# THE COLLEGIAN NORTH

# CITY OF ANN ARBOR, WASHTENAW COUNTY, MICHIGAN SITE PLAN

# OWNER

SOUTH UNIVERSITY - NORTH LLC. 30100 TELEGRAPH ROAD, SUITE 220 BINGHAM FARMS, MI 48025 PH. (248) 647-2600 ATTN: SEAN T. HAVERA

# SURVEYOR/CIVIL ENGINEER/ LANDSCAPE ARCHITECT

MIDWESTERN CONSULTING, LLC 3815 PLAZA DR. ANN ARBOR, MI 48108 PH. (734) 995-0200 ATTN: TOM COVERT, RLA, AICP, LEED AP TINA FIX, RLA, LEED AP

# **ARCHITECT**

HOBBS & BLACK 100 N. STATE STREET ANN ARBOR, MI 48104 PH. (734) 663-4189

#### EXISTING BUILDING (UNIVERSITY OF MICHIGAN) SITE DATA COMPARSION CHART Required / Permitted Proposed 0.38 ac/16,561.82 sf Lot Width S University St.: 142.85 ft Character District South University South University Primary (both) Street Frontage Type Primary (both) EXISTING BUILDING (1121 S. UNIVERSITY PROPOSED BUILDING 55 Units, 145 dua 243 bedrooms total / 640 bra 1 bldg; basement; underground storm detention 1111111111111111 ground level: commercial, trash, mail, access evel 2: commercial, residential, residential amenity 10 levels apartments above; EXISTING BUILDING fully fire suppressed Proposed Building (1101 S. UNIVERSITY) 115,933 / 700% 115,552 sf / 698% Usable Floor Area: 66,247 sf / 400% 97,346sf residential; 18,206 sf Commercial Floor Area Ratio: 49,685 sf max. / 300% 49,305 sf / 298% Residential Premiums 2 stories min., 3 stories max. 2 stories Streetwall Height -------Offset at Top of Streetwa 5 ft average 6.5' average 45 ft max 43 ft max. See architectural plans Massing articulation See chart on architectural plans Unit Types/No.s: Vehicular Parking: 1 per 1000sf premium 49,305 sf residential premium 50 spaces No vehicular parking proposed SOUTH UNIVERSITY AVENUE (propose using one of the In lieu of parking options) Total Vehicular Parking 50 spaces Bicycle Parking\*: Residential @ 1:2,500 sf 39 Class A 40 Class A 0 Class B Retail@ 1:10,000 sf 2 Class C 12 Class C 52 spaces; 0.94 per unit 39 Class A, 2 Class C Front (south): 0 ft min, 1 ft max. Front (south): 0 ft min Setbacks: Side (east): 0 ft Side (east): 0 ft Side (west): 0 ft Side (west): 0 ft Rear (north): 0 ft Rear (north): 0 ft min. 25-28 ft existing Building Height: 149'-9" maximum 150 ft max. permitted EXISTING BUILDING 16,563 sf existing / 100% 16,563 sf existing / 100% 0 sf / 0% 0 sf / 0%

PROJECT SUMMARY

THE PROPOSED DEVELOPMENT INCLUDES THE DEMOLITION OF FOUR EXISTING BUILDINGS AND CONSTRUCTION OF A 12 STORY MIXED-USE BUILDING INCLUDING COMMERCIAL AND STUDENT

FOCUSED RESIDENTIAL. STORMWATER DETENTION IS PROPOSED IN AN UNDERGROUND DETENTION

CHAMBER. NO VEHICULAR PARKING IS PROPOSED WITH THE DEVELOPMENT. BIKE PARKING IS PROVIDED IN LOCKABLE SPACES ON THE FIRST FLOOR OF THE BUILDING AND IN THE ALLEY

NORTH OF THE BUILDING. TOTAL NEW FLOOR AREA WILL BE 115,552 SF WITH 698% FLOOR AREA

# UNIT TABULATION

| UNIT NAME    | UNIT TYPE | NET AREA(SF) | UNIT COUNT | BEDS | PERCENTAGE | RENTABLE AREA | PERCENTAGE |
|--------------|-----------|--------------|------------|------|------------|---------------|------------|
| 2 Bed(ADA)   | 2br/2ba   | 872          | 1          | 2    | 1.82%      | 872           | 1.17%      |
| 3 Bed-1      | 3br/3ba   | 954          | 10         | 30   | 18.18%     | 9,540         | 12.75%     |
| 3 Bed-2      | 3br/3ba   | 959          | 1          | 3    | 1.82%      | 959           | 1.28%      |
| 3 Bed-3      | 3br/3ba   | 970          | 1          | 3    | 1.82%      | 970           | 1.30%      |
| 3 Bed-4(ADA) | 3br/3ba   | 1,139        | 1          | 3    | 1.82%      | 1,197         | 1.60%      |
| 4 Bed-1      | 4br/4ba   | 1,182        | 7          | 28   | 12.73%     | 1,139         | 1.52%      |
| 4 Bed-2      | 4br/4ba   | 1,193        | 7          | 28   | 12.73%     | 8,274         | 11.06%     |
| 4 Bed-3      | 4br/4ba   | 1,197        | 1          | 4    | 1.82%      | 8,351         | 11.16%     |
| 4 Bed-4      | 4br/4ba   | 1,244        | 1          | 4    | 1.82%      | 1,244         | 1.66%      |
| 4 Bed-5      | 4br/4ba   | 1,257        | 1          | 4    | 1.82%      | 1,257         | 1.68%      |
| 5 Bed        | 5br/5ba   | 1,386        | 10         | 50   | 18.18%     | 13,860        | 18.53%     |
| 6 Bed-1      | 6br/6ba   | 1,755        | 7          | 42   | 12.73%     | 12,285        | 16.42%     |
| 6 Bed-2      | 6br/6ba   | 2,123        | 7          | 42   | 12.73%     | 14,861        | 19.87%     |
| TOTALS       |           |              | 55         | 243  | 100.00%    | 74,809        | 100.00%    |

**UNIT AVERAGE NET SF:** 1,360.2 SF

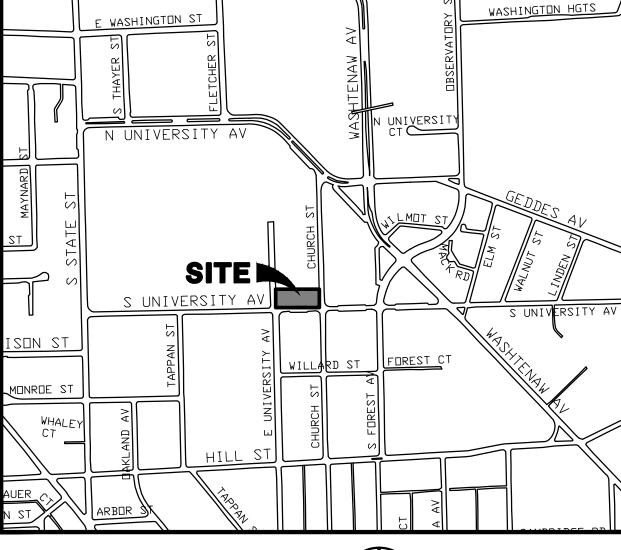
# **GENERAL NOTES:**

PER CHAPTER 49, SECTION 4:58 OF THE CITY CODE, "ALL SIDEWALKS ARE TO BE KEPT AND MAINTAINED IN GOOD REPAIR BY THE OWNER OF THE LAND ADJACENT TO AND ABUTTING THE SAME." PRIOR TO ISSUANCE OF THE FINAL CERTIFICATE OF OCCUPANCY FOR THIS SITE, ALL EXISTING SIDEWALKS MUST BE REPAIRED IN ACCORDANCE WITH CITY STANDARDS.

"THE CONSTRUCTION COVERED BY THESE PLANS SHALL CONFORM TO THE CITY OF ANN ARBOR PUBLIC SERVICES DEPARTMENT STANDARD SPECIFICATIONS WHICH ARE INCLUDED BY REFERENCE."

"THE OMISSION OF ANY STANDARD DETAILS DOES NOT RELIEVE THE CONTRACTORS OF THEIR OBLIGATION TO CONSTRUCT ITEMS IN COMPLETE ACCORDANCE WITH PUBLIC SERVICES DEPARTMENT STANDARD SPECIFICATIONS."

THE PROPOSED DOWNTOWN DEVELOPMENT AUTHORITY (DDA) SOUTH UNIVERSITY STREETSCAPE IMPROVEMENTS SHALL BE CONSTRUCTED PER THE STREETSCAPE IMPROVEMENT PLANS AS APPROVED BY THE CITY OF ANN ARBOR.





# SHEET INDEX

| SHEET<br>NUMBER | SHEET TITLE                           |
|-----------------|---------------------------------------|
| 1               | COVER SHEET                           |
| 2               | PROJECT DATA AND GENERAL INFORMATION  |
| 3               | SOIL BORINGS                          |
| 4               | EXISTING CONDITIONS                   |
| 5               | REMOVAL PLAN                          |
| 6               | DIMENSIONAL SITE PLAN                 |
| 7               | GRADING AND SOIL EROSION CONTROL PLAN |
| 8               | UTILITY PLAN                          |
| 9               | STORM WATER MANAGEMENT PLAN           |
| 10              | STORM WATER MANAGEMENT CALCS          |
| 11              | MISCELLANEOUS SITE DETAILS            |
| 11.1            | DDA STREETSCAPE DETAILS               |
| 12              | FIRE PROTECTION PLAN                  |
| A-100           | BASEMENT FLOOR PLAN                   |
| A-101           | GROUND FLOOR PLAN                     |
| A-102           | SECOND FLOOR PLAN                     |
| A-103           | THIRD-NINTH FLOOR PLANS               |
| A-104           | TENTH FLOOR PLAN                      |
| A-105           | ELEVENTH FLOOR PLAN                   |
| A-106           | TWELFTH FLOOR PLAN                    |
| A-107           | ROOF PLAN                             |
| A-200           | SOUTH ELEVATION                       |
| A-201           | NORTH ELEVATION                       |
| A-202           | WEST ELEVATION                        |
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# THE COLLEGIAN NORTH

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| JOB No. <b>15006</b>                            |                     | DATE: 10/28/16           |
|   |                     | SHEET 1 OF 26            |
| REVISIONS:                                      | REV. DATE           | CADD: DAG                |
| 1. REV. PER CITY REVIEW 2. REV. PER CITY REVIEW | 12/05/16<br>1/05/17 | ENG: SGF                 |
| 3. REV. PER OWNER & CITY REVIEW                 | 1/31/17             | PM: TJC                  |
| 4. REV. PER CITY REVIEW                         | 3/02/17             | TECH:                    |
|   |                     | SITE\15006CV1.DWG<br>FB# |
|   |                     | •                        |
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EAST ELEVATION

BUILDING SECTION

CONSULTING 3815 Plaza Drive Ann Arbor, Michigan 48108 (734) 995-0200 • www.midwesternconsulting.com and Development • Land Survey • Institutional • Municipal Wireless Communications • Transportation • Landfill Services

| Wilele        | 33 Commonications | · Transportation · Landini Services |
|---------------|-------------------|-------------------------------------|
| RELEASED FOR: | DATE              |                                     |
|               |                   |                                     |
|               |                   |                                     |
|               |                   |                                     |
|               |                   | SCOTT G FISHER                      |
|               |                   | SCOTT G. FISHER<br>P.E. #58473      |

- 4). Terms and conditions of Agreement regarding party wall, as recorded in Liber 509, Page 151, Washtenaw County records
- 5). Terms and conditions of Agreement regarding vacated portion of East University Avenue, as recorded in Liber 521, Page 521, Washtenaw County
- 6). Easement for Emergency Egress as disclosed by instrument recorded in Liber 2260, Page 270, Washtenaw County Records.

ABSOLUTE TITLE, INC. FILE NO. 77523 Rev. 1, DATED JANUARY 28, 2015 1111-1113 S. University:

Beginning at a point on the North line of South University Avenue 122.66 feet East of the Southwest corner of Lot 21, R.S. Smith's Addition to the City of Ann Arbor, as recorded in Liber 42 of Deeds, Pages 446 and 447, Washtenaw County Records; thence East in the North line of South University Avenue 34.70 feet; thence Northerly 82.0 feet to a point 157.26 East of the West line of Lot 20 in the addition; thence West parallel to the South University Avenue 34.70 feet; thence Southerly along a line which is the continuation Northerly of the West face of the West wall of the existing building and along the West face of the existing wall 82.00 feet to the Place of Beginning, being a part of Lots 20, 21 and 29, R.S. Smith's Addition to the City of Ann Arbor. Together with Agreement for Emergency Egress Easement as recorded in Liber 2260, Page 270, Washtenaw County Records. Being subject to:

4). Terms and provisions of the party wall agreement as recorded in Liber 509, Page 151, Washtenaw County Records.

5). Terms and conditions of Agreement for Emergency Egress Easement, as recorded in Liber 2260, Page 270, Washtenaw County Records 6). Easement (right of way) in favor of The Detroit Edison Company, as recorded in Liber 3864, Page 241, Washtenaw County Records.

ABSOLUTE TITLE, INC. FILE NO. 77524, DATED JANUARY 12, 2015 1115-1117 S. University

Beginning at a point in the North line of South University Avenue 157.36 feet East of the Southwest corner of Lot 21, R.S. Smith's Addition to the City of Ann Arbor, as recorded in Liber 42 of Deeds, Pages 446 and 447, Washtenaw County Records; thence East in the North line of South University Avenue 41.72 feet to the Southeast corner of Lot 29; thence Northerly 92.0 feet in the East line of Lot 29; thence West parallel to the South University Avenue 41.82 feet; thence Southerly 92.00 feet to the Place of Beginning, being a part of Lot 29, R.S. Smith's Addition to the City of Ann Arbor. Together with Agreement for Emergency Egress Easement as recorded in Liber 2260, Page 270, Washtenaw County Records. Being subject to:

4). Terms and conditions of Agreement for Emergency Egress Easement, as recorded in Liber 2260, Page 270, Washtenaw County Records 5). Easement (right of way) in favor of The Detroit Edison Company, as recorded in Liber 3864, Page 241, Washtenaw County Records.

ABSOLUTE TITLE, INC. FILE NO. 77525, DATED JANUARY 12, 2015 1119 S. University

Part of Lot 30, R.S. Smith's Addition to the City of Ann Arbor, as recorded in Liber 42 of Deeds, Pages 446 and 447, Washtenaw County Records, described as: Commencing at the Southwest corner of Lot 30, and running East along South University Avenue, 22 and 36/100 feet to a stake; thence North parallel with the West line of the lot, 82 feet to a stake; thence West 22 and 26/100 feet to the West line of the lot; thence South 82 feet to the Place of Beginning. Also a right of way along and over a parcel of land 10 feet in width having its South boundary line 82 feet North from the South line of the lot and extending parallel with the South line of the Lot from the East to the West line thereof. Also together with Agreement for Emergency Egress Easement, as recorded in Liber 2260, Page 270, Washtenaw County Records.

Being subject to:

4). Common right of way as disclosed by instrument recorded in Liber 484, Page 418, Washtenaw County Records.

5). Terms and conditions of Agreement for Emergency Egress Easement, as recorded in Liber 2260, Page 270, Washtenaw County Records

6). Easement (right of way) in favor of The Detroit Edison Company, as recorded in Liber 3864, Pages 231 and 232, Washtenaw County Records.

U OF M ALLEY NORTH OF PARCEL NO. 09-09-28-312-008

Being more particularly described as:

Commencing at the SW Corner of Lot 21 of "R.S. Smith's Addition to the City of Ann Arbor", as recorded in Liber 42 of Deeds, Pages 446 & 447, Washtenaw County Records, thence N 88°35'57" E 199.10 feet along the South line of Lots 21 and 29 of said "R.S. Smith's Addition and the North right-of-way line of South University Avenue (variable width); thence N 01°37'33" W 82.00 feet along the West line of Lot 30 of said "R.S. Smith's Addition" to the Point of Beginning,

thence continuing N 01°37'33" W 10.00 feet along the West line of said Lot

thence N 88°35'57" E 22.26 feet parallel to South University Avenue; thence S 01°37'33" E 10.00 feet parallel to the West line of said Lot 30;

thence S 88°35'57" W 22.26 feet parallel to South University Avenue to the Point of Beginning. Being a part of the E 1/2 of the SW 1/4 of Section 28, T2S, R6E, City of Ann Arbor, Washtenaw County, Michigan and containing 222.60 square feet or 0.0051 acres of land, more or less. Being subject to easements and restrictions of record, if any.

TÓTAL PROJECT LIMITS SOUTH UNIVERSITY AVENUE TOTAL PROJECT PARCEL SKETCH

# PRELIMINARY TRASH AND RECYCLE SUMMARY

# 1101 S. UNIVERSITY & 1107 S. UNIVERSITY SHARED TRASH PRICING SUMMARY

| Service Type | Monday | Tuesday | Wednesday | Thursday | Friday | Saturday | Total Yds/<br>Week | Total Yds/<br>Month |
|--------------|--------|---------|-----------|----------|--------|----------|--------------------|---------------------|
| 4 yd Trash   | 1      | 1       | 1         | 1        | 1      | 1        | 24                 | 96                  |
| 2 yd Trash   | 2      | 1       | 1         | 1        | 1      | 1        | 14                 | 56                  |
| 2 cy Recycle | 2      | 1       | 1         | 1        | 1      | 1        | 14                 | 56                  |
| 4 cv Recycle | 1      | 1       | 1         | 1        | 1      | 1        | 24                 | 96                  |

# SITE SUMMARY NOTES

THE PROPOSED DEVELOPMENT WILL COMPLY WITH THE FOLLOWING OFF-STREET PARKING REGULATIONS FOR BUILDINGS THAT EXCEED THE NORMAL MAXIMUM PERMITTED USABLE

NO OFF-STREET MOTOR VEHICLE PARKING IS REQUIRED IN THE SPECIAL PARKING DISTRICT FOR STRUCTURES WHICH DO NOT EXCEED THE NORMAL MAXIMUM PERMITTED USABLE FLOOR AREA OR FOR STRUCTURES ZONED PUD WITH USABLE FLOOR AREA WHICH DOES NOT EXCEED 400 PERCENT OF THE LOT AREA. STRUCTURES WHICH EXCEED THE NORMAL MAXIMUM USABLE FLOOR AREA BY PROVIDING FLOOR AREA PREMIUMS, OR PUD-ZONED STRUCTURES THAT EXCEED 400 PERCENT OF LOT AREA, SHALL PROVIDE PARKING SPACES FOR THE USABLE FLOOR AREA IN EXCESS OF THE NORMAL MAXIMUM PERMITTED. THIS PARKING SHALL BE PROVIDED AT A RATE OF 1 OFF-STREET PARKING SPACE FOR EACH 1,000 SQUARE FEET OF USABLE FLOOR AREA.

THE AMOUNT OF USEABLE FLOOR SPACE ABOVE THE NORMAL MAXIMUM PERMITTED FLOOR AREA IS 49.305 SF. THE 49.305SF RESIDENTIAL PREMIUM / 1,000 = 49.31 SPACES REQUIRED. 50 TOTAL PARKING SPACES ARE REQUIRED. NO VEHICULAR PARKING SPACES ARE PROVIDED. THE DEVELOPMENT WILL UTILIZE A PARKING AGREEMENT WITH THE DDA PER THE CITY'S POLICY FOR CONTRIBUTIONS IN LIEU OF PARKING.

THE PROPOSED DEVELOPMENT WILL COMPLY WITH THE FOLLOWING BICYCLE PARKING REGULATIONS FOR BUILDINGS IN THE D1 ZONING DISTRICT: OFF-STREET BICYCLE PARKING IS REQUIRED FOR RESIDENTIAL USES IN THE SPECIAL PARKING DISTRICT AT A RATE OF 1 OFF-STREET BICYCLE SPACE FOR EACH 2,500 SQUARE FEET OF USABLE FLOOR AREA AND SHALL BE PROVIDED IN COMPLIANCE WITH THE REQUIREMENTS OF SECTION 5:168.1 FOR CLASS A SPACES. OFF-STREET BICYCLE PARKING IS REQUIRED FOR NON-RESIDENTIAL USES IN THE SPECIAL PARKING DISTRICT AT A RATE OF 1 OFF-STREET BICYCLE PARKING SPACE FOR EACH 10.000 SQUARE FEET OF USABLE FLOOR AREA AND SHALL BE PROVIDED IN COMPLIANCE WITH THE REQUIREMENTS OF SECTION 5:168.1 FOR CLASS C SPACES.

THE USEABLE FLOOR AREA OF THE BUILDING IS 115,552 SF. THE 97,346 SF RESIDENTIAL 2,500 = 38 CLASS A BIKE SPACES REQUIRED AND 18,206 SF NON-RESIDENTIAL / 10.000 SF = 2 CLASS C BIKE SPACE REQUIRED. A TOTAL OF 41 SPACES ARE REQUIRED. 52 BIKE SPACES ARE PROPOSED, INCLUDING 40 CLASS A RESIDENT SPACES IN THE BIKE ROOM ON THE FIRST FLOOR OF THE BUILDING AND 12 CLASS C SPACES IN THE ALLEY NORTH OF THE

THE PROPOSED DEVELOPMENT WILL COMPLY WITH THE FOLLOWING RESIDENTIAL USE

RESIDENTIAL USE PREMIUM. IN D1 AND D2 DISTRICTS, 0.75 SQUARE FOOT OF FLOOR AREA IN EXCESS OF THE NORMAL MAXIMUM USABLE FLOOR AREA IN PERCENTAGE OF LOT AREA SHALL BE ALLOWED FOR EACH SQUARE FOOT OF FLOOR AREA. REGARDLESS OF LOCATION WITHIN THE BUILDING, THAT IS USED FOR MULTIPLE-FAMILY DWELLINGS HOUSING AND THAT MEETS THE STANDARDS OF CHAPTER 105 (HOUSING CODE).

THE ALLOWABLE RESIDENTIAL USE PREMIUM IS CALCULATED TO BE THE PROPOSED FLOOR AREA (BY RIGHT) OF 66,248 SF X 0.75 = 49,685 SF MAXIMUM. RESIDENTIAL USE PREMIUM PROPOSED IS 49,305 SF. MAXIMUM PERMITTED FAR IS 115.933 SF / 700%.

THE TOTAL PROPOSED FLOOR AREA (BY RIGHT) IS 115,552SF / 698%. THIS INCLUDES 97,346 SF OF ALLOWABLE RESIDENTIAL USEABLE FLOOR AREA USING

THE PROPOSED DEVELOPMENT WILL COMPLY WITH THE FOLLOWING RESIDENTIAL USE

EVERY SLEEPING ROOM IN THE BUILDING SHALL HAVE AT LEAST 1 WINDOW, SLIDING GLASS DOOR, SKYLIGHT, OR OTHER ACCEPTABLE LIGHT TRANSMITTING MEDIA FACING DIRECTLY TO THE OUTDOORS. THE MINIMUM TOTAL GLAZED AREA FOR EVERY SLEEPING ROOM SHALL BE NOT LESS THAN 8% OF THE HABITABLE FLOOR AREA OF SUCH ROOM. IF DWELLING UNITS CONSTITUTE A PORTION OF A MIXED USE BUILDING, DWELLING UNITS MUST BE COMPLETED AND RECEIVE A CERTIFICATE OF OCCUPANCY IN ADVANCE OR AT THE SAME TIME AS THE CERTIFICATE OF OCCUPANCY FOR NONRESIDENTIAL USE, OR THE PROPERTY OWNER SHALL PROVIDE A PERFORMANCE BOND FOR THE RESIDENTIAL USE AT THE TIME THE CERTIFICATE OF OCCUPANCY IS REQUESTED. SUBJECT TO THE REQUIREMENTS OF CHAPTER 57.

THE PROPOSED DEVELOPMENT WILL COMPLY WITH THE FOLLOWING: AS A CONDITION OF RECEIVING THE ADDITIONAL FLOOR AREA THROUGH A PREMIUM OPTION, THE BUILDING MUST COMPLY WITH THE FOLLOWING ENERGY EFFICIENCY STANDARDS FOR THE CONSTRUCTION OF ALL NEW FLOOR AREA:

1. A MINIMUM OF TWO POINTS MUST BE ACHIEVED UNDER THE U.S. GREEN BUILDING COUNCIL LEADERSHIP IN ENERGY AND ENVIRONMENTAL DESIGN (LEED) ENERGY & ATMOSPHERE CREDIT NO. 1. THE MOST RECENT VERSION IN EFFECT AT THE TIME OF SITE PLAN APPROVAL SHALL BE APPLIED.

COMPLIANCE WITH THIS REQUIREMENT SHALL BE VERIFIED AND DOCUMENTED BY THE PROPERTY OWNER USING AN INDUSTRY STANDARD SOFTWARE ENERGY MODELING TOOL (EQUEST OR EQUIVALENT) PRIOR TO THE ISSUANCE OF BUILDING PERMITS.

INDUSTRY STANDARD SOFTWARE ENERGY MODELING DATA WILL BE UTILIZED BY OUR MECHANICAL ENGINEER TO DOCUMENT OUR COMPLIANCE AND SUBMITTED FOR APPROVAL AS PART OF OUR BUILDING PERMIT APPLICATION.

## City of Ann Arbor Geodetic Reference System (AAGRS) **Coordinate Transformation Worksheet**

This document is designed to provide the City of Ann Arbor a datum shift between a Project's local coordinate system and AAGRS coordinates (Michigan State Plane). This information will provide the data necessary to import project infrastructure items into the Ann Arbor Geographic Information System (GIS).

Project Name: THE COLLEGIAN NORTH Company Name: MIDWESTERN CONSULTING, LLC Contact: PATRICK L. HASTINGS

Date Submitted: 10/31/16 Contact No.: 734-995-0200

From what coordinate system was this project derived?

X AAGRS (MI State Plane) Geoid: 12B Local coordinates (user defined)

If a **local** coordinate system was used, complete the *Project Reference Coordinates* section below.

**Project Reference Coordinates** AAGRS coordinates used for projection of local coordinates into Michigan State Plane coordinates (International feet) AAGRS No. Easting (X) Northing (Y) Elevation (Z) ocal coordinates projected into AAGRS Michigan State Plane coordinates (International feet). Point No. Easting (X) Northing (Y) Elevation (Z) AREA BELOW IS FOR CITY OF ANN ARBOR USE ONLY

TRAKIT Planning No TRAKIT Civil Plan No.

# SITE PLAN REQUIREMENTS

- (1) THE EXISTING CONDITIONS PLAN SHOWS THE SURVEY AS PREPARED (CONT'D)
- (2) THE SITE DATA COMPARISON CHART IS SHOWN ON THE COVER (3) THE NUMBER AND TYPE OF DWELLING UNITS. INCLUDING THE
- NUMBER OF BEDROOMS IS SHOWN IN THE SITE DATA COMPARISON
- (4) THE PROJECT IS 12 LEVELS WITH A BASEMENT. THE MAXIMUM HEIGHT IS 149'-9" TO THE TOP OF THE HIGHEST ROOF APPURTENANCE. SCALED MASSING ELEVATIONS OF THE PROPOSED BUILDING ARE SHOWN ON THE ARCHITECTURAL PLANS.
- BUILDING CONTEXT: SEE ARCHITECTURAL PLANS. (5) PARKING: NO ON-SITE VEHICULAR PARKING IS PROPOSED. THE DEVELOPMENT HAS A BASE FAR OF 400%, PREMIUM RESIDENTIAL FAR OF 298% AND 18,206 SF COMMERCIAL FOR A TOTAL NET FAR OF
- 698% / 115 552 SQUARE FEET THE TOTAL NUMBER OF PARKING SPACES IS SHOWN IN THE SITE DATA COMPARISON CHART. 50 SPACES ARE REQUIRED FOR THE PREMIUM RESIDENTIAL FAR. PARKING IS NOT PROPOSED WITH THIS

DEVELOPMENT. AN AGREEMENT WILL BE ESTABLISHED WITH THE DDA PER THE CITY'S POLICY FOR CONTRIBUTIONS IN LIEU OF PARKING. RESIDENTIAL USE IS 97,346 SF. COMMERCIAL USE IS 18,206 SF.

41 BIKE PARKING SPACES ARE REQUIRED. 52 SPACES ARE PROVIDED INCLUDING 40 CLASS A BIKE PARKING SPACES IN THE BIKE ROOM IN 3. THE BASEMENT OF THE BUILDING. 12 CLASS C SPACES WILL BE PROVIDED IN THE ALLEY NORTH OF THE BUILDING. STORM WATER RUNOFF FROM THE BUILDING AND SITE AREAS WILL BE COLLECTED IN A DETENTION CHAMBER IN THE BASEMENT LEVEL

STORM LINE IN S. UNIVERSITY AVENUE (6) PROPOSED SETBACKS ARE SHOWN ON THE DIMENSIONAL SITE PLAN AND IN THE SITE DATA COMPARISON CHART ON THE COVER SHEET.

OF THE BUILDING. THE CHAMBER WILL DISCHARGE TO THE EXISTING

(7) NO FENCING IS PROPOSED.

(8) TRASH MANAGEMENT SYSTEMS: PER DISCUSSION WITH CITY STAFF, THE BEST CONCEPT FOR THIS PARTICULAR LOCATION IS FOR TRASH AND RECYCLABLES TO BE ROLLED OUT TO THE CURB ALONG CHURCH STREET VIA AN ACCESS EASEMENT OVER THE ALLEY ON THE PROPERTY TO THE EAST, WHICH HAS AN OVERHEAD STRUCTURE THAT BLOCKS CLEARANCE FOR TRUCKS TO ACCESS THE ALLEY. THE DUMPSTERS WILL BE ROLLED BEHIND THE ADJACENT BUILDING IN THE ALLEY AND THE CITY WILL ROLL THE DUMPSTERS TO THE CURB FOR PICKUP. THE TRASH DUMPSTERS WILL BE THREE 2- CY UNITS AND TWO 4-CY UNITS. THE TRASH ROOM WILL ALSO HAVE THREE 2-CY DUMPSTERS AND TWO 4-CY DUMPSTER ON WHEELS FOR RECYCLING. THE TRASH SERVICE WILL INCLUDE 1101 S. UNIVERSITY AND WILL PROVIDE A FUTURE OPPORTUNITY FOR 1121 S. UNIVERSITY. SEE THE CHART FOR PRELIMINARY TRASH PICKUP SCHEDULE.

FREQUENCY OF PICKUP WILL BE ADJUSTED AS NECESSARY. (9) EXISTING STRUCTURES AND DRIVEWAY CURB CUTS ADJACENT TO THE PROPERTY ARE SHOWN ON THE EXISTING CONDITIONS PLAN.

(10) EXISTING AND PROPOSED TOPOGRAPHIC CONTOURS ARE SHOWN

ON THE GRADING PLAN. (11) PROPOSED LANDSCAPING IS LIMITED TO LANDSCAPING REQUIRED FOR THE DDA STREETSCAPE IMPROVEMENTS. THE LANDSCAPE REQUIREMENTS CHART IS INCLUDED ON THE SITE LAYOUT PLAN. (12) SOIL EROSION CONTROL IS SHOWN ON THE SOIL EROSION CONTROL

(13) THE DRAINAGE AREA IS THE ENTIRE SITE.

(14) EXISTING AND PROPOSED DRIVEWAYS AND CURB CUTS ARE SHOWN WITH DIMENSIONS ON THE DIMENSIONAL SITE PLAN. (15) EXISTING WATER MAINS, SANITARY SEWER MAINS, AND STORM SEWER LINES ARE SHOWN ON THE EXISTING CONDITIONS PLAN. PROPOSED WATER, SANITARY AND STORM LEADS ARE SHOWN ON THE UTILITY PLAN.

(16) A STREET TREE ESCROW IS TO BE PROVIDED AS SHOWN ON THE SITE LAYOUT PLAN. LANDSCAPE REQUIREMENTS. THE S. UNIVERSITY STREETSCAPE INCUDES PROPOSED STREET TREES AND PERENNIALS IN CURBED PLANTING BEDS AS DESIGNED IN THE DDA STREETSCAPE IMPROVEMENTS PLANS.

(17) THE ANTICIPATED TRIP GENERATION FOR THE PROJECT HAS BEEN PROVIDED UNDER SEPARATE COVER. NO VEHICULAR PARKING IS

PROPOSED. (18) PER THE CITY OF ANN ARBOR PLANNING STAFF, AN ARCHAEOLOGICAL SURVEY IS NOT REQUIRED.

(19) NATURAL FEATURES: SOILS: THE SITE IS A PREVIOUSLY DISTURBED, PREVIOUSLY DEVELOPED AREA. THE GENERAL SOILS IN THIS AREA ARE FOX SANDY LOAM (FOA), GRAVELLY SAND, AT 0 TO 2 PERCENT SLOPE. PERMEABILITY IS MODERATE. RUNOFF IS SLOW. THE DEPTH TO

WATER TABLE IS MORE THAN 5 FEET. SOIL BORING LOGS ARE

SHOWN ON SHEET 2. (a) THE LIMITS OF SOIL DISTURBANCE ARE SHOWN ON THE OVERALL GRADING PLAN. THE ENTIRE SITE IS TO BE DISTURBED. S. UNIVERSITY STREET STREETSCAPE IS TO BE DISTURBED FOR THE INSTALLATION OF THE DDA STREETSCAPE IMPROVEMENTS, THE ROAD IS TO BE DISTURBED FOR DISCONNECTION OF EXISTING SERVICES AND FOR CONSTRUCTION OF PROPOSED WATER AND SANITARY SEWER 4.

LEADS, AND STORM SEWER OUTLET. (b) THERE IS NO ENDANGERED SPECIES HABITAT ON THE SITE. (c) THERE IS NO 100-YEAR FLOOD PLAIN ON THE SITE.

(d) THERE ARE NO LANDMARK TREES ON THE SITE. TWO LANDMARK TREES WILL BE REMOVED AS PART OF THE DDA STREETSCAPE IMPROVEMENTS.

(e) THERE ARE NO STEEP SLOPES ON THE SITE.

THERE ARE NO WATERCOURSES ON THE SITE. (a) THERE ARE NO WETLANDS ON THE SITE.

(h) THERE ARE NO WOODLANDS ON THE SITE.

(20) NATURAL FEATURES OPEN SPACE: NOT APPLICABLE (21) NATURAL FEATURES STATEMENT OF IMPACT: NOT APPLICABLE.

# PROJECT INFORMATION AND ANALYSIS

DEVELOPMENT PROGRAM: (a) DESCRIPTION: THE PROPOSED DEVELOPMENT IS LOCATED IN THE D1 -DOWNTOWN CORE DISTRICT, SOUTH UNIVERSITY CHARACTER OVERLAY. THE SITE HAS FRONTAGE ON S. UNIVERSITY AVENUE, AND E. UNIVERSITY STREET, BOTH OF WHICH ARE PRIMARY FRONTAGE STREETS. THE PROJECT INCLUDES REMOVAL OF FOUR EXISTING BUILDINGS AND CONSTRUCTION OF A MIXED USE BUILDING. THE SITE WILL BE EXCAVATED TO CONSTRUCT THE FOUNDATION, BASEMENT AND A STORM WATER DETENTION CHAMBER. THE GROUND FLOOR IS PRIMARILY COMMERCIAL SPACE WITH AN OPPORTUNITY FOR A TWO STORY TENANT AS WELL AS MAIL DELIVERY AND TRASH REMOVAL POTENTIAL TENANTS INCLUDE FOOD SERVICE ESTABLISHMENTS, BANKING, AND RETAILERS. NO VEHICULAR PARKING IS PROPOSED WITH THE DEVELOPMENT. BIKE PARKING IS PROVIDED IN LOCKABLE SPACES ON THE FIRST FLOOR OF THE BUILDING AND IN THE ALLEY NORTH OF THE BUILDING. TOTAL NEW FLOOR AREA WILL BE 115,552 SF WITH 698% FLOOR AREA RATIO.

STUDENT FOCUSED APARTMENTS ARE PROPOSED ON UPPER LEVELS WITH A TOTAL OF 55 UNITS WITH 243 BEDS. APARTMENTS INCLUDE 2 TO 6 BEDROOM UNITS. LEVEL 12 INCLUDES RESIDENTIAL APARTMENTS AND THE MECHANICAL PENTHOUSE. STORM WATER FROM THE BUILDING WILL BE CAPTURED AND DIRECTED

TO A DETENTION CHAMBER UNDER THE BASEMENT. THE CHAMBER WILL DISCHARGE TO THE EXISTING STORM SEWER IN S. UNIVERSITY AVENUE. THE CHAMBER WILL BE SIZED TO POTENTIALLY ACCOMMODATE STORMWATER RUNOFF FROM 1101 S. UNIVERSITY AND 1121 S. UNIVERSITY IN THE FUTURE. SANITARY SEWER AND WATER LEADS WILL LEADS CONNECT TO EXISTING MAINS IN S. UNIVERSITY

- (b) PROPOSED PHASING AND PROBABLE CONSTRUCTION COST: THE DEVELOPMENT WILL BE CONSTRUCTED IN ONE PHASE, BEGINNING IN LATE JULY, 2017, WITH COMPLETION IN AUGUST 2019. COMMUNITY ANALYSIS:
- (a) IMPACT ON PUBLIC SCHOOLS: THE UNITS RANGE FROM UNITS WITH 2 TO 6 BEDROOMS. THE UNITS ARE DESIGNED PRIMARILY FOR YOUNG PROFESSIONALS, FACULTY, VISITING PROFESSORS, AND COLLEGE STUDENTS. THE NUMBER OF CHILDREN LIVING IN THE BUILDING IS EXPECTED TO BE MINIMAL SO THERE WILL BE VIRTUALLY NO IMPACT ON PUBLIC ELEMENTARY AND HIGH SCHOOLS.

# PROJECT INFORMATION AND ANALYSIS

COMMUNITY ANALYSIS:

(b) RELATIONSHIP TO NEIGHBORING USES: THE RESIDENTIAL UNITS WILL PROVIDE ADDITIONAL HOUSING VERY CLOSE TO THE UNIVERSITY OF MICHIGAN CENTRAL CAMPUS. THE RESIDENTS ARE LIKELY TO PATRONIZE EXISTING RESTAURANTS. PROPOSED RETAIL, OTHER BUSINESSES IN THE NEARBY BUILDINGS, AND MAY ATTEND LOCAL CHURCHES. THE LIMITED AMOUNT OF PROPOSED COMMERCIAL USE WILL PROVIDE SERVICES FOR THE RESIDENTS AND FOR THE NEIGHBORHOOD. ADJACENT BUILDINGS INCLUDE A MIX OF UNIVERSITY OF

MICHIGAN AND COMMERCIAL/ (FINANCIAL/RETAIL/RESTAURANT) BUILDINGS. IMPACT OF ADJACENT USES ON PROPOSED DEVELOPMENT: RESIDENTS WILL LIKELY PATRONIZE THE BUSINESSES AND INSTITUTIONS IN THE SURROUNDING

IMPACT ON AIR AND WATER QUALITY AND EXISTING NATURAL FEATURES: NO SIGNIFICANT IMPACT ON AIR AND WATER QUALITY IS EXPECTED. THERE ARE NO LANDMARK TREES ON THE SITE. THERE ARE 6 TREES, 2 OF WHICH ARE LANDMARK TREES, LOCATED IN THE SOUTH UNIVERSITY RIGHT-OF-WAY THAT WILL BE REMOVED WITH THE DOWNTOWN DEVELOPMENT AUTHORITY STREETSCAPE IMPROVEMENTS.

(e) IMPACT ON HISTORIC SITES/STRUCTURES: THE SITE IS NOT LOCATED IN OR ADJACENT TO A HISTORIC DISTRICT. THE EXISTING BUILDINGS ARE NOT HISTORIC STRUCTURES.

SITE ANALYSIS: (a) EXISTING LAND USE AND SITE ACTIVITY:

MIXED USE INCLUDING: 549 E. UNIVERSITY, 1107, 1109, & 1111 S. UNIVERSITY - TWO STORY, 1ST FLOOR RETAIL. 2ND FLOOR OFFICE 1113 S. UNIVERSITY - ONE STORY, RETAIL

1115 - 1117 S. UNIVERSITY - TWO STORY, 1ST FLOOR RETAIL, 2ND FLOOR OFFICE 1119 S. UNIVERSITY - TWO STORY, 1ST FLOOR RETAIL, 2ND FLOOR OFFICE

(b) INVENTORY OF SITE CONDITIONS: SOIL TYPES: FOX SANDY LOAM (FOA), AT ZERO TO 2 PERCENT SLOPES. VEGETATION: NO SIGNIFICANT VEGETATION. TWO LANDMARK TREES WILL BE

TOPOGRAPHY: THE MAJORITY OF THE SITE IS EXISTING BUILDING. THE SITE SLOPES AWAY FROM THE BUILDING TO TOWARD SOUTH UNIVERSITY AVENUE. THE ALLEY ON THE NORTHERN EDGE OF THE PROPERTY SLOPES TOWARD STORM CATCH BASINS IN THE CENTER OF THE ALLEY.

REMOVED WITH THE DOWNTOWN DEVELOPMENT AUTHORITY STREETSCAPE

(c) DESCRIPTION OF ON-SITE NATURAL FEATURES:

**ENDANGERED SPECIES HABITAT**: NONE. 100-YEAR FLOODPLAIN: NONE. LANDMARK TREES: NONE ON-SITE. TWO LANDMARK TREES ARE LOCATED IN PLANTERS IN THE S. UNIVERSITY AVENUE RIGHT-OF-WAY.

STEEP SLOPES: NONE. XISTING WATERCOURSES: NONE.

*VETLANDS*: NONE. WOODLANDS: NONE.

(d) EXISTING STRUCTURES ON-SITE: MIXED USE INCLUDING

549 E. UNIVERSITY, 1107, 1109, & 1111 S. UNIVERSITY - TWO STORY, 1ST FLOOR RETAIL, 2ND FLOOR OFFICE 1113 S. UNIVERSITY - ONE STORY, RETAIL

1115 - 1117 S. UNIVERSITY - TWO STORY, 1ST FLOOR RETAIL, 2ND FLOOR OFFICE 1119 S. UNIVERSITY - TWO STORY, 1ST FLOOR RETAIL, 2ND FLOOR OFFICE

(e) EXISTING AND PROPOSED PATHWAYS / ACCESS POINTS: EXISTING SITE ACCESS IS VIA PUBLIC STREETS AND SIDEWALKS THAT ARE LOCATED ON THE SOUTH AND WEST EDGES OF THE SITE. S. UNIVERSITY AVENUE IS A CITY OF ANN ARBOR PUBLIC STREET THAT SUPPORTS PEDESTRIAN ACCESS AND IS ALONG BOTH UNIVERSITY OF MICHIGAN AND CITY OF ANN ARBOR BUS ROUTES. S. UNIVERSITY AVENUE WILL BE THE PRIMARY ENTRY FOR THE RESIDENTIAL UNITS AND COMMERCIAL SPACE ON THE EASTERN SIDE OF THE BUILDING. E. UNIVERSITY RIGHT-OF-WAY PROVIDES PRIMARY ACCESS TO COMMERCIAL SPACE ON THE WESTERN SIDE OF THE BUILDING. CHURCH STREET IS A CITY OF ANN ARBOR PUBLIC STREET THAT PROVIDES ACCESS TO AN ALLEY ALONG THE NORTHERN BOUNDARY OF THE SITE. THE TRASH AND RECYCLING WILL BE ACCESSED FROM CHURCH STREET. RETAIL SPACES WILL HAVE DIRECT ACCESS TO THE ADJACENT PUBLIC SIDEWALKS. BICYCLE STORAGE WILL BE PROVIDED IN THE BASEMENT OF THE BUILDING. NO VEHICULAR PARKING IS PROPOSED. AN AGREEMENT WILL BE ESTABLISHED WITH THE DDA PER THE CITY'S POLICY FOR CONTRIBUTIONS IN

(f) UTILITY AVAILABILITY, EXISTING RIGHTS-OF-WAY AND EASEMENTS: SEE EXISTING CONDITIONS PLAN. WATER MAIN - 12" WATER MAINS ARE LOCATED IN THE NORTH SIDE OF S.

UNIVERSITY AND 6" WATER MAIN ON WEST SIDE OF CHURCH STREET. PROPOSED CONNECTION IS TO THE 12" WATER MAIN ON S. UNIVERSITY. SANITARY SEWER - AN 18" AND 15" SEWER IS LOCATED APPROXIMATELY IN THE CENTER OF S. UNIVERSITY AND AN 8" SEWER IS LOCATED IN THE EAST HALF OF CHURCH STREET. PROPOSED CONNECTION IS TO THE 15" SEWER ON S.

STORM SEWER - A 24" SEWER IS LOCATED IN THE SOUTH HALF OF S. UNIVERSITY AND A 18" SEWER IS LOCATED IN THE EAST HALF OF CHURCH STREET. PROPOSED CONNECTION IS TO THE 24" SEWER ON S. UNIVERSITY.

(g) GENERAL DRAINAGE PATTERN: THE MAJORITY OF THE SITE IS EXISTING BUILDING. THE SITE SLOPES AWAY FROM THE BUILDING TO TOWARD SOUTH UNIVERSITY AVENUE. THE ALLEY ON THE NORTHERN EDGE OF THE PROPERTY

SLOPES TOWARD STORM CATCH BASINS IN THE CENTER OF THE ALLEY. SCHEMATIC DESIGN: (a) COMPARISON CHART OF PROPOSED DEVELOPMENT AND CITY REQUIREMENTS

SEE THE SITE DATA COMPARISON CHART ON THE COVER SHEET. (b) EXISTING / PROPOSED TOPOGRAPHY AND LIMITS OF SOIL DISTURBANCE: SEE EXISTING TOPOGRAPHY ON THE EXISTING CONDITIONS PLAN. PROPOSED

GRADING AND LIMITS OF DISTURBANCE ARE SHOWN ON THE GRADING PLAN. (c) ORIENTATION AND GENERAL LOCATION OF PROPOSED IMPROVEMENTS: SEE DIMENSIONAL SITE PLAN. (d) VERTICAL SECTIONS RESULTING IN SIGNIFICANT CHANGE OF STEEP SLOPE: NOT

(e) PROPOSED CIRCULATION PATTERNS ON-SITE: SEE DIMENSIONAL SITE PLAN AND ARCHITECTURAL PLANS. PRIMARY PEDESTRIAN ACCESS FOR RESIDENTS IS AT THE WEST CORNER OF THE BUILDING ON S. UNIVERSITY. SECONDARY PEDESTRIAN ACCESS IS PROVIDED AT NORTHEAST END OF BUILDING. RETAIL SPACES WILL HAVE DIRECT ACCESS TO THE ADJACENT PUBLIC SIDEWALKS ON E.

UNIVERSITY AND S. UNIVERSITY. EXISTING LOADING SPACE IS LOCATED ON CHURCH STREET ADJACENT TO THE SITE. NO VEHICULAR PARKING IS PROPOSED WITH THE DEVELOPMENT. TRASH AND RECYCLE STORAGE WILL BE LOCATED INSIDE THE GROUND FLOOR LEVEL OF THE BUILDING. TRASH AND RECYCLING CARTS WILL BE WHEELED OUT INTO THE JOINT USE ALLEY NORTH OF THE SITE FOR PUBLIC PICKUP.

FREQUENCY OF PICKUP WILL BE ADJUSTED AS NECESSARY. (f) PROPOSED LOT AND SETBACK LINES: SEE DIMENSIONAL SITE PLAN. (g) DISTURBANCE OF NATURAL FEATURES AND PROPOSED MITIGATION MEASURES: NO REGULATED NATURAL FEATURES EXIST ON SITE. THERE ARE NO LANDMARK TREES ON THE SITE. TWO LANDMARK TREES WILL BE REMOVED WITH THE DDA STREETSCAPE IMPROVEMENTS. SIX TREES WILL BE PLANTED IN THE

RIGHT-OF-WAY AS PART OF THE DDA STREETSCAPE IMPROVEMENTS. GENERAL INFORMATION:

(a) PROJECT NAME: THE COLLEGIAN NORTH (b) PETITIONER'S NAME AND ADDRESS: SOUTH UNIVERSITY-NORTH, LLC. 30100 TELEGRAPH ROAD, SUITE 220, BINGHAM FARMS, MI 48025.

(c) NORTH ARROW AND DRAWING SCALE: SEE EACH SHEET. (d) EXISTING AND PROPOSED ZONING: D1. (e) TOTAL FLOOR AREA (NO. OF DWELLING UNITS): 115,552SF USABLE FLOOR AREA

INCLUDING 97,346 SF RESIDENTIAL/55 UNITS, LEASING AND AMENITY AREA; AND 18,206 SF COMMERCIAL.

(f) PROPOSED BUILDING HEIGHT: 149'-9" MAXIMUM. (g) STATEMENT OF INTEREST: SOUTH UNIVERSITY - NORTH, LLC HAS A LONG-TERM GROUND LEASE WITH THE OWNERS.

(h) MAP OF APPLICANT'S CONTIGUOUS LAND HOLDINGS IN PROPOSED DEVELOPMENT AREA: THE APPLICANT HAS ADDITIONAL LONG-TERM GROUND LEASES WITH THE OWNERS FOR PROPERTY AT 1100-1110 S. UNIVERSITY, 1114 S. UNIVERSITY, 1200-1202 S. UNIVERSITY, 1209/1211/1213 S. UNIVERSITY, 609 E. UNIVERSITY, 603-607 CHURCH ST, AND 610 CHURCH ST. ADDITIONALLY, THE APPLICANT IS FEE TITLE OWNER OF 1112 S. UNIVERSITY.

VICINITY MAP OF PROPERTY WITHIN 250 FEET OF DEVELOPMENT: SEE THE COVER SHEET. PROJECT TIME SCHEDULE: START BY END OF AUGUST 2017 AND COMPLETE IN

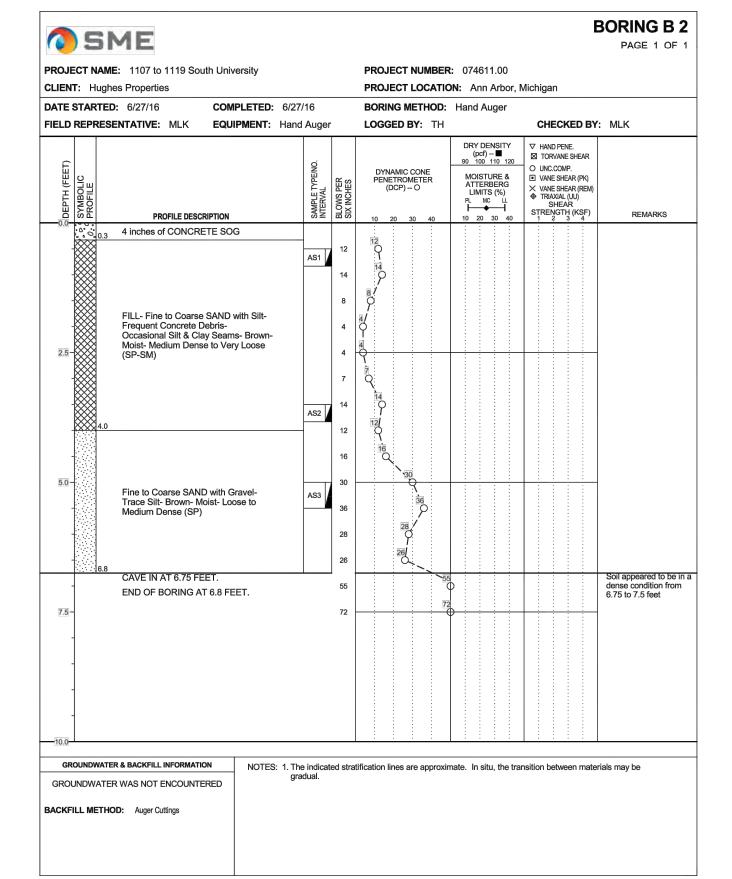
AUGUST 2019. (k) LOCATION / IDENTIFICATION OF PUBLIC AREAS/MUNICIPAL CORPORATION LINES IN PROPOSED DEVELOPMENT AREA: SEE EXISTING CONDITIONS PLAN. THE SITE IS LOCATED IN DOWNTOWN ANN ARBOR.

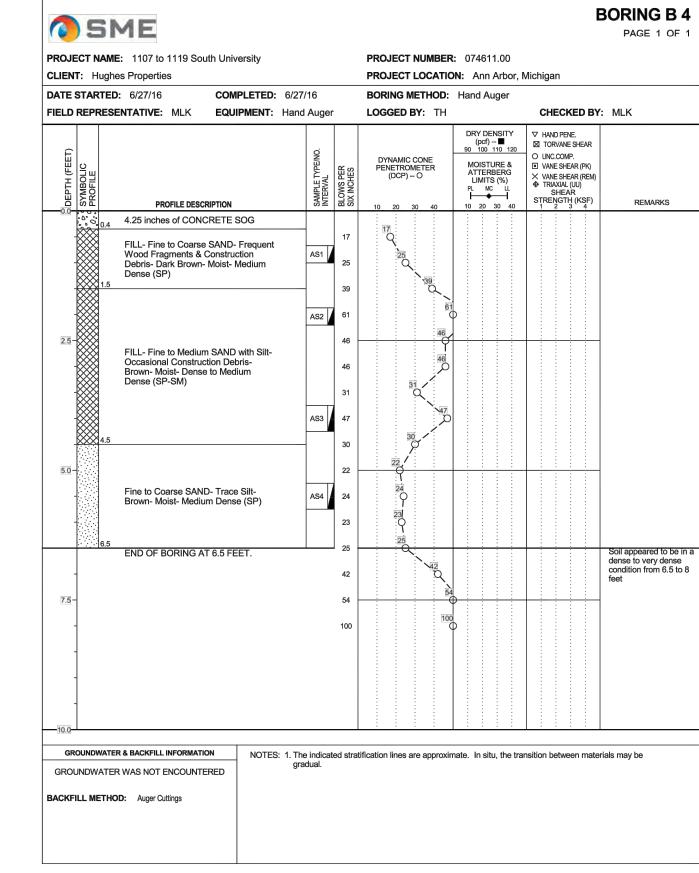
(I) LEGAL DESCRIPTION OF PARCEL: SEE EXISTING CONDITIONS PLAN. (m) COPY OF PROPOSED PLAN IN 8-1/2 X 11 FORMAT: TO BE PROVIDED AS PDF'S. - HE 8 8 2

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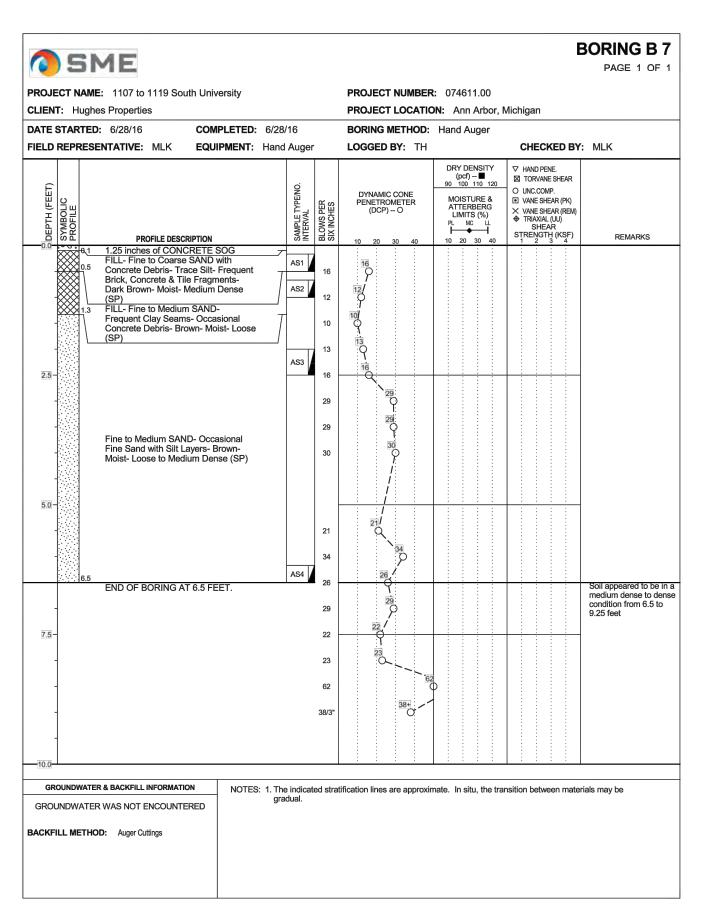
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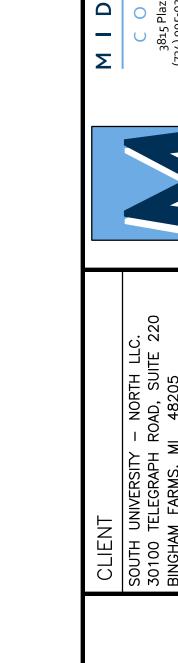




| CLIENT: Hugh                        | E: 1107 to 1119 Sounes Properties   |              |                             |                         | PROJECT NUMBER: PROJECT LOCATION          |   | Michigan   |  |
|-------------------------------------|---|--------------|-----------------------------|-------------------------|---|---|--|--|
| DATE STARTE                         | <b>D:</b> 6/27/16   | COMPLETED:   | 6/27/16                     |                         | BORING METHOD:                            | Hand Auger  |  |  |
| FIELD REPRES                        | ENTATIVE: MLK   | EQUIPMENT: H | Hand Auger                  |                         | LOGGED BY: TH                             |   | CHECKED BY   | : MLK  |
| DEPTH (FEET)<br>SYMBOLIC<br>PROFILE |   | DIDTION      | SAMPLE TYPE/NO.<br>INTERVAL | BLOWS PER<br>SIX INCHES | DYNAMIC CONE<br>PENETROMETER<br>(DCP) - O | DRY DENSITY (pcf)  90 100 110 120  MOISTURE & ATTERBERG LIMITS (%) PL MC LL | ▼ HAND PENE. ■ TORVANE SHEAR O UNC.COMP. ■ VANE SHEAR (PK) ▼ VANE SHEAR (REM) ● TIAXIAL (UU) SHEAR STRENGTH (KSF) 1 (45) | REMARKS  |
| 0.0                                 | PROFILE DESC<br>2.75 inches of CONO   |              | 05=                         | ш 0)                    | 10 20 30 40                               | 10 20 30 40   | 1 2 3 4  | TIETO TI TICO  |
|                                     | FILL- Fine to Coarse Frequent Concrete & Debris- Brown- Mois Medium Dense (SP-  CAVE IN AT 4 FEET END OF BORING A | ON NOTES:    | AS2                         | 11                      | ification lines are approxima             | ite. In situ, the trai  | nsition between mater  | Soil appeared to be in medium dense to dens condition from 4 to 8.5 feet |



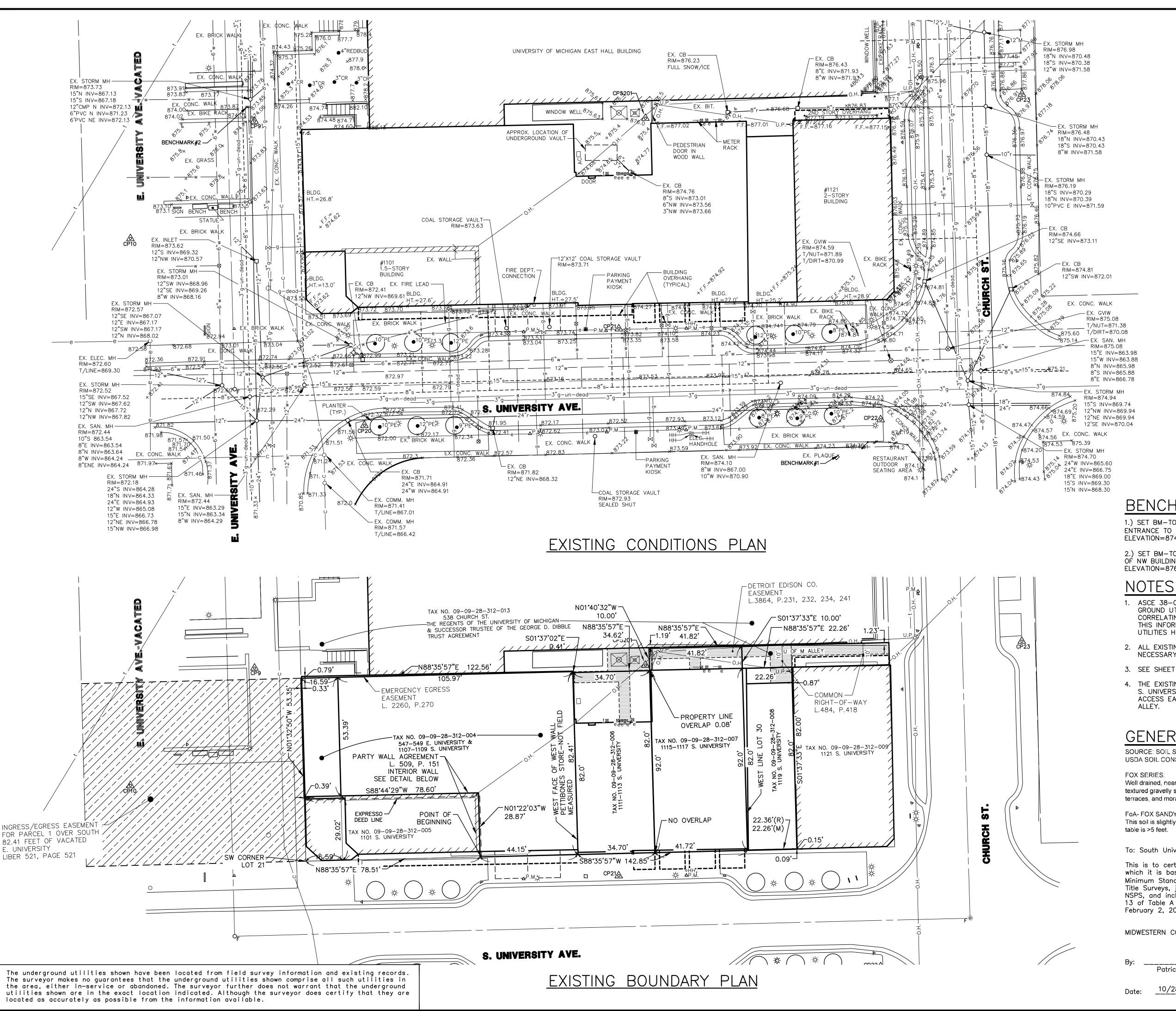
| CLIEN         | <b>Γ</b> : Hugh | E: 1107 to 1119 Sou<br>les Properties   |                            |   |                                   | TON: Ann Arbor, I  | Michigan   |   |
|---------------|-----------------|---|----------------------------|---|-----------------------------------|--|--|---|
|               |                 | D: 6/28/16<br>ENTATIVE: MLK   | COMPLETED: 6 EQUIPMENT: Ha |   | BORING METHOD<br>LOGGED BY: TH    | _  | CHECKED BY   | : MLK   |
| Врертн (FEET) | SYMBOLIC        | PROFILE DESC  | RIPTION                    | SAMPLE TYPE/NO.<br>INTERVAL<br>BI OWS PFR | DYNAMIC CONE PENETROMETER (DCP) O | DRY DENSITY (pcf) - ■ 90 100 110 120  MOISTURE & ATTERBERG LIMITS (%) PL MC LL 10 20 30 40 | V HAND PENE.  ☑ TORVANE SHEAR  O UNC.COMP.  ☑ VANE SHEAR (PK)  X VANE SHEAR (REM)  ♦ TRIAXIAL (UN)  SHEAR  STRENGTH (KSF)  1 2 3 4 | REMARKS   |
| 5.0           | 1.0             | FILL- Fine SAND- Fine Partings- Occasional Debris- Light Brown- (SP)  Fine to Medium SAN Loose to Dense (SP)  END OF BORING A | I Concrete<br>Moist- Loose | AS1 AS2 AS3 AS4                           | 0                                 | 60   |  | Soil appeared to be<br>dense to very dense<br>condition from 6.5 to<br>7.5 feet |
|               |                 | ER & BACKFILL INFORMATION R WAS NOT ENCOUNTE  |                            | The indicated gradual.                    | stratification lines are appro    | ximate. In situ, the tra   | nsition between mate   | rials may be  |

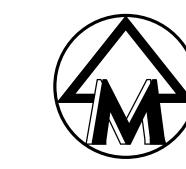


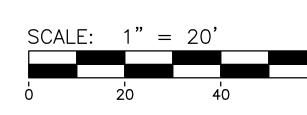
SITE PLAN SOIL BORINGS

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|                   |               | •         |           |          |         |       |                   |  |
|-------------------|---------------|-----------|-----------|----------|---------|-------|-------------------|--|
| 21 /22 /21 :211/2 | SHEET 3 OF 26 |           | CADD: DAG | ENG: SGF | PM: TJC | TECH: | SITE\15006CV1.dwg |  |
|                   | L<br>H        | REV. DAIE |           |          |         |       |                   |  |
|                   |               |           |           |          |         |       |                   |  |

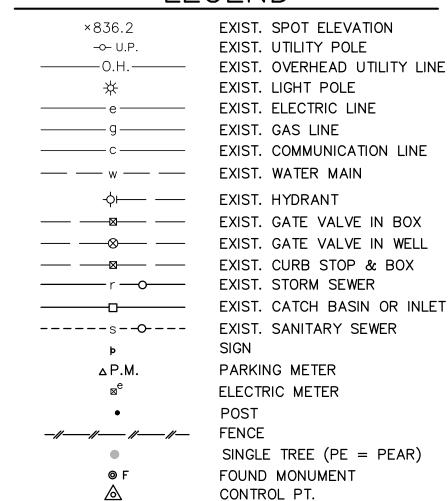








# LEGEND



# **BENCHMARKS**

1.) SET BM-TOP/NORTH CORNER ON PLAQUE IN SIDEWALK AT ELEVATION=874.33 NAVD 88.

2.) SET BM-TOP/WALL END 10 FEET NORTH AND 23 FEET WEST OF NW BUILDING CORNER OF 1101 SOUTH UNIVERSITY AVENUE. ELEVATION=876.39 NAVD 88.

- 1. ASCE 38-02 QUALITY LEVEL SURVEY INVOLVES SURVEYING VISIBLE ABOVE GROUND UTILITY FACILITIES SUCH AS MANHOLES, VALVE BOXES, POSTS, ETC., AND CORRELATING THIS INFORMATION WITH EXISTING UTILITY RECORDS. WHEN USING THIS INFORMATION, IT IS NOT UNUSUAL TO FIND THAT MANY UNDERGROUND UTILITIES HAVE BEEN EITHER OMITTED OR ERRONEOUSLY PLOTTED.
- 2. ALL EXISTING ON-SITE EASEMENTS ARE TO BE VACATED OR RELOCATED AS NECESSARY PER THE PROPOSED DEVELOPMENT PLANS.
- 3. SEE SHEET 2 FOR EXISTING PROPERTY LEGAL DESCRIPTIONS.
- 4. THE EXISTING 10 FOOT WIDE COMMON RIGHT-OF-WAY NORTH OF 1119 AND 1121 S. UNIVERSITY IS TO BE ADDED TO THOSE RESPECTIVE PROPERTIES WITH A NEW ACCESS EASEMENT CREATED TO MAINTAIN ACCESS TO THE ENTIRE EXISTING

# GENERAL SOILS DESCRIPTION

SOURCE: SOIL SURVEY OF WASHTENAW COUNTY USDA SOIL CONSERVATION SERVICE, 1977

Well drained, nearly level to steep soils formed in loamy textured and sandy textured gravelly sand. These soils are on outwash plains, kames, valley trains, terraces, and moraines. Available water capacity and permeability is moderate.

FoA- FOX SANDY LOAM, 0 TO 2 PERCENT SLOPES; CLASS B This soil is slightly droughty and runoff is slow. Depth to seasonal high water

To: South University — North LLC, and Absolute Title Inc.:

This is to certify that this map or plat and the survey on which it is based were made in accordance with the 2011 Minimum Standard Detail Requirements for ALTA/ACSM Land Title Surveys, jointly established and adopted by ALTA and NSPS, and includes Items 1, 2, 3, 4, 7Å, 8, 9, 10, 11 and 13 of Table A thereof. The field work was completed on February 2, 2015.

<sup>,7</sup>PATRIGK L.

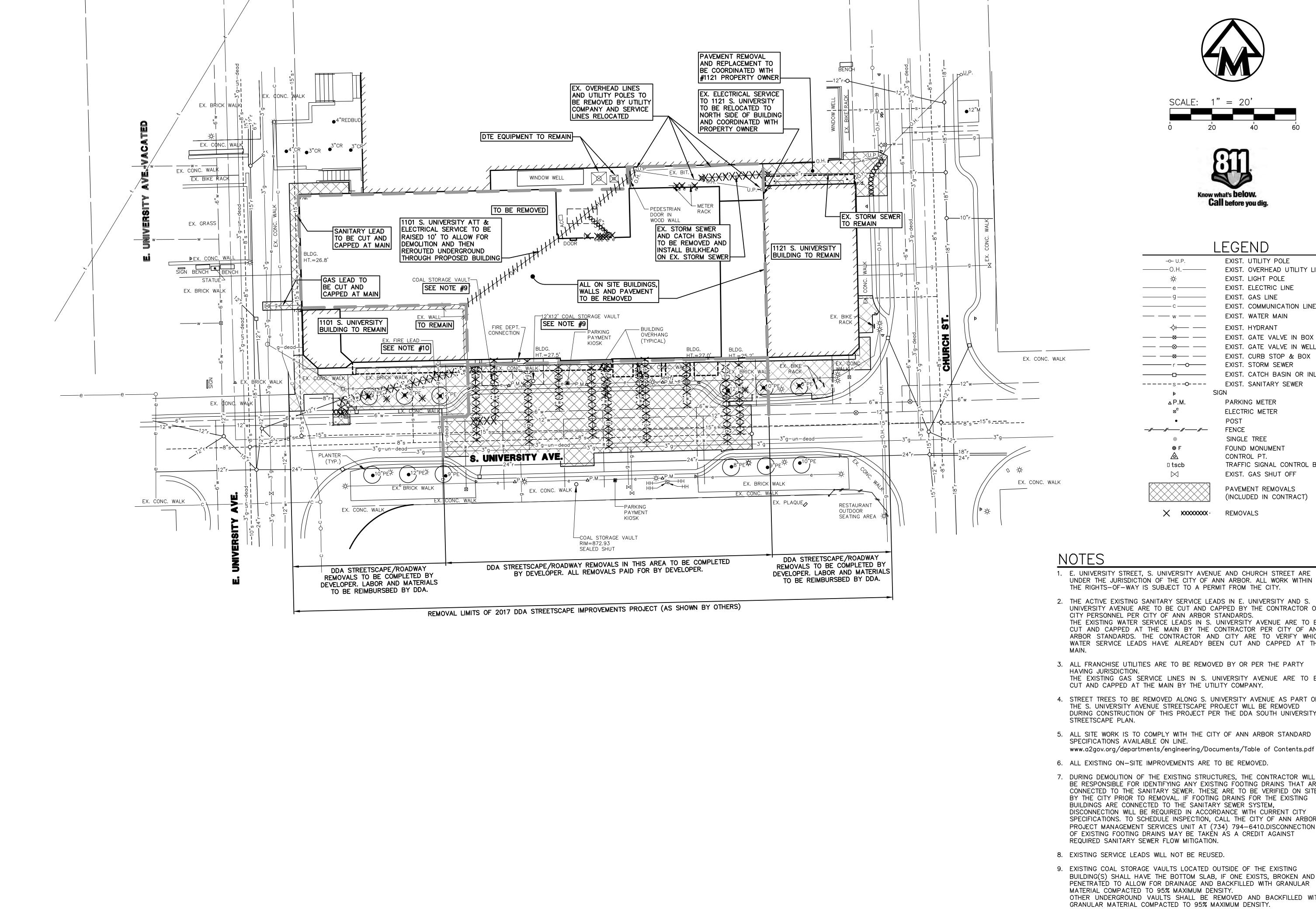
MIDWESTERN CONSULTING, LLC

Patrick L. Hastings, P.S. No. 37

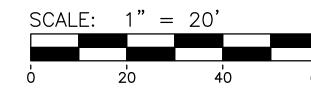
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LEGEND

| U.P.          | EXIST. UTILITY POLE         |
|---------------|-----------------------------|
| H.——          | EXIST. OVERHEAD UTILITY LIN |
| <u>,</u>      | EXIST. LIGHT POLE           |
| ; ———         | EXIST. ELECTRIC LINE        |
| ] ———         | EXIST. GAS LINE             |
| ;             | EXIST. COMMUNICATION LINE   |
| <i>,</i> —— — | EXIST. WATER MAIN           |
| <del></del>   | EXIST. HYDRANT              |
| <b></b>       | EXIST. GATE VALVE IN BOX    |
| <b>—</b>      | EXIST. GATE VALVE IN WELL   |
| <del></del>   | EXIST. CURB STOP & BOX      |
| <del></del>   | EXIST. STORM SEWER          |
| <b>)</b> ———  | EXIST. CATCH BASIN OR INLE  |
| ;O            | EXIST. SANITARY SEWER       |

PARKING METER ELECTRIC METER **FENCE** 

SINGLE TREE FOUND MONUMENT CONTROL PT. TRAFFIC SIGNAL CONTROL BOX EXIST. GAS SHUT OFF

> PAVEMENT REMOVALS (INCLUDED IN CONTRACT)

XXXXXXXXX REMOVALS

1. E. UNIVERSITY STREET, S. UNIVERSITY AVENUE AND CHURCH STREET ARE UNDER THE JURISDICTION OF THE CITY OF ANN ARBOR. ALL WORK WITHIN

2. THE ACTIVE EXISTING SANITARY SERVICE LEADS IN E. UNIVERSITY AND S. UNIVERSITY AVENUE ARE TO BE CUT AND CAPPED BY THE CONTRACTOR OR CITY PERSONNEL PER CITY OF ANN ARBOR STANDARDS. THE EXISTING WATER SERVICE LEADS IN S. UNIVERSITY AVENUE ARE TO BE CUT AND CAPPED AT THE MAIN BY THE CONTRACTOR PER CITY OF ANN ARBOR STANDARDS. THE CONTRACTOR AND CITY ARE TO VERIFY WHICH WATER SERVICE LEADS HAVE ALREADY BEEN CUT AND CAPPED AT THE

- 3. ALL FRANCHISE UTILITIES ARE TO BE REMOVED BY OR PER THE PARTY THE EXISTING GAS SERVICE LINES IN S. UNIVERSITY AVENUE ARE TO BE
- 4. STREET TREES TO BE REMOVED ALONG S. UNIVERSITY AVENUE AS PART OF THE S. UNIVERSITY AVENUE STREETSCAPE PROJECT WILL BE REMOVED DURING CONSTRUCTION OF THIS PROJECT PER THE DDA SOUTH UNIVERSITY
- 5. ALL SITE WORK IS TO COMPLY WITH THE CITY OF ANN ARBOR STANDARD
- 6. ALL EXISTING ON-SITE IMPROVEMENTS ARE TO BE REMOVED.
- 7. DURING DEMOLITION OF THE EXISTING STRUCTURES, THE CONTRACTOR WILL BE RESPONSIBLE FOR IDENTIFYING ANY EXISTING FOOTING DRAINS THAT ARE CONNECTED TO THE SANITARY SEWER. THESE ARE TO BE VERIFIED ON SITE BY THE CITY PRIOR TO REMOVAL. IF FOOTING DRAINS FOR THE EXISTING BUILDINGS ARE CONNECTED TO THE SANITARY SEWER SYSTEM, DISCONNECTION WILL BE REQUIRED IN ACCORDANCE WITH CURRENT CITY SPECIFICATIONS. TO SCHEDULE INSPECTION, CALL THE CITY OF ANN ARBOR PROJECT MANAGEMENT SERVICES UNIT AT (734) 794-6410.DISCONNECTION OF EXISTING FOOTING DRAINS MAY BE TAKEN AS A CREDIT AGAINST
- 8. EXISTING SERVICE LEADS WILL NOT BE REUSED.
- 9. EXISTING COAL STORAGE VAULTS LOCATED OUTSIDE OF THE EXISTING BUILDING(S) SHALL HAVE THE BOTTOM SLAB, IF ONE EXISTS, BROKEN AND PENETRATED TO ALLOW FOR DRAINAGE AND BACKFILLED WITH GRANULAR MATERIAL COMPACTED TO 95% MAXIMUM DENSITY. OTHER UNDERGROUND VAULTS SHALL BE REMOVED AND BACKFILLED WITH
- 10. EXISTING WATER SERVICE LEAD SHALL BE CUT AND CAPPED AT MAIN PER NOTE #2, ABOVE, AND EXISTING PIPE SHALL BE ABANDONED IN PLACE.

AN PLAN Ш

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S 01'40'32" E

10.00'—

S 88'35'57" W

rs 88°35'57" W

122.56'

N 01°37'02" W

-N 88'44'29" E

78.60'

SW CORNER

LOT 21

0.41'—

**34.62'—** 

S 01°22'03" E

28.87

POINT OF

PROPOSED PARCEL SKETCH

S 88°35'57" W

64.08

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CANOPY LOSS IS ASSOCIATED WITH DDA STREETSCAPE IMPROVEMENT PROJECT TREES TO BE REMOVED: 10", 10", 12", 12", 10", 8" PEAR = TOTAL 62" DBH REPLACEMENT TREES: SIX 3" CALIPER TREES

TOTAL CALIPER INCHES OF REPLACEMENT TREES - 18"

- 2. STREET TREE ESCROW: S. UNIVERSITY STREET FRONTAGE = 143 LF 143 LF X \$1.30 = \$185.90 OR EQUIVALENT STREET TREE ESCROW OF \$185.90 WILL BE PROVIDED PRIOR TO ISSUING BUILDING PERMITS AND WILL BE REFUNDED AFTER CITY STAFF INSPECTION SHOWS LONG TERM SURVIVAL OF THE PROPOSED STREET TREES.
- 3. LANDMARK TREE REPLACEMENT: NONE REQUIRED
- 4. 5:602 VEHICULAR USE AREA LANDSCAPING AND SCREENING: RIGHT-OF-WAY SCREENING: NOT APPLICABLE INTERIOR LANDSCAPE ISLANDS: NOT APPLICABLE
- 5. 5:603 CONFLICTING LAND USE BUFFERS: NOT APPLICABLE

# PARKS CONTRIBUTION

PER CITY OF ANN ARBOR DEVELOPER CONTRIBUTIONS FOR PARKS AND OPEN SPACE GUIDANCE, THE DEVELOPMENT WILL INCLUDE A CONTRIBUTION IN LIEU OF LAND TO THE CITY OF ANN ARBOR PARKS AND RECREATION AT A RATE OF 0.0124 ACRES PER RESIDENTIAL UNIT.

55 UNITS X 0.0124 ACRES = 0.682 X \$50,000 = \$34,100.00

# LANDSCAPE REQUIREMENTS

- STREET TREE CANOPY LOSS: NOT APPLICABLE STREET TREE

# LEGEND

Know what's below.

Call before you d'

△ P.M.

PARKING METER RAMP

EXIST. CURB & GUTTER PROP. CURB & GUTTER EXIST. STREET LIGHT

PROPOSED/RELOCATED STREET LIGHT PROPOSED PROJECT BOUNDARY

PROP. BITUMINOUS PAVEMENT

PROP. CONCRETE PAVEMENT

PROP. DDA STREET TREE

EX. CONC. WALK

EX. CONC. WALK

NOTES STANDARD SIDEWALK REPAIR AND MAINTENANCE NOTE PER CHAPTER 49, SECTION 4:58 OF CITY OF ANN ARBOR CODE: ALL SIDEWALKS ARE TO BE KEPT AND MAINTAINED IN GOOD REPAIR BY THE OWNER OF THE LAND ADJACENT TO AND ABUTTING THE SAME. PRIOR TO THE ISSUANCE OF THE FINAL CERTIFICATE OF OCCUPANCY FOR THIS SITE. ALL EXISTING SIDEWALKS IN NEED OF REPAIR MUST BE REPAIRED IN ACCORDANCE WITH CITY STANDARDS.

2. ALL SIDEWALKS SHALL MEET REQUIREMENTS AND GUIDELINES AS SET FORTH IN THE ADA STANDARDS FOR ACCESSIBLE DESIGN.

3. SOUTH UNIVERSITY STREETSCAPE DESIGN IS DRAWN PER SOUTH UNIVERSITY IMPROVEMENTS PLANS PROVIDED BY SMITHGROUP JJR DATED DECEMBER 5, 2016 AND AMENDED ON DECEMBER 21, 2016 AND JANUARY 6, 2017. PROPOSED SOUTH UNIVERSITY STREETSCAPE INCLUDES A CONCRETE SIDEWALK, CURBED LANDSCAPE BED AT STREET TREES, TREE GRATES, BIKE RACK, BRICK PAVERS AND PROPOSED PEDESTRIAN LIGHTS. THE ANN ARBOR DOWNTOWN DEVELOPMENT AUTHORITY (DDA) IS PREPARING STREETSCAPE PLANS FOR THE CORRIDOR, AND WORK ALONG THIS BUILDING SHALL MATCH THE DDA'S DESIGN. REFER TO PLANS PREPARED BY SMITHGROUP JJR FOR ALL DIMENSIONS AND DETAILS OF PROPOSED STREETSCAPE IMPROVEMENTS.

THE DEVELOPER WILL COMPLETE THE STREETSCAPE RENOVATIONS ON THE NORTH SIDE OF SOUTH UNIVERSITY BETWEEN EAST UNIVERSITY AND CHURCH STREET WITH THE EXCEPTION OF LANDSCAPING AS DIMENSIONED ON THE DIMENSIONAL SITE PLAN. THE DEVELOPER WILL FURNISH ALL LABOR AND MATERIAL NECESSARY TO COMPLETE THE RENOVATIONS WITH THE EXCEPTION OF THE FOLLOWING:

- THE DDA WILL FURNISH THE GRATES, PAVERS, BIKE HOOPS, BENCHES, LIGHT GLOBES, AND PLANTER CURB MATERIALS FOR THE ENTIRE BLOCK
- THE DDA WILL REIMBURSE THE DEVELOPER FOR THE LABOR AND MATERIAL COSTS ASSOCIATED. WITH THE WORK FRONTING 1101 AND 1121 SOUTH UNIVERSITY.
- THE DDA WILL INSTALL ALL LANDSCAPING. THE DEVELOPER WILL BE RESPONSIBLE TO REIMBURSE THE DDA FOR THE COST OF THE LANDSCAPING FRONTING THE DEVELOPMENT
- 4. THERE ARE NO PROPOSED FIREWALLS IN THE BUILDING.
- 5. THE FOUNDATION SYSTEM WILL BE FULLY DESIGNED DURING PREPARATION OF THE CONSTRUCTION PLANS. IF TEMPORARY TIE-BACKS ARE REQUIRED IN THE RIGHT-OF-WAY FOR CONSTRUCTION PURPOSES, A TEMPORARY LICENSING AGREEMENT WILL BE PROVIDED. BUILDING FOOTINGS WILL NOT BE LOCATED WITHIN THE PUBLIC RIGHT-OF-WAY.
- 6. TRASH MANAGEMENT SYSTEMS: TRASH WILL BE COLLECTED IN THE BUILDING, AND ROLLED OUT ON TRASH DAY TO THE ALLEYWAY FOR PICKUP AT THE CURB.
- 7. PROPOSED GENERATOR IS TO BE LOCATED INSIDE THE BUILDING FOOTPRINT WITH OUTSIDE ACCESS FROM THE ALLEY. AN ADDITIONAL TRANSFORMER IS TO BE LOCATED ADJACENT TO EXISTING TRANSFORMER AND ELECTRICAL EQUIPMENT OUTSIDE ALONG THE NORTH SIDE OF THE ALLEY. OPERATION AND MAINTENANCE, INCLUDING REGULAR TESTING OF SUCH EQUIPMENT, IS SUBJECT TO CHAPTER 119 NOISE CONTROL.
- 8. PROPOSED MOSAIC TILES ARE TO BE INSTALLED IN THE PROPOSED SIDEWALK ADJACENT TO AND INSIDE OF THE WEST AND SOUTH PROPERTY LINES. NO TILES WILL BE INSTALLED WITHIN THE RIGHT-OF-WAY.
- 9. THE PROPOSED BUILDING OVERHANGS ALONG S. UNIVERSITY AND E. UNIVERSITY ARE A MINIMUM OF 12'-0" ABOVE THE PROPOSED SIDEWALK GRADE.

SCALE: 1" = 20'



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of Beginning,

PROPOSED LEGAL DESCRIPTION

the Southerly extension of the wall;

it's extension West;

thence N 01°40'32" W 10.00 feet;

record, if any.

LEGAL DESCRIPTION OF A 0.380 ACRE PARCEL OF LAND LOCATED IN

SECTION 28, T2S, R6E, CITY OF ANN ARBOR,

Commencing at the SW Corner of Lot 21 of "R.S. Smith's Addition to the City of

WASHTENAW COUNTY, MICHIGAN

Ann Arbor", as recorded in Liber 42 of Deeds, Pages 446 & 447, Washtenaw County

Records, thence N 88°35'57" E 78.51 feet along the South line of said Lot 21 and

the North right-of-way line of South University Avenue (variable width) to the Point

thence N 01°22'03" W 28.87 feet along the East face of an existing wall and in

thence S 88°44'29" W 78.60 feet along the North face of an existing wall and

thence S 01°37'02" E 0.41 feet along a line which is the continuation Northerly

thence N 01°32'50" W 53.35 feet along the West line of Lot's 21 and 22 of

thence S 01°37'33" E 92.00 feet parallel to the West line of Lot 30 of said

thence S 88°35'57" W 142.85 feet along the North line of South University

Smith's Addition to the City of Ann Arbor" to the Point of Beginning.

land, more or less. Being subject to easements and restrictions of

Being a part of the E 1/2 of the SW 1/4 of Section 28, T2S, R6E, City

Avenue and along the South line of said Lots 21, 29, and 30 of said "R.S.

of Ann Arbor, Washtenaw County, Michigan and containing 0.3803 acres of

said "R.S. Smith's Addition to the City of Ann Arbor";

of the West face of the West wall of Pettibone's Store;

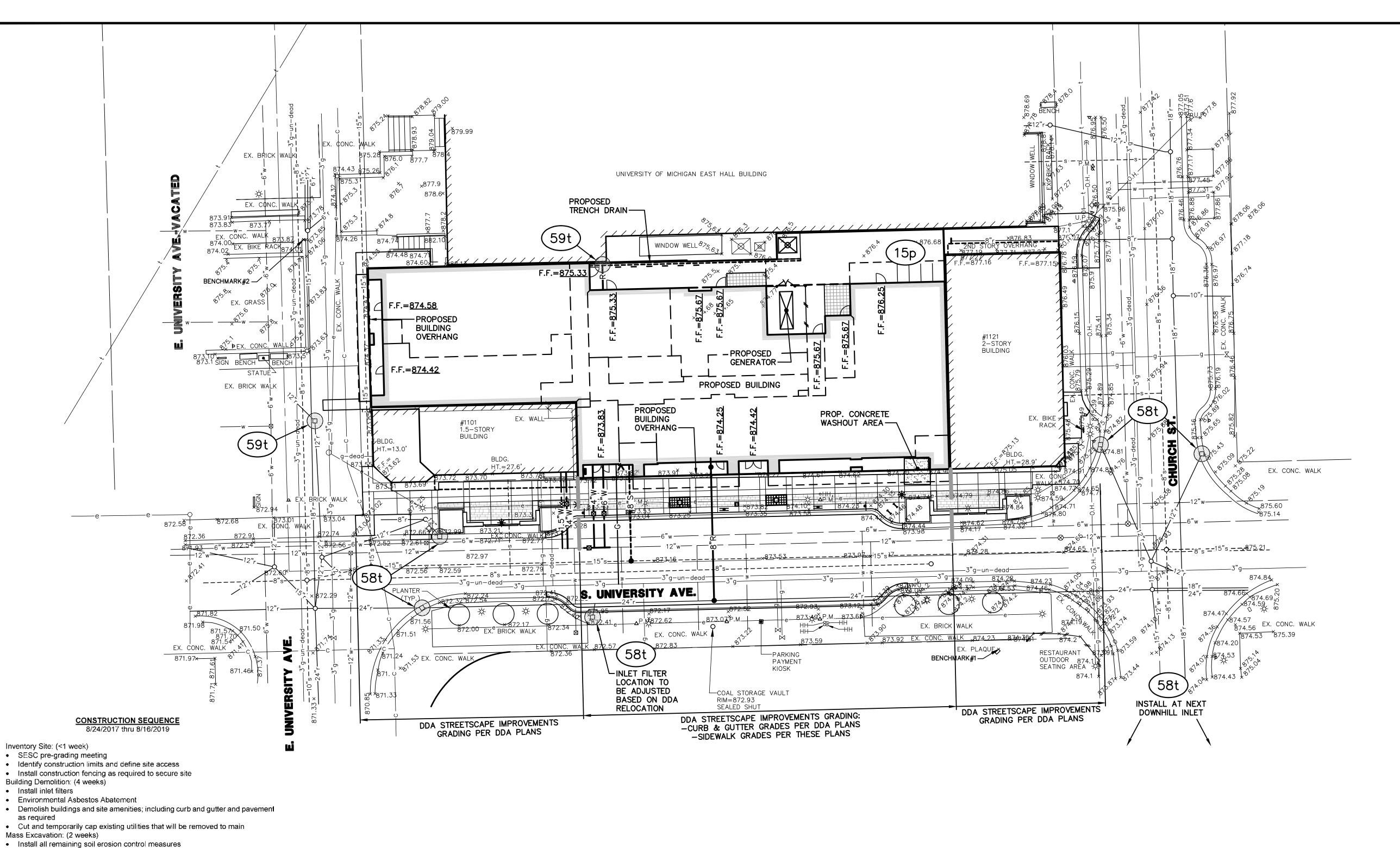
thence N 88°35'57" E 122.56 feet parallel to South University Avenue;

thence N 88°35'57" E 34.62 feet parallel to South University Avenue;

thence N 88°35'57" E 64.08 feet parallel to South University Avenue;

"R.S. Smith's Addition to the City of Ann Arbor";

VISIONS: REV. PEI ADD PRC REV. PEI



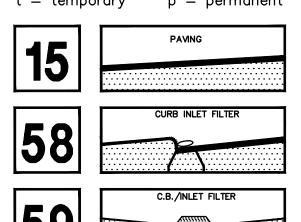
**SOIL EROSION CONTROL NOTES:** 

- 1. All soil erosion control measures shall comply with the current City of Ann Arbor ordinances, Washtenaw County standards and specifications for soil erosion and sedimentation control, and State of Michigan "Soil Erosion and Sedimentation Control Act - P.A. 347".
- 2. Prior to commencing earthmoving operations, the grading contractor shall install the temporary catch basin filter(s) shown on the plans.
- 3. The removal of trapped sediment and the cleanout or replacement of clogged storm sewer may be necessary after each storm event during the project.
- 4. Only upon stabilization of all disturbed areas may the temporary inlet filters be
- removed. All storm sewers must be also cleaned of all sediment. 8. All inlets and catch basins will have sediment filters installed after their construction. These filters will be maintained until all areas around the structure have been
- 9. The Contractor will maintain all necessary soil erosion control devices until soil stabilization has occurred.
- 10. Appropriate emergency access will be provided during construction.
- 11. The estimated cost of soil erosion control measures is \$2500.
- 12. The estimated cost to protect all soil surfaces from erosion should construction discontinue is \$1000.
- 13. External streets will be immediately cleaned of any tracked mud following each mudtracking occurrence.
- 14. Estimated project earthwork is 400 CYD excavation and 3,000 CYD fill. 15. Dewatering operations during construction, if necessary, must be done per City
- requirements including sediment control and disposal. Discharge should be to the S.
- 16. Final locations and dimensions of the concrete washout area are to be determined by the contractor subject to City approval.

# MAINTENANCE PROGRAM FOR SOIL EROSION CONTROLS

1. The Owner shall be responsible for maintaining the permanent soil erosion control measures.

# SOIL EROSION CONTROL MEASURES



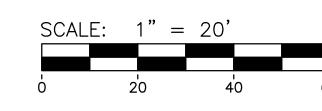
# PERMANENT MAINTENANCE TASKS AND SCHEDULE

Components

|                                   | Storm  | Catch |           | Outflow   |                          |             |
|-----------------------------------|--------|-------|-----------|-----------|--------------------------|-------------|
|                                   | Sew er | Basin | Detention | Control   |                          |             |
|                                   | System | Sumps | Chamber   | Structure | Schedule                 | Annual Cost |
| Inspect for sediment accumulation | Χ      | Х     | Х         | Х         | semi-annual              | \$200       |
| Removal of sediment accumulation  | Х      | Х     | Х         | Х         | every 2 years, as needed | \$400       |
| Inspect for floatables and debris | Х      | Х     | Х         |           | annually                 | \$100       |
| Cleaning of floatables and debris | Х      | Х     | Х         |           | annually                 | \$400       |

| rary                                  | p = perman        | ent    |
|---------------------------------------|-------------------|--------|
|                                       | PAVING            |        |
|                                       |                   |        |
|                                       | CURB INLET FILTER |        |
|                                       |                   |        |
|                                       | C.B./INLET FILTER |        |
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# NOTES

- 1. PROPOSED CURB & GUTTER, PAVEMENT AND SIDEWALK TO MATCH EXISTING PAVEMENT/SIDEWALK GRADE AT REMOVAL
- 2. SEE SHEET 9 FOR ALL SOIL EROSION AND SEDIMENTATION CONTROL DETAILS.
- 3. NO MUD TRACKING MAT IS PROPOSED FOR THIS PROJECT. ALL VEHICLE TRAFFIC AND DIRT HAULING WILL BE LIMITED TO THE ADJACENT ROADWAYS AND NOT ALLOWED ON SITE.



EGIAN

TE PLAN

EROSION

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1500

 Maintain existing controls Install earth retention system

Install sanitary sewer lead

Building Construction: (84 weeks)

Maintain existing controls

Remove construction fencing

Remove catch basin silt sacks

Finalize Building Construction: (1 week)

completed, tested and approved.

Plant landscape items

Clean up debris

Install water main leads

Install storm sewer lead

final grading or final grade change

Install silt sack on any proposed inlets

final grading or final grade change

continue Building Construction: (3 weeks)

Follow-Up After the Site is Stabilized: (1 week)

Foundation Construction and Utility Installation/Removal: (8 weeks)

Construct detention chamber within the building foundation

Excavate for foundation/basement/storm detention chamber

Install Sidewalk, Curb and Gutter and Final Street Paving

Remove sediment from detention chambers and storm sewer system

 Provide as-built certification of the storm water detention system. Note: Construction sequence & schedule is preliminary and subject to adjustment in response to forces beyond our control. These may include weather, material

availability, labor unrest or other unforeseen circumstances.

Prior to the first Certificate of Occupancy, all Life Safety Systems shall be

A "Knox Box" emergency responder access system shall be installed prior to

the first Certificate of Occupancy. Forms for the Knox Box are available thru

• Maintain existing controls; install permanent controls within five (5) days after

· Restore pavement within thru traffic lanes that was removed during utility

• A wet or dry standpipe shall be installed per 3311.1 of the Michigan Building

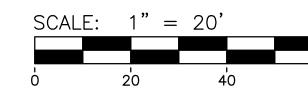
Maintain existing controls; install permanent controls within five (5) days after

Install Sidewalk, Curb and Gutter, Alley Pavement, Final Street Paving and

Code. The standpipe can be permanent or temporary with a permanent or

temporary FDC provided. Connections for hose operations shall be 2 1/2" NST.







# LEGEND

--- U.P. EXIST. UTILITY POLE W/ TRANS. -**%**− U.P. GUY WIRE ELEC. TRANSFORMER EXIST. OVERHEAD UTILITY LINE EXIST. LIGHT POLE PROP. LIGHT POLE EXIST. TELEPHONE LINE PROP. TELEPHONE LINE EXIST. ELECTRIC LINE PROP. ELECTRIC LINE EXIST. GAS LINE PROP. GAS LINE EXIST. GAS VALVE EXIST. FIBER OPTIC LINE PROP. FIBER OPTIC LINE EXIST. WATER MAIN PROP. WATER MAIN EXIST. HYDRANT PROP. HYDRANT EXIST. GATE VALVE IN BOX PROP. GATE VALVE IN BOX EXIST. GATE VALVE IN WELL PROP. GATE VALVE IN WELL EXIST. CURB STOP & BOX PROP. CURB STOP & BOX EXIST. BLOW-OFF PROP. BLOW-OFF POST INDICATOR VALVE THRUST BLOCK PROP. KNOXBOX EXIST. STORM SEWER \_\_\_\_ r \_\_O\_\_\_\_ PROP. STORM SEWER EXIST. CATCH BASIN OR INLET PROP. CATCH BASIN OR INLET EXIST. DOWNSPOUT PROP. DOWNSPOUT EXIST. SANITARY SEWER PROP. SANITARY SEWER DRAINAGE DIRECTION SIGN PARKING METER MAILBOX

- MATERIAL COSTS ASSOCIATED WITH THE WORK FRONTING 1101 AND 1121
- THE DDA WILL INSTALL ALL LANDSCAPING. THE DEVELOPER WILL BE RESPONSIBLE TO REIMBURSE THE DDA FOR THE COST OF THE LANDSCAPING FRONTING THE DEVELOPMENT PROPERTY.
- 2. DURING DEMOLITION OF THE EXISTING STRUCTURES, THE CONTRACTOR WILL BE RESPONSIBLE FOR IDENTIFYING ANY EXISTING FOOTING DRAINS THAT ARE CONNECTED TO THE SANITARY SEWER. THESE ARE TO BE VERIFIED ON SITE BY THE CITY PRIOR TO REMOVAL. IF FOOTING DRAINS FOR THE EXISTING BUILDINGS ARE CONNECTED TO THE SANITARY SEWER SYSTEM, DISCONNECTION WILL BE REQUIRED IN ACCORDANCE WITH CURRENT CITY SPECIFICATIONS. TO SCHEDULE INSPECTION, CALL THE CITY OF ANN ARBOR PROJECT MANAGEMENT SERVICES UNIT ALISON HEATLEY AT (734) 794-6410 EXT. 43621. DISCONNECTION OF EXISTING FOOTING DRAINS MAY BE TAKEN AS A CREDIT AGAINST REQUIRED SANITARY SEWER FLOW MITIGATION.
- SANITARY SEWER FLOW MITIGATION IS TO BE PROVIDED AS REQUIRED.
- 6. DOMESTIC WATER AND FIRE SUPPRESSION WATER SERVICES ARE TO TAP INTO THE EXISTING 12" WATER MAIN IN SOUTH UNIVERSITY. BASED UPON SAMPLING AND CALCULATIONS, IT WILL BE DETERMINED WHETHER BOOSTER PUMPS WILL BE REQUIRED FOR DOMESTIC AND FIRE WATER SERVICES.
- BASED UPON EXISTING GROUND CONDITIONS, DEWATERING OPERATIONS DURING CONSTRUCTION ARE NOT ANTICIPATED TO BE REQUIRED. ON-SITE SOILS ARE SAND AND THE WATER TABLE IS BELOW THE DEPTH OF THE PROPOSED EXCAVATION.
- 8. THERE ARE NO PROPOSED FIREWALLS IN THE BUILDING.
- PROPOSED GENERATOR IS TO BE LOCATED INSIDE THE BUILDING FOOTPRINT WITH OUTSIDE ACCESS FROM THE ALLEY. AN ADDITIONAL TRANSFORMER IS TO BE LOCATED ADJACENT TO EXISTING TRANSFORMER AND ELECTRICAL EQUIPMENT OUTSIDE ALONG THE NORTH SIDE OF THE ALLEY. OPERATION AND MAINTENANCE, INCLUDING REGULAR TESTING OF SUCH EQUIPMENT. IS SUBJECT TO CHAPTER 119 NOISE CONTROL.
- 10. WATER SERVICE CONNECTIONS TO 1101 S. UNIVERSITY (1.5" DOMESTIC SERVICE AND 4" FIRE PROTECTION SERVICE) ARE TO BE RELOCATED AS PART OF THIS PROJECT WITH THE WORK PERFORMED BY THE COLLEGIAN NORTH DEVELOPER.

= 1,719.86 gpd Total credit for existing flows: Proposed Flow: Based on the City of Ann Arbor's sanitary sewer flow evaluation Table 'A', the design dry weather flow rate for the development will be:

RESTAURANT

SEATING AREA

The Collegian North will be a combined apartment and retail building. It will be a multi-

The sanitary sewer flow produced by the existing, occupied, commercial/non-residential

= 276.81 gpd

= 553.62 gpd

= 830.43 gpd

= 390.00 gpd

= 390.00 gpd

= 103.59 gpd

= 157.08 gpd

= 83.50 gpd

= 344.17 gpd

= 48.42 gpd

= 96.84 gpd

= 145.26 gpd

547/549 E. University Street & 1107/1109/1111 S. University Avenue

9,227 sf Non Medical Office Space @ 0.06 gpd/sf

1113 S. University Avenue:

1119 S. University Avenue:

1,614 sf Dry Store Retail @ 0.03 gpd/sf

13 seat café @ 30 gpd/seat

1115/1117 S. University Avenue

OUTDOOR

EX. TELE. MH

RIM = 877.45T/LINE=873.3

> -EX. STORM MH RIM = 876.98

18"N INV=870.48

18"S INV=870.38

12"W INV=871.58

-EX. STORM MH

RIM = 876.48

-EX. STORM MH

18"S INV=870.29

18"N INV=870.39

─X | 10"PVC E INV=871.59

RIM = 874.66

12"SE INV=873.11

∠EX. CB

RIM = 874.81

12"SW INV=872.01

EX. CONC. WALK

– EX. GVIW

RIM = 875.08

T/NUT=871.38

T/DIRT=870.08

-EX. SAN. MH

RIM = 875.08

15"E INV=863.98

15"W INV=863.88

8"N INV=865.98

8"S INV=865.88

8"E INV=866.78

EX. STORM MH

15"S INV=869.74

12"NW INV=869.94

12"NE INV=869.94 12'SE INV=870.04

RIM = 874.94

-EX. STORM MH

24"W INV=865.60

24"E INV=866.75

18"E INV=869.00

15'S INV=869.30

15'N INV=868.30

RIM=874.70

-EX. CB

RIM = 876.19

18"N INV=870.43

18"S INV=870.43

8"W INV=871.58

EX. STORM MH-RIM = 878.1612"W INV=872.71 12"SE INV=872.66

EX. STREET LIGHT

ON UTILITY POLE TO

BE RELOCATED AND

COORDINATED WITH

UTILITY COMPANY-

-PROP. CANOPY

🖊 EX. GVIW —

∕RIM=874.59

T/NUT=871.89

EX. PLAQUE

OVERHANG

EX. COMCAST UTILITY

LINE TO BE BE

RELOCATED AND

COORDINATED WITH

UTILITY COMPANY ---

2-STORY

BUILDING

| Э.  | 243 beds University Housing @ 75 gpd/capita             | = | 18,255.00 gpd |  |
|-----|---|---|---------------|--|
| ٥.  | Toilet rooms (10th floor and 11th floor) @ 210 gpd/room | = | 420.00 gpd    |  |
|     | (Assumed 60 flushes per day per toilet)                 |   |               |  |
| ٥.  | 1,278 sf Non Medical Office Space @ 0.06 gpd/sf         | = | 76.68 gpd     |  |
| d.  | 45 seat Restaurant w/ dishwasher @ 30 gpd/seat          | = | 1,350.00 gpd  |  |
| €.  | 8,227 sf Dry Store Retail @ 0.03 gpd/sf                 | = | 246.81 gpd    |  |
| tal | Design average flow                                     | = | 20,318.49 gpd |  |
|     |   |   |               |  |

Mitigation flow = Design average flow - Existing average flow Mitigation flow = 20,318.49 gpd - 1,719.86 gpd = 18,598.63 gpdMitigation peak flow = 18,598.63 gpd x 4(peaking) x 1.1 (recovery) = 81,833.97 gpd or 56.8 gpm

Mitigation will be required for a flow of 57 gallons per minute, or equivalent alternate mitigation to equate to the additional peak flow produced from the site.

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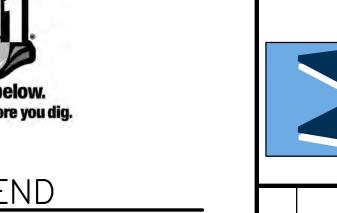
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The underground utilities shown have been located from field survey information and existing records. The surveyor makes no guarantees that the underground utilities shown comprise all such utilities in the area, either in-service or abandoned. The surveyor further does not warrant that the underground utilities shown are in the exact location indicated. Although the surveyor does certify that they are located as accurately as possible from the information available.

SOUTH UNIVERSITY.

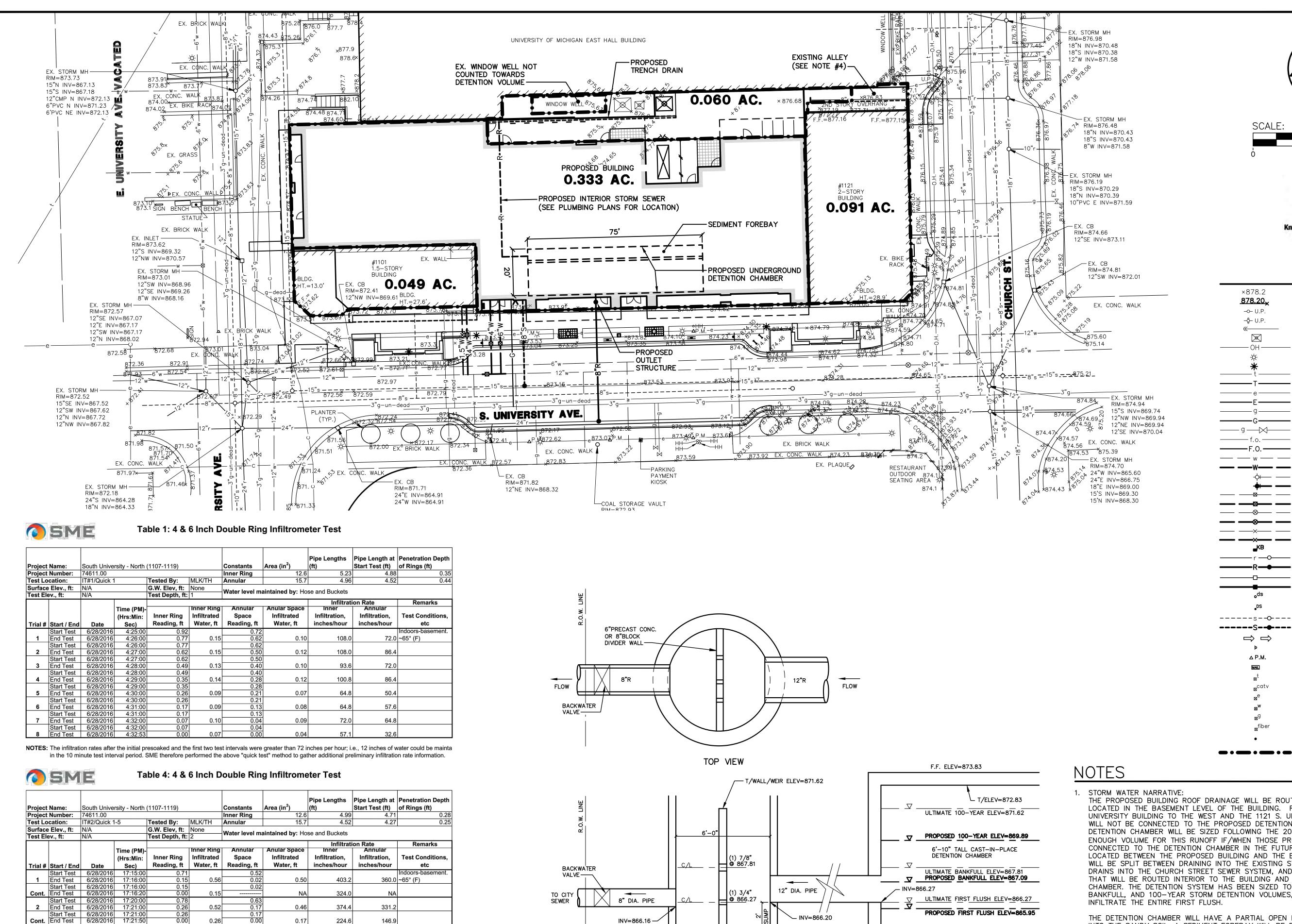


EXIST. UTILITY POLE

----s--O--------S-- $\Rightarrow \Rightarrow$ Δ P.M.

> TELEPHONE RISER CABLE TELEVISION RISER ELECTRIC METER WATER METER GAS METER

FIBER OPTIC MARKER POST



7/5/2016 17:41:00

in the 10 minute test interval period. SME therefore performed the above "quick test" method to gather additional preliminary infiltration rate information.

PLAN VIEW

TOP OF STONE

CONTROL STRUCTURE MANHOLE DETAIL

NOT TO SCALE

ELEV=865.00 ----

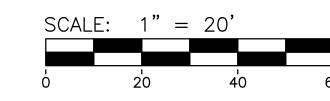
– MIN. 12" MDOT 6A STONE

OVER GEOTEXTILE FABRIC

THE PROPOSED BUILDING ROOF DRAINAGE WILL BE ROUTED TO THE DETENTION CHAMBER LOCATED IN THE BASEMENT LEVEL OF THE BUILDING. ROOF DRAINAGE FROM THE 1101 S. UNIVERSITY BUILDING TO THE WEST AND THE 1121 S. UNIVERSITY BUILDING TO THE EAST WILL NOT BE CONNECTED TO THE PROPOSED DETENTION CHAMBER AT THIS TIME. THE DETENTION CHAMBER WILL BE SIZED FOLLOWING THE 2016 STANDARDS TO INCLUDE ENOUGH VOLUME FOR THIS RUNOFF IF/WHEN THOSE PROPERTIES ARE REDEVELOPED/ CONNECTED TO THE DETENTION CHAMBER IN THE FUTURE. RUNOFF FROM THE ALLEY LOCATED BETWEEN THE PROPOSED BUILDING AND THE EXISTING BUILDING TO THE NORTH WILL BE SPLIT BETWEEN DRAINING INTO THE EXISTING STORM SEWER SYSTEM THAT DRAINS INTO THE CHURCH STREET SEWER SYSTEM, AND DRAINING TO NEW STORM SEWER THAT WILL BE ROUTED INTERIOR TO THE BUILDING AND CONNECTED TO THE DETENTION CHAMBER. THE DETENTION SYSTEM HAS BEEN SIZED TO PROVIDE FIRST FLUSH, BANKFULL, AND 100-YEAR STORM DETENTION VOLUMES, AND HAS BEEN DESIGNED TO

 $\Rightarrow \Rightarrow$ 

- THE DETENTION CHAMBER WILL HAVE A PARTIAL OPEN BOTTOM TO PERMIT INFILTRATION INTO THE SANDY SOIL. A SEDIMENT FOREBAY WILL BE PROVIDED TO MAINTAIN THE INFILTRATION CAPABILITIES OF THE BOTTOM OF THE DETENTION CHAMBER.
- THE STORM WATER STORAGE VOLUME WILL BE DETAINED AND DISCHARGED AT A CONTROLLED RATE THROUGH AN OUTLET STRUCTURE LOCATED OUTSIDE OF THE BUILDING. THE OUTFLOW WILL BE BY GRAVITY TO THE EXISTING STORM SEWER SYSTEM. THE OUTLET STRUCTURE WILL ALSO SERVE AS THE EMERGENCY OVERFLOW OF THE SYSTEM WITH AN OPEN GRATE.
- 2. THE LONG TERM MAINTENANCE PLAN AND ESTIMATED COSTS ARE SHOWN ON SHEET 7.
- 3. THE SITE WITHIN THE DRAINAGE BOUNDARY DRAINS THROUGH EXISTING AND PROPOSED ROOF DRAINS THROUGH THE PROPOSED PLUMBING SYSTEM INTO THE DETENTION CHAMBERS.
- 4. EXISTING ALLEY ADJACENT TO 1121 S. UNIVERSITY HAS BEEN INCLUDED IN DETENTION CALCULATIONS THOUGH ALLEY WILL NOT BE DRAINED INTO DETENTION SYSTEM.





**LEGEND** 

878.20<sub>×</sub>

-->- U.P.

-**%**− U.P.

EXIST. SPOT ELEVATION PROP. SPOT ELEVATION EXIST. UTILITY POLE EXIST. UTILITY POLE W/ TRANS. GUY WIRE ELEC. TRANSFORMER EXIST. OVERHEAD UTILITY LINE EXIST. LIGHT POLE PROP. LIGHT POLE EXIST. TELEPHONE LINE PROP. TELEPHONE LINE EXIST. ELECTRIC LINE

PROP. ELECTRIC LINE EXIST. GAS LINE PROP. GAS LINE EXIST. GAS VALVE EXIST. FIBER OPTIC LINE

PROP. FIBER OPTIC LINE EXIST. GATE VALVE IN BOX

EXIST. GATE VALVE IN WELL PROP. CURB STOP & BOX PROP. KNOXBOX

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EXIST. DOWNSPOUT PROP. DOWNSPOUT ----s--O--- EXIST. SANITARY SEWER PROP. SANITARY SEWER DRAINAGE DIRECTION

PARKING METER

TELEPHONE RISER CABLE TELEVISION RISER ELECTRIC METER WATER METER GAS METER FIBER OPTIC MARKER

> POST DRAINAGE AREA BOUNDARY

 $\mathbf{C}$ 0

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| DATE: 10/28/16 | SHEET 9 OF 26 | CADD: DAG             | ENG: SGF | PM: TJC | TECH: | 15006DA1.dwg | FB# |
|----------------|---------------|-----------------------|----------|---------|-------|--------------|-----|
|                |               | REV. DAIE<br>12/05/16 | 1/05/17  | 1/31/17 |       |              |     |
|                |               |                       |          | W       |       |              |     |

15006 JOB No.
REVISIONS:
1. REV. PEF
2. REV. PEF
3. REV. PEF

CALCULATIONS TO BE USED FOR PROPOSED DETENTION SYSTEM VOLUME FOR HOLE SIZE(S) AND ELEVATION(S). PROPOSED DRAINAGE AREA INCLUDES 547-549 E. UNIVERSITY & 1107-1119 S. UNIVERSITY AVENUE AND ADJACENT ALLEY ALONG NORTH SIDE OF SAID ADDRESSES & PART OF ALLEY NORTH OF 1121 S. UNIVERSITY AVENUE. THESE CALCULATIONS ARE TO BE USED FOR CONSTRUCTION OF THE PROPOSED OUTLET STRUCTURE.

# **Storm Water Calculations**

|    | Detention  |
|----|--|
| 1. | Post Development Cover Types, Areas, Curve Numbers, and Runoff Coefficie |

| Rational | Method | Variables |
|----------|--------|-----------|

| Cover Type     | Soil Type    | Area (sf) | Area (ac) | Runoff Coeff.   | C x A (ac) |
|----------------|--------------|-----------|-----------|-----------------|------------|
| Ex. East Bldg  |              | 0         | 0.00      | 0.90            | 0.00       |
| Ex. East Alley |              | 0         | 0.00      | 0.90            | 0.00       |
| Ex. West Bldg  |              | 0         | 0.00      | 0.90            | 0.00       |
| Prop. Bldg     |              | 14487     | 0.33      | 0.95            | 0.32       |
| Paved Alley    |              | 2071      | 0.05      | 0.95            | 0.05       |
| Gravel Alley   |              | 548       | 0.01      | 0.8             | 0.01       |
| Grass          | А            |           | 0.00      |                 | 0.00       |
| Grass          | В            |           | 0.00      |                 | 0.00       |
| Grass          | С            |           | 0.00      |                 | 0.00       |
|                | Total Area = | 17106     |           | Total of C x A  | 0.371      |
|                |              |           |           | Total Area (ac) | 0.393      |
|                |              |           |           | Weighted C      | 0.945      |

## NCRS Variables (Pervious)

| Cover Type | Soil Type    | Area (sf) | Area (ac) | Curve Number   | CN x A (ac) |
|------------|--------------|-----------|-----------|----------------|-------------|
| Grass      | Α            | 0         | 0.00      | 39             | 0.00        |
| Grass      | В            | 0         | 0.00      | 61             | 0.00        |
| Grass      | С            | 0         | 0.00      | 74             | 0.00        |
|            |              |           |           |                |             |
|            |              |           |           |                |             |
|            | Total Area = | 0.00001   |           | Total of C x A | 0.00        |
|            |              |           |           | Area Total     | 0.00        |
|            |              |           |           | Weighted CN    | 74.00       |
|            |              |           |           |                |             |

#### NCRS Variables (Impervious)

| Cover Type     | Soil Type    | Area (sf) | Area (ac) | Curve Number   | CN x A |
|----------------|--------------|-----------|-----------|----------------|--------|
| Ex. Building   |              | 0         | 0.00      | 98             | 0.00   |
| Prop. Building |              | 14487     | 0.33      | 98             | 32.59  |
| Pavement-Alley |              | 2071      | 0.05      | 98             | 4.66   |
| Gravel-Alley   |              | 548       | 0.01      | 85             | 1.07   |
|                |              |           |           |                |        |
|                | Total Area = | 17106     |           | Total of C x A | 38.32  |
|                |              |           |           | Area Total     | 0.39   |

#### First Flush Calculations $V_{ff} = (1"/12) \times (43560 \text{ cf} / 1 \text{ ac}) \times A \times C$

 $Q = (P - 0.2S)^2 / (P + 0.8S)$ 

| , , | (1) (1) (1)  | •                           |         |          |
|-----|--|-----------------------------|---------|----------|
|     | $V_{ff} = (1"/12) \times (43560 \text{ cf / 1 ac}) \times$ | 0.393 x                     | 0.945 = | 1,347 cf |
| 3.  | Standard Runoff Volume Calculations                        |                             |         |          |
|     | Pre-development Bankfull Runoff Calculat                   | ions (V <sub>bf-pre</sub> ) |         |          |
| Α   | 2 year/ 24 hour event                                      |                             | P =     | 2.35 in  |
| В   | Pre-developed land   |                             |         |          |
|     | Impervious Area, type B soils                              |                             | CN =    | 98       |
| С   | S = (1000/CN) - 10   |                             | S =     | 0.204    |
|     |  |                             |         |          |

Weighted CN 97.58

2.122 in

17,106 sf

3,024 cf

1,347 cf

## Total Site Area (sf) excluding Self-Crediting BMP's $V_{bf-pre} = Q (1/12) Area$ Standard Runoff Volume Calculations

|    | Pervious Cover Post-development Bankfull Runoff | Calculations (V <sub>bf-per-l</sub> | oost)    |
|----|---|-------------------------------------|----------|
| Α. | 2 year/ 24 hour event                           | P =                                 | 2.35 iı  |
| B. | Developed land                                  |                                     |          |
|    | Pervious Cover, Weighted CN.                    | CN =                                | 74.00    |
| C. | S = (1000/CN) - 10                              | S =                                 | 3.514    |
| D. | $Q = (P - 0.2S)^2 / (P + 0.8S)$                 | Q =                                 | 0.526 ii |
| E. | Pervious Cover Area                             |                                     | 0 s      |
| F. | V <sub>bf-per-post</sub> = Q (1/12) Area        |                                     | 0 c      |

### Standard Runoff Volume Calculations Impervious Cover Post-development Bankfull Runoff Calculations (V<sub>bf-imp-post</sub>) 2 year/ 24 hour event

| B. | Developed land                    |      |           |
|----|-----------------------------------|------|-----------|
|    | Ex. Building                      | CN = | 98        |
|    | Prop. Building                    | CN = | 98        |
|    | Pavement - Alley                  | CN = | 98        |
|    | Gravel - Alley                    | CN = | 85        |
|    | Weighted                          | CN = | 98        |
| C. | S = (1000/CN) - 10                | S =  | 0.204     |
| D. | $Q = (P - 0.2S)^2 / (P + 0.8S)$   | Q =  | 2.122 in  |
| E. | Impervious Cover Area             |      | 17,106 sf |
| F. | $V_{bf-imp-post} = Q (1/12) Area$ |      | 3,024 cf  |

## Standard Runoff Volume Calculations Pervious Cover Post-development 100 Year Runoff Calculations (V<sub>100-per-post</sub>)

| A. | 100 year/ 24 hour event            | P =  | 5.11 in  |
|----|------------------------------------|------|----------|
| B. | Developed land                     |      |          |
|    | Grass, Lawn , type B soils         | CN = | 74.00    |
| C. | S = (1000/CN) - 10                 | S =  | 3.514    |
| D. | $Q = (P - 0.2S)^2 / (P + 0.8S)$    | Q =  | 2.452 in |
| E. | Pervious Cover Area                |      | 0 sf     |
| F. | $V_{100-per-post} = Q (1/12) Area$ |      | 0 cf     |
|    |                                    |      |          |

#### Standard Runoff Volume Calculations Impervious Cover Post-development 100 Year Runoff Calculations (V.

|    | Impervious Cover Post-development 100 Year Runoff Calculations (V <sub>100-imp-post</sub> ) |      |           |  |  |  |  |
|----|---|------|-----------|--|--|--|--|
| Α. | 100 year/ 24 hour event   | P =  | 5.11 in   |  |  |  |  |
| B. | Developed land  |      |           |  |  |  |  |
|    | Ex. Building  | CN = | 98        |  |  |  |  |
|    | Prop. Building  | CN = | 98        |  |  |  |  |
|    | Pavement - Alley  | CN = | 98        |  |  |  |  |
|    | Weighted  | CN = | 98        |  |  |  |  |
| C. | S = (1000/CN) - 10  | S =  | 0.248     |  |  |  |  |
| D. | $Q = (P - 0.2S)^2 / (P + 0.8S)$   | Q =  | 4.824 in  |  |  |  |  |
| E. | Impervious Cover Area   |      | 17,106 sf |  |  |  |  |
| F. | $V_{100-imp-post} = Q (1/12) Area$  |      | 6,877 cf  |  |  |  |  |
|    |   |      |           |  |  |  |  |

#### Time of Concentration Due to small site size, Tc of 15 minutes will be used. 0.25 hours

# Runoff Summary and Onsite Infiltration Requirement

Greater of First Flush Volume or Bankfull Volume Difference

|    | Ranon Gammary and Onsite minitiation Requirement  |                             |       |
|----|---|-----------------------------|-------|
| Α. | Runoff Summary from Previous Worksheets           |                             |       |
|    | First Flush Volume                                | $V_{ff} =$                  | 1,347 |
|    | Pre-Development Bankfull Volume                   | $V_{bf-pre} =$              | 3,024 |
|    | Pervious Cover Post-Development Bankfull Volume   | $V_{bf-per-post} =$         | 0     |
|    | Impervious Cover Post-Development Bankfull Volume | $V_{bf-imp-post} =$         | 3,024 |
|    | Pervious Cover Post-Development 100-yr Volume     | V <sub>100-per-post</sub> = | 0     |
|    | Impervious Cover Post-Development 100-yr Volume   | $V_{100-imp-post} =$        | 6,877 |

|    | Pervious Cover Post-Development 100-yr Volume   | V 100-per-post —        | U     |
|----|---|-------------------------|-------|
|    | Impervious Cover Post-Development 100-yr Volume | $V_{100-imp-post} =$    | 6,877 |
| В. | Determine Onsite Infiltration Requirement       |                         |       |
|    | Total Post-Development Bankfull Volume          | $V_{bf-per-post} =$     | 3,024 |
|    | Pre-Development Bankfull Volume                 | $V_{\mathrm{bf-pre}} =$ | 3,024 |
|    |   |                         | _     |

| Determine Onsite infiltration Requirement |                         |       |
|---|-------------------------|-------|
| Total Post-Development Bankfull Volume    | $V_{bf-per-post} =$     | 3,024 |
| Pre-Development Bankfull Volume           | $V_{\mathrm{bf-pre}} =$ | 3,024 |
| Bankfull Volume Difference                |                         | 0 0   |
|   |                         |       |

#### 10. Detention Requirement 238.6 \* Tc<sup>n-0.82</sup> A. Q<sub>n</sub>=

|    | ~p   |                    |          |
|----|--|--------------------|----------|
| B. | Total Site Area Excluding "Self-Crediting" BMP's                 |                    | 0.39 ac  |
| Ċ. | $Q_{100} = Q_{100-per} + Q_{100-imp}$                            |                    | 7.277 in |
| D. | Peak Flow (PF) = $(Q_p \times Q_{100} \times Area (ac)) / 640$   | PF =               | 3.3 cfs  |
| E. | Δ = PF - 0.15 * Area (ac) =                                      | △ =                | 3.3 cfs  |
| F. | $V_{det} = \Delta$ / PF x $V_{100} - V_{inf} =$                  | $V_{det} =$        | 6,755 cf |
|    | Outflow is below the flowing the flood elevation of the existing | City storm         |          |
|    | sewer so the 100-year volume will assume zero outflow            |                    |          |
|    |  | V <sub>det</sub> = | 6,877 cf |
| G. | Sediment Volume Req'd = 5% x V <sub>det</sub>                    | $V_{fb} =$         | 344 cf   |

743.6 cfs/in-mi<sup>2</sup>

 $V_{\text{total}} = 7,221 \text{ cf}$ 

## 11. Determine Applicable BMPs and Associated Volume Credits

The soil borings for this project indicate the soils are very good for infiltration. Per the geotechnical study and infiltration testing, an infiltration rate of 20+ in/hr is suggested for use. For calculations we will use 10 in/hr based on a factor of safety of 2 and meeting the maximum infiltration rate allowed.

| Infiltration |                 | Ave Inf.     | Inf. Storm |
|--------------|-----------------|--------------|------------|
| Area (sf)    | Stor. Vol. (cf) | Rate (in/hr) | (cf)       |
| 876          | 10,133          | 10.00        | 4,380      |

### Runoff Volume Infiltration Requirement (Vinf) from W9= 1,347 cf

| Rune  | off Volumes |
|-------|-------------|
| -irst | Flush       |

| First Flush    | 1,347 cf |
|----------------|----------|
| Bankfull Storm | 3,024 cf |
| 100-year Event | 7,221 cf |
|                |          |

# Runoff Volumes (Reduced by 6-hr Infiltration)

| First Flush    | -     | CT |
|----------------|-------|----|
| Bankfull Storm | -     | cf |
| 100-year Event | 2,841 | cf |
|                |       |    |

## Detention Outlet Calculations

| First Flush Volume Required              | 1347 |    | ¢f |
|--|------|----|----|
| Bankfull (2 year/24-hour storm) Required | 3024 |    | cf |
| 100 - Year Storage Volume Required       | 7221 |    | cf |
| Detention Chamber Dimensions             | 75   | Ft |    |
|  | 20   | Ft |    |

### 12. Detention Staged Storage Volume Proposed

| , ,,,,,  |          |          |        |   |                   |  |
|----------|----------|----------|--------|---|-------------------|--|
| Vol.(cf) | Vol (cf) | Area(sf) | Elev.  |   |                   |  |
| 0        | 0        | 1425     | 865.00 | = | Elev <sub>b</sub> |  |
| 2138     | 2138     | 1500     | 866.50 |   |                   |  |
| 10133    | 7995     | 1500     | 871.83 |   |                   |  |
| CF .     | 10133 C  |          | Total: |   |                   |  |

| The following interpola | itions determine t | he | water stora | age ( | elevatio | ns fo | Г      |
|-------------------------|--------------------|----|-------------|-------|----------|-------|--------|
| the three different     | storm events:      |    |             |       |          |       |        |
| First Flush:            | 866.50 -           | -  | 865.00      | =     | х        | -     | 865.00 |
|                         | 2138 -             |    | 0           |       | 134      | 7 -   | 0      |
|                         |                    |    |             |       |          |       | -1.    |

|                 | $x = Elev_{ff} = 865.95$                                     | 5 |
|-----------------|--|---|
|                 | Elevation of Ultimate First Flush = Elev ff = 866.27         | 7 |
| Bankfull Flood: | 871.83 - 866.50 <sub>=</sub> x - 866.50                      |   |
|                 | 7995 - 0 887 - 0   |   |
|                 | (4098-2138)  |   |
|                 | $x = Elev_{bf} = 867.09$                                     | € |
|                 | Elevation of Ultimate Bankfull = Elev <sub>ff</sub> = 867.87 | 1 |
| 100 Yr. Flood:  | 871.83 - 866.50 <sub>=</sub> x - 866.50                      |   |

|                                      | (9810-2138) |                   |     |        |
|--------------------------------------|-------------|-------------------|-----|--------|
|                                      | x =         | Elev 100          | =   | 869.89 |
| These yield pond water elevations of | 865.95      | for the First Flu | sh, |        |

## 867.09 for the Bankfull Flood, and 869.89 for the 100 Yr. Storm Event

# C. Outflow Structure

The volume required to infiltrate will be retained. The volume in excess of the first flush elevation will discharge by the allowable discharge through a 2-stage outlet structure with holes for the bankfull and 100-year storm events. The discharge will flow from the outlet structure into an outlet pipe, utilizing gravity flow, into the City's storm sewer system located along the south side of S. University Avenue.

# Bankfull Flood;

The bankfull flood must be detained in 36-48 hrs. A target release time of 40.0 hrs. will be chosen for the bankfull flood. The volume

| V(rem)=          | V <sub>bf</sub>    | -                | V <sub>ff</sub> |         |           |
|------------------|--------------------|------------------|-----------------|---------|-----------|
| V(rem)=          | 3024 CF            | -                | 1347 CF =       |         | 1677 CF   |
| T(rem)=          | T(target)          | -                | T ff            |         |           |
| T(rem)=          | 40.0 hrs.          | -                | 0.0 hrs.        | =       | 40.0 hrs. |
| V <sub>2</sub> = | V(rem)             | - V <sub>1</sub> |                 |         |           |
| V <sub>2</sub> = | 1677 -             | 0                | = 16            | 677 CF  |           |
| $Q_2 =$          | $V_2$ / $T(rem) =$ | 1677 /(          | 40.0 x 36       | 500 ) = | 0.012 CFS |
| H(over)          | _                  | 2/3/Elov         | -Flow \         |         |           |

#### H(avg) <sub>bf</sub> = 2/3(Elev <sub>bf</sub> -Elev <sub>FF</sub>) Ultimate first flush flood elevation will be used to eliminate future modification to outlet structure 2/3( 867.09 - 866.27 ) =

|  |          | ·           |          |   |            |  |
|--|----------|-------------|----------|---|------------|--|
| Area of Orifice = Q <sub>2</sub> Area of | / (0.62) | (2gH(avg) ы | · )^0.5) | = | 0.00316 SF |  |
| 0.750 "                                  | hole =   | 0.0031      | SF       |   |            |  |

No. of 0.750 " hole(s) = 0.0032 / 0.0031 = 1.03 hole(s)

#### Therefore, use: ONE( 1 ) 0.750 " hole(s) at Elev. =

# 100-Year Discharge

Therefore, use:

# Flow allowed to pass:

| Q A   | =    | (   | 0.15  | x    | 0.39    | 3 Ac.)    | =          | 0.059      | CFS     |          |           |
|---|------|-----|-------|------|---------|-----------|------------|------------|---------|----------|-----------|
| the required 100-year detention volume elevation, the |      |     |       |      |         |           |            |            |         |          |           |
|   | ONE( | 1 ) | 0.75  | 50 " | hole(s) | designed  | for the ba | nkfull flo | od will | discharg | je:       |
| 0.62(   | 1    | х   | 0.003 | 31)  | х       | (2 x 32.2 | х          | 3.62       | )^0.5   | =        | 0.029 CFS |

#### 0.059 - 0.029 = 0.030 CFS The remaining allowable outflow= Ultimate bankfull flood elevation will be used to eliminate future modification to outlet structure $0.62(A)(2 \times 32.2 \times (869.89 - 867.81)) ^0.5 =$ 0.030 CFS

#### A = 0.004 SF Area of 0.875 " hole = 0.0042 SF No. of 0.875 " hole(s) = 0.0042 / 0.0042 = 1.00 hole(s)

The result of using the ultimate flood storage elevations will be the proposed development is infiltrating more volume and outletting less volume than is actually permitted. This will minimize the load imposed on the City storm sewer until the time that the adjacent properties are re-developed.

# ULTIMATE DRAINAGE CALCS

CALCULATIONS TO BE USED FOR ULTIMATE (PROPOSED+FUTURE) DETENTION SYSTEM VOLUME, 100-YEAR DETENTION ELEVATION AND FUTURE REQUIRED OUTLET HOLE SIZE(S) AND ELEVATION(S). ULTIMATE DRAINAGE AREA INCLUDES 547-549 E. UNIVERSITY & 1101-1121 S. UNIVERSITY AVENUE AND ADJACENT ALLEY ALONG NORTH SIDE OF SAID ADDRESSES. THESE CALCULATIONS ARE TO BE USED TO MODIFY THE OUTLET STRUCTURE IF/WHEN THE 1101 AND 1121 S. UNIVERSITY AVENUE PROPERTIES ARE RE-DEVELOPED IN THE FUTURE.

# **Storm Water Calculations**

|    | Detention   |
|----|---|
| 1. | Post Development Cover Types, Areas, Curve Numbers, and Runoff Coefficients |
|    |   |
|    | Rational Method Variables   |

| Cover Type     | Soil Type    | Area (sf) | Area (ac) | Runoff Coeff.   | C x A (ac) |
|----------------|--------------|-----------|-----------|-----------------|------------|
| Ex. East Bldg  |              | 3804      | 0.09      | 0.90            | 0.08       |
| Ex. East Alley |              | 163       | 0.00      | 0.90            | 0.00       |
| Ex. West Bldg  |              | 2117      | 0.05      | 0.90            | 0.04       |
| Prop. Bldg     |              | 14487     | 0.33      | 0.95            | 0.32       |
| Paved Alley    |              | 2071      | 0.05      | 0.95            | 0.05       |
| Gravel Alley   |              | 548       | 0.01      | 0.8             | 0.01       |
| Grass          | Α            |           | 0.00      |                 | 0.00       |
| Grass          | В            |           | 0.00      |                 | 0.00       |
| Grass          | С            |           | 0.00      |                 | 0.00       |
|                | Total Area = | 23190     |           | Total of C x A  | 0.497      |
|                |              |           |           | Total Area (ac) | 0.532      |
|                |              |           |           | Weighted C      | 0.933      |

### NCRS Variables (Pervious)

| Cover Type | Soil Type    | Area (sf) | Area (ac) | Curve Number   | CN x A (ac) |
|------------|--------------|-----------|-----------|----------------|-------------|
| Grass      | А            | 0         | 0.00      | 39             | 0.00        |
| Grass      | В            | 0         | 0.00      | 61             | 0.00        |
| Grass      | С            | 0         | 0.00      | 74             | 0.00        |
|            |              |           |           |                |             |
|            |              |           |           |                |             |
|            | Total Area = | 0.00001   |           | Total of C x A | 0.00        |
|            |              |           |           | Area Total     | 0.00        |

Weighted CN

74.00

2.35 in

0.204

2.122 in

23,190 sf 4,100 cf

4,100 cf

0 cf

1,804 cf

ÇN =

S =

### NCRS Variables (Impervious)

| Cover Type     | Soil Type    | Area (sf) | Area (ac) | Curve Number   | CN x A |
|----------------|--------------|-----------|-----------|----------------|--------|
| Ex. Building   |              | 5921      | 0.14      | 98             | 13.32  |
| Prop. Building |              | 14487     | 0.33      | 98             | 32.59  |
| Pavement-Alley |              | 2234      | 0.05      | 98             | 5.03   |
| Gravel-Alley   |              | 548       | 0.01      | 85             | 1.07   |
|                |              |           |           |                |        |
|                | Total Area = | 23190     |           | Total of C x A | 52.01  |
|                |              |           |           | Area Total     | 0.53   |

|    |    | 10tal /11ca = 20100  | Total of C |       | 02.01 |     |    |
|----|----|--|------------|-------|-------|-----|----|
|    |    |  | Area To    | tal   | 0.53  |     |    |
|    |    |  | Weighted   | CN    | 97.69 |     |    |
| 2. |    | First Flush Calculations   |            |       |       |     |    |
|    | Α. | $V_{ff} = (1''/12) \times (43560 \text{ cf} / 1 \text{ ac}) \times A \times C$ |            |       |       |     |    |
|    |    | $V_{ff} = (1"/12) \times (43560 \text{ cf} / 1 \text{ ac}) \times$             | 0.532 x    | 0.933 | = 1,: | 804 | cf |

| 3. |    | Standard Runoff Volume Calculations                   |  |  |  |  |
|----|----|---|--|--|--|--|
|    |    | Pre-development Bankfull Runoff Calculations (Vbf-pre |  |  |  |  |
|    | A. | 2 year/ 24 hour event                                 |  |  |  |  |
|    | В. | Pre-developed land                                    |  |  |  |  |
|    |    | Impervious Area, type B soils                         |  |  |  |  |
|    | C. | S = (1000/CN) - 10                                    |  |  |  |  |
|    | D. | $Q = (P - 0.2S)^2 / (P + 0.8S)$                       |  |  |  |  |

## $V_{bf-pre} = Q (1/12) Area$ 4 Standard Runoff Volume Calculation

| ₹. | Standard Runoff Volume Calculations               |                                   |                   |
|----|---|-----------------------------------|-------------------|
|    | Pervious Cover Post-development Bankfull Runoff C | alculations (V <sub>bf-per-</sub> | <sub>post</sub> ) |
| A. | 2 year/ 24 hour event                             | P =                               | 2.35              |
| B. | Developed land                                    |                                   |                   |
|    | Pervious Cover, Weighted CN.                      | CN =                              | 74.00             |
| C. | S = (1000/CN) - 10                                | S =                               | 3.514             |
| D. | $Q = (P - 0.2S)^2 / (P + 0.8S)$                   | Q =                               | 0.526             |
| E. | Pervious Cover Area                               |                                   | 0                 |
| F. | V <sub>bf-per-post</sub> = Q (1/12) Area          |                                   | 0                 |

Total Site Area (sf) excluding Self-Crediting BMP's

# Standard Runoff Volume Calculations

| <i>/</i> . | Ctaridard region volume careculations          |                                      |           |
|------------|--|--------------------------------------|-----------|
|            | Impervious Cover Post-development Bankfull Rui | noff Calculations (V <sub>bf-i</sub> | imp-post) |
| A.         | 2 year/ 24 hour event                          | P =                                  | 2.35 in   |
| В.         | Developed land                                 |                                      |           |
|            | Ex. Building                                   | CN =                                 | 98        |
|            | Prop. Building                                 | CN =                                 | 98        |
|            | Pavement - Alley                               | CN =                                 | 98        |
|            | Gravel - Alley                                 | CN =                                 | 85        |
|            | Weighted                                       | CN =                                 | 98        |
| C.         | S = (1000/CN) - 10                             | S =                                  | 0.204     |
| D.         | $Q = (P - 0.2S)^2 / (P + 0.8S)$                | <b>Q</b> =                           | 2.122 in  |
| E.         | Impervious Cover Area                          |                                      | 23,190 sf |
|            |  |                                      |           |

# Standard Runoff Volume Calculations

F.  $V_{bf-imp-post} = Q (1/12)$  Area

| Pervious Cover Post-development 100 Year Runoff Calculations (V <sub>100-per-post</sub> ) |   |            |          |  |  |  |
|---|---|------------|----------|--|--|--|
| A.  | 100 year/ 24 hour event                   | P = .      | 5.11 ir  |  |  |  |
| B.  | Developed land                            |            |          |  |  |  |
|   | Grass, Lawn , type B soils                | CN =       | 74.00    |  |  |  |
| Ċ.  | S = (1000/CN) - 10                        | <b>S</b> = | 3.514    |  |  |  |
| D.  | $Q = (P - 0.2S)^2 / (P + 0.8S)$           | Q =        | 2.452 ir |  |  |  |
| E.  | Pervious Cover Area                       |            | 0 s      |  |  |  |
| F.  | V <sub>100-per-post</sub> = Q (1/12) Area |            | 0 c      |  |  |  |

# Standard Runoff Volume Calculations

|    | Impervious Cover Post-development 100 Year Runoff C    | alculations (V <sub>10</sub> | 0-imp-post) |
|----|--|------------------------------|-------------|
| A. | 100 year/ 24 hour event                                | P =                          | 5.11 in     |
| В. | Developed land   |                              |             |
|    | Ex. Building   | CN =                         | 98          |
|    | Prop. Building   | CN =                         | 98          |
|    | Pavement - Alley                                       | CN =                         | 98          |
|    | Weighted   | CN =                         | 98          |
| C. | S = (1000/CN) - 10                                     | S =                          | 0.236       |
| D. | $Q = (P - 0.2S)^2 / (P + 0.8S)$                        | Q =                          | 4.837 in    |
| E. | Impervious Cover Area                                  |                              | 23,190 sf   |
| F. | $V_{100-imp-post} = Q (1/12) Area$                     |                              | 9,348 cf    |
| 8. | Time of Concentration                                  |                              |             |
|    | Due to small site size, To of 15 minutes will be used. |                              | 0.25 hours  |

# Due to small site size, Tc of 15 minutes will be used.

|    | First Flush Volume                                | V <sub>ff</sub> =           | 1,804 | cf |
|----|---|-----------------------------|-------|----|
|    | Pre-Development Bankfull Volume                   | $V_{bf-pre} =$              | 4,100 | cf |
|    | Pervious Cover Post-Development Bankfull Volume   | $V_{bf-per-post} =$         | 0     | cf |
|    | Impervious Cover Post-Development Bankfull Volume | $V_{bf-imp-post} =$         | 4,100 | cf |
|    | Pervious Cover Post-Development 100-yr Volume     | V <sub>100-per-post</sub> = | 0     | cf |
|    | Impervious Cover Post-Development 100-yr Volume   | $V_{100-imp-post} =$        | 9,348 | cf |
| B. | Determine Onsite Infiltration Requirement         |                             |       |    |
|    | Total Post-Development Bankfull Volume            | $V_{bf-per-post} =$         | 4,100 | cf |
|    | Pre-Development Bankfull Volume                   | $V_{bf-pre} =$              | 4,100 | cf |

# Pre-Development Bankfull Volume

A. Runoff Summary from Previous Worksheets

| Bankfull Volume Difference                                  |
|---|
| Greater of First Flush Volume or Bankfull Volume Difference |

Runoff Summary and Onsite Infiltration Requirement

# 10. Detention Requirement

 $A_{n} = Q_{n} =$ 

238.6 \* Tc^-0.82

|    | P  |                    |                |
|----|--|--------------------|----------------|
| В. | Total Site Area Excluding "Self-Crediting" BMP's   |                    | 0.53 ac        |
| C. | $Q_{100} = Q_{100-per} + Q_{100-imp}$  |                    | 7.289 in       |
| D. | Peak Flow (PF) = (Q <sub>p</sub> x Q <sub>100</sub> x Area (ac)) / 640   | PF =               | 4.5 cfs        |
| E. | Δ = PF - 0.15 * Area (ac) =  | Δ =                | 4.4 cfs        |
| F. | $V_{det} = \Delta / PF \times V_{100} - V_{inf} =$   | V <sub>det</sub> = | 9,182 cf       |
|    | Outflow is below the flowing the flood elevation of the existi sewer so the 100-year volume will assume zero outflow   | ng City storm      |                |
|    | one of the feet form to the deciment of the control | V <sub>det</sub> = | 9,348 cf       |
| G. | Sediment Volume Req'd = 5% x V <sub>det</sub>  | $V_{fb} =$         | <b>4</b> 67 cf |

743.6 cfs/in-mi<sup>2</sup>

9,815 cf

4100

9815

10133

and 871.62 for the 100 Yr. Storm Event

75 Ft

20 Ft

# 11. Determine Applicable BMPs and Associated Volume Credits

The soil borings for this project indicate the soils are very good for infiltration. Per the geotechnical study and infiltration testing, an infiltration rate of 20+ in/hr is suggested for use. For calculations we will use 10 in/hr based on a factor of safety of 2 and meeting the maximum infiltration rate allowed.

| Infiltration |                 | Ave Inf.     | Inf. Storm |
|--------------|-----------------|--------------|------------|
| Area (sf)    | Stor. Vol. (cf) | Rate (in/hr) | (cf)       |
| 876          | 10,133          | 10.00        | 4,380      |

## Runoff Volume Infiltration Requirement (Vinf) from W9= 1,804 cf

4,100 cf

| Runoit volume II | militration Requirem |
|------------------|----------------------|
| Runoff Volumes   |                      |
| First Flush      | 1,804 cf             |

| 100-year Event             | 9,815       | cf    |
|----------------------------|-------------|-------|
| Runoff Volumes (Reduced by | / 6-hr Infi | Itrat |
| First Flush                | _           | cf    |

Bankfull Storm

#### Bankfull Storm 5.435 cf 100-year Event

| 100-year Everit               | 3,403 6 |      |
|-------------------------------|---------|------|
| Detention Outlet Calculations |         |      |
| First Flush Volume Requi      | ired    | 1804 |

Bankfull (2 year/24-hour storm) Required

100 - Year Storage Volume Required

Detention Chamber Dimensions

| Detention Staged Storage Volume Proposed |   |        |          |          |          |  |  |  |
|--|---|--------|----------|----------|----------|--|--|--|
|  |   |        |          |          | Acc.     |  |  |  |
|  |   | Elev.  | Area(sf) | Vol (cf) | Vol.(cf) |  |  |  |
| Elev <sub>b</sub>                        | = | 865.00 | 1425     | 0        | 0        |  |  |  |
|  |   | 866.50 | 1500     | 2138     | 2138     |  |  |  |

## The following interpolations determine the water storage elevations for

871.83

| the three different storr | n events: |   |          |                     |      |                    |   |        |
|---------------------------|-----------|---|----------|---------------------|------|--------------------|---|--------|
| First Flush:              | 866.50    | - | 865.00 = | Х                   | -    | 865.00             |   |        |
|                           | 2138      | - | 0        | 18                  | 04 - | 0                  |   |        |
|                           |           |   |          |                     | x =  | Elev <sub>ff</sub> | = | 866.27 |
| Bankfull Flood:           | 871.83    | - | 866.50 = | Х                   | -    | 866.50             |   |        |
|                           | 7995      | - | 0        | 19                  | 63 - | 0                  |   |        |
|                           |           |   | (4       | 4098-2 <sup>-</sup> | 138) |                    |   |        |
|                           |           |   |          |                     | x =  | Elev <sub>bf</sub> | = | 867.81 |
| 100 Yr. Flood:            | 871.83    | - | 866.50 = | Х                   | -    | 866.50             |   |        |
|                           | 7995      | - | 0        | 76                  | 78 - | 0                  |   |        |
|                           |           |   | (9       | 9810-2 <sup>-</sup> | 138) |                    |   |        |

1500

7995

10133 CF

### $x = Elev_{100} = 871.62$ These yield pond water elevations of 866.27 for the First Flush, 867.81 for the Bankfull Flood,

# C. Outflow Structure

The volume required to infiltrate will be retained. The volume in excess of the first flush elevation will discharge by the allowable discharge through a 2-stage outlet structure with holes for the bankfull and 100-year storm events. The discharge will flow from the outlet structure into an outlet pipe, utilizing gravity flow, into the City's storm sewer system located along the south side of S. University Avenue.

# Bankfull Flood:

The bankfull flood must be detained in 36-48 hrs. A target release time of 40.0 hrs. will be chosen for the bankfull flood. The volume

| V(rem)=              | V <sub>bf</sub>    | _                      | $V_{ff}$                     |          |   |            |
|----------------------|--------------------|------------------------|------------------------------|----------|---|------------|
| V(rem)=              | 4100 CF            | -                      | 1804 CF                      | =        |   | 2296 CF    |
| T(rem)=              | T(target)          | -                      | T $_{ff}$                    |          |   |            |
| T(rem)=              | 40.0 hrs.          | -                      | 0.0 hrs.                     |          | = | 40.0 hrs.  |
| V <sub>2</sub> =     | V(rem)             | - V <sub>1</sub>       |                              |          |   |            |
| V <sub>2</sub> =     | 2296 -             | 0                      | =                            | 2296 CF  |   |            |
| $Q_2 =$              | $V_2$ / $T(rem) =$ | 2296 /(                | 40.0 x                       | 3600 ) = |   | 0.016 CFS  |
| H(avg) <sub>bf</sub> | =                  | 2/3(Elev <sub>bf</sub> | -Elev <sub>Ff</sub> )        |          |   |            |
| H(avg) <sub>bf</sub> | = 2/3(             | 867.81 -               | 866.27 )                     | =        |   | 1.03 FT    |
| Δre                  | a of Orifice = Q 2 | / (0.62(               | 2gH(avg) <sub>bf</sub> )^0   | 1.5)     | = | 0.00316 SF |
|                      | Area of            | 7 (0.02)               | zgi i(avg) <sub>bi</sub> ) c | 7.0)     | _ | 0.00010 01 |
|                      | 1160 01            |                        |                              |          |   |            |

0.750 " hole = 0.0031 SF

No. of 0.750 " hole(s) = 0.0032 / 0.0031 = 1.03 hole(s)

#### 2. 100-Year Discharge Flow allowed to pass:

Therefore, use:

| Q A  | =    | (0.15  | x 0.53       | 2 Ac.) =           | 0.080 CFS                     |  |  |  |  |
|--|------|--------|--------------|--------------------|-------------------------------|--|--|--|--|
| At the required 100-year detention volume elevation, the |      |        |              |                    |                               |  |  |  |  |
|  | ONE( | 1) 0.7 | 750 " hole(s | ) designed for the | e bankfull flood will dischar |  |  |  |  |

ONE( 1 ) 0.750 " hole(s) at Elev. =

|                                  |         | ONE( | 1 )    | 0.750 "        | hole(s | s) design | ed for the ba | ankfull flo | ood will d | isch | arge:       |
|----------------------------------|---------|------|--------|----------------|--------|-----------|---------------|-------------|------------|------|-------------|
| Q =                              | 0.62(   | 1    | Х      | 0.0031)        | X      | (2 x 32   | 2 x           | 5.35        | )^0.5      | =    | 0.035 CFS   |
|                                  | + 0.62( | 0    | Х      | 0.0000)        | Х      | (2 x 32   | 2 x           | 0.00        | )^0.5 =    |      | 0.03532 CFS |
| The remaining allowable outflow= |         |      |        | 0              | .080 - | 0.035 =   | 0.045         | CFS         |            |      |             |
|                                  |         |      | 0.62(A | )(2 x 32.2 x ( | 871.   | .62 -     | 867.81 )) ^   | 0.5 =       |            |      | 0.045 CFS   |

| The remaining allowable | 0.080 -   | -            | 0.035 = | = 0 | 0.045 CI | FS    |   |  |           |
|-------------------------|-----------|--------------|---------|-----|----------|-------|---|--|-----------|
|                         | 0.62(A)(2 | 2 x 32.2 x ( | 871.62  | -   | 867.81)  | 0.5 ^ | = |  | 0.045 CFS |
|                         | A =       | 0.005 SF     |         |     |          |       |   |  |           |
| Are                     | a of      | 0.875 "      | hole =  |     | 0.0042   | SF    |   |  |           |

|     | 0.62(A)(2 x | 32.2 x ( 87 | '1.62 - 8 | 867.81 )) · | ^ 0.5 = |   | 0.045 CFS    |
|-----|-------------|-------------|-----------|-------------|---------|---|--------------|
|     | A = 0       | 005 SF      |           |             |         |   |              |
| Are | a of 0      | .875 " h    | nole = (  | 0.0042      | SF      |   |              |
| No  | of 0        | 875 " hole  | e(s) = 0  | 0 0046 /    | 0.0042  | = | 1.10 hole(s) |

## No. of 0.875 noie(s) = 0.00467 0.0042Therefore, use

# One( 1 ) 0.875 " hole(s) at Elev. =

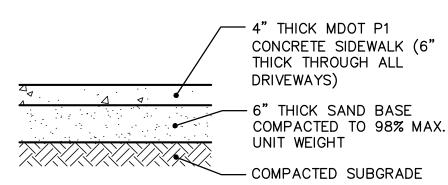
 $\square$ 0

5 Ш

0

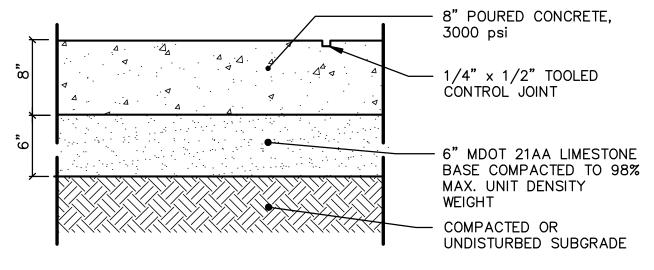
One( 1 ) 0.875 " hole(s) at Elev. = 867.81

EDGE OF CONCRETE ALLEY

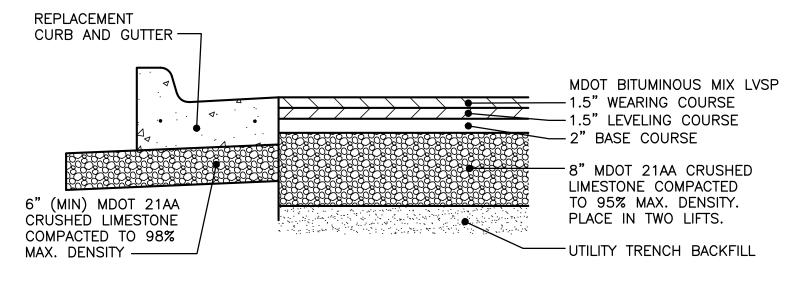


# CONCRETE SIDEWALK SECTION (ALONG EAST UNIVERSITY)

NOT TO SCALE

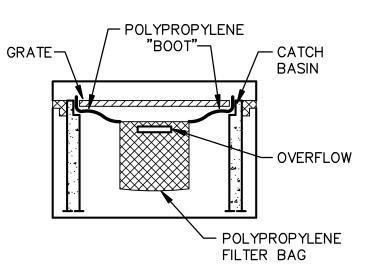


# CONCRETE ALLEY DETAIL

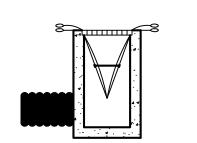


# S. UNIVERSITY PAVEMENT DETAIL

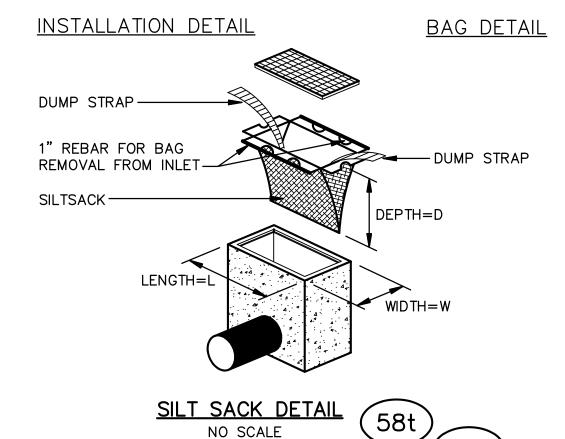
NOT TO SCALE



NOTE: TEMPORARY INLET SEDIMENT FILTER TO BE INSTALLED ON ALL PAVED CATCH BASINS OR STORM INLETS. INLET FILTER TO BE SIMILAR TO "STREAMGUARD" AS MANUFACTURED BY STORMWATER SERVICES CORPORATION (206-767-0441) OR "SILTSACK" AS MANUFACTURED BY ATLANTIC CONSTRUCTION FABRICS, INC.; (800-448-3636). CLEAN FILTER AS NEEDED.



2 EACH DUMP STRAPS -EXPANSION RESTRAINT (1/4" NYLON ROPE.2" FLAT WASHERS) ——



CONCRETE | WASH□UT — 4 MIL POLY LINER PINCH POINT TO-4' or 6' TREATED WATER RESISTANT SECURE LINER TO WASHOUT CORRUGATED BOARD -OPTIONAL TAB TO SECURE WASHOUT TO GROUND

- 1. THE CONCRETE WASHOUT AREA SHALL BE INSTALLED PRIOR TO ANY CONCRETE PLACEMENT ON THIS PROJECT 2. SIGNS SHALL BE PLACED AS NECESSARY TO CLEARLY INDICATE THE LOCATION OF THE CONCRETE WASHOUT.
- 3. THE CONCRETE WASHOUT AREA WILL BE REPLACED AS NECESSARY TO MAINTAIN CAPACITY FOR WASTE CONCRETE AND
- OTHER LIQUID WASTE.
- 4. WASHOUT RESIDUE SHALL BE REMOVED FROM THE SITE AND DISPOSED OF AT AN APPROVED WASTE SITE.
- 5. DO NOT MIX EXCESS AMOUNTS OF FRESH CONCRETE OR CEMENT ON-SITE.
- 6. DO NOT WASH OUT CONCRETE TRUCKS INTO STORM DRAINS, OPEN DITCHES, STREETS, OR STREAMS. 7. AVOID DUMPING EXCESS CONCRETE IN NON-DESIGNATED DUMPING AREAS.
- 8. LOCATE WASHOUT AREA AT LEAST 50' (15 METERS) FROM STORM DRAINS, OPEN DITCHES, OR WATERBODIES. 9. WASH OUT WASTES INTO THE OUTPACK WASHOUT AS SHOWN WHERE THE CONCRETE CAN SET, BE BROKEN UP, AND THEN DISPOSED OF PROPERLY.

OR APPROVED EQUAL

CONCRETE WASHOUT SYSTEM NOT TO SCALE

2 GIAN E PLAN US SITE

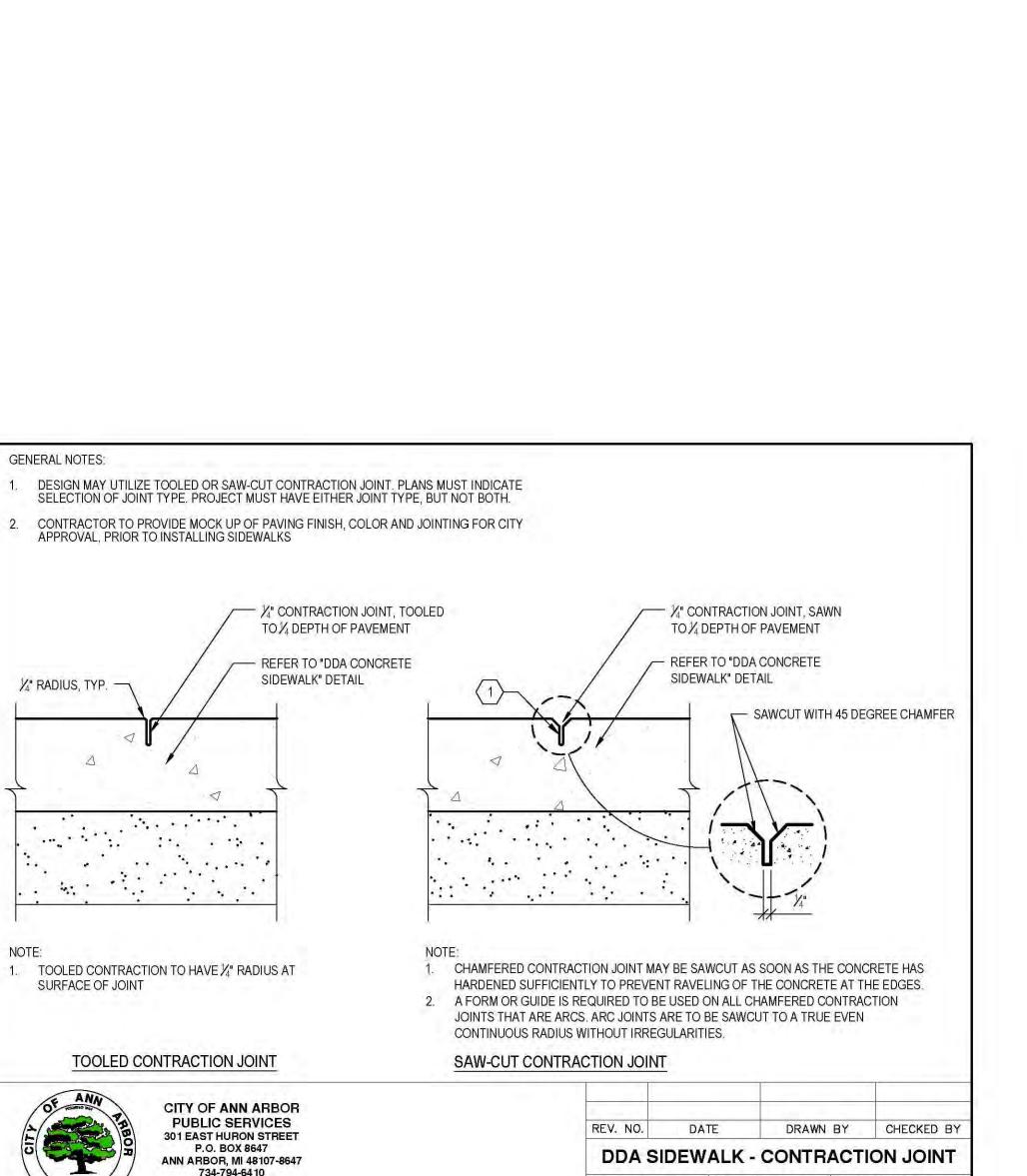
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GENERAL NOTES:

1/4" RADIUS, TYP. —

SURFACE OF JOINT

www.a2gov.org



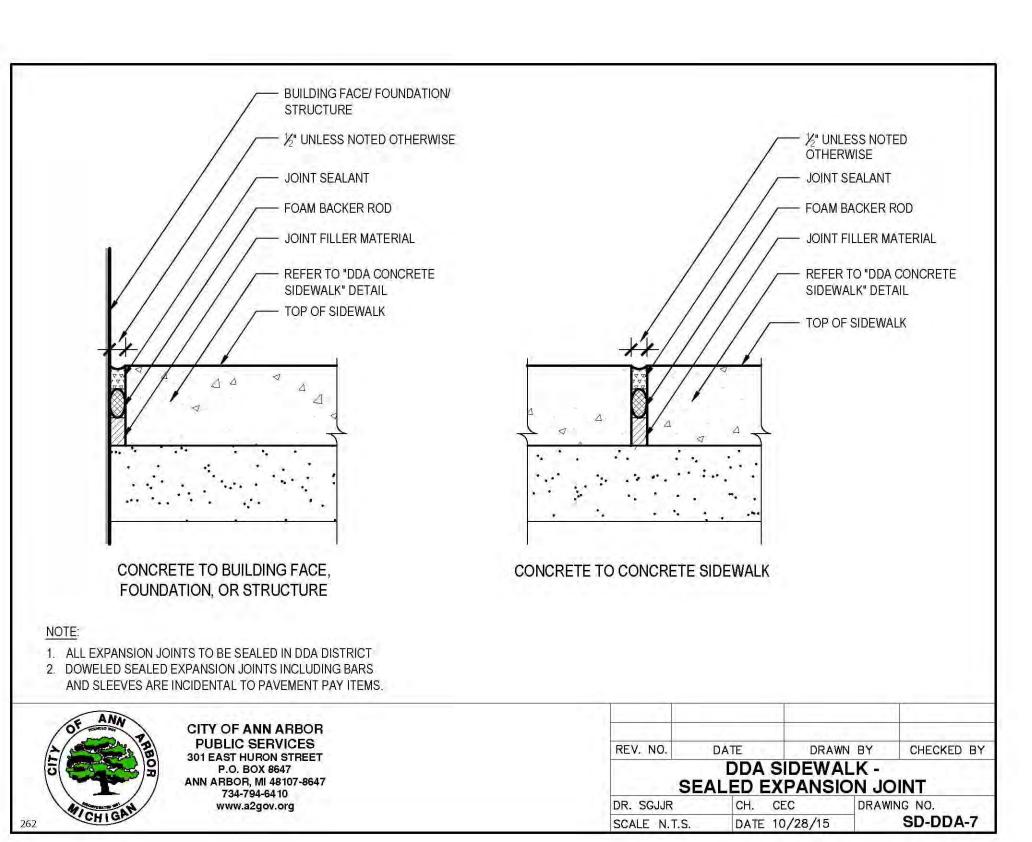
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DATE 10/28/15

SCALE N.T.S.

DRAWING NO.

SD-DDA-6



CITY OF ANN ARBOR

PUBLIC SERVICES

301 EAST HURON STREET

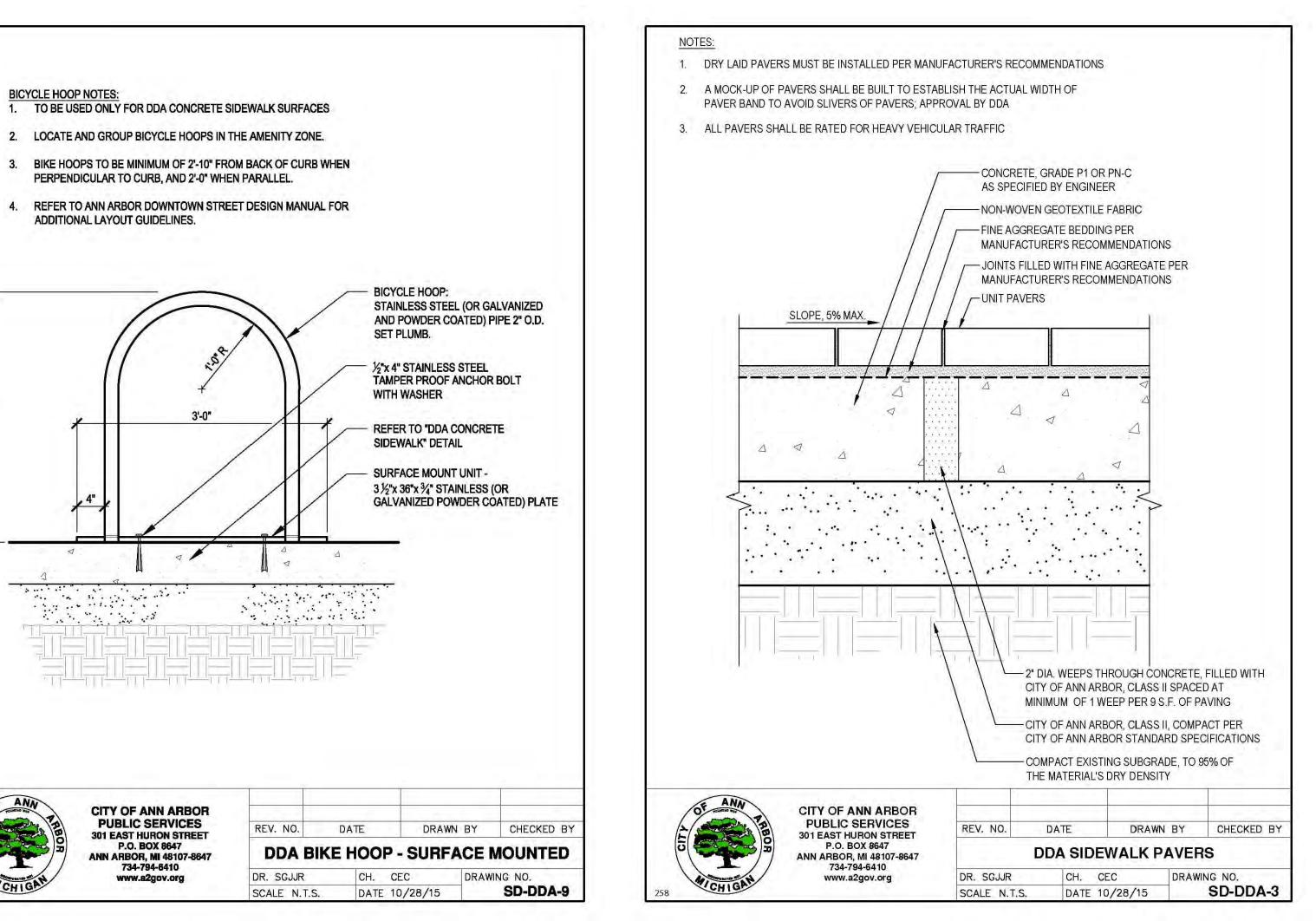
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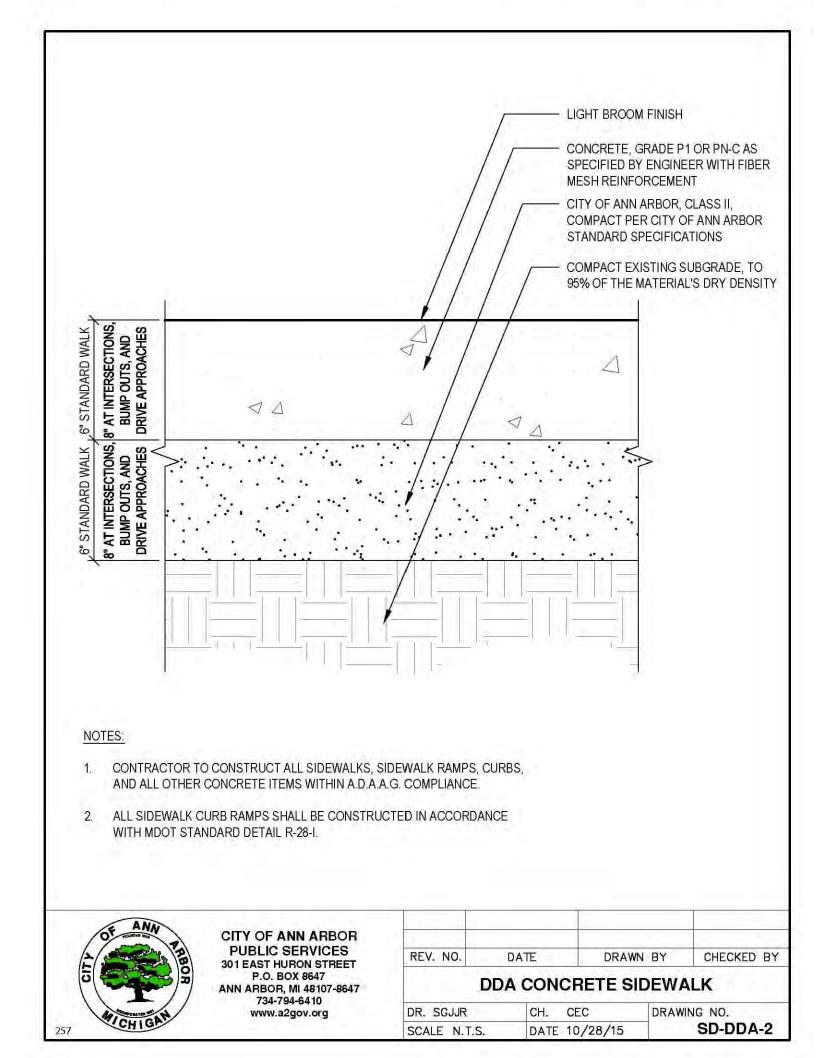
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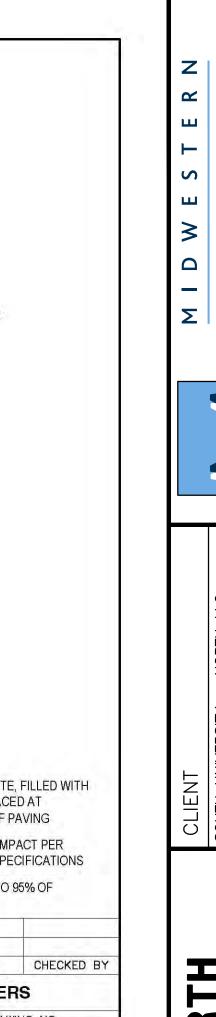
www.a2gov.org

ANN ARBOR, MI 48107-8647

ADDITIONAL LAYOUT GUIDELINES.







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SIAN CAPE

# FIRE PROTECTION PLAN NOTES

1. WATER SERVICES ARE TO BE SEPARATE DOMESTIC AND FIRE LINES.

- ADDRESSING: NUMERICS SHALL BE A MINIMUM OF 4 INCHES IN HEIGHT AND CLEARLY VISIBLE WHEN APPROACHING THE BUILDING.
- 3. FLOW REQUIREMENTS: FLOW SHALL COMPLY WITH NFPA 13 STANDARDS AND SHALL MEET 2009 INTERNATIONAL FIRE CODE (IFC) STANDARDS FOUND IN APPENDIX B. TABLE B 105.1 OF THE CODE. (IBC). TYPE OF CONSTRUCTION IS BASED ON THE INTERNATIONAL BUILDING CODE
- PURSUANT TO 2009 IFC, A REDUCTION IN REQUIRED FIRE—FLOW OF UP TO 75% IS ALLOWED WITH AN APPROVED AUTOMATIC SPRINKLER SYSTEM, BUT SHALL NOT BE LESS THAN 1,500 GPM FOR THE PRESCRIBED DURATION AS SPECIFIED IN TABLE B105.1
- SHOULD A FIRE PUMP BE INSTALLED DUE TO INSUFFICIENT WATER FLOW AND PRESSURE TO SUPPORT THE FIRE PROTECTION SYSTEM, THE FOLLOWING SHALL BE MET:
- IFC 2009, SECTION 914.3.1.2 REQUIRED FIRE PUMP SHALL BE SUPPLIED BY CONNECTIONS TO A MINIMUM OF TWO WATER MAINS LOCATED IN DIFFERENT STREETS. SEPARATE SUPPLY PIPING SHALL BE PROVIDED BETWEEN EACH CONNECTION TO THE WATER MAIN AND THE PUMPS. EACH CONNECTION AND THE SUPPLY PIPING BETWEEN THE CONNECTION AND THE PUMPS SHALL BE SIZED TO SUPPLY THE FLOW AND PRESSURE REQUIRED FOR THE PUMPS TO OPERATE. EXCEPTION: TWO CONNECTIONS TO THE SAME MAIN SHALL BE PERMITTED PROVIDED THE MAIN IS VALUED SUCH THAT AN INTERRUPTION CAN BE ISOLATED SO THAT THE WATER SUPPLY WILL CONTINUE WITHOUT INTERRUPTION THROUGH AT LEAST ONE OF THE CONNECTIONS.
- 4. FIRE DEPARTMENT CONNECTIONS (FDC'S) SHALL BE WITHIN 100 FEET OF A FIRE HYDRANT.

- 5. FIRE DEPARTMENT CONNECTION (FDC) LOCATION: HOOK-UP LOCATION IS SUBJECT TO FIRE MARSHAL'S APPROVAL.
- 6. FDC'S SHALL BE (2) 2 ½ INCH NST CONNECTIONS. FDC SHALL HAVE LOCKING KNOX CAPS ON THE FIRE HOSE INLET CONNECTIONS.
- 7. FDC ACCESS SHALL COMPLY WITH IFC 912.3.
- 8. FDC SIGNAGE SHALL BE PROVIDED AND SHALL COMPLY WITH IFC
- 9. FIRE PROTECTION ALARM AND DETECTION SYSTEM SHALL BE IN COMPLIANCE WITH ALL APPLICABLE CODES ADOPTED BY THE CITY OF ANN ARBOR, INCLUDING NFPA 72, 2007 EDITION AND ALL OTHER REFERENCED STANDARDS.
- a. A HORN STROBE DEVICE SHALL BE INSTALLED ABOVE THE FDC AND SHALL ACTIVATE UPON SPRINKLER WATER FLOW.
  b. EMERGENCY RESPONDER RADIO COVERAGE SHALL COMPLY WITH 2009
- IFC SECTION 510.

  c.EMERGENCY VOICE/ALARM COMMUNICATIONS SYSTEM SHALL COMPLY
- WITH 2009 IFC SECTION 907.6.2.2.

  d.OCCUPANT NOTIFICATION APPLIANCES SHALL ACTIVATE THROUGHOUT THE NOTIFICATION ZONES UPON SPRINKLER WATER FLOW.
- e.PLACE SIGNAGE ON FIRE SUPPRESSION SYSTEM CONTROL ROOM
  DOOR (IFC 2009 SECTION 509.1) IF APPLICABLE.
  FIRE COMMAND CENTER: BUILDING MEETS HIGH—RISE CLASSIFICATION
- 10. FIRE COMMAND CENTER: BUILDING MEETS HIGH-RISE CLASSIFICATION AND SHALL BE EQUIPPED WITH A GROUND FLOOR FIRE COMMAND CENTER THAT COMPLIES WITH 2009 IFC SECTION 508 AND 2012 MBC SECTION 911. THE FIRE COMMAND CENTER IS TO BE ACCESSED FROM
- A HALLWAY CONNECTED TO SOUTH UNIVERSITY AVENUE.

  11. KNOX BOX EMERGENCY ACCESS SYSTEM WITH KEYS TO ACCESS THE

- BUILDING, THE FIRE SUPPRESSION SYSTEM CONTROL ROOM (IF APPLICABLE), AN ELEVATOR KEY, AND ANY OTHER KEYS TO AREAS THAT MAY BE RELEVANT DURING EMERGENCIES WILL BE REQUIRED. KNOX BOX WITH PROPER KEYS SHALL BE IN PLACE PRIOR TO ISSUANCE OF CERTIFICATES OF OCCUPANCY FOR THE BUILDINGS.
- 12. THE KNOX BOX SHALL BE MOUNTED ON AN EXTERIOR LOCATION NO HIGHER THAN 6 FEET FROM GRADE IN AN APPROVED LOCATION ON THE EXTERIOR FOR EMERGENCY ACCESS TO THE BUILDING AS WELL AS ACCESS TO THE FIRE SUPPRESSION SYSTEM CONTROL ROOMS IF APPLICABLE.
- 13. CONSTRUCTION SEQUENCING
- a.FIRE HYDRANTS MUST BE IN SERVICE AND APPROVED DURING CONSTRUCTION.
- b.FIRE HYDRANTS PROVIDING PROTECTION COVERAGE FOR THE BUILDING MUST BE IN SERVICE AND APPROVED BY BOTH PLANNING AND FIRE DEPARTMENTS BEFORE THE FIRE DEPARTMENT WILL SUPPORT PERMIT ISSUANCE FOR NEW CONSTRUCTION PHASE AND BEFORE COMBUSTIBLE MATERIALS ARE PLACED ON THE JOB SITE.
- c. STORAGE AREAS FOR CONSTRUCTION MATERIALS MUST BE APPROVED SO AS NOT TO INTERFERE WITH FIRE/EMERGENCY SITE ACCESS.

  d. IF SITE ACCESS IS TO BE RESTRICTED DURING CONSTRUCTION, KNOX BOX LOCKS FOR GATES ARE TO BE PROVIDED.
- 14. NO FIREWALLS WILL BE CONSTRUCTED WITHIN THE BUILDING.
- 15. IF BOOSTER PUMPS ARE REQUIRED, THEY ARE TO BE PROVIDED ON THE DOMESTIC WATER SERVICE AND THE FIRE SUPPRESSION WATER SERVICE LEADS. THE PUMPS SHALL MEET 2009 IFC STANDARDS, SECTION 914.3.1.2.
- 16. NO SEPARATE FIRE SUPPRESSION SYSTEM CONTROL ROOM IS REQUIRED.

NIVERSITY – NORTH LLC. ELEGRAPH ROAD, SUITE 220 FARMS, MI 48205 HAVERA

SOUTH UNIVERSIT 30100 TELEGRAPH BINGHAM FARMS, SEAN T. HAVERA (248)647-2600

EGIAN NORT
TE PLAN
OTECTION PLAN

SITE PROTECT

12

BEV. DATE: 10/28/16

SHEET 13 OF 26

12/05/16 CADD: DAG

1/31/17 ENG: SGF

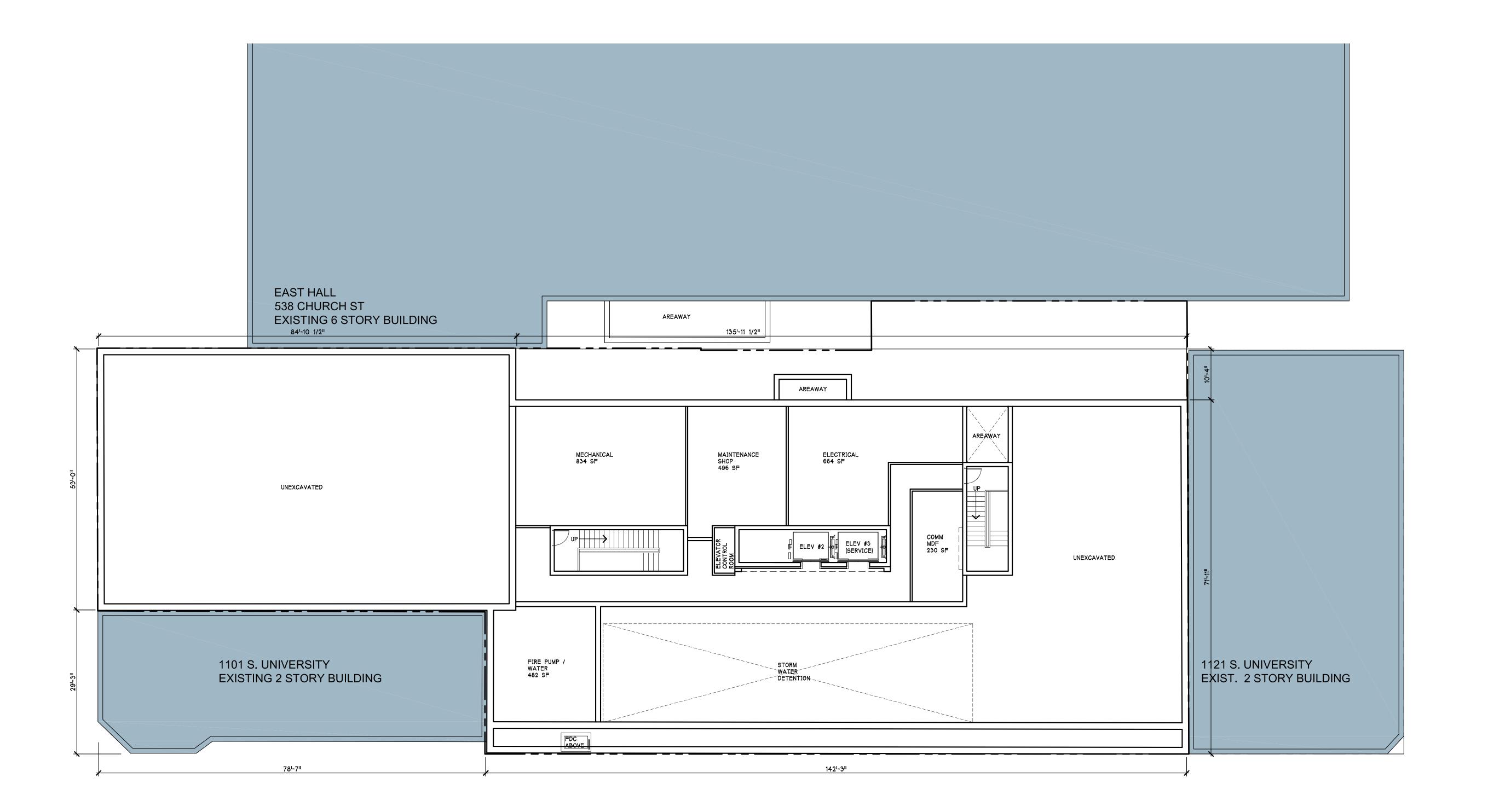
TECH:

15006FP1.dwg

FR#

No. **15006**No. : PER CITY REVIEW
: PER OWNER REVIEW

The underground utilities shown have been located from field survey information and existing records. The surveyor makes no guarantees that the underground utilities shown comprise all such utilities in the area, either in—service or abandoned. The surveyor further does not warrant that the underground utilities shown are in the exact location indicated. Although the surveyor does certify that they are located as accurately as possible from the information available.



BASEMENT PLAN SCALE - 3/32" = 1'-0"

SITE PLAN RESUBMITTAL 1/20/2017 SITE PLAN RESUBMITTAL 12/2/2016 SITE PLAN APPROVAL 10/28/2016 DATE ISSUED

DRAWN BY

CHECKED BY

PROJECT

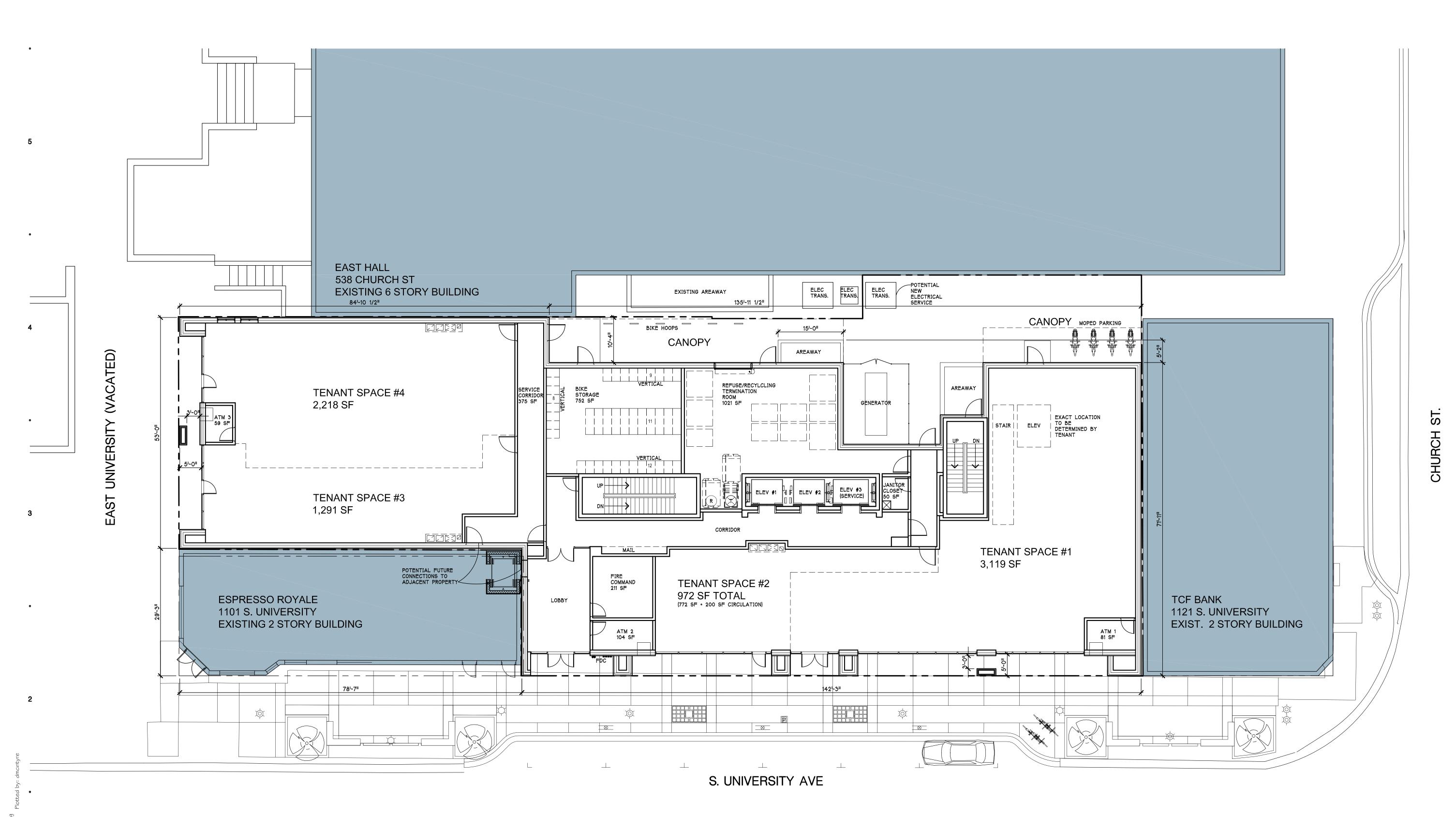
BASEMENT FLOOR PLAN

SHEET TITLE

16-003 PROJECT NUMBER

A-100

SHEET NUMBER



EGIAN NORTH
PROPERTIES
Am

HUGHES PROPI SOUTH UNIVERS ANN ARBOR, MI 4

SITE PLAN RESUBMITTAL 1/20/2017
SITE PLAN RESUBMITTAL 12/2/2016
SITE PLAN APPROVAL 10/28/2016

DATE ISSUED

DRAWN BY

CHECKED BY

PROJECT

CONSULTANT

FIRST FLOOR PLAN

SHEET TITLE

16-003

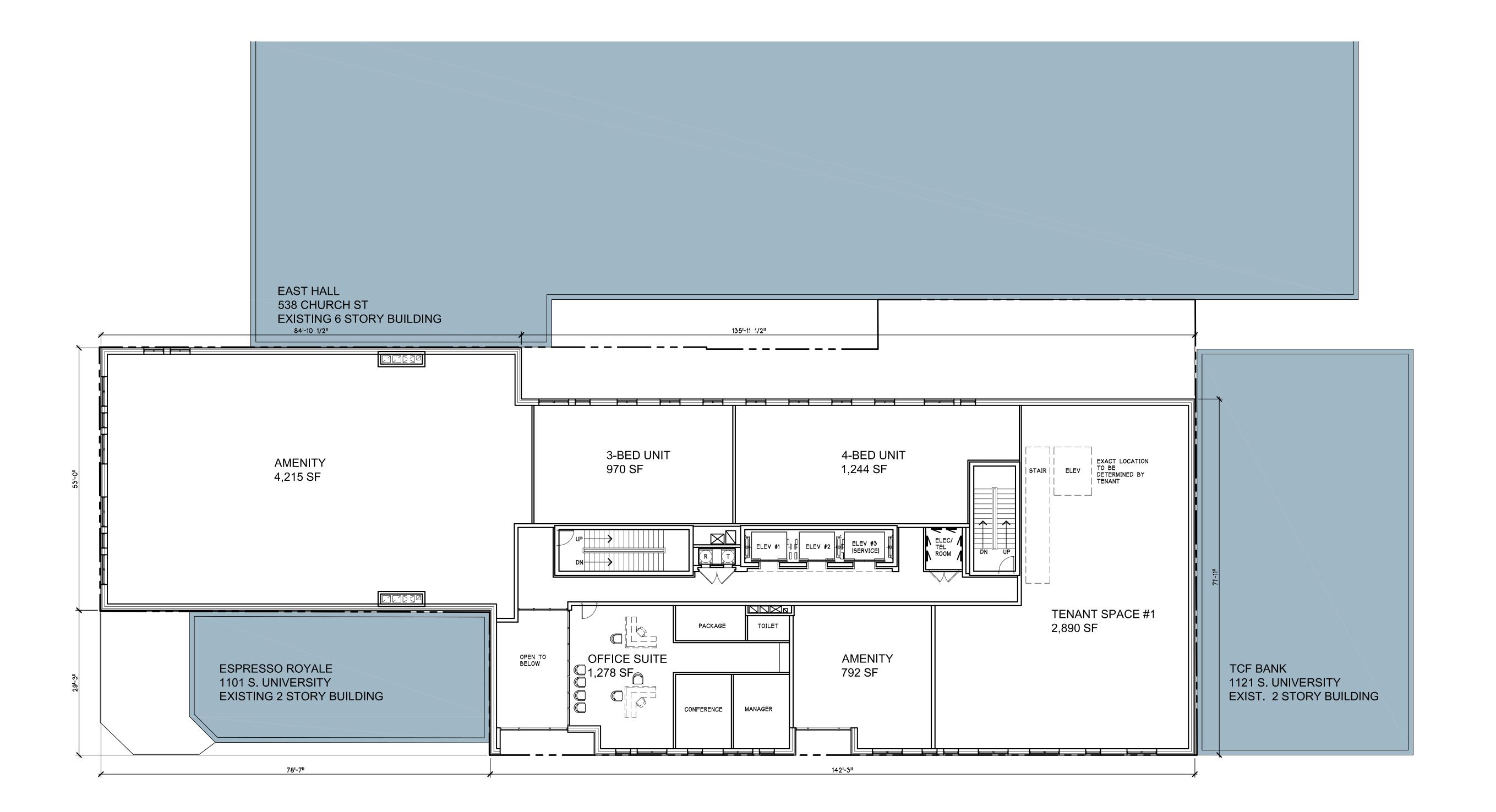
PROJECT NUMBER

A-101

SHEET NUMBER

FIRST
FLOOR

SCALE - 3/32" = 1'-0"



SECOND FLOOR SCALE - 3/32" = 1'-0"

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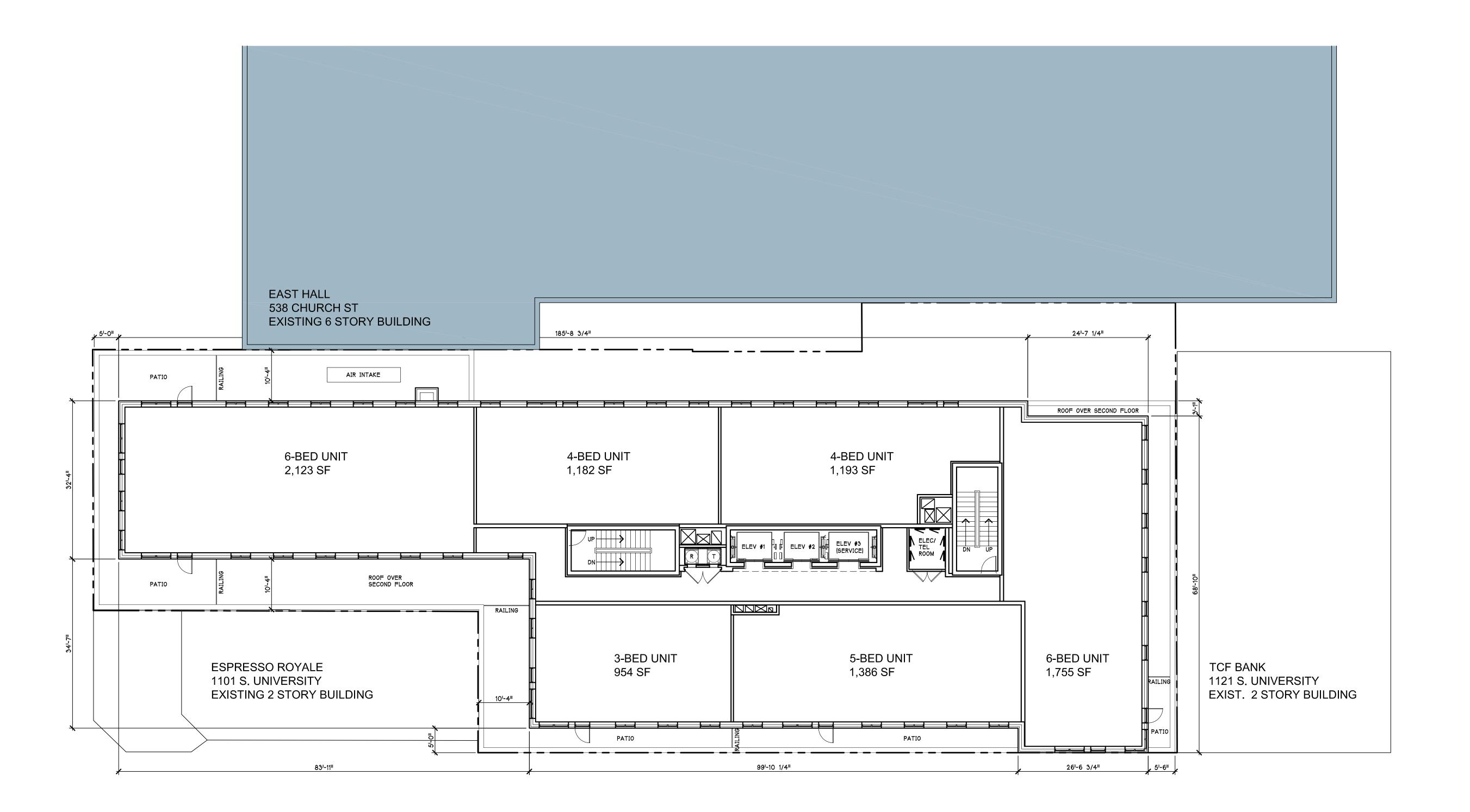
SECOND FLOOR PLAN

SHEET TITLE

PROJECT NUMBER

16-003

SHEET NUMBER



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THIRD - NINTH FLOOR PLANS

SHEET TITLE

16-003 PROJECT NUMBER

A-103

SHEET NUMBER

THIRD - NINTH FLOORS SCALE - 3/32" = 1'-0"

28¹-7 1/4¹¹ **AMENITY** 778 SF 4-BED UNIT 1,197 SF 3-BED UNIT 959 SF PATIO OVER 9TH FLOOR 5-BED UNIT 1,386 SF 3-BED UNIT 4-BED UNIT 954 SF 1,257 SF 99'-10 1/4" 26<sup>1</sup>-6 3/4<sup>11</sup>

SHEET TITLE

TENTH FLOOR PLAN

PROJECT

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16-003 PROJECT NUMBER

A-104

SHEET NUMBER

TENTH FLOOR SCALE - 3/32" = 1'-0"

107'-5 3/8" r-----BOILER/ WATER HEATER ROOF OVER 10TH FLOOR COOLING TOWER 3-BED UNIT 1,139 SF JANITOR CLOSET AMENITY 549 SF PATIO OVER 10TH FLOOR 5-BED UNIT 1,386 SF 3-BED UNIT 954 SF 101'-9 1/8" 12'-11" 91-7 5/811

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SOUTH UNIVERSITY
ANN ARBOR, MI 48104

CONSULTAN

ELEVENTH FLOOR PLAN

SHEET TITLE

16-003

PROJECT NUMBER

A-105

SHEET NUMBER

FLOOR

SCALE - 3/32" = 1'-0"

Jan 19, 2017, 2:57pm Layout: 24x36-Layout Plotted by: c

107<sup>1</sup>-5 3/8<sup>11</sup> COOLING TOWER BELOW MAKE UP AIR UNIT MAKE UP AIR UNIT 2-BED UNIT 872 SF 5-BED UNIT 1,386 SF 3-BED UNIT 954 SF 101'-9 1/8" 91-7 5/811

TWELFTH
FLOOR
SCALE - 3/32" = 1'-0"
AJ92AP12

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PROJECT

TWELFTH FLOOR PLAN

SHEET TITLE

16-003

A-106

SHEET NUMBER

PROJECT NUMBER

107<sup>1</sup>-5 3/8<sup>11</sup> SCREENWALL ROOF OVER 10TH FLOOR ROOF OVER 11TH FLOOR ROOF OVER 11TH FLOOR ELEV ROOF 91-7 5/811

PROJECT

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ROOF PLAN

SHEET TITLE

16-003 PROJECT NUMBER

A-107

ROOF PLAN SCALE - 3/32" = 1'-0"

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16-003

PROJECT NUMBER

A-203

SHEET NUMBER



EAST ELEVATION SCALE - 3/32" = 1'-0" 2016/1010 - SUN ELEVTO



WEST ELEVATION SCALE - 3/32" = 1'-0"

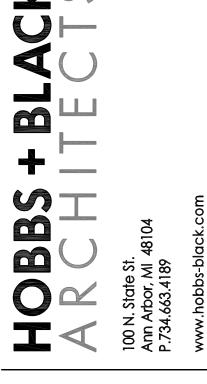
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PROJECT

WEST ELEVATION

SHEET TITLE

16-003

PROJECT NUMBER

A-202

SHEET NUMBER

ELEVATION

SCALE - 3/32" = 1'-0"

2016/1010 - SUN ELEVIO

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NORTH ELEVATION

BRICK TYPE #2

SHEET TITLE

16-003

PROJECT NUMBER

A-201

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SOUTH ELEVATION SCALE - 3/32" = 1'-0" 2016/1010 - SUN ELEVIO Sheet Size - 24x36
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SOUTH ELEVATION

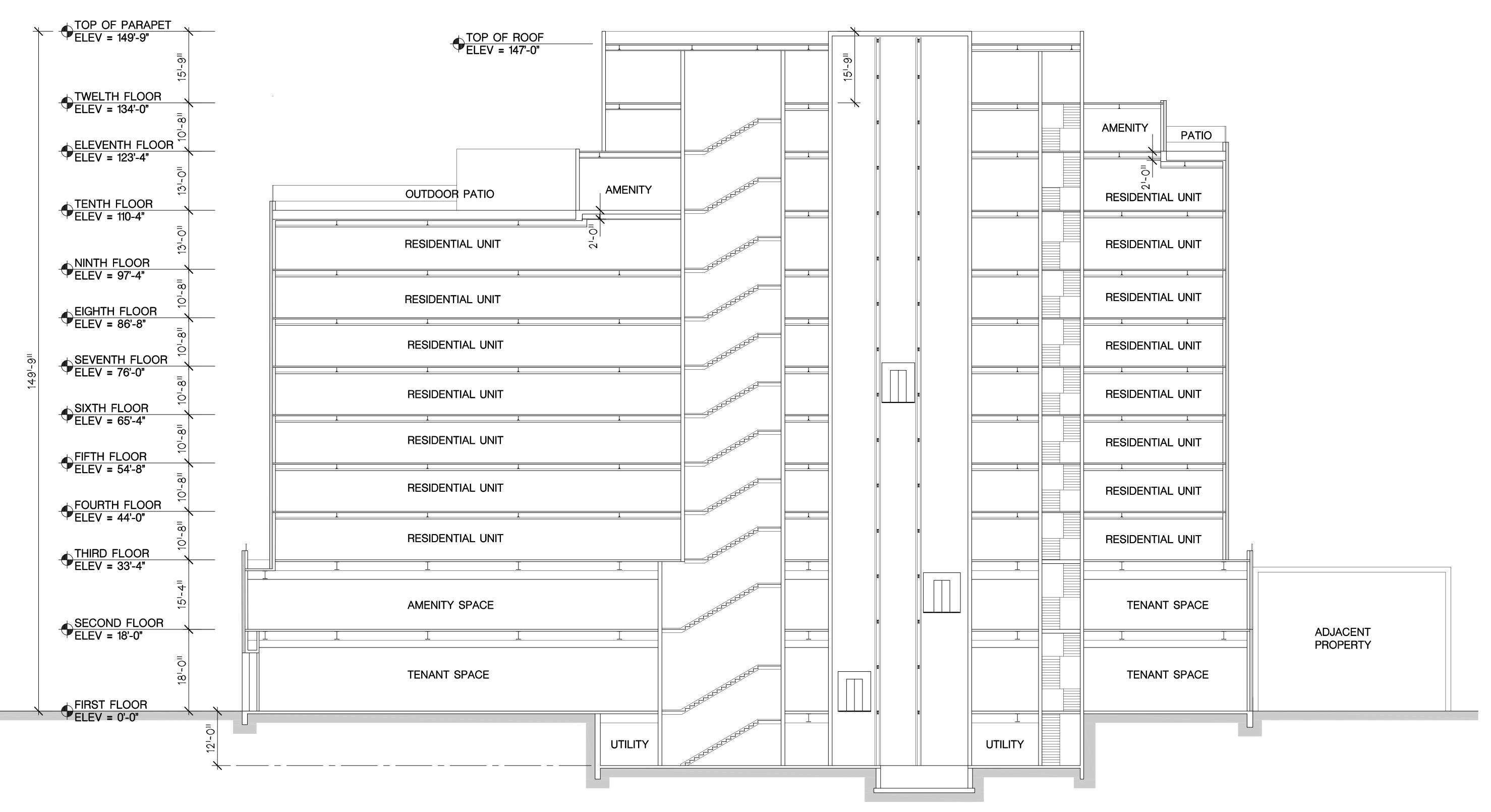
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16-003

A-200

SHEET NUMBER

PROJECT NUMBER



BUILDING SECTION SCALE - 3/32" = 1'-0" 20161010 - SUN ELEVIO SITE PLAN RESUBMITTAL 1/20/2017
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BUILDING SECTION

SHEET TITLE

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PROJECT NUMBER

A-300
SHEET NUMBER

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