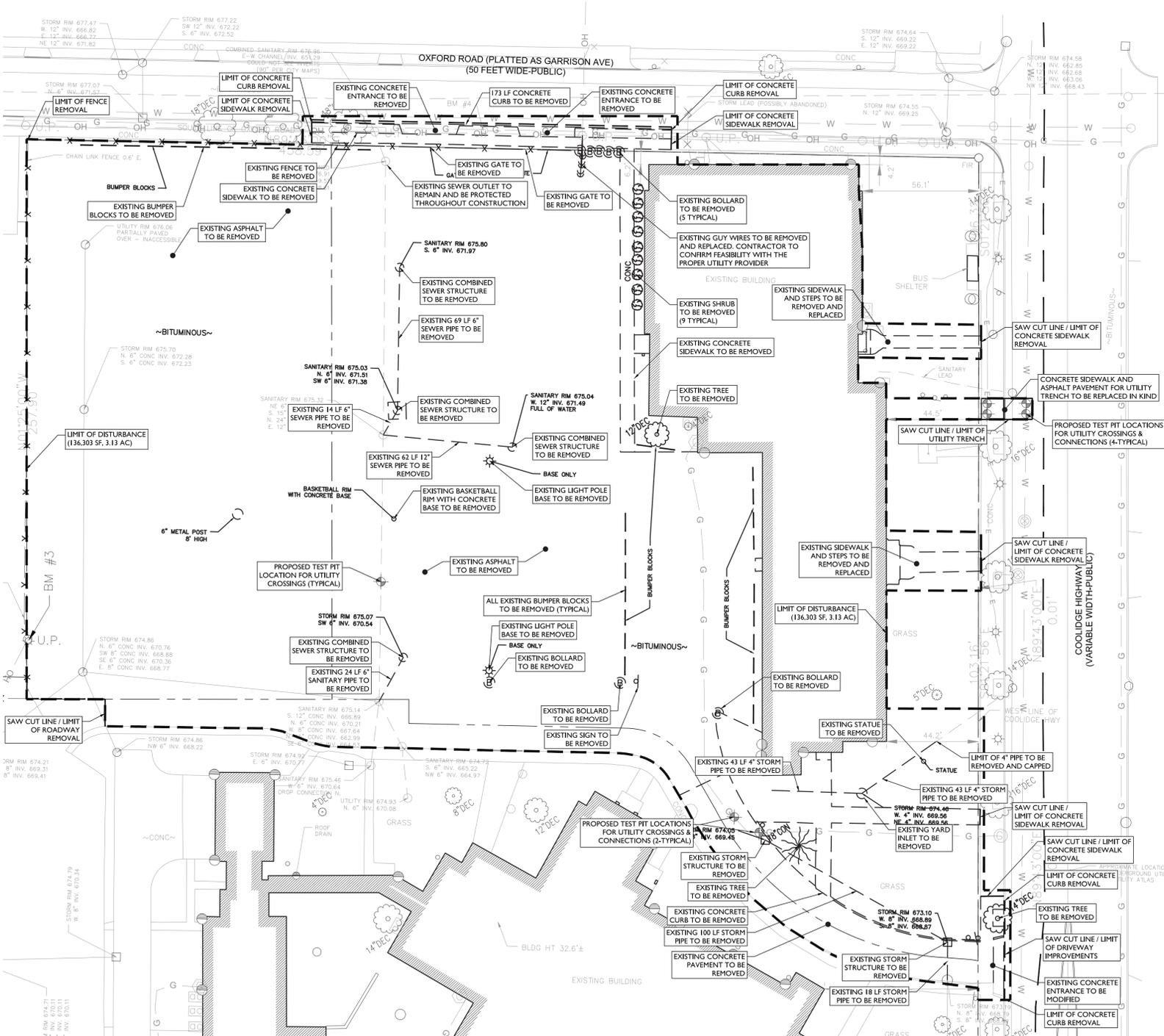




| SITE DEMOLITION QUANTITIES |           |
|----------------------------|-----------|
| ASPHALT REMOVAL            | 91,144 SF |
| CONCRETE SIDEWALK REMOVAL  | 9,695 SF  |
| CONCRETE CURB REMOVAL      | 1,320 LF  |
| LIGHT POLE REMOVAL         | 2 EA      |
| 4" SEWER PIPE REMOVAL      | 86 LF     |
| 6" SEWER PIPE REMOVAL      | 146 LF    |
| 18" SEWER PIPE REMOVAL     | 73 LF     |
| FENCE & GATE REMOVAL       | 261 LF    |
| SEWER STRUCTURE REMOVAL    | 7 EA      |
| TREE REMOVAL               | 3 EA      |
| SHRUB REMOVAL              | 9 EA      |



| SYMBOL | DESCRIPTION                        |
|--------|------------------------------------|
| ---    | FEATURE TO BE REMOVED / DEMOLISHED |
| ---    | LIMIT OF DISTURBANCE               |
| ⊙      | PROPOSED TEST PIT LOCATIONS        |

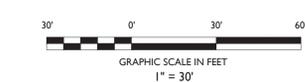


**ALL SITE FEATURES ON THIS PLAN ARE TO REMAIN AND BE PROTECTED UNLESS OTHERWISE NOTED. THE CONTRACTOR SHALL NOTIFY STONEFIELD ENGINEERING & DESIGN, LLC. IF SIGNIFICANT DISCREPANCIES ARE DISCERNED BETWEEN THIS PLAN AND FIELD CONDITIONS**



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

- DEMOLITION NOTES**
1. THE WORK REFLECTED ON THE DEMOLITION PLAN IS TO PROVIDE GENERAL INFORMATION TOWARDS THE EXISTING ITEMS TO BE DEMOLISHED AND/OR REMOVED. THE CONTRACTOR IS RESPONSIBLE TO REVIEW THE ENTIRE PLAN SET AND ASSOCIATED REPORTS/REFERENCE DOCUMENTS INCLUDING ALL DEMOLITION ACTIVITIES AND INCIDENTAL TASKS NECESSARY TO COMPLETE THE SITE IMPROVEMENTS.
  2. THE CONTRACTOR IS RESPONSIBLE TO DETERMINE THE MEANS AND METHODS OF DEMOLITION ACTIVITIES.
  3. EXPLOSIVES SHALL NOT BE USED UNLESS WRITTEN CONSENT FROM BOTH THE OWNER AND ANY APPLICABLE GOVERNING AGENCY IS OBTAINED. BEFORE THE START OF ANY EXPLOSIVE PROGRAM, THE CONTRACTOR IS RESPONSIBLE TO OBTAIN ALL LOCAL, STATE, AND FEDERAL PERMITS. ADDITIONALLY, THE CONTRACTOR WILL BE RESPONSIBLE FOR ALL SEISMIC TESTING AS REQUIRED AND ANY DAMAGES AS THE RESULT OF SAID DEMOLITION PRACTICES.
  4. ALL DEMOLITION ACTIVITIES SHALL BE PERFORMED IN ACCORDANCE WITH LOCAL, STATE, AND FEDERAL CODES. THE CONTRACTOR IS RESPONSIBLE FOR ENSURING ALL UTILITIES ARE DISCONNECTED IN ACCORDANCE WITH THE UTILITY AUTHORITY'S REQUIREMENTS PRIOR TO STARTING THE DEMOLITION OF ANY STRUCTURE. ALL EXCAVATIONS ASSOCIATED WITH DEMOLISHED STRUCTURES OR REMOVED TANKS SHALL BE BACKFILLED WITH SUITABLE MATERIAL AND COMPACTED TO SUPPORT SITE AND BUILDING IMPROVEMENTS. A GEOTECHNICAL ENGINEER SHOULD BE PRESENT DURING BACKFILLING ACTIVITIES TO OBSERVE AND CERTIFY THAT BACKFILL MATERIAL WAS COMPACTED TO A SUITABLE CONDITION.
  5. DEMOLISHED DEBRIS SHALL NOT BE BURIED ON SITE. ALL WASTE/DEBRIS GENERATED FROM DEMOLITION ACTIVITIES SHALL BE DISPOSED OF IN ACCORDANCE WITH ALL LOCAL, STATE AND FEDERAL REQUIREMENTS. THE CONTRACTOR IS RESPONSIBLE TO MAINTAIN ALL RECORDS OF THE DISPOSAL TO DEMONSTRATE COMPLIANCE WITH THE ABOVE REGULATIONS.



| NO. | DATE       | ISSUE | BY | DESCRIPTION                       |
|-----|------------|-------|----|-----------------------------------|
| 2   | 10/31/2019 | MG    |    | SUBMISSION FOR SITE PLAN APPROVAL |
| 1   | 08/12/2019 | MH    |    | SUBMISSION FOR VARIANCE APPROVAL  |

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Phone 248.247.1115

**THE BERKLEY**  
PROPOSED RESIDENTIAL COMMUNITY

PARCEL ID: 25-18-431-015 THRU 25-18-431-017 &  
25-18-431-022  
CITY OF BERKLEY  
OAKLAND COUNTY, MI



**STONEFIELD**  
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SCALE: 1" = 30' PROJECT ID: 1731.01

TITLE:  
**DEMOLITION PLAN**

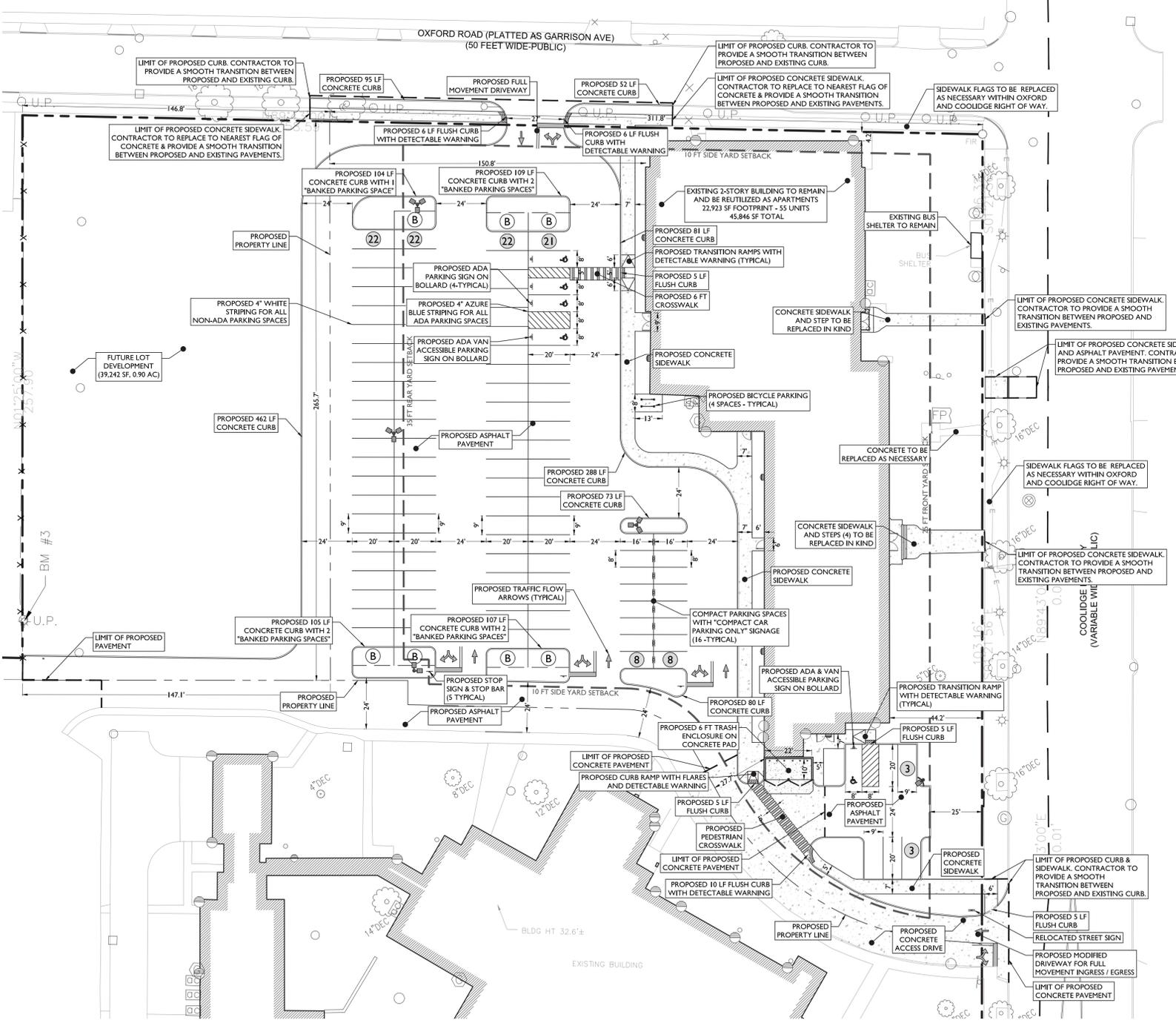
DRAWING:  
**C-2**

| OFF-STREET PARKING REQUIREMENTS |  |                                  |
|---------------------------------|--|----------------------------------|
| CODE SECTION                    | REQUIRED   | PROPOSED                         |
| § 138-219                       | MULTI-FAMILY APARTMENTS:<br>2 SPACES PER DWELLING UNIT<br>(55 UNITS) (2 SPACES / UNIT) = 110 SPACES                              | 109 SPACES                       |
| § 138-220(b)                    | COMPACT CAR PARKING: (1)<br>8 FT X 16 FT WITH 24 FT DRIVE AISLE  | INCLUDING:<br>16 COMPACT SPACES  |
| § 138-221                       | BARRIER FREE PARKING SPACES:<br>101 TO 150 PARKING SPACES = 5 BARRIER FREE SPACES  | 5 BARRIER FREE SPACES            |
| § 138-268                       | BICYCLE PARKING CREDIT: (2)<br>REDUCES REQUIRED PARKING BY 2 PER 4 BICYCLE SPACES<br>4 BICYCLE SPACES = 2 VEHICLE PARKING SPACES | 4 BICYCLE SPACES                 |
| § 138-222                       | 90° PARKING:<br>9 FT X 20 FT WITH 24 FT DRIVE AISLE  | 9 FT X 20 FT WITH<br>24 FT AISLE |

- (1) § 138-220(b):  
COMPACT CAR SPACES SHALL BE AN ACCESSIBLE RECTANGLE HAVING A WIDTH OF EIGHT FEET AND A LENGTH OF 16 FEET. COMPACT CAR SPACES SHALL ACCOUNT FOR NO MORE THAN 30 PERCENT OF THE TOTAL PARKING REQUIREMENT AND BE CLEARLY SIGNED FOR "SMALL CARS ONLY."  
(0.30) x (112 PARKING SPACES) = 34 COMPACT SPACES PERMITTED
- (2) § 138-268:  
BICYCLE PARKING MAY BE USED TO REDUCE THE NUMBER OF REQUIRED OFF-STREET PARKING SPACES. EXISTING DEVELOPMENTS MAY ELECT TO REDUCE THE REQUIRED OFF-STREET PARKING BY TWO CAR PARKING SPACES BY PROVIDING FOUR BICYCLE PARKING SPACES (I.E. BY INSTALLING TWO INVERTED U LOOP STYLE OR OTHER APPROVED STYLE OF BICYCLE RACK).

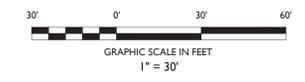
| TABLE OF LAND USE AND ZONING                |                 |  |
|---|-----------------|--|
| PARCEL ID: 25-18-431-015 THRU 25-18-431-021 |                 |  |
| MULTI-FAMILY RESIDENTIAL (RM)               |                 |  |
| PROPOSED USE                                | PERMITTED USE   | PROPOSED   |
| MULTI-FAMILY DWELLINGS                      |                 |  |
| ZONING REQUIREMENT                          | REQUIREMENT     | PROPOSED   |
| MINIMUM LOT AREA                            | N/A             | 97,532 SF (2.24 AC)                                  |
| MINIMUM LOT WIDTH                           | N/A             | 311.8 FT   |
| MAXIMUM LOT COVERAGE                        | 35% (34,136 SF) | 23.5% (22,923 SF)                                    |
| MAXIMUM LOT COVERAGE (CORNER LOT)           | 45% (43,889 SF) | 23.5% (22,923 SF)                                    |
| MAXIMUM BUILDING HEIGHT                     | 30 FT           | 39 FT (TOP OF PARAPET<br>51 FT EXISTING CHIMNEY) (V) |
| MINIMUM FRONT YARD SETBACK (1)              | 25 FT (5)       | 44.2 FT  |
| MINIMUM SIDE YARD SETBACK (ONE) (1) (5)     | 10 FT (5)       | 4.2 FT (V)   |
| MINIMUM SIDE YARD SETBACK (TOTAL) (1) (4)   | 20 FT (4)       | 31.9 FT  |
| MINIMUM REAR YARD SETBACK (1)               | 35 FT           | 150.8 FT   |
| MINIMUM FLOOR AREA (5)                      | FOOTNOTE (5)    | TBD  |

- (V) VARIANCE - APPROVED BY ZONING BOARD OF APPEALS (09/09/2019)
- (1) PROPOSED BUILDING OVERHANGS MAY OVERHANG UP TO 4 FT INTO PROPOSED SETBACKS.
- (2) § 138-527(b):  
OR AVERAGE SETBACK OF THE SIX ADJACENT BUILDINGS ON THE SAME BLOCK (WHICHEVER IS GREATER)
- (3) § 138-527(g):  
EVERY LOT ON WHICH A MULTIPLE DWELLING IS ERRECTED SHALL BE PROVIDED WITH A SIDE YARD ON EACH SIDE OF SUCH LOT. EACH SIDE YARD SHALL BE INCREASED BY ONE-HALF FOOT FOR EACH TEN FEET OR PART THEREOF BY WHICH THE LENGTH OF THE MULTIPLE DWELLING EXCEEDS 50 FEET IN OVERALL DIMENSION ALONG THE ADJOINING LOT LINE
- (4) § 138-527(f):  
NO MULTIPLE DWELLING SHALL BE ERRECTED ON A LOT OR PARCEL OF LAND THAT HAS AN AREA OF LESS THAN 10,000 SQUARE FEET. THE TOTAL NUMBER OF ROOMS (OTHER THAN KITCHEN AND SANITARY FACILITIES) PROVIDED SHALL NOT BE MORE THAN THE AREA OF THE PARCEL IN SQUARE FEET DIVIDED BY 500.  
MAXIMUM NUMBER OF ROOMS = (97,532 SF) / (500) = 195 ROOMS
- (5) § 138-527(h):  
THE FOLLOWING MINIMUM FLOOR AREAS SHALL BE MET (THE NUMBER OF ROOMS LISTED IS IN ADDITION TO THE KITCHEN AND SANITARY FACILITIES):  
EFFICIENCY APARTMENT: ONE-ROOM—250 SQUARE FEET MINIMUM FLOOR AREA PER UNIT.  
ONE-BEDROOM-THREE-ROOM—450 SQUARE FEET MINIMUM FLOOR AREA PER UNIT.  
TWO-BEDROOM-FOUR-ROOM—400 SQUARE FEET MINIMUM FLOOR AREA PER UNIT.  
THREE-BEDROOM-FIVE-ROOM—750 SQUARE FEET MINIMUM FLOOR AREA PER UNIT.  
THE MAXIMUM FLOOR AREA FOR AN EFFICIENCY APARTMENT SHALL NOT EXCEED 300 SQUARE FEET (IN ADDITION TO THE KITCHEN AND SANITARY FACILITIES).



| SYMBOL | DESCRIPTION   |
|--------|---|
| ---    | PROPERTY LINE   |
| ---    | SETBACK LINE  |
| ---    | SAWCUT LINE   |
| ---    | PROPOSED CURB   |
| ---    | PROPOSED FLUSH CURB                                   |
| ---    | PROPOSED SIGNS / BOLLARDS                             |
| ---    | PROPOSED BUILDING                                     |
| ---    | PROPOSED CONCRETE                                     |
| ---    | PROPOSED BICYCLE PARKING                              |
| ---    | PROPOSED AREA LIGHT                                   |
| ---    | PROPOSED BUILDING DOORS                               |
| ---    | PROPOSED BANKED PARKING SPACES FOR FUTURE DEVELOPMENT |

- GENERAL NOTES**
- THE CONTRACTOR SHALL VERIFY AND FAMILIARIZE THEMSELVES WITH THE EXISTING SITE CONDITIONS AND THE PROPOSED SCOPE OF WORK (INCLUDING DIMENSIONS, LAYOUT, ETC.) PRIOR TO INITIATING THE IMPROVEMENTS IDENTIFIED WITHIN THESE DOCUMENTS. SHOULD ANY DISCREPANCY BE FOUND BETWEEN THE EXISTING SITE CONDITIONS AND THE PROPOSED WORK, THE CONTRACTOR SHALL NOTIFY STONEFIELD ENGINEERING & DESIGN, LLC PRIOR TO THE START OF CONSTRUCTION.
  - THE CONTRACTOR SHALL OBTAIN ALL NECESSARY PERMITS AND ENSURE THAT ALL REQUIRED APPROVALS HAVE BEEN OBTAINED PRIOR TO THE START OF CONSTRUCTION. COPIES OF ALL REQUIRED PERMITS AND APPROVALS SHALL BE KEPT ON SITE AT ALL TIMES DURING CONSTRUCTION.
  - ALL CONTRACTORS WILL, TO THE FULLEST EXTENT PERMITTED BY LAW, INDEMNIFY AND HOLD HARMLESS STONEFIELD ENGINEERING & DESIGN, LLC, AND ITS SUB-CONSULTANTS FROM AND AGAINST ANY DAMAGES AND LIABILITIES INCLUDING ATTORNEY'S FEES ARISING OUT OF CLAIMS BY EMPLOYEES OF THE CONTRACTOR IN ADDITION TO CLAIMS CONNECTED TO THE PROJECT AS A RESULT OF NOT CARRYING THE PROPER INSURANCE FOR WORKERS COMPENSATION, LIABILITY INSURANCE, AND LIMITS OF COMMERCIAL GENERAL LIABILITY INSURANCE.
  - THE CONTRACTOR SHALL NOT DEVIATE FROM THE PROPOSED IMPROVEMENTS IDENTIFIED WITHIN THIS PLAN SET UNLESS APPROVAL IS PROVIDED IN WRITING BY STONEFIELD ENGINEERING & DESIGN, LLC.
  - THE CONTRACTOR IS RESPONSIBLE TO DETERMINE THE MEANS AND METHODS OF CONSTRUCTION.
  - THE CONTRACTOR SHALL NOT PERFORM ANY WORK OR CAUSE DISTURBANCE ON A PRIVATE PROPERTY NOT CONTROLLED BY THE PERSON OR ENTITY WHO HAS AUTHORIZED THE WORK WITHOUT PRIOR WRITTEN CONSENT FROM THE OWNER OF THE PRIVATE PROPERTY.
  - THE CONTRACTOR IS RESPONSIBLE TO RESTORE ANY DAMAGED OR UNDERMINED STRUCTURE OR SITE FEATURE THAT IS IDENTIFIED TO REMAIN ON THE PLAN SET. ALL REPAIRS SHALL USE NEW MATERIALS TO RESTORE THE FEATURE TO ITS EXISTING CONDITION AT THE CONTRACTOR'S EXPENSE.
  - CONTRACTOR IS RESPONSIBLE TO PROVIDE THE APPROPRIATE SHOP DRAWINGS, PRODUCT DATA, AND OTHER REQUIRED SUBMITTALS FOR REVIEW. STONEFIELD ENGINEERING & DESIGN, LLC, WILL REVIEW THE SUBMITTALS IN ACCORDANCE WITH THE DESIGN INTENT AS REFLECTED WITHIN THE PLAN SET.
  - THE CONTRACTOR IS RESPONSIBLE FOR TRAFFIC CONTROL IN ACCORDANCE WITH MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES, LATEST EDITION.
  - THE CONTRACTOR IS REQUIRED TO PERFORM ALL WORK IN THE PUBLIC RIGHT-OF-WAY IN ACCORDANCE WITH THE APPROPRIATE GOVERNING AUTHORITY AND SHALL BE RESPONSIBLE FOR THE PROCUREMENT OF STREET OPENING PERMITS.
  - THE CONTRACTOR IS REQUIRED TO RETAIN AN OSHA CERTIFIED SAFETY INSPECTOR TO BE PRESENT ON SITE AT ALL TIMES DURING CONSTRUCTION & DEMOLITION ACTIVITIES.
  - SHOULD AN EMPLOYEE OF STONEFIELD ENGINEERING & DESIGN, LLC, BE PRESENT ON SITE AT ANY TIME DURING CONSTRUCTION, IT DOES NOT RELIEVE THE CONTRACTOR OF ANY OF THE RESPONSIBILITIES AND REQUIREMENTS LISTED IN THE NOTES WITHIN THIS PLAN SET.



| DATE       | ISSUE | DESCRIPTION                       |
|------------|-------|-----------------------------------|
| 10/31/2019 | 1     | SUBMISSION FOR SITE PLAN APPROVAL |
| 08/12/2019 | 2     | SUBMISSION FOR VARIANCE APPROVAL  |

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**THE BERKLEY**  
PROPOSED RESIDENTIAL COMMUNITY

PARCEL ID: 25-18-431-015 THRU 25-18-431-017 & 25-18-431-022  
2219 COOLIDGE HIGHWAY  
CITY OF BERKLEY  
OAKLAND COUNTY, MI



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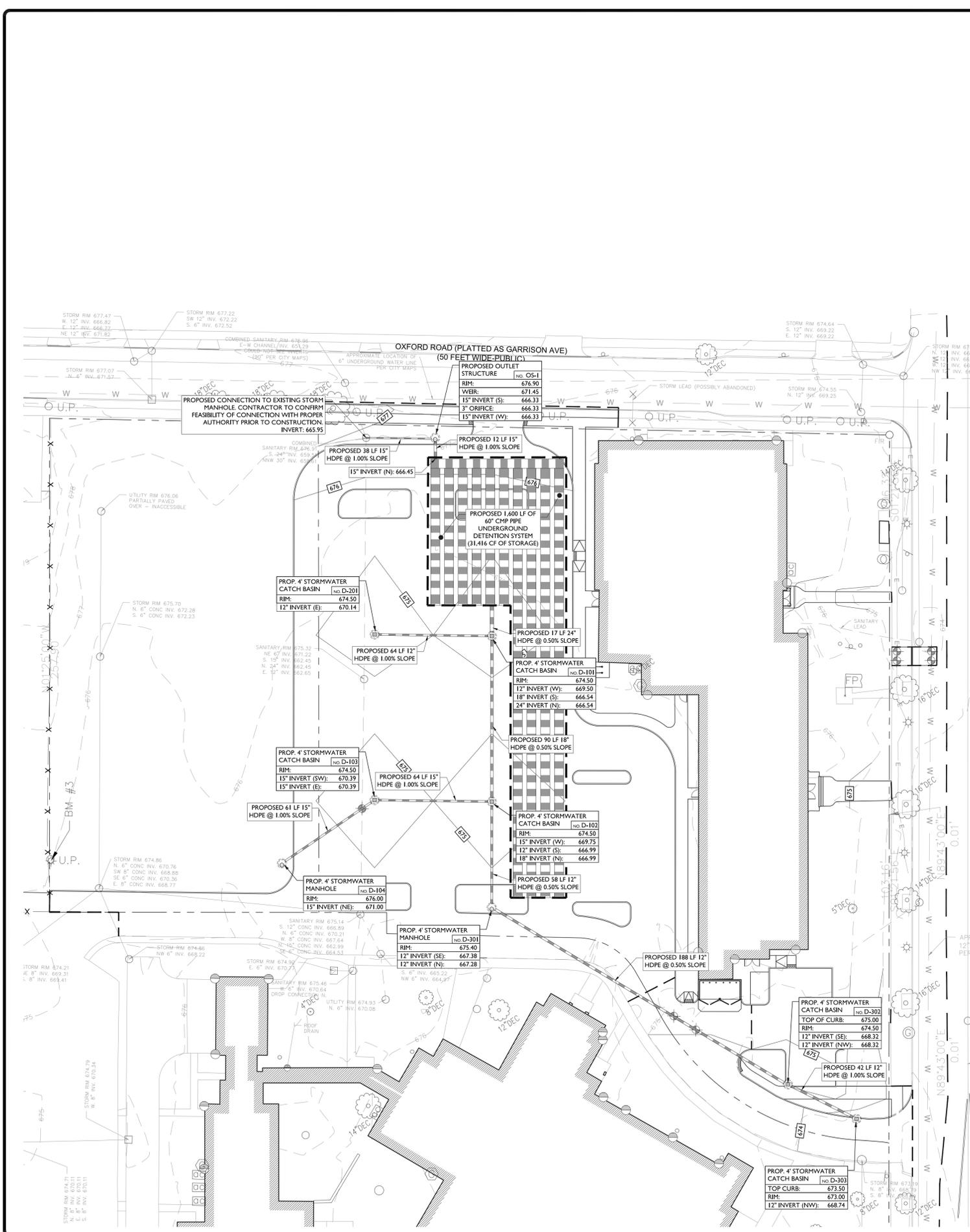
SCALE: 1" = 30' PROJECT ID: 17311.01

TITLE: **SITE PLAN**

DRAWING: **C-3**







### STORMWATER MANAGEMENT CALCULATIONS

(Based on the Oakland County Simple Method of Detention Basin Design)

Project: **Coolidge Berkley, MI**      Designer: **MAG**      Date: **10/30/19**

| COMPOSITE C VALUE    |                |          |                |
|----------------------|----------------|----------|----------------|
| Landcover            | Area (SF)      | C-Value* | Weighted Value |
| Building / Roof      | 22,923         | 0.90     | 20,631         |
| Pavement / Hardscape | 89,661         | 0.90     | 80,695         |
| Pervious Area        | 28,441         | 0.25     | 7,110          |
| <b>TOTALS</b>        | <b>141,025</b> |          | <b>108,436</b> |

\*Future Phase 2 has been accounted for and assumed 90% Impervious  
\*C-values obtained from Oakland County Method

Composite C Value, C: **0.77**

**ALLOWABLE SITE DISCHARGE & BASIN DISCHARGE RATIO**

Total Site Area, A<sub>T</sub>: **3.24 AC**

\*Allowable Discharge Ratio: **0.20 CFS/AC**

Allowable Site Discharge, Q<sub>A</sub>: **0.65 CFS**

Basin Discharge Ratio, Q<sub>B</sub>: **0.26 CFS/AC/IMP**

**BASIN STORAGE TIME**

Design Storm Frequency: **100 YR**

Basin Storage Time, T: **174.12 MINS**

**BASIN VOLUME REQUIRED**

$Y = (16,500 * T / (T + 25)) - 40 * Q * T$

$V_T = V * A * C$

Basin Volume Ratio, V<sub>r</sub>: **12.617 CHAC/IMP**

Basin Volume Required, V<sub>r</sub>: **31,408 CF**

**UNDERGROUND BASIN VOLUME PROVIDED**

Basin Storage Ratio, S<sub>r</sub>: **19.63 CF/IF**

Required Total Basin Quantity, L<sub>r</sub>: **1,600 LF**

Basin Quantity Proposed: **1,600 LF**

**REQUIRED CONTROL ORIFICE SIZE**

$A_o = Q_A / (0.62 * (2 * 32.2 * H)^{0.5})$

Control Orifice Area, A<sub>o</sub>: **7.65 IN<sup>2</sup>**

Control Orifice Diameter, D<sub>o</sub>: **3.12 IN**

Orifice Diameter Proposed: **3.00 IN**

### STORM WATER MANAGEMENT CALCULATIONS

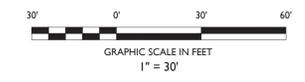
#### SYMBOL DESCRIPTION

|  |                                |
|--|--------------------------------|
|  | PROPERTY LINE                  |
|  | PROPOSED GRADING CONTOUR       |
|  | PROPOSED GRADING RIDGELINE     |
|  | PROPOSED STORMWATER STRUCTURES |
|  | PROPOSED STORMWATER PIPING     |
|  | EXISTING DOWNSPOUT LOCATIONS   |

- #### EXCAVATION, SOIL PREPARATION, AND DEWATERING NOTES
- THE CONTRACTOR IS REQUIRED TO REVIEW THE REFERENCED GEOTECHNICAL DOCUMENTS PRIOR TO CONSTRUCTION. THESE DOCUMENTS SHALL BE CONSIDERED A PART OF THE PLAN SET.
  - THE CONTRACTOR IS REQUIRED TO PREPARE SUBGRADE SOILS BENEATH ALL PROPOSED IMPROVEMENTS AND BACKFILL ALL EXCAVATIONS IN ACCORDANCE WITH RECOMMENDATIONS BY THE GEOTECHNICAL ENGINEER OF RECORD.
  - THE CONTRACTOR IS RESPONSIBLE FOR PROVIDING SHORING FOR ALL EXCAVATIONS AS REQUIRED. CONTRACTOR SHALL HAVE THE SHORING DESIGN PREPARED BY A QUALIFIED PROFESSIONAL SHORING DESIGNER. DESIGNS SHALL BE SUBMITTED TO STONEFIELD ENGINEERING & DESIGN, LLC, AND THE OWNER PRIOR TO THE START OF CONSTRUCTION.
  - THE CONTRACTOR IS RESPONSIBLE FOR ENSURING THAT ALL OPEN EXCAVATIONS ARE PERFORMED AND PROTECTED IN ACCORDANCE WITH THE LATEST OSHA REGULATIONS.
  - THE CONTRACTOR IS RESPONSIBLE FOR ANY DEWATERING DESIGN AND OPERATIONS, AS REQUIRED, TO CONSTRUCT THE PROPOSED IMPROVEMENTS. THE CONTRACTOR SHALL OBTAIN ANY REQUIRED PERMITS FOR DEWATERING OPERATIONS AND GROUNDWATER DISPOSAL.

ALL EXISTING ROOF LEADERS TO BE REUSED

THE CONTRACTOR IS TO INSTALL "FINGER" OR "STUB" DRAINS PER THE GEOTECHNICAL INVESTIGATION REPORT AT ALL CATCH BASINS, MANHOLES, AND BEHIND CURB OF LANDSCAPE ISLANDS.



| SUBMISSION FOR VARIANCE APPROVAL | SUBMISSION FOR SITE PLAN APPROVAL | MG         | MH         | BY | DESCRIPTION |
|----------------------------------|-----------------------------------|------------|------------|----|-------------|
|                                  |                                   |            |            |    |             |
|                                  |                                   | 10/31/2019 | 08/12/2019 |    |             |
|                                  |                                   | 2          | 1          |    | ISSUE       |

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SITE DEVELOPMENT PLANS

# THE BERKLEY

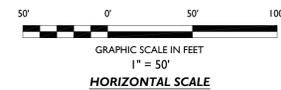
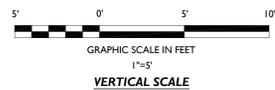
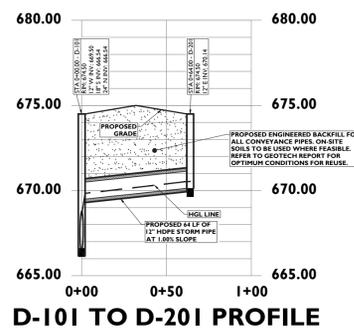
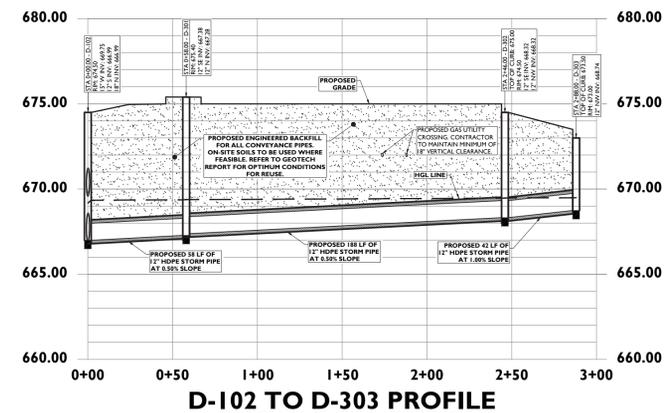
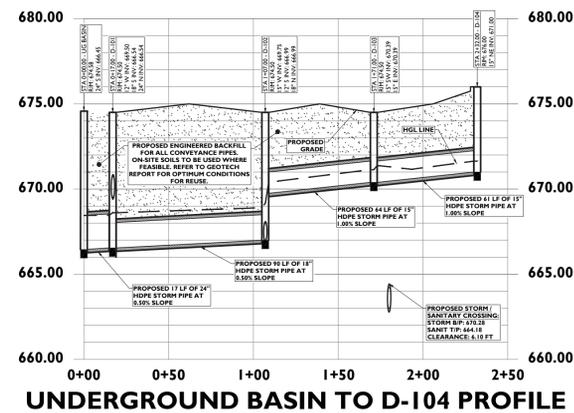
PROPOSED RESIDENTIAL COMMUNITY

PARCEL ID: 25-18-431-015 THRU 25-18-431-017 &  
 25-18-431-022  
 2219 COOLIDGE HIGHWAY  
 CITY OF BERKLEY  
 OAKLAND COUNTY, MI

SCALE: 1" = 30'    PROJECT ID: 17311.01

TITLE: **STORMWATER MANAGEMENT PLAN**

DRAWING: **C-6**



**10-YEAR STORMWATER SYSTEM DESIGN**

| Line # | Line ID   | Rim Elevation Downstream (FT) | Rim Elevation Upstream (FT) | Invert Downstream (FT) | Invert Upstream (FT) | Pipe Size (IN) | Pipe Length (FT) | Pipe Slope (%) | Velocity Downstream (FPS) | Flow Rate (CFS) | Pipe Capacity (CFS) | HGL Downstream (FT) | HGL Upstream (FT) | Drainage Area (ACRES) | Runoff Coefficient | Time of Concentration (MIN) | Rainfall Intensity (IN/HR) | Rim to HGL Elevation (FT) | Known Q (CFS) |
|--------|-----------|-------------------------------|-----------------------------|------------------------|----------------------|----------------|------------------|----------------|---------------------------|-----------------|---------------------|---------------------|-------------------|-----------------------|--------------------|-----------------------------|----------------------------|---------------------------|---------------|
| 1      | UG-D101   | 674.58                        | 674.50                      | 666.45                 | 666.54               | 24.00          | 17.00            | 0.50           | 2.43                      | 7.63            | 16.45               | 668.45              | 668.47            | 0.31                  | 0.80               | 25.80                       | 3.44                       | 5.89                      | 0.00          |
| 2      | D101-D102 | 674.50                        | 674.50                      | 666.54                 | 666.99               | 18.00          | 90.00            | 0.50           | 3.41                      | 6.02            | 7.43                | 668.61              | 668.90            | 0.27                  | 0.85               | 25.40                       | 3.47                       | 5.33                      | 0.00          |
| 3      | D102-D103 | 674.50                        | 674.50                      | 669.75                 | 670.39               | 15.00          | 64.00            | 1.00           | 5.34                      | 3.44            | 6.46                | 670.40              | 671.14            | 0.28                  | 0.83               | 20.30                       | 3.86                       | 3.36                      | 0.00          |
| 4      | D103-D104 | 674.50                        | 676.00                      | 670.39                 | 671.00               | 15.00          | 61.00            | 1.00           | 2.43                      | 2.54            | 6.46                | 671.38              | 671.64            | 0.00                  | 0.00               | 20.00                       | 0.00                       | 4.36                      | 2.54 *        |
| 5      | D201-D101 | 674.50                        | 674.50                      | 669.50                 | 670.14               | 12.00          | 64.00            | 1.00           | 3.76                      | 0.89            | 3.56                | 669.84              | 670.53            | 0.30                  | 0.76               | 20.00                       | 3.89                       | 3.97                      | 0.00          |
| 6      | D102-D301 | 674.50                        | 675.40                      | 666.99                 | 667.28               | 12.00          | 58.00            | 0.50           | 0.91                      | 0.71            | 2.52                | 669.34              | 669.37            | 0.00                  | 0.00               | 24.30                       | 3.55                       | 6.02                      | 0.00          |
| 7      | D301-D302 | 675.40                        | 674.50                      | 667.38                 | 668.32               | 12.00          | 188.00           | 0.50           | 0.97                      | 0.76            | 2.52                | 669.38              | 669.46            | 0.15                  | 0.58               | 21.10                       | 3.80                       | 5.03                      | 0.00          |
| 8      | D302-D303 | 674.50                        | 673.00                      | 668.32                 | 668.74               | 12.00          | 42.00            | 1.00           | 0.57                      | 0.44            | 3.56                | 669.48              | 669.48            | 0.13                  | 0.88               | 20.00                       | 3.89                       | 3.51                      | 0.00          |
| 9      | EXST-OS1  | 676.91                        | 674.50                      | 665.95                 | 666.33               | 15.00          | 38.00            | 1.00           | 0.97                      | 0.65            | 6.46                | 666.62              | 666.64            | 0.00                  | 0.00               | 20.00                       | 0.00                       | 7.86                      | 0.65          |

\* Known Q obtained from Future Phase 2 Drainage Area (see Sheet C-5)  
 D103-D104 Known Q = CIA = 0.83 \* 3.89 \* 0.78 = 2.54 CFS

**STORM WATER CONVEYANCE CALCULATIONS**

| NO. | DATE       | ISSUE | BY | DESCRIPTION                       |
|-----|------------|-------|----|-----------------------------------|
| 2   | 10/31/2019 | MG    |    | SUBMISSION FOR SITE PLAN APPROVAL |
| 1   | 08/12/2019 | MH    |    | SUBMISSION FOR VARIANCE APPROVAL  |

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**SITE DEVELOPMENT PLANS**

**THE BERKLEY**  
 PROPOSED RESIDENTIAL COMMUNITY

PARCEL ID: 25-18-431-015 THRU 25-18-431-017 &  
 25-18-431-022  
 2219 COOLIDGE HIGHWAY  
 CITY OF BERKLEY  
 OAKLAND COUNTY, MI



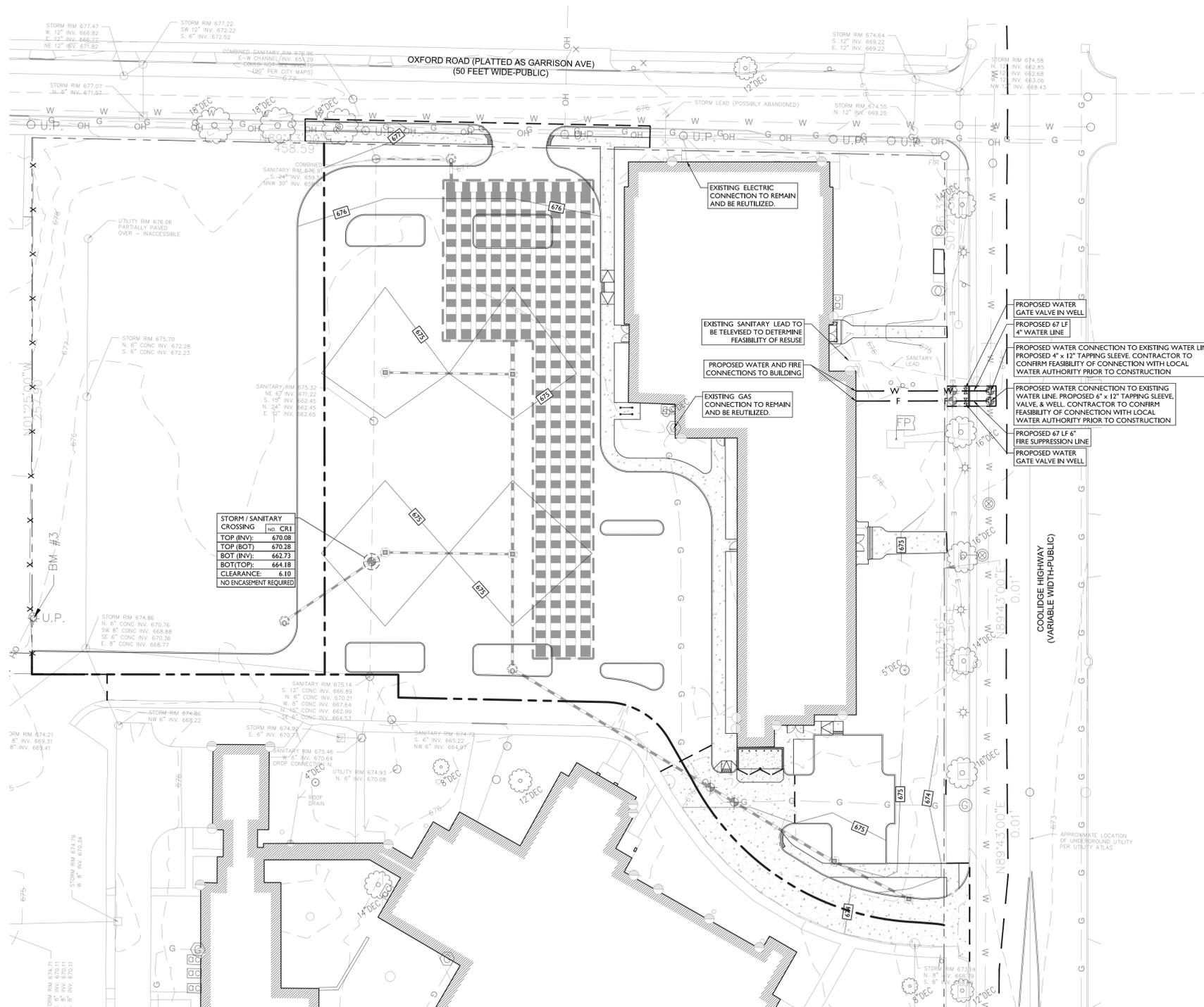
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SCALE: AS SHOWN PROJECT ID: 17311.01

TITLE:  
**STORMWATER PROFILES**

DRAWING:  
**C-7**

V:\P\2019\17311.01\18-RIDHWAN\231-COOLIDGE HIGHWAY, BERKLEY, MI\CDOT\TOP\09-06-07\17311.DWG



**WATER SERVICE DESIGN SUMMARY**

OAKLAND COUNTY UNIT ASSIGNMENT FACTOR:  
MULTI-FAMILY RESIDENCES: 0.60 UNITS PER RESIDENCE  
(35 RESIDENCES) (0.60) = 33.0 UNITS

**TOTAL UNITS: 33.0 UNITS**

ONE (1) UNIT EQUALS 320 GPD

AVERAGE DAY FLOW = (33.0 UNITS)(320 GPD/UNIT)

**AVERAGE DAY FLOW: 10,560 GPD**

PEAK FACTOR = 2

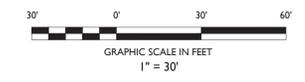
MAX DAY FLOW = (2)(AVERAGE DAY FLOW)

MAX DAY FLOW = (2)(10,560 GPD)

**MAX DAY FLOW: 21,120 GPD**

| SYMBOL  | DESCRIPTION                     |
|---------|---------------------------------|
| ---     | PROPERTY LINE                   |
| — SAN — | PROPOSED SANITARY LATERAL       |
| — W —   | PROPOSED DOMESTIC WATER SERVICE |
| — F —   | PROPOSED FIRE WATER SERVICE     |
| ⊗       | PROPOSED VALVE                  |
| ⊕       | PROPOSED WATER TEE / BEND       |
| ⊙       | PROPOSED TEST PIT LOCATIONS     |

- DRAINAGE AND UTILITY NOTES**
- THE CONTRACTOR IS REQUIRED TO CALL THE APPROPRIATE AUTHORITY FOR NOTICE OF CONSTRUCTION/EXCAVATION AND UTILITY MARK OUT PRIOR TO THE START OF CONSTRUCTION IN ACCORDANCE WITH STATE LAW. CONTRACTOR IS REQUIRED TO CONFIRM THE HORIZONTAL AND VERTICAL LOCATION OF UTILITIES IN THE FIELD. SHOULD A DISCREPANCY EXIST BETWEEN THE FIELD LOCATION OF A UTILITY AND THE LOCATION SHOWN ON THE PLAN SET OR SURVEY, THE CONTRACTOR SHALL NOTIFY STONEFIELD ENGINEERING & DESIGN, LLC IMMEDIATELY IN WRITING.
  - THE CONTRACTOR IS RESPONSIBLE TO PROTECT AND MAINTAIN IN OPERATION ALL UTILITIES NOT DESIGNATED TO BE REMOVED.
  - THE CONTRACTOR IS RESPONSIBLE FOR REPAIRING ANY DAMAGE TO ANY EXISTING UTILITY IDENTIFIED TO REMAIN WITHIN THE LIMITS OF THE PROPOSED WORK DURING CONSTRUCTION.
  - A MINIMUM HORIZONTAL SEPARATION OF 10 FEET IS REQUIRED BETWEEN ANY SANITARY SEWER SERVICE AND ANY WATER LINES IF THIS SEPARATION CANNOT BE PROVIDED, A CONCRETE ENCASEMENT SHALL BE UTILIZED FOR THE SANITARY SEWER SERVICE AS APPROVED BY STONEFIELD ENGINEERING & DESIGN, LLC.
  - ALL WATER LINES SHALL BE VERTICALLY SEPARATED ABOVE SANITARY SEWER LINES BY A MINIMUM DISTANCE OF 18 INCHES. IF THIS SEPARATION CANNOT BE PROVIDED, A CONCRETE ENCASEMENT SHALL BE UTILIZED FOR THE SANITARY SEWER SERVICE AS APPROVED BY STONEFIELD ENGINEERING & DESIGN, LLC.
  - THE CONTRACTOR TO PERFORM A TEST PIT PRIOR TO CONSTRUCTION (RECOMMEND 30 DAYS PRIOR) AT LOCATIONS OF EXISTING UTILITY CROSSINGS FOR WATER AND SANITARY SEWER CONNECTION IMPROVEMENTS. SHOULD A CONFLICT EXIST, THE CONTRACTOR SHALL IMMEDIATELY NOTIFY STONEFIELD ENGINEERING & DESIGN, LLC IN WRITING.
  - THE CONTRACTOR IS RESPONSIBLE FOR COORDINATING GAS, ELECTRIC AND TELECOMMUNICATION CONNECTIONS WITH THE APPROPRIATE GOVERNING AUTHORITY.
  - CONTRACTOR SHALL START CONSTRUCTION OF ANY GRAVITY SEWER AT THE LOWEST INVERT AND WORK UP GRADIENT.
  - THE CONTRACTOR IS RESPONSIBLE TO MAINTAIN A RECORD SET OF PLANS REFLECTING THE LOCATION OF EXISTING UTILITIES THAT HAVE BEEN CAPPED, ABANDONED, OR RELOCATED BASED ON THE DEMOLITION/REMOVAL ACTIVITIES REQUIRED IN THIS PLAN SET. THIS DOCUMENT SHALL BE PROVIDED TO THE OWNER FOLLOWING COMPLETION OF WORK.
  - THE CONTRACTOR IS RESPONSIBLE TO MAINTAIN A RECORD OF THE AS-BUILT LOCATIONS OF ALL PROPOSED UNDERGROUND INFRASTRUCTURE. THE CONTRACTOR SHALL NOTE ANY DISCREPANCIES BETWEEN THE AS-BUILT LOCATIONS AND THE LOCATIONS DEPICTED WITHIN THE PLAN SET. THIS RECORD SHALL BE PROVIDED TO THE OWNER FOLLOWING COMPLETION OF WORK.
  - CONTRACTOR IS TO TELEVIEW EXISTING SANITARY LEAD TO BUILDING TO CONFIRM FEASIBILITY OF REUSE. IF REUSE IS NOT FEASIBLE, A NEW SANITARY LEAD WILL BE REQUIRED.
  - ALL UTILITY MATERIALS TO CONFORM TO APPROVED CITY OF BERKLEY SPECIFICATIONS ATTACHED TO SHEET C-13.



| DATE       | ISSUE | BY | DESCRIPTION                       |
|------------|-------|----|-----------------------------------|
| 10/31/2019 | 1     | MG | SUBMISSION FOR SITE PLAN APPROVAL |
| 08/12/2019 | 1     | MH | SUBMISSION FOR VARIANCE APPROVAL  |

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OAKLAND COUNTY, MI



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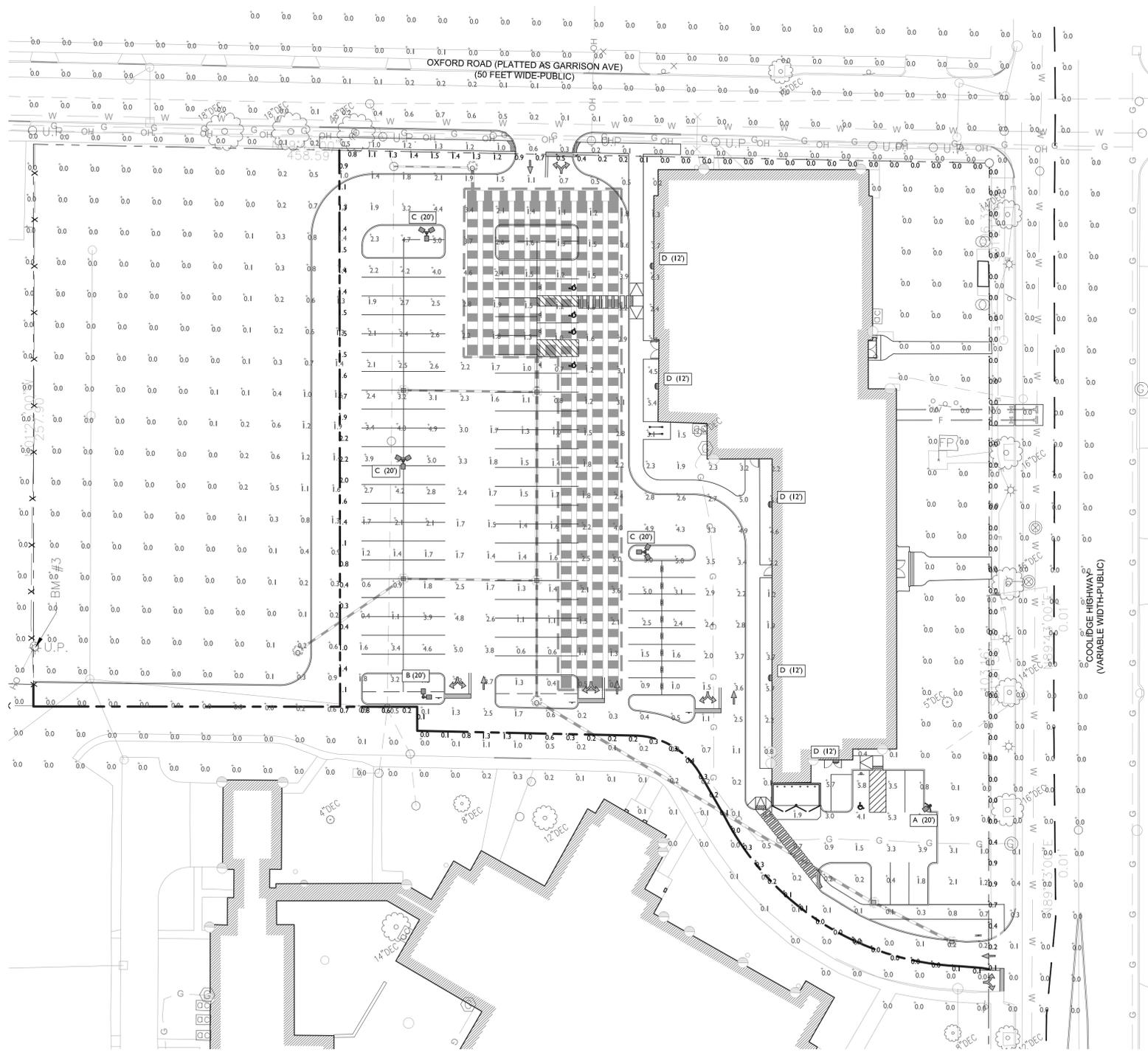
SCALE: 1" = 30' PROJECT ID: 17311.01

TITLE:  
**UTILITY PLAN**

DRAWING:  
**C-8**

| PROPOSED LUMINARIES SCHEDULE |       |          |  |              |      |       |              |                                  |  |
|------------------------------|-------|----------|--|--------------|------|-------|--------------|----------------------------------|--|
| SYMBOL                       | LABEL | QUANTITY | LIGHTING                                       | DISTRIBUTION | LLF  | WATTS | MANUFACTURER | IES FILE                         |  |
|                              | A     | 1        | MIRADA MEDIUM - LED AREA POLE LIGHT - HSS      | III          | 0.90 | 94 W  | LSI          | MRM-LED-12L-SIL-3-30-70CRI-Lies  |  |
|                              | B     | 1        | MIRADA MEDIUM - LED AREA POLE LIGHT - 2 @ 90°  | III          | 0.90 | 94 W  | LSI          | MRM-LED-12L-SIL-3-30-70CRI-Lies  |  |
|                              | C     | 3        | MIRADA MEDIUM - LED AREA POLE LIGHT - 3 @ 120° | V            | 0.90 | 94 W  | LSI          | MRM-LED-12L-SIL-5W-30-70CRI-Lies |  |
|                              | D     | 5        | MIRADA - LED WALL SCONCE                       | FT           | 0.90 | 102 W | LSI          | XWM-FT-LED-08L-30.ies            |  |

| SYMBOL | DESCRIPTION                                 |
|--------|---|
| A (XX) | PROPOSED LIGHTING FIXTURE (MOUNTING HEIGHT) |
| xxx    | PROPOSED LIGHTING INTENSITY (FOOTCANDLES)   |
|        | PROPOSED AREA LIGHT                         |
|        | PROPOSED BUILDING MOUNTED LIGHT             |



| REQUIREMENT  | PROPOSED |
|--|----------|
| § 138-14(a)(3): LIGHTS ON POLES, INCLUDING THE BASE, SHALL NOT BE TALLER THAN THE BUILDING WHOSE AREA THEY ILLUMINATE NOR TALLER THAN 20 FEET, WHICHEVER IS SHORTER. | 20 FT    |
| § 138-223: OFF-STREET PARKING AREAS SHALL BE LIGHTED AND NOT EXCEED A MAXIMUM OF 5.0 FC NOR LESS THAN 1.5 FC AT PAVEMENT LEVEL.                                      | PROVIDED |

**Mirada Medium - MRM Outdoor LED Area Light**

The Mirada's sleek design makes it perfectly-suited for architectural & commercial applications, while its cost-effective die-cast aluminum housing makes its acquisition cost very competitive. The Mirada offers high performance factory-rotatable silicone optics, 5 standard CCT's, 42,000+ delivered lumens, and is available with Integral Airlink™ Wireless Controls.

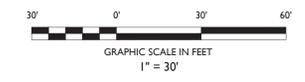
FIXTURES 'A', 'B', & 'C'

**Mirada Wall Sconce - XWM Outdoor LED Wall Sconce**

The XWM's sleek design makes it perfectly-suited for architectural & commercial applications, while its cost-effective die-cast aluminum housing makes its acquisition cost very competitive. The XWM offers high performance silicone optics, 4 standard CCT's, 5 lumen packages, and is available with Integral Airlink™ Wireless Controls.

FIXTURE 'D'

- GENERAL LIGHTING NOTES**
- THE LIGHTING LEVELS DEPICTED WITHIN THE PLAN SET ARE CALCULATED UTILIZING DATA OBTAINED FROM THE LISTED MANUFACTURER. ACTUAL ILLUMINATION LEVELS AND PERFORMANCE OF ANY PROPOSED LIGHTING FIXTURE MAY VARY DUE TO UNCONTROLLABLE VARIABLES SUCH AS WEATHER, VOLTAGE SUPPLY, LAMP TOLERANCE, EQUIPMENT SERVICE LIFE AND OTHER VARIABLE FIELD CONDITIONS.
  - WHERE APPLICABLE, THE EXISTING LIGHT LEVELS DEPICTED WITHIN THE PLAN SET SHALL BE CONSIDERED APPROXIMATE. THE EXISTING LIGHT LEVELS ARE BASED ON FIELD OBSERVATIONS AND THE MANUFACTURER'S DATA OF THE ASSUMED OR MOST SIMILAR LIGHTING FIXTURE MODEL.
  - UNLESS NOTED ELSEWHERE WITHIN THIS PLAN SET, THE LIGHT LOSS FACTORS USED IN THE LIGHTING ANALYSIS ARE AS FOLLOWS:
    - LIGHT EMITTING DIODES (LED): 0.90
    - HIGH PRESSURE SODIUM: 0.72
    - METAL HALIDE: 0.72
  - THE CONTRACTOR SHALL NOTIFY STONEFIELD ENGINEERING & DESIGN, LLC IN WRITING, PRIOR TO THE START OF CONSTRUCTION, OF ANY PROPOSED LIGHTING LOCATIONS THAT CONFLICT WITH EXISTING/PROPOSED DRAINAGE, UTILITY, OR OTHER IMPROVEMENTS.
  - THE CONTRACTOR IS RESPONSIBLE TO PREPARE A WIRING PLAN AND PROVIDE ELECTRIC SERVICE TO ALL PROPOSED LIGHTING FIXTURES. THE CONTRACTOR IS REQUIRED TO PREPARE AN AS-BUILT PLAN OF WIRING AND PROVIDE COPIES TO THE OWNER AND STONEFIELD ENGINEERING & DESIGN, LLC.



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CITY OF BERKLEY  
OAKLAND COUNTY, MI

**STONEFIELD**  
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SCALE: 1" = 30' PROJECT ID: 17311.01

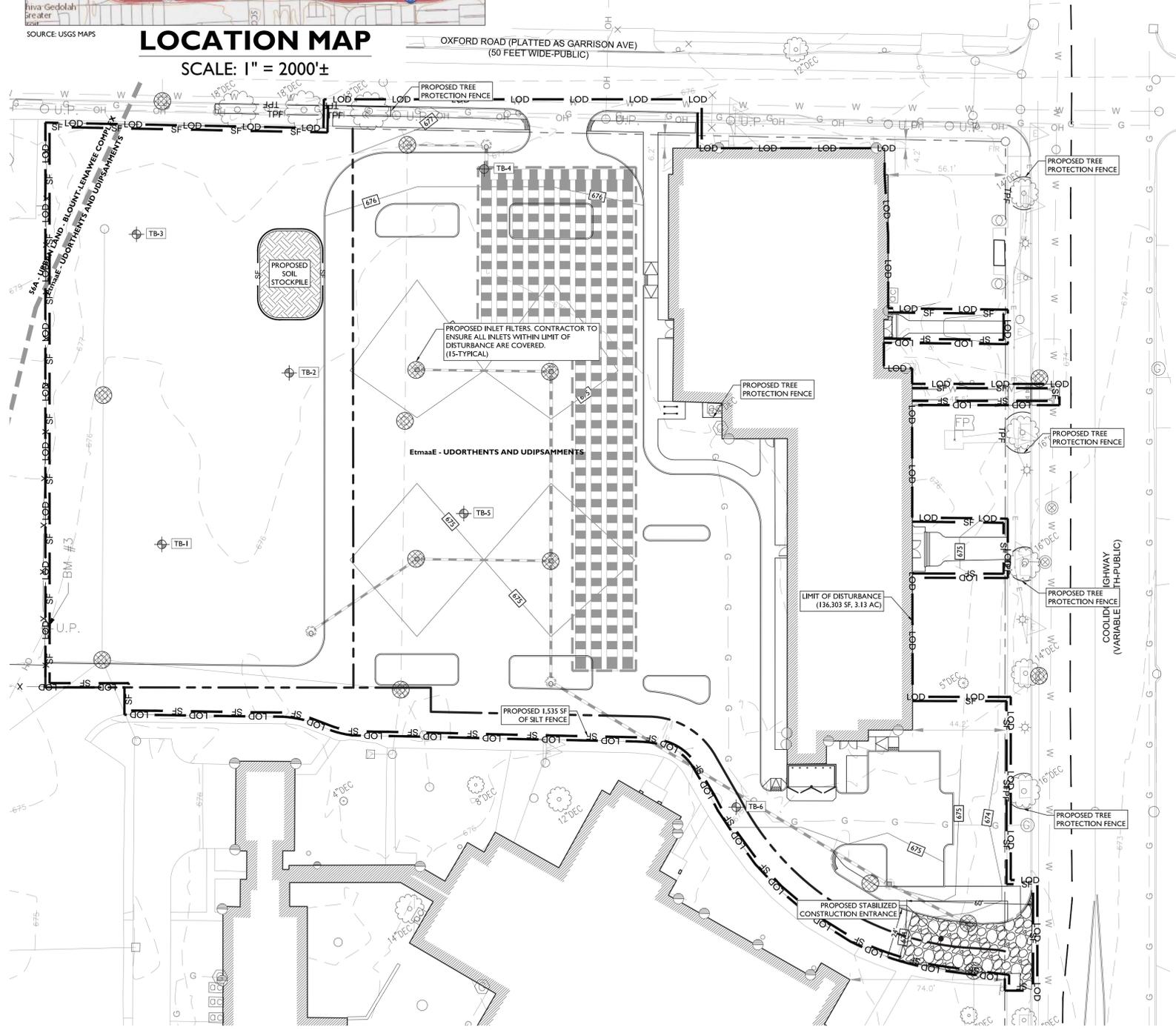
TITLE:  
**LIGHTING PLAN**

DRAWING:  
**C-9**



**LOCATION MAP**

SCALE: 1" = 2000'±



| SYMBOL   | DESCRIPTION   |
|----------|---|
| ---      | PROPERTY BOUNDARY   |
| - - -    | ADJACENT PROPERTY BOUNDARY                                      |
| ---      | PROPOSED LIMIT OF DISTURBANCE                                   |
| ---      | PROPOSED SILT FENCE   |
| ---      | PROPOSED TREE PROTECTION FENCE                                  |
| [Symbol] | PROPOSED STOCKPILE & EQUIPMENT STORAGE                          |
| [Symbol] | PROPOSED STABILIZED CONSTRUCTION ENTRANCE                       |
| [Symbol] | PROPOSED INLET PROTECTION FILTER                                |
| [Symbol] | APPROXIMATE TEST BORING LOCATION (REFER TO GEOTECHNICAL REPORT) |

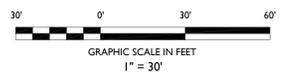
- SOIL EROSION AND SEDIMENT CONTROL NOTES**
1. THE CONTRACTOR IS RESPONSIBLE FOR SOIL EROSION AND SEDIMENT CONTROL IN ACCORDANCE WITH LOCAL, STATE, AND FEDERAL REQUIREMENTS.
  2. THE CONTRACTOR IS RESPONSIBLE FOR DUST CONTROL IN COMPLIANCE WITH LOCAL, STATE, AND FEDERAL AIR QUALITY STANDARDS.
  3. THE CONTRACTOR IS RESPONSIBLE TO INSPECT ALL SOIL EROSION AND SEDIMENT CONTROL MEASURES WEEKLY AND AFTER A PRECIPITATION EVENT GREATER THAN 1 INCH. THE CONTRACTOR SHALL MAINTAIN AN INSPECTION LOG ON SITE AND DOCUMENT CORRECTIVE ACTION TAKEN THROUGHOUT THE COURSE OF CONSTRUCTION AS REQUIRED.
  4. CONTRACTOR TO PROVIDE INLET FILTERS ON ALL INLETS WITHIN PLAN. IF THERE ARE ANY DISCREPANCIES BETWEEN THIS PLAN AND FIELD CONDITIONS, CONTRACTOR IS TO NOTIFY STONEFIELD ENGINEERING & DESIGN, LLC.

- ENVIRONMENTAL NOTES:**
1. THERE ARE NO RIPARIAN ZONES ON SITE
  2. NO PORTION OF THIS SITE LIE WITHIN A FLOOD HAZARD AREA
  3. THERE ARE NO WETLANDS ON SITE
  4. THERE ARE NO STREAMS OR WATERWAYS ON SITE
  5. ALL ELEVATIONS SHOWN ARE BASED ON NAVD 1988 DATUM

- SEQUENCE OF CONSTRUCTION**
1. INSTALL SILT FENCE AND CONSTRUCTION ENTRANCE (2 DAYS).
  2. ROUGH GRADING AND TEMPORARY SEEDING (20 DAYS).
  3. EXCAVATE AND INSTALL DRAINAGE PIPING, AND INLETS (20 DAYS).
  4. INSTALL INLET FILTERS (1 DAY).
  5. BUILDING CONSTRUCTION AND SITE IMPROVEMENTS (90 DAYS).
  6. CONSTRUCT RIGHT OF WAY IMPROVEMENTS (2 DAYS).
  7. LANDSCAPING IMPROVEMENTS AND FINAL SEEDING (7 DAYS).
  8. REMOVE SOIL EROSION MEASURES (1 DAY).
- NOTE: TIME DURATIONS ARE APPROXIMATE AND ARE INTENDED TO ACT AS A GENERAL GUIDE TO THE CONSTRUCTION TIMELINE. ALL DURATIONS ARE SUBJECT TO CHANGE BY CONTRACTOR. CONTRACTOR SHALL SUBMIT CONSTRUCTION SCHEDULE TO TOWNSHIP AND ENGINEER. CONTRACTOR SHALL PHASE CONSTRUCTION ACCORDINGLY.

| UDORTHENTS & UDIPSAMMENTS (EtmmaE) |                     |
|------------------------------------|---------------------|
| TYPE OF SOIL                       | UDORTHENTS          |
| HYDROLOGIC SOIL GROUP              | C                   |
| DEPTH TO RESTRICTIVE LAYER         | ABOUT 39 INCHES     |
| SOIL PERMEABILITY                  | 0.09 TO 0.01 IN/HR  |
| DEPTH TO WATER TABLE               | > 80 INCHES         |
| TYPE OF SOIL                       | UDIPSAMMENTS        |
| HYDROLOGIC SOIL GROUP              | A                   |
| DEPTH TO RESTRICTIVE LAYER         | > 80 INCHES         |
| SOIL PERMEABILITY                  | 2.00 TO 20.00 IN/HR |
| DEPTH TO WATER TABLE               | > 80 INCHES         |

| URBAN LAND - BLOUNT - LENAWEE (56A) |                          |
|-------------------------------------|--------------------------|
| TYPE OF SOIL                        | BLOUNT                   |
| HYDROLOGIC SOIL GROUP               | C                        |
| DEPTH TO RESTRICTIVE LAYER          | > 80 INCHES              |
| SOIL PERMEABILITY                   | 0.06 TO 0.57 IN/HR       |
| DEPTH TO WATER TABLE                | ABOUT 12 TO 36 INCHES    |
| TYPE OF SOIL                        | LENAWEE                  |
| HYDROLOGIC SOIL GROUP               | C / D                    |
| DEPTH TO RESTRICTIVE LAYER          | > 80 INCHES              |
| SOIL PERMEABILITY                   | ABOUT 0.20 TO 0.57 IN/HR |
| DEPTH TO WATER TABLE                | 0 INCHES                 |



| ISSUE | DATE       | BY | DESCRIPTION                       |
|-------|------------|----|-----------------------------------|
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CITY OF BERKLEY  
OAKLAND COUNTY, MI

**STATE OF MICHIGAN**  
JONATHAN STRANK  
LICENSED PROFESSIONAL ENGINEER  
No. 2010053002

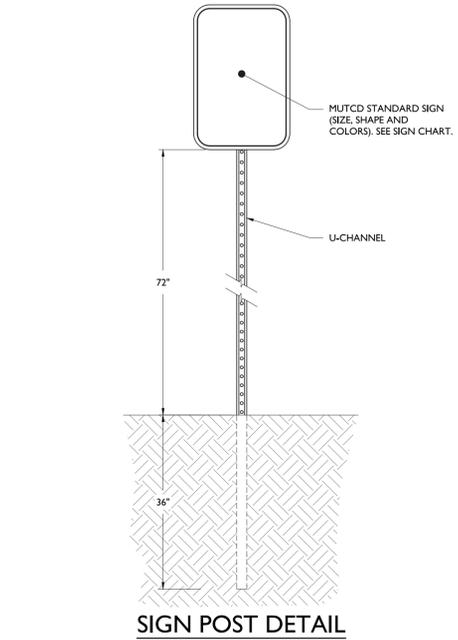
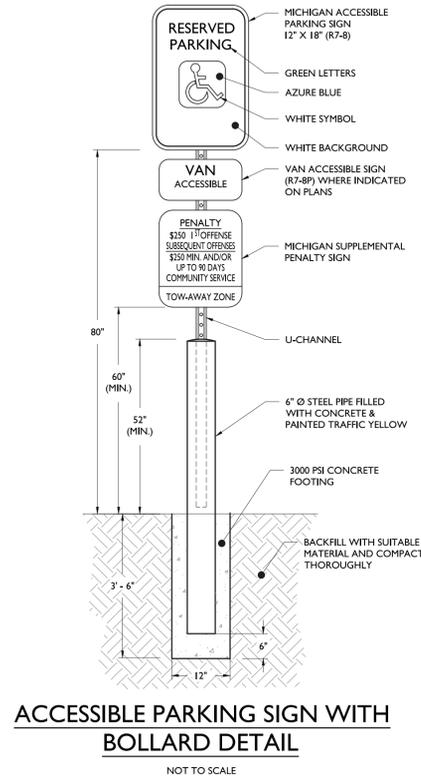
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SCALE: 1" = 30' PROJECT ID: 1731.01

TITLE:  
**SOIL EROSION & SEDIMENT CONTROL PLAN**

DRAWING:  
**C-10**

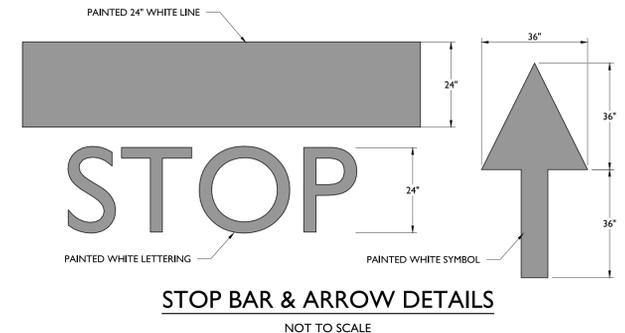
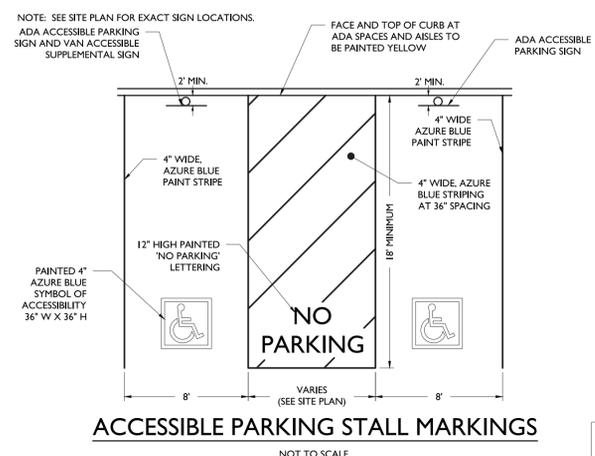
V:\P\2019\1731.01\18-IRRD\N\231 COOLIDGE HIGHWAY, BERKLEY, MI\CD\102\102P-18-03C.DWG



**SIGN DATA TABLE**  
NOT TO SCALE

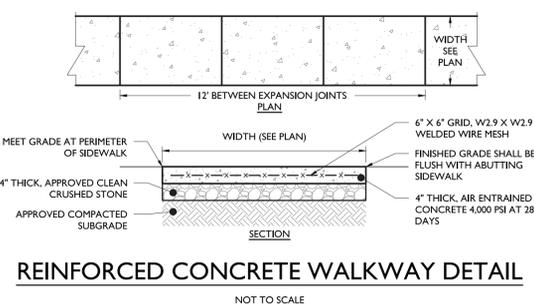
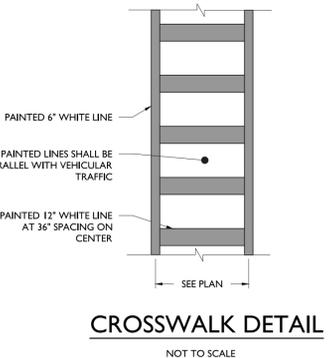
| M.U.T.C.D. NUMBER               | TEXT                     | COLOR  |            | SIZE OF SIGN (WIDTH X HEIGHT) | TYPE OF MOUNT |
|---------------------------------|--------------------------|--------|------------|-------------------------------|---------------|
|                                 |                          | LEGEND | BACKGROUND |                               |               |
| STOP SIGN (R1-1)                | STOP                     | WHITE  | RED        | 36"x36"                       | GROUND        |
| COMPACT CAR PARKING ONLY (R-7Z) | COMPACT CAR PARKING ONLY | GREEN  | WHITE      | 12"x18"                       | GROUND        |

NOTE:  
1. ALL SIGNS SHALL BE IN ACCORDANCE WITH THE FEDERAL HIGHWAY ADMINISTRATION (FHWA) MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (MUTCD), EXCEPT AS NOTED.  
2. ALL SIGNS SHALL BE MOUNTED AS TO NOT OBSTRUCT THE SHAPE OF "STOP" (R1-1) AND "YIELD" (R1-2) SIGNS.

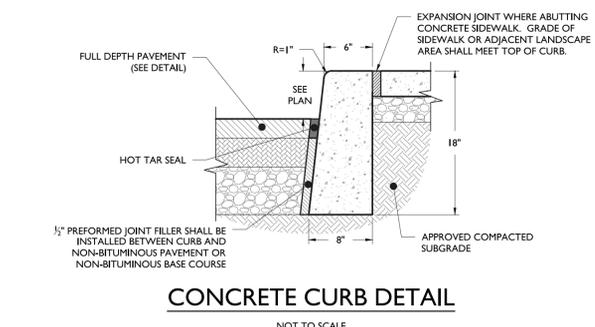


**PAVEMENT STRIPING & MARKINGS NOTES:**

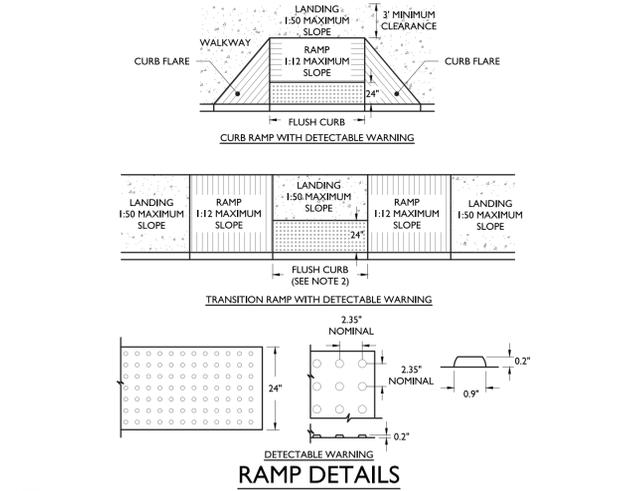
- ALL SIGNING AND STRIPING IN EXISTING CONDITION IN CONFLICT WITH THE PROPOSED DESIGN PLAN SHALL BE REMOVED.
- ALL PROPOSED SIGNING AND STRIPING SHALL CONFORM TO THE CURRENT MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (MUTCD) PUBLISHED BY THE FEDERAL HIGHWAY ADMINISTRATION.
- PAVEMENT STRIPING AND MARKINGS SHALL BE INSTALLED IN CONFORMANCE WITH ALL APPLICABLE LOCAL, COUNTY AND STATE REQUIREMENTS.
- UNLESS OTHERWISE SPECIFIED, ALL STRIPING AND MARKINGS IN THE PUBLIC RIGHT-OF-WAY SHALL BE OF THERMOPLASTIC PAINT OR PREFORMED THERMOPLASTIC MARKINGS.
- UNLESS OTHERWISE SPECIFIED, ON SITE PARKING STALL STRIPING, FIRE LANE STRIPING AND DIRECTIONAL ARROWS SHALL BE EPOXY PAINT. ON SITE STOP BARS, "DO NOT ENTER" BARS, AND ASSOCIATED LETTERING SHALL BE THERMOPLASTIC PAINT OR PREFORMED THERMOPLASTIC MARKINGS.



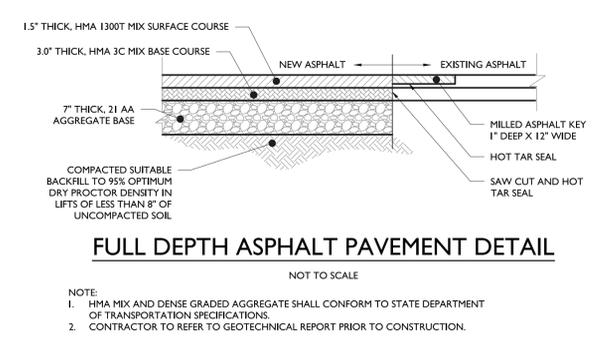
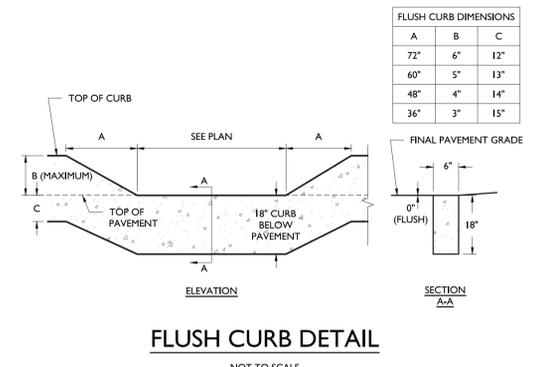
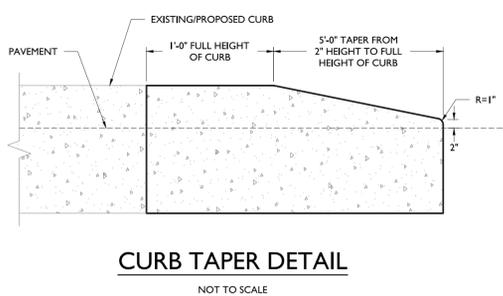
NOTES:  
1. MAXIMUM CROSS SLOPE SHALL BE 1/4" PER FOOT.  
2. 1/2" EXPANSION JOINTS SHALL BE PROVIDED AT 12' INTERVALS WITH PRE-MOLDED, BITUMINOUS JOINT FILLER, RECESSED 1/2" FROM THE SURFACE.  
3. 1" DEEP BY 1/2" WIDE, TOGGLED CONTRACTION JOINTS SHALL BE PROVIDED AT 4' INTERVALS.  
4. EXPANSION JOINT SHALL BE PROVIDED WHERE ADJACENT TO A BUILDING.



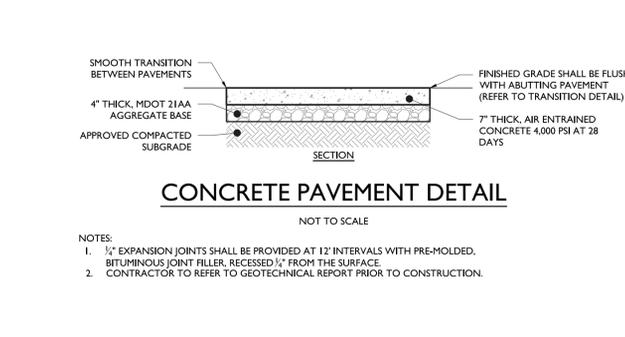
NOTES:  
1. CONCRETE SHALL BE 3500 PSI AT 28 DAYS, AIR-ENTRAINED.  
2. TRANSVERSE EXPANSION JOINTS SHALL BE PROVIDED AT 20 FOOT INTERVALS WITH PRE-MOLDED, BITUMINOUS JOINT FILLER, RECESSED 1/2" FROM SURFACE.  
3. HALF DEPTH CONTRACTION JOINTS SHALL BE PROVIDED AT 10 FOOT INTERVALS.  
4. 18" CURB DEPTH SHALL BE MAINTAINED AT DEPRESSED OR FLUSH CURBED AREAS.



NOTES:  
1. CROSS SLOPE ON RAMP SHALL NOT EXCEED 2%.  
2. A FLUSH CURB SHALL HAVE A MINIMUM WIDTH OF 36". SEE PLAN FOR EXACT WIDTH.  
3. DOMES SHALL BE ALIGNED ON A SQUARE GRID IN THE PREDOMINANT DIRECTION OF TRAVEL TO PERMIT WHEELS TO ROLL BETWEEN DOMES.  
4. VISUAL CONTRAST: THERE SHALL BE A MINIMUM OF 70% CONTRAST IN LIGHT REFLECTANCE BETWEEN THE DETECTABLE WARNING AND AN ADJOINING SURFACE.  
5. DETECTABLE WARNING STRIP REQUIRED WHERE RAMP DIRECTS PEDESTRIAN TRAFFIC TOWARDS VEHICLE TRAVEL WAY. WARNING STRIP SHALL BE CAST-IN-PLACE.  
6. RAMP SHALL HAVE A MAXIMUM RISE OF 6" WITHOUT A HANDRAIL.  
7. WHERE A 60" X 60" LANDING EXISTS AT THE TOP OF RAMP, RAMP FLARE SHALL NOT EXCEED 1:10 SLOPE. WHERE LANDING IS NOT PROVIDED RAMP FLARE SHALL NOT EXCEED 1:12 SLOPE.



NOTES:  
1. HMA MIX AND DENSE GRADED AGGREGATE SHALL CONFORM TO STATE DEPARTMENT OF TRANSPORTATION SPECIFICATIONS.  
2. CONTRACTOR TO REFER TO GEOTECHNICAL REPORT PRIOR TO CONSTRUCTION.



NOTES:  
1. 1/2" EXPANSION JOINTS SHALL BE PROVIDED AT 12' INTERVALS WITH PRE-MOLDED, BITUMINOUS JOINT FILLER, RECESSED 1/2" FROM THE SURFACE.  
2. CONTRACTOR TO REFER TO GEOTECHNICAL REPORT PRIOR TO CONSTRUCTION.

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OAKLAND COUNTY, MI

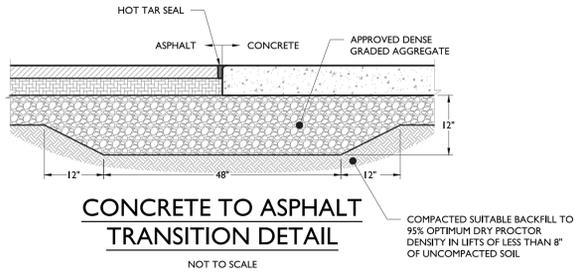
**STATE OF MICHIGAN**  
JONATHAN STRANK  
Professional Engineer  
No. 201063002  
LICENSED PROFESSIONAL ENGINEER

**STONEFIELD engineering & design**

SCALE: AS SHOWN PROJECT ID: 1731.01  
TITLE: CONSTRUCTION DETAILS  
DRAWING: C-11

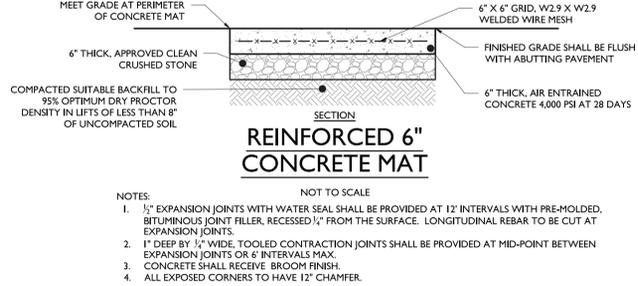
| NO. | DATE       | BY | DESCRIPTION                       |
|-----|------------|----|-----------------------------------|
| 1   | 10/31/2019 | MG | SUBMISSION FOR SITE PLAN APPROVAL |
| 2   | 08/12/2019 | MH | SUBMISSION FOR VARIANCE APPROVAL  |
| 3   |            |    |                                   |
| 4   |            |    |                                   |
| 5   |            |    |                                   |
| 6   |            |    |                                   |
| 7   |            |    |                                   |
| 8   |            |    |                                   |
| 9   |            |    |                                   |
| 10  |            |    |                                   |
| 11  |            |    |                                   |
| 12  |            |    |                                   |
| 13  |            |    |                                   |
| 14  |            |    |                                   |

NOT APPROVED FOR CONSTRUCTION



**CONCRETE TO ASPHALT TRANSITION DETAIL**

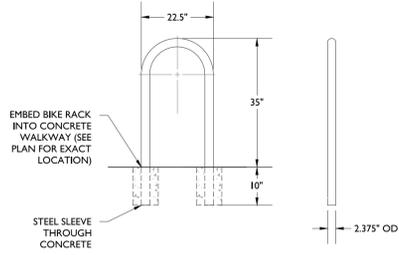
NOT TO SCALE



**REINFORCED 6" CONCRETE MAT**

NOT TO SCALE

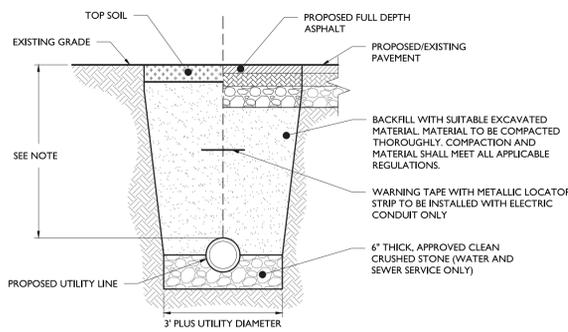
- NOTES:
1. 1/2" EXPANSION JOINTS WITH WATER SEAL SHALL BE PROVIDED AT 12' INTERVALS WITH PRE-MOLDED, BITUMINOUS JOINT FILLER, RECESSED 1/4" FROM THE SURFACE. LONGITUDINAL REBAR TO BE CUT AT EXPANSION JOINTS.
  2. 1" DEEP BY 1/2" WIDE, TOOLED CONTRACTION JOINTS SHALL BE PROVIDED AT MID-POINT BETWEEN EXPANSION JOINTS OR 6' INTERVALS MAX.
  3. CONCRETE SHALL RECEIVE BROOM FINISH.
  4. ALL EXPOSED CORNERS TO HAVE 12" CHAMFER.



**HOOP RACK HD IN GROUND MOUNTED BIKE RACK DETAIL**

NOT TO SCALE

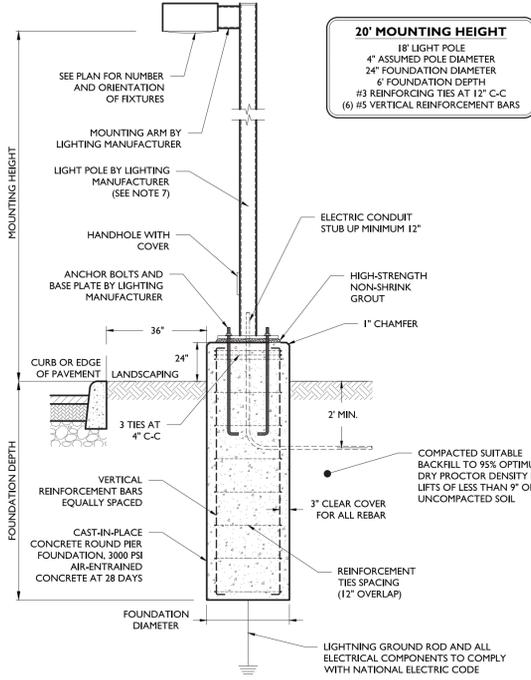
- NOTES:
1. BIKE RACK TO BE MANUFACTURED BY DERO BIKE RACKS OR APPROVED EQUAL.
  2. INSTALLATION TO BE COMPLETED IN ACCORDANCE WITH MANUFACTURER'S SPECIFICATIONS.



**UTILITY TRENCH DETAIL**

NOT TO SCALE

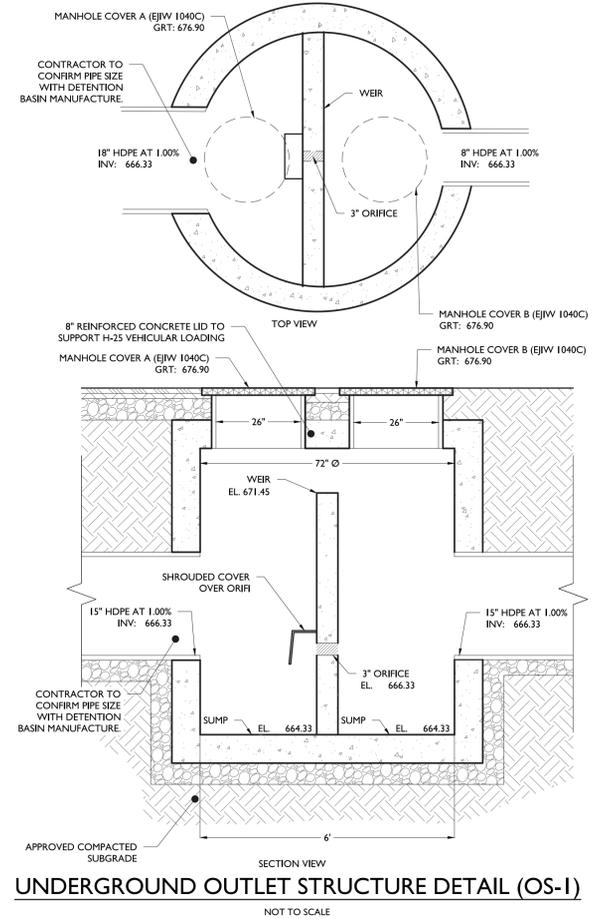
- NOTE:
- MINIMUM PIPE COVER SHALL BE AS FOLLOWS:
- ELECTRIC SERVICE - PER APPLICABLE UTILITY AUTHORITY
  - GAS SERVICE - PER APPLICABLE UTILITY AUTHORITY
  - SEWER SERVICE - 36" MINIMUM
  - WATER SERVICE - 48" MINIMUM



**LIGHT POLE INSTALLATION DETAIL**

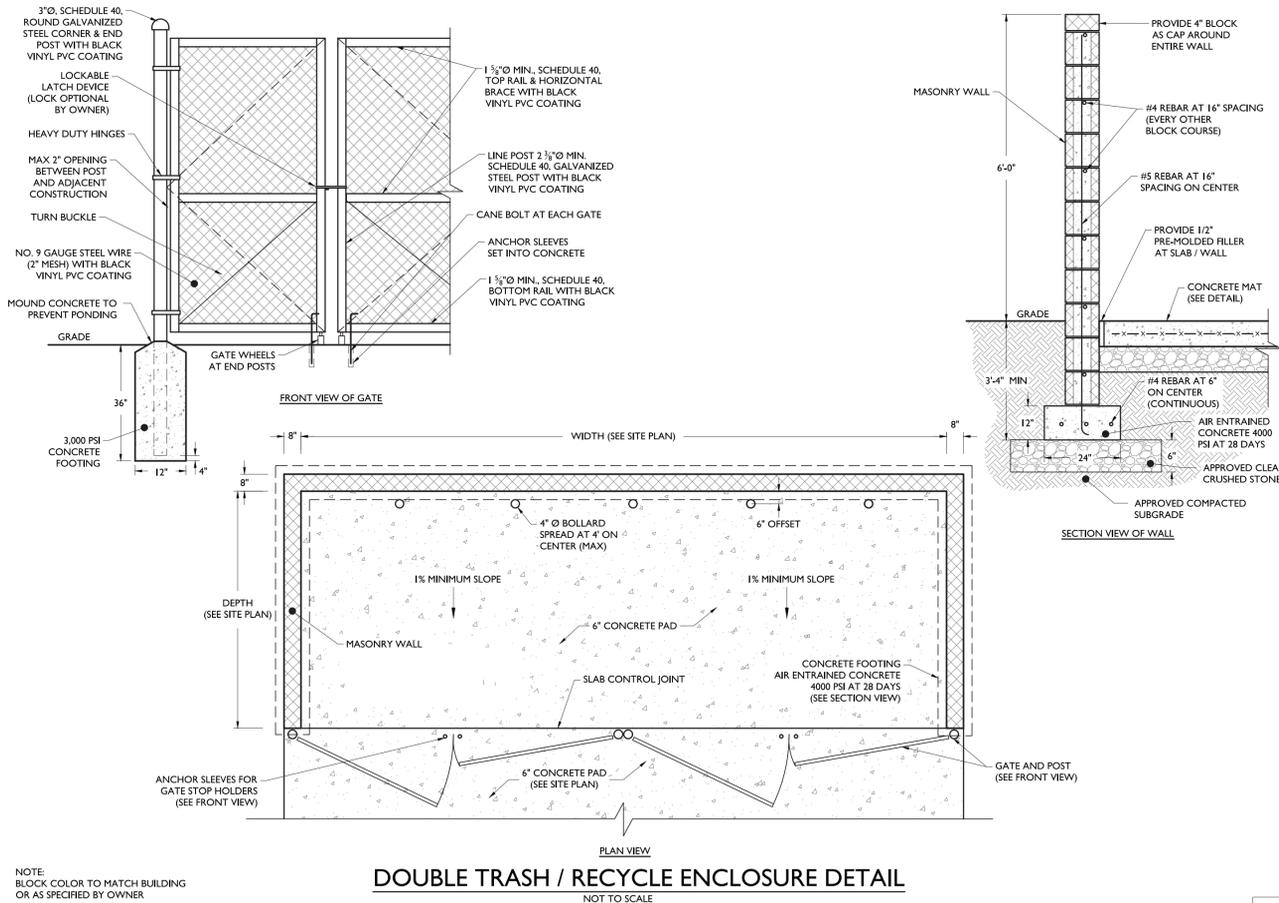
NOT TO SCALE

- NOTES:
1. MINIMUM SOIL BEARING PRESSURE OF 1500 PSF, SOIL FRICTION ANGLE OF 30 DEGREES, AND SOIL DRY UNIT WEIGHT OF 120 PCF SHALL BE CONFIRMED IN THE FIELD BY A QUALIFIED PROFESSIONAL.
  2. CAST-IN-PLACE CONCRETE SHALL BE CONSOLIDATED USING VIBRATOR.
  3. ALL REBAR TO BE NEW GRADE 60 STEEL.
  4. PRE-CAST PIERS ACCEPTABLE UPON WRITTEN APPROVAL OF SHOP DRAWING BY ENGINEER.
  5. CONCRETE TO BE INSTALLED A MINIMUM OF 7 DAYS PRIOR TO INSTALLING LIGHT POLE. POURED CONCRETE MIX REQUIRED TO OBTAIN 80% OF DESIGN STRENGTH PRIOR TO INSTALLING LIGHT POLE.
  6. CONCRETE SHALL HAVE A MAXIMUM SLUMP OF 4" (WITHIN 1" TOLERANCE).
  7. POLE SHALL BE RATED FOR 10 MPH HIGHER THAN MAXIMUM WIND SPEED 33FT ABOVE GROUND FOR THE AREA BASED ON ANS/ASCE 7-93.
  8. POUR TO BE TERMINATED AT A FORM.
  9. WORK SHALL CONFORM TO A.C.I. BEST PRACTICES FOR APPROPRIATE TEMPERATURE AND WEATHER CONDITIONS.
  10. CONTRACTOR TO TEMPORARILY SUPPORT ADJACENT SOIL AND STRUCTURES DURING EXCAVATION IF REQUIRED.



**UNDERGROUND OUTLET STRUCTURE DETAIL (OS-I)**

NOT TO SCALE



**DOUBLE TRASH / RECYCLE ENCLOSURE DETAIL**

NOT TO SCALE

- NOTE:
- BLOCK COLOR TO MATCH BUILDING OR AS SPECIFIED BY OWNER

**Mirada Medium - MRM Outdoor LED Area Light**

Performance (Cont.)

All published luminaire photometric testing performed to IESNA LM-79 standards. ISO footcandle plots below demonstrate the Mirada (MRM) light patterns only. Not for total fixture output. For complete specifications and IES files, see website.

Ordering Guide

TYPICAL ORDER EXAMPLE: **MRM LED 36L SIL FIA UNV DIM 50 70CRI ALSCS04 BRZ IL**

| Luminaire Part | Light Source     | Lumen Package    | Light Output     | Distribution | Orientation                         | Voltage                             | Finish             |
|----------------|------------------|------------------|------------------|--------------|-------------------------------------|-------------------------------------|--------------------|
| MRM LED        | 36" 7,200 lumen  | 36" 7,200 lumen  | 36" 7,200 lumen  | 3" Type 2    | Down - Standard                     | 120V - Universal Voltage (120-277V) | BRZ - Bronze       |
| MRM LED        | 36" 18,000 lumen | 36" 18,000 lumen | 36" 18,000 lumen | 3" Type 3    | Down - Universal Voltage (120-277V) | 120V - Universal Voltage (120-277V) | BLK - Black        |
| MRM LED        | 36" 30,000 lumen | 36" 30,000 lumen | 36" 30,000 lumen | 3" Type 3    | Down - Universal Voltage (120-277V) | 120V - Universal Voltage (120-277V) | WHI - White        |
| MRM LED        | 36" 42,000 lumen | 36" 42,000 lumen | 36" 42,000 lumen | 3" Type 3    | Down - Universal Voltage (120-277V) | 120V - Universal Voltage (120-277V) | SLV - Satin Silver |

Color Temp: 3000K - 5000K

Ordering Guide (continued):

| Color Temp | Color Rendering | Controls (Choose One) | Finish             | Options                  |
|------------|-----------------|-----------------------|--------------------|--------------------------|
| 3000K      | 90 CRI          | ALS - ActiLink System | BLK - Black        | IL - Integral Louver HSS |
| 3000K      | 90 CRI          | ALS - ActiLink System | SLV - Satin Silver |                          |
| 3000K      | 90 CRI          | ALS - ActiLink System | WHI - White        |                          |
| 3000K      | 90 CRI          | ALS - ActiLink System | SLV - Satin Silver |                          |

CONTRACTOR TO COORDINATE WITH ARCHITECT PRIOR TO CONSTRUCTION

**SPECIFICATIONS FOR FIXTURES 'A', 'B', & 'C'**

NOT TO SCALE

**Mirada Wall Sconce - XWM Outdoor LED Wall Sconce**

Ordering Guide

TYPICAL ORDER EXAMPLE: **XWM 2 LED OS1 27 UE BRZ ALS**

| Luminaire Part | Light Source     | Lumen Package    | Light Output     | Distribution | Orientation                         | Voltage                             | Finish             |
|----------------|------------------|------------------|------------------|--------------|-------------------------------------|-------------------------------------|--------------------|
| XWM 2 LED      | 27" 2,700 lumen  | 27" 2,700 lumen  | 27" 2,700 lumen  | 2" Type 2    | Down - Standard                     | 120V - Universal Voltage (120-277V) | BRZ - Bronze       |
| XWM 2 LED      | 27" 5,400 lumen  | 27" 5,400 lumen  | 27" 5,400 lumen  | 2" Type 2    | Down - Universal Voltage (120-277V) | 120V - Universal Voltage (120-277V) | BLK - Black        |
| XWM 2 LED      | 27" 8,100 lumen  | 27" 8,100 lumen  | 27" 8,100 lumen  | 2" Type 2    | Down - Universal Voltage (120-277V) | 120V - Universal Voltage (120-277V) | WHI - White        |
| XWM 2 LED      | 27" 10,800 lumen | 27" 10,800 lumen | 27" 10,800 lumen | 2" Type 2    | Down - Universal Voltage (120-277V) | 120V - Universal Voltage (120-277V) | SLV - Satin Silver |

Color Temp: 3000K - 5000K

Ordering Guide (continued):

| Color Temp | Color Rendering | Controls (Choose One) | Finish             | Options                  |
|------------|-----------------|-----------------------|--------------------|--------------------------|
| 3000K      | 90 CRI          | ALS - ActiLink System | BLK - Black        | IL - Integral Louver HSS |
| 3000K      | 90 CRI          | ALS - ActiLink System | SLV - Satin Silver |                          |
| 3000K      | 90 CRI          | ALS - ActiLink System | WHI - White        |                          |
| 3000K      | 90 CRI          | ALS - ActiLink System | SLV - Satin Silver |                          |

CONTRACTOR TO COORDINATE WITH ARCHITECTURAL PLANS PRIOR TO CONSTRUCTION

**SPECIFICATIONS FOR FIXTURE 'D'**

NOT TO SCALE

**STONEFIELD engineering & design**

Detroit, MI - New York, NY  
Princeton, NJ - Tampa, FL - Rutherford, NJ  
www.stonefielddesign.com

607 Shelby Suite 200, Detroit, MI 48226  
Phone 248.247.1115

**THE BERKLEY**  
PROPOSED RESIDENTIAL COMMUNITY

STATE OF MICHIGAN  
JONATHAN STRANK  
LICENSED PROFESSIONAL ENGINEER  
No. 0211063002

SCALE: AS SHOWN PROJECT ID: 1731.01

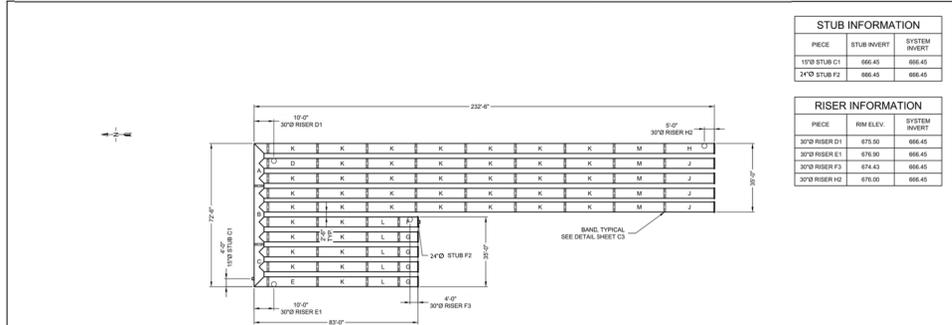
TITLE: CONSTRUCTION DETAILS

DRAWING: C-12

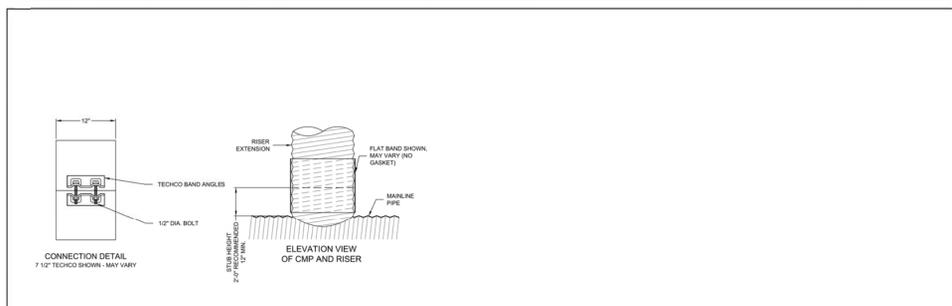
NOT APPROVED FOR CONSTRUCTION

DESCRIPTION

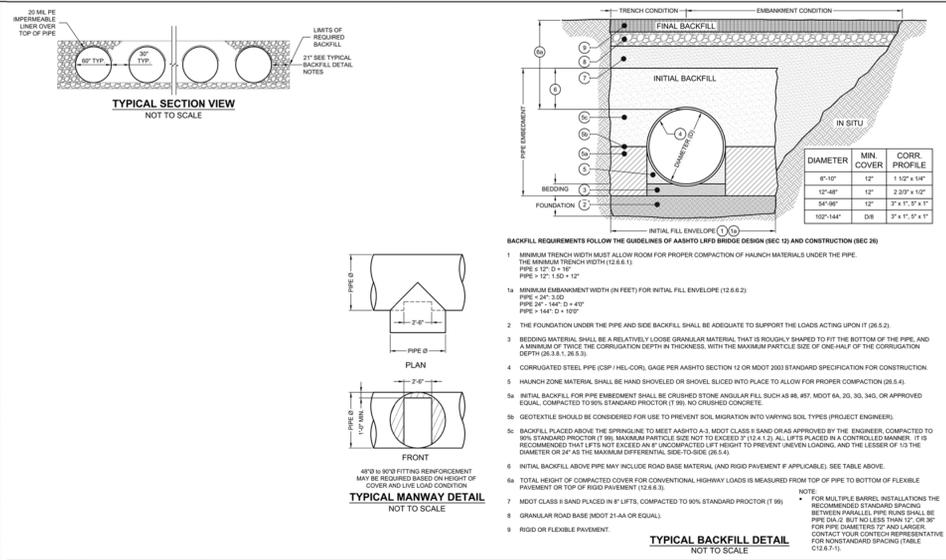
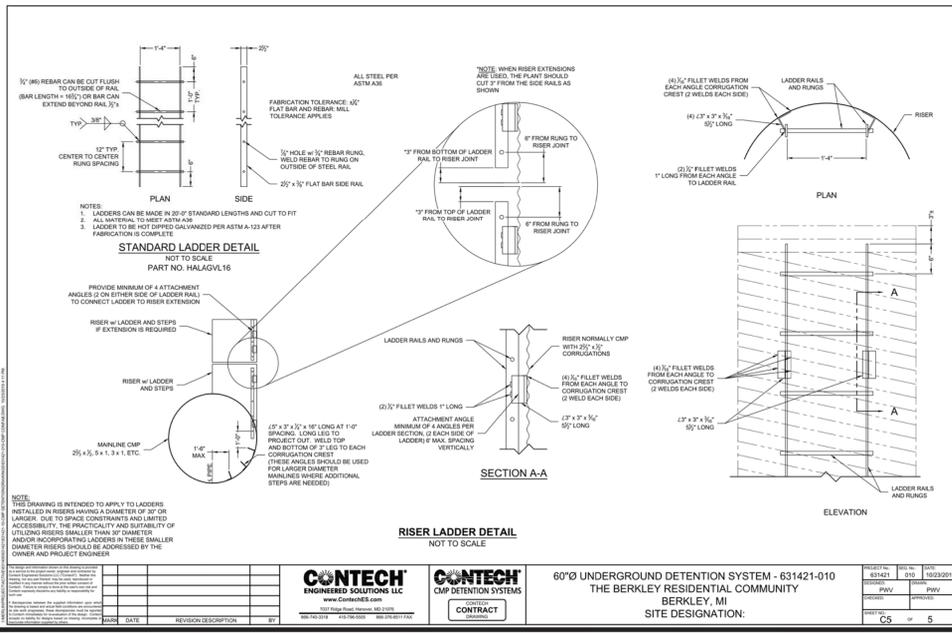
| NO. | DATE       | ISSUE                                |
|-----|------------|--------------------------------------|
| 2   | 10/31/2019 | MG SUBMISSION FOR SITE PLAN APPROVAL |
| 1   | 08/12/2019 | MH SUBMISSION FOR VARIANCE APPROVAL  |



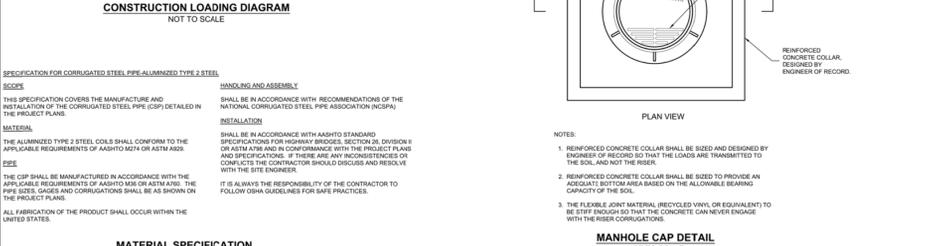
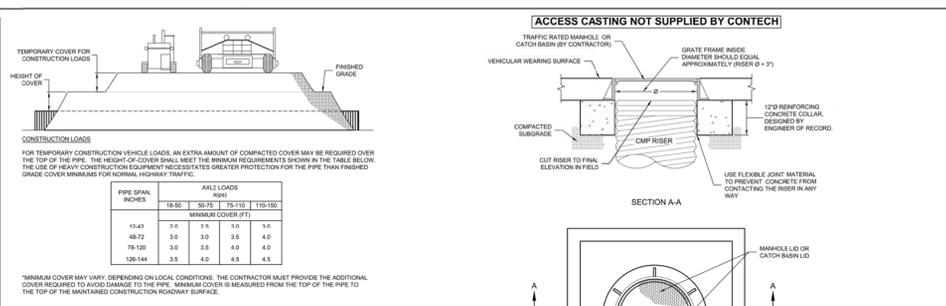
| 60"Ø UNDERGROUND DETENTION SYSTEM - 631421-010<br>THE BERKLEY RESIDENTIAL COMMUNITY<br>BERKLEY, MI<br>SITE DESIGNATION: | <table border="1"> <tr> <th>REV</th> <th>DATE</th> <th>DESCRIPTION</th> <th>BY</th> <th>CHK</th> <th>APP</th> </tr> <tr> <td>01</td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </table> | REV         | DATE | DESCRIPTION | BY  | CHK | APP | 01 |  |  |  |  |  |
|---|---|-------------|------|-------------|-----|-----|-----|----|--|--|--|--|--|
| REV   | DATE  | DESCRIPTION | BY   | CHK         | APP |     |     |    |  |  |  |  |  |
| 01  |   |             |      |             |     |     |     |    |  |  |  |  |  |



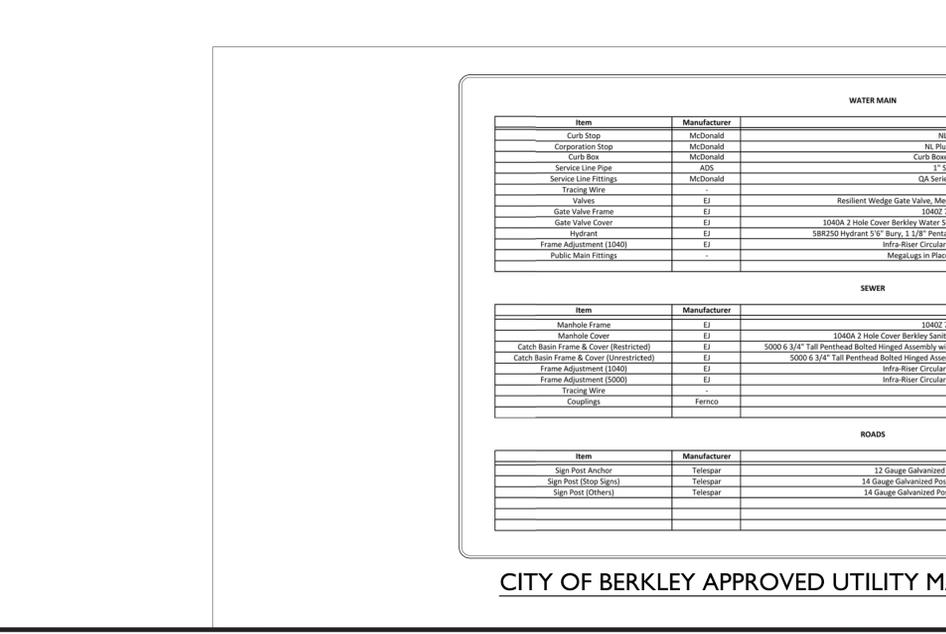
| 60"Ø UNDERGROUND DETENTION SYSTEM - 631421-010<br>THE BERKLEY RESIDENTIAL COMMUNITY<br>BERKLEY, MI<br>SITE DESIGNATION: | <table border="1"> <tr> <th>REV</th> <th>DATE</th> <th>DESCRIPTION</th> <th>BY</th> <th>CHK</th> <th>APP</th> </tr> <tr> <td>01</td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </table> | REV         | DATE | DESCRIPTION | BY  | CHK | APP | 01 |  |  |  |  |  |
|---|---|-------------|------|-------------|-----|-----|-----|----|--|--|--|--|--|
| REV   | DATE  | DESCRIPTION | BY   | CHK         | APP |     |     |    |  |  |  |  |  |
| 01  |   |             |      |             |     |     |     |    |  |  |  |  |  |



| 60"Ø UNDERGROUND DETENTION SYSTEM - 631421-010<br>THE BERKLEY RESIDENTIAL COMMUNITY<br>BERKLEY, MI<br>SITE DESIGNATION: | <table border="1"> <tr> <th>REV</th> <th>DATE</th> <th>DESCRIPTION</th> <th>BY</th> <th>CHK</th> <th>APP</th> </tr> <tr> <td>01</td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </table> | REV         | DATE | DESCRIPTION | BY  | CHK | APP | 01 |  |  |  |  |  |
|---|---|-------------|------|-------------|-----|-----|-----|----|--|--|--|--|--|
| REV   | DATE  | DESCRIPTION | BY   | CHK         | APP |     |     |    |  |  |  |  |  |
| 01  |   |             |      |             |     |     |     |    |  |  |  |  |  |



| 60"Ø UNDERGROUND DETENTION SYSTEM - 631421-010<br>THE BERKLEY RESIDENTIAL COMMUNITY<br>BERKLEY, MI<br>SITE DESIGNATION: | <table border="1"> <tr> <th>REV</th> <th>DATE</th> <th>DESCRIPTION</th> <th>BY</th> <th>CHK</th> <th>APP</th> </tr> <tr> <td>01</td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </table> | REV         | DATE | DESCRIPTION | BY  | CHK | APP | 01 |  |  |  |  |  |
|---|---|-------------|------|-------------|-----|-----|-----|----|--|--|--|--|--|
| REV   | DATE  | DESCRIPTION | BY   | CHK         | APP |     |     |    |  |  |  |  |  |
| 01  |   |             |      |             |     |     |     |    |  |  |  |  |  |



|  |                          |   |                      |
|--|--------------------------|---|----------------------|
| <b>CONTECH ENGINEERED SOLUTIONS</b>  |                          | <b>Round Pipe Stage Storage Table</b>                             |                      |
| Contech Engineered Solutions, LLC Engineer<br>Date: 10/23/2019<br>Site Information: Project Name: The Berkley Residential Community, Project Location: Berkley, MI |                          | PWV: 10/23/2019<br>The Berkley Residential Community, Berkley, MI |                      |
| Enter Pipe I.D. = 60 in.   | Total Volume = 19.63     | Total CMP Length = 1899   | System Invert = 0.00 |
| Enter Desired Increment = 1 in.  |                          |   |                      |
| <b>Inc Num</b>   | <b>Water Level (ft.)</b> | <b>Inc Area (sq. ft.)</b>   | <b>Hyd Rad (ft.)</b> |
| 1  | 0.07                     | 0.06  | 1.28                 |
| 2  | 0.20                     | 0.11  | 1.80                 |
| 3  | 0.37                     | 0.16  | 2.18                 |
| 4  | 0.56                     | 0.22  | 2.49                 |
| 5  | 0.78                     | 0.27  | 2.76                 |
| 6  | 1.02                     | 0.32  | 3.00                 |
| 7  | 1.28                     | 0.37  | 3.21                 |
| 8  | 1.58                     | 0.42  | 3.40                 |
| 9  | 1.85                     | 0.46  | 3.57                 |
| 10   | 2.15                     | 0.51  | 3.73                 |
| 11   | 2.47                     | 0.56  | 3.87                 |
| 12   | 2.80                     | 0.60  | 4.00                 |
| 13   | 3.13                     | 0.65  | 4.12                 |
| 14   | 3.48                     | 0.69  | 4.23                 |
| 15   | 3.84                     | 0.73  | 4.33                 |
| 16   | 4.20                     | 0.77  | 4.42                 |
| 17   | 4.58                     | 0.82  | 4.51                 |
| 18   | 4.98                     | 0.85  | 4.58                 |
| 19   | 5.34                     | 0.89  | 4.65                 |
| 20   | 5.73                     | 0.93  | 4.71                 |
| 21   | 6.12                     | 0.97  | 4.77                 |
| 22   | 6.52                     | 1.00  | 4.82                 |
| 23   | 6.93                     | 1.04  | 4.88                 |
| 24   | 7.33                     | 1.07  | 4.90                 |
| 25   | 7.74                     | 1.10  | 4.93                 |
| 26   | 8.16                     | 1.14  | 4.96                 |
| 27   | 8.57                     | 1.17  | 4.97                 |
| 28   | 8.98                     | 1.19  | 4.99                 |
| 29   | 9.40                     | 1.22  | 5.00                 |
| 30   | 9.82                     | 1.25  | 5.00                 |
| 31   | 10.23                    | 1.28  | 5.00                 |
| 32   | 10.65                    | 1.30  | 4.99                 |
| 33   | 11.07                    | 1.32  | 4.97                 |
| 34   | 11.48                    | 1.35  | 4.96                 |
| 35   | 11.89                    | 1.37  | 4.93                 |
| 36   | 12.30                    | 1.39  | 4.90                 |
| 37   | 12.71                    | 1.41  | 4.86                 |
| 38   | 13.11                    | 1.42  | 4.82                 |
| 39   | 13.51                    | 1.44  | 4.77                 |
| 40   | 13.91                    | 1.46  | 4.71                 |
| 41   | 14.29                    | 1.47  | 4.65                 |
| 42   | 14.68                    | 1.48  | 4.58                 |
| 43   | 15.08                    | 1.49  | 4.51                 |
| 44   | 15.43                    | 1.50  | 4.42                 |
| 45   | 15.80                    | 1.51  | 4.33                 |
| 46   | 16.15                    | 1.51  | 4.23                 |
| 47   | 16.50                    | 1.52  | 4.12                 |
| 48   | 16.84                    | 1.52  | 4.00                 |
| 49   | 17.17                    | 1.52  | 3.87                 |
| 50   | 17.48                    | 1.52  | 3.73                 |
| 51   | 17.78                    | 1.52  | 3.57                 |
| 52   | 18.08                    | 1.51  | 3.40                 |
| 53   | 18.35                    | 1.50  | 3.21                 |
| 54   | 18.61                    | 1.49  | 3.00                 |
| 55   | 18.85                    | 1.48  | 2.76                 |
| 56   | 19.07                    | 1.46  | 2.49                 |
| 57   | 19.27                    | 1.43  | 2.18                 |
| 58   | 19.43                    | 1.40  | 1.80                 |
| 59   | 19.58                    | 1.36  | 1.38                 |
| 60   | 19.63                    | 1.25  | 0.00                 |

| 60"Ø UNDERGROUND DETENTION SYSTEM - 631421-010<br>THE BERKLEY RESIDENTIAL COMMUNITY<br>BERKLEY, MI<br>SITE DESIGNATION: | <table border="1"> <tr> <th>REV</th> <th>DATE</th> <th>DESCRIPTION</th> <th>BY</th> <th>CHK</th> <th>APP</th> </tr> <tr> <td>01</td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </table> | REV         | DATE | DESCRIPTION | BY  | CHK | APP | 01 |  |  |  |  |  |
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| 01  |   |             |      |             |     |     |     |    |  |  |  |  |  |

**CONTECH UNDERGROUND DETENTION STORAGE CALCULATIONS**

These results are submitted to you as a guideline only, without liability on the part of CONTECH Construction Products Inc. for accuracy or suitability to any particular application, and are subject to your verification.

**STONEFIELD engineering & design**

**THE BERKLEY PROPOSED RESIDENTIAL COMMUNITY**

PARCEL ID: 25-18-431-015 THRU 25-18-431-017 & 25-18-431-022  
2219 COOLIDGE HIGHWAY  
CITY OF BERKLEY  
OAKLAND COUNTY, MI

SCALE: AS SHOWN PROJECT ID: 1731.01

**CONSTRUCTION DETAILS**

DRAWING: C-13

# ALTA/NSPS LAND TITLE SURVEY



Know what's below.  
Call before you dig.

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

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

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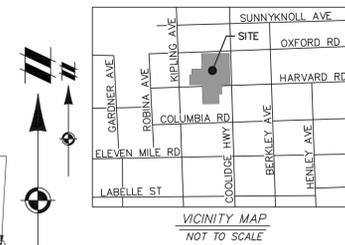
SECTION 18  
TOWNSHIP 1 NORTH, RANGE 11 EAST  
CITY OF BERKLEY  
OAKLAND COUNTY, MICHIGAN

DPG 2 LLC  
ALTA/NSPS LAND TITLE SURVEY

DATE 05/03/2019

06/12/2019 REV. PER UTILITY LOCATE  
07/18/2019 REV. PER UTILITY LOCATE  
10/31/2019 REV. PER CITY COMMENTS

REVISIONS  
SCALE 0 25 50  
1" = 50 FEET  
DR. JR. CH. CK  
P.M. J. CECIL  
BOOK NA  
JOB 19001565  
SHEET NO. 1 OF 1



VICINITY MAP  
NOT TO SCALE

SCHEDULE B - PART II (EXCEPTIONS) PER COMMITMENT FOR TITLE INSURANCE ISSUED BY AMROCK INC., AN ISSUING AGENT FOR STEWART TITLE GUARANTY COMPANY, COMMITMENT NUMBER: 62471765 REVISION 7, COMMITMENT DATE: MARCH 20, 2018:

7. BUILDING AND USE RESTRICTIONS CONTAINED IN INSTRUMENTS RECORDED IN LIBER 371, PAGE 150, AND LIBER 762, PAGE 1 BUT OMITTING ANY COVENANT BASED ON RACE, COLOR, RELIGION, SEX, HANDICAP, FAMILIAL STATUS, OR NATIONAL ORIGIN:  
L.371, PG.150 COVERS THE EAST HALF OF LOT 53. L.762, PG.1 COVERS LOT 52. NOT A SURVEY MATTER, NOT PLOTTABLE.

EXHIBIT A - LEGAL DESCRIPTION PER COMMITMENT FOR TITLE INSURANCE ISSUED BY AMROCK INC., AN ISSUING AGENT FOR STEWART TITLE GUARANTY COMPANY, COMMITMENT NUMBER: 62471765 REVISION 7, COMMITMENT DATE: MARCH 20, 2018:

TAX ID NUMBER(S): 25-18-431-019, 25-18-431-021, 25-18-431-015, 25-18-431-016, 25-18-431-017, 25-18-431-018, 25-18-431-020, 25-18-431-022, 25-18-477-006, 25-18-477-007, 25-18-477-008

LAND SITUATED IN THE CITY OF BERKLEY IN THE COUNTY OF OAKLAND IN THE STATE OF MI

WEST 50 FEET OF LOT 10, LOT 11 EXCEPT FRONT 10.02 FEET, LOT 12 EXCEPT FRONT 10.02 FEET, LOT 13 EXCEPT EAST 10.03 FEET, LOT 14 EXCEPT EAST 10.06 FEET, LOT 15 EXCEPT EAST 10.04 FEET, LOT 52, LOT 53, THE EAST 42 FEET OF LOT 62 EXCEPT THE NORTH 93 FEET OF THE EAST 42 FEET, LOTS 63 THROUGH 67 OF DENLIER ACRES ACCORDING TO THE PLAT THEREOF AS RECORDED IN LIBER 15 OF PLATS, PAGE 35, OAKLAND COUNTY RECORDS.

CLIENT REFERENCE: 2600, 2651, 2700 HARVARD RD. & 2277 COOLIDGE HWY., BERKLEY, MI 48072

DESCRIPTION OF A 2.239 ACRE PARCEL OF LAND (PARCEL A) BEING A PART OF LOTS 12 THRU 15, INCLUSIVE, AND A PART OF LOTS 52, 53, 64 AND 65, DENLIER ACRES, ACCORDING TO THE PLAT THEREOF RECORDED IN LIBER 15 OF PLATS, PAGE 35, OAKLAND COUNTY RECORDS, ALSO BEING THE SOUTH RIGHT OF WAY LINE OF OXFORD ROAD (PLATTED AS GARRISON AVENUE) (50 FEET WIDE) AND THE WEST RIGHT OF WAY LINE OF COOLIDGE HIGHWAY (VARIABLE WIDTH);

ALL OF LOTS 14, 15 AND 52, AND PART OF LOTS 12, 13, 53, 64 AND 65, DENLIER ACRES, ACCORDING TO THE PLAT THEREOF RECORDED IN LIBER 15 OF PLATS, PAGE 35, OAKLAND COUNTY RECORDS, ALSO BEING THE SOUTH RIGHT 1/4 OF SECTION 18, TOWN 1 NORTH, RANGE 11 EAST, CITY OF BERKLEY, OAKLAND COUNTY, MICHIGAN, AND BEING MORE PARTICULARLY DESCRIBED AS:

BEGINNING AT THE POINT OF INTERSECTION OF THE NORTH LINE OF LOT 15, DENLIER ACRES, ACCORDING TO THE PLAT THEREOF RECORDED IN LIBER 15 OF PLATS, PAGE 35, OAKLAND COUNTY RECORDS, ALSO BEING THE SOUTH RIGHT OF WAY LINE OF OXFORD ROAD (PLATTED AS GARRISON AVENUE) (50 FEET WIDE) AND THE WEST RIGHT OF WAY LINE OF COOLIDGE HIGHWAY (VARIABLE WIDTH); THENCE S01°21'56"E 206.32 FEET ALONG THE WEST RIGHT OF WAY LINE OF SAID COOLIDGE HIGHWAY; THENCE N89°43'00"E 0.01 FEET; THENCE S01°21'56"E 103.16 FEET ALONG THE WEST RIGHT OF WAY LINE OF SAID COOLIDGE HIGHWAY; THENCE N89°43'00"E 0.01 FEET; THENCE S01°21'56"E 75.06 FEET ALONG THE WEST RIGHT OF WAY LINE OF SAID COOLIDGE HIGHWAY; THENCE N87°07'01"W 21.13 FEET; THENCE 132.46 FEET ALONG THE ARC OF A 133.07 FOOT RADIUS CIRCULAR CURVE TO THE RIGHT, CHORD BEARING N57°33'02"W 127.06 FEET; THENCE N31°30'35"W 25.22 FEET; THENCE 36.11 FEET ALONG THE ARC OF A 37.00 FOOT RADIUS CIRCULAR CURVE TO THE LEFT, CHORD BEARING N62°02'16"W 34.70 FEET; THENCE S89°49'43"W 104.67 FEET; THENCE N01°28'06"W 11.47 FEET; THENCE S88°36'50"W 36.96 FEET; THENCE N01°29'20"W 265.71 FEET; THENCE N89°43'00"E 311.79 FEET ALONG THE SOUTH RIGHT OF WAY LINE OF SAID OXFORD ROAD TO THE PLACE OF BEGINNING, BEING A PART OF THE SOUTHEAST 1/4 OF SAID SECTION 18, CONTAINING 2.239 ACRES OF LAND, MORE OR LESS, AND BEING SUBJECT TO EASEMENTS, CONDITIONS, RESTRICTIONS AND EXCEPTIONS OF RECORD, IF ANY.

### CERTIFICATION

TO:  
- STEWART TITLE GUARANTY COMPANY  
- TITLE SOURCE, INC.  
- BERKLEY-COOLIDGE LLC, A MICHIGAN LIMITED LIABILITY COMPANY

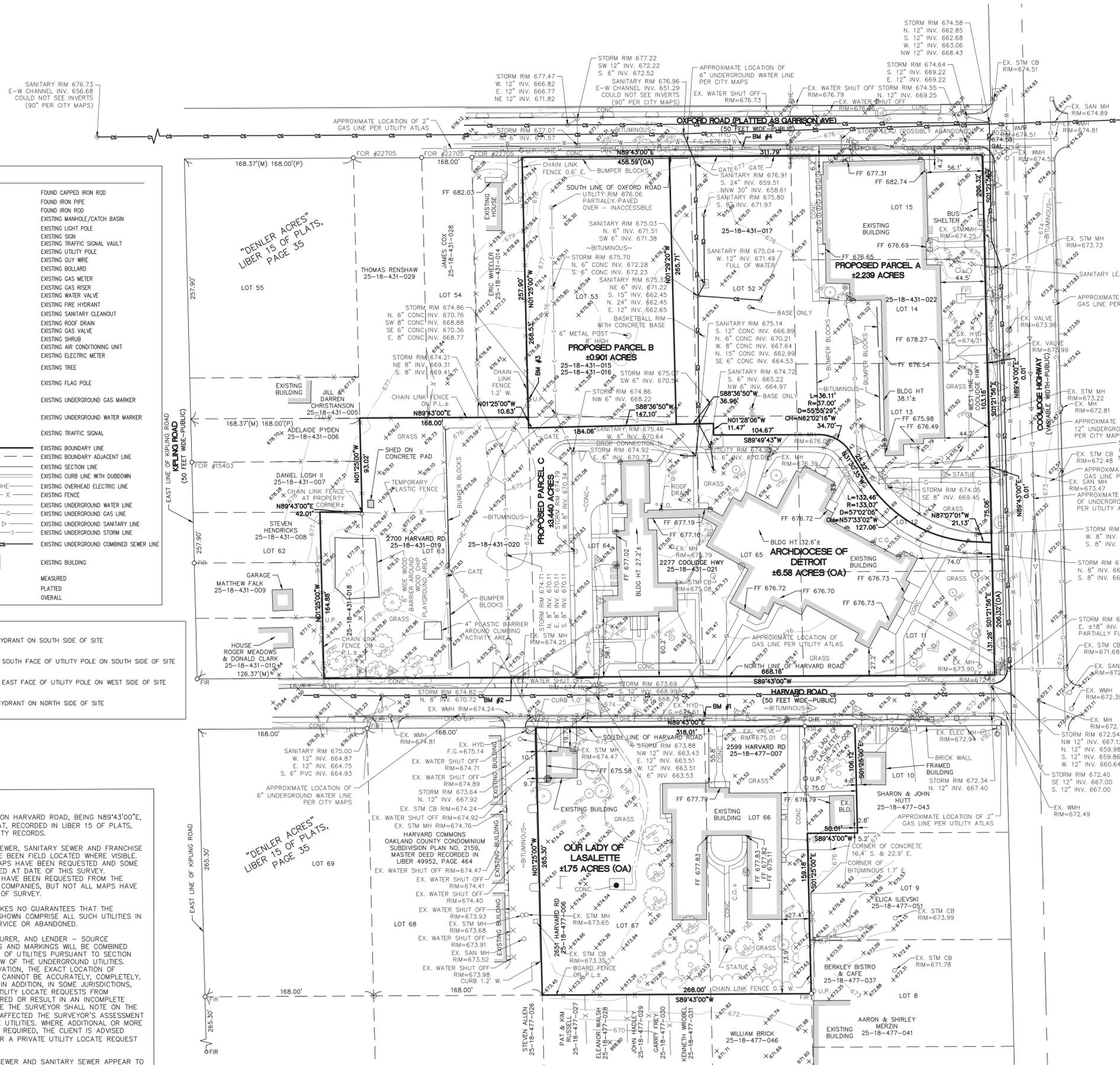
THIS IS TO CERTIFY THAT THIS MAP OR PLAT AND THE SURVEY ON WHICH IT IS BASED WERE MADE IN ACCORDANCE WITH THE 2016 MINIMUM STANDARD DETAIL REQUIREMENTS FOR ALTA/NSPS LAND TITLE SURVEYS, JOINTLY ESTABLISHED AND ADOPTED BY ALTA AND NSPS, AND INCLUDES NO ITEMS FROM TABLE A THEREOF.

THE FIELD WORK WAS COMPLETED ON JULY 17, 2019.



CHRISTOPHER P. KELLY  
REGISTERED PROFESSIONAL SURVEYOR NO. 56500  
CKELLY@ATWELL-GROUP.COM  
TWO TOWNE SQUARE, SUITE 700  
SOUTHFIELD, MICHIGAN 48076  
248.447.2000

DATE: 10/31/2019



### LEGEND

- OF CIR FOUND CAPPED IRON ROD
- OF FIR FOUND IRON PIPE
- OF FIR FOUND IRON ROD
- OF M EXISTING MANHOLE/CATCH BASIN
- OF L EXISTING LIGHT POLE
- OF S EXISTING SIGN
- OF T EXISTING TRAFFIC SIGNAL VAULT
- OF U.P. EXISTING UTILITY POLE
- OF W EXISTING WIRE
- OF X EXISTING GUY WIRE
- OF Y EXISTING BOLLARD
- OF Z EXISTING GAS METER
- OF AA EXISTING GAS RISER
- OF AB EXISTING WATER VALVE
- OF AC EXISTING FIRE HYDRANT
- OF AD EXISTING SANITARY CLEANOUT
- OF AE EXISTING ROOF DRAIN
- OF AF EXISTING GAS VALVE
- OF AG EXISTING SHRUB
- OF AH EXISTING AIR CONDITIONING UNIT
- OF AI EXISTING ELECTRIC METER
- OF AJ EXISTING TREE
- OF AK EXISTING FLAG POLE
- OF AL EXISTING UNDERGROUND GAS MARKER
- OF AM EXISTING UNDERGROUND WATER MARKER
- OF AN EXISTING TRAFFIC SIGNAL
- OF AO EXISTING BOUNDARY LINE
- OF AP EXISTING BOUNDARY ADJACENT LINE
- OF AQ EXISTING SECTION LINE
- OF AR EXISTING CURB LINE WITH DUBDOOM
- OF AS EXISTING OVERHEAD ELECTRIC LINE
- OF AT EXISTING UNDERGROUND WATER LINE
- OF AU EXISTING UNDERGROUND GAS LINE
- OF AV EXISTING UNDERGROUND SANITARY LINE
- OF AW EXISTING UNDERGROUND STORM LINE
- OF AX EXISTING UNDERGROUND COMBINED SEWER LINE
- OF AY EXISTING BUILDING
- OF AZ MEASURED
- OF BA PLATTED
- OF BB OVERALL

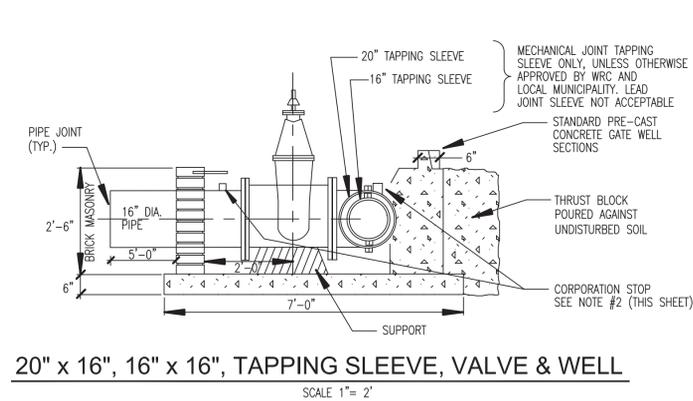
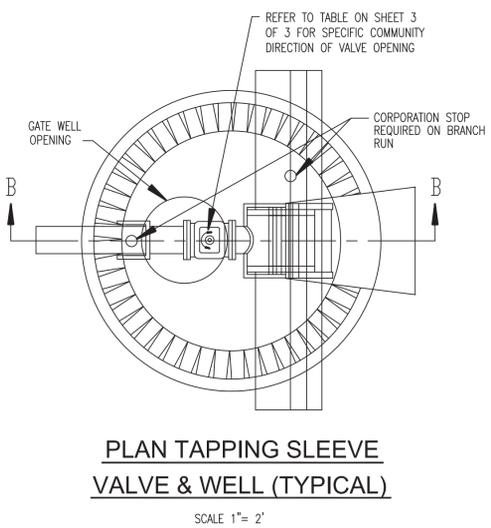
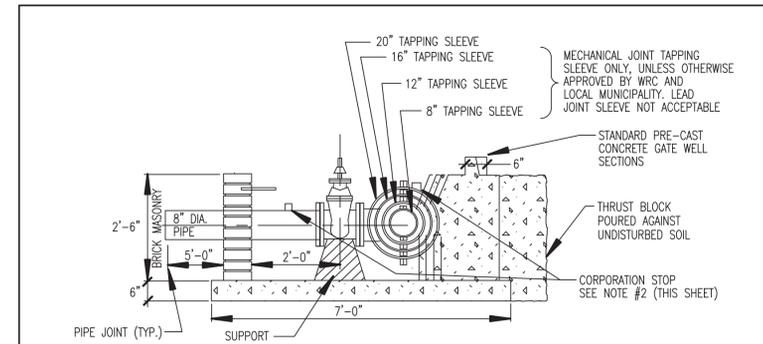
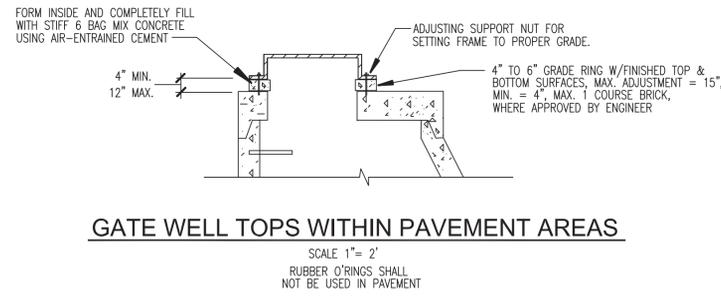
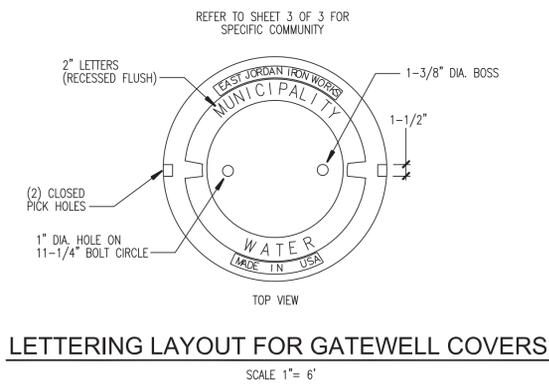
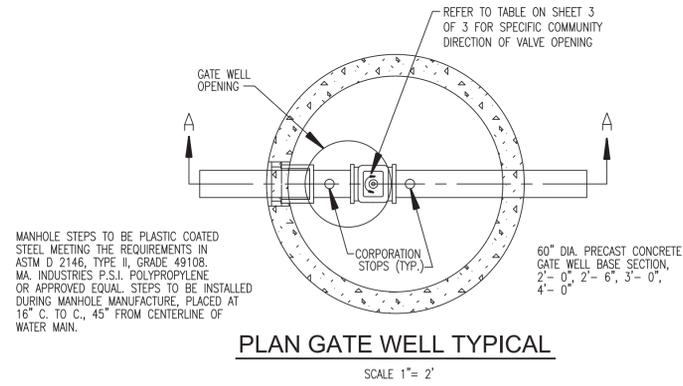
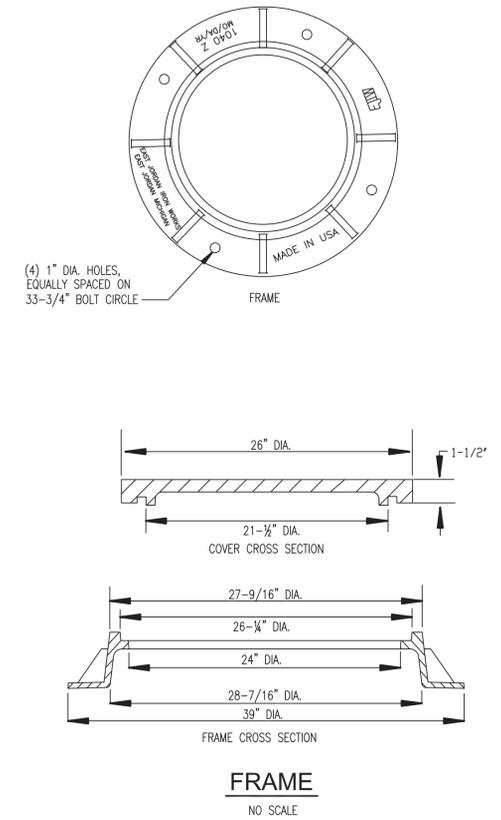
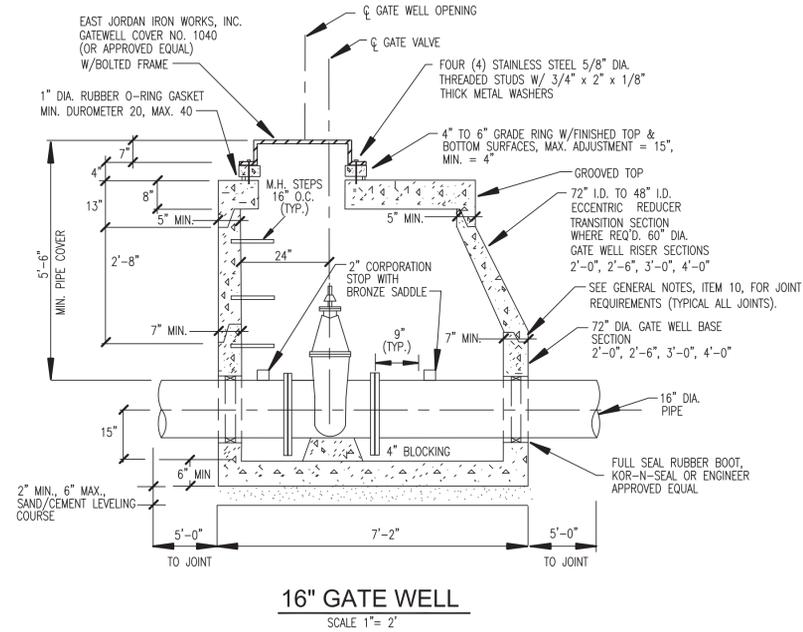
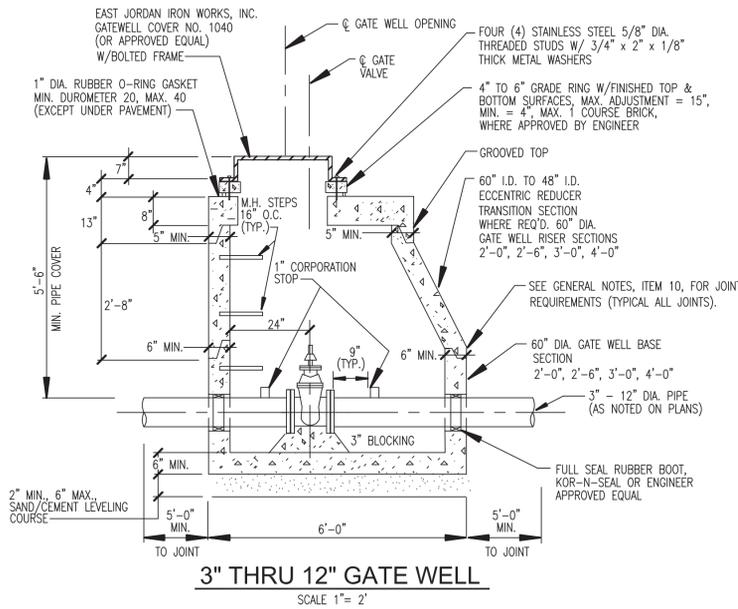
- ### BENCHMARKS:
- BENCHMARK #1: ARROW ON HYDRANT ON SOUTH SIDE OF SITE  
ELEVATION: 677.30 (NAVD88)
  - BENCHMARK #2: GEAR PIN IN SOUTH FACE OF UTILITY POLE ON SOUTH SIDE OF SITE  
ELEVATION: 676.10 (NAVD88)
  - BENCHMARK #3: GEAR PIN IN EAST FACE OF UTILITY POLE ON WEST SIDE OF SITE  
ELEVATION: 677.34 (NAVD88)
  - BENCHMARK #4: ARROW ON HYDRANT ON NORTH SIDE OF SITE  
ELEVATION: 679.27 (NAVD88)

- ### NOTES:
1. BEARINGS ARE BASED ON HARVARD ROAD, BEING N89°43'00"E, PER "DENLIER ACRES" PLAT, RECORDED IN LIBER 15 OF PLATS, PAGE 35, OAKLAND COUNTY RECORDS.
  2. WATER MAIN, STORM SEWER, SANITARY SEWER AND FRANCHISE UTILITY STRUCTURES HAVE BEEN FIELD LOCATED WHERE VISIBLE. UTILITY AND AS-BUILT MAPS HAVE BEEN REQUESTED AND SOME MAPS HAVE BEEN RECEIVED AT DATE OF THIS SURVEY. FRANCHISE UTILITY MAPS HAVE BEEN REQUESTED FROM THE APPROPRIATE FRANCHISE COMPANIES, BUT NOT ALL MAPS HAVE BEEN RECEIVED AT DATE OF SURVEY.
  - NOTE: THE SURVEYOR MAKES NO GUARANTEES THAT THE UNDERGROUND UTILITIES SHOWN COMPRISE ALL SUCH UTILITIES IN THE AREA, EITHER IN-SERVICE OR ABANDONED.
  - NOTE TO THE CLIENT, INSURER, AND LENDER - SOURCE INFORMATION FROM PLANS AND MARKINGS WILL BE COMBINED WITH OBSERVED EVIDENCE OF UTILITIES PURSUANT TO SECTION 5.E.I.V. TO DEVELOP A VIEW OF THE UNDERGROUND UTILITIES. HOWEVER, LACKING EXCAVATION, THE EXACT LOCATION OF UNDERGROUND FEATURES CANNOT BE ACCURATELY, COMPLETELY, AND RELIABLY DEPICTED. IN ADDITION, IN SOME JURISDICTIONS, 811 OR OTHER SIMILAR UTILITY LOCATE REQUESTS FROM SURVEYORS MAY BE IGNORED OR RESULT IN AN INCOMPLETE RESPONSE, IN WHICH CASE THE SURVEYOR SHALL NOTE ON THE PLAT OR MAP HOW THIS AFFECTED THE SURVEYOR'S ASSESSMENT OF THE LOCATION OF THE UTILITIES. WHERE ADDITIONAL OR MORE DETAILED INFORMATION IS REQUIRED, THE CLIENT IS ADVISED THAT EXCAVATION AND/OR A PRIVATE UTILITY LOCATE REQUEST MAY BE NECESSARY.
  3. PORTIONS OF STORM SEWER AND SANITARY SEWER APPEAR TO BE COMBINED SEWER.

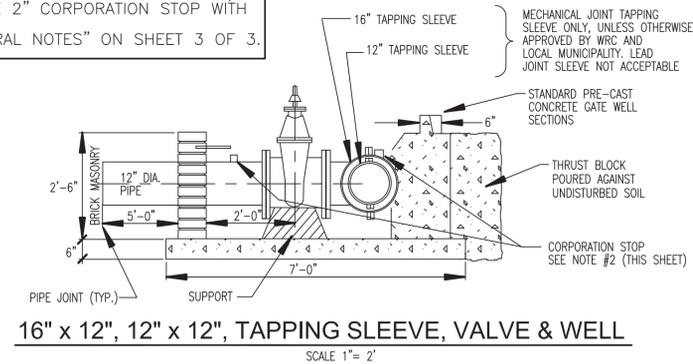
"DENLIER ACRES"  
LIBER 15 OF PLATS,  
PAGE 35

"DENLIER ACRES"  
LIBER 15 OF PLATS,  
PAGE 35

# GATE VALVE & WELL DETAILS



- NOTES:**
- REFER TO NOTE 7 OF "VALVE AND SLEEVE NOTES" ON SHEET 3 OF 3.
  - FOR PIPE SMALLER THAN 16" USE 1" CORPORATION STOP, FOR 16" PIPE OR LARGER USE 2" CORPORATION STOP WITH BRONZE SADDLE.
  - REFER TO NOTE 11 OF "GENERAL NOTES" ON SHEET 3 OF 3.



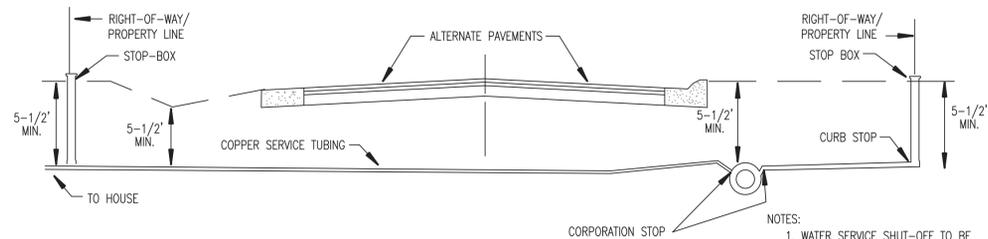
## TAPPING SLEEVE GATE VALVE & WELL DETAILS

**WATER MAIN STANDARD DETAILS**

| REVISION BLOCK |              | Data Source / Source Date: NA |  |
|----------------|--------------|-------------------------------|--|
| Rev. No.       | Rev. Date    | Description                   |  |
| 1              | LJC 10/09/01 | NOTE UPDATES                  |  |
| 2              | LJC 10/27/01 | NOTE UPDATES PER REVIEW       |  |
| 3              | JKM 10/09/02 | NOTE UPDATES                  |  |
| 4              | DS 10/15/13  | UPDATE TITLEROCK AND ARROWS   |  |

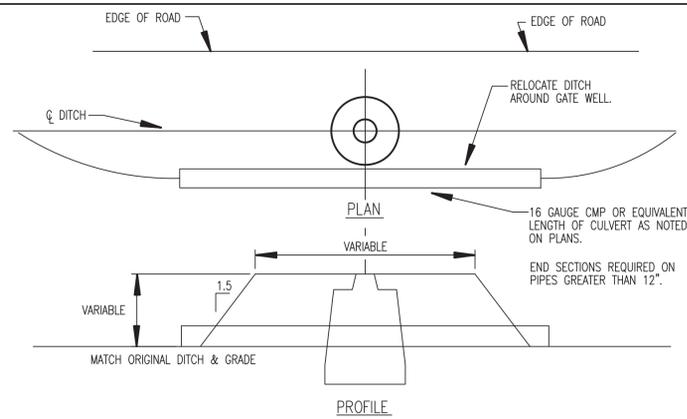
ORIG. DATE: 01/01/01  
SCALE: NONE  
DESIGNED BY: WRC WATER RESOURCES COMMISSIONER  
DRAWN BY: WRC Mapping

ONE PUBLIC WORKS DRIVE, BLDG 95 WEST WATERFORD, MICHIGAN 48328-1907  
SHEET NO.: 1 of 3

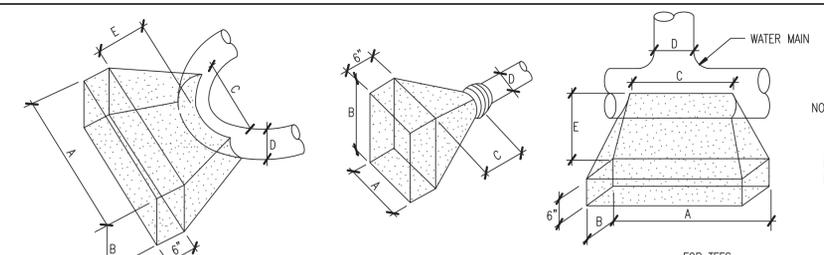


**TYPICAL PUBLIC ROAD WATER SERVICE CONNECTION**  
NO SCALE

- NOTES:  
1. WATER SERVICE SHUT-OFF TO BE PLACED AT PROPERTY LINE.  
2. LATERAL LOCATION SHALL BE AS REQUESTED BY THE ADJUTING PROPERTY OWNER.



**DITCH ENCLOSURE AT GATE WELL**  
NO SCALE



FOR 90° BENDS OR SMALLER

| D   | A  | B    | C    | E MIN. |
|-----|----|------|------|--------|
| 20" | 8' | 6.5' | 3.5' | 2.5'   |
| 16" | 6' | 4'   | 2.5' | 2'     |
| 12" | 4' | 3'   | 2'   | 1.75'  |
| 10" | 3' | 3'   | 2'   | 1.75'  |
| 8"  | 3' | 2'   | 2'   | 1.5'   |
| 6"  | 2' | 1.5' | 2'   | 1.25'  |

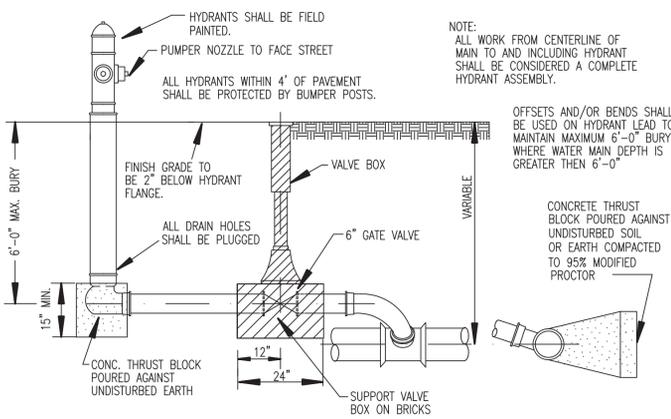
FOR PLUGS

| D   | A      | B      | C MIN. |
|-----|--------|--------|--------|
| 20" | 7'     | 5'     | 2.5'   |
| 16" | 4'-10" | 4'-10" | 2'     |
| 12" | 4'-4"  | 3'     | 1'-9"  |
| 10" | 3'     | 2'     | 1'-6"  |
| 8"  | 2'-10" | 2'-6"  | 1'-6"  |
| 6"  | 1'-6"  | 1'-6"  | 3'     |

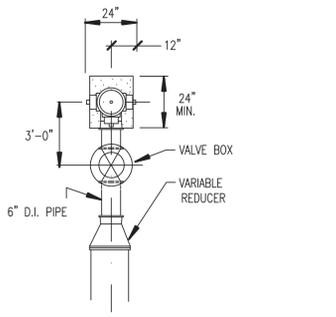
FOR TEES

| D   | A     | B     | C    | E MIN. |
|-----|-------|-------|------|--------|
| 20" | 6.5'  | 4.5'  | 3.5' | 3'     |
| 16" | 4'-8" | 4'-8" | 2.5' | 2.75'  |
| 12" | 4'    | 3'    | 2.5' | 2.5'   |
| 10" | 3'    | 2'    | 2'   | 2.25'  |
| 8"  | 2'-6" | 2'    | 2'   | 2.25'  |
| 6"  | 2'    | 2'    | 2'   | 2.25'  |

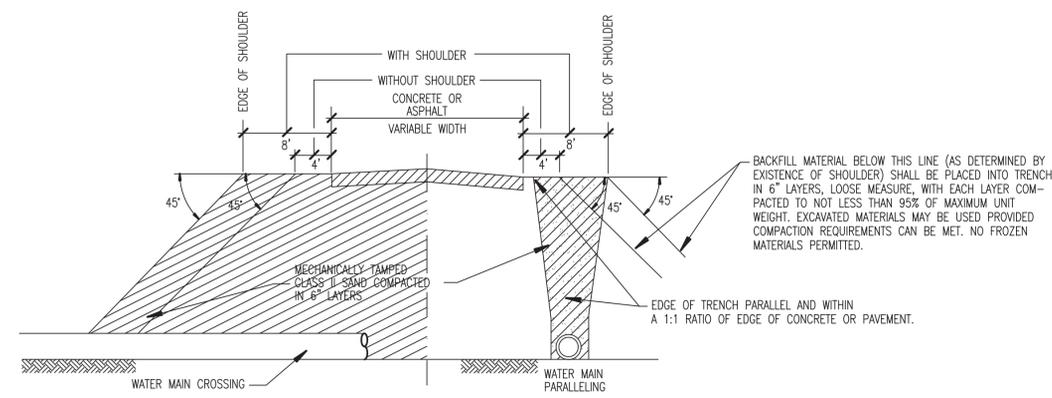
**THRUST BLOCK DETAILS**



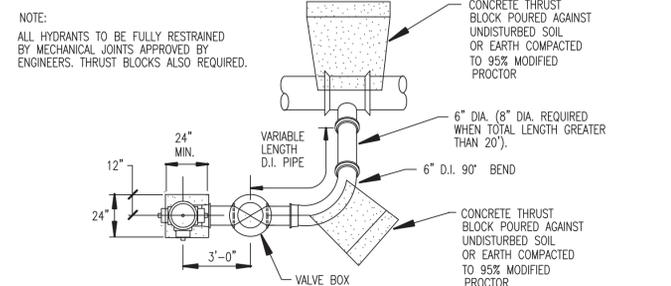
**SECTION 6" HYDRANT SIDE OUTLET**  
SCALE 1" = 2'



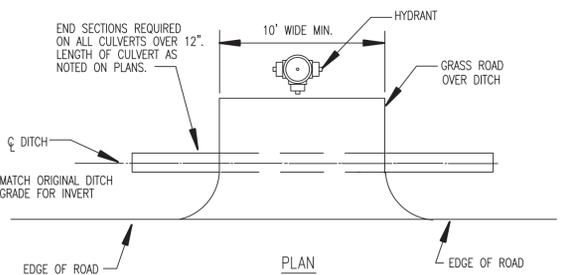
**PLAN 6" HYDRANT WATER MAIN END**  
SCALE 1" = 1'



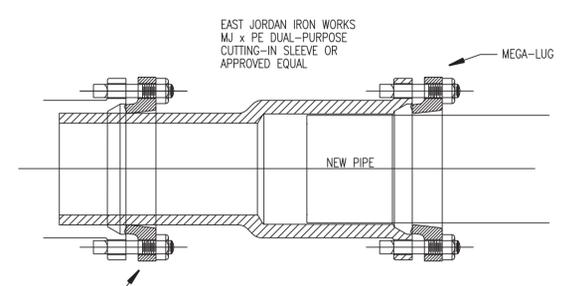
**MINIMUM BACKFILL UNDER OR NEAR PAVEMENT**  
SCALE 1" = 6'



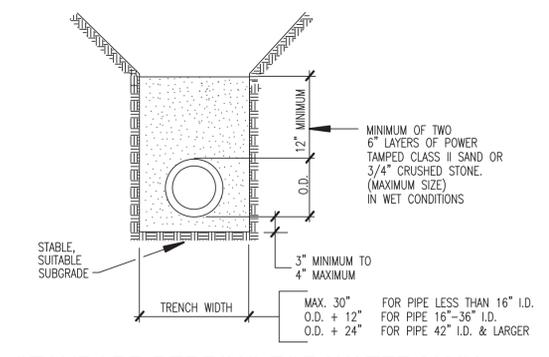
**PLAN 6" HYDRANT SIDE OUTLET**  
SCALE 1" = 1'



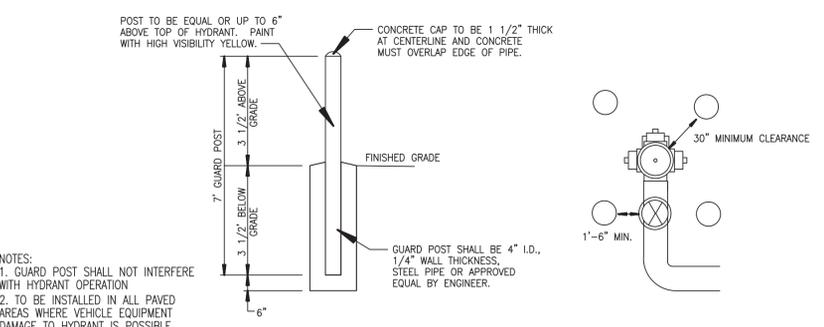
**DITCH ENCLOSURE AT HYDRANT**  
NO SCALE



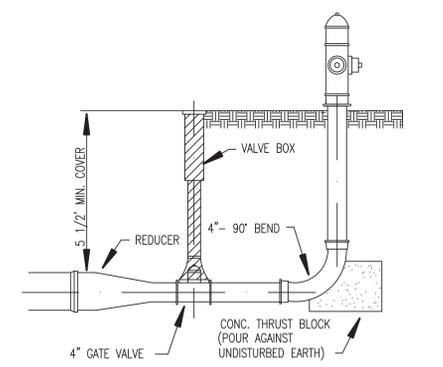
**BOTTLE SLEEVE**  
SCALE 1" = 4'



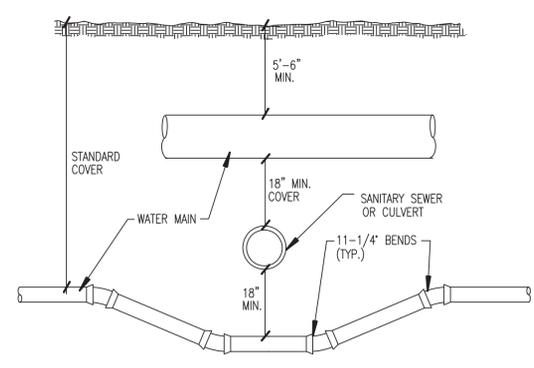
**STANDARD BEDDING FOR WATER MAIN**  
SCALE 1" = 4'



**GUARD POST**  
SCALE 1" = 3'



**DEAD END BLOWOFF CONNECTION**  
SCALE 1" = 1'



**SEWER OR CULVERT CROSSING**  
SCALE 1" = 2'

**WATER MAIN STANDARD DETAILS**

| Rev. | By  | Date     | Description             |
|------|-----|----------|-------------------------|
| 1    | JLN | 06/06/02 | NOTE UPDATES PER REVIEW |
| 2    | JLN | 06/06/02 | NOTE AND DETAIL UPDATE  |
| 3    |     |          |                         |
| 4    |     |          |                         |

ORIG. DATE: 01/01/01  
SCALE: NONE  
DESIGNED BY: WRC  
DRAWN BY: WRC Mapping

ONE PUBLIC WORKS DRIVE, BLDG 95 WEST WATERFORD, MICHIGAN 48328-1907

WRC WATER RESOURCES COMMISSIONER  
Jim Nash

SHEET NO.: 2 of 3

## GENERAL NOTES

- ALL CONSTRUCTION PROCEDURES AND MATERIALS SHALL CONFORM TO THE CURRENT STANDARDS AND SPECIFICATIONS OF THE WATER RESOURCES COMMISSIONER AND/OR THE LOCAL MUNICIPALITY.
- THE CONTRACTOR SHALL OBTAIN AN WATER RESOURCES COMMISSIONER WATER INSPECTION PERMIT PRIOR TO THE START OF CONSTRUCTION. SEE CORRESPONDING WATER MAIN CONSTRUCTION PERMIT REQUEST LETTER FOR COST OF THE PERMIT.
- A PRE-CONSTRUCTION MEETING SHALL BE HELD PRIOR TO THE START OF CONSTRUCTION AND SHALL BE SCHEDULED BY THE LOCAL MUNICIPAL ENGINEER. THOSE IN ATTENDANCE SHALL INCLUDE 1) LOCAL MUNICIPAL ENGINEER, 2) DESIGN ENGINEER, 3) OWNER/DEVELOPER, 4) ROAD COMMISSION FOR OAKLAND COUNTY, 5) OAKLAND COUNTY DRAIN COMMISSIONER (WATER, SEWER AND STORM DIVISIONS) AND 6) ALL UTILITY COMPANIES. CONTRACTOR SHALL PROVIDE MATERIALS LISTING FOR APPROVAL BY MUNICIPAL ENGINEER AND O.C.D.C.
- CONTRACTOR MUST CONTACT MISS DIG (1-800-482-7171) THREE WORKING DAYS BEFORE THE START OF CONSTRUCTION FOR UNDERGROUND UTILITY LOCATIONS. ALL UTILITIES SHALL BE STAKED BEFORE CONSTRUCTION STARTS.
- ALL NECESSARY EASEMENTS FOR WATER MAINS SHALL BE PROVIDED IN THE NAME OF THE OWNER OF THE WATER MAIN PRIOR TO CONSTRUCTION AND ACCEPTANCE OF THE WATER DISTRIBUTION SYSTEM FOR OPERATION.
- ALL WATER MAINS SHALL BE CONSTRUCTED WITH A MINIMUM COVER OF FIVE AND ONE-HALF (5-1/2) FEET BELOW FINISHED GRADES INCLUDING OPEN DRAINAGE COURSES.
- ALL TRENCHES UNDER OR WITHIN A 1:1 RATIO OF EXISTING OR PROPOSED PAVEMENT OR DRIVEWAYS SHALL BE BACKFILLED WITH THOROUGHLY COMPACTED CLASS II SAND TO GRADE (95% MAXIMUM UNIT DENSITY).
- WHERE TWO UTILITIES CROSS, PROVIDE CLASS II BACKFILL MATERIAL IN TWELVE (12) INCH COMPACTED LAYERS TO THE UNDERSIDE OF THE HIGHER UTILITY.
- WHERE WATER MAINS MUST DIP TO PASS UNDER OTHER UTILITIES, THE SECTIONS WHICH ARE DEEPER THAN NORMAL SHALL BE KEPT TO A MINIMUM LENGTH AND SHALL BE CONSTRUCTED WITH ELEVEN AND ONE-QUARTER (11-1/4) DEGREE VERTICAL BENDS, PROPERLY ANCHORED.
- ALL PRECAST CONCRETE GATE WELL SECTIONS SHALL BE MANUFACTURED TO CONFORM WITH A.S.T.M. C478, STANDARD SPECIFICATIONS FOR PRECAST REINFORCED CONCRETE MANHOLE SECTIONS, EXCEPT WALL THICKNESS SHALL BE AS SHOWN ON THESE DETAILS. ALL JOINTS FOR PRECAST CONCRETE GATE WELL SECTIONS SHALL BE "MODIFIED GROOVE TONGUE" WITH GASKET MANUFACTURED TO CONFORM WITH A.S.T.M. C 443, STANDARD SPECIFICATION FOR JOINTS FOR CIRCULAR CONCRETE SEWER AND CULVERT PIPE USING RUBBER GASKETS.
- CONTRACTOR SHALL INSTALL VALVES, TAPPING SLEEVES AND GATE WELL STRUCTURES IN STRICT COMPLIANCE WITH MEASUREMENTS PROVIDED ON SHEET 1 (i.e. 2'-0" BETWEEN GATE WELL WALL & CENTERLINE OF OPERATING NUT) TO ALLOW PROPER OPERATION OF VALVE THROUGH GATEWELL OPENING. FAILURE TO DO SO WILL REQUIRE CONTRACTOR TO CORRECT AT HIS EXPENSE.
- ALL CROSS-CONNECTION CONTROL DEVICES SHALL BE INSTALLED AS REQUIRED BY THE LOCAL PLUMBING INSPECTOR AND IN ACCORDANCE WITH THE STANDARDS OF THE WATER RESOURCES COMMISSIONER OPERATION AND MAINTENANCE DIVISION AND THE MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY, DIVISION OF DRINKING WATER AND RADIOLOGICAL PROTECTION.
- ALL WATER SERVICE CONNECTIONS TWO (2) INCHES AND SMALLER SHALL BE MADE BY THE OAKLAND COUNTY DRAIN COMMISSIONER, OPERATIONS AND MAINTENANCE DIVISION AFTER WATER MAIN ACCEPTANCE AND APPLICABLE TAP PERMITS ARE OBTAINED.
- ALL FITTINGS AND BENDS SHOULD BE BLOCKED IN ACCORDANCE WITH THRUST BLOCK DETAILS, UNLESS ALTERNATE THRUST RESTRAINT SYSTEM, AS INDICATED IN PLANS AND SPECIFICATIONS, IS APPROVED BY WATER RESOURCES COMMISSIONER AND THE LOCAL MUNICIPALITY.

## WATER MAIN MATERIALS NOTES

- TEMPORARY CONNECTIONS, WHICH MAY BE MADE FOR CHLORINATING AND FLUSHING PURPOSES, SHALL INCLUDE A TESTABLE DOUBLE CHECK VALVE BACKFLOW PREVENTER WITH CURRENT CERTIFICATION.
- CORPORATION STOPS USED FOR INSERTION INTO MAINS SHALL BE MUELLER TYPE H-15000. ALL STOPS SHALL HAVE BRONZE CAST BODIES, KEYS, STEM WASHERS AND NUTS. INLET THREADS SHALL CONFORM TO THE LATEST VERSION OF AWWA C800.
- ALL DUCTILE IRON PIPE (D.I.P.) WATER MAINS SHALL BE DESIGNED FOR 150 PSI MINIMUM WORKING PRESSURE.
- THE DUCTILE IRON PIPE TO BE FURNISHED AND DELIVERED UNDER THIS SPECIFICATION SHALL MEET ALL THE REQUIREMENTS OF THE CURRENT AWWA C151 (ANSI A21.5), EXCEPT AS OTHERWISE SPECIFIED HEREIN. PIPE SHALL BE DOUBLE CEMENT-LINED AND SEAL COATED WITH AN APPROVED BITUMINOUS SEAL COAT IN ACCORDANCE WITH AWWA C104 (ANSI A21.4).
- DUCTILE IRON PIPE SHALL BE CLASS 54 FOR SIZES THREE (3) INCH THROUGH TWENTY (20) INCH. SIZE TWENTY-FOUR (24) INCH AND LARGER SHALL BE CLASS 55 DUCTILE IRON PIPE (ABBREVIATED "D.I." IN DETAILS AND ON THIS SHEET).
- PIPES OF SIZES LARGER THAN TWENTY-FOUR (24) INCHES IN NOMINAL DIAMETER SHALL MEET ALL THE REQUIREMENTS OF THE CURRENT AWWA C100 FOR DUCTILE IRON WATER PIPE.
- MECHANICAL AND SLIP-ON JOINTS FOR DUCTILE IRON WATER MAIN SHALL BE IN ACCORDANCE WITH AWWA C111 (ANSI A21.11).
- FLANGE JOINTS FOR DUCTILE IRON WATER MAIN SHALL BE IN ACCORDANCE WITH AWWA C110 (ANSI A21.10).
- FITTINGS FOR DUCTILE IRON PIPE SHALL BE DUCTILE IRON OR CAST IRON AND SHALL MEET REQUIREMENTS OF AWWA C110 (ANSI A21.10) OR AWWA C153 (ANSI A21.53). DUCTILE IRON FITTINGS SHALL BE RATED FOR 350 PSI. PIPE SIZES TWENTY-FOUR (24) INCH DIAMETER AND LESS AND 250 PSI FOR PIPE SIZES OVER TWENTY-FOUR (24) INCH DIAMETER. DUCTILE IRON FLANGE FITTINGS SHALL BE RATED FOR 250 PSI FOR ALL PIPE DIAMETERS.
- ALL BURIED BOLTS, NUTS, AND WASHERS SHALL BE CORTEN OR EQUIVALENT AND POLY-WRAPPED.

## VALVE AND SLEEVE NOTES

- GATE VALVES, SIZES THREE (3) INCH THROUGH SIXTEEN (16) INCH AND TAPPING VALVES SHALL BE LOCAL MUNICIPAL STANDARD AS DETAILED WITH NON-RISING STEM.
- ALL IN LINE GATE VALVES THREE (3) INCH AND LARGER SHALL BE IN WELLS AS DETAILED. SPECIFICATIONS SHALL INCLUDE THE DIRECTION OF OPERATION OF ALL VALVES.
- ALL GATE WELL COVERS SHALL BE LOCAL MUNICIPAL STANDARD AS DETAILED.
- ALL GATE VALVES WITH OPERATING NUTS AT A DISTANCE GREATER THAN FIVE (5) FEET BELOW GROUND SURFACE SHALL BE PROVIDED WITH AN EXTENSION STEM. THE LENGTH OF THE EXTENSION STEM SHALL REACH WITHIN FIVE (5) FEET FROM THE GROUND SURFACE. WHEN AN EXTENSION STEM IS USED, IT SHALL BE HELD IN PLACE BY AN EXTENSION STEM GUIDE SUITABLY FASTENED TO THE WALL OF THE GATE WELL. THE EXTENSION STEM SHALL BE MECHANICALLY ATTACHED TO THE OPERATING NUT. DETAILS OF THE EXTENSION SYSTEM AND THE METHOD OF INSTALLATION SHALL BE APPROVED BY THE ENGINEER PRIOR TO INSTALLATION.
- BUTTERFLY VALVES MAY BE USED FOR VALVES GREATER THAN 16-INCH DIAMETER AND SHALL BE MODEL 2F11 AS MANUFACTURED BY HENRY PRATT COMPANY OR APPROVED EQUAL.
- TAPPING VALVES SHALL BE SERIES "A" AS MANUFACTURED BY EAST JORDAN IRON WORKS OR RESILIENT SEATED GATE VALVES AS APPROVED BY LOCAL MUNICIPALITY.
- TAPPING SLEEVES SHALL BE MANUFACTURED BY ROMAC INDUSTRIES; MUELLER; EAST JORDAN; SMITH-BLAIR OR APPROVED EQUAL AND APPROVED BY WATER RESOURCES COMMISSIONER.

## HYDRANT REQUIREMENTS

- ALL HYDRANTS SHALL BE CONSTRUCTED WITH A SIX (6) INCH COMPANION GATE VALVE IN A THREE (3) PIECE, ADJUSTABLE DUCTILE IRON VALVE BOX, WHICH SHALL INCLUDE A FIVE AND ONE-QUARTER (5-1/4) INCH SCREW SHAFT. VALVE BOXES SHALL BE SERIES 6860 AS MANUFACTURED BY TYLER PIPE OR APPROVED EQUAL.
- ALL HYDRANTS SHALL BE EAST JORDAN IRON WORKS NO. 5-BR- TRAFFIC MODEL, OR MUELLER SUPER CENTURIAN MODEL 250, OR APPROVED EQUAL. SELF-DRAINING HYDRANTS SHALL NOT BE USED. ALL HYDRANTS SHALL BE LOCAL MUNICIPAL STANDARD AS DETAILED. HYDRANTS SHALL HAVE BREAKAWAY FLANGE.
- ALL HYDRANTS SHALL BE PAINTED RED ABOVE GROUND AND BLACK BELOW GROUND WITH A FINISH COAT OF GLOMORTEX 501 ENAMEL, COLOR 314 VERMILION OR APPROVED EQUAL. HYDRANT CAP SHALL BE PAINTED SAME COLOR AS THE HYDRANT.
- ALL FIRE HYDRANT JOINTS SHALL BE TOTALLY RESTRAINED BY THE USE OF MEC-A-LUGS OR OTHER RESTRAINED JOINT. THRUST BLOCKS ARE ALSO REQUIRED.

## ACCEPTANCE OF NEW WATER MAINS

- PRIOR TO WATER MAIN ACCEPTANCE THE FOLLOWING CONDITIONS MUST BE MET: 1) PRESSURE TESTING AND BACTERIA TESTING MUST BE COMPLETED IN ACCORDANCE WITH THE WATER RESOURCES COMMISSIONER 2) ALL EASEMENT AND RIGHT-OF-WAY ACQUISITION MUST BE ACCEPTED BY THE OAKLAND COUNTY DRAIN COMMISSIONER, RIGHT-OF-WAY DIVISION 3) THE LOCAL MUNICIPALITY MUST BE PROVIDED WITH THE BILL OF SALE AND 4) ALL MYLAR "RECORD DRAWINGS" MUST BE ACCEPTED AND APPROVED BY THE OAKLAND COUNTY DRAIN COMMISSIONER, OPERATIONS AND MAINTENANCE DIVISION. THE WATER RESOURCES COMMISSIONER AND LOCAL ENGINEER MUST WITNESS THE CONNECTION OF THE WATER MAIN TO THE EXISTING WATER MAIN, AFTER WHICH RESIDENTIAL AND COMMERCIAL TAPS WILL BE ALLOWED.
- THE CONTRACTOR SHALL NOTIFY THE WATER RESOURCES COMMISSIONER, OPERATIONS AND MAINTENANCE DIVISION THROUGH THE LOCAL ENGINEER FOR PRESSURE TESTING, BACTERIOLOGICAL SAMPLING, CONNECTIONS TO EXISTING WATER MAIN AND FINAL FIELD REVIEW. A SEVENTY-TWO (72) HOUR ADVANCE NOTICE IS REQUIRED.
- THE CONTRACTOR SHALL DISINFECT AND PRESSURE TEST ALL NEW WATER MAIN CONSTRUCTION PURSUANT TO THE CURRENT STANDARDS SPECIFIED BY THE WATER RESOURCES COMMISSIONER. THE WATER MAIN SHALL PASS A TEST OF 150 PSI FOR A TWO (2) HOUR PERIOD. WATER LOSS SHALL NOT EXCEED A RATE OF 11.65 U.S. GALLONS PER INCH DIAMETER PER MILE OF WATERLINE IN TWENTY-FOUR (24) HOURS.
- WHERE CONTRACTOR SUPPLIED GAUGES ARE REQUIRED, MINIMUM SIZE SHALL BE 3/4" DIAMETER OR LARGER GRADUATED IN ONE (1) OR TWO (2) POUND INCREMENTS FROM 1 TO 160 P.S.I. OR HIGHER.
- PRESSURE TESTING AND BACTERIA TESTING MUST BE COMPLETED PRIOR TO CONNECTING TO THE EXISTING WATER MAIN.

## WATER RESOURCES COMMISSIONER WATER SYSTEM STANDARDS - GATE VALVES

| COMMUNITY            | DIRECTION TO OPEN | VALVE TYPE      |               |
|----------------------|-------------------|-----------------|---------------|
|                      |                   | STD. GATE VALVE | TAPPING VALVE |
| BINGHAM FARMS        | RIGHT             | C500            | C500          |
| BLOOMFIELD HILLS     | RIGHT             | C500            | C500          |
| COMMERCE TOWNSHIP    | RIGHT             | C500 or C515    | C500 or C515  |
| FARMINGTON HILLS     | RIGHT             | C500            | C500          |
| HIGHLAND TOWNSHIP    | LEFT              | C500 OR C515    | C500 OR C515  |
| KEEGO HARBOR         | RIGHT             | C500            | C500          |
| LYON TOWNSHIP        | LEFT              | C500 or C515    | C500 OR C515  |
| OAKLAND TOWNSHIP     | LEFT              | C500 or C515    | C500 or C515  |
| ORCHARD LAKE VILLAGE | LEFT              | C500            | C500          |
| OXFORD TOWNSHIP      | LEFT              | C500 OR C515    | C500 OR C515  |
| PONTIAC              | LEFT              | C500            | C500          |
| ROYAL OAK TOWNSHIP   | RIGHT             | C500            | C500          |
| SPRINGFIELD TOWNSHIP | LEFT              | C500            | C500          |

- C500 GATE VALVE - MANUFACTURED BY EAST JORDAN IRON WORKS OR APPROVED EQUAL.
- C509 RESILIENT SEATED GATE VALVE - MANUFACTURED BY U.S. PIPE, MUELLER, EAST JORDAN IRON WORKS, AMERICAN FLOW CONTROL OR APPROVED EQUAL.

## FIRE HYDRANT NOZZLE SIZE AND THREAD SPECIFICATIONS

| LOCATION                                | PUMPER NOZZLE         | HOSE NOZZLE           | OPERATING NUT | STYLE |
|---|-----------------------|-----------------------|---------------|-------|
| BINGHAM FARMS                           | (1) - 3-3/4" - D.F.D. | (2) - 2-1/2" - D.F.D. | 1-1/8"        | 5 BR  |
| BLOOMFIELD HILLS                        | (1) - 3-3/4" - D.F.D. | (2) - 2-1/2" - D.F.D. | 1-1/8"        | 5 BR  |
| COMMERCE TWP/<br>WOLVERINE LAKE VILLAGE | (1) - 5" STORZ        | (2) - 2-1/2" - N.S.T. | 1-1/2"        | 5 BR  |
| FARMINGTON HILLS                        | (1) - 3-3/4" - D.F.D. | (2) - 2-1/2" - N.S.T. | 1-1/8"        | 5 BR  |
| HIGHLAND TOWNSHIP                       | (1) - 5" STORZ        | (2) - 2-1/2" - N.S.T. | 1-1/2"        | 5 BR  |
| KEEGO HARBOR                            | (1) - 3-3/4" - D.F.D. | (2) - 2-1/2" - D.F.D. | 1-1/8"        | 5 BR  |
| LYON TOWNSHIP                           | (1) - 5" - STORZ      | (2) - 2-1/2" - N.S.T. | 1-1/2"        | 5 BR  |
| OAKLAND TOWNSHIP                        | (1) - 4" - STORZ      | (2) - 2-1/2" - D.F.D. | 1-1/2"        | 5 BR  |
| ORCHARD LAKE VILLAGE                    | (1) - 3-3/4" - D.F.D. | (2) - 2-1/2" - D.F.D. | 1-1/8"        | 5 BR  |
| OXFORD TOWNSHIP                         | (1) - 5" STORZ        | (2) - 2-1/2" - N.S.T. | 1-1/2"        | 5 BR  |
| PONTIAC                                 | (1) - 3-3/4" - D.F.D. | (2) - 2-1/2" - D.F.D. | 1-5/8"        | 5 BR  |
| ROYAL OAK TOWNSHIP                      | (1) - 3-3/4" - D.F.D. | (2) - 2-1/2" - D.F.D. | 1-1/8"        | 5 BR  |
| SPRINGFIELD TOWNSHIP                    | (1) - 4-1/2" - N.S.T. | (2) - 2-1/2" - N.S.T. | 1-1/2"        | 5 BR  |

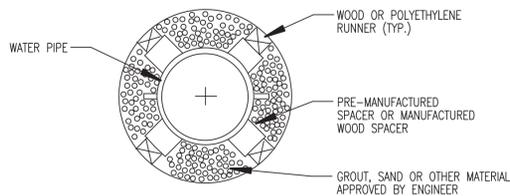
- D.F.D. - DETROIT FIRE DEPARTMENT THREAD
- N.S.T. - NATIONAL STANDARD THREAD
- STORZ NOZZLES SHALL BE COMPATIBLE WITH STORZ COUPLED LARGE DIAMETER FIRE HOSE. NOZZLES SHOULD BE MADE OF "LEAD FREE" BRASS OR ALUMINUM, AS APPROVED BY LOCAL CITY, VILLAGE OR TOWNSHIP. THE NOZZLE SHALL BE AN INTEGRAL PART OF THE HYDRANT, RESISTANT TO TAMPER AND REMOVAL. ENGAGEMENT LUGS SHALL BE ON THE NOZZLE AND CAP TO PREVENT FAILURE UNDER HIGH PRESSURE. NOZZLE AND CAP SHALL MEET AWWA C502 SPECIFICATIONS. NOZZLE SHALL BE COMPATIBLE WITH HOSE LOCK TO PREVENT HOSE FROM DISCONNECTING WHILE IN USE.

UNLESS OTHERWISE SPECIFIED, MINIMUM CASING PIPE SHALL BE ASTM A-139 GRADE B, WALL THICKNESS AS FOLLOWS:

| NOMINAL SIZE | MINIMUM WALL THICKNESS |
|--------------|------------------------|
| 8" - 42"     | 0.375                  |
| 48" - 60"    | 0.500                  |

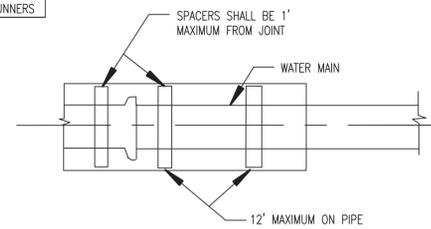
REQUIRED QUANTITY OF RUNNERS IN ACCORDANCE WITH SIZE

|                 |           |
|-----------------|-----------|
| TO 14" DIA.     | 4 RUNNERS |
| 16" TO 36" DIA. | 6 RUNNERS |
| 38" TO 48" DIA. | 8 RUNNERS |



SUPPORT FOR WATER MAIN  
CONSTRUCTED IN CASING PIPE

SCALE 1"= 4'



WATER MAIN IN CASING SECTION

SCALE 1"= 2'

## WATER MAIN IN CASING DETAILS

## WATER RESOURCES COMMISSIONER OPERATIONS AND MAINTENANCE DIVISION WATER SYSTEMS RECORD DRAWING SPECIFICATIONS

IN AREAS WHERE WATER SYSTEMS ARE OPERATED AND MAINTAINED BY THE WATER RESOURCES COMMISSIONER, OPERATIONS AND MAINTENANCE DIVISION, FINAL ACCEPTANCE OF THE WATER SYSTEM MUST BE RENDERED BY THE OAKLAND COUNTY DRAIN COMMISSIONER, OPERATIONS AND MAINTENANCE DIVISION, BEFORE THE SYSTEM CAN BE USED FOR THE SERVICE INTENDED.

ONE ITEM REQUIRED FOR FINAL ACCEPTANCE SHALL BE THE SUBMISSION OF RECORD DRAWINGS TO THE OAKLAND COUNTY DRAIN COMMISSIONER, OPERATIONS AND MAINTENANCE DIVISION, BY THE DESIGN ENGINEER. RECORD DRAWINGS SHALL BE DEFINED AS AND CONTAIN THE FOLLOWING INFORMATION:

- THE DESIGN ENGINEER SHALL FURNISH "RECORD DRAWINGS" WATER MAIN PLANS UPON JOB COMPLETION. "RECORD DRAWINGS" SHALL BE FORWARDED TO THE WATER RESOURCES COMMISSIONER BY THE LOCAL MUNICIPAL ENGINEER AFTER THEIR REVIEW AND APPROVAL.
- RECORD DRAWINGS SHALL BE PROVIDED ON THREE (3) MIL. MYLAR. XEROX OR ANY HEAT PROCESS REPRODUCTIONS WILL NOT BE ACCEPTED.
- ALONG WITH THE MYLAR PLAN SET, PROVIDE TWO (2) SETS OF BLUEPRINTS, PRODUCED FROM THE MYLARS AND THE PLANS ON ELECTRONIC MEDIA IN AUTOCAD FORMAT (LATEST VERSION).
- EACH AND EVERY SHEET SHALL BE SEALED BY THE PROJECT DESIGN ENGINEER, ALONG WITH THE FOLLOWING CERTIFICATION STATEMENT ON THE COVER SHEET:

I HEREBY CERTIFY THAT OUR FIRM HAS PREPARED THESE RECORD DRAWINGS OF THE IMPROVEMENTS AS CONSTRUCTED, AND THAT TO THE BEST OF MY KNOWLEDGE THOSE IMPROVEMENTS NOTED AS "RECORD DRAWINGS" WERE CONSTRUCTED IN SUBSTANTIAL CONFORMANCE WITH THE APPROVED CONSTRUCTION PLANS; AND ALSO THAT THE WATER MAIN AND STRUCTURES, AS CONSTRUCTED, LIE WITHIN THE EASEMENT DESCRIPTIONS REQUIRED BY THE WATER RESOURCES COMMISSIONER'S OFFICE.

\_\_\_\_\_  
(COMPANY NAME)

\_\_\_\_\_  
(ENGINEER'S SIGNATURE)

PROFESSIONAL ENGINEER NO. \_\_\_\_\_

\_\_\_\_\_  
ENGINEER SEAL

- THE MINIMUM SCALE SHALL BE ONE (1) INCH EQUALS ONE HUNDRED (100) FEET.
- THE SIZE, LENGTH, CLASS AND MANUFACTURER OF PIPE INSTALLED SHALL BE INDICATED.
- THE SIZE, BRAND AND MODEL NUMBERS OF ALL VALVES AND HYDRANTS INSTALLED SHALL BE INDICATED.
- A TOTAL RECORD DRAWING QUANTITY LIST SHALL BE INCLUDED, AS WELL AS A RECORD DRAWING QUANTITY LIST ON EACH INDIVIDUAL SHEET.
- THE LOCATIONS SHALL BE SHOWN ON THE PLANS WITH AN ACCURACY OF ONE (1) FOOT.
- THE OFFSET OF THE WATER MAIN FROM PROPERTY LINES SHALL BE INDICATED.
- ALL GATE VALVE WELLS, HYDRANTS AND ALL WATER SYSTEM APPURTENANCES SHALL BE LOCATED FROM THE NEAREST PROPERTY CORNER.
- ALL UNDERGROUND APPURTENANCES, SUCH AS GATE VALVE WELLS, METER PITS, PRESSURE REDUCING VALVE PITS, ETC. SHALL BE LOCATED FROM THE NEAREST HYDRANT THAT IS CONNECTED TO THE SAME WATER MAIN AS THE APPURTENANCE.
- THE LOCATION, SIZE, BRAND AND MODEL NUMBER OF EVERY RESTRAINED JOINT SHALL BE NOTED.
- THE ACCURATE LOCATION OF ALL UTILITY CROSSINGS WHERE THE RECOMMENDED SEPARATION, VERTICALLY OR HORIZONTALLY, IS LESS THAN THE TEN STATE STANDARDS SHALL BE NOTED.

## WATER MAIN STANDARD DETAILS

| REVISION BLOCK |          |            |  |
|----------------|----------|------------|--|
| Rev. No.       | Rev. By: | Rev. Date: | Description  |
| 1              | WRC      | 08/05/22   | NOTE AND DIGITAL UPDATES   |
| 2              | WRC      | 10/10/26   | NOTE UPDATES PER REVIEW  |
| 3              | WRC      | 05/27/10   | UPDATE TO FIRE HYDRANT NOZZLE SIZE AND THREAD SPECIFICATIONS     |
| 4              | WRC      | 03/19/13   | PRINTING AND DRAWING ADDED TO THE VALVE & HYDRANT SPECIFICATIONS |

ORIG. DATE: 01/01/01

SCALE: NONE

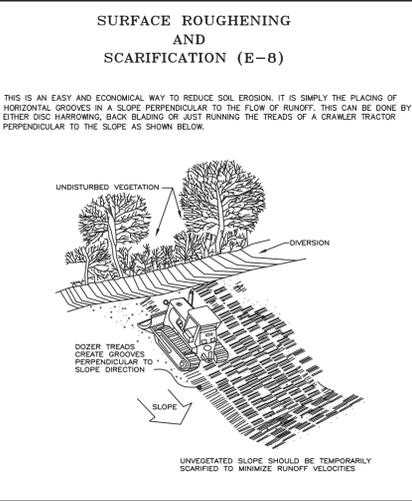
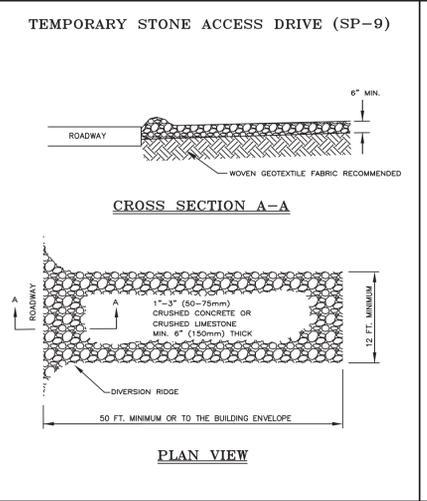
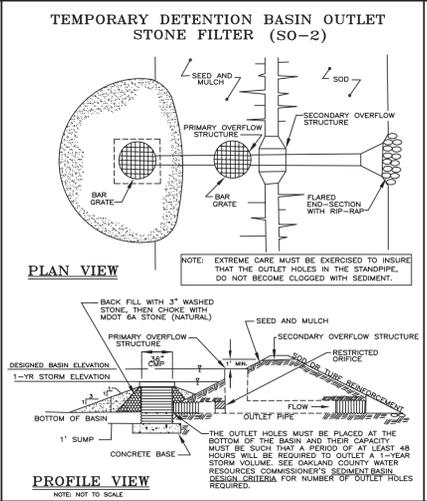
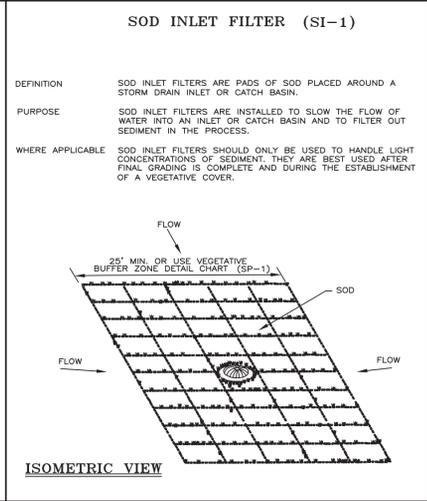
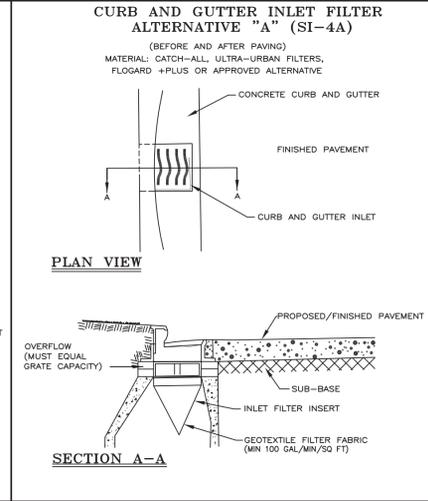
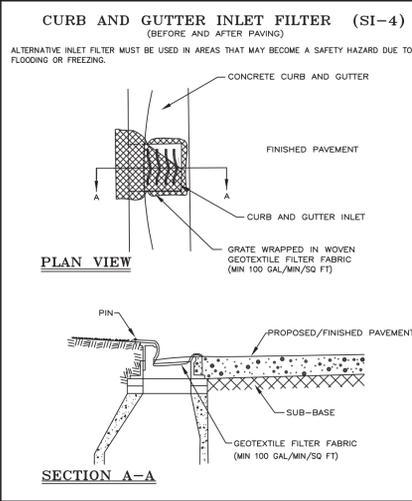
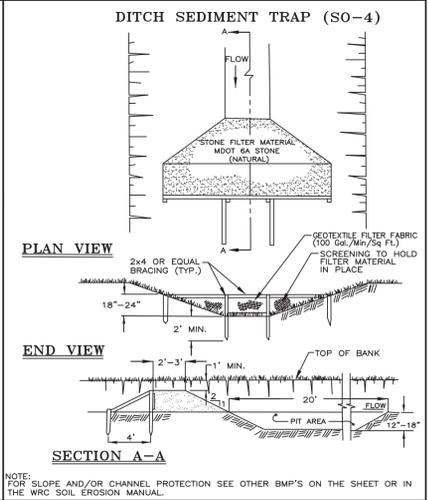
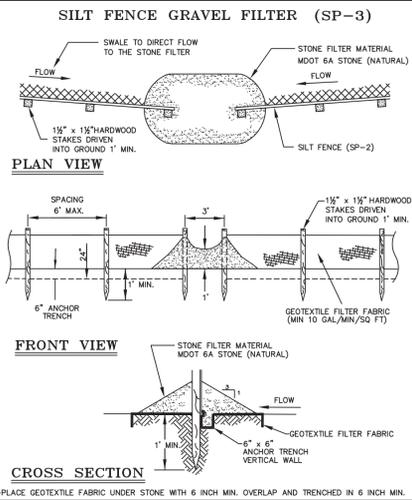
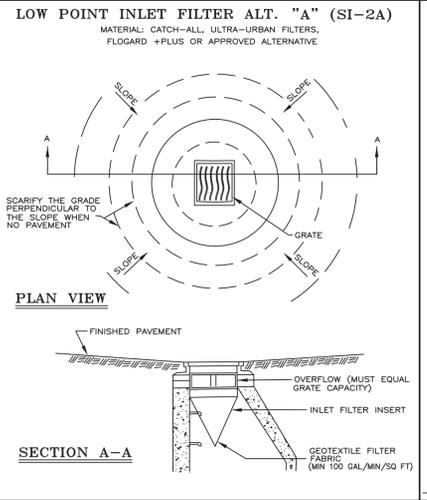
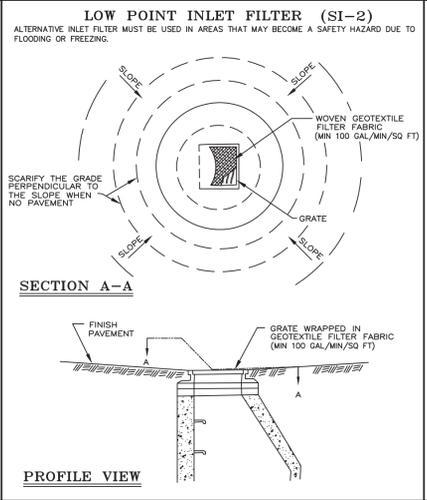
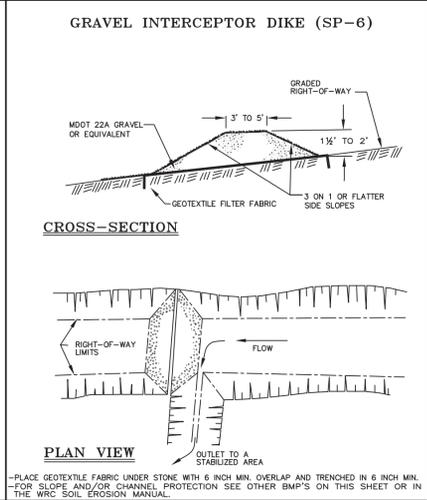
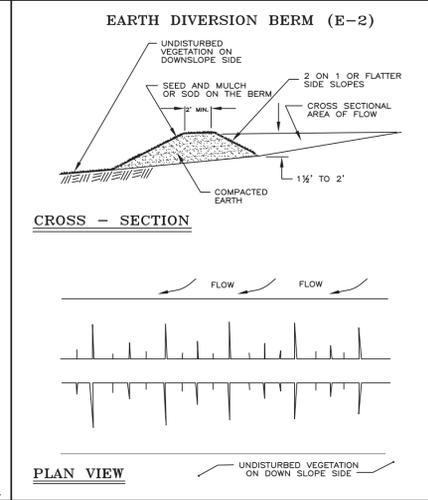
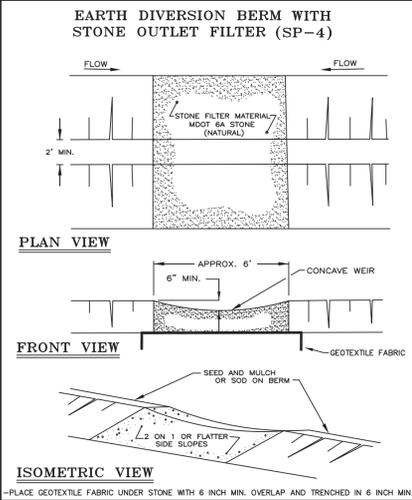
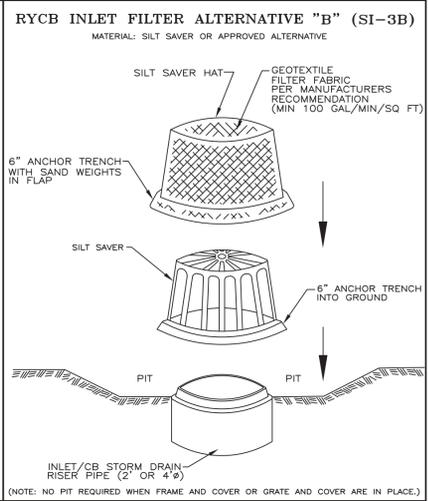
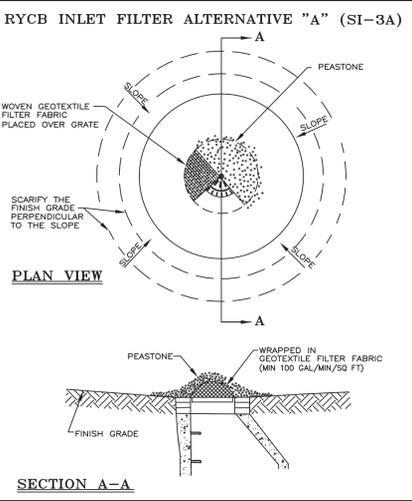
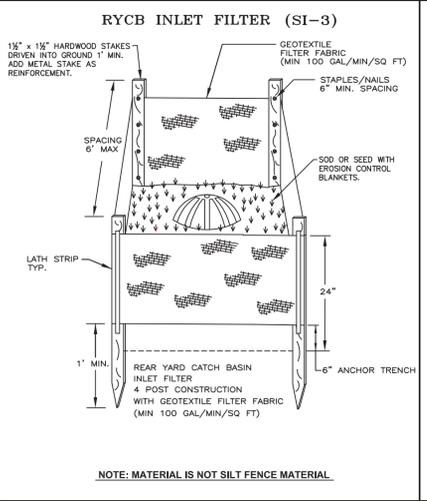
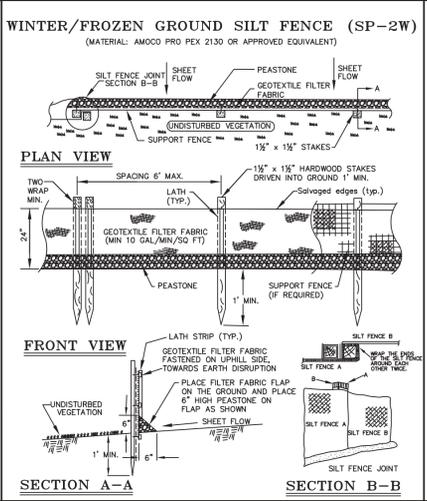
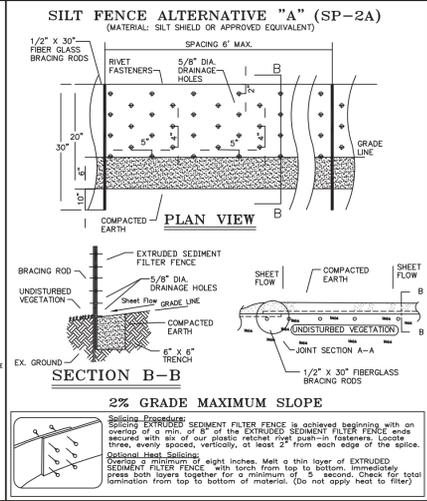
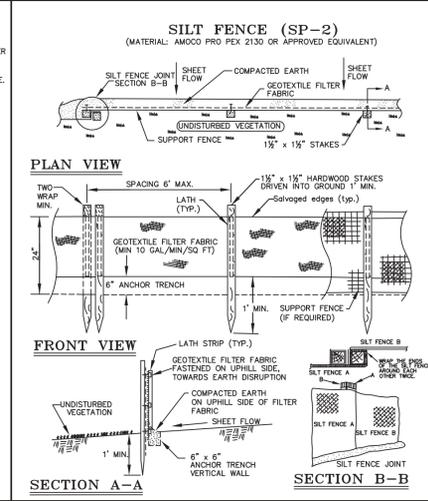
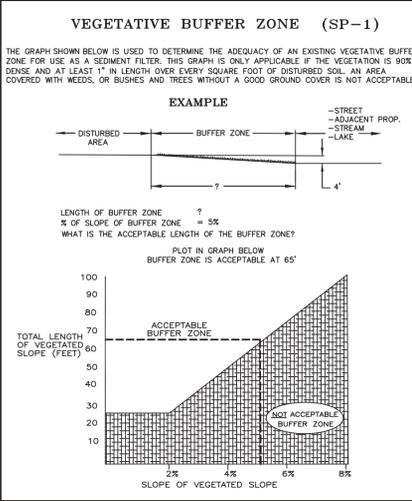
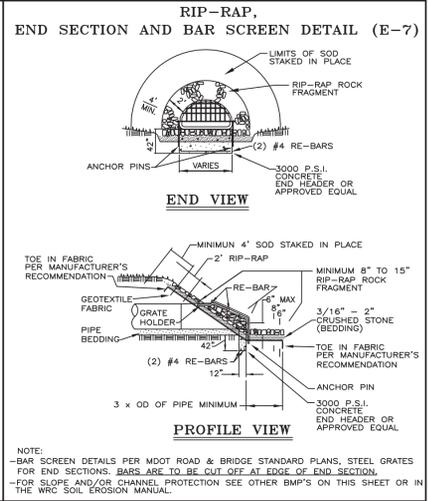
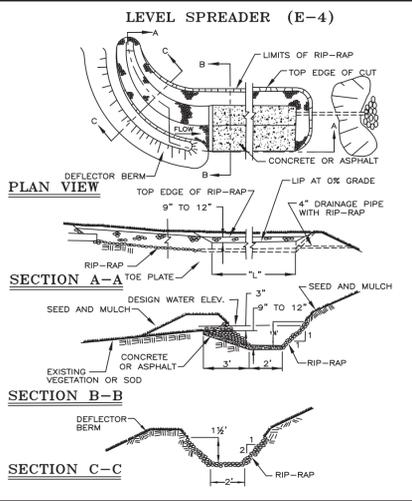
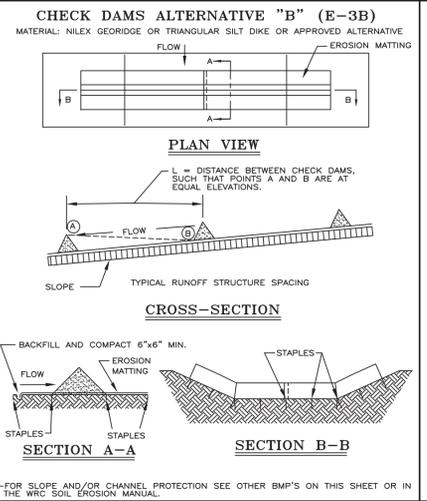
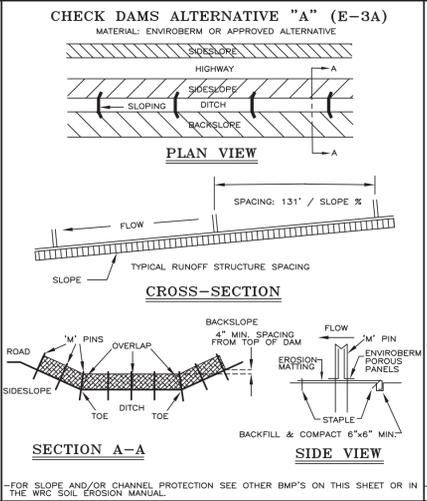
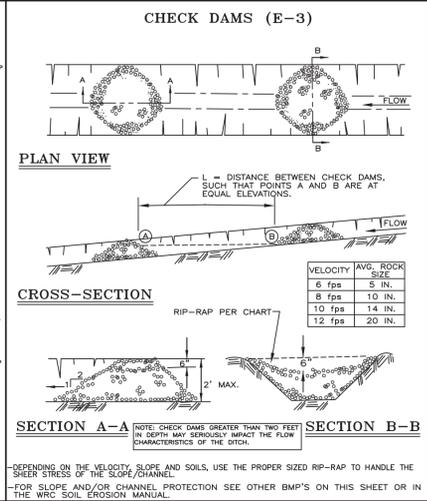
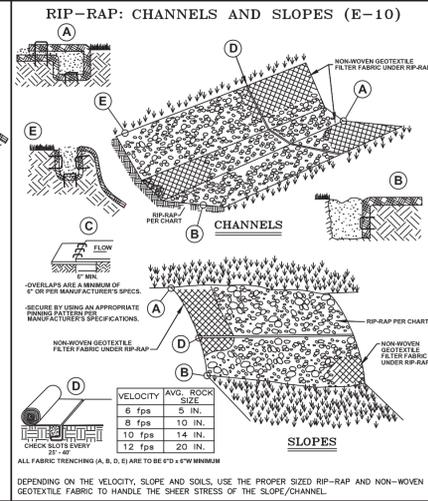
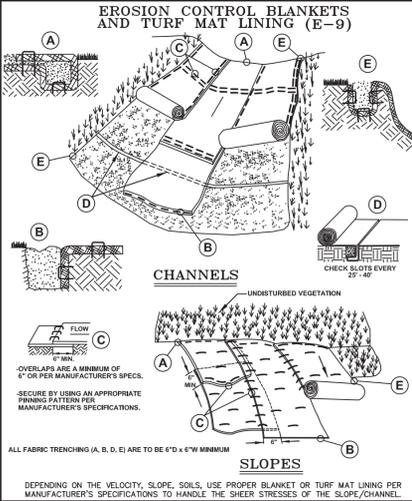
DESIGNED BY: WRC

DRAWN BY: WRC Mapping

**WRC**  
WATER RESOURCES COMMISSIONER  
Jim Nash

ONE PUBLIC WORKS DRIVE, BLDG 95 WEST  
WATERFORD, MICHIGAN  
48328-1907

SHEET NO.: 3 OF 3



**NOTE:**

WHILE PERFORMING WORK INVOLVING GROUNDS MAINTENANCE AND/OR THE CONSTRUCTION/MAINTENANCE OF ANY INFRASTRUCTURE, INCLUDING ROADS, WATER MAINS, SANITARY SEWERS, STORM DRAINS AND STORM WATER BEST MANAGEMENT PRACTICES (BMPs), CONTRACTORS SHALL MINIMIZE POLLUTION FROM STORM WATER RUNOFF THAT CAN AFFECT WATER QUALITY RELATED TO WORK ACTIVITIES. POLLUTANTS THAT COULD IMPAIR WATER QUALITY MAY INCLUDE FUEL, GREASE AND OIL, NUTRIENTS, BACTERIA AND PATHOGENS, LITTER AND DEBRIS, AND SOIL EROSION AND SEDIMENTATION. APPLICABLE BMPs SHALL BE IMPLEMENTED BY THE CONTRACTOR TO THE MAXIMUM EXTENT PRACTICABLE TO PROTECT WATER QUALITY AND WILDLIFE HABITAT.

### SOIL EROSION AND SEDIMENTATION CONTROL DETAILS

| REV. | DATE     | DESCRIPTION                             |
|------|----------|---|
| 1    | 01/01/01 | ISSUED FOR CONSTRUCTION                 |
| 2    | 01/01/01 | PROPOSED DETAIL REVISIONS               |
| 3    | 01/01/01 | FOR CONSTRUCTION APPROVAL, NAME CHANGES |
| 4    | 01/01/01 | FOR CONSTRUCTION APPROVAL, NAME CHANGES |
| 5    | 01/01/01 | FOR CONSTRUCTION APPROVAL, NAME CHANGES |

ORIG. DATE: 01/01/01

SCALE: NONE

DESIGNED BY: WRC

DRAWN BY: Mapping

WATER RESOURCES COMMISSIONER

ONE PUBLIC WORKS DRIVE, BLDG 905 WEST WATERFORD, MICHIGAN 48320-1907

SHEET NO.: 1 of 1