TOWN OF MUNSTER
BOARD OF ZONING APPEALS
STAFF REPORT
TUESDAY, JULY 12, 2016, 7:00 PM

Preliminary Hearing

1. **Petition BZA 16-007** – ARA Dialysis, 10010 Donald Powers Drive, c/o NWI Medical Realty, LLC, 9201 Calumet Ave, – requesting variances to front and rear planting strips, rear yard width, and parking requirements.

   Current Zoning is C-1.

   The Petitioner is requesting variances to 26-602(1)(d) – Front Planting Strip, 26-602(1)(f) – Rear Planting Strip, 26-602(2)(c) – Minimum Rear Yard, and 26-231(20) – Parking Requirement.

   - *26-602(1)(d) – Front Planting Strip: Requesting a reduction from the required 100 feet of front planting strip to 16 feet of front planting strip.*
   - *26-602(1)(f) – Rear Planting Strip: Requesting a reduction from the required 15 feet of rear planting strip to 2.5 feet of rear planting strip.*
   - *26-602(2)(c) – Minimum Rear Yard: Requesting a reduction from the required 80 feet of rear yard to 21 feet of rear yard.*
   - *26-231(20) – Parking Requirement: Requesting a reduction from the required 110 parking spaces to 105 parking spaces.*

   Staff recommends to set for Public Hearing.

BZA 16-007
DATE 06-24-16
FEE $ 300.
Sign $ 25.
325.

TOWN OF MUNSTER
APPLICATION FOR DEVELOPMENTAL STANDARDS VARIANCE

NOTE: APPLICATION MUST BE COMPLETED AND FILED WITH THE CLERK-TREASURERS OFFICE, 1005 RIDGE ROAD, MUNSTER INDIANA, AT LEAST 10 DAYS PRIOR TO BOARD OF ZONING APPEALS MEETING AT WHICH THE BOARD IS TO CONSIDER SUCH APPLICATION. IF THE APPLICANT IS OTHER THAN THE OWNER OF THE PROPERTY, OWNER MUST ALSO SIGN THE APPLICATION, OR SUBMIT A LETTER AUTHORIZING APPLICANT TO ACT ON OWNERS BEHALF

APPLICANT TRK Construction, LLC
PHONE 816-888-7800

ADDRESS 9201 Calumet Avenue, Munster, IN 46321

PROPERTY OWNER NWI Medical Realty, LLC PHONE (219) 836-9024

OWNERS ADDRESS 9201 Calumet Avenue, Munster, IN 46321

GENERAL LOCATION OF SUBJECT PROPERTY SW corner of Harold P. Hagburg Drive and Calumet Avenue

LEGAL DESCRIPTION OF PROPERTY See attached.

CONTAINING 2.06 ACRES (AREA) CURRENT ZONING C-1 DATE PURCHASED 12/30/2015

DEVELOPMENTAL STANDARDS VARIANCE REQUESTED See attached.

ORDINANCE REQUIREMENT See attached.

PROPOSED USE Medical Clinic (15,055 SF) and Office (7,185 SF)

I AM REQUESTING THE DEVELOPMENTAL STANDARDS VARIANCE FOR THE FOLLOWING REASON
See attached.

ATTACHMENTS: APPLICANT MUST SUBMIT TEN (10) COPIES OF THE LEGAL PLAT IN ACCORDANCE WITH THE REQUIREMENTS LISTED IN THE TOWN OF MUNSTER ZONING ORDINANCE.

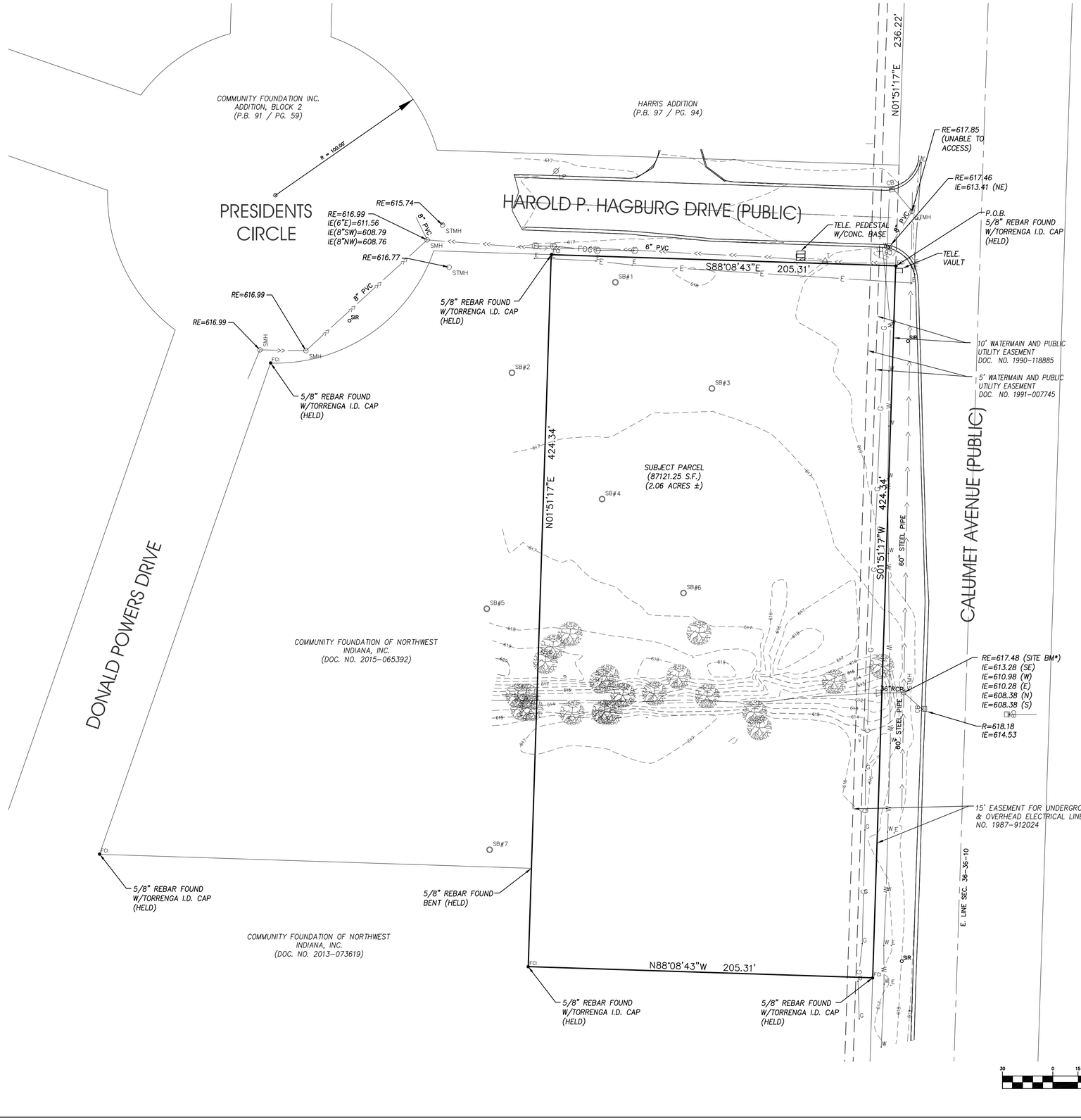
SIGNATURE OF APPLICANT Todd R. Keilholz DATE 06/07/16
Todd R. Keilholz

SITE DEVELOPMENT PLANS FOR

ARA MUNSTER

10120 CALUMET AVENUE, MUNSTER, INDIANA 46628

SITE
Lynwood
Lansing Municipal Airport
Centennial Park
Centennial Park Golf Course
Superior Ave
Calumet Ave
Columbia Ave
Main St
Treadway Rd
Glenwood Dyer Rd
Lansing Drainage Ditch
Hart Ditch
Fran Lin Pkwy
Oriole Dr
Camellia Dr
45th Ave
45th St
44th St
Timberwood Ln
Poplar Ln
Prairie Ave
Spruce Dr
Woodhollow Dr
Leicester Rd
Salisbury Dr
Exeter Rd
Carnaby Pl
Alpha St
Baker St
Wellington Dr
Fairmore Ave
Pine St
Cypress Dr
Birch St
Redwood Rd
White Oak Ave
Windfield Dr
Burlwood Dr
Willowood Dr
Bluebird Ln
Spring St
Gant St
Ada St
Grant St
Aviation Way
Blue Jay Way
Lake Park Dr
Lake Lynwood Dr
Oakwood Ave
Orchard Ave
Lakewood Ave
Monterey Ave
Crescent Ave
Dexter Ave
Cedar Ave
Lynn Ave
Lynn Ct
Lynn Pl
Lynn St
Lynn Way
Lynn Ln
Lynn Dr
Lynn Cir



LEGEND:

	= CATCH BASIN
	= CURB CATCH BASIN
	= ELECTRIC LOCATION
FIR	= FOUND CAPPED IRON
SIR	= SET IRON ROD
G	= GAS LOCATION
MH	= GENERAL MANHOLE
LP	= LIGHT POLE
SMH	= SANITARY MANHOLE
SB#	= SOIL BORING LOCATION
STMH	= STORM MANHOLE
	= TELEPHONE PEDESTAL
W	= WATER LOCATION
SB#	= SOIL BORING LOCATION
	= TREE (DECIDUOUS)
	= DRAINAGE END SECTION
746	= CONTOUR ELEVATION (NAVD88 DATUM)
W	= WATER MAIN
>>	= SANITARY SEWER
>	= STORM SEWER
G	= GAS MAIN/LINE
FOC	= BURIED FIBER OPTIC
E	= BURIED ELECTRICAL
	= BOUNDARY

NOTES:

1. This map based upon Survey entitled, "ALTA/NSPS Land Title Survey, Sheet 1 of 1, dated 03-22-2016 by Scott M. Gregory, P.L.S. of Abonmarche Consultants, Inc.
2. Refer to "Report – Geotechnical Engineering Exploration, File No. 16111, dated 02/05/2016 by K&S Engineering, Inc.

NO.	REVISION DESCRIPTION:	BY:	DATE:
1	REVISE LANDSCAPE PLAN, SIDEWALK	SEG	06-08-16

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PROJECT:

ARA MUNSTER
10120 CALUMET AVENUE,
MUNSTER. IN

SHEET TITLE:

EXISTING CONDITIONS MAP

DRAWN BY: SEG
DESIGNED BY: SEG
PM REVIEW: BMc
QA/QC REVIEW:
DATE: 04-18-2016
SEAL:

DARYL S. KNIP
REGISTERED
No. PE19900167
STATE OF
INDIANA
PROFESSIONAL ENGINEER

SIGNATURE:
DATE: 07/07/16

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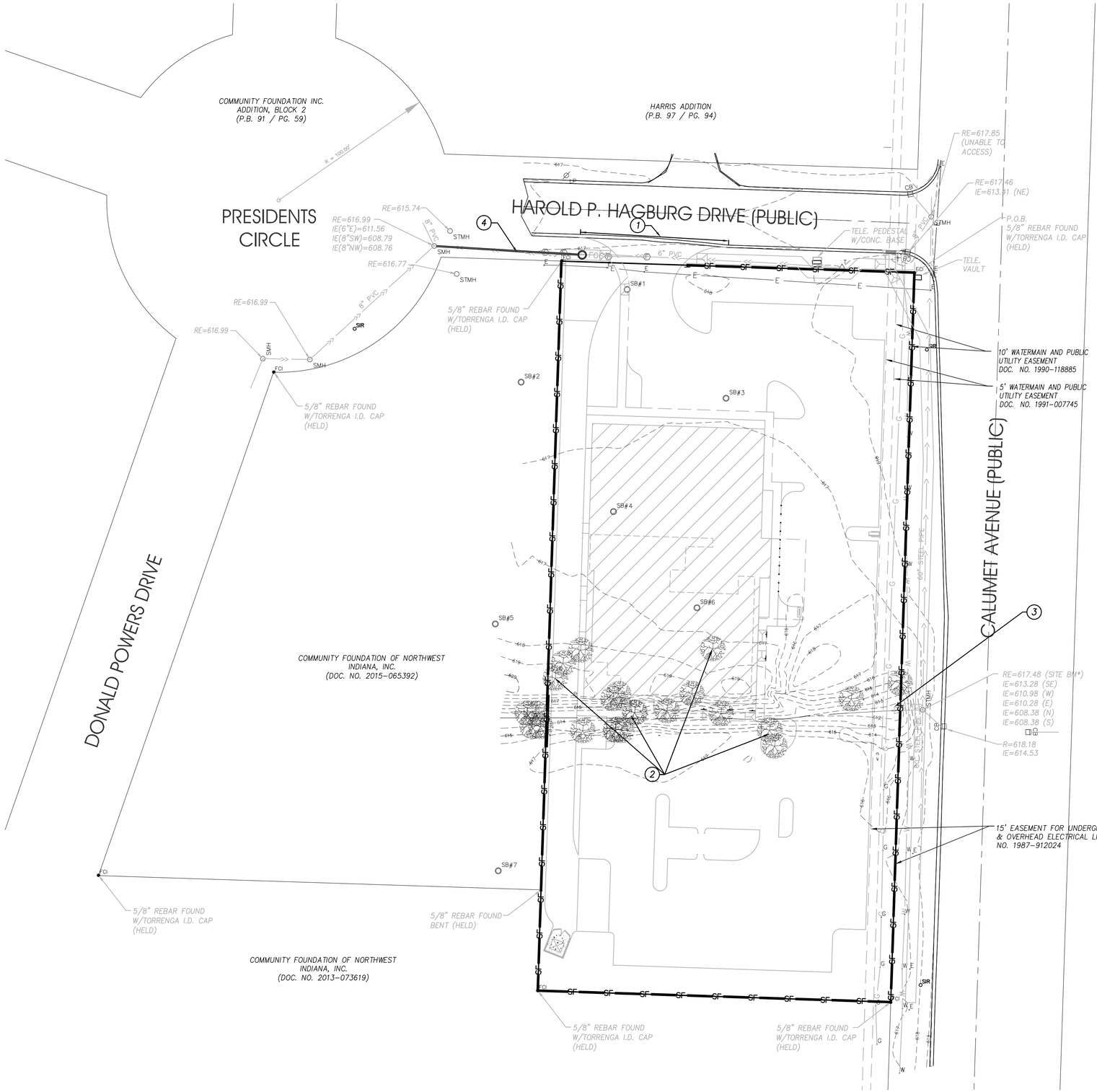
HORZ:
VERT:

ACI JOB #
16-0017

SHEET NO.
C1.0



LEGEND

(XX) Removal Activities Description (See Keynote)

—SF— Temporary Silt Fence

KEYNOTE DESCRIPTIONS

1. Remove and dispose of Curb and Gutter
2. Remove all trees and vegetation onsite
3. Remove 36" End Section and any existing rip rap
4. Remove 6" PVC (See Utilities, Drainage and Stormwater Management Plan)

GENERAL NOTES

1. Removals and disposal shall be in accordance with all applicable local, state and federal codes.
2. Curbs and concrete shall be removed up to existing control joints or saw cuts.
3. Asphalt pavements shall be saw cut prior to removal.

NO.	REVISION DESCRIPTION:	BY:	DATE:
1	REVISE LANDSCAPE PLAN, SIDEWALK	SEG	06-08-16

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PROJECT:

ARA MUNSTER
10120 CALUMET AVENUE,
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SHEET TITLE:

REMOVALS PLAN

DRAWN BY: SEG

DESIGNED BY: SEG

P.M. REVIEW: BMc

QA/QC REVIEW:

DATE: 04-18-2016

SEAL:

DARYL B. KNUD
REGISTERED
NO. PE19900067
STATE OF INDIANA
PROFESSIONAL ENGINEER

SIGNATURE:

DATE: 07/07/16

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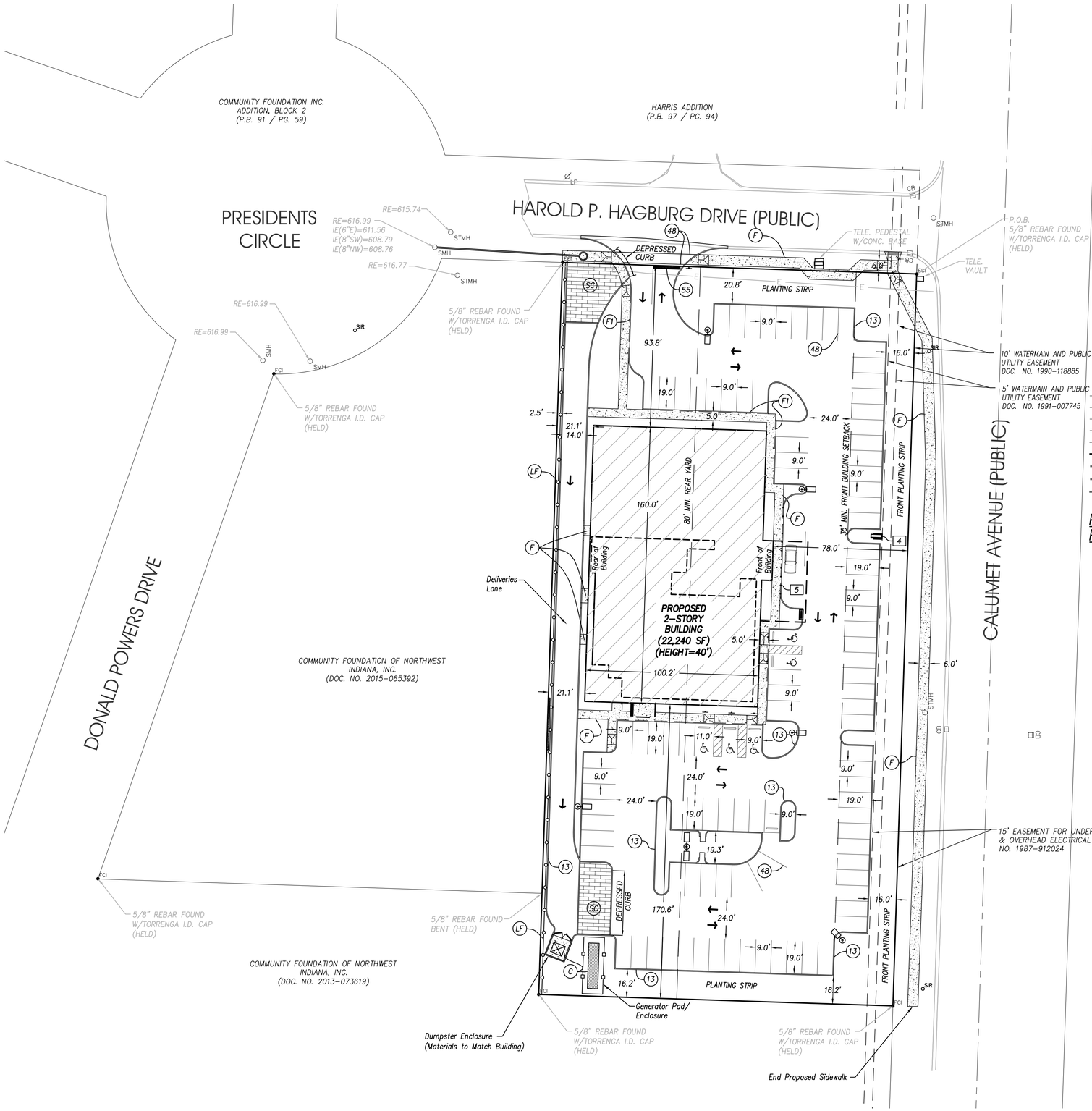

LEGEND:

- = EXISTING CATCH BASIN
- = EXISTING CURB CATCH BASIN
- = EXISTING ELECTRIC LOCATION
- = EXISTING FOUND CAPPED IRON
- = EXISTING GAS LOCATION
- = EXISTING GENERAL MANHOLE
- = EXISTING LIGHT POLE
- = EXISTING SANITARY MANHOLE
- = EXISTING SOIL BORING LOCATION
- = EXISTING STORM MANHOLE
- = EXISTING STREET SIGN
- = EXISTING TELEPHONE PEDESTAL
- = EXISTING WATER LOCATION
- = PROPOSED WHEEL STOP
- = PROPOSED MONUMENT SIGN
- = PROPOSED LIGHT POLE & LUMINARE
- = PROPOSED STAMPED CONCRETE
- = PROPOSED BUILDING
- = PROPOSED DUMPSTER PAD & ENCL.
- = PROPOSED CONCRETE SIDEWALK
- = EXISTING SANITARY SEWER
- = EXISTING STORM SEWER
- = GAS MAIN/LINE
- = BURIED FIBER OPTIC
- = BURIED ELECTRICAL
- = BOUNDRY
- = PROPOSED STANDARD CURB
- = PROPOSED INTEGRAL CURB/SIDEWALK
- = PROPOSED FENCE

KEYNOTE LEGEND– PROPOSED IMPROVEMENTS

- ADA International Symbol of Accessibility
- (C) Concrete Pad, 8" thick
- (SC) Stamped Concrete (Color to Match Pavers at Existing Roundabout, "President's Circle")
- (LF) Living Fence – FILTREXX Sustainable Technologies 6' Tall "Green Living Fence" (or equivalent)
- (F) Concrete Sidewalk, Width as Dimensioned
- (F1) Integral Curb/Sidewalk Section
- (13) Standard Curb, Concrete
- (48) 4" Solid White Paint Line
- (55) 24" Solid White Paint Line
- (4) Monument Sign
- (5) Steel Pipe Bollard, Concrete Filled (Typical of 11)

GENERAL NOTES:

1. Parcel ID: 45-06-36-426-006.000-027 (2.06± Acres)
2. Current Zoning: "C-1" Highway Oriented General Business District
3. Existing Land Use: Vacant
   Proposed Land Use: Medical Clinic (Permitted)
   Offices (Permitted)
4. The project shall be serviced by Town of Munster sanitary sewer and water.
5. Minimum Building setbacks shown are in accordance with the "C-1" Highway Oriented General Business District, Town of Munster Zoning Ordinance.
6. Proposed parking areas shall be paved and privately owned.
7. References:
   i) Architectural Sheets AE-001, AE-002, AE-121, AE-203 & AE-204 dated 04/18/2016 by Richard L. Embers, R.A. of PULSE DESIGN GROUP.
   ii) Report Geotechnical Engineering Exploration, File 11611, dated 02/05/2016, by K & S Engineers, Inc.
   iii) ALTA/NSPS Land Title Survey, Sheet 1 of 1, dated 03/22/2016 by Scott M. Gregory, P.L.S. of Abonmarche Consultants, Inc.
8. Public Service Notes:
   A. No additional parkland proposed or required.
   B. No Rights-of-Way or Easements proposed or required.
   C. Harold P. Hagburg Drive and Calumet Avenue are public streets.

FLOOR AREA OF BUILDING BY USE:

Medical Clinic (Main Floor):	15,055 sq. ft.
Offices (Second Floor):	7,185 sq. ft.
Total:	22,240 sq. ft.

ZONING SUMMARY:

C-1 DISTRICT (Sec. 206-601)	REQUIRED	PROPOSED
206-602(1)(c) Min. Front Building Setback:	35 feet	78 feet (COMPLY)
206-602(1)(d) Min. Front Planting Strip:	100 feet (*1)	**16 feet (Variance Proposed)**
206-602(1)(f) Min. Rear Planting Strip:	15 feet (*2)	**2.5 feet (Variance Proposed)**
206-602(2)(c) Min. Rear Yard:	80 feet (*3)	**21 feet (Variance Proposed)**
206-602(3)(c) Min. Side Yard: (Facing an existing Street)	10% (of Lot Width) (405'x10%=40.5')	93.8 feet (COMPLY)
206-602(3)(c) Min. Side Planting Strip: (Facing an existing Street)	10 feet	20.8 feet (COMPLY)

(*1): Whenever a building is to be located in or toward the rear of a lot or tract to be improved, and all or a part of the parking is to be provided in front of the building, in addition to the planting strip or green area, the front yard shall not be less than 80 feet in addition to the green area of 20 feet.

(*2): Any through lot or tract of real estate having less than 290 feet in average depth from front to rear shall have a planting strip or green area of a minimum of 15 feet at the rear of the lot or tract of real estate in the same manner as is provided for a planting strip or green area in the front yard thereof.

(*3): In addition to all other requirements, there shall be a minimum rear yard of at least two feet in the least dimension for each one foot of height of the building, but not less than 15 feet.

Sec. 26-603 Height Regulations: Maximum Building Height:	50 feet	40 feet (COMPLY)
Sec. 26-605 Min. Frontage:	75 feet	424 feet (COMPLY)
Sec. 26-606 Maximum Floor Area & Lot Coverage: Maximum Floor Area:	3 x (Lot Area) Lot Area: 87,121 sf = 3 x (87,121 sf) = 261,363 sf	23,337 feet (COMPLY)
Sec. 26-606 Maximum Lot Coverage:	70% of Lot Area = 0.70 x 87,121 sf = 60,985 sf	16,165 sf (COMPLY)

GRAPHIC SCALE

30 0 15 30 60 120

(IN FEET)
1 inch = 30 ft.

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1	REVISE LANDSCAPE PLAN, SIDEWALK	SEG	06-08-16

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PROJECT:

ARA MUNSTER
10120 CALUMET AVENUE,
MUNSTER, IN

SHEET TITLE:

SITE LAYOUT
& LAND USE PLAN

DRAWN BY: SEG
DESIGNED BY: SEG
P.M. REVIEW: BMc
QA/QC REVIEW:
DATE: 04-18-2016
SEAL:

DARYL S. KNIP
REGISTERED
No. PE19900180
STATE OF INDIANA
PROFESSIONAL ENGINEER

SIGNATURE:
DATE: 07/07/16

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16-0017

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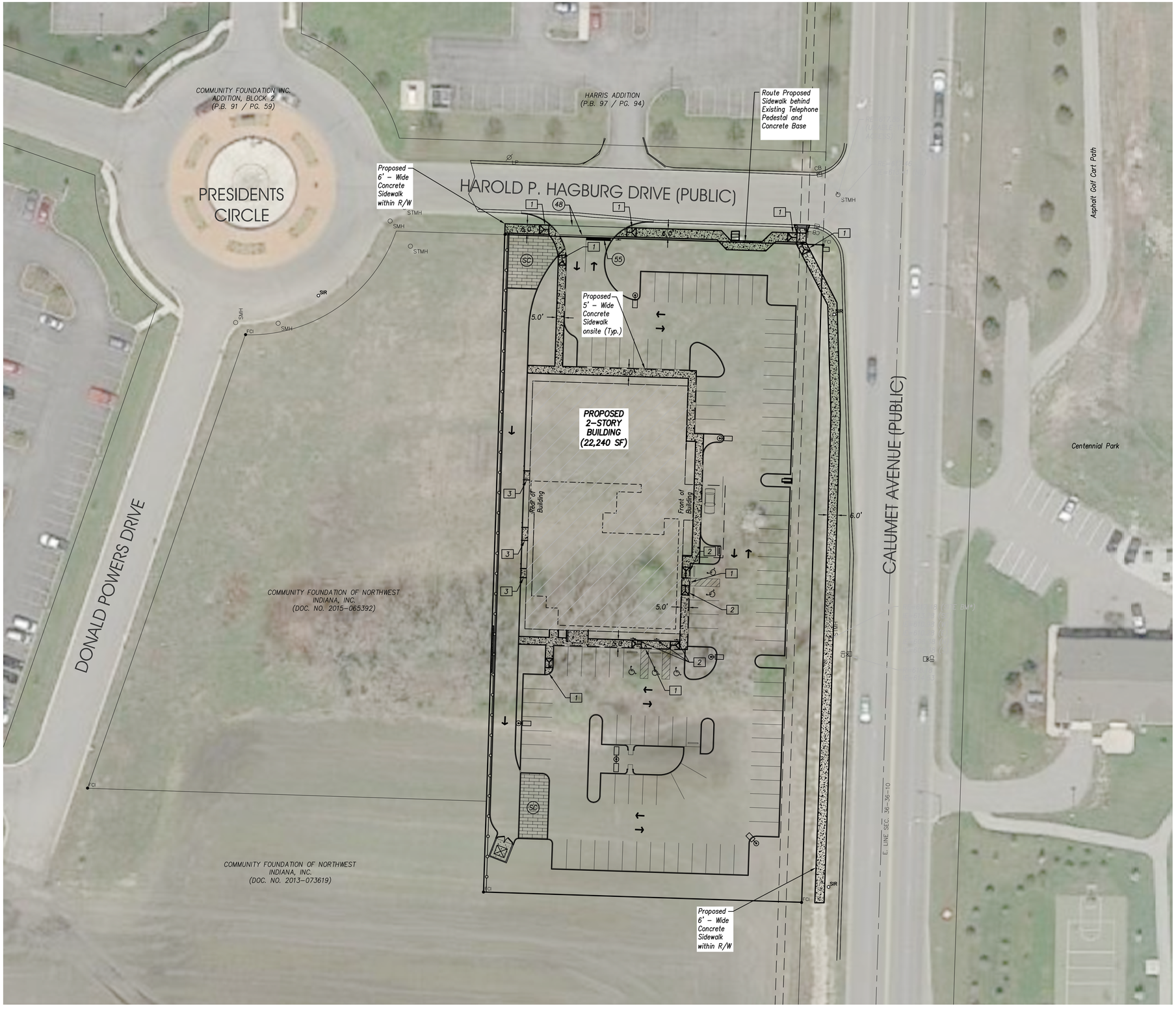

KEYNOTE LEGEND–PROPOSED IMPROVEMENTS

- ADA International Symbol of Accessibility
- 1 ADA Sidewalk Ramp with Truncated Dome Warning Surface
- 2 ADA Parking Sign, Passenger Vehicle and Van Accessible
- 3 Concrete stoop, 4" thick, flush with doorway, slope 2% (min.) away from building. Concrete steps as necessary to finished grade.
- SC Stamped Concrete (Color to Match Pavers at Existing Roundabout, "President's Circle")
- 48 4" White Paint Line
- 55 24" White Paint Line

GRAPHIC SCALE

30 0 15 30 60 120

(IN FEET)
1 inch = 30 ft.

NO.	REVISION DESCRIPTION:	BY:	DATE:
1	REVISE LANDSCAPE PLAN, SIDEWALK	SEG	06-08-16

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PROJECT:

ARA MUNSTER
10120 CALUMET AVENUE,
MUNSTER. IN

SHEET TITLE:

SIDEWALK LAYOUT PLAN

DRAWN BY: SEG
DESIGNED BY: SEG
PM REVIEW: BMc
QA/QC REVIEW:
DATE: 04-18-2016
SEAL:

DARYL S. KNUP
LICENSED
No. PE19900163
STATE OF INDIANA
PROFESSIONAL ENGINEER

SIGNATURE:
DATE: 07/07/16

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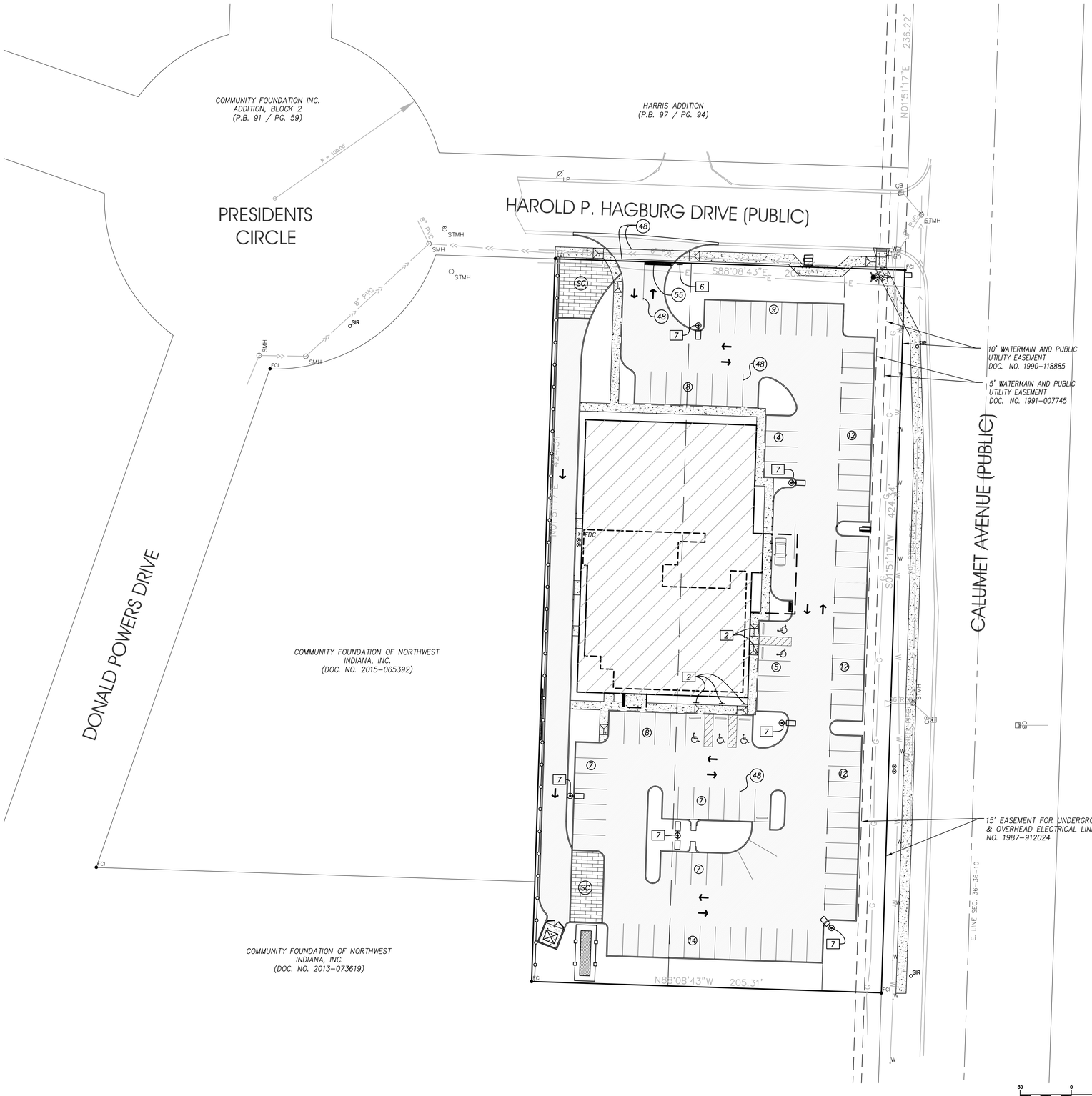

KEYNOTE LEGEND–PROPOSED IMPROVEMENTS

- (#) Number of Parking Spaces
- ADA International Symbol of Accessibility
- 2 ADA Parking Sign, Passenger Vehicle and Van Accessible
- 6 Stop Sign R1-1, (1) Type 2 Post
- 7 Light Pole & Luminare
- (48) 4" Solid White Paint Line
- (55) 24" Solid White Paint Line
- (SC) Stamped Concrete (Color to Match Pavers at Existing Roundabout, "President's Circle")
- Direction of Vehicular Traffic

PARKING SUMMARY: C–1 DISTRICT

Parking Requirement: (Section 26–931)

26–931(21) Medical Clinic: 5.7 spaces per 1,000 SF of Floor Area
5.7 spaces x (15,055 / 1000) = 85.8 (86) spaces

96–231(20) Offices: 3.3 spaces per 1000 SF of Floor Area
3.3 spaces x (7,185 / 1,000) = 23.7 (24) spaces

Total Required: 86 + 24 = **110 spaces**

Parking Provided: **105 spaces** (9.0' x 19.0') – Includes 5 ADA (1 Van Accessible Req'd, 11'x19') **(Variance Proposed)**

NOTES:

1. Refer to Sheet ME10 for Photometric Site Plan

NO.	REVISION DESCRIPTION:	BY:	DATE:
1	REVISE LANDSCAPE PLAN, SIDEWALK	SEG	06-08-16

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PROJECT:

ARA MUNSTER
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MUNSTER, IN

SHEET TITLE:

PARKING & LIGHTING PLAN

DRAWN BY: SEG
DESIGNED BY: SEG
P.M. REVIEW: BMc
QA/QC REVIEW:
DATE: 04-18-2016
SEAL: DARYL S. KNIP REGISTERED No. PE19900167 STATE OF INDIANA PROFESSIONAL ENGINEER
SIGNATURE:
DATE: 07/07/16

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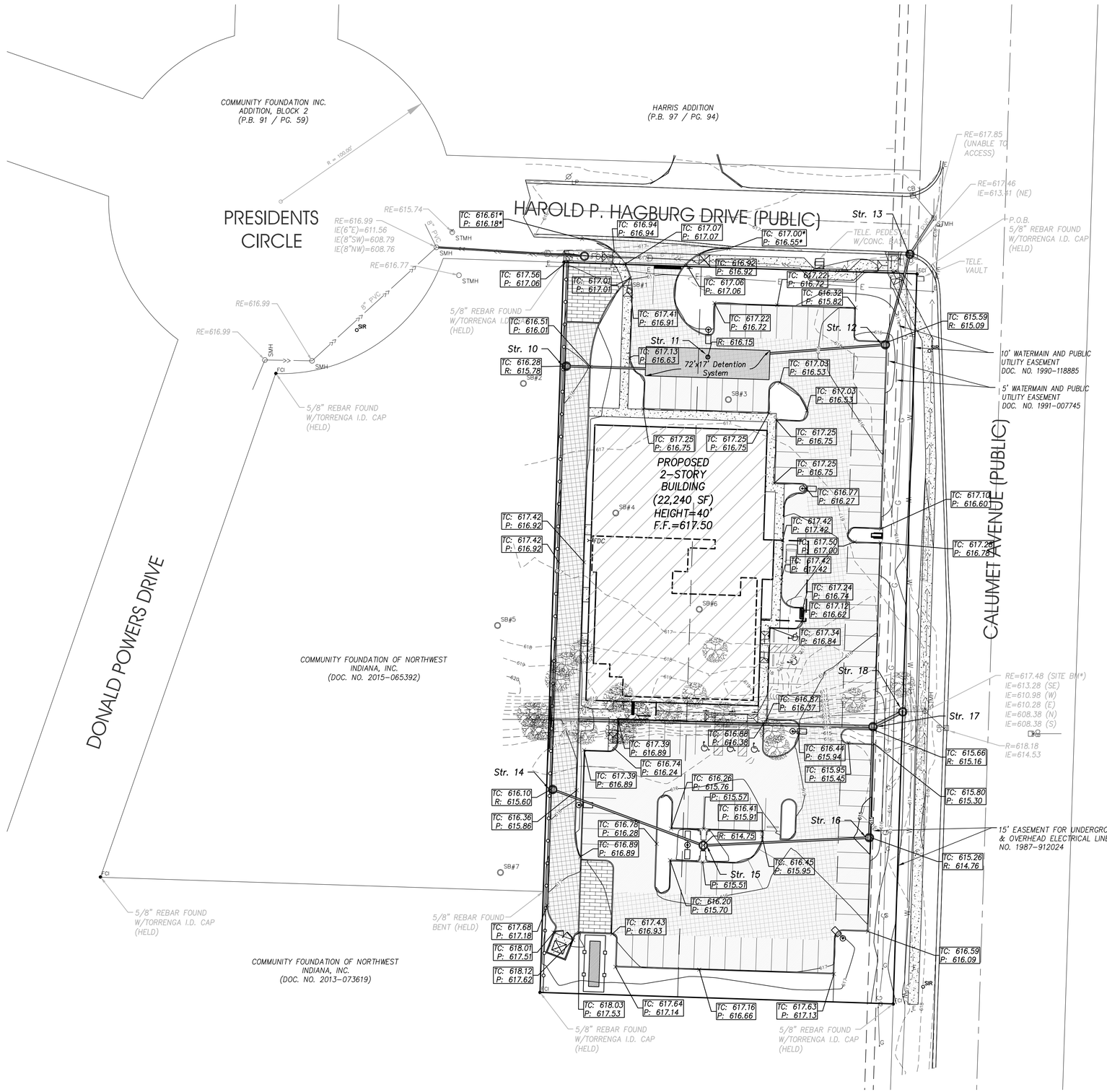

DRAINAGE NOTES

1. Drainage Design shall conform to the requirements set forth by the Town of Munster.
2. Storm sewer material shall be HDPE corrugated smooth-lined for cover greater than 2 feet above top of pipe, RCP Class III for cover less than 2 feet above top of pipe, RCP Class V for cover less than one foot above top of pipe, or unless otherwise specified. Pipe shall be bedded as required for pipe material, and backfilled in 6" lifts with clean suitable granular material and compacted to 100% Standard Proctor.
3. All roof downspouts shall be connected to the storm sewer. Contractor shall review the Architect's Plans prior to construction to account for all downspouts and coordinate with the Developer prior to sewer installation.
4. All open castings shall be embossed with "Dump No Waste", "Drains to Waterways" and have the "fish" image. All solid, flat cover castings shall be embossed with "STORM".
5. Any topsoil or silt material present in the storm sewer structures after construction is completed shall be removed by the Contractor prior to acceptance by the Developer and at no additional expense. The bottom shall be free of construction silt to allow proper drainage.
6. Discrepancies or conflicts in the plans and/or site conditions shall be communicated to the Surveyor/Engineer to ensure that clarifications and/or revisions can be made prior to construction.

GRADING NOTES

1. Contractor shall follow the latest Indiana "Rule 5" Soil Erosion Control Practices, Town of Munster MS4 Requirements, and the Storm Water Pollution Prevention Plan (SWPPP) prepared for the project.
2. All topsoil shall be removed/stockpiled onsite at a location approved by the Developer. A minimum of four (4) inches of topsoil shall be placed on all disturbed areas outside the buildings and parking areas.
3. All exposed subgrade shall be proof-rolled and witnessed by a Geotechnical Engineer to determine unsuitable soil locations prior to any paving operations. Any unsuitable soil shall be excavated, backfilled, and compacted with suitable material in accordance with the Geotechnical Report.
4. Positive drainage shall be maintained to prevent any ponding of water or encroachment onto adjacent properties.
5. Finish grade at doorways equals the finished floor unless otherwise noted.
6. All curb ends shall transition from 6-inch reveal to 0-inch reveal.
7. Contractor is responsible for meeting current ADA guidelines for all sidewalks, ramps, patios, and parking/drives.
8. Contractor to review proposed pavement and sidewalk grades with the Architect's drawings prior to construction to ensure all building doors have proper accessible access.
9. Contractor shall field verify the water table elevation, finished floor elevation and tie-ins to existing features and report any discrepancies to the Engineer.

PAVEMENT RECOMMENDATIONS

CONTRACTOR SHALL FOLLOW 2015 INDOT SPEC. FOR PAVEMENT MATERIALS AND INSTALLATION PROCEDURE.

CONTRACTOR SHALL ALSO BE FAMILIAR WITH "REPORT – GEOTECHNICAL ENGINEERING EXPLORATION", FILE NO. 16111, DATED 02/05/2016 BY K&S ENGINEERING, INC.

STANDARD DUTY PAVEMENT (PARKING)
1 ½" HMA Surface, 9.5mm (165 lbs/syd)
2 ½" HMA Binder, 19.0mm (220 lbs/syd)
10" Compacted INDOT #53 Aggregate or Crushed Concrete

HEAVY DUTY PAVEMENT (DRIVES/LOADING AREAS)
2" HMA Surface, 9.5mm (165 lbs/syd)
3" HMA Base, 25mm (385 lbs/syd)
10" Compacted INDOT #53 Aggregate or Crushed Concrete

C1 **RIGID (CONCRETE) PAVEMENT (UTILITY PADS/ DUMPSTER PAD)**
8" Class "A" Reinforced Concrete with Structural TUF-STRAND Fiber or 6"x6"W.W.M.)
6" Compacted INDOT #53 Aggregate or Crushed Concrete
- Curing compound, Light broom finish perpendicular to traffic direction
- All joints in accordance with ACI 330, not exceed 15' x 15'
- Sawcut joints, 2" deep, install silicon joint sealant
- If multiple pours, construction joints in accordance with ACI 330
- Install 1/2" expansion joint with elastomeric filler adjacent to building

DRAWING LEGEND

FF	Finished Floor Elevation
TC:	Top of Curb Elevation
P:	Pavement Elevation
G:	Ground Elevation
R:	Rim Elevation
W:	Sidewalk Elevation
⟹	Drainage / Grading Direction

* Denotes Existing Elevation (Field Verify)

GRAPHIC SCALE

30 0 15 30 60 120

(IN FEET)
1 inch = 30 ft.

NO.	REVISION DESCRIPTION:	BY:	DATE:
2	REVISE LNDSCP. PLAN PER 06/28/16 PLAN COMM., GRD.PL., UTIL.PL.	SEG	07-07-16
1	REVISE LANDSCAPE PLAN, SIDEWALK	SEG	06-08-16

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PROJECT:
ARA MUNSTER
10120 CALUMET AVENUE,
MUNSTER, IN

SHEET TITLE:
GRADING PLAN

DRAWN BY: SEG
DESIGNED BY: ACG
P.M REVIEW: BMc
QA/QC REVIEW:
DATE: 04-18-2016
SEAL: DARYL S. KNUP REGISTERED No. PE19900163 STATE OF INDIANA PROFESSIONAL ENGINEER
SIGNATURE:
DATE: 07/07/16

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ACI JOB # 16-0017

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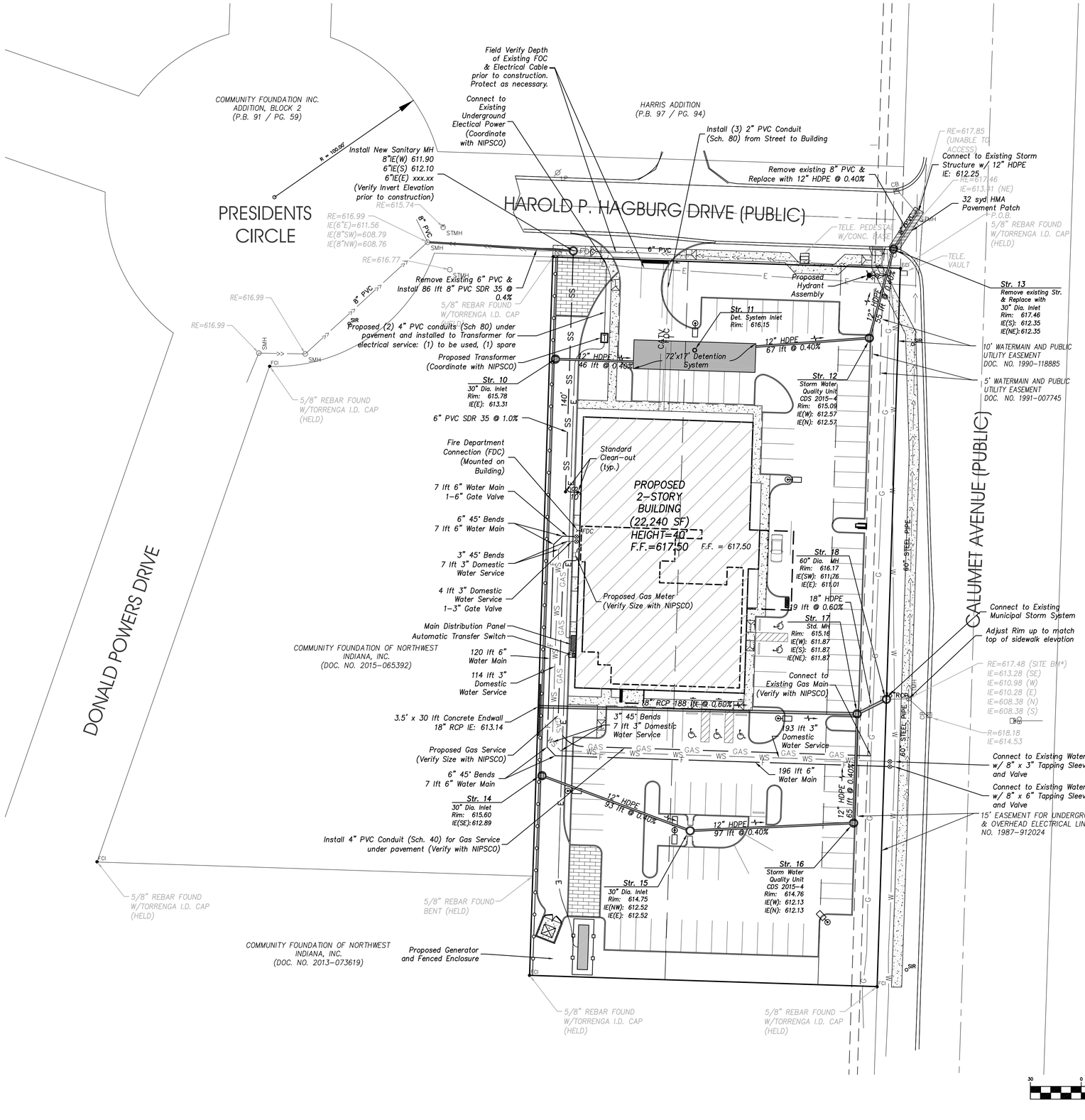

LEGEND:

- = EXISTING CATCH BASIN
- = EXISTING CURB CATCH BASIN
- = EXISTING ELECTRIC LOCATION
- = EXISTING FOUND CAPPED IRON
- = EXISTING GAS LOCATION
- = EXISTING GENERAL MANHOLE
- = EXISTING LIGHT POLE
- = EXISTING SANITARY MANHOLE
- = EXISTING SOIL BORING LOCATION
- = EXISTING STORM MANHOLE
- = EXISTING STREET SIGN
- = EXISTING TELEPHONE PEDESTAL
- = EXISTING WATER LOCATION
- = PROP. LIGHT POLE & LUMINARE
- = PROPOSED ELEC. TRANSFORMER
- = PROPOSED STORM STRUCTURE
- = PROPOSED BUILDING
- = PROPOSED DUMPSTER
- = PROPOSED CONCRETE SIDEWALK
- = EXISTING SANITARY SEWER
- = EXISTING STORM SEWER
- = GAS MAIN/LINE
- = EXISTING BURIED FIBER OPTIC
- = EXISTING BURIED ELECTRICAL
- = BOUNDARY
- = PROPOSED GAS SERVICE LINE
- = PROPOSED BURIED FIBER OPTIC
- = PROPOSED BURIED ELECTRICAL
- = PROPOSED LIVING FENCE
- = PROPOSED 3" DOMESTIC WATER SERVICE
- = PROPOSED 6" WATER (FIRE SUPPRESSION)
- = PROPOSED 6" SANITARY SEWER
- = PROPOSED STORM MH & STORM SEWER FLOW DIRECTION

UTILITIES NOTES

1. Utility Construction and Testing shall be in accordance with the General Construction Specifications for the Town of Munster.
2. Water and sewer pipes shall have a minimum horizontal separation of 10 feet from edge of pipe to edge of pipe. Whenever water pipes must cross above or below sewer pipes, a minimum vertical separation of 18 inches is required between the outside of the water pipe and the outside of the sewer pipe. If this cannot be met, the sewer pipe shall be constructed of water grade pipe meeting AWWA Standards for a distance of 10 feet each side of the water pipe. At crossings, one full length of water pipe shall be installed so that the joints will be as far from the sewer pipe as possible.
3. Contractor shall request utility locates through INDIANA 811 and also contact all Utility companies prior to construction to confirm locations of underground Utilities. Any damages done to any public and/or private properties during construction shall be repaired at the Contractor's expense.
4. All Utilities, such as natural gas, electric, MetroNet and telephone shall be underground and installed within PVC conduit for locations under pavements, sidewalks, and curbs.
5. Contractor shall obtain all necessary project permits from all respective governmental agencies.
6. All backfill for pipe trenches and site grading shall be performed in 6-inch lifts maximum and compacted to 100% Standard Proctor to proposed subgrade. Pipe bedding shall also be in accordance with ASTM D-2321. All testing shall be done by a qualified soil testing firm approved by the owner.
7. Contractor shall verify the water table and include in the bid the cost for dewatering. The water table shall be lowered to 24 inches below the pipe invert prior to installation.
8. Water main and services shall have a minimum cover of 5 feet above the pipe.
9. If there are lawn sprinklers, the main sprinkler service line shall branch off the domestic service inside the building and contain a separate meter.
12. Pipe lengths for sanitary sewer are measured to outside of structure.
13. Paving Contractor is responsible for adjusting all castings located in the pavement to final grade. The Sewer Contractor shall install all castings to within 0.1 feet of finished grade.
14. Contractor shall supply Record Drawings with actual field locations and elevations to the Owner/Developer and Engineer upon completion of work.
15. Contractor shall coordinate with local Utility companies on conduit locations and depths from the street to the building prior to installation.
16. Contractor to verify sanitary lateral locations and depths, and other utility service points at building with architect prior to construction.
17. See Architect's drawings for interior building plumbing plan.
18. Connect roof downspouts to storm sewer.
19. Contractor shall contact Town of Munster Fire Inspector to coordinate water main pressure test. Water main shall be pressure tested per the standards of the Town of Munster Fire Inspector.
20. Contractor shall leave all water main joints exposed until approved by the Town of Munster Fire Inspector. Contractor shall coordinate inspection of water main joints with Fire Inspector.
21. Proposed routing location for electric service, telephone/data, and gas shall be coordinated as required by the local utility provider and approved by the Owner.

NO.	REVISION DESCRIPTION:	BY:	DATE:
2	REVISE LNDSCP. PLAN PER 06/28/16 PLAN COMM., GRD.PL., UTIL.PL.	SEG	07-07-16
1	REVISE LANDSCAPE PLAN, SIDEWALK	SEG	06-08-16

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Lafayette, IN

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F 574.231.4440

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PROJECT:

ARA MUNSTER
10120 CALUMET AVENUE,
MUNSTER, IN

SHEET TITLE:

UTILITIES,
DRAINAGE & STORMWATER
MANAGEMENT
PLAN

DRAWN BY: SEG
DESIGNED BY: SEG
P.M. REVIEW: BMc
QA/QC REVIEW:
DATE: 04-18-2016
SEAL: DARYL S. KNIP REGISTERED No. PE19900163 STATE OF INDIANA PROFESSIONAL ENGINEER
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16-0017

SHEET NO.
C7.0

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PLANT SCHEDULE:

CANOPY AND STREET TREES

QTY	SYM	COMMON NAME	BOTANICAL NAME	SIZE	TYPE	NOTES
3	AS	Green Mountain Sugar Maple	Acer Saccharum 'Green Mountain'	2" CAL	B&B	–
2	GB	Princeton Sentry Ginkgo	Ginkgo biloba 'Princeton Sentry'	2" CAL	B&B	Male Specimen
11	GT	Skyline Honey Locust	Gleditsia triacanthos inermis 'Skycole Skyline'	2" CAL	B&B	–
6	KP	Golden Raintree	Koelreuteria paniculata	2" CAL	B&B	–
1	QR	Northern Red Oak	Quercus rubra	2" CAL	B&B	–
3	TC	Corinthian Littleleaf Linden	Tilia cordata 'Corinthian'	2" CAL	B&B	–

ORNAMENTAL TREES

QTY	SYM	COMMON NAME	BOTANICAL NAME	SIZE	TYPE	NOTES
3	CC	Crusader Thornless Hawthorn	Crateagus crus–galli 'Crusader'	1–1/2" CAL	B&B	Matching
4	MR	Rejoice Crabapple	Malus 'Rejzam' Rejoice	1–1/2" CAL	B&B	Matching

SHRUBS

QTY	SYM	COMMON NAME	BOTANICAL NAME	SIZE	TYPE	NOTES
45	BL	Purple Haze Butterfly Bush	Beddelia X Lo and Behold 'Purple Haze' PP24514	15" HGT	#3 Cont.	–
46	CP	Golden Mop Japanese False Cypress	Chameacyparis pisifera 'Golden Mop'	18" Spread	#3 Cont.	–
9	FM	Large Fothergilla	Fothergilla major	15" HGT	#3 Cont.	–
45	IV	Little Henry Sweetspire	Ilex virginica 'PP 10988 Little Henry'	12" HGT	#3 Cont.	–
55	JC	Sea Green Juniper	Juniperus chinensis 'Sea Green'	24" Spread	#3 Cont.	Plant 4' O/C Max.
41	JCE	Eternal Gold Chinese Juniper	Juniperus chinensis 'Etgozam' Eternal Gold	24" Spread	#3 Cont.	Plant 4' O/C Max.
34	MP	Northern Bayberry	Myrica Pensylvanica	36" HGT	#5 Cont.	Or B&B
14	PO	Summer Wine Ninebark	Physocarpus opulifolius 'PP 14821 Summer Wine'	30" HGT	#5 Cont.	Or B&B
70	SJ	Neon Flash Spiraea	Spiraea japonica 'Neon Flash'	15" HGT	#3 Cont.	–
63	TM	Everlow Yew	Taxus X media 'Everlow'	24" Spread	B&B	Plant 4' O/C Max.
23	VD	Raspberry Tart Arrowwood	Viburnum dentatum 'Raspberry Tart'	24" HGT	#5 Cont.	–
17	VJ	Judd Viburnum	Viburnum X juddi	30" HGT	#5 Cont.	–
24	WF	Wine & Roses Weigela	Weigela florida 'PP 107722 Wine & Roses'	24" HGT	#5 Cont.	–

MB	Shredded Hardwood Mulch Bed	Natural brown, debris–free	C.Y. Quantity Per Contractor	Install 3" depth

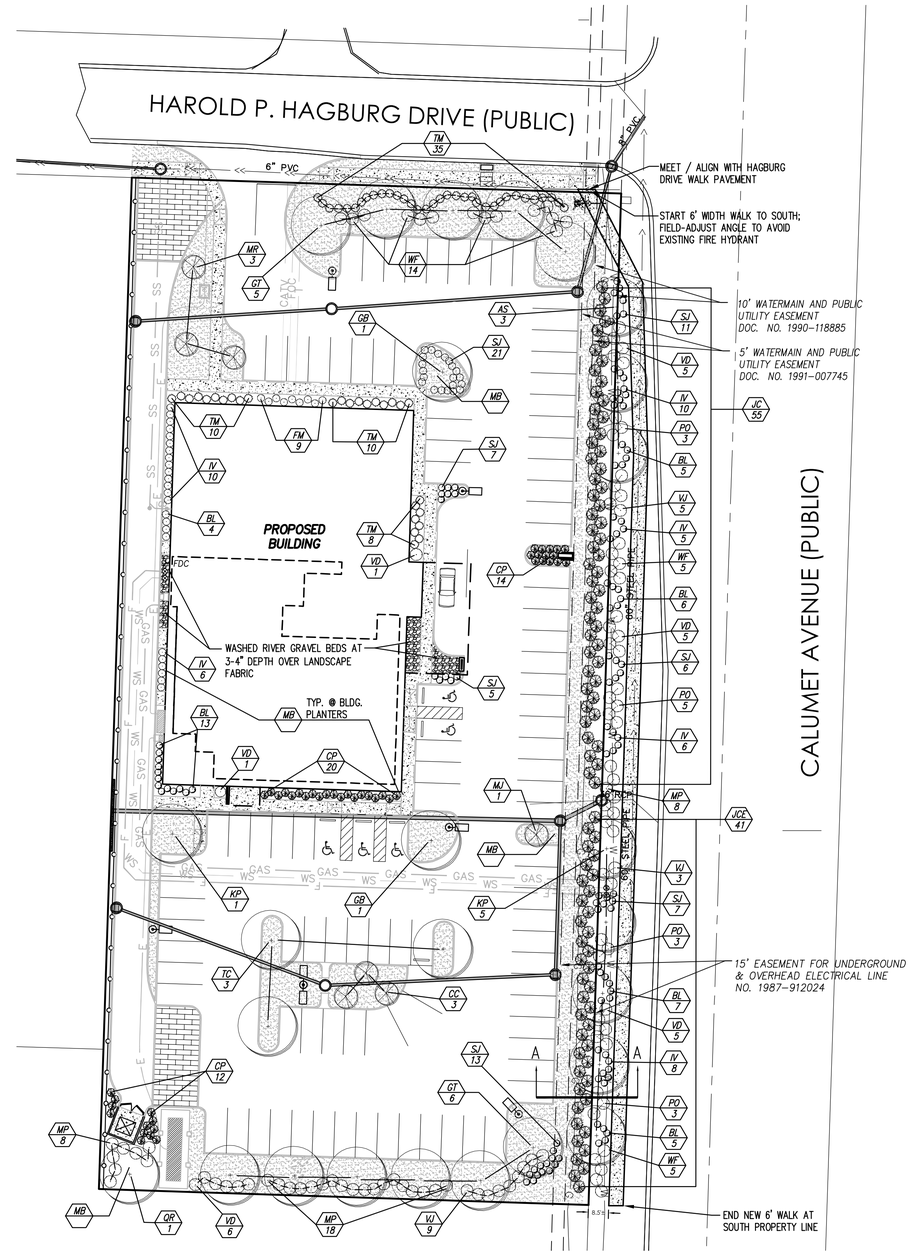
QUANTITIES SHOWN ON THE PLANT LIST ARE FOR CONTRACTOR'S INFORMATION ONLY. IN CASE OF DISCREPANCY, THE ACTUAL COUNT ON THE LANDSCAPE PLAN PREVAILS. WHERE MINIMUM ACCEPTABLE SIZES ARE SHOWN, LARGER SPECIMENS ARE ACCEPTABLE.

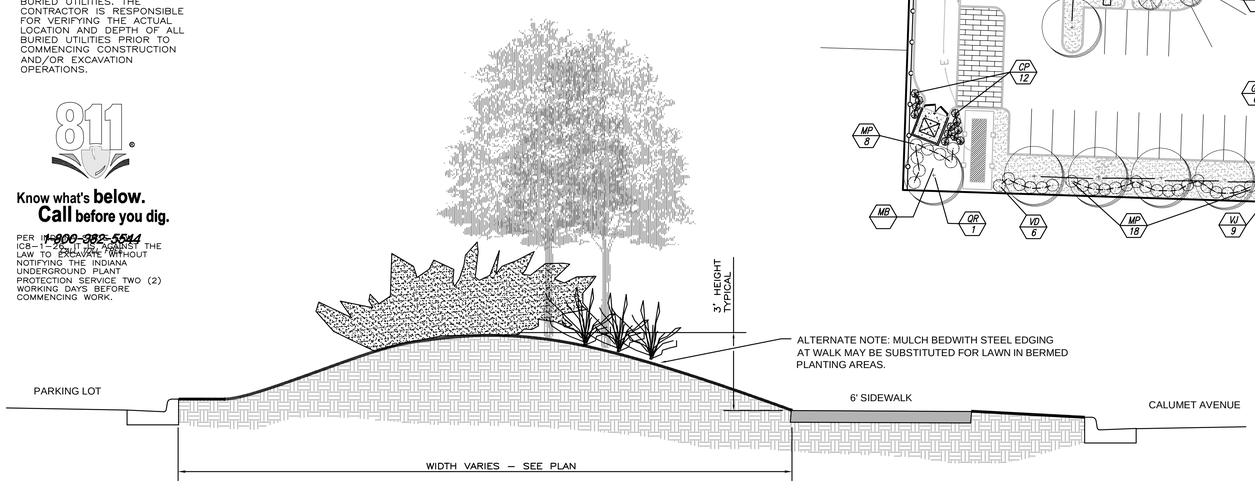
NOTE: THE LOCATION OF BURIED UTILITIES AS SHOWN ON THESE PLANS IS BASED ON A COMBINATION OF ABOVE–GROUND OBSERVED EVIDENCE, PLAN DRAWINGS PROVIDED BY OTHERS, AND ELECTRONIC DATA. IN SOME CASES, LITTLE OR NO EVIDENCE EXISTS REGARDING THE AS–BUILT LOCATION OF BURIED UTILITIES. THE CONTRACTOR IS RESPONSIBLE FOR VERIFYING THE ACTUAL LOCATION AND DEPTH OF ALL BURIED UTILITIES PRIOR TO COMMENCING CONSTRUCTION AND/OR EXCAVATION OPERATIONS.

811

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

PER IC8–1–26, IT IS AGAINST THE LAW TO EXCAVATE WITHOUT NOTIFYING THE INDIANA UNDERGROUND PLANT PROTECTION SERVICE TWO (2) WORKING DAYS BEFORE COMMENCING WORK.





BERM SECTION 'A-A'

NO SCALE

GRAPHIC SCALE

30 0 15 30 60 120

(IN FEET)
1 inch = 30 ft.

LEGEND:

- = EXISTING CATCH BASIN
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- = EXISTING STORM MANHOLE
- = EXISTING STREET SIGN
- = EXISTING TELEPHONE PEDESTAL
- = EXISTING WATER LOCATION
- = PROP. LIGHT POLE & LUMINARE
- = PROPOSED ELEC. TRANSFORMER
- = PROPOSED 30" CURB INLET
- = PROPOSED BUILDING
- = PROPOSED DUMPSTER
- = PROPOSED STAMPED CONCRETE
- = PROPOSED CONCRETE SIDEWALK
- = EXISTING SANITARY SEWER
- = EXISTING STORM SEWER
- = GAS MAIN/LINE
- = EXISTING BURIED FIBER OPTIC
- = EXISTING BURIED ELECTRICAL
- = BOUNDARY
- = PROPOSED GAS SERVICE LINE
- = PROPOSED BURIED FIBER OPTIC
- = PROPOSED BURIED ELECTRICAL
- = PROPOSED LIVING FENCE
- = PROPOSED 3" DOMESTIC WATER SERVICE
- = PROPOSED 6" WATER (FIRE SUPPRESSION)
- = PROPOSED 6" SANITARY SEWER
- = PROPOSED STORM MH & STORM SEWER
- = PROPOSED LAWN (SEED OR SOD PER OWNER)
- = CANOPY TREE
- = ORNAMENTAL TREE
- = DECIDUOUS SHRUB
- = EVERGREEN SHRUB
- = PLANT TAG

NO.	REVISION DESCRIPTION:	BY:	DATE:

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Architects
Land Surveyors
Mechanical Engineers
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Development Service
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South Haven, MI
Buffalo Grove, IL
Benton Harbor, MI
Portage, IN
750 Lincoln Way East
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PROJECT:

ARA MUNSTER
HAROLD P. HAGBURG DR
MUNSTER, IN

SHEET TITLE:

LANDSCAPE PLAN

DRAWN BY: SEG,EJF
DESIGNED BY: SEG,EJF
P.M REVIEW: BMc
QA/QC REVIEW:
DATE: 04-18-2016
SEAL:

SIGNATURE:
DATE:

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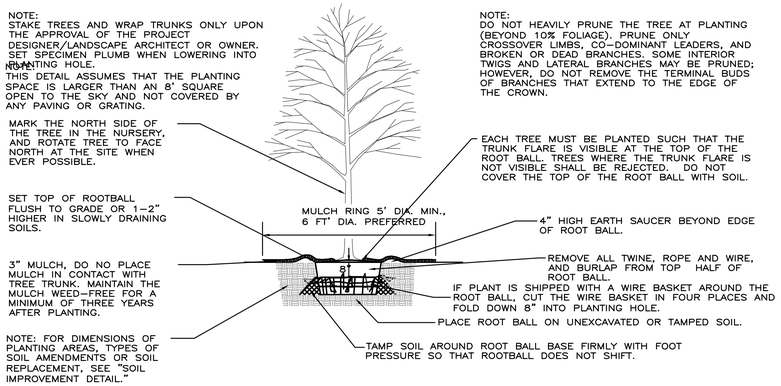
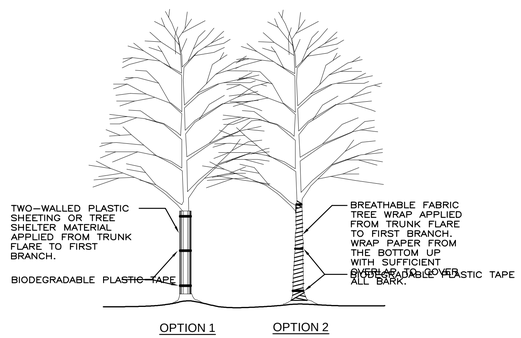


L1 DECIDUOUS TREE PLANTING DETAIL

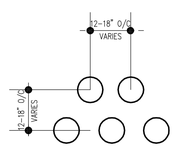
NOT TO SCALE



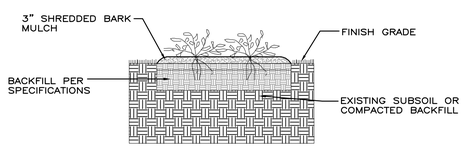
APPLY THE PLASTIC SHEETING LOOSELY AROUND THE TRUNK TO LEAVE A 0.5 INCH GAP BETWEEN THE TRUNK AND THE SHEETING.
TREE WRAP SHOULD BE INSTALLED AT TIME OF PLANTING AND BE REMOVED WHEN DIRECTED BY THE LANDSCAPE ARCHITECT, BUT NO LATER THAN 12 MONTHS AFTER PLANTING.
CONTRACTOR IS RESPONSIBLE FOR REMOVAL OF WRAPPING.

L2 TREE WRAPPING DETAIL

NOT TO SCALE

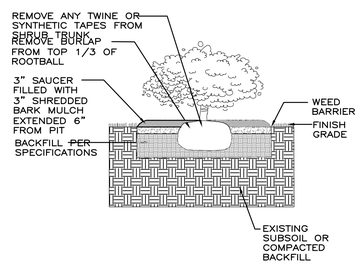


TYPICAL SPACING (SEE PLANS)



L3 GROUNDCOVER/PERENNIAL PLANTING DETAIL

NOT TO SCALE



L4 SHRUB PLANTING DETAIL

NOT TO SCALE

LANDSCAPE NOTES

1. QUANTITIES SHOWN ON THE PLANT LIST ARE FOR CONTRACTOR'S INFORMATION ONLY. IN CASE OF DISCREPANCY, THE ACTUAL COUNT ON THE LANDSCAPE PLAN PREVAILS.
2. ALL PLANT MATERIALS SHALL BE NURSERY GROWN AND SHALL MEET THE LATEST EDITION OF THE "AMERICAN STANDARD FOR NURSERY STOCK". LANDSCAPE ARCHITECT MAY REQUEST A LIST OF NURSERIES WHERE PLANT MATERIAL WAS ACQUIRED FROM.
3. TREE CALIPER SIZE INDICATES THE DIAMETER OF THE TRUNK TAKEN AT 6" ABOVE GROUND LEVEL.
4. ALL TREES TO BE BALLED AND BURLAPPED, UNLESS OTHERWISE NOTED.
5. LANDSCAPE CONTRACTOR IS RESPONSIBLE FOR COORDINATION WITH OTHER WORK FOR PROPER INSTALLATION OF PLANT MATERIALS AND LANDSCAPE WORK.
6. CONTRACTOR IS RESPONSIBLE FOR LOCATING ALL UTILITIES PRIOR TO CONSTRUCTION. ANY DAMAGE DONE TO ANY PUBLIC AND/OR PRIVATE PROPERTIES DURING CONSTRUCTION SHALL BE REPAIRED AT THE CONTRACTOR'S EXPENSE.
7. ALL EXISTING TREES TO REMAIN SHALL BE PROTECTED AND MAINTAINED WITHOUT INJURY AND WITH SUFFICIENT AREA FOR THE ROOT SYSTEM TO SUSTAIN THE TREE. PROTECTIVE CARE AND PHYSICAL RESTRAINT BARRIERS AT THE DRIP LINE, SUCH AS TEMPORARY PROTECTIVE FENCING SHALL BE PROVIDED TO PREVENT ALTERATION, COMPACTION OR INCREASED DEPTH OF THE SOIL IN THE ROOT SYSTEM AREA PRIOR TO AND DURING GROUNDWORK AND CONSTRUCTION. HEAVY EQUIPMENT TRAFFIC AND THE STORAGE OF CONSTRUCTION EQUIPMENT OR MATERIALS SHALL NOT OCCUR WITHIN THE DRIP LINE OF THE TREES. ANY EXISTING LAWN AND PLANTING AREAS DISTURBED DURING CONSTRUCTION TO BE RESTORED.
7. CONTRACTOR TO NOTIFY OWNER IMMEDIATELY OF ANY FOREIGN SUBSTANCE THAT MAY BE DAMAGING TO PLANT MATERIAL, PRIOR TO PLANTING SO THAT ADJUSTMENTS CAN BE MADE.
8. KEEP THE SOIL OF ALL PLANTS MOIST UNTIL THEY ARE PLANTED. CHECK BALLED AND BURLAPPED PLANTS TO ENSURE THEY ARE RECEIVING WATER THROUGH BURLAP MATERIAL. IF PLANTS CANNOT BE PLANTED IMMEDIATELY, ROOTS SHOULD BE HEELED IN AND COVERED WITH MULCH.
9. ALL SOIL PREPARATION OF PLANTING AREAS SHALL BE DONE BY AN EXPERIENCED LANDSCAPE CONTRACTOR.
10. CONDUCT SOIL TEST TO VERIFY FERTILITY OF TOPSOIL. AMEND SOIL IF PH IS LESS THAN 5.5 OR GREATER THAN 7.5. DISCUSS WITH OWNER, PRIOR TO MAKING ANY OTHER ADJUSTMENTS THE SOIL ANALYSIS INDICATES.
11. TOPSOIL TO BE 4" MIN DEPTH IN ALL LAWN AREAS. TOPSOIL TO BE CLEAN FRIABLE LOAM FROM LOCAL SOURCE, FREE FROM STONES OR DEBRIS OVER 3/4" DIA, AND FREE FROM HERBICIDES OR OTHER TOXINS.
12. PLANTING MIX TO BE 18" MINIMUM DEPTH IN ALL PLANTING BEDS AND CONSIST OF 2/3 TOPSOIL, 1/3 PEAT MOSS AND FERTILIZER. MIX IN WITH NATIVE SOIL AT BASE OF DEPTH.
13. APPLY PRE–EMERGENT HERBICIDE TO ALL LANDSCAPE BEDS.
14. LANDSCAPE BEDS SHALL HAVE A CLEAN LINED SPADED NATURAL EDGE AND RECEIVE 3" THICK, DARK BROWN SHREDDED HARDWOOD MULCH. ALL TREES NOT WITHIN LANDSCAPE BEDS ARE TO RECEIVE A SPADED NATURAL "V" EDGED HARDWOOD MULCH RING 4' RADIUS AND 3" THICK.
15. INSTALL PLANTS SO THAT THEY ARE SET PLUMB IN A LEVEL PIT BASE AND THE TOP OF ROOT BALL IS EVEN WITH FINISHED GRADE. FOR BACKFILL AREAS, PLANT ROOT BALL UP TO 3" HIGH TO ALLOW FOR SETTLING.
16. CONTRACTOR SHALL PROVIDE A TWO YEAR STRAIGHTENING GUARANTEE IN LIEU OF STAKING TREES AND A ONE YEAR GUARANTEE FOR ALL PLANT MATERIALS FROM THE DATE OF INSTALLATION.
17. PRIOR TO WRAPPING, THE TREE TRUNKS SHALL BE INSPECTED BY OWNER. ALL TREE WRAP/TWINE ETC. SHALL BE REMOVED FROM THE TREE IN ONE (1) YEAR AS PART OF MAINTENANCE.
18. ALL LAWN AREAS TO BE HYDROSEEDED. ANY OTHER AREAS DISTURBED DURING CONSTRUCTION TO BE RESTORED. PROVIDE ALTERNATE PRICE FOR SODDING IN LIEU OF HYDROSEEDING.
19. IRRIGATE ALL PLANTING AND LAWN AREAS PER OWNER'S DIRECTION. A PERMANENT BELOW GROUND, FULLY AUTOMATIC IRRIGATION SYSTEM IS TO BE PROVIDED ON A DESIGN–BUILD BASIS TO IRRIGATE 100% OF THE LANDSCAPE AREAS.
20. FIELD–MODIFY PLANTING LOCATIONS AS NEEDED TO AVOID OVERHEAD AND UNDERGROUND UTILITIES AND SWALES.

ZONING SUMMARY:

C–1 DISTRICT	REQUIRED	PROPOSED
26–1303(1)(a) Parkway Planting:	1 Tree per 30 feet	Harold P. Hagburg Drive: (COMPLY) Calumet Avenue: **Waiver Proposed**– Utility Easements along Calumet Avenue
26–1303(3)(a) Parking Lot Internal Planting:	10% of total parking lot area	(COMPLY)
26–1303(3)(b) Parking Lot Internal Tree Ratio:	One tree per 125 SF of internal landscape area	(COMPLY)

LANDSCAPE ARCHITECT STATEMENT:

The undersigned landscape architect, registered in the State of Indiana, ackowledges that the landscape planting plan and construction details shown on the attached landscape plan for the property located at the southwest corner of the intersection of Harold P. Hagburg Drive and Calumet Avenue, Town of Munster, Indiana has been designed in accordance with the requirements of the Town of Munster Municipal Code, the landscaping standards of the Town of Munster Zoning Ordinance, and the Guide to the Town of Munster Landscape Ordinances.

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South Haven, MI
Kalamazoo, MI
Benton Harbor, MI
Portage, IN

PROJECT:

ARA MUNSTER
HAROLD P. HAGBURG DR
MUNSTER, IN

SHEET TITLE:

LANDSCAPE PLAN
DETAILS AND NOTES

DRAWN BY: SEG,EJF
DESIGNED BY: SEG,EJF
P.M REVIEW: BMc
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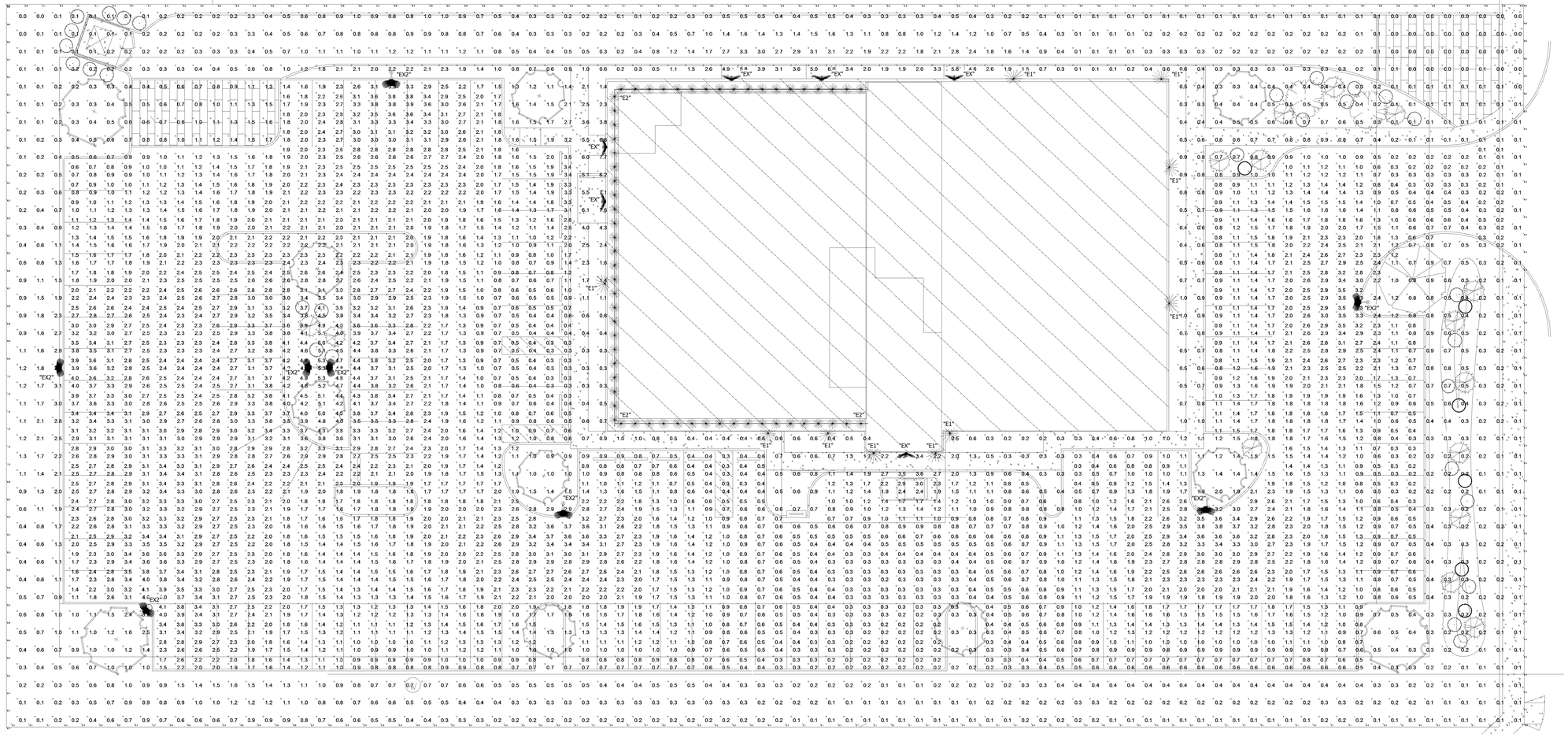

1 ME10 **Photometric Plan**
SCALE: NTS

NORTH

7/6/2016 11:33:36 AM

3" = 1'-0" 1 1/2" = 1'-0" 3/4" = 1'-0" 1/4" = 1'-0" 1/8" = 1'-0"

PULSE

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AMERICANRENAL® associates

MWI MEDICAL GROUP
American Renal Associates
9201 Calumet Avenue
Munster, IN 46321

DRAWN:	CAB
CHECKED:	TPM
DATE:	05/20/16
JOB #:	94504-16

#	REVISION	DATE

ME10
PHOTOMETRIC SITE PLAN

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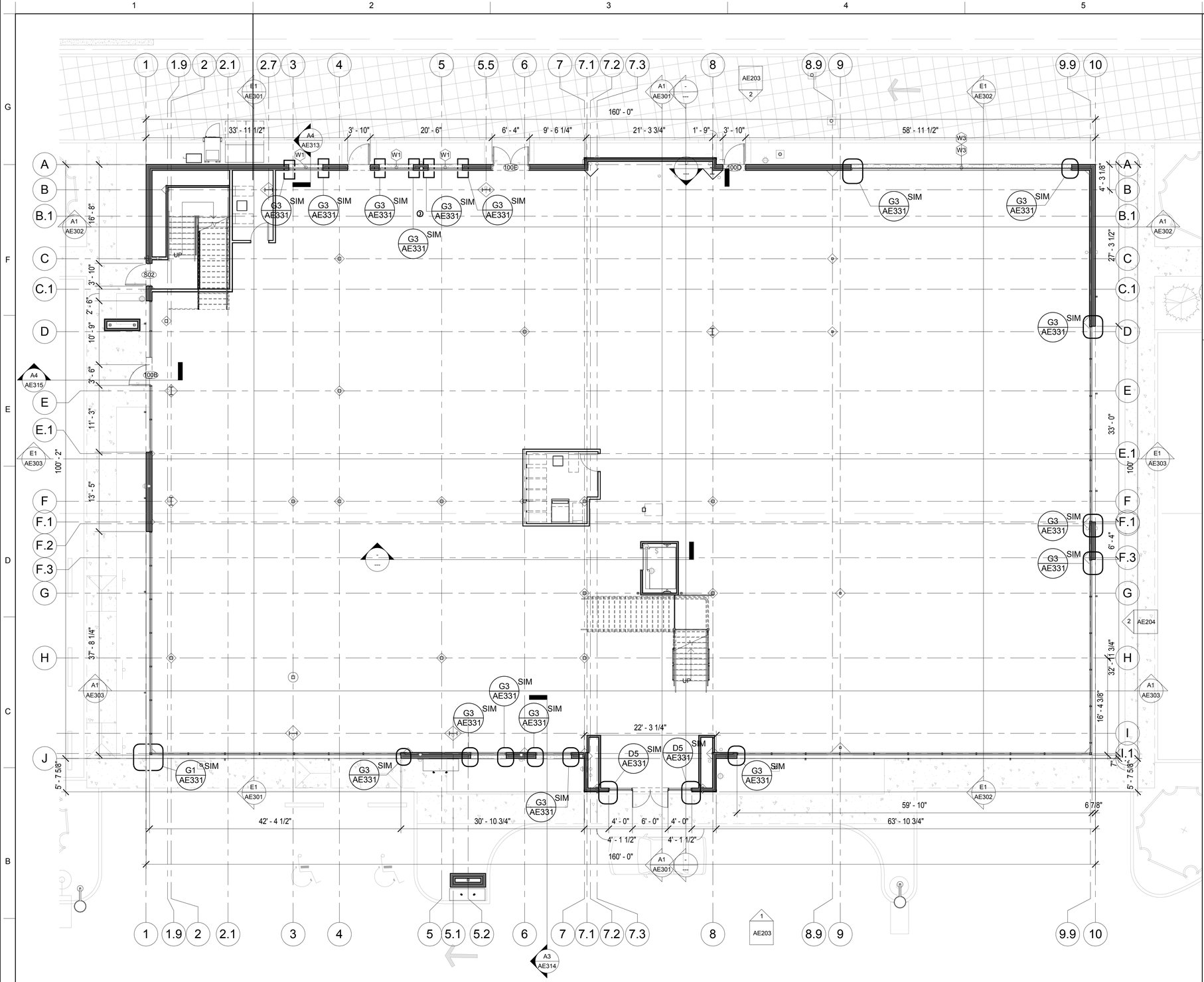

SHELL PLAN LEGEND

- ST-4: 3-5/8" METAL STUD WALL WITH STONE VENEER
- CM-4: 3-5/8" METAL STUD WALL WITH CORRUGATED METAL SIDING
- LB-4: 3-5/8" DOUBLE METAL STUD WALL WITH LONGBOARD SIDING
- CW-5: NEW STOREFRONT OR WINDOW
- NEW DOOR & FRAME
- COLUMN PER STRUCTURAL

SHELL PLAN 1ST FLOOR

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

PLAN NORTH

3" = 1'-0" 1 1/2" = 1'-0" 3/4" = 1'-0" 1/4" = 1'-0" 1/8" = 1'-0"

7/6/2016 11:14:14 AM

PULSE

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ARA MUNSTER, IN - SHELL
Plan Commission Submittal

MUNSTER, IN

DRAWN:	Author
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DATE:	07.07.16
JOB #:	16002

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AE001

PROPOSED SHELL PLAN 1ST FLOOR

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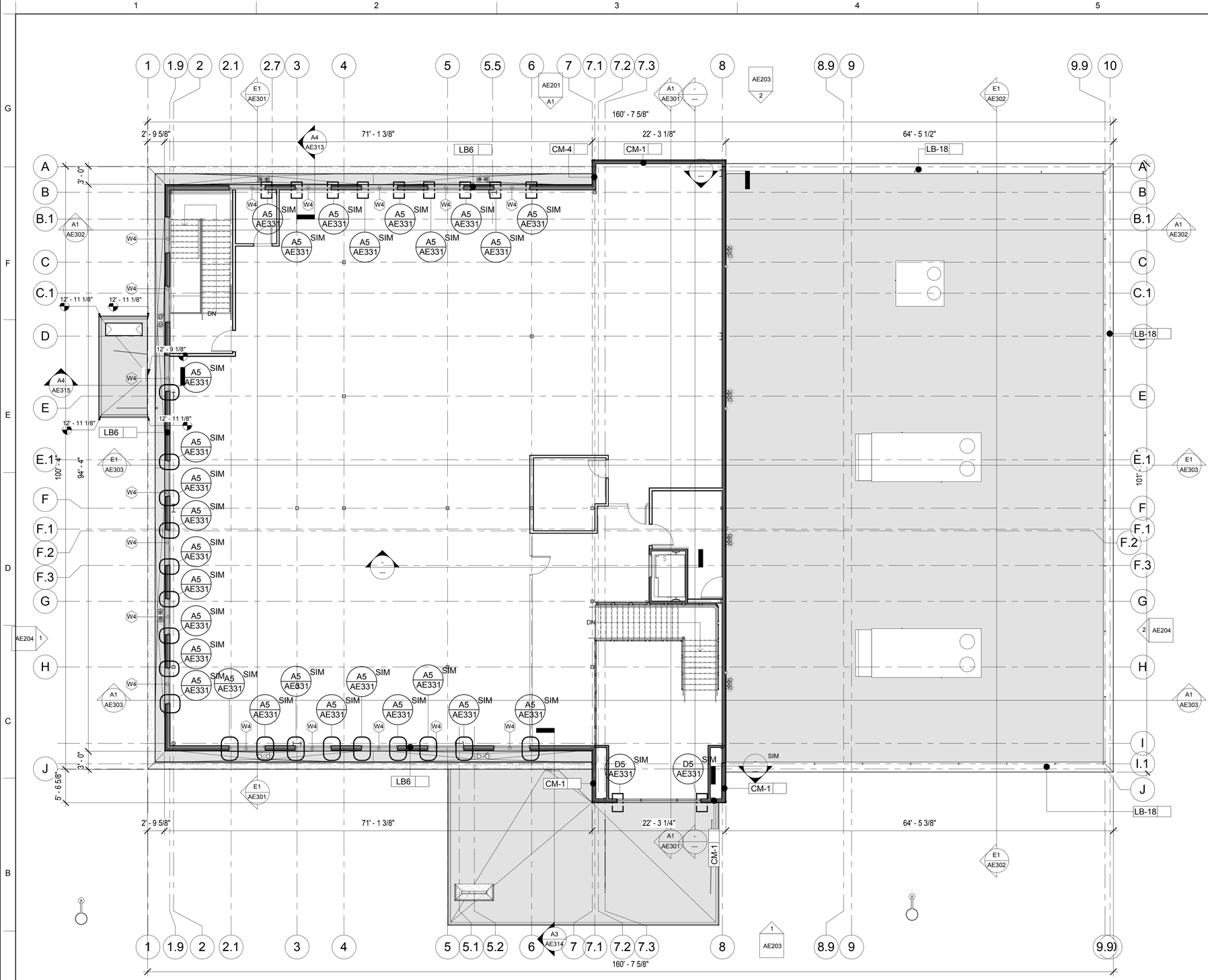

SHELL PLAN LEGEND

- ST-4: 3-5/8" METAL STUD WALL WITH STONE VENEER
- CM-4: 3-5/8" METAL STUD WALL WITH CORRUGATED METAL SIDING
- LB-4: 3-5/8" DOUBLE METAL STUD WALL WITH LONGBOARD SIDING
- CW-5: NEW STOREFRONT OR WINDOW
- NEW DOOR & FRAME
- COLUMN PER STRUCTURAL

SHELL PLAN 2ND FLOOR

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

PLAN NORTH

3" = 1'-0" | 1 1/2" = 1'-0" | 3/4" = 1'-0" | 1/4" = 1'-0" | 1/8" = 1'-0"

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MUNSTER, IN

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AE002

PROPOSED SHELL PLAN 2ND FLOOR

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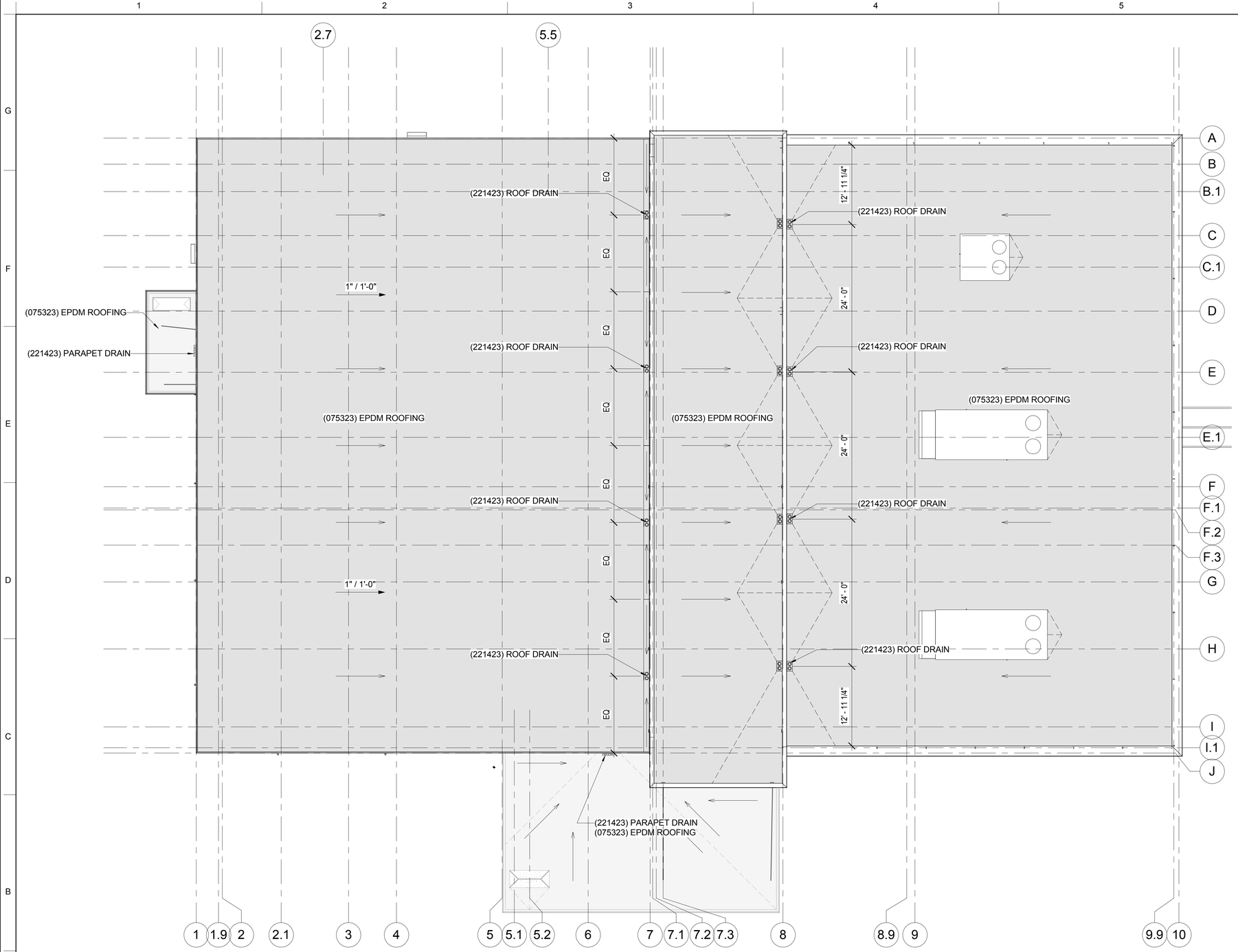

ROOF PLAN

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

ROOF GENERAL NOTES

1 ALL ROOF DETAILS TO BE FROM MANUFACTURER'S STANDARD, WARRANTABLE DETAILS

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ROOF PLAN

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3" = 1'-0" 0' 3" 6" 1'

1 1/2" = 1'-0" 0' 3" 6" 1' 2'

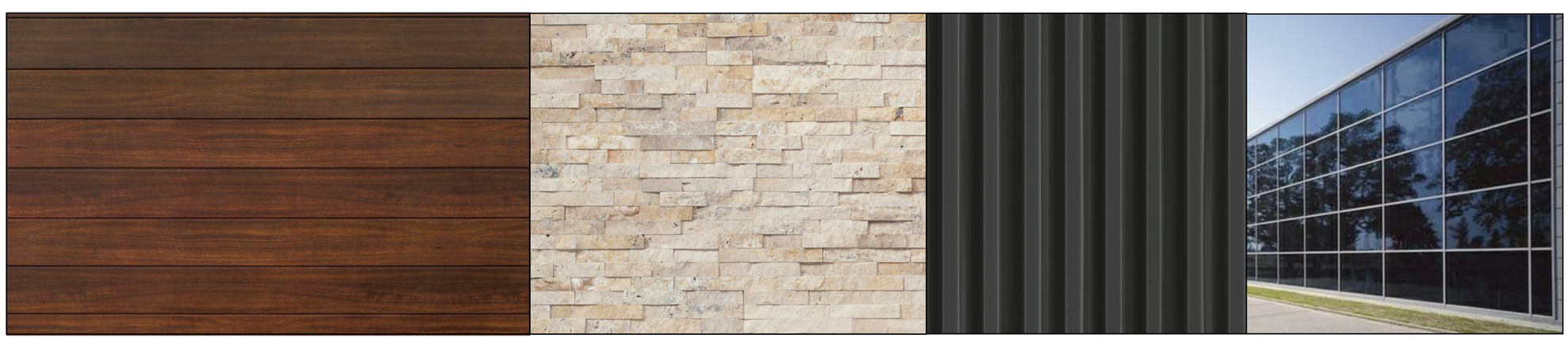
3/4" = 1'-0" 0' 6" 1' 2' 4'

1/4" = 1'-0" 0' 1' 2' 4' 8' 16'

1/8" = 1'-0" 0' 2' 4' 8' 16' 32'

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

2 WEST ELEVATION
1/8" = 1'-0"



LONGBOARD ALUMINUM SIDING - TABLE WALNUT FINISH | INDIANA LIMESTONE - ROCK FACE | CORRUGATED METAL SIDING - CHARCOAL | CLEAR ANODIZED ALUMINUM WITH BLUE TINED GLAZING

3" = 1'-0" 0' 3" 6" 1'
1 1/2" = 1'-0" 0' 3" 6" 1' 2'
3/4" = 1'-0" 0' 6" 1' 2' 4'
1/4" = 1'-0" 0' 1' 2' 4' 8' 16'
1/8" = 1'-0" 0' 2' 4' 8' 16' 32'

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AE203
COLOR ELEVATIONS

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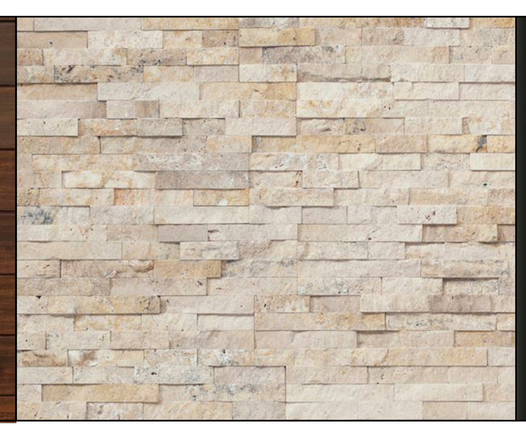
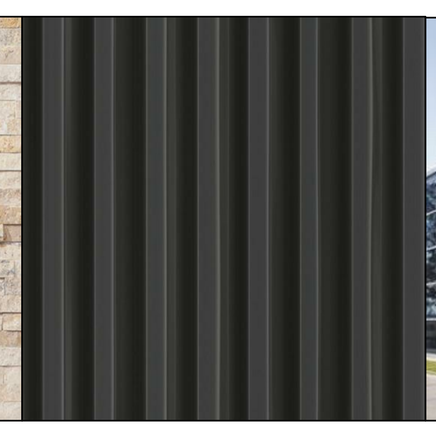
1 SOUTH ELEVATION
1/8" = 1'-0"

2 NORTH ELEVATION
1/8" = 1'-0"

LONGBOARD ALUMINUM SIDING - TABLE WALNUT FINISH



INDIANA LIMESTONE - ROCK FACE



CORRUGATED METAL SIDING - CHARCOAL

CLEAR ANODIZED ALUMINUM WITH BLUE TINED GLAZING

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1 1/2" = 1'-0" 0' 3" 6" 1' 2'
3/4" = 1'-0" 0' 6" 1' 2' 4'
1/4" = 1'-0" 0' 1' 2' 4' 8' 16'
1/8" = 1'-0" 0' 2' 4' 8' 16' 32'

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AE204
COLOR ELEVATIONS

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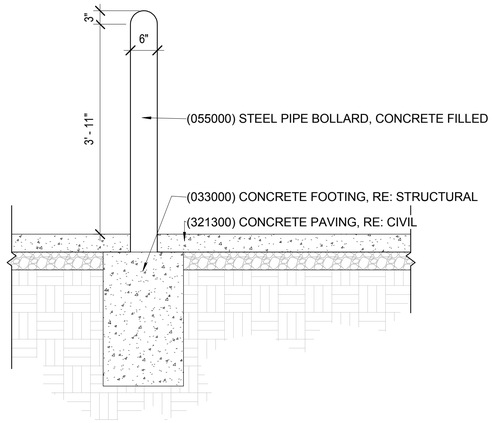
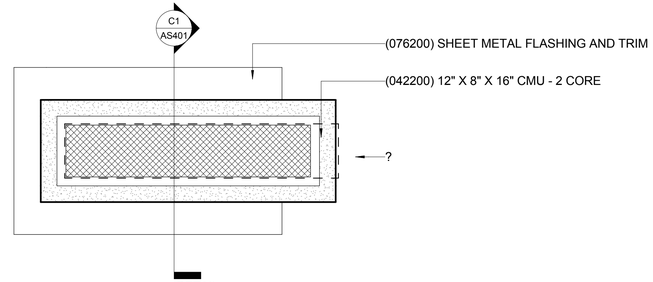
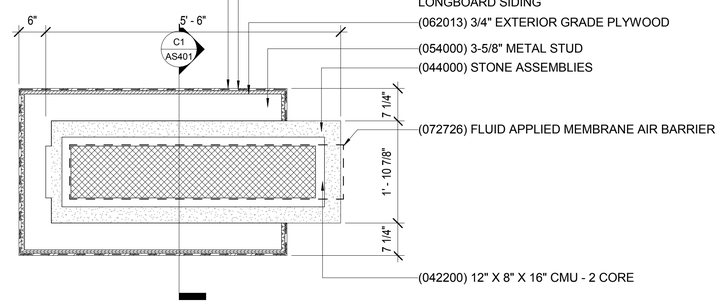


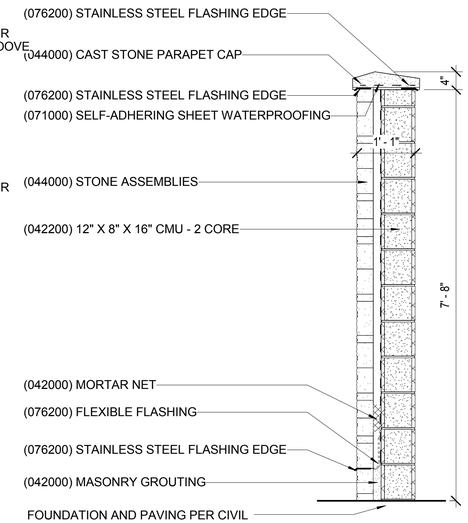
F1 BOLLARD DETAIL
3/4" = 1'-0"



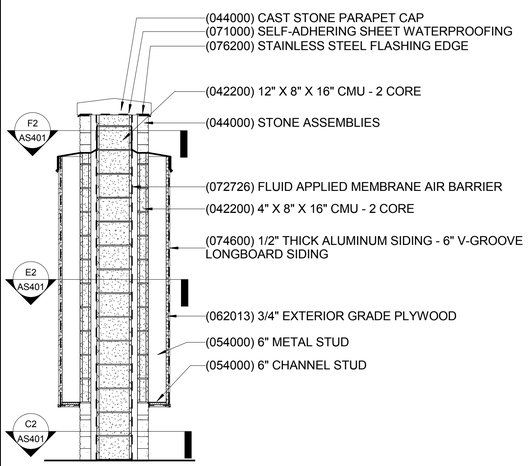
F2 DETAIL
3/4" = 1'-0"



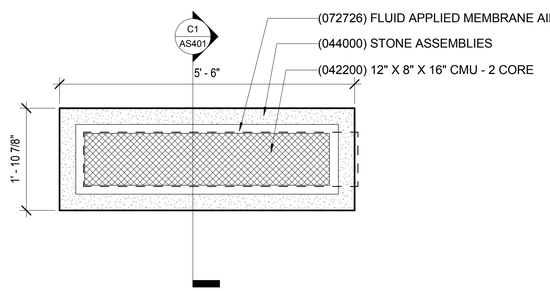
E2 DETAIL - MONUMENT SIGN - PLAN - MIDDLE
3/4" = 1'-0"



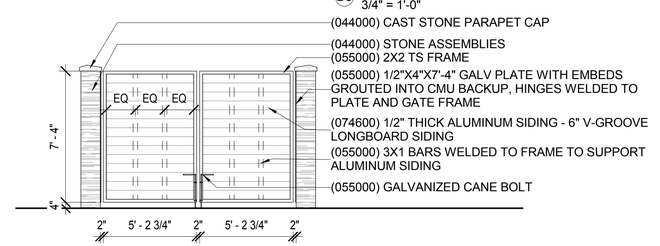
D5 SECTION
3/4" = 1'-0"



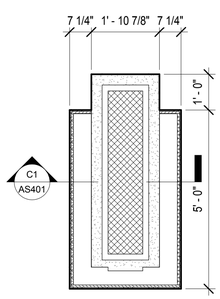
C1 SECTION - MONUMENT SIGN - LAT
1/2" = 1'-0"



C2 DETAIL
3/4" = 1'-0"

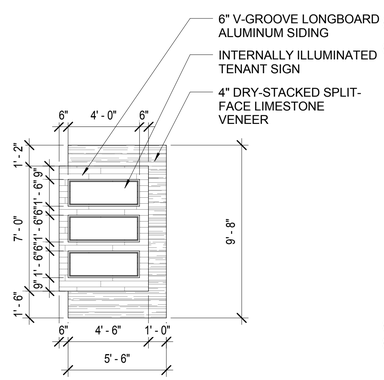


C4 TRASH ENCLOSURE GATE
1/4" = 1'-0"

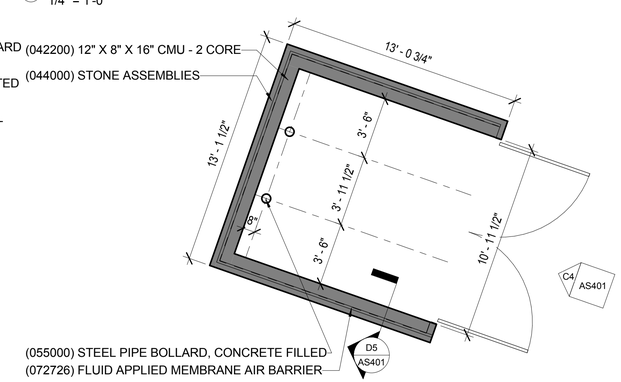


1 MONUMENT SIGN PLAN DETAIL
1/2" = 1'-0"

NOTE: FINAL SIGN SIZE TO BE COORDINATED AND APPROVED BY AUTHORITIES HAVING JURISDICTION PRIOR TO FABRICATION.



A2 MONUMENT SIGN ELEV.
1/4" = 1'-0"



A4 DUMPSTER ENCLOSURE
1/4" = 1'-0"

3" = 1'-0" 0' 3" 6" 1'
1 1/2" = 1'-0" 0' 3" 6" 1' 2'
3/4" = 1'-0" 0' 6" 1' 2' 4'
1/4" = 1'-0" 0' 1' 2' 4' 8' 16'
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ARA MUNSTER, IN - SHELL
MUNSTER, IN

DRAWN:	Author
CHECKED:	Checker
DATE:	07.07.16
JOB #:	16002

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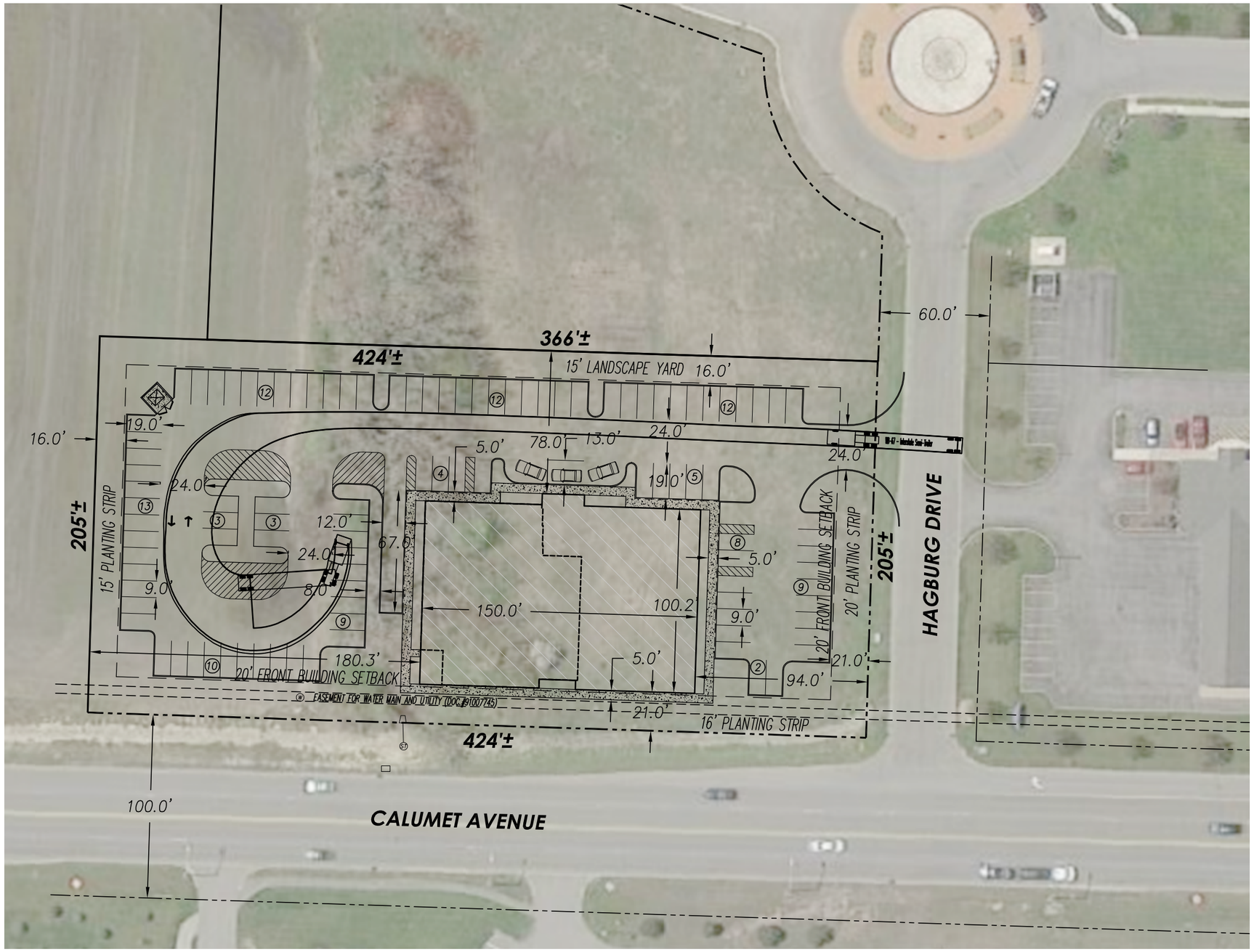
AS401
DUMPSTER / GENERATOR ENCLOSURE DETAILS



GENERAL NOTES:

1. Parcel ID: 45-06-36-426-006.000-027 (2.06± Acres)
2. Current Zoning: "C-1" Highway Oriented General Business District
3. Existing Land Use: Vacant
   Proposed Land Use: Medical Clinic (Permitted)
   Offices (Permitted)
4. The project shall be serviced by Town of Munster sanitary sewer and water.
5. Minimum Building setbacks shown are in accordance with the "C-1" Highway Oriented General Business District, Town of Munster Zoning Ordinance.
6. Proposed parking areas shall be paved and privately owned.
7. References:
   i) Architectural Sheets AE-001, AE-002, AE-121, AE-203 & AE-204 dated 04/18/2016 by Richard L. Embers, R.A. of PULSE DESIGN GROUP.
   ii) Report Geotechnical Engineering Exploration, File 11611, dated 02/05/2016, by K & S Engineers, Inc.
   iii) ALTA/NSPS Land Title Survey, Sheet 1 of 1, dated 03/22/2016 by Scott M. Gregory, P.L.S. of Abonmarche Consultants, Inc.
8. Public Service Notes:
   A. No additional parkland proposed or required.
   B. No Rights-of-Way or Easements proposed or required.
   C. Harold P. Hagburg Drive and Calumet Avenue are public streets.

FLOOR AREA OF BUILDING BY USE:

Medical Clinic (Main Floor):	15,055 sq. ft.
Offices (Second Floor):	7,185 sq. ft.
Total:	22,240 sq. ft.

ZONING SUMMARY:

C-1 DISTRICT (Sec. 206-601)	REQUIRED	PROPOSED
206-602(1)(c) Min. Front Building Setback:	20 feet	21 feet (COMPLY)
206-602(1)(d) Min. Front Planting Strip:	20 feet	**16 feet (Variance Required)**
206-602(1)(f) Min. Rear Planting Strip:	15 feet	16 feet (COMPLY)
206-602(2)(c) Min. Rear Yard:	80 feet (*1)	**78 feet (Variance Required)**
206-602(3)(c) Min. Side Yard: (Facing an existing Street)	10% (of Lot Width) (405'x10%=40.5')	180.3 feet (COMPLY)
206-602(3)(c) Min. Side Planting Strip: (Facing an existing Street)	10 feet	21 feet (COMPLY)

(*1): In addition to all other requirements, there shall be a minimum rear yard of at least two feet in the least dimension for each one foot of height of the building, but not less than 15 feet.

Sec. 26-603 Height Regulations: Maximum Building Height:	50 feet	40 feet (COMPLY)
Sec. 26-605 Min. Frontage:	75 feet	424 feet (COMPLY)
Sec. 26-606 Maximum Floor Area & Lot Coverage: Maximum Floor Area:	3 x (Lot Area) Lot Area: 87,121 sf = 3 x (87,121 sf) = 261,363 sf	22,719 sf (COMPLY)
Sec. 26-606 Maximum Lot Coverage:	70% of Lot Area = 0.70 x 87,121 sf = 60,985 sf	15,053 sf (COMPLY)

PARKING CALCULATIONS

Parking Requirement:

Medical Clinic: 5.7 spaces per 1,000 SF of Floor Area
5.7 spaces x (15,055 / 1000) = 85.8 (86) spaces

Offices: 3.3 spaces per 1000 SF of Floor Area
3.3 spaces x (7,185 / 1,000) = 23.7 (24) spaces

Total Required: 86 + 26 = 110

Parking Provided: **102 spaces** (9.0' x 19.0') – Includes 5 ADA Spaces (1 Van Accessible Req'd)

(Hence, Parking Variance Required)

Note, too, many parking spaces are "compromised" by path of tractor trailer making deliveries once or twice per week.

GRAPHIC SCALE

60 0 30 60 120

(IN FEET)
1 inch = 60 ft.

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South Bend, IN 46601
T 574.237.9940
F 574.237.4440

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PROJECT:
ARA
CALUMET AVE/HAGBURG DR
MUNSTER, INDIANA

SHEET TITLE:
CONCEPT "B"

DRAWN BY: SEG
DESIGNED BY: BMc
PM REVIEW: BMc
QA/QC REVIEW:
DATE: 07/07/16
SEAL:
SIGNATURE:
DATE:
SCALE:
HORZ: 1" = 60'
VERT: n/a
ACI JOB #
P16-0017
SHEET NO.
1 of 1

Abonmarche - July 07, 2016 - 11:19am

Drainage and Storm Water Management Plan Report

FOR

ARA Munster

10120 Calumet Avenue
Munster, Indiana 46628

Date: July 8, 2016

Prepared for:

TRK Construction Company
8350 N. St. Clair Avenue
Kansas City, MO 64151

Prepared By:

Abonmarche Consultants, Inc.
750 Lincoln Way East
South Bend, IN 46601
Tel: (574) 232-8700

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I. NATURAL RESOURCES ASSESSMENT 1
II. ESTIMATION OF STORM WATER RUNOFF 1
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V. HYDRAULIC GRADIENT COMPUTATIONS 2
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Exhibits

Exhibit “A” – Drainage Maps & Computations
Exhibit “B” – Storm Sewer Design Computations
Exhibit “C” – Storm Water Quality Units

I. NATURAL RESOURCES ASSESSMENT

a. As illustrated on "Site Improvement Plans for ARA Munster – Existing Conditions Map", drawing C1.0, dated 04/18/16 and last revised on 07/07/16 by Abonmarche Consultants, Inc., the site consists of a vacant lot with an existing, manmade drainage ditch. The ditch flows west to east across the site across the site and is approximately 290 feet south of Hagburg Drive.

II. ESTIMATION OF STORM WATER RUNOFF

a. See enclosed "Exhibit 'A' – Drainage Maps and Computations" for plans showing the existing time of concentration segments and site catchment areas. See "Exhibit B – Storm Sewer Design Computations" for storm sewer design calculations.

b. Weighted runoff coefficient calculations:

i. Drainage Area 1:

Total Area	=	1.97 acres	
Building Area	=	0.37 acres	(c = 0.85)
Impervious Area	=	1.14 acres	(c = 0.85)
Open Area	=	0.46 acres	(c = 0.15)

$$\text{Modified C} = \frac{(0.37 \times 0.85) + (1.14 \times 0.85) + (0.46 \times 0.15)}{1.97}$$

$$= \underline{\mathbf{0.69}}$$

(Note: The runoff coefficient c-values for surface types were taken from the definition of *"Affected stormwater runoff area"* in Section 58-162 of the Munster, Indiana – Code of Ordinances.)

c. Time of Concentration (Tc) Computations:

i. See enclosed "Exhibit A" for a map illustrating the storm water runoff course through the existing site along with a copy for TR-55 Worksheet 3 for time of concentration computations.

III. CLOSED CONDUIT AND OPEN CHANNEL DESIGN COMPUTATIONS

a. See enclosed "Exhibit 'B' – Storm Sewer Design Computations" for a spreadsheet showing computed values for:
   i. Size of pipe
   ii. Pipe inverts
   iii. Roughness Coefficients
   iv. Flow Velocities
   v. Design Capacities
   vi. Detention System Storage Computations
   vii. Computations for peak discharge from vacant lot to the west and 18-inch culvert capacity to replace ditch

IV. HEAD LOSS COMPUTATIONS IN MANHOLES AND JUNCTION CHAMBERS

a. See "Exhibit 'B' – Storm Sewer Design Computations" for our Structure Data Table

V. HYDRAULIC GRADIENT COMPUTATIONS

a. See "Exhibit 'B' – Storm Sewer Design Computations" for our Structure Data Table

VI. EROSION CONTROL METHODS

a. Silt fence will be utilized to prevent sedimentation from leaving the boundaries of the site via runoff from sheet flow.

b. Storm sewer inlet protection will be utilized during construction to prevent sedimentation from entering the storm sewer system.

VII. BEST MANAGEMENT PRACTICES (BMPs) COMPUTATIONS

a. See "Exhibit 'C' – Storm Water Quality Units" for computations for SQU sizing.

VIII. DRAINAGE NARRATIVE

Under existing conditions, the site sheet flows into the existing drainage ditch. The ditch flows from west to east into an existing 36-inch pipe which drains into the municipal storm sewer system. The existing municipal storm sewer system consists of a series of 72-inch pipes which flow from south to north along Calumet Avenue, per the "Town of Munster Stormwater Utilities" map. The municipal storm sewer ultimately discharges into Maynard Lake, approximately 2,100 feet northeast of the project site, per the town utility map.

Under post-developed conditions, storm water runoff will be collected onsite thru the proposed storm sewer system which consists of storm sewer inlets, pipes and curb turn-outs. The storm sewer system will have to points in which the site will discharge into the municipal storm sewer. One connection will be at the northern end of the site at the intersection of Hagburg Drive and Calumet Avenue. The site plans propose to replace the existing inlet structure located in the south radius of Hagburg Drive with an new 30-inch diameter inlet, and replace the existing 8-inch PVC pipe with a 12-inch HDPE pipe to connect to the existing storm structure in the center of the approach for Hagburg Drive. A detention system is also proposed in the northern portion of the site with a capacity to detain approximately 2,600 cft of storm water runoff. This capacity is approximately the difference between the preconstruction and post-construction peak discharge for a 10 year storm event. See "Exhibit B" for computations regarding peak discharges and detention system sizing. Runoff from the southern half of the site will discharge into the municipal storm sewer via the existing 36-inch pipe which will be reset to produce inverts that will yield positive drainage into the municipal storm sewer. The existing drainage ditch will be filled in to allow for construction of the proposed parking lot and sidewalks. An 18-inch culvert pipe at will be installed under the proposed parking lot in lieu of the drainage ditch to allow for runoff from the ditch to still connect to the municipal storm sewer. The vacant lot west of the proposed project will result in a peak discharge of approximately 1.25 cfs, while the 18-inch pipe has a capacity of approximately 8.16 cfs (See "Exhibit B" for computations).

Discharge of storm water runoff leaving the site will be treated by two storm water quality units (SQU), one unit located in the north half of the site and the other located in the south have of the site. All runoff from pavement areas will pass through one of the two SQU's. It is intended that the north half of the building rooftop runoff will flow thru the northern SQU, while the south half of the building's rooftop runoff will connect directly into the 18-inch storm sewer pipe that will replace the ditch. Other than the small section of rooftop runoff, all other hard

surface areas will have runoff treated by the two SQU's (See "Exhibit C – Storm Water Quality Units" for sizing and treatment calculations).

Exhibit "A"

Drainage Maps & Computations

GRAPHIC SCALE

60 0 30 60 120

(IN FEET)
1 inch = 60 ft.

NO.	REVISION DESCRIPTION:	BY:	DATE:

ABONMARCHE
Confidence By Design
750 Lincoln Way East
South Bend, IN 46601
T 574.232.8700
F 574.251.4440
Portage, IN
Benton Harbor, MI
Manistee, MI
South Haven, MI
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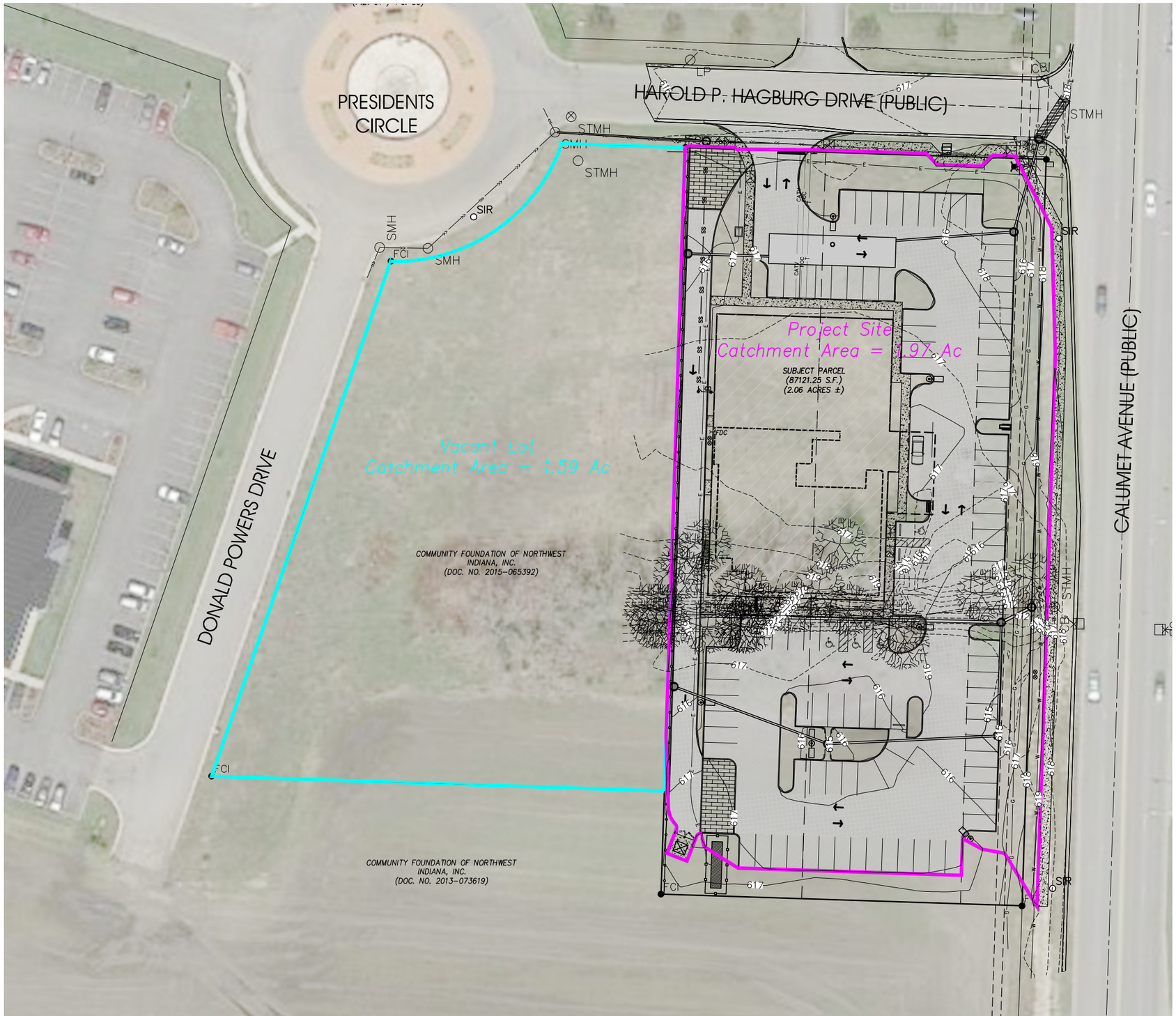
PROJECT:
ARA MUNSTER

SHEET TITLE:
EXHIBIT "A" - EXISTING TIME OF CONCENTRATION

DRAWN BY: AKG
DESIGNED BY: AKG
PM REVIEW: BCM
QA/QC REVIEW:
DATE: 07-07-16
SCALE:
HORZ: 1" = 60'
VERT: N/A
ACI JOB # 16-0017
SHEET NO.
EXHIBIT "A"
SHEET 1 OF 3

O:\Projects\2016\16-0017 TRK, ARA Munster\CAD_Civil\Exhibits\2016-07-07 SWM Exhibits.dwg, 24x36 (2), 7/7/2016 5:53:53 PM, Tabloid, 1:1



GRAPHIC SCALE

60 0 30 60 120

(IN FEET)
1 inch = 60 ft.

NO.	REVISION DESCRIPTION:	BY:	DATE:

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PROJECT:
ARA MUNSTER

SHEET TITLE:
EXHIBIT "A" - PROPOSED CATCHMENT AREAS

DRAWN BY: AKG
DESIGNED BY: AKG
PM REVIEW: BCM
QA/QC REVIEW:
DATE: 07-07-16
SCALE: HORZ: 1" = 60' VERT: N/A
ACI JOB # 16-0017
SHEET NO. EXHIBIT "A" SHEET 2 OF 3

O:\Projects\2016\16-0017 TRK, ARA MunsterCAD_Civil\Exhibits\2016-07-07 SWM Exhibits.dwg, 24x36 (3), 7/7/2016 5:53:09 PM, Tabloid, 1:1

Worksheet 3: Time of Concentration (T_c) or travel time (T_t)

Project	By	Date
ARA MUNSTER	AKG	7/7/16
Location	**Checked**	**Date**
HAGBURG DR. + CALUMET AVE MUNSTER, IN		

Check one: ☒ Present ☐ Developed

Check one: ☐ T_c ☒ T_t through subarea

Notes: Space for as many as two segments per flow type can be used for each worksheet.
Include a map, schematic, or description of flow segments.

Sheet flow (Applicable to T_c only)

	Segment ID		
1. Surface description (table 3-1)	T_1		
2. Manning's roughness coefficient, n (table 3-1)	DENSE GRASS		
3. Flow length, L (total L ≤ 300 ft) ft	0.24		
4. Two-year 24-hour rainfall, P_2 in	104		
5. Land slope, s ft/ft	2.96		
6. $T_t = \frac{0.007\ (nL)^{0.8}}{P_2^{0.5}\ s^{0.4}}$ Compute T_t hr	0.01		
	0.34	+	= 0.34

Shallow concentrated flow

	Segment ID		
7. Surface description (paved or unpaved)			
8. Flow length, L ft			
9. Watercourse slope, s ft/ft			
10. Average velocity, V (figure 3-1) ft/s			
11. $T_t = \frac{L}{3600\ V}$ Compute T_t hr			
		+	=

Channel flow

	Segement ID		
12. Cross sectional flow area, a ft^2	T_2	T_3	
13. Wetted perimeter, p_w ft	25.20	7.07	
14. Hydraulic radius, $r = \frac{a}{p_w}$ Compute r ft	17.85	9.42	
15 Channel slope, s ft/ft	1.41	0.75	
16. Manning's roughness coefficient, n	0.01	0.002	
17. $V = \frac{1.49\ r^{2/3}\ s^{1/2}}{n}$ Compute V ft/s	0.035	0.013	
18. Flow length, L ft	5.35	4.23	
19. $T_t = \frac{L}{3600\ V}$ Compute T_t hr	325	13.45	
	0.017	+ 0.0009	= 0.02
20. Watershed or subarea T_c or T_t (add T_t in steps 6, 11, and 19) Hr			0.36

Exhibit "B"

Storm Sewer Design Computations

STRUCTURE DATA TABLE

STORM SEWER SIZED FOR A 10 YEAR, 30 MINUTE STORM EVENT

Structure					Structure	Structure	Total Area	Cumulative	Cumulative	Intensity	Q Req'd	Length	Pipe Dia.	Slope	Q Prov'd	Velocity	Upper	Lower	Pipe Dia.	Downstream	Rim	Rim	Pavement	Cover	Cover	Structure	Outlet
Number	Downstream	Rim	Area (sft)	Area (Ac.)	C	CA	(Ac.)	C	CA	(in/hr)	(cfs)	(feet)	(inches)	(ft/100 ft)	(cfs)	(ft/sec)	I.E.	I.E.	Change, Drop	Str. Drop	Up	Down	Depth	Up	Down		
10	11	615.78	4973.00	0.11	0.60	0.07	0.11	0.61	0.07	3.20	0.22	46	12	0.40	2.26	2.9	613.31	613.13	0.00	0.29	615.78	616.15	0.00	1.24	1.79	Std. 30" Dia. Inlet	Str 11
11	12	616.15	16621.00	0.38	0.75	0.29	0.50	0.73	0.36	3.20	1.15	67	12	0.40	2.26	2.9	612.84	612.57	0.00	0.00	616.15	615.09	0.00	2.08	1.29	Std. 30" Dia. Inlet	Str 12
12	13	615.09	13198.00	0.30	0.57	0.17	0.80	0.66	0.53	3.20	1.70	55	12	0.40	2.26	2.9	612.57	612.35	0.00	0.00	615.09	617.46	0.00	1.29	3.88	SQU	Str 13
13	EX. MH	617.46	0.00	0.00	0.00	0.00	0.80	0.66	0.53	3.20	1.70	25	12	0.40	2.26	2.9	612.35	612.25	0.00	0.00	617.46	617.85	0.00	3.88	4.37	Std. 30" Dia. Inlet	EX. MH
14	15	615.60	4901.00	0.11	0.68	0.08	0.11	0.71	0.08	3.20	0.26	93	12	0.40	2.26	2.9	612.89	612.52	0.00	0.00	615.60	614.75	0.00	1.48	1.01	Std. Manhole	Str 15
15	16	614.75	18916.00	0.43	0.77	0.33	0.55	0.75	0.41	3.20	1.31	97	12	0.40	2.26	2.9	612.52	612.13	0.00	0.00	614.75	614.76	0.00	1.01	1.40	Std. 30" Dia. Inlet	Str 16
16	17	614.76	8474.00	0.19	0.54	0.11	0.74	0.70	0.52	3.20	1.66	65	12	0.40	2.26	2.9	612.13	611.87	0.00	0.00	614.76	615.16	0.00	1.40	2.06	SQU	Str 17
17	18	615.16	18548.00	0.43	0.72	0.31	1.17	0.71	0.83	3.20	2.66	19	18	0.60	8.16	4.6	611.87	611.76	0.00	0.75	615.16	616.17	0.00	1.52	2.64	Std. Manhole	Str 18
18	EX. MH	616.17	0.00	0.00	0.00	0.00	1.17	0.71	0.83	3.20	2.66	13	36	0.20	29.91	4.2	611.01	610.98	0.00	0.00	616.17	617.48	0.00	1.77	3.11	60" Dia. Manhole	EX. MH

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Job 16-0017 EXHIBIT "B"
Sheet No. SHEET 2 OF 5 of
Calculated by AKG Date 7/6/16
Checked by Date
Scale

REQ'D STORAGE

PRE CONSTRUCTION PEAK FLOW

t_c = 0.36 hrs (SEE EXHIBIT "A" SHEET 1 FOR TIME OF CONCENTRATION MAP AND TR-55 WORKSHEET 3 FOR T_c COMPUTATIONS)

USE i FOR 10yr 20 min STORM EVENT

TOTAL AREA OF PRENT WATERSHED: $\frac{164,546 \text{ ft}}{43,560}$ = 3.78 AC

C = 0.20 FOR ENTIRE CONTRIBUTING AREA

Q = (0.20)(3.92)(3.78) = 2.96 cfs

VOLUME = (2.96 cfs)(20 min)(60 sec/min) = 3,552 cft

POST CONSTRUCTION t_c = 15 min

Q = CiA = (0.69)(4.64)(4.97) USE i FOR 10yr 15 min STORM TO MA

Q = 6.31 cfs

VOLUME = (6.31)(15 min)(60 sec/min) = 5,679 cft

Δ VOL = 5,679 - 3,552 = 2,127 cft

PROVIDE STORAGE FOR ΔVOL = 2,500 cft

CONTECH ENGINEERED SOLUTIONS

Detention or Infiltration System Designer

EXHIBIT "B"
SHEET 3 OF 5

Design

DYODS #:	855
System Description:	System 1 - North Parking Lot
Project:	ARA Munster
Application:	Infiltration (Perforated CMP)
Created:	07/07/2016
Modified:	07/07/2016

System Selection

Application:	Infiltration
System:	CMP - Perforated w/ Stone Backfill

Structural Backfill Detail

Stone Porosity:	40 %
Width At Ends:	12 in
Above Pipe:	6 in
Width At Sides:	12 in
Below Pipe:	6 in

Design Parameters

Storage Volume:	2,500 cf
Limiting Length:	75 ft
Limiting Width:	24 ft
Pavement Type:	Flexible Pavement
Pavement Depth:	4 in
Freeboard Depth:	0 in
Invert Depth:	612.98 ft

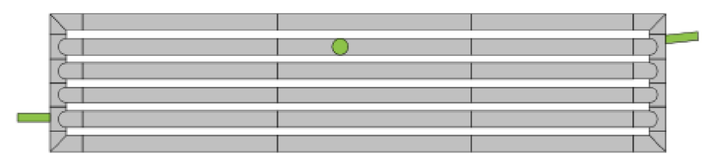
Pipe Detail

Material:	Steel
Shape:	Round
Size:	24 in
Corrugation:	2-2/3" x 1/2"
Gage:	16
Pipe Spacing:	12 in
Coating:	Aluminized Steel Type 2 (ALT2)
Layout:	Single Manifold

Calculations (Your design differs from our calculations.)

Status:	OK
Barrel Count:	6
CMP Footprint (LxW):	72 x 17 ft
Length Per Barrel:	70 ft
Length Per Header:	17 ft
Pipe Storage:	~~1,372~~ **1,517** cf
Structural Backfill Zone Storage:	1,138 cf
Total Storage Provided:	~~2,510~~ **2,655** cf
Percent Of Required Storage:	100.44 %
Total CMP Footage:	437 ft
Approximate CMP Piece Count:	~~19~~ **20**
Approximate Coupling Bands:	~~18~~ **19**
Approximate Truckloads:	~~1~~ **0**
Total Excavation:	31,947 cy
Structural Backfill:	105 cy
Pavement Volume:	17 cy
Remaining Backfill To Pavement:	31,773 cy

Draftboard



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Job 16-0017 EXHIBIT "B"
Sheet No. of SHEET 4 OF 5
Calculated by AKG Date 7/7/16
Checked by Date
Scale

RUNOFF TO DITCH (LOT WEST OF PROJECT SITE)

CATCHMENT AREA FOR VACANT LOT TO 18" CULVERT PIPE $= \frac{69,165 \text{ s/f}}{43,560} = 1.59 \text{ Ac}$

C = 0.2 FOR ENTIRE CONTRIBUTING AREA

MODIFIED $C = \frac{(0.2)(1.59)}{1.59} = \underline{0.20}$

$t_c = 0.35$ hrs (SEE EXHIBIT "B" SHEET 5 FOR Tc COMPUTATIONS)

USE 10 YR. 20 min STORM

$Q = CiA = (0.20)(3.92)(1.59)$

$\boxed{Q = 1.25 \text{ cfs}}$

CAPACITY OF 18" PIPE @ 0.60%

$V = \frac{1.49\left(\frac{D}{4}\right)^{2/3} S^{1/2}}{n}$ $n = 0.013$ $A = \pi(0.75)^2 = 1.77 \text{ ft}^2$

$= \frac{1.49\left(\frac{1.5}{4}\right)^{2/3}(0.006)^{.5}}{0.013} = 4.62 \text{ ft/s}$

$Q = VA = (4.62)(1.77) = \underline{8.16 \text{ cfs}}$ $\underline{Q_{PIPE} > Q_{SITE}}$

Worksheet 3: Time of Concentration (T_c) or travel time (T_t)

Project	By	Date
ARA MUNSTER	AKG	7/7/16
Location	**Checked**	**Date**
LOT WEST OF PROJECT SITE		

Check one: ☒ Present ☐ Developed

Check one: ☒ T_c ☐ T_t through subarea

Notes: Space for as many as two segments per flow type can be used for each worksheet. Include a map, schematic, or description of flow segments.

Sheet flow (Applicable to T_c only)

	Segment ID		
1. Surface description (table 3-1)	DENSE GRASS		
2. Manning's roughness coefficient, n (table 3-1)	0.24		
3. Flow length, L (total L ≤ 300 ft) ft	104		
4. Two-year 24-hour rainfall, P_2 in	2.96		
5. Land slope, s ft/ft	0.01		
6. $T_t = \frac{0.007\ (nL)^{0.8}}{P_2^{0.5}\ s^{0.4}}$ Compute T_t hr	0.34	+	= 0.34

Shallow concentrated flow

	Segment ID		
7. Surface description (paved or unpaved)			
8. Flow length, L ft			
9. Watercourse slope, s ft/ft			
10. Average velocity, V (figure 3-1) ft/s			
11. $T_t = \frac{L}{3600\ V}$ Compute T_t hr		+	=

Channel flow

	Segement ID		
12. Cross sectional flow area, a ft^2	T_2		
13. Wetted perimeter, p_w ft	25.20		
14. Hydraulic radius, $r = \frac{a}{p_w}$ Compute r ft	17.85		
15 Channel slope, s ft/ft	0.71		
16. Manning's roughness coefficient, n	0.01		
17. $V = \frac{1.49\ r^{2/3}\ s^{1/2}}{n}$ Compute V ft/s	0.035		
18. Flow length, L ft	3.39		
19. $T_t = \frac{L}{3600\ V}$ Compute T_t hr	120		
	0.01	+	= 0.01

20. Watershed or subarea T_c or T_t (add T_t in steps 6, 11, and 19) Hr 0.35

Exhibit "C"

Storm Water Quality Units

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Job 16-0017 ARA MUNSTER
Sheet No. ____ of ____
Calculated by AKG Date 7/6/16
Checked by ____ Date ____
Scale ____

STORM WATER QUALITY UNITS

BMP Str. 12

TOTAL CATCHMENT AREA = 34,000 sft => 0.78 Ac

TOTAL BLDG AREA = 8,082 sft => 0.19 Ac

TOTAL HARD SURFACE = 17,377 sft => 0.40 Ac

TOTAL OPEN AREA = 0.80 - 0.19 - 0.40 = 0.19 Ac

$$\text{MODIFIED } C = \frac{(0.19)(0.96) + (0.4)(0.90) + (0.21)(0.20)}{0.78} = 0.74$$

BMP Str. 16

TOTAL CATCHMENT AREA = 30,563 sft => 0.70 Ac

TOTAL HARD SURFACE AREA = 25,231 sft => 0.58 Ac

TOTAL OPEN SPACE = 0.70 - 0.58 = 0.12 Ac

$$\text{MODIFIED } C = \frac{(0.58)(0.90) + (0.12)(0.20)}{0.70} = 0.78$$

Hydrodynamic Separation Product Calculator

ARA Munster

Str. 12

CDS 2015-4

EXHIBIT "C"
SHEET 2 OF 9

Project Information					
Project Name	ARA Munster			**Option #**	A
Country	US	**State**	Indiana	**City**	Munster

Contact Information			
First Name	Andrew	**Last Name**	Gebhard
Company		**Phone #**	574-203-9522
Email	agebhard@abonmarche.com		

Design Criteria					
Site Designation	Str. 12			**Drainage Area (ac)**	0.78
Runoff Coefficient	0.74	**TC (Min)**	5	**Peak Flow (cfs)**	2.26
Screening Required?	No	**Pipe Invert Depth (ft)**	0 - 5	**Bedrock Depth (ft)**	>15
Groundwater Depth (ft)	10 - 15	**Grate Inlet Required?**	Yes	**Pipe Size (in)**	12
Multiple Inlets?	No	**180° between inlet and outlet?**	No	**90° between two inlets?**	N/A
Required Particle Size Distribution?	No	**Rainfall Station**	54 - Chicago O'Hare Airport, IL		

Treatment Selection					
Treatment Unit	CDS	**System Model**	2015-4		
Target Removal	80.00%	**Mean Particle Size (microns)**	125	**Predicted Net Annual Removal**	87.86%

Hydrodynamic Separation Product Calculator

ARA Munster

Str. 12

CDS 2015-4

EXHIBIT "C"
SHEET 3 OF 9

CDS ESTIMATED NET ANNUAL SOLIDS LOAD REDUCTION BASED ON THE RATIONAL RAINFALL METHOD								
Rainfall Intensity[1] (in/hr)	% Rainfall Volume[1]	Cumulative Rainfall Volume	Rainfall Volume Treated	Total Flowrate (cfs)	Treated Flowrate (cfs)	Operating Rate (%)	Removal Efficiency (%)	Incremental Removal (%)
0.0200	10.60%	10.60%	10.60%	0.0115	0.0115	1.64%	100.00%	10.60%
0.0400	9.05%	19.65%	9.05%	0.0231	0.0231	3.30%	100.00%	9.05%
0.0600	8.92%	28.57%	8.92%	0.0346	0.0346	4.94%	100.00%	8.92%
0.0800	7.61%	36.18%	7.61%	0.0462	0.0462	6.60%	100.00%	7.61%
0.1000	6.84%	43.02%	6.84%	0.0577	0.0577	8.24%	99.76%	6.82%
0.1200	3.66%	46.68%	3.66%	0.0693	0.0693	9.90%	99.43%	3.64%
0.1400	3.92%	50.60%	3.92%	0.0808	0.0808	11.54%	99.10%	3.88%
0.1600	4.27%	54.87%	4.27%	0.0924	0.0924	13.20%	98.77%	4.22%
0.1800	2.90%	57.77%	2.90%	0.1039	0.1039	14.84%	98.44%	2.85%
0.2000	2.80%	60.57%	2.80%	0.1154	0.1154	16.49%	98.11%	2.75%
0.2500	6.46%	67.03%	6.46%	0.1443	0.1443	20.61%	97.29%	6.28%
0.3000	4.12%	71.15%	4.12%	0.1732	0.1732	24.74%	96.46%	3.97%
0.3500	4.38%	75.53%	4.38%	0.2020	0.2020	28.86%	95.64%	4.19%
0.4000	1.76%	77.29%	1.76%	0.2309	0.2309	32.99%	94.81%	1.67%
0.4500	2.88%	80.17%	2.88%	0.2597	0.2597	37.10%	93.99%	2.71%
0.5000	1.87%	82.04%	1.87%	0.2886	0.2886	41.23%	93.16%	1.74%
0.7500	5.92%	87.96%	5.92%	0.4329	0.4329	61.84%	89.04%	5.27%
1.0000	3.60%	91.56%	3.60%	0.5772	0.5772	82.46%	84.91%	3.06%
1.5000	5.57%	97.13%	4.50%	0.8658	0.7000	100.00%	65.81%	3.67%
2.0000	2.85%	99.98%	1.73%	1.1544	0.7000	100.00%	49.36%	1.41%
0.0000	0.00%	99.98%	0.00%	0.0000	0.0000	0.00%	100.00%	0.00%
0.0000	0.00%	99.98%	0.00%	0.0000	0.0000	0.00%	100.00%	0.00%
0.0000	0.00%	99.98%	0.00%	0.0000	0.0000	0.00%	100.00%	0.00%
0.0000	0.00%	99.98%	0.00%	0.0000	0.0000	0.00%	100.00%	0.00%
								94.31%
							Removal Efficiency Adjustment2 =	6.45%
							Predicted % Annual Rainfall Treated =	91.34%
							Predicted Net Annual Load Removal Efficiency =	87.86%
1 - Based on 10 years of hourly precipitation data from NCDC Station 1549, Chicago O'Hare WSO Airport, Cook County, IL								
2 - Reduction due to use of 60-minute data for a site that has a time of concentration less than 30-minutes.								

2. The contractor shall fill all voids associated with lifting provisions provided by the manufacturer. These voids shall be filled with non-shrinking grout providing a finished surface consistent with adjacent surfaces. The contractor shall trim all protruding lifting provisions flush with the adjacent concrete surface in a manner, which leaves no sharp points or edges.

3. The contractor shall removal all loose material and pooling water from the SWTD prior to the transfer of operational responsibility to the Owner.

TABLE 1
Storm Water Treatment Device
Hydraulic and Storage Capacities

CDS Model	Treatment Capacity (cfs)/(L/s)	Minimum Sump Storage Capacity (yd^3)/(m^3)	Minimum Oil Storage Capacity (gal)/(L)
CDS2015-G	0.7 (19.8)	0.5 (0.4)	70 (265)
CDS2015-4	0.7 (19.8)	0.5 (1.4)	70 (265)
CDS2015	0.7(19.8)	1.3 (1.0)	92 (348)
CDS2020	1.1 (31.2)	1.3 (1.0)	131 (496)
CDS2025	1.6 (45.3)	1.3 (1.0)	143 (541)
CDS3020	2.0 (56.6)	2.1 (1.6)	146 (552)
CDS3030	3.0 (85.0)	2.1 (1.6)	205 (776)
CDS3035	3.8 (106.2)	2.1 (1.6)	234 (885)
CDS4030	4.5 (127.4)	5.6 (4.3)	407 (1540)
CDS4040	6.0 (169.9)	5.6 (4.3)	492 (1862)
CDS4045	7.5 (212.4)	5.6 (4.3)	534 (2012)
CDS2020-D	1.1 (31.2)	1.3 (1.0)	131 (495)
CDS3020-D	2.0 (56.6)	2.1 (1.6)	146 (552)
CDS3030-D	3.0 (85.0)	2.1 (1.6)	205 (776)
CDS3035-D	3.8 (106.2)	2.1 (1.6)	234 (885)
CDS4030-D	4.5 (127.4)	4.3 (3.3)	328 (1241)
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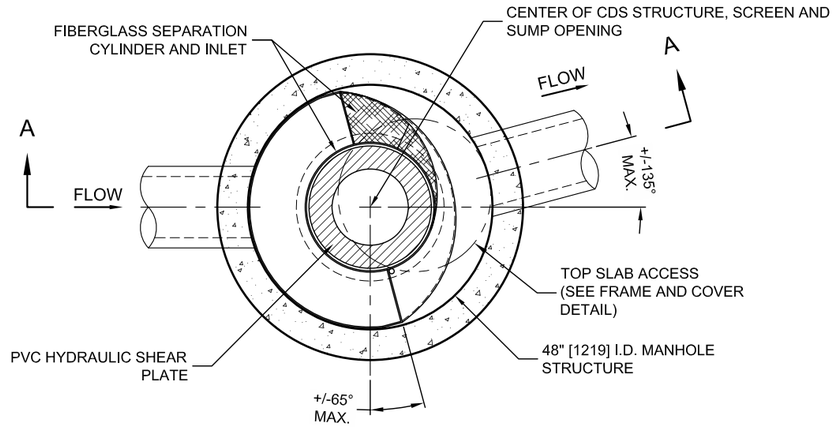
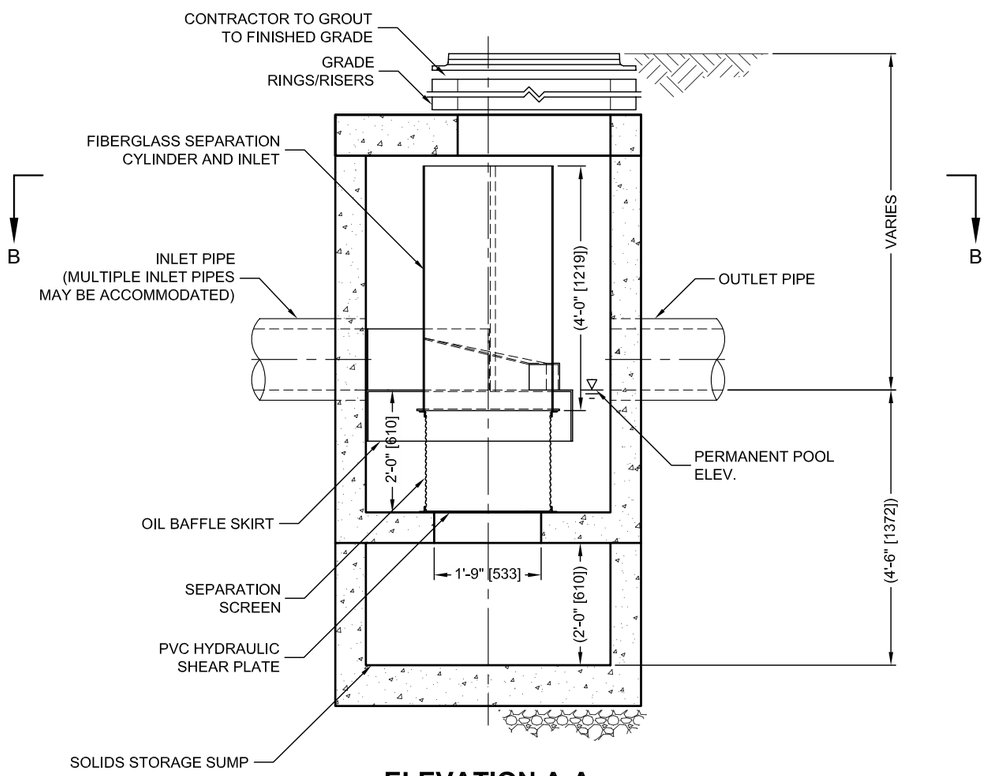
END OF SECTION

EXHIBIT "C"
SHEET 5 OF 9



PLAN VIEW B-B
N.T.S.



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CDS2015-4-C DESIGN NOTES

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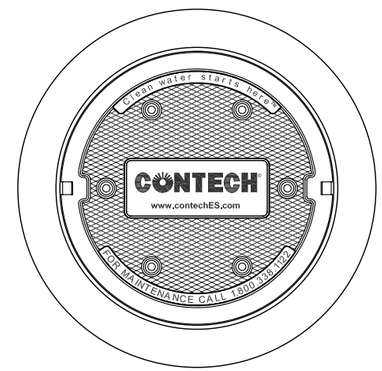
GRATED INLET WITH INLET PIPE OR PIPES
CURB INLET ONLY (NO INLET PIPE)
CURB INLET WITH INLET PIPE OR PIPES
SEPARATE OIL BAFFLE (SINGLE INLET PIPE REQUIRED FOR THIS CONFIGURATION)
SEDIMENT WEIR FOR NJDEP / NJCAT CONFORMING UNITS



FRAME AND COVER
(DIAMETER VARIES)
N.T.S.

SITE SPECIFIC DATA REQUIREMENTS

STRUCTURE ID			
WATER QUALITY FLOW RATE (CFS OR L/s)			*
PEAK FLOW RATE (CFS OR L/s)			*
RETURN PERIOD OF PEAK FLOW (YRS)			*
SCREEN APERTURE (2400 OR 4700)			*
PIPE DATA:	I.E.	MATERIAL	DIAMETER
INLET PIPE 1	*	*	*
INLET PIPE 2	*	*	*
OUTLET PIPE	*	*	*
RIM ELEVATION			*
ANTI-FLOTATION BALLAST		WIDTH	HEIGHT
		*	*

NOTES/SPECIAL REQUIREMENTS:

* PER ENGINEER OF RECORD

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5. STRUCTURE SHALL MEET AASHTO HS20 AND CASTINGS SHALL MEET HS20 (AASHTO M 306) LOAD RATING, ASSUMING GROUNDWATER ELEVATION AT, OR BELOW, THE OUTLET PIPE INVERT ELEVATION. ENGINEER OF RECORD TO CONFIRM ACTUAL GROUNDWATER ELEVATION.
6. PVC HYDRAULIC SHEAR PLATE IS PLACED ON SHELF AT BOTTOM OF SCREEN CYLINDER. REMOVE AND REPLACE AS NECESSARY DURING MAINTENANCE CLEANING.

INSTALLATION NOTES
A. ANY SUB-BASE, BACKFILL DEPTH, AND/OR ANTI-FLOTATION PROVISIONS ARE SITE-SPECIFIC DESIGN CONSIDERATIONS AND SHALL BE SPECIFIED BY ENGINEER OF RECORD.
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C. CONTRACTOR TO ADD JOINT SEALANT BETWEEN ALL STRUCTURE SECTIONS, AND ASSEMBLE STRUCTURE.
D. CONTRACTOR TO PROVIDE, INSTALL, AND GROUT PIPES. MATCH PIPE INVERTS WITH ELEVATIONS SHOWN.
E. CONTRACTOR TO TAKE APPROPRIATE MEASURES TO ASSURE UNIT IS WATER TIGHT, HOLDING WATER TO FLOWLINE INVERT MINIMUM. IT IS SUGGESTED THAT ALL JOINTS BELOW PIPE INVERTS ARE GROUTED.

CONTECH®
ENGINEERED SOLUTIONS LLC
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9025 Centre Pointe Dr., Suite 400, West Chester, OH 45069
800-338-1122 513-645-7000 513-645-7993 FAX

CDS2015-4-C
INLINE CDS
STANDARD DETAIL

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Hydrodynamic Separation Product Calculator

ARA Munster

Str. 16

CDS 2015-4

EXHIBIT "C"
SHEET 6 OF 9

Project Information					
Project Name	ARA Munster			**Option #**	A
Country	US	**State**	Indiana	**City**	Munster

Contact Information			
First Name	Andrew	**Last Name**	Gebhard
Company		**Phone #**	574-203-9522
Email	agebhard@abonmarche.com		

Design Criteria					
Site Designation	Str. 16			**Drainage Area (ac)**	0.70
Runoff Coefficient	0.78	**TC (Min)**	10	**Peak Flow (cfs)**	2.26
Screening Required?	No	**Pipe Invert Depth (ft)**	0 - 5	**Bedrock Depth (ft)**	>15
Groundwater Depth (ft)	10 - 15	**Grate Inlet Required?**	Yes	**Pipe Size (in)**	12
Multiple Inlets?	No	**180° between inlet and outlet?**	No	**90° between two inlets?**	N/A
Required Particle Size Distribution?	No	**Rainfall Station**	54 - Chicago O'Hare Airport, IL		

Treatment Selection					
Treatment Unit	CDS	**System Model**	2015-4		
Target Removal	80.00%	**Mean Particle Size (microns)**	125	**Predicted Net Annual Removal**	88.32%

Hydrodynamic Separation Product Calculator

ARA Munster

Str. 16

CDS 2015-4

EXHIBIT "C"
SHEET 7 OF 9

CDS ESTIMATED NET ANNUAL SOLIDS LOAD REDUCTION BASED ON THE RATIONAL RAINFALL METHOD								
Rainfall Intensity[1] (in/hr)	% Rainfall Volume[1]	Cumulative Rainfall Volume	Rainfall Volume Treated	Total Flowrate (cfs)	Treated Flowrate (cfs)	Operating Rate (%)	Removal Efficiency (%)	Incremental Removal (%)
0.0200	10.60%	10.60%	10.60%	0.0109	0.0109	1.56%	100.00%	10.60%
0.0400	9.05%	19.65%	9.05%	0.0218	0.0218	3.11%	100.00%	9.05%
0.0600	8.92%	28.57%	8.92%	0.0328	0.0328	4.69%	100.00%	8.92%
0.0800	7.61%	36.18%	7.61%	0.0437	0.0437	6.24%	100.00%	7.61%
0.1000	6.84%	43.02%	6.84%	0.0546	0.0546	7.80%	99.85%	6.83%
0.1200	3.66%	46.68%	3.66%	0.0655	0.0655	9.36%	99.54%	3.64%
0.1400	3.92%	50.60%	3.92%	0.0764	0.0764	10.91%	99.23%	3.89%
0.1600	4.27%	54.87%	4.27%	0.0874	0.0874	12.49%	98.91%	4.22%
0.1800	2.90%	57.77%	2.90%	0.0983	0.0983	14.04%	98.60%	2.86%
0.2000	2.80%	60.57%	2.80%	0.1092	0.1092	15.60%	98.29%	2.75%
0.2500	6.46%	67.03%	6.46%	0.1365	0.1365	19.50%	97.51%	6.30%
0.3000	4.12%	71.15%	4.12%	0.1638	0.1638	23.40%	96.73%	3.99%
0.3500	4.38%	75.53%	4.38%	0.1911	0.1911	27.30%	95.95%	4.20%
0.4000	1.76%	77.29%	1.76%	0.2184	0.2184	31.20%	95.17%	1.67%
0.4500	2.88%	80.17%	2.88%	0.2457	0.2457	35.10%	94.39%	2.72%
0.5000	1.87%	82.04%	1.87%	0.2730	0.2730	39.00%	93.61%	1.75%
0.7500	5.92%	87.96%	5.92%	0.4095	0.4095	58.50%	89.70%	5.31%
1.0000	3.60%	91.56%	3.60%	0.5460	0.5460	78.00%	85.80%	3.09%
1.5000	5.57%	97.13%	4.76%	0.8190	0.7000	100.00%	69.57%	3.88%
2.0000	2.85%	99.98%	1.83%	1.0920	0.7000	100.00%	52.18%	1.49%
0.0000	0.00%	99.98%	0.00%	0.0000	0.0000	0.00%	100.00%	0.00%
0.0000	0.00%	99.98%	0.00%	0.0000	0.0000	0.00%	100.00%	0.00%
0.0000	0.00%	99.98%	0.00%	0.0000	0.0000	0.00%	100.00%	0.00%
0.0000	0.00%	99.98%	0.00%	0.0000	0.0000	0.00%	100.00%	0.00%
								94.77%
							Removal Efficiency Adjustment2 =	6.45%
							Predicted % Annual Rainfall Treated =	91.70%
							Predicted Net Annual Load Removal Efficiency =	88.32%

1 - Based on 10 years of hourly precipitation data from NCDC Station 1549, Chicago O'Hare WSO Airport, Cook County, IL

2 - Reduction due to use of 60-minute data for a site that has a time of concentration less than 30-minutes.

CONTECH ENGINEERED SOLUTIONS

2. The contractor shall fill all voids associated with lifting provisions provided by the manufacturer. These voids shall be filled with non-shrinking grout providing a finished surface consistent with adjacent surfaces. The contractor shall trim all protruding lifting provisions flush with the adjacent concrete surface in a manner, which leaves no sharp points or edges.

3. The contractor shall removal all loose material and pooling water from the SWTD prior to the transfer of operational responsibility to the Owner.

TABLE 1
Storm Water Treatment Device
Hydraulic and Storage Capacities

CDS Model	Treatment Capacity (cfs)/(L/s)	Minimum Sump Storage Capacity (yd^3)/(m^3)	Minimum Oil Storage Capacity (gal)/(L)
CDS2015-G	0.7 (19.8)	0.5 (0.4)	70 (265)
CDS2015-4	0.7 (19.8)	0.5 (1.4)	70 (265)
CDS2015	0.7(19.8)	1.3 (1.0)	92 (348)
CDS2020	1.1 (31.2)	1.3 (1.0)	131 (496)
CDS2025	1.6 (45.3)	1.3 (1.0)	143 (541)
CDS3020	2.0 (56.6)	2.1 (1.6)	146 (552)
CDS3030	3.0 (85.0)	2.1 (1.6)	205 (776)
CDS3035	3.8 (106.2)	2.1 (1.6)	234 (885)
CDS4030	4.5 (127.4)	5.6 (4.3)	407 (1540)
CDS4040	6.0 (169.9)	5.6 (4.3)	492 (1862)
CDS4045	7.5 (212.4)	5.6 (4.3)	534 (2012)
CDS2020-D	1.1 (31.2)	1.3 (1.0)	131 (495)
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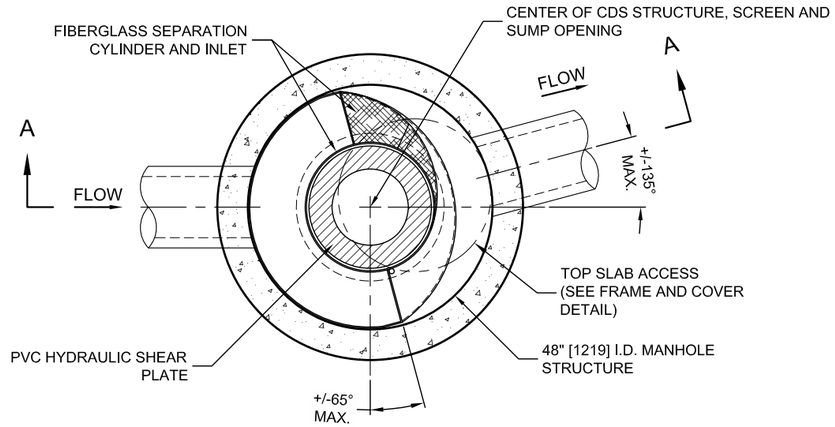
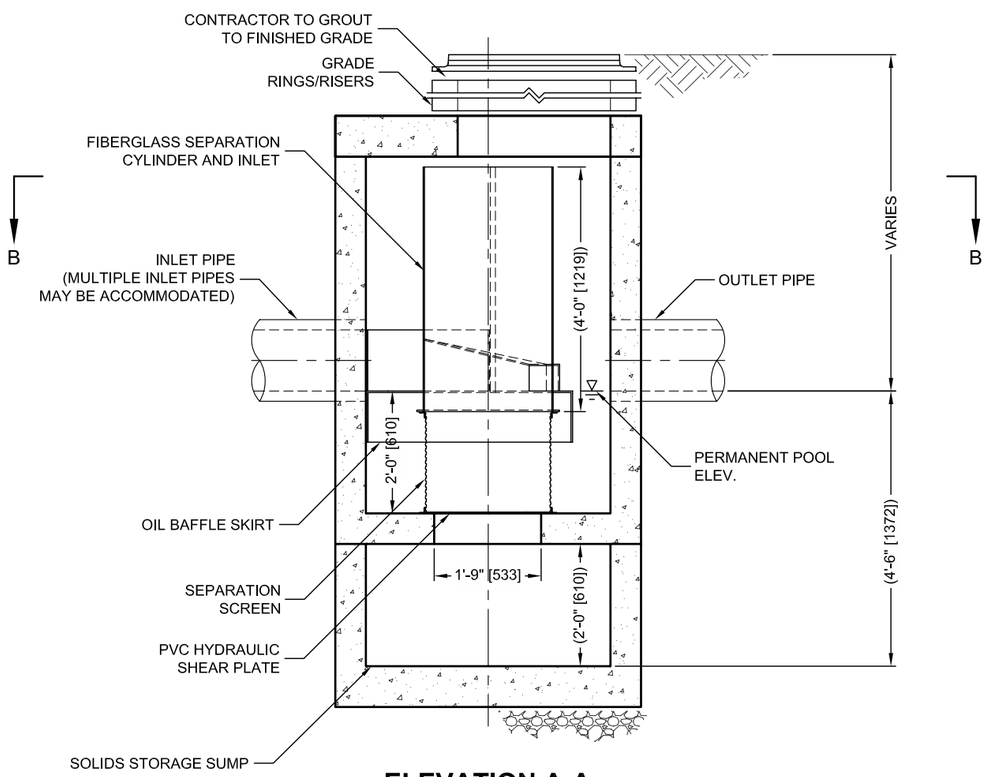
END OF SECTION

EXHIBIT "C"
SHEET 9 OF 9



PLAN VIEW B-B
N.T.S.



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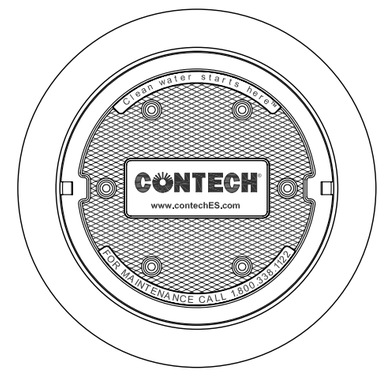

FRAME AND COVER
(DIAMETER VARIES)
N.T.S.

SITE SPECIFIC DATA REQUIREMENTS

STRUCTURE ID			
WATER QUALITY FLOW RATE (CFS OR L/s)			*
PEAK FLOW RATE (CFS OR L/s)			*
RETURN PERIOD OF PEAK FLOW (YRS)			*
SCREEN APERTURE (2400 OR 4700)			*
PIPE DATA:	I.E.	MATERIAL	DIAMETER
INLET PIPE 1	*	*	*
INLET PIPE 2	*	*	*
OUTLET PIPE	*	*	*
RIM ELEVATION			*
ANTI-FLOTATION BALLAST	WIDTH	HEIGHT	
	*	*	

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CDS2015-4-C
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