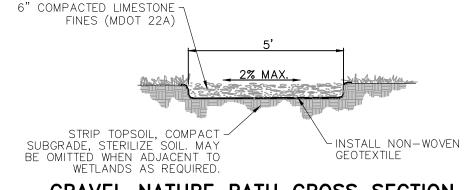
CONCRETE SIDEWALK SECTION NOT TO SCALE

DECIDUOUS TREE PLANTING DETAIL

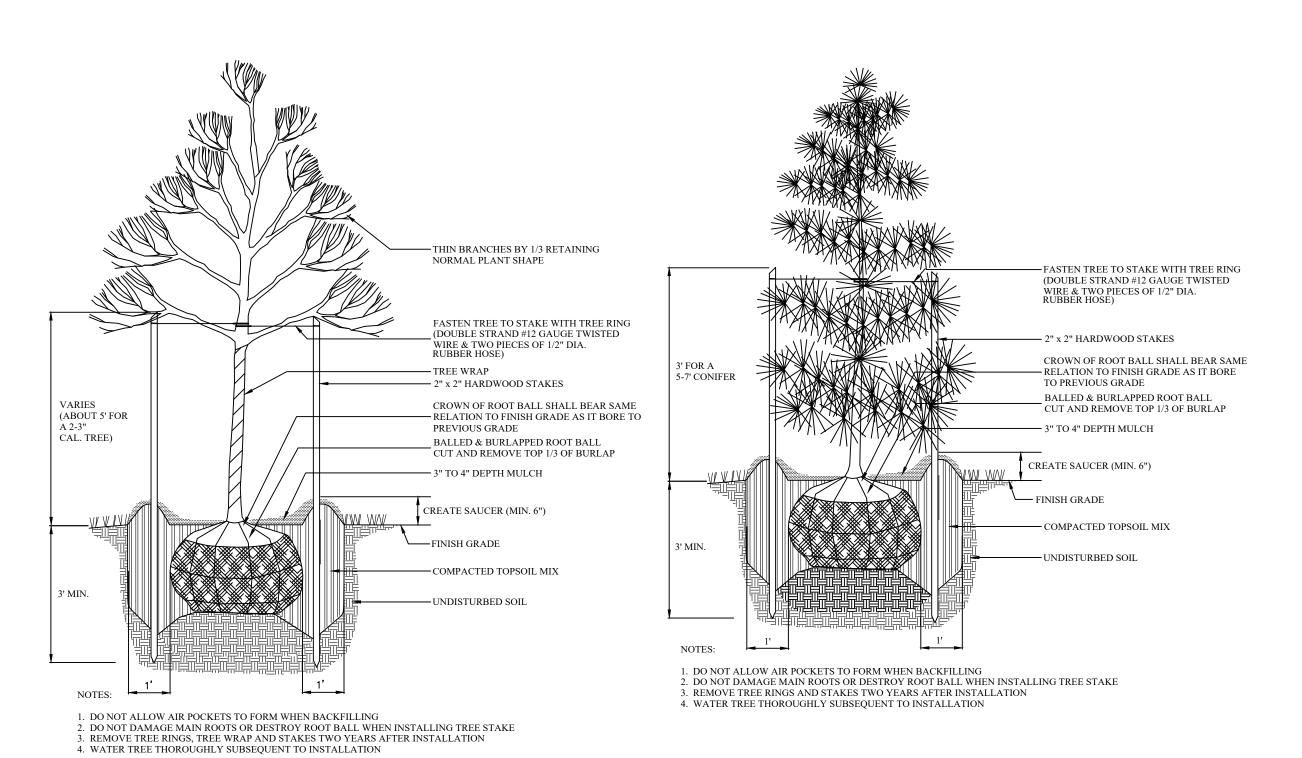
NO SCALE



	DETAIL	DIMENSION T	LANE TIES	CONCRETE CYD / LFT	
	D1	9″	AS SHOWN	0.0788	1
	D2	9″	OMITTED	0.0788	Ī
	D3	10"	AS SHOWN	0.0826	]
<u>N</u>	<u> IOUN</u>	ABLE	CUR	B &	<u>GUT</u>
		NC	T TO SC	<b>ALE</b>	

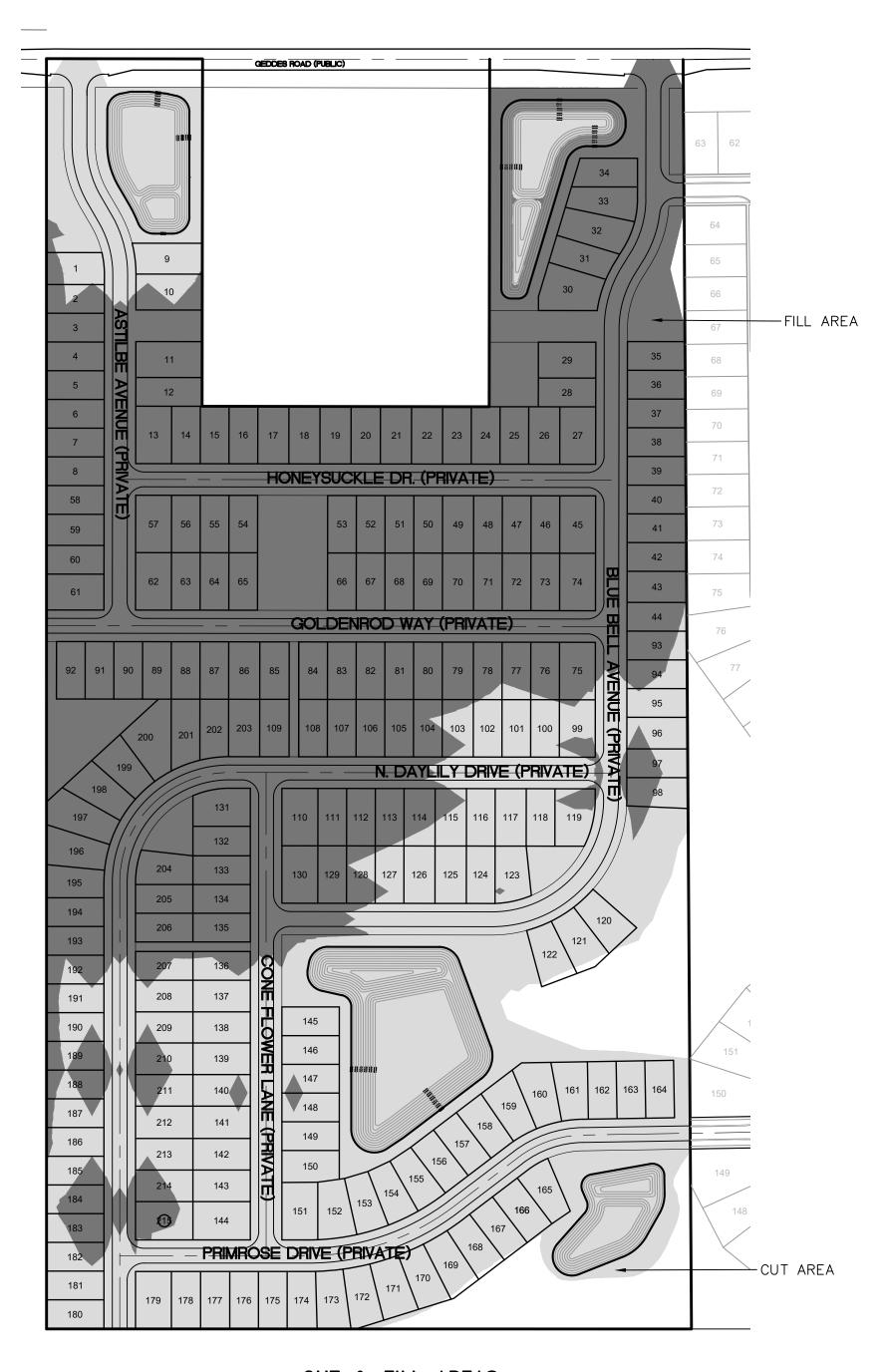


GRAVEL NATURE PATH CROSS SECTION



CONIFEROUS TREE PLANTING DETAIL

NO SCALE



CUT & FILL AREAS

SCALE: 1" = 200'

Know what's **below.** 

Call before you dig. THE LOCATIONS OF EXISTING
UNDERGROUND UTILITIES ARE
SHOWN IN AN APPROXIMATE WAY
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OWNER OR ITS REPRESENTATIVE.
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BE FULLY RESPONSIBLE FOR ANY
AND ALL DAMAGES WHICH MIGHT BE
OCCASIONED BY THE CONTRACTOR'S OCCASIONED BY THE CONTRACTOR'S
FAILURE TO EXACTLY LOCATE AND
PRESERVE ANY AND ALL
UNDERGROUND UTILITIES.

NOTICE: NOTICE:

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