KEY TO COUNTIES

GENESSEE COUNTY

PLANS FOR

FLOYD J McCREE SURFACE PARKING LOT

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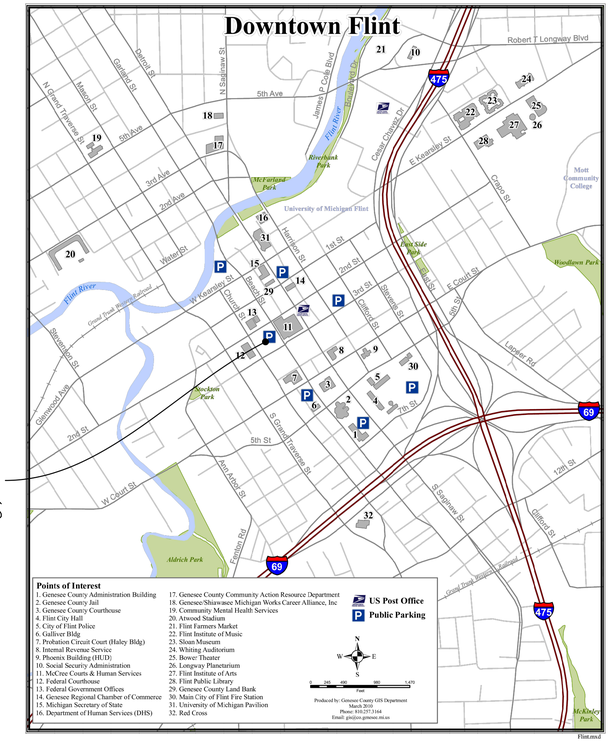
C-002	Site Grading Plan
C-003	Site Utility Plan
C-004	Landscaping Plan
A-001	Architectural Specifications and Details
E-001	Electrical Title Sheet
E-002	Electrical Site Plan
E-003	Electrical & Lighting Specifications
E-004	Electrical Gate and Controller Specifications (NOT INCLUDED IN SET)
	Plans of Demolished Parking Structure (FOR REFERENCE ONLY)

PROJECT LOCATIONS



LOCATION MAP

GENESSEE COUNTY
BOARD OF COMMISSIONERS

1101 BEACH STREET, ROOM 223, FLINT, MI 48502-1470 (810) 257-3020

BRYANT W. NOLDEN	DISTRICT 1
BRENDA CLACK	DISTRICT 2
ELLEN ELLENBERG	DISTRICT 3
KIM COURTS	DISTRICT 4
MARK YOUNG – CHAIRMAN	DISTRICT 5
DREW SHAPIRO	DISTRICT 6
MARTIN COUSINEAU	DISTRICT 7
TED HENRY	DISTRICT 8
DAVID MARTINI	DISTRICT 9

PREPARED UNDER THE SUPERVISION OF

RYAN WHITEHERSE — REGISTERED PROFESSIONAL ENGINEER

52538 — REGISTRATION NO.

JOHNSON & ANDERSON, INC. — ORGANIZATION

Johnson&Anderson

4494 Elizabeth Lake Road
Waterford, Michigan 48328
tel (248) 681-7800
fax (248) 681-2660

950 W. Norton Avenue, Suite 207
Muskegon, Michigan 49441
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2387 S. Linden Road, Suite B-142
Flint, Michigan 48532
tel (810) 820-9159
fax (248) 681-2660

J&A PROJECT No.:18528

SOIL EROSION AND SEDIMENTATION CONTROL NOTES AND MAINTENANCE NOTES

1. This Project shall be constructed in compliance with Part 91 of Act 451 of 1994 as amended, the Soil Erosion and Sedimentation Control Act and the Genesee County Drain Commissioner Soil Erosion and sedimentation Control requirements
2. All erosion and sedimentation control work shall conform to the standards and specifications of the Genesee County Drain Commissioner.
3. Erosion and any sedimentations from work on this site shall be contained on the site and not allowed to collect on any off site areas or in Waterways. Waterways include both natural and man made open ditches, streams, storm drains, lakes and ponds.
4. Staging the work will be done by the Contractor as directed in these plans and as required to ensure progressive stabilization and maintenance of disturbed earth change.
5. The Contractor shall be responsible for installation and maintenance of soil erosion and sedimentation control devices.
6. The Contractor shall implement and maintain the soil erosion control measures as shown on the plans before and at all times during construction of this project. Any modifications or additions to soil erosion control measures due to construction or changed conditions shall be complied with as required or directed by the Office of the Genesee County Drain Commissioner.
7. If any of SESC measures on the site are deemed inadequate or ineffective, the Genesee County Drain Commission has the right to require additional SESC measures at the expense of the Contractor.
8. The Soil Erosion and Sedimentation Control Measures shall be maintained weekly and after every storm event by the Contractor.
9. Install silt fence as indicated on the plans and at additional areas as necessary.
   - A Silt Fence shall be installed per detail.
   - B Build up of sediment shall be removed when sediment accumulates to 1/3 to 1/2 of the height of the silt fence.
   - C If silt fence fabric decomposes or becomes ineffective prior to the end of expected usable life and the barrier is still required, the silt fence shall be replaced promptly.
   - D Silt fence shall be inspected weekly under normal conditions, within 24 hours of rainfall and daily during a prolonged rain event. Required maintenance shall be provided promptly.
10. Install Inlet Filter on all permanent catch basins per detail.
    - A Inlet filters shall be inspected weekly under normal conditions, within 24 hours of a rainfall and daily during a prolonged rain event.
    - B Buildup of sediment and debris shall be removed promptly.
    - C If fabric decomposes or becomes ineffective prior to the end of expected usable life and the barrier is still required, the silt fence shall be replaced promptly.

Install drain guards on all catch basins per detail, seed or sod the area between the silt fence and the inlet.

- A Drain guards shall be inspected weekly during normal conditions, within 24 hours of rainfall and daily during a prolonged rain event.
- B Build up of sediment shall be removed when sediment accumulates to 1/3 to 1/2 of the height of the silt fence.
- C If fabric decomposes or becomes ineffective prior to the end of expected usable life and the barrier is still required, the silt fence shall be replaced promptly.

11. Utilities and Pump station
    - A The road right-of-way must be seeded and mulched within five days after utilities have been installed. If this is not possible, all SESC measures must stay in place and must be maintained until permanent stabilization in completed.
12. All stockpiled soils shall be maintained in such a way as to prevent erosion from leaving the site. If the stockpile will be on site for more than 30 days, then the stockpile must be seeded. Silt fence must be installed around the perimeter of the stockpile. Immediately after seeding, mulch all seeded areas with unweathered small grain straw, spread uniformly at the rate of 1 to 2 tons per acre or 100 pounds (2-3 bales) per 1000 square feet. This mulch should be anchored with disc type mulch anchoring tool or other means as approved by the Genesee County Drain Commissioner. Mulch matting may be used in lieu of loose mulch.
13. If any dewatering is needed, it shall be discharged through a filter bag over a well vegetated area. The pump must discharge at a non-erosive velocity. If necessary, an approved energy dissipater may be used.
14. All dirt tracked onto roadways shall be removed immediately.
15. Streets and or parking areas will be scraped on a daily basis and swept at a minimum of once per week by the landowner or landowners representative.
16. During dry periods, all disturbed areas shall be watered for dust control.
17. Permanent soil erosion control measures for all slopes, channels, ditched, or any disturbed land area shall be completed within 5 calendar days after final grading or the final earth change has been completed. When it is not possible to permanently stabilize a disturbed area after earth change activity ceases, temporary soil erosion control measures shall be implemented immediately. All temporary soil erosion control shall be maintained until permanent soil erosion control measures are implemented. All permanent soil erosion control measures will be implemented and established before a certificate of compliance is issued.
18. Final grade. establish vegetation and or landscape all disturbed areas not built or paved upon.
19. Remove all temporary soil erosion control devices after permanent stabilization is established.

GENERAL NOTES

General:

1. Contractor to notify Engineer immediately of discrepancies or of missing information.
2. Utility locations are depicted from records provided by the respective utility company. Locations, sizes and depths shall be field verified by the contractor.
3. Sanitary sewer lead locations are depicted from records provided by the Owner. Locations, sizes and depths shall be field verified by the contractor.
4. Drives shall be accessible at all times unless prior arrangements have been made with the respective property owner(s).
5. The contractor shall coordinate all service interruptions with the residents a minimum of 48 hours prior to the interruptions. Contractor is responsible for all notifications.
6. All signs within project limits shall be salvaged and reinstalled incidental to the contract.
7. Contractor is responsible for providing advance notice to property owners of service interruptions.
8. All sidewalk curb ramps at intersections shall have ADA EJIW detectable warning surfaces. Refer to MDOT detail R-28.
9. All abandoned sewer main, within project limits, shall be removed.
10. Contractor shall notify local businesses that will be directly impacted by closures.
11. All tree removals shall be field determined and authorized by the Engineer.
12. Concrete & composite pavement repairs shall be in accordance with MDOT Standard Detail R-44. Joint types shall match the adjacent joints. If edge of pavement repair is not at an existing joint, tied, joint (Trg) type shall be used.

Restoration:

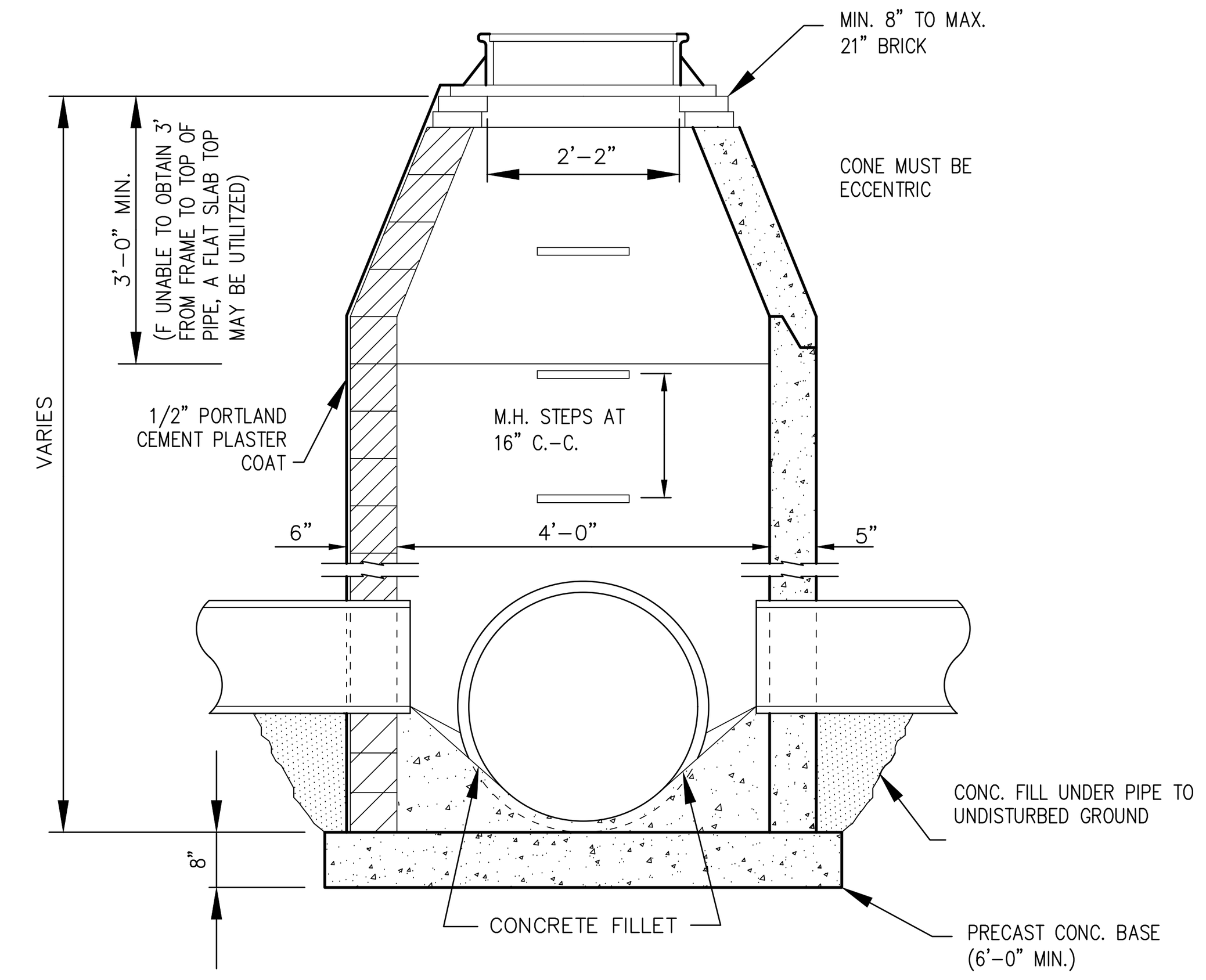
1. Replace all disturbed curbs ramps.
2. Restore all disturbed landscape.

Permits Required:

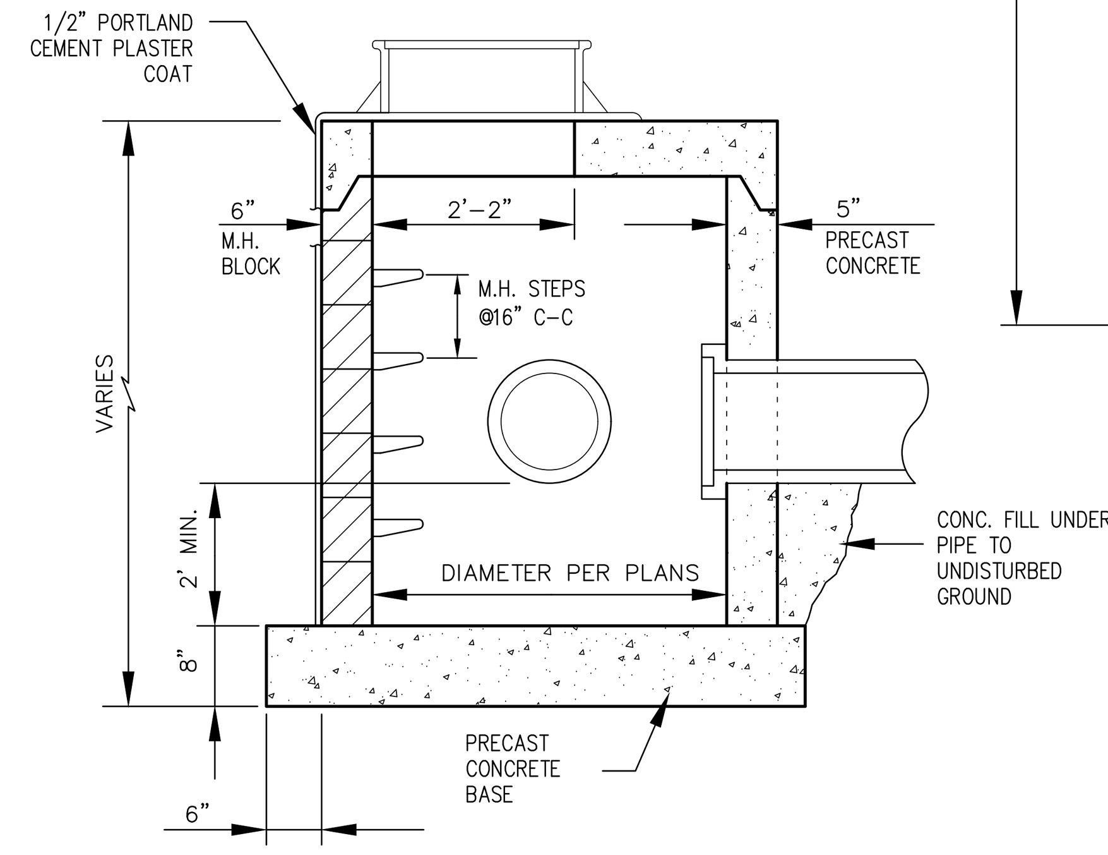
- Genesee County Drain Commissioner Soil Erosion and Sediment Control permit
- City of Flint (Right of Way)

Abbreviations:

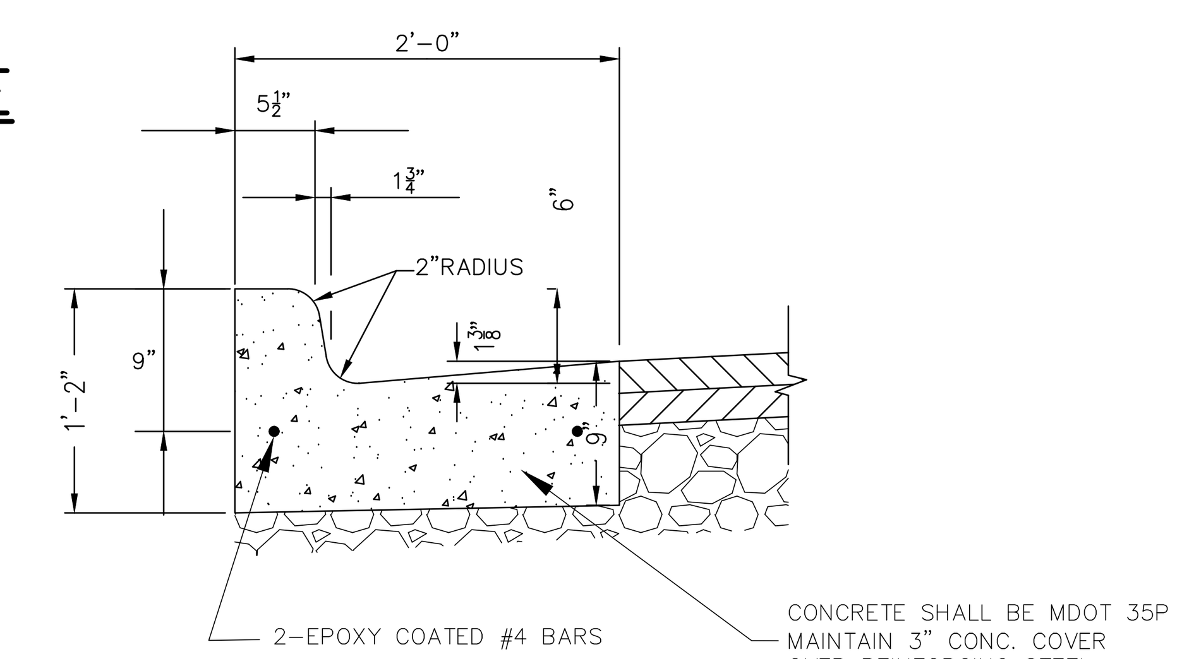
F/S = Finished Surface
T/C = Top of Curb
T/W = Top of Walk
C/C = Curb Cut
San = Sanitary
MH = Manhole



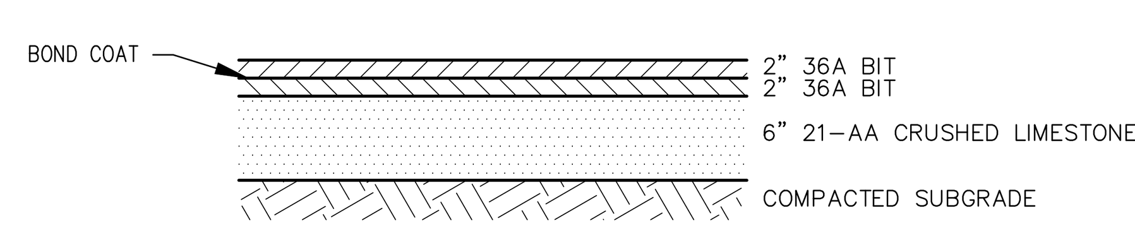
STORM MANHOLE
NO SCALE



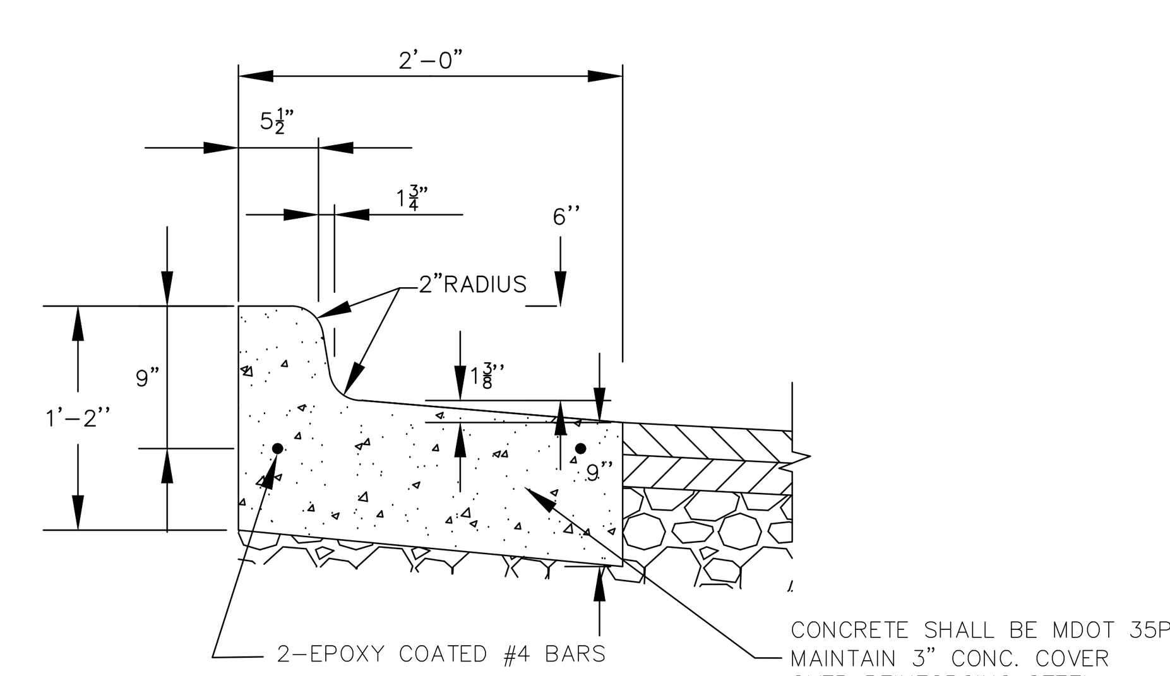
CATCH BASIN-FLAT SLAB
NO SCALE



STANDARD F-4 CURB AND GUTTER DETAIL
PER MDOT R-30 SERIES STANDARD PLAN NO SCALE



BITUMINOUS PAVING SECTION
NO SCALE



MODIFIED F-4 CURB AND GUTTER DETAIL
NO SCALE

LEGEND

EXISTING

- WATER MAIN
- SANITARY SEWER
- SL — SLUDGE LINE
- FM — FORCE MAIN
- STORM SEWER
- G — GAS MAIN
- E — UNDERGROUND ELECTRIC
- C — UNDERGROUND CABLE
- T — UNDERGROUND TELEPHONE/CONDUIT
- FO — UNDERGROUND FIBER OPTIC
- LIGHT POLE
- GUY ANCHOR
- GUY POLE
- UTILITY POLE
- TELEPHONE MANHOLE
- U/G TELEPHONE BOX
- U/G CABLE TV BOX
- U/G ELECTRIC BOX
- TRANS — TRANSFORMER
- GAS METER
- ELECTRIC METER
- ELECTRIC MANHOLE
- ELECTRIC OUTLET
- ELECTRIC GROUND LIGHT
- MAILBOX
- SIGN
- METAL POST
- CONCRETE FILLED POST
- GUARD POST
- FLAGPOLE
- WATER SERVICE VALVE BOX
- GATE VALVE IN WELL
- WATER VALVE
- SPRINKLER VALVE
- SPRINKLER HEAD
- FIRE HYDRANT
- FIRE HYDRANT VALVE
- STORM MANHOLE
- CATCH BASIN
- SANITARY MANHOLE
- CLEAN OUT
- FOUND IRON/RE-ROD/PIPE
- FOUND MONUMENT
- x645.92 — ELEVATION TAKEN HERE
- E.U/G — ELECTRIC MARKER
- GAS MARKER
- CONSUMERS ENERGY GAS MARKER
- CONSUMERS ENERGY GAS TEST STATION
- GAS LINE TEST STATION
- GAS VALVE
- GAS MANHOLE
- GAS LIGHT
- GAS STATION FILL PIPE
- AIR FILLL TANK
- DECIDUOUS TREE w/DRIPLINE
- CONIFEROUS TREE w/DRIPLINE
- BUSH

EX. PAVEMENT LEGEND

- EX. BITUMINOUS PAVEMENT
- EX. GRAVEL
- EX. CONCRETE

PROPOSED

- TAPPING SLEEVE VALVE & WELL
- GATE VALVE & WELL
- HYDRANT
- DETECTABLE WARNING SURFACE
- SILT FENCE
- SILT SACK

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MISS DIG System, Inc.
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WARNING

UTILITY LOCATIONS ARE NOT CONFIRMED. THOSE SHOWN WERE OBTAINED FROM UTILITY OWNERS OR PLANS. THREE FULL WORKING DAYS PRIOR TO BEGINNING WORK THE CONTRACTOR SHALL NOTIFY UTILITY OWNERS TO HAVE WORK AREA STAKED AND HE SHALL PROTECT OR HAVE RELOCATED, AS NOTED IN THE SPECIFICATIONS, ALL UTILITIES THAT MIGHT INTERFERE WITH CONSTRUCTION.

Genesee County
1101 Beach St
Flint, Michigan 48502

LEGEND & NOTES
Surface Parking Lot

SCALE 1" = 30'
0 30' 60'

MARK	ISSUED FOR	DATE
	BIDS	10/18/17
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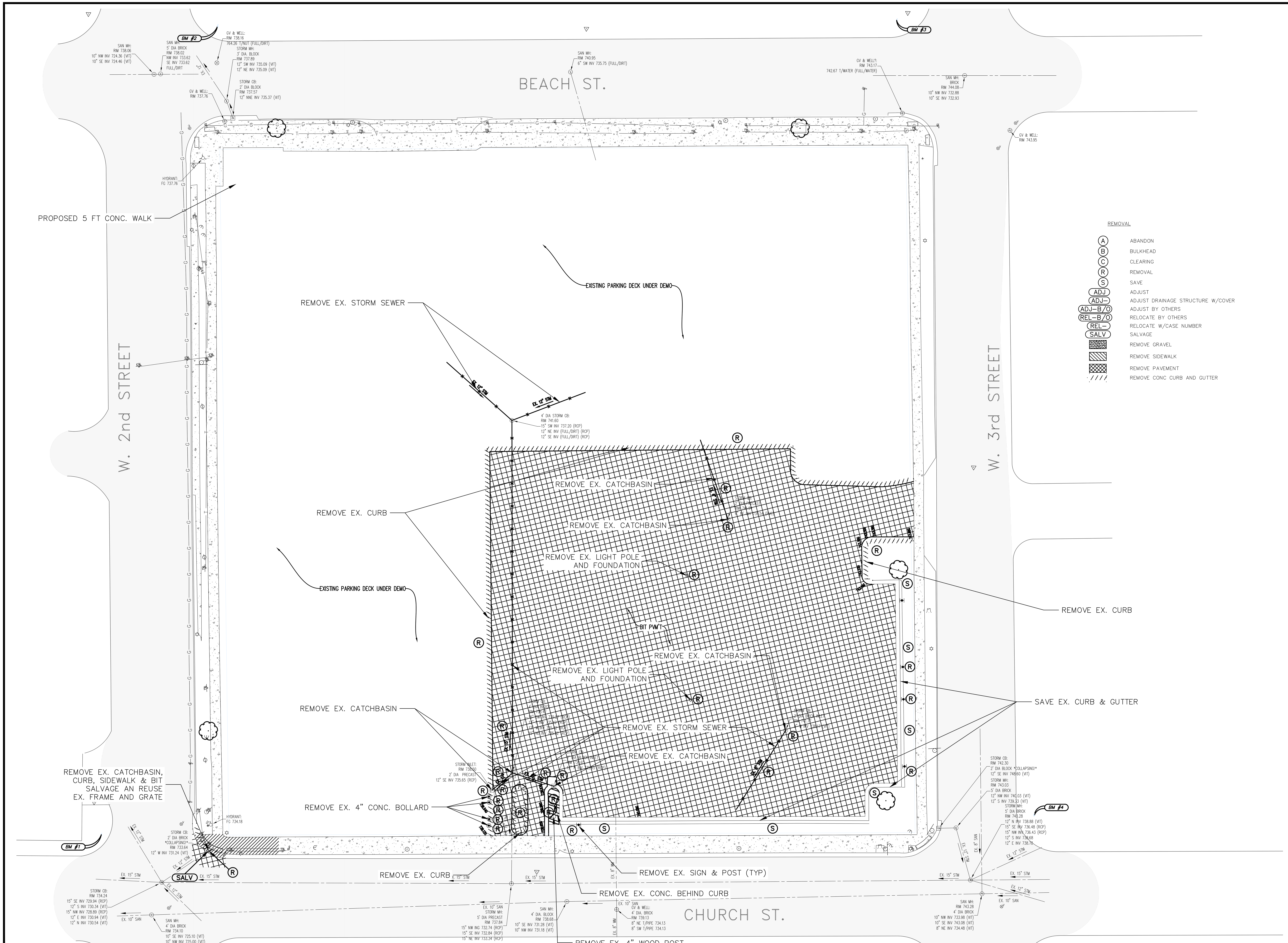
DRAWN BY: RPW
DESIGN BY: RPW
CHECKED BY:

J&A JOB NUMBER: 18528

SHEET NO.
G-001



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Genesee County
1101 Beach St
Flint, Michigan 48502

DEMOLITION PLAN
Surface Parking Lot

MARK	ISSUED FOR	DATE
	BIDS	10/18/17
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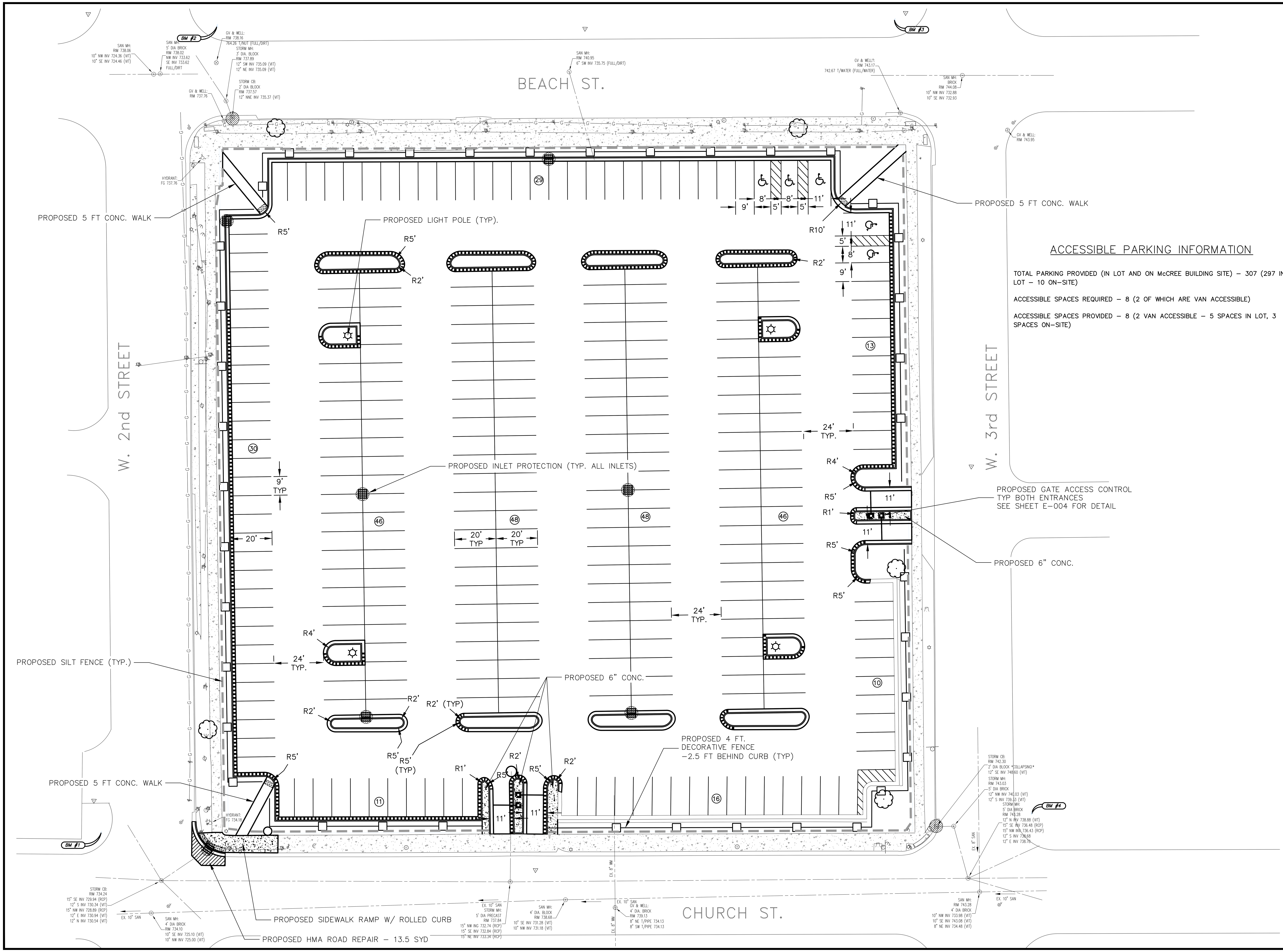
DRAWN BY: J&A
DESIGN BY: –
CHECKED BY: –

J&A JOB NUMBER: 18528

SHEET NO. V-001



ACCESSIBLE PARKING INFORMATION

TOTAL PARKING PROVIDED (IN LOT AND ON McCREE BUILDING SITE) – 307 (297 IN LOT – 10 ON–SITE)

ACCESSIBLE SPACES REQUIRED – 8 (2 OF WHICH ARE VAN ACCESSIBLE)

ACCESSIBLE SPACES PROVIDED – 8 (2 VAN ACCESSIBLE – 5 SPACES IN LOT, 3 SPACES ON–SITE)

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Genesee County
1101 Beach St
Flint, Michigan 48502

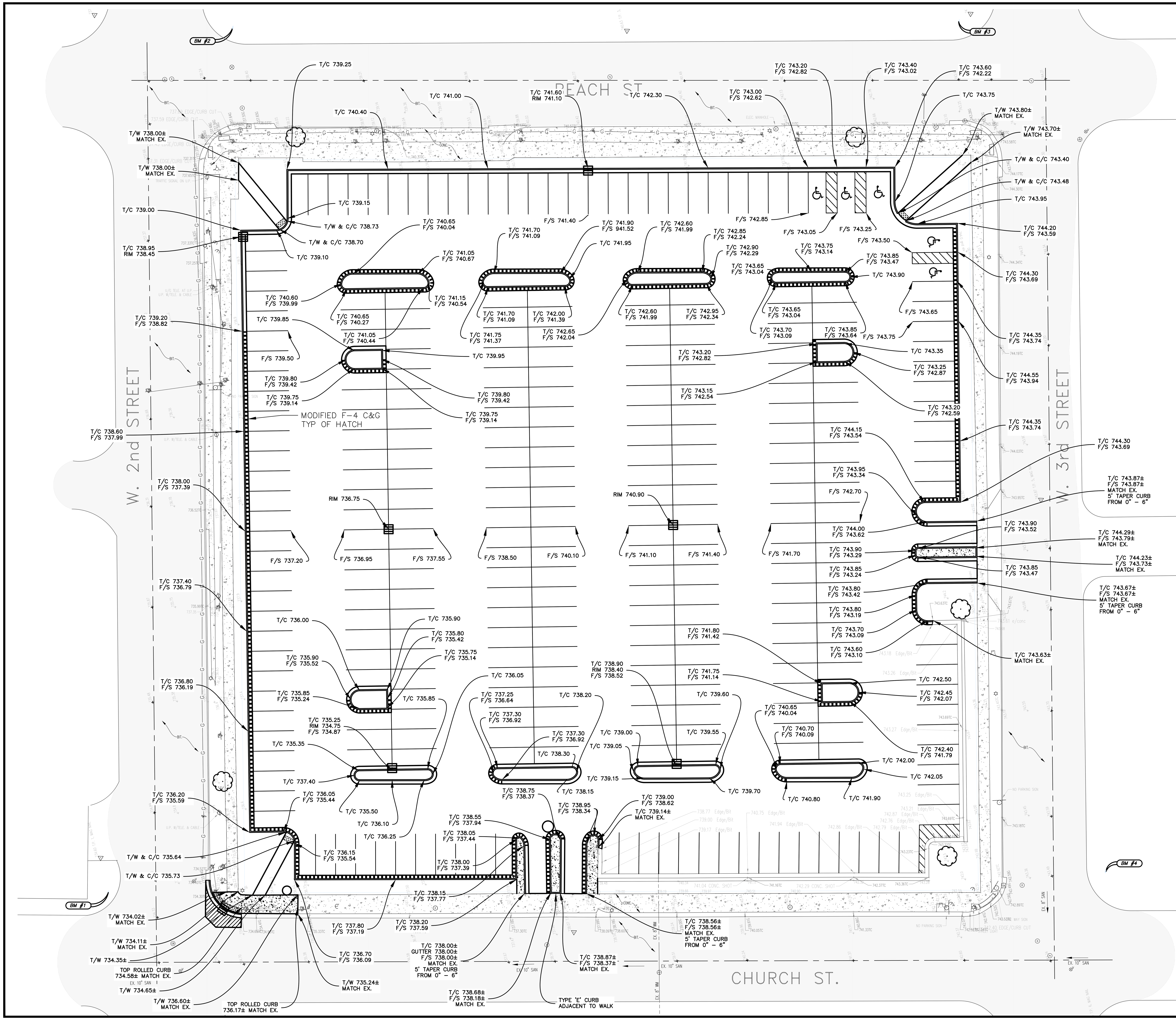
SITE PLAN
Surface Parking Lot

MARK	ISSUED FOR	DATE
	BIDS	10/18/17

DRAWN BY: J&A
DESIGN BY: –
CHECKED BY: –

J&A JOB NUMBER: 18528

SHEET NO. C-001



B.M. #1 ELEV. = 735.04 NAVD 1988
NAIL IN SE FACE/UTIL POLE @ NE QUAD OF 2ND & CHURCHILL STREET

B.M. #2 ELEV. = 740.67 NAVD 1988
ARROW ON HYDRANT @ SE QUAD. OF 2ND & BEACH ST.

B.M. #3 ELEV. = 745.38 NAVD 1988
ARROW ON HYDRANT @ NE QUAD OF 3RD AND BEACH STREET

B.M. #4 ELEV. = 745.87 NAVD 1988
ARROW ON HYDRANT@ SE QUAD OF 3RD & CHURCH STREET

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Genesee County
1101 Beach St
Flint, Michigan 48502

SITE GRADING PLAN
Surface Parking Lot

0 20' 40'
SCALE

MARK	ISSUED FOR	DATE
	BIDS	10/18/17
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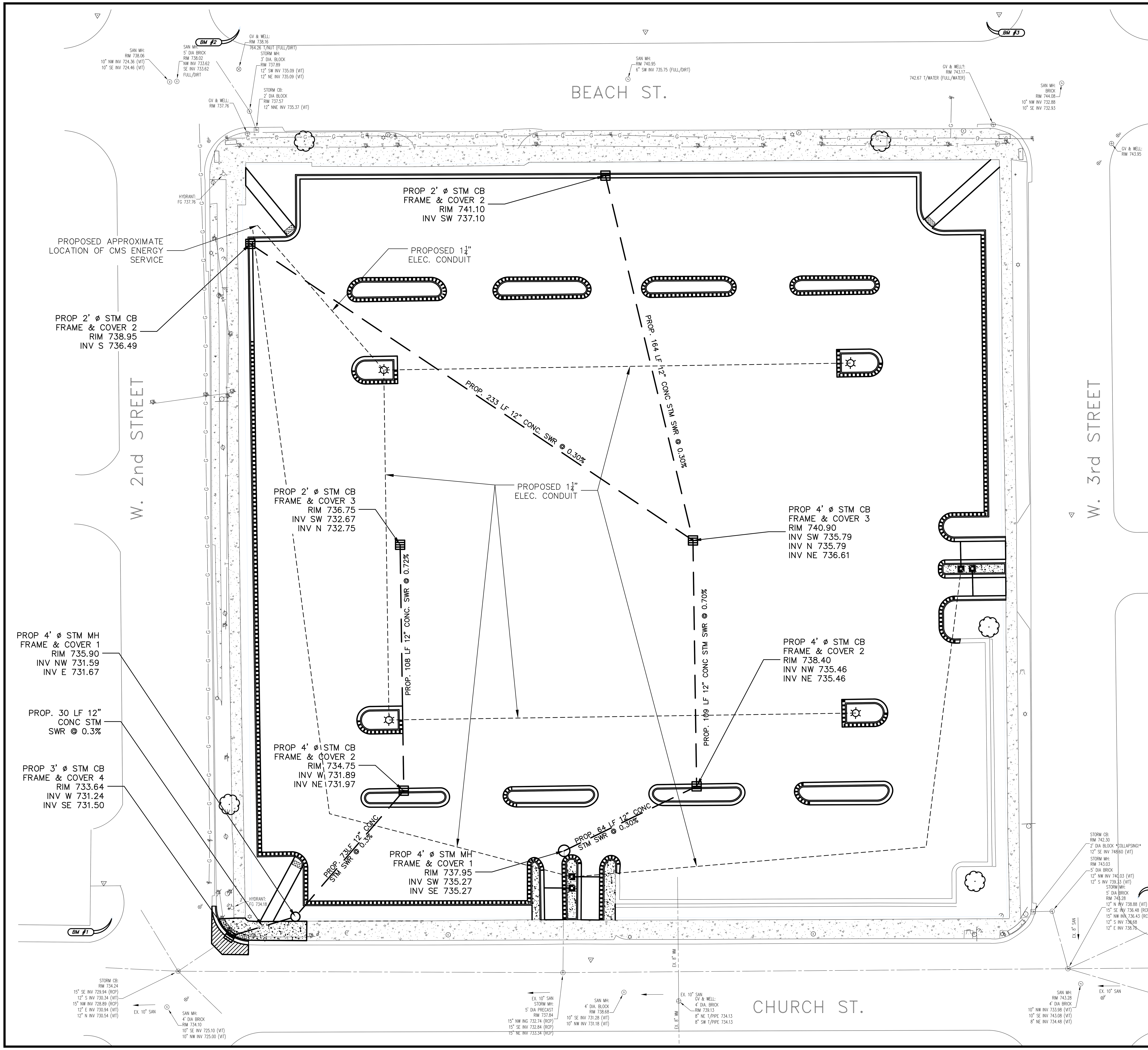
J&A JOB NUMBER: 18528

SHEET NO.
C-002



FRAME & COVER TYPES

1. MANHOLES – EAST JORDAN IRON WORKS 1046Z FRAME W/ TYPE 1040A SOLID COVER STORM
2. CURB INLET CATCH BASINS – EAST JORDAN IRON WORKS 7045 FRAME W/ TYPE M1 GRATE
3. FLAT INLET CATCH BASINS – EAST JORDAN IRON WORKS 1046Z FRAME W/ TYPE 1040M1 GRATE
4. INLET IN CURB LINE IN SIDEWALK RAMP – RE-USE EXISTING COVER

B.M. #1 ELEV. = 735.04 NAVD 1988
NAIL IN SE FACE/UTIL POLE @ NE QUAD OF 2ND & CHURCHILL STREET

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ARROW ON HYDRANT @ SE QUAD. OF 2ND & BEACH ST.

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Genesee County
1101 Beach St
Flint, Michigan 48502

SITE UTILITY PLAN
Surface Parking Lot

SCALE 0 20' 40'

MARK	ISSUED FOR	DATE
	BIDS	10/18/17
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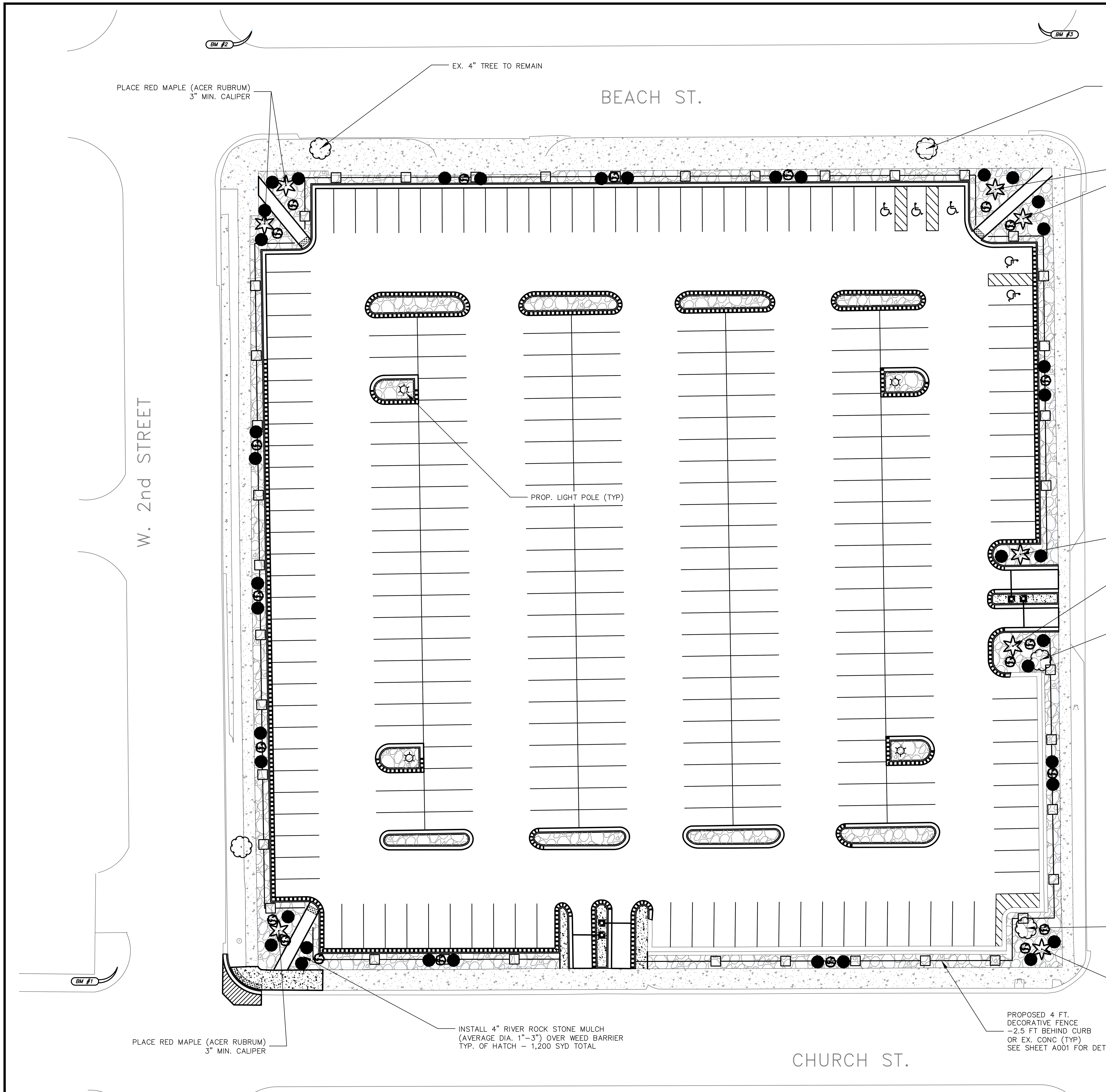
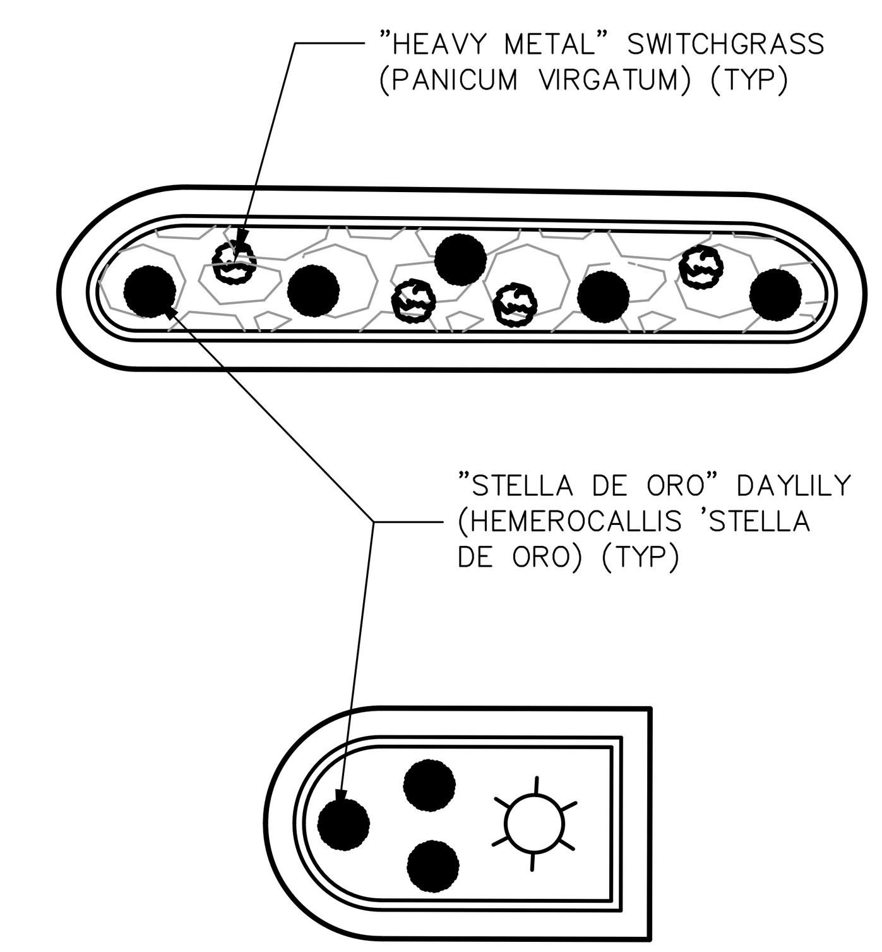
J&A JOB NUMBER: 18528

SHEET NO. C-003



PLANTING QUANTITIES

SYMBOL	QUANTITY	COMMON NAME	SCIENTIFIC NAME	SIZE REQUIREMENTS
(star)	8	RED MAPLE	ACER RUBRUM	3" MIN. CALIPER
(filled circle)	90	STELLA DE ORO DAYLILY	HEMEROCALLIS 'STELLA DE ORO'	1 GALLON (MIN.)
(open circle)	53	'HEVY METAL' SWITCHGRASS	PANICUM VIRGATUM 'HEAVY METAL'	3 GALLON (MIN.)



TYPICAL ISLAND PLANTING

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Genesee County
1101 Beach St
Flint, Michigan 48502

LANDSCAPING PLAN
Surface Parking Lot

SCALE 0 20' 40'

MARK	ISSUED FOR	DATE
	BIDS	10/18/17
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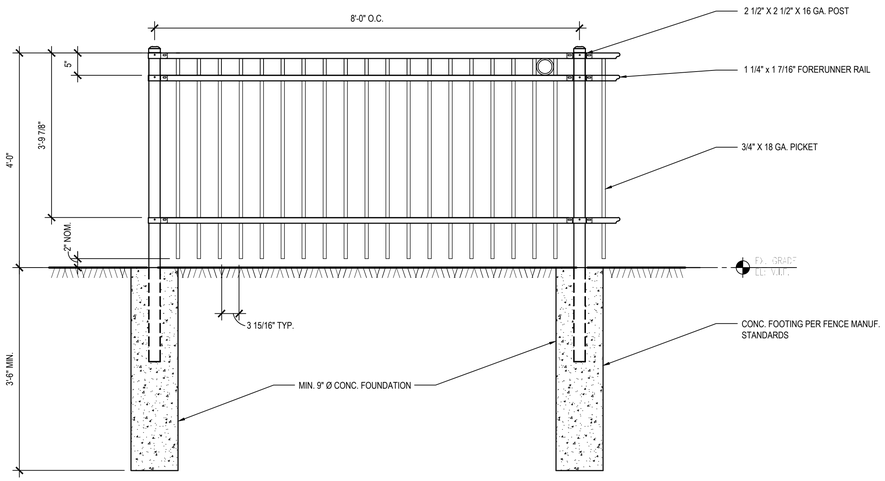
J&A JOB NUMBER: 18528

SHEET NO. C-004

ARCHITECTURE SHEET INDEX

SHEET	DESCRIPTION	DESCRIPTION
A–001	SPECIFICATIONS AND DETAILS	



1 / A-001 FENCE DETAIL

SCALE: 3/4" = 1'-0"

0 1 2 4

OVERVIEW OF ARCHITECTURAL SCOPE

THIS OVERVIEW OF SCOPE IS INCLUDED TO GIVE THE CONTRACTOR A GENERAL OVERVIEW OF THE PROJECT REQUIREMENTS. THE OVERVIEW IS NOT ALL INCLUSIVE AND IS NOT INTENDED TO, AND SHOULD NOT BE USED TO, ESTABLISH CONTRACT LIMITS OR PRICING INCLUSIONS. THE CONTRACT DOCUMENTS SHALL BE USED TO ESTABLISH CONSTRUCTION CONTRACT SCOPE.

THIS OVERVIEW OF SCOPE INCLUDES, BUT IS NOT LIMITED TO THE FOLLOWING:

ARCHITECTURAL:

1. PROVIDE FENCE & STRUCTURE AS INDICATED. REFER TO CIVIL DRAWING.

PROJECT REQUIREMENTS

PROVIDE ALL NECESSARY PERMITS. ALL WORK SHALL BE INSTALLED TO COMPLY WITH THE OWNER'S STANDARDS, STATE AND LOCAL CODES INCLUDING, BUT NOT LIMITED TO, THE FOLLOWING CODES AND THEIR RELATED REFERENCES.

2015 MICHIGAN BUILDING CODE

2015 MICHIGAN MECHANICAL CODE

2015 MICHIGAN PLUMBING CODE

2015 INTERNATIONAL FIRE CODE (AS REFERENCED)

2015 INTERNATIONAL FUEL GAS CODE

NFPA 101 LIFE SAFETY CODE 1997 AND 2006 (AS REFERENCED)

MICHIGAN ENERGY CODE-ASHRAE 90.1-2013

2014 NATIONAL ELECTRICAL CODE AS AMENDED BY THE 2014 MICHIGAN ELECTRICAL CODE RULES, PART 8.

MANUFACTURER AND MODEL NUMBER LISTED REPRESENTS THE BASIS OF DESIGN FOR THIS PROJECT. THE CONTRACTOR SHALL BEAR ALL ADDITIONAL COSTS ASSOCIATED WITH USING EQUIPMENT AND/OR SYSTEMS BY OTHER APPROVED MANUFACTURERS INCLUDING ADDITIONAL COSTS BY OTHER TRADES.

ALL EQUIPMENT AND/OR SYSTEMS INSTALLED SHALL BE IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS. WHERE FIELD OR PROJECT CONDITIONS DO NOT ALLOW ALL MANUFACTURER'S RECOMMENDATIONS TO BE MET, THE INSTALLING CONTRACTOR SHALL SUBMIT IN WRITING TO THE ARCHITECT THE PROPOSED DEVIATION, IN A SKETCH FORM, ACCOMPANIED BY THE MANUFACTURER'S CONCURRENCE.

GENERAL PROJECT NOTES:

1. VERIFY EXISTING CONDITIONS IN FIELD, INCLUDING BUT NOT LIMITED TO DIMENSIONS, WALL CONSTRUCTION, WALL CAVITIES AND CONCEALED STRUCTURE.
2. NOTIFY OWNER & ARCHITECT IMMEDIATELY IF CONDITIONS DO NOT MATCH WHAT IS INDICATED ON DOCUMENTS.
3. FOR CIVIL AND ELECTRICAL DEMOLITION WORK AND NEW WORK, REFER TO CIVIL AND ELECTRICAL DWGS.
4. AS REQUIRED PATCH, REPAIR AND OR PAINT / REPLACE ADJACENT SURFACES TO MATCH ORIGINAL CONDITIONS WHERE PROPOSED ARCH. & M.E.P. WORK (INCLUDING INSTALLATION OF M.E.P. EQUIPMENT) DISTURBED EXISTING CONDITIONS.
5. ALL SPACES ARE TO BE CLEANED AND ANY DAMAGE CAUSED BY THE CONTRACTOR IS TO BE PATCHED, REPAIRED AND OR PAINTED / REPLACED TO MATCH ORIGINAL CONDITIONS ONCE WORK IS COMPLETED.

GENERAL CONTRACTOR NOTES:

1. OWNER, ARCHITECT AND ENGINEERS ARE NOT RESPONSIBLE FOR JOB SITE SAFETY.
2. OWNER, ARCHITECT AND ENGINEERS ARE NOT RESPONSIBLE FOR MEANS AND METHODS OF CONSTRUCTION UNLESS EXPLICITLY NOTED OTHERWISE.
3. CONTRACTOR IS RESPONSIBLE FOR PAYMENT OF PLAN REVIEW AND PERMIT APPLICATIONS TO THE A.H.J.

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JOHNSON & ANDERSON
GEN COUNTY SURFACE PARKING
610 BEACH ST.

SPECIFICATIONS AND DETAILS

ISSUED FOR	DATE
REVIEW	10/10/17
BIDS	10/18/17

DESIGNER:	JSR
DRAWN:	ZJR
PM / PIC:	JSR
CHECKED:	XXX
ACADFILE:	17-1312-A-001
PROJECT No.	17–1312

A–001

SECTION 323119 - Aluminum Ornamental Fence System

PART 1 - GENERAL
1.01 WORK INCLUDED
The contractor shall provide all labor, materials and all necessary items for the installation of the Echelon Plus® ornamental aluminum fence system defined herein.

1.02 RELATED WORK
Section 312000 – Earth Moving
Section 033000 – Cast in Place Concrete

1.03 SYSTEM DESCRIPTION
The manufacturer shall supply a total ornamental aluminum fencing system of the Ameristar Echelon Plus® (Majestic™) design. The system shall include all components (i.e., pickets, posts, rails, gates and hardware) required.

1.04 QUALITY ASSURANCE
The contractor shall provide laborers and supervisors who are thoroughly familiar with the type of construction involved and the materials specified.

1.05 REFERENCES
- ASTM B117 - Practice for Operating Salt-Spray (Fog) Apparatus.
- ASTM B221 - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles and Tubes.
- ASTM D523 - Test Method for Specular Gloss.
- ASTM D822 - Practice for Conducting Tests on Paint and Related Coatings and Materials using Filtered Open-Flame Carbon-Arc Light and Water Exposure Apparatus.
- ASTM D1654 - Test Method for Evaluation of Painted or Coated Specimens Subjected to Corrosive Environments.
- ASTM D2244 - Test Method for Calculation of Color Differences from Instrumentally Measured Color Coordinates.
- ASTM D2794 - Test Method for Resistance of Organic Coatings to the Effects of Rapid Deformation (Impact).
- ASTM D3359 - Test Method for Measuring Adhesion by Tape Test.

1.06 SUBMITTAL
The manufacturer's submittal package shall be submitted prior to installation to confirm compliance with all requirements for materials specified in this section.

1.07 PRODUCT HANDLING AND STORAGE
Upon receipt at the job site, all materials shall be checked to ensure that no damages occurred during shipping or handling. Materials shall be stored in such a manner to ensure proper ventilation and drainage and to protect against damage, weather, vandalism and theft.

PART 2 - MATERIALS
2.01 MANUFACTURER
The ornamental fence system shall conform to Ameristar's Echelon Plus Majestic aluminum ornamental fencing,3-rail style manufactured by Ameristar Fence Products, Inc. in Tulsa, Oklahoma.

2.02 MATERIAL
A. Aluminum material for fence framework (i.e., tubular pickets, rails and posts) shall conform to the requirements of ASTM B221. The aluminum extrusions for posts and rails shall be Alloy and Temper Designation 6005-T52. The aluminum extrusions for pickets shall be Alloy and Temper Designation 6063-T52.

B. Pickets shall be 3/4" square x .045" thick. Horizontal rails shall be 1-1/4" x 1-7/16" Forerunner™ channel with .060" thick top & internal web wall, and .090" thick side walls and shall be punched to allow picket to pass through the top of the rail. The Forerunner rail shall be constructed with an internal web insert providing a raceway for the pickets to be retained with a 1/8" retaining rod. The number of rails shall vary with the style, height and strength as determined by manufacturer. Fence posts and gate posts shall meet the minimum size requirements of Table 1.

C. Accessories: Aluminum castings shall be used for all post caps, scrolls, finials, and other miscellaneous hardware. Hinges and latches shall be fabricated from aluminum, stainless steel or composite materials.

2.03 FABRICATION

A. Pickets, rails and posts shall be pre-cut to specified lengths. ForeRunner rails shall be pre-punched to accept pickets. Grommets shall be inserted into the pre-punched holes in the rails and pickets shall be inserted through the grommets so that pre-drilled picket holes align with the internal upper raceway of the ForeRunner rails (Note: This can best be accomplished by using an alignment template). Retaining rods shall be inserted into each ForeRunner rail so that they pass through the pre-drilled holes in each picket, thus completing the panel assembly.

B. The manufactured framework shall be subjected to the Ameristar thermal stratification coating process (high-temperature, in-line, multi-stage, and multi-layer) including, as a minimum, a six-stage pretreatment/wash and an electrostatic spray application of a polyester finish. The topcoat shall be a "no-mar" TGIC polyester powder coat finish with a minimum thickness of 2 mils (0.0508mm). The color shall be Black. The stratification-coated framework shall be capable of meeting the performance requirements for each quality characteristic shown in Table 2.

C. Finish: All fence components shall be subject to a six-stage pretreatment/wash followed by an electrostatic spray application of a "no-mar" TGIC polyester powder coat finish with a minimum thickness of 2-4 mils. The color shall be Black.

D. Completed panels shall be capable of supporting a 200 lb. load (applied at midspan) without permanent deformation. Panels without rings shall be biasable to a 12.5% change in grade.

E. Swing gates shall be fabricated using 1-1/4" x 1-7/16" Forerunner rail, 1.75" sq. x .125" gate ends, and 3/4" sq. x .080 pickets. Gates that exceed 6' in width will have a 1.75" sq. x .125" intermediate upright. All rail and upright intersections shall be joined by welding. All picket and rail intersections shall also be joined by welding.

PART 3 - EXECUTION
3.01 PREPARATION
All new installation shall be laid out by the contractor in accordance with the construction plans.

3.02 FENCE INSTALLATION
Fence post shall be spaced according to Table 3, plus or minus ½". For installations that must be raked to follow sloping grades, the post spacing dimension must be measured along the grade. Fence panels shall be attached to posts with brackets supplied by the manufacturer. The "Earthwork" and "Concrete" sections of this specification shall govern material requirements for the concrete footer. Posts setting by other methods such as plated posts or grouted core-drilled footers are permissible only if shown by engineering analysis to be sufficient in strength for the intended application.

3.03 FENCE INSTALLATION MAINTENANCE
When cutting/drilling rails or posts adhere to the following steps to seal the exposed surfaces; 1) Remove all metal shavings from cut area. 2) Apply custom finish paint matching fence color. Failure to seal exposed surfaces per steps 1 & 2 above will negate warranty. Ameristar spray cans or paint pens shall be used to finish exposed surfaces; it is recommended that paint pens be used to prevent overspray. Use of non-Ameristar parts or components will negate the manufactures' warranty.

3.04 GATE INSTALLATION
Gate posts shall be spaced according to the manufacturers' gate drawings, dependent on standard out-to-out gate leaf dimensions and gate hardware selected. Type and quantity of gate hinges shall be based on the application; weight, height, and number of gate cycles. The manufacturers' gate drawings shall identify the necessary gate hardware required for the application. Gate hardware shall be provided by the manufacture of the gate and shall be installed per manufacturer's recommendations.

3.05 CLEANING
The contractor shall clean the jobsite of excess materials; post-hole excavations shall be scattered uniformly away from posts.

Table 1 – Minimum Sizes for Echelon Plus Posts

Fence Posts	Panel Height		
2-1/2" x 2-1/2" x .060" w/ reinforced web	Up to 6' Height		
Gate Leaf	Gate Height		
	Up to & Including 4'	Over 4' Up to & Including 5'	Over 5' Up to & Including 6'
Up to 4'	2 1/2" x 2-1/2" x .060" Alum.	3" x 3" x .120" Alum.	4" x 4" x .250" Alum. or 3" x 3" x 12ga. Steel
4'1" to 6'	3" x 3" x .120" Alum.	4" x 4" x .250" Alum. or 3" x 3" x 12ga. Steel	3" x 3" x 12ga. Steel
6'1" to 8'	4" x 4" x .250" Alum. or 3" x 3" x 12ga. Steel	4" x 4" x 11ga. Steel	4" x 4" x 11ga. Steel

Table 2 – Coating Performance Requirements

Quality Characteristics	ASTM Test Method	Performance Requirements
Adhesion	D3359 – Method B	Adhesion (Retention of Coating) over 90% of test area (Tape and knife test).
Corrosion Resistance	B117 & D1654	Corrosion Resistance over 1000 hours (Scribed per D1654; failure mode is accumulation of 1/8" coating loss from scribe or medium #8 blisters).
Impact Resistance	D2794	Impact Resistance over 60 inch lb. (Forward impact using 0.625" ball).
Weathering Resistance	D822, D2244, D523 (60˚ Method)	Weathering Resistance over 1,000 hours (Failure mode is 60% loss of gloss or color variance of more than 3 delta-E color units).

Table 3 – Echelon Plus – Post Spacing By Bracket Type

Span	8' Nominal (91-3/4" Rail)				
Post Size	2-1/2"	2-1/2"	3"	2-1/2"	3"
Bracket Type	Echelon Plus Line Boulevard (ABB3)	Echelon Plus Swivel* (ABB2)		Echelon Plus Flat Mount (ABB1)	
Post Settings ± 1/2" O.C.	95"	*95"	*95-1/2"	95"	95-1/2"
Span	6' Nominal (73-1/16" Rail)				
Post Size	2-1/2"	2-1/2"	3"	2-1/2"	3"
Bracket Type	Echelon Plus Line Boulevard (ABB3)	Echelon Plus Swivel* (ABB2)		Echelon Plus Flat Mount (ABB1)	
Post Settings ± 1/2" O.C.	76-1/4"	*76-1/4"	*76-3/4"	76-1/4"	76-3/4"

*Note: When using ABB2 swivel brackets on either or both ends of a panel installation, care must be taken to ensure the spacing between post and adjoining pickets meets applicable codes. This will require trimming one or both ends of the panel.

120/240VOLT–1PHASE–3WIRE+GRND PANELBOARD SCHEDULE

PANELBOARD DESIGNATION NEW LP–"A" LOCATION PARKING LOT

100 AMP BUS X M.C.B. M.L.O. MOUNTING: FLUSH SURFACE X

SPECIAL REQUIREMENTS "MAIN SERVICE RATED" 60A–2P MB, WATERTIGHT WITH LOCK/KEY

CKT NO.	VA	LOAD TYPE	A	B	LOAD TYPE	VA	CKT NO.
1	836	LIGHTS			GATE ACCESS CONTROL UNIT	780	2
3	780	GATE ACCESS CONTROL UNIT			GATE ACCESS CONTROL UNIT	780	4
5	780	GATE ACCESS CONTROL UNIT			SPARE	--	6
7	836	LIGHTS			SPARE	--	8
9	--	SPARE			SPARE	--	10
11	--	SPARE			SPARE	--	12

LIGHTING	1,672 VA	AT	100 %	=	1,672 VA	
RECEPTACLE	2,880 VA	AT	100 %	=	2,880 VA	(FIRST 10,000 VA AT 100%)
RECEPTACLE	0 VA	AT	50 %	=	0 VA	
MISC.	240 VA	AT	100 %	=	240 VA	
TOTAL	4,792 VA	TOTAL DEMAND		=	4,792 VA / 240 V = 19.97 A	

(1) ALL BREAKERS ARE 20A–1P U.O.N.

LIGHTING FIXTURE SCHEDULE

TYPE	DESCRIPTION	MOUNTING	WATTAGE
"LA"	(2) OUTDOOR 26" L. X 13" W. X 7" D. ARM MOUNTED FULL CUTOFF TYPE PARKING LOT LIGHTING FIXTURES W/UNIVERSAL MVOLT LED DRIVER, 120V OPERATION, (1) 60 LED LIGHT ENGINE AT 70 CRI PER FIXTURE, 1000MA, 23,121 LUMENS PER LUMINAIRE, SINGLE PIECE DIE–CAST ALUMINUM HOUSING WITH DARK BRONZE THERMOSET POWDER COAT FINISH, FUSING, PRECISION–MOLDED ACRYLIC LENS, TYPE 5 SQUARE LIGHT DISTRIBUTION, LABELED "SUITABLE FOR USE IN WET LOCATIONS" AND MOUNTED 180° APART ON A 27'–6" HIGH SQUARE STRAIGHT STEEL POLE WITH VIBRATION DAMPER AND DARK BRONZE FINISH. LITHONIA CAT. NO. (2)DSX1LED–60C–1000–P6–50K–T5W–MVOLT–SPA–SF–DDBXD AND POLE #SSA–27.5–4C–DM28AS–DDBXD–VD OR APPROVED EQUAL. (SEE NOTE #1)	POLE MOUNTED	418

NOTE:

1. FOR "APPROVED EQUAL" FIXTURE, THE CONTRACTOR IS RESPONSIBLE TO MEET THE CITY OF FLINT ORDINANCE FOR PARKING LOT LIGHTING REQUIREMENTS, INCLUDING SUBMISSION OF FIXTURE TYPE/MANUFACTURER AND PHOTOMETRIC LIGHTING PLAN FOR REVIEW/APPROVAL.

SYMBOL SCHEDULE

SYMBOL	DESCRIPTION
———	NEW
---SL---	UNDERGROUND SITE LIGHTING SERVICE.
---Ep---	UNDERGROUND ELECTRIC SERVICE – PRIMARY
--- G ---	UNDERGROUND GROUND CABLE
--- P ---	UNDERGROUND POWER SERVICE
T	POLE MOUNTED TRANSFORMER
	TWIN HEAD SITE LIGHT
	LIGHTING/RECEPTACLE/EQUIPMENT PANEL
C	CONTACTOR
T	DIGITAL TIMECLOCK (7 DAY PROGRAMMABLE)
P	PHOTO CELL (FACING NORTH)
M	ELECTRIC SERVICE METER
	GROUND ROD
MB	MAIN BREAKER
U.O.N.	UNLESS OTHERWISE NOTED

ELECTRICAL SHEET INDEX

OVERVIEW OF ELECTRICAL SCOPE

THIS OVERVIEW OF SCOPE IS INCLUDED TO GIVE THE CONTRACTOR A GENERAL OVERVIEW OF THE PROJECT REQUIREMENTS. THE OVERVIEW IS NOT ALL INCLUSIVE AND IS NOT INTENDED TO, AND SHOULD NOT BE USED TO, ESTABLISH CONTRACT LIMITS OR PRICING INCLUSIONS. THE CONTRACT DOCUMENTS SHALL BE USED TO ESTABLISH CONSTRUCTION CONTRACT SCOPE.

THIS OVERVIEW OF SCOPE INCLUDES, BUT IS NOT LIMITED TO THE FOLLOWING:

ELECTRICAL:

1. PROVIDE ALL REQUIRED ELECTRICAL DEVICES, CONDUIT, WIRING, BREAKERS, BACK BOXES, ETC. AS INDICATED ON THE DRAWINGS.
2. PROVIDE POWER FEEDERS AND/OR BRANCH CIRCUITS FOR ELECTRICAL SERVICE, INCLUDING ASSOCIATED CONDUIT, PANEL, CIRCUIT BREAKERS, WEATHERHEAD, WIRING, ETC. WHERE INDICATED.
3. PROVIDE LIGHTING CONTROL SYSTEM, INCLUDING ASSOCIATED TIMECLOCK, WIRING, CONDUIT, CONTACTOR, PHOTOCELL, ETC. WHERE INDICATED.
4. PROVIDE ALL REQUIRED LIGHTING FIXTURES, INCLUDING ASSOCIATED CONDUIT, WIRING, CONCRETE BASES, BREAKERS, ACCESSORIES, LAMPS, POLES, ETC. AS INDICATED ON THE DRAWINGS.
5. PROVIDE POWER FEEDERS AND/OR BRANCH CIRCUITS FOR ELECTRIC GATE ACCESS CONTROL OPERATORS, INCLUDING ASSOCIATED CONDUIT, CIRCUIT BREAKERS, WIRING, ETC. WHERE INDICATED.

GENERAL NOTES: (FOR ALL ELECTRICAL SHEETS)

1. ALL CONDUIT SIZES ARE BASED ON THW WIRES, U.O.N.
2. ALL ELECTRICAL ITEMS SHOWN ON THE DRAWINGS ARE NEW, UNLESS OTHERWISE NOTED.
3. ALL ELECTRICAL ITEMS SHOWN, SHALL BE PROVIDED, INSTALLED, ETC. (AS INDICATED), BY THE CONTRACTOR, U.O.N.
4. ALL NEW BRANCH CIRCUITS SHALL BE 20A–1P, WIRED WITH 3/4"C.–2#12 AND 1#12 GROUND, UNLESS OTHERWISE NOTED. PROVIDE #10 WIRE FOR CIRCUITS OVER 100'–0" FROM RESPECTIVE PANEL. PROVIDE THE NEXT SIZE LARGER WIRE SIZE FOR CIRCUITS OVER 100'–0" FROM RESPECTIVE PANEL AND WHICH ALREADY HAVE A WIRE SIZE LARGER THAN #12.
5. INSTALL ALL NEW CONDUITS "CONCEALED", UNLESS SPECIFIC APPROVAL IS RECEIVED FROM THE OWNER OR ARCHITECT TO INSTALL CONDUITS EXPOSED.

PROJECT REQUIREMENTS

PROVIDE AND PAY FOR ALL NECESSARY PERMITS. ALL WORK SHALL BE INSTALLED TO COMPLY WITH THE OWNER'S STANDARDS, STATE AND LOCAL CODES INCLUDING, BUT NOT LIMITED TO, THE FOLLOWING CODES AND THEIR RELATED REFERENCES.

2015 MICHIGAN BUILDING CODE

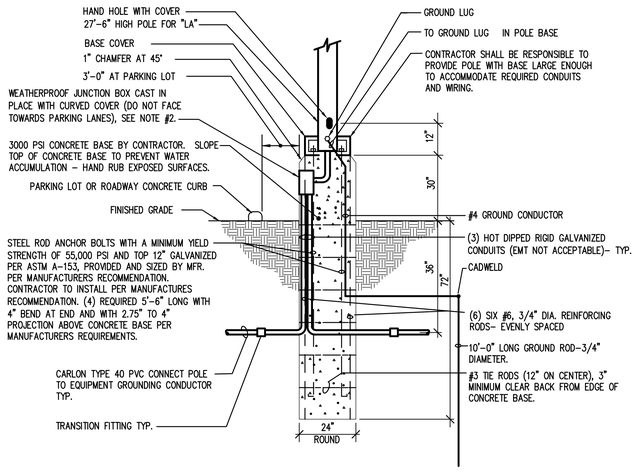
2017 NATIONAL ELECTRICAL CODE AS AMENDED BY THE 2011 MICHIGAN ELECTRICAL CODE RULES PART B.

MANUFACTURER AND MODEL NUMBER LISTED REPRESENTS THE BASIS OF DESIGN FOR THIS PROJECT. THE ELECTRICAL CONTRACTOR SHALL BEAR ALL ADDITIONAL COST ASSOCIATED WITH USING EQUIPMENT BY OTHER APPROVED MANUFACTURERS INCLUDING ADDITIONAL COSTS BY OTHER TRADES.

ALL EQUIPMENT INSTALLED SHALL BE IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS. WHERE FIELD OR PROJECT CONDITIONS DO NOT ALLOW ALL MANUFACTURER'S RECOMMENDATIONS TO BE MET, THE INSTALLING CONTRACTOR SHALL SUBMIT IN WRITING TO THE ENGINEER THE PROPOSED DEVIATION, IN A SKETCH FORM, ACCOMPANIED BY THE MANUFACTURER'S CONCURRENCE.

NOTE

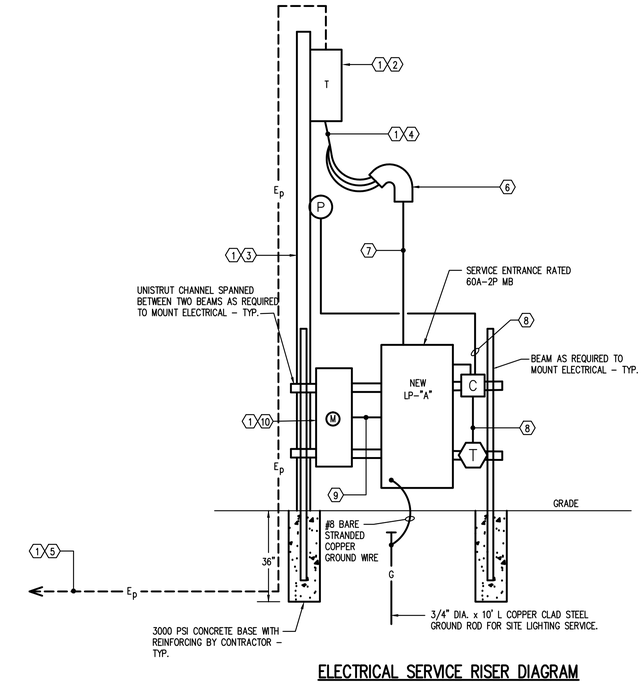
ALL LIGHTING SHALL BE SHIELDED FROM ADJACENT RESIDENTIAL DISTRICTS.



TYPICAL TYPE "LA" LIGHTING FIXTURE POLE BASE DETAIL

NO SCALE

NOTE:
1. ALL WORK TO BE DONE BY THE CONTRACTOR, UNLESS OTHERWISE NOTED.
2. USE JUNCTION BOX WHERE (3) OR MORE CONDUITS ENTER POLE BASE.
3. REFER TO SHEET #E–002 FOR LOCATION OF PARKING LOT LIGHTING POLES.



ELECTRICAL SERVICE RISER DIAGRAM

NO SCALE

LOCATION MAP
NO SCALE

KEY NOTES

1. ALL UTILITY COMPANY COSTS SHALL BE PAID FOR BY THE OWNER.
2. NEW CONSUMERS ENERGY COMPANY (C. E. CO.) 120/240V–1ø–3W SECONDARY POLE MOUNTED TRANSFORMER, PROVIDED AND INSTALLED BY C. E. CO. THE CONTRACTOR SHALL BE RESPONSIBLE TO COORDINATE EXACT LOCATION, INSTALLATION, VOLTAGE AVAILABLE, ETC. WITH C. E. CO. IN FIELD.
3. NEW POWER POLE, PROVIDED AND INSTALLED BY C. E. CO. CONTRACTOR SHALL BE RESPONSIBLE TO COORDINATE EXACT LOCATION, INSTALLATION, ETC. WITH C. E. CO. IN FIELD.
4. NEW 120/240V–1ø–3W SECONDARY ELECTRIC SERVICE WIRING, PROVIDED AND INSTALLED BY C. E. CO.
5. NEW UNDERGROUND PRIMARY ELECTRIC SERVICE WIRING, TO EXISTING C. E. CO. POLE, PROVIDED AND INSTALLED BY C. E. CO. IN 6" CONDUIT PROVIDED AND INSTALLED BY CONTRACTOR PER C. E. CO. STANDARDS. CONTRACTOR SHALL BE RESPONSIBLE TO COORDINATE EXACT ROUTING, TERMINATION POINT, INSTALLATION, ETC. WITH C. E. CO. IN FIELD.
6. NEW 120/240V–1ø–3W ELECTRIC SERVICE WEATHERHEAD, PROVIDED AND INSTALLED BY CONTRACTOR.
7. NEW 1"C. – 3#6, BY CONTRACTOR.
8. NEW 3/4"C. – 2#12 AND 1#12 GROUND.
9. NEW 1" CONDUIT WITH WIRING AS DIRECTED BY C. E. CO., PROVIDED AND INSTALLED BY CONTRACTOR PER C. E. CO. STANDARDS/SPECIFICATIONS.
10. NEW 120/240V–1ø–3W ELECTRIC SERVICE METER, PROVIDED BY C. E. CO. AND INSTALLED BY CONTRACTOR.

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JOHNSON & ANDERSON

GEN COUNTY SURFACE PARKING

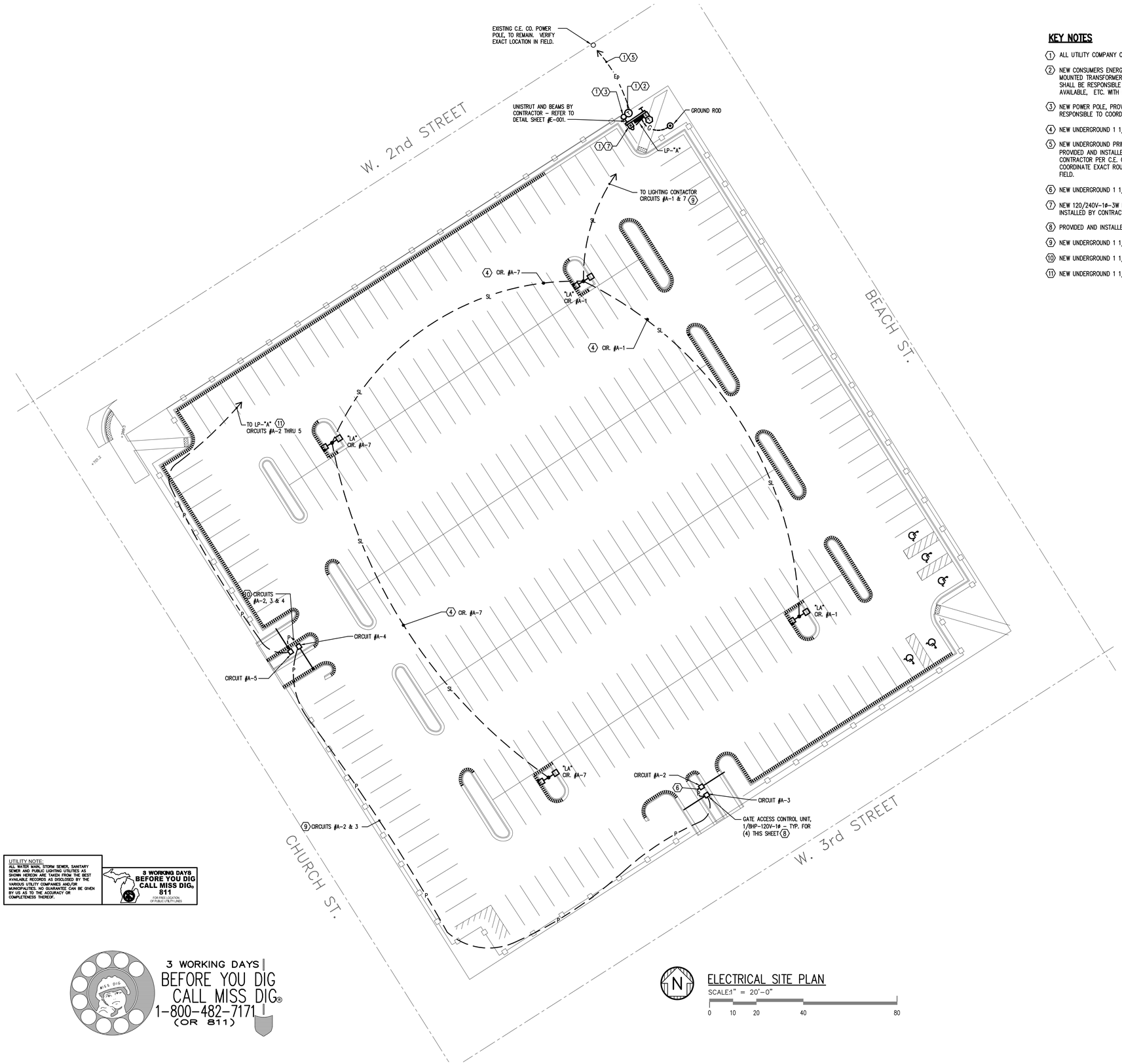
610 BEACH ST.

ELECTRICAL TITLE SHEET

ISSUED FOR	DATE
REVIEW	10/10/17
BIDS	10/18/17

DESIGNER:	DL
DRAWN:	DDA
PM / PIC:	JSR
CHECKED:	SM
ACADFILE:	17-1312E-001
PROJECT No.	**17-1312**

E-001



KEY NOTES

(1) ALL UTILITY COMPANY COSTS SHALL BE PAID FOR BY THE OWNER.

(2) NEW CONSUMERS ENERGY COMPANY (C.E. CO.) 120/240V–1ø–3W SECONDARY, POLE MOUNTED TRANSFORMER, PROVIDED AND INSTALLED BY C.E. CO. THE CONTRACTOR SHALL BE RESPONSIBLE TO COORDINATE EXACT LOCATION, INSTALLATION, VOLTAGE AVAILABLE, ETC. WITH C.E. CO. IN FIELD.

(3) NEW POWER POLE, PROVIDED AND INSTALLED BY C.E. CO. CONTRACTOR SHALL BE RESPONSIBLE TO COORDINATE EXACT LOCATION, INSTALLATION, ETC. WITH C.E. IN FIELD.

(4) NEW UNDERGROUND 1 1/4" C. – 2#10 AND 1#10 GROUND.

(5) NEW UNDERGROUND PRIMARY ELECTRIC SERVICE WIRING TO EXISTING C.E. CO. POLE, PROVIDED AND INSTALLED BY C.E. CO. IN 6" CONDUIT PROVIDED AND INSTALLED BY CONTRACTOR PER C.E. CO. STANDARDS. CONTRACTOR SHALL BE RESPONSIBLE TO COORDINATE EXACT ROUTING, TERMINATION POINT, INSTALLATION, ETC. WITH C.E. CO. IN FIELD.

(6) NEW UNDERGROUND 1 1/4" C. – 2#6 AND 1#10 GROUND.

(7) NEW 120/240V–1ø–3W ELECTRIC SERVICE METER, PROVIDED BY C.E. CO. AND INSTALLED BY CONTRACTOR.

(8) PROVIDED AND INSTALLED BY OTHERS, WIRED BY CONTRACTOR.

(9) NEW UNDERGROUND 1 1/4" C. – 3#6 AND 1#10 GROUND.

(10) NEW UNDERGROUND 1 1/4" C. – 3#6, 2#8 AND 1#10 GROUND.

(11) NEW UNDERGROUND 1 1/4" C. – 3#6, 3#8 AND 1#10 GROUND.

UTILITY NOTE:
ALL WATER MAIN, STORM SEWER, SANITARY SEWER AND PUBLIC LIGHTING UTILITIES AS SHOWN HEREON ARE TAKEN FROM THE BEST KNOWN SOURCES AS DISCLOSED BY THE VARIOUS UTILITY COMPANIES AND/OR MUNICIPALITIES. NO GUARANTEE CAN BE GIVEN BY US AS TO THE ACCURACY OR COMPLETENESS THEREOF.

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N

ELECTRICAL SITE PLAN
SCALE:1" = 20'–0"
0 10 20 40 80

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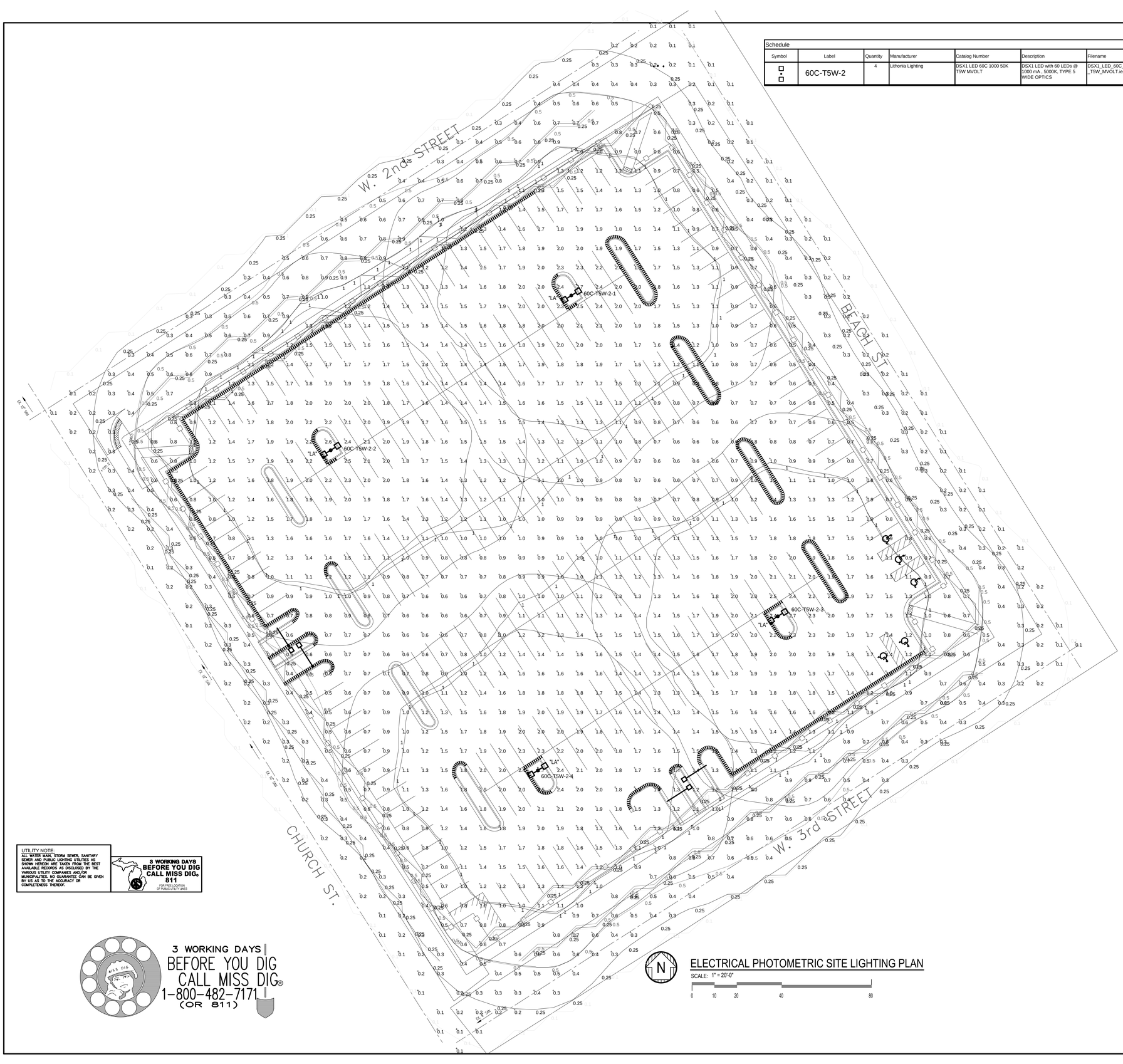
ELECTRICAL SITE PLAN

ISSUED FOR	DATE
REVIEW	10/10/17
BIDS	10/18/17

DESIGNER:	DL
DRAWN:	DDA
P.M. / PIC:	JSR
CHECKED:	SM
ACADFILE:	17-1312E-002
PROJECT No.	17-1312

E-002



Schedule											
Symbol	Label	Quantity	Manufacturer	Catalog Number	Description	Filename	Lamp	Number Lamps	Lumens Per Lamp	Light Loss Factor	Wattage
	60C-T5W-2	4	Lithonia Lighting	DSX1 LED 60C 1000 50K T5W MVOLT	DSX1 LED with 60 LEDs @ 1000 mA , 5000K, TYPE 5 WIDE OPTICS	DSX1_LED_60C_1000_50K _T5W_MVOLT.ies	LED	1	23120.91	0.9	418

Statistics						
Description	Symbol	Avg	Max	Min	Max/Min	Avg/Min
Calc Zone #2 - ALT	+	1.3 fc	2.7 fc	0.4 fc	6.8:1	3.3:1
EXTEND 25' BEYOND PROPERTY - ALT	+	0.4 fc	1.9 fc	0.1 fc	10.0:1	4.0:1

UTILITY NOTE:
ALL WATER MAIN, STORM SEWER, SANITARY SEWER AND PUBLIC LIGHTING UTILITIES AS SHOWN HEREON ARE TAKEN FROM THE BEST AVAILABLE RECORDS AS DISCLOSED BY THE VARIOUS UTILITY COMPANIES AND/OR MUNICIPALITIES. NO GUARANTEE CAN BE GIVEN BY US AS TO THE ACCURACY OR COMPLETENESS THEREOF.

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N

ELECTRICAL PHOTOMETRIC SITE LIGHTING PLAN

SCALE: 1" = 20'-0"

0 10 20 40 80

DiClemente Siegel Design Inc.
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ELECTRICAL PHOTOMETRIC SITE LIGHTING PLAN

ISSUED FOR	DATE
REVIEW	10/10/17
BIDS	10/18/17

DESIGNER:	DL
DRAWN:	DDA
PM / PIC:	JSR
CHECKED:	SM
ACADFILE:	17-13124E-002A
PROJECT No.	17-1312

E-002A

ELECTRICAL SPECIFICATIONS

GENERAL

ALL ELECTRICAL WORK SHALL COMPLY WITH THE LATEST EDITION OF N.E.C., LOCAL AND STATE CODES, ORDINANCES AND REGULATIONS, INCLUDING THE OCCUPATIONAL SAFETY AND HEALTH ACT (OSHA).

SUPPLEMENTARY GENERAL CONDITIONS ARE A PART OF THE CONTRACT FOR THIS WORK. CONTRACTOR SHALL CONSULT THEM AND THE GENERAL REQUIREMENTS, DIV. 1, FOR INSTRUCTIONS PERTAINING TO WORK UNDER THIS SECTION.

WORK INCLUDED

THE CONTRACTOR SHALL PROVIDE ALL ITEMS, ARTICLES, MATERIALS, OPERATIONS, OR METHODS MENTIONED, LISTED OR SCHEDULED ON THE DRAWINGS AND IN THESE SPECIFICATIONS, INCLUDING ALL LABOR, MATERIALS, EQUIPMENT, AND ALL INCIDENTALS NECESSARY REQUIRED FOR THE COMPLETION AND OPERATION OF ALL SYSTEMS.

THE INSTALLATION SHALL BE MADE SO THAT ALL COMPONENT PARTS FUNCTION TOGETHER AS A WORKABLE SYSTEM; IT SHALL BE COMPLETE WITH ALL ACCESSORIES NECESSARY FOR PROPER OPERATION. WHEN THE INSTALLATION IS COMPLETE, ALL EQUIPMENT SHALL BE OPERATIVE AND IN PROPER ADJUSTMENT. ALL WORK SHALL BE EXECUTED IN CONFORMITY WITH THE BEST PRACTICE SO AS TO CONTRIBUTE TO EFFICIENCY OF OPERATION, MINIMUM MAINTENANCE, ACCESSIBILITY AND SIGHTLINES.

TO ACCOMPLISH THESE RESULTS, THE CONTRACTOR SHALL CONSULT THE ARCHITECT'S AND ENGINEER'S PLANS COVERING THE VARIOUS OTHER TRADES, THE FIELD LAYOUTS OF THE CONTRACTORS FOR THESE TRADES AND THEIR SHOP DRAWINGS. HE SHALL COORDINATE HIS WORK ACCORDINGLY.

LOCAL CONDITIONS

THE CONTRACTOR SHALL VISIT THE SITE AND SHALL FAMILIARIZE HIMSELF WITH CONDITIONS WHICH WILL AFFECT THE WORK HE IS TO PERFORM. THE SUBMISSION OF A PROPOSAL BY THIS CONTRACTOR SHALL BE CONCLUSIVE EVIDENCE THAT THIS CONTRACTOR HAS VISITED THE SITE AND HAS GIVEN PROPER CONSIDERATION AND EVALUATION OF THESE CONDITIONS IN THE PREPARATION OF HIS PROPOSAL. NO ALLOWANCE SHALL SUBSEQUENTLY BE MADE IN HIS BEHALF FOR EXTRA EXPENSE INCURRED DUE TO FAILURE OR NEGLECT ON HIS PART TO MAKE THIS VISIT AND EXAMINATION.

WHERE ACTIVE SEWERS, GAS, ELECTRIC, OR OTHER SERVICES ARE ENCOUNTERED DURING THE PERFORMANCE OF THIS CONTRACT, THE CONTRACTOR SHALL PROTECT, BRACE AND SUPPORT THEM AS REQUIRED. DO NOT PREVENT, INTERRUPT OR DISTURB OPERATION OF EXISTING SERVICES THAT ARE TO REMAIN. RELOCATE EXISTING SERVICES IF REQUIRED.

PERMITS AND INSPECTIONS

THE CONTRACTOR SHALL TAKE OUT ALL PERMITS AND ARRANGE FOR ALL NECESSARY INSPECTIONS AND SHALL PAY ALL FEES AND EXPENSES IN CONNECTION THEREWITH AS A PART OF HIS WORK UNDER THEIR CONTRACT.

UPON COMPLETION OF THE WORK, THEY SHALL FURNISH TO THE OWNER ALL CERTIFICATES OF INSPECTION AND APPROVAL WHICH ARE CUSTOMARY FOR THE CLASSES OF WORK INVOLVED.

RULES, CODES AND STANDARDS

ALL WORK SHALL BE PERFORMED OR INSTALLED IN STRICT ACCORDANCE WITH ALL APPLICABLE RULES, REGULATIONS AND CODES OF LOCAL, STATE AND FEDERAL GOVERNMENTS, OR OTHER AUTHORITIES HAVING LAWFUL JURISDICTION, AND EACH CONTRACTOR AND SUBCONTRACTOR SHALL BE RESPONSIBLE FOR SUCH COMPLIANCE.

ALL ELECTRICAL WORK AND EQUIPMENT SHALL CONFORM TO THE REQUIREMENTS OF THE CURRENT ISSUE OF THE NATIONAL ELECTRICAL CODE, NFPA, ADA AND SHALL BEAR THE LABEL OF LISTING WITH THE UNDERWRITER'S LABORATORIES.

ALL MATERIALS, PRODUCTS AND EQUIPMENT, INCLUDING COMPONENTS THEREOF, SHALL BE NEW.

ELECTRICAL DISTRIBUTION SYSTEM SHALL BE DESIGNED TO WITHSTAND AND SAFELY INTERRUPT AN AVAILABLE SHORT CIRCUIT CURRENT THAT HAS BEEN VERIFIED WITH UTILITY COMPANY BY CONTRACTOR.

ALL ELECTRICAL WORK SHALL BE INSTALLED TO BE READILY ACCESSIBLE FOR OPERATING, SERVICING, MAINTAINING AND REPAIRING.

SHOP DRAWINGS

COMPLETE SHOP DRAWINGS FOR ALL ELECTRICAL MANUFACTURED ITEMS SHALL BE SUBMITTED TO THE ARCHITECT AND ENGINEERS FOR REVIEW AND ACCEPTANCE BEFORE FABRICATION OF THE ITEMS. DRAWINGS SHALL INDICATE NAME OF PROJECT AND NAME OF CONTRACTOR.

THE ELECTRICAL CONTRACTOR SHALL SUBMIT EQUIPMENT SHOP DRAWINGS TO THE ARCHITECT FOR APPROVAL BEFORE INSTALLATION OF ANY OF THE FOLLOWING ELECTRICAL EQUIPMENT:

A. LIGHTING FIXTURES
B. LIGHTING CONTROLS
C. PANELS

THE CONTRACTOR SHALL THOROUGHLY CHECK ALL SHOP DRAWINGS AS REGARDS TO MEASUREMENTS, SIZES OF EQUIPMENT, MATERIALS AND DETAILS TO SATISFY HIMSELF THAT THEY CONFORM TO THE INTENT OF ENGINEER'S DRAWINGS AND SPECIFICATIONS. DRAWINGS FOUND TO BE INACCURATE OR OTHERWISE IN ERROR ARE TO BE RETURNED TO THE SUBCONTRACTORS FOR CORRECTION BEFORE SUBMITTING SAME TO THE ENGINEERS.

THE REVIEW AND ACCEPTANCE OF SHOP DRAWINGS BY THE ENGINEERS SHALL BE CONSTRUED AS ASSISTING THE CONTRACTOR, AND THE ENGINEER'S ACTION DOES NOT RELIEVE THE CONTRACTOR FROM THE RESPONSIBILITY FOR ERRORS OR OMISSIONS WHICH MAY EXIST THEREIN. WHERE ERRORS OR OMISSIONS ARE DISCOVERED LATER, THEY MUST ACCORDINGLY BE MADE GOOD BY THE CONTRACTOR.

DRAWINGS NOT ACCEPTED MUST BE CORRECTED AND RETURNED FOR FINAL ACCEPTANCE. NO SHOP DRAWINGS SHALL BE USED ON THE WORK UNLESS ACCEPTED BY THE ENGINEER. TWO COPIES OF ALL DRAWINGS SUBMITTED WILL BE RETAINED BY THE ENGINEERS AND OWNER'S REPRESENTATIVE. CONTRACTOR MAY SUBMIT UP TO THREE ADDITIONAL COPIES WHICH WILL BE RETURNED FOR HIS USE. EXCESS COPIES WILL BE RETURNED UNMARKED. THE CONTRACTOR SHALL FURNISH TO THE FIELD, PRINTS OF REVIEWED AND ACCEPTED SHOP DRAWINGS AS REQUIRED BY THE CONSTRUCTION OPERATIONS. COST FOR DUPLICATION OF MARKED DRAWINGS IN EXCESS OF THE THREE MARKED SETS ABOVE SHALL BE BORNE BY THE CONTRACTOR.

AFTER SHOP DRAWINGS HAVE BEEN SUBMITTED TO THE ENGINEER, ACCEPTED, AND RETURNED TO THE CONTRACTOR, THE CONTRACTOR WILL NOT BE ALLOWED TO RESUBMIT SHOP DRAWINGS OF ANOTHER MANUFACTURER FOR THIS SAME ITEM WITHOUT THE ENGINEER'S CONSENT.

EXTRA WORK

FOR ANY EXTRA ELECTRICAL WORK WHICH MAY BE PROPOSED, THIS CONTRACTOR SHALL FURNISH TO THE GENERAL CONTRACTOR AN ITEMIZED BREAKDOWN OF THE ESTIMATED COST OF THE MATERIALS AND LABOR REQUIRED TO COMPLETE THIS WORK. THE CONTRACTOR SHALL PROCEED ONLY AFTER RECEIVING A WRITTEN ORDER FROM THE GENERAL CONTRACTOR ESTABLISHING THE AGREED PRICE AND DESCRIBING THE WORK TO BE DONE.

SCHEDULE OF WORK

COORDINATE ALL WORK WITH THAT OF OTHER TRADES. PERFORM WORK IN A PHASED MANNER AS REQUIRED TO ACCOMMODATE THE PROJECT CONSTRUCTION SCHEDULE. COORDINATE ALL WORK AND THE SEQUENCE OF INSTALLATION WITH THE GENERAL CONTRACTOR. THE CONTRACTOR SHALL WORK OVERTIME AT HIS OWN EXPENSE SO THAT ALL WORK MAY BE COMPLETED WITHIN THE TIME OUTLINED.

CUTTING AND PATCHING

THE CONTRACTOR SHALL "BUILD IN" HIS WORK AND SHALL BE RESPONSIBLE FOR HOLDING HIS WORK IN PLACE WHILE CONCRETE IS BEING POURED.

ALL MEASUREMENTS NECESSARY FOR THE PROPER INSTALLATION OF MATERIALS OR APPARATUS SHALL BE TAKEN IN THE FIELD. THE ELECTRICAL CONTRACTOR WILL BE HELD RESPONSIBLE FOR THE CORRECT FIT OF WORK INSTALLED.

TESTS AND ADJUSTMENTS

ALL ELECTRICAL CIRCUITS SHALL BE TESTED AS SOON AS CONDUCTORS ARE INSTALLED, AND FINAL TESTS SHALL BE MADE IN PRESENCE OF THE OWNER'S REPRESENTATIVE, WHEN ALL WORK IS COMPLETE, IF REQUIRED. IF CIRCUITS ARE NOT PROPERLY CONTROLLED AND INSULATED, MAKE NECESSARY CHANGES AND REPAIRS.

"AS-BUILT" CONDUIT DRAWINGS

AT COMPLETION, THE CONTRACTOR SHALL FURNISH TO THE OWNER ONE (1) COMPLETE SET OF BOND REPRODUCIBLE PRINTS, NEATLY MARKED AND DIMENSIONED WHERE REQUIRED TO SHOW ALL VARIATIONS BETWEEN ACTUAL CONSTRUCTION AS BUILT AND WORK AS INDICATED ON THE PRINTED DRAWINGS, INCLUDING ALL CHANGES IN LOCATIONS, SIZES, ETC. MARKINGS SHALL BE IN RED FOR ADDITIONS AND GREEN FOR DELETIONS. THESE REPRODUCIBLE BOND PRINTS SHALL BE NEW SETS PURCHASED FROM THE ARCHITECT, EACH SHEET CERTIFIED AS BUILT BY THE CONTRACTOR, AND TURNED OVER TO THE OWNER IN GOOD CONDITION.

GUARANTEE AND WARRANTY

CONTRACTOR SHALL GUARANTEE ALL WORK INSTALLED BY HIM OR HIS SUBCONTRACTORS TO BE FREE FROM DEFECT IN MATERIAL AND WORKMANSHIP FOR A PERIOD OF ONE YEAR FOLLOWING THE DATE OF FINAL ACCEPTANCE OF THE WORK, UNLESS A LONGER PERIOD IS STIPULATED UNDER SPECIFIC HEADINGS, AND HE SHALL REPAIR OR REPLACE AT NO ADDITIONAL COST TO THE OWNER, ANY MATERIAL OR EQUIPMENT DEVELOPING DEFECTS AND SHALL ALSO MAKE GOOD ANY DAMAGE CAUSED BY SUCH DEFECTS OR THE CORRECTION OF DEFECTS.

REPAIRS OR REPLACEMENTS SHALL BEAR ADDITIONAL TWELVE (12) MONTHS GUARANTEE, AS ORIGINALLY CALLED FOR, DATED FROM THE FINAL ACCEPTANCE OF THE REPAIR OR REPLACEMENT. THIS REQUIREMENT SHALL BE BINDING EVEN THOUGH IT WILL EXCEED PRODUCT GUARANTEES NORMALLY FURNISHED BY SOME MANUFACTURERS.

CONTRACTOR SHALL SUBMIT HIS OWN AND EACH EQUIPMENT MANUFACTURER'S WRITTEN CERTIFICATES, WARRANTING THAT EACH ITEM OF EQUIPMENT FURNISHED COMPLIES WITH ALL REQUIREMENTS OF THE DRAWINGS AND SPECIFICATIONS.

NOTE THAT GUARANTEE SHALL RUN FROM DATE OF FINAL ACCEPTANCE OF THE WORK, NOT FROM DATE OF INSTALLATION OF A DEVICE OR PIECE OF EQUIPMENT.

STENCILING AND PAINTING

PANELS SHALL HAVE THE NAME OF THE PANELS ON FRONT COVER IN ONE INCH LETTERS ON ENGRAVED BAKELITE NAMEPLATES.

PAINT ALL IRON WORK AND OTHER MISCELLANEOUS IRON TWO COATS OF AN APPROVED ENAMEL PAINT. COLOR OF PAINT SHALL BE SELECTED SUCH THAT IT BLEND WITH SURROUNDINGS.

ALL EXPOSED CONDUIT SHALL BE PAINTED BY THE CONTRACTOR. COLOR TO BLEND IN WITH EXISTING COLOR SCHEME.

CONDUITS AND FITTINGS

CONDUIT EXPOSED AND CONDUIT LARGER THAN 2" SHALL BE HOT-DIP GALVANIZED, RIGID HEAVYWALL TYPE, UNLESS OTHERWISE NOTED.

CONDUIT SHALL BE DELIVERED TO THE SITE IN STANDARD 10 FOOT LENGTHS, EACH LENGTH BEARING THE UL LABEL. HOT-DIP GALVANIZED CONDUIT SHALL BE SO LABELED.

MINIMUM SIZE OF CONDUIT SHALL BE 3/4", UNLESS OTHERWISE NOTED.

ALL CONDUIT SHALL BE SECURELY FASTENED IN PLACE WITH APPROVED CLAMPS AND CAREFULLY REAMED BEFORE INSTALLING.

EXPOSED CONDUIT SHALL BE INSTALLED PARALLEL, OR AT RIGHT ANGLES AND SHALL BE SUPPORTED AT INTERVALS NOT EXCEEDING EIGHT FEET.

GROUPS OF CONDUITS, WHERE SUSPENDED, SHALL BE SUPPORTED ON TRAPEZE TYPE HANGERS, USING 3/8" ROD AND CHANNEL IRON OR UNISTRUT. INDIVIDUAL CONDUITS NOT SUPPORTED ON PIPE STRAPS SHALL BE PROVIDED WITH CONDUIT CLAMPS OR STIRRUP HANGERS SUSPENDED ON RODS. PERFORATED IRON STRAPS OR SOFT IRON WIRE FOR PIPE SUPPORTS SHALL NOT BE USED.

FLEXIBLE STEEL CONDUIT SHALL NOT BE USED IN PLACE OF STANDARD THINWALL OR RIGID CONDUIT.

ALL WIRING SHALL BE ENCLOSED IN A METAL RACEWAY, UNLESS OTHERWISE NOTED.

ALL EMPTY CONDUITS SHALL HAVE A NYLON "FISH TAPE" LEFT IN THEM.

EXPOSED CONDUIT SHALL BE IN STRAIGHT LINES AND PARALLEL.

CONNECTORS AND COUPLINGS FOR ELECTRICAL METALLIC TUBING SHALL BE OF THE COMPRESSION TYPE AS MANUFACTURED BY T & B, MIDWEST, OR ELECTRIC TUBE PRODUCTS CO.

OUTLET BOXES

OUTLET BOXES FOR SURFACE MOUNTED WIRING DEVICES SHALL BE FD CAST BOXES.

ALL OUTLET BOXES, PULL BOXES AND JUNCTION BOXES SHALL BE RIGIDLY SECURED IN PLACE IN AN APPROVED METHOD.

CONDUCTORS OF LIGHTING CIRCUITS SHALL NOT BE INSTALLED IN THE SAME CONDUIT WITH RECEPTACLE CIRCUITS. NO OUTLET BOX FOR ONE CONDUIT SYSTEM SHALL BE USED AS A JUNCTION BOX FOR ANY OTHER SYSTEM.

ALL SURFACE MOUNTED OUTLET BOXES SHALL BE CROUSE-HINDS FS SERIES OR EQUAL BY KILLARK OR APPLETON, WITH THREADED HUBS AS REQUIRED.

NO OUTLET BOX FOR ONE CONDUIT SYSTEM SHALL BE USED AS A JUNCTION BOX FOR ANY OTHER SYSTEM.

INSTALLATION OF CABLES

BEFORE CONDUCTORS ARE INSTALLED IN CONDUIT RUNS, THE CONDUITS SHALL BE SWABBED OR THE EQUIVALENT TO ENSURE THEIR DRYNESS AND FREEDOM FROM FOREIGN MATTER DETRIMENTAL TO THE CONDUCTOR INSULATION.

GROUNDING

ALL CABINETS, CONDUIT SYSTEMS, PANELBOARDS, ETC., SHALL BE THOROUGHLY GROUNDED IN ACCORDANCE WITH THE REQUIREMENTS OF THE NATIONAL ELECTRICAL CODE.

PROVIDE A GREEN INSULATED EQUIPMENT GROUNDING CONDUCTOR IN EACH CONDUIT. WHERE CIRCUITS FROM DIFFERENT SOURCES ARE INSTALLED IN THE SAME CONDUIT, SEPARATE EQUIPMENT GROUNDING CONDUCTORS SHALL BE PROVIDED FOR EACH SOURCE.

WIRES AND CABLES

ALL WIRE AND CABLE SHALL CONFORM TO THE LATEST REQUIREMENTS OF THE CURRENT EDITION OF THE NEC AND SHALL MEET ALL ASTM SPECIFICATIONS. WIRE AND CABLE SHALL BE NEW; SHALL HAVE SIZE, GRADE OF INSULATION, VOLTAGE AND MANUFACTURER'S NAME PERMANENTLY MARKED ON OUTER COVERING AT REGULAR INTERVALS; SHALL BE DELIVERED IN COMPLETE COILS OR REELS WITH IDENTIFYING SIZE AND INSULATION TAGS.

WIRE AND CABLE SHALL BE SUITABLY PROTECTED FROM WEATHER AND DAMAGE DURING STORAGE AND HANDLING AND SHALL BE IN FIRST-CLASS CONDITION WHEN INSTALLED.

ALL CONDUCTORS SHALL BE STRANDED, SOFT-DRAWN COPPER UNLESS OTHERWISE NOTED.

SERVICE ENTRANCE CONDUCTORS SHALL BE TYPE XHHW; THHN SHALL BE USED IN DRY LOCATIONS ONLY. ALL OTHER WIRING SHALL BE THHN, THWN, XHHW OR TYPE THW UNLESS A HIGHER TEMPERATURE WIRE IS REQUIRED TO FEED LIGHTING FIXTURES, HIGH TEMPERATURE CUTOUTS, ETC.

CONDUIT AND WIRE SIZES ARE BASED ON THW CONDUCTORS.

WIRE AND CABLE SHALL BE AS MANUFACTURED BY SOUTHWIRE, GENERAL CABLE, OKONITE OR ANACONDA.

ALL CONDUCTORS SHALL BE COLOR CODED.

ALL WIRING SHALL BE INSTALLED IN CONDUIT.

MINIMUM SIZE WIRE SHALL BE #12 AWG UNLESS OTHERWISE NOTED.

PROVIDE A SEPARATE NEUTRAL CONDUCTOR FOR EACH CIRCUIT OR MULTI-WIRE BRANCH CIRCUIT.

PROVIDE A GREEN INSULATED EQUIPMENT GROUNDING CONDUCTOR IN EACH CONDUIT. WHERE CIRCUITS FROM DIFFERENT SOURCES ARE INSTALLED IN THE SAME CONDUIT, SEPARATE EQUIPMENT GROUNDING CONDUCTORS SHALL BE PROVIDED FOR EACH SOURCE.

WIRE CONNECTORS

SPLICES IN CONDUCTORS NO. 8 AND SMALLER SHALL BE MADE BY PRE INSULATED "SCOTCH LOCK" OR IDEAL "WING-NUT" SPRING TENSION CONNECTORS, INSTALLED IN STRICT ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS. SPLICES OF NO. 6 CONDUCTORS AND LARGER SHALL BE MADE WITH SOLDERLESS, COMPRESSION TYPE CONNECTORS, UL LABELED AND COMPRESSED WITH APPROVED TOOLS. ALL SPLICES SHALL BE INSULATED WITH AN APPROVED VINYL PLASTIC ALL WEATHER TAPE TO A THICKNESS EQUIVALENT OF THE CONDUCTOR INSULATION.

ALL SPLICES SHALL BE INSULATED WITH AN APPROVED VINYL PLASTIC ALL WEATHER TAPE TO A THICKNESS EQUIVALENT OF THE CONDUCTOR INSULATION.

HANGERS

HANGERS SHALL INCLUDE ALL MISCELLANEOUS STEEL AND SHALL BE FASTENED TO STEEL, CONCRETE OR MASONRY, NOT TO PIPING.

HANGERS AND SUPPORTS EXPOSED TO PUBLIC VIEW MUST BE UNIFORMLY SPACED AND NEATLY INSTALLED, WITH NO EXCESS MATERIAL BEYOND WHAT IS REQUIRED FOR THE SUPPORT FUNCTION.

LIGHTING

THESE SPECIFICATIONS AND THE ACCOMPANYING PLANS CONTEMPLATE THE FURNISHING OF ALL LABOR AND MATERIAL NECESSARY FOR A COMPLETE INSTALLATION OF FIXTURES AND LAMPS FOR LIGHTING OUTLETS SHOWN ON DRAWINGS. THESE FIXTURES SHALL BE COMPLETE IN EVERY DETAIL, PROPERLY WIRED AND CONNECTED WITH CIRCUITS SUPPLYING SAME.

BEFORE FIXTURES ARE FABRICATED OR ORDERED, THIS CONTRACTOR SHALL SUBMIT CUTS AND SPECIFICATIONS FOR EACH FIXTURE TYPE FOR APPROVAL BY THE ENGINEER.

ALL FIXTURES SHALL BE UL LISTED.

ALL LED DRIVERS SHALL BE RATED FOR 120 VOLT OPERATION AS NOTED.

EACH LED DRIVER SHALL BE HIGH POWER FACTOR WITH INDIVIDUAL NON-RESETTING OVERLOAD PROTECTION, CBM CERTIFIED, CLASS "P", WITH AN "A" SOUND RATING, ELECTRONIC TYPE AND PROVIDE A BUSSMAN GLR FUSE IN AN HLR HOLDER. DRIVER HARMONICS MAY NOT EXCEED THAT TOTAL HARMONIC DISTORTION ALLOWABLE BY THE ELECTRIC UTILITY COMPANY.

UNLESS OTHERWISE NOTED, ALL LAMPS SHALL BE LED. LAMPS SHALL BE AS MANUFACTURED BY GENERAL ELECTRIC, SYLVANIA OR WESTINGHOUSE.

AFTER ALL FIXTURES AND LAMPS ARE INSTALLED, A LIGHTING TEST SHALL BE MADE IN THE PRESENCE OF THE ENGINEER, AND ANY DEFECTS IN CONTROL OR OPERATION FOUND AT THIS TIME SHALL BE CORRECTED BY THE CONTRACTOR AT HIS OWN EXPENSE.

WHEN COMPLETE JOB IS TURNED OVER TO THE OWNER, ALL LIGHTING FIXTURES SHALL BE CLEAN AND CONTRACTOR SHALL PROVIDE SPARE LAMPS TO THE OWNER; FOUR OF EACH TYPE AND WATTAGE USED ON PROJECT.

MOUNTING HEIGHTS

IN GENERAL, MOUNTING HEIGHTS ABOVE FINISHED GRADE TO THE CENTERLINE OF BOXES AND EQUIPMENT SHALL BE AS FOLLOWS UNLESS OTHERWISE INDICATED ON THE DRAWINGS:

PANEL	4'-0" TO CENTER OF PANEL PROVIDING BOTTOM OF CABINET IS NOT LESS THAN 1'-0" ABOVE GRADE AND TOP NOT ABOVE 6'-0".
TIMER	4'-0"
METER	4'-0"
PHOTOCELL	7'-0"
LIGHTING CONTACTOR	4'-0"

NEW PANEL

PANEL SHALL BE 120/240 VOLT, SINGLE PHASE, THREE WIRE SERVICE, SQUARE D TYPE NQOD, WATERTIGHT, NEMA TYPE 4 ENCLOSURE, DEAD FRONT OR EQUAL AS MANUFACTURED BY WESTINGHOUSE, GTE SYLVANIA, CUTLER HAMMER, SIEMENS OR G.E., HAVING BUS BARS WITH CONNECTIONS IN MAINS FOR CONNECTION TO FEEDERS AND WITH UNITS IN BRANCHES OF NUMBER AND AMPERE CAPACITY SHOWN ON THE PLANS. PROVIDE SPARE CIRCUITS AS SHOWN. VERIFY VOLTAGE AVAILABLE WITH UTILITY COMPANY.

CONTINUOUS MAIN CURRENT RATINGS AS INDICATED IN ASSOCIATED SCHEDULE ON DRAWINGS, NOT TO EXCEED 600 AMPERES MAXIMUM. MINIMUM SHORT CIRCUIT CURRENT RATING: 22,000 A.I.C. IN RMS SYMMETRICAL AMPERES AT 240 VOLTS AC. VERIFY AVAILABLE SHORT CURRENT RATING FOR EQUIPMENT WITH UTILITY COMPANY.

PROVIDE ONE (1) CONTINUOUS BUS BAR PER PHASE. EACH BUS BAR SHALL HAVE SEQUENTIALLY PHASED BRANCH CIRCUIT CONNECTORS SUITABLE FOR BOLT-ON BRANCH CIRCUIT BREAKERS. THE BUSSING SHALL BE FULLY RATED. PANELBOARD BUS CURRENT RATINGS SHALL BE DETERMINED BY HEAT-RISE TESTS CONDUCTED IN ACCORDANCE WITH UL 67. BUSSING RATED 100-400 AMPERES SHALL BE COPPER. BUSSING RATED FOR 600 AMPERES SHALL BE COPPER AS STANDARD CONSTRUCTION.

ALL CURRENT CARRYING PARTS SHALL BE INSULATED FROM GROUND AND PHASE-TO-PHASE BY NORYL HIGH DIELECTRIC STRENGTH THERMOPLASTIC OR EQUIVALENT.

SPLIT SOLID NEUTRAL SHALL BE PLATED AND LOCATED IN THE MAINS COMPARTMENT UP TO 225 AMPERES SO ALL INCOMING NEUTRAL CABLE MAY BE OF THE SAME LENGTH.

INTERIOR TRIM SHALL BE OF DEAD-FRONT CONSTRUCTION TO SHIELD USER FROM ENERGIZED PARTS. DEAD-FRONT TRIM SHALL HAVE PREFORMED TWISTOUTS COVERING UNUSED MOUNTING SPACE.

INTERIOR SHALL BE FIELD CONVERTIBLE FOR TOP OR BOTTOM INCOMING FEED. MAIN AND SUB-FEED CIRCUIT BREAKERS SHALL BE VERTICALLY MOUNTED. MAIN TUB INTERIORS UP TO 400 AMPERES SHALL BE FIELD CONVERTIBLE TO MAIN BREAKER.

CABINET OF PANEL SHALL BE OF CODE GAUGE GALVANIZED STEEL WITH PROPER SPACE FOR ALL WIRES AND CONNECTIONS AND SHALL BEAR UNDERWRITERS LABORATORIES INSPECTION LABEL. CABINET SHALL BE A MINIMUM OF 5-3/4" DEEP x 20" WIDE.

PANEL SHALL BE SURFACE MOUNTED. FRONT SHALL BE OF CODE GAUGE, FURNITURE LEVELED STEEL HAVING A FLUSH DOOR WITH FLUSH HINGES. PROVIDE A CHROME PLATED FLUSH COMBINATION LOCK AND CATCH AND DIRECTORY CARD SET IN A FRAME.

THERE SHALL BE TWO FORMS OF VISIBLE TRIP INDICATION FOR BREAKERS. THE BREAKER HANDLE SHALL RESIDE IN A "TRIPPED" POSITION BETWEEN "ON" AND "OFF". IN ADDITION THERE SHALL BE A VISI-TRIP INDICATOR APPEARING IN THE CLEAR WINDOW OF THE CIRCUIT BREAKER HOUSING.

THE EXPOSED FACEPLATES OF ALL BRANCH CIRCUIT BREAKERS SHALL BE FLUSH WITH ONE ANOTHER.

CONTRACTOR SHALL BE RESPONSIBLE TO REARRANGE LOADS TO DIFFERENT CIRCUIT NUMBERS AS REQUIRED TO BALANCE LOADS ON PHASES OF PANEL.

ALL BREAKERS SHALL BE BOLTED TYPE.

LUGS SHALL BE UL LISTED TO ACCEPT SOLID OR STRANDED COPPER AND ALUMINUM CONDUCTORS. LUGS SHALL BE SUITABLE FOR 75°C RATED WIRE, SIZED ACCORDING TO THE 75° TEMPERATURE RATING PER NEC TABLE 310-16. BRANCH BREAKERS RATED 30 AMPERES AND BELOW SHALL BE UL LISTED TO ACCEPT 60°C RATED WIRE.

CIRCUIT BREAKERS FOR PANELS SHALL HAVE AN OVERCENTER TOGGLE MECHANISM WHICH WILL PROVIDE QUICK-MAKE, QUICK-BREAK CONTACT ACTION. CIRCUIT BREAKERS SHALL HAVE THERMAL AND MAGNETIC TRIP ELEMENTS IN EACH POLE. TWO AND THREE POLE CIRCUIT BREAKERS SHALL HAVE AN INTERNAL COMMON TRIP CROSSBAR TO PROVIDE SIMULTANEOUS TRIPPING.

ALL LOCKS SHALL BE KEYED ALIKE. FRONT SHALL BE FINISHED IN TWO COATS OF GRAY BAKED ENAMEL. DIRECTORY CARDS SHALL BE FILLED OUT TO INDICATED CIRCUITRY WITH TYPED LARGE CASE LETTERS FOR PANEL.

PANEL SHALL BE LABELED INSIDE DOOR WITH BLACK STENCIL PAINT SHOWING THE NAME AND OPERATING VOLTAGE: E.G. LIGHTING PANEL "A-120/240V".

TEMPORARY LIGHT AND POWER

THE CONTRACTOR SHALL PROVIDE, INSTALL AND MAINTAIN ALL FACILITIES REQUIRED FOR TEMPORARY LIGHTING AND POWER AS HEREINAFTER SPECIFIED.

CONTRACTOR SHALL PROVIDE A 100A-120/240V PANEL, POWER POLE AND OVERHEAD WIRING AS REQUIRED - COORDINATE WITH UTILITY COMPANY.

INSTALL A WEATHERPROOF OUTLET ON TEMPORARY POWER POLE.

CONTRACTOR SHALL PROVIDE LIGHTS AS REQUIRED FOR TEMPORARY USE AND LAMPS TO MAINTAIN LIGHTING.

OTHER CONTRACTORS USING THIS TEMPORARY SERVICE SHALL PROVIDE THEIR OWN EXTENSION CORDS AND ANY REQUIRED ADDITIONAL LAMPS.

IF ADDITIONAL POWER OR WIRING IS REQUIRED, CONTRACTOR REQUIRING SAME SHALL PAY THE CONTRACTOR FOR PROVIDING THIS SERVICE.

COST OF CURRENT CONSUMED WILL BE PAID BY THE OWNER.

THE CONTRACTOR SHALL ALSO PROVIDE TEMPORARY WIRING AND CONNECTIONS FOR FAN MOTORS, PUMPS, FUEL BURNERS, ETC., AT THE DIRECTION OF THE ARCHITECT, WHEN HEAT OR VENTILATION IS REQUIRED DURING THE CONSTRUCTION OF THE BUILDING.

THE CONTRACTOR SHALL PERFORM HIS WORK IN ACCORDANCE WITH ANY APPLICABLE SAFETY LAWS, RULES, OR REGULATIONS OF THE STATE OF MICHIGAN.

LIGHTING CONTACTOR

SHALL BE RATED 240 VOLTS, AC, SINGLE THROW, WATERTIGHT NEMA TYPE 4 ENCLOSURE, ELECTRICALLY OPERATED MECHANICALLY HELD PERMANENT MAGNETIC LATCH TYPE WITH OPERATING COIL FOR VOLTAGE REQUIRED, WITH HAND-OFF-AUTO CONTROLS AND WITH NUMBER OF POLES AS REQUIRED OR AS INDICATED ON THE DRAWINGS. AMPERE RATING FOR LIGHTING CONTACTOR SHALL BE AS REQUIRED OR AS CALLED FOR ON THE DRAWINGS. CONTACTOR SHALL BE SQUARE D CLASS 8903 OR ENGINEER APPROVED EQUAL.

DIGITAL TIME CLOCK

SHALL BE RATED 20 AMPERE INDUCTIVE AT VOLTAGE REQUIRED, WATERTIGHT NEMA TYPE 4 ENCLOSURE, SINGLE POLE DOUBLE THROW, ELECTRONIC PROGRAMMABLE TYPE WITH DOOR, POLES AS REQUIRED, AND SHALL INCLUDE 7-DAY 24 HOUR DIAL, (4) CIRCUIT, MINIMUM OF 1000 SET POINTS, USER SELECTABLE OVERRIDE, ASTRONOMICAL SWITCHING, INDIVIDUAL PROGRAMMING PER CIRCUIT, UP TO 99 DIFFERENT HOLIDAYS, FULLY AUTOMATIC DAYLIGHT SAVING TIME ADJUSTMENT AND WITH NEMA 4 ENCLOSURE FOR SURFACE MOUNTING. TIMER SHALL BE INTERMATIC CAT. #ET70415CR OR T174 (VOLTAGE RATING AS REQUIRED) OR ENGINEER APPROVED EQUAL.

PHOTOELECTRIC CONTROLLER

SHALL BE WEATHERPROOF FOR OUTSIDE MOUNTING. CONTROLLER SHALL BE SPDT WITH CONTACT ARRANGEMENTS COMPATIBLE WITH TYPE OF CONTACTOR PROVIDED, AND SHALL OPERATE AT VOLTAGE REQUIRED, 60 HERTZ POWER, RATED A MINIMUM OF 1000 WATTS AND SHALL HAVE PRESET, ADJUSTABLE TURN-ON AND TURN-OFF POINTS FROM 1.0 TO 12.0 FOOT-CANDLES. TIME DELAY FEATURE SHALL BE INCLUDED TO PREVENT SWITCHING OF LIGHTS DUE TO TRANSIENT LIGHTING CHANGES. CONTROLLER SHALL BE EQUIPPED WITH 1/2" PIPE-THREAD AND SHALL BE INTERMATIC NO. K1811 OR ENGINEER APPROVED EQUAL.

FUSES

ALL MAIN FUSES ABOVE 600 AMPS SHALL BE HIGH-CAPACITY, CURRENT-LIMITING FUSES WITH A MINIMUM SHORT-CIRCUIT RATING OF 200,000 RMS AMPS, SHALL CHARACTERISTICS TO COORDINATE WITH OTHER FUSES AS NOTED; AND DIMENSIONS TO MOUNT IN SWITCHGEAR AS SPECIFIED. FUSES SHALL BE BUSSMAN "HI-CAP", TYPE KRP-C.

ALL OTHER FUSES SHALL BE DUAL ELEMENT, CURRENT LIMITING CARTRIDGE TYPE AND SHALL HAVE A MINIMUM SHORT-CIRCUIT RATING OF 200,000 AMPS. FUSES SHALL BE BUSSMAN "LOW PEAK".

IN ADDITION OF FUSES BLOWN DURING CONSTRUCTION AND TESTING, A COMPLETE SET OF SPARE FUSES SHALL BE PROVIDED FOR EACH DIFFERENT AMP SIZE OF FUSES ON PROJECT.

FUSES FOR ALL CIRCUITS AND OTHER EQUIPMENT SHALL BE SELECTED IN RATINGS IN ACCORDANCE WITH THE NATIONAL ELECTRICAL CODE, TO PROVIDE A COORDINATED SYSTEM OF OVER-CURRENT PROTECTION. THUS IN CASE OF A FAULT OR HARMFUL OVERLOAD, ONLY THE FUSES NEAREST THE FAULT OR OVERLOADED EQUIPMENT SHALL OPEN.

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ELECTRICAL SPECIFICATIONS

ISSUED FOR	DATE
REVIEW	10/10/17
BIDS	10/18/17

DESIGNER:	DL
DRAWN:	DDA
PM / PIC:	JSR
CHECKED:	SM
ACADFILE:	17-1312-E-003
PROJECT No.	17-1312

E-003