# ANN ARBOR WELDING SUPPLY

# PRELIMINARY SITE PLAN

March 13, 2020

PRELIMINARY SITE PLAN

## 4811 CARPENTER ROAD
## YPSILANTI, MI 48197

### OWNER / APPLICANT

ANN ARBOR WELDING SUPPLY
4811 CARPENTER ROAD
YPSILANTI, MI 48197
CONTACT: MITCH MICHALUK

### PROJECT ENGINEER


B R ⓘ
Beckett&Raeder
*Landscape Architecture Planning, Engineering & Environmental Services*

**Beckett & Raeder, Inc.**
535 West William, Suite 101
Ann Arbor, MI 48103

734 663.2622 ph
734 663.6759 fx


### LEGAL DESCRIPTION

(PER ABSOLUTE TITLE, INC., FILE NO.: 86334, EFFECTIVE DATE: JULY 1, 2019)

COMMENCING AT THE SOUTHWEST COMER OF SECTION 13, T3S, R6E, PITTSFIELD TOWNSHIP, WASHTENAW COUNTY, MICHIGAN, THENCE NORTH 00°28' WEST 1085.16 FEET ALONG THE WEST LINE OF SAID SECTION 13 AND THE CENTERLINE OF CARPENTER ROAD TO THE POINT OF BEGINNING; THENCE NORTH 00°28' WEST 156.00 FEET ALONG THE CENTER LINE OF CARPENTER ROAD; THENCE SOUTH 87°53'50" EAST 1321.50 FEET; THENCE SOUTH 0°23'20" EAST 396.00 FEET; THENCE NORTH 87°53'50" WEST 1070.91 FEET; THENCE NORTH 0°28' WEST 240.00 FEET; THENCE NORTH 87°53'50" WEST 250.04 FEET TO THE POINT OF BEGINNING; BEING A PART OF THE SOUTHWEST 1/4 OF SECTION 13, T3S, R6E; ALSO HAVING AND GRANTING THE RIGHTS TO A 20 FOOT EASEMENT FOR INGRESS AND EGRESS DESCRIBED IN INSTRUMENT RECORDED IN LIBER 1968, PAGE 566, WASHTENAW COUNTY RECORDS.

### SITE DATA

| Site Data Comparison | | | Existing Industrial (I) | | Required | |
|---|---|---|---|---|---|---|
| Zoning | | | I | | I | |
| | Industrial and Office District | | Industrial | | Industrial | |
| | Site Type | | General industrial | | General Industrial | |
| | Use Group | | | | 7: Industrial Uses | |
| Site Density | | | | | | |
| | Min. Lot Area | | 462,607.20 | sf Gross Approx. | 43,560 | sf Gross Approx. |
| | | | 10.62 | Ac. Gross Approx. | 1 | Ac. Gross Approx. |
| | | *Net lot area excludes road rowwaeements, access easements, wetland, water bodies, drain easements | 432,890.89 | sf net approx. | 43,560 | sf net approx. |
| | | | | Ac. Net Approx. | | Ac. Net Approx. |
| | Min. Lot Width | | 396 | ft | 150 | ft |
| | Maximum Lot Coverage (Gross lot area) | | 4% | | 30% | |
| | Maximum Impervious Surface Ratio (Gross lot area) | | 18% | | 60% | |
| | Maximum Floor Area Ratio (Net lot area) | | 4% | | 60% | |
| Building Height | | | 22 | ft | 45 | ft |
| | | | 1 | Story | 2 | Story |
| Site Setbacks (to lot line) | | | | | | |
| | Front | | 317.81 | ft | 50 | ft |
| | Side | South | 0 | ft | 20 | ft |
| | | North | 79.89 | ft | 20 | ft |
| | Rear | | 908.27 | ft | 35 | ft |
| | | | whichever is greater | | whichever is greater | |
| Parking | | | | | | |
| | Setbacks | | | | 5' side and rear setback from adjacent property (10' if residential) | |
| | Required Parking | | 30 spaces | | 1 space per 550' FAR (none) | |
| | Available Parking | | 49 spaces | | 1 space per 550' FAR (none) | |
| Loading | | | | | | |
| | Non-residential | | | | | |
| | | | 3 | | 10ft wd x 55ft length x 14ft ht<br>0 for first 16,000 sf<br>1 space for 1401 sf up to 20,000 sf<br>1 space plus 1 additional space per additional 20,000 sf up to 100,000 sf<br>5 spaces for GFA 100,001 sf+ | |
| Storage | | | | | | |
| Front Yard | | | Existing landscaping berms along front | | Conflicting land uses and ROW frontage require screening from adjacent lots | |
| Side Yards | | Unscreened storage and structure within side setback | Non-opaque fence, some vegetation along south | | Outdoor storage shall be screened on all sides with landscaping or an 8' opaque fence. No structures are to be located within required setbacks | |

### SITE MAP

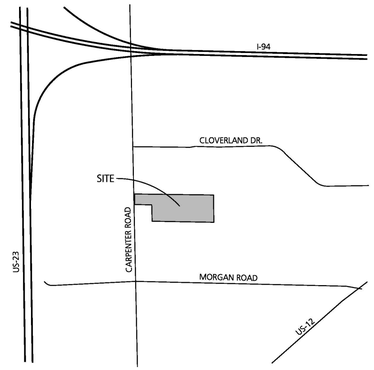
SCALE: NO SCALE

### PROJECT DESCRIPTION

THE PROJECT CONSISTS OF A SMALL EXPANSION FOR OUTDOOR STORAGE AREAS AND FOR PARKING. THERE ARE NO CHANGES TO THE EXISTING BUILDING OR STRUCTURES. OUTDOOR STORAGE AREAS THAT CONTAIN FLAMMABLE MATERIALS WILL BE FENCED AND SURROUNDED BY STEEL BOLLARDS.

### OUTDOOR STORAGE AREAS

OUTDOOR STORAGE WHICH CONSISTS OF EMPTY CYLINDERS FOR INVENTORY PRODUCTION TEMPORARY SHIPMENTS, BULK TANKS THAT CANNOT BE STORED INSIDE WAITING FOR INSTALLATION PROJECTS, RESIDENTIAL PROPANE TANKS THAT ARE EMPTY WAITING FOR INSTALLATION. ALL OUTDOOR STORAGE CYLINDERS OR TANKS ARE EMPTY AND ARE NON-FLAMMABLE. IN ADDITION THERE WILL BE FREIGHT DELIVERIES OF NEW PRODUCT CYLINDERS THAT WE WOULD TEMPORARY STAGE IN THE STORAGE AREAS.

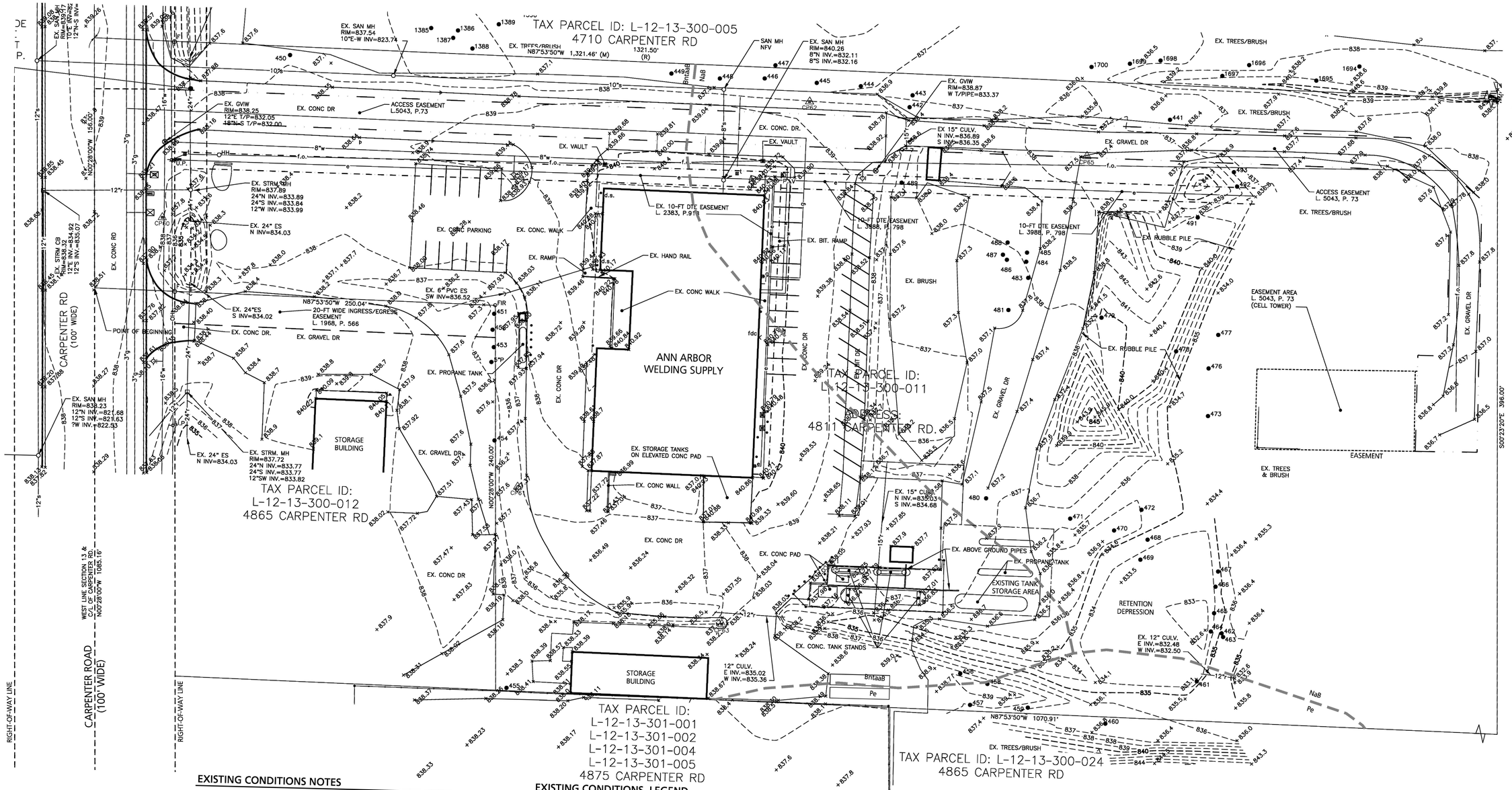



### VICINITY MAP

SCALE: NO SCALE

### SHEET INDEX


| | |
|---|---|
| C000 | COVER SHEET |
| C001 | SURVEY |
| EC100 | EXISTING CONDITIONS PLAN |
| C100 | DEMOLITION & SESC PLAN |
| C200 | LAYOUT & MATERIALS PLAN |
| C300 | GRADING & UTILITY PLAN |
| C400 | STORMWATER MANAGEMENT PLAN |
| C401 | STORMWATER CALCULATIONS |
| C500 | SITE DETAILS |
| C501 | SITE DETAILS |
| C600 | FIRE SAFETY PLAN |
| L100 | LANDSCAPE PLAN |
| L101 | LANDSCAPE DETAILS |




## EXISTING CONDITIONS NOTES

1. CONTRACTOR SHALL CALL MISS DIG (811) A MINIMUM OF THREE WORKING DAYS PRIOR TO START OF CONSTRUCTION.
2. CONTRACTOR SHALL INVESTIGATE EXTENT AND LOCATION OF ALL EXISTING UTILITIES AND SHALL BE RESPONSIBLE FOR PROTECTION AND RESTORATION OF SAME IF DAMAGED AS A RESULT OF CONTRACTOR'S OPERATIONS.
3. CONTOUR INTERVAL SHOWN IS 1-FOOT.

## SURVEY PREPARED BY:

MIDWESTERN CONSULTING

3815 PLAZA DRIVE
ANN ARBOR, MI 48108
734.995.0200
WWW.MIDWESTERNCONSULTING.COM

## BENCHMARK NOTES

OPEN ARROW ON HYDRANT LOCATED ON THE EAST SIDE OF CARPENTER RD. JUST SOUTH OF THE DRIVEWAY FOR HOUSE NO. 4701.
ELEV.=839.96 (NAVD 88 DATUM)

## SOIL TYPES

THE NATURAL RESOURCE CONSERVATION SERVICE SOIL SURVEY INDICATES THE SITE IS COMPRISED OF BLOUNT LOAM (BntaaB), NAPPANEE SILTY CLAY LOAM (NaB), AND PEWAMO CLAY LOAM (Pe); SEE THIS SHEET FOR SOIL BOUNDARIES.

## EXISTING CONDITIONS LEGEND

- RIGHT-OF-WAY LINE
- 838 — EXIST. CONTOUR
- ×836.2 — EXIST. SPOT ELEVATION
- GUY WIRE
- OH — EXIST. OVERHEAD UTILITY LINE
- g — EXIST. GAS LINE
- EXIST. GAS VALVE
- w — EXIST. WATER MAIN
- EXIST. HYDRANT
- EXIST. GATE VALVE IN BOX
- EXIST. GATE VALVE IN WELL
- r — EXIST. STORM SEWER
- DTE EASEMENT
- INGRESS - EGRESS EASEMENT
- ACCESS EASEMENT
- CELL TOWER EASEMENT
- EXIST. CATCH BASIN OR INLET
- CULVERT
- s — EXIST. SANITARY SEWER
- C/L OF DITCH
- MAILBOX
- ELECTRIC METER
- POST
- FENCE
- SINGLE TREE
- TREE OR BRUSH LIMIT
- FOUND IRON PIPE
- FOUND IRON ROD
- CONTROL PT.

## SOILS TABLE

| I.D. | DESCRIPTION | AREA(ac) |
|---|---|---|
| BntaaB | Blount loam, 2 to 6 percent slopes | 2.6 |
| NaB | Nappanee silty clay loam, 2 to 6 percent slopes | 7.1 |
| Pe | Pewamo clay loam, 0 to 2 percent slopes | 0.3 |
| | Total | 10.0 |

CAUTION: FIELD VERIFY ALL UNDERGROUND ELECTRICAL & GAS LINES & PROTECT.

0 15 30 60 90 120

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Consultants

Seal

Project Title

**Ann Arbor Welding Supply Preliminary Site Plan**

4811 Carpenter Road
Ypsilanti, Michigan 48197

Sheet Title

Existing Conditions Plan

Dates

| Dates | Issued for |
|---|---|
| 11/12/2019 | Owner Review |
| 11/19/2019 | Owner Review |
| 11/22/2019 | Owner Review |
| 12/03/2019 | Preliminary Site Plan |
| 02/28/2020 | Owner Review |
| 03/13/2020 | Preliminary Site Plan |

Scale

1 " = 30.00'

Quality Control

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Approved: KE

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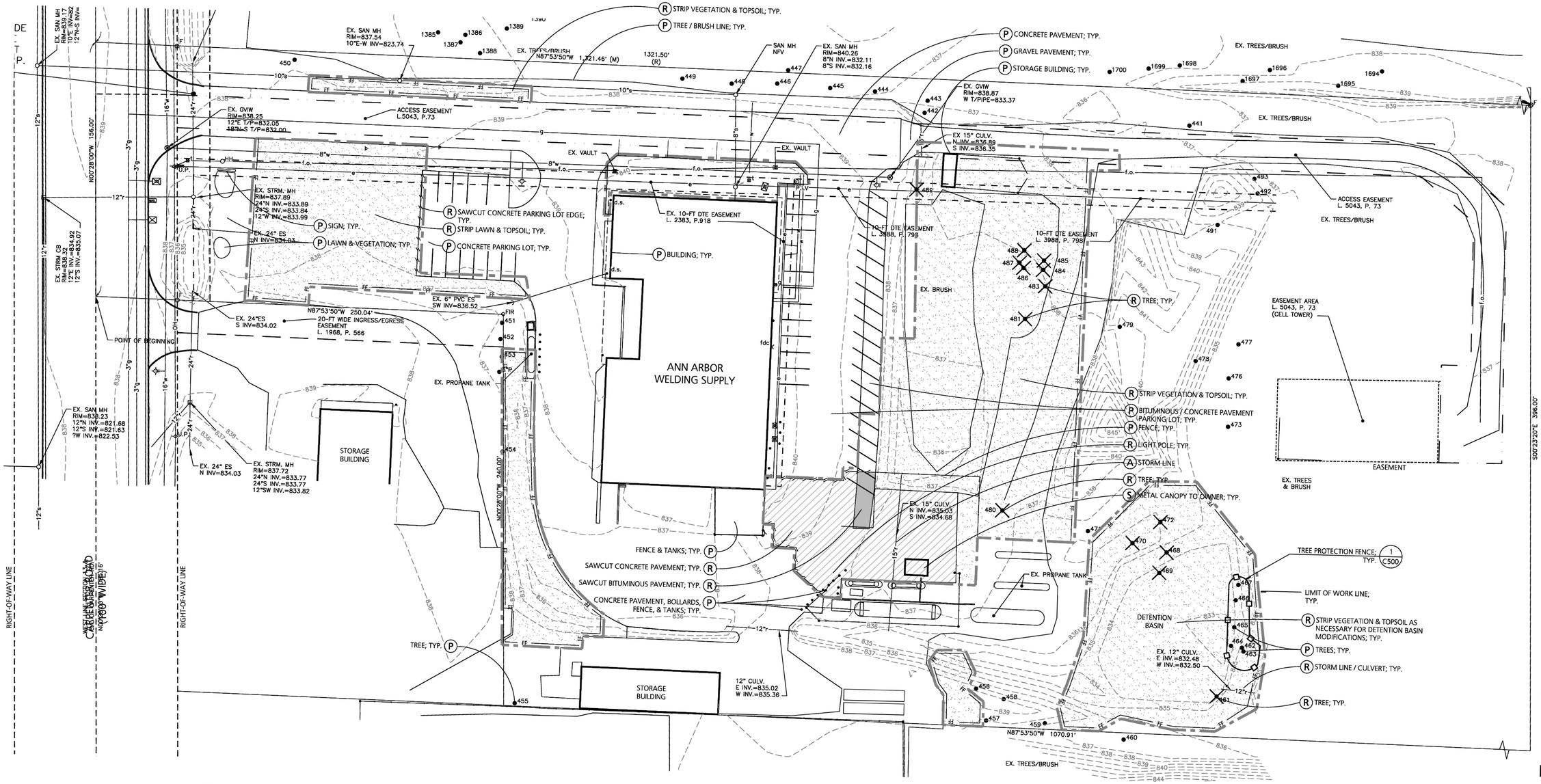


## DEMOLITION NOTES

1. CONTRACTOR SHALL CALL MISS DIG (811) A MINIMUM OF THREE WORKING DAYS PRIOR TO START OF CONSTRUCTION.
2. CONTRACTOR SHALL INVESTIGATE EXTENT AND LOCATION OF EXISTING UTILITIES AND SHALL BE RESPONSIBLE FOR PROTECTION AND RESTORATION OF SAME IF DAMAGED AS A RESULT OF CONTRACTOR'S OPERATIONS.
3. ALL ITEMS NOT INDICATED FOR REMOVAL SHALL REMAIN UNDISTURBED AND PROTECTED. CONTRACTOR SHALL FULLY RESTORE ANY ITEMS/MATERIALS DAMAGED DURING CONSTRUCTION AT NO ADDITIONAL COST TO THE OWNER.
4. ALL CONCRETE PAVEMENT AND CURB REMOVALS SHALL BE TO THE NEAREST JOINT BEYOND INDICATED EXTENT.
5. CONTRACTOR SHALL MAINTAIN CLEAN SAW CUT EDGES FOR PROPOSED WORK TO ABUT. BROKEN EDGES RESULTING FROM CONTRACTOR'S FAILURE TO PROTECT THE EDGE WILL BE SAW CUT BEYOND THE BREAKS AT THE NEAREST JOINT, AT THE CONTRACTOR'S EXPENSE.
6. ALL REMOVALS SHALL BE SAW CUT FULL DEPTH AND COORDINATED WITH LAYOUT / GRADING PLANS.
7. REMOVALS SHALL INCLUDE SUBSOIL/EXISTING BASE MATERIALS TO FULL DEPTH REQUIRED FOR INSTALLATION OF NEW WORK INCLUDING BASE COURSE. ALL EXCAVATIONS SHALL PROVIDE ADEQUATE SOIL SUPPORT THROUGH THE USE OF ADEQUATE CUT SLOPES OR STRUCTURAL SHORING.
8. OWNER TO COORDINATE WITH RESPECTIVE UTILITY COMPANY FOR REMOVAL OF EXISTING TRANSFORMER, ELECTRICAL, CABLE, TELEPHONE AND FIBER OPTIC LINES.
9. FIELD VERIFY IF PROJECT AREA IS PARTIALLY IRRIGATED. REMOVE EQUIPMENT AFFECTED BY NEW WORK AND SALVAGE TO OWNER. CUT, CAP AND RECORD LOCATIONS OF ALL LINES.
10. CONTRACTOR SHALL REPAIR ALL DISTURBED TURF AREAS OUTSIDE OF PROJECT LIMITS DAMAGED DURING CONSTRUCTION.
11. ALL TOPSOIL AND ORGANIC MATERIAL SHALL BE REMOVED FROM UNDER PROPOSED BUILDING, FOOTINGS, SLABS, AND PAVED AREAS.
12. ALL SPOIL MATERIAL, INCLUDING TOPSOIL, TO BE REMOVED OFF SITE AND DISPOSED IN A LEGAL MANNER.
13. CONTRACTOR TO RELOCATE TREE PROTECTION FENCE WITH LANDSCAPE ARCHITECT/ENGINEER'S APPROVAL IN ORDER TO ACCOMPLISH WORK.
14. LAWN AND TOPSOIL REMOVALS AROUND EXISTING TREES TO BE PERFORMED WITH EXTREME CARE. REMOVALS TO BE COMPLETED BY HAND. NO HEAVY EQUIPMENT ALLOWED BENEATH TREE CANOPY.
15. DISCHARGE OF WATER, DUST, OR DEBRIS FROM CONCRETE AND ASPHALT WORK TO STORM OR SANITARY SYSTEMS IS PROHIBITED.
16. STORM DRAINS MUST BE PROTECTED FROM DUST AND DEBRIS.
17. ANY WATER USED DURING CONCRETE AND ASPHALT WORK (INCLUDING SWEEPING AND SAWCUTTING) MUST BE CONTAINED AND COLLECTED FOR PROPER DISPOSAL. SUGGESTED CONTROLS INCLUDE WET VACUUM OR ABSORBENTS.

## DEMOLITION LEGEND

- RIGHT-OF-WAY LINE
- LIMIT OF WORK LINE
- FF — FILTER FABRIC FENCE
- TREE PROTECTION FENCE
- SAWCUT PAVEMENT
- REMOVE BITUMINOUS PAVEMENT
- REMOVE CONCRETE PAVEMENT
- REMOVE LAWN / VEGETATION / GRAVEL
- (R) REMOVE ITEM
- (P) PROTECT ITEM
- (S) SALVAGE ITEM TO OWNER
- (A) ABANDON ITEM
- 488 REMOVE TREE

CAUTION: FIELD VERIFY ALL UNDERGROUND ELECTRICAL & GAS LINES & PROTECT.

0 15 30 60 90 120

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**Consultants**

**Seal**

**Project Title**

Ann Arbor Welding Supply
Preliminary Site Plan

4811 Carpenter Road
Ypsilanti, Michigan 48197

**Sheet Title**

Demolition Plan

**Dates**

| Dates | Issued for |
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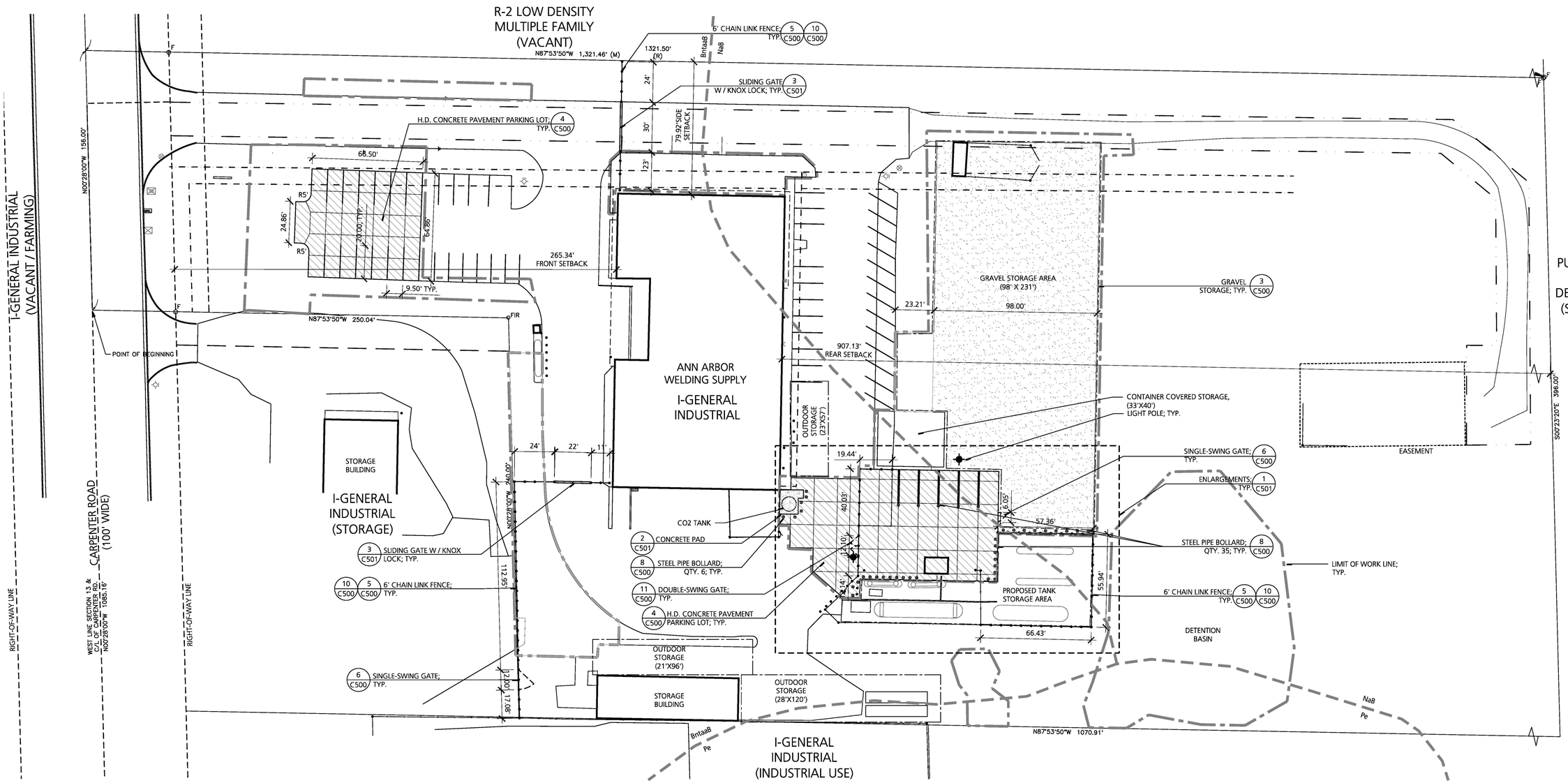


## LAYOUT & MATERIALS NOTES

1. ALL WORK SHALL BE COMPLETED IN CONFORMANCE WITH CURRENT ADA STANDARDS.
2. ALL DIMENSIONS ARE TO BACK OF CURB, FACE OF BUILDING OR EDGE OF MATERIAL UNLESS OTHERWISE NOTED.
3. ALL LINES ARE PARALLEL OR PERPENDICULAR TO THE CURB/ PAVEMENT/ BUILDING LINE FROM WHICH THEY ARE DIMENSIONED UNLESS OTHERWISE NOTED.
4. FOLLOWING LAYOUT OF ALL MATERIALS, CONTRACTOR SHALL REVIEW WITH OWNER'S REPRESENTATIVE.
5. ANY DISCREPANCIES IN THE LAYOUT PLAN SHOULD BE IMMEDIATELY REPORTED TO OWNER'S REPRESENTATIVE.

## PARKING SUMMARY

SPACES REQUIRED BY ORDINANCE : $\frac{1}{550}$ SF X 16,695 SF= 30 SPACES
SPACES PROVIDED: 49 SPACES

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## SITE SETBACKS

FRONT REQUIRED BY ORDINANCE: 50 FT
FRONT PROVIDED: 265.34 FT
SIDE REQUIRED BY ORDINANCE: 20 FT
SIDE PROVIDED: 79.92 FT NORTH, 0 FT SOUTH
REAR REQUIRED BY ORDINANCE: 35 FT
REAR PROVIDED: 907.13 FT

## LAYOUT AND MATERIALS LEGEND

- RIGHT-OF-WAY LINE
- LIMIT OF WORK LINE
- H.D. CONCRETE PAVEMENT
- 21" THICK C02 TANK CONCRETE PAD
- GRAVEL STORAGE AREA
- 6' CHAIN LINK FENCE LINE & SLIDE GATE WITH KNOX LOCK
- LIGHT POLE
- BOLLARD
- OUTDOOR STORAGE AREA
- 20' SETBACK

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0 15 30 60 90 120

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Consultants

Seal

Project Title

**Ann Arbor Welding Supply Preliminary Site Plan**

4811 Carpenter Road
Ypsilanti, Michigan 48197

Sheet Title

Layout & Materials Plan

Dates

| Dates | Issued for |
|---|---|
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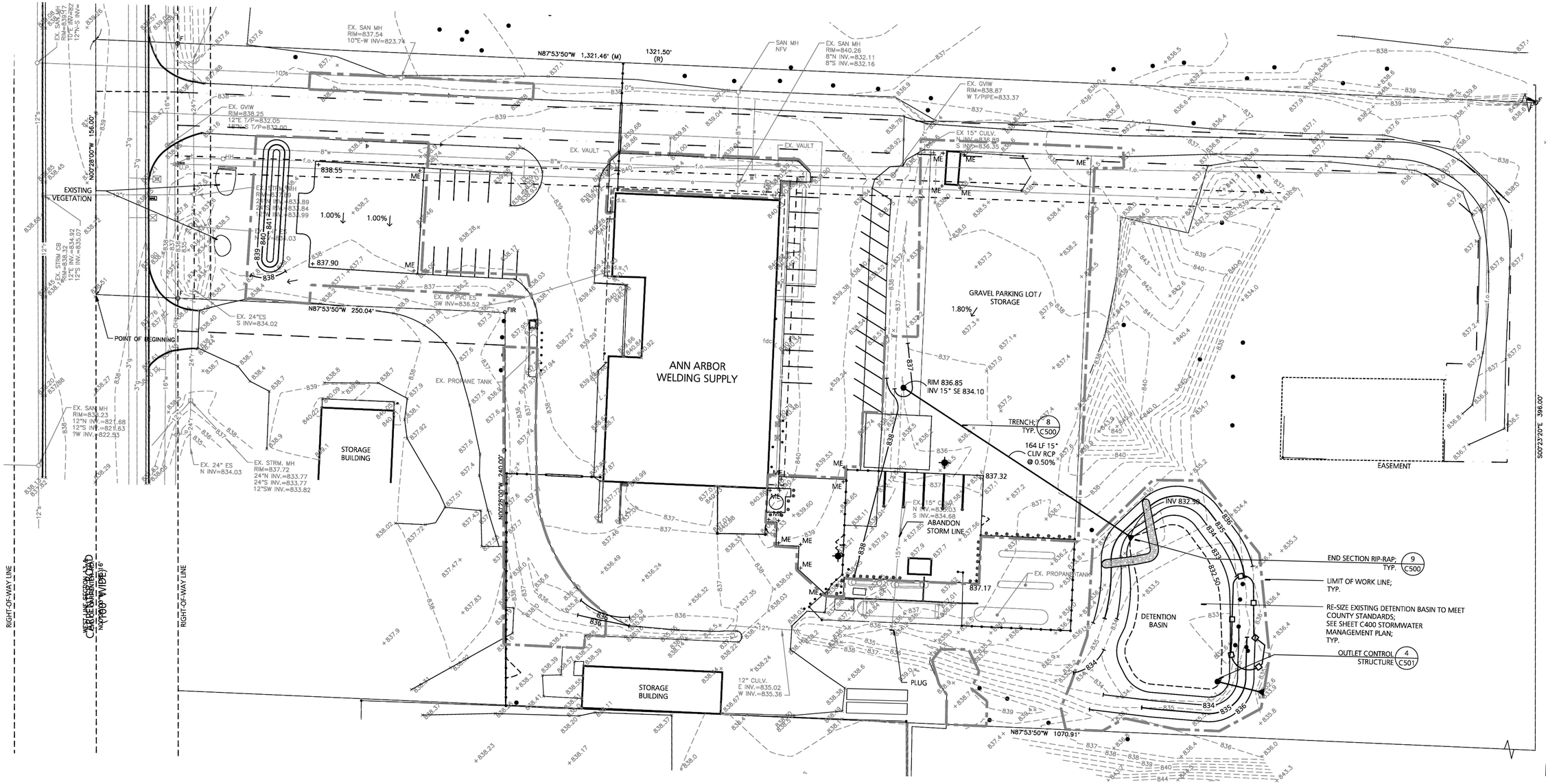


## GRADING NOTES

1. CONTRACTOR IS RESPONSIBLE FOR CONSTRUCTION ALL WORK COMPLETED IN CONFORMANCE WITH CURRENT ADA STANDARDS.
2. PROPOSED CONTOUR LINES AND SPOT ELEVATIONS REFLECT FINISH GRADES. HOLD DOWN SUBGRADE ELEVATIONS ACCORDINGLY. ADJUST RIM ELEVATIONS OF ALL UTILITIES AFFECTED BY WORK IN THIS CONTRACT. CONTRACTOR SHALL ENSURE POSITIVE DRAINAGE ON THE SITE. ANY AREA THAT APPEARS TO NOT PROPERLY DRAIN SHALL BE BROUGHT TO THE IMMEDIATE ATTENTION OF THE LANDSCAPE ARCHITECT/ ENGINEER FOR RESOLUTION.

## UTILITY NOTES

1. ALL UTILITIES SHOWN FOR CONCEPTUAL DESIGN DEVELOPMENT ONLY. FINAL ROUTING, SIZING AND CONNECTIONS WILL VARY.
2. PROPOSED CONTOUR LINES AND SPOT ELEVATIONS REFLECT FINISH GRADES. HOLD DOWN SUBGRADE ELEVATIONS ACCORDINGLY. ADJUST RIM ELEVATIONS OF ALL UTILITIES AFFECTED BY WORK IN THIS CONTRACT. CONTRACTOR SHALL ENSURE POSITIVE DRAINAGE ON THE SITE. ANY AREA THAT APPEARS TO NOT PROPERLY DRAIN SHALL BE BROUGHT TO THE IMMEDIATE ATTENTION OF THE LANDSCAPE ARCHITECT/ ENGINEER FOR RESOLUTION.
3. CONTRACTOR SHALL VERIFY ALL EXISTING UTILITY LOCATIONS, DEPTHS AND ELEVATIONS PRIOR TO CONSTRUCTION. NO CHANGES IN CONTRACT PRICE WILL BE AWARDED FOR ACTUAL DISCREPANCIES IN UTILITY LOCATIONS DUE TO THE FAILURE TO VERIFY ACTUAL FIELD LOCATIONS.
4. THE CONTRACTOR SHALL RESTORE ALL AREAS DISTURBED BY HIS CONSTRUCTION OPERATIONS TO A CONDITION EQUAL TO OR BETTER THAN THAT EXISTING PRIOR TO CONSTRUCTION. THE CONTRACTOR SHALL CLEAN UP AND HAUL AWAY ALL CONSTRUCTION DEBRIS AND LITTER CAUSED BY HIS OPERATIONS.
5. CONTRACTOR SHALL PROTECT ALL EXISTING UTILITIES FROM DAMAGE DURING CONSTRUCTION. ANY DAMAGE INCURRED SHALL BE REPAIRED AT THE CONTRACTOR'S EXPENSE.
6. ALL UTILITY CROSSINGS SHALL HAVE A MINIMUM OF 18" VERTICAL CLEARANCE.

## GRADING & UTILITY LEGEND

| | |
|---|---|
| | RIGHT-OF-WAY LINE |
| | LIMIT OF WORK LINE |
| 857 | EXISTING MINOR CONTOUR |
| 855 | EXISTING MAJOR CONTOUR |
| 855.58+ | EXISTING SPOT ELEVATION |
| 838 | MINOR CONTOUR |
| 840 | MAJOR CONTOUR |
| +57.55 | SPOT ELEVATION (ADD 800) |
| +R57.55 | RIM ELEVATION (ADD 800) |
| +ME | MATCH EXISTING ELEVATION |

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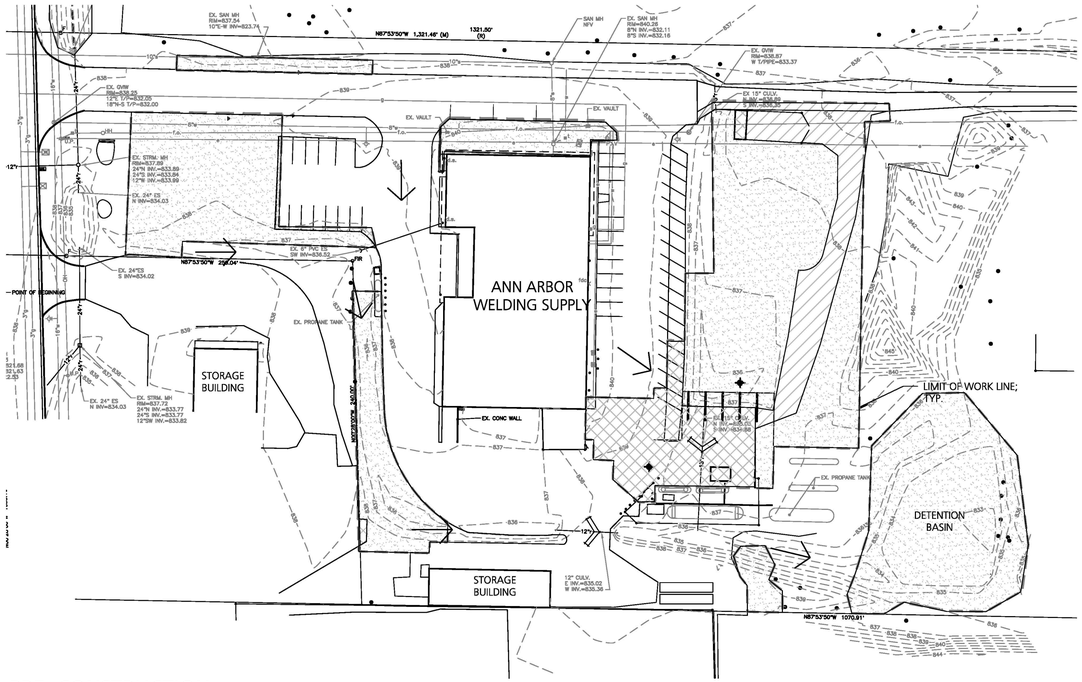
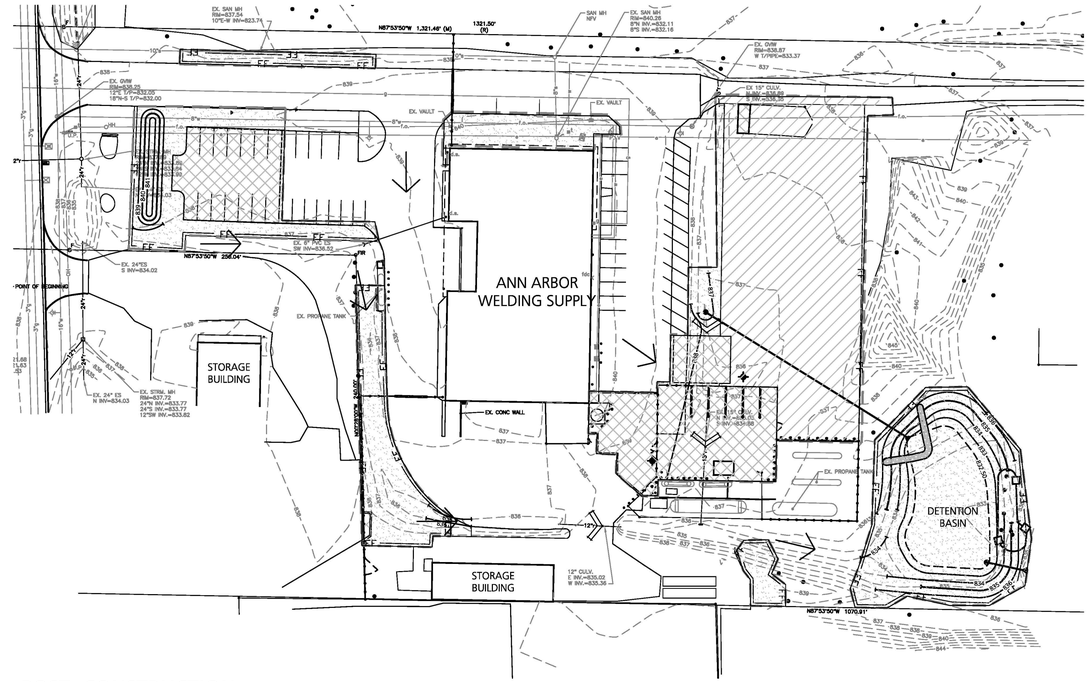



## PRE- CONSTRUCTION




## POST- CONSTRUCTION

## EXISTING AND PROPOSED CONDITION TABLE

| EXISTING CONDITIONS | | | | |
|---|---|---|---|---|
| Type of Surface | Size (SF) | C | CN | Size (ac) |
| PERVIOUS (Lawn & Landscape) | 55,537 | 0.45 | 76 | 1.27 |
| IMPERVIOUS (Pavement) | 7,880 | 0.95 | 98 | 0.18 |
| SEMI PERVIOUS (Gravel) | 6,746 | 0.85 | 90 | 0.15 |
| | **70,163** | **0.54** | **80** | **1.61** |
| **PROPOSED CONDITIONS** | | | | |
| Type of Surface | Size (SF) | C | CN | Size (ac) |
| PERVIOUS (Lawn & Landscape) | 33,083 | 0.45 | 76 | 0.76 |
| IMPERVIOUS (Building & Pav't) | 14,842 | 0.95 | 98 | 0.34 |
| SEMI PERVIOUS (Gravel) | 22,238 | 0.85 | 90 | 0.51 |
| | **70,163** | **0.68** | **85** | **1.61** |

## STORMWATER MANAGEMENT LEGEND

- RIGHT-OF-WAY LINE
- LIMIT OF WORK LINE
- IMPERVIOUS PAVEMENT & BUILDINGS
- GRAVEL
- PERVIOUS OPEN SPACES
- OVERLAND FLOW LINE
- STORMWATER PIPE FLOW LINE

## OUTLET CONTROL STRUCTURE CALCULATIONS

PROPOSED OUTLET CONTROL STRUCTURE

Storage Elevations

| | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Vff | 4,968 | cft | | Qffmin | 0.057 | cfs | | havg | 1.20 | ft | | Qallow | 0.242 | cfs | |
| Xff | 833.40 | | | havg | 0.60 | ft | | Qbf | 0.0834 | cfs | | Qffbf | 0.133 | cfs | |
| Vbf | 12,400 | cft | | Aff | 0.0149 | sf | | Tbf | 41.3 | hr | | Q100max | 0.109 | cfs | |
| Xbf | 834.29 | | | Orif Dia | 0.75 | in | | Vrem | 7,432 | cft | | A100max | 0.0317 | sf | |
| V100 | 18,151 | cft | | Orif A | 0.0031 | sf | | Target | 44 | hr | | Orif Dia | 1.00 | in | |
| X100 | 834.77 | | | Max#Orif | 4.86 | | | Trem | 20.7 | hr | | Orif A | 0.0055 | sf | |
| | | | | Qffact | 0.0592 | cfs | | hffavg | 1.50 | ft | | Max#Orif | 5.82 | | |
| | | | | Tffact | 23.3 | hr (>24) | | Qffbf | 0.0934 | cfs | | Qtot | 0.245 | cfs (<Qallow) | |
| | | | | | | | | Vffbf | 6,955 | cft | | hallavg | 834.61 | ft | |
| | | | | | | | | Vbf | 477 | cft | | Qall | 2.204 | cfs | |
| | | | need: | 5 | holes @ | 833.40 | | Qbf | 0.0064 | cfs | | hbfavg | 1.21 | ft | |
| | | | | | | | | hbfavg | 0.59 | ft | | Qbf100 | 0.017 | cfs | |
| | | | | | | | | Abf | 0.0017 | sf | | h100avg | 0.32 | ft | |
| | | | | | | | | Orif Dia | 0.75 | in | | Q100avg | 0.092 | cfs | |
| | | | | | | | | Orif A | 0.0031 | sf | | Vrem | 5,752 | cft | |
| | | | | | | | | Max#Orif | 0.54 | | | T100 | 43.6 | hr (<72) | |
| | | | | | | | | Qbfact | 0.0118 | cfs | | | | | |
| | | | | | | | | Tbfact | 42.9 | hr (bet. 36 & 48) | | | | | |
| | | | | | | | | | | | | need: | 6 | holes @ | 834.77 |
| | | | | | | | need: | 1 | holes @ | 834.29 | | | | | |

## POND DESIGN CALCULATIONS

WCWRC CALCULATIONS

| | |
|---|---|
| 1.61 | Acres |
| 0.85 | c-value |
| 0.15 | cfs per acre Outlet Rate |

REQUIRED VOLUME

Qa = Outlet Rate x Acres

Qa = 0.242 cfs

Qo = Qa / (A x c)

Qo = 0.18 cfs

T = -25 + (10,312.5 / Qo)^0.5

T = 216.74

Vs = 16,500 T / (T+25) - 40 x Qo x T

Vs = 13,264 ac/impervious

Vt = Vs x A x c

Vt = 18,151 cft

DETENTION

| Elevation | Area (sft) | Depth (ft) | Volume (cft) | Total Volume (cft) | Goal |
|---|---|---|---|---|---|
| 837.00 | FREEBOARD | | | | |
| 836.00 | 15,010 | 1.00 | 13,258 | 33,201 | 28,868 |
| 835.00 | 11,580 | 1.00 | 9,995 | 19,943 | |
| 834.00 | 8,490 | 1.00 | 7,240 | 9,948 | |
| 833.00 | 6,058 | 0.50 | 2,708 | 2,708 | |
| 832.50 | 4,799 | 0.00 | 0 | 0 | |
| | 0 | 0.00 | 0 | 0 | |
| | | | | 33,201 | cft |

EXISTING DETENTION

| Elevation | Area (sft) | Depth (ft) | Volume (cft) | Total Volume (cft) | Goal |
|---|---|---|---|---|---|
| 837.00 | FREEBOARD | | | | |
| 836.00 | FREEBOARD | | | | |
| 835.00 | 10,280 | 1.00 | 8,492 | 11,532 | |
| 834.00 | 6,822 | 1.00 | 3,040 | 3,040 | |
| 833.00 | 483 | 0.00 | 0 | 0 | |
| | 0 | 0.00 | 0 | 0 | |
| | 0 | 0.00 | 0 | 0 | |
| | | | | 11,532 | cft |

FOREBAY VOLUME

Vfb = 0.05 x Vt

Vfb = 908 cft

| Elevation | Area (sft) | Depth (ft) | Volume (cft) | Total Volume (cft) | Goal |
|---|---|---|---|---|---|
| 837.00 | FREEBOARD | | | | |
| 836.00 | 650 | 1.00 | 521 | 1,094 | 908 |
| 835.00 | 402 | 1.00 | 330 | 572 | |
| 834.00 | 263 | 1.00 | 214 | 242 | |
| 833.00 | 169 | 0.50 | 28 | 28 | |
| 832.50 | 0 | 0.00 | 0 | 0 | |

CAUTION: FIELD VERIFY ALL UNDERGROUND ELECTRICAL & GAS LINES & PROTECT.

0 25 50 100 150 200

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


B R
Beckett&Raeder
*Landscape Architecture Planning, Engineering & Environmental Services*

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**Consultants**

**Seal**

**Project Title**

**Ann Arbor Welding Supply Preliminary Site Plan**

4811 Carpenter Road
Ypsilanti, Michigan 48197

**Sheet Title**

Stormwater Management Plan

**Dates**

| Dates | Issued for |
|---|---|
| 11/12/2019 | Owner Review |
| 11/19/2019 | Owner Review |
| 11/22/2019 | Owner Review |
| 12/03/2019 | Preliminary Site Plan |
| 02/28/2020 | Owner Review |
| 03/13/2020 | Preliminary Site Plan |

**Scale**

1" = 50.00'

**Quality Control**

Drawn: BB
Checked: KE
Approved: KE

**Project Number**

2019.116

**Sheet Number**

C400

# WASHTENAW COUNTY STORMWATER CALCULATIONS

## WASHTENAW COUNTY

W1 — Updated 10/6/2014 — Project Name: AA Welding — Calcs by: KAV — Date: 2/24/20

**Determining Post-Development Cover Types, Areas, Curve Numbers and Runoff Coefficients**

Total Site Area = 0.45 ac

Total Site Area excluding "Self-Crediting" BMPs = 0.45 ac[A]

Rational Method Variables[B]

| Cover Type | Soil Type | Area (ft²) | Area (ac) | Runoff Coefficient (C) | (C)(Area) |
|---|---|---|---|---|---|
| LAWN | NRCS - C/D | 0 | 0.00 | 0.45 | 0.00 |
| Pavement/Bldg | Fill | 6,962 | 0.16 | 0.95 | 0.15 |
| Gravel | Fill | 15,492 | 0.36 | 0.85 | 0.30 |
| | | | | | 0.00 |
| | | | | | 0.00 |
| | | | | | 0.00 |
| | | | | | 0.00 |
| | | | | | 0.00 |

Total = ∑(C)(Area) = 0.45
Area Total = ∑ac or ∑sf = 0.52 ac 22,454 ft²
Weighted C = ∑(C)(Area)/∑ac or ∑sf = 0.88

NRCS Variables[C] (required for first flush calculations)

| Pervious Cover Type | Soil Type | Area (ft²) | Area (ac) | Curve Number | (CN)(Area) |
|---|---|---|---|---|---|
| LAWN | NRCS - A | 0 | 0.00 | 78 | 0.00 |
| | | | | | 0 |
| | | | | | 0 |
| | | | | | 0 |
| | | | | | 0 |
| | | | | | 0 |
| | | | | | 0 |
| | | | | | 0 |

Total = ∑(C)(Area) = 0.00
Area Total = ∑ac or ∑sf = 0.00 ac 0 ft²
Weighted C = ∑(C)(Area)/∑ac or ∑sf = #DIV/0!

NRCS Variables[C] (required for bankfull and 100-year runoff)

| Impervious Cover Type | Soil Type | Area (ft²) | Area (ac) | Curve Number | (CN)(Area) |
|---|---|---|---|---|---|
| Pavement/Bldg | Fill | 6,962 | 0.16 | 98 | 15.66 |
| Gravel | Fill | 15,492 | 0.36 | 90 | 32.008 |
| | | | | | 0 |
| | | | | | 0 |
| | | | | | 0 |
| | | | | | 0 |
| | | | | | 0 |
| | | | | | 0 |

Total = ∑(C)(Area) = 47.67
Area Total = ∑ac or ∑sf = 0.52 ac 22,454 ft²
Weighted C = ∑(C)(Area)/∑ac or ∑sf = 92

[A] Use this area for the remainder of the runoff calculations
[B] Required for first flush runoff calculations
[C] Required for bankfull and 100-year runoff calculations

## WASHTENAW COUNTY

W2 — Updated 10/6/2014 — Project Name: AA Welding — Calcs by: KAV — Date: 2/24/2020

**Standard Method Runoff Volume Calculations**

First Flush Runoff Calculations (Vff)

$V_{ff}$ = (1") (1/12") (43560ft²/1ac)AC

A = Total Site Area excluding "Self-Crediting" BMPs(from W1) = 0.45 ac

C = Weighted Runoff Coefficient (from W1) = 0.88

$V_{ff}$ = 1,452 ft³

## WASHTENAW COUNTY

W3 — Updated 10/6/2014 — Project Name: AA Welding — Calcs by: KAV — Date: 2/24/2020

**Standard Method Runoff Volume Calculations**

Pre-development Bankfull Runoff Calculations ($V_{bf\text{-}pre}$)

A. 2 year/24 hour storm event — P = 2.35 in
from AVERAGE RECURRENCE INTERVALS chart page 110 of the WCWRC Rules and Guidelines

B. The pre-development land cover will be **Good Cover Woods or Meadow.** Determine the associated soil hydrologic group for the entire site and choose the curve number. — CN = 78
from the Commonly used curve numbers (CNs) from TR-55 (AMC2) table on page 40 of the WCWRC Rules and Guidelines

C. S = (1000/CN) - 10
S = 2.82 in

D. Q = (P-0.2S)²/ (P+0.8S)
Q = 0.69 in

E. Total Site Area excluding "Self-Crediting" BMPs
A = 19782.1 ft²

F. $V_{bf\text{-}pre}$ = Q(1/12)Area
$V_{bf\text{-}pre}$ = 1,141 ft³

## WASHTENAW COUNTY

W4 — Updated 10/6/2014 — Project Name: AA Welding — Calcs by: KAV — Date: 2/24/2020

**Standard Method Runoff Volume Calculations**

Pervious Cover Post-Development Bankfull Runoff Calculations ($V_{bf\text{-}per\text{-}post}$)

A. 2 year/24 hour storm event — P = 2.35 in
from AVERAGE RECURRENCE INTERVALS chart page 110 of the WCWRC Rules and Guidelines

B. Pervious Cover CN from Worksheet 1 — CN = 78
from the Commonly used curve numbers (CNs) from TR-55 (AMC2) table on page 40 of the WCWRC Rules and Guidelines

C. S = (1000/CN) - 10
S = 2.82 in

D. Q = (P-0.2S)²/ (P+0.8S)
Q = 0.69 in

E. Pervious Cover Area from Worksheet 1
A = 0 ft²

F. $V_{bf\text{-}per\text{-}post}$ = Q(1/12)Area
$V_{bf\text{-}per\text{-}post}$ = 0 ft³

## WASHTENAW COUNTY

W5 — Updated 10/6/2014 — Project Name: AA Welding — Calcs by: KAV — Date: 2/24/2020

**Standard Method Runoff Volume Calculations**

Impervious Cover Post-Development Bankfull Runoff Calculations ($V_{bf\text{-}imp\text{-}post}$)

A. 2 year/24 hour storm event — P = 2.35 in
from AVERAGE RECURRENCE INTERVALS chart page 110 of the WCWRC Rules and Guidelines

B. Impervious Cover CN from Worksheet 1 — CN = 92
from the Commonly used curve numbers (CNs) from TR-55 (AMC2) table on page 40 of the WCWRC Rules and Guidelines

C. S = (1000/CN) - 10
S = 0.81 in

D. Q = (P-0.2S)²/ (P+0.8S)
Q = 1.59 in

E. Impervious Cover Area from Worksheet 1
A = 22454 ft²

F. $V_{bf\text{-}imp\text{-}post}$ = Q(1/12)Area
$V_{bf\text{-}imp\text{-}post}$= 2,984 ft³

## WASHTENAW COUNTY

W6 — Updated 10/6/2014 — Project Name: AA Welding — Calcs by: KAV — Date: 2/24/2020

**Standard Method Runoff Volume Calculations**

Pervious Cover Post-Development 100-year Storm Runoff Calculations ($V_{100\text{-}per\text{-}post}$)

A. 100-year Storm Event — P = 5.11 in
from AVERAGE RECURRENCE INTERVALS chart page 110 of the WCWRC Rules and Guidelines

B. Pervious Cover CN from Worksheet 1 — CN = 78
from the Commonly used curve numbers (CNs) from TR-55 (AMC2) table on page 40 of the WCWRC Rules and Guidelines

C. S = (1000/CN) - 10
S = 2.82 in

D. $Q_{100\text{-}per}$ = (P-0.2S)²/ (P+0.8S)
$Q_{100\text{-}per}$ = 2.81 in

E. Pervious Cover Area from Worksheet 1
A = 0 ft²

F. $V_{100\text{-}per\text{-}post}$ = Q(1/12)Area
$V_{100\text{-}per\text{-}post}$ = 0 ft³

## WASHTENAW COUNTY

W7 — Updated 10/6/2014 — Project Name: AA Welding — Calcs by: KAV — Date: 2/24/2020

**Standard Method Runoff Volume Calculations**

Impervious Cover Post-Development 100-year Storm Runoff Calculations ($V_{100\text{-}imp\text{-}post}$)

A. 100-year Storm Event — P = 5.11 in
from AVERAGE RECURRENCE INTERVALS chart page 110 of the WCWRC Rules and Guidelines

B. Impervious Cover CN from Worksheet 1 — CN = 92
from the Commonly used curve numbers (CNs) from TR-55 (AMC2) table on page 40 of the WCWRC Rules and Guidelines

C. S = (1000/CN) - 10
S = 0.81 in

D. $Q_{100\text{-}imp}$ = (P-0.2S)²/ (P+0.8S)
$Q_{100\text{-}imp}$ = 4.25 in

E. Impervious Cover Area from Worksheet 1
A = 22,454 ft²

F. $V_{100\text{-}imp\text{-}post}$ = Q(1/12)Area
$V_{100\text{-}imp\text{-}post}$ = 7,951 ft³

## WASHTENAW COUNTY

W8 — Updated 10/6/2014 — Project Name: AA Welding — Calcs by: KAV — Date: 2/24/2020

**Standard Method Runoff Volume Calculations**

Determine Time of Concentration for Applicable Flow Types ($T_{c\text{-}hrs}$)

| Flow Type | K | Change in Elevation | Length (L) | Slope % (S) | $S^{0.5}$ | V = K*$S^{0.5}$ | Tc = L/(V*3600) |
|---|---|---|---|---|---|---|---|
| Sheet Flow* | 0.48 | | | | 0 | 0 | #DIV/0! |
| | | | | | | | |
| Waterway | 1.2 | 5.55 | 700 | 0.79% | 0.089 | 0.1069 | 1.82 |
| Waterway | 1.2 | | | | 0 | 0 | #DIV/0! |
| Waterway | 1.2 | | | | 0 | 0 | #DIV/0! |
| Waterway | 1.2 | | | | 0 | 0 | #DIV/0! |
| Waterway | 1.2 | | | | 0 | 0 | #DIV/0! |
| Waterway | 1.2 | | | | 0 | 0 | #DIV/0! |
| Waterway | 1.2 | | | | 0 | 0 | #DIV/0! |
| Waterway | 1.2 | | | | 0 | 0 | #DIV/0! |
| Waterway | 1.2 | | | | 0 | 0 | #DIV/0! |
| Waterway | 1.2 | | | | 0 | 0 | #DIV/0! |
| Waterway | 1.2 | | | | 0 | 0 | #DIV/0! |
| Waterway | 1.2 | | | | 0 | 0 | #DIV/0! |
| Waterway | 1.2 | | | | 0 | 0 | #DIV/0! |
| Waterway | 1.2 | | | | 0 | 0 | #DIV/0! |
| Waterway | 1.2 | | | | 0 | 0 | #DIV/0! |
| Waterway | 1.2 | | | | 0 | 0 | #DIV/0! |
| Small Tributary | 2.1 | | | | 0 | 0 | #DIV/0! |
| Small Tributary | 2.1 | | | | 0 | 0 | #DIV/0! |
| Small Tributary | 2.1 | | | | 0 | 0 | #DIV/0! |
| Small Tributary | 2.1 | | | | 0 | 0 | #DIV/0! |
| Small Tributary | 2.1 | | | | 0 | 0 | #DIV/0! |
| Small Tributary | 2.1 | | | | 0 | 0 | #DIV/0! |
| Small Tributary | 2.1 | | | | 0 | 0 | #DIV/0! |
| Small Tributary | 2.1 | | | | 0 | 0 | #DIV/0! |
| Small Tributary | 2.1 | | | | 0 | 0 | #DIV/0! |
| Small Tributary | 2.1 | | | | 0 | 0 | #DIV/0! |
| Small Tributary | 2.1 | | | | 0 | 0 | #DIV/0! |
| Small Tributary | 2.1 | | | | 0 | 0 | #DIV/0! |
| Small Tributary | 2.1 | | | | 0 | 0 | #DIV/0! |

Total Time of Concentration ($T_{c\text{-}hrs}$) = 1.82

*Sheet flow cannot exceed 300 feet. Anything beyond this is considered waterway.

## WASHTENAW COUNTY

W9 — Updated 10/6/2014 — Project Name: AA Welding — Calcs by: KAV — Date: 2/24/2020

**Standard Method Runoff Volume Calculations**

Runoff Summary & Onsite Infiltration Requirement

**A. Runoff Summary from Previous Worksheets**

First Flush Volume ($V_{ff}$) 1,452 ft³

Pre-development Bankfull Runoff Volume ($V_{bf\text{-}pre}$) 1,141 ft³

Pervious Cover Post-Development Bankfull Runoff Volun 0 ft³

Impervious Cover Post-Development Bankfull Runoff Vol 2,984 ft³

**Total BF Volume ($V_{bf\text{-}post}$) 2,984 ft³**

Pervious Cover Post-Development 100-year Storm Runo 0 ft³

Impervious Cover Post-Development 100-year Storm Ru 7,951 ft³

**Total 100-year Volume ($V_{100}$) 7,951 ft³**

**B. Determine Onsite Infiltration Requirement**

Subtract the Pre-development Bankfull from the Post-Development Bankfull volume

Total Post-Development Bankfull Volume ($V_{bf\text{-}post}$) = 2,984 ft³

Pre-Development Bankfull Runoff Volume ($V_{bf\text{-}pre}$) = 1,141 ft³

Bankfull Volume Difference 1,842 ft³

Compare the Bankfull Volume Difference with the First Flush Volume. The **greater** of the two is the Onsite Infiltration

Onsite Infiltration Requirement ($V_{inf}$) = 1,842 ft³

## WASHTENAW COUNTY

W10 — Updated 10/6/2014 — Project Name: AA Welding — Calcs by: KAV — Date: 2/24/2020

**Standard Method Runoff Volume Calculations**

**Detention**

**A.** $Q_p = 238.6Tc^{-0.82}$ — $Q_p$ = 146.03 cfs/in-mi²
Peak of the Unit Hydrograph

**B.** Total Site Area (ac) excluding "Self-Crediting" BMPs — Area = 0.454134527 ac

**C.** $Q_{100} = Q_{100\text{-}per} + Q_{100\text{-}imp}$ — $Q_{100}$ = 7.05 in
Note $Q_{100\text{-}per}$ and $Q_{100\text{-}imp}$ from W6 and W7, respectively

**D.** Peak Flow (PF) = $Q_p$(cfs/in-mi2)*$Q_{100}$(in)*Area(ac)/640 — PF = 0.73 cfs

**E.** Δ = PF (cfs) - 0.15Area(ac) — Δ = 0.66 cfs

**F.** $V_{det}$ = (Δ(cfs)/PF(cfs)) * $V_{100}$(ft³) - $V_{inf}$(ft³) — $V_{det}$ = **7,210** ft³

**Retention**

**A.** $V_{ret} = 2(V_{100})$ — $V_{ret}$ = 15,901 ft³

## WASHTENAW COUNTY

W11 — Updated 10/6/2014 — Project Name: AA Welding — Calcs by: KAV — Date: 2/24/2020

**Standard Method Runoff Volume Calculations**

**Determine Applicable BMPs and Associated Volume Credits**

| Proposed BMP[A] | Area (ft²) | Storage Volume[B] (ft³) | Ave. Design Infiltration Rate (in/hr) | Infiltration Volume During Storm[C] (ft³) | Total Volume Reduction[D] (ft³) |
|---|---|---|---|---|---|
| Porous Pavement w/Infiltration Bed | | | | | |
| Infiltration Basin | 14,117 | 26,416 | 1.13 | 0 | 0 |
| Subsurface Infiltration Bed | | | | | |
| Infiltration Trench | | | | | |
| Rain Garden/Bioretention | | | | | |
| Dry Well | | | | | |
| Bioswale | | | | | |
| Vegetated Filter Strip | | | | | |
| Green Roof | | | | | |

Total Volume Reduction Credit by Proposed Structural BMPs (ft³) 0 ft³
Runoff Volume Infiltration Requirement ($V_{inf}$) from Worksheet 9 - 1,842 ft³
Runoff Volume Credit (ft³) = -1,842 ft³

[A] Complete checklist from Chapter VI for each Structural BMP type
[B] Storage volume as defined in individual BMP write-ups
[C] Approximated as the average design infiltration rate over 6 hours multiplied by the BMP area:
Infiltration Rate x 6 hours x BMP Area x Unit Conversions = Infiltration Volume (ft³)
[D] Total Volume Reduction Credit is the sum of the Storage Volume and the Infiltration Volume During Storm

## WASHTENAW COUNTY

W11 — Updated 10/6/2014 — Project Name: AA Welding — Calcs by: KAV — Date: #

**Standard Method Runoff Volume Calculations**

**Determine Applicable BMPs and Associated Volume Credits**

| Proposed BMP[A] | Area (ft²) | Storage Volume[B] (ft³) | Ave. Design Infiltration Rate (in/hr) | Infiltration Volume During Storm[C] (ft³) | Total Volume Reduction[D] (ft³) |
|---|---|---|---|---|---|
| Porous Pavement w/Infiltration Bed | | | | | |
| Infiltration Basin | 14,117 | 26,416 | 1.13 | 0 | 0 |
| Subsurface Infiltration Bed | | | | | |
| Infiltration Trench | | | | | |
| Rain Garden/Bioretention | | | | | |
| Dry Well | | | | | |
| Bioswale | | | | | |
| Vegetated Filter Strip | | | | | |
| Green Roof | | | | | |

Total Volume Reduction Credit by Proposed Structural BMPs (ft³) 0 ft³
Runoff Volume Infiltration Requirement ($V_{inf}$) from Worksheet 9 - 1,842 ft³
Runoff Volume Credit (ft³) = -1,842 ft³

[A] Complete checklist from Chapter VI for each Structural BMP type
[B] Storage volume as defined in individual BMP write-ups
[C] Approximated as the average design infiltration rate over 6 hours multiplied by the BMP area:
Infiltration Rate x 6 hours x BMP Area x Unit Conversions = Infiltration Volume (ft³)
[D] Total Volume Reduction Credit is the sum of the Storage Volume and the Infiltration Volume Dur

## WASHTENAW COUNTY

W11 — Updated 10/6/2014 — Project Name: AA Welding — Calcs by: KAV — Date: 2/24/2020

**Standard Method Runoff Volume Calculations**

**Determine Applicable BMPs and Associated Volume Credits**

| Proposed BMP[A] | Area (ft²) | Storage Volume[B] (ft³) | Ave. Design Infiltration Rate (in/hr) | Infiltration Volume During Storm[C] (ft³) | Total Volume Reduction[D] (ft³) |
|---|---|---|---|---|---|
| Porous Pavement w/Infiltration Bed | | | | | |
| Infiltration Basin | 14,117 | 26,416 | 1.13 | 0 | 0 |
| Subsurface Infiltration Bed | | | | | |
| Infiltration Trench | | | | | |
| Rain Garden/Bioretention | | | | | |
| Dry Well | | | | | |
| Bioswale | | | | | |
| Vegetated Filter Strip | | | | | |
| Green Roof | | | | | |

Total Volume Reduction Credit by Proposed Structural BMPs (ft³) 0 ft³
Runoff Volume Infiltration Requirement ($V_{inf}$) from Worksheet 9 - 1,842 ft³
Runoff Volume Credit (ft³) = -1,842 ft³

[A] Complete checklist from Chapter VI for each Structural BMP type
[B] Storage volume as defined in individual BMP write-ups
[C] Approximated as the average design infiltration rate over 6 hours multiplied by the BMP area:
Infiltration Rate x 6 hours x BMP Area x Unit Conversions = Infiltration Volume (ft³)
[D] Total Volume Reduction Credit is the sum of the Storage Volume and the Infiltration Volume During Storm

## WASHTENAW COUNTY

W13 — Updated 10/6/2014 — Project Name: YDL — Calcs by: KAV — Date: 2/24/2020

**Standard Method Runoff Volume Calculations**

Site Summary of Infiltration & Detention

**A. Stormwater Management Summary**

Minimum Onsite Infiltration Requirement, Vinf 1,842 ft³

Designed/Provided Infiltration Volume 0 ft³

% Minimum Required Infiltration Provided 0 %

Total Calculated Detention Volume, Vdet 7,210 ft³

Net Required Detention Volume 7,210 ft³

**B. Detention Volume Increase for site where the required infiltration volume cannot be achieved**

% Required Infiltartion NOT provided 100 %

Net % Penalty 20 %

Total Required Detention Volume, including Penalty **8,652 ft³**

Existing Detention Volume Provided: 20,216 ft³

**Total Required: 28,868 ft³**

**Total Provided: 33,201 ft³**


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Consultants

Seal

Project Title

Ann Arbor Welding Supply
Preliminary Site Plan

4811 Carpenter Road
Ypsilanti, Michigan 48197

Sheet Title

Stormwater Calculations

Dates

| Dates | Issued for |
|---|---|
| 11/12/2019 | Owner Review |
| 11/19/2019 | Owner Review |
| 11/22/2019 | Owner Review |
| 12/03/2019 | Preliminary Site Plan |
| 02/28/2020 | Owner Review |
| 03/13/2020 | Preliminary Site Plan |

Scale

1" = 30.00'

Quality Control

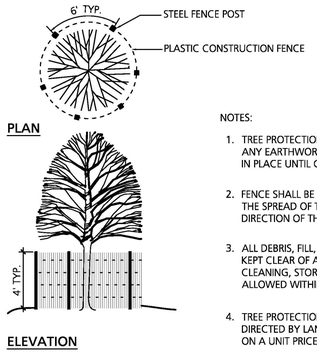
Drawn: BB
Checked: KE
Approved: KE

Project Number

2019.116

Sheet Number

C401

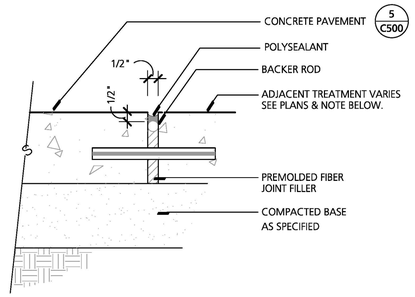



NOTES:

1. TREE PROTECTION FENCING SHALL BE ERECTED PRIOR TO ANY EARTHWORK OR CONSTRUCTION AND IS TO REMAIN IN PLACE UNTIL CONSTRUCTION IS COMPLETE.
2. FENCE SHALL BE LOCATED AT THE OUTER PERIMETER OF THE SPREAD OF THE BRANCHES OR CLOSER ONLY AT THE DIRECTION OF THE PROJECT LANDSCAPE ARCHITECT.
3. ALL DEBRIS, FILL, EQUIPMENT AND MATERIAL SHALL BE KEPT CLEAR OF AREA WITHIN PROTECTIVE FENCE. NO CLEANING, STORAGE, OR DISPOSAL OF ANY MATERIAL ALLOWED WITHIN THE DRIP LINE OF TREES TO BE SAVED.
4. TREE PROTECTION FENCING SHALL BE INSTALLED WHERE DIRECTED BY LANDSCAPE ARCHITECT AND SHALL BE PAID ON A UNIT PRICE BASIS.

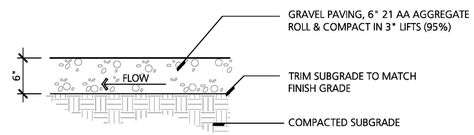
## 1 Tree Protection Fence

NO SCALE



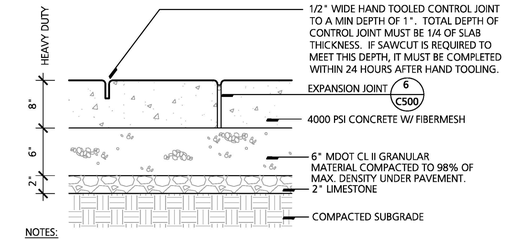

## 2 Expansion Joint

NO SCALE




## 3 Gravel Parking Lot / Storage

NO SCALE

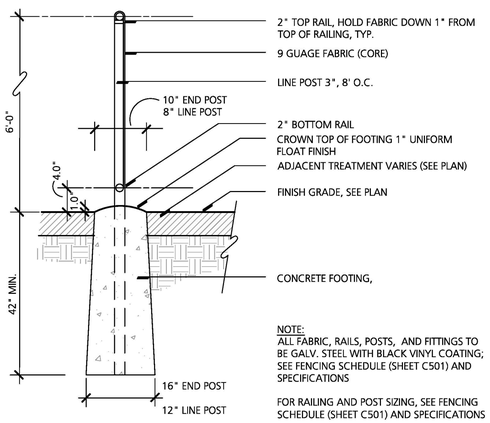



NOTES:

1. EXPANSION JOINTS SHALL BE INSTALLED SUCH THAT NO SINGLE DIMENSION EXCEEDS 50 FT.
2. 1/2 " EXPANSION PAPER SHALL BE PLACED AT ALL LOCATIONS THAT NEW SIDEWALK ABUTS BUILDINGS, CONCRETE CURB, EXISTING SIDEWALK, LIGHT POLE BASES AND RETAINING WALLS.
3. SNAP-CAP EXPANSION JOINT STRIPS CAN BE USED ON ALL EXPANSION JOINTS
4. ALL EXPANSION JOINTS SHALL BE SEALED.
5. BROOM FINISH PARALLEL TO JOINTS AND PERPENDICULAR TO TRAFFIC (IF BROOMING PATTERN NOT SHOWN).

## 4 H.D. Concrete Pavement

NO SCALE

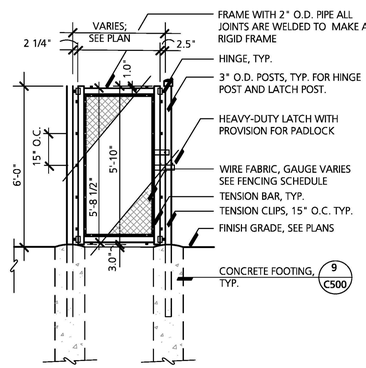



NOTE:
ALL FABRIC, RAILS, POSTS, AND FITTINGS TO BE GALV. STEEL WITH BLACK VINYL COATING; SEE FENCING SCHEDULE (SHEET C501) AND SPECIFICATIONS

FOR RAILING AND POST SIZING, SEE FENCING SCHEDULE (SHEET C501) AND SPECIFICATIONS

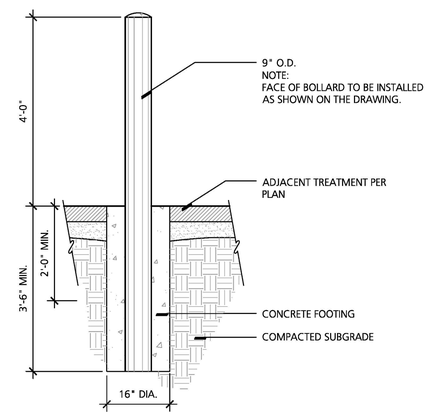
## 5 6' Chain Link Fence Post Installation

NO SCALE



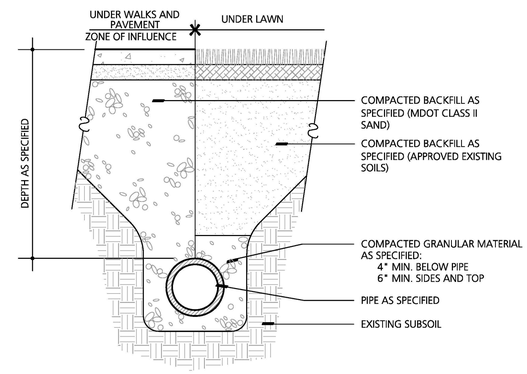

## 6 Single-Swing Chain Link Gate Elevation

NO SCALE



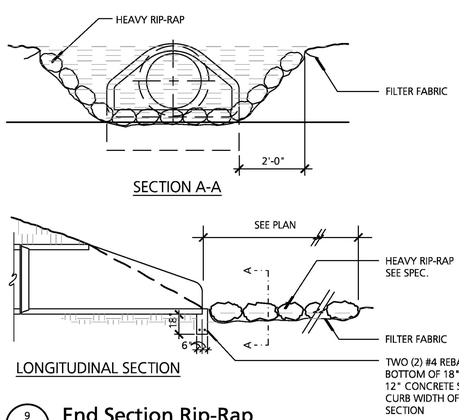

## 7 Bollard

NO SCALE



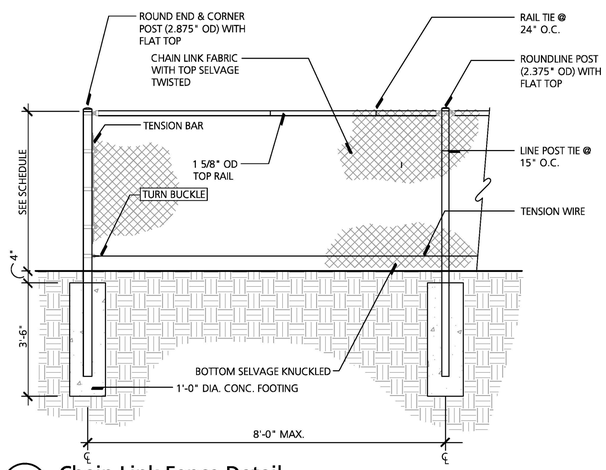

## 8 Trench Detail

NO SCALE



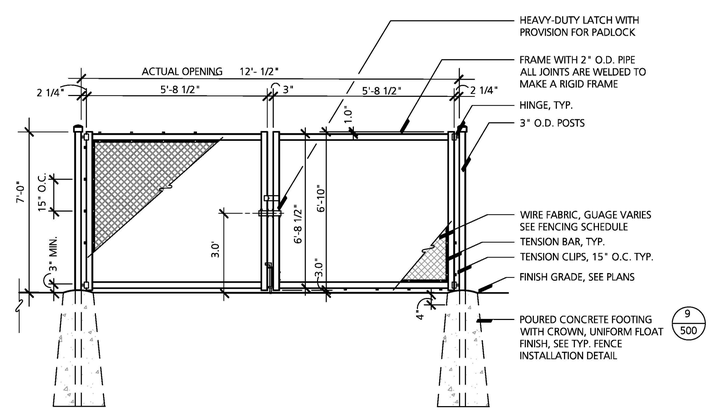

## 9 End Section Rip-Rap

NO SCALE




## 10 Chain Link Fence Detail

NO SCALE




## 11 Double Swing Gate Elevation

NO SCALE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**Consultants**

**Seal**

**Project Title**

Ann Arbor Welding Supply
Preliminary Site Plan

4811 Carpenter Road
Ypsilanti, Michigan 48197

**Sheet Title**

Site Details

**Dates**

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| 02/28/2020 | Owner Review |
| 03/13/2020 | Preliminary Site Plan |

**Scale**

1 " = 30.00'

**Quality Control**

Drawn: BB
Checked: KE
Approved: KE

**Project Number**

2019.116

**Sheet Number**

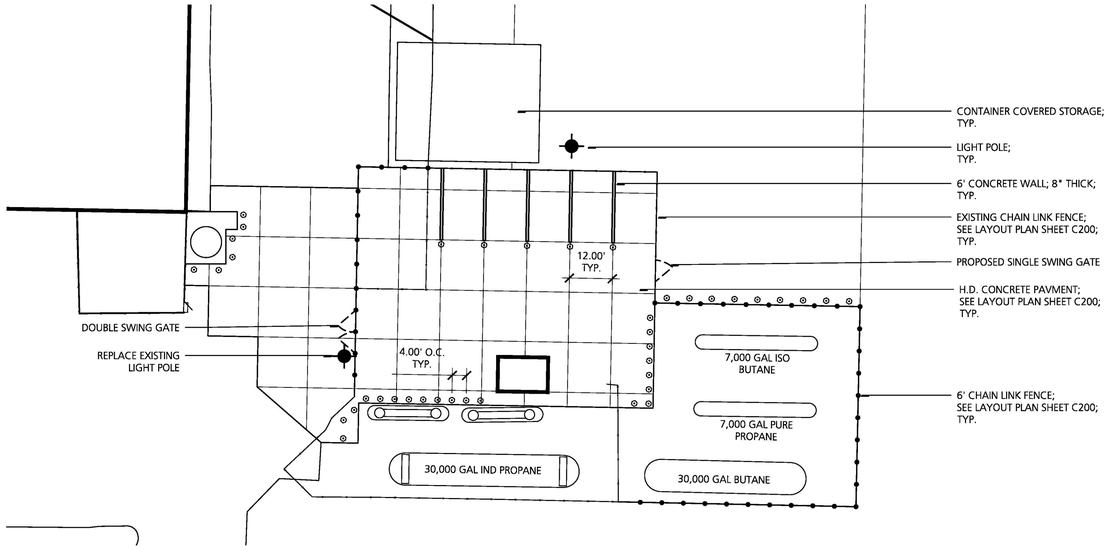
C500

## Fencing & Gate Schedule

| | | | |
|---|---|---|---|
| FENCING: | 6'-0" HGT. | POSTS: | 3" O.D. TERMINAL, 2.5" LINE, 8.0' O.C. (EQUAL.) |
| | | RAILS: | TOP, BOTTOM & MIDRAILS 1 5/8" O.D. |
| | | FABRIC: | 9 GAUGE WIRE, 2" MESH |
| SINGLE-SWING GATE: | 6'-0" HGT. | POSTS: | 3" O.D. |
| | | FRAME: | 2" O.D., WELDED |
| | | FABRIC: | 9 GAUGE WIRE |
| DOUBLE-SWING GATE: | 6'-0" HGT. | POSTS: | 3" O.D. |
| | | FRAME: | 2" O.D., WELDED |
| | | FABRIC: | 9 GAUGE WIRE |

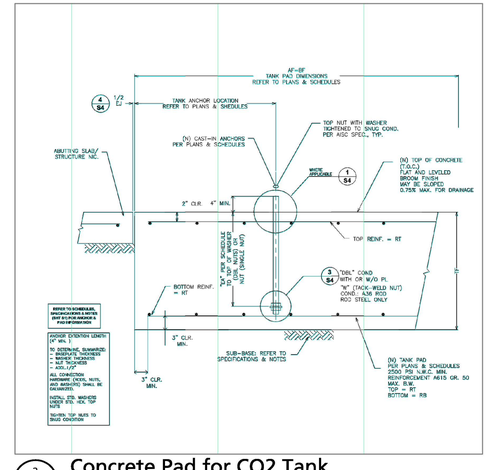
## Fencing & Gate Notes

1. ALL FABRIC, RAILS, POSTS, GATES AND FITTINGS SHALL BE HOT DIPPED GALVANIZED STEEL (SEE SPECIFICATIONS) ALL FABRIC SHALL BE 2" DIAMOND MESH UNLESS OTHERWISE SPECIFIED.
2. ALL FENCING SHALL BE KNUCKLED TOP & BOTTOM.
3. ALL RAIL CONNECTIONS SHALL UTILIZE PRESS FITTINGS.
4. CONTRACTOR SHALL PROVIDE COMPLETE SHOP DRAWINGS FOR ALL BACKSTOP, FENCING & GATE WORK.
5. CONTRACTOR SHALL PROVIDE SAMPLES FOR ALL FENCING COMPONENTS. (POSTS, RAILS, FABRIC, HINGES, & LATCH).
6. ALL GATE FRAMES SHALL BE CONSTRUCTED IN SHOP. CONTRACTOR SHALL FIELD MEASURE POSTS PRIOR TO CONSTRUCTION.
7. ALL GATE FRAMES SHALL BE CONSTRUCTED WITH WELDED CUPPED JOINTS.
8. ALL WELDS SHALL BE CLEAN, UNIFORM & FREE OF RUST. GRIND PRIOR TO APPLYING TOUCH-UP GALVANIZED MATERIAL. LIQUID GALVANIZED STEEL (SEE SPECIFICATIONS) MATERIAL SHALL BE APPLIED NEATLY, MATERIAL TO BE APPLIED AFTER JOINT INSPECTION BY LANDSCAPE ARCHITECT.
9. ALL POSTS, PIPE, FABRIC AND FITTINGS TO BE GALVANIZED STEEL (SEE SPECIFICATIONS).



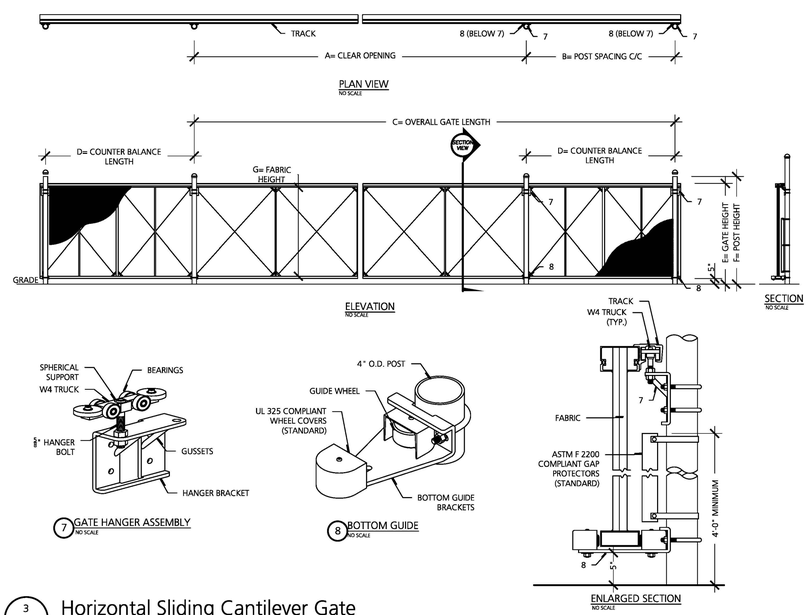

1 Concrete Pad Enlargement

SCALE: 1" = 20'-0"




2 Concrete Pad for CO2 Tank

NO SCALE

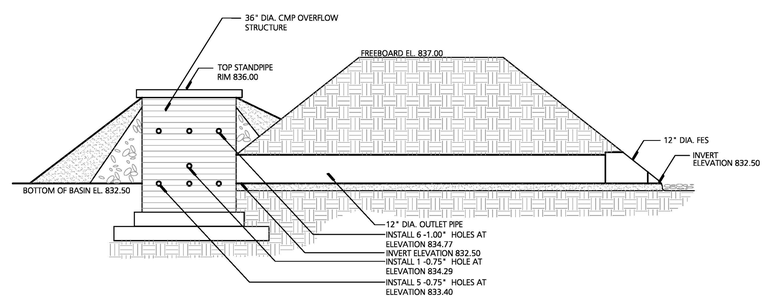



| CRITICAL DIMENSION CHART | | | | |
|---|---|---|---|---|
| MARK | DESCRIPTION | FORMULA | SOUTH GATE DIM. | NORTH GATE DIM. |
| A | CLEAR OPENING | A | 22'-0" | 30'-0" |
| B | COUNTERBALANCE POST SPACING C/C | (A/2)-11" | 10'-1" | 14'-1" |
| C | OVERALL GATE LENGTH | A x1.5 | 33'-0" | 45'-0" |
| D | COUNTERBALANCE LENGTH | A x 0.5 | 11'-0" | 15'-0" |
| E | NOMINAL GATE HEIGHT | E | 6'-0" | 6'-0" |
| F | POST HEIGHT | E+1'-6" | 7'-6" | 7'-6" |
| G | FABRIC HEIGHT | E- 1'- 0" | 5'-0" | 5'-0" |

NOTES:
1. ALL FITTINGS STANDARDLY PROVIDED FOR 4" O.D. POSTS. OTHER SIZES AVAILABLE UPON REQUEST.

3 Horizontal Sliding Cantilever Gate

No Scale




4 Outlet Control Structure Detail

NO SCALE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Quality Control

Drawn: BB
Checked: KE
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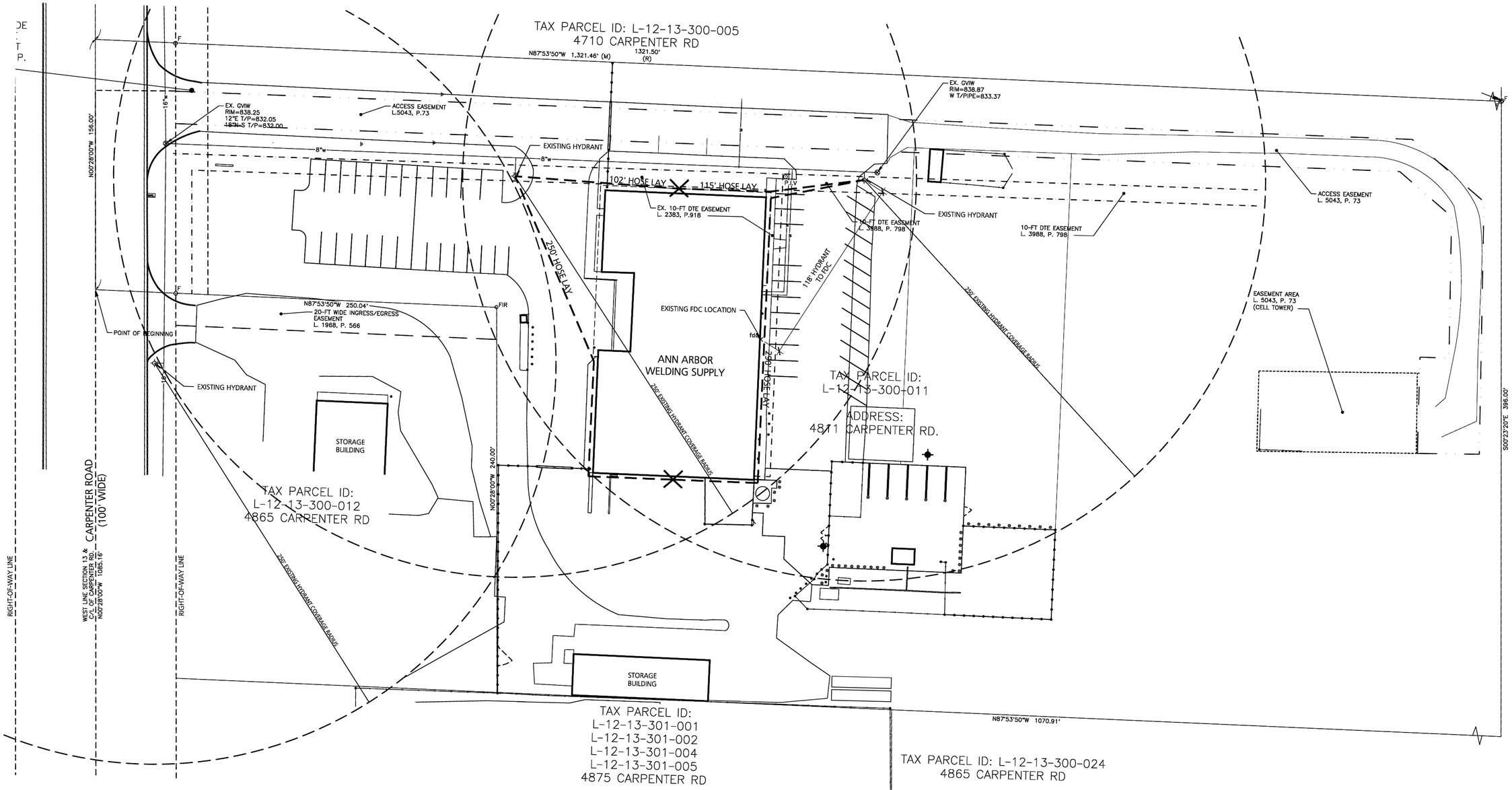


## FIRE SAFETY LEGEND

- 250' HYDRANT COVERAGE RADIUS
- HYDRANT
- FIRE HOSE LAY PATH AND LENGTH

## FIRE SAFETY NOTES

1. ENTIRE BUILDING FOOTPRINT IS WITHIN 250' RADIUS OF A HYDRANT.
2. ENTIRE BUILDING FALLS WITHIN A 400' HOSE LAY FROM A HYDRANT.
3. ENTIRE BUILDING CAN BE CIRCUMNAVIGATED BY A FIRE TRUCK.

## SECONDARY CONTAINMENT MEASURES

CAUTION: FIELD VERIFY ALL UNDERGROUND ELECTRICAL & GAS LINES & PROTECT.

0 15 30 60 90 120

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Fire Safety Plan

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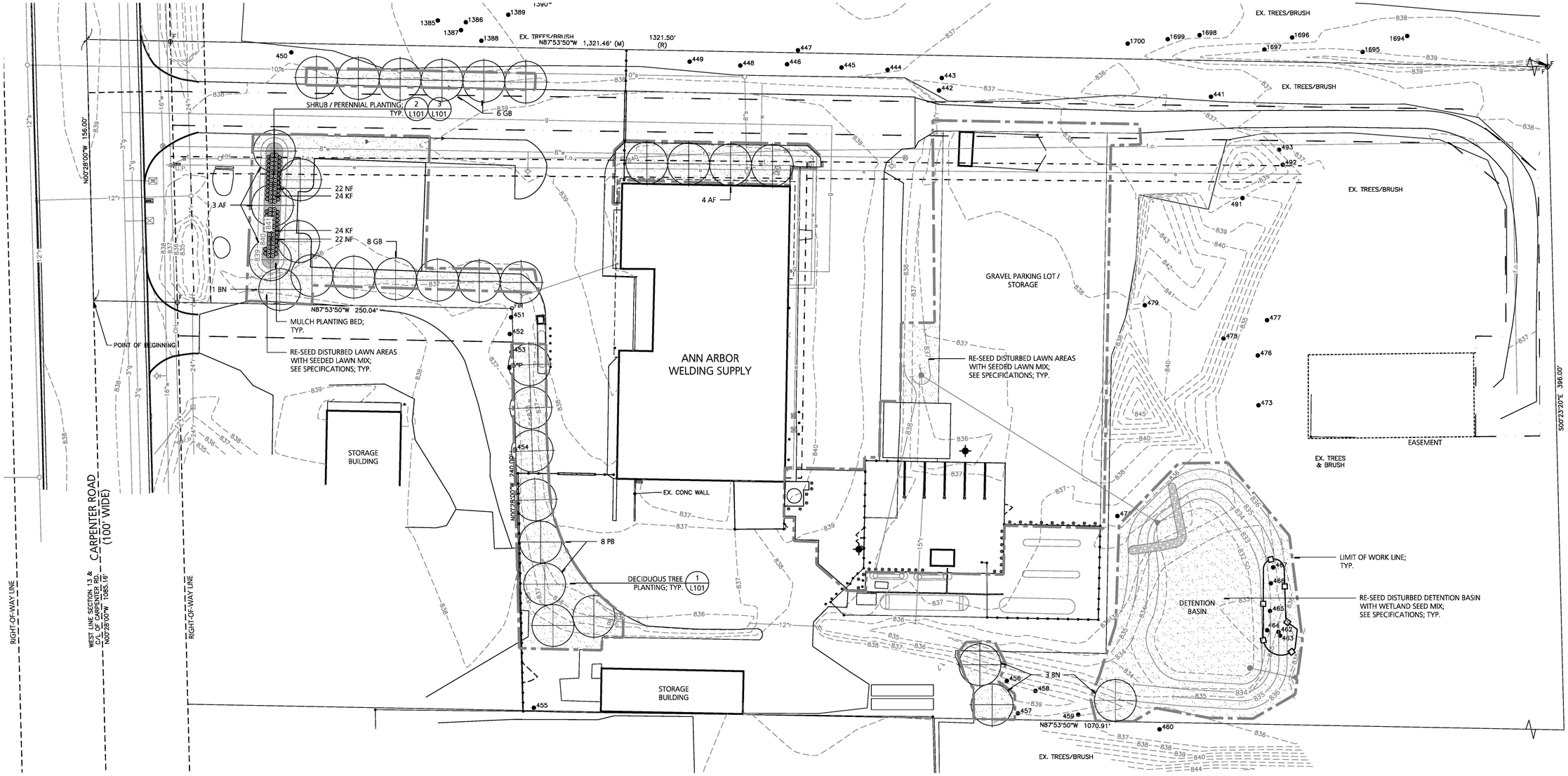
Sheet Number

C600




## LANDSCAPE NOTES

1. TOPSOIL (4") AND SEED ALL DISTURBED TURF AREAS.
2. ALL IMPORTED TOPSOIL SHALL BE SCREENED AND BE APPROVED BY LANDSCAPE ARCHITECT/ENGINEER PRIOR TO INSTALLATION. PROVIDE CERTIFICATION FOR ALL IMPORTED TOPSOIL.
3. MULCH ALL LANDSCAPE BEDS PER SPECIFICATIONS.

## LANDSCAPE REQUIREMENTS

TREE REQUIREMENTS -
WEST PARKING LOT:
26 SPACES = 4 TREES;
400 LF PERIMETER = 10 TREES

EAST PARKING LOT:
29 SPACES = 4 TREES;
465 LF PERIMETER = 12 TREES

GREENBELT TREE REQUIREMENTS:
75 LF = 3 TREES

TOTAL REQUIRED TREES = 33 TREES
TOTAL TREES SHOWN = 33 TREES

## LANDSCAPE LEGEND

- RIGHT-OF-WAY LINE
- LIMIT OF WORK LINE
- FILTER FABRIC FENCE
- BED LINE
- PROPOSED DECIDUOUS TREE
- PROPOSED SHRUB / ORNAMENTAL GRASS / PERENNIAL
- PROPOSED SEEDED LAWN / WETLAND SEED MIX
- PROPOSED MULCH BED; 3" SHREDDED BARK MULCH

## PLANT LIST

### DECIDUOUS TREES

| QTY. | SYM. | BOTANICAL NAME | COMMON NAME | SIZE | COMMENTS |
|---|---|---|---|---|---|
| 7 | AF | ACER X FREEMANII 'JEFFSRED' | JEFFSRED AUTUMN BLAZE MAPLE | 2.5" CALIPER | SINGLE STRAIGHT TRUNK; FULL UNIFORM HEAD |
| 4 | BN | BETULA NIGRA | RIVER BIRCH | 8' HEIGHT | MULTI-STEM TRUNK (5 TRUNKS MIN.); FULL UNIFORM HEAD |
| 14 | GB | GINKGO BILOBA 'PRINCETON SENTRY' | PRINCETON SENTRY GINGKO | 2.5" CALIPER | SINGLE STRAIGHT TRUNK; FULL UNIFORM HEAD |
| 8 | PB | PLATANUS X ACERIFOLIA 'BLOODGOOD' | BLOODGOOD LONDON PLANE | 2.5" CALIPER | SINGLE STRAIGHT TRUNK; FULL UNIFORM HEAD |

### PERENNIALS & ORNAMENTAL GRASSES

| QTY. | SYM. | BOTANICAL NAME | COMMON NAME | SIZE | COMMENTS |
|---|---|---|---|---|---|
| 48 | KF | CALAMAGROSTIS X ACUTIFLORA 'KARL FOERSTER' | KARL FOERSTER FEATHER REED GRASS | 2 GALLON | FULL HEAVY PLANTS; 30" O.C. |
| 44 | NF | NEPETA X FAASSENII ' WALKER'S LOW' | WALKERS LOW CATMINT | 1 GALLON | FULL HEAVY PLANTS; 24" O.C. |

CAUTION: FIELD VERIFY ALL UNDERGROUND ELECTRICAL & GAS LINES & PROTECT.

0 15 30 60 90 120

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Sheet Number

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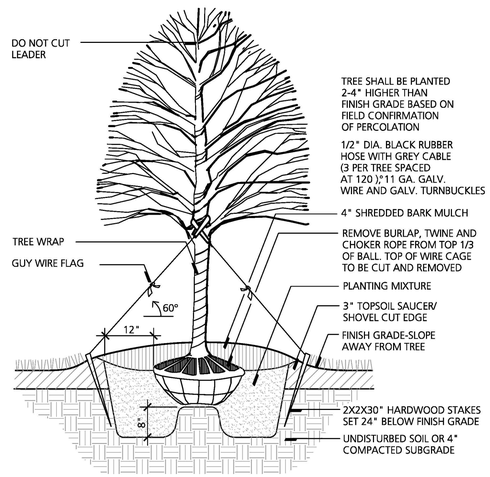
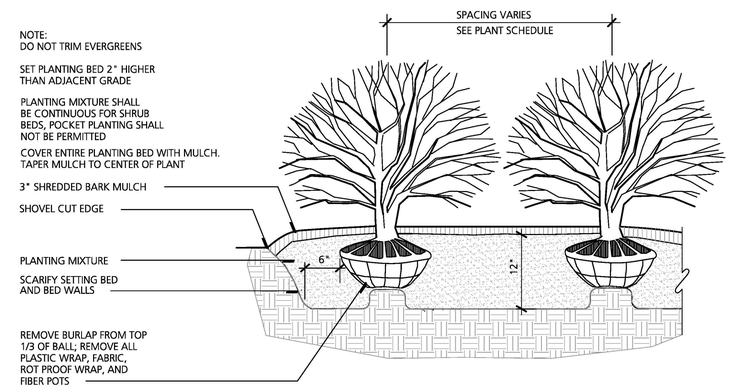
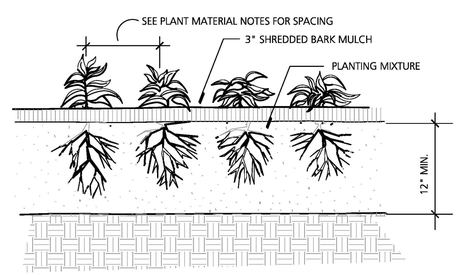



1 **Deciduous Tree Planting**
NO SCALE




2 **Shrub Planting**
NO SCALE




NOTE:
SET TOP OF ROOTBALL FLUSH WITH TOP OF PLANTING MIXTURE FINISH GRADE. SEPARATE FOLIAGE AND MULCH.

3 **Perennial and Ornamental Grass Planting**
NO SCALE

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**Sheet Number**

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