PRELIMINARY SITE PLANS

ZIPPY AUTO WASH

BESTECH LOT 2

PITTSFIELD TOWNSHIP, MICHIGAN

ABBREVIATIONS

A	A.F.F.	ABOVE FINISH FLOOR
	AC	ACRE
	A/C	AIR CONDITION
	ALUM	ALUMINUM
	ASPH.	ASPHALT
	B.F.F.	BELOW FINISH FLOOR
B	BIT.	BITUMINOUS
	BLDG	BUILDING
C	CB	CATCH BASIN
	C.O.	CLEAN OUT
	COMP	COMPRESSOR
	CONC	CONCRETE
	CMU	CONCRETE MASONRY UNIT
	C.J.	CONTROL JOINT
D	DIA	DIAMETER
	DIM	DIMENSION
	DWG	DRAWING
	D.I.	DUCTILE IRON
E	EA.	EACH
	ELEC	ELECTRIC
	EL. / ELEV	ELEVATION
	EQ	EQUAL
	EXIST / EX	EXISTING
	EXP	EXPANSION
	E.J.	EXPANSION JOINT
	EXT	EXTERIOR
F	FT.	FEET
	F.F.	FINISH FLOOR
	F.H.	FIRE HYDRANT
	FIX.	FIXTURE
	FLR	FLOOR
	F.A.R.	FLOOR/AREA RATIO
G	GA	GAUGE
	GALV	GALVANIZED
	GL	GLASS
H	HT	HEIGHT
	H.P.	HIGH POINT
	H.M.	HOLLOW METAL
	HORIZ	HORIZONTAL
I	I.D.	INSIDE DIAMETER
	INT.	INTERIOR
	INV	INVERT
J	JT	JOINT
L	LL	LIVE LOAD
	L.L.H.	LONG LEG HORIZONTAL
	L.L.V.	LONG LEG VERTICAL
	L.P.	LOW POINT
M	MFR.	MANUFACTURER
	MH	MANHOLE
	MAS	MASONRY
	M.O.	MASONRY OPENING
	MAX	MAXIMUM
	MIN.	MINIMUM
	MTD	MOUNTED
N	NOM	NOMINAL
	N.I.C.	NOT IN CONTRACT
	NO	NUMBER
O	O.C.	ON CENTER
	O.D.	OUTSIDE DIAMETER
	O.H.	OVERHEAD
	OE	OVERHEAD ELECTRIC
	O.T.E.	OVERHEAD TELEPHONE & ELECTRIC
P	PTD	PAINTED
	PSF	POUNDS PER SQUARE FOOT
	PSI	POUNDS PER SQUARE INCH
	PEMB	PRE-ENGINEERED METAL BUILDING
	PREFAB	PREFABRICATED
R	RAD	RADIUS
	REV.	REVISED
	R.O.W.	RIGHT OF WAY
	RTU	ROOF TOP UNIT
	RM.	ROOM
S	SAN.	SANITARY
	SCHED./SCH	SCHEDULE
	SIM	SIMILAR
	S.P.A.	SITE PLAN APPROVAL
	SQ. FT./ S.F.	SQUARE FEET
	STD.	STANDARD
	ST. MH	STORM MANHOLE
T	TV&S	TAPPING VALVE & SLEEVE
	T/C	TOP OF CURB
	T/W	TOP OF MASONRY
	TBR	TO BE REMOVED
	TYP	TYPICAL
U	UE	UNDERGROUND ELECTRICAL
	UTE	UNDERGROUND TELEPHONE & ELECTRICAL
	U.N.O.	UNLESS NOTED OTHERWISE
	U.P.	UTILITY POLE
V	VERT	VERTICAL
W	W/	WITH
	W/O	WITHOUT

LEGAL DESCRIPTION

LOT 2 OF BESTECH CENTER, ACCORDING TO THE RECORDED PLAT THEREOF, AS RECORDED IN LIBER 34, PAGES 81 THROUGH 87, INCLUSIVE OF PLATS, WASHTENAW COUNTY RECORDS

PROPERTY TAX ID: L-12-23-110-002

PROJECT DESCRIPTION

The proposed use is an automatic car wash in a 4,843 sf building with a 150 foot fully automatic wash bay with mechanical dryers, heated exit and entrance slab to the tunnel, and vacuum stations. Two automatic pay stations located at the rear of the site provide ample stacking spaces for traffic queuing on site. The concrete entrance and exit ramps shall be heated to prevent freezing. Areas beyond these slab shall be salted regularly in freezing temperatures to prevent ice on paved surfaces. There shall be three vacuum islands located adjacent to the building with two vacuums each. Employee and customer parking is located adjacent to the building

GENERAL NOTES:

1. All site work shall meet all applicable codes, laws and regulations including Michigan Barrier-Free Design Requirements and ADA Accessibility Guidelines (ADAAG).
2. Verify existing conditions on site. Notify architect/engineer of discrepancies prior to proceeding with construction.
3. Provide signs per Michigan Barrier-Free Requirements at handicapped spaces. Van spaces shall have an additional sign, "VAN ACCESSIBLE" per ADAAG requirements.
4. All work in R.O.W. shall conform to WCRC Standards and permitting guidelines.
5. All roads leading to the site are designated Class A for all season travel.
6. All work done shall be performed in accordance with Pittsfield Township's current ordinances, standards and regulations.
7. Existing utility information and locations are per existing records and may or may not have been field verified.

UTILITY NOTES

The existing utilities shown on the drawings represent the best information available as obtained by field surveys and from existing records. This information does not relieve the contractor of the responsibility to contact Miss Dig or to satisfy himself as to the accuracy of the location shown

SEWER AND WATER	TELEPHONE
Utilities Department City of Saline 7605 N. Maple Rd Saline, Michigan Office (734) 429-5624	AT&T 5500 South Maple Road Ann Arbor, Michigan 48103 (734) 996-5351
ELECTRIC	**GAS**
DTE 8001 Haggerty Road Belleville, MI 48112 (734) 332-3322	Michigan Consolidated Gas Co 3150 East Michigan Avenue Ypsilanti, Michigan 48198 (734) 485-8230

For protection of underground utilities, the contractor shall notify the Miss Dig Utility Location Service a minimum of 72 hours prior to excavation

The improvements covered by these plans shall be done in accordance with the City of Saline's standards and supplemental specifications.

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

SITE INFORMATION

CURRENT ZONING: I - Industrial
SITE AREA: 1.75 AC.
EXISTING USE: VACANT
PROPOSED BUILDING USE: Automatic Car Wash
PROPOSED BUILDING AREA: 4,843 SF - 1 Story

	REQUIRED	PROPOSED
MIN. LOT AREA	1 Acre	1.75 Acres Gross (76,301 SF)
MIN. LOT WIDTH	150'	269'
MAX. LOT COVERAGE	30%	6.3%
FLOOR AREA RATIO	60%	6.3%
MAX. IMPERVIOUS	80%	48.4% (80,417 SF)
MAX. BUILDING HEIGHT	45' max., 2 stories	25', 1 story
FRONT SETBACK	50'	63'-6"
SIDE SETBACK	20' Least, 40' Tota	55'-4"
REAR SETBACK	35'	175'-1"

PARKING & LOADING:

Parking Spaces Required:
2 spaces, plus 1 space per 1 employee at peak shift; 2 spaces, plus 7 spaces for employees, plus 12 stacking spaces per bay for a fully-automatic wash.

Total Required Parking Spaces: 9 spaces, plus 12 stacking spaces

Parking Spaces Provided:
9 parking spaces are provided, including 1 carrier-free space, 20+ Stacking spaces provided

Loading Spaces:
1 Loading Spaces Provided. Owner states that deliveries are made by cube vans (no semi-trailer deliveries)

SOILS INFORMATION:

StB - St. Clair Loam, 2 to 6 Percent Slopes, D
Ho - Hoytville silty clay loam, D/C

NATURAL FEATURES:

There is an onsite wetland area in the southeast corner of the site which shall have a 25' setback to all construction related activities. This area shall be protected by silt fence and tree fence barriers. Trees over 6" in diameter removed shall be surveyed and marked for removal and replacement as required in the zoning ordinance.

BENCHMARK #1:
STEAMER VALVE ON HYDRANT EAST SIDE OF CARPENTER ROAD OPPOSITE BESTECH DRIVE.
ELEV = 829.39 FEET (NAVD 88)

VARIANCE:
REDUCTION OF THE LANDSCAPE FRONTAGE BUFFER DISTANCE OF 5' FROM WASH ENTRANCE LANE TO THE CARPENTER ROAD ROW

LOCATION MAP
SCALE 1" = 1000'-0"

GENERAL INFORMATION

PROPERTY LOCATION:
3952 Bestech Drive
Ypsilanti, Michigan 48197

LAND OWNER:
VO INVESTMENTS LLC
8150 Jackson Road, Ste. A
Ann Arbor, Mi 48103
(734) 424-0661

DEVELOPER/OWNER:
Carey & Michelle Weaver, Zippy Auto Wash LLC
223 W. Ellsworth Road
Ann Arbor, Michigan 48108
(734)994-6368

SITE PLANNER/ENGINEER/CONTRACTOR:
Vanston/O'Brien, Inc.
8150 Jackson Road, Ste. A
Ann Arbor, Mi 48103
(734) 424-0661

DRAWING INDEX:

C-1	TITLE SHEET
C-2	EXISTING CONDITIONS PLAN
C-3	SITE PLAN
C-4	GRADING PLAN
C-5	LANDSCAPE PLAN
C-6	FIRE PROTECTION & CIRCULATION PLAN
A-1	FLOOR PLAN & ELEVATIONS

ZIPPY AUTO WASH

DESIGNERS
Vanston/O'Brien, Inc.
BUILT
8150 Jackson Road, Ste. A
Ann Arbor, MI 48103
Tel (734) 424-0661
Fax (734) 424-0617
e-mail: design@vanston.com • www.vanston.com

Zippy Auto Wash
3952 Bestech Drive
Pittsfield Township, Michigan

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ISSUED FOR:	DATE:
PRELIMINARY SITE PLAN	3-2-20
REVISED	4-8-20
REVISED	6-5-20

DRAWN BY: GAR
JOB NO.: XXX

TITLE SHEET

SHEET NO.
C-1

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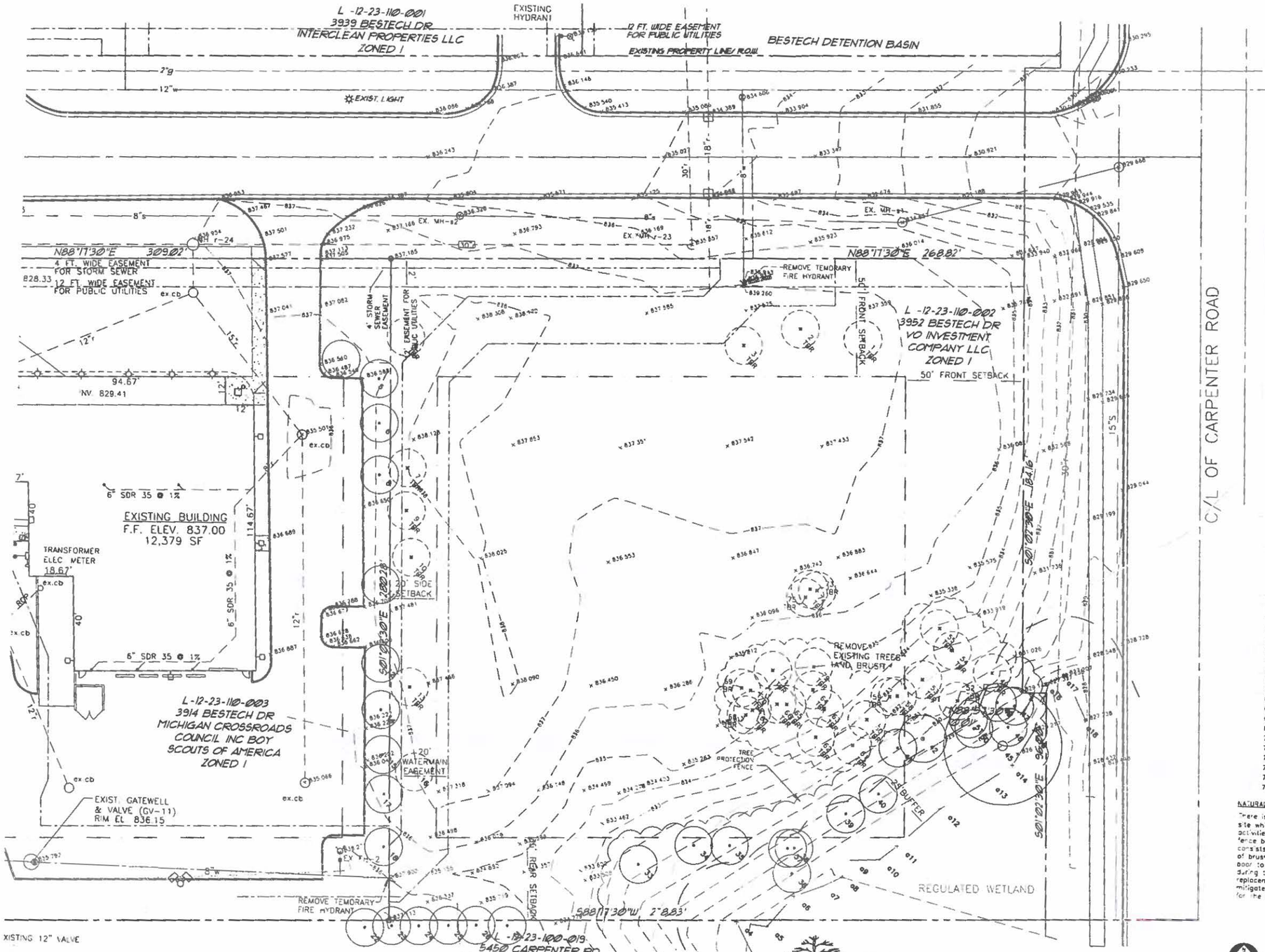

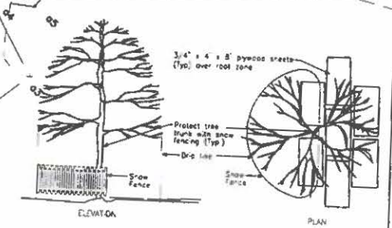

STANDARD TREE PROTECTION

NOTE: Pull back fencing to install plywood when access in root zone is necessary.

Tree No.	TREE	SIZE	REMOVE	CONDITION
1	Douglas Fir	9.5"	x	Fair
2	White Pine	11.0"	x	Good
3	Blue Spruce	10.0"	x	Good
4	Cherry	7.0"	x	Fair
5	Honey Locust	8.0"		Good
6	Shingle Oak	10.5"		Good
7	Austrian Pine	12.25"	x	Poor
8	Maple	11.0"		Good
9	Norway Spruce	8.0"	x	Good
10	Austrian Pine	11.5"	x	Poor
11	Shingle Oak	12.5"		Good
12	Honey Locust	6.75", 6.0"		Multi-stem, Fair
13	White Spruce	6.75"	x	Fair
14	Honey Locust	7.0"		Good
15	Honey Locust	4.75",5.75",7"		Multi-stem, Fair
16	Norway Spruce	10.5"		Good
17	Shingle Oak	9.25"		Good
18	Shingle Oak	15.0"		Good
19	Shingle Oak	5.0",5.25"		Fair
20	Blue Spruce	15.25"		Poor
21	Blue Spruce	11.5"		Poor
22	Blue Spruce	15.5"		Fair
23	Blue Spruce	12.5"		Poor
24	Blue Spruce	12.5"		Poor
25	Blue Spruce	13.5"		Fair
26	Blue Spruce	14.0"		Very Good
27	Blue Spruce	14.0"		Very Good
28	Austrian Pine	20.0"		Poor, HERITAGE
29	Austrian Pine	18.0"		Poor, HERITAGE
30	Black Walnut	17.0"		Fair
31	Elm	13.0"		Fair
32	Black Walnut	10.0"		Poor
33	Black Cherry	18.0"		Poor, HERITAGE
34	Black Cherry	10.0"		Poor
35	Black Walnut	16.5"		Fair
36	Black Walnut	18.0"		Fair, HERITAGE
37	Black Walnut	11.0"		Fair
38	Black Walnut	17.0"		Fair
39	Black Walnut	7.5"		Fair
40	Black Walnut	10.5"		Fair
41	Cottonwood	13.0"		Fair
42	Black Cherry	15.0"		Fair
43	Black Walnut	6.5"		Fair
44	Cottonwood	10.0"		Poor
45	Cottonwood	60.0"		Good, HERITAGE
46	Cottonwood	13.0"		Poor
47	Cottonwood	10.5"		Poor
48	Cottonwood	8.0"		Poor
49	Elm	9.0"	x	Fair to Poor
50	Black Cherry	10.0"		Fair
51	Cottonwood	9.5"		Poor
52	Cottonwood	13.5"	x	Fair
53	Black Walnut	31.5"	x	Good
54	Black Walnut	12.75"	x	Good
55	DEAD	6.75"	x	
56	DEAD	8.0"	x	
57	Elm	7.0"	x	Poor
58	Cottonwood	8.0"	x	Poor
59	Cottonwood	8.5"	x	Poor
60	Black Walnut	7.5"	x	Good
61	Cottonwood	8.0"	x	Poor
62	Black Walnut	6.0"	x	Good
63	Black Walnut	6.0"	x	Fair
64	Black Walnut	12.0"	x	Good
65	Black Walnut	5.0"	x	Not Regulated
66	Cottonwood	6.0"	x	Good
67	DEAD	6.0"	x	
68	Black Cherry	6.5", 7.0"	x	Good
69	Black Cherry	6.5"	x	Good
70	Black Cherry	7.0", 3.5"	x	Good
71	Cottonwood	8.0"	x	Good
72	Cottonwood	6.0"	x	Poor
73	Cottonwood	8.0"	x	Fair
74	Cottonwood	6.0"	x	Fair
75	Black Walnut	9.75", 7.0"	x	Fair

NATURAL FEATURES:

There is an onsite wetland area in the southeast corner of the site which shall have a 25' setback to all construction related activities. This area shall be protected by silt fence and tree fence barriers. The woodland area adjacent to the wetland consists of black walnut cherry and cottonwood trees. The area of brush and volunteer trees located on the northern fringe is poor to fair quality. This area appears to have been filled during the subdivision development. We proposed a tree replacement of 50 trees marked as V on the landscape plan to mitigate the removals necessary to accommodate the circulation for the car wash lane.

EXISTING CONDITIONS PLAN

SCALE 1" = 20'-0"

LEGEND

PROPERTY LINE
SETBACK
EASEMENT
PROPOSED STORM
PROPOSED WATER
PROPOSED UNDERGROUND ELECTRIC & TELEPHONE
PROPOSED GAS
PROPOSED SANITARY
EXISTING STORM
EXISTING WATER
EXISTING TELEPHONE
EXISTING ELECTRIC
EXISTING UNDERGROUND CABLE
EXISTING GAS
EXISTING SANITARY
EXISTING CENTERLINE OF DITCH
EXISTING CONTOUR
PROPOSED CONTOUR
NEW BUILDING MOUNTED LIGHTING
NEW POLE-MOUNTED LIGHT
EXISTING UTILITY POLE
EXISTING MANHOLE
EXISTING CATCH BASIN
PROPOSED MANHOLE
NEW CATCH BASIN
EXISTING FIRE HYDRANT
NEW FIRE HYDRANT
PROPOSED ELEVATION
EXISTING ELEVATION
LINE OF TREE PROTECTION
DRAINAGE AREA
EXISTING BUILDING
EXISTING PAVING
PROPOSED CONCRETE
PROPOSED BUILDING
PROPOSED ASPHALT PAVING

LOT 2

DESIGNERS
Vanston/O'Brien, Inc.
BUILDERS
8150 Jackson Road, Ste. A
Ann Arbor, MI 48103
Tel: (734) 424-0661
Fax: (734) 424-0627
e-mail: design@vanston.com • www.vanston.com

Zippy Auto Wash
3952 Bestech Drive
Pittsfield Township, Michigan

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ISSUED FOR:	DATE:
PRELIMINARY SITE PLAN	3-2-20
REVISED	4-8-20
REVISED	5-8-20

DRAWN BY: GAN
JOB NO.: XXX

EXISTING CONDITIONS PLAN

SHEET NO.

C-2

L -12-23-110-001
3939 BESTECH DR
INTERCLEAN PROPERTIES LLC
ZONED I

EXISTING HYDRANT

12 FT WIDE EASEMENT FOR PUBLIC UTILITIES

EXISTING PROPERTY LINE/ ROW

BESTECH DETENTION BASIN

EXIST. LIGHT

1/80' ROW

EX INV - 830.82

EX VH-s2

EX VH-s1

EX VH r-23

EX INV - 828.80

N88°17'30"E 309.07'

4 FT. WIDE EASEMENT FOR STORM SEWER

12 FT. WIDE EASEMENT FOR PUBLIC UTILITIES

828.33

VH r-24

ex cb

94.67'

INV. 829.41

ex.cb

6" SDR 35 @ 1%

EXISTING BUILDING
F.F. ELEV. 837.00
12,379 SF

TRANSFORMER
ELEC. METER
18.67'

ex.cb

tx cb

6" SDR 35 @ 1%

L-12-23-110-003
3914 BESTECH DR
MICHIGAN CROSSROADS
COUNCIL INC BOY
SCOUTS OF AMERICA
ZONED I

EXIST. GATEWELL
& VALVE (GV-11).
RIM EL. 836.15

EX FH-2

REMOVE TEMORARY
FIRE HYDRANT

XISTING 12" VALVE

4' STORM SEWER EASEMENT

EASEMENT FOR PUBLIC UTILITIES

S01°02'30"E 280.28'

20' SIDE SETBACK

35'

20' WATERMAIN EASEMENT

PR. CONCRETE PAVING

REMOVE TEMORARY FIRE HYDRANT

NEW FH 1

CB R-1

50' FRONT SETBACK

PR. SIGN

L -12-23-110-002
3952 BESTECH DR
VO INVESTMENT
COMPANY LLC
ZONED I

50' FRONT SETBACK

CB R-2

PROP. BUILDING
4,843 SF

PR. ELEC. TRANSFORMER

CURB STOP

LOADING

CB R-4

CB R-3

HC

PR. CONCRETE PAVING

CB R-5

PR. DUMPSTER ENCLOSURE

3550SF INFILTRATION BED

12"R RISER PIPE

ES R-6

SILT FENCE

35' REAR SETBACK

S88°17'30"W 278.83'

L -12-23-100-019
5450 CARPENTER RD
SAMS PW INC PROPERTY TAX
DEPARTMENT MAIL STOP 0555
ZONED PUD

REGULATED WETLAND

25' BUFFER

N88°57'30"E
100.01'

S01°02'30"E 96.00'

175.1'

C/L OF CARPENTER ROAD

65' ROW

1/2 ROW

SITE PLAN

SCALE: 1" = 20'-0"

LEGEND

PROPERTY LINE
SETBACK
EASEMENT
PROPOSED STORM
PROPOSED WATER
PROPOSED UNDERGROUND ELECTRIC & TELEPHONE
PROPOSED GAS
PROPOSED SANITARY
EXISTING STORM
EXISTING WATER
EXISTING TELEPHONE
EXISTING ELECTRIC
EXISTING UNDERGROUND CABLE
EXISTING GAS
EXISTING SANITARY
EXISTING CENTERLINE OF DITCH
EXISTING CONTOUR
PROPOSED CONTOUR

NEW BUILDING MOUNTED LIGHTING
NEW POLE-MOUNTED LIGHT
EXISTING UTILITY POLE
EXISTING MANHOLE
EXISTING CATCH BASIN
PROPOSED MANHOLE
NEW CATCH BASIN
EXISTING FIRE HYDRANT
NEW FIRE HYDRANT
PROPOSED ELEVATION
EXISTING ELEVATION

EXISTING BUILDING
EXISTING PAVING
PROPOSED CONCRETE
PROPOSED BUILDING
PROPOSED ASPHALT PAVING

LINE OF SILT FENCE
DRAINAGE AREA

LOT 2

DESIGNERS
Vanston/O'Brien, Inc.
BUILDERS

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Ann Arbor, MI 48103
Tel: (734) 424-0066
Fax: (734) 424-0677
e-mail: design@vanston.com • www.vanston.com

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REVISED	5-8-20

DRAWN BY: GAE
JOB NO.: XXX

SITE PLAN

SHEET NO.
C-3

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L -12-23-110-001
3939 BESTECH DR
INTERCLEAN PROPERTIES LLC
ZONED I

EXISTING HYDRANT

12 FT. WIDE EASEMENT FOR PUBLIC UTILITIES

EXISTING PROPERTY LINE/ R.O.W.

BESTECH DETENTION BASIN

EXIST. LIGHT

EX. INV.- 830.82

EX. MH-S2

EX. MH-S3

EX. MH-S1

EX. INV.- 828.80

N88°17'30"E 309.02'

4 FT. WIDE EASEMENT FOR STORM SEWER

12 FT. WIDE EASEMENT FOR PUBLIC UTILITIES

828.33

VH 1-24

ex.cb

94.67'

INV. 829.41

N88°17'30"E 268.92'

REMOVE TEMORARY FIRE HYDRANT

NEW FH-1

PR. SIGN

PR. CONCRETE PAVING

4' STORM SEWER EASEMENT

20' EASEMENT FOR PUBLIC UTILITIES

CB R-1

L -12-23-110-002
3952 BESTECH DR
VO INVESTMENT COMPANY LLC
ZONED I

TEST PIT #3

50' FRONT SETBACK

CB R-2

PROP BUILDING 4,843 SF

PR. ELEC. TRANSFORMER

CURB STOP

6" SDR 35 @ 1%

EXISTING BUILDING
F.F. ELEV. 837.00
12,379 SF

TRANSFORMER ELEC. METER

18.67'

114.67'

S01°02'30"E 280.28'

70' SIDE SETBACK

CB R-4

CB R-3

PR. CONCRETE PAVING

CB R-5

PR. DUMPSTER ENCLOSURE

3550SF INFILTRATION BED

12"R RISER PIPE

TEST PIT #2

TEST PIT #1

ES R-6

20' WATER MAIN EASEMENT

N88°57'30"E 10.01'

S01°02'30"E 96.00'

25' BUFFER

L-12-23-110-003
3914 BESTECH DR
MICHIGAN CROSSROADS COUNCIL INC BOY SCOUTS OF AMERICA
ZONED I

EXIST. GATEWELL & VALVE (GV-11)
RIM EL. 836.15

SILT FENCE

35' RIGHT SETBACK

REMOVE TEMORARY FIRE HYDRANT

S88°17'30"W 278.83'

REGULATED WETLAND

EXISTING 12" VALVE

L -12-23-100-019
5450 CARPENTER RD
SAMS PW INC PROPERTY TAX DEPARTMENT MAIL STOP 0555
ZONED PUD

℄ OF CARPENTER ROAD

PREVIOUS DESIGN DETENTION VOLUME FOR LOT #2

Area = 1.30 AC
Cfactor = 0.64
Allowed Out Volume 10842 CF

WASHTENAW COUNTY
PROPOSED DRAINAGE CALCULATION

DETENTION VOLUME CALCULATIONS

	ACRES		OFF-SITE
Impervious Area @ 90%	0.77	Cr	0.79
Pervious Area @ 30%	0.48	Ar	1.29 ACRES
Bentall Basin 1 @	0.00		

ALLOWABLE RELEASE RATE =

$Q_{allowable}$ = ALLOWABLE RELEASE RATE x A =

0.16 CFS/AC
0.16 CFS

FIRST FLUSH VOLUME

V_{ff} = 1"*1/12*43560SF*Impervious Area*Cr V_{ff} = 2389 cf

Pre-Development Bentall Volume

2-year/24 hour storm event Pv
Pre-Development CN Cbn 77
S = 1000/CN - 10= Sn 2.95 in
C = (P-0.2S)^2 / (P+0.8S) Cn 2.867 in
Total Site Area (sf) excl. S.C BMPs An 0.848 in
$V_{bn\,pre}$ = Q/12 x A $V_{bn\,pre}$ = 52472 sf

Pervious Cover Post-Development Bentall Volume

2-year/24 hour storm event Pv
Pervious Cover CN Cbn 2.35 in
S = 1000/CN - 10= Sn 80
C = (P-0.2S)^2 / (P+0.8S) Cn 2.500 in
Pervious Cover Area (sf) Apn 0.197 in
$V_{bn\,per\,post}$ = Q/12 x Ap $V_{bn\,per\,post}$ = 20014 sf 1312 cf

Impervious Cover Post-Development Bentall Volume

2-year/24 hour storm event Pv
Impervious Cover CN Cbn 2.35 in
S = 1000/CN - 10= Sn 98
C = (P-0.2S)^2 / (P+0.8S) Cn 0.204 in
Impervious Cover Area (sf) Ap 2.122 in
$V_{bn\,imp\,post}$ = Q/12 x Ai $V_{bn\,imp\,post}$ = 32459 sf 3046 cf

Pervious Cover Post-Development 100-Year Volume

100-year storm event Pv
Pervious Cover CN Cbn 5.11 in
S = 1000/CN - 10= Sn 80
$Q_{100\,per}$ = (P-0.2S)^2 / (P+0.8S) $Q_{100\,per}$ = 2.500 in
Pervious Cover Area (sf) $A_{100\,per}$ = 20014 sf
$V_{100\,per\,post}$ = Q/12 x Ap $V_{100\,per\,post}$ = 4665 cf

Impervious Cover Post-Development 100-Year Volume

100-year storm event Pv
Impervious Cover CN Cbn 5.11 in
S = 1000/CN - 10= Sn 98
$Q_{100\,imp}$ = (P-0.2S)^2 / (P+0.8S) $Q_{100\,imp}$ = 4.873 in
Impervious Cover Area (sf) $A_{100\,imp}$ = 32459 sf
$V_{100\,imp}$ = Q/12 x $A_{100\,imp}$ $V_{100\,imp}$ = 13587 cf

Runoff Summary

V_{ff} = 2389 cf
$V_{bn\,pre}$ = 2889 cf
$V_{bn\,per\,post}$ = 1312 cf
$V_{bn\,imp\,post}$ = 3046 cf
$V_{100\,per}$ = 4665 cf
$V_{100\,imp}$ = 7238 cf
V_{ff} = 12100 cf
$V_{bn\,pre}$ = 4665 cf
$V_{bn\,post}$ = 4367 cf
V_{total} = 19872 cf

Time of Concentration

Flow Type	K	Dev. Change	Length (L)	Slope % (S)	S^1/2	Vel. = S^1/2	T_c = L / (V*3600)
Sheet Flow	0.48	0	100	0.556	0.745	0.358	0.140
Waterway	1.70	0.0	0	0.000	0.000	0.000	0.000
Small Subareas	2.18	0.0	0	0.000	0.000	0.000	0.000

T_c = 0.14 hr

Q_p = 228.8 x $T_c^{-0.4}$ Q_p = 1199.04 cfs

Total Site Area (ac) excl. SC BMPs An 1.23 ac

Q_{out} = $Q_{allowable}$ + $Q_{off\,site}$ Q_{out} = 7.98 cs

Peak Flow (PF) = Q_p + Q_{out} x A - 640 PF = 1627 cfs

Δ = PF/640 - 0.15*Q_p/640 Δ = 17.88 cfs

V_S = Δ * PF x Y V_S = 16383 cf

REQUIRED DETENTION VOLUME WITH INFILTRATION

V_{det} = V_S + V_{off} V_{det} = 16842 cf OFF SITE DETENTION

On-Site Infiltration Requirement

Greater of First Flush volume or Difference between pre and post development bentall volumes

Bentall Volume Difference = $V_{bn\,pre}$ - $V_{bn\,post}$ = 4367 cf

INFILTRATION DESIGN

Required Infiltration $V_{req\,inf}$ = 4367 cf
Depth of back storage d_b = 1.9
Depth of aggregate storage d_a = 1.9
Aggregate void ratio (%) n_a = 0.3 %
Field Infiltration Rate f_c = 3 in/hr
Design Infiltration Rate f_d vs. 2 f_d = 1.5 in/hr
Inflow infiltration period t_d = 6 hr
Infiltration Interface Area A_i = 3550 sf
Inflow Infiltration Volume
V_i = A_i x f_d x t_d V_i = 2663 cf
Aggregate Storage Volume
V_a = A_i x d_a x n_a V_a = 1568 cf
Basin Storage Volume V_b = 3581 cf
Total Proposed Infiltration V_t = V_i + V_a + V_b = V_{tot} = 7811 cf

On-Site Infiltration Proposed

On-Site design net infiltration rate f_n = 1.50 in/hr
PROPOSED INFILTRATION V_{inf} = 7811 cf
INFILTRATION PERIOD T = 17.3 hr

INFILTRATION BASIN STORAGE PROVIDED

ELEV	AREA (FT^2)	DEPTH (FT)	VOLUME (FT^3)	TOTAL VOLUME (FT^3)	
633	4609	1	4 641	7 670	Freeboard
632	3187	1	3 029	3 029	Design Volume
631	1872	1	1 088	1 088	
630	488	0.5	133	133	
629.5	95	0	0	0	

BOTTOM OF BASIN X_b = 629.50
INF BASIN STORAGE X_i = 631.88 OVERFLOW OUTLET

INFILTRATION BASIN TRIBUTARY VOLUME

Pervious Cover Post-Development 100-Year Volume

100-year storm event Pv
Pervious Cover CN Cbn 5.11 in
S = 1000/CN - 10= Sn 80
$Q_{100\,per}$ = (P-0.2S)^2 / (P+0.8S) $Q_{100\,per}$ = 2.500 in
Pervious Cover Area (sf) $A_{100\,per}$ = 20014 sf
$V_{100\,per\,post}$ = Q/12 x Ap $V_{100\,per\,post}$ = 12326 sf 3046 cf

Impervious Cover Post-Development 100-Year Volume

100-year storm event Pv
Impervious Cover CN Cbn 5.11 in
S = 1000/CN - 10= Sn 98
$Q_{100\,imp}$ = (P-0.2S)^2 / (P+0.8S) $Q_{100\,imp}$ = 4.873 in
Impervious Cover Area (sf) $A_{100\,imp}$ = 32459 sf
$V_{100\,imp}$ = Q/12 x $A_{100\,imp}$ $V_{100\,imp}$ = 13587 cf
$V_{100\,total}$ = 8673 cf

GRADING PLAN

SCALE: 1" = 20'-0"

LEGEND

PROPERTY LINE
SETBACK
EASEMENT
PROPOSED STORM
PROPOSED WATER
PROPOSED UNDERGROUND ELECTRIC & TELEPHONE
PROPOSED GAS
PROPOSED SANITARY
EXISTING STORM
EXISTING WATER
EXISTING TELEPHONE
EXISTING ELECTRIC
EXISTING UNDERGROUND CABLE
EXISTING GAS
EXISTING SANITARY
EXISTING CENTERLINE OF DITCH
EXISTING CONTOUR
PROPOSED CONTOUR
NEW BUILDING MOUNTED LIGHTING
NEW POLE-MOUNTED LIGHT
EXISTING UTILITY POLE
EXISTING MANHOLE
EXISTING CATCH BASIN
PROPOSED MANHOLE
NEW CATCH BASIN
EXISTING FIRE HYDRANT
NEW FIRE HYDRANT
PROPOSED ELEVATION
EXISTING ELEVATION
LINE OF SILT FENCE
DRAINAGE AREA
EXISTING BUILDING
EXISTING PAVING
PROPOSED CONCRETE
PROPOSED BUILDING
PROPOSED ASPHALT PAVING

LOT 2

DESIGNERS
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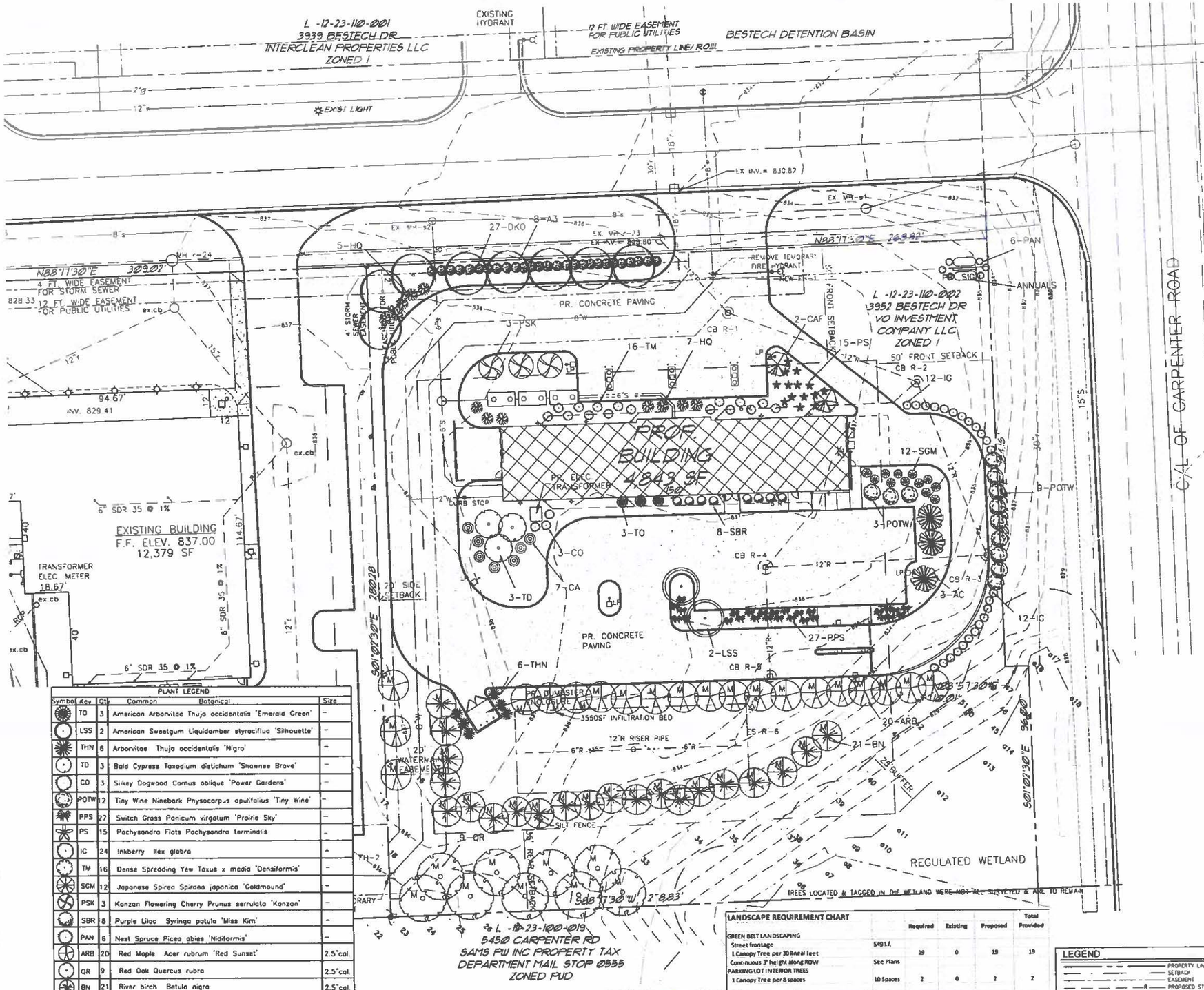
ISSUED FOR:	DATE:
PRELIMINARY SITE PLAN	3-2-20
REVISED	4-8-20
REVISED	5-8-20

DRAWN BY: GAR
JOB NO.: XXX

GRADING PLAN

SHEET NO.
C-4



Landscape Notes

1. All plant material shall meet current American Association of Nurserymen, Inc. (AAN) standard for nursery stock. (ANSI 260.1 – 1973)
2. Landscape installation shall be in accordance with the American Association of Nursery standards and with the Township/City's landscape requirements.
3. Planting schedules: 1) Deciduous material shall be planted from March 15 for spring planting and from October 1 until the ground freezes for fall planting. 2) Evergreen material shall be planted from March 1 through May 31 for Spring plantings and from August 1 through September 30 for all fall planting.
4. Mulch plant beds, individual tree and shrub planting at a uniform depth of 4 inches.
5. Provide weed mat for greenbelt and foundation plantings.
6. All planting beds are to be edged. Recommended either "Permalok Aluminum" edging or "Black Diamond" plastic edging.
7. All areas with stone cover shall have weed mat.
8. All landscaping to be continuously maintained.
9. All site improvements detailed on this plan are to be completed prior to issuance of final certificate of occupancy.
10. All construction to conform to the latest applicable Township/City regulations.
11. R.O.W. areas to be seeded or sod.
12. Tree protection consists of:
    A. Yellow ribbon barriers for large areas not disturbed by construction.
    B. Stakes 10' on center and wood snow fence around individual and groups of individual trees.
    C. Trees to be removed will be tagged with red ribbon.

    The barrier or fence surrounding the tree or group of trees shall be located no closer to the tree than the tree's drip line. If this is not possible, the barrier shall be no closer than 6 feet from the trunk of the tree or group of trees.
13. There will be no outside storage on site.
14. Seed Mix

* Temporary planting mixture for erosion control.
  - Seed Oats — 30 pounds per acre
  - Annual Rye — 10 pounds per acre
* Permanent planting mixture on all disturbed areas excluding BMPs.
  - Scotts Hard Fescue — 12 pounds per acre
  - Danson's Creeping Red Fescue — 6 pounds per acre
  - Perennial Rye — 20 pounds per acre
  - Buffalo Grass — 20 pounds per acre
  - Creeping Bent — 0.5 pounds per acre
  - Little Blue Stem — 20 pounds per acre
  - Sheep Fescue — 15 pounds per acre

Existing soil nutrient levels shall be tested by an independent soil testing laboratory before fertilizers are applied.

15. Rain Water Garden / Infiltration Basin Plantings

* Within areas above the first flush elevation of the infiltration basins, seeding and/or live plantings are allowed. Only native seeds (as defined by Michigan Flora, www.michiganflora.net) are allowed for permanent soil stabilization. Annual seeds are allowed in an amount necessary to temporarily stabilize the limits of disturbance.

* Within areas below the first flush elevation of the infiltration basins, only live plantings are allowed in a storm water system of any kind. Native plants are preferred. Cultivars and non-native perennials are allowable if approved by WCWRC. Plants listed on the WCWRC Rain Garden Plant List are acceptable (invasive species are not allowed (see the City of Ann Arbor's invasive species list).

LANDSCAPE PLAN PREPARED BY
ECO LANDSCAPE DESIGN & CONSULTING, LLC
WATERFORD, MI

PLANT LEGEND

Symbol	Key	Qty	Common / Botanical	Size
	TO	3	American Arborvitae Thuja occidentalis 'Emerald Green'	–
	LSS	2	American Sweetgum Liquidamber styraciflua 'Silhouette'	–
	THN	6	Arborvitae Thuja occidentalis 'Nigra'	–
	TD	3	Bald Cypress Taxodium distichum 'Shawnee Brave'	–
	CD	3	Silkey Dogwood Cornus oblique 'Power Gardens'	–
	POTW	12	Tiny Wine Ninebark Physocarpus opulifolius 'Tiny Wine'	–
	PPS	27	Switch Grass Panicum virgatum 'Prairie Sky'	–
	PS	15	Pachysandra Flats Pachysandra terminalis	–
	IG	24	Inkberry Ilex glabra	–
	TM	16	Dense Spreading Yew Taxus x media 'Densiformis'	–
	SGM	12	Japanese Spirea Spiraea japonica 'Goldmound'	–
	PSK	3	Kanzan Flowering Cherry Prunus serrulata 'Kanzan'	–
	SBR	8	Purple Lilac Syringa patula 'Miss Kim'	–
	PAN	6	Nest Spruce Picea abies 'Nidiformis'	–
	ARB	20	Red Maple Acer rubrum 'Red Sunset'	2.5"cal.
	QR	9	Red Oak Quercus rubra	2.5"cal.
	BN	21	River birch Betula nigra	2.5"cal.
	HQ	12	Snowflake Hydrangea Hydrangea quercifolia 'Snowflake'	–
	DKO	27	Kodiak Orange Honeysuckle Diervilla x. Kodiak Orange	–
	AS	8	Sugar Maple Acer saccharinum 'Green Mountain	2.5"cal.
	CABF	7	Tatarian Dogwood Cornus alba 'Spaethii'	–
	CAF	2	Upright European Hornbeam Carpinus betulus 'Fastigiata	2.5"cal.
	AC	5	White Fir Abies Concolor	2.5"cal.

LANDSCAPE REQUIREMENT CHART

		Required	Existing	Proposed	Total Provided
GREEN BELT LANDSCAPING					
Street frontage	549 l.f.				
1 Canopy Tree per 30 lineal feet		19	0	19	19
Continuous 3' height along ROW	See Plans				
PARKING LOT INTERIOR TREES					
1 Canopy Tree per 8 spaces	10 Spaces	2	0	2	2
PARKING LOT PERIMETER TREES					
Lot Perimeter	See Plans				
1 Canopy Tree per 40 lineal feet					
SITE LANDSCAPING					
20 % of Site Area to be planted per ordinance	See Plans				
ENTRANCE SIGN LANDSCAPING	See Plans				
DUMPSTER SCREENING LANDSCAPING	See Plans				
TREE MITIGATION (note M label on tree symbol)					
100% of woodland DBH removed	187.5 DBH				
Min. 2.5 caliper tree		75		50	25 remain

ROBERT M. O'REILLY
LANDSCAPE ARCHITECT
NO. 3301001417
STATE OF MICHIGAN

LANDSCAPE PLAN
SCALE: 1" = 20'-0"

LEGEND

PROPERTY LINE
SETBACK
EASEMENT
PROPOSED STORM
PROPOSED WATER
PROPOSED UNDERGROUND ELECTRIC & TELEPHONE
PROPOSED GAS
PROPOSED SANITARY
EXISTING STORM
EXISTING WATER
EXISTING TELEPHONE
EXISTING ELECTRIC
EXISTING UNDERGROUND CABLE
EXISTING GAS
EXISTING SANITARY
EXISTING CENTERLINE OF DITCH
EXISTING CONTOUR
PROPOSED CONTOUR
NEW BUILDING MOUNTED LIGHTING
NEW POLE-MOUNTED LIGHT
EXISTING UTILITY POLE
EXISTING MANHOLE
EXISTING CATCH BASIN
PROPOSED MANHOLE
NEW CATCH BASIN
EXISTING FIRE HYDRANT
NEW FIRE HYDRANT
PROPOSED ELEVATION
EXISTING ELEVATION
LINE OF SILT FENCE
DRAINAGE AREA
EXISTING BUILDING
EXISTING PAVING
PROPOSED CONCRETE
PROPOSED BUILDING
PROPOSED ASPHALT PAVING
PLANTINGS BELOW FIRST FLUSH
SEEDING ABOVE FIRST FLUSH

LOT 2
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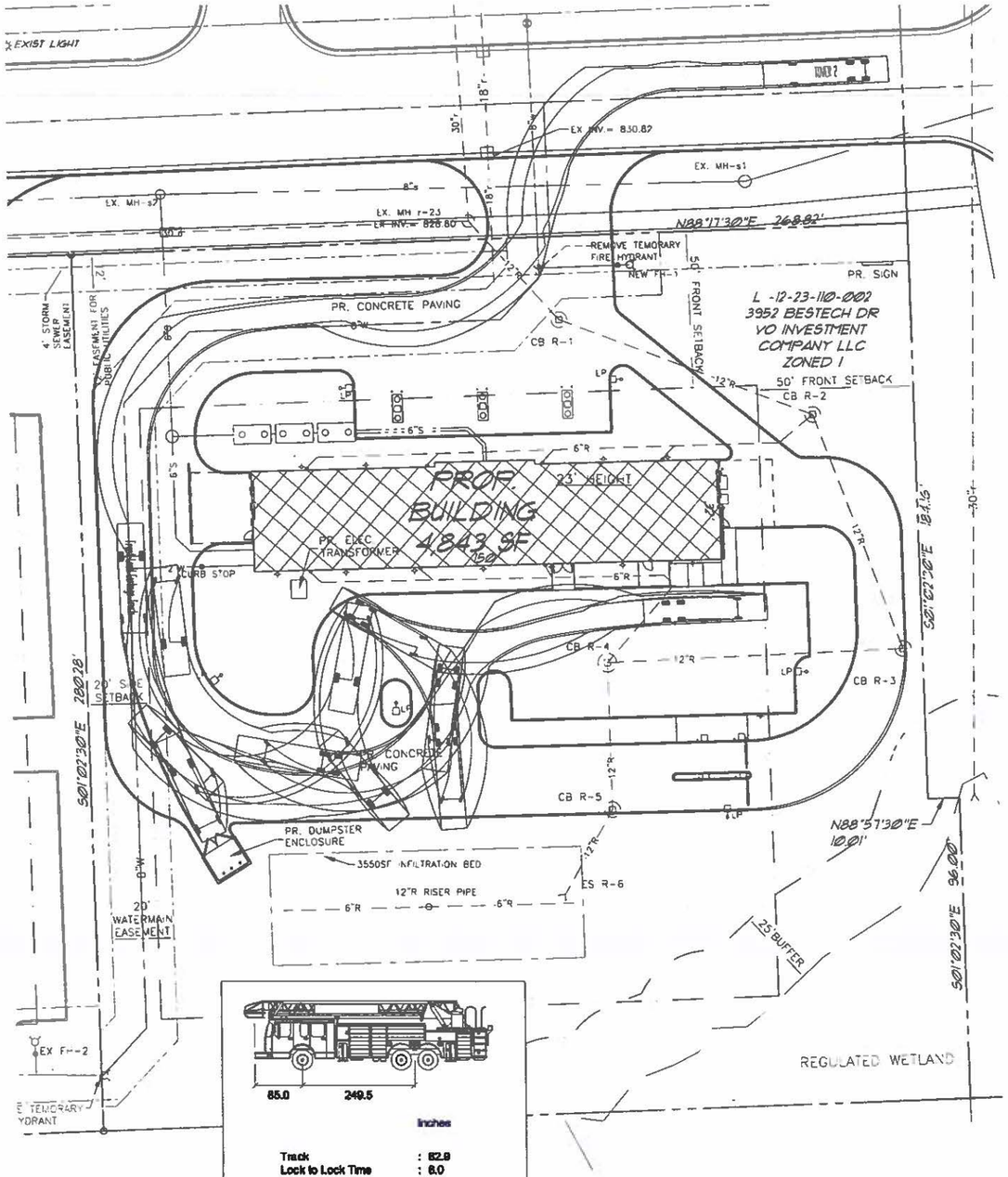
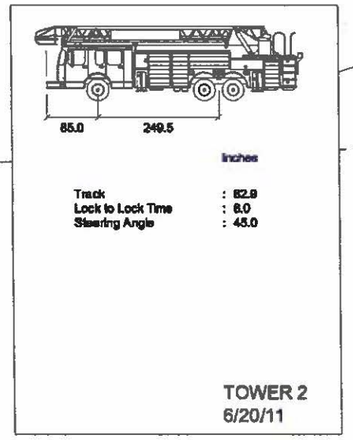
ISSUED FOR:	DATE:
PRELIMINARY SITE PLAN	3-2-20
REVISED	4-8-20
REVISED	6-8-20

DRAWN BY: GAB
JOB NO.: XXX

LANDSCAPE PLAN

SHEET NO.
C-5



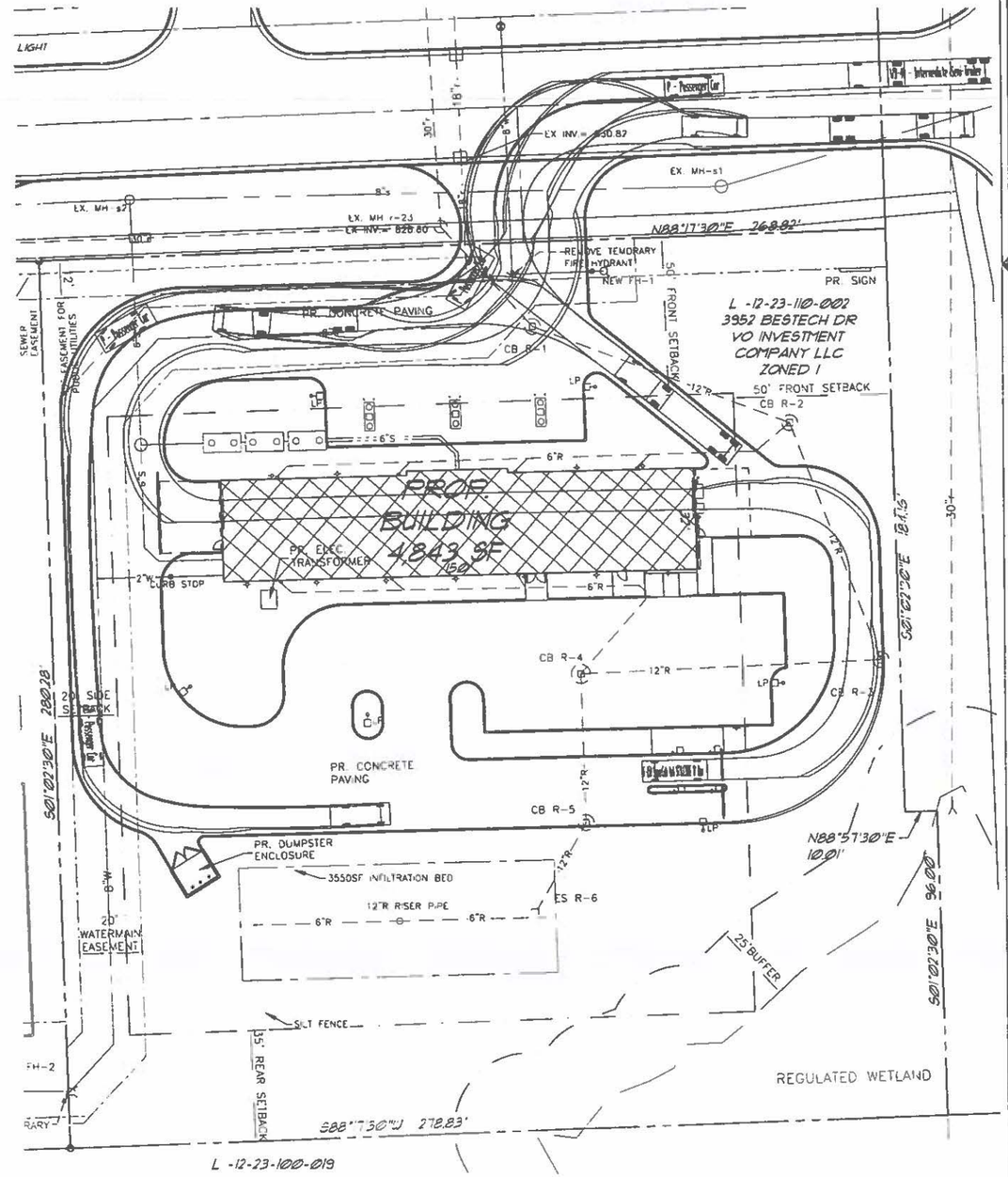


TURNING TEMPLATE SHOWN THIS SHEET

FIRE PROTECTION PLAN

SCALE 1" = 20'-0"

GENERAL NOTES:
1. NO FIRE SUPPRESSION CONTAINED WITHIN BUILDING
2. KNOX BOX SHALL BE MOUNTED NEAR BUILDING ENTRANCE



CIRCULATION PLAN

SCALE: 1" = 20'-0"

LEGEND

	PROPERTY LINE
	SETBACK
	EASEMENT
R	PROPOSED STORM
W	PROPOSED WATER
UTE	PROPOSED UNDERGROUND ELECTRIC & TELEPHONE
G	PROPOSED GAS
S	PROPOSED SANITARY
	EXISTING STORM
	EXISTING WATER
	EXISTING TELEPHONE
	EXISTING ELECTRIC
	EXISTING UNDERGROUND CABLE
G	EXISTING GAS
S	EXISTING SANITARY
	EXISTING CENTERLINE OF DITCH
518	EXISTING CONTOUR
	PROPOSED CONTOUR
	NEW BUILDING MOUNTED LIGHTING
	NEW POLE-MOUNTED LIGHT
EX UP	EXISTING UTILITY POLE
EX MH	EXISTING MANHOLE
EX CB	EXISTING CATCH BASIN
MH S-1	PROPOSED MANHOLE
CB R-1	NEW CATCH BASIN
EX FH	EXISTING FIRE HYDRANT
NEW FH (1)	NEW FIRE HYDRANT
100.00	PROPOSED ELEVATION
x 99.50	EXISTING ELEVATION
	LINE OF SILT FENCE
	DRAINAGE AREA
	EXISTING BUILDING
	EXISTING PAVING
	PROPOSED CONCRETE
	PROPOSED BUILDING
	PROPOSED ASPHALT PAVING

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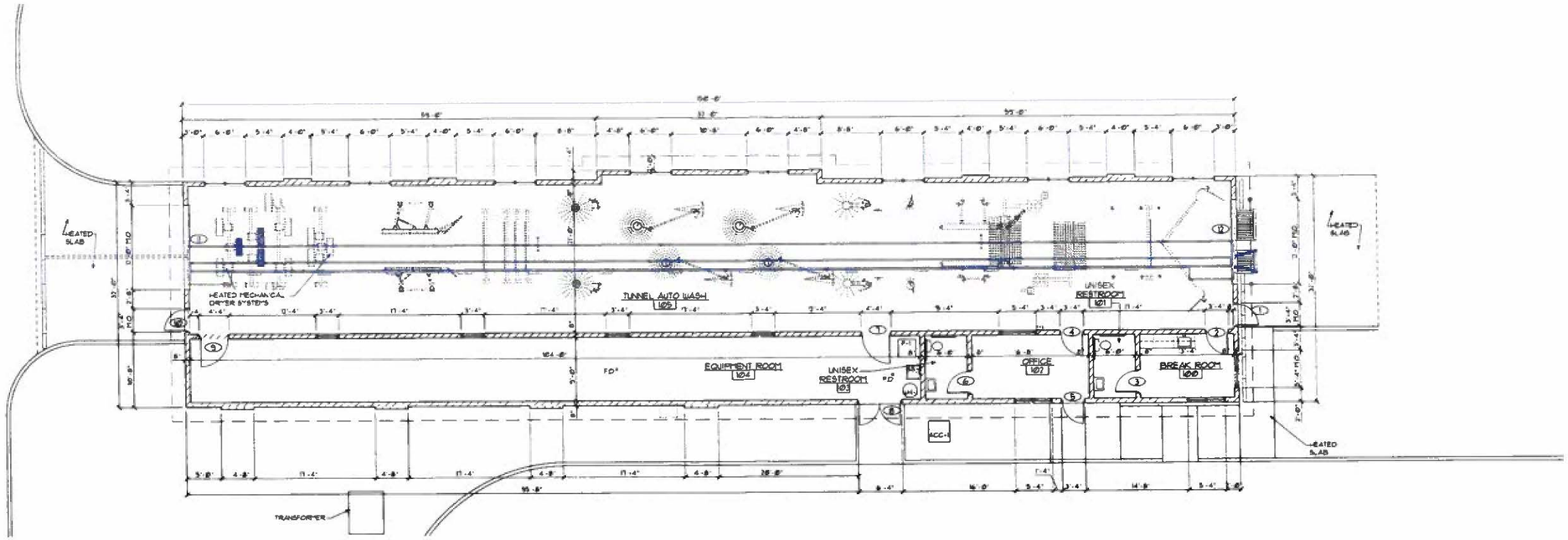
ISSUED FOR:	DATE:
PRELIMINARY SITE PLAN	3-2-20
REVISED	4-6-20
REVISED	5-8-20

DRAWN BY: GAB
JOB NO.: XXX

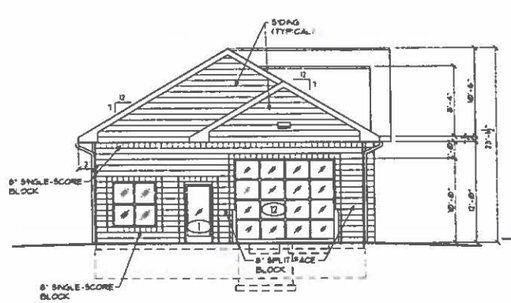
FIRE PROTECTION & CIRCULATION PLAN

SHEET NO.

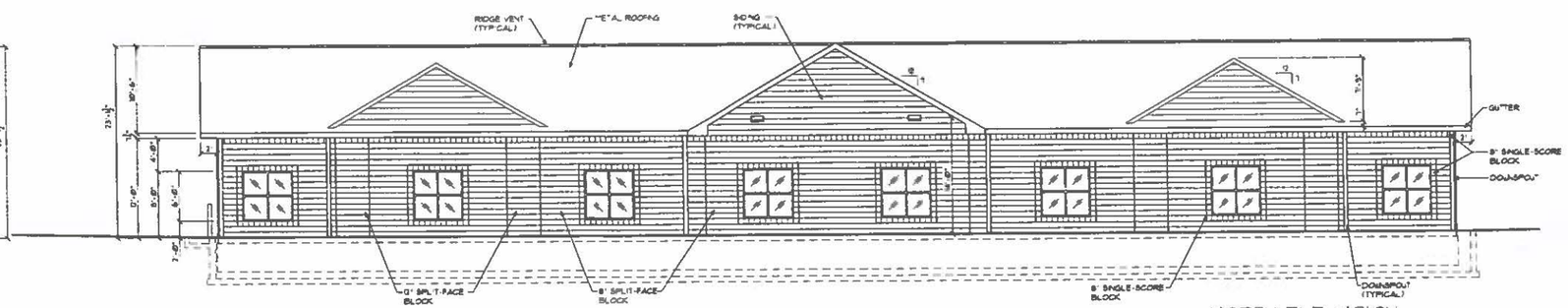
C-6



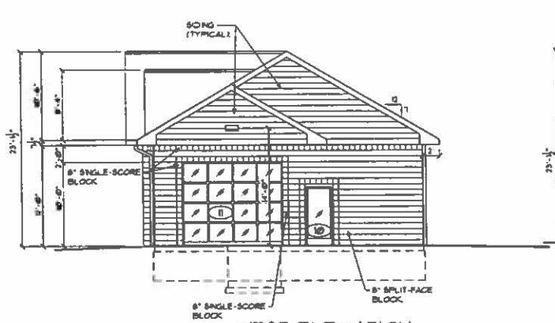
FLOOR PLAN
SCALE 1/8" = 1'-0"



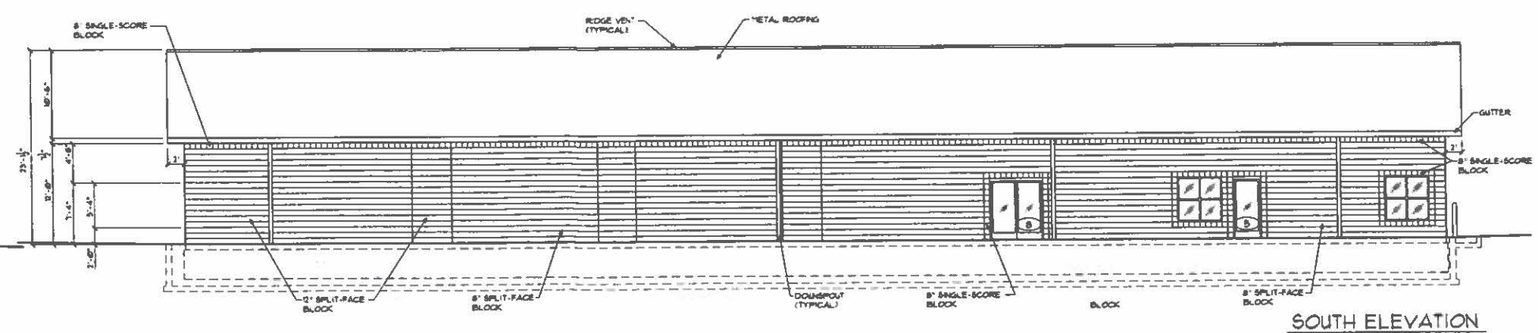
EAST ELEVATION
SCALE: 1/8" = 1'-0"



NORTH ELEVATION
SCALE: 1/8" = 1'-0"



WEST ELEVATION
SCALE: 1/8" = 1'-0"



SOUTH ELEVATION
SCALE: 1/8" = 1'-0"

ZIPPY AUTO WASH

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ISSUED FOR:	DATE:
PRELIMINARY SITE PLAN	3-2-20

DRAWN BY: CLK/SA
JOB NO.: XXX

BUILDING FLOOR PLAN & ELEVATIONS

SHEET NO.
A-1