

# EAST VILLAGE MASTER PLAN

INDIANA MASONIC HOME  
690 STATE STREET  
FRANKLIN, IN 46131

CURRENT DRAWING SET: 01/22/2019

ARCHITECT & LANDSCAPE ARCHITECT:

**BROWNING  
DAY MULLINS  
DIERDORF**  
LEADERSHIP + DESIGN®

**BROWNING DAY MULLINS DIERDORF**  
626 N. ILLINOIS STREET  
INDIANAPOLIS, INDIANA 46204  
Ph: (317) 635-5030  
CONTACT PERSON: RYAN MILLER  
rmiller@bdmd.com

PROJECT DEVELOPER/OWNER:

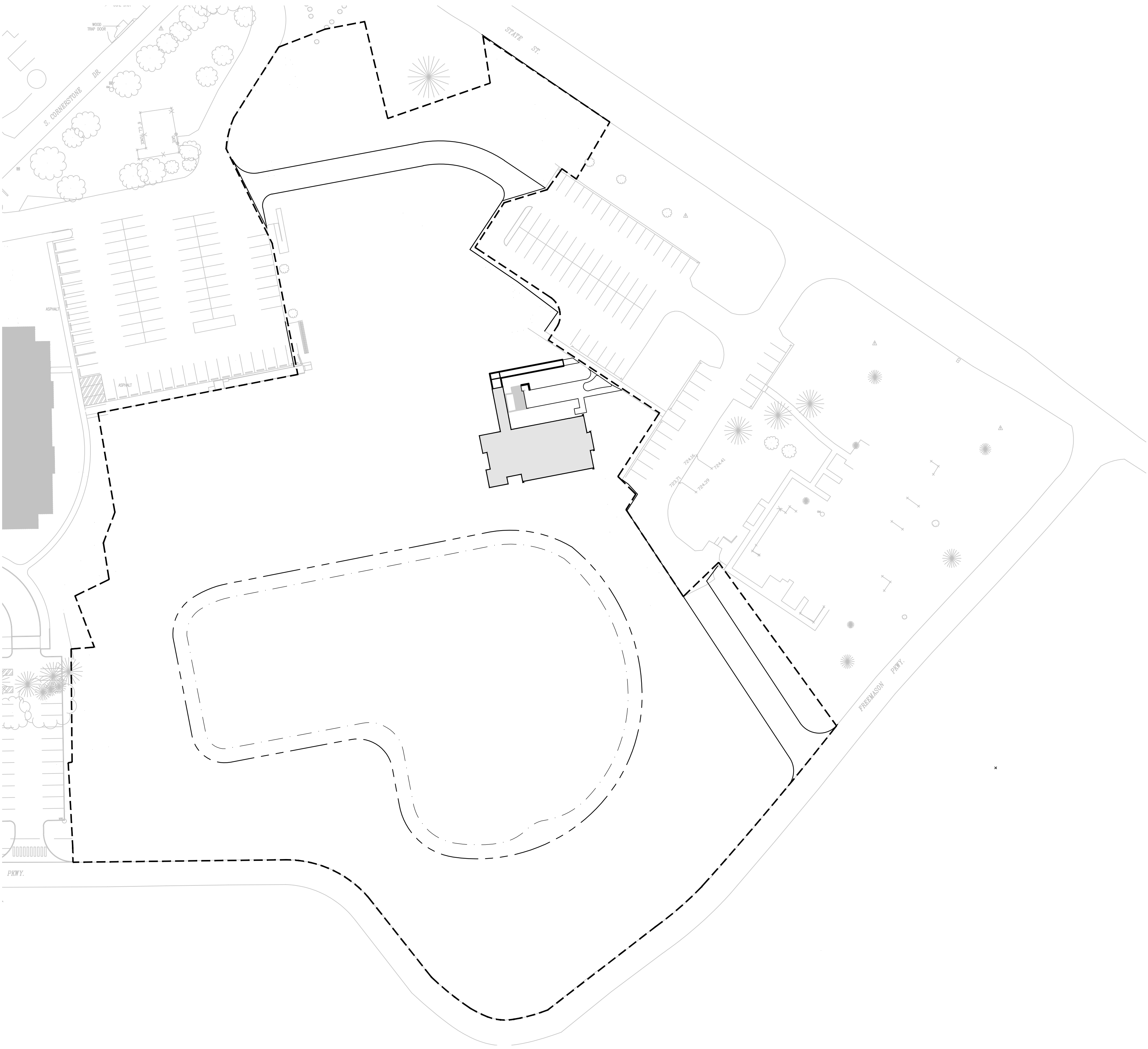


**INDIANA MASONIC HOME AT COMPASS PARK**  
690 STATE STREET  
FRANKLIN, INDIANA 46131  
Ph: (317) 714-0079  
CONTACT PERSON: DENNY SHEETS  
dsheets@barthelectric.com

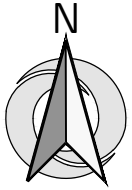
PLANS PREPARED BY:



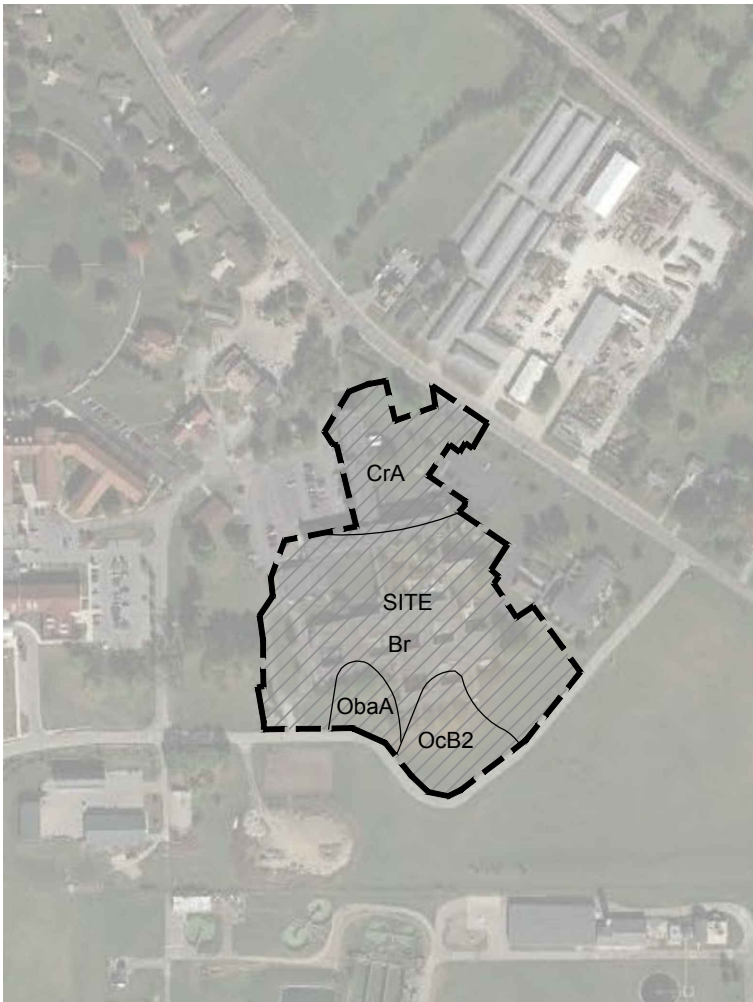
**V3 COMPANIES**  
619 NORTH PENNSYLVANIA STREET  
INDIANAPOLIS, INDIANA 46204  
Ph: 317.423.0690  
PRIMARY CONTACT: DAVID MARKS  
dmarks@v3co.com



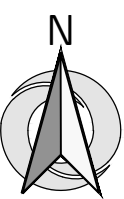
PROJECT LAYOUT MAP  
SCALE: 1" = 80'



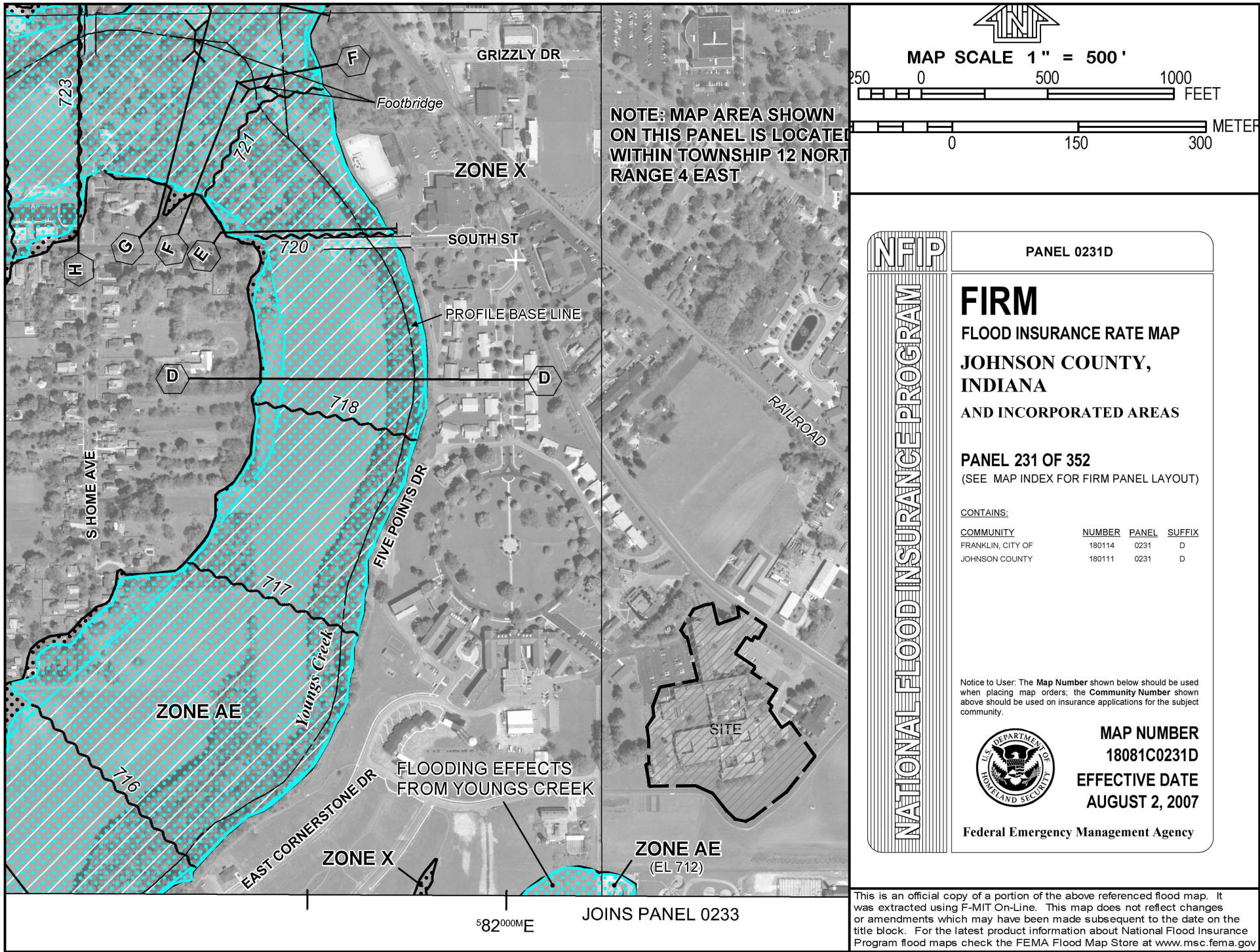
Sheet List Table	
SHEET NUMBER	SHEET TITLE
C0.0	COVER SHEET
C1.0	DEMOLITION PLAN
C2.0	SITE PLAN
C3.0	GRADING PLAN
C4.0	EROSION CONTROL PLAN
C4.1	EROSION CONTROL DETAILS
C4.2	SWPPP
C5.0	UTILITY PLAN
C6.0	CONSTRUCTION DETAILS
C9.0	SPECIFICATIONS
C9.1	SPECIFICATIONS



SOILS MAP  
NOT TO SCALE



VICINITY MAP  
SCALE: 1" = 1,000'



FLOOD INSURANCE RATE MAP  
SCALE: 1" = 1,000'





**BROWNING  
DAY MULLINS  
DIERDORF  
ARCHITECTS**

Browning Day Mullins Dierdorf  
Architecture  
Landscape Architecture  
Planning

626 North Illinois Street  
Indianapolis, Indiana 46204  
P: 317.636.0000  
F: 317.634.0400  
W: www.bdmnd.com

Indiana Masonic Home  
Owner

690 State Street  
Franklin, Indiana 46131  
P: 317.736.6141  
F: 317.736.6141  
E: 317.736.6141

Shiel Sexton  
Construction Management

902 North Capitol Ave.  
Indianapolis, Indiana 46204  
P: 317.423.6000  
F: 317.423.6300  
E: ssc@shielsexton.com

D2 Architecture  
Architectural Consultant

2001 North Lamar Street, Suite 300  
Dallas, Texas 75202  
P: 214.220.1800  
F: 214.220.1818  
E: gwarnier@d2-architecture.com

Lawson Elser Engineering  
Structural Engineer

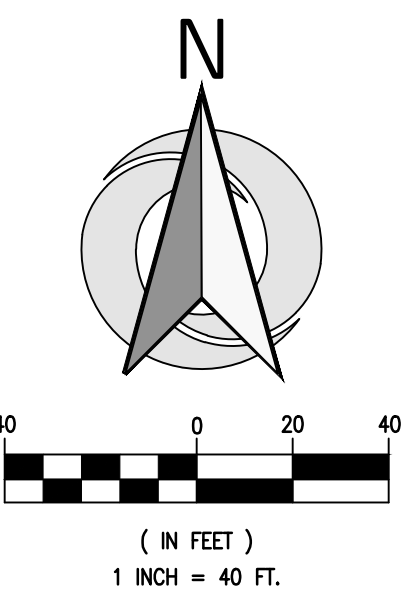
650 East Carmel Drive Suite 150  
Carmel, Indiana 46032  
P: 317.574.9409  
F: 317.574.9431  
E: mlawson@lawsonelser.com

V3 Companies  
Civil Engineer

619 North Pennycuik Street  
Indianapolis, Indiana 46204  
P: 317.423.0600  
F: 317.423.0600  
E: dmurphy@v3co.com

Musset Nicholas + Associates  
MEP

502 S. West Street  
Indianapolis, Indiana 46225  
P: 317.631.9241  
F: 317.631.9241  
E: jnehar@williamscreek.net



**LEGEND**

- LIMITS OF DISTURBANCE
- - - EXISTING FENCE
- - - EXISTING GAS
- - - EXISTING WATER LINE
- - - EXISTING SANITARY SEWER
- - - EXISTING STORMSEWER
- - - EXISTING STORM STRUCTURES
- - - EXISTING BURIED ELECTRIC CABLE
- - - EXISTING BURIED TELEPHONE CABLE
- - - DEMO ITEM (I.E. UTILITY LINES, FENCES, ETC.)
- - - PERIMETER CONSTRUCTION FENCE
- - - SAW CUT EXISTING PAVEMENT
- - - DEMO ITEM (I.E. LIGHT POLE, TRANSFORMER, ETC.)
- - - EXISTING TREE OR SHRUB TO BE REMOVED

- EXISTING PAVEMENT, CURB, OR HARDSCAPE TO BE REMOVED
- EXISTING STRUCTURE TO BE REMOVED
- NON-PAVED AREAS TO BE DISTURBED

**DEMOLITION NOTES**

1. THE CONTRACTOR SHALL BE RESPONSIBLE FOR REMOVAL AND DISPOSAL OFF-SITE OF ALL ITEMS SHOWN ON THE DEMOLITION PLAN INCLUDING ITEMS ENCOUNTERED DURING EXCAVATION OF BUILDING FOUNDATIONS AND UTILITY PLACEMENT.
2. PRIOR TO STARTING DEMOLITION, IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO OBTAIN ALL PERMITS REQUIRED BY LOCAL GOVERNMENTAL AGENCIES.
3. THE CONTRACTOR SHALL COORDINATE WITH THE LOCAL UTILITY COMPANIES FOR THE DISCONNECTION AND REMOVAL OF SERVICES TO EXISTING STRUCTURES.
4. ITEMS SHOWN ON THE DEMOLITION PLAN TO BE SALVAGED SHALL BE TRANSPORTED TO A LOCATION SPECIFIED BY THE OWNER OR HIS/HER REPRESENTATIVE.
5. ITEMS OF SALVAGEABLE VALUE TO THE CONTRACTOR MAY BE REMOVED WITH THE OWNER OR HIS/HER REPRESENTATIVE'S PERMISSION ONLY. THE CONTRACTOR SHALL NOT STORE THESE ITEMS ON SITE.
6. THE CONTRACTOR MAY NOT USE EXPLOSIVES OR BURN DEBRIS.
7. CONDUCT DEMOLITION OPERATIONS TO ENSURE MINIMAL INTERFERENCE WITH ROADS, SIDEWALKS AND ANY OTHER ADJACENT OCCUPIED FACILITIES.
8. DO NOT CLOSE OR OBSTRUCT ROADS, SIDEWALKS, OR ANY OTHER OCCUPIED FACILITIES WITHOUT PERMISSION FROM THE LOCAL AUTHORITY HAVING JURISDICTION AND/OR PROPERTY OWNERS.
9. THE CONTRACTOR SHALL ENSURE SAFE PASSAGE OF PERSONS TRAVERSING THROUGH OR AROUND THE CONSTRUCTION SITE.
10. THE CONTRACTOR SHALL PROTECT FROM DAMAGE, SURROUNDING STRUCTURES, UTILITIES, AND OTHER FACILITIES DURING DEMOLITION AND REMOVAL OPERATIONS.
11. ALL EXISTING CURB AND PAVEMENT SHALL BE SAW CUT ALONG LIMITS OF DEMOLITION PRIOR TO REMOVAL.



CERTIFICATION

**EAST VILLAGE MASTER PLAN**

690 STATE STREET  
FRANKLIN, IN 46131

Project No.: 16029  
Drawn By: PCB  
Checked By: DAM  
Scale: See Drawing  
Issue Date: 22 JANUARY 2019

REVISION SCHEDULE		
Rev. #	Revision Description	Issue Date

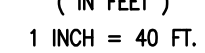


**DEMOLITION PLAN**

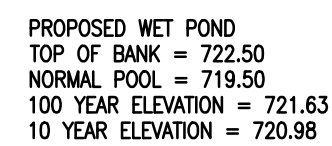
**C1.0**



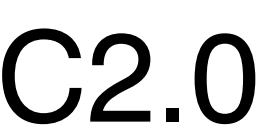
502 S. West Street  
Indianapolis, Indiana 46225  
P: 317.631.9241  
F:  
E: [jrinehart@williams creek.com](mailto:jrinehart@williams creek.com)



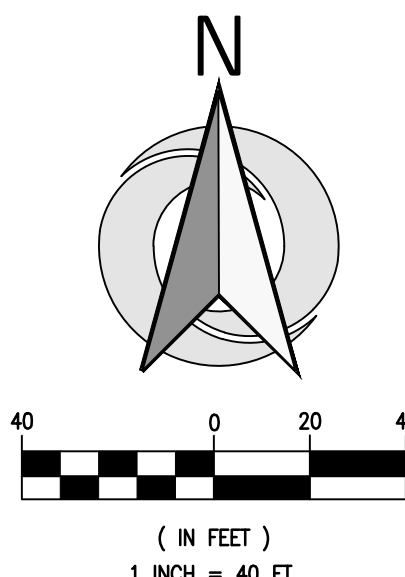
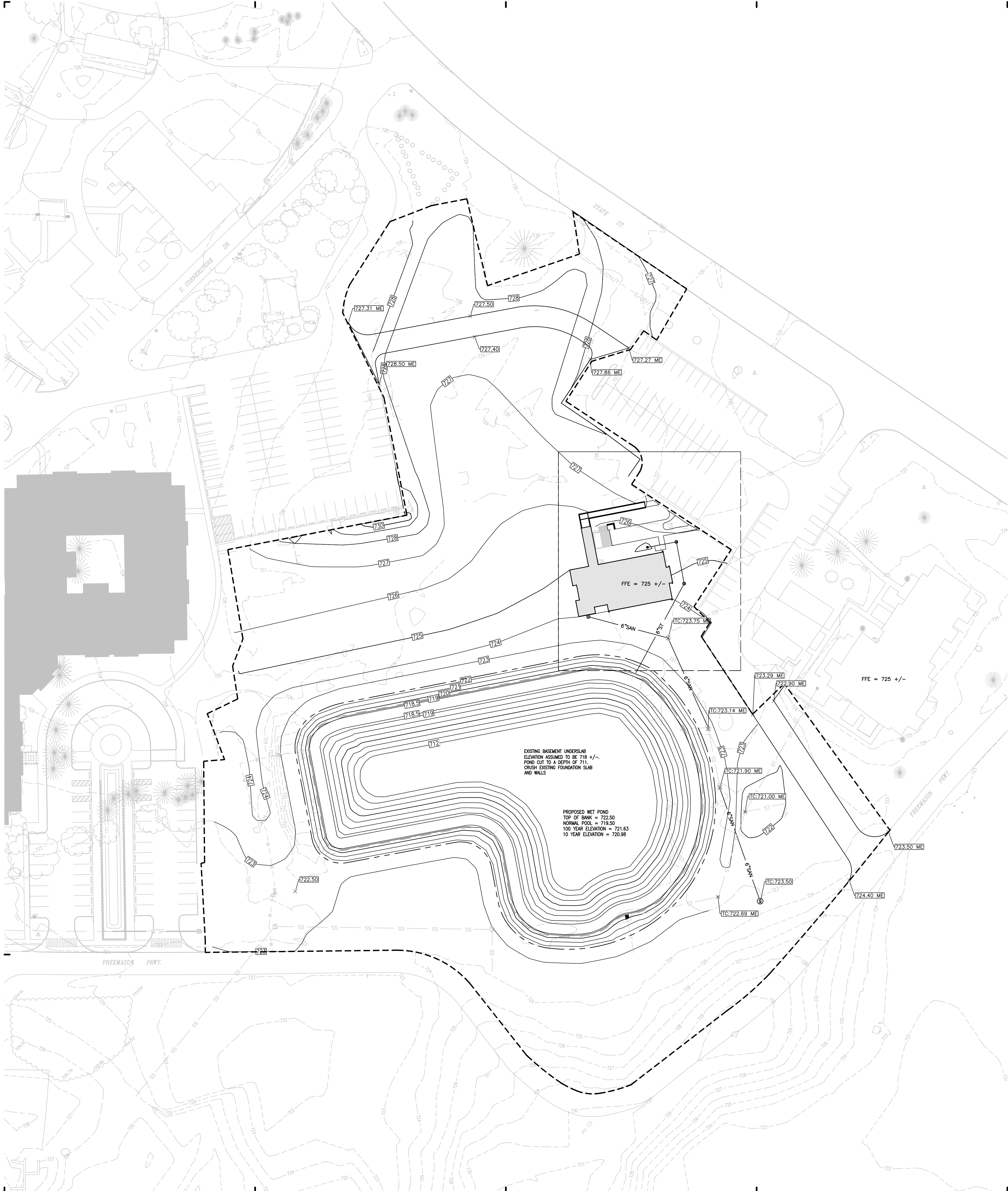
1. ALL CONSTRUCTION METHODS AND MATERIALS MUST CONFORM TO CURRENT STANDARDS AND SPECIFICATIONS OF THE FEDERAL, STATE, COUNTY, CITY, OR LOCAL REQUIREMENTS, WHICHEVER HAS JURISDICTION.
2. ALL DIMENSIONS ARE TO EDGE OF PAVEMENT, UNLESS OTHERWISE NOTED.
3. THE CONTRACTOR SHALL VERIFY ALL DIMENSIONS AND ELEVATIONS IN THE FIELD PRIOR TO THE START OF CONSTRUCTION. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL FIELD DIMENSIONS AND ELEVATIONS. THEREFORE, DIMENSIONS AND ELEVATIONS SHOWN ON THESE PLANS ARE FOUND IN THESE PLANS FROM ACTUAL FIELD DIMENSIONS, THE CONTRACTOR SHALL CONTACT THE ENGINEER IMMEDIATELY.
4. PROVIDE SMOOTH TRANSITION FROM NEWLY PAVED AREAS TO EXISTING AREAS AS NECESSARY. ALL AREAS WHERE PROPOSED PAVEMENT MEETS EXISTING PAVEMENT, THE EXISTING EDGE OF PAVEMENT SHALL BE REPAIRED AND REFINISHED. WHERE DESIRED, THE EXISTING PAVEMENT SHALL BE PROPERLY SEALED WITH AN APPROPRIATE SEALER WITH A TACK COAT MATERIAL. IN ALL AREAS WHERE NEW ASPHALT PAVEMENT IS INTENDED TO JOIN EXISTING PAVEMENT, THE CONTRACTOR SHALL CONTACT THE ENGINEER IMMEDIATELY.
5. ALL EXCAVATED AREAS TO BE SOODED AND/OR SEEDED AFTER FINAL GRADING UNLESS OTHERWISE NOTED. IN ALL NEWLY SOODED/SEEDDED AREAS SHALL HAVE A MINIMUM OF 4" OF TOPSOIL, HOLD SOIL DOWN 1" FROM PAVEMENT ELEVATION, CONTRACTOR TO SUPPLY STRAW MULCH WHERE GRASS SEED HAS BEEN PLANTED.
6. RESURFACE OR RECONSTRUCT AT LEAST TO ORIGINAL DIMENSIONS ALL AREAS WHERE TRAFFIC BY CONTRACTORS, SUBCONTRACTORS OR SUPPLIERS HAVE CAUSED EXISTING PAVEMENT, LAINS OR OTHER IMPROVEMENTS DURING CONSTRUCTION, AFTER CONSTRUCTION WORK IS COMPLETE.
7. ALL UTILITY TRENCHES WITHIN 5 FEET OF PAVEMENT SHALL BE COMPLETELY BACKFILLED WITH GRANULAR BACKFILL.
8. ALL RADI INDICATED SHALL BE CONSTRUCTED AS CIRCULAR ARCS.
9. WHERE CONNECTIONS ARE MADE TO EXISTING MANHOLES OR INLET STRUCTURES, THOSE STRUCTURES SHALL BE REHABILITATED OR REPLACED IF WARRANTED. THE REHABILITATION SHALL INCLUDE THE INSTALLATION OF A BENCH WITH A MINIMUM 1% SLOPE TO THE STRUCTURE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE REMOVAL OF BACKFILL MATERIALS INTO THE PIPE SYSTEM.
10. CONTRACTOR SHALL COORDINATE WITH THE CITY OF FRANKLIN DURING ALL PHASES OF CONSTRUCTION. THE ADDRESS IS 201 S MONROE STREET, FRANKLIN, IN 46131. THE CONTACT PHONE NUMBER IS 877-333-3333.



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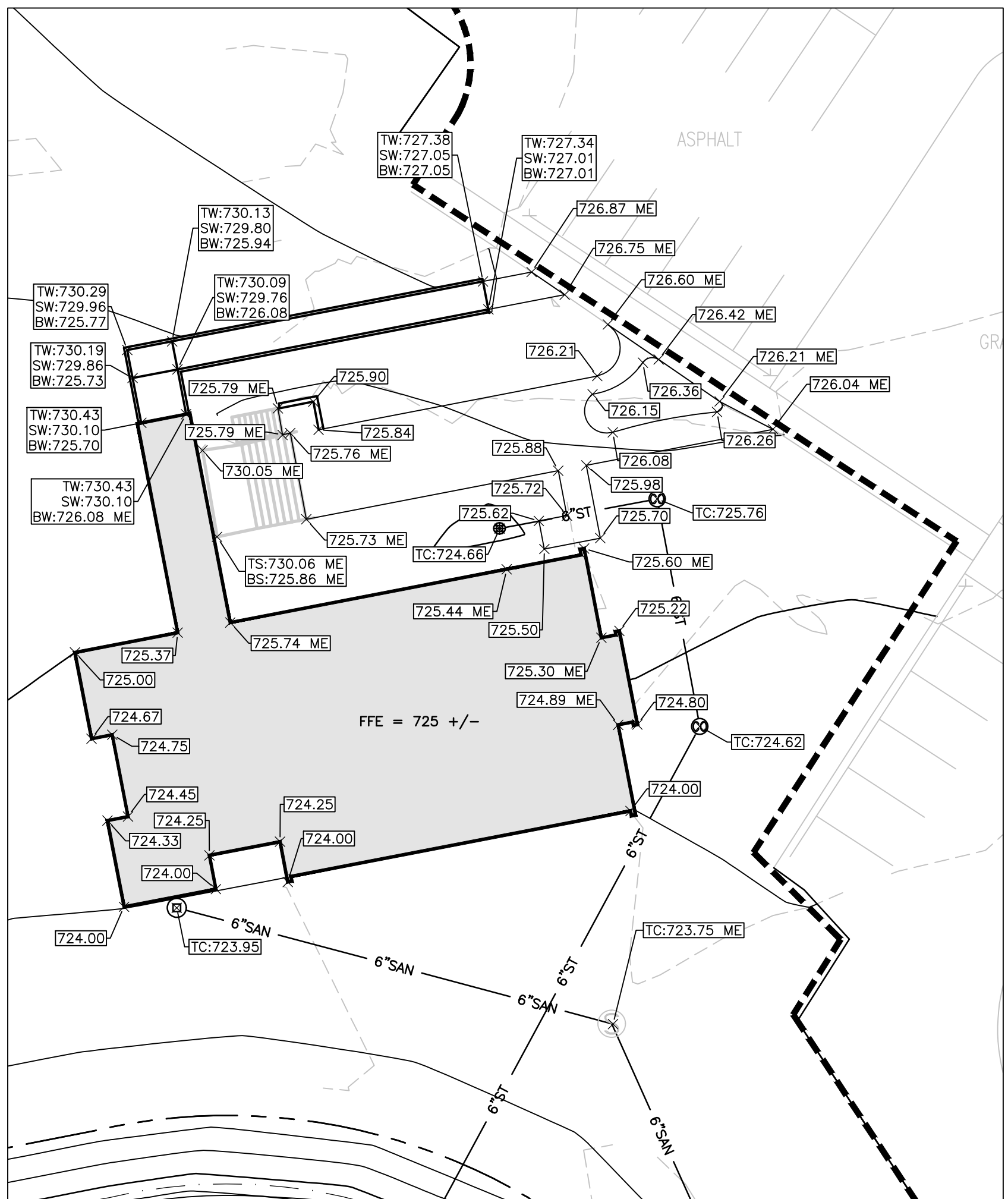


LEGEND

- |     |                       |
|-----|-----------------------|
| --- | PROPERTY BOUNDARY     |
| --- | EXISTING CONTOUR      |
| --- | PROPOSED CONTOUR      |
| --- | EDGE OF PAVEMENT      |
| --- | SIDEWALK              |
| --- | LIMITS OF DISTURBANCE |
| --- | TOP OF BANK           |
| --- | NORMAL POOL           |
| --- | TC                    |
| --- | ME                    |
| --- | TW                    |
| --- | SW                    |
| --- | BW                    |
| --- | TOP OF CASTING        |
| --- | MATCH EXISTING        |
| --- | TOP OF WALL           |
| --- | SIDEWALK              |
| --- | BOTTOM OF WALL        |

EARTHWORK ESTIMATE

CUT VOLUME = 13,895 CYS  
FILL VOLUME = 13,895 CYS  
(POND MAY BE UNDERCUT ADDITIONAL DEPTH TO LOSE TOPSOIL)



SCALE 1" = 20'

BROWNING  
DAY MULLINS  
DIERDORF  
ARCHITECTS

Browning Day Mullins Dierdorf  
Architecture  
Landscape Architecture  
Planning  
626 North Illinois Street  
Indianapolis, Indiana 46204  
P: 317.635.5030  
F: 317.634.5409  
W: www.bdmnd.com

Indiana Masonic Home  
Owner

690 State Street  
Franklin, Indiana 46131  
P: 317.736.6141  
F: 317.574.9431

Shiel Sexton  
Construction Management

902 North Capitol Ave.  
Indianapolis, Indiana 46204  
P: 317.423.6000  
F: 317.423.6000  
E: ssc@shielsexton.com

D2 Architecture  
Architectural Consultant

2001 North Lamar Street, Suite 300  
Dallas, Texas 75202  
P: 214.220.1800  
F: 214.220.1819  
E: gwerner@d2architecture.com

Lawson Elser Engineering  
Structural Engineer

650 East Carmel Drive Suite 150  
Carmel, Indiana 46032  
P: 317.574.9409  
F: 317.574.9431  
E: mlawson@lawsonelser.com

V3 Companies  
Civil Engineer

619 North Pennsylvania Street  
Indianapolis, Indiana 46204  
P: 317.423.0690  
F: 317.423.0690  
E: dmarks@v3co.com

Musset Nicholas + Associates  
MEP

502 S. West Street  
Indianapolis, Indiana 46225  
P: 317.631.9241  
F: 317.631.9241  
E: jrnehart@williamscreek.net



CERTIFICATION

EAST VILLAGE MASTER PLAN

690 STATE STREET  
FRANKLIN, IN 46131

Project No.: 16029

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Checked By: DAM

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Issue Date: 16 JANUARY 2019

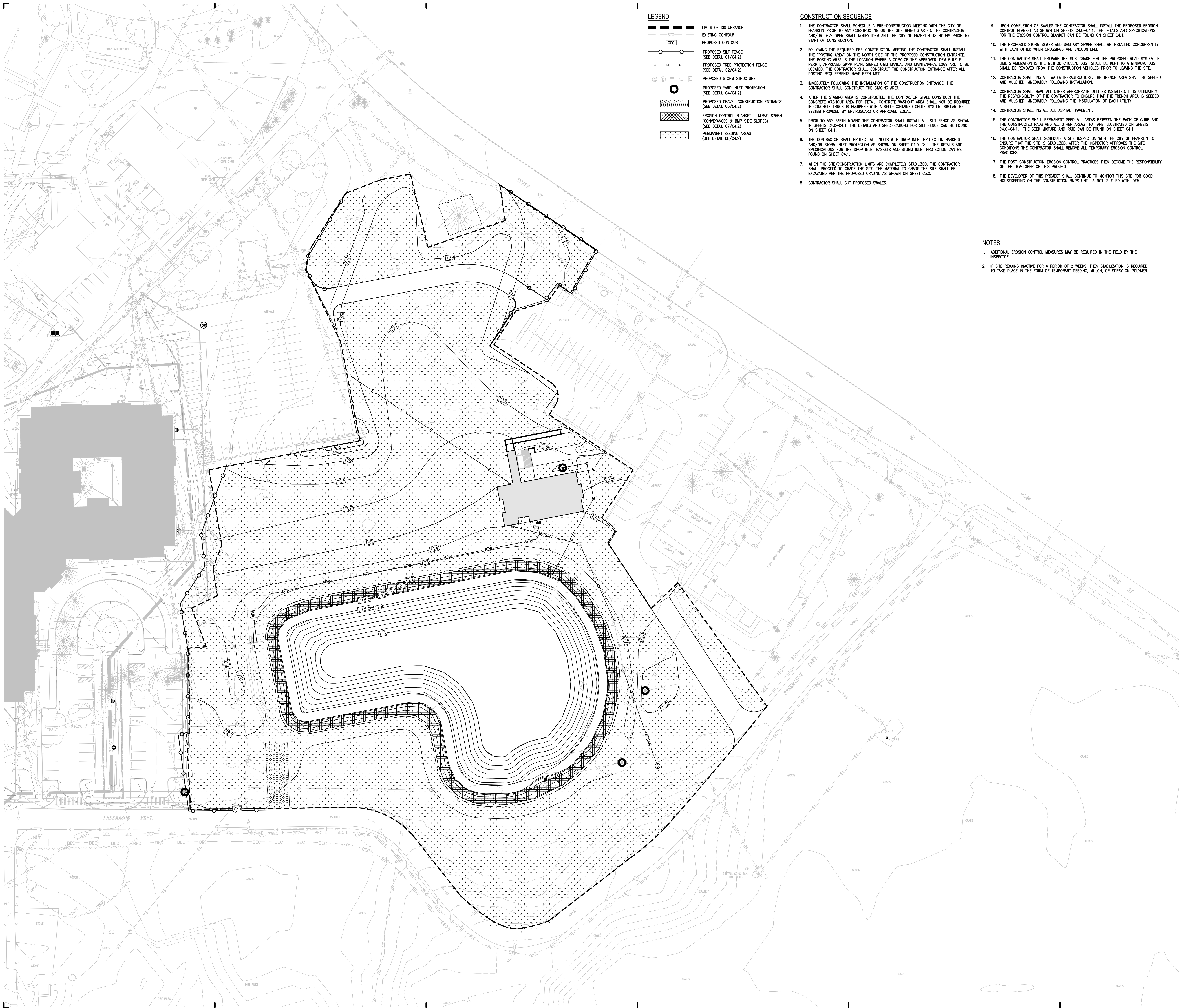
REVISION SCHEDULE		
Rev. #	Revision Description	Issue Date



GRADING PLAN

C3.0





# BROWNING DAY MULLINS DIERDORF

## LEADERSHIP + DESIGN

Browning Day Mullins Dierdorf Architects  
Architecture  
Landscape Architecture  
Planning  
Interior Design  
606 North Illinois Street  
Indianapolis, Indiana 46204  
Phone: 317.635.5030  
Website: www.bdmnd.com

D2 ARCHITECTURE  
Associate Architect  
2001 North Lamar Street,  
Dallas, Texas 75202  
Phone: 214.220.1800  
Website: www.d2architecture.com

Indiana Masonic Home at Compass Park  
Owner

690 State Street  
Franklin, Indiana 46131  
Phone: 765.735.6141  
Website: www.compasspark.org

Lawson Elser  
Structural Engineer

650 East Carmel Drive Suite 150  
Carmel, Indiana 46032  
Phone: 317.631.5400  
Website: www.lawsonelser.com

Mussett, Nicholas & Associates, Inc.  
MEP Engineer

502 South West Street  
Indianapolis, Indiana 46225  
Phone: 317.631.3040  
Website: www.m-n-a.com

V3 Companies  
Civil Engineer

619 North Pennsylvania Street  
Indianapolis, Indiana 46204  
Phone: 317.631.0690  
Website: www.v3co.com

Reitano Design Group  
Food Service Consultant

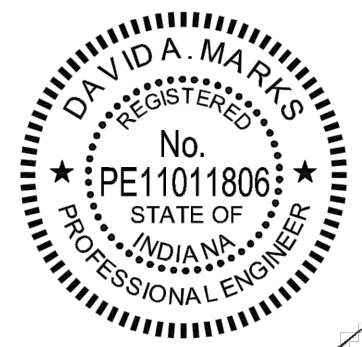
302 North East Street - Studio One  
Indianapolis, Indiana 46204  
Phone: 317.631.3040  
Website: www.reitanodesigngroup.com

RTM Consultants, Inc.  
Code Consultant

6640 Parkdale Place Suite J  
Indianapolis, Indiana 46254  
Phone: 317.329.7700  
Website: www.rtmconsultants.com

Shiel Sexton  
Construction Manager

902 North Capitol Avenue  
Indianapolis, Indiana 46204  
Phone: 317.423.6000  
Website: www.shiels Sexton.com



CERTIFICATION  
*David A. Marks*

## EAST VILLAGE MASTER PLAN

690 State Street, Franklin, IN

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## EROSION CONTROL PLAN

# C4.0



# BROWNING DAY MULLINS DIERDORF

## LEADERSHIP + DESIGN

Browning Day Mullins Dierdorf Architects

Architecture  
Landscape Architecture  
Planning  
Interior Design

626 North Illinois Street  
Indianapolis, Indiana 46204  
Phone: 317.635.5030  
Website: www.bdmdnd.com

D2 ARCHITECTURE  
Associate Architect

2001 North Lamar Street,  
Dallas, Texas 75202  
Phone: 755.735.6141  
Website: www.d2architecture.com

Indiana Masonic Home at Compass Park  
Owner

690 State Street  
Franklin, Indiana 46131  
Phone: 317.635.6141  
Website: www.compasspark.org

Lawson Elser  
Structural Engineer

650 East Carmel Drive Suite 150  
Carmel, Indiana 46032  
Phone: 317.631.5400  
Website: www.lawsonelser.com

Mussett, Nicholas & Associates, Inc.  
MEP Engineer

502 South West Street  
Indianapolis, Indiana 46225  
Phone: 317.631.8040  
Website: www.m-n-a.com

V3 Companies  
Civil Engineer

619 North Pennsylvania Street  
Indianapolis, Indiana 46204  
Phone: 317.423.0690  
Website: www.v3co.com

Reitano Design Group  
Food Service Consultant

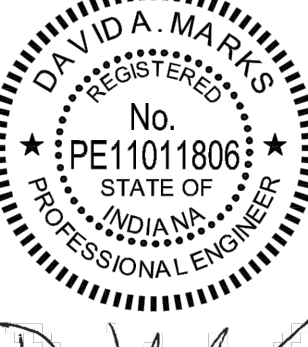
302 North East Street - Studio One  
Indianapolis, Indiana 46254  
Phone: 317.631.3240  
Website: www.reitanodesigngroup.com

RTM Consultants, Inc.  
Code Consultant

6640 Parkdale Place Suite J  
Indianapolis, Indiana 46254  
Phone: 317.329.7700  
Website: www.rtmconsultants.com

Shiel Sexton  
Construction Manager

902 North Capitol Avenue  
Indianapolis, Indiana 46204  
Phone: 317.423.6000  
Website: www.shielsexton.com



CERTIFICATION

## EAST VILLAGE MASTER PLAN

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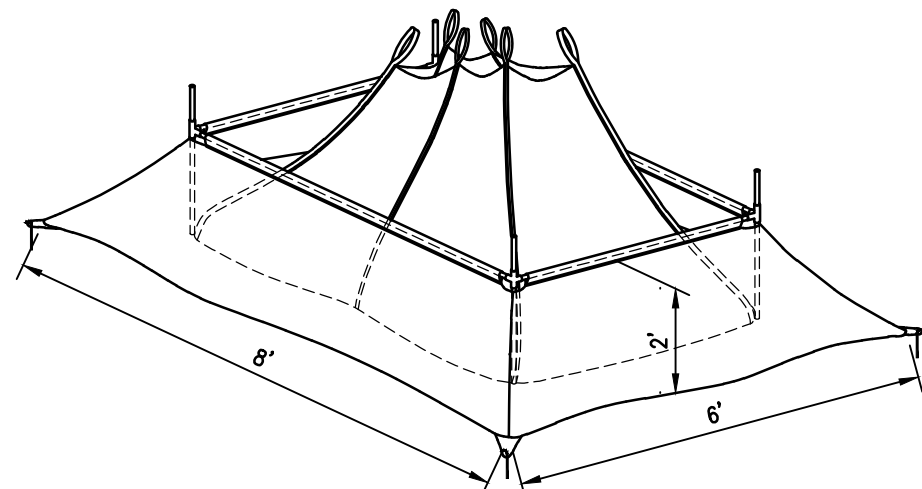
Rev. # Revision Description Issue Date

## EROSION CONTROL DETAILS

# C4.1



Know what's below.  
Call before you dig.



6'X2' PORTABLE CONCRETE WASHOUT CONTAINER  
VINYL-CON™ DETAIL A-2  
NOT TO SCALE

### Concrete Washout Specifications

#### VINYL-CON CONCRETE WASHOUT SYSTEM SPECIFICATIONS

Vinyl-Con™ system utilizes a portable, self-contained and watertight container with filter bag system and Aqua-Solution™ to control, capture and contain concrete wastewater and washout material.

Vinyl-Con System is compliant with EPA regulations for Concrete Washout.

#### Site Management

- Complete installation of the system and have washout locations operational prior to concrete delivery.
- Do not wash out concrete trucks or equipment into storm drains, wetlands, streams, rivers, creeks, ditches, or streets.
- Never wash out into a storm sewer drainage system. These systems are typically connected to a natural conveyance system.
- Where necessary, provide stable ingress and egress.
- Do not back flush equipment at the project site. Back flushing should be restricted to the plant as it generates large volumes of waste that may exceed the capacity of the washout systems. If an emergency arises, back flush should only be performed with the permission of the on-site manager for the project.

#### Location

- Locate concrete washout systems at least 50 feet from any creeks, wetlands, ditches, karst features, or storm drains/nomade conveyance systems.
- To the extent practical, locate concrete washout systems in relatively flat areas that have established vegetation and do not receive runoff from adjacent land areas.
- Locate in areas that provide easy access for concrete trucks and other construction equipment.
- Locate away from other construction traffic to reduce the potential for damage to the system.

#### Vinyl-Con Container

- Locate the washout in an area that is free of rocks and other debris that may cause tears or punctures in the Vinyl-Con Container.
- Spread the Vinyl-Con™ flat on the ground with the opening facing up.
- Lay out the framework pieces on the ground as follows:  
End Vinyl-Con™: (4) 4-way corner fittings; (4) 2" upright fittings; (2) couplers; (4) 15" legs;  
(2) 47" walls; (4) 35.5" walls

#### Assembly

- Insert 47" wall into 4" pocket of Vinyl-Con™ (repeat on opposite side)
  - Attach (2) 35.5" walls together with (1) coupler (repeat on opposite side)
  - Insert the wall with coupler into 4" pocket of Vinyl-Con™ (repeat on opposite side)
  - Connect (4) legs into 4-ways
  - Connect (4) 4-ways in each corner to the walls
  - Insert 2" upright into the top of the 4-way on each corner (for use of filter bags)
  - Loops are available on each corner to secure the Vinyl-Con™ to the ground with stakes in high wind areas. Once the concrete is in the Vinyl-Con™ there is no need for stakes.
- #### Install Filter Bag
- Spread the Vinyl-Con™ Filter Bag flat inside the Vinyl-Con™ container
  - Insert the 7" pvc uprights into the top of the corner fittings on the Vinyl-Con™ container
  - Place the Filter Bag corner loops over the Vinyl-Con™ corner uprights. Be sure to twist the loops several times and then loop over the corner pvc uprights. This helps secure the filter bag in place.
  - Begin pouring concrete washout into the filter bag
  - When the filter bag is full of concrete, lift the bag with the straps allowing the water to permeate through the bag and into the Vinyl-Con™ container.
  - Set the filter bag aside and refill the Vinyl-Con™ container with another filter bag

#### Maintenance

- Place a cover over the washout facility prior to a predicted rainfall event to prevent accumulation of water and possible overflow of the system
- Inspect daily and after each storm event.
- Inspect the integrity of overall structure including, the containment system.
- Inspect the system for leaks, spills, and tracking of soil by equipment
- Once filter bag is full of hardened washout material, remove for recycling.
- Place another filter bag inside the Vinyl-Con watertight container and repeat step #1 over again multiple times.
- Once Vinyl-Con watertight container is full of cementitious wastewater, place last filter bag inside to allow wastewater to permeate up through the filter bag and broadcast Aqua-Solution into wastewater turning the wastewater into a gelled content in about 5 minutes.
- Once entire filter bag of wastewater is a gelled content, remove for recycling.
- Reuse Vinyl-Con watertight container, begin with step #1 with more filter bags.

#### Benefits

The Vinyl-Con™ Washout Systems is reusable with the filter bags. You may fill 1-3 filter bags by washing out 75+ concrete trucks (Vinyl-Con 68). Once each filter bag is full of hardened concrete you lift the filter bag (rated for 2,500lbs) out of the Vinyl-Con container and set it aside for the concrete recycling company. Then after filling about 3 filter bags the Vinyl-Con is full of wash water. Place the fourth filter bag into the Vinyl-Con and let the water permeate up through the filter bag into the bag has settled on the bottom of the Vinyl-Con container. Sprinkle aqua-solution into the water, the water turn to gel in about 5 minutes. Once the water is in gel form lift the fourth filter bag and set aside for the concrete recyclers. The Vinyl-Con container is empty and ready to use again. (<http://www.vinyl-con.com/> )

#### Specifications

DETAIL A-2 -Vinyl-Con 68 (6'X2size) Approximately 25+ concrete trucks per filter bag to washout up to 75-90+ concrete trucks until Vinyl-Con watertight container is full of wastewater. Reuse again.

### SILT FENCE

#### LOCATION

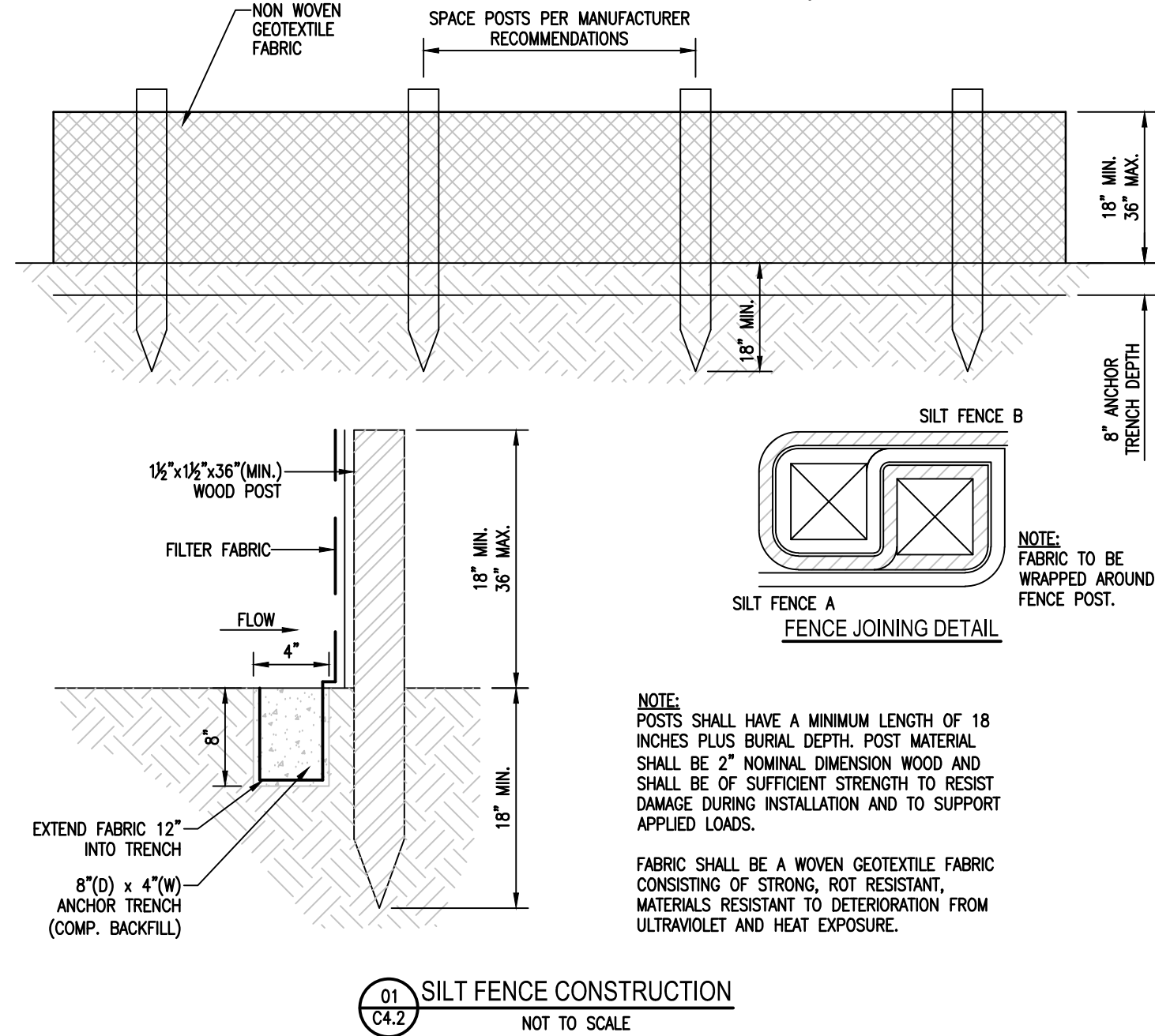
- Installed parallel to the slope contour.
- Minimum of 10 feet beyond the toe of slope to provide a broad, shallow sediment pool.
- Accessible for maintenance (removal of sediment and silt fence repair).

#### INSTALLATION

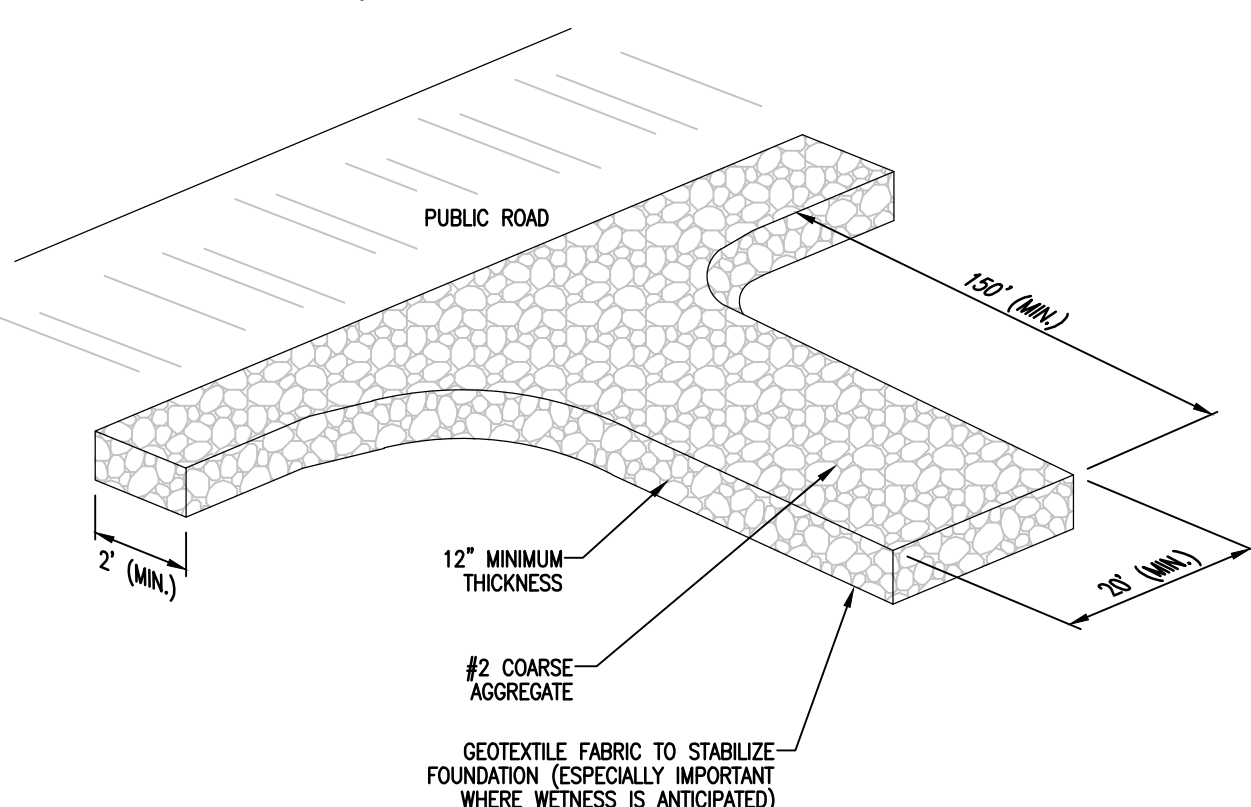
- Lay out the location of the fence so that it is parallel to the contour of the slope and at least 10 feet beyond the toe of slope to provide a sediment storage area. Turn the ends of the fence up slope such that the point of contact between the ground and the bottom of the fence and terminates at a higher elevation than the top of the fence at its lowest point.
- Excavate an eight-inch deep by four-inch wide trench along the entire length of the fence line. Installation by plowing is also acceptable.
- Install the silt fence with the filter fabric located on the up-slope side of the excavated trench and the support posts on the down-slope side of the trench.
- Drive the support posts at least 18 inches into the ground, tightly stretching the fabric between the posts on each side driven into the soil. A minimum of 12 inches of the filter fabric should extend into the trench. (If it is necessary to join the ends of two fences, use the wrap joint method shown)
- Lay the lower four inches of filter fabric on the bottom of the trench and extend it toward the down-slope side of the trench.
- Backfill the trench with soil material and compact it in place.

#### MAINTENANCE

- Inspect within 24 hours of a rain event and at least once every seven calendar days.
- If fence fabric tears, starts to decompose, or in any way becomes ineffective, replace the affected portion immediately. Note: All repairs should meet specifications as outlined within this measure.
- Remove deposited sediment when it is causing the filter fabric to bulge or when it reaches one-half the height of the fence at its lowest point. When contributing drainage area has been stabilized, remove the fence and sediment deposits, grade the site to blend with the surrounding area, and stabilize.



SILT FENCE CONSTRUCTION  
C4.2  
NOT TO SCALE



### Temporary Construction Entrance

- Width - 20 feet minimum or full width of entrance/exit roadway, whichever is greater.
- Length - 150 feet minimum (length can be shorter for small sites).
- Thickness - eight inches minimum.
- Washing Facility (optional)
- Level area with three inch, or larger, washed aggregate or install a commercial wash rack.
- Divert waste water to a sediment trap or basin.

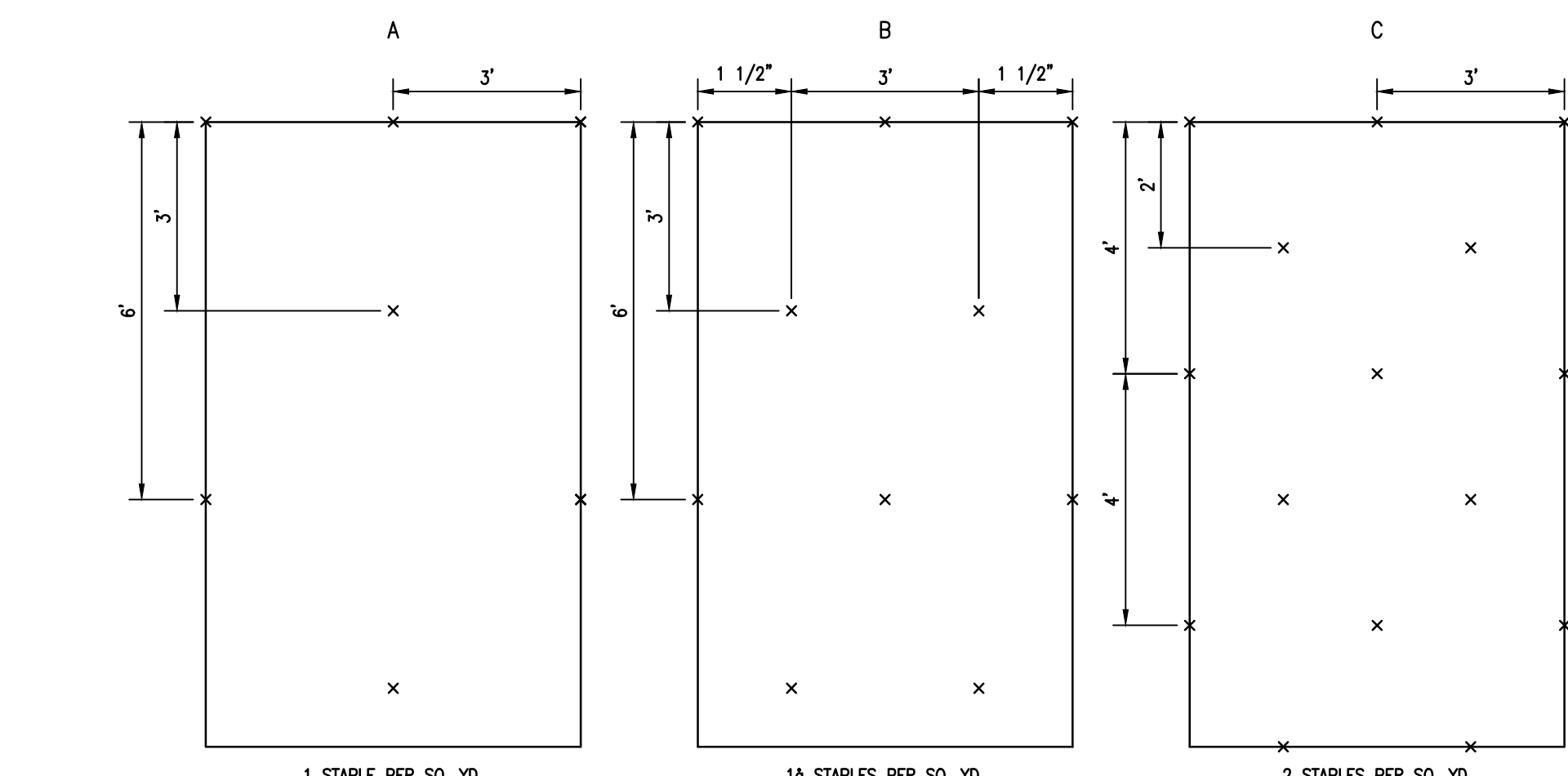
#### Installation

- Remove all vegetation and other objectionable material from the foundation area.
- Grade foundation and crown for positive drainage. If the slope of the construction entrance is toward a public road and exceeds two percent, construct an eight inch high diversion ridge with a ratio of 3-to-1 side slopes across the foundation area about 15 feet from the entrance to divert runoff away from the road.
- Install a culvert pipe under the pad if needed to maintain proper public road drainage.
- If wet conditions are anticipated, place geotextile fabric on the graded foundation to improve stability.
- Place aggregate (DOT CA No. 2) to the dimensions and grade shown in the construction plans, leaving the surface smooth and sloped for drainage.

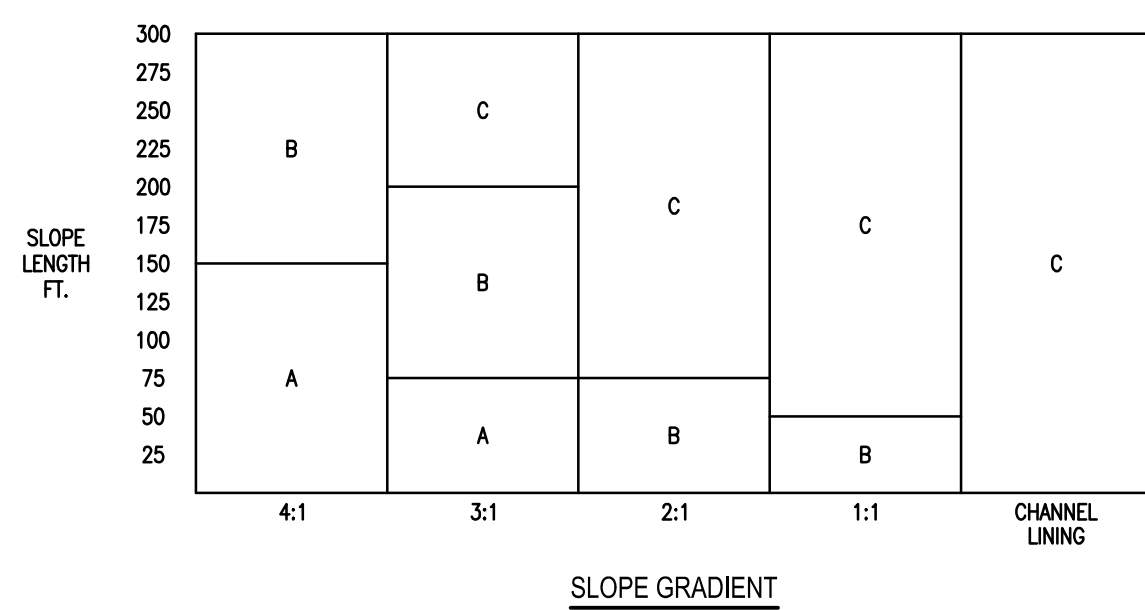
#### Maintenance

- Inspect daily.
- Reinforce pad as needed for drainage and runoff control.
- Top dress with clean aggregate as needed.
- Immediately remove mud and sediment tracked or washed onto public roads.
- Flushing should only be used if the water can be conveyed into a sediment trap or basin.

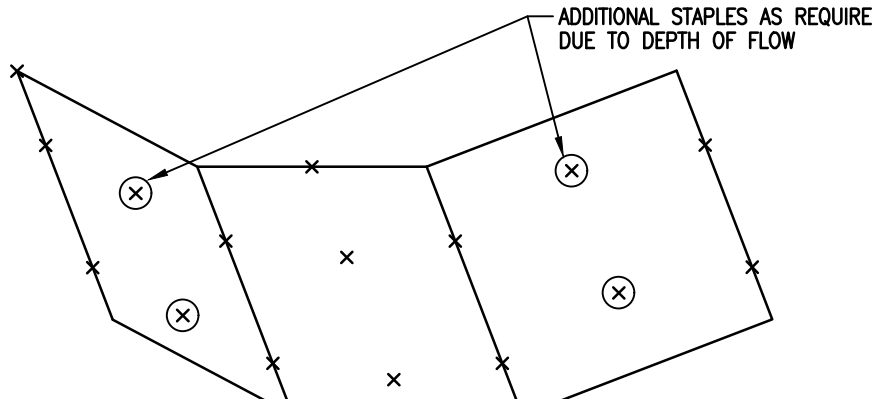
TEMPORARY CONSTRUCTION ENTRANCE  
C4.2  
NOT TO SCALE



### GENERAL STAPLE RECOMMENDATIONS



### SLOPE GRADIENT



### NOTES

CHANNEL LININGS UTILIZE STAPLE PATTERN "C" WITH ADDITIONAL STAPLES ON SIDE SLOPES AT PROTECTED WATER LINE.  
STAPLE PATTERNS APPLY TO ALL NORTH AMERICAN GREEN EROSION CONTROL BLANKETS. STAPLE PATTERNS MAY VARY DEPENDING UPON SOIL TYPE AND AVERAGE RAINFALL.  
AT SLOPE LENGTHS GREATER THAN 300 FEET OR WHERE DRAINAGE OVER LARGE AREAS IS DIRECTED ONTO THE BLANKETS, STAPLE PATTERN "C" SHOULD BE UTILIZED.

EROSION CONTROL MAT INSTALLATION GUIDE DETAIL  
C4.2  
NOT TO SCALE

### NOTES:

- OTHER PLASTIC OR WOOD, ORANGE SNOW FENCING OF 4-FOOT HEIGHT SHALL BE INSTALLED AT OR BEYOND THE DRIP LINE UNLESS MORE SUBSTANTIAL FENCING IS REQUIRED.
- STAKES SHALL BE 5" METAL T" POLES SPACED NO FURTHER APART THAN 4' ON CENTER.
- FENCING SHALL NOT BE INSTALLED CLOSER TO THE TREE THAN THE DRIP LINE OF THOSE TREES TO BE SAVED.
- FENCING SHALL BE ERECTED PRIOR TO ANY CONSTRUCTION ACTIVITY.
- UNDER NO CIRCUMSTANCE SHALL THE PROTECTIVE FENCING BE REMOVED WITHOUT PROPER APPROVAL FROM THE CITY.
- NO PERSON SHALL CONDUCT ANY ACTIVITY WITHIN THE AREAS PROPOSED TO REMAIN. THIS SHALL INCLUDE, BUT NOT BE LIMITED TO:
  - NO SOLVENTS OR CHEMICALS WITHIN THE PROTECTED AREAS.
  - NO BUILDING MATERIALS OR CONSTRUCTION EQUIPMENT WITHIN THE PROTECTED AREAS.
  - NO GRADE CHANGES, INCLUDING FILL, WITHIN THE PROTECTED AREAS.
  - NO REMOVAL OF VEGETATION FROM THE GROUND UP WITHOUT PERMISSION FROM THE CITY.
- ANY REQUIRED SHALE NEEDS TO BE DIRECTED AROUND THE PROTECTED AREAS. IN INSTANCES WHERE SHALES ARE APPROVED THROUGH A PROTECTED AREA, THE SHALES NEED TO BE HAND DUG. MACHINERY OF ANY KIND IS PROHIBIT.
- REGULATED WOODLANDS OR REGULATED TREES ADJACENT TO THE PROPERTY ARE ALSO REQUIRED TO BE PROTECTED.

TREE PROTECTION FENCE  
C4.2  
NOT TO SCALE

SILT FENCE SHALL BE OF HEAVY DUTY TYPE, SECURED TO A WELDED WIRE FRAME. SILT FENCE SHALL BE PLACED IN A CIRCULAR CONFIGURATION AROUND THE INLET TO FORM A MINIMUM 5 FOOT DIAMETER ZONE OF PROTECTION.

INSTALLATION:  
THE WIRE FRAME WILL BE SECURED IN THE CIRCULAR CONFIGURATION BY OVERLAPPING THE ENDS TO THE DESIRED SIZE AND FASTENING ONE END OF THE WELDED WIRE FRAME TO THE OVERLAPPED SECTION WITH NYLON SIP TIES OR WIRE HOE RING TYPE FASTENERS.

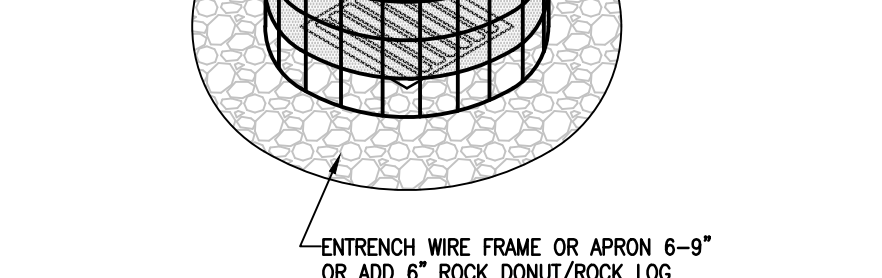
BASED ON MANUFACTURE RECOMMENDATIONS AND/OR PRODUCT CONSTRUCTION:  
1. INLET PROTECTORS WITH APRON-  
THE APRON OF THE SILT FENCE SHALL BE TRENCHED INTO THE SOIL (6-9") OR A ROCK DONUT PLACED ON THE APRON. (ROCK LOGS MAY BE SUBSTITUTED FOR THE ROCK DONUT)

2. INLET PROTECTORS WITHOUT AN APRON-  
THE WIRE FRAME SHALL BE TRENCHED INTO THE SOIL 6-9". IF THE FRAME CANNOT BE TRENCHED INTO THE SOIL, A ROCK DONUT SHALL BE PLACED AROUND THE BOTTOM OF THE DEVICE. (ROCK LOGS MAY BE SUBSTITUTED FOR THE ROCK DONUT). THE DEVICE SHALL BE SECURED BY EITHER ATTACHING THE WIRE FRAME TO POSTS SECURED INTO THE GROUND OR THE FRAME MAY BE WIRED DIRECTLY TO THE INLET GRATE FROM TWO OPPOSITE DIRECTIONS.

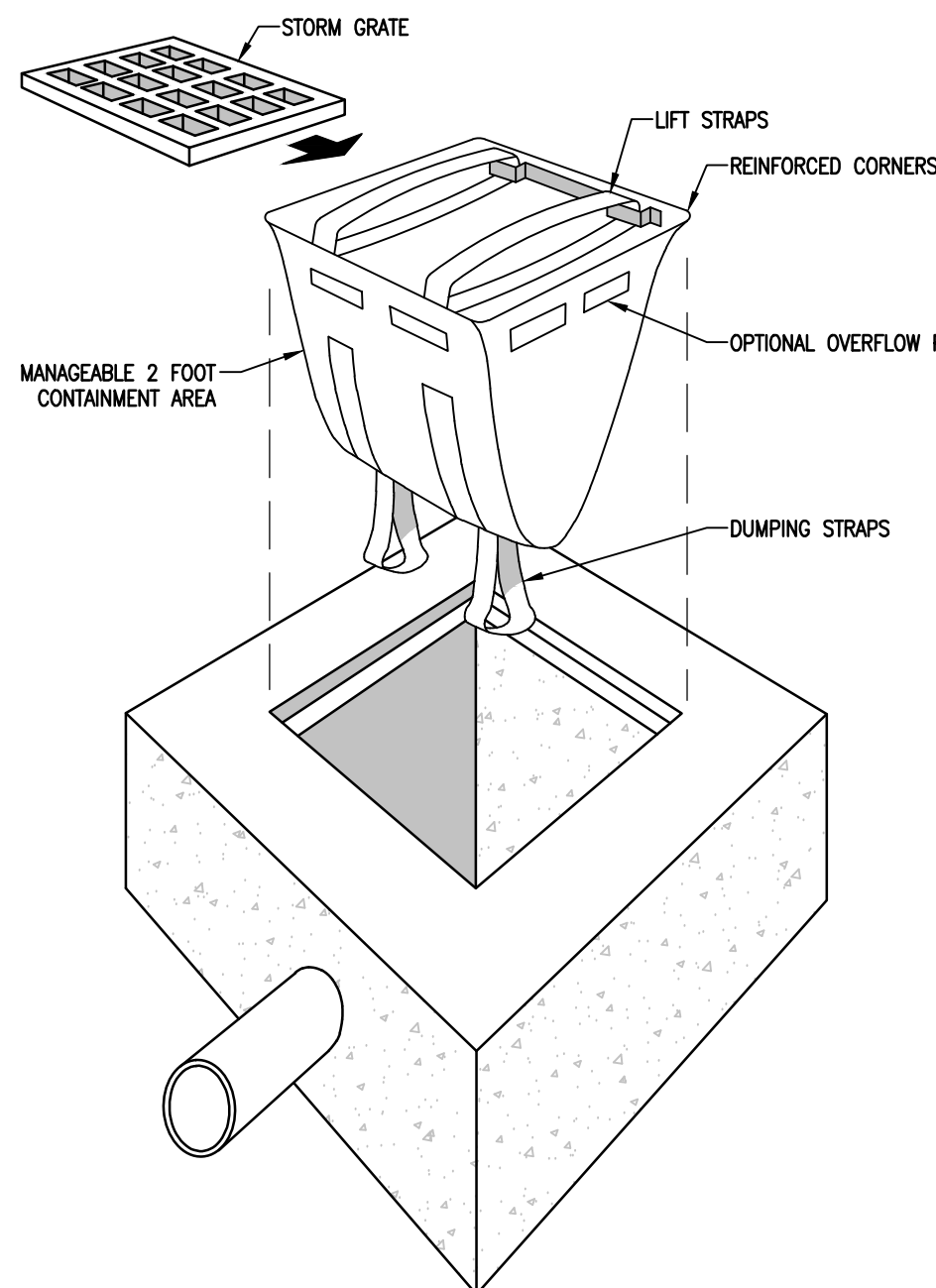
MAINTENANCE  
1. INSPECT THE DROP INLET PROTECTION WEEKLY AND AFTER EACH STORM EVENT, MAKE NEEDED REPAIRS IMMEDIATELY.

2. REMOVE SEDIMENT FROM THE POOL AREA TO ENSURE ADEQUATE RUNOFF STORAGE FOR THE NEXT RAIN.

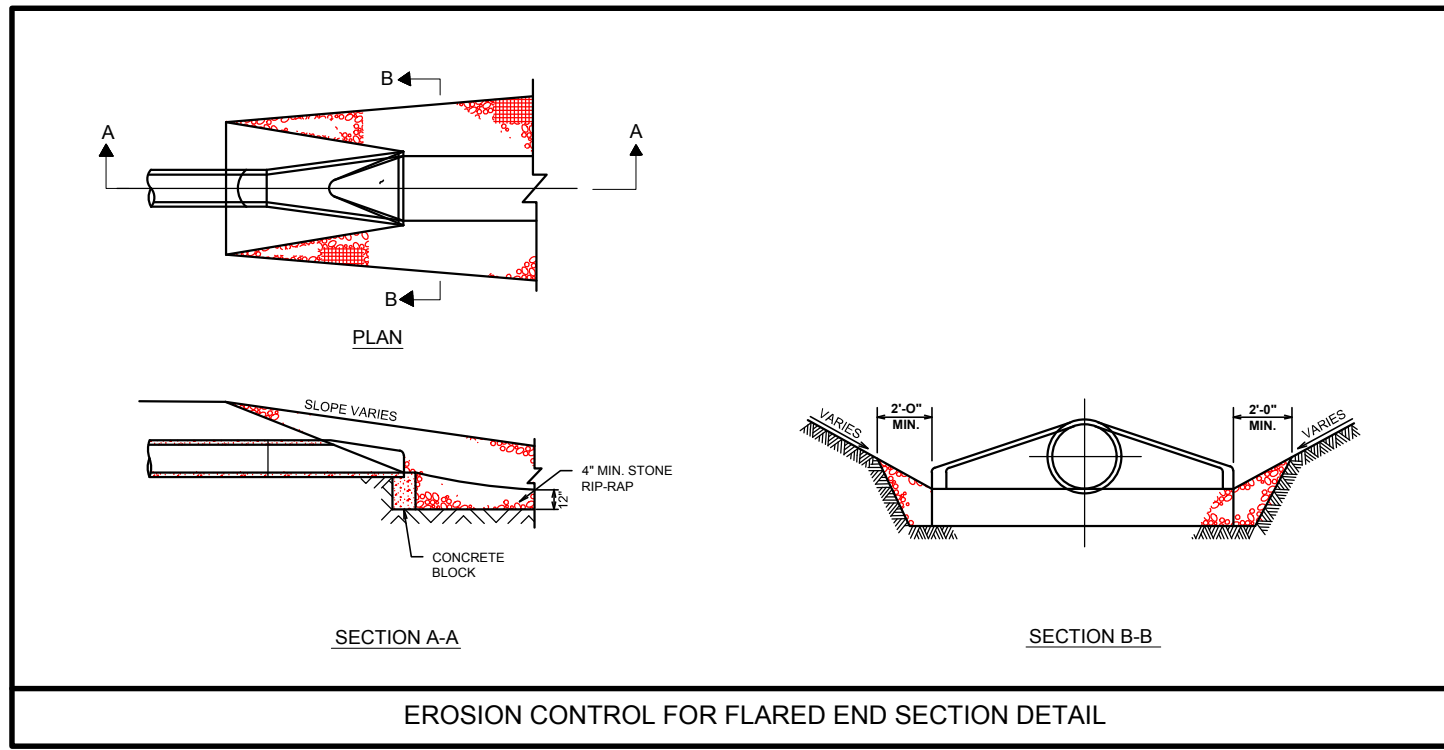
3. WHEN THE SURROUNDING AREA HAS BEEN STABILIZED, REMOVE THE INLET PROTECTION, AND SEDIMENT, GRADE THE DISTURBED AREA TO THE ELEVATION OF THE TOP OF THE INLET AND STABILIZE.



WELDED WIRE MONOFILAMENT  
YARD INLET PROTECTION  
C4.2  
NOT TO SCALE



CURB INLET PROTECTION DANDY SACK™ DETAIL  
C4.2  
NOT TO SCALE

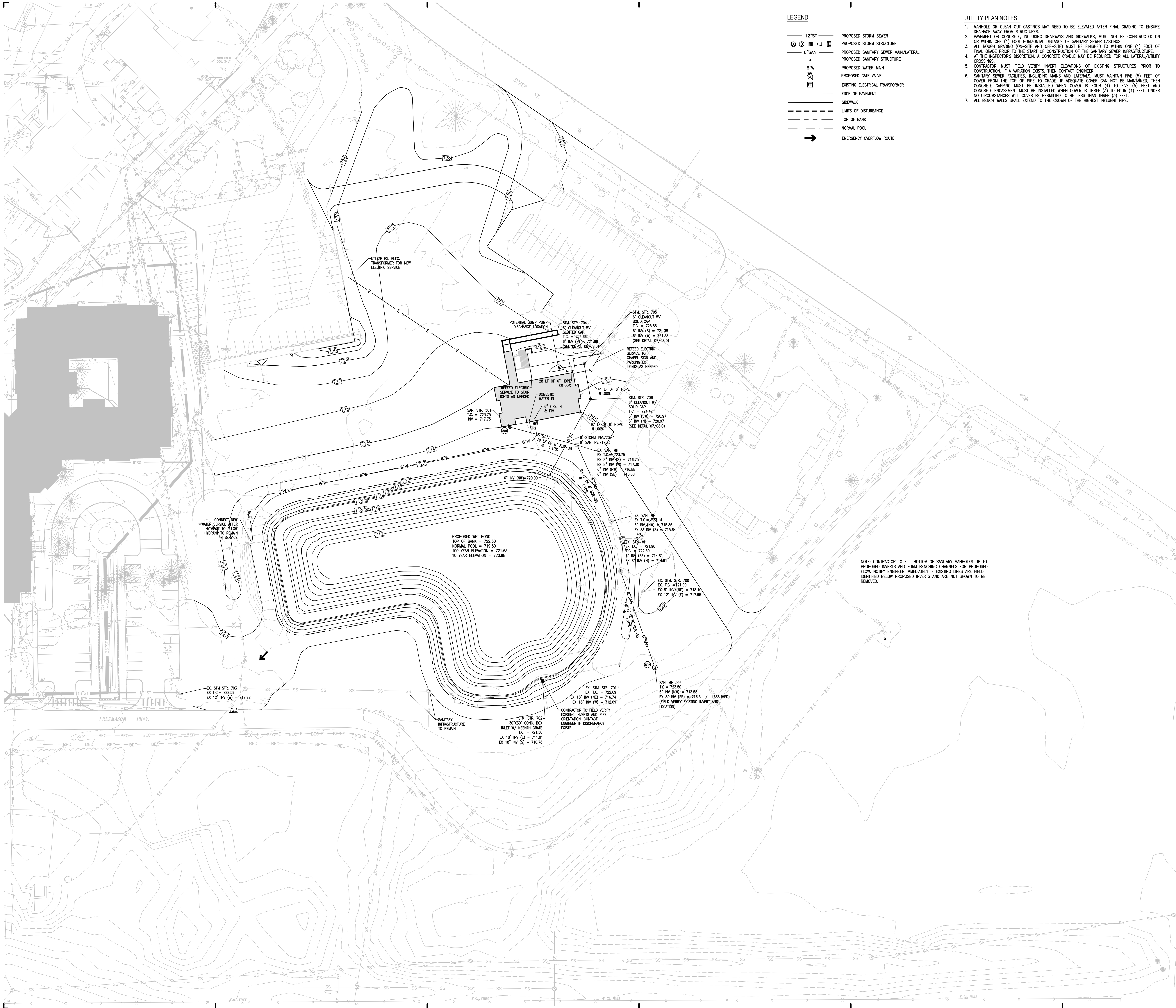


EROSION CONTROL FOR FLARED END SECTION DETAIL









**BROWNING DAY MULLINS DIERDORF**  
LEADERSHIP + DESIGN

Browning Day Mullins Dierdorf Architects  
Architecture  
Landscape Architecture  
Planning  
Interior Design  
626 North Illinois Street  
Indianapolis, Indiana 46204  
Phone: 317.635.5030  
Website: www.bdmd.com

**D2 ARCHITECTURE**  
Associate Architect  
2001 North Lamar Street,  
Dallas, Texas 75202  
Phone: 214.220.1800  
Website: www.d2architecture.com

Indiana Masonic Home at Compass Park  
Owner  
690 State Street  
Franklin, Indiana 46131  
Phone: 765.736.6141  
Website: www.compasspark.org

Lawson Elser  
Structural Engineer  
650 East Carmel Drive Suite 150  
Carmel, Indiana 46032  
Phone: 317.674.5400  
Website: www.lawsonelser.com

Mussett, Nicholas & Associates, Inc.  
MEP Engineer  
502 South West Street  
Indianapolis, Indiana 46225  
Phone: 317.637.3040  
Website: www.m-n-a.com

V3 Companies  
Civil Engineer  
619 North Pennsylvania Street  
Indianapolis, Indiana 46224  
Phone: 317.423.0690  
Website: www.v3co.com

Reitano Design Group  
Food Service Consultant  
302 North East Street - Studio One  
Indianapolis, Indiana 46224  
Phone: 317.329.7700  
Website: www.reitanodesigngroup.com

RTM Consultants, Inc.  
Code Consultant  
6640 Parkdale Place Suite J  
Indianapolis, Indiana 46224  
Phone: 317.329.7700  
Website: www.rtmconsultants.com

Shiel Sexton  
Construction Manager  
902 North Capitol Avenue  
Indianapolis, Indiana 46204  
Phone: 317.423.6000  
Website: www.shielsexton.com



CERTIFICATION

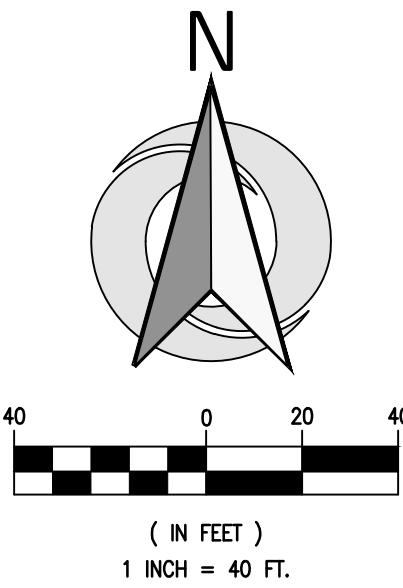
**EAST VILLAGE MASTER PLAN**

690 State Street, Franklin, IN  
Project No.: 16029  
Drawn By: PCB  
Checked By: DAM  
Scale: See Drawing  
Issue Date: 16 JANUARY 2019

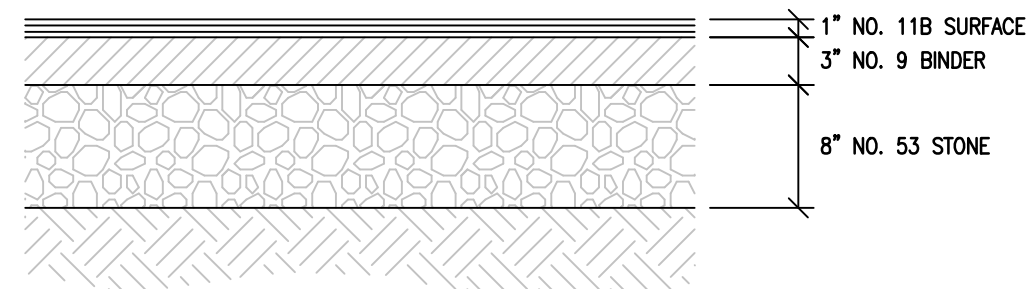
REVISION SCHEDULE		
Rev. #	Revision Description	Issue Date

**UTILITY PLAN**

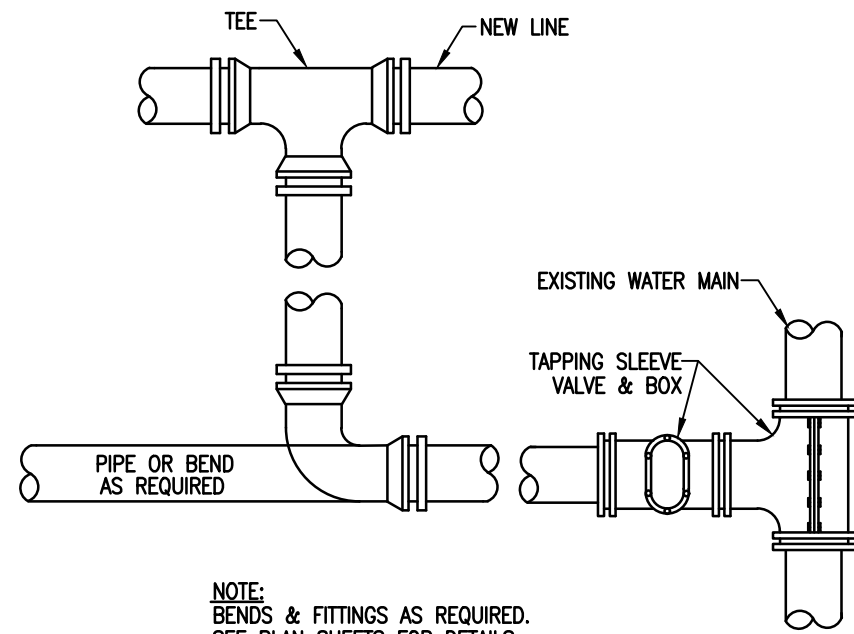
**C5.0**



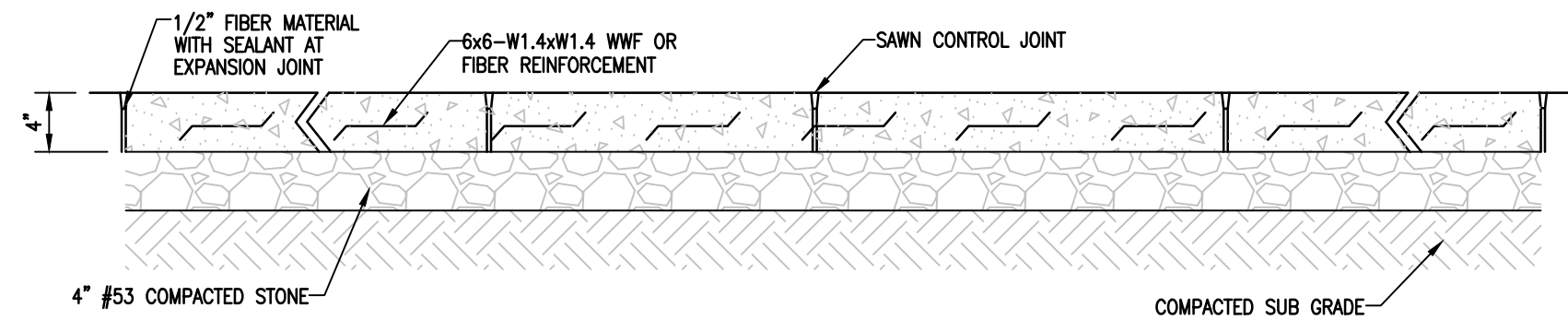




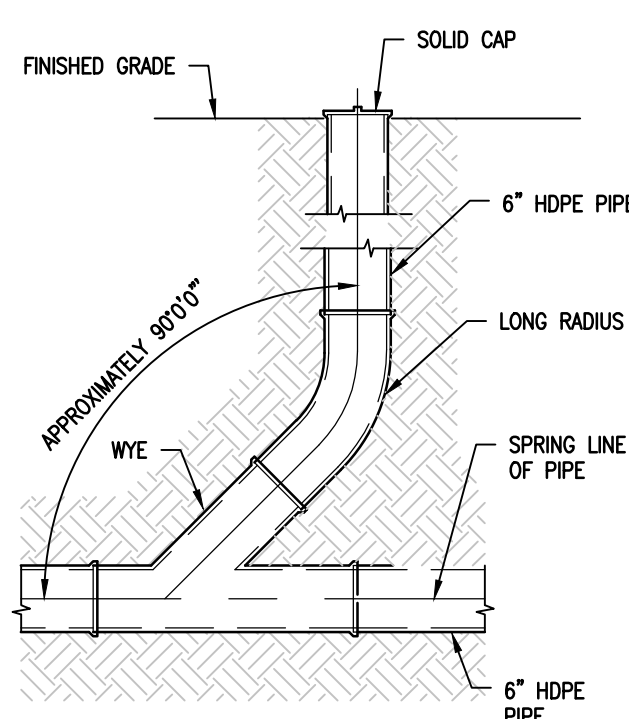
01 HEAVY DUTY ASPHALT PAVEMENT SECTION NOT TO SCALE



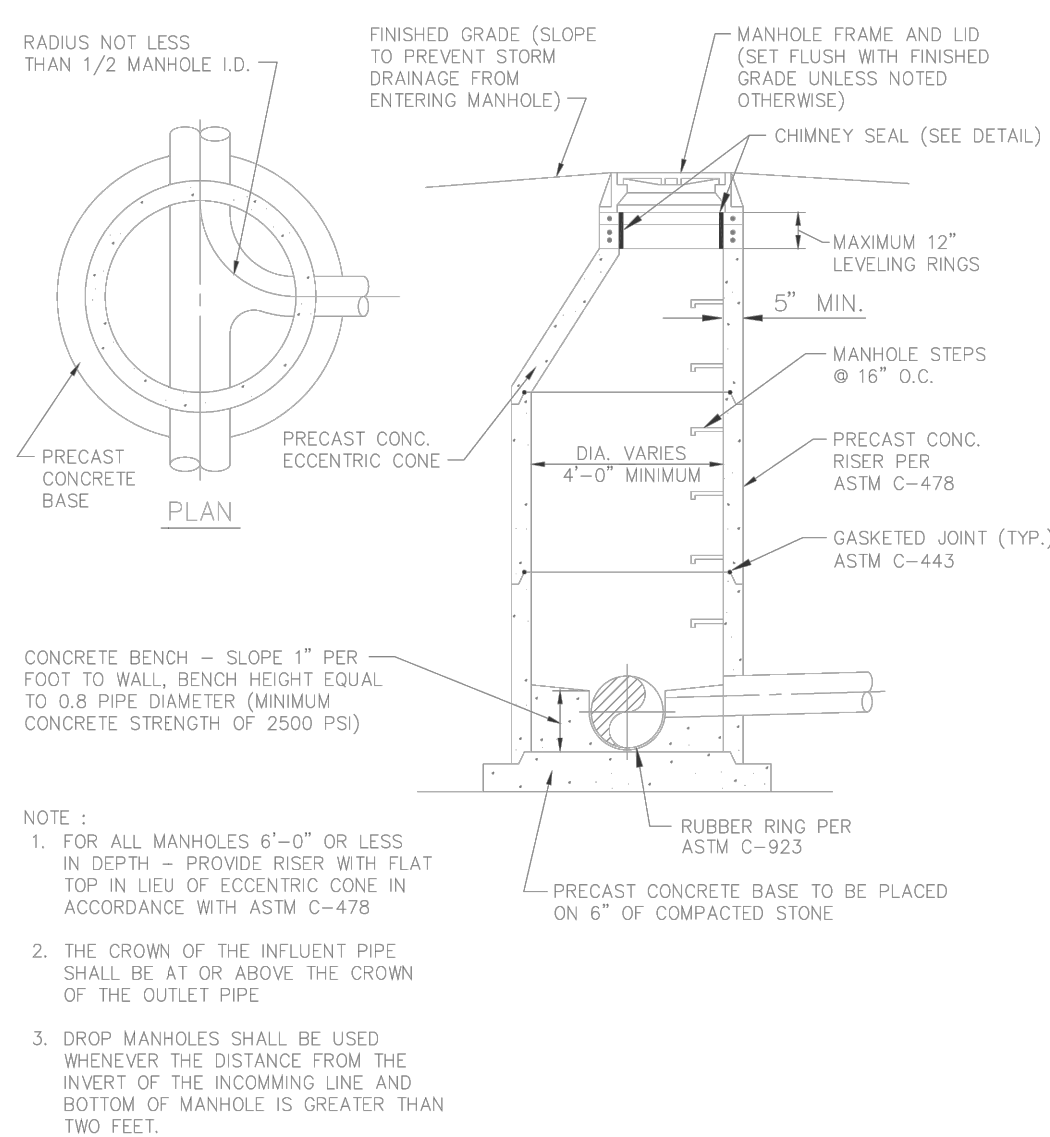
02 CONNECTION TO EXISTING WATER LINE NOT TO SCALE



03 CONCRETE PAVEMENT CROSS SECTION NOT TO SCALE

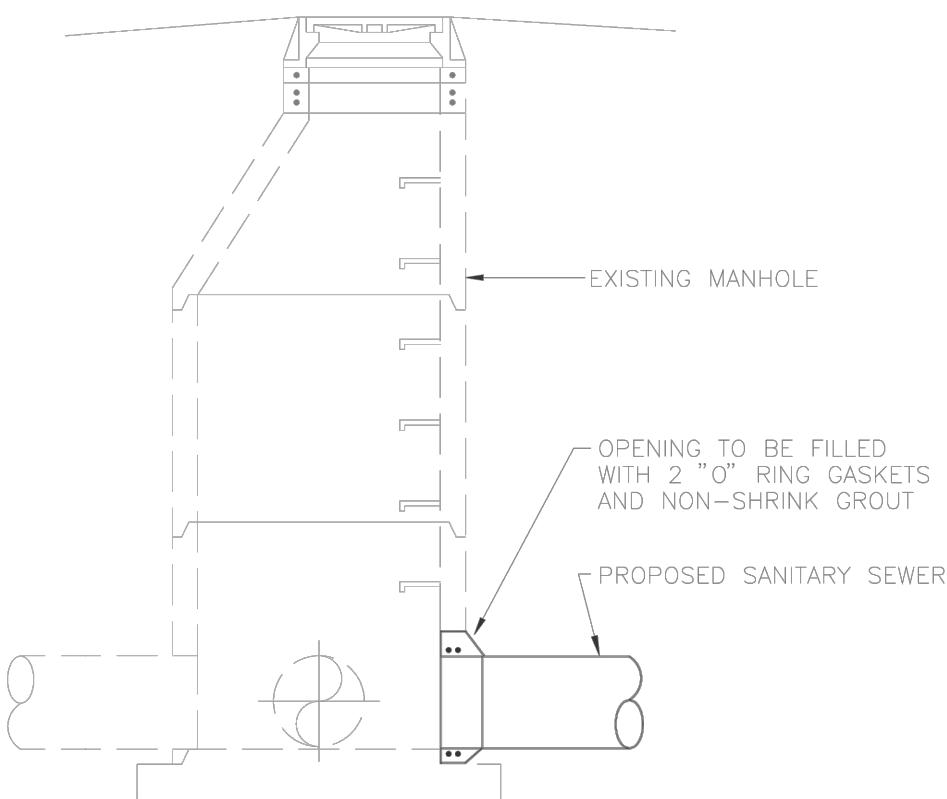


04 CLEANOUT DETAIL NOT TO SCALE



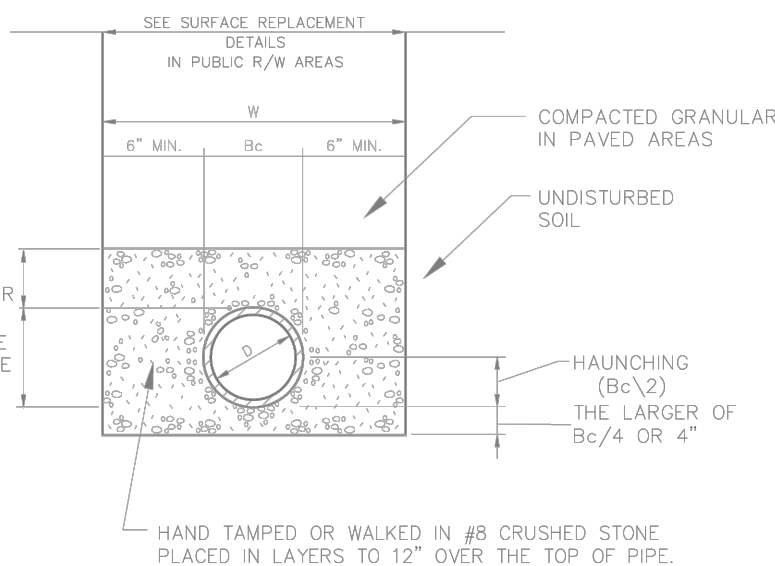
STANDARD MANHOLE DETAIL

REVISION DATE  
CITY of FRANKLIN, INDIANA  
DPW  
FIGURE



TYPICAL EXISTING MANHOLE ENTRY DETAIL

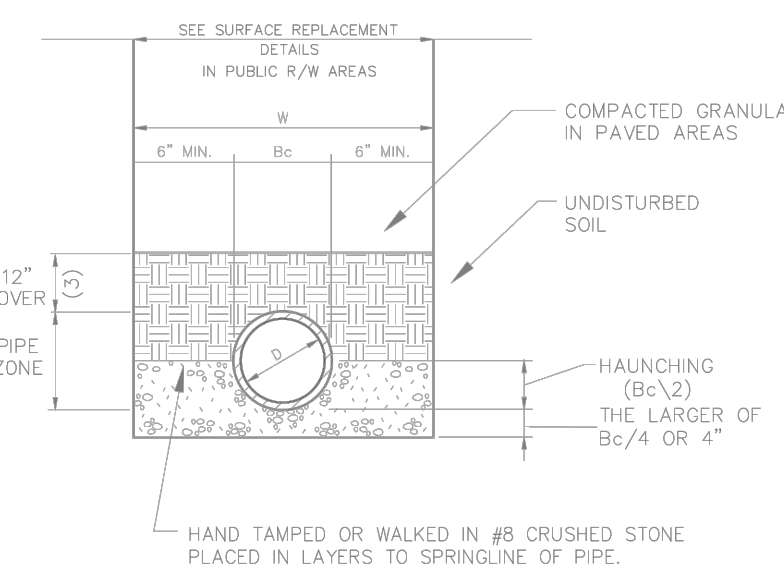
REVISION DATE  
CITY of FRANKLIN, INDIANA  
DPW  
FIGURE



- NOTES:
1. BEDDING STOPS AT A POINT 12" ABOVE THE TOP OF THE PIPE. BACKFILLING ABOVE THIS POINT SHALL BE IN ACCORDANCE WITH THE SPECIFICATIONS.
  2. WORK FALLING UNDER THE JURISDICTION OF THE INDIANA STATE HIGHWAY COMMISSION SHALL UTILIZE COMPACTED GRANULAR BACKFILL MATERIAL FOR INITIAL AND FINAL BACKFILL ANYWHERE WITHIN 12 FEET OF THE EDGE OF PAVEMENT. OTHERWISE, COMPACTED GRANULAR BACKFILL MATERIAL SHALL ONLY BE USED UNDER PAVEMENT SURFACES OR OTHER SPECIFICALLY DESIGNATED AREAS.

FIRST CLASS PIPE LAYING METHOD FOR:  
1) FLEXIBLE (PVC, RPVC, ABS & HDPE PIPE) AND  
2) DUCTILE IRON WITHIN PVM-T LIMITS

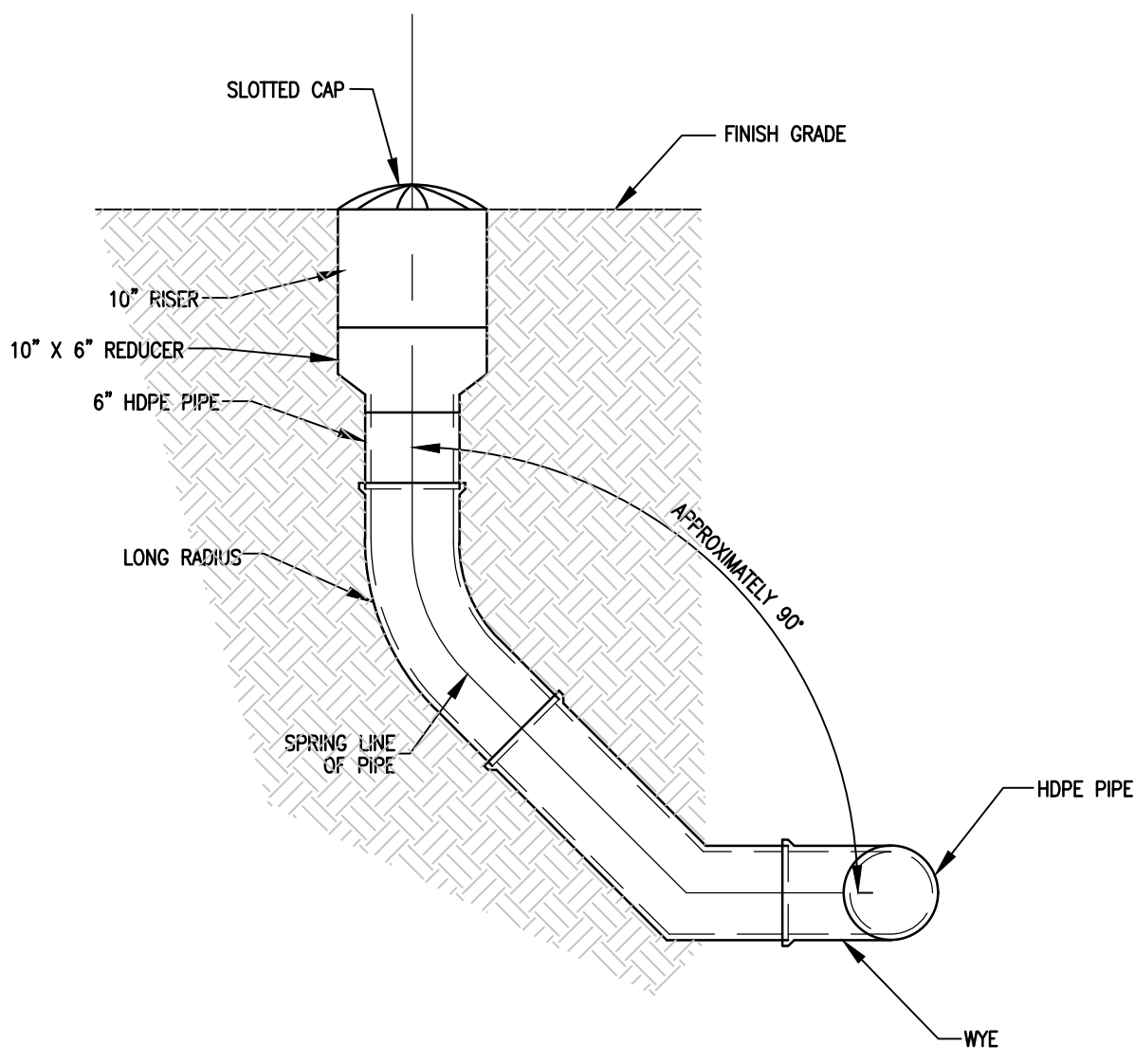
REVISION DATE  
CITY of FRANKLIN, INDIANA  
DPW  
FIGURE



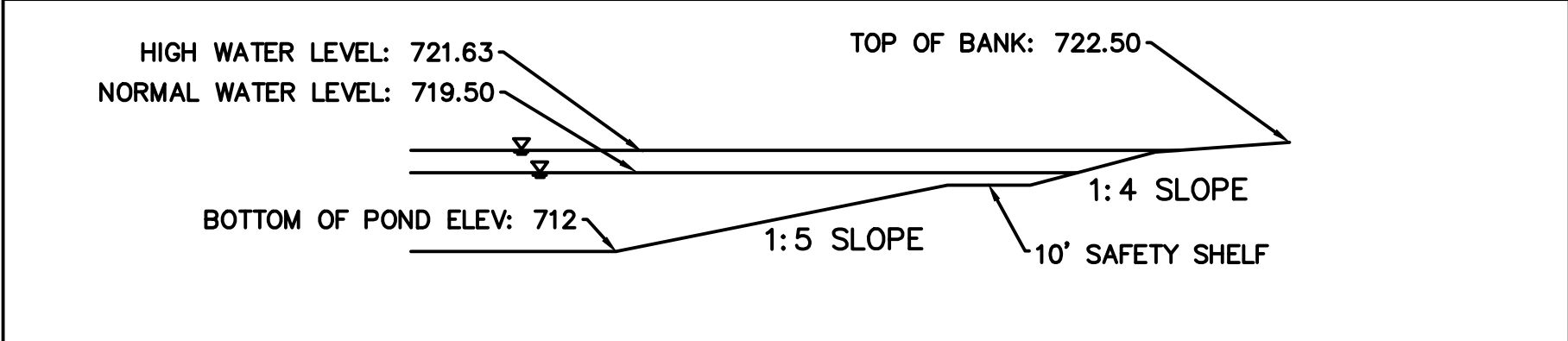
- NOTES:
1. BEDDING STOPS AT SPRINGLINE OF THE PIPE. BACKFILLING ABOVE THIS POINT SHALL BE IN ACCORDANCE WITH THE SPECIFICATIONS.
  2. WORK FALLING UNDER THE JURISDICTION OF THE INDIANA STATE HIGHWAY COMMISSION SHALL UTILIZE COMPACTED GRANULAR BACKFILL MATERIAL FOR INITIAL AND FINAL BACKFILL ANYWHERE WITHIN 12 FEET OF THE EDGE OF PAVEMENT. OTHERWISE, COMPACTED GRANULAR BACKFILL MATERIAL SHALL ONLY BE USED UNDER PAVEMENT SURFACES OR OTHER SPECIFICALLY DESIGNATED AREAS.
  3. GRANULAR FILL IN PAVED AREAS

FIRST CLASS PIPE LAYING METHOD FOR:  
RIGID CONDUITS (RCP & CMP)

REVISION DATE  
CITY of FRANKLIN, INDIANA  
DPW  
FIGURE



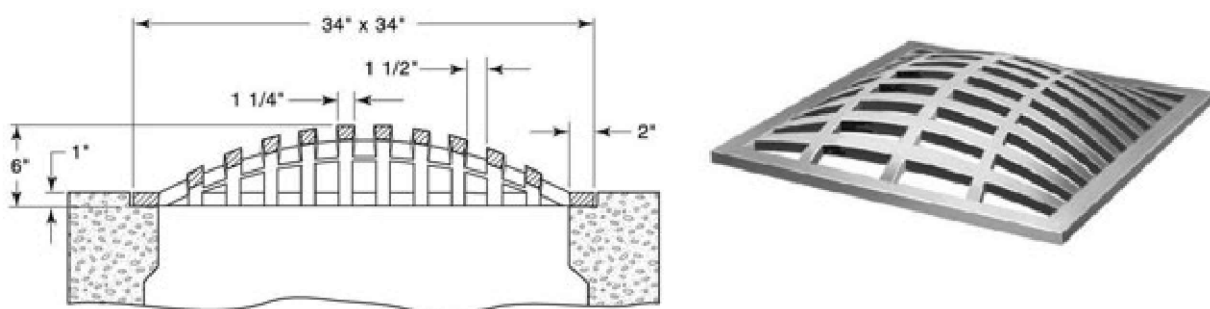
05 STRUCTURE 704 DETAIL NOT TO SCALE



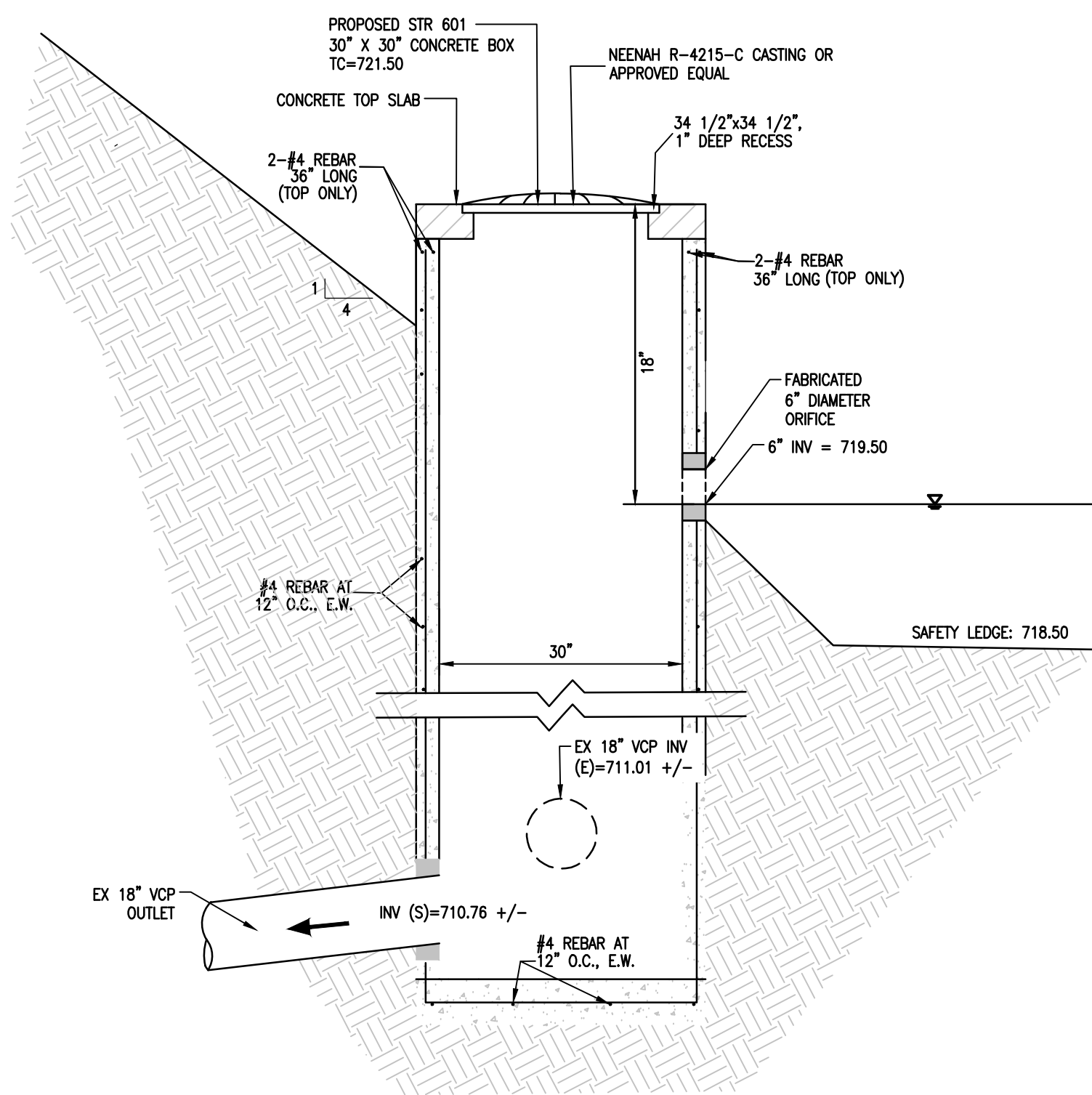
06 POND CROSS SECTION 1:20 SCALE

R-4215-C

Convex Grate  
Heavy Duty



07 NEENAH BEEHIVE CASTING R-4215-C NOT TO SCALE



CROSS SECTION

08 STORM STRUCTURE 703A NOT TO SCALE

# BROWNING DAY MULLINS DIERDORF ARCHITECTS

Browning Day Mullins Dierdorf  
Architecture  
Landscape Architecture  
Planning

626 North Illinois Street  
Franklin, Indiana 46204  
P: 317.635.5030  
F: 317.634.5409  
W: www.bdmnd.com

Indiana Masonic Home  
Owner

690 State Street  
Franklin, Indiana 46131  
P: 317.736.6141  
F: 317.736.6141  
E: ssc@shelseton.com

Shiel Sexton  
Construction Management

902 North Capitol Ave.  
Indianapolis, Indiana 46204  
P: 317.423.6000  
F: 317.423.6000  
E: ssc@shelseton.com

D2 Architecture  
Architectural Consultant

2001 North Lamar Street, Suite 300  
Dallas, Texas 75202  
P: 214.220.1800  
F: 214.220.1819  
E: gwarner@d2architecture.com

Lawson Elser Engineering  
Structural Engineer

650 East Carmel Drive Suite 150  
Carmel, Indiana 46032  
P: 317.574.9409  
F: 317.574.9431  
E: mlawson@lawsonelser.com

Williams Creek Consulting  
Civil Engineer

619 North Pennsylvania Street  
Indianapolis, Indiana 46204  
P: 317.423.0590  
F: 317.423.0590  
E: dmarks@williamsccr.com

Musset Nicholas + Associates  
MEP

502 S. West Street  
Indianapolis, Indiana 46225  
P: 317.631.9241  
F: 317.631.9241  
E: jstephens@m-n-a.com



CERTIFICATION

EAST VILLAGE MASTER PLAN

690 STATE STREET  
FRANKLIN, IN 46131

Project No.: 16029

Drawn By: PCB

Checked By: DAM

Scale: See Drawing

Issue Date: 16 JANUARY 2019

REVISION SCHEDULE		
Rev. #	Revision Description	Issue Date

CONSTRUCTION DETAILS

C8.0



Know what's below.  
Call before you dig.







## EARTHWORK

### 1. SCOPE OF WORK

- A. Eriect. The work required under this section consists of all excavating, filling, rough grading and related items necessary to complete the work indicated on the drawings and described in the specifications. The Contractor shall notify in writing the owners and the Engineer of any changes, errors or omissions found on the plans or in the field before work is started or resumed.
1. In general, the items of work to be performed under this section shall include: clearing and grubbing, removal of trees and stumps (where required), protection of trees to remain, stripping and storage of topsoil, fill, compaction and rough grading of entire site.
2. Excavated material that is suitable may be used for fills. All unsuitable material and all spoils excavated material not required shall be removed from the site. The location, depth and length of haul shall be the Contractor's responsibility.
3. Provide and place any additional fill material from off the site as may be necessary to produce the grades required. Fill obtained from off site shall be of kind and quality as specified for fill herein and the source approved by the Owner.
4. The Contractor shall accept the site as (a) site finds it and shall remove all trash, rubbish and debris from the site prior to starting excavation.
- B. Work not included: The following items of related work are specified and included in other sections of these specifications:
- Excavation, grading and backfilling for utility lines
  - Storm drainage systems
  - Sewer sewer systems
  - Streets and parking
  - Water supply system

### 2. BENCH MARKS

- A. Maintain carefully all bench marks, monuments and other reference points: if disturbed or destroyed, Contractor shall contact engineer. Replacement shall be at Contractor's expense.

### 3. REMOVAL OF TREES

- A. Remove all trees and stumps from area to be occupied by building, road and surfaced areas. Removal of trees outside these areas shall only be done as noted on drawings or approved by the Owner.
- B. All brush, stumps, wood and other refuse from the trees shall be removed to disposal area of off site.

### 4. PROTECTION OF TREES

- A. General Protection: The Contractor shall be responsible for the protection of top, trunks and roots of existing trees on the project site that are to remain. Existing trees subject to construction damage shall be bared, fenced or otherwise protected before any work is started; do not disturb until branch spread. Remove interfering branches without injury to trunks and cover areas with tree paint. See landscape plans for additional detail.

### 5. HANDLING OF TOPSOIL

- A. Remove all organic material from the areas to be occupied by buildings, roads, walks and parking areas. Plow and store topsoil at a location where it will not interfere with construction operations. Topsoil shall be reasonably free from subsoil, debris, weeds, grass, stones, etc.
- B. After completion of site grading and subsurface utility installation, top soil shall be amended and replaced in areas designated on the grading plan for restoration and the erosion control plan for seeding, and/or seed. Any remaining topsoil shall be used for finished grading around structures and landscaping areas.

### 6. DISPOSITION OF UTILITIES

- A. Rules and regulations governing the respective utilities shall be observed in executing work under this section.
- B. If active utilities are encountered but not shown on the drawings, the Engineer shall be advised before work is continued.
- C. Inactive and abandoned utilities encountered in excavating and grading operations shall be reported to the Engineer. They shall be removed, plugged or capped as directed by the Utility Company or the Engineer.
- D. It shall be the responsibility of each contractor to verify all existing utilities and conditions pertaining to the phase of the work. It shall also be the contractors responsibility to contact the owners of the various utilities before work is started.

### 7. SITE GRADING

- A. Grades: Contractor shall perform all cutting, filling, compacting of fill and rough grading required to bring entire project area to grade as shown on the drawings.
- B. Rough Grading: the tolerance for paved areas shall not exceed 0.10 feet plus or minus above the established subgrade. All other areas shall not exceed 0.10 feet plus or minus the established grade. All berms and other breaks in grade shall be rounded at top and bottom.
- C. Compaction Requirements:
- All areas under building pads and paved areas shall be compacted to 95% maximum dry density (n) in accordance with ASTM D-1557
  - Compaction shall be done in areas designated for Green Infrastructure (BMPs) including infiltration and/or bioretention
  - All other fill areas shall be compacted to 80% modified proctor density.
  - All areas where cut is necessary to meet the design sub-grade are required to be compacted 12 inches below sub-grade and meet the above compaction requirements.
  - Refer to Subsurface Investigation & Geotechnical Recommendations report for additional design information.

### 8. EARTH WORK BALANCE

- A. The Contractor shall confirm all earthwork quantities prior to start of construction. If an excess or shortage of earth is encountered, the Contractor shall confirm with the Owner and Engineer the requirements for accepting, removal or importing of earth.
- B. Minor adjustments to the grades may be required to earthwork balances when minor excess material or shortages are encountered. It is recognized by the parties hereto that the calculations of the Engineer in determining earthwork quantities shall be accomplished in accordance with the American Society of Civil Engineers Standards for such situations. Further, that these calculations are subject to the interpretations of soil borings as the physical limits of the various soil types, the allowable variation in final grade and compaction permitted the contractor, and that all of these parameters may cause either an excess or shortage of actual earthwork materials to complete the project. If such an actual minor excess or shortage of materials occurs, the contractor shall contact the Engineer to determine if adjustment can be made to correct the imbalance of earth.

### 9. TESTING

- A. Contractor shall hire at Contractors expense an independent soil testing system to assure soil compaction with testing to be approved by Engineer. Copies of test results shall be submitted to the Engineer.

## Geosynthetics for Rain Garden

### PART GENERAL

- 1.1 DESCRIPTION
- A. Scope
1. Contractor shall provide all labor, materials, equipment, and services required to provide and place geosynthetics as shown and specified.
- 1.2 REFERENCES
- A. Standards referenced in this Section are listed below:
- American Society for Testing and Materials, (ASTM)
  - ASTM D1595 - Test Method for Density of Plastics by the Density-Gradient Technique
  - ASTM D1693 - Test Method for Environmental Stress Cracking of Ethylene Plastics
  - ASTM D4355 - Test Method for Determination of Geotextiles by Exposure to Light, Moisture and Heat in a Xenon Arc Type Apparatus
  - ASTM D4891 - (Repealed) Test Methods for Water Permeability of Geotextiles by Permittivity
  - ASTM D4822 - 08 Standard Test Method for Grip Breaking Load and Elongation of Geotextiles
  - ASTM D1519 - Test Method for Measuring Normal Thickness of Geosynthetics
- 1.3 QUALITY ASSURANCE
- A. Manufacturer's Qualifications
1. Geosynthetic manufacturer shall be a specialist in the manufacture of geosynthetic carbon fabric, and have products and successfully installed a minimum of five million square feet.
- 1.4 PRODUCT DELIVERY, STORAGE AND HANDLING
- A. All geosynthetics delivered to the Site shall be labeled by the manufacturer identifying the manufacturer's name and product identification.
- B. All rolls and packages shall be inspected by Contractor upon delivery to the Site. Contractor shall notify Resident Project Representative if any loss or damage exists to geosynthetics. Replace loss and repair damage to new condition, in accordance with manufacturer's instructions.
- C. Geosynthetics shall be protected from ultraviolet light exposure, precipitation or other radiation, mold, dirt, dust, puncture, cutting or any other damage or deleterious conditions. Geosynthetic rolls shall be shipped and stored in weatherly coque and weatherlight wraps.

### PART 2 PRODUCTS

- 2.1 GEOTEXTILE
- A. Non-Woven Geotextiles-Aggregate Separation
1. Install Geotextiles for aggregate separation including but not limited to these applications:
- Temporary sediment trap
  - Rock check dam
  - Riprap
- Non-woven geotextiles for aggregate separation shall conform to the following:

Physical Properties	Test Method	Unit	Min Value
Grab Tensile Strength	ASTM D 4242	lbs	200
Grab Tensile Elongation	ASTM D 4242	%	60
Puncture Strength	ASTM D 4243	lbs	500
Apparent Opening Size (AOS)	ASTM D 4241	U.S. Sieve	#60
Flow Rate	ASTM D 4461	gpm/ft <sup>2</sup>	15

### PART 3 EXECUTION

- 3.1 INSPECTION
- A. Contractor shall examine the conditions under which the Work is to be installed and notify the RPR, in writing, of conditions detrimental to the proper and timely completion of the Work. Do not proceed with the Work until unsatisfactory conditions have been corrected.
- 3.2 GEOTEXTILE INSTALLATION- GENERAL
- A. Cut geosynthetic to proper width prior to placement. Width should be enough to conform to the trench perimeter with at least a 6 inch top overlap.
- B. Place the geosynthetic roll over the trench, and unroll enough geosynthetic that the geosynthetic can be placed down into the trench.
- C. Anchor the edges of the geosynthetic with heavy objects to prevent the geosynthetic from falling into the trench.
- D. Where overlaps are necessary between rolls, allow for 3 foot overlap from the upstream to the downstream roll.
- E. All geotextiles shall be weighted with sandbags or the equivalent when required. Such sandbags shall be installed during placement and shall remain until replaced with cover material or geomembrane.
- F. Contractor shall take any necessary precautions to prevent damage to underlying layers during placement of the geotextile.
- G. Geotextiles shall not be exposed to precipitation prior to being installed, and shall not be exposed to direct sunlight for more than 15 days.
- 3.3 GEOTEXTILE REPAIR
- A. Any holes or tears in the fabric shall be repaired as follows:
- On slopes, a fabric patch shall be sewn into place using a double sewn lock stitch (14-inch to 34-inch apart and no closer than 1 inch from any edge). Should any tear exceed ten percent of the width of the roll, roll it shall be removed from the slope and replaced.
  - Non-slopes: A fabric patch shall be spot-seamed in place with a minimum of 24-inches of overlap in all directions.
- 3.4 PLACEMENT OF COVER MATERIALS
- A. Contractor shall place all cover materials in such a manner to ensure the geotextile is not damaged; minimal spilling of the geotextile or underlying layers; and no excess tireless stresses in the geotextile.

## SANITARY SEWER SYSTEMS

### 1. SCOPE OF WORK

- A. The work under this section includes all sanitary sewers, manholes, cleanouts and related items including excavating and backfilling, necessary to complete the work shown in the drawings. The ends of sewer laterals shall be properly plugged or capped at the terminal points, and marked in accordance with City of Franklin Sanitary Standards.
- B. Work and materials shall meet City of Franklin Sanitary Standards.
2. MATERIALS
- A. Polyvinyl Chloride Pipe (PVC)
- 6"-10" PVC pipe shall be SDR 35 and conform to ASTM D3034, with a minimum classification of C154.8 or C154.8C. Greater than 10" PVC pipe shall also be the contractors responsibility to contact the owners of the various utilities with and coordinate. The contractor shall verify in writing the work and the engineer of any changes, errors or omissions found on these plans or in the field before work is started or resumed.
  - Service Laterals - Individual building service lines shall be 6 inches in diameter and of material equal to that specified in 2.1 of this section. Service lines shall be connected to the main sewer by a wye at locations generally shown within plans. Wyes are to be fitted up to 45 degrees from the horizontal, with suitable fittings for all changes in direction. Service lines shall be extended to a distance of 5 feet beyond the right-of-way line and within 2' of the existing ground surface. The ends shall be plugged and sealed with a water tight plug. Service lines shall be marked with a "2x4" painted frame and extending from the lateral end to 3' above grade.
- P. New Sanitary Sewer Main Construction - Contractor shall record length and dimensions of each service line stub from nearest downstream manhole measured along the sanitary sewer main. The locations of manholes and all service lines along with any other construction changes to be incorporated on manholes and service lines along with any other construction changes are to be incorporated on the original construction drawings as "as-built" locations and submitted to the Engineer as soon after completion of construction as possible, not.
- Q. The Contractor shall remove by pumping or other suitable methods any water which may accumulate in trenches. A plug that is installed between the new system being built with this project and the existing system. Said plug shall remain in place until construction is complete. No ground or surface water will be permitted to enter the existing system.

3. TESTING
- A. Citizens Energy Group shall be notified prior to all testing of sanitary sewers.
1. The Contractor shall be responsible for all tests for leakage, infiltration and deflection established by the governing agency having jurisdiction and the IDEH Construction Permit. Any portions not passing said tests for acceptance shall be repaired or replaced at the Contractor's expense, including re-excavation and backfill.
2. Deflation Test - Shall be performed on all flexible pipe. The test shall be conducted after the final backfill has been in place at least 30 days to permit stabilization of the soil-pipe system. No pipe shall exceed a deflection of 5 percent. If deflection exceeds 5 percent, replacement or correction shall be accomplished in accordance with requirements in the approved specifications. The rigid ball method used for test sections for pipe having a diameter not less than 85 percent of the base inside diameter or average inside diameter of 24 inches depending on which is specified in the ASTM Specifications, including the appendix, to which the pipe is manufactured. The test shall be performed without mechanical pulling devices.
2. Leakage Test - For Gravity Sewers shall be by the Air Test Method. The infiltration-infiltration test for the subject sewer system shall not exceed 200 gallons per inch of diameter per mile of sewer in a 24 hour testing period. The air test, as a minimum, conforms to the test procedure described in ASTM C-562 for day pipe, ASTM C-562 for concrete pipe, ASTM F-1417 for plastic pipe and test procedure approved by the regulatory agency for other materials.
3. Sanitary Manhole Vacuum Testing - Manholes shall be air tested in accordance with ASTM C-1344-03, Standard Test Method for Concrete Sewer Manholes by the Negative Air Pressure (Vacuum) Test. Air manhole vacuum tests shall be conducted by the presence of a representative of the Department of Public Works.
- The vacuum test equipment shall consist of:
- Inflatable bags for all incoming and outgoing sewer lines, an inflatable test seal to seal the manhole at the manhole frame, and a vacuum pump. A vacuum gauge shall be located in-line between the test collar and the pump to accurately indicate the vacuum in inches of mercury within the manhole. The vacuum gauge shall have a range to no more than forty (40) inches of mercury with scale markings of no greater than on half inch of mercury vacuum and in accordance to within plus or minus two percent (2%) of true vacuum.

- Internal Manhole Chimney Seals shall consist of a flexible internal rubber sleeve, interlocking endpieces, and stainless steel compression bands conforming to ASTM C-923.
- D. Manholes Chimney Seals
- Internal Chimney Seals per City of Franklin Sanitary Standards shall be installed on the joints of all manholes between the casing frame and the cone section per manufacturer's recommendation.
  - Temporary sediment trap
  - Rock check dam
  - Riprap
- Non-woven geotextiles for aggregate separation shall conform to the following:

- The seal shall remain flexible throughout a 25-year design life, allowing repeated vertical movement of the frame of not less than two (2) inches and repeated horizontal movement of the frame of not less than one-half (1/2) inch. The sleeve portion of the seal shall be a minimum double pleated with a minimum unpleated vertical height of 8, 10, or 13 inches, respectively. The sleeve and extension shall have a minimum thickness of three-sixteenths (3/16) inches and shall be made from a high quality rubber compound conforming to the applicable requirements of ASTM C-923, with a hardness (durometer) of 48 to 55.

- The area of the seal that compresses against the manhole flange and the chimney cone shall provide a watertight seal. The bands shall be fabricated from 1/4 gauge stainless steel and over welded at joints and shall have a minimum adjustment range of two (2) diameter inches. Any screws, bolts, or nuts used to lock the bands in place shall be stainless steel. The internal seals shall be as manufactured by Cretex Specialty Products, Inc. or approved equal.

### 3. APPLICATION

- A. Permits and Codes - The intent of this section of the specifications is that the contractor's bid on the work covered herein shall be based upon all drawings and specifications but that the work comply with all applicable codes and regulations as amended by any waivers. The contractor shall furnish all bonds necessary to get permits for cuts and connections to existing sewers. The Contractor shall be responsible for obtaining a written approval from the city or portions of this project prior to starting construction. The Contractor shall notify the local or county inspector or utility superintendent 48 hours prior to commencing of sanitary construction.
- B. Local Standards - The term "Local Standards" as used herein means the standards of design and construction of the respective municipal department or utility company.
- C. Existing Improvements - Maintain in operating condition all active utilities, sewers and other drains encountered in the sewer installation. Repair to the satisfaction of the owner any damage to existing active improvements.
- D. Workmanship - To conform to all local, state and national codes and to be approved by all local state agencies having jurisdiction.
- E. Trenching - Lay all pipe in open trenches, except when the local authority gives written permission for tunneling or jacking of pipe. Open the trench sufficiently ahead of pipe-laying to reveal any obstructions. The width of the trench shall be the inside pipe diameter plus 24 inches for 12" inches above the pipe. Shield and brace the trench as necessary to protect workers and adjacent structures. All trenching to comply with Occupational Safety and Health Administration Standards. Open trenches shall be properly protected and/or barricaded when left unattended. Keep trenches free from water while construction is in progress. Under no circumstances shall pipe or appurtenances be left in standing water. Conduct the discharge from trench dewatering to drains or natural drainage channels.

- F. Special Supports - Wherever, in the opinion of the Engineer, the soil at or below the pipe grade is unsuitable for supporting sewers and appurtenances specified in this section, such special support, in addition to those shown or specified, shall be provided at the Engineer's may direct, and the contract will be adjusted.
- G. Backfilling - For a depth of at least 12 inches above the top of the pipe, backfill with 12" of 85 crushed stone or R8 fractured face aggregate. Compact this backfill thoroughly, taking care not to disturb the pipe. For the remaining trench depth, backfill with earth or granular material containing stones or rocks not larger than 4 inches. Backfill under and within standards. All trenching to comply with Occupational Safety and Health Administration Standards. Open trenches shall be properly protected and/or barricaded when left unattended. Keep trenches free from water while construction is in progress. Under no circumstances shall pipe or appurtenances be left in standing water. Conduct the discharge from trench dewatering to drains or natural drainage channels.

- H. Flow Channels - The flow channels within manholes shall be an integral part of the present basin. The channels shall be shaped and formed for a clean transition with proper hydraulics to allow the smooth conveyance of flow through the manhole. The trench wall shall be formed to the crown of the inlet and outlet pipes to form a 10" tapered channel. The trench wall shall slope back from the crown at 12 inch per foot to the manhole wall. No brick, rock or sand fillers will be allowed.
- I. Infiltration - The contractor shall furnish necessary equipment to test sewers for infiltration. Infiltration tests shall not exceed the Local Standards. All sanitary sewer lines upon completion will be required to pass a low pressure air test, unless otherwise directed by Citizens Energy Group. Said test shall be conducted according to NCPH Standard Method, and shall be witnessed by an inspector authorized by the City Engineer. Infiltration under test shall not exceed 100 gallons per inch of inside diameter of sewer pipe per mile of sewer in 24 hours and is inclusive of all appurtenances within the section being tested such as manholes, house connections, etc. Any portions not passing said tests for acceptance shall be repaired or replaced, including re-excavation and backfill, at the Contractor's expense.
- J. Flushing Sewers - Flush all sanitary sewers except building sewers with water to obtain free flow through each line. Remove all silt and trash from appurtenances just prior to acceptance of work.
- K. Plastic Sewer Pipe Installation - Plastic sewer pipe shall be installed in accordance with ASTM D2221 per latest revision, and no plastic pipe shall exceed an 11 point marshall test deflection of 5%. All sewer mains shall be clamped at the time the manhole test is conducted. All mains shall be true to alignment and grade.

## L. Storm Water Connections - No roof drains, footing drains and/or surface water drains may be connected to the sanitary sewer systems, including temporary connections during construction.

### 1. SCOPE OF WORK

- M. Waterline Crossing - Water and sewer line crossings and separations shall be in accordance with Indiana State Standards and local and state codes. Waterlines and sanitary sewers shall maintain a minimum of 10 foot horizontal separation and a minimum 18 inches of clearance between pipes at crossings. Otherwise, sanitary sewer within 10 feet of waterlines shall be constructed of water works grade Ductile Iron Pipe, with mechanical joints and fittings. The length of sewer pipe should be centered at the waterline crossing so that no joint is closer than 10 feet to the waterline.
- N. Utilities - It shall be the responsibility of each contractor to verify all existing utilities and conditions pertaining to the phase of the work. It shall also be the contractors responsibility to contact the owners of the various utilities with and coordinate. The contractor shall verify in writing the work and the engineer of any changes, errors or omissions found on these plans or in the field before work is started or resumed.
- O. Service Laterals - Individual building service lines shall be 6 inches in diameter and of material equal to that specified in 2.1 of this section. Service lines shall be connected to the main sewer by a wye at locations generally shown within plans. Wyes are to be fitted up to 45 degrees from the horizontal, with suitable fittings for all changes in direction. Service lines shall be extended to a distance of 5 feet beyond the right-of-way line and within 2' of the existing ground surface. The ends shall be plugged and sealed with a water tight plug. Service lines shall be marked with a "2x4" painted frame and extending from the lateral end to 3' above grade.
- P. New Sanitary Sewer Main Construction - Contractor shall record length and dimensions of each service line stub from nearest downstream manhole measured along the sanitary sewer main. The locations of manholes and all service lines along with any other construction changes to be incorporated on manholes and service lines along with any other construction changes are to be incorporated on the original construction drawings as "as-built" locations and submitted to the Engineer as soon after completion of construction as possible, not.
- Q. The Contractor shall remove by pumping or other suitable methods any water which may accumulate in trenches. A plug that is installed between the new system being built with this project and the existing system. Said plug shall remain in place until construction is complete. No ground or surface water will be permitted to enter the existing system.

3. TESTING
- A. Citizens Energy Group shall be notified prior to all testing of sanitary sewers.
1. The Contractor shall be responsible for all tests for leakage, infiltration and deflection established by the governing agency having jurisdiction and the IDEH Construction Permit. Any portions not passing said tests for acceptance shall be repaired or replaced at the Contractor's expense, including re-excavation and backfill.
2. Deflation Test - Shall be performed on all flexible pipe. The test shall be conducted after the final backfill has been in place at least 30 days to permit stabilization of the soil-pipe system. No pipe shall exceed a deflection of 5 percent. If deflection exceeds 5 percent, replacement or correction shall be accomplished in accordance with requirements in the approved specifications. The rigid ball method used for test sections for pipe having a diameter not less than 85 percent of the base inside diameter or average inside diameter of 24 inches depending on which is specified in the ASTM Specifications, including the appendix, to which the pipe is manufactured. The test shall be performed without mechanical pulling devices.
2. Leakage Test - For Gravity Sewers shall be by the Air Test Method. The infiltration-infiltration test for the subject sewer system shall not exceed 200 gallons per inch of diameter per mile of sewer in a 24 hour testing period. The air test, as a minimum, conforms to the test procedure described in ASTM C-562 for day pipe, ASTM C-562 for concrete pipe, ASTM F-1417 for plastic pipe and test procedure approved by the regulatory agency for other materials.
3. Sanitary Manhole Vacuum Testing - Manholes shall be air tested in accordance with ASTM C-1344-03, Standard Test Method for Concrete Sewer Manholes by the Negative Air Pressure (Vacuum) Test. Air manhole vacuum tests shall be conducted by the presence of a representative of the Department of Public Works.
- The vacuum test equipment shall consist of:
- Inflatable bags for all incoming and outgoing sewer lines, an inflatable test seal to seal the manhole at the manhole frame, and a vacuum pump. A vacuum gauge shall be located in-line between the test collar and the pump to accurately indicate the vacuum in inches of mercury within the manhole. The vacuum gauge shall have a range to no more than forty (40) inches of mercury with scale markings of no greater than on half inch of mercury vacuum and in accordance to within plus or minus two percent (2%) of true vacuum.

- Internal Manhole Chimney Seals shall consist of a flexible internal rubber sleeve, interlocking endpieces, and stainless steel compression bands conforming to ASTM C-923.
- D. Manholes Chimney Seals
- Internal Chimney Seals per City of Franklin Sanitary Standards shall be installed on the joints of all manholes between the casing frame and the cone section per manufacturer's recommendation.
  - Temporary sediment trap
  - Rock check dam
  - Riprap
- Non-woven geotextiles for aggregate separation shall conform to the following:

- The seal shall remain flexible throughout a 25-year design life, allowing repeated vertical movement of the frame of not less than two (2) inches and repeated horizontal movement of the frame of not less than one-half (1/2) inch. The sleeve portion of the seal shall be a minimum double pleated with a minimum unpleated vertical height of 8, 10, or 13 inches, respectively. The sleeve and extension shall have a minimum thickness of three-sixteenths (3/16) inches and shall be made from a high quality rubber compound conforming to the applicable requirements of ASTM C-923, with a hardness (durometer) of 48 to 55.

- The area of the seal that compresses against the manhole flange and the chimney cone shall provide a watertight seal. The bands shall be fabricated from 1/4 gauge stainless steel and over welded at joints and shall have a minimum adjustment range of two (2) diameter inches. Any screws, bolts, or nuts used to lock the bands in place shall be stainless steel. The internal seals shall be as manufactured by Cretex Specialty Products, Inc. or approved equal.

### 3. APPLICATION

- A. Permits and Codes - The intent of this section of the specifications is that the contractor's bid on the work covered herein shall be based upon all drawings and specifications but that the work comply with all applicable codes and regulations as amended by any waivers. The contractor shall furnish all bonds necessary to get permits for cuts and connections to existing sewers. The Contractor shall be responsible for obtaining a written approval from the city or portions of this project prior to starting construction. The Contractor shall notify the local or county inspector or utility superintendent 48 hours prior to commencing of sanitary construction.
- B. Local Standards - The term "Local Standards" as used herein means the standards of design and construction of the respective municipal department or utility company.
- C. Existing Improvements - Maintain in operating condition all active utilities, sewers and other drains encountered in the sewer installation. Repair to the satisfaction of the owner any damage to existing active improvements.
- D. Workmanship - To conform to all local, state and national codes and to be approved by all local state agencies having jurisdiction.
- E. Trenching - Lay all pipe in open trenches, except when the local authority gives written permission for tunneling or jacking of pipe. Open the trench sufficiently ahead of pipe-laying to reveal any obstructions. The width of the trench shall be the inside pipe diameter plus 24 inches for 12" inches above the pipe. Shield and brace the trench as necessary to protect workers and adjacent structures. All trenching to comply with Occupational Safety and Health Administration Standards. Open trenches shall be properly protected and/or barricaded when left unattended. Keep trenches free from water while construction is in progress. Under no circumstances shall pipe or appurtenances be left in standing water. Conduct the discharge from trench dewatering to drains or natural drainage channels.

- F. Special Supports - Wherever, in the opinion of the Engineer, the soil at or below the pipe grade is unsuitable for supporting sewers and appurtenances specified in this section, such special support, in addition to those shown or specified, shall be provided at the Engineer's may direct, and the contract will be adjusted.
- G. Backfilling - For a depth of at least 12 inches above the top of the pipe, backfill with 12" of 85 crushed stone or R8 fractured face aggregate. Compact this backfill thoroughly, taking care not to disturb the pipe. For the remaining trench depth, backfill with earth or granular material containing stones or rocks not larger than 4 inches. Backfill under and within standards. All trenching to comply with Occupational Safety and Health Administration Standards. Open trenches shall be properly protected and/or barricaded when left unattended. Keep trenches free from water while construction is in progress. Under no circumstances shall pipe or appurtenances be left in standing water. Conduct the discharge from trench dewatering to drains or natural drainage channels.

- H. Flow Channels - The flow channels within manholes shall be an integral part of the present basin. The channels shall be shaped and formed for a clean transition with proper hydraulics to allow the smooth conveyance of flow through the manhole. The trench wall shall be formed to the crown of the inlet and outlet pipes to form a 10" tapered channel. The trench wall shall slope back from the crown at 12 inch per foot to the manhole wall. No brick, rock or sand fillers will be allowed.
- I. Infiltration - The contractor shall furnish necessary equipment to test sewers for infiltration. Infiltration tests shall not exceed the Local Standards. All sanitary sewer lines upon completion will be required to pass a low pressure air test, unless otherwise directed by Citizens Energy Group. Said test shall be conducted according to NCPH Standard Method, and shall be witnessed by an inspector authorized by the City Engineer. Infiltration under test shall not exceed 100 gallons per inch of inside diameter of sewer pipe per mile of sewer in 24 hours and is inclusive of all appurtenances within the section being tested such as manholes, house connections, etc. Any portions not passing said tests for acceptance shall be repaired or replaced, including re-excavation and backfill, at the Contractor's expense.
- J. Flushing Sewers - Flush all sanitary sewers except building sewers with water to obtain free flow through each line. Remove all silt and trash from appurtenances just prior to acceptance of work.
- K. Plastic Sewer Pipe Installation - Plastic sewer pipe shall be installed in accordance with ASTM D2221 per latest revision, and no plastic pipe shall exceed an 11 point marshall test deflection of 5%. All sewer mains shall be clamped at the time the manhole test is conducted. All mains shall be true to alignment and grade.

## STORM SEWER SYSTEMS

### 1. SCOPE OF WORK

- A. The work under this section includes all storm sewers, storm water inlets, and related items, including excavating and backfilling, necessary to complete the work shown on the plans. Work and materials shall meet City of Franklin Stormwater Quality Management Plan.
2. MATERIALS
- A. Storm Sewers
- Reinforced concrete sewer pipe shall conform to ASTM C-76 latest revision, with joints conforming to ASTM C-443 latest revision when storm pipe is located within public right-of-way.
  - Aluminized type 2 composed steel pipe shall be manufactured in accordance with AASHTO M456 type 1 with 2.27 x 1/2 corrugations for 12" and 15" diameters, type IR with 3/4" x 3/4" x 7 1/2" corrugations for 18" diameter and larger). The pipe shall be formed from an aluminized steel type 2 coil that conforms to AASHTO M274. The minimum pipe thickness of the pipe shall be as follows:
- | Diameter | Thickness |
|----------|-----------|
| 12"-30"  | 16        |
| 36"-48"  | 14        |
| 54"-60"  | 12        |
3. High density polyethylene pipe shall perform to AASHTO M252 and M294 Type S specifications, latest revision, and shall have material specifications conforming to ASTM D1248 or D1530, latest revision.
- B. Manholes
- Precast reinforced concrete manhole sections and steps shall conform to ASTM C-478 latest revision.
  - Casting shall be of uniform quality, free from blow holes, porosity, hard spots, shrinkage distortion or other defects. They shall be smooth and well finished by shot blasting or by some other approved method. They shall be coated with asphalt paint which shall result in a smooth coating, tough and tenacious when cold, not tacky or brittle. They shall be gray iron meeting and submitted to the Engineer as soon after completion of construction as possible, not.
  - Joints - Manhole sections shall be jointed with rubber type gaskets. The well-cleaned by shot blasting or by some other approved method. They shall be coated with asphalt paint which shall result in a smooth coating, tough and tenacious when cold, not tacky or brittle. They shall be gray iron meeting and submitted to the Engineer as soon after completion of construction as possible, not.
- C. Subdrains
- Perforated plastic pipe subdrains shall conform to ASTM F-405, AASHTO M-252 (4" to 10" pipe).

- C. Application
- A. Permits and Codes - The intent of this section of the specifications is that the contractor's bid on the work covered herein shall be based upon all drawings and specifications but that the work shall comply with all applicable codes and regulations as amended by any waivers. The contractor shall furnish all bonds necessary to get permits for cuts and connections to existing sewers. Contractor shall notify the local governing jurisdiction a minimum of 72 hours prior to the commencement of active construction.
- B. Local Standards - The term "Local Standards" as used herein means the standards of design and construction of the respective municipal department or utility company.
- C. Existing Improvements - Maintain in operating condition all active utilities, sewers and other drains encountered in the sewer installation. Repair to the satisfaction of the owner any damage to existing active improvements.
- D. Workmanship - To conform to all local, state and national codes and to be approved by all local state agencies having jurisdiction.
- E. Trenching - Lay all pipe in open trenches, except when the local authority gives written permission for tunneling. Open the trench sufficiently ahead of pipe laying to reveal any obstructions. The width of the trench shall be the inside pipe diameter plus 24 inches for 12 inches above the pipe. Shield and brace the trench as necessary to protect workers and adjacent structures. All trenching to comply with Occupational Safety and Health Administration Standards. Keep trenches free from water while construction is in progress. Under no circumstances shall pipe or appurtenances be left in standing water. Conduct the discharge from trench dewatering to drains or natural drainage channels.

- F. Special Supports - Wherever, in the opinion of the Engineer the soil at or below the pipe grade is unsuitable for supporting sewers and appurtenances specified in this section, such special support, in addition to those shown or specified, shall be provided as the Engineer may direct, and the contract will be adjusted.
- G. Backfilling - For a depth of at least 12 inches above the top of the pipe, backfill with earth or granular material free from large stones, rock fragments, roots or soil. Tamp this backfill thoroughly, taking care not to disturb the pipe. For the remaining trench depth, backfill with earth or granular material containing stones or rocks not larger than 4 inches. Backfill under and within standards. All trenching to comply with Occupational Safety and Health Administration Standards. Keep trenches free from water while construction is in progress. Under no circumstances shall pipe or appurtenances be left in standing water. Conduct the discharge from trench dewatering to drains or natural drainage channels.

- H. Manhole Inverts - Conduct manhole flow channels of concrete sewer pipe or brick, smoothly finished and of semicircular section conforming to the inside diameter of the connecting sewers. Make changes in size or grade gradually and changes in direction by flow curves. Provide such channels for all connecting sewers at each manhole.
- I. Subdrains - A subdrains shall be of the size shown on the plans and shall be constructed to the grade shown. All drains constructed off site as part of the other drain test be located as shown.
- J. Utilities - It shall be the responsibility of each contractor to verify all existing utilities and conditions pertaining to the phase of the work. It shall also be the contractors responsibility to contact the owners of the various utilities before work is started. The contractor shall notify in writing the owners or the engineer of any changes, errors or omissions found on these plans or in the field before work is started or resumed.

1. Slopes - Provide 1/4 inch per foot cross slope. Make adjustments in slopes at walk intersections as necessary to provide proper drainage.
2. Dimensions - Walks and steps shall be one course construction and of widths and details shown on the drawings.
3. Finish - Trench and spread concrete as soon as placed, and fill any honey combed places. Finish square corners to 1/4" radius and fill any corner sidewalks intersect, and at a maximum spacing of 48 feet between expansion joints.

- J. Curing Concrete - Exposed as otherwise specified, cure all concrete by one of the methods described in Section 501.17 of the Indiana Department of Transportation Specifications, latest revision.

### WATER MAIN

- The work under this section includes all distribution piping, valves, hydrants, appurtenances and related items including excavating and backfilling, necessary to complete the work shown on the drawings. All work and materials shall meet the current Citizens Energy Group Standards. All materials are to be made in the United States of America.
1. Trenching Procedures
- Install the chimney seal and only the bottom expansion band per manufacturer's recommendation. Fully tighten the bottom band. Do not install the top expansion band.
  - Pulling the top of the seal away from the manhole frame, pour one (1) gallon of water behind the seal.
  - Observe the bottom seal for a minimum of one (1) minute for leakage.
  - Drain the water by tilting the top of the chimney seal down.
  - If the chimney seal passes the test, install the top expansion band per manufacturer's recommendation.
3. Determination of Chimney Seal Acceptance - If the bottom expansion band holds water without leaking, the chimney seal will have passed the test.
4. Determination of Chimney Seal Failure - If the bottom expansion band has any leakage during the test time, the chimney seal will have failed the test. The Contractor shall be required to remove, replace, or reposition the bottom expansion band and retest.

- All manholes which do not pass shall be repaired by the contractor and retested as described above until a successful test is made. After each test the temporary plugs shall be removed.

4. Manhole Chimney Seal Testing - All internal chimney seals shall be tested per Section 604.05 of Citizen Energy Group Sanitary Standards Manual.
- The vacuum test shall be done BEFORE the chimney seal is installed and tested.

- The leakage test shall be as follows:
- Waiting Period - The leakage test shall be done AFTER the manhole has passed the vacuum test.
  - Testing Procedures
    - Install the chimney seal and only the bottom expansion band per manufacturer's recommendation. Fully tighten the bottom band. Do not install the top expansion band.
    - Pulling the top of the seal away from the manhole frame, pour one (1) gallon of water behind the seal.
    - Observe the bottom seal for a minimum of one (1) minute for leakage.
    - Drain the water by tilting the top of the chimney seal down.
    - If the chimney seal passes the test, install the top expansion band per manufacturer's recommendation.

3. Determination of Chimney Seal Acceptance - If the bottom expansion band holds water without leaking, the chimney seal will have passed the test.

4. Determination of Chimney Seal Failure - If the bottom expansion band has any leakage during the test time, the chimney seal will have failed the test. The Contractor shall be required to remove, replace, or reposition the bottom expansion band and retest.

## STREETS AND PAVING

### 1. SCOPE OF WORK

- A. The work required under this section includes all concrete and bituminous paving and related items necessary to complete the work indicated on drawings and described in the specifications, including but not limited to: All streets, parking areas in contract limits, curbs and gutters, sidewalks and concrete slabs, and exterior steps.
2. MATERIALS
- A. Concrete - Concrete shall be ready-mixed concrete and shall be a mix of proportioned fine and coarse aggregates with Portland cement and water. Minimum cement content shall be 6 bags per cubic yard of concrete and maximum water content shall be 5.5 U.S. gallons per sack of cement, including materials in the aggregate. Slump for normal weight concrete shall be a maximum of 4 inches and a minimum of 2 inches. The slump of machine place concrete shall be no less than 1-1/4 inches nor more than 3 inches. Standard test ASTM C-143 shall be used to measure slump. If compressive strength of concrete at 28 days shall be 40