

SITE CONSTRUCTION PLANS FOR



CONVIENENCE STORE AT BRIDGEWATER

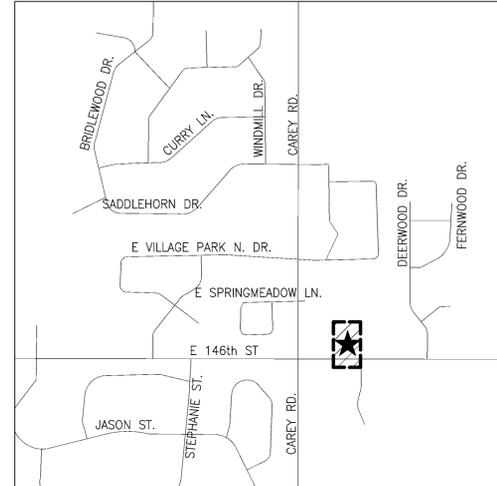
3404 EAST 146th STREET WESTFIELD, IN 46033

PLANS PREPARED FOR
RICKER'S
 30 WEST 11TH STREET
 ANDERSON, INDIANA 46016
 TELEPHONE: 765.643.3016
 CONTACT PERSON: TRAVIS SMITH
 EMAIL: TSMITH@RICKERS.NET

PLANS PREPARED BY
WEIHE ENGINEERS, INC.
 10505 N. COLLEGE AVE.
 INDIANAPOLIS, INDIANA 46280
 TELEPHONE: 317.846.6611
 FAX: 317.843.0546
 CONTACT PERSON: JAMIE SHINNEMAN
 EMAIL: SHINNEMANJ@WEIHE.NET



★ PROJECT LOCATION
 LOCATION MAP



★ PROJECT LOCATION
 LOCATION MAP

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GENERAL NOTES

- THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING, OR VERIFYING THAT ALL PERMITS AND APPROVALS ARE OBTAINED FROM THE RESPECTIVE CITY, COUNTY, AND STATE AGENCIES PRIOR TO STARTING CONSTRUCTION.
- IT SHALL BE THE CONTRACTORS RESPONSIBILITY TO DETERMINE THE EXACT LOCATION OF ALL EXISTING UTILITIES IN THE VICINITY OF THE CONSTRUCTION AREA PRIOR TO STARTING CONSTRUCTION.
- IT SHALL BE THE CONTRACTORS RESPONSIBILITY TO NOTIFY AND COORDINATE CONSTRUCTION WITH ALL RESPECTIVE UTILITIES.
- ALL QUANTITIES GIVEN ON THESE PRINTS, VERBALLY OR IN THE SCOPE OF WORK SECTION ARE ESTIMATES AND SHALL BE CONFIRMED BY THE BIDDING CONTRACTORS.
- OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION (OSHA) STANDARDS FOR EXCAVATIONS; FINAL RULE 29 CFR PART 1926, SUBPART 1926.1000 APPLIES TO ALL EXCAVATIONS EXCEEDING FIVE (5) FEET IN DEPTH.
- IN ADDITION, EXCAVATION EXCEEDING TWENTY (20) FEET IN DEPTH REQUIRE THE DESIGN OF A TRENCH SAFETY SYSTEM BY A REGISTERED PROFESSIONAL ENGINEER.
- IT SHALL BE THE RESPONSIBILITY OF THE DEVELOPER AND CONTRACTOR TO MAINTAIN QUALITY CONTROL THROUGHOUT THIS PROJECT.
- TEMPORARY TRAFFIC CONTROL DURING CONSTRUCTION TO CONFORM TO APPLICABLE LOCAL STANDARDS.
- THE ENGINEER AND/OR OWNER DISCLAIM ANY ROLE IN THE CONSTRUCTION MEANS AND METHODS ASSOCIATED WITH THE PROJECT AS SET FORTH IN THESE PLANS.
- ANY FIELD TILES ENCOUNTERED DURING EXCAVATION SHALL BE REPAIRED AND CONNECTED TO NEW STORM SEWERS AND POSITIVE DRAINAGE PRESERVED.
- IT SHALL BE THE RESPONSIBILITY OF THE DEVELOPER THAT ALL LANDSCAPE REQUIREMENTS ARE MET AND CONFORM TO APPLICABLE LOCAL STANDARDS.
- THE SITE DOES NOT LIE IN A SPECIAL FLOOD HAZARD AREA AS ESTABLISHED BY THE FEDERAL EMERGENCY MANAGEMENT AGENCY - NATIONAL FLOOD INSURANCE PROGRAM, WHEN PLOTTED BY SCALE ON FLOOD INSURANCE RATE MAP #18057C0138 F, DATED FEBRUARY 19, 2003.
- BEARINGS, DIMENSIONS AND EASEMENTS ARE SHOWN FOR REFERENCE ONLY. SEE RECORD SURVEYS & PLAT FOR EXACT INFORMATION.
- THIS SITE DOES NOT CONTAIN ANY WETLANDS AS SHOWN ON THE U.S. DEPARTMENT OF THE INTERIOR FISH AND WILDLIFE SERVICE, WESTFIELD, INDIANA, NATIONAL WETLANDS INVENTORY MAP DATED 1989.

LAND DESCRIPTION

LOT 2 OF BRIDGEWATER CENTER AT 146TH STREET PER THE PLAT THEREOF RECORDED AS INSTRUMENT NUMBER 2013059183 ON SLIDE 126 IN PLAT CABINET 5 IN THE OFFICE OF THE RECORDER OF HAMILTON COUNTY, INDIANA.

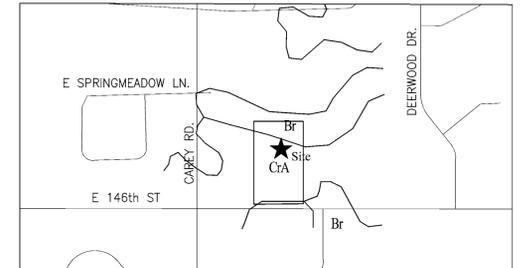
ORIGINATING BENCHMARK - HCBR 146

AS DESCRIBED BY THE HAMILTON COUNTY INDIANA SURVEYORS' OFFICE: "HAMILTON COUNTY 'GEODEIC CONTROL' DISK SET AT THE 151ST STREET BRIDGE OVER COOL CREEK, SET IN TOP OF THE NORTHEAST CONCRETE BRIDGE ABUTMENT, 16.5' NORTH OF THE CENTERLINE OF 151ST STREET, 2.0' NORTH OF THE STEEL GAURDRAIL, 0.7' SOUTH OF THE NORTH END OF THE ABUTMENT."
 ELEVATION = 825.91 NAVD83
 825.51 NAVD88 (CONVERTED USING CORPSCON 6.0.1)

TBM 1
 THE SOUTHEAST FLANGE BOLT OF A FIRE HYDRANT ON THE SOUTH SIDE OF STREET B NEAR THE NORTH LINE OF THE SITE.
 ELEVATION = 845.16 NAVD88

OPERATING AUTHORITIES

- | | | | |
|--|--|---|---|
| VECTREN (GAS)
ATTENTION: BRIAN HARGER
P.O. BOX 1700
WESTFIELD, IN 46081
317.776.5560 | CITY OF WESTFIELD - COMM. DEVELOPMENT
ATTENTION: MATT SKELTON
2706 EAST 171ST STREET
WESTFIELD, IN 46074
317.804.3172 | INDOT
ATTENTION: SHELLEY HANEY
32 SOUTH BROADWAY
GREENFIELD, IN 46140
317.467.3492 | HAMILTON COUNTY SURVEYOR'S OFFICE
ATTENTION: GREG HOYES
1 HAMILTON COUNTY SQUARE, STE. 146
NOBLESVILLE, IN 46060
317.776.9626 |
| AMERITECH (TELEPHONE)
ATTENTION: STEVE KREBS
5859 NORTH COLLEGE AVENUE
INDIANAPOLIS, IN 46220
317.252.4275 | WESTFIELD FIRE DEPARTMENT
ATTENTION: GARRY HARLING
17355 DARTOWN ROAD
WESTFIELD, IN 46074
317.896.2704 | HAMILTON COUNTY HIGHWAY DEPT.
ATTENTION: DAVE LUCAS
1700 SOUTH 10TH STREET
NOBLESVILLE, IN 46060
317.773.7770 | |
| DUKE ENERGY (ELECTRIC)
ATTENTION: SHIRLEY HUNTER
16475 SOUTH PARK DRIVE
WESTFIELD, IN 46074
317.896.6711 | CITY OF WESTFIELD UTILITIES
(SANITARY SEWER AND WATER)
ATTENTION: JEREMY LOLLAR
2706 EAST 171ST STREET
WESTFIELD, IN 46074
317.804.3000 | | |



★ PROJECT LOCATION
 SOILS MAP

SOILS TYPE LEGEND

- Br BROCKTON SILTY CLAY LOAM
 THE MAIN SOIL FEATURES THAT ADVERSELY AFFECT ENGINEERING USES OF THIS SOIL ARE A SEASONAL HIGH WATER TABLE, HIGH POTENTIAL FROST ACTION, MODERATE SHRINK-SWELL POTENTIAL, AND MODERATE PERMEABILITY. THIS SOIL HAS SEVERE LIMITATIONS FOR BUILDING SITES. THE SITES NEED TO BE ARTIFICIALLY DRAINED AND PROTECTED FROM FLOODING. DWELLINGS AND SMALL BUILDINGS WITH BASEMENTS SHOULD NOT BE CONSTRUCTED ON THIS SOIL. USING PROPERLY DESIGNED FOUNDATIONS AND FOOTINGS HELPS TO PREVENT STRUCTURAL DAMAGE FROM FROST ACTION AND SHRINKING AND SWELLING OF THE SOIL. THIS SOIL HAS SEVERE LIMITATIONS FOR LOCAL ROADS AND STREETS BECAUSE OF SEASONAL HIGH WATER TABLE AND HIGH POTENTIAL FROST ACTION. INSTALLATION OF DRAINAGE DITCHES ALONG ROADS HELPS TO LOWER THE WATER TABLE AND PREVENT DAMAGE FROM FROST ACTION. THE BASE MATERIAL FOR ROADS AND STREETS SHOULD BE REPLACED OR STRENGTHENED WITH SUITABLE MATERIAL.
- C1a CROSBY SILT LOAM
 THE MAIN SOIL FEATURES THAT ADVERSELY AFFECT THE ENGINEERING USES OF THIS SOIL ARE A SEASONAL HIGH WATER TABLE, MODERATE SHRINK-SWELL POTENTIAL, HIGH POTENTIAL FROST ACTION, AND SLOW PERMEABILITY. THIS SOIL HAS SOME SEVERE LIMITATIONS FOR BUILDING SITES. THE SITES NEED TO BE ARTIFICIALLY DRAINED TO PREVENT WETNESS FROM BECOMING A PROBLEM. DWELLINGS AND SMALL BUILDINGS WITH BASEMENTS SHOULD NOT BE CONSTRUCTED ON THIS SOIL. USING PROPERLY DRAINED FOUNDATIONS AND FOOTINGS HELPS TO PREVENT STRUCTURAL DAMAGE FROM LOW STRENGTH AND SHRINKING AND SWELLING OF THE SOIL. THIS SOIL HAS SEVERE LIMITATIONS FOR LOCAL ROADS AND STREETS. THE BASE MATERIAL FOR ROADS NEEDS TO BE STRENGTHENED OR REPLACED WITH SUITABLE MATERIAL.



Know what's below.
 Call before you dig.

Within Indiana Call
 811 or 800-382-5544
 24 Hours a Day, 7 Days a Week.

PER INDIANA STATE LAW (C 8-1-26,
 IT IS AGAINST THE LAW TO EXCAVATE
 WITHOUT NOTIFYING THE UNDERGROUND
 LOCATION SERVICE TWO (2) WORKING
 DAYS BEFORE COMMENCING WORK.

10505 N. College Avenue
 Indianapolis, Indiana 46280
 weihe.net
 317 | 846 - 6611
 800 | 452 - 6408
 317 | 843 - 0546 fax

WEIHE ENGINEERS
 Land Surveying | Civil Engineering
 Landscape Architecture

PROJECT NO.: W13.0559
 DWG NAME: 10505C001 title.dwg
 DESIGNED BY: JBS
 DRAWN BY: RLW
 CHECKED BY: BUS
 DATE: 12.23.2013

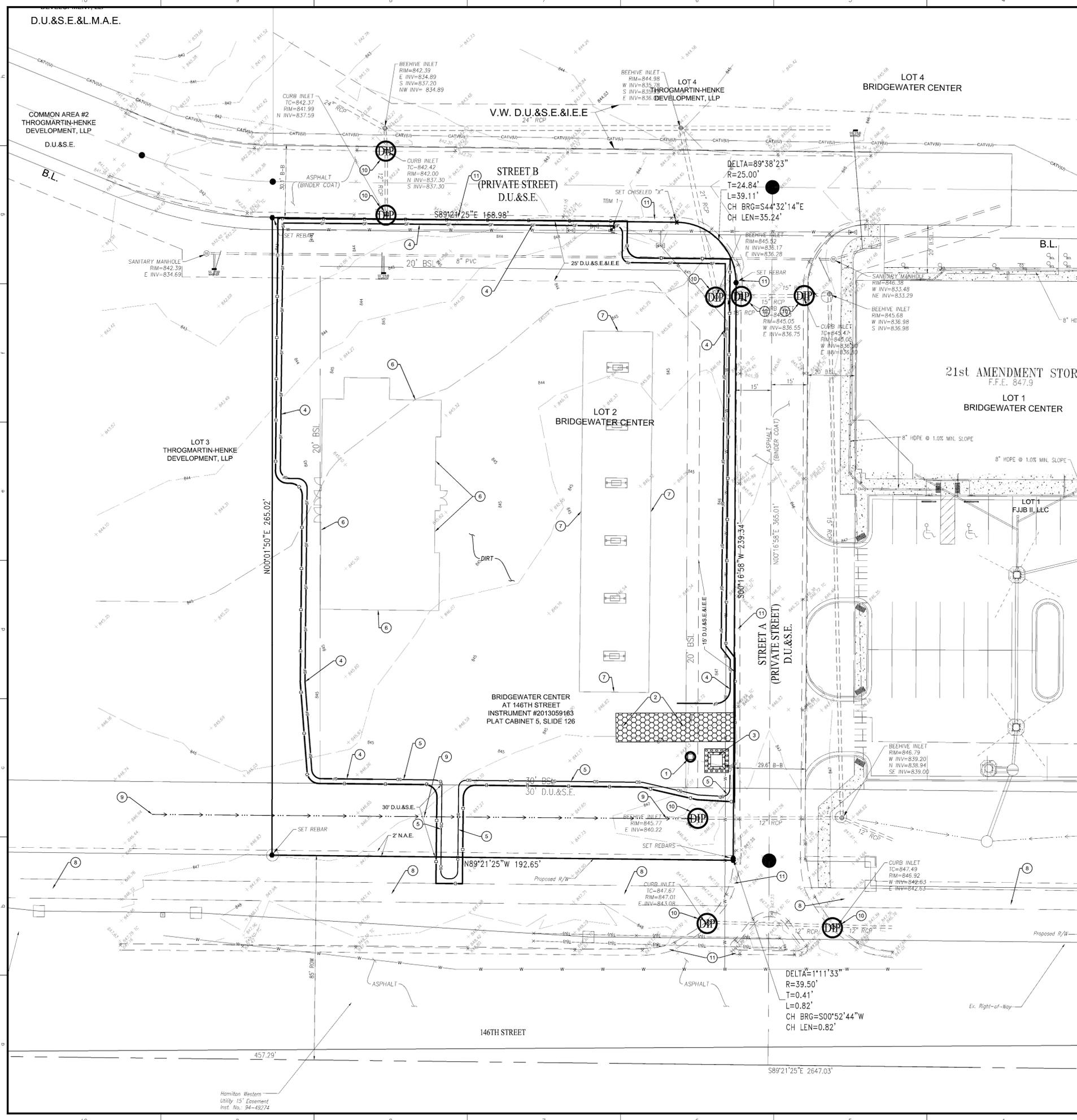
DATE: 12.23.2013
 BY: RLW
 REVISIONS AND ISSUES:
 PRE-FILE DRAFTING
 SUBMITTED FOR REVIEW



JAMES K. SHINNEMAN P.E. 10200392

PREPARED FOR:
Ricker's AT BRIDGEWATER
 Section M4, Lot 2 of Bridgewater Center located at 3404 East 146th Street, Westfield, IN 46033
 TITLE SHEET
 Part of the S1/4 of Section 17, Township 18 North, Range 4 East, Washington Township, Hamilton County, Indiana

SHEET NO.
C001
 PROJECT NO.
 W13.0559



SITE PREPARATION / SWPPP PHASE I NOTES

- INSTALL PERMIT POSTING AREA. 4" PVC TUBE WITH END CAPS ATTACHED TO PROJECT CONSTRUCTION SIGN TO CONTAIN APPROVED CONSTRUCTION DRAWINGS AND PERMITS FOR INSPECTORS.
- INSTALL CONSTRUCTION ENTRANCE. REFER TO DETAIL ON SHEET C104
- INSTALL CONCRETE WASHOUT. REFER TO DETAIL ON SHEET C104
- INSTALL SILT FENCE. REFER TO DETAIL ON SHEET C104
- INSTALL COIR LOG. REFER TO DETAIL ON SHEET C104
- LIMITS OF PROPOSED BUILDING
- LIMITS OF PROPOSED CANOPY
- EXISTING STORM, INSTALLED BY THE DEVELOPER, TO REMAIN IN PLACE.
- EXISTING STORM SUBSURFACE DRAIN TILE TO REMAIN.
- INSTALL COCONUT MAT INLET PROTECTION ON ALL INLETS LOCATED WITHIN THE STREET. COORDINATE INLET PROTECTION WITH DEVELOPER'S CONTRACTOR. PROVIDE MATS IF DEVELOPER'S CONTRACTOR DID NOT PROVIDE DURING THE INSTALLATION OF THE STREETS AND INFRASTRUCTURE.
- EXISTING CURB, INSTALLED BY THE DEVELOPER, TO REMAIN IN PLACE.

EROSION CONTROL SPECIFICATIONS

- THIS PLAN IS DESIGNED AS AN ATTEMPT TO PREVENT ANY AND ALL SEDIMENT FROM LEAVING THE CONSTRUCTION SITE BY WAY OF EROSION. IF EROSION OF SEDIMENT FROM THE SITE IS TAKING PLACE, THE CONTRACTOR AND/OR OWNER SHALL TAKE PREVENTATIVE ACTION IMMEDIATELY. THE ENGINEER SHALL BE CONSULTED IN THE EVENT THIS HAPPENS.
- TEMPORARY SEEDING IS TO BE APPLIED TO ANY DISTURBED AREA THAT WILL REMAIN UNALTERED IN EXCESS OF 15 DAYS.
- PERMANENT SEEDING IS TO BE APPLIED IMMEDIATELY TO AREAS THAT HAVE ACHIEVED FINAL AND FINISHED GRADE.
- PRESERVE EXISTING VEGETATION ON THE SITE WHENEVER AND WHEREVER POSSIBLE TO PREVENT TOPSOIL EROSION.
- ALL SEDIMENT CAPTURING MEASURES SHALL BE IMPLEMENTED PRIOR TO THE DISTURBANCE OF THE CONSTRUCTION AREA THEY ARE INTENDED TO SERVICE. ALL EROSION CONTROL MEASURES PROPOSED ARE TO BE PROPERLY MAINTAINED TO CONTINUE THEIR EFFECTIVENESS.
- IF GRADING OCCURS DURING THE MONTHS OF DECEMBER, JANUARY OR FEBRUARY DORMANT KEEPING PROCEDURES SHALL BE USED.
- DURING DRY WEATHER, KEEP LAWNS WATERED WITH SPRINKLERS OR OTHER APPROVED METHODS. RESEED ANY AREAS NOT GERMINATING OR DAMAGED AT INTERVALS AS MAY BE REQUIRED ACCORDING TO SEASONAL CONDITION AND/OR CONSTRUCTION ACTIVITY. WATER GRASS AND EXECUTE NECESSARY WEEDING UNTIL FULL STAND OF GRASS HAS BEEN OBTAINED.
- THE IMPLEMENTATION AND MAINTENANCE OF THE EROSION CONTROL IS THE SOLE RESPONSIBILITY OF THE CONTRACTOR AND/OR OWNER.
- IT SHALL BE THE CONTRACTOR'S AND/OR OWNER'S RESPONSIBILITY TO MINIMIZE SEDIMENTATION (FROM ON-SITE CONSTRUCTION ACTIVITIES) FROM BEING DEPOSITED ONTO ADJACENT PROPERTIES AND RECEIVING STREAMS/DITCHES IN STRICT COMPLIANCE WITH "RULE 5" (327 IAC 15-5, CONSTRUCTION ACTIVITY STORM WATER RUNOFF CONTROL). IT SHALL ALSO BE THE CONTRACTOR'S AND/OR OWNER'S RESPONSIBILITY TO OBTAIN ANY APPROVALS REQUIRED FROM THE LOCAL AUTHORITY AND TO SUBMIT A COMPLETE NOTICE OF INTENT LETTER TO THE OFFICE OF WATER MANAGEMENT, INDIANA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT PRIOR TO ANY CONSTRUCTION ACTIVITY.
- FOR SEASONAL VARIATIONS - SEE SEASONAL SOIL PROTECTION CHART IN THESE PLANS.
- PORTABLE TOILETS MUST BE ANCHORED.

GENERAL NOTES

- IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO VERIFY WITH THE OWNER DURING BIDDING AND DURING CONSTRUCTION ACTIVITIES ALL ITEMS TO BE REMOVED. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO REMOVE ANY MATERIALS AND/OR STRUCTURES NOT LOCATED ON THIS SURVEY FOR THE INSTALLATION OF THE NEW WORK.
- IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO VERIFY ALL EXISTING UTILITIES PERTAINING TO THEIR PHASE OF WORK, AND TO VERIFY WHICH UTILITIES WILL BE REMOVED BY UTILITY COMPANY. ANY AND ALL UTILITIES NOT REMOVED BY THE UTILITY COMPANY SHALL BE REMOVED BY THE CONTRACTOR.
- UTILITIES ARE SHOWN TO BE APPROXIMATE AND SHALL BE RELOCATED AND/OR CAPPED AND ABANDONED BEFORE CONSTRUCTION AT NO ADDITIONAL COST TO THE OWNER.
- ALL DEMOLITION MATERIAL AND SALVAGEABLE MATERIAL IS THE PROPERTY OF THE DEMOLITION CONTRACTOR AND SHALL BE PROPERLY DISPOSED OFF THE SITE.
- SLABS ON GRADE MUST BE REMOVED COMPLETELY AND TAKEN OFF THE SITE.
- ALL UTILITIES MUST REMAIN ACTIVE FOR AREA TENANTS THAT ARE REMAINING. NO UTILITY SERVICE SHALL BE INTERRUPTED DURING THE CONSTRUCTION PROCESS.
- BEARINGS, DIMENSIONS, AND EASEMENTS ARE SHOWN FOR REFERENCE ONLY. SEE RECORD SURVEYS AND PLATS FOR EXACT INFORMATION.
- IF THERE ARE ANY QUESTIONS CONCERNING THIS DEMOLITION PLAN, PLEASE CONTACT THE ENGINEER BEFORE CONTINUING WORK.

EXISTING AREAS

TOTAL SITE	= 1.170 AC.
DISTURBED	= 0.980 AC.
PERVIOUS	= 1.170 AC.
IMPERVIOUS	= 0.000 AC.

NOTE

ANY EXISTING TREE(S) THAT MAY REQUIRE REMOVAL BUT ARE NOT SHOWN ON THE PLAN AS BEING REMOVED MAY BE DONE SO, AS LONG AS THE TREE(S) ARE RELOCATED TO AN APPROVED ALTERNATIVE LOCATION ON SITE.

CONTACT PERSON FOR EROSION CONTROL & SEDIMENT PRACTICES

WEIHE ENGINEERS, INC.
10505 N. COLLEGE AVE.
INDIANAPOLIS, IN 46268
TELEPHONE: (317) 846-6611
FAX: (317) 846-0546
EMAIL: SHINNEMAN@WEIHE.NET
CONTACT PERSON: JAMIE SHINNEMAN

SWPPP I LEGEND

- INLET PROTECTION - USE SUBSURFACE INLET PROTECTION WITH OVERFLOW CAPABILITY, UNLESS OTHERWISE NOTED
- CONSTRUCTION ENTRANCE
- STAGING AREA
- POSTING AREA - 4" PVC TUBE WITH END CAPS ATTACHED TO PROJECT CONSTRUCTION SIGN TO CONTAIN APPROVED CONSTRUCTION DRAWINGS AND PERMITS FOR INSPECTORS.
- CONCRETE WASHOUT
- SILT FENCE
- LIMITS OF DISTURBANCE
- COIR LOG

LEGEND

- EXIST. FIRE HYDRANT
- EXIST. WATER METER/VALVE
- EXIST. SIGN
- EXIST. MONITOR WELL
- EXIST. IRON PIN & OR PK (SET/FLOW)
- EXIST. GAS METER
- EXIST. GAS VALVE
- EXIST. STORM INLET
- EXIST. STORM/SAN./TELE. MANHOLE
- EXIST. ELECTRIC METER
- EXIST. POWER POLE/POWER POLE w/ LIGHT
- EXIST. GUY ANCHOR
- EXIST. TELEPHONE PEDESTAL
- EXIST. HVAC UNIT
- CLEANOUT
- MAILBOX
- LIGHT POLE
- EXIST. BOLLARD
- EXIST. SANITARY SEWER LINE
- EXIST. STORM SEWER LINE
- EXIST. CONTOURS
- CONCRETE END SECTION (C.E.S.)
- GATE POST
- TRANSFORMER
- RIGHT-OF-WAY LINE
- DRAINAGE FLOW ARROW
- EXISTING TREE LINE
- FINISH FLOOR ELEVATION
- TOP OF (MANHOLE / INLET) CASTING
- INVERT ELEVATION
- REINFORCED CONCRETE PIPE
- CORRUGATED METAL PIPE
- POLYVINYL CHLORIDE PIPE
- HIGH DENSITY POLYETHYLENE
- FLOW LINE
- STRUCTURE
- TOP OF WALL
- SUB-SURFACE DRAINAGE
- TOP OF CURB
- GUTTER
- WATER LINE
- GAS LINE
- OVERHEAD UTILITY LINE
- TELEPHONE LINE
- ELECTRIC LINE
- TEMPORARY BENCHMARK
- PARKING COUNT

EROSION CONTROL NOTES

- ALL DISTURBED AREAS SHALL BE SOODED OR SEEDDED, EXCEPT BUILDING PAD AND LANDSCAPE BEDS. SEE LANDSCAPE PLANS FOR LOCATION OF LANDSCAPE BEDS.
- INSTALL SILT FENCE ALONG ALL DOWNSTREAM SLOPES. SILT FENCE TO FOLLOW CONTOUR.
- THERE SHALL BE NO DIRT, DEBRIS OR STORAGE OF MATERIAL IN THE STREET.

ORIGINATING BENCHMARK - HCBR 146

AS DESCRIBED BY THE HAMILTON COUNTY INDIANA SURVEYOR'S OFFICE: HAMILTON COUNTY GEODETIC CONTROL DISK SET AT THE 151ST STREET BRIDGE OVER COOL CREEK. SET IN TOP OF THE NORTHEAST CONCRETE BRIDGE ABUTMENT, 16.5' NORTH OF THE CENTERLINE OF 151ST STREET, 2.0' NORTH OF THE STEEL GAURDRAIL, 0.7' SOUTH OF THE NORTH END OF THE ABUTMENT.
ELEVATION = 825.91 NAVD83
825.51 NAVD88 (CONVERTED USING CORPSCON 6.0.1)

TBM 1

THE SOUTHEAST FLANGE BOLT OF A FIRE HYDRANT ON THE SOUTH SIDE OF STREET IS NEAR THE NORTH LINE OF THE SITE.
ELEVATION: 845.16 NAVD88

811
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24 Hours a Day, 7 Days a Week.

PER INDIANA STATE LAW IC 8-1-26, IT IS AGAINST THE LAW TO EXCAVATE WITHOUT NOTIFYING THE UNDERGROUND LOCATION SERVICE TWO (2) WORKING DAYS BEFORE COMMENCING WORK.

SCALE: 1" = 20'

10505 N. College Avenue
Indianapolis, Indiana 46280
weihe.net
317 846 - 6611
800 452 - 6408
317 843 - 0546 fax

WEIHE ENGINEERS
Land Surveying / Civil Engineering
Landscape Architecture

PROJECT NO.:	W13.0559
DWG NAME:	SWPPP PHASE I
DATE:	12.23.2013
BY:	RLW
DATE:	01.29.2014
REVISIONS AND ISSUES:	
PRE-FILE MEETING:	
SUBMITTED FOR REVIEW:	

JAMES K. SHINNEMAN P.E. 10200392

AT BRIDGEWATER
Section M4, Lot 2 of Bridgewater Center located at 3404 East 146th Street, Westfield, IN 46033

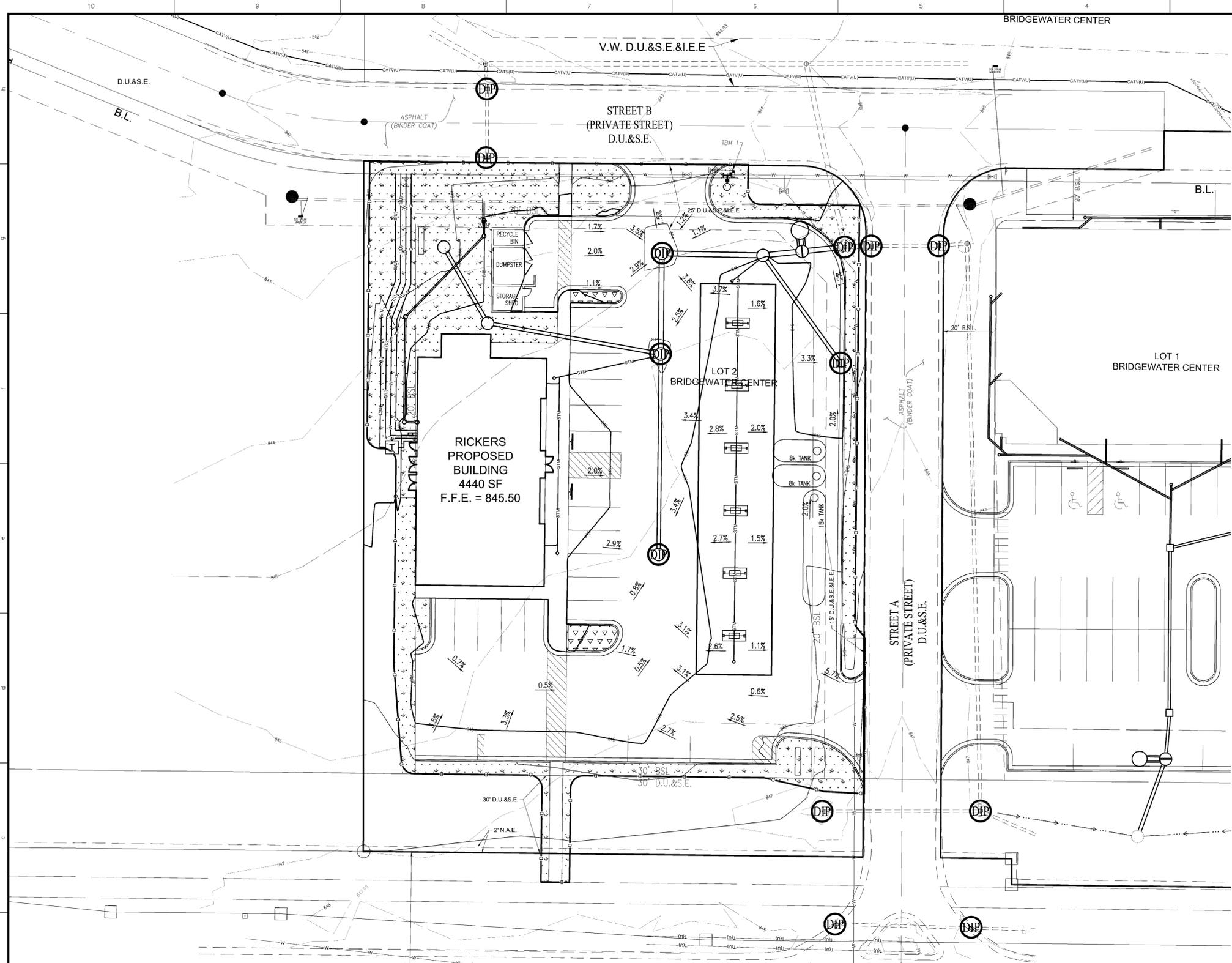
SWPPP PHASE I

SHEET NO. **C101**

PROJECT NO. **W13.0559**

LOCATION: H:\2013\W130559\Engineering\Design\Concept\W130559-C101_swppp1.dwg
DATE/TIME: 12/23/2013 10:43:29 AM
PLOT/DWG: weiherr

Hamilton Western
Utility 15' Easement
Ref. No. 94-49274



- ### EROSION CONTROL SPECIFICATIONS
- THIS PLAN IS DESIGNED AS AN ATTEMPT TO PREVENT ANY AND ALL SEDIMENT FROM LEAVING THE CONSTRUCTION SITE BY WAY OF EROSION. IF EROSION OF SEDIMENT FROM THE SITE IS TAKING PLACE, THE CONTRACTOR AND/OR OWNER SHALL TAKE PREVENTATIVE ACTION IMMEDIATELY. THE ENGINEER SHALL BE CONSULTED IN THE EVENT THIS HAPPENS.
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 - FOR SEASONAL VARIATIONS - SEE SEASONAL SOIL PROTECTION CHART IN THESE PLANS.
 - PORTABLE TOILETS MUST BE ANCHORED.

LAND DESCRIPTION

LOT 2 OF BRIDGEWATER CENTER AT 146TH STREET PER THE PLAT THEREOF RECORDED AS INSTRUMENT NUMBER 2013059163 ON SLIDE 126 IN PLAT CABINET 5 IN THE OFFICE OF THE RECORDER OF HAMILTON COUNTY, INDIANA.

ORIGINATING BENCHMARK - HCBR 146

AS DESCRIBED BY THE HAMILTON COUNTY INDIANA SURVEYOR'S OFFICE: 'HAMILTON COUNTY GEODETIC CONTROL' DISK SET AT THE 151ST STREET BRIDGE OVER COOL CREEK, SET IN TOP OF THE NORTHEAST CONCRETE BRIDGE ABUTMENT, 16.5' NORTH OF THE CENTERLINE OF 151ST STREET, 2.7' NORTH OF THE STEEL GAURDRAIL, 0.7' SOUTH OF THE NORTH END OF THE ABUTMENT.
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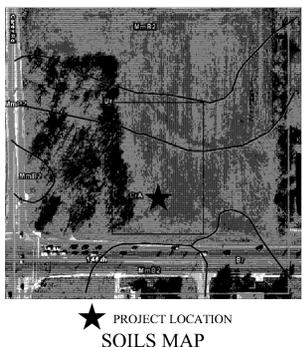
TBM 1
 THE SOUTHEAST FLANGE BOLT OF A FIRE HYDRANT ON THE SOUTH SIDE OF STREET B NEAR THE NORTH LINE OF THE SITE.
 ELEVATION = 845.16 NAVD88

- ### SWPPP LEGEND
- DTP** - INLET PROTECTION - USE SUBSURFACE INLET PROTECTION WITH OVERFLOW CAPABILITY
 - - PERMANENT/TEMPORARY SEEDING USE PLANTING CHART
 - ▽▽▽▽** - MULCH

DISTURBED ACREAGE
 = 0.960± AC.

-WARNING-
 THIS PLAN TO BE USED FOR EROSION CONTROL PURPOSES ONLY. ADDITIONAL EROSION CONTROL MEASURES MAY BE REQUIRED IN THE FIELD BY THE INSPECTOR.

-NOTE-
 THIS PLAN INDICATES EROSION CONTROL MEASURES REQUIRED AFTER SOIL STRIPPING AND PAD BUILDING HAS TAKEN PLACE. COORDINATE WITH DEVELOPER FOR MEASURES REQUIRED UNTIL PROPERTY TURNED OVER FOR DEVELOPMENT. COORDINATE WITH SOIL CONSERVATION DISTRICT REPRESENTATIVE FOR ANY OTHER MEASURES REQUIRED DUE TO SITE CONDITIONS.



SOILS TYPE LEGEND

Br BROOKSTON SILTY CLAY LOAM
 THE MAIN SOIL FEATURES THAT ADVERSELY AFFECT ENGINEERING USES OF THIS SOIL ARE A SEASONAL HIGH WATER TABLE, HIGH POTENTIAL FROST ACTION, MODERATE SHRINK-SWELL POTENTIAL, AND MODERATE PERMEABILITY. THIS SOIL HAS SEVERE LIMITATIONS FOR BUILDING SITES. THE SITES NEED TO BE ARTIFICIALLY DRAINED AND PROTECTED FROM FLOODING. DWELLINGS AND SMALL BUILDINGS WITH BASEMENTS SHOULD NOT BE CONSTRUCTED ON THIS SOIL. USING PROPERLY DESIGNED FOUNDATIONS AND FOOTINGS HELPS TO PREVENT STRUCTURAL DAMAGE FROM FROST ACTION AND SHRINKING AND SWELLING OF THE SOIL. THIS SOIL HAS SEVERE LIMITATIONS FOR LOCAL ROADS AND STREETS BECAUSE OF SEASONAL HIGH WATER TABLE AND HIGH POTENTIAL FROST ACTION. INSTALLATION OF DRAINAGE DITCHES ALONG ROADS HELPS TO LOWER THE WATER TABLE AND PREVENT DAMAGE FROM FROST ACTION. THE BASE MATERIAL FOR ROADS AND STREETS SHOULD BE REPLACED OR STRENGTHENED WITH SUITABLE MATERIAL.

CtA CROSBY SILT LOAM
 0 TO 2 PERCENT SLOPES. THE MAIN SOIL FEATURES THAT ADVERSELY AFFECT THE ENGINEERING USES OF THIS SOIL ARE A SEASONAL HIGH WATER TABLE, MODERATE SHRINK-SWELL POTENTIAL, HIGH POTENTIAL FROST ACTION, AND SLOW PERMEABILITY. THIS SOIL HAS SOME SEVERE LIMITATIONS FOR BUILDING SITES. THE SITES NEED TO BE ARTIFICIALLY DRAINED TO PREVENT WETNESS FROM BECOMING A PROBLEM. DWELLINGS AND SMALL BUILDINGS WITH BASEMENTS SHOULD NOT BE CONSTRUCTED ON THIS SOIL. USING PROPERLY DRAINED FOUNDATIONS AND FOOTINGS HELPS TO PREVENT STRUCTURAL DAMAGE FROM LOW STRENGTH AND SHRINKING AND SWELLING OF THE SOIL. THIS SOIL HAS SEVERE LIMITATIONS FOR LOCAL ROADS AND STREETS. THE BASE MATERIAL FOR ROADS NEEDS TO BE STRENGTHENED OR REPLACED WITH SUITABLE MATERIAL.

SEASONAL SOIL PROTECTION CHART

SOIL STABILIZATION METHOD	JAN.	FEB.	MAR.	APR.	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.
PERMANENT SEEDING	A											
DORMANT SEEDING	B											
TEMPORARY SEEDING	C											
SODDING	D											
MULCHING	G											

A = KENTUCKY BLUEGRASS 40 LBS/ACRE; CREEPING RED FESCUE 40 LBS/ACRE; PLUS 2 TONS STRAW MULCH/ACRE, OR ADD ANNUAL RYEGRASS 20 LBS/ACRE.
 B = KENTUCKY BLUEGRASS 60 LBS/ACRE; CREEPING RED FESCUE 60 LBS/ACRE; PLUS 2 TONS STRAW MULCH/ACRE, OR ADD ANNUAL RYEGRASS 30 LBS/ACRE.
 C = SPRING OATS 3 BUSH/ACRE.
 D = WHEAT OR RYE 2 BUSH/ACRE.
 E = ANNUAL RYEGRASS 40 LBS/ACRE.
 F = SOD (BLEND 3 IMPROVED VARIETIES).
 G = STRAW MULCH 2 TONS/ACRE.
 *Irrigation needed during JUNE, JULY, AND/OR SEPTEMBER.
 **Irrigation needed for 2 TO 3 WEEKS AFTER APPLYING SOD.
 ***KENTUCKY BLUEGRASS BLEND OF 3 IMPROVED VARIETIES.

- ### EROSION CONTROL NOTES
- ALL DISTURBED AREAS SHALL BE SODDED OR SEEDDED, EXCEPT BUILDING PAD AND LANDSCAPE BEDS. SEE LANDSCAPE PLANS FOR LOCATION OF LANDSCAPE BEDS.
 - INSTALL SILT FENCE ALONG ALL DOWNSTREAM SLOPES. SILT FENCE TO FOLLOW CONTOUR.
 - THERE SHALL BE NO DIRT, DEBRIS OR STORAGE OF MATERIAL IN THE STREET.

CONTACT PERSON FOR EROSION CONTROL & SEDIMENT PRACTICES

WEIHE ENGINEERS, INC.
 10505 N. COLLEGE AVE
 INDIANAPOLIS, IN 46268
 TELEPHONE: (317) 846-6611
 FAX: (317) 843-5545
 EMAIL: SHINNEMAN@WEIHE.NET
 CONTACT PERSON: JAMIE SHINNEMAN

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SCALE: 1" = 20'

0 10 20 40

10505 N. College Avenue
 Indianapolis, Indiana 46280
 weihe.net
 317 846 - 6611
 800 452 - 6408
 317 843 - 0546 fax
 ALLAN H. WEIHE, P.E., L.S. - FOUNDER

WEIHE ENGINEERS
 Land Surveying / Civil Engineering
 Landscape Architecture

REVISIONS AND ISSUES

DATE	BY	REASON
12.23.2013	RLW	W13.0559 PRE-FILE DRAFTING
01.29.2014	RLW	W13.0559 C102 SUBMITTED FOR REVIEW

PROJECT NO: W13.0559
 DWG NAME: W130559-C102-01-01
 DESIGNER: RLW
 DRAWN BY: RLW
 CHECKED BY: RLW
 DATE: 12.23.2013

JAMES K. SHINNEMAN
 REGISTERED PROFESSIONAL ENGINEER
 No. 10206392
 STATE OF INDIANA
 PROFESSIONAL ENGINEER

JAMES K. SHINNEMAN P.E. 10206392

PREPARED FOR:
AT BRIDGEWATER
 Section M4, Lot 2 of Bridgewater Center located at 3404 East 146th Street, Westfield, IN 46033

EROSION CONTROL & SWPPP PHASE 2
 Part of the SWPPP of Section 17, Township 18 North, Range 4 East, Washington Township, Hamilton County, Indiana

SHEET NO.
C102

PROJECT NO.
 W13.0559

LOCATION: 11/20/13 10:55:59 Engineering\Projects\W130559-C102_eros.dwg
 DATE/TIME: January 29, 2014 - 4:39pm
 PLOTTED BY: weiherr

SECTION A - CONSTRUCTION PLAN ELEMENTS

- A1 PLAN INDEX - SEE BELOW
A2 11'x17' PLAN - REDUCTION OF STORMWATER POLLUTION PREVENTION PLAN TO BE SUBMITTED WITH FULL SIZE PLAN
A3 PROJECT NARRATIVE - THIS IS A PROPOSED COMMERCIAL DEVELOPMENT ON APPROXIMATELY 1.17 ACRES...

SECTION B - SWPPP - CONSTRUCTION PHASE

- B1 DESCRIPTION OF POTENTIAL POLLUTANT SOURCES - POTENTIAL POLLUTANTS FROM CONSTRUCTION ACTIVITY SUCH AS ASPHALT FROM PAVING, CONCRETE FROM CURBING, SIDEWALKS, OIL, GREASE, ANTIFREEZE, GASOLINE AND DIESEL FUEL
B2 SEQUENCE DESCRIBING STORMWATER QUALITY MEASURE IMPLEMENTATION RELATIVE TO LAND DISTURBING ACTIVITIES
B3 PRE-CONSTRUCTION MEETING WITH THE CITY OF WESTFIELD IS REQUIRED PRIOR TO THE COMMENCEMENT OF ANY EARTHWORK...

SECTION C - SWPPP - POST-CONSTRUCTION PHASE

- C1 DESCRIPTION OF POLLUTANTS AND THEIR SOURCES ASSOCIATED WITH THE PROPOSED LAND USE - POTENTIAL POLLUTANTS FROM POST-CONSTRUCTION ACTIVITY SUCH AS SANDS AND SALTS FROM SNOW REMOVAL, OIL, GREASE, ANTIFREEZE, ETC.
C2 SEQUENCE DESCRIBING STORMWATER QUALITY MEASURE IMPLEMENTATION - WATER QUALITY FOR THIS LOT WILL BE PROVIDED BY AN AQUA SWIRL UNIT SHOWN ON THE PLANS...

SECTION 1 EMERGENCY RESPONSE NUMBERS

Table with 2 columns: Agency Name and Phone Number. Includes Westfield Fire Department (317.896.2704), Westfield Police Department (317.776.6336), Indiana Dept. of Natural Resources (317.232.4200), Indiana Dept. of Environmental Management (317.233.7745), Hamilton County County Soil and Water (317.773.2181), and City of Westfield Public Works (317.804.3100).

SECTION 2 MATERIAL HANDLING AND SPILL PREVENTION PLAN

IN ORDER TO MINIMIZE THE RELEASE OF POTENTIAL POLLUTANTS DURING CONSTRUCTION THE CONTRACTORS SHALL IMPLEMENT THIS MATERIAL HANDLING AND SPILL PREVENTION PLAN. THE CONTRACTOR SHALL REVIEW THIS PLAN WITH ALL SUBCONTRACTORS AND REQUIRE THAT THEY IMPLEMENT THE PLAN AS WELL.

- 1. CONSTRUCTION EQUIPMENT
A. FUELING, LUBRICATION AND FLUIDS: ALL OPERATIONS INVOLVING THE ADDITION OF FLUIDS TO EQUIPMENT SHOULD BE DONE IN ONE LOCATION...
B. EQUIPMENT REPAIR, ESPECIALLY WHEN FLUIDS MUST BE REMOVED FROM THE EQUIPMENT OR THE POSSIBILITY OF FLUID SPILLS IS HIGH, SHOULD ALWAYS BE DONE AT A FACILITY THAT IS MORE SUITABLE THAN A CONSTRUCTION SITE TO HANDLE SPILLS...
2. CONSTRUCTION MATERIALS AND THEIR PACKAGING
A. EROSION CONTROL MEASURES SHOWN ON THE SUBJECT PROJECT SHALL BE IMPLEMENTED PRIOR TO AND DURING CONSTRUCTION IN THE PROPER SEQUENCING TO MINIMIZE SOIL EROSION...

RULE 6. SPILLS OF OIL AND OTHER OBJECTIONABLE SUBSTANCES; REPORTING, CONTAINMENT AND CLEANUP

REPEALED BY WATER POLLUTION CONTROL BOARD; FILED FEB 25, 1997, 1:00 P.M.; 20 IR 1734)

RULE 6.1. SPILLS; REPORTING, CONTAINMENT, AND RESPONSE

327 IAC 2-6.1-1 APPLICABILITY
AFFECTED: IC 13-14-8; IC 13-18-1; IC 13-18-3; IC 13-18-8; IC 13-18-17
SEC. 1. THIS RULE APPLIES TO THE REPORTING AND CONTAINMENT OF, AND THE RESPONSE TO, SPILLS OF HAZARDOUS SUBSTANCES, EXTREMELY HAZARDOUS SUBSTANCES, PETROLEUM, AND OBJECTIONABLE SUBSTANCES THAT ARE OF A QUANTITY, TYPE, DURATION AND IN A LOCATION AS TO DAMAGE THE WATERS OF THE STATE...

327 IAC 2-6.1-2 SPECIAL AREAS

AFFECTED: IC 13-11-2; IC 13-18-1; IC 13-18-3; IC 13-18-8; IC 13-18-17
SEC. 2. CERTAIN AREAS OF THE STATE ARE RECOGNIZED AS HAVING UNIQUE GEOLOGY. A LARGE SECTION OF THE MID-SOUTHERN PART OF THE STATE IS A KARST REGION, PORTIONS OF SAINT JOSEPH, ELKHART, KOSCIUSKO, AND LAGRANGE COUNTIES CONTAIN A SOLE SOURCE AQUIFER AS REFERENCED IN 42 U.S.C. 1008-3(5). THE WATERS OF THE STATE ARE PARTICULARLY VULNERABLE TO DAMAGE FROM SPILLS IN THESE AREAS...

327 IAC 2-6.1-3 EXCLUSIONS

AFFECTED: IC 13-14-8; IC 13-11-2; IC 13-18-1; IC 13-18-3; IC 13-18-8; IC 13-18-17
SEC. 3. NOTWITHSTANDING ANY OTHER SECTION OF THIS RULE, THE REPORTING REQUIREMENT OF THIS RULE DOES NOT APPLY TO THE FOLLOWING OCCURRENCES:

- (1) DISCHARGES OR EXCEEDANCES THAT ARE UNDER THE JURISDICTION OF AN APPLICABLE PERMITS WHEN THE SUBSTANCE IN QUESTION IS COVERED BY THE PERMIT AND DEATH OR ACUTE INJURY OR ILLNESS TO ANIMALS OR HUMANS DOES NOT OCCUR.
(2) LAWFUL APPLICATION OF MATERIALS, INCLUDING, BUT NOT LIMITED TO: (A) COMMERCIAL OR NATURAL FERTILIZERS AND PESTICIDES ON OR TO LAND OR WATER; OR (B) DUST SUPPRESSION MATERIALS.
(3) THE APPLICATION OF PETROLEUM NECESSARY FOR CONSTRUCTION THAT DOES NOT DAMAGE WATERS OF THE STATE.

327 IAC 2-6.1-4 DEFINITIONS

AFFECTED: IC 13-14-8; IC 13-18-1; IC 13-18-3; IC 13-18-8; IC 13-18-17; IC 14-8-2-7; IC 14-25-7-13; IC 14-25-7-15
SEC. 4. IN ADDITION TO THE DEFINITIONS CONTAINED IN IC 13-11-2-17(D), IC 13-11-2-26(A), IC 13-11-2-61, IC 13-11-2-61(A), IC 13-11-2-260, IC 13-11-2-265, AND IN 327 IAC 1, THE FOLLOWING DEFINITIONS APPLY THROUGHOUT THIS RULE:
(1) "ANIMAL" MEANS ALL MAMMALS, BIRDS, REPTILES, AMPHIBIANS, FISH, CRUSTACEANS, AND MOLLUSKS.
(2) "AQUATIC LIFE" MEANS THOSE PLANTS AND MACROINVERTEBRATES THAT ARE DEPENDENT UPON AN AQUATIC ENVIRONMENT.

IN COMMERCE. THIS DEFINITION EXCLUDES CARRIAGE WITHIN A FACILITY BY TRANSPORTATION EQUIPMENT OWNED, OPERATED, OR CONTROLLED BY THAT FACILITY.

(11) "OBJECTIONABLE SUBSTANCES" MEANS SUBSTANCES THAT ARE: (A) OF A QUANTITY AND A TYPE; AND (B) PRESENT FOR A DURATION AND IN A LOCATION SO AS TO DAMAGE WATERS OF THE STATE. THIS DEFINITION EXCLUDES HAZARDOUS SUBSTANCES, EXTREMELY HAZARDOUS SUBSTANCES, PETROLEUM, AND MIXTURES THEREOF.
(12) "ON-SCENE COORDINATOR" MEANS A STATE OR FEDERAL OFFICIAL DESIGNATED BY THE DEPARTMENT OF NATURAL RESOURCES, ENVIRONMENTAL PROTECTION AGENCY, OR THE UNITED STATES COAST GUARD TO DIRECT AND COORDINATE SPECIAL SPILL RESPONSE ACTIVITIES.

(13) "RECREATIONAL WATERS" MEANS ANY WATER USED FOR: (A) BOATING, SWIMMING, FISHING, HUNTING, TRAPPING, OR WILDLIFE VIEWING; OR (B) PUBLIC ACCESS AREAS THAT ARE OWNED BY THE DEPARTMENT OF NATURAL RESOURCES OR THE FEDERAL GOVERNMENT, AS LISTED BY THE DEPARTMENT.
(14) "REPORTABLE QUANTITY" MEANS THE AMOUNT OF A HAZARDOUS SUBSTANCE OR EXTREMELY HAZARDOUS SUBSTANCE THAT IS REQUIRED TO BE REPORTED UNDER FEDERAL LAW UNDER 42 U.S.C. 9602(A) AND (B) AND 42 U.S.C. 9603(A), (40 CFR 302.4 OR 40 CFR 355 APPENDIX A), (15) "SPILL" MEANS ANY UNEXPECTED, UNINTENDED, ABNORMAL, OR UNAPPROVED DUMPING, LEAKAGE, DRAINAGE, SEEPAGE, DISCHARGE OR OTHER LOSS OF PETROLEUM, HAZARDOUS SUBSTANCES, EXTREMELY HAZARDOUS SUBSTANCES, OR OBJECTIONABLE SUBSTANCES...

(16) "SPILL RESPONSE" FOR PURPOSES OF THIS RULE, MEANS THE FOLLOWING: (A) THE SPILL IS CONTAINED; AND (B) FREE MATERIAL IS REMOVED OR NEUTRALIZED.
(17) "SPILL REPORT" MEANS A REPORT THAT INCLUDES THE FOLLOWING INFORMATION ABOUT A SPILL, TO THE EXTENT THAT THE INFORMATION IS KNOWN AT THE TIME OF THE REPORT: (A) THE NAME, ADDRESS, AND TELEPHONE NUMBER OF THE PERSON MAKING THE SPILL REPORT.

(B) THE NAME, ADDRESS, AND TELEPHONE NUMBER OF A CONTACT PERSON IF DIFFERENT FROM CLAUSE (A). (C) THE LOCATION OF THE SPILL. (D) THE TIME OF THE SPILL. (E) THE IDENTIFICATION OF THE SUBSTANCE SPILLED. (F) THE APPROXIMATE QUANTITY OF THE SUBSTANCE THAT HAS BEEN OR MAY FURTHER BE SPILLED. (G) THE DURATION OF THE SPILL. (H) THE SOURCE OF THE SPILL. (I) NAME AND LOCATION OF THE WATERS DAMAGED. (J) THE IDENTITY OF ANY RESPONSE ORGANIZATION RESPONDING TO THE SPILL. (K) WHAT MEASURES HAVE BEEN OR WILL BE UNDERTAKEN TO PERFORM A SPILL RESPONSE. (L) ANY OTHER INFORMATION THAT MAY BE SIGNIFICANT TO THE RESPONSE ACTION.

(18) "WATER AS DEFINED IN IC 13-11-2-265, MEANS THE ACCUMULATIONS OF WATER, SURFACE AND UNDERGROUND, NATURAL AND ARTIFICIAL, PUBLIC AND PRIVATE, OR PARTS THEREOF, THAT ARE WHOLLY OR PARTIALLY WITHIN, FLOW THROUGH, OR BORDERS THE STATE. THIS TERM DOES NOT INCLUDE AN INLAND PRIVATE POND OR ANY OFF-STREAM POND, RESERVOIR, OR FACILITY BUILT FOR REDUCTION OR CONTROL OF POLLUTION OR COOLING OF WATER PRIOR TO DISCHARGE UNLESS THE DISCHARGE FROM THE POND, RESERVOIR, OR FACILITY IS INTO A WATERWAY THAT IS SUBJECT TO STATE WATER POLLUTION, (WATER POLLUTION CONTROL BOARD, 327 IAC 2-6.1-4; FILED FEB 25, 1997, 1:00 P.M.; 20 IR 1731; ERRATA FILED MAR 7, 1997, 2:25 P.M.; 20 IR 1738; READOPTED FILED JAN 10, 2001, 3:23 P.M.; 24 IR 1518; READOPTED FILED NOV 21, 2007, 1:16 P.M.; 20070625-IR-327060419ACA)

327 IAC 2-6.1-5 REPORTABLE SPILLS; FACILITY
AFFECTED: IC 13-14-8; IC 13-11-2; IC 13-18-1; IC 13-18-3; IC 13-18-8; IC 13-18-17
SEC. 5. THE FOLLOWING SPILLS FROM A FACILITY MUST BE REPORTED: (1) SPILLS THAT DAMAGE THE WATERS OF THE STATE SO AS TO CAUSE DEATH OR ACUTE INJURY OR ILLNESS TO HUMANS OR ANIMALS. (2) SPILLS FROM A FACILITY THAT HAS BEEN NOTIFIED IN WRITING BY A WATER UTILITY THAT IT IS LOCATED IN A DELINEATED PUBLIC WATER SUPPLY WELLHEAD PROTECTION AREA AS APPROVED BY THE DEPARTMENT UNDER 327 IAC 8-4-1 THAT ARE: (A) SPILLS OF HAZARDOUS SUBSTANCES OR EXTREMELY HAZARDOUS SUBSTANCES WHEN THE AMOUNT SPILLED EXCEEDS ONE HUNDRED (100) POUNDS OR THE REPORTABLE QUANTITY, WHICHEVER IS LESS; (B) SPILLS OF PETROLEUM WHEN THE AMOUNT SPILLED EXCEEDS FIFTY-FIVE (55) GALLONS; OR (C) SPILLS OF OBJECTIONABLE SUBSTANCES AS DEFINED IN SECTION 4(11) OF THIS RULE.

(3) SPILLS THAT DAMAGE WATERS OF THE STATE AND THAT: (A) ARE LOCATED WITHIN FIFTY (50) FEET OF A KNOWN PRIVATE DRINKING WATER WELL LOCATED BEYOND THE PROPERTY BOUNDARY; OR (B) ARE LOCATED WITHIN ONE HUNDRED (100) YARDS OF: (I) ANY HIGH QUALITY WATER DESIGNATED AS AN OUTSTANDING STATE RESOURCE PURSUANT TO 327 IAC 2-1-2(3), EXCLUDING LAKE MICHIGAN; (II) ANY WATER DESIGNATED AS EXCEPTIONAL USE PURSUANT TO 327 IAC 2-13(A)(6) (SIC, 327 IAC 2-1-3(A)(6)) AND 327 IAC 2-1-11(B); OR (III) ANY WATER THAT IS A FISH HATCHERY, FISH AND WILDLIFE AREA, NATURE PRESERVE, OR RECREATIONAL WATER OWNED BY THE DEPARTMENT OF NATURAL RESOURCES OR THE FEDERAL GOVERNMENT.
(4) FOR ANY SPILL WHICH DOES NOT MEET THE CRITERIA IN SUBDIVISIONS (1) THROUGH (3), THE FOLLOWING MUST BE REPORTED: (A) SPILLS TO SURFACE WATERS: (I) SPILLS OF HAZARDOUS SUBSTANCES OR EXTREMELY HAZARDOUS SUBSTANCES WHEN THE AMOUNT SPILLED EXCEEDS ONE HUNDRED (100) POUNDS OR THE REPORTABLE QUANTITY, WHICHEVER IS LESS; (II) SPILLS OF PETROLEUM OF SUCH QUANTITY AS TO CAUSE A SHEEN UPON THE WATERS; OR (III) SPILLS OF OBJECTIONABLE SUBSTANCES AS DEFINED IN SECTION 4(11) OF THIS RULE. (B) SPILLS TO SOIL BEYOND THE FACILITY BOUNDARY: (I) SPILLS OF HAZARDOUS SUBSTANCES OR EXTREMELY HAZARDOUS SUBSTANCES WHEN THE AMOUNT SPILLED EXCEEDS ONE HUNDRED (100) POUNDS OR THE REPORTABLE QUANTITY, WHICHEVER IS LESS; (II) SPILLS OF PETROLEUM WHEN THE AMOUNT SPILLED EXCEEDS FIFTY-FIVE (55) GALLONS; OR (III) SPILLS OF OBJECTIONABLE SUBSTANCES AS DEFINED IN SECTION 4(11) OF THIS RULE. (C) SPILLS TO SOIL WITHIN THE FACILITY BOUNDARY: (I) SPILLS OF HAZARDOUS SUBSTANCES OR EXTREMELY HAZARDOUS SUBSTANCES WHEN THE AMOUNT SPILLED EXCEEDS THE REPORTABLE QUANTITY; (II) SPILLS OF PETROLEUM WHEN THE SPILLED AMOUNT EXCEEDS ONE THOUSAND (1,000) GALLONS; OR (III) SPILLS OF OBJECTIONABLE SUBSTANCES AS DEFINED IN SECTION 4(11) OF THIS RULE.

(5) ANY SPILL FOR WHICH A SPILL RESPONSE HAS NOT BEEN DONE. (WATER POLLUTION CONTROL BOARD, 327 IAC 2-6.1-5; FILED FEB 25, 1997, 1:00 P.M.; 20 IR 1732; ERRATA FILED MAR 7, 1997, 2:25 P.M.; 20 IR 1738; READOPTED FILED JAN 10, 2001, 3:23 P.M.; 24 IR 1518; READOPTED FILED NOV 21, 2007, 1:16 P.M.; 20071219-IR-3270705538FA)

327 IAC 2-6.1-6 REPORTABLE SPILLS; TRANSPORTATION
AUTHORITY: IC 13-14-8
AFFECTED: IC 13-11-2; IC 13-18-1; IC 13-18-3; IC 13-18-8; IC 13-18-17
SEC. 6. THE FOLLOWING SPILLS FROM A MODE OF TRANSPORTATION MUST BE REPORTED: (1) SPILLS THAT DAMAGE THE WATERS OF THE STATE SO AS TO CAUSE DEATH OR ACUTE INJURY OR ILLNESS TO HUMANS OR ANIMALS. (2) SPILLS THAT DAMAGE SURFACE WATERS. (3) SPILLS TO SOIL: (A) SPILLS OF HAZARDOUS SUBSTANCES OR EXTREMELY HAZARDOUS SUBSTANCES WHEN THE AMOUNT SPILLED EXCEEDS ONE HUNDRED (100) POUNDS OR THE REPORTABLE QUANTITY, WHICHEVER IS LESS; (B) SPILLS OF PETROLEUM WHEN THE AMOUNT SPILLED EXCEEDS FIFTY-FIVE (55) GALLONS; OR (C) SPILLS OF OBJECTIONABLE SUBSTANCES AS DEFINED IN SECTION 4(11) OF THIS RULE. (4) ANY SPILL FOR WHICH A SPILL RESPONSE HAS NOT BEEN DONE. (WATER POLLUTION CONTROL BOARD, 327 IAC 2-6.1-6; FILED FEB 25, 1997, 1:00 P.M.; 20 IR 1733; READOPTED FILED JAN 10, 2001, 3:23 P.M.; 24 IR 1518; READOPTED FILED NOV 21, 2007, 1:16 P.M.; 20071219-IR-3270705538FA)

327 IAC 2-6.1-7 REPORTABLE SPILLS; RESPONSIBILITIES
AUTHORITY: IC 13-14-8
AFFECTED: IC 13-11-2; IC 13-18-1; IC 13-18-3; IC 13-18-8; IC 13-18-17
SEC. 7. ANY PERSON WHO OPERATES, CONTROLS, OR MAINTAINS ANY MODE OF TRANSPORTATION OR FACILITY FROM WHICH A SPILL OCCURS SHALL, UPON DISCOVERY OF A REPORTABLE SPILL TO THE SOIL OR SURFACE WATERS OF THE STATE, DO THE FOLLOWING: (1) CONTAIN THE SPILL, IF POSSIBLE, TO PREVENT ADDITIONAL SPILLED MATERIAL FROM ENTERING THE WATERS OF THE STATE. (2) UNDERTAKE OR CAUSE OTHERS TO UNDERTAKE ACTIVITIES NEEDED TO ACCOMPLISH A SPILL RESPONSE. (3) AS SOON AS POSSIBLE, BUT WITHIN TWO (2) HOURS OF DISCOVERY, COMMUNICATE A SPILL REPORT TO THE DEPARTMENT OF ENVIRONMENTAL MANAGEMENT, OFFICE OF LAND QUALITY, EMERGENCY RESPONSE SECTION. AREA CODE 1-888-233-7745 FOR IN-STATE CALLS (TOLL FREE), (317) 233-7745 FOR OUT-OF-STATE CALLS. (WATER POLLUTION CONTROL BOARD, 327 IAC 2-6.1-7; FILED FEB 25, 1997, 1:00 P.M.; 20 IR 1733; READOPTED FILED JAN 10, 2001, 3:23 P.M.; 24 IR 1518; READOPTED FILED NOV 21, 2007, 1:16 P.M.; 20071219-IR-3270705538FA; ERRATA FILED MAY 27, 2008, 2:06 P.M.; 20080625-IR-327080419ACA)

(4) FOR SPILLS TO SURFACE WATER THAT CAUSE DAMAGE, THE NEAREST AFFECTED DOWNSTREAM WATER USER LOCATED WITHIN TEN (10) MILES OF THE SPILL AND IN THE STATE OF INDIANA: AND (5) FOR SPILLS TO SOIL, OUTSIDE THE FACILITY BOUNDARY, THE AFFECTED PROPERTY OWNER OR OWNERS, OPERATOR OR OPERATORS, OR OCCUPANT OR OCCUPANTS. (WATER POLLUTION CONTROL BOARD, 327 IAC 2-6.1-7; FILED FEB 25, 1997, 1:00 P.M.; 20 IR 1733; READOPTED FILED JAN 10, 2001, 3:23 P.M.; 24 IR 1518; ERRATA FILED FEB 6, 2006, 1:15 A.M.; 20 IR 1806; ERRATA FILED OCT 20, 2006, 10:08 A.M.; 20061101-IR-327060491ACA; READOPTED FILED NOV 21, 2007, 1:16 P.M.; 20071219-IR-3270705538FA; ERRATA FILED MAY 27, 2008, 2:06 P.M.; 20080625-IR-327080419ACA)

327 IAC 2-6.1-8 EMERGENCY SPILL RESPONSE ACTIONS
AUTHORITY: IC 13-14-8
AFFECTED: IC 13-11-2; IC 13-18-1; IC 13-18-3; IC 13-18-8; IC 13-18-17
SEC. 8. NOTWITHSTANDING ANY OTHER SECTION OF THIS RULE, EMERGENCY SPILL RESPONSE ACTIONS TAKE PRECEDENCE OVER REPORTING REQUIREMENTS, AND WHEN EMERGENCY SPILL RESPONSE ACTIVITIES RENDER SPILL REPORTING INCONSISTENT WITH EFFECTIVE RESPONSE ACTIVITIES, COMMUNICATION OF THE SPILL REPORT TO THE INDIANA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT MAY BE DELAYED. IN SITUATIONS WHERE THE SPILL REPORT IS DELAYED, THE BURDEN OF PROVING THE NEED FOR THE DELAY SHALL BE UPON THE RESPONSIBLE PERSON. (WATER POLLUTION CONTROL BOARD, 327 IAC 2-6.1-8; FILED FEB 25, 1997, 1:00 P.M.; 20 IR 1734; READOPTED FILED JAN 10, 2001, 3:23 P.M.; 24 IR 1518; READOPTED FILED NOV 21, 2007, 1:16 P.M.; 20071219-IR-3270705538FA)

327 IAC 2-6.1-9 COMPLIANCE CONFIRMATION
AUTHORITY: IC 13-14-8
AFFECTED: IC 13-11-2; IC 13-18-1; IC 13-18-3; IC 13-18-8; IC 13-18-17
SEC. 9. WHEN SPILL REPORTING AND RESPONSE, AS PROVIDED FOR IN THIS RULE, HAS OCCURRED, THE DEPARTMENT SHALL, UPON REQUEST, ISSUE A LETTER CONFIRMING COMPLIANCE WITH THIS RULE AND STATING THAT NO FURTHER ACTION IS REQUIRED UNDER THIS RULE. (WATER POLLUTION CONTROL BOARD, 327 IAC 2-6.1-9; FILED FEB 25, 1997, 1:00 P.M.; 20 IR 1734; READOPTED FILED JAN 10, 2001, 3:23 P.M.; 24 IR 1518; READOPTED FILED NOV 21, 2007, 1:16 P.M.; 20071219-IR-3270705538FA)

10505 N. College Avenue
Indianapolis, Indiana 46280
weihe.net
317 | 846 - 6611
800 | 452 - 6408
317 | 843 - 0546 fax

WEIHE ENGINEERS
Land Surveying/Civil Engineering
Landscape Architecture

PROJECT NO.: W13.0559
DATE: 12-23-2013
BY: RLV
DATE: 12-23-2013



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PER INDIANA STATE LAW IC 8-1-26, IT IS AGAINST THE LAW TO EXCAVATE WITHOUT NOTIFYING THE UNDERGROUND LOCATION SERVICE TWO (2) WORKING DAYS BEFORE COMMENCING WORK.

SHEET NO. C103 PROJECT NO. W13.0559

- NOTES:**
- ANY OAT OR WHEAT COMBINATION OR NURSE CROP MAY BE USED WITH ANY OF THE ABOVE PERMANENT SEEDING MIXTURES, AT THE FOLLOWING RATES:
 - SPRING OATS - ONE-FOURTH TO THREE-FOURTHS BUSHEL PER ACRE
 - WHEAT - NO MORE THAN ONE-HALF BUSHEL PER ACRE
 - A HIGH POTENTIAL FOR FERTILIZER, SEED, AND MULCH TO WASH EXISTS ON STEEP BANKS, CUTS, AND IN CHANNELS AND AREAS OF CONCENTRATED FLOW.

INSTALLATION

- GRADE THE SITE TO ACHIEVE POSITIVE DRAINAGE.
- ADD TOPSOIL OR COMPOST MULCH TO ACHIEVE NEEDED DEPTH FOR ESTABLISHMENT OF VEGETATION. (COMPOST MATERIAL MAY BE ADDED TO IMPROVE SOIL MOISTURE HOLDING CAPACITY, SOIL FRIABILITY, AND NUTRIENT AVAILABILITY.)

SEEDBED PREPARATION

- TEST SOIL TO DETERMINE PH AND NUTRIENT LEVELS.
- APPLY SOIL AMENDMENTS AS RECOMMENDED BY THE SOIL TEST AND WORK INTO THE UPPER TWO TO FOUR INCHES OF SOIL. IF TESTING IS NOT DONE, APPLY 400 TO 600 POUNDS PER ACRE OF 12-12-12 ANALYSIS FERTILIZER, OR EQUIVALENT.
- TILL THE SOIL TO OBTAIN A UNIFORM SEEDBED. USE A DISK OR RAKE OPERATED ACROSS THE SLOPE, TO WORK THE SOIL AMENDMENTS INTO THE UPPER TWO TO FOUR INCHES OF THE SOIL.

SEEDING

OPTIMUM SEEDING DATES ARE MARCH 1 TO MAY 10 AND AUGUST 10 TO SEPTEMBER 30. PERMANENT SEEDING DONE BETWEEN MAY 10 AND AUGUST 10 MAY NEED TO BE IRRIGATED. SEEDING OUTSIDE OR BEYOND OPTIMUM SEEDING DATES IS STILL POSSIBLE WITH THE UNDERSTANDING THAT RESEEDING OR OVERSEEDING MAY BE REQUIRED IF ADEQUATE SURFACE COVER IS NOT ACHIEVED. RESEEDING OR OVERSEEDING CAN BE EASILY ACCOMPLISHED IF THE SOIL SURFACE REMAINS WELL PROTECTED WITH MULCH.

- SELECT A SEEDING MIXTURE AND RATE FROM TABLE 1. SELECT SEED MIXTURE BASED ON SITE CONDITIONS, SOIL PH, INTENDED LAND USE, AND EXPECTED LEVEL OF MAINTENANCE.
- APPLY SEED UNIFORMLY WITH A DRILL OR CULTPACKER SEEDER OR BY BROADCASTING. PLANT OR COVER THE SEED TO A DEPTH OF ONE-FOURTH TO ONE-HALF INCH. IF DRILLING OR BROADCASTING THE SEED, ENSURE GOOD SEED-TO-SOIL CONTACT BY FIRING THE SEEDBED WITH A ROLLER OR CULTPACKER AFTER COMPLETING SEEDING OPERATIONS. (IF SEEDING IS DONE WITH A HYDROSEEDER, FERTILIZER AND MULCH CAN BE APPLIED WITH THE SEED IN A SLURRY MIXTURE.)
- MULCH ALL SEEDED AREAS AND USE APPROPRIATE METHODS TO ANCHOR THE MULCH IN PLACE. CONSIDER USING EROSION CONTROL BLANKETS ON SLOPING AREAS AND CONVEYANCE CHANNELS.

MAINTENANCE

- INSPECT WITHIN 24 HOURS OF EACH RAIN EVENT AND AT LEAST ONCE EVERY SEVEN CALENDAR DAYS UNTIL THE VEGETATION IS SUCCESSFULLY ESTABLISHED. CHARACTERISTICS OF A SUCCESSFUL STAND INCLUDE VIGOROUS DARK GREEN OR BLOSSOMING SEEDLINGS WITH A UNIFORM VEGETATIVE COVER DENSITY OF 80 PERCENT OR MORE.
- CHECK FOR EROSION OR MOVEMENT OF MULCH. REPAIR DAMAGED, BARE, GULLED, OR SPARSELY VEGETATED AREAS AND THEN FERTILIZE, RESEED, AND APPLY ANCHOR MULCH.
- IF PLANT COVER IS SPARSE OR PATCHY, EVALUATE THE PLANT MATERIALS CHOSEN, SOIL FERTILITY, MOISTURE CONDITION, AND MULCH APPLICATION; REPAIR AFFECTED AREAS EITHER BY OVERSEEDING OR PREPARING A NEW SEEDBED AND RESEEDING. APPLY AND ANCHOR MULCH ON THE NEWLY SEEDED AREAS.
- IF VEGETATION FAILS TO GROW, CONSIDER SOIL TESTING TO DETERMINE SOIL PH OR NUTRIENT DEFICIENCY PROBLEMS. (CONTACT YOUR SOIL AND WATER CONSERVATION DISTRICT OR COOPERATIVE EXTENSION OFFICE FOR ASSISTANCE.)
- IF ADDITIONAL FERTILIZATION IS NEEDED TO GET A SATISFACTORY STAND, DO SO ACCORDING TO SOIL TEST RECOMMENDATIONS.
- ADD FERTILIZER THE FOLLOWING GROWING SEASON. FERTILIZE ACCORDING TO SOIL TEST RECOMMENDATIONS.
- FERTILIZE TURF AREAS ANNUALLY. APPLY FERTILIZER IN A SPLIT APPLICATION. FOR COOL-SEASON GRASSES, APPLY ONE-HALF OF THE FERTILIZER IN LATE SPRING AND ONE HALF IN EARLY FALL. FOR WARM-SEASON GRASSES, APPLY ONE-THIRD IN EARLY SPRING, ONE-THIRD IN LATE SPRING, AND THE REMAINING ONE-THIRD IN MIDDLE SUMMER.

TABLE 1. PERMANENT SEEDING RECOMMENDATIONS
THIS TABLE PROVIDES SEVERAL SEED MIXTURE OPTIONS. ADDITIONAL SEED MIXTURES ARE AVAILABLE COMMERCIALY. WHEN SELECTING A MIXTURE, CONSIDER INTENDED LAND USE AND SITE CONDITIONS, INCLUDING SOIL PROPERTIES (E.G., SOIL PH AND DRAINAGE), SLOPE ASPECT, AND THE TOLERANCE OF EACH SPECIES TO SHADE AND DROUGHT.

REFERENCE IN CHAPTER 7 PAGES 35-40 IN THE INDIANA STORM WATER QUALITY MANUAL.

PERMANENT SEED

OPEN LOW-MAINTENANCE AREAS (REMAINING IDLE MORE THAN SIX MONTHS)

SEED MIXTURES	RATE PER ACRE PURE LIVE SEED	OPTIMUM SOIL PH
1. PERENNIAL RYEGRASS - WHITE CLOVER	70 LBS. - 2 LBS.	5.8 TO 7.0
2. PERENNIAL RYEGRASS - TALL FESCUE	70 LBS. - 2 LBS.	5.6 TO 7.0
3. TALL FESCUE - WHITE CLOVER	70 LBS. - 2 LBS.	5.5 TO 7.5

STEEP BANKS AND CUTS, LOW-MAINTENANCE AREAS (NOT MOWED)

SEED MIXTURES	RATE PER ACRE PURE LIVE SEED	OPTIMUM SOIL PH
1. SMOOTH BROME GRASS - RED CLOVER	35 LBS. - 2 LBS.	5.5 TO 7.0
2. TALL FESCUE - WHITE CLOVER	50 LBS. - 2 LBS.	5.5 TO 7.5
3. TALL FESCUE - RED CLOVER	50 LBS. - 2 LBS.	5.5 TO 7.5
4. ORCHARD GRASS - RED CLOVER	30 LBS. - 2 LBS.	5.6 TO 7.0
5. CROWN VETCH - TALL FESCUE	12 LBS. - 2 LBS.	5.6 TO 7.0

LAWNS AND HIGH-MAINTENANCE AREAS

SEED MIXTURES	RATE PER ACRE PURE LIVE SEED	OPTIMUM SOIL PH
1. BLUEGRASS	140 LBS.	5.5 TO 7.0
2. PERENNIAL RYEGRASS (TURF TYPE)	60 LBS.	5.6 TO 7.0
3. TALL FESCUE (TURF TYPE) - BLUEGRASS	170 LBS. - 30 LBS.	5.6 TO 7.5

CHANNELS AND AREAS OF CONCENTRATED FLOW

SEED MIXTURES	RATE PER ACRE PURE LIVE SEED	OPTIMUM SOIL PH
1. PERENNIAL RYEGRASS - WHITE	150 LBS. - 2 LBS.	5.5 TO 7.0
2. KENTUCKY BLUEGRASS - SMOOTH BROMEGRASS - SWITCHGRASS	20 LBS. - 3 LBS. - 4 LBS.	5.5 TO 7.5
3. TALL FESCUE - PERENNIAL RYEGRASS - WHITE CLOVER	150 LBS. - 2 LBS. - 2 LBS.	5.5 TO 7.5
4. TALL FESCUE - PERENNIAL RYEGRASS - KENTUCKY BLUEGRASS	150 LBS. - 20 LBS. - 20 LBS.	5.5 TO 7.5

TABLE 1. TEMPORARY SEEDING SPECIFICATIONS

SEED SPECIES	RATE PER ACRE	PLANTING DEPTH	OPTIMUM DATES
WHEAT OR RYE	150 LBS.	1 TO 1 1/2 INCHES	SEPT. 15 - OCT. 30
SPRING OATS	100 LBS.	1 INCH	MARCH 1 - APRIL 15
ANNUAL RYEGRASS	40 LBS.	3/4 INCH	MARCH 1 - MAY 1 AUG. 1 - SEPT. 1
GERMAN MILLET	40 LBS.	1 TO 2 INCHES	MAY 1 - JUNE 1
SUDANGRASS	35 LBS.	1 TO 2 INCHES	MAY 1 - JULY 30
BUCKWHEAT	60 LBS.	1 TO 2 INCHES	APRIL 15 - JUNE 1
CORN (BROADCAST)	300 LBS.	1 TO 2 INCHES	MAY 11 - AUG. 10
SORGHUM	35 LBS.	1 TO 2 INCHES	MAY 1 - JULY 15

- PERENNIAL SPECIES MAY BE USED AS A TEMPORARY COVER, ESPECIALLY IF THE AREA TO BE SEEDED WILL REMAIN IDLE FOR MORE THAN ONE YEAR.
- SEEDING DONE OUTSIDE THE OPTIMUM SEEDING DATES INCREASES THE CHANCES OF SEEDING FAILURE. DATES MAY BE EXTENDED OR SHORTENED BASED ON THE LOCATION OF THE PROJECT SITE WITHIN THE STATE.

NOTES:

- MULCH ALONE IS AN ACCEPTABLE TEMPORARY COVER AND MAY BE USED IN LIEU OF TEMPORARY SEEDING, PROVIDED THAT IT IS APPROPRIATELY ANCHORED.
- A HIGH POTENTIAL FOR FERTILIZER, SEED, AND MULCH TO WASH EXISTS ON STEEP BANKS, CUTS, AND IN CHANNELS AND AREAS OF CONCENTRATED FLOW.

SEEDBED PREPARATION

- TEST SOIL TO DETERMINE PH AND NUTRIENT LEVELS.
- APPLY SOIL AMENDMENTS AS RECOMMENDED BY THE SOIL TEST. IF TESTING IS NOT DONE, APPLY 400 TO 600 POUNDS PER ACRE OF 12-12-12 ANALYSIS FERTILIZER, OR EQUIVALENT.
- WORK THE SOIL AMENDMENTS INTO THE UPPER TWO TO FOUR INCHES OF THE SOIL WITH A DISK OR RAKE OPERATED ACROSS THE SLOPE.

SEEDING

- SELECT A SEED SPECIES OR AN APPROPRIATE SEED MIXTURE AND APPLICATION RATE FROM TABLE 1.
- APPLY SEED UNIFORMLY WITH A DRILL OR CULTPACKER SEEDER OR BY BROADCASTING. PLANT OR COVER SEED TO THE DEPTH SHOWN IN TABLE 1.

NOTES:

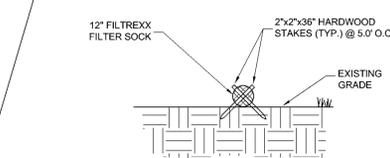
- IF DRILLING OR BROADCASTING THE SEED, ENSURE GOOD SEED-TO-SOIL CONTACT BY FIRING THE SEEDBED WITH A ROLLER OR CULTPACKER AFTER COMPLETING SEEDING OPERATIONS.
- DAILY SEEDING WHEN THE SOIL IS MOIST IS USUALLY MOST EFFECTIVE.
- IF SEEDING IS DONE WITH A HYDROSEEDER, FERTILIZER AND MULCH CAN BE APPLIED WITH THE SEED IN A SLURRY MIXTURE.
- APPLY MULCH AND ANCHOR IT IN PLACE.

MAINTENANCE

- INSPECT WITHIN 24 HOURS OF EACH RAIN EVENT AND AT LEAST ONCE EVERY SEVEN CALENDAR DAYS.
- CHECK FOR EROSION OR MOVEMENT OF MULCH AND REPAIR IMMEDIATELY.
- MONITOR FOR EROSION DAMAGE AND ADEQUATE COVER (80 PERCENT DENSITY); RESEED, FERTILIZE, AND APPLY MULCH WHERE NECESSARY.
- IF NITROGEN DEFICIENCY IS APPARENT, TOP-DRESS FALL SEEDED WHEAT OR RYE SEEDING WITH 50 POUNDS PER ACRE OF NITROGEN IN FEBRUARY OR MARCH.

REFERENCE IN CHAPTER 7 PAGES 31-33 IN THE INDIANA STORM WATER QUALITY MANUAL.

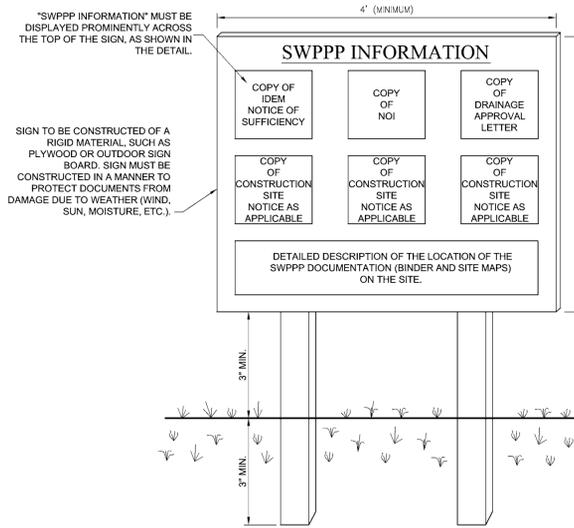
TEMPORARY SEED



COIR LOG (FIBER ROLL)

MAINTENANCE:

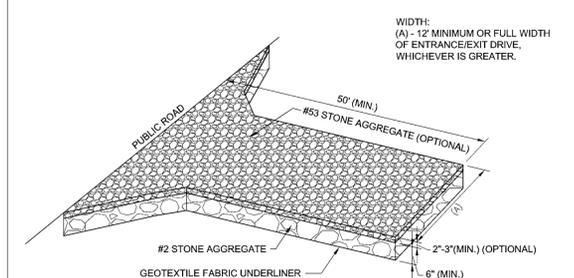
- INSPECT DAILY.
- REMOVE ACCUMULATED SEDIMENT FROM PAVED AREA (DO NOT FLUSH WITH WATER) AFTER EACH STORM EVENT. DEPOSIT SEDIMENT IN AN AREA WHERE IT WILL NOT RE-ENTER THE PAVED AREA OR STORM DRAINS.
- INSPECT FOR DAMAGE BY VEHICULAR TRAFFIC AND REPAIR IF NEEDED.



- NOTES:**
- THE SWPPP INFORMATION SIGN MUST BE LOCATED NEAR THE CONSTRUCTION EXIT OF THE SITE, SUCH THAT IT IS ACCESSIBLE AND VIEWABLE BY THE GENERAL PUBLIC, BUT NOT OBSTRUCTING VIEWS AS TO CAUSE A SAFETY HAZARD.
 - ALL POSTED DOCUMENTS MUST BE MAINTAINED IN A CLEARLY READABLE CONDITION AT ALL TIMES THROUGHOUT CONSTRUCTION AND UNTIL THE NOTICE-OF-TERMINATION (NOT) IS FILED FOR THE PERMIT.
 - CONTRACTOR SHALL POST OTHER STORM WATER AND/OR EROSION AND SEDIMENT CONTROL RELATED PERMITS ON THE SIGN AS REQUIRED BY THE GOVERNING AGENCY.
 - SIGN SHALL BE LOCATED OUTSIDE OF PUBLIC RIGHT-OF-WAY AND EASEMENTS UNLESS APPROVED BY THE GOVERNING AGENCY.
 - CONTRACTOR IS RESPONSIBLE FOR ENSURING STABILITY OF THE SWPPP INFORMATION SIGN.

SWPPP INFORMATION SIGN

(NO SCALE)



- INSTALLATION**
- REMOVE ALL VEGETATION AND OTHER OBJECTIONABLE MATERIAL FROM THE FOUNDATION AREA.
 - GRADE THE FOUNDATION AND CROWN FOR POSITIVE DRAINAGE.
 - 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 (INDOT CA NO. 2) TO THE DIMENSIONS AND GRADE SHOWN IN THE CONSTRUCTION PLANS, LEAVING THE SURFACE SMOOTH AND SLOPED FOR DRAINAGE.
 - TOP-DRESS THE DRIVE WITH WASHED AGGREGATE (INDOT CA NO. 53).
 - WHERE POSSIBLE, DIVERT ALL STORM WATER RUNOFF AND DRAINAGE FROM THE TEMPORARY CONSTRUCTION INGRESS/EGRESS PAD TO A SEDIMENT TRAP OR BASIN.

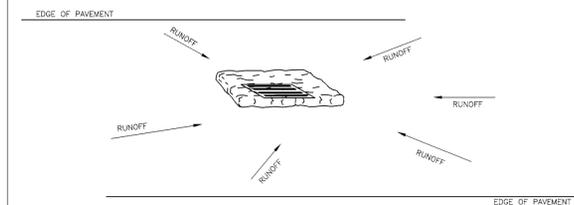
MAINTENANCE

- INSPECT DAILY.
- RESHAPE 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 FROM THE CONSTRUCTION DRIVE CAN BE CONVEYED INTO A SEDIMENT TRAP OR BASIN.

REFERENCED IN CHAPTER 7 PAGE 22 AND 23 IN INIANA STORM WATER QUALITY MANUAL.

TEMPORARY CONSTRUCTION INGRESS/EGRESS PAD

SMALL SITES - LESS THAN TWO ACRES (NO SCALE)

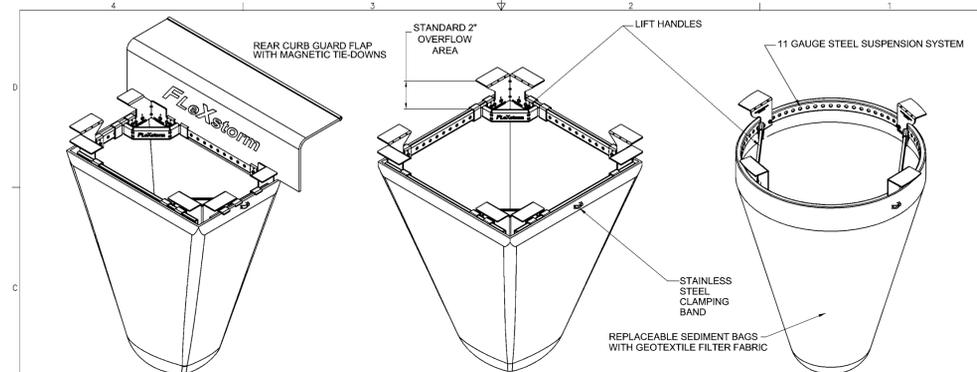


MAINTENANCE:

- INSPECT DAILY.
- REMOVE ACCUMULATED SEDIMENT FROM PAVED AREA (DO NOT FLUSH WITH WATER) AFTER EACH STORM EVENT. DEPOSIT SEDIMENT IN AN AREA WHERE IT WILL NOT RE-ENTER THE PAVED AREA OR STORM DRAINS.
- INSPECT FOR DAMAGE BY VEHICULAR TRAFFIC AND REPAIR IF NEEDED.

COCONUT MAT INLET PROTECTION

FOR SAG INLETS LOCATIONS (NO SCALE)



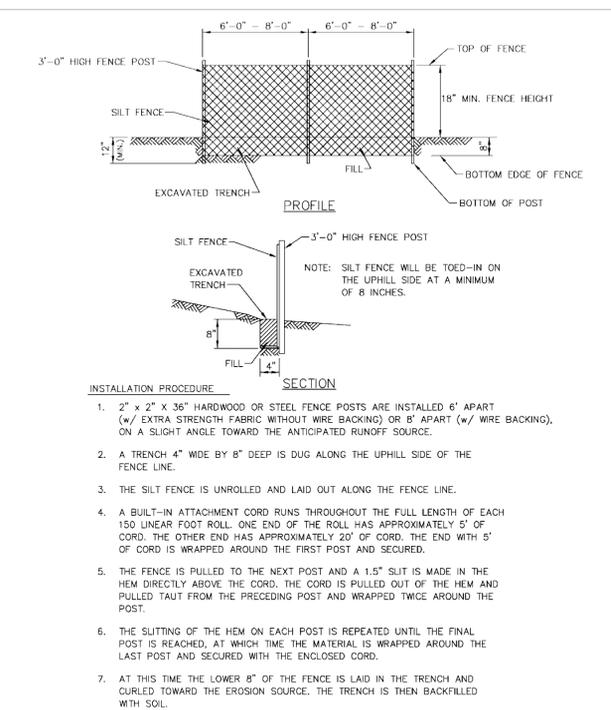
INSTALLATION:

- REMOVE GRATE
- DROP FLEXSTORM INLET FILTER ONTO LOAD BEARING LIP OF CASTING OR CONCRETE STRUCTURE
- REPLACE GRATE

FLEXSTORM Inlet Filter Specifications

Material Property	Test Method	Value (ave)
Grab Tensile	ASTM D 4632	255 x 275
Puncture Strength	ASTM D 4633	135 lbs
Trapezoidal Tear	ASTM D 4533	75 lbs
UV Resistance	ASTM D 4355	90%
App Open Size (AOS)	ASTM D 4751	20 sieve
Permittivity	ASTM D 4491	1.5 / sec
Water Flow Rate	ASTM D 4491	200 gpm/sqft
Sediment Removal Efficiency (8% mix)	ASTM D 7351	82%

811
Know what's below. Call before you dig.
Within Indiana Call 811 or 800-382-5544 24 Hours a Day, 7 Days a Week.
IT IS AGAINST THE LAW TO EXCAVATE WITHOUT NOTIFYING THE UNDERGROUND LOCATION SERVICE TWO (2) WORKING DAYS BEFORE COMMENCING WORK.



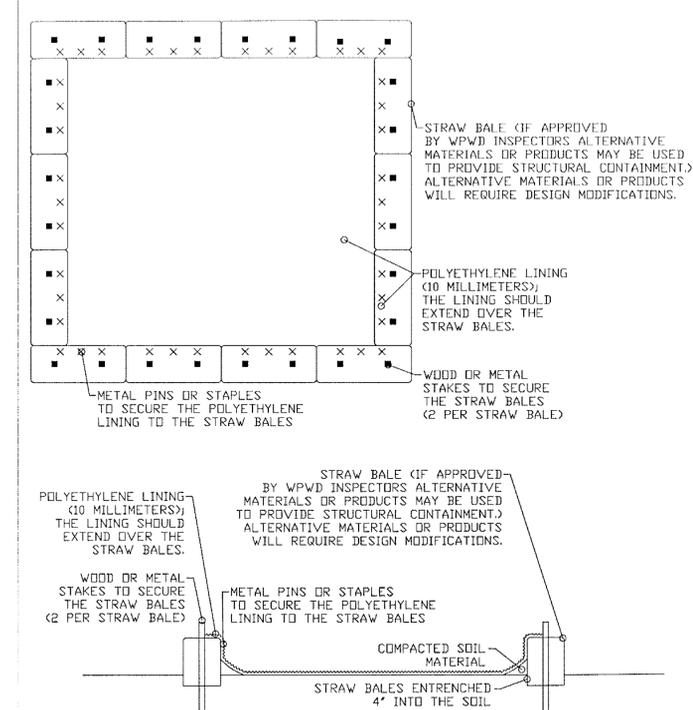
INSTALLATION PROCEDURE

- 2" x 2" x 36" HARDWOOD OR STEEL FENCE POSTS ARE INSTALLED 6' APART (w/ EXTRA STRENGTH FABRIC WITHOUT WIRE BACKING) OR 8' APART (w/ WIRE BACKING), ON A SLIGHT ANGLE TOWARD THE ANTICIPATED RUNOFF SOURCE.
- A TRENCH 4" WIDE BY 8" DEEP IS DUG ALONG THE UPHILL SIDE OF THE FENCE LINE.
- THE SILT FENCE IS UNROLLED AND LAID OUT ALONG THE FENCE LINE.
- A BUILT-IN ATTACHMENT CORD RUNS THROUGHOUT THE FULL LENGTH OF EACH 150 LINEAR FOOT ROLL. ONE END OF THE ROLL HAS APPROXIMATELY 5' OF CORD. THE OTHER END HAS APPROXIMATELY 20' OF CORD. THE END WITH 5' OF CORD IS WRAPPED AROUND THE FIRST POST AND SECURED.
- THE FENCE IS PULLED TO THE NEXT POST AND A 1.5" SLIT IS MADE IN THE HEM DIRECTLY ABOVE THE CORD. THE CORD IS PULLED OUT OF THE HEM AND PULLED TAUT FROM THE PRECEDING POST AND WRAPPED TWICE AROUND THE POST.
- THE SLITTING OF THE HEM ON EACH POST IS REPEATED UNTIL THE FINAL POST IS REACHED, AT WHICH TIME THE MATERIAL IS WRAPPED AROUND THE LAST POST AND SECURED WITH THE ENCLOSED CORD.
- AT THIS TIME THE LOWER 8" OF THE FENCE IS LAID IN THE TRENCH AND CURLED TOWARD THE EROSION SOURCE. THE TRENCH IS THEN BACKFILLED WITH SOIL.

SILT FENCE DETAIL

TOWN OF WESTFIELD, INDIANA

Renée Lynn Hoff 4/10/06 DATE FIGURE EC-4



CONCRETE WASHOUT DETAIL

CITY OF WESTFIELD, INDIANA

Neil B. Van Tassle 7/15/08 DATE FIGURE EC-5



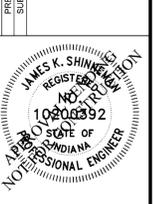
10505 N. College Avenue
Indianapolis, Indiana 46280
weihe.net
317 | 846 - 6611
800 | 452 - 6408
317 | 843 - 0546 fax

WEIHE ENGINEERS
Land Surveying/Civil Engineering
Landscape Architecture

PROJECT NO.: W13.0558
DATE: 12-23-2013
BY: RLW
DATE: 01-29-2014
SUBMITTED FOR REVIEW

DESIGNED BY: RLW
DRAWN BY: RLW
CHECKED BY: RLW
DATE: 12-23-2013

REVISIONS AND ISSUES
DATE: 12-23-2013
BY: RLW
DESCRIPTION: SUBMITTED FOR REVIEW



JAMES K. SHINNEMAN P.E. 10206392

Section M4, Lot 2 of Bridgewater Center located at 3404 East 146th Street, Westfield, IN 46033

EROSION CONTROL & SWPPP DETAILS

Part of the SWPPP of Section 17, Township 18 North, Range 4 East, Washington Township, Hamilton County, Indiana

PREPARED FOR: AT BRIDGEWATER

FIGURE EC-4

FIGURE EC-5

FIGURE EC-6

FIGURE EC-7

FIGURE EC-8

FIGURE EC-9

FIGURE EC-10

FIGURE EC-11

FIGURE EC-12

FIGURE EC-13

FIGURE EC-14

FIGURE EC-15

FIGURE EC-16

FIGURE EC-17

FIGURE EC-18

FIGURE EC-19

FIGURE EC-20

FIGURE EC-21

FIGURE EC-22

FIGURE EC-23

FIGURE EC-24

FIGURE EC-25

FIGURE EC-26

FIGURE EC-27

FIGURE EC-28

FIGURE EC-29

FIGURE EC-30

FIGURE EC-31

FIGURE EC-32

FIGURE EC-33

FIGURE EC-34

FIGURE EC-35

FIGURE EC-36

FIGURE EC-37

FIGURE EC-38

FIGURE EC-39

FIGURE EC-40

FIGURE EC-41

FIGURE EC-42

FIGURE EC-43

FIGURE EC-44

FIGURE EC-45

FIGURE EC-46

FIGURE EC-47

FIGURE EC-48

FIGURE EC-49

FIGURE EC-50

FIGURE EC-51

FIGURE EC-52

FIGURE EC-53

FIGURE EC-54

FIGURE EC-55

FIGURE EC-56

FIGURE EC-57

FIGURE EC-58

FIGURE EC-59

FIGURE EC-60

FIGURE EC-61

FIGURE EC-62

FIGURE EC-63

FIGURE EC-64

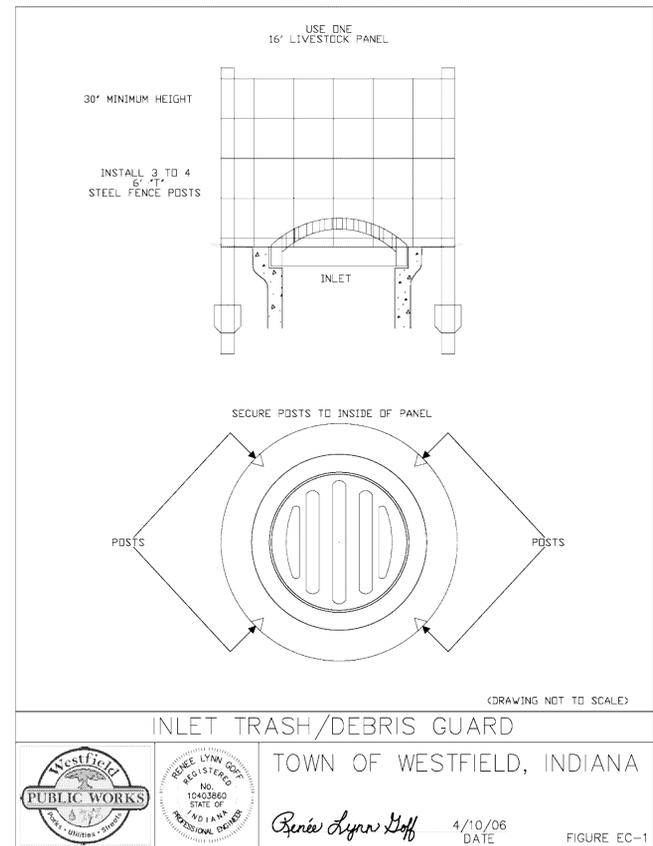
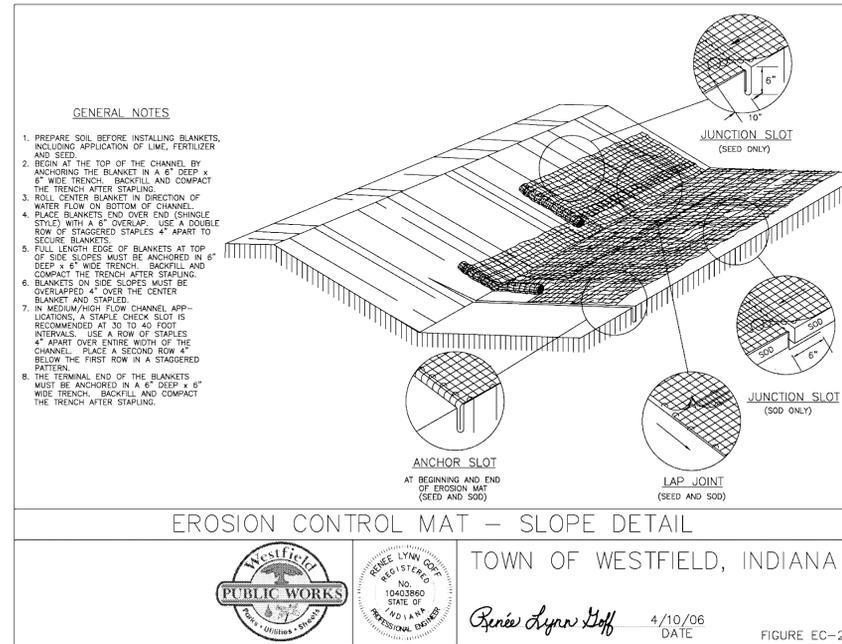
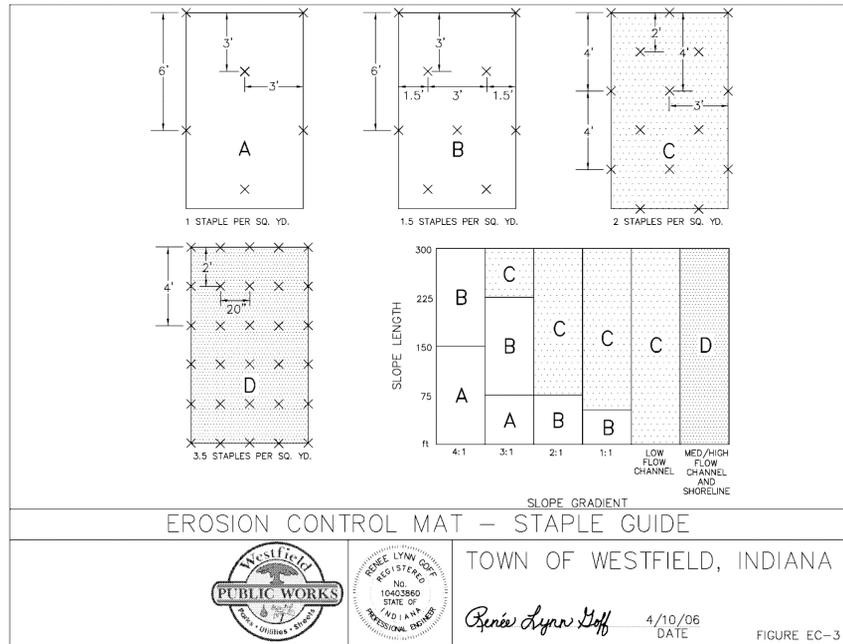
FIGURE EC-65

FIGURE EC-66

FIGURE EC-67

FIGURE EC-68

FIGURE EC-69



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 WITHOUT NOTIFYING THE UNDERGROUND
 LOCATION SERVICE TWO (2) WORKING
 DAYS BEFORE COMMENCING WORK.

PREPARED FOR:
AT BRIDGEWATER
 Section M4, Lot 2 of Bridgewater Center located at 3404 East 146th Street, Westfield, IN 46033
EROSION CONTROL & SWPPP DETAILS
 Part of the SW/4 of Section 17, Township 18 North, Range 4 East, Washington Township, Hamilton County, Indiana

REVISIONS AND ISSUES:
 DATE BY DESCRIPTION
 12/23/2013 RLW PROJECT NO. W13.0559
 01/29/2014 RLW DWG NAME: wt130559-EC01.dwg
 DESIGNED BY: RLW
 DRAWN BY: RLW
 CHECKED BY: RLW
 DATE: 12/23/2013

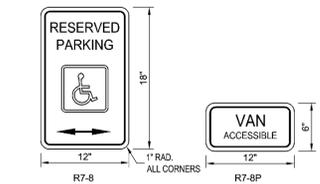
JAMES K. SHINNEMAN
 REGISTERED PROFESSIONAL ENGINEER
 No. 10200392
 STATE OF INDIANA
 PROFESSIONAL ENGINEER

JAMES K. SHINNEMAN P.E. 10200392

SHEET NO.
C105
 PROJECT NO.
 W13.0559

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 Land Surveying | Civil Engineering
 Landscape Architecture

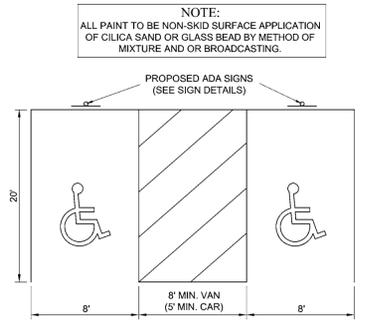
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 800 | 452 - 6408
 317 | 843 - 0546 fax
 ALLAN H. WEIHE, P.E., L.S. - FOUNDER



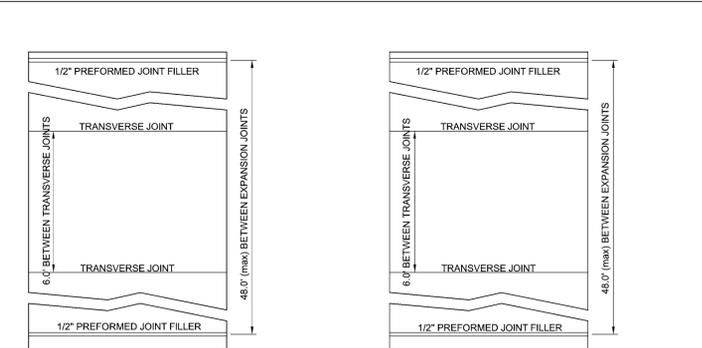
ADA SIGNS
(NO SCALE)



ADA PARKING
SYMBOL DETAIL
(NO SCALE)

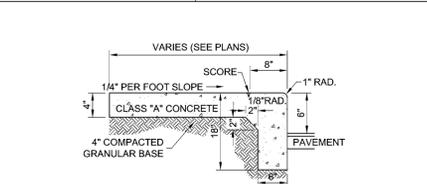


"ADA" PARKING SPACES
(NO SCALE)

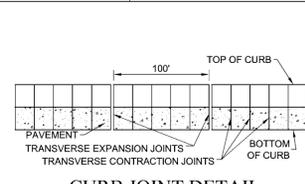


SIDEWALK SECTION
- DRIVEWAY CROSSING
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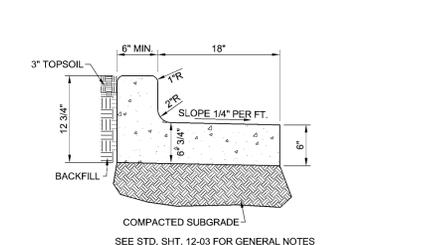
TYPICAL
SIDEWALK SECTION
(NO SCALE)



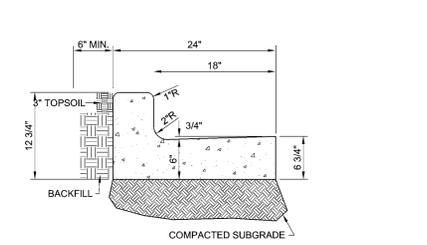
INTEGRAL WALK AND CURB DETAIL
(NO SCALE)



CURB JOINT DETAIL
(NO SCALE)



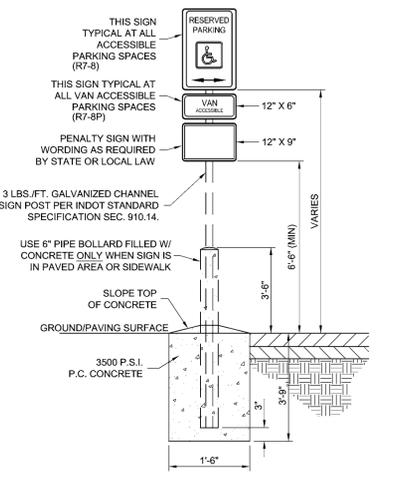
COMBINED CONCRETE CURB & GUTTER
TYPE III
(NO SCALE)



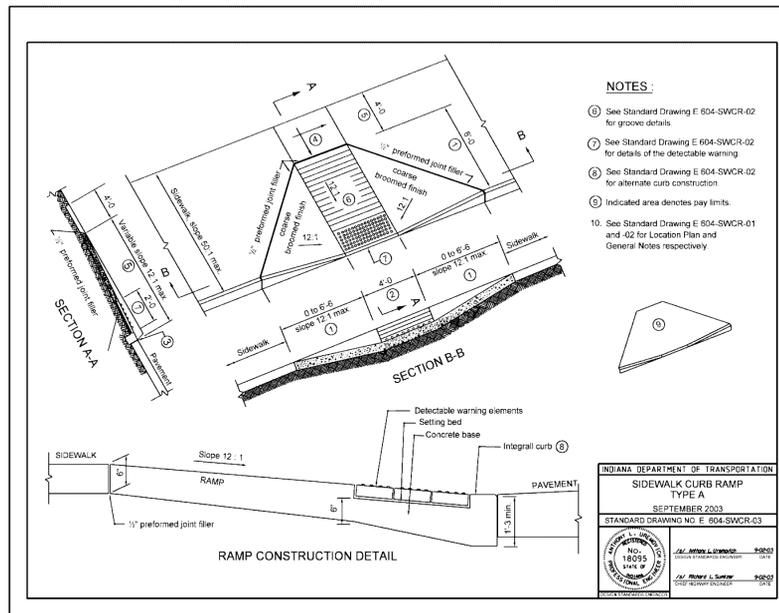
COMBINED CONCRETE CURB & GUTTER
TYPE II
(NO SCALE)

ALL SIGNS SHALL COMPLY WITH U.S. DEPARTMENT OF TRANSPORTATION, FEDERAL HIGHWAY ADMINISTRATIONS' MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES, LOCAL CODES AND AS SPECIFIED. MOUNT SIGNS TO POST IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS.

WHERE PARKING SPACES THAT ARE RESERVED FOR PERSONS WITH DISABILITIES ARE DESIGNATED TO ACCOMMODATE WHEELCHAIR VANS, A VAN ACCESSIBLE (R7-8P) PLAQUE SHALL BE MOUNTED BELOW THE R7-8 SIGN. THE R7-8 SIGN SHALL HAVE A GREEN LEGEND AND BORDER AND A WHITE WHEELCHAIR SYMBOL ON A BLUE SQUARE ALL ON A WHITE BACKGROUND. THE R7-8P PLAQUE SHALL HAVE A GREEN LEGEND AND BORDER ON A WHITE BACKGROUND.



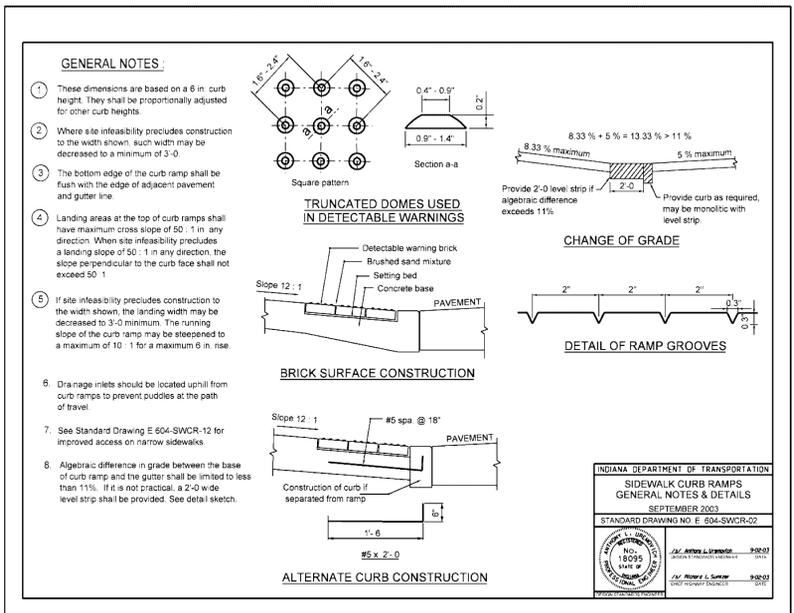
ADA SIGN BOLLARD
MOUNT DETAIL
(NO SCALE)



RAMP CONSTRUCTION DETAIL

- NOTES:
- See Standard Drawing E 604-SWCR-02 for groove details.
 - See Standard Drawing E 604-SWCR-02 for details of the detectable warning.
 - See Standard Drawing E 604-SWCR-02 for alternate curb construction.
 - Indicated area denotes pay limits.
 - See Standard Drawing E 604-SWCR-01 and -02 for Location Plan and General Notes respectively.

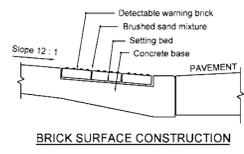
INDIANA DEPARTMENT OF TRANSPORTATION
SIDEWALK CURB RAMP
TYPE A
SEPTEMBER 2003
STANDARD DRAWING NO. E 604-SWCR-03



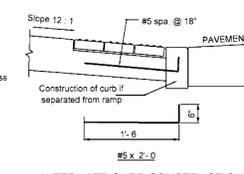
GENERAL NOTES:

- These dimensions are based on a 6 in. curb height. They shall be proportionally adjusted for other curb heights.
- Where site infeasibility precludes construction to the width shown, such width may be decreased to a minimum of 3'-0".
- The bottom edge of the curb ramp shall be flush with the edge of adjacent pavement and gutter line.
- Landing areas at the top of curb ramps shall have maximum cross slope of 50 : 1 in any direction. When site infeasibility precludes a landing slope of 50 : 1 in any direction, the slope perpendicular to the curb face shall not exceed 50 : 1.
- If site infeasibility precludes construction to the width shown, the landing width may be decreased to 3'-0" minimum. The running slope of the curb ramp may be steepened to a maximum of 10 : 1 for a maximum 6 in. rise.
- Drainage inlets should be located uphill from curb ramps to prevent puddles at the path of travel.
- See Standard Drawing E 604-SWCR-12 for improved access on narrow sidewalks.
- Algebraic difference in grade between the base of curb ramp and the gutter shall be limited to less than 11%. If it is not practical, a 2'-0" wide level strip shall be provided. See detail sketch.

TRUNCATED DOMES USED IN DETECTABLE WARNINGS

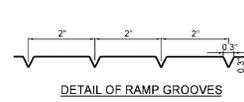


BRICK SURFACE CONSTRUCTION

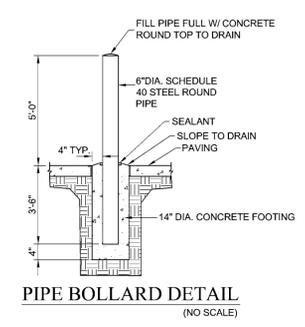


ALTERNATE CURB CONSTRUCTION

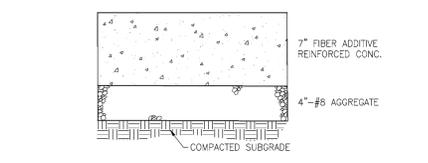
CHANGE OF GRADE



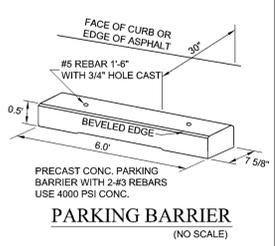
DETAIL OF RAMP GROOVES



PIPE BOLLARD DETAIL
(NO SCALE)



HEAVY DUTY AREA PAVING SECTION
(NO SCALE)



PARKING BARRIER
(NO SCALE)

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LOCATION SERVICE TWO (2) WORKING
DAYS BEFORE COMMENCING WORK.

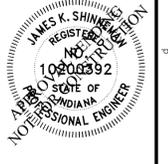
10505 N. College Avenue
Indianapolis, Indiana 46280
weihe.net
317 | 846 - 6611
800 | 452 - 6408
317 | 843 - 0546 fax
ALLAN H. WEIHE, P.E., L.S. - FOUNDER

WEIHE ENGINEERS
Land Surveying | Civil Engineering
Landscape Architecture

PROJECT NO.:	W13.0559
DWG NAME:	W130559-C201-std.dwg
DESIGNED BY:	BAW
DRAWN BY:	RLW
CHECKED BY:	BJS
DATE:	12.23.2013

DATE:	12.23.2013	BY:	RLW
DATE:	01.29.2014	BY:	RLW

REVISIONS AND ISSUES	DATE	BY
PRE-FILE REVISION	12.23.2013	RLW
SUBMITTED FOR REVIEW	01.29.2014	RLW

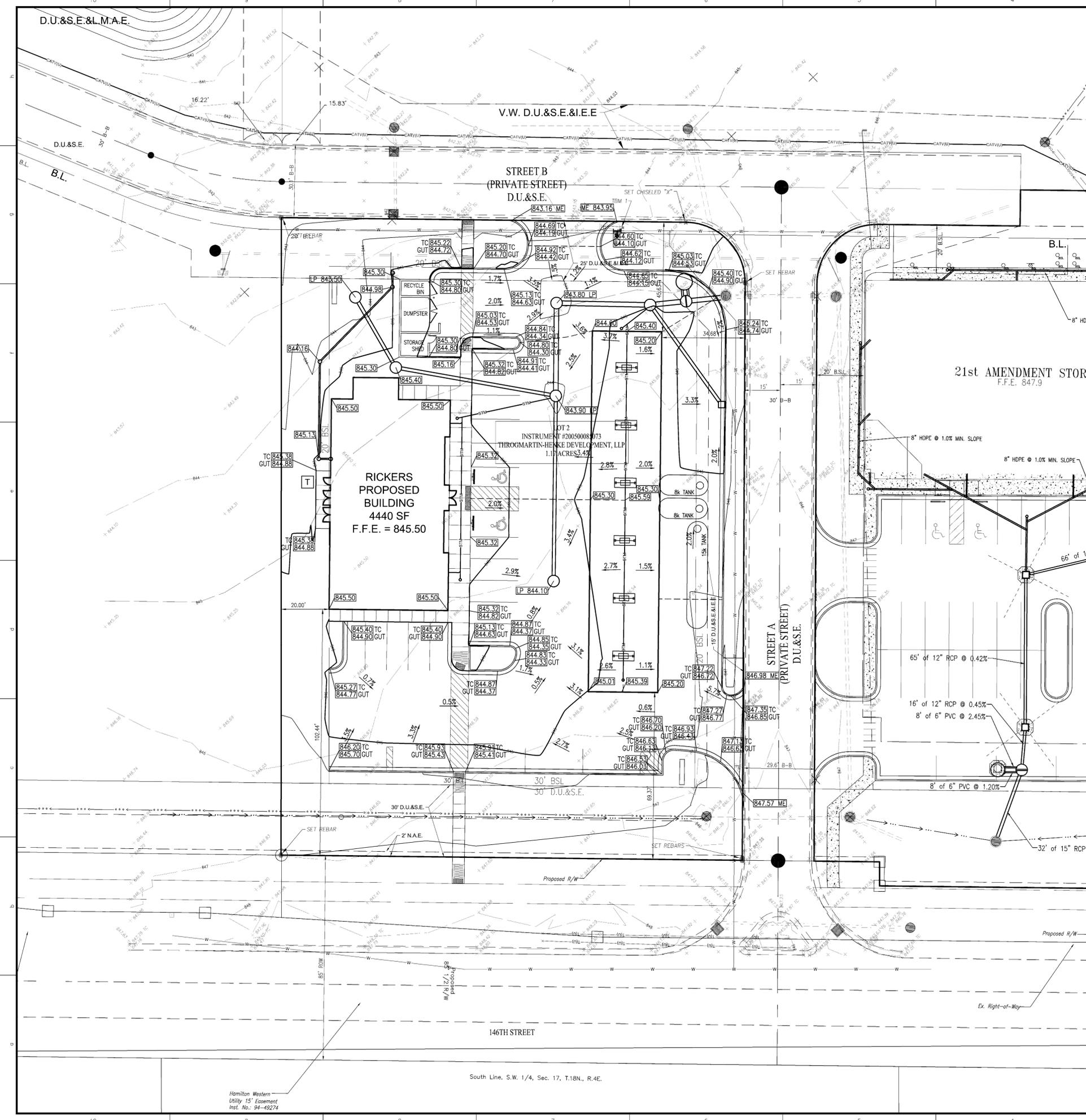


JAMES K. SHINNEMAN P.E. 10206392

Section M4, Lot 2 of Bridgewater Center located at 3404 East 146th Street, Westfield, IN 46033

PREPARED FOR:
AT BRIDGEWATER
SHEET NO. **C201**
PROJECT NO. **W13.0559**

Part of the SW/4 of Section 17, Township 18 North, Range 4 East, Washington Township, Hamilton County, Indiana



GENERAL GRADING NOTES

- REFER TO THE INDIANA DEPARTMENT OF TRANSPORTATION (INDOT) STANDARD SPECIFICATIONS, 1995 EDITION, FOR BASIC MATERIALS AND CONSTRUCTION METHODS. THE SECTIONS BELOW FOR VARIOUS ITEMS ARE TO CLARIFY THE INTENT OF THE REQUIREMENTS FOR THIS PROJECT. PLEASE NOTE THAT OTHER SECTIONS OF THE INDOT STANDARD SPECIFICATIONS MAY ALSO BE APPLICABLE.
- FILL MATERIAL SHALL CONSIST OF EARTH OBTAINED FROM CUT AREAS, BORROW PITS OR OTHER APPROVED SOURCES. EARTH SHALL BE FREE FROM ORGANIC MATTER AND OTHER DELETERIOUS SUBSTANCES AND LARGE ROCKS. THE FILL MATERIAL SHALL BE PLACED IN LAYERS NOT TO EXCEED SIX INCHES FOLLOWING COMPACTION. PROPER MOISTURE CONTENT OF FILL MATERIAL WILL BE SUCH TO ACHIEVE SPECIFIED COMPACTION DENSITY. ALL FILL BENEATH PAVED AREAS, FLOOR SLABS AND FUTURE BUILDINGS SHALL BE COMPACTED TO AT LEAST 95% OF THE MAXIMUM DRY DENSITY PER ASTM D-1557. FIELD COMPACTING TEST SHALL BE RUN ON EACH LIFT, IN FILL SECTIONS, AND THE REQUIRED COMPACTION ON EACH LIFT SHALL BE IN ACCORDANCE WITH INDOT SECTION 211.
- MAXIMUM LAWN SLOPE IS 3:1.
- THE CONTRACTOR SHALL CONTACT ALL UTILITY COMPANIES TO LOCATE MAINS, CONDUITS, SERVICE LINES, ETC. IN THE AFFECTED CONSTRUCTION AREA. EXISTING UTILITY STRUCTURES ARE SHOWN HERE IN ACCORDANCE WITH AVAILABLE INFORMATION. THE LOCATION AND PROTECTION OF UTILITY STRUCTURES, THEIR SUPPORT AND MAINTENANCE DURING CONSTRUCTION (IN COOPERATION WITH APPLICABLE UTILITY COMPANY) IS THE EXPRESSED RESPONSIBILITY OF THE CONTRACTOR.
- ALL SPOT ELEVATIONS ARE TO FINISHED GRADE.
- COMPACTED "B" BORROW BACK FILL REQ'D. OVER ALL UTILITIES IN PAVED AREAS.
- ALL GRADES AT BOUNDARY SHALL MEET EXISTING.
- ANY PART OF SANITARY OR STORM SEWER TRENCHES RUNNING UNDER OR WITHIN 5' OF PAVEMENT TO BE BACKFILLED WITH GRANULAR MATERIAL.
- ALL CONSTRUCTION ON THIS SITE TO BE PERFORMED IN COMPLIANCE WITH O.S.H.A. STANDARDS FOR WORKER SAFETY.
- THE CONTRACTOR SHALL CONFIRM ALL EARTHWORK QUANTITIES PRIOR TO THE START OF CONSTRUCTION. IF AN EXCESS OR SHORTAGE OF EARTH IS ENCOUNTERED, THE CONTRACTOR SHALL CONFIRM WITH THE OWNER AND ENGINEER THE REQUIREMENTS FOR STOCKPIILING, REMOVAL OR IMPORTING OF EARTH.
- PROVIDE POSITIVE DRAINAGE WITHOUT PONDING IN ALL AREAS AFTER INSTALLATION. CONTRACTOR TO TEST FOR AND CORRECT ANY PONDING CONDITIONS. ANY AREAS THAT HOLD WATER MORE THAN 1/8" DEEP SHALL BE CUT OUT AND CORRECTED TO POSITIVE DRAINAGE AT NO COST TO THE OWNER (DEVELOPER OR ENGINEER).
- VERTICAL CURVES, WITH A MINIMUM LENGTH OF 50', SHALL BE USED WHERE POSSIBLE BETWEEN VERTICAL CHANGES IN DIRECTION (SLOPE) TO ALLOW FOR POSITIVE DRAINAGE AND SMOOTH TRANSITIONS.
- CONTRACTOR TO INSTALL CONCRETE CRADLES WHEN THE VERTICAL SEPARATION (AS MEASURED FROM THE EXTERIOR OF THE PIPES) BETWEEN SANITARY SEWER FACILITIES, WATER MAIN, AND STORM SEWERS IS 18" OR LESS.

LEGEND

	EXIST. FIRE HYDRANT
	EXIST. WATER METER VALVE
	EXIST. SIGN
	EXIST. MONITOR WELL
	EXIST. IRON PIN & OR PK (SET/FOUND)
	EXIST. GAS METER
	EXIST. GAS VALVE
	EXIST. STORM INLET
	EXIST. STORM/MAN/TELE. MANHOLE
	EXIST. ELECTRIC METER
	EXIST. POWER POLE/POWER POLE W/ LIGHT
	EXIST. GUY ANCHOR
	EXIST. TELEPHONE PEDESTAL
	HVAC UNIT
	CLEANOUT
	MAILBOX
	LIGHT POLE
	EXIST. BOLLARD
	EXIST. SANITARY SEWER LINE
	EXIST. STORM SEWER LINE
	EXIST. CONTOURS
	CONCRETE END SECTION (C.E.S.)
	GATE POST
	TRANSFORMER
	RIGHT-OF-WAY LINE
	PROPOSED SANITARY SEWER LINE
	PROPOSED STORM SEWER LINE
	PROPOSED HDPE ROOF DRAIN
	PROPOSED PIPE BOLLARD
	PROPOSED MANHOLE (MH)
	PROPOSED CONTOURS
	PROPOSED ELEVATION
	DRAINAGE FLOW ARROW
	EXISTING TREE LINE
	PROPOSED DIRECTIONAL SIGN
	FINISH FLOOR ELEVATION
	TOP OF (MANHOLE/INLET) CASTING
	INVERT ELEVATION
	REINFORCED CONCRETE PIPE
	CORRUGATED METAL PIPE
	POLYVINYL CHLORIDE PIPE
	HIGH DENSITY POLYETHYLENE PIPE
	FLOW LINE
	STRUCTURE
	MATCH EXISTING GRADE
	TOP OF WALL
	SUB-SURFACE DRAINAGE
	TOP OF CURB
	GUTTER
	WATER LINE
	GAS LINE
	OVERHEAD UTILITY LINE
	TELEPHONE LINE
	ELECTRIC LINE
	TEMPORARY BENCHMARK
	PARKING COUNT

ORIGINATING BENCHMARK - HCBR 146

AS DESCRIBED BY THE HAMILTON COUNTY INDIANA SURVEYORS' OFFICE: HAMILTON COUNTY GEODETIC CONTROL DISK SET AT THE 151ST STREET BRIDGE OVER COOL CREEK. SET IN TOP OF THE NORTHEAST CONCRETE BRIDGE ABUTMENT. 16.5' NORTH OF THE CENTERLINE OF 151ST STREET, 2.0' NORTH OF THE STEEL GAURDRAIL, 0.7' SOUTH OF THE NORTH END OF THE ABUTMENT.
 ELEVATION = 825.91 NGVD29
 825.51 NAVD88 (CONVERTED USING CORPSCON 6.0.1)

TBM 1
 THE SOUTHEAST FLANGE BOLT OF A FIRE HYDRANT ON THE SOUTH SIDE OF STREET B NEAR THE NORTH LINE OF THE SITE.
 ELEVATION = 845.16 NAVD88

FLOOD NOTE:
 THE SITE DOES NOT LIE IN A SPECIAL FLOOD HAZARD AREA AS ESTABLISHED BY THE FEDERAL EMERGENCY MANAGEMENT AGENCY - NATIONAL FLOOD INSURANCE PROGRAM, WHEN PLOTTED BY SCALE ON FLOOD INSURANCE RATE MAP #18057C0138 F, DATED FEBRUARY 19, 2003

EXISTING AREAS
 PERVIOUS = 1.170 AC.
 IMPERVIOUS = 0.000 AC.

PROPOSED AREAS
 PERVIOUS = 0.410 AC.
 IMPERVIOUS = 0.760 AC.

100 YEAR ELEVATION
 = 826.82

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SCALE: 1" = 20'

0 10 20 40

10505 N. College Avenue
 Indianapolis, Indiana 46280
 weihe.net
 317 846 - 6611
 800 452 - 6408
 317 843 - 0546 fax
 ALLAN H. WEIHE, P.E., L.S. - FOUNDER

WEIHE ENGINEERS
 Land Surveying/Civil Engineering
 Landscape Architecture

DATE	BY	REVISIONS AND ISSUES
12/23/2013	W13.0558	PROJECT NO.
01/29/2014	RLW	DWG NAME
		DESIGNER
		DRAWN BY
		CHECKED BY
		DATE

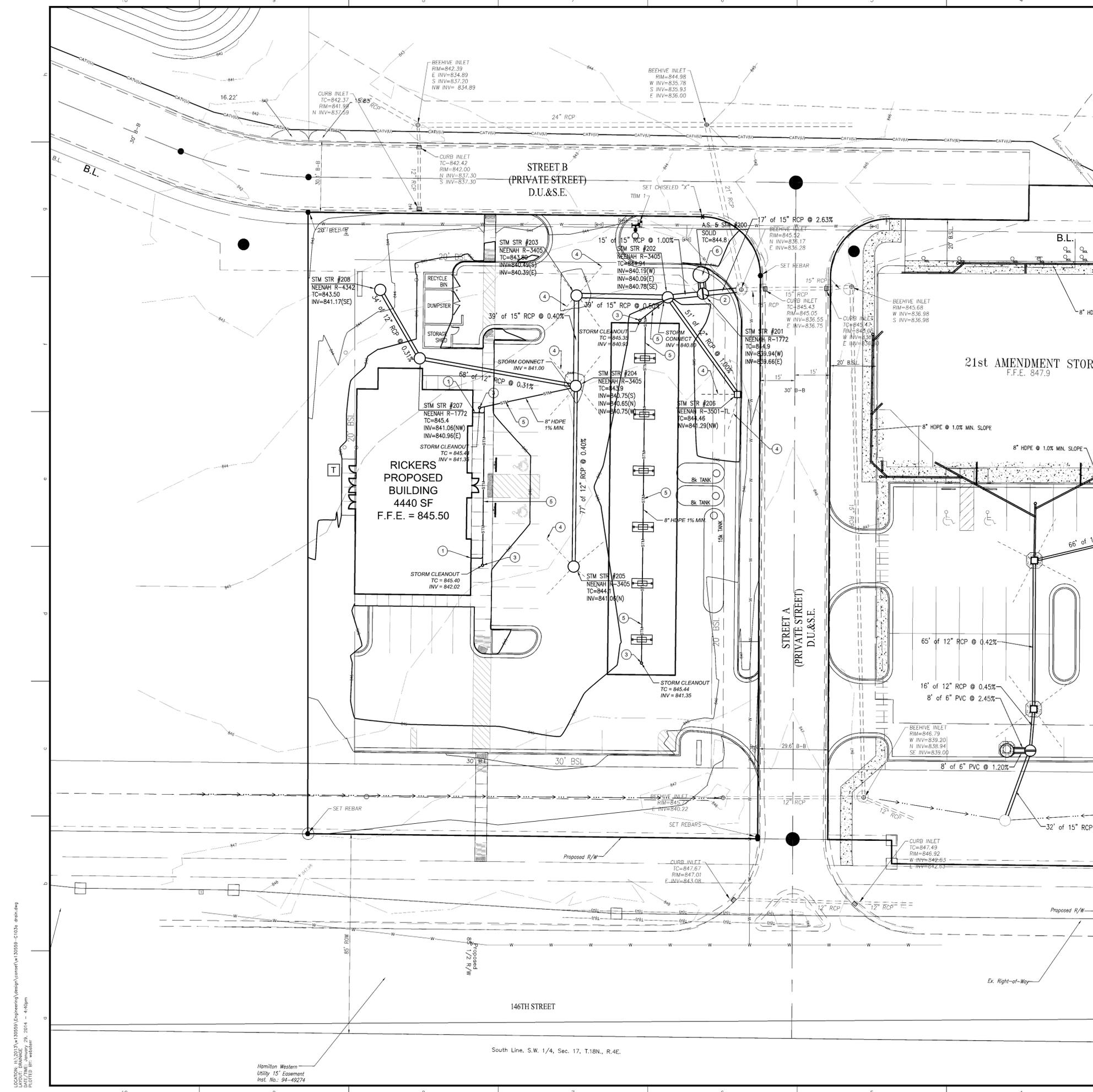
JAMES K. SHINNEMAN P.E. 10200392

AT BRIDGEWATER
 Section M4, Lot 2 of Bridgewater Center located at 3404 East 146th Street, Westfield, IN 46033
GRADING PLAN
 Part of the S1/4 of Section 17, Township 18 North, Range 4 East, Washington Township, Hamilton County, Indiana

SHEET NO.
C300
 PROJECT NO.
 W13.0559

LOCATION: H:\2013\130559\Engineering\Layout\130559-C103_grad.dwg
 DATE/TIME: January 29, 2014 - 4:40pm
 PLOTTED BY: weiherr

Hamilton Western
 Utility 15' Easement
 Inst. No. 94-49274



GRADING PLAN NOTES

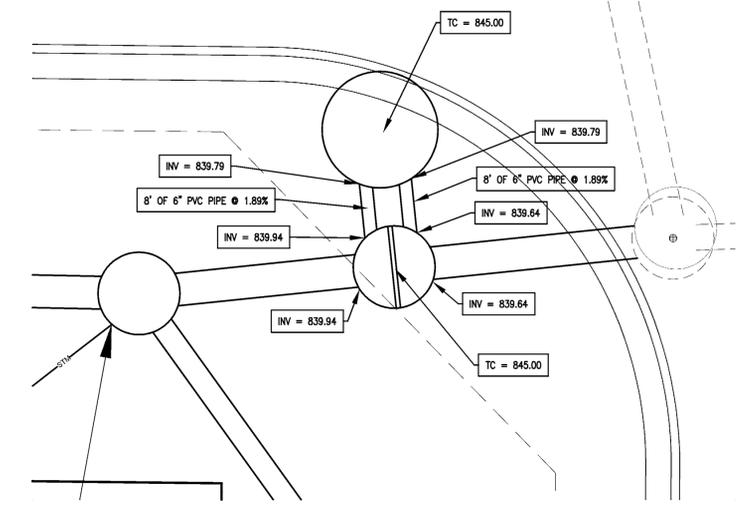
- APPROXIMATE DOWN SPOUT LOCATION SEE ARCHITECTURAL PLANS FOR FINAL LOCATION TYP. INV. = 842.10 ±. CONNECT ROOF DRAIN DOWNSPOUT WITH 6" HDPE TO 8" SUBSURFACE HDPE DRAIN AND ROUTE TO STORM SEWER STRUCTURE.
- PROVIDE A 4" WIDE, 1.5" TALL CONCRETE WEIR AT THE BOTTOM OF STRUCTURE #201. THE WEIR TO SPAN THE WIDTH OF THE STRUCTURE.
WEIR ELEVATION = 840.05
- INSTALL PVC CLEANOUTS.
- INSTALL 25 FEET OF 4" PVC PERFORATED UNDERDRAINS.
- INSTALL 8" UNDERDRAIN.
- PROVIDE A.S. 5 AQUASWIRL WATER QUALITY UNIT. SEE C302 FOR DETAILS.

FLOOD NOTE:
THE SITE DOES NOT LIE IN A SPECIAL FLOOD HAZARD AREA AS ESTABLISHED BY THE FEDERAL EMERGENCY MANAGEMENT AGENCY - NATIONAL FLOOD INSURANCE PROGRAM, WHEN PLOTTED BY SCALE ON FLOOD INSURANCE RATE MAP #18057C0138 F, DATED FEBRUARY 19, 2003

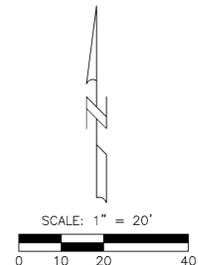
100 YEAR ELEVATION
= 836.82

LEGEND

- EXIST. FIRE HYDRANT
- EXIST. WATER METER/VALVE
- EXIST. SIGN
- EXIST. MONITOR WELL
- EXIST. IRON PIN & OR PK (SET/FOUND)
- EXIST. GAS METER
- EXIST. STORM INLET
- EXIST. STORM/SAN/TELE. MANHOLE
- EXIST. ELECTRIC METER
- EXIST. POWER POLE/POWER POLE W/ LIGHT
- EXIST. GUY ANCHOR
- EXIST. TELEPHONE PEDESTAL
- HVAC UNIT
- CLEANOUT
- MAILBOX
- LIGHT POLE
- EXIST. BOLLARD
- PROPOSED SANITARY SEWER LINE
- EXIST. STORM SEWER LINE
- EXIST. CONTOURS
- CONCRETE END SECTION (C.E.S.)
- GATE POST
- TRANSFORMER
- RIGHT-OF-WAY LINE
- PROPOSED SANITARY SEWER LINE
- PROPOSED STORM ROOF DRAIN
- PROPOSED PIPE BOLLARD
- PROPOSED MANHOLE (MH)
- PROPOSED CONTOURS
- PROPOSED ELEVATION
- DRAINAGE FLOW ARROW
- EXISTING TREE LINE
- PROPOSED DIRECTIONAL SIGN
- FINISH FLOOR ELEVATION
- TOP OF (MANHOLE / INLET) CASTING
- INVERT ELEVATION
- REINFORCED CONCRETE PIPE
- CORRUGATED METAL PIPE
- POLYVINYL CHLORIDE PIPE
- HIGH DENSITY POLYETHYLENE FLOW LINE
- STRUCTURE
- MATCH EXISTING GRADE
- TOP OF WALL
- TOP OF CURB
- GUTTER
- WATER LINE
- GAS LINE
- OVERHEAD UTILITY LINE
- TELEPHONE LINE
- ELECTRIC LINE
- TEMPORARY BENCHMARK
- PARKING COUNT



AQUA-SWIRL UNIT DETAIL
SCALE: 1" = 5'



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WEIHE ENGINEERS
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Landscape Architecture

DATE	BY	PROJECT NO.	REVISIONS AND ISSUES
12/23/2013	WJ3.0559	W13.0559	PRE-FILE DRAFTING
01/29/2014	WJ3.0559	W13.0559	SUBMITTED FOR REVIEW



JAMES K. SHINNEMAN P.E. 10200392

PREPARED FOR:
AT BRIDGEWATER
Section M4, Lot 2 of Bridgewater Center located at 3404 East 146th Street, Westfield, IN 46033
DRAINAGE PLAN
Part of the S1/4 of Section 17, Township 18 North, Range 4 East, Washington Township, Hamilton County, Indiana

SHEET NO.
C301
PROJECT NO.
W13.0559

LOCATION: H:\2013\W130559\Engineering\Design\Layout\W130559-C103s.dwg
DATE/PLT: January 29, 2014 - 4:40pm
PLOTTER: HP DesignJet 2450

Hamilton Western
Utility 15' Easement
Inst. No. 94-49274

South Line, S.W. 1/4, Sec. 17, T.18N., R.4E.

REQUIREMENTS FOR ALL STORM SEWER BENCHWALLS

BENCH WALLS SHALL BE SHAPED AND FORMED FOR A CLEAN TRANSITION WITH PROPER HYDRAULICS TO ALLOW THE SMOOTH CONVEYANCE OF FLOWS THROUGH THE MANHOLE OR BOX INLET. THE BENCH WALL SHALL FORM A DEFINED CHANNEL TO A MINIMUM HEIGHT OF 80 PERCENT OF THE INSIDE DIAMETER OF THE INLET AND OUTLET PIPES TO FORM A "U" SHAPED CHANNEL, CONSTRUCTED AT A MINIMUM 1/4-INCH PER FOOT SLOPE TO THE MANHOLE WALL.

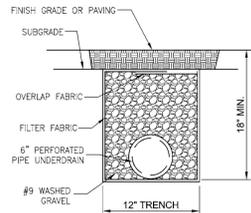
WHERE A FLOW CHANNEL IS CONSTRUCTED AS AN INTEGRAL PART OF THE PRE-CAST BASE, IT SHALL BE SHAPED AND FORMED AS DESCRIBED ABOVE, WITH THE EXCEPTION THAT THE BOTTOM OF THE FLOW CHANNEL MAY BE FORMED FROM THE BOTTOM OF INLET AND OUTLET PIPES IF THE PIPE WALL THICKNESS IS NOT GREATER THAN ONE (1) INCH.

FOR CAST-IN-PLACE FLOW CHANNELS, THE BOTTOM INVERT OF ALL PIPES ENTERING A MANHOLE SHALL BE AT LEAST THREE (3) INCHES ABOVE THE TOP OF THE BASE SLAB TO THE OUTLET INVERT SO THE FINISHED SEWER CHANNEL MAY BE INSTALLED AND SHARED.

FOR CONNECTIONS TO EXISTING STORM SEWER STRUCTURES, FLOW CHANNELS SHALL BE SHAPED, AS SPECIFIED HEREIN, AS IF IT WERE A NEW MANHOLE OR BOX INLET STRUCTURE.

SPECIFICATIONS FOR ALL STORM SEWER CASTINGS

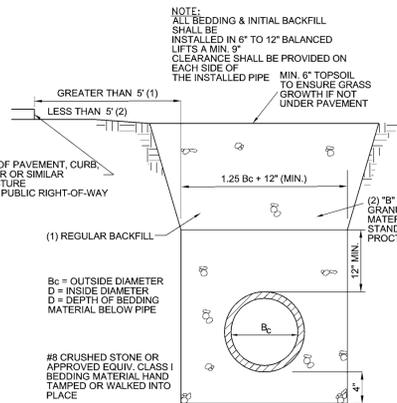
ALL STORM WATER INLETS AND CATCH BASINS SHALL HAVE THE WORDS "NO DUMPING, DRAINS TO STREAM", OR SIMILARLY APPROVED MESSAGE, CAST IN RAISED OR RECESSED LETTERS AT A MINIMUM OF 1" IN HEIGHT. IN ADDITION, A SYMBOL OF A FISH SHALL ALSO BE CAST WITH THE LETTERS.



SECTION

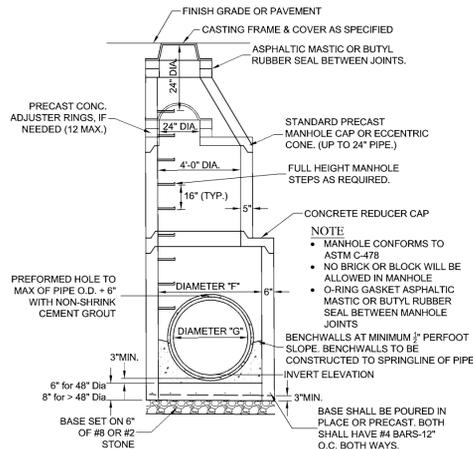
NOTE:
INVERT TO BE 18" WHEN PLACED IN SWALE
INVERT TO BE 36" WHEN PLACED FROM A PAVED INLET.

SUB-SURFACE UNDERDRAIN TILE
(NO SCALE)



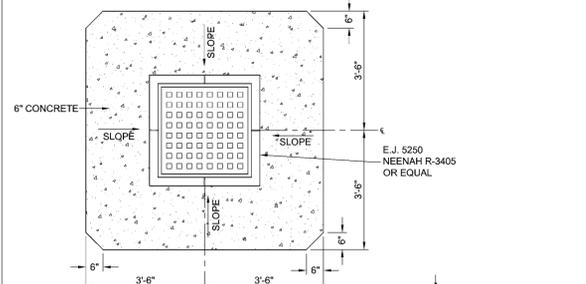
TYPICAL BEDDING SECTION - PVC & HDPE
(NO SCALE)

PIPE SIZE (DIA. "G")	MANHOLE (DIA. "F") PIPES ENTERING/ LEAVING AT 0-45 DEGREES	MANHOLE (DIA. "F") PIPES ENTERING/ LEAVING AT 45-90 DEGREES	UP TO 60 DEGREES
12"-21"	48"	48"	N/A
24"	48"	60"	N/A
27"-30"	60"	60"	N/A
33"-36"	60"	72"	N/A
42"	72"	84"	N/A
48"	84"	96"	N/A
54"	N/A	N/A	96"
60"	N/A	N/A	96"
66"	N/A	N/A	96"



NOTE:
MANHOLE STEPS SHALL BE POLYPROPYLENE, POLYPROPYLENE COATED STEEL REINFORCING OR AN APPROVED NON-CORROSIVE FIBERGLASS MATERIAL. THE COPOLYMER POLYPROPYLENE SHALL MEET THE REQUIREMENTS OF ASTM D-4101 REINFORCED WITH DEFORMED 3/8" DIA. REINFORCED STEEL CONFORMING TO THE REQUIREMENTS OF ASTM A-615, GRADE 60. NON-COATED CAST IRON STEPS ARE NOT ACCEPTABLE.

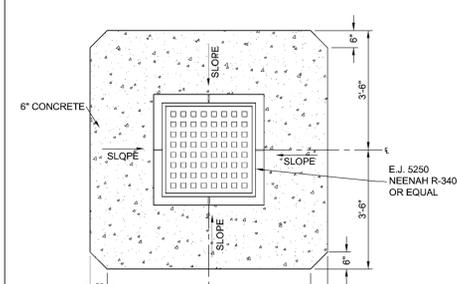
STANDARD STORM MANHOLE
(NO SCALE)



- NOTES**
- 6" CONCRETE PRECAST OR POURED IN PLACE.
 - REFER TO BEDDING DETAIL AS REQUIRED.
 - VAR. PIPE SIZE
24" MAX STRAIGHT CONNECTIONS
15" MAX SKEW/CORNER CONNECTIONS

PAVED AREA INLET TYPE "E"
(NO SCALE)

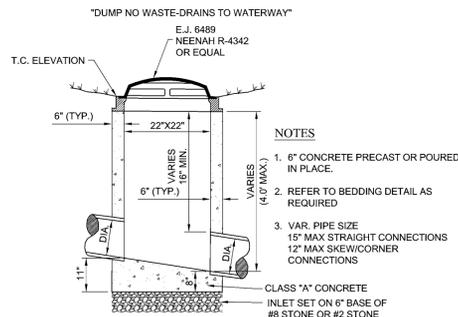
NOTE: TO BE USED WHEN CLEAR DISTANCE (FROM EXTERIOR PIPE DIAMETER TO EXTERIOR PIPE DIAMETER) BETWEEN SANITARY SEWER PIPING (MAINS, LATERALS, FORCE MAINS, ETC.) AND ALL OTHER PIPES IS 18" OR LESS, PER INSPECTOR'S DIRECTION, OR WHERE NOTED ON THE DRAWINGS. A MINIMUM CLEAR DISTANCE OF 3" MUST BE PROVIDED TO MAINTAIN STRUCTURAL INTEGRITY OF THE CONCRETE.



- NOTES**
- 6" CONCRETE PRECAST OR POURED IN PLACE.
 - REFER TO BEDDING DETAIL AS REQUIRED.
 - VAR. PIPE SIZE
15" MAX STRAIGHT CONNECTIONS
12" MAX SKEW/CORNER CONNECTIONS

PAVED AREA INLET TYPE "A"
(NO SCALE)

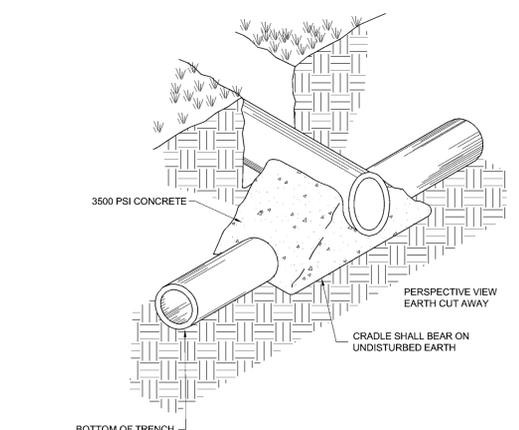
NOTE: TO BE USED WHEN CLEAR DISTANCE (FROM EXTERIOR PIPE DIAMETER TO EXTERIOR PIPE DIAMETER) BETWEEN SANITARY SEWER PIPING (MAINS, LATERALS, FORCE MAINS, ETC.) AND ALL OTHER PIPES IS 18" OR LESS, PER INSPECTOR'S DIRECTION, OR WHERE NOTED ON THE DRAWINGS. A MINIMUM CLEAR DISTANCE OF 3" MUST BE PROVIDED TO MAINTAIN STRUCTURAL INTEGRITY OF THE CONCRETE.



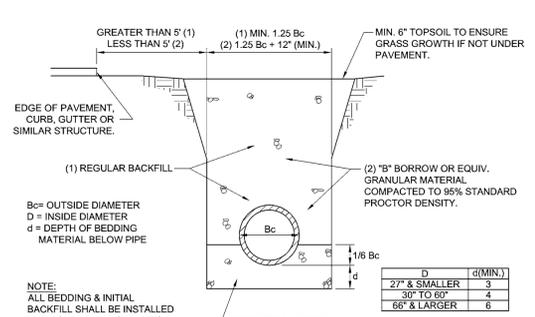
- NOTES**
- 6" CONCRETE PRECAST OR POURED IN PLACE.
 - REFER TO BEDDING DETAIL AS REQUIRED.
 - VAR. PIPE SIZE
15" MAX STRAIGHT CONNECTIONS
12" MAX SKEW/CORNER CONNECTIONS

BEEHIVE INLET TYPE "A"
(NO SCALE)

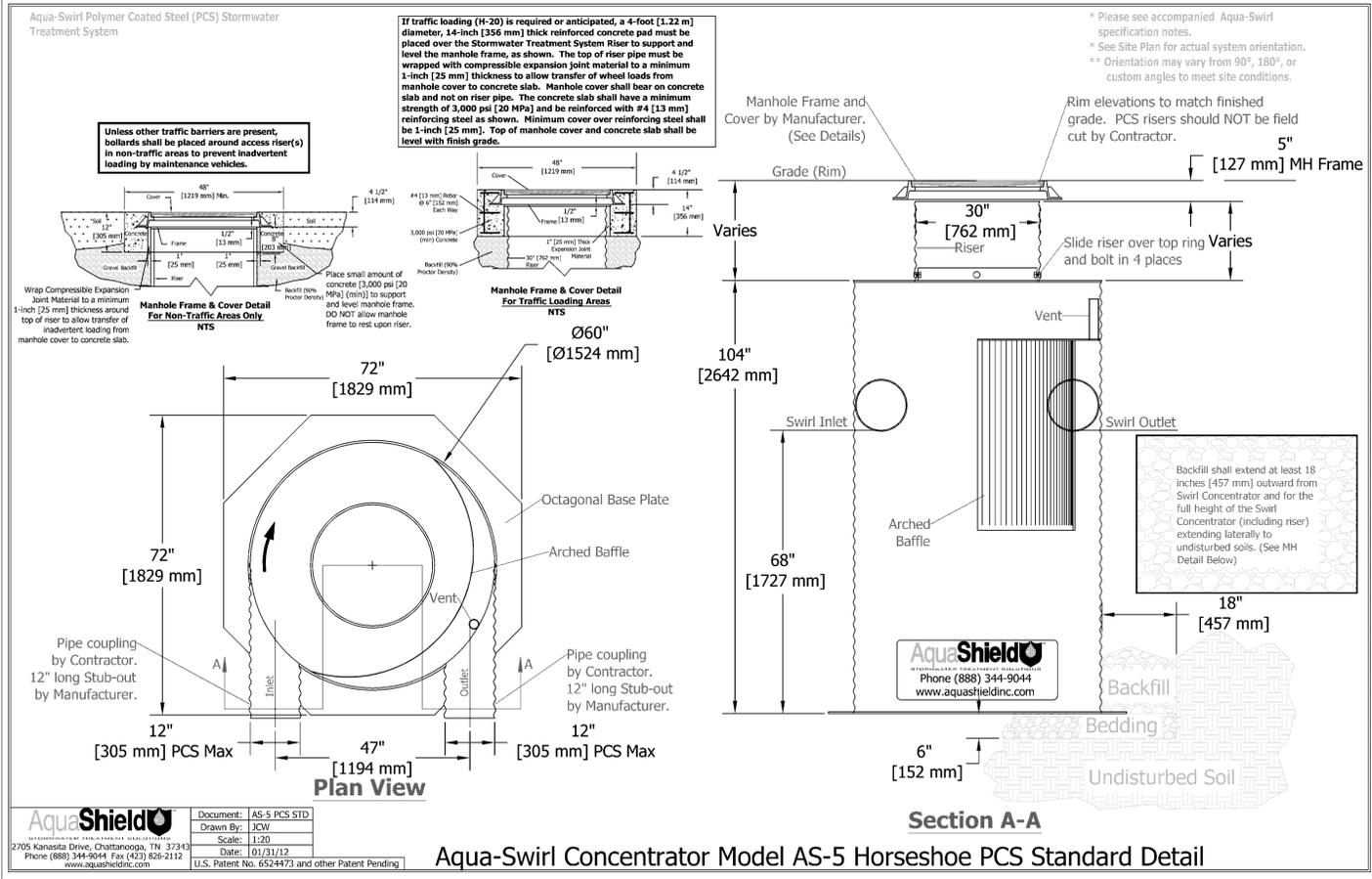
NOTE: TO BE USED WHEN CLEAR DISTANCE (FROM EXTERIOR PIPE DIAMETER TO EXTERIOR PIPE DIAMETER) BETWEEN SANITARY SEWER PIPING (MAINS, LATERALS, FORCE MAINS, ETC.) AND ALL OTHER PIPES IS 18" OR LESS, PER INSPECTOR'S DIRECTION, OR WHERE NOTED ON THE DRAWINGS. A MINIMUM CLEAR DISTANCE OF 3" MUST BE PROVIDED TO MAINTAIN STRUCTURAL INTEGRITY OF THE CONCRETE.



CONCRETE CRADLE DETAIL
(NO SCALE)



TYPICAL BEDDING SECTION - RCP PIPE
(NO SCALE)



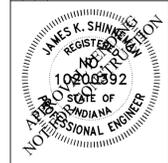
AquaShield
Document: AS-5 PCS STD
Drawn By: JCV
Scale: 1:20
Date: 01/31/12
U.S. Patent No. 6524473 and other Patent Pending

AquaShield Concentrator Model AS-5 Horseshoe PCS Standard Detail

10505 N. College Avenue
Indianapolis, Indiana 46280
we@weh-engineers.net
317 846 - 6611
800 452 - 6408
317 843 - 0546 fax

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Landscape Architecture

DATE	BY	PROJECT NO.	W13.0559
12.23.2013	RLW	DWG NAME:	STORM SEWER DETAILS
01.29.2014	RLW	DESIGNER:	JCV
	RLW	DRAWN BY:	RLW
	RLW	CHECKED BY:	RLW
	RLW	DATE:	12.23.2013



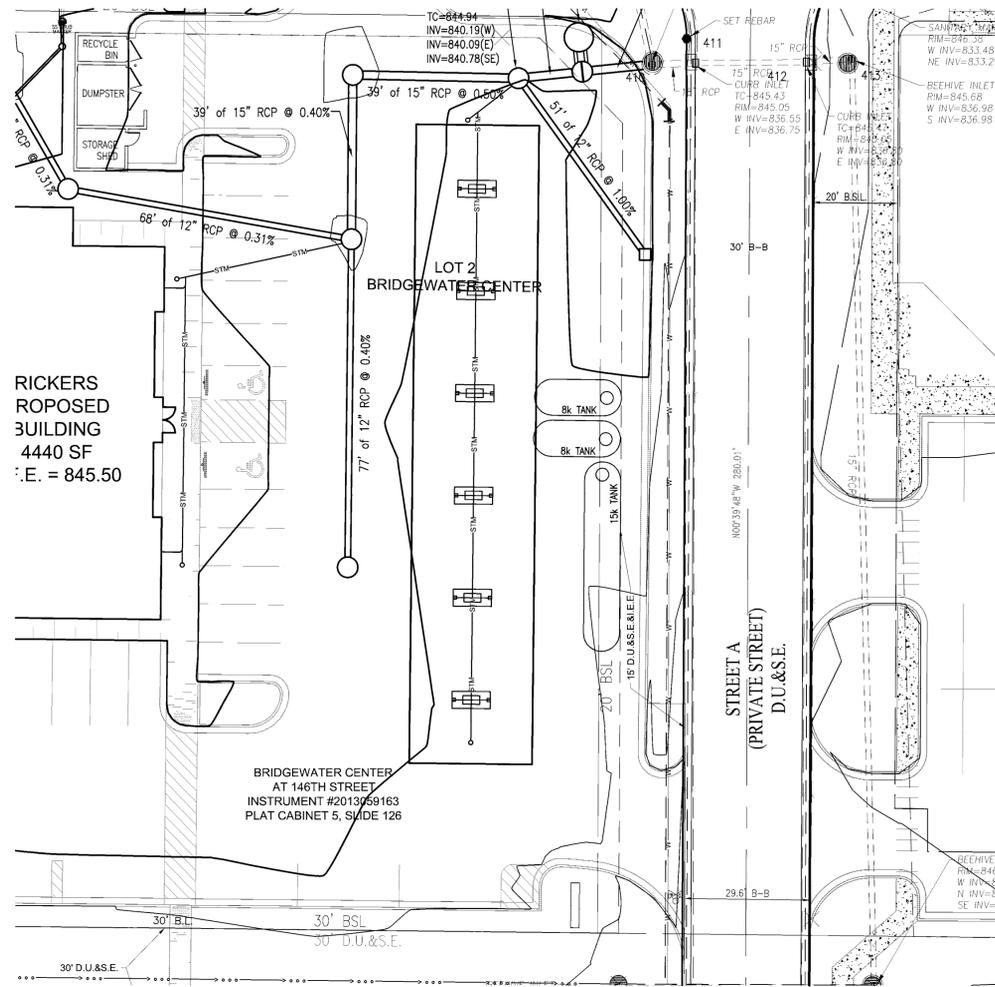
JAMES K. SHINNEMAN P.E. 10200392

PREPARED FOR:
AT BRIDGEWATER
Section M4, Lot 2 of Bridgewater Center located at 3404 East 146th Street, Westfield, IN 46033

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811 or 800-382-5544
24 hours a Day, 7 days a Week.
IT IS AGAINST THE LAW TO EXCAVATE WITHOUT NOTIFYING THE UNDERGROUND LOCATION SERVICE TWO (2) WORKING DAYS BEFORE COMMENCING WORK.

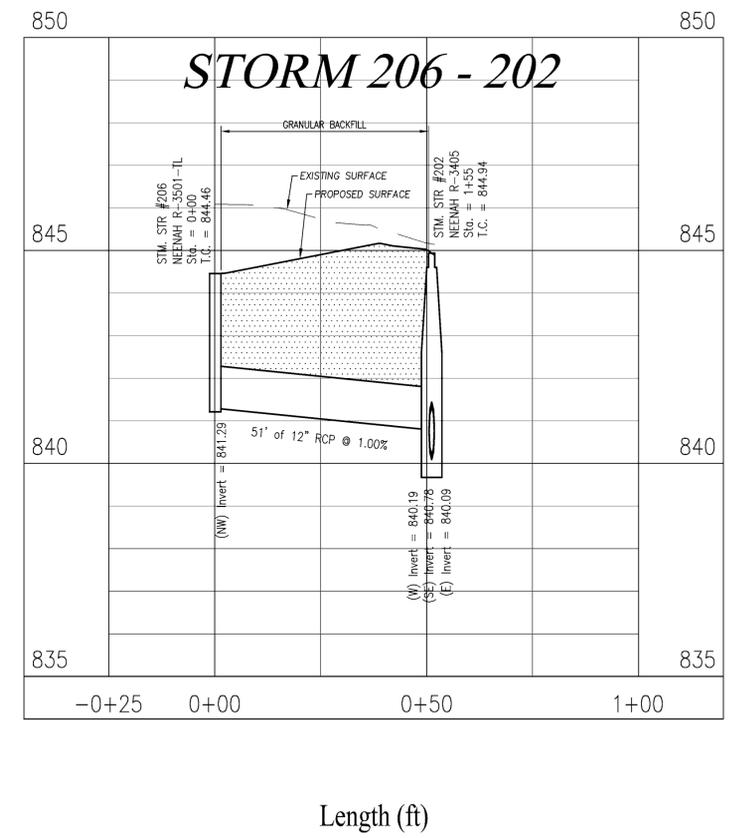
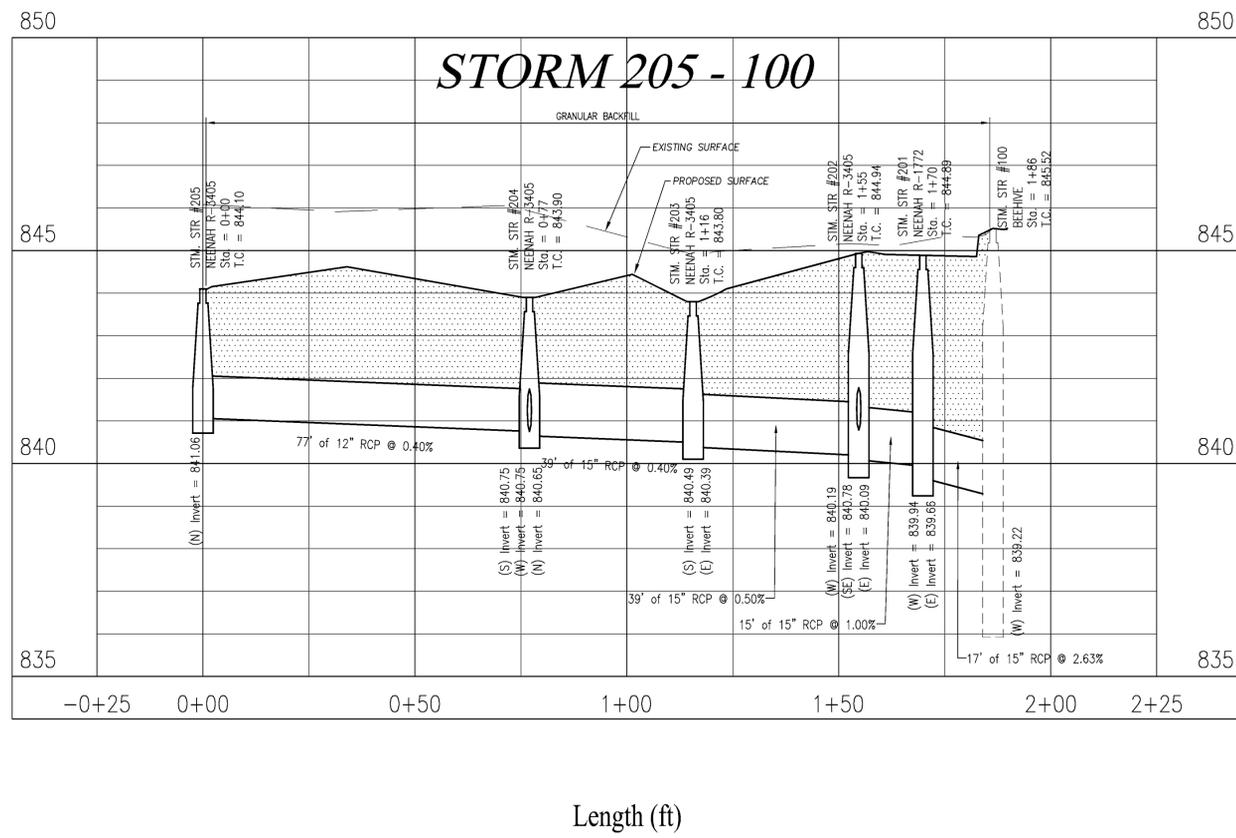
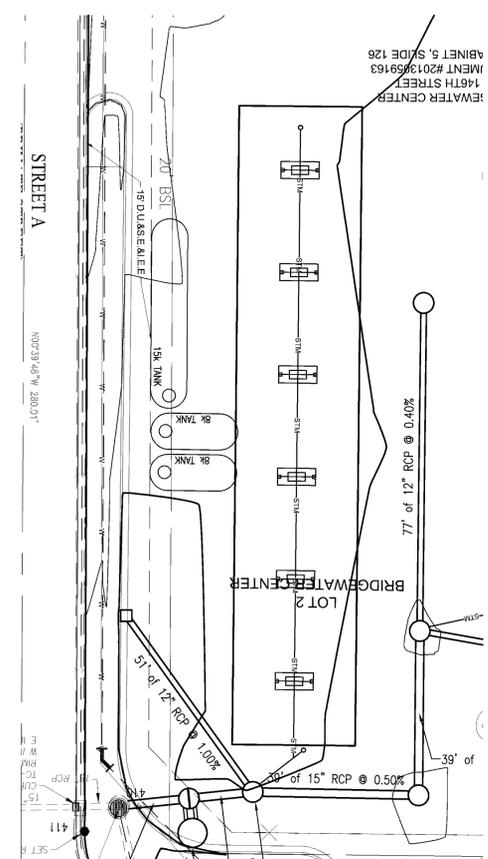
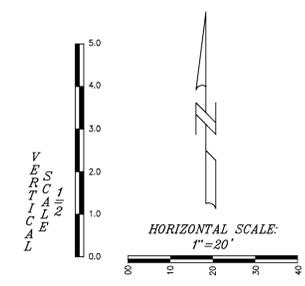
SHEET NO.
C302
PROJECT NO.
W13.0559

LOCATION: 11/20/13 W 130559 Engineering\Concept\W130559-C201_4d.dwg
DATE/TIME: 12/23/2013 10:41:12 AM
PLOT/DWG: weh.dwg



-NOTE-
RUN WATER LINE A MINIMUM OF 54" DEEP.
PROVIDE MINIMUM OF 10" HORIZONTAL & 2" VERTICAL CLEARANCE BETWEEN WATER & SANITARY LINE. SANITARY SEWER LINE IN PROXIMITY OF WATER LINE SHALL BE C900 WATER MAIN GRADE PVC.

- GENERAL NOTES**
- STRUCTURES DEEPER THAN 4' MUST BE ACCESSIBLE WITH STEPS.
 - ALL STORM SEWER SHALL BE CLEARED AND TELEVIEWED AFTER ALL UNDERGROUND UTILITIES ARE INSTALLED.
 - ALL BEEHIVE CASTINGS ON 2x2 BOX SHALL HAVE A SQUARE RISER WITH A ROUND HOLE.



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PER INDIANA STATE LAW (C 8-1-26, IT IS AGAINST THE LAW TO EXCAVATE WITHOUT NOTIFYING THE UNDERGROUND LOCATION SERVICE TWO (2) WORKING DAYS BEFORE COMMENCING WORK.

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PROJECT NO:	W13.0559
DWG NAME:	#130559-C107 - profile
DESIGNED BY:	BAJ
DRAWN BY:	RLW
CHECKED BY:	BAJ
DATE:	12-23-2013

DATE	BY	REVISIONS AND ISSUES
12/23/2013	RLW	PRE-FILE MEETING
01/29/2014	RLW	SUBMITTED FOR REVIEW



JAMES K. SHINNEMAN P.E. 10200392

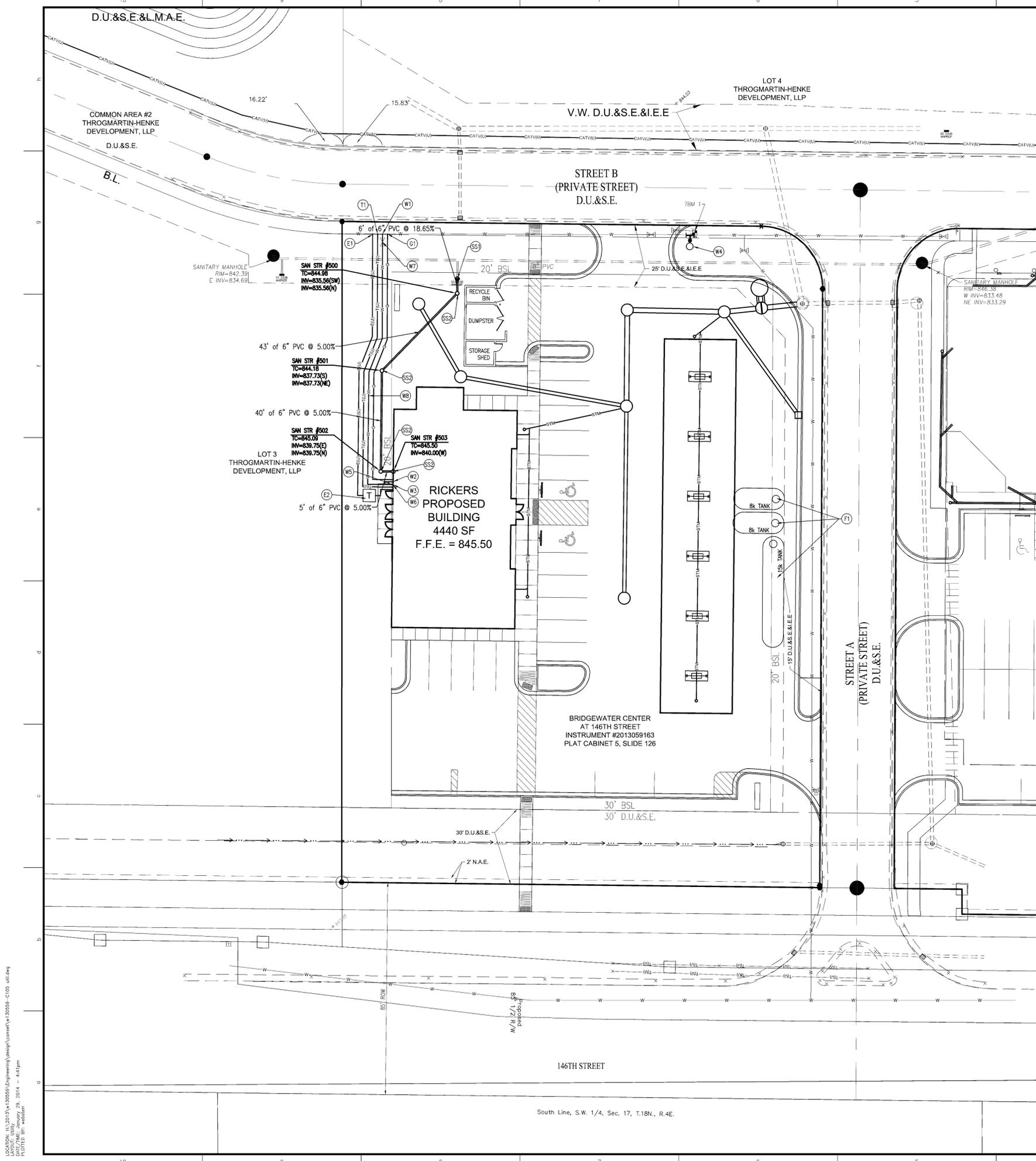
AT BRIDGEWATER
Section M4, Lot 2 of Bridgewater Center located at 3404 East 146th Street, Westfield, IN 46033
STORM PLAN AND PROFILE
Part of the S1/4 of Section 17, Township 18 North, Range 4 East, Washington Township, Hamilton County, Indiana

PREPARED FOR:
811
AT BRIDGEWATER

SHEET NO.
C600

PROJECT NO.
W13.0559

LOCATION: I:\2013\130559\Engineering\Design\Consent\W130559-C107 - profile.dwg
DATE/TIME: January 29, 2014 - 4:41pm
PLOT/DIM: weihel



UTILITY PLAN NOTES

SANITARY SEWER NOTES

- (SS1) CONNECT PROPOSED 6" SANITARY SEWER LATERAL TO EXISTING SANITARY SEWER LATERAL, STUB, COORDINATE BUILDING CONNECTION WITH MEP. PROVIDE CLEANOUTS AS REQUIRED/SHOWN. VERIFY INVERTS ON EXISTING LINE AND COORDINATE CONDITIONS WITH MEP. ADJUST AS REQUIRED.
 - (SS2) PROPOSED SANITARY LATERAL CLEANOUT. REFER TO DETAIL ON SHEET C206.
- WATER SERVICE NOTES:**
- (W1) COORDINATE AND CONNECT 6" WATER SERVICE LINE TO EXISTING 8" WATER MAIN WITH STAINLESS STEEL SADDLE TAP.
 - (W2) COORDINATE CONNECTION OF 2" TYPE-K COPPER DOMESTIC SERVICE LINE WITH PLUMBING DRAWINGS.
 - (W3) COORDINATE CONNECTION OF BUILDING WATER LINE SERVICE METER LOCATION WITH LOCAL SERVICE PROVIDER. REFER TO FIG. W13 SHEET C801.
 - (W4) EXISTING FIRE HYDRANT.
 - (W5) PROPOSED POST INDICATOR VALVE PER DETAIL W13 ON SHEET C801
 - (W6) FIRE DEPARTMENT CONNECTION PER DETAIL W13 ON SHEET C801
 - (W7) PROPOSED 6" WATER VALVE
 - (W8) PROPOSED 6" PVC MAIN SERVICE LINE

ELECTRIC NOTES:

- (E1) COORDINATE AND CONNECT BUILDING ELECTRICAL LINE TO ELECTRICAL TRANSFORMER. COORDINATE CONNECTION WITH POWER COMPANY AND ELECTRICAL DRAWINGS. ADJUST AS REQUIRED. 2" EC CONDUITS TO BE INSTALLED WITH PULL STRINGS. 1400 AMP TOTAL ELECTRIC REQUIRED.
 - (E2) TRANSFORMER PAD LOCATION. COORDINATE WITH DUKE ENERGY.
- TELEPHONE NOTES:**
- (T1) COORDINATE AND CONNECT BUILDING TELEPHONE SERVICE LINE TO CONNECTION POINT AS PROVIDED. COORDINATE CONNECTION WITH SITE DRAWINGS AND SERVICE PROVIDER FOR LOCATION OF PEDESTAL. ADJUST AS REQUIRED. 4" PVC CONDUIT TO BE INSTALLED WITH PULL STRINGS.

GAS SERVICE NOTES:

- (G1) CONNECT PROPOSED GAS SERVICE TO EXISTING GAS LINE. REFER TO ARCHITECTURAL DRAWINGS AND COORDINATE WITH SERVICE PROVIDER.

FUEL TANK NOTES:

- (F1) UNDERGROUND FUEL TANKS. SEE TANK AND PIPING PLANS FOR FURTHER DETAIL AND PIPING LAYOUT.

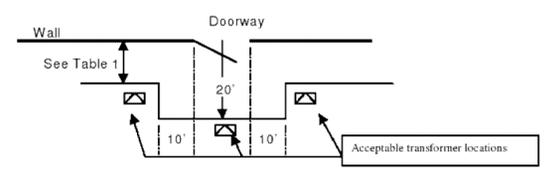
LEGEND

- = EXIST. FIRE HYDRANT
- = EXIST. WATER METER/VALVE
- = EXIST. SIGN
- = EXIST. MONITOR WELL
- = EXIST. GAS VALVE
- = EXIST. GAS METER
- = EXIST. STORM INLET
- = EXIST. STORM/SAN/TELE. MANHOLE
- = EXIST. ELECTRIC METER
- = EXIST. POWER POLE/POST w/ LIGHT
- = EXIST. GUY ANCHOR
- = EXIST. TELEPHONE PEDESTAL
- = HVAC UNIT
- = CLEANOUT
- = MAILBOX
- = LIGHT POLE
- = EXIST. BOLLARD
- = EXIST. SANITARY SEWER LINE
- = EXIST. STORM SEWER LINE
- = EXIST. CONTOURS
- = CONCRETE END SECTION (C.E.S.)
- = GATE POST
- = TRANSFORMER
- = RIGHT-OF-WAY LINE
- = PROPOSED SANITARY SEWER LINE
- = PROPOSED STORM SEWER LINE
- = PROPOSED HDPE ROOF DRAIN
- = PROPOSED PIPE BOLLARD
- = PROPOSED MANHOLE (MH)
- = PROPOSED CONTOURS
- = PROPOSED ELEVATION
- = DRAINAGE FLOW ARROW
- = EXISTING TREE LINE
- = PROPOSED DIRECTIONAL SIGN
- = FINISH FLOOR ELEVATION
- = TOP OF (MANHOLE / INLET) CASTING
- = INVERT ELEVATION
- = REINFORCED CONCRETE PIPE
- = CORRUGATED METAL PIPE
- = POLYVINYL CHLORIDE PIPE
- = HIGH DENSITY POLYETHYLENE
- = FLOW LINE
- = STRUCTURE
- = MATCH EXISTING GRADE
- = TOP OF WALL
- = SUB-SURFACE DRAINAGE
- = TOP OF CURB
- = GUTTER
- = WATER LINE
- = GAS LINE
- = OVERHEAD UTILITY LINE
- = TELEPHONE LINE
- = ELECTRIC LINE
- = TEMPORARY BENCHMARK
- = PARKING COUNT

TRANSFORMER DETAIL

A. Doors, Fire Escapes, or Fire Exits

Padmounted transformers shall not be located within a zone extending outward 20 feet and 10 feet to the side from any doorway, fire escape, or fire exit. See diagram below.



REFER TO THE COMPLETE DUKE ENERGY GUIDELINES AS PROVIDED IN THE SPECIFICATIONS.

WATER NOTES

1. POST CAPS SHALL BE INSTALLED ON ALL VALVES.
2. MAIN SHALL BE SADDLE TAPPED AND BEDDED WITH SAND 6" BELOW AND 12" OVER THE PIPE WITH MARKING TAPE INSTALLED 2" ABOVE THE MAIN.
3. NUMBER TWELVE (#12) GAUGE LOCATING WIRE SHALL BE TAPED TO THE TOP OF THE MAIN AND PULLED THROUGH ALL VALVE BOXES (TO THE SURFACE) FOR LOCATING PURPOSES.

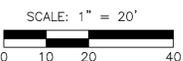
SANITARY NOTES

1. ALL SANITARY SEWER LATERALS SHALL HAVE LOCATE WIRE RUN WHEN INSTALLED.
2. CONTRACTOR SHALL INSTALL LATERAL NO GREATER THAN 8' BELOW PAD GRADE AT LATERAL END.

-NOTE-
 RUN WATER LINE A MINIMUM OF 54" DEEP. PROVIDE MINIMUM OF 10' HORIZONTAL & 2' VERTICAL CLEARANCE BETWEEN WATER & SANITARY LINE. SANITARY SEWER LINE IN PROXIMITY OF WATER LINE SHALL BE C900 WATER MAIN GRADE PVC.

GENERAL UTILITY NOTES

1. THE CONTRACTOR SHALL CONTACT ALL APPLICABLE UTILITIES AND VERIFY ANY AND ALL FEES ASSOCIATED WITH THE INSTALLATION OF ALL UTILITIES.
2. PROVIDE THRUST BLOCKS FOR ALL WATER LINE BENDS AND TEES, INCLUDING TAP CONNECTION.
3. CONTRACTOR SHALL COORDINATE WITH WATER COMPANY FOR DOMESTIC AND FIRE SERVICE. CONNECT TO BUILDING DOMESTIC AND FIRE LINE. COORDINATE WITH PLUMBING DRAWINGS.
4. COORDINATE LOCATION OF ELECTRICAL AND TELEPHONE LINES WITH LOCAL UTILITIES.
5. COORDINATE LOCATION AND SIZE OF GAS SERVICE CONNECTION AND INSTALLATION OF SERVICE LINE AND METER WITH GAS COMPANY.
6. COORDINATE LOCATIONS AND CONNECTIONS OF BUILDING STORM LINES WITH PLUMBING DRAWINGS.
7. VERIFY EXISTING INVERT AND LOCATION OF SANITARY SEWER. ADJUST INVERTS AS REQUIRED. DOCUMENT ANY CHANGES.
8. MAINTAIN 10' HORIZONTAL AND 18" VERTICAL CLEARANCE BETWEEN STORM / SANITARY SEWER SYSTEMS AND DOMESTIC/FIRE LINE SERVICE.
9. FOLLOW ALL LOCAL AND STATE CODES IN REFERENCE TO DOMESTIC/FIRE LINE INSTALLATION AND STORM SEWER / SANITARY SEWER INSTALLATION.
10. COORDINATE LOCATION OF REQUIRED CONDUITS FOR LIGHT POLES, TELEPHONE SERVICE AND IRRIGATION SYSTEM.
11. COORDINATE UTILITY CONDUITS WITH SERVICE PROVIDERS.
12. SANITARY SEWER LATERAL, WATER SERVICE, & ELECTRICAL/TELEPHONE CONDUITS SHALL BE GRANULAR BACKFILL FOR ENTIRE RUN.



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DATE	BY	REVISIONS AND ISSUES
12/23/2013	WJ3.0558	PROJECT NO. W13.0558
01/29/2014	RLW	DWG NAME: W130558-010 - 08.dwg
		DESIGNED BY: JAS
		DRAWN BY: RLW
		CHECKED BY: RLW
		DATE: 12/23/2013

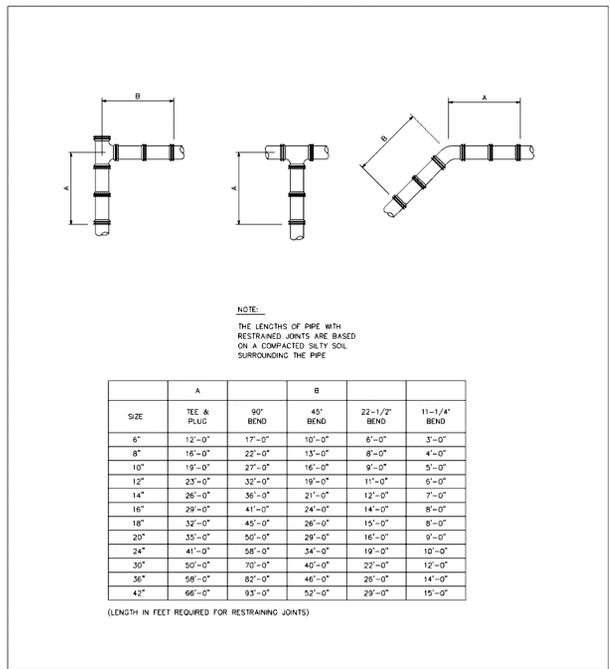


JAMES K. SHINNEMAN P.E. 10206392

PREPARED FOR:
AT BRIDGEWATER
 Section M4, Lot 2 of Bridgewater Center located at 3404 East 146th Street, Westfield, IN 46033
 UTILITY PLAN
 Part of the S1/4 of Section 17, Township 18 North, Range 4 East, Washington Township, Hamilton County, Indiana

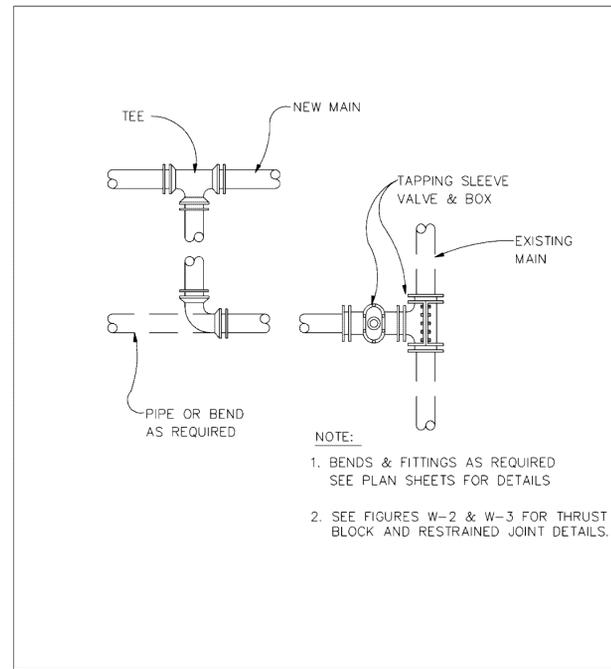
SHEET NO.
C800
 PROJECT NO.
W13.0559

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 PLOTTED BY: weiherr



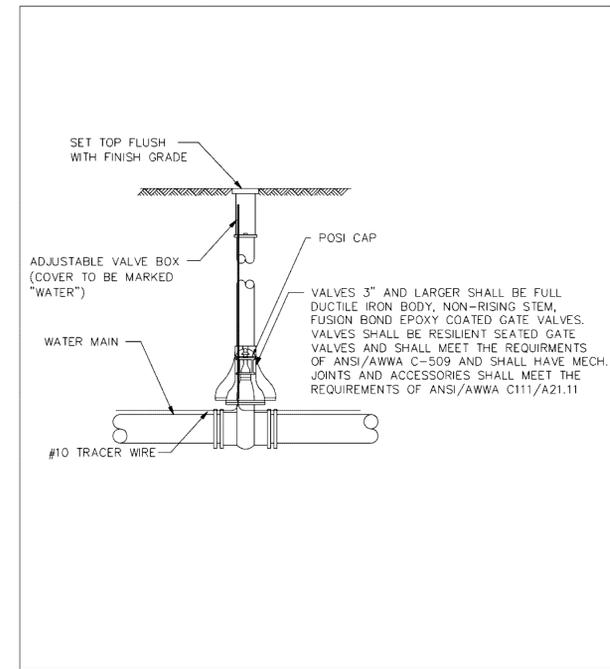
RESTRAINED JOINT DETAILS
TOWN OF WESTFIELD, INDIANA

Renée Lynn Hoff 10/9/06 DATE
FIGURE W-3



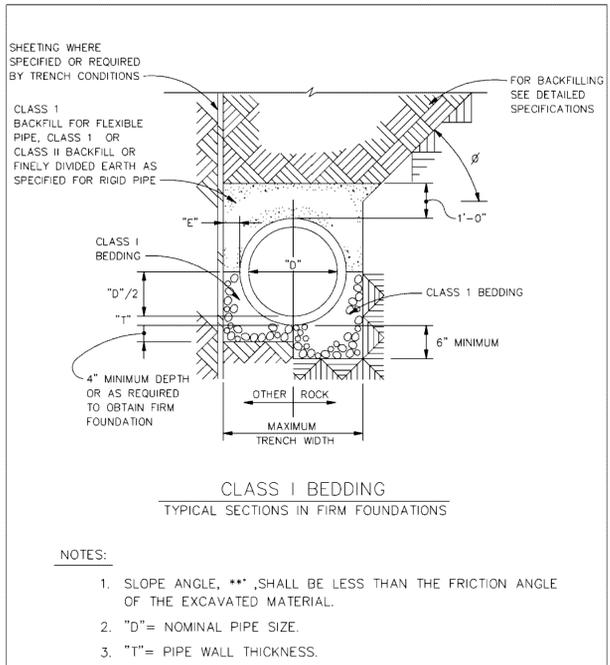
CONNECTION TO EXISTING MAIN
TOWN OF WESTFIELD, INDIANA

Renée Lynn Hoff 10/9/06 DATE
FIGURE W-5



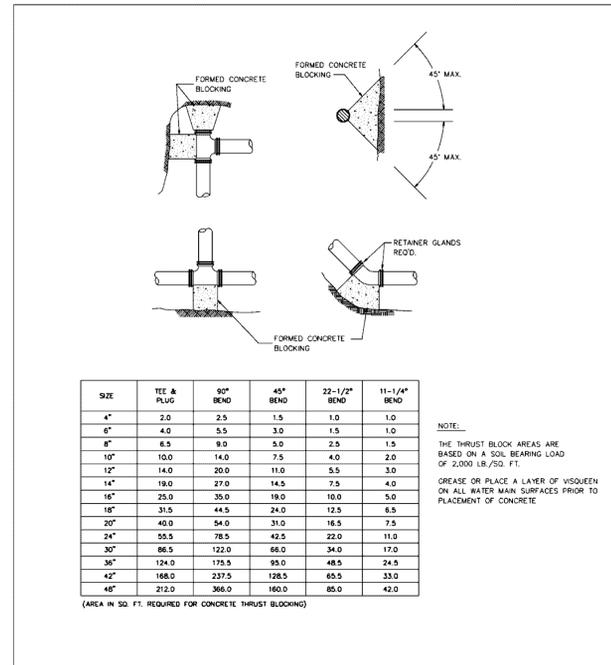
GATE VALVE AND BOX
TOWN OF WESTFIELD, INDIANA

Renée Lynn Hoff 10/9/06 DATE
FIGURE W-6



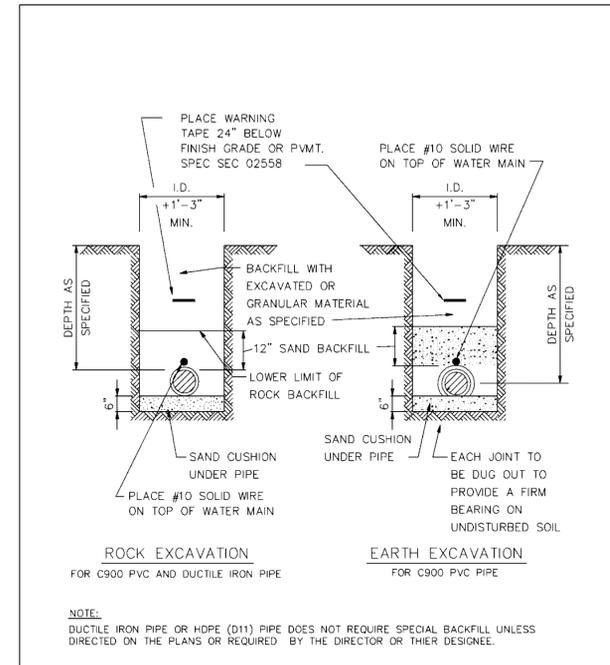
PVC BEDDING DETAIL
TOWN OF WESTFIELD, INDIANA

Renée Lynn Hoff 10/9/06 DATE
FIGURE W-14



THRUST BLOCK DETAIL
TOWN OF WESTFIELD, INDIANA

Renée Lynn Hoff 10/9/06 DATE
FIGURE W-2



WATER MAIN INSTALLATION DETAIL
TOWN OF WESTFIELD, INDIANA

Renée Lynn Hoff 10/9/06 DATE
FIGURE W-1

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WITHOUT NOTIFYING THE UNDERGROUND
LOCATION SERVICE TWO (2) WORKING
DAYS BEFORE COMMENCING WORK.

PREPARED FOR:
AT BRIDGEWATER
Section M4, Lot 2 of Bridgewater Center located at 3404 East 146th Street, Westfield, IN 46033
UTILITY DETAILS
SHEET NO.
C801
PROJECT NO.
W13.0559

JAMES K. SHINNEMAN
REGISTERED PROFESSIONAL ENGINEER
NO. 10200392
STATE OF INDIANA
NOTES: 1. ALL WORK SHALL BE IN ACCORDANCE WITH THE LATEST EDITIONS OF THE INTERNATIONAL CODES AND STANDARDS.

JAMES K. SHINNEMAN P.E. 10200392

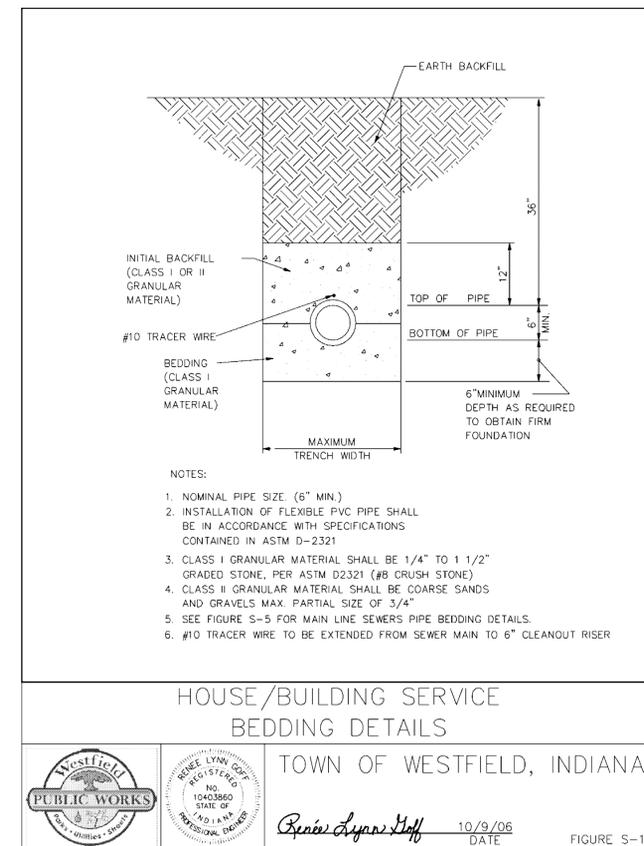
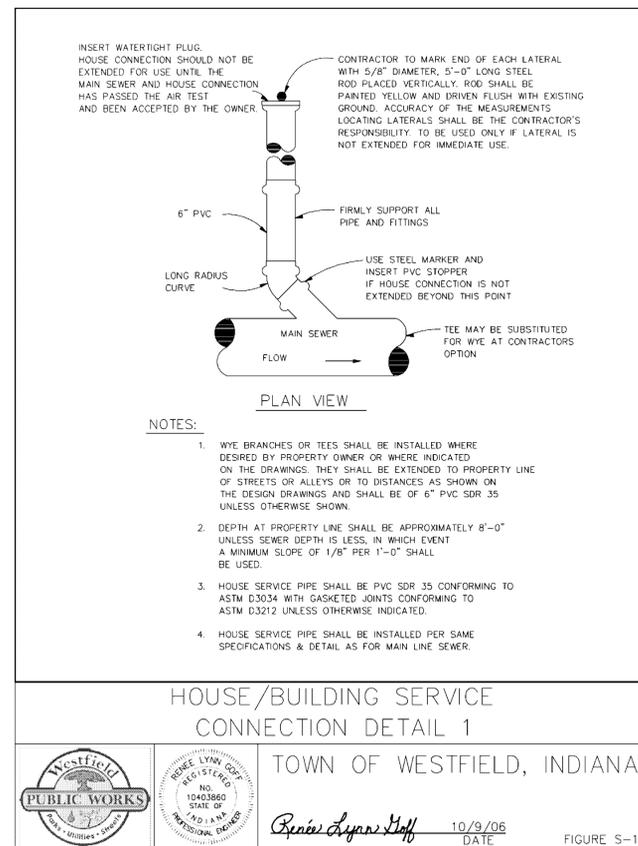
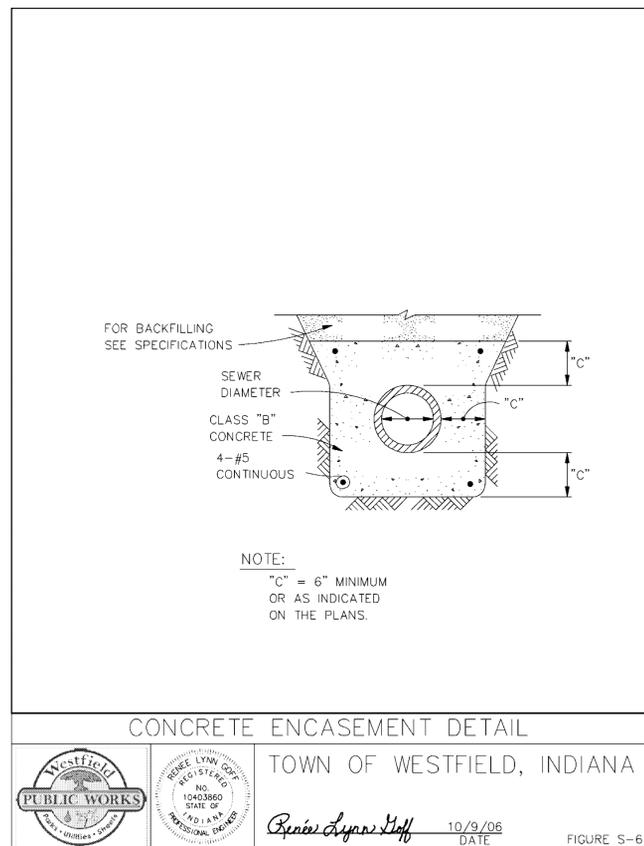
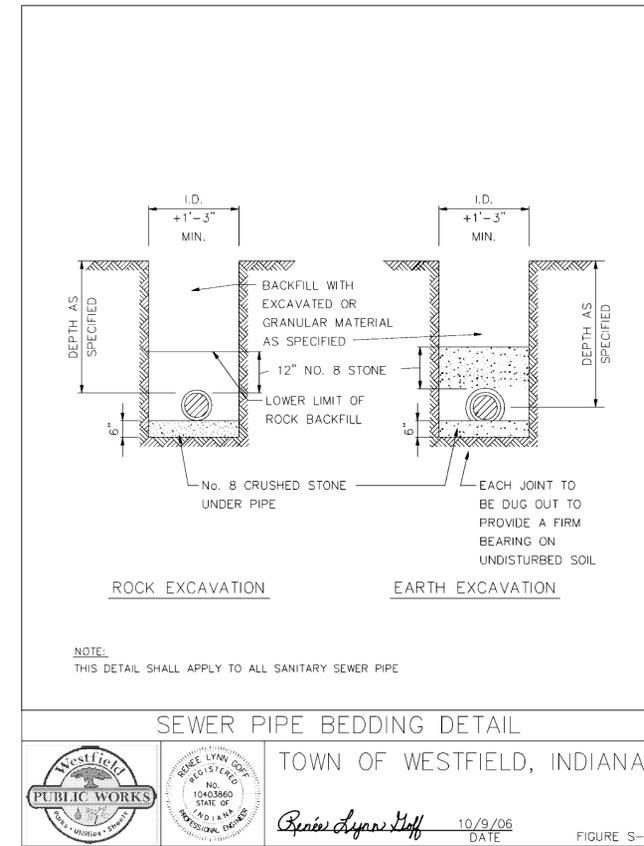
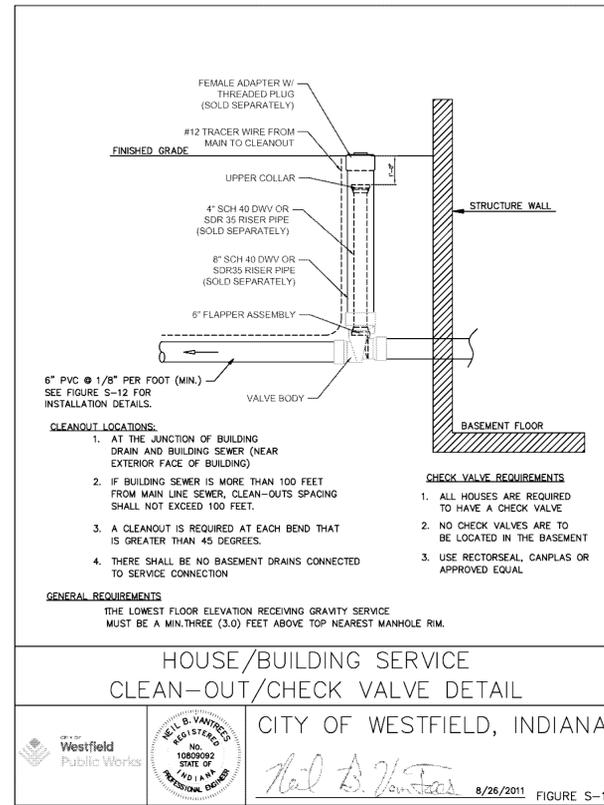
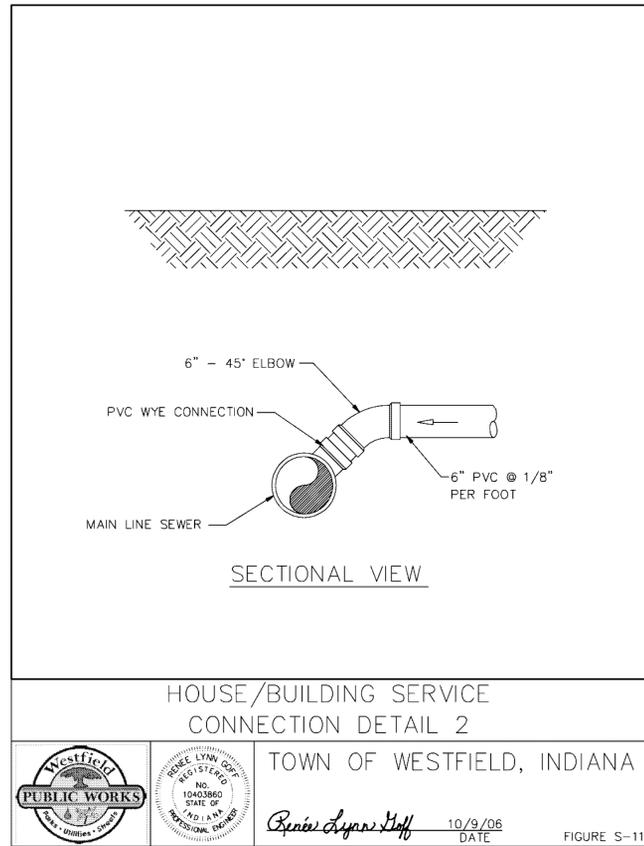
REVISIONS AND ISSUES

DATE	BY	REASON
12/23/2013	RLW	W13.0559
01/29/2014	RLW	W13.0559-C201-REV.DWG

DESIGNED BY: RLW
DRAWN BY: RLW
CHECKED BY: RLW
DATE: 12/23/2013

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800 | 452 - 6408
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ALLAN H. WEIHE, P.E., L.S. - FOUNDER



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PROJECT NO.:	W13.0559
DWG NAME:	W130559-C201-REV.DWG
DESIGNER:	RENEE LYNN HOFF
DRAWN BY:	RENEE LYNN HOFF
CHECKED BY:	BUS
DATE:	12/23/2013

REVISIONS AND ISSUES

DATE	BY	REVISION
12/23/2013	RLW	REVISED FOR REVIEW
01/29/2014	RLW	REVISED FOR REVIEW

JAMES K. SHINNEMAN
REGISTERED PROFESSIONAL ENGINEER
NO. 10200392
STATE OF INDIANA

JAMES K. SHINNEMAN P.E. 10200392

AT BRIDGEWATER
Section M4, Lot 2 of Bridgewater Center located at 3404 East 146th Street, Westfield, IN 46033
UTILITY DETAILS

Part of the SW/4 of Section 17, Township 18 North, Range 4 East, Washington Township, Hamilton County, Indiana

PREPARED FOR:
Atwater's
AT BRIDGEWATER

SHEET NO.
C802

PROJECT NO.
W13.0559

LOCATION: I:\130559\Engineering\Design\Consent\W130559-C201.dwg
DATE/TIME: January 29, 2014 - 4:42pm
PLOT/DIM: weiherr

1.1 DEFINITIONS
A. Whenever used in these specifications the following terms have the meanings indicated which are applicable to both the singular and plural thereof:
1. Town - The Town of Westfield, represented by the Town Council.

1.2 WORK TO BE PERFORMED
Work to be performed shall be in accordance with drawings and specifications approved by the Town.

1.3 SAFETY AND HEALTH REGULATIONS FOR CONSTRUCTION
The Contractor shall be solely responsible for all obligations prescribed as employer obligations under Chapter XVII of Title 29, Code of Federal Regulations, Part 1926, otherwise known as "Safety and Health Regulations for Construction."

1.4 DISCOVERY OF HAZARDOUS MATERIAL
If, during the course of the work, the existence of hazardous material, including asbestos containing material, is observed in the work area, the Contractor shall immediately notify the Owner in writing.

1.5 EASEMENTS
A. The Developer will obtain utility and/or drainage easements over and through certain private lands for the construction and rehabilitation. The width or limits of such rights-of-way will be defined by the Town before the work or construction shall begin.

1.6 OPERATIONS WITHIN RIGHT-OF-WAY
In public thoroughfares, all operations of the Contractor, including those of temporary nature, must be confined within the applicable right-of-way limits after having obtained approval of the Town or other Local Governing Entity.

1.7 PERMITS
A. The Developer will obtain permits which relate to the completed facilities. Permits obtained by the Developer include permits from the following:
1. Town of Westfield
2. Department of Natural Resources

1.8 MAINTAINING TRAFFIC
A. Before closing any thoroughfare, the Contractor shall notify and, if necessary, obtain a permit or permits from the duly constituted public authority having jurisdiction, state, county, city/town.

1.9 WALKS AND PASSAGEWAYS
The Contractor, when required, shall make provisions at cross streets for the free passage of vehicles and foot passengers, either by bridging or otherwise. Do not obstruct the sidewalks, gutters, or streets, or prevent in any manner the flow of water in streets.

1.10 WARNING LIGHTS AND ARROW BOARDS
The Contractor shall place sufficient warning lights and arrow boards on or near the work and keep them illuminated during periods of construction and reduced visibility (from twilight in the evening until sunrise) and shall be held responsible for any damages that any party or the Owner may sustain in consequences of neglecting the necessary precaution in prosecuting this work.

1.11 UTILITIES
A. Temporary Removal: All existing Town utility systems which conflict with the construction of the work herein which can be temporarily removed and replaced shall be accomplished at the expense of the Developer or Contractor with approval from the Westfield Public Works Department. Work shall be done by the WPWD unless the WPWD approves in writing that the work may be done by the Developer or Contractor.

1.12 SUBMITTALS - CERTIFICATE OF COMPLIANCE
The Developer shall upon request of the Town Council or the Westfield Public Works Department, submit to the WPWD a Certificate of Compliance from the manufacturer and/or supplier of each and every specified material or manufactured equipment item.

1.13 MANUFACTURER'S SERVICE TIME
A. When a lift station or other equipment is to be furnished by the Developer or Contractor and maintained by the WPWD, service by the manufacturer is required to be furnished as part of work and shall be at the Contractor's expense.

B. The service provided shall be by a qualified representative to check the completed installation, place the equipment in operation, and instruct the Town's operators in the operation and maintenance procedures.

C. The services shall further demonstrate to the Town's complete satisfaction that the equipment will satisfactorily perform the functions for which it has been installed.

1.1.4 RECORD DRAWINGS
The Developer will be responsible for preparation and submittal of digital as-builts/record drawings as required by the requirements set forth in the Town's Digital As-Built requirements. A copy of the most recent requirements are available on the Town's website at http://www.westfield.gov/egov/docs/1517135335_990447.pdf.

WESTFIELD STANDARD - 2006 SECTION 02101 - TEMPORARY EROSION AND DUST CONTROL
PART 1 - GENERAL
1.1 DESCRIPTION
PLEASE SEE CHAPTER 600 OF THE TOWN OF WESTFIELD STORMWATER MANUAL.

WESTFIELD STANDARD - 2006 SECTION 02222 - EARTHWORK UTILITIES
PART 1 - GENERAL
1.1 DESCRIPTION
A. Scope: Specifications for the stripping of topsoil and vegetation, excavation, trenching, bedding, filling, backfilling, compaction, and related work in connection with the installation of water mains, gravity sanitary sewers, storm sewers, and force mains are included in this Section.

B. Definitions
1. Excavation: Removal of earth and rock to form a trench for the installation of a water main, gravity sanitary sewer, storm sewer, or force main.

2. Earth: Unconsolidated material in the crust of the Earth derived by weathering and erosion. Earth includes:
a. Materials of both inorganic and organic origin;
b. Boulders less than 1/3 cubic yard in volume, gravel, sand, silt, and clay;

3. Rock: A natural aggregate of mineral particles connected by strong and permanent cohesive forces. Rock includes:
a. Limestone, sandstone, dolomite, granite, marble, and lava;
b. Boulders 1/3 cubic yard or more in volume;

4. Undercutting: Excavation of rock and unsuitable earth below the bottom of the pipe or conduit to be installed in the trench.

5. Subgrade: Undisturbed bottom of a trench.
6. Bedding: Earth placed in trench to support pipe and conduit.

7. Backfill and Fill: Earth placed in trench from the top of bedding to finished grade, or to subbase of pavement.
8. Topsoil: Earth containing sufficient organic materials to support the growth of grass.

1.2 SITE CONDITIONS
Existing storm sewers, sanitary sewers, water mains, gas mains, electric ducts, telephone ducts, steam mains and other under-ground structures, lines, and their house connections are to be shown on the plans according to the best available information. The exact location and protection of these facilities and structures, their support and maintenance in operation during construction (in cooperation with the proper authorities), is the responsibility of the Contractor.

2.1 BEDDING
A. Class I bedding shall be angular 6 to 12 mm (1/4 to 1/2 inch) graded stone, coral, slag, cinders, crushed stone or crushed shells.
B. Class II bedding shall be coarse sands and gravels with maximum particle size of 20 mm (3/4 inch). Class II bedding includes variously graded sands and gravels containing small percentage of fines generally granular and non-cohesive, either wet or dry. Soil Types GW (well-graded gravel), SW (well-graded sand), and SP (poorly graded and/or crushed stone mixed with sand) are included in this class.

2.2 BACKFILL
A. General: Backfill shall be suitable of such gradation and moisture content that the soil will compact to the specified density and remain stable. Unusable materials shall not be used.
B. Cover Material: Pipe cover material shall consist of durable particles ranging in size from fine to coarse (No. 200 to 1 inch) in size in a substantially uniform combination. Unwashed bank-run sand and crushed bank-run gravel will be considered generally acceptable. Bedding material may be used for cover material.

C. Granular Backfill - Special Backfill: Granular backfill, when indicated on the plans or as ordered by the Engineer, shall be used for backfilling provided it meets the following soils classified by the Unified Soil Classification System ASTM D-2487 or the Indiana State Highway Standard Specification Section 211 - Special Fill and Backfill ("B" Borrow).
Group Symbols Typical Names
GW Well-graded gravels and gravel-sand mixtures, little or no fines
SW Well-graded sands and gravel-sand mixtures, little or no fines

D. Suitable Excavated Materials as Backfill: Excavated material shall be used when earth backfill is specified on the plans or where granular backfill or flowable fill is not specifically specified, provided that such material consists of loam, clay, or other materials which, are suitable for backfilling. Unsuitable backfill or frozen backfill material shall not be used. Suitable backfill shall be the following soils, classified by the Unified Soil Classification System, ASTM D-2487:
Group Symbols Typical Names
GW Well-graded gravels and gravel-sand mixtures, little or no fines
SW Well-graded sands and gravel-sand mixtures, little or no fines
SP Poorly graded sands and gravelly sands, little or no fines
SM Silty sands, sand-silt mixtures
SC Clayey sands, sand-clay mixtures
ML Inorganic silts, very fine sands, rock flour, silt, or clayey fine sands
CL Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, silty clays, lean clays

E. Unsuitable Materials: Materials which are unsuitable for backfill include stones greater than 8 inches in their largest dimension, pavement, rubbish, debris, wood, metal, plastic, and the following soils, classified by the Unified Soil Classification System, ASTM D-2487:
Group Symbols Typical Names
OL Organic silts and organic silty clays of low plasticity
OH Organic clays of high plasticity, fat clays
MH Organic clays of medium to high plasticity
PT Peat, muck, and other highly organic soils

F. Concrete Backfill: Concrete used for backfill around sewers, water mains, or other utility piping shall be Class B concrete.
G. Cellular Concrete: Light weight Cellular concrete may be used for filling of abandoned sewers as a grouting mixture for filling voids and as a substitute for backfill concrete in tunnels or casing pipes. The cellular concrete shall be produced by blending preformed foam with cement-sand/grout slurry to produce a concrete having a fresh weight per cubic foot of not less than 75 pounds.

H. Flowable Fill
1. Flowable fill shall be in accordance with INDOTSS Section 213 and as specified herein.
a. Unconfined Compressive Strength (28 day): 50-150 psi
b. Flow Test - Diameter of Spread: 8 inches ± 1 inch

2. Design: Mix design shall be prepared to be submitted and approved by the Town of Westfield Public Works Department or designated engineer. A trial batch demonstration may be required. The mix design shall include a list of all ingredients, the source of all materials, the gradation of all aggregates, the names of all admixtures and dosage rates, and the batch weights. Except for adjustments to compensate for routine moisture fluctuations, minor mix design changes after the trial batch verification shall be documented and justified prior to implementation by the Contractor. A change in the source of materials or addition or deletion of admixtures or cementitious materials will require the mix design to be re-submitted for approval. The Contractor shall be required to provide test data from a laboratory which shows that the proposed mix design is in accordance with the requirements listed in this specification.

PART 3 - EXECUTION
3.1 EXISTING UTILITIES, STRUCTURES, AND PROPERTY
A. All poles, fences, sewer, gas, water or other pipes, wires, conduits and manholes, railroad tracks, buildings, structures and property along the route of excavation shall be supported and maintained as shown on the drawings. Replace movable items which are damaged during construction.
B. Movable items such as mail boxes may be temporarily relocated during construction. Place movable items in their original location immediately after backfilling is completed, unless otherwise shown on the drawings.

C. The Contractor shall proceed with caution in the excavation and preparation of trenches so that the exact location of underground utilities and structures, both known and unknown, may be determined. The Contractor shall be responsible for the repair of utilities and structures when broken or otherwise damaged.
D. Whenever, in the opinion of the Westfield Public Works Department, it is necessary to explore and excavate to determine the location of underground structures, the Contractor shall make explorations and excavations for such purpose.

E. Wherever sewer, gas, water, or other pipes or conduits cross the trench, the Contractor shall support said pipes and conduits without damage to them. The manner of supporting such pipes, etc., shall be subject to the approval of the owner of the utility involved.
F. When utility lines that have to be removed or relocated are encountered within the area of operations, the Contractor shall notify the Westfield Public Works Department or the owner of that utility in ample time for the necessary measure to be taken to prevent interruption of the service.

G. The Contractor shall so conduct the work that no equipment, material, or debris will be placed or allowed to fall upon private property in the vicinity of the work unless he shall have first obtained the property owner's written consent thereto and shall have shown said written consent to the Town.
H. All excavated material shall be piled in a manner that will avoid obstructing sidewalks and driveways. Hydrants under pressure, valve pit, and police call boxes, fire and police call boxes, or other utility controls shall be left unobstructed and accessible until the work is completed. Gutters shall be kept clear and other satisfactory provisions made for street drainage, and natural watercourses shall not be obstructed.

I. All streets, alleys, pavements, parkways, and private property shall be thoroughly cleaned of all surplus materials, earth, and rubbish placed thereon by the Contractor.
3.2 CLEARING
A. Clear and remove logs, stumps, brush, vegetation, rubbish, and other perishable matter from the project site as required to perform work.
B. Do not remove or damage trees that do not interfere with the work. Completely remove trees required to be removed, including stumps and roots. Properly treat damaged trees which can be saved.

C. Debris from the trees removed, including trunk, branches, leaves, roots and stumps, shall not be buried or burned on the job site, but must be completely hauled away and disposed of at the Developer's or Contractor's expense.
D. Clear and remove trees, logs, stumps, brush, vegetation, rubbish, and other perishable matter from the existing and proposed right-of-way.
3.3 STRIPPING AND STOCKPILING OF TOPSOIL
A. Strip topsoil and vegetation from the excavated areas. Clean topsoil may be stockpiled for reuse as the upper 6 inches of the areas to be seeded.

3.4 PAVEMENT AND WALK REMOVAL
A. Remove existing pavement and walks from the excavated areas. Remove excavated asphaltic and concrete materials from the job site as these materials are excavated.
B. The width of pavement removed along the normal trench for the installation of pipe and structures shall not be less than two (2) feet on either side of the trench and be in accordance with Standard Detail P-18. Remove all existing pavement when excavation requires the removal of 75% or more of the total existing pavement width. If over 50% of one travel lane is disturbed, restoration must be extended to the centerline of the roadway.

C. Remove walks completely when excavation is along the length of a walk and requires the removal of part of the walk. Remove walks to existing joints in the walks when excavation crosses walks. If there are no joints in an existing walk, the width of walk removed shall not exceed the width of the trench by more than 12 inches on each side of the trench.
D. Use methods to remove pavement and walks that will assure the breaking or cutting of pavement and walks along straight lines. The face of the remaining pavement and walk surfaces shall be approximately vertical.

E. All concrete sidewalk and asphaltic paths removed must be replaced per the WPWD Standards Section 02500 and Standard Details P-10, P-11, and P-16. All restoration work is subject to inspection by WPWD.
3.5 EXCAVATING
A. General: After stripping of topsoil and vegetation, perform excavations of every description regardless of material encountered within the grading limits of the project to lines and grades as indicated on the drawings or as otherwise specified.
1. Materials removed below the depths indicated shall be replaced to the indicated excavation grade with satisfactory bedding materials placed and compacted.

2. Dewatering: Keep excavations free from water until the water mains, force mains, sewers, structures, and appurtenances to be constructed in the excavations are completed and will safely withstand forces from water. Provide sufficient dewatering equipment and make satisfactory arrangements for the disposal of the water without undue interference with other work, damage to property, or damage to the environment.
3. Operate dewatering equipment ahead of pipe laying and keep the water level below the pipe invert until the pipe is secured by backfill.
C. Trenching: Trees, boulders, and other surface encumbrances, located so as to create a hazard to employees involved in excavation work or in the vicinity thereof at any time during operations, shall be removed or made safe before excavating is begun.

4. Do not open more than 100 feet of trench in advance of the installed pipe, unless otherwise directed or permitted by the Westfield Public Works Department or designer. Excavate the trench within 6 inches of full depth for a distance of at least 30 feet in advance of the pipe laying, unless otherwise directed or permitted.
5. Contractor shall be responsible for the determination of the angle of repose of the soil in which the trenching is to be done. Excavate all slopes to at least the angle of repose except for areas where solid rock allows for line drilling or pre-splitting, or where shoring or trench box is to be used.

6. Sides, slopes, and faces of all excavations shall meet accepted engineering requirements by scaling, benching, barricading, rock bolting, wire meshing, or other equally effective means. Give special attention to slopes which may be adversely affected by weather or moisture content.
7. Flatten the trench faces when an excavation has water conditions, silty materials, loose boulders, and areas where erosion, deep frost action, and slide planes appear.

8. Shoring, sheeting, trench box, or other means shall be used to support sides of trenches in hard or compact soil when the trench is more than 5 feet in depth and 8 feet or more in length. Sides of trenches shall include embankments adjacent to trenches. In lieu of shoring, the sides of the trench above the 5-foot level may be sloped to preclude collapse, but shall not be steeper than a 1-foot rise to each 1 1/2-foot horizontal. Provide a bench of 4 feet minimum at the toe of the sloped portion of the trench wall when the outside diameter of the pipe to be installed is greater than 6 feet.
9. Provide diversion ditches, dikes, or other suitable means to prevent surface water from entering an excavation and to provide adequate drainage of the area adjacent to the excavation. Do not allow water to accumulate in an excavation. If possible, the grade should be away from the excavation.

10. Excavations shall be inspected by a competent Contractor's representative after every rainstorm or other hazard-increasing occurrence, and the protection against slides and cave-ins shall be increased, if necessary.
11. Do not store excavated or other material nearer than 4 feet from the edge of any excavation. Store and retain materials so to prevent materials from falling or sliding back into the excavation. Install substantial stop log or barricades when mobile equipment is utilized or allowed adjacent to excavations.

12. The design of the water main, force main, and/or sewer pipe and structures is predicated upon the width of trench specified in this Article. The Contractor shall be responsible for the provision and installation, at his own expense, of such remedial measures as may be directed by the Westfield Public Works Department or designer; should the trench width limits specified in this Article be exceeded.
13. Test the air in excavations in locations where oxygen deficiency or gaseous conditions are possible. Establish controls to assure acceptable atmospheric conditions. Provide adequate ventilation and eliminate sources of ignition when flammable gases are present. Attended emergency rescue equipment, such as breathing apparatus, a safety harness and line, and basket stretcher, shall be readily available where adverse atmospheric conditions may exist or develop in an excavation.

14. Provide walkways or bridges with guardrails where employees or equipment are required or permitted to cross over excavations.
15. Provide adequate barriers and physically protect all remotely located excavations. Barricade or cover all wells, pits, shafts, and similar excavations. Backfill temporary wells, pits, shafts, and similar excavations upon completion of exploration and similar operations.

D. Quicksand: Carry on the work with utmost vigor and proceed with the work expeditiously when running sand, quicksand, or other bad or treacherous ground is encountered. Install bedding to support the pipe as directed.
E. Blasting: Removal of rock from the excavation may be facilitated by the use of controlled explosives.
1. Blasting supervision and Blasting Monitoring and Control Programs shall meet the requirements of this Section.
2. Storage procedures for explosives shall be developed by the Contractor and submitted to the Engineer before explosives are brought to the job site.

3.6 SHEETING
A. The Contractor shall be responsible for construction means, methods, techniques, and procedures, and for providing a safe place for the performance of the work by the Contractor, Subcontractors, suppliers and their employees, and for access use, work, or occupancy by all authorized persons.
B. The Contractor shall be solely responsible for all obligations prescribed as employer obligations under Chapter XVII of Title 29, Code of Federal Regulations, Part 1926, otherwise known as "Safety and Health Regulations for Construction."

C. Adequate supporting systems, such as sheeting, shoring, piling, cribbing, and bracing shall be furnished and installed by the Contractor as required to protect existing buildings, utilities, and property from damage during the progress of the work.
3.7 STORAGE AND REMOVAL OF EXCAVATED MATERIAL
A. Suitable excavated material required for filling and backfilling operations may be stockpiled in on-site locations, at the discretion of the Westfield Public Works Department or designer, until the material is ready to be placed.

B. Remove unusable materials from the job site as unusable materials are excavated. Remove surplus suitable materials from the job site as trenches are backfilled.
3.8 TEMPORARY PILING
Prevent foreign matter from entering pipe while it is being installed. Do not place debris, tools, clothing, or other material in the pipe. Close the open ends of pipe by watertight plugs when pipe laying is not in progress. Remove any earth or other material that enters pipe, lateral pipe, or appurtenances through any open pipe end.

3.9 BACKFILLING WATER MAIN AND FORCE MAIN TRENCHES
A. Backfilling of water main and force main trenches shall meet the requirements of ANSI/AWWA C600, unless otherwise specified in this Section.
B. Do not backfill trenches and excavations until all utilities have been inspected by the Westfield Public Works Department or designer and until all underground utilities and piping systems are installed in accordance with the requirements of the specifications and the drawings. Required hydrostatic tests may be applied to the line either before or after the trench is backfilled, subject to approval of the Westfield Public Works Department or designer.

C. Place and tamp bedding and backfill in a manner which will not damage pipe coating, wrapping, or encasement.
D. Material from the trench subgrade to the centerline of the pipe shall be Class II bedding. Place bedding by hand or approved mechanical methods in layers of 8 inches loose depth. Compact bedding by hand tamping or with a power operated hand vibrating compactor. Deposit bedding in the trench for its full width on each side of the pipe simultaneously.
E. Place pipe cover material from the centerline of the pipe to 12 inches over the pipe. Compact pipe cover material to the density required to allow backfill over the pipe cover material to be compacted to the density specified in this Article.

3.11 MAINTAINING TRAFFIC
A. Before closing any thoroughfare, the Contractor shall notify and, if necessary, obtain a permit or permits from the duly constituted public authority having jurisdiction, state, county, or city/town, school corporation, and public safety agencies, which notice shall be given not less than 72 hours in advance of the time when it may be necessary in the process of construction to close such thoroughfare.
B. The Contractor shall notify the Town of his intention to close a particular street 72 hours in advance of the proposed closing. The Contractor shall place all proper detour signs and barricades prior to the actual street closing.

C. During the construction, the Contractor shall be responsible for maintaining and protecting the pedestrian and vehicular traffic at all times at all streets and providing access to all residential and commercial establishments adjacent to the construction area. The Contractor shall furnish and maintain signage, barricades, flares, etc., in accordance with the latest version of the Indiana Manual on Uniform Traffic Control Devices. The signage, barricades, etc., must be in good condition.
D. The Contractor shall conduct his work in such manner as not to unduly or unnecessarily restrict or impede normal traffic through the streets of the community. Insofar as it is practicable, excavated material and spoil banks shall be located in such manner as to avoid obstructing traffic and the traveled way of all streets, roads, and alleys shall be kept clear and unobstructed insofar as is possible and shall not be used for the storage of construction materials, equipment, supplies, or excavated earth, except when and where necessary. If required by duly constituted public authority, the Contractor shall, at his own expense, construct bridges or other temporary crossing structures over trenches so as not to unduly restrict traffic. Such structures shall be of adequate strength and proper construction and shall be maintained by the Contractor in such manner as not to constitute an undue traffic hazard. Private driveways shall not be closed except when and where necessary, and then only upon due advance notice to the Engineer and for the shortest practicable period of time consistent with efficient and expeditious construction. The Contractor shall be liable for any damages to persons or property resulting from his work.

3.12 WALKS AND PASSAGEWAYS
The Contractor, when required, shall make provisions at cross streets for the free passage of vehicles and foot passengers, either by bridging or otherwise, and shall not obstruct the sidewalks, gutters, or streets, nor prevent in any manner the flow of water in the latter, but shall use all proper and necessary means to permit the free passage of surface water along the gutters. The Contractor shall immediately cart away all offensive matter, exercising such precaution as may be directed by Westfield Public Works Department or designer. All material excavated may be disposed of as to inconvenience to the public and adjacent tenants as little as possible and to prevent injury to trees, sidewalks, fences, and adjacent property of all kinds. The Contractor may be required to erect suitable barriers to prevent such inconvenience or injury.

3.13 WARNING LIGHTS
The Contractor shall place sufficient warning lights on or near the work and keep them illuminated during periods of reduced visibility (from twilight in the evening until sunrise) and will be held responsible for any damages that any party or the Town may sustain in consequences of neglecting the necessary precaution in prosecuting this work.
F. Do not use the following materials for backfill:
1. Unusable materials;
2. Frozen materials;
3. Materials which are too wet or too dry to be compacted to the densities specified in this Article.

G. Where the edge of the trench is within 5 feet of the existing roadway pavement, it shall be backfilled with Flowable Backfill. Where the trench is located within existing pavement or any trench specifically indicated on the drawings shall be backfilled with Flowable Backfill. Where the edge of the trench is within 5 feet or crosses a proposed roadway pavement, it shall be backfilled with Flowable Backfill. Place Flowable Backfill in lifts. In all areas, cuts and trenches shall be backfilled with Flowable Backfill to within 1 1/2 inches of the existing asphalt paved surface. The remainder of the trench is to be filled with crushed stone and compacted in place, prior to opening the street to traffic. The Contractor shall add crushed stone and grade until sufficient settlement has taken place and final restoration is made.

3.10 BACKFILLING SANITARY SEWER AND STORM SEWER TRENCHES
A. Do not backfill trenches and excavations until all utilities have been inspected by the Westfield Public Works Department or designer and until all underground utilities and piping systems are installed in accordance with the requirements of the specifications and the drawings.
B. Place and tamp bedding and backfill in a manner which will not damage pipe coating, wrapping, or encasement.
C. Bedding procedures for sanitary sewers and storm sewers shall be as specified in manufacturers recommendation or WPWD specification. The more stringent specification shall apply.

D. If bedding does not cover the pipe, place pipe cover material from the top of bedding to 12 inches over the pipe. Compact pipe cover material to the density required to allow backfill over the pipe cover material to be compacted to the density specified in this Article.
E. Do not use the following materials for backfill:
1. Unusable materials;
2. Frozen materials;
3. Materials which are too wet or too dry to be compacted to the densities specified in this Article.

F. Where the edge of the trench is within 5 feet of or crosses the existing roadway pavement, it shall be backfilled with Flowable Backfill. Backfill any trench specifically indicated on the drawings with Flowable Backfill.
G. Trenches Not Requiring Special Backfill: Backfill trenches not requiring granular backfill with suitable excavated material. Place and compact backfill to produce an adequate foundation for the applicable paved or unpaved surface treatment. Fill and restore any settlement of the backfill. In paved areas, backfill shall be maintained to subbase elevation. In unpaved areas, backfill shall be mounded above finish grade to allow for settlement. Grade unpaved area to be restored 6 inches below finish grade after settlement of backfill and immediately before restoration of vegetated areas. Place 6 inches of topsoil over area to be restored.

H. Trenches in Traveled Pavement: All cuts and trenches in paved streets or other paved areas shall be backfilled with flowable fill material unless granular backfill is specifically approved by the Director of Public Works to within 12 inches of the street surface in grass areas or to the bottom of the pavement section.

3.14 CLEANUP AND MAINTENANCE
A. Cleanup the job site as backfilling is completed. Remove excess earth, rock, bedding, materials, and backfill materials. Remove unused piping materials, structure components, and appurtenances. Restore items moved, damaged, or destroyed during construction. Grade area to be restored. Leave backfill mounded over trenches which are not backfilled with Special Backfill. Cleanup and restoration specified in this paragraph shall be completed within 1,000 feet of excavation.
B. Restoration of grass, bushes, trees, and other plants shall be completed by Contractor to original condition or better condition.
C. Restoration of pavement and walks shall be specified in Section 02500, Paving and Surfacing. A temporary driving surface, such as crushed stone, shall be compacted in place in the trench area as backfilling is complete. Cold-mix asphalt patching material may be used as a temporary driving surface at the Contractor's option or when specifically called for in the plans or specifications. Temporary pavement shall not be more than 1,000 feet behind the excavation. When no existing pavement remains after excavation, a temporary compacted aggregate surfacing may be provided instead of the permanent pavement or a temporary cold-mix asphalt pavement.

D. Maintain the job site until the work has been completed and accepted. Fill trenches which settle when settlement is visible. Restore items damaged by construction or improper restoration. Keep dust conditions to minimum by the use of water.
END OF SECTION 02222 WESTFIELD STANDARD - 2006

WESTFIELD STANDARD - 2006 SECTION 02558 - IDENTIFICATION/LOCATION TAPE AND WIRE
PART 1 - GENERAL
1.1 SCOPE
A. Furnish and install identification and warning tape over the centerline of all buried piping. See Figure W-1 for detail.
B. Furnish and install location wire for all buried non-metallic piping. See Figure W-1 for detail.

PART 2 - PRODUCTS
2.1 IDENTIFICATION TAPE
A. Identification/Location Tape
1. Identification/Location tape shall be manufactured of inert polyethylene so as to be highly resistant to alkalis, acids and other destructive agents found in soil, and shall have a minimum thickness of four mils. Tape width shall be a minimum of three inches and a maximum of six inches and shall have background color specified below, imprinted with black letters. Imprint shall be as specified below and shall repeat itself a minimum of once every two feet for entire length of tape.
2. Warning tape shall be as described above except no solid foil is required.

B. Tape background colors and imprints shall be as follows:
Imprint Background Color
"Caution - Water Line Buried Below" Blue
"Caution - Sanitary Force Main Buried Below" Green
C. Identification tape shall be as follows:
1. For PVC Water Pipe: Terra Tape Sentry Line or approved equal.
2. For PVC Sanitary Force Main Pipe: Terra Tape Sentry Line or approved equal.

D. Products above are as manufactured by Reef Industries, Inc., Houston, Texas or equivalent manufacture.
2.2 LOCATOR WIRE
Locator wire shall be #10 solid copper wire.
PART 3 - EXECUTION
3.1 INSTALLATION OF IDENTIFICATION TAPE
A. Identification tape shall be installed over all buried piping in accordance with the manufacturer's installation instructions and as specified herein.
B. Identification tape shall be installed one foot over centerline of pipe unless otherwise noted on plans.
C. Warning tape shall be installed two feet below final grade over centerline of pipe.

3.2 INSTALLATION OF LOCATOR WIRE FOR NON-METALLIC PIPE
A. Identification tape shall be installed over all buried piping in accordance with the manufacturer's installation instructions and as specified herein.
B. For sanitary force main, locator wire shall be installed along the top and taped to the pipe. Access points for the locator wire shall be placed every 400 feet. Access points shall be 4-inch diameter PVC with threaded metallic caps painted green. Pipe shall be flush with grade. Wire shall be pulled to within 6-inches of the top of the pipe.
C. For open-cut trenches installation, one locator wire should be used. For trenchless installations (jacking and bore or directional drilling) two locator wires shall be used.

10505 N. College Avenue Indianapolis, Indiana 46280
weihe.net
317 846 - 6611
800 452 - 6408
317 843 - 0546 fax
ALLAN H. WEIHE, P.E., I.S., - FOUNDER

WEIHE ENGINEERS
Land Surveying/Civil Engineering
Landscape Architecture

Table with columns: DATE, BY, REV, PROJECT NO., DWG NAME, DESIGNED BY, DRAWN BY, CHECKED BY, DATE. Includes revision history for project W13.0559.

REVISIONS AND ISSUES
DATE BY REV
12-23-2015 RLV W13.0559
01-29-2016 RLV W130559-001 (ISSUE)
SUBMITTED FOR REVIEW

JAMES K. SHINNEMAN P.E. 01003932
REGISTERED PROFESSIONAL ENGINEER
STATE OF INDIANA
NOTES:
1. ALL DIMENSIONS ARE TO FACE UNLESS OTHERWISE NOTED.
2. SEE DRAWING FOR ALL DIMENSIONS.

END OF SECTION 02558 WESTFIELD STANDARD - 2006
JAMES K. SHINNEMAN P.E. 01003932

Section M4, Lot 2 of Bridgewater Center located at 3404 East 146th Street, Westfield, IN 46033
WESTFIELD SPECS - GENERAL
Part of the S/W of Section 17, Township 18 North, Range 4 East, Washington Township, Hamilton County, Indiana

PREPARED FOR:
Rethelers AT BRIDGEWATER
SHEET NO. C901
PROJECT NO. W13.0559

LOCATION: 111 2013 W 130559 Engineering\Westfield\130559-C-001.rvt
DATE/TIME: January 29, 2016 8:42:20m
PLOT/DWG: 101 - weihelr

WESTFIELD STANDARD – 2003
SECTION 02731 – GRAVITY SANITARY SEWERS

PART 1 – GENERAL

1.1 GENERAL

A. This section covers all work necessary for the installation of gravity sanitary sewers and related items complete, including manholes, junction chambers, diversion chambers, hosing chambers, and miscellaneous concrete structures.

B. Sewer pipe shall be the size shown on the drawings and shall meet all requirements of these specifications.

C. If a material type is shown on the drawings, that material shall be used in the installation unless otherwise noted in the specifications.

1.2 PIPE MARKING

Each length of pipe shall bear the name or trademark of the manufacturer, the location of the plant, and the date of manufacture. Each length shall likewise be marked to designate the class or strength of the pipe. The marking shall be made on the exterior or interior of the pipe barrel near the bell or groove end and shall be plainly visible.

1.3 SUBMITTALS

Before construction and preferably before fabrication, the Contractor shall submit to the Westfield Public Works Department for approval calculations on the thickness or strength class and drawings showing pipe lengths, joints, and other construction and installation details. All pipe furnished shall be fabricated only in accordance with the drawings and these specifications.

1.4 QUALITY ASSURANCE

A. Performance Tests: The Contractor shall test all gravity sewers constructed. The Contractor shall constantly check horizontal and vertical alignment. Testing for vertical deflection in the case of non-rigid pipe and sewer watertightness testing in the case of all gravity sewers and hydrostatic testing of ductile iron pipe shall be as specified in this Section.

B. Line and Grade Requirements: The Contractor shall provide assurance to the Westfield Public Works Department's representative that the sewer is laid accurately to the required line and grade as shown on the drawings. The Contractor shall utilize a laser beam instrument to lay and check the alignment and grade between manholes. Before proceeding with the next section of sewer, the last section shall be checked for proper line and grade. Variations from a uniform line and grade as shown on the drawings and described below shall be cause for the line to be rejected.

1. Variance from established line and grade shall not be greater than 1/32 of an inch per inch of pipe diameter and not to exceed 1/2 inch, provided that such variation does not result in a level or reverse sloping invert; provided also that the variation in the invert elevation between adjoining ends of pipe, due to non-concentricity of joining surface and pipe interior surfaces, does not exceed 1/64 inch per inch of pipe diameter or 1/2 inch maximum.

C. Test Sections

1. Initial Performance Test: An initial performance and leakage test will be performed on the first sections of sanitary sewer constructed of approximately 600 feet in length of each size and type sewer material installed. No additional tests shall be required until the first section of sewer of each size and type of sewer material has satisfactorily passed the test for line and grade and the leakage test.

2. Subsequent Performance Testing: After the initial performance test and leakage test and as work progresses, the Westfield Public Works Department or designee may designate additional sections for testing as conditions in his opinion warrant. If a review of the Contractor's workmanship leads the Westfield Public Works Department or designee to question whether or not the tolerances and standards specified are being met, the Westfield Public Works Department or designee, reserves the right to select other locations and lengths to be tested. The Westfield Public Works Department or designee shall notify the Contractor of the location where a test is to be required not later than 15 days after the sewer installation has been completed. Unless otherwise authorized, the Contractor shall arrange to commence the test within 15 days after the sewer has been installed or 15 days after receiving notification by the Westfield Public Works Department, whichever date is later.

3. Final Performance Testing for Acceptance: Before acceptance for all new sanitary sewers, the Contractor and the Westfield Public Works Department or designee shall check all sewers, even if previously checked, for accurate alignment and grade. Also, all sanitary sewers shall be tested as specified in Articles 3.10 through 3.14 of this Section for watertightness. The program of testing whether by infiltration, exfiltration, or testing, or vacuum testing shall be determined by the Westfield Public Works Department.

1.5 LENGTH OF OPEN TRENCH

Except by permission of the Westfield Public Works Department not more than 450 feet of trench shall be opened at any one time. Not more than 30 feet of trench may be opened in advance of the completed pipe laying operation, and not more than one street crossing may be obstructed by the same trench at any one time.

1.6 RELATION TO WATER MAINS

A. Sewers must be laid to least 10 feet horizontally from any existing or proposed water main. The distance is to be measured edge to edge. Should special conditions prevent this separation, the Contractor shall notify the Westfield Public Works Department for specific instructions regarding the treatment of the separation. Special conditions may allow installation of the sewer closer to a water main, provided that the water main is in a separate trench or on an undisturbed earth shelf located on one side of the sewer and at an elevation so the bottom of the water main is at least 18 inches above the top of the sewer. It may be necessary to install 150 psi water main pipe and joints as sewer pipe for the congested areas.

B. Whenever the sewer crosses a water main, it should be laid at least 18 inches below the main, or the water main should be relaid with fittings to cross over the sewer. The crossing shall be arranged so that the sewer joints will be equidistant and as far as possible from the water main joints.

C. When it is impossible to obtain proper horizontal and vertical separation as stipulated above, the sewer shall be designed and constructed equal to water pipe, and shall be pressure tested to assure watertightness prior to backfilling. Maximum distance between sewer pipe joints and water pipe shall be provided where vertical separation is a problem.

PART 2 – PRODUCTS

2.1 MATERIALS

A. Sewers 15 inches or Smaller

1. Sewers 15 inches in diameter or smaller shall be PVC composite pipe, polyvinyl chloride pipe or ductile iron pipe.

2. PVC Composite Sewer Pipe and Fittings: PVC composite sewer pipe and fittings shall conform to ASTM D2680, latest revision.

3. Polyvinyl Chloride Pipe and Fittings

a. Polyvinyl chloride pipe and fittings shall conform to ASTM D3034 SDR 35, Type PSM, latest revision.

4. Ductile Iron Pipe and Fittings: Ductile iron pipe and fittings shall conform to the requirements of ANSI/ASTM A746, Ductile Iron Gravity Sewer Pipe.

a. Thickness class requirements of ductile iron pipe to be used in conveyance of sanitary sewage by gravity shall be minimum thickness of Class 350 unless otherwise noted for standard length pipe.

b. Outside surfaces of the pipe and fittings shall be bituminous coated complying with ANSI/AWWA A21.51/C151 and ANSI/AWWA A21.110/C110.

c. Inside surfaces of all pipe, fittings and adapters shall be lined with cement mortar and a bituminous seal coat. Cement mortar lining and bituminous seal coat shall meet the requirements of ANSI/AWWA A21.4/C104.

d. Ductile iron pipe and fittings shall be push-on type conforming to ANSI A21.11 (AWWA C111), latest revision. Fittings shall be ductile iron and shall comply with ANSI Specification A21.10, latest revision, with mechanical joints for 150 psi working pressure.

5. Joints for PVC Sewer Pipe

a. Joints on PVC sewer pipe shall be the integral bell type gasketed joint designed so that when assembled the gasket inside the bell is compressed radially on the pipe spigot to form a positive seal. The joint shall be so designed to avoid displacement of the gasket when installed in accordance with manufacturer's recommendations. The joint shall comply with the physical requirements of ASTM D3212, and the gasket shall be the only element depended upon to make the joint flexible and watertight.

b. All PVC pipe entering a manhole shall have a manhole watertop gasket as supplied by the manufacturer firmly clamped around the pipe at the manhole. If flexible entry type manhole system is used, the watertop gasket is not required.

B. Fittings

1. Fittings such as wyes and bends shall be made in such a manner as will provide strength and watertightness at least equal to the class of the adjacent main line pipe to which they are jointed and shall conform to all other requirements specified for pipe of corresponding class and internal diameter. Joints shall be of the same type as used on the adjoining pipe.

2. Fabricated branches for wyes and tees shall be securely attached to the wall of the pipe in a watertight manner and shall be flush with the inside surface of the pipe. The branch shall have their axes perpendicular to the longitudinal axis of the pipe. Wye branches shall have their axes approximately 60 degrees for clay pipe and 45 degrees for concrete pipe from the longitudinal axis of the pipe, measured from the bell end. Pipe reinforcement shall not be interrupted beyond a radial distance of 3 inches outside of the fitting.

C. Manholes and Other Structures: Manholes shall be constructed of monolithic concrete or precast manhole sections. Precast manhole sections shall conform to requirements of ASTM Specification C478, latest revision.

1. Materials for manholes, junction chambers, diversion chambers, and miscellaneous concrete structures shall comply with the following:

a. Concrete for precast manhole sections shall be 3000 psi concrete. Monolithic manholes shall use 4000 psi concrete. Ready-mix concrete shall conform to ASTM C94 Alternate

2. Maximum size of aggregate shall be 1-1/2 inches. Slump shall be between 2 and 4 inches.

b. Forms for chamber and structures shall be plywood or other approved material. Steel forms shall be used for the inside face of monolithic concrete manholes.

c. Reinforcing steel shall conform to ASTM A615, Grade 40 deformed bars, or ASTM A616, Grade 40 deformed bars.

Mortar Materials
(1) Sand – ASTM Designation C144, passing a No. 8 sieve.
(2) Cement – ASTM Designation C150, Type 1.
(3) Water – shall be potable.

e. All joints shall be fully sealed and waterproofed. Rubber gaskets for precast concrete manhole sections shall meet the requirements of ASTM C443. The gasket shall be the sole element depended upon to make the joint flexible and watertight.

f. The manufacturer of the precast manholes shall provide core-drilled openings to produce a smooth, uniform, cylindrical hole of the proper size to accommodate a resilient connector meeting the requirements of ASTM C 923 for all sewers entering and leaving the manhole. The resilient connectors shall be either Press-Seal Gasket Corp., which provides PSX gasket or Press Wedge II; or similar flexible manhole sleeves furnished by Kor-N-Seal by NPG Systems, Inc.; or equal.

g. Precast manhole sections shall be steam cured and shall not be shipped from the point of manufacture for at least five days after having been cast. The exterior surface of each section shall be thoroughly coated with a cool tar epoxy type coating as manufactured by INEMEC Co., Trade-468413 Hi-Build Ineme-Tar; or approved equal by the Engineer. Final dry mix thickness shall be a minimum of 12 mils. Monolithic concrete manholes and other concrete structures shall be cured for a minimum of seven days and then coated in the field with a cool tar epoxy type coating as mentioned above.

h. Manhole castings shall be of good quality cast iron and/or ductile iron, conforming to ASTM Designation A48. Castings shall have a total weight of not less than 335 pounds and shall conform to the design of the manhole.

i. Manhole castings shall be of good quality cast iron and/or ductile iron, conforming to ASTM Designation A48. Castings shall have a total weight of not less than 335 pounds and shall conform to the design of the manhole.

j. Any other special manholes, junction chambers, diversion chambers, and miscellaneous concrete structures shall be constructed as detailed on the drawings.

k. The Contractor may, at his option, furnish and install a combination precast concrete base and first section with pre-cut openings for services. Detailed drawings shall be submitted to the Westfield Public Works Department prior to manufacture.

l. Precast manhole sections shall have a lifting eye cast into the wall for lifting the section. Lifting holes through the precast section shall not be allowed.

D. Gross Trench: Gross top tank shall be constructed of 6000 psi concrete. All tank joints shall be sealed watertight with butyl rubber extrudible preformed gasket material. All outside riser ring surfaces shall be waterproofed 1/8" with trowelable grade butyl rubber back plaster.

PART 3 – EXECUTION

3.1 INSPECTION AND REJECTION OF PIPE

A. The quality of all materials, the process of manufacture, and the finished pipe shall be subject to inspection and approval by the Westfield Public Works Department. Such inspection may be made at the place of manufacture or on the work after delivery, or at both places; and the pipe shall be subject to rejection at any time on account of failure to meet any of the specifications' requirements even though sample pipes may have been accepted as satisfactory at the place of manufacture.

B. Prior to being lowered into the trench, each pipe shall be carefully inspected, and those not meeting the specifications shall be rejected and at once removed from the work.

C. The Westfield Public Works Department or designee shall have the right to cut cores from such pieces of the concrete pipe as he desires for such inspection and test as he may wish to apply. The cost to cut the cores and administer appropriate test shall be paid by the developer.

D. Holes left by the removal of cores shall be filled in an approved manner by and at the expense of the manufacturer of the pipe.

E. The Westfield Public Works Department or designee shall also have the right to take samples of concrete and test thereof as he may wish. The cost to administer appropriate test shall be paid by the developer.

F. Any pipe which has been damaged after delivery will be rejected and replaced solely at the Contractor's expense.

3.2 HANDLING PIPE

Each pipe section shall be handled into its position in the trench only in such manner and by such means as the Westfield Public Works Department or designee approves as satisfactory. As far as practicable, the Contractor will be required to furnish slings, straps, and other approved devices to permit satisfactory support of all parts of the pipe when it is lifted.

3.3 NOTICE TO WESTFIELD PUBLIC WORKS DEPARTMENT

The Westfield Public Works Department or designee shall be notified when the pipes are to be laid in the trench. At least 15 feet of the pipe shall, under ordinary circumstances, be laid before covering begins.

3.4 LAYING PIPE

A. All pipe shall be inspected for soundness and damage due to handling immediately before being lowered into the trench. Any pipe found to be unsound or damaged will be rejected and shall be removed immediately from the site of the work.

B. All pipe shall be laid accurately to the required line and grade as shown on the drawings, and in the manner prescribed by the pipe manufacturer and appropriate ASTM Specifications, to form a close, concentric joint with the adjoining pipe and to bring the invert of each section to the required grade. The supporting of pipe on block will not be permitted.

C. Pipe laying shall proceed upward, beginning at the lower end of the sewer.

D. All sewers shall be designed and constructed to give mean velocities, when flowing full, of not less than 2.0 feet per second (0.6 m/s), based on Manning's formula using an "n" value of 0.013. The following are the recommended minimum slopes which should be provided; however, slopes greater than these are desirable.

Sewer Size	Minimum Slope	Nominal Slope in Feet Per 100 Feet (m/100m)
8 inch (200 mm)	0.40	0.40
10 inch (250 mm)	0.28	0.28
12 inch (300 mm)	0.22	0.22
14 inch (350 mm)	0.17	0.17
15 inch (375 mm)	0.15	0.15
16 inch (400 mm)	0.14	0.14
18 inch (450 mm)	0.12	0.12
21 inch (525 mm)	0.10	0.10
24 inch (600 mm)	0.08	0.08
27 inch (675 mm)	0.067	0.067
30 inch (750 mm)	0.058	0.058
33 inch (825 mm)	0.052	0.052
36 inch (900 mm)	0.046	0.046
39 inch (975 mm)	0.041	0.041
42 inch (1050 mm)	0.037	0.037

E. Practically watertight work is required, and the Contractor shall construct the sewers with the type of joint specified.

F. All pipe shall be laid to the line and grade as shown on the drawings. Variations from a uniform line and grade as shown on the drawings shall be cause for the line to be rejected.

G. The ends of the pipe shall be satisfactorily cleaned just before laying, and the joint shall be made in a satisfactory manner in accordance with the recommendations of the manufacturer on particular type of joint. All joint work shall be done by experienced workmen.

H. PVC (polyvinyl chloride) gravity sewer pipe and fittings, ASTM Designation D3034 SDR 35, shall be installed in accordance with the directions contained in ASTM Designation D2321. Only materials classified as Class I will be acceptable for bedding, haunching, and initial backfill of the pipe placed and compacted in accordance with ASTM D2321.

I. Joints on PVC pipe shall be the integral bell type gasketed joint designed so that when assembled the elastomeric gasket inside the bell is compressed radially on the pipe spigot to form a positive seal. The joint shall be so designed to avoid displacement of the gasket when installed in accordance with the manufacturer's recommendations. The gasket shall be the only element depended upon to make the joint flexible and watertight.

J. All PVC pipe entering a manhole shall have manhole watertop gasket as supplied by the manufacturer firmly clamped around the pipe. If flexible entry type manhole system is used, the watertop gasket is not required.

K. All PVC pipe shall have a deflection test performed by the Contractor in the presence of the Westfield Public Works Department or designee.

L. All pipe shall be bedded as described in this specification under Pipe Bedding. Bell holes shall be excavated in advance of pipe laying so the entire pipe barrel will bear uniformly on the prepared subgrade.

M. Each length of pipe shall be mechanically pulled "home" with a winch or come-along against the section previously laid and held in place until the trench and bedding are prepared for the next pipe section. Core shall be present in laying the pipe so as not to damage the bell end of the pipe. Mechanical means consisting of a cable placed inside the pipe with a winch, jack, or come-along shall be considered to pull the pipe home where pushing the pipe will not result in a joint going completely home and staying in place. Pushing the pipe home shall be done by means of a block and push bar. Use of hydraulic excavating equipment as the means of pushing or moving the pipe to grade will not be permitted.

N. The Contractor shall use laser beam equipment to maintain accurate alignment and grade. A qualified operator shall handle the equipment during the course of construction. If bending of the laser beam due to air temperature variations or dust in the air is apparent within the pipe units, a fan shall be provided to circulate the air. However, air velocity shall be used no so excessive as to cause pulsating or vibrating of the beam. Survey instruments may be used for checking alignment and grade if questions arise about the accuracy of the work.

O. Open excavation shall be satisfactorily protected at all times. At the end of each day's work, the open ends of all pipes shall be protected against the entrance of animals, earth, or debris by bulkheads or stoppers. The bulkheads or stoppers shall be perforated to allow passage of water into the installed pipe line to prevent flotation of the pipe line. Any earth or other material that may find entrance into the main sewer or into any lateral sewer through any such open end of unplugged branch must be removed at the Contractor's expense.

P. The Contractor shall conduct a leakage test as described in Sewer Tests of the specification on the first section of sewer of each size and type sewer material installed. No additional sewer pipe shall be installed until the first reach of sewer of each size and each type sewer material has satisfactorily passed the leakage test.

Q. The Contractor shall prevent all ground water and surface water from entering the existing sewer system during construction of a new sewer or force main extension.

R. Sanitary sewer designs that require crossing a county legal drain shall be approved and constructed per the latest standards of the Hamilton County Surveyor's Office.

3.5 PIPE BEDDING AND HAUNCHING

A. Each pipe section shall be laid in a firm foundation of bedding material and haunched and backfilled with care.

B. Prior to pipe installation, carefully bring bedding material to grade along the entire length of pipe to be installed. To provide adequate support for the pipe, the following bedding procedures are recommended.

1. When Class I material is used for bedding, little or no compaction is necessary due to the nature of the angular particles. A depth of 4 to 6 inches is generally sufficient to provide uniform bedding.

C. Bedding material shall have a minimum thickness beneath the pipe of 4 inches (100 mm) or one-eighth of the outside diameter of the pipe, whichever is greater, and shall extend up the sides of the pipe one-sixth of the outside diameter of the pipe.

D. For rigid pipe, such as concrete or ductile iron, backfill between the bedding material and a plane 12 inches (300 mm) over the top of the pipe shall be hand-placed finely divided earth, free from debris and stones, or granular backfill if required.

E. For flexible pipe such as PVC, the placement of embedment material, consisting of bedding, haunching, and initial backfill, must be done with care. The ability of the pipe to withstand loading in a trench depends a large part on the method employed in its installation. Class I material, as defined in specification Section 02022, Article 2.01, paragraph A, shall be used as embedment material for flexible pipe. Bedding thickness shall be as specified in paragraph C of this Section. The haunching material (the material from the bedding to the pipe springline) and initial backfill (the material from the pipe springline to a plane 12-inches over the top of the pipe), shall be hand placed. Care must be taken to not cause damage by compacting the material directly over the pipe.

F. In yielding subsoils, the trench bottom shall be undercut to the depth necessary and backfilled with graded, crushed stone to form a firm foundation. No additional payment shall be made for stabilizing yielding subsoils.

G. Where excavation occurs in rock or hard shale, the trench bottom shall be undercut and a minimum of 6 inches (150 mm) crushed stone bedding placed prior to pipe installation. Additional payment for rock excavation shall be made on "unit cost" projects only, and as prescribed under basis for payment.

3.6 MANHOLES AND OTHER STRUCTURES

A. Manholes and other structures are to be constructed at locations shown on the drawings and in accordance with the following specifications:

1. Precast concrete manhole sections shall conform to ASTM Designation C478, except as modified herein:
a. The joint design of the precast sections shall consist of a bell or groove on one end of the unit of pipe and a spigot or tongue on the adjacent end of the joining section.

b. The joint shall consist of a round rubber gasket confined in a groove in the spigot end of the precast manhole section and shall conform to Sections 6.1.6, 6.1.7 and 9 of ASTM Designation C443, latest revision and a 6 inch wide flexible butyl rubber joint sealant between the outside joints. Inside manhole joints are to be sealed with hydrogrip or nonshrink grout and brushed smooth.

2. Openings in manhole sections for sewer connections shall be coredrilled at the point of manufacture and shall be done to produce a smooth, uniform, cylindrical hole of proper size to accommodate a resilient connector meeting requirements of ASTM C 923. The resilient connectors shall be either Press-Seal Gasket Corp., PSX Gasket or Press-Wedge II; or similar flexible manhole sleeves furnished by Kor-N-Seal by NPC Systems, Inc.; or equal.

3. Manhole bases shall be cast-in-place concrete, reinforced as shown on the Standard Detail Sheet, or monolithic base and first section combination. Manhole bases shall be cast or placed on a minimum of 6 inches of compacted crushed stone.

4. Manhole chambers or inverts shall be preformed and poured with Class "B" concrete to the spring line of the connecting pipe. The finished invert shall be a semi-circular shaped smooth channel directing the flow to the downstream sewer.

5. Monolithic concrete manholes, junction chambers, and other cast-in-place concrete structures shall be cured for a minimum of seven days. The exterior surfaces shall then be coated thoroughly with a cool tar epoxy type coating as manufactured by INEMEC Co., Trade-468413 Hi-Build Ineme-Tar; or approved equal by the Westfield Public Works Department. Coating shall be 12 mil minimum dry film thickness. Each joint of precast concrete manhole sections, lifting holes, and holes left by the removal of cores shall be fully mortared and seal be coated with a 12 mil minimum dry film thickness of cool tar epoxy as specified upon reaching its final set.

6. Any additional holes cut in the field shall be drilled with a coredrill or in a manner approved by the Westfield Public Works Department or designee.

7. Manhole frames and lids shall weigh not less than 335 pounds and be of good quality cast iron, conforming to ASTM Designation A48. Unless specifically designated otherwise, manhole castings shall be the non-locking type. All manhole frames shall be cast or drilled with be cast or drilled with three holes equally spaced around base of frame and shall be securely anchored to cone section with three 3/8-inch stainless steel bolts, nuts, and washers. The joint between the casting frame and cone section shall be first sealed with cement mortar and then coated with a pliable butyl rubber or a cool tar epoxy coating upon reaching its final set to become a watertight joint.

8. Manhole steps shall be made form a steel reinforcing rod encapsulated in a copolymer polypropylene resin. Steps shall be placed as shown on the approved drawings.

3.7 HOUSE/BUILDING SERVICES

A. The Contractor shall install 6-inch diameter house/building service sewer shall be installed as shown on the Standard Detail Sheet. The house/building service shall extend from a "wye" or "tee" fitting in the main sewer line to the property line or easement line, unless stated otherwise.

B. The backwater prevention valve shall be located on the inside of basements or crawl spaces and readily accessible at all times. The backwater prevention valve for buildings located on slabs shall be installed on the building side of the clean out.

C. The Contractor shall contact the individual property owners for the preferred location of the house/building service to best suit the property owner's needs. If the Contractor is unable to contact the property owner in advance of laying the main sewer by or across the property, the Contractor shall so notify the Westfield Public Works Department or designee in writing.

D. Fittings for house/building service connections on a main line sewer 15 inches in diameter or smaller shall be tees or 45-degree wyes and shall be of the same material as the main line sewer, unless otherwise approved by the Westfield Public Works Department.

E. House/building services and connections on main line sewers greater than 15 inches in diameter shall be of a type that will maintain the structural integrity of the main line sewer and provide a watertight connection. Infrusion of house/building services into the flow way of the main line sewer should not be permitted.

F. Six-inch lateral pipe shall connect to the main line sewer at an angle of 15 degrees to 45 degrees from the spring line and shall include the necessary bends and straight pipe sections to reach the property line at the elevations specified. A pipe stopper or a bell cap shall be placed on/in the last bell. This stopper or bell cap should be compatible with the type of infiltration/exfiltration test performed on the sewer.

G. The Contractor shall furnish and use the proper fittings, couplings, and adapters suited to make the transition between different pipe materials which will maintain the structural integrity and the watertightness of the entire sewer system.

H. At the discretion of the Westfield Public Works Department, when and where improper installation practices are suspected, or questionable bedding materials and methods are employed, or where the installations are severe, the Contractor will be required deflection testing on the 6-inch house laterals as specified in Article 3.9.

I. Backfill around fittings and lateral pipe shall be carefully placed and compacted to prevent damage from backfill settlement and shall be installed in same manner as described for sewer installation.

J. The Contractor shall keep accurate horizontal and vertical location measurements of each house/building service installed. The location of all house/building services shall be shown on record drawings as noted in Section 1.17 Record Drawings. The accuracy of the measurements shall be the Contractor's responsibility.

3.8 STUBS, CONNECTIONS, BULKHEADS, AND MISCELLANEOUS ITEMS OF WORK

A. Where special junction chambers are to be constructed or where existing sewers carrying sanitary sewage are encountered, the Contractor shall provide and maintain temporary connections to prevent a nuisance.

B. Where called for shop connections and stubs for future sewer connections shall be provided.

C. New sewer connections to existing manholes shall be neatly made by cutting a hole in the existing structure, concreting the sewer in place, and providing a watertight connection.

D. The Contractor shall not connect any existing sewers or house/building services prior to the completion of the exfiltration/infiltration tests, air tests, and acceptance of the sewer without the permission of the Westfield Public Works Department.

3.9 VERTICAL DEFLECTION TESTING

For PVC pipe, the entire length of installed mainline pipe shall be tested for acceptance with an approved go-no-go mandrel under the observation of the Engineer. The testing shall be conducted after the final backfill has been in place for at least 30 days. No pipe shall exceed a deflection of 5%. The deflection test shall be run using a mandrel having a diameter equal to 95% of the inside diameter of the pipe in accordance with ASTM D-3004 Appendices. The pipe shall be measured in compliance with ASTM D-2122. All pipe exceeding the allowable deflection shall be replaced, repaired, and retested.

3.10 INFILTRATION LIMITS

A. Maximum infiltration/exfiltration limits for all new sanitary sewers shall not exceed 200 gallons per inch of diameter per mile of pipe per 24 hours for any section of the system. All sections of the sewer shall be tested, and any sections not meeting this infiltration standard shall be repaired and retested.

B. The Contractor shall note the special provision under Article 3.04, paragraph O, that the first section of sewer of each size and type of sewer shall be given a satisfactory leakage test before proceeding with any additional construction.

3.11 SEWER WATERTIGHTNESS TESTING

A. Tests for watertightness shall be conducted on all installed sewers in the presence of and in the manner accepted by the Westfield Public Works Department or designee. The Contractor shall furnish and install all equipment necessary for the sewer tests.

B. Watertightness tests shall be conducted on short sections of the sewer as soon as the manholes have been constructed and the backfilling completed.

C. Where the section tested is in excess of the allowable limits, the Contractor shall correct the construction of the sewer so that the section tested is within the allowable limit. All methods and materials used in the repair shall be approved by the Westfield Public Works Department or designee.

D. The program of testing shall fit the conditions as determined by the Westfield Public Works Department or designee using Air Test for Leakage. When ductile iron pipe with push-on type joints are used for sewer construction, a hydrostatic pressure test shall be performed.

1. The Air Test for Leakage

a. The air test for leakage shall be used to test sewer watertightness on all sewer pipe unless otherwise noted.

b. The ends of the sewer section being tested shall be sealed and properly blocked. The seal at one end shall have an orifice through which to pass air into the pipe. An air supply shall be connected to the orifice at one end of the section. The air supply line will contain an off-on gas valve and a pressure gauge having a range from 0 to 25 psi. The gauge shall have minimum divisions of 0.10 psi and shall have an accuracy of the nearest ±0.1 psi. The seals at each manhole shall be properly blocked to prevent displacement while the line is under pressure.

2. Procedure for Conducting a Low Pressure Air Test

a. Clean pipe to be tested by propelling a snug fitting inflated ball through the pipe by water pressure or other adequate method. This step is important because it not only flushes out construction debris, but the water used to flush the ball through the pipe dampens the pipe wall. The rate of air loss through pipe wall permeation can be significant on dry pipes.

b. Plug all pipe outlets with pneumatic plugs having a sealing length equal to or greater than the diameter of the pipe to be tested. The pneumatic plug shall be able to resist internal testing pressures without requiring external bracing.

c. The groundwater level surrounding the section of sewer under testing shall be determined by one of the procedures previously outlined in paragraph D(1). If the groundwater table is above the pipe, then test pressures shall be increased by the corresponding increment (e.g., if the groundwater table is above the lowest crown of the pipe, the air pressure should be increased

1.1 DESCRIPTION
A. Scope: Furnish and install pipe, fittings, valves, hydrants and appurtenances necessary to complete work shown or specified.
B. Codes, specifications and standards referred to by title or number in this specification shall be adhered to, and latest revisions shall apply in all cases.
C. Definitions
1. Abbreviations
ANSI – American National Standards Institute.
ASTM – American Society for Testing & Materials.
AWWA – American Water Works Association.
2. All pipe, fitting and valve sizes and references to pipe diameter on the drawings or in the specifications are intended to be nominal size or diameter and shall be interpreted as such.

1.2 QUALITY ASSURANCE
A. Mark pipe, fittings, valves and hydrants according to the applicable specification or standard. Each length of pipe shall bear the name or trademark of the manufacturer, the location of the plant, and the date of manufacture. Each length shall likewise be marked to designate the class or strength of the pipe. The marking shall be made on the exterior or interior of the pipe barrel near the bell or groove end and shall be plainly visible. Pipe shall have permanently extruded stripes on three (3) or four (4) sides according to the following schedule:
Water Main: Blue Stripes
B. The Contractor shall test and disinfect water mains constructed under this Contract, as specified in this Section.
C. The Town shall collect samples of water from water mains constructed after the piping has been disinfected. The Town will submit the samples to the applicable regulatory agency for bacteriological analysis. Collection and submission of these samples shall meet the requirements of the applicable regulatory agency. If samples do not pass the requirements of the bacteriological analysis, the water main will be disinfected and sampled again. This procedure will be followed until the samples pass the analysis.
D. A performance test may be required by the Public Works Director, at any time, for each crew installing water mains. The Contractor shall perform these tests at no additional cost to the Owner. When required by the Public Works Director, the Contractor shall test a given section of water main installed by a given crew. The section shall be a continuous section of water main which can be isolated by valves shown on the drawings. The Contractor shall not install water mains in other sections until the first section has been successfully tested.

PART 2 – PRODUCTS
2.1 GENERAL
All pipe, fittings, valves, hydrants and appurtenances shall be as shown on the drawings or as required by the manufacturer's and ANSI/AWWA specifications. All pipe, fittings, valves, hydrants and appurtenances shall be new and unused.
2.2 BURIED WATER MAIN PIPE AND FITTINGS
A. Ductile Iron Water Mains (3" and Larger)
1. Pipe
a. Ductile iron pipe shall meet the requirements of ANSI/AWWA C151/A21.51-91. Design and manufacture pipe for the pressure class listed plus 100 psi surge pressure. Additionally, a safety factor of 2.0 and a depth of cover, indicated on the drawings or as required by the manufacturer's and ANSI/AWWA specifications, shall be included. Minimum thickness class shall be as follows:

Size Range	Pressure Class
4" - 12"	350
14" - 20"	250

b. Pipe joints shall be push-on type. Joints shall meet the requirements of ANSI/AWWA C111/A21.11. Restrained joints shall be Lok-Ring, Lok-Fast, Lok-Tyte, or equal.
2. Fittings
Fittings shall be ductile iron. Fittings for standard size pipe shall meet the requirements of ANSI/AWWA C110/A21.10-93. Compact or short body fittings 3 inches through 16 inches shall meet the requirements of ANSI/AWWA C153/A21.53-94. Design and manufacture fittings for a pressure rating of at least 150 psi.
Fitting joints shall be mechanical joints or restrained push-on joints. Joints shall meet the requirements of ANSI/AWWA C111/A21.11. Thrust block all mechanical joints as indicated on the drawings or as required by the manufacturer's and ANSI/AWWA specifications. Pipe connecting to restrained joint fittings shall be restrained as indicated on the drawings or as required by the manufacturer's and ANSI/AWWA specifications.

3. Adapters
Adapters from ductile iron water mains to flange joint valves or fittings shall be ductile iron. Adapters shall meet the requirements of ANSI/AWWA C110/A21.10-93. Design and manufacture adapters for a pressure class rating of 150 psi.
4. Adapter ends connecting to ductile iron water mains shall be one of the following: plain end, push-on joint, mechanical joint or restrained push-on joint. Adapters with plain ends, push-on joints or mechanical joints may be used where restrained joints are not required. Adapters shall have restrained push-on joints where restrained joint piping is required, as indicated on the drawings. Mechanical joints and restrained push-on joints shall meet the requirements of ANSI/AWWA C111/A21.11. Restrained joints shall be Lok-Ring, Lok-Fast, Lok-Tyte or as approved by the Public Works Director.
5. Adapter ends connecting to flange joint valves or fittings shall have joints complying with the specifications for the applicable valves or fittings.

4. Line the inside surfaces of all pipe, fittings and adapters with single layer cement mortar lining. Cement mortar lining and seal coating shall meet the requirements of ANSI/AWWA C104/A21.4
95. Coat the outside surfaces of all pipe, fittings and adapters with a bituminous coating, complying with ANSI/AWWA C151.
5. Gaskets for mechanical joints and push-on joints shall meet the requirements of ANSI/AWWA C111/A21.11.
6. Nuts and Bolts
Nuts and bolts for mechanical joints shall be high strength, heat treated, alloy steel. Nuts shall be hexagon nuts, bolts shall be tee head bolts. Nuts and bolts shall meet the requirements of ANSI/AWWA C111/A21.11. Nuts and bolts for restrained push-on joints shall meet the requirements of the joint manufacturer.
7. Polyethylene encasement for ductile iron water mains shall be installed and shall meet the requirements of ANSI/AWWA C155/A21.5. Installation of the polyethylene encasement shall be omitted if written approval is made by the ductile iron pipe manufacturer and/or the Public Works Director. Contractor/Developer shall be required to provide soils testing results for corrosivity at no additional charge to the Town if omission of the polyethylene encasement is proposed.

8. Polyvinyl Chloride Water Mains (3" to 8")
1. Pipe
A. Polyvinyl chloride pipe shall meet the requirements of ANSI/AWWA C900, Class 150/DR18. Design and manufacture pipe for a working pressure of 150 psi plus 100 psi surge pressure. Additionally, a safety factor of 2.0 and a depth of cover, indicated on the drawings or as required by the manufacturer's and ANSI/AWWA specifications, shall be included.
B. Polyvinyl chloride pipe shall have ductile-iron-pipe-equivalent outside diameter.
C. Pipe joints shall be push-on type and meet the requirements of ANSI/AWWA C900. Do not use solvent-cement joints.
2. Fittings
A. Fittings shall be ductile iron and meet the requirements of ANSI/AWWA C110/A21.10. Design and manufacture fittings for a pressure rating of 150 psi.
B. Line the inside surfaces of fittings with cement mortar lining and bituminous seal coating shall meet the requirements of ANSI/AWWA C104/A21.4. Coat outside surfaces of fittings with bituminous coating. Outside coating shall meet the requirements of ANSI/AWWA C110/A21.10.
C. Fitting joints shall be mechanical joints. Mechanical joints shall meet the requirements of ANSI/AWWA C111/A21.11.
D. Mark each fitting. Marking shall meet the requirements of ANSI/AWWA C110/A21.10.

3. Adapters
A. Adapters from polyvinyl chloride water mains to viticultural flange joint valves or fittings shall be ductile iron. Adapters shall meet the requirements of ANSI/AWWA C110/A21.10. Design and manufacture adapters for a pressure rating of 150 psi.
B. Line the inside surfaces of adapters with a single cement mortar lining. Cement mortar lining and seal coating shall meet the requirements of ANSI/AWWA C104/A21.4. Coat outside surfaces of adapters with bituminous coating, complying with ANSI/AWWA C151/A21.51.
C. Adapter ends connecting to polyvinyl chloride water mains shall have plain ends or mechanical joints. Mechanical joints shall meet the requirements of ANSI/AWWA C111/A21.11.
D. Adapter ends connecting to viticultural flange joint valves or fittings shall have joints complying with the specifications for the applicable valves or fittings.

4. Gaskets
A. Gaskets for polyvinyl chloride push-on joints shall meet the requirements of ANSI/AWWA C900.
B. Gaskets for mechanical joints shall meet the requirements of ANSI/AWWA C111/A21.11 and ASTM F477.
5. Nuts and bolts for mechanical joints shall be high strength, heat treated, alloy steel. Nuts shall be hexagon nuts, and bolts shall be tee head bolts. Nuts and bolts shall meet the requirements of ANSI/AWWA C111/A21.11.
C. High-density polyethylene (HDPE) for Water Mains (3" or larger)
1. Pipes: Polyethylene piping and fittings shall be made of a high density polyethylene pipe compound with extra high molecular weight that meets the requirements for Type II, Grade 3345 Polyethylene Material as defined in ASTM D-1248 (PE 3408). The minimum pressure class/SDR rating acceptable shall be Class 160/SDR 11. The pipe shall be DIPS and shall have an interior diameter no less than the piping that it is connected to.

2. Joints: Joints shall be of a heat fusion joining system. Pipe and fittings shall be thermal butt fusion, saddle fusion, or socket fusion in accordance with manufacturer recommended procedures and ASTM D-2161. At the point of fusion, the outside diameter and minimum wall thickness of the fitting shall match the outside diameter and minimum wall thickness specifications of ASTM D-1248 for the same size pipe.
3. Joining of the pipes and fittings shall be performed in accordance with ASTM D-2774. Depending upon the installation requirements and site location, joining shall be performed within or outside the excavation. Joints of the pipe sections shall be smooth on the inside and internal projection beads shall not be greater than 3/16 inch. The tensile strength at yield of the butt-fusion joints shall not be less than the pipe. A specimen of the pipe cut across the butt-fusion joints shall be tested in accordance with ASTM D-638.
The manufacturer shall provide fusion training. The contractor and the onsite jointing operator shall be trained by the manufacturer or manufacturer's authorized representative.
The fusion equipment and operator shall be required to demonstrate successful field experience. Regarding fusion over 36" capability, the fusion unit shall be field tested for a period of five years and the fusion operator shall have pipe size experience of the same size pipe for this project for five years or longer.

3. Fittings: All fitting shall be provided as indicated on the plans. HDPE fittings shall be of the same material and class as the pipe and shall be manufactured by the manufacturer of the pipe. HDPE elbows, tees, and wyes shall be manufactured by reinforced fabrication. The manufacturer shall have a written specification for all standard mitered fittings, which establishes Quality Control criteria and tolerances. The manufacturer may be required to demonstrate its ability to produce product required by this specification.
Mechanical joint anchor fittings (M Adapter or Harvey Adapter) shall be used to transition from ductile iron to HDPE and from HDPE to PVC. The fitting shall be stronger than the pipe in that when it is subjected to tensile stress the pipe will pull apart before the fitting will pull out and the pipe will blow before the fitting will rupture under pressure.
All pressure rated fittings shall be rated according to the manufacturer's written specifications, and clearly labeled on the fittings as such.
2.3 PIPE AND FITTINGS SMALLER THAN 3-INCH
A. Pipe shall be Type K drawn copper and shall meet the requirements of ASTM B88. Cooper pipe must be used for all piping to the meter pit.
B. Fittings and couplings shall be cast bronze and shall meet the requirements of ASTM B16.18. Construct and manufacture fittings and couplings for a pressure rating of 150 psi.
C. Unions shall be bronze and shall meet the requirements of ASTM B16.18. Design and manufacture unions for a pressure rating of 150 psi.
D. Flanges for connection of screwed joint pipe to flange joint valves or fittings shall be 12S-16 cast iron, screwed companion flanges, complying with both ASTM A126 and ANSI B16.1.

E. Taps for screwed joints shall be teled.
F. Gaskets for flange joints shall be 1/16-inch thick, full face and conform to ANSI/AWWA C111/A21.11. Gaskets shall be rubber or as approved by the Public Works Director.
G. Bolts for flange joints shall be steel, heavy hexagon head machine bolts. Nuts shall be steel, semi-finished, heavy hexagon nuts. Nuts and bolts shall meet the requirements of ASTM A307 for Grade B and be zinc-coated alloy steel.
2.4 VALVES
A. Butterfly Valves
1. Butterfly valves and operators shall meet the requirements of AWWA Standard C504. Valves and operators shall be Class 150B.
2. Buried butterfly valves shall have mechanical joints. Mechanical joints shall meet the requirements of AWWA C111. Butterfly valves installed above ground or in structures shall have flange joints as specified in AWWA Standard C504. Nuts, bolts, and gaskets for flange joints shall meet the requirements of ANSI/AWWA C110/A21.10. Nuts and bolts shall be cadmium plated. Gaskets shall be full face and shall be red rubber, or equal.
3. Each buried butterfly valve shall have a manual operator and a 2-inch opening ball. Valve opening direction shall be consistent with operation of existing valves in the waterworks in which the valves are installed, unless otherwise directed by the Engineer.
4. Each butterfly valve installed above ground or in a structure shall have a manual operator and handwheel.
B. Gate Valves
1. Buried gate valves 4-inches and larger shall be full ductile iron body, epoxy fusion bonded inside and out, non-rising stem gate valves. Valves shall meet the requirements of ANSI/AWWA C500 or C509 and have mechanical joint ends. Mechanical joints and joint accessories shall comply with ANSI/AWWA C111/A21.11. Valve opening direction shall be consistent with operation of existing valves in the waterworks where the valves are installed, unless otherwise directed by the Public Works Director.
2. Three-inch buried gate valves shall be full ductile iron body, epoxy fusion bonded inside and out, non-rising stem gate valves. Valves shall meet the requirements of ANSI/AWWA C500 or C509, except, ends shall be screwed. Screwed ends shall conform to ANSI B16.5. Valve opening direction shall be consistent with operation of existing valves in the waterworks where the valves are installed, unless otherwise directed by the Public Works Director.
3. Gate valves 4-inches and larger installed above ground or in structures shall be full ductile iron body, epoxy fusion bonded inside and out, outside screw and yoke gate valves. Valves shall correspond to ANSI/AWWA C500 or C509. Outside screw and yoke gate valves shall have flange joint ends and malleable iron handwheels. Flange joints and accessories shall be as specified in ANSI/AWWA C110/A21.10. Nuts and bolts shall be zinc-coated alloy steel. Gaskets shall be full face and rubber, or as approved by the Public Works Director.
4. Gate valves smaller than 4-inch shall be installed above ground or in structures shall be 12S-16 cast iron, double disc, screw-in bonnet, rising stem, inside screw gate valves with screwed ends and malleable iron handwheels. Valves shall meet the requirements of Federal specifications WASTEWATER-V-54d for Class A, Type III Valves.

C. Buried valves 2-inch and smaller shall be curb stops. Curb stops shall meet the applicable requirements of ANSI/AWWA C800, ASTM B-62 for 85-5-5 composition bronze, and USAS B2.1. Curb stops shall be Mueller H-10283, Ford B1 Series, or as approved by the Public Works Director.
D. Tapping Valves
1. Tapping valves shall comply with both ANSI/AWWA C500 or C509 and have flange mechanical joint ends. Double disc gate valve gates, gate rings and body-seat rings shall be oversized to permit entry and exit of tapping machine cutters.
2. Valve and connecting to tapping sleeve shall have a flange for bolting to the sleeve. The flange shall have a tongue which fits a recess in the sleeve. Tongues shall meet the requirements of MSS SP-60. Resilient seated gate valves having a port diameter equal to or exceeding 1/4 inch over nominal diameter shall not require a tongue. Flange dimensions and drilling shall meet the requirements of ANSI/AWWA C110/A21.10-93. Nuts and bolts shall be zinc-coated alloy steel, and gaskets shall be rubber, or as approved by the Public Works Director. Mechanical joints and accessories shall meet the requirements of ANSI/AWWA C111/A21.11. A full nominal diameter cutter shall be used for tapping.
Tapping valves 1/4-inch and smaller shall be installed vertically. Tapping valves 1/2-inch and larger shall be installed horizontally and shall have bypass valves. Tapping valves installed horizontally shall have rollers and tracks. Valves 1/2-inch and larger shall have gear operators with enclosed gear cassettes suitable for buried service. Gear cassettes shall be extended type or totally enclosed type. Extended type gear cassettes shall have bolted side plates to cover stem and stuffing box.
E. Air and Vacuum Valves: Air and vacuum valves shall be as follows:
1/2" Apco No. 141WD, Val-Matic 100DWS, or equal
1" Apco No. 142WD, Val-Matic 101DWS, or equal
2" Apco No. 144WD, Val-Matic 102DWS, or equal
3" Apco No. 146WD, Val-Matic 103DWS, or equal
4" Apco No. 160A/152, Val-Matic 104DWS, or equal
6" Apco No. 160B/153, Val-Matic 106DWS, or equal

2.5 VALVE BOXES
A. Valve boxes for butterfly valves and gate valves shall be cast iron. Valve boxes shall be two piece or three piece type. Each two piece box shall be complete with bottom section, top section and cover. Each three piece box shall be complete with base, center section, top section and cover. Valve boxes shall be extension type with slide or screw type adjustment.
Each base and bottom section shall be the proper size for the valve served. Each valve box assembly shall be the proper length for the valve served. The minimum thickness of metal shall be 3/16-inch. Cast the word "WATER" in each valve box cover.
2.6 FIRE HYDRANTS
A. Fire hydrants shall be dry-bore, compression shaft, traffic model and comply with AWWA C502. Main valve size shall be 5-1/4 inch. Inlets shall be 8-inch mechanical joint. Each hydrant shall have two 2-1/2-inch nozzles and one 5-inch Storz pumper nozzle. Nozzle threads and hydrant opening direction shall be consistent with existing fire hydrants in the waterworks in which the fire hydrants are installed, unless otherwise directed by the Public Works Director. Each hydrant shall be the proper length for the water main to which the hydrant shall be connected. Fire hydrant coating shall meet the requirements of AWWA C502. Fire hydrants shall be MAB Fire Protection Red (7068), within the Westfield Washington Fire Department jurisdiction or MAB Caution Yellow (7077), within the Noblesville Fire Department jurisdiction. Hydrants shall be Model No. 4423, as manufactured by Mueller Company.
B. Fire Hydrant Placement – Fire hydrants shall be placed no further apart than 300 feet in all residential subdivisions, subdivision sections, and other residential areas in which dwelling density meets or exceeds three dwelling units per gross acre. Fire hydrants shall be placed no further apart than 300 feet in all industrial, Business, and Commercial areas, and all industrial, Business, and Commercial uses. Such requirement shall be in full force and effect unless explicitly exempted by the Chief of the local fire department. For residential uses with densities less than three dwelling units per gross acre, the requirements as established in Table No. III-B-A of the Uniform Fire Code shall apply. Where there is any ambiguity or dispute concerning the interpretation of this requirement, the decision of the Chief of the local fire department shall prevail subject to appeal.

2.7 SPRINKLER SYSTEMS
Multi-family developments, duplexes, and hotels/motels shall be required to have sprinkler systems installed in the attic of said structure as approved by the Chief of the local fire department. Such requirement shall be in full force and effect unless explicitly exempted by the Chief of the local fire department. Where there is any ambiguity or dispute concerning the interpretation of this requirement, the decision of the Chief of the local fire department shall prevail subject to approval.
2.8 TAPPING SLEEVES
A. Tapping sleeves shall be stainless steel split sleeves. Each sleeve shall have a branch connection with a flange end. The inside diameter of each branch shall be over-sized to permit entry and exit of tapping machine cutters. Each flange shall have a recess to center a tapping valve. Recesses shall meet the requirements of MSS SP-80. Flange dimensions and drilling shall meet the requirements of ANSI B16.1. The sleeve dimensions shall be such that the sleeves will not leak when installed on cast iron, ductile iron, or polyvinyl chloride pipe with outside diameters shown in ANSI/AWWA Standards.
B. Tapping sleeves for 4-inch through 16-inch pipe shall be mechanical joint type. Design and manufacture tapping sleeves for a working pressure of 200 psi.
C. Tapping sleeves for 18-inch and larger pipe shall be mechanical joint type. Design and manufacture tapping sleeves for a working pressure of 150 psi.

2.9 TAPPING SADDLES
A. Design and manufacture tapping saddles for a working pressure of 200 psi. Saddle bodies shall be stainless steel. Saddle straps shall be corrosion resistant steel alloy. Saddle gaskets shall be positively confined O-ring gasket. The sleeve dimensions shall be such that the sleeves will not leak when installed on cast iron, ductile iron, or polyvinyl chloride pipe with outside diameter shown in ANSI/AWWA Standards.
B. Each saddle used for making a dry connection shall have a branch connection with a flange end. The inside diameter of each branch shall be oversized to permit entry and exist of tapping machine cutters. Each flange shall have a recess to center a tapping valve. Recesses shall meet the requirements of MSS SP-60. Flange dimensions and drilling shall meet the requirements of ANSI B16.1.
C. Each saddle used for making a dry connection shall have a branch connection with a flange or mechanical joint end. Flange dimensions and drilling shall meet the requirements of ANSI B16.1. Nuts and bolts for flange joints shall meet the requirements of ANSI/AWWA C110/A21.10 and be zinc-coated alloy steel. Gaskets shall comply with ANSI/AWWA C110/A21.10, full face and rubber, or as approved by the Public Works Director. Mechanical joints and accessories shall meet the requirements of ANSI/AWWA C111/A21.11.
D. Gaskets used to seal joints between saddle bodies and tapped pipes shall be O-ring type, circular in cross section, and made of natural or synthetic rubber with a Durometer Hardness of 70 ± 5.

2.10 FLANGE-MECHANICAL JOINT ADAPTERS
Flange-mechanical joint adapters shall be Dresser Style 127, Smith-Blair Type 912 or as approved by the Public Works Director.

2.11 AIR AND VACUUM VALVE CHAMBERS
A. Air and vacuum valve chambers shall be 4-foot diameter precast concrete manhole barrels with precast concrete flat slab tops. Precast manhole barrels shall meet the requirements of ASTM C478.
B. Air and vacuum valve chamber access frames and cover shall be Neenah R-1915-G, or equal. Cast the word "WATER" in each cover.
2.12 WATER SERVICES
A. Pipe shall be seamless copper tubing and shall meet the requirements of ASTM B88, Type "K".
B. Fittings and Couplings: Couplings for copper tubing shall be copper to copper or copper to iron, as required, and shall meet the applicable requirements of AWWA C800, ASTM B-62 for 85-5-5 composition bronze, and ANSI B2.1. Fittings and couplings shall be Ford Products, Pack Type Compression Joints, or equal.
C. Service connections made to a PVC water main shall be made using a stainless steel saddle with a corporation stop.

PART 3 – EXECUTION
3.1 INSPECTION
Inspect water main pipe, fittings, valves, hydrants, and appurtenances prior to installation. Promptly remove damaged or unsuitable products from the job site. Replace damaged or unsuitable products with undamaged and suitable products.
3.2 LAYING OF WATER MAINS
A. Proper tools and facilities shall be provided and used by the Contractor for safe working conditions.
B. Lay and maintain pipe to the lines and grades shown on the drawings or to the minimum depth specified in this Article. Install fittings, valves and hydrants in the locations shown on the drawings.
C. When the exact location of buried utilities is unknown and piping is to be constructed parallel and close to said utilities, adjust the alignment of the piping to least interfere with these utilities. This applies unless otherwise shown on the drawings or specified by the Public Works Director.
D. All crossings of water mains and sanitary sewers or storm sewers must be in accordance with 327 IAC 8-3.2-9. Water mains shall be laid at least 10 feet horizontally from any existing sanitary sewer, sewage force main, or storm sewer. The distance shall be measured from outside edge of water main to outside edge of the sanitary sewer or storm sewer. Water mains crossing sanitary sewer, sewage force main, or storm sewer shall be laid to provide a minimum vertical distance of 18 inches between the outside of the water main and the outside of the sanitary sewer, force main, or storm sewer. The 18-inch separation shall apply whether the water main is over or under the sewer or force main. Lay water mains at crossings of sewers and force mains so a full length of water main pipe is centered on the sewer or force main whenever possible.
E. No water mains shall be within eight (8) feet of a sanitary sewer manhole, a storm sewer manhole, or a drainage grate support structure as measured from the outside edge of the water main to the outside edge of the sanitary sewer manhole, storm sewer manhole, or drainage grate support structure, per 327 IAC 8-3.2-9.e.
F. All piping shall be laid at a depth that provides at least 4'-6" of cover. Cover shall be measured as the vertical distance from the top of the pipe to the finish grade elevation.
G. Laying of water mains shall meet the requirements of ANSI/AWWA C600, unless otherwise specified in this Section.

H. Shape the bottom of the trench to give uniform circumferential support of the lower quarter of each pipe.
I. Do not lay pipe in water or when the trench or weather conditions are unsuitable for proper installation.
J. As each length of pipe is placed in a trench, joint the pipe being laid to the previously laid pipe. Bring the pipe to correct line and grade. Secure the pipe in place with bedding tamped under the pipe. Tamp bedding up to the centerline of the pipe.
K. Deflection from a straight line or grade shall not exceed the limits specified in this Section. If the alignment requires joint deflectors in excess of the allowable deflection per joint, furnish and install fittings or a sufficient number of shorter lengths of pipe.
L. Provide thrust restraint at horizontal and vertical deflection fittings and at tees, plugs, tapping sleeves and tapping saddles. Restraint shall be concrete thrust blocking or restrained joint piping.
M. Where concrete thrust blocking is used, thrust blocking to be blocked with vasqueen or a heavy duty grease to prevent adherence of the concrete to the fitting.
N. Block the open end of the pipe at the close of each day's work to prevent contamination from dirt or rain water and entry of any animal or foreign material.
O. Lower pipe, fittings, valves and hydrants into the trench by hand, hoists or ropes or other suitable tools or equipment that will not damage products, coatings or linings. Do not drop or dump pipe, fittings, valves, or hydrants into the trench.
P. Water main designs that require crossing a county legal drain shall be approved and constructed per the latest standards of the Hamilton County Surveyor's Office.

3.3 SETTING VALVES, VALVE BOXES AND FIRE HYDRANTS
A. Clean the interiors of valves and hydrants of foreign matter before installation. Tighten stuffing boxes. Inspect valves and hydrants in opened and closed positions to ensure all parts are in working condition.
B. Set valves and valve boxes plumb. Center valve boxes on the valves or valve operators. Locate valves outside the area of roads and streets where feasible. Tamp backfill around each valve box to a distance of 4 feet on all sides of the box or to the undisturbed trench face if less than 4 feet.
C. Set hydrants plumb with the pumper nozzle facing the street. The centerline of the outlet nozzles shall be at least 18 inches or at most 30 inches above finished grade at a hydrant. Install hydrant extensions where required to bring hydrant to proper depth. Set each hydrant upon a slab of stone or concrete not less than 4 inches thick and 15 inches square. Wedge the side of each hydrant opposite the pipe connection against the undisturbed trench face to prevent the hydrant from blowing off the branch connection. Compact the backfill around each hydrant to finish grade. Furnish and install a gate valve and valve box in each hydrant branch connection. In the field, (Westfield) apply two coats of MAB Fire Protection Red (7068), (Noblesville) MAB Caution Yellow (7077) to the fire hydrants installed. All installed hydrants meeting the requirement of Section 2660, Para. 2.6 (a), shall be pointed by the contractor either MAB Fire Protection Red (7068), within the Westfield Washington Fire Department jurisdiction or MAB Caution Yellow (7077), within the Noblesville Fire Department jurisdiction. A three (3) foot clear space shall be maintained around the circumference of fire hydrants except as otherwise required or approved.
D. All inlet water valve box caps shall be pointed blue. All hydrant valve caps shall be pointed MAB Fire Protection Red (7068).

3.4 CONNECTING TO EXISTING MAINS
A. The Contractor shall locate and verify exact size of all existing mains, both horizontally and vertically. Additionally, allow adequate time, after location and prior to making new connections, for changes in the connection location and size. Backfill excavation immediately after main is located and measured.
B. Make each wet connection with a tapping valve and tapping sleeve. Install and hydrostatically test each tapping valve and tapping sleeve assembly prior to tapping existing water main. Inspect each tapping valve prior to tapping existing water main. Open and close tapping valves, and inspect tapping valves in opened and closed positions to ensure all parts are in working condition. Inspect each tapping valve immediately before connecting tapping machine to ensure the tapping valve is open. Install waterlight plug on the tapping valve outlet and backfill excavation if existing water main is not tapped within 48 hours after installing tapping valve and tapping sleeve or tapping sleeve assembly. Install waterlight plug on the tapping valve outlet and backfill excavation if new water main is not connected to tapping valve within 48 hours after making tap in existing water main.
C. Make each dry connection with fittings and valves indicated on the drawings. Furnish and install sleeves required to complete connections. All required pipe, fittings, valves, tools, and equipment shall be at the connection site prior to starting connection. Wash interior of new pipe, fittings, and valves with a solution containing 50 mg/l of chlorine prior to making connection. Make connections at night and on weekends when required. The Owner will operate existing valves. Install sufficient water main and restrain joints so existing water mains can be up in service immediately after connection is completed. Inspect joints and eliminate leaks immediately after connection is completed and existing mains are put in service. Install waterlight plugs on open ends of pipe and valves, and backfill excavation if new water main is not connected to dry connection within 48 hours after completing dry connection.

3.5 JOINTING
A. Ductile Iron Push-on Joints
1. Pipe must be cleaned and installed as specified by the manufacturer and ANSI/AWWA C600 requirements. Additionally, all lumps, blisters, excess bituminous coating and foreign material must be removed from the bell and spigot end of each pipe.
2. For restrained push-on joints, move the loose retainer ring into position against the retainer bar on the spigot end of the pipe being installed. Loosely assemble the joint. Tighten the nut and nut washer. Repair leaks and repair the pipe after jointing, if deflection is required. The amount of deflection shall not exceed the limits shown in the following table:

Pipe Size	Maximum Deflection Upon 18-Foot Pipe Length
4"	5" 18-1/2"
6"	5" 18-1/2"
8"	5" 18-1/2"
10"	5" 18-1/2"
12"	5" 18-1/2"

3. For restrained push-on joints, pull the nuts to a uniform tightness by hand or with a short wrench. Do not pull the spigot of the pipe being installed against the back of the bell of the receiving pipe. Engage at least a full nut on each bolt when joint deflection is required.
B. Polyvinyl Chloride Push-on Joints
1. Pipe must be cleaned and installed as specified by the manufacturer's requirements. Additionally, all joints must be free of all foreign material.
2. Deflect the pipe after jointing, if deflection is required. The amount of deflection shall not exceed the limits recommended by the jointing.
C. Mechanical Joints
1. Pipe must be cleaned and installed as specified by the manufacturer and AWWA C600 requirements. Additionally, all lumps, blisters, excess bituminous coating and foreign material must be removed from the bell and spigot end of each pipe.
2. Evenly tighten the nuts using a torque wrench. The torque shall be within the range listed in the following table:

Pipe Size	Ball Size	Torque Range
4"	3/4"	75 to 90 ft.-lb.

3. Deflect pipe, fittings or valves after jointing, if deflection is required. The amount of deflection shall not exceed the limits shown in the following table:

Pipe Size	Maximum Deflection Upon 18-Foot Pipe Length
4"	5" 18-1/2"
6"	5" 18-1/2"
8"	5" 18-1/2"
10"	5" 18-1/2"
12"	5" 18-1/2"

Pipe Size	Ball Size	Torque Range
4"	3/4"	75 to 90 ft.-lb.

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Pipe Size	Ball Size	Torque Range
4"	3/4"	75 to 90 ft.-lb.

Pipe Size	Maximum Deflection Upon 18-Foot Pipe Length
4"	5" 18-1/2"
6"	5" 18-1/2"
8"	5" 21"
10"	5" 21"
12"	5" 21"
14"	3" 35"
16"	3" 35"
18"	3" 35"
20"	3" 0"
24"	2" 23"

Pipe Size	Maximum Deflection Upon 18-Foot Pipe Length
4"	5" 18-1/2"
6"	5" 18-1/2"
8"	5" 21"
10"	5" 21"
12"	5" 21"
14"	3" 35"
16"	3" 35"
18"	3" 35"
20"	3" 0"
24"	2" 23"

Pipe Size	Maximum Deflection Upon 18-Foot Pipe Length
4"	5" 18-1/2"
6"	5" 18-1/2"
8"	5" 21"
10"	5" 21"
12"	5" 21"
14"	3" 35"
16"	3" 35"
18"	3" 35"
20"	3" 0"
24"	2" 23"

Pipe Size	Maximum Deflection Upon 18-Foot Pipe Length
4"	5" 18-1/2"
6"	5" 18-1/2"
8"	5" 21"
10"	5" 21"
12"	5" 21"
14"	3" 35"
16"	3" 35"
18"	3" 35"
20"	3" 0"
24"	2" 23"

Pipe Size	Maximum Deflection Upon 18-Foot Pipe Length
4"	5" 18-1/2"
6"	5" 18-1/2"
8"	5" 21"
10"	5" 21"
12"	5" 21"
14"	3" 35"
16"	3" 35"
18"	3" 35"
20"	3" 0"
24"	2" 23"

Pipe Size	Maximum Deflection Upon 18-Foot Pipe Length
4"	5" 18-1/2"
6"	5" 18-1/2"
8"	5" 21"
10"	5" 21"
12"	5" 21"
14"	3" 35"
16"	3" 35"
18"	3" 35"
20"	3" 0"
24"	2" 23"

Pipe Size	Maximum Deflection Upon 18-Foot Pipe Length
4"	5" 18-1/2"
6"	5" 18-1/2"
8"	5" 21"
10"	5" 21"
12"	5" 21"
14"	3" 35"
16"	3" 35"
18"	3" 35"
20"	3" 0"
24"	2" 23"

Pipe Size	Maximum Deflection Upon 18-Foot Pipe Length
4"	5" 18-1/2"
6"	5" 18-1/2"
8"	5" 21"
10"	5" 21"
12"	5" 21"
14"	3" 35"
16"	3" 35"
18"	3" 35"
20"	3" 0"
24"	2" 23"

Pipe Size	Maximum Deflection Upon 18-Foot Pipe Length
4"	5" 18-1/2"
6"	5" 18-1/2"
8"	5" 21"
10"	5"

CHAPTER 400 STORM SEWER PIPES AND OPEN CULVERT MATERIALS
SECTION 401 GENERAL

401.01 Introduction

This section covers all work necessary for the construction of the storm sewer piping systems and related items, including catch basins and inlet drains, manholes, junction chambers, diversion chambers, outfall structures, and miscellaneous structures.

This specification covers the following types of materials for storm sewers, culverts, underdrains, inlet drains, conduits, and miscellaneous accessories:

1. Reinforced Concrete Pipe and Fittings
2. Polyvinyl Chloride Pipe (PVC)
3. Corrugated Metal Pipe
4. Structural Plate Arches
5. Aluminum or Aluminized Steel Pipe and Structural Plate
6. Multi-Plate Pipe and Pipe Arches
7. PVC Composite Pipe
8. Corrugated Polyethylene Pipe - SSD (Perforated and Non-Perforated)

All lots shall have access to a subsurface or storm drain or open ditch. Storm sewer systems shall have a minimum of four hundred (400) feet between structures.

This specification requires project plans and construction specifications to be submitted and approved by all appropriate regulatory agencies prior to beginning any work. Before construction and preferably before fabrication, the Contractor shall submit to the Town of Westfield Public Works Department for approval calculations on the thickness of pipe and strength of pipe. All drawings showing pipe joints, lengths, and other construction and installation details.

401.02 Pipe Marking

Each length of pipe shall bear the name or trademark of the manufacturer, the location of the plant, and the date of manufacture. Each length shall likewise be marked to designate the class or strength of the pipe. The marking shall be made on the exterior or interior of the pipe barrel near the bell or groove end and shall be plainly visible.

401.03 Minimum Size for Storm Sewers

The minimum diameter of all storm sewers shall be 12 inches. When the minimum 12-inch diameter pipe will not limit the rate of release to the required amount, the rate of release for detention storage shall be controlled by an orifice plate or other device, subject to acceptance of the Town of Westfield Public Works Department.

401.03 Materials

Manholes, inlets, and other structures shall be constructed of precast reinforced concrete. Material and construction shall conform to the latest edition of the Indiana Department of Transportation (INDOT) "Standard Specifications", Sections 702 and 720. Materials for manholes, junction chambers, diversion chambers, and miscellaneous concrete structures shall comply with the following:

1. Cement shall be Portland cement and shall meet the requirements of ASTM Specification C150, ACI 301, and ACI 318. Concrete for precast manhole sections shall be 3000 psi concrete. Monolithic manholes shall use 4000 psi concrete. Ready-mix concrete shall conform to ASTM C94, Alternate 2. Maximum size of aggregate shall be 3/4 inch. Slump shall be between 2 and 5 inches.
2. Forms for chamber and structures shall be plywood or other approved material. Steel forms shall be used for the inside face of monolithic concrete manholes.
3. Reinforcing steel shall conform to ASTM A615, Grade 60 deformed bars, or ASTM A616 Grade 60 deformed bars.
4. Mortar Materials:
 - a. Sand - ASTM Designation C144, passing a No. 8 sieve.
 - b. Cement - ASTM Designation C150, Type 1.
 - c. Water - shall be potable.

The manufacturer shall provide openings for sewers entering and leaving the manhole. Any additional openings needed to be made in the field shall be made by drilling holes at least 1/2 inch in diameter with a maximum spacing of 3 inches. Manhole steps shall be made from a steel reinforcing rod encapsulated in a copolymer polypropylene resin. The manhole steps shall equal or exceed OSHA requirements. Any other special manholes, junction chambers, diversion chambers, and miscellaneous concrete structures shall be constructed as detailed on the drawings. Manhole bases shall be set on a minimum of six (6) inches of # 8 concrete. Concrete ends sections shall have a minimum of a twenty-four (24) inch tie plate, either poured in place or precast, bolted to the end section per Standard Detail (ST-30). Corrugated end sections with top plates shall require Westfield Public Works approval.

Catch Basins

During construction, precautionary measures such as adequate screening of grades shall be maintained to deter earth and other materials from entering the drains. Catch Basins, for sediment control, locations to be determined by a Professional Engineer, and approved by the Town of Westfield Public Works Department. Catch Basins shall be located within easily accessible dedicated easements or right of way of sufficient size to facilitate the required maintenance of these structures. Catch basins and curb inlet structures which are two (2) feet by two (2) feet in size shall not have a depth deeper than four (4) feet from the invert of the lowest pipe to the lowest part of the rim elevation of the casting. All structures which do not meet this criteria shall be a manhole type which is forty-eight (48) inches in diameter.

Castings

Cast iron or ductile iron frames and gratings for catch basins and drain inlets shall be as shown on the drawings. Bearing surfaces shall be clean and shall provide uniform contact. Castings shall be tough, close-grained gray iron, sound, smooth, clean, free from blisters, blow holes, shrinkage, cold shuts, and all defects and shall conform to ASTM A48 Class No. 30-B.

During construction, precautionary measures such as adequate screening of grades shall be maintained to deter earth and other materials from entering the drains. The following castings types are required:

1. Manholes - Neenah R 1772 A or equivalent
2. Beehive inlets - Neenah R 4342 or equivalent
3. "Roll Curb" inlets - Neenah 3501 - TR or TL or equivalent
4. "Char Block" Curb Inlet - Neenah 3267 - 10V or equivalent
5. Other types shall require approval of the Westfield Public Works Department.

Curb inlets castings which possess open backs or have grate bars parallel to traffic flow (are not "bicycle safe") will not be accepted by the Westfield Public Works Department. Storm sewer castings manhole covers, beehive inlets, curb inlets or other approved castings shall have the following phrases cast in recessed letters two (2) inches in height:

1. "Storm Sewer"
2. "Drains to River" or "Drains to Waterway"
3. "Dump No Waste"
4. Other phrases shall require approval of the Westfield Public Works Department.

All castings frames shall have a horizontal bearing surface around the entire perimeter of the frame in order to support the cover or grate.

Bench Walls

Bench walls shall be shaped and formed for a clean transition with proper hydraulics to allow the smooth conveyance of flows through the structure. The bench wall shall form a defined channel, to a minimum height of the spring line of the pipe. Bench walls shall be formed using full depth Class "A" concrete. Solid concrete block, stone or sand shall not be permitted as a base or filler for the construction of the bench wall.

Reinforced Concrete Pipe and Fittings

Reinforced concrete pipe and fittings shall conform to ASTM C76, latest revision, for circular pipe and ASTM C507 for elliptical pipe.

Reinforced concrete pipe and fittings for normal conditions shall be reinforced in accordance with ASTM C76, Class III, IV or V, Wall B (minimum). Acceptance shall be on the basis of Subsection 4.1.1 of ASTM C76. Circumferential reinforcing in circular pipe shall be required. Only with approval from the Westfield Public Works Department will elliptical reinforcing or combination of elliptical and circumferential reinforcing or part circular reinforcing shall be permitted. In circular pipe, concrete pipe shall be storm cured and shall not be shipped from point of manufacture for at least five days after having been cast. Joints shall conform to the requirements of ASTM C443. Gaskets shall be of an oil resistant type having a maximum swell of 90% when tested in accordance with ASTM D471. Lubricant for jointing shall be approved by gasket manufacturer. All rubber gaskets similar to and equal to "Press-Seal" or "Tylox" conforming to ASTM Designation C443, latest revision. The gasket shall be attached to the spigot of the pipe and shall be the sole element depended upon to make the joint flexible and practically watertight. Butyl mastic joint sealant in rope or trowel applied form specifically made for permanently sealing joints in tongue and groove concrete sewer pipe. The material shall adhere tightly to the pipe surface and form a tight, flexible joint. The material shall have been in use for at least five years. Test results and material specifications shall be submitted to the Westfield Public Works Department and shall have been approved prior to use on the project.

Polyvinyl Chloride Pipe and Fittings

Polyvinyl chloride (PVC) pipe and fittings shall comply with ASTM D 3034.

Corrugated Metal Pipe and Pipe Arches

- The following specifications shall govern the manufacture of the corrugated steel pipe and pipe arches.
1. Specifications for Zinc Coated (galvanized) Steel Sheets (ASTM A444).
 2. Manufacture of Corrugated Steel Culverts and Underdrains (ASHTO M-36).
 3. Structural Plate for Pipe, Pipe Arches, and Arches (ASHTO M-167).
 4. Bituminous Coated Steel Pipe and Arches (ASHTO M-190).
 5. Sheet Material (ASTM A525).

Bituminous Coated Welded Seam Helically Corrugated Steel Pipe

The pipe shall be fabricated from flat coils. The base metal, spelter coating, and fabrication shall meet the applicable requirements of ASHTO M-36. Corrugations shall be 2-2/3-inch pitch by 1/2-inch depth. Each pipe shall have two annular corrugations rolled in each end. After the ends are rolled, the pipe shall be coated with bituminous material, inside and outside, to a minimum thickness of 0.05 inch as required by ASHTO M-190 for Type A coating.

Bituminous Coated and Paved Invert Welded Se Corrugated Steel Pipe

The pipe shall be fabricated from flat coils. The base metal, spelter coating, and fabrication shall meet the applicable requirements of ASHTO M-36. Corrugations shall be 2-2/3-inch pitch by 1/2-inch depth. Each pipe shall have two annular corrugations rolled in each end. After the ends are rolled, the pipe shall be coated with bituminous material, inside and outside, to a minimum thickness of 0.05 inch. In addition, bituminous material shall be applied to form a smooth pavement in the bottom 25% of pipe and in the bottom 40% of pipe arch as required by ASHTO M-190 for Type C coating.

Smooth Lined Welded Seam Helically Corrugated Steel Pipe

The pipe shall be fabricated from flat coils. The base metal, spelter coating, and fabrication shall meet the applicable requirements of ASHTO M-36. Corrugations shall be 2-2/3-inch pitch by 1/2-inch depth. Each pipe shall have two annular corrugations rolled in each end. Each pipe shall have two lifting lugs welded to the outside of the pipe. After the ends have been rolled, the pipe shall be coated with bituminous material, inside and outside, to a minimum thickness of 0.05 inch as required by ASHTO M-190 for Type A coating. The pipe shall be centrifugally lined on the inside with bituminous material to form a smooth interior which fits the corrugations to a minimum thickness of 1/8 inch above the crests of the corrugations. The bituminous lining material shall meet the requirements of ASHTO M-190.

Bituminous Coated Pipe Couplings

Coupling bands shall be the same base metal and spelter coating as the pipe. Bands shall be 0.064-inch thick and 10-1/2 inches wide. Bands shall be bituminous coated and shall have two corrugations 7-5/8 inches center to center. Bands 12-inch diameter through 30-inch diameter shall be one-piece, and 36-inch diameter through 96-inch diameter shall be two-piece. Band lugs 12-inch diameter through 48-inch diameter shall be joined by one galvanized bar, bolt, and strap connector. Band lugs 34-inch diameter through 96-inch diameter shall be joined by two galvanized bar, bolt, and strap connectors.

Aluminum Alloy Structural Plate

Aluminum alloy plates and fasteners intended for use in the construction of structural plate pipe and pipe arch for storm sewers shall meet the applicable requirements of ASHTO M-219. The plate shall be fabricated from aluminum alloy 5052 H141. The chemical composition of the plates shall conform to ASTM B209 alloy 5052. The corrugations shall have a pitch of 9 inches plus or minus 3/8 inch and depth of 2-1/2 inches plus or minus 1/8 inch. The inside crown radius of the corrugation shall be not less than 2 inches. The structural plate pipe or arches shall be assembled in accordance with the manufacturer's erection instructions and in accordance with the drawings.

Aluminized Steel Pipe and Arches

Aluminized coated corrugated steel pipe and pipe arch intended for use in the construction of storm sewers shall meet the applicable requirements of ASHTO M-36. Sheet material shall meet the latest revision of ASTM A525 and ASHTO M-274. The coils from which the pipe is produced shall be coated with 1.0 ounce per square foot of commercially pure aluminum. Pipe shall be furnished circular or as a pipe-arch shape as required and shall be fabricated with helical corrugations and a continuous welded seam extending from end to end of each length of pipe. Each end of each pipe with the welded seam shall have two annular corrugations reformatted to permit joining with huffer bands. Coupling bands shall be huffer bands.

Multi-plate Pipe and Pipe Arches

Multi-plate pipe and pipe arch structures shall be in accordance with ASHTO M-167. They shall be made with steel sections with corrugations 6 inches wide by 2 inches deep running at right angles to the section. Bolts and nuts shall be special heat-treated galvanized 3/4-inch diameter bolts in accordance with ASTM specifications. Multi-plate pipes and pipe arches shall be designed in accordance with the manufacturer's design criteria and in accordance with the drawings. Detailed instructions regarding erection shall be furnished by the manufacturer.

PVC Composite Pipe and Fittings

ABS or PVC composite pipe and fittings shall conform to ASTM D 2680, Latest Revision.

Corrugated Polyethylene Pipe and Fittings

Corrugated polyethylene pipe shall comply with the requirements for materials, test methods, dimensions, and marking in accordance with ASHTO M-252 for pipe diameters 6" - 10", ASHTO M-294 for pipe diameters of 12" - 48", and ASHTO MP7 for 54" and 60". The resin material shall meet ASTM D3350 cell classification 335400C. The pipe lengths shall be connected using a gasketed, bell and spigot joint. This joint shall consist of a factory installed, gasketed double bell polyethylene coupling, a factory welded bell or integral bell. The spigot end of the pipe shall be furnished with a factory installed elastomeric profile "O-ring" rubber gasket that meets ASTM F-477. The pipe shall be shipped with a removable wrap to protect the gasket. Provide lubrication to the joint prior to pushing together. At least two (2) corrugations of the spigot end must insert into the bell end. All HDPE pipe shall be certified through the Plastic Pipe Institute (PPI) Third Party Certification Program. All HDPE pipe delivered and installed shall bear the Third Party Administered PPI Seal.

Subsurface Drain Tiles

Double wall smooth bore corrugated polyethylene tile, manufactured under specification ASTM F 667, shall be required for all subsurface drain tile installed in swales. Single wall corrugated polyethylene drain tile shall be required for curb sub-grade drainage. Polyethylene tile shall possess male and female pipe ends, which allow the construction of overlapping, gasket pipe joints, in conformance with the requirements of ASTM F 477. As an alternative, pipe joints utilizing external couplings bonds will be accepted, provided the minimum ASHTO requirements for satisfying soil lightness are also achieved. Storm sewer pipe shall be of the size shown on the drawings and shall meet all requirements of these specifications. Subsurface drains (SSD) shall have a minimum of four hundred (400) feet between structures. Subsurface drains shall have clean-outs installed every 400 feet or at changes in direction.

CHAPTER 500 INSTALLATION OF STORMWATER FACILITIES
SECTION 501 GENERAL

501.01 Pipe Cover

501.02 Inspection and Rejection

501.03 Manholes/Inlets

501.04 Installation and Workmanship

501.05 Special Hydraulic Structures

501.06 Connections to Storm Sewer System

501.07 Insulation and Protection

501.08 Handling Pipe

501.09 Notice to Westfield Public Works Department

501.10 Laying Pipe

501.11 Bedding and Haunching

501.12 Concrete Curbles (Class "A" Bedding)

501.13 Manholes and Other Structures

501.14 Manholes and Inlets

501.15 Laying Pipe

501.16 Bedding and Haunching

501.17 Concrete Curbles (Class "A" Bedding)

501.18 Manholes and Other Structures

501.19 Manholes and Inlets

501.20 Laying Pipe

501.21 Bedding and Haunching

501.22 Concrete Curbles (Class "A" Bedding)

501.23 Manholes and Other Structures

501.24 Manholes and Inlets

501.25 Laying Pipe

501.26 Bedding and Haunching

501.27 Concrete Curbles (Class "A" Bedding)

501.28 Manholes and Other Structures

501.29 Manholes and Inlets

501.30 Laying Pipe

501.31 Bedding and Haunching

501.32 Concrete Curbles (Class "A" Bedding)

501.33 Manholes and Other Structures

501.34 Manholes and Inlets

501.35 Laying Pipe

501.36 Bedding and Haunching

501.37 Concrete Curbles (Class "A" Bedding)

501.38 Manholes and Other Structures

501.39 Manholes and Inlets

501.40 Laying Pipe

501.41 Bedding and Haunching

501.42 Concrete Curbles (Class "A" Bedding)

501.43 Manholes and Other Structures

501.44 Manholes and Inlets

501.45 Laying Pipe

501.46 Bedding and Haunching

501.47 Concrete Curbles (Class "A" Bedding)

501.48 Manholes and Other Structures

501.49 Manholes and Inlets

501.50 Laying Pipe

501.51 Bedding and Haunching

501.52 Concrete Curbles (Class "A" Bedding)

501.53 Manholes and Other Structures

501.54 Manholes and Inlets

501.55 Laying Pipe

501.56 Bedding and Haunching

501.57 Concrete Curbles (Class "A" Bedding)

501.58 Manholes and Other Structures

501.59 Manholes and Inlets

501.60 Laying Pipe

501.61 Bedding and Haunching

501.62 Concrete Curbles (Class "A" Bedding)

501.63 Manholes and Other Structures

501.64 Manholes and Inlets

501.65 Laying Pipe

501.66 Bedding and Haunching

501.67 Concrete Curbles (Class "A" Bedding)

501.68 Manholes and Other Structures

501.69 Manholes and Inlets

501.70 Laying Pipe

501.71 Bedding and Haunching

501.72 Concrete Curbles (Class "A" Bedding)

501.73 Manholes and Other Structures

501.74 Manholes and Inlets

501.75 Laying Pipe

501.76 Bedding and Haunching

501.77 Concrete Curbles (Class "A" Bedding)

501.78 Manholes and Other Structures

501.79 Manholes and Inlets

501.80 Laying Pipe

501.81 Bedding and Haunching

501.82 Concrete Curbles (Class "A" Bedding)

501.83 Manholes and Other Structures

501.84 Manholes and Inlets

501.85 Laying Pipe

501.86 Bedding and Haunching

501.87 Concrete Curbles (Class "A" Bedding)

501.88 Manholes and Other Structures

501.89 Manholes and Inlets

501.90 Laying Pipe

501.91 Bedding and Haunching

501.92 Concrete Curbles (Class "A" Bedding)

501.93 Manholes and Other Structures

501.94 Manholes and Inlets

501.95 Laying Pipe

501.96 Bedding and Haunching

501.97 Concrete Curbles (Class "A" Bedding)

501.98 Manholes and Other Structures

501.99 Manholes and Inlets

501.100 Laying Pipe

501.101 Bedding and Haunching

501.102 Concrete Curbles (Class "A" Bedding)

501.103 Manholes and Other Structures

501.104 Manholes and Inlets

501.105 Laying Pipe

501.106 Bedding and Haunching

501.107 Concrete Curbles (Class "A" Bedding)

501.108 Manholes and Other Structures

501.109 Manholes and Inlets

501.110 Laying Pipe

501.111 Bedding and Haunching

501.112 Concrete Curbles (Class "A" Bedding)

501.113 Manholes and Other Structures

501.114 Manholes and Inlets

501.115 Laying Pipe

501.116 Bedding and Haunching

501.117 Concrete Curbles (Class "A" Bedding)

501.118 Manholes and Other Structures

501.119 Manholes and Inlets

501.120 Laying Pipe

501.121 Bedding and Haunching

501.122 Concrete Curbles (Class "A" Bedding)

501.123 Manholes and Other Structures

501.124 Manholes and Inlets

501.125 Laying Pipe

501.126 Bedding and Haunching

501.127 Concrete Curbles (Class "A" Bedding)

501.128 Manholes and Other Structures

501.129 Manholes and Inlets

501.130 Laying Pipe

501.131 Bedding and Haunching

501.132 Concrete Curbles (Class "A" Bedding)

501.133 Manholes and Other Structures

501.134 Manholes and Inlets

501.135 Laying Pipe

501.136 Bedding and Haunching

501.137 Concrete Curbles (Class "A" Bedding)

501.138 Manholes and Other Structures

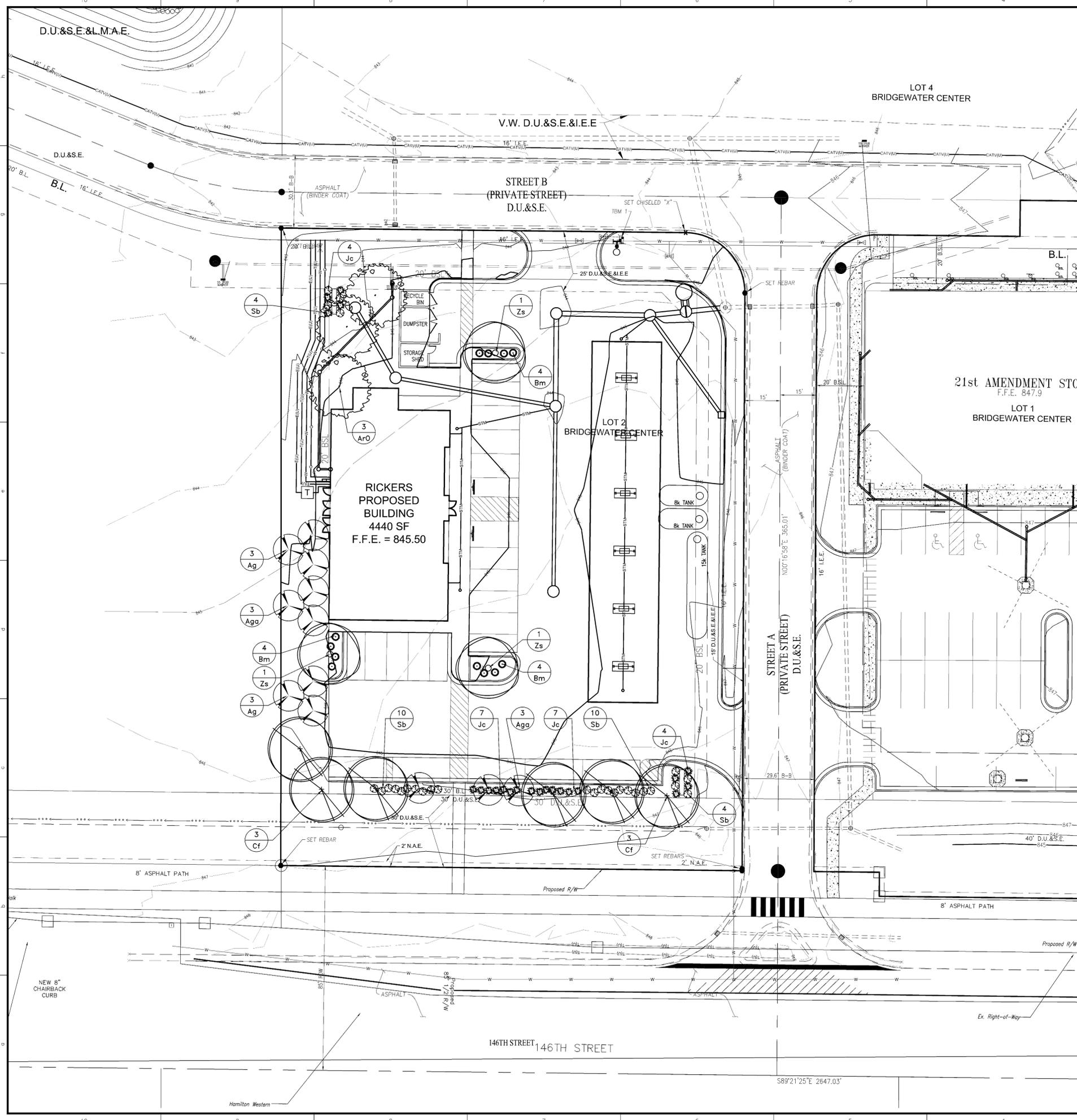
501.139 Manholes and Inlets

501.140 Laying Pipe

501.141 Bedding and Haunching

501.142 Concrete Curbles (Class "A" Bedding)

501.



GENERAL NOTES

- IN CASE OF DISCREPANCIES BETWEEN THE PLAN AND THE PLANT LIST, THE PLAN SHALL DICTATE. IF IN QUESTION, CONTACT THE LANDSCAPE DESIGNER.
- ALL SHRUBS PLANTING AREAS TO BE COVERED WITH 4" THICK LAYER OF SHREDDED HARDWOOD BARK MULCH. ALL GROUND COVER BEDS SHALL BE COVERED WITH 1" SHREDDED HARDWOOD BARK MULCH. BARK MULCH SHALL BE APPROVED BY LANDSCAPE DESIGNER AND SHALL BE UNIFORM IN TEXTURE AND COLOR AND SHALL BE OBTAINED FROM SAWMILL OR LUMBERING OPERATIONS. NO UTILITY MULCH OR PROCESSED TREE TRIMMINGS WILL BE ALLOWED.
- AN APPROVED PRE-EMERGENT HERBICIDE SHALL BE APPLIED IN ALL PLANTING AND GROUND COVER BEDS AT RATES SPECIFIED BY MANUFACTURER FOR EACH VARIETY OF PLANT.
- FINAL PLACEMENT OF PLANT MATERIALS, ETC. SHALL BE APPROVED BY LANDSCAPE DESIGNER BEFORE PLANTING OPERATIONS ARE TO PROCEED. ALL TREE LOCATIONS SHALL BE MARKED WITH A WOODED STAKE INDICATING VARIETY AND SIZE OF TREE. ALL GROUND COVER AND MULCH BED LINES SHALL BE MARKED BY A HIGHLY VISIBLE PAINT LINE WITH OCCASIONAL WOOD STAKES FOR REFERENCE. ALL STAKES SHALL BE REMOVED FOLLOWING PLANTING OPERATIONS. LANDSCAPE DESIGNER RESERVES THE RIGHT TO ADJUST PLANT LOCATIONS ON SITE.
- NO SUBSTITUTIONS OF PLANT MATERIAL WILL BE ALLOWED. IF PLANTS ARE SHOWN TO BE UNAVAILABLE, THE CONTRACTOR SHALL NOTIFY LANDSCAPE DESIGNER PRIOR TO BID DATE IN WRITING. ALL PLANTS SHALL BE INSPECTED AND TAGGED WITH PROJECT IDENTIFICATION AT NURSERY OR CONTRACTORS OPERATION PRIOR TO MOVING TO JOB SITE. PLANTS MAY ALSO BE INSPECTED AND APPROVED OR REJECTED ON THE JOB SITE.
- ALL PLANTS ARE TO MEET OR EXCEED AMERICAN STANDARDS FOR NURSERY STOCK, LATEST EDITION, AS SET FORTH BY AMERICAN ASSOCIATION OF NURSERYMEN.
- PLANTS AND ALL OTHER MATERIALS TO BE STORED ON SITE WILL BE PLACED WHERE THEY WILL NOT CONFLICT WITH CONSTRUCTION OPERATIONS AND AS DIRECTED BY OWNER.
- ALL NEW LANDSCAPE PLANTINGS SHALL BE GUARANTEED FOR A PERIOD OF ONE YEAR FOLLOWING FINAL INSPECTION BY LANDSCAPE DESIGNER. AT THE END OF THIS PERIOD, PLANT MATERIAL TERMED DEAD OR UNSATISFACTORY FOLLOWING LANDSCAPE DESIGNER SHALL BE REPLACED AT NO ADDITIONAL CHARGE BY THE LANDSCAPE CONTRACTOR.
- THE LANDSCAPE CONTRACTOR SHALL OBTAIN AND PAY FOR ALL PERMITS AND FEES THAT MAY BE REQUIRED FOR HIS PORTION OF WORK.
- PEAT MOSS TO BE USED ON PROJECT SHALL BE A DOMESTIC OR IMPORTED MATERIAL, CHOCOLATE BROWN IN COLOR AND COMPOSED OF PARTIALLY DECOMPOSED VEGETABLE MATERIAL. PEAT MOSS TO ALSO BE MILDLY ACIDIC IN CHARACTER AND SHALL MEET APPROVAL OF LANDSCAPE DESIGNER.
- LANDSCAPE CONTRACTOR SHALL NOTIFY LANDSCAPE DESIGNER IN WRITING PRIOR TO BID DATE OF ANY PLANTS THAT HE FEELS MAY NOT SURVIVE IN LOCATIONS NOTED.
- ALL LANDSCAPING PLANTINGS TO BE MAINTAINED FOR 1 YEAR FOLLOWING TURNOVER. MAINTENANCE TO INCLUDE WATERING, WEEDING, CULTIVATION, MULCHING, MOVING AND ALL OTHER NECESSARY OPERATIONS REQUIRED FOR PROPER ESTABLISHMENT OF PLANTINGS. NOTE: AT END OF MAINTENANCE PERIOD, CONTRACTOR TO REMOVE GUYING AND STAKING FROM TREES.
- CONTRACTOR TO SUBMIT UNIT PRICES ON EVERY TYPE OF WORK AS REQUESTED BY LANDSCAPE DESIGNER.
- BACKFILL FOR TREE AND SHRUB PLANTING SHALL BE 75% APPROVED TOPSOIL AND 25% APPROVED PEAT MOSS. TOP LAYER OF BACKFILL SHALL BE 100% EXISTING TOPSOIL. A 5-10-5 ANALYSIS SLOW RELEASE FERTILIZER SHALL BE INCORPORATED INTO BACKFILL AT APPROVED RATES.
- PROVIDE MINIMUM 4" PLANTING SOIL IN ALL GROUND COVER AND FLOWER AREAS WITH MIXTURE COMPRISING OF ONE PART COMMERCIAL GRADE "POTTING SOIL", 5 PARTS TOPSOIL AND 4 PARTS PEAT MOSS. A FULL 4" LAYER OF APPROVED SHREDDED FIBROUS PEAT MOSS MAY BE USED IN LIEU OF PLANTING MIX.
- PLANTS SHALL BEAR A TAG SHOWING GENUS, SPECIES AND VARIETY.
- PLANTS SHALL BE CERTIFIED BY THE STATE OF INDIANA DEPARTMENT OF NATURAL RESOURCES AND FREE FROM DISEASE OR HAZARDOUS INSECTS.
- IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO VERIFY ALL EXISTING UTILITIES PERTAINING TO THEIR PHASE OF WORK. UTILITIES ARE SHOWN TO BE APPROXIMATE. CALL UTILITY LOCATE PRIOR TO ANY PLACEMENT OF PLANT MATERIAL OR OTHER LANDSCAPE MATERIAL.

LANDSCAPE RECOMMENDATIONS (ORDINANCE #06-49)

REQUIREMENT:	REQUIRED:	PROVIDED:
SECTION 16.06.050-01: MINIMUM ONSITE REQUIREMENTS		
-10 CANOPY TREES PER ACRE x 1.17 ACRES = 11.7 REQUIRED	-12 TREES	-12 TREES
-10 UNDERSTORY TREES PER ACRE x 1.17 ACRES = 11.7 REQUIRED	-12 TREES	-12 TREES
-25 SHRUBS PER ACRE x 1.17 ACRES = 30 SHRUBS REQUIRED	-30 SHRUBS	-30 SHRUBS
SECTION 16.06.050, B. ROAD FRONTAGE STANDARDS		PROVIDED AS PART OF SECTION 16.06050-01
-1 CANOPY TREE PER 40 LF. ALONG R.O.W. 156LF/40 = 3.9 REQUIRED	-5 TREES	
SECTION 16.06.070: PARKING AREA LANDSCAPING		
-25 TO 49 SPACES REQUIRES 7.5% OF PARKED AREA TO BE LANDSCAPED.	-347 SF.	-369 SF.
SECTION 16.06.070, A2.e. PARKING LOT ISLANDS		PROVIDED AS PART OF SECTION 16.06050-01
-1 TREE PER ISLAND	-3 TREES	
-4 SHRUBS ISLAND	-12 SHRUBS	
SECTION 16.06.070, B.2. PERIMETER PARKING LOT LANDSCAPING		PROVIDED AS PART OF SECTION 16.06050-01
-1 TREE PER 30 LF.	-6 TREES	
-180 LF / 30 = 6 REQUIRED		
-1 SHRUB PER 3 LF.	-34 SHRUBS	-34 SHRUBS
-180 LF / 3 = 34 REQUIRED		
OPEN SPACE	20%	34.7%

PLANT SCHEDULE

PLAN KEY	BOTANICAL NAME	COMMON NAME	SIZE	QUANTITY	ROOT CONDITION	ON CENTER	SPECIAL INSTRUCTIONS
CANOPY DECIDUOUS TREES							
A/O	ACER RUBRUM 'OCTOBER GLORY'	OCTOBER GLORY RED MAPLE	2 1/2"	3	X		SEE PLAN
Cf	CARPINUS b 'FRANS FONTAINE'	FRANS FONTAINE HORNBEAM	2 1/2"	6	X		SEE PLAN
Zs	ZELKOVA SERRATA	JAPANESE ZELKOVA	2 1/2"	3	X		SEE PLAN
ORNAMENTAL UNDERSTORY TREES							
Ag	ACER GINNALA 'FLAME'	AMUR MAPLE	2"	6	X		SEE PLAN
AgA	AMELANCHIER X GRANDIFLORA 'AUTUMN BRILLIANCE'	AUTUMN BRILLIANCE SERVICEBERRY	2"	6	X		SEE PLAN, MULTI BRANCH
DECIDUOUS SHRUBS							
Sb	SPIRAEA X BUMALDA 'ANTHONY WATERER'	ANTHONY WATERER SPIREA	#3	28		X	SEE PLAN, MIN 18"
EVERGREEN SHRUBS							
Bm	BUXUS MICROPHYLLA	LITTLELEAF BOXWOOD	#1	12		X	SEE PLAN, MIN. 36"
Jc	JUNIPERUS CHINENSIS 'PFITZERERANA'	COMPACT JUNIPER	18"	22		X	SEE PLAN, MIN 18"

LANDSCAPE NOTES

- REFER TO SHEET C102 FOR AREAS OF SEED AND MULCH. SOD TO BE USED AS AN ALTERNATE.

10505 N. College Avenue
Indianapolis, Indiana 46280
weihe.net
317 846-6611
800 452-6408
317 843-0546 fax
ALLAN H. WEIHE, P.E., I.S. - FOUNDER

WEIHE ENGINEERS
Land Surveying / Civil Engineering
Landscape Architecture

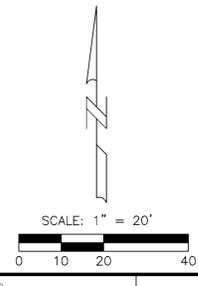
DATE	BY	REVISIONS AND ISSUES
12/23/2013	W13.0559	PROJECT NO.
01/29/2014	R/W	PRELIMINARY REVIEW
	R/W	SUBMITTED FOR REVIEW



ROBERT A. MEZOWSKI L.A. 80050002

PREPARED FOR:
AT BRIDGEWATER
Section M4, Lot 2 of Bridgewater Center located at 3404 East 146th Street, Westfield, IN 46033
LANDSCAPE PLAN
Part of the S1/4 of Section 17, Township 18 North, Range 4 East, Washington Township, Hamilton County, Indiana

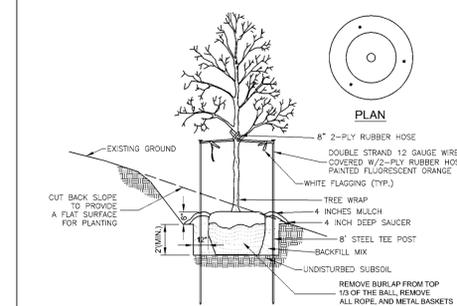
SHEET NO.
L100
PROJECT NO.
W13.0559



SCALE: 1" = 20'
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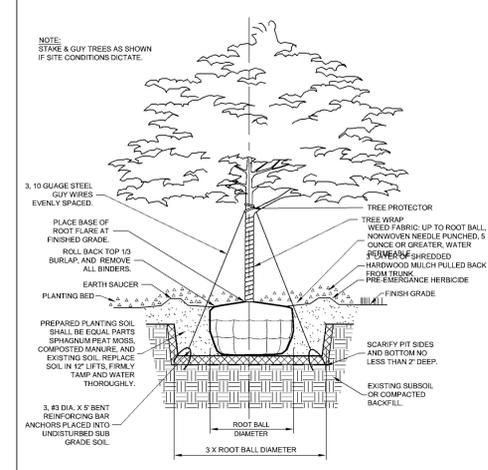
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DATE/TIME: January 29, 2014 - 4:42pm
PLOTID: 01r_weiherr

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 PLOTTED BY: weihelr

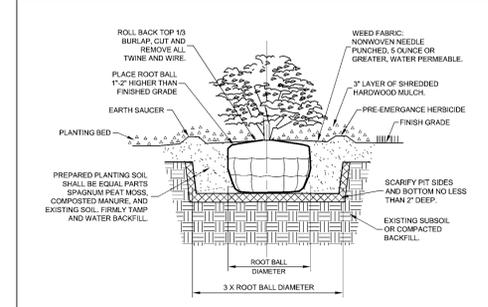


NOTES:
 • SEE LANDSCAPE NOTES FOR THE TYPE OF MULCH MATERIAL TO USE.
 • TOP OF ROOT BALL TO BE SET 4" HIGHER THAN ADJACENT EARTH GRADE.

TREE PLANTING ON SLOPE
 (NO SCALE)



SHADE TREE PLANTING DETAIL
 (NO SCALE)



SHRUB & SMALL TREE PLANTING DETAIL
 (NO SCALE)

10505 N. College Avenue
 Indianapolis, Indiana 46280
 weihe.net
 317 | 846 - 6611
 800 | 452 - 6408
 317 | 843 - 0546 fax
 ALLAN H. WEIHE, P.E., L.S. - FOUNDER

WEIHE ENGINEERS
 Land Surveying | Civil Engineering
 Landscape Architecture

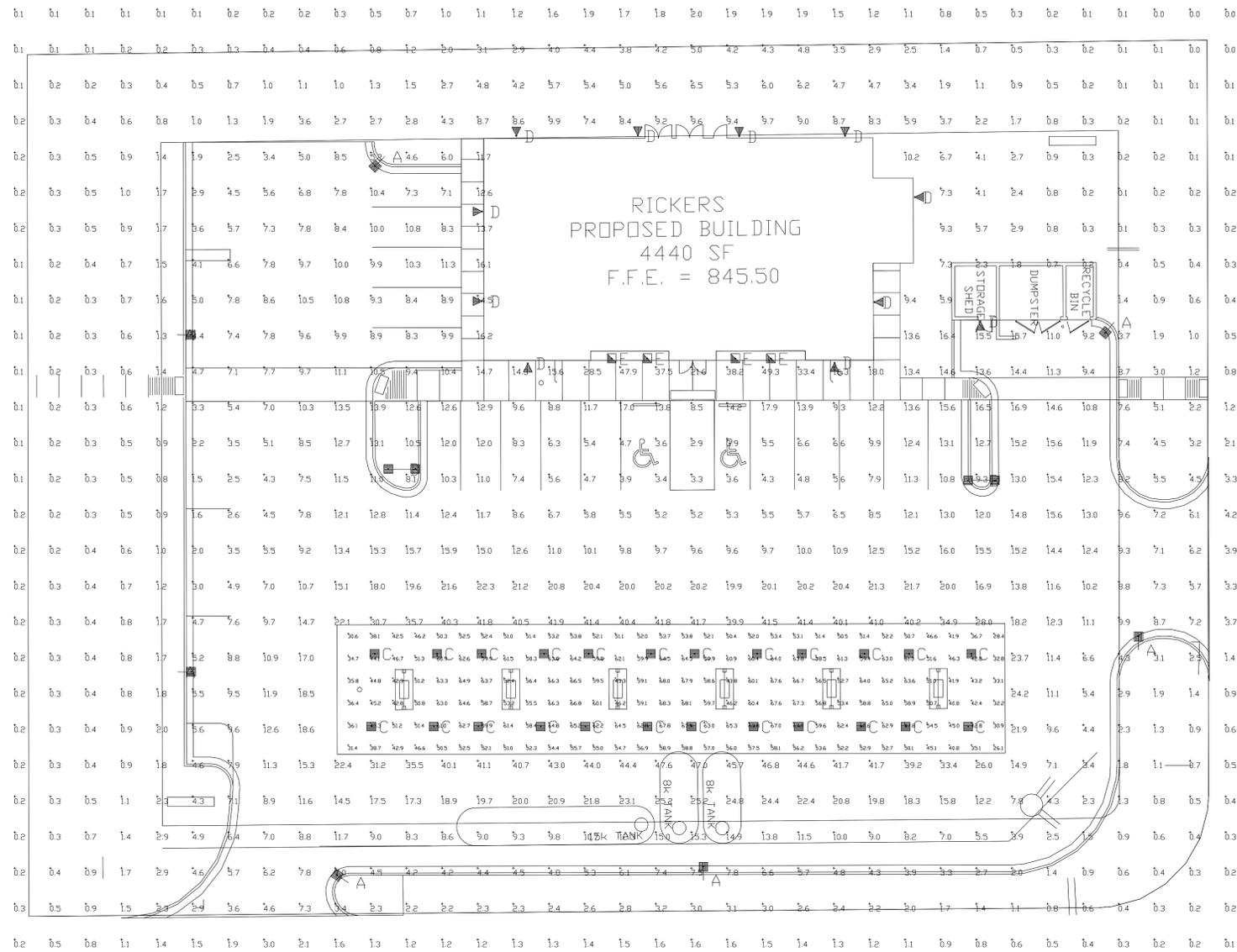
REVISIONS AND ISSUES	DATE	BY	PROJECT NO.
PRE-FILE DRAFTING	12/23/2013	RLW	W13.0559
SUBMITTED FOR REVIEW	01/29/2014	RLW	W130559-L101.dwg
			DESIGNED BY: RLW
			DRAWN BY: RLW
			CHECKED BY: RLW
			DATE: 12/23/2013



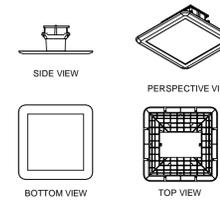
ROBERT A. MEZIKOWSKI L.A. 80050303

PREPARED FOR:
At Bridgewater
 Section M4, Lot 2 of Bridgewater Center located at 3404 East 146th Street, Westfield, IN 46033
LANDSCAPE DETAILS
 Part of the S1/4 of Section 17, Township 18 North, Range 4 East, Washington Township, Hamilton County, Indiana

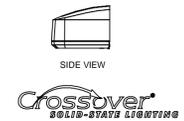
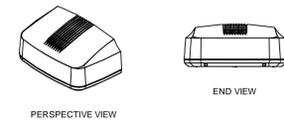
SHEET NO.
L200
 PROJECT NO.
W13.0559



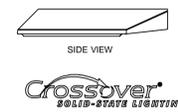
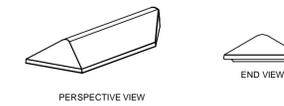
CRU-SC-LED
LED CANOPY LIGHT - LEGACY



XPWS3
LED Crossover Wall Mount Light



XAMU
LED Crossover Area Light



XSL2-S-50
LED Crossover Soffit



Symbol	Qty	Label	Arrangement	Description	LLF	Lumens/Lamp	Arr. Lum. Lumens	Arr. Watts
	7	A	SINGLE	XAMU-FT-LED-128-HD-CW-UE-HSS-18'POLE+2'BASE	1.000	N.A.	12527	179
	2	B	D180°	XAMU-S-LED-128-HD-CW-UE-D180-18'POLE+2'BASE	1.000	N.A.	29576	350
	24	C	SINGLE	CRU-SC-LED-HD-CW-UE	1.000	N.A.	17001	149
	11	D	SINGLE	XPWS3-FT-LED-48-450-CW-UE-12'MH	1.000	N.A.	6159	72
	4	E	SINGLE	XSL2-S-LED-50-HD-CW-10'MH	1.000	N.A.	8347	86.2

Label	CalcType	Units	Avg	Max	Min	Avg/Min	Max/Min
CalcPts	Illuminance	Fc	7.59	49.3	0.0	N.A.	N.A.
CANDPY	Illuminance	Fc	54.15	68.3	26.1	2.07	2.62
INSIDE CURB	Illuminance	Fc	13.64	47.6	1.5	9.09	31.73

Footcandle levels taken at grade.

Drawing scaled or converted from PDF file or scanned / submitted image. Dimensions are approximate.

Based on the information provided, all dimensions and luminaire locations shown represent recommended positions. The engineer and/or architect must determine the applicability of the layout to existing or future field conditions.

This lighting plan represents illumination levels calculated from laboratory data taken under controlled conditions in accordance with The Illuminating Engineering Society (IES) approved methods. Actual performance of any manufacturer's luminaires may vary due to changes in electrical voltage, tolerance in lamps/LED's and other variable field conditions. Calculations do not include obstructions such as buildings, curbs, landscaping, or any other architectural elements unless noted.

Total Project Watts
Total Watts = 6665801

Lighting Proposal LD-119971-1
 RICKERS
 146th & CAREY RD
 WESTFIELD, IN
 BY: MVE DATE: 03-27-14 REV: 1-30-14 SHEET 1 OF 1
 SCALE: 1"=16' 0 16

LED CANOPY LIGHT - LEGACY™ (CRU)



LED lighting facts
A Program of the U.S. DOE

Crossover LED Lighting

Light Output (Lumens)	16997
Watts	148.9
Lumens per Watt (Efficacy)	114
Color Accuracy Color Rendering Index (CRI)	74

Light Color
Correlated Color Temperature (CCT)

5037 (Daylight)

2700K 3000K 4500K 6500K

Warm White Bright White Daylight

Warranty** Yes

All results, except LED Lumen Maintenance, are according to IESNA LM-79-2008: Approved Method for the Electrical and Photometric Testing of Solid-State Lighting. The U.S. Department of Energy (DOE) verifies product test data and results.

** See www.lightingfacts.com/products for details.

Registration Number: KGGN-NZWH8 (6/12/2013)
Model Number: CRU SC LED HO CW UE
Type: Canopy light

US & Int'l. patents pending.

SMARTTEC™ ENERGY SAVING FEATURES

THERMAL CONTROL - LSI drivers feature integral sensor which reduces drive current, when ambient temperatures exceeds rated temperature.

HOUSING - Low profile, durable die-cast, aluminum construction, providing a reliable weather-tight seal.

LEDS - Features an array of select, mid-power, high brightness, high efficiency LED chips; 5300°K color temperature, 70 CRI (nominal).

DRIVE CURRENT - Choice of Low Wattage (LW), Mid Wattage (MW), Super Saver (SS), High Output (HO), or Very High Output (VHO).

OPTICS / DISTRIBUTION - Symmetrical, which directs light through a clear tempered glass lens, to provide a uniform distribution of light to vertical and horizontal surfaces.

OPTICAL UNIT - Features an ultra-slim 3/4" profile die cast housing, with a flat glass lens. Unit is water-resistant, sealed to an IP67 rating. Integral designed heat sink does not trap dirt and grime, ensuring cool running performance over the life of the fixture.

PRESSURE STABILIZING VENT - Luminaire assembly incorporates a pressure stabilizing vent breather to prevent seal fatigue and failure.

HAZARDOUS LOCATION - Designed for lighter than air fuel applications. Product is suitable for Class 1 Division 2 only when properly installed per LSI installation instructions.

DRIVER - State-of-the-art driver technology superior energy-efficiency and optimum light output. LSI driver components are fully encased in potting for IP65 moisture resistance. Complies with IEC and FCC standards. Surge protected at 10KV.

DRIVER HOUSING - Die cast aluminum, wet location rated driver/electrical enclosure is elevated above canopy deck to prevent water entry, provide easy "knock-out" connection of primary wiring and contributes to attaining the lowest operating temperatures available. Seals to optical housing via one-piece molded silicone gasket.

OPERATING TEMPERATURE - -40°C to 50°C (-40°F to +122°F)

ELECTRICAL - Universal voltage power supply, 120-277 VAC, 50/60 HZ input. LSI drivers feature two-stage surge protection (including separate surge protection built into electronic driver) meets IEEE C62.41.2-2002, Scenario 1, Location Category C.

FINISH - Standard color is white and is finished with LSI's DuraGrip polyester powder coat process. DuraGrip withstands extreme weather changes without cracking or peeling.

INSTALLATION - One person installation. No additional sealant required. Installs in a 12" or 16" deck pan. Deck penetration consists of a 4" hole, simplifying installation and water sealing. Unit is designed to quickly retrofit into existing Scottsdale (4") hole as well as openings for Encore and Encore Top Access and to reconnect wiring for the SC/ECTA without having to relocate the conduit. Retro panels are available for existing Encores (see back page) as well as kits for recessed and 2x2 installations (see separate spec sheets). Support brackets are provided standard, to prevent sagging of deck.

SHIPPING WEIGHT - 25 pounds (single pack), 50 pounds (double pack).

EXPECTED LIFE - Minimum 60,000 to 100,000 hours depending upon the ambient temperature of the installation location. See LSI web site for specific guidance.

WARRANTY - Limited 5-year warranty.

LISTING - UL and ETL listed to UL 1598, UL 8750 and other U.S. and International safety standards. Suitable for wet locations.

PHOTOMETRICS - Applications layouts are available upon request. Contact LSI Petroleum Lighting or petroleum.apps@lsi-industries.com

This product, or selected versions of this product, meet the standards listed below. Please consult factory for your specific requirements.



Class 1, Division 2 – Standard on HO, SS, MW & LW only

T5 Temperature Classification – The surface temperature of this product will not rise above 100°C., within a 40°C ambient.

Gas Groups A,B,C, and D – Group A: Acetylene / Group B: Hydrogen / Group C: Propane and Ethylene / Group D: Benzene, Butane, Methane & Propane.

LED CANOPY LIGHT - LEGACY™ (CRU)

LUMINAIRE ORDERING INFORMATION

TYPICAL ORDER EXAMPLE: **CRU SC LED SS CW UE WHT**

Prefix	Distribution	Light Source	Drive Current	Color Temperature	Input Voltage	Finish	Options
CRU	SC - Standard Symmetric	LED	LW - Low Watt MW - Mid Wattage SS - Super Saver HO - High Output VHO - Very High Output	CW - Cool White	UE - Universal Voltage (120-277V) 347-347V ¹	WHT - White BRZ - Bronze BLK - Black	2L - Bi-Level Switching ²

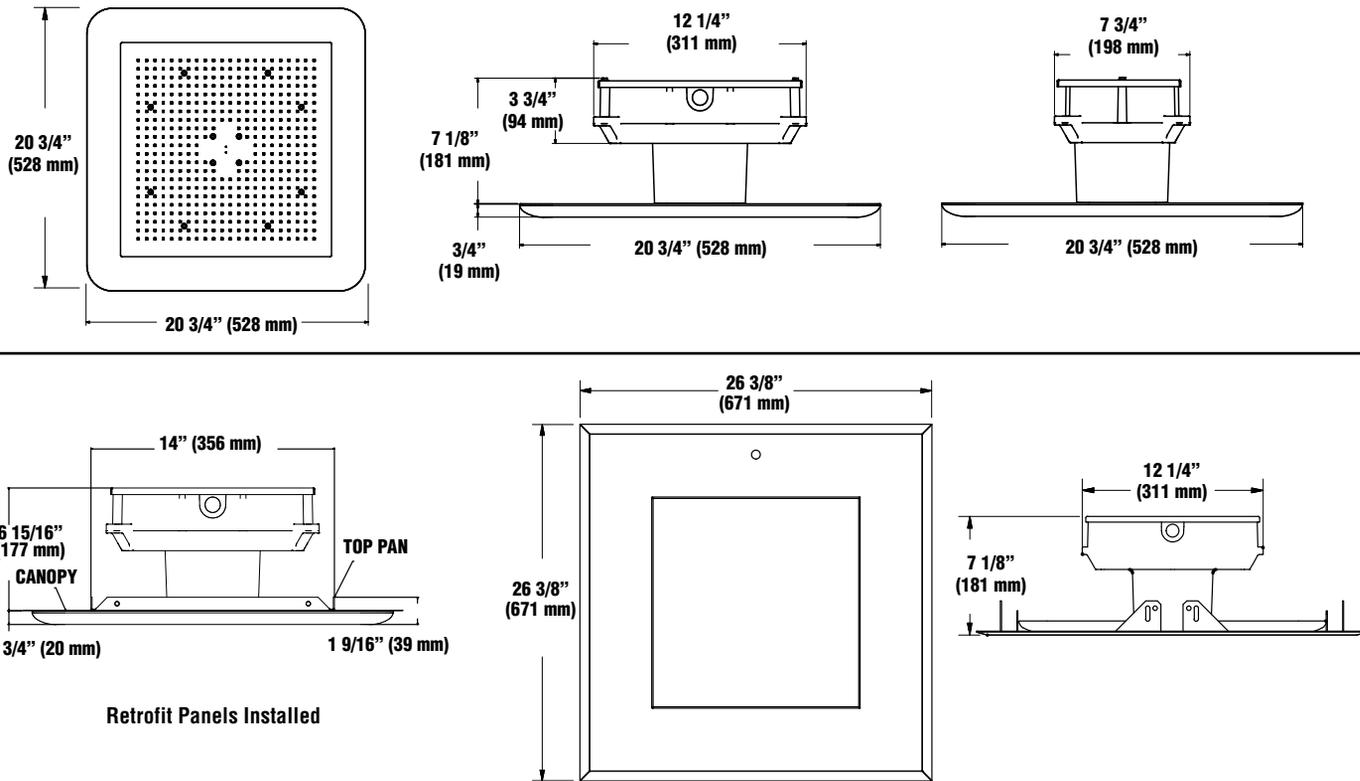
FOOTNOTES:

1- 347V only available in HO drive current.
2- Bi-Level available on "HO" drive current only.

ACCESSORY ORDERING INFORMATION (Accessories are field installed)

Description	Order Number	Description	Order Number
Retrofit Panels - EC / ECTA / SCF to CRU, for 16" Deck Panel	525946	Kit - Hole Plugs and Silicone (enough for 25 retrofits) ¹	1320540
Retrofit Panels - ECTA / SCF to CRU, for 12" Deck Panel	530281	CRU FKL - Flange Kit ²	537530WHT
Retrofit 2x2 Cover Panel Blank (no holes)	357282	1- Consists of (25) 7/8" hole plugs and (1) 10.3 oz tube of RTV	
Retrofit RIC Cover Panel Blank (no holes)	354702	2- Flange Kit used to mount CRU in double deck applications	

DIMENSIONS



CRU FKL (for double deck applications)

LIGHT OUTPUT - CRU				
	Lumens	Watts	LPW	
Cool White	LW - Low Watt	8,438	76	111
	MW - Mid Watt	11,656	103	113
	SS - Super Saver	13,638	129	106
	HO - High Output	17,001	149	114
	VHO - Very High Output	20,997	192	109

LED AREA LIGHTS - AEROMAX™ MEDIUM (XAMU)



US patent 7828456, 7952293, 8002428 and CAN 2693131 & 2701653 and US & Int'l. patents pending

SMARTTEC™ THERMAL CONTROL - Sensors in both optical unit and driver enclosure reduce drive current when ambient temperatures exceed 50°C. Current is lowered in imperceptible 5% increments every 5 minutes until safe operating temperature is reached.

ENERGY SAVING CONTROL OPTIONS – DIM – 0-10 volt dimming enabled with controls by others. BLS – Bi-level switching responds to external line voltage signal from separate controller or sensor (by others), with low light level decreased to 30% maximum drive current.

EXPECTED LIFE - Minimum 60,000 hours to 100,000 hours depending upon the ambient temperature of the installation location. See LSI web site for specific guidance.

LEDS - Select high-brightness LEDs in Cool White (5000°K nominal) or Neutral White (4000°K nominal) color temperature. 70 CRI (nominal).

DISTRIBUTION/PERFORMANCE - Types 3, FT and 5. Exceptional uniformity creates bright environment at lower light levels. Improved backlight cutoff minimizes light trespass.

HOUSING - One-piece, die-formed aluminum. Weather-tight housing contains factory prewired driver and field connections. Extruded one-piece EPDM gasketed wiring access door (with safety lanyard) is located underneath and utilizes tool-less thumbscrew fastener.

OPTICAL UNIT - Clear tempered optical grade flat glass lens sealed to aluminum optics housing creates an IP67 rated, sealed optical unit. Optical unit is recessed into housing cavity and sealed to the housing with extruded one-piece EPDM gasket. Pressure stabilizing breather allows super-tight IP67 protection while preventing temperature cycling from building up internal pressures and vacuums that can stress optical unit seals and components. Optical unit lanyard serves dual purposes of safety and provides positive ground between unit and housing.

MOUNTING - Tapered rear design allows fixtures to be mounted in a quad pattern without the need for extension arms. Use with 3" reduced drilling pattern on round and square poles. A round pole plate (X4RPP, X5RPP) is required for mounting to round poles. Wall mount available by ordering wall mounting bracket (BKS-XBO-WM-* -CLR). See Accessory Ordering Information chart for all brackets.

ELECTRICAL - A terminal block for attachment of incoming primary wiring is supplied. Two-stage surge protection (including separate surge protection built into electronic driver) meets IEEE C62.41.2-2002, Location Category C. Available with universal voltage power supply 120-277VAC (50/60Hz input), and 347-480 VAC. Optional twistlock photocell receptacle is available. Photocell must be ordered separately. Fixture Watts: SS - 139, HO - 176 nominal.

DRIVER - Available in SS (Super Saver) and HO (High Output) drive currents (Drive currents are factory programmed). State-of-the-art driver technology designed specifically for LSI LED light sources provides unsurpassed system efficiency. Components are fully encased in potting material for IP65 moisture resistance. Driver complies with IEC and FCC standards. Driver and key electronic components can easily be accessed.

OPERATING TEMPERATURE - -40°C to +50°C (-40°F to +122°F).

FINISH - Fixtures are finished with LSI's DuraGrip® polyester powder coat finishing process. The DuraGrip finish withstands extreme weather changes without cracking or peeling, and is guaranteed for five full years.

WARRANTY - LSI LED fixtures carry a limited 5-year warranty.

PHOTOMETRICS - Application layouts are available upon request. Contact LSI Applications Group at lighting.apps@lsi-industries.com

SHIPPING WEIGHT (in carton) - 39 lbs. / 17.7 Kg

LISTING - ETL listed to U.S. and International safety standards. Suitable for wet locations.

Crossover LED Lighting

lighting facts®

A Program of the U.S. DOE

Light Output (Lumens) 14091

Watts 135.5

Lumens per Watt (Efficacy) 104

Color Accuracy
Color Rendering Index (CRI) 72

Light Color
Correlated Color Temperature (CCT) 5477 (Daylight)

2700K 3000K 4500K 6500K

Warranty** Yes

All results, except LED Lumen Maintenance, are according to IESNA LM-79-2008: Approved Method for the Electrical and Photometric Testing of Solid-State Lighting. The U.S. Department of Energy (DOE) verifies product test data and results.

** See www.lightingfacts.com/products for details.

Registration Number: KGGN-QMKWZ6 (3/11/2013)
Model Number: XAMU FT LED 128 SS CW UE
Type: Outdoor area/roadway fixture

LIGHT OUTPUT - XAMU					
		# of LEDs	Lumens (Nominal)		
			Type 3	Type FT	Type 5
Cool White	SS	128	13500	14100	12100
	HO	128	16500	17300	14800
Neutral White	SS	128	12400	13200	11200
	HO	128	15000	15800	12500

This product, or selected versions of this product, meet the standards listed below. Please consult factory for your specific requirements.



IP65 / IP67



Fixtures comply with ANSI C136.31-2001 American National Standard for Roadway Lighting Equipment - Luminaire Vibration 3G requirements.

LED AREA LIGHTS - AEROMAX™ MEDIUM (XAMU)

LUMINAIRE ORDERING INFORMATION

TYPICAL ORDER EXAMPLE: **XAMU FT LED 128 HO CW UE WHT PCR**

Prefix	Distribution	Light Source	# of LEDs	Drive Current	Color Temperature	Input Voltage	Finish	Controls	Sensor/Options
XAMU	3 - Type 3 5 - Type 5 FT - Type FT	LED	128	SS - Super Saver HO - High Output	CW - Cool White NW - Neutral White	UE - Universal Voltage (120-277) 347-480 - Universal Voltage (347-480V)	BLK - Black BRZ - Bronze GPT - Graphite MSV - Metallic Silver PLP - Platinum Plus SVG - Satin Verde Green WHT - White	Virtinet Wireless Network (requires a Ventura controller/Mailbu link - see Virticus catalog page.) (blank) - None VCM - Standard (revenue grade) VCMB - Basic VCMH - Standard (Host) VCMBH - Basic (Host) DIM - 0-10 volt dimming (required for satellite fixtures) Stand-Alone Control (blank) - None DIM ¹ - 0-10V Dimming (from external signal) BLS ¹ - Bi-level Switching (from external signal)	Sensor ES ² - External Sensor Options PCR - Photoelectric Control Receptacle ³

LUMINAIRE EPA CHART - XAMU

	Single	1.4
	D180°	2.8
	D90°	2.4
	T90°	4.0
	TN120°	4.0
	Q90°	4.7

Note: House Side Shield adds to fixture EPA. Consult Factory.

ACCESSORY ORDERING INFORMATION

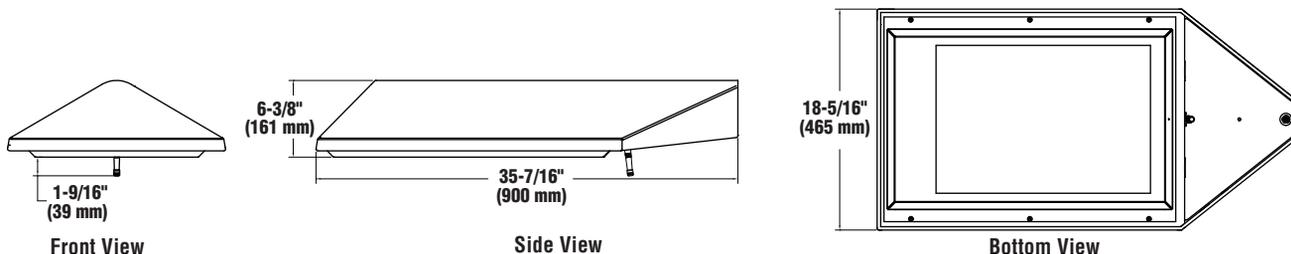
(Accessories are field installed)

Description	Order Number	Description	Order Number
BKA-XBO-EC-6-CLR 6" Extension Arm	382136CLR	DFK208, 240 Double Fusing (208V, 240V)	DFK208, 240 ⁶
BKS-XBO-WM-* - CLR Wall Mounting Bracket	382132CLR	DFK480 Double Fusing (480V)	DFK480 ⁶
XAMU-3/FT-HSS House Side Shield (Black only)	524670BLK ⁴	FK347 Single Fusing (347V)	FK347 ⁶
X4RPP Round Pole Plate for 4" Poles	379967CLR	ROSB120 - WL Remote Box with 120V Occupancy Sensor	C/F ⁷
X5RPP Round Pole Plate for 5" Poles	379968CLR	ROSB277 - WL Remote Box with 277V Occupancy Sensor	C/F ⁷
PC120 Photocell for use with PCR option (120V)	122514 ⁵	RPSB120 - Wet Location Remote Box with 120V External Photocell	C/F ⁷
PC208-277 Photocell for use with PCR option (208V, 240V, 277V)	122515 ⁵	RPSB208-277 - Wet Location Remote Box with 208-277V External Photocell	C/F ⁷
PC347 Photocell for use with PCR option (347V)	159516 ⁵	PMOS120 - 120V Pole-Mount Occupancy Sensor	C/F ⁸
PC480 Photocell for use with PCR option (480V)	1225180 ⁵	PMOS277 - 277V Pole-Mount Occupancy Sensor	C/F ⁸
FK120 Single Fusing (120V)	FK120 ⁶		
FK277 Single Fusing (277V)	FK277 ⁶		

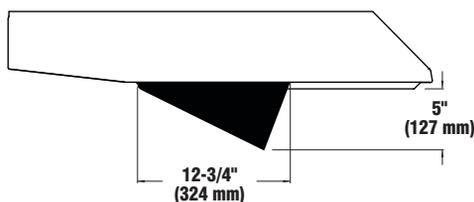
FOOTNOTES:

- DIM and BLS cannot be ordered together.
- Do not specify for satellite units.
- Photocell must be ordered separately. See Accessories.
- House Side Shield adds to fixture EPA. Consult factory.
- Factory installed PCR or VCMPCR option required. See Options.
- Fusing must be located in the hand hole of pole.
- Includes VCM. To be used in conjunction with VCM option in fixture. Consult factory.
- To be used in conjunction with any of the VCM control modules and ES sensor option in fixture. Consult factory.

DIMENSIONS (shown with VCM/VCME option)



XAMU HSS - House Side Shield



LED PATRIOT® WALL SCNCE (XPWS3)



US patent 7828456, 8002428 and CAN 2736757 & 2736757 and MX patent 29631 and ISRL 49679 and AUS 2008312668 and US & Int'l. patents pending

SMARTTEC™ ENERGY SAVING FEATURES:

THERMAL CONTROL - Sensors in both optical and driver enclosure reduce driver current when ambient temperatures exceed 50°C. Current is lowered in imperceptible 5% increments every 5 minutes until safe operating temperature is reached.

OPTIONAL INTEGRAL MOTION SENSOR - Passive infrared motion sensor activates switching of luminaire light levels. High level light is activated when passersby enter target zone and increased to full bright in 1-2 seconds. Low light level (30% of maximum drive current) is activated when target zone is absent of motion activity for 5 minutes and is gradually ramped down (10 seconds) to low level. Sensor detection range 110° horizontal x 93° vertical x 10 meters maximum distance.

EXPECTED LIFE - Minimum 60,000 hours to 100,000 hours depending upon the ambient temperature of the installation location. See LSI web site for specific guidance.

LEDS - Available with 28 or 48 select high-brightness LEDs in Cool White (5300°K nominal) or Neutral White (4200°K nominal) color temperature, 70 CRI (nominal).

OPTICS/DISTRIBUTIONS - Ultra-high efficiency reflectors provide three distributions. Choose from Wide Throw (WT), Forward Throw (FT) or Wall Wash (WW).

HOUSING - One-piece die-cast aluminum housing is smoothly contoured rectangular shape. Mounting hardware is stainless steel or electro-zinc plated steel. Housing and optical unit are sealed with extruded silicone gasket; supply conductors with molded EPDM bushing.

OPTICAL UNIT - Clear tempered optical-grade flat glass lens sealed to the aluminum optic housing creates an IP65 rated unit. Pressure stabilizing breather allows super-tight protection while preventing cycling from building up internal pressures and vacuums that can stress optical unit seals.

WALL MOUNTING - Galvanized-steel universal wall mounting plate easily mounts directly to 4" octagonal or square junction box. EPDM gasket is supplied to be installed between mounting plate and junction box, sealing junction box from entrance of water. Universal plate permits fixture to be mounted in uplighting (indoor only) or downlighting position.

POLE MOUNTING - XPMA (for square) or XPMAR (for round) allows mounting to poles in single and D180 configurations. Use with 3" reduced drilling pattern.

ELECTRICAL - Two-stage surge protection (including separate surge protection built into electronic driver) meets IEEE C62.41.2-2002, Location Category C. Available with universal voltage power supply 120-277VAC (50/60Hz input) or 347-480VAC.

DRIVER - Available in 350mA and 450mA drive currents (Drive currents are factory programmed). Components are fully encased in potting material for IP65 moisture resistance. Driver complies with IEC and FCC standards. Driver can be easily accessed and removed.

EMERGENCY OPTIONS - Integral emergency battery-back-up options are available. BB option operates in 0°C to 60°C ambient temperature and CWBB operates in -20°C to 60°C ambient temperature. When primary AC power failure occurs, both options operate 10 LEDs for minimum of 90 minutes.

OPERATING TEMPERATURE - -40°C to +50°C (-40°F to +122°F)

FINISH - LSI's DuraGrip® polyester powder coat finishing process withstands extreme weather changes without cracking or peeling. Guaranteed for five full years.

WARRANTY - LSI LED fixtures carry a limited 5-year warranty.

PHOTOMETRICS - Application layouts are available upon request. Contact LSI Applications Group at lighting.apps@lsi-industries.com

SHIPPING WEIGHT (in carton) - 30 lbs./13.6Kg

LISTING - ETL listed to ANSI/UL1598, UL8750 and other U.S. and international safety standards. Suitable for wet locations in downlight position. Optional Class 1 Division 2 (groups A, B, C & D) hazardous location rating is available. (Select HL option)

Crossover LED Lighting

lighting facts®

A Program of the U.S. DOE

Light Output (Lumens)	4020
Watts	53
Lumens per Watt (Efficacy)	76

Color Accuracy Color Rendering Index (CRI)	67
--	-----------

Light Color Correlated Color Temperature (CCT)	5320 (Daylight)
Warm White 2700K	Bright White 3000K
4500K	Daylight 6500K

All results are according to IESNA LM-79-2008: Approved Method for the Electrical and Photometric Testing of Solid-State Lighting. The U.S. Department of Energy (DOE) verifies product test data and results.

Visit www.lightingfacts.com for the Label Reference Guide.

Registration Number: KGGN-V1H7ZA
Model Number: XPWS3 FT LED 48 350 CW UE
Type: Outdoor wall pack

LIGHT OUTPUT - XPWS3						
		Distribution/Lumens (Nominal)				
Milliamps	# of LEDs	Type FT	Type WT	Type WW	Watts	
Cool White 450 mA	350 mA	28	3100	3000	3200	34
		48	5100	5100	5200	55
	350 mA	28	3700	3600	3800	44
		48	6200	6100	6300	72
Neutral White 450 mA	350 mA	28	2900	2900	3100	34
		48	4900	4800	4900	55
	350 mA	28	3500	3500	3700	44
		48	5800	5700	5800	72

This product, or selected versions of this product, meet the standards listed below. Please consult factory for your specific requirements.



IP65



ARRA
Funding Compliant

DESIGNLIGHTS
CONSORTIUM

Suitable for wet locations (downlight only)



Project Name _____ Fixture Type _____

Catalog # _____

06/20/13

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LSI INDUSTRIES INC.

LED PATRIOT® WALL SCNCE (XPWS3)

LUMINAIRE ORDERING INFORMATION

TYPICAL ORDER EXAMPLE: **XPWS3 FT LED 48 450 CW UE WHT BB**

Prefix	Distribution	Light Source	# of LEDs	Drive Current	Color Temperature	Input Voltage	Finish	Options
XPWS3 - LED Patriot Wall Sconce	WT - Wide Throw FT - Forward Throw WW - Wall Wash	LED	28 48	350 - 350mA 450 - 450mA	CW - Cool White NW - Neutral White	UE - Universal Voltage (120-277) 347-480	BLK - Black BRZ - Bronze GPT - Graphite MSV - Metallic Silver PLP - Platinum Plus SVG - Satin Verde Green WHT - White	BB - Battery Back-up ¹ CWBB - Cold Weather Battery Back-up ¹ IMS - Integral Motion Sensor EMR2 - Two Emergency 12V Circuit Provisions with (2) 35 Watt Halogen Lamps ² PCI 120 - Button Type Photocell PCI 208 - Button Type Photocell PCI 240 - Button Type Photocell PCI 277 - Button Type Photocell PCI 347 - Button Type Photocell HL - Class1, Division2, Hazardous Location Rating. ETL listed to UL84 ³ XPMA - Pole Mounting Adaptor w/fixture backplate for use with square poles ⁴ XPMAR4 - Pole Mounting Adaptor w/fixture backplate for use with 4" O.D. round poles ⁴ XPMAR5 - Pole Mounting Adaptor w/fixture backplate for use with 5" O.D. round poles ⁴

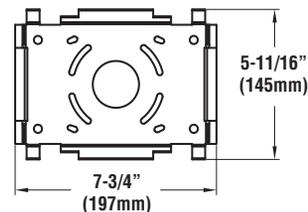
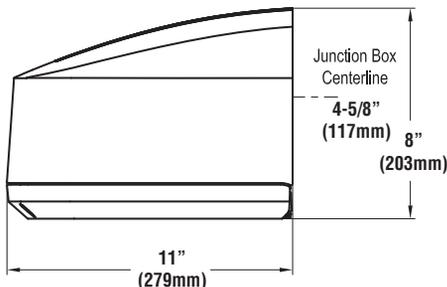
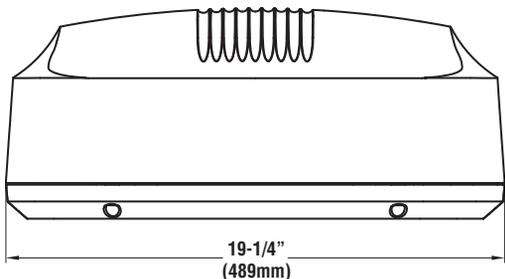
ACCESSORY ORDERING INFORMATION (Accessories are field installed)

Description	Order Number
XPWS3 Polycarbonate Shield	244657
XPWS3 SW BLK - Surface Wiring Box (Available in black only)	356915BLK

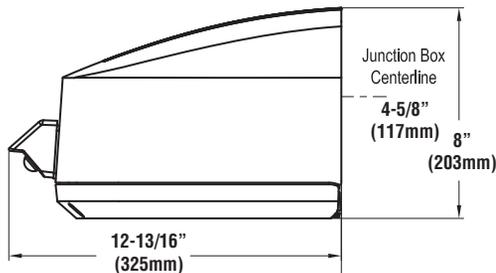
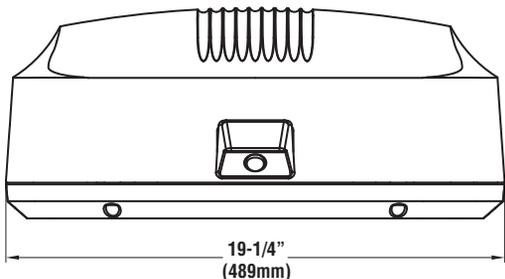
FOOTNOTES:

- 1 - Available with UE voltage only.
- 2 - Utilizes GZ4 sockets. 12 volt separate circuits required. Not available with battery back-up, photocell option, HL, XPMA or XPMAR options.
- 3 - Not available with battery backup, photocell or EMR2 option.
- 4 - Not available with EMR2 option. Designed with 3" reduced drilling pattern. For S or D180 mounting configuration only.

DIMENSIONS



Universal Mounting Plate



Shown with IMS Option

LED SOFFIT LIGHT (XSL2)



US patents D574994 & D595896 & 7828456 and US & Int'l. patents pending

EXPECTED LIFE - Minimum 60,000 hours to 100,000 hours depending upon the ambient temperature of the installation location. See LSI web site for specific guidance.

LEDS - Select high-brightness LEDs. Cool White 5000°K color temperature, 69 CRI (nominal).

DISTRIBUTION/PERFORMANCE - Type S (Symmetric) or 5A (Type 5). Excellent uniformity with Bug rating of BU-UO-G1. Optional diffused lens available to reduce visibility of diodes

HOUSING/OPTICAL UNIT - Housing is die-formed aluminum with a gasketed clear tempered glass lens providing a water-resistant seal. Weather-tight aluminum enclosure contains factory prewired driver to ensure no water entry. Sealed optical unit containing LEDs rated IP67.

MOUNTING - Direct mounts with screws through the trim frame (standard). Optional channel bar kit available to suspend assembly from ceiling joists. 12" clearance required for ease of installation.

ELECTRICAL - Universal frequency power supply (50/60 Hz). Supply voltage must be specified for pre-wired thermal protectors.

DRIVER - State-of-the-art driver technology designed specifically for LSI LED light sources provides unsurpassed system efficiency. Driver will operate with input of 120/208/240/277V (50/60 Hz). Components are fully encased in potting material for moisture resistance. Driver complies with IEC and FCC standards.

OPERATING TEMPERATURE - -40°C to +50°C (-40°F to +122°F).

FINISH - Each fixture is finished with LSI's DuraGrip® polyester powder coat finishing process. The DuraGrip finish withstands extreme weather changes without cracking or peeling, and is guaranteed for five full years. Standard color is white.

WARRANTY - LSI LED fixtures carry a limited 5-year warranty.

PHOTOMETRICS - Application layouts are available upon request. Contact LSI Applications Group at lighting.apps@lsi-industries.com

LISTING - Listed to U.S. and Canadian safety standards. Suitable for damp locations.

Crossover® LED Lighting

lighting facts

A Program of the U.S. DOE

Light Output (Lumens)	4957
Watts	62.2
Lumens per Watt (Efficacy)	79

Color Accuracy Color Rendering Index (CRI)	69
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Light Color
Correlated Color Temperature (CCT)

5100 (Daylight)

2700K 3000K 4500K 6500K

All results are according to IESNA LM-79-2008: *Approved Method for the Electrical and Photometric Testing of Solid-State Lighting*. The U.S. Department of Energy (DOE) verifies product test data and results. Products qualified under the DOE ENERGY STAR® program have the ENERGY STAR mark on this label.

Visit www.lightingfacts.com for the *Label Reference Guide*.

Registration Number: KGGN-EDE2GE
Model Number: XSL2-S-LED-50-CW-UE
Type: Surface and pendant-mounted downlights

This "Lighting Facts Label" represents LSI's commitment, through participation in the Department of Energy's SSL Quality Advocates program, to accurately report performance criteria of our LED fixtures. **This label represents a single test of a single fixture. Input power below represents rated values for the family.** Color temperature and lumen output for each variation of this Crossover® fixture can be found in the ordering information below as well as at www.lightingfacts.com.

LIGHT OUTPUT - XSL2		
Distribution	Lumens (Nominal)	Watts
Type S	5000	60
Type 5A	6959	86

This product, or selected versions of this product, meet the standards listed below. Please consult factory for your specific requirements.



IP67



ROHS COMPLIANT



ARRA
Funding Compliant

Suitable for damp locations

DESIGNLIGHTS
CONSORTIUM

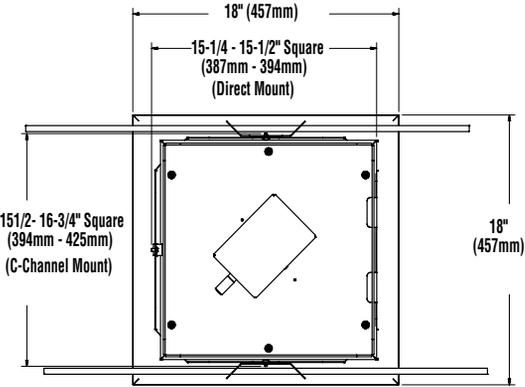
LED SOFFIT LIGHT (XSL2)

PRODUCT ORDERING INFORMATION

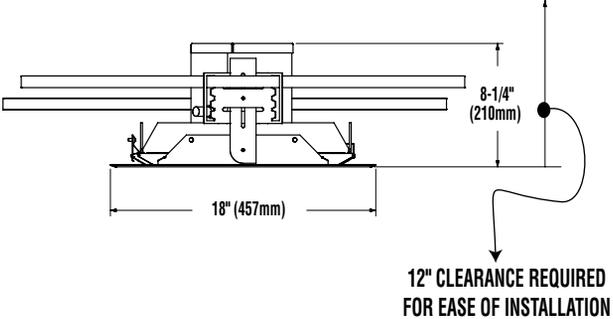
TYPICAL ORDER EXAMPLE: **XSL2 S LED 50 SS CW 120 WHT CMT**

Prefix	Distribution	Light Source	# of LEDs	Drive Current	Color Temperature	Input Voltage	Finish	Options
XSL2 - Soffit Light	S - Symmetric 5A - Type 5	LED	50	HO - High Output SS - Super Saver	CW - Cool White (5000° K nom.)	120 208 240 277 347	WHT - White	CMT - Channel Bar Mounting Kit DM - Direct Mount DFL - Diffused Lens

DIMENSIONS

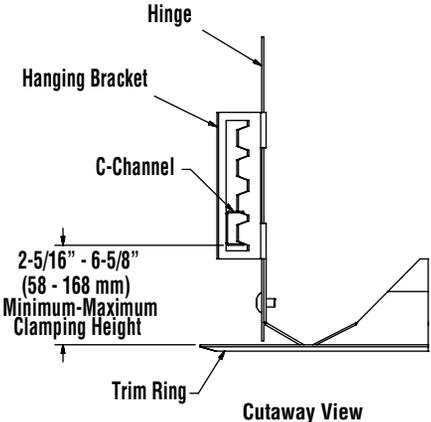


TOP VIEW



SIDE VIEW
(Channel Mount Shown)

SHIPPING WEIGHT - 14 lbs. (6.4kg)



Cutaway View



4'-10"

16"

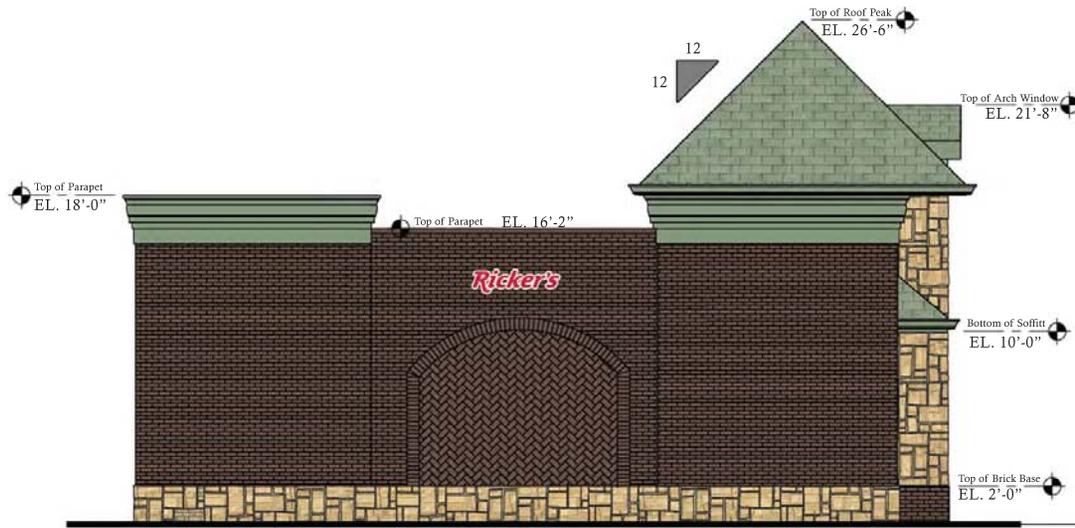
Ricker's

Signage Elevation

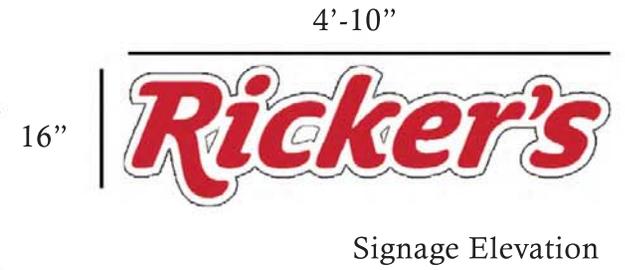
East Elevation



West Elevation



South Elevation



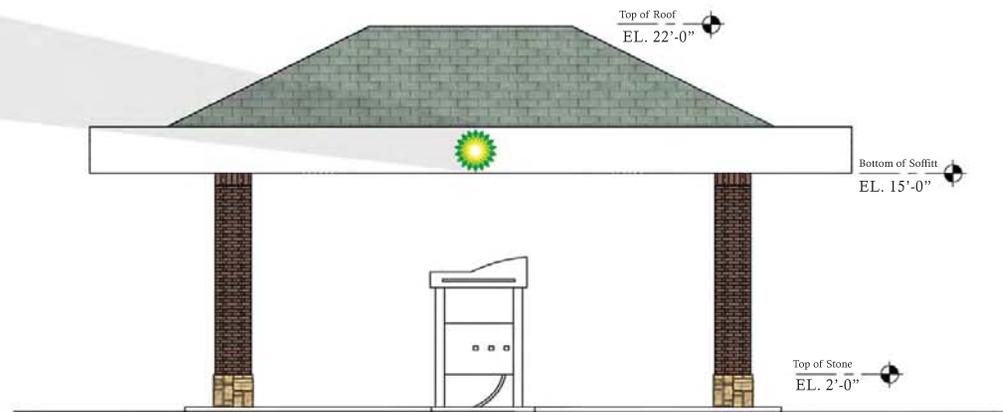
North Elevation



East / West Canopy Elevation

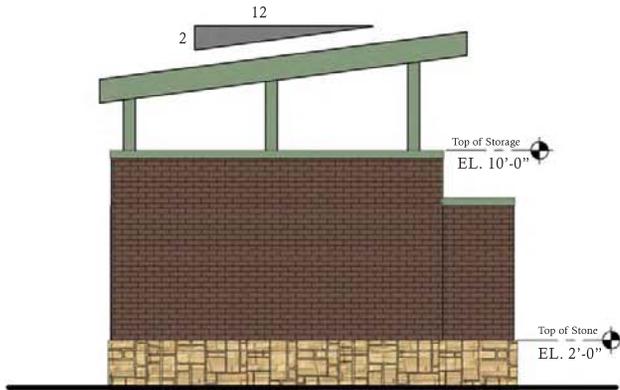


Signage 3'-2" x 3'-2"



North / South Canopy Elevation

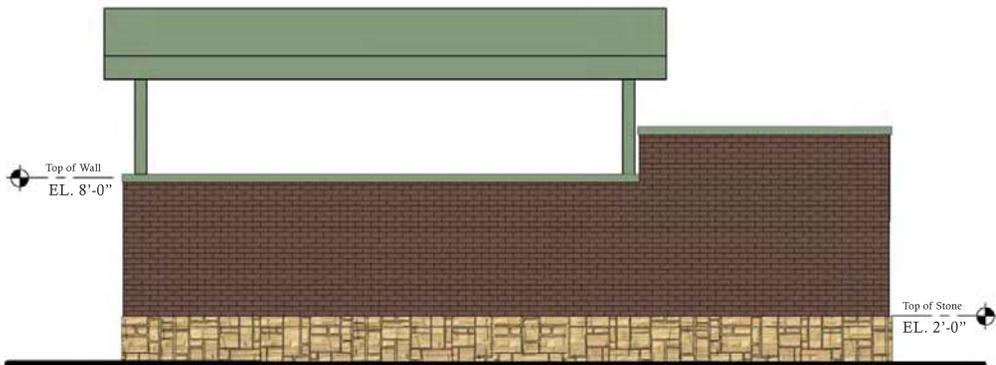
Dumpster Elevations



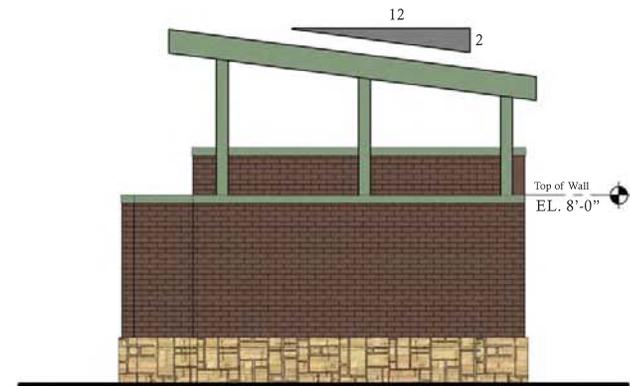
North Elevation



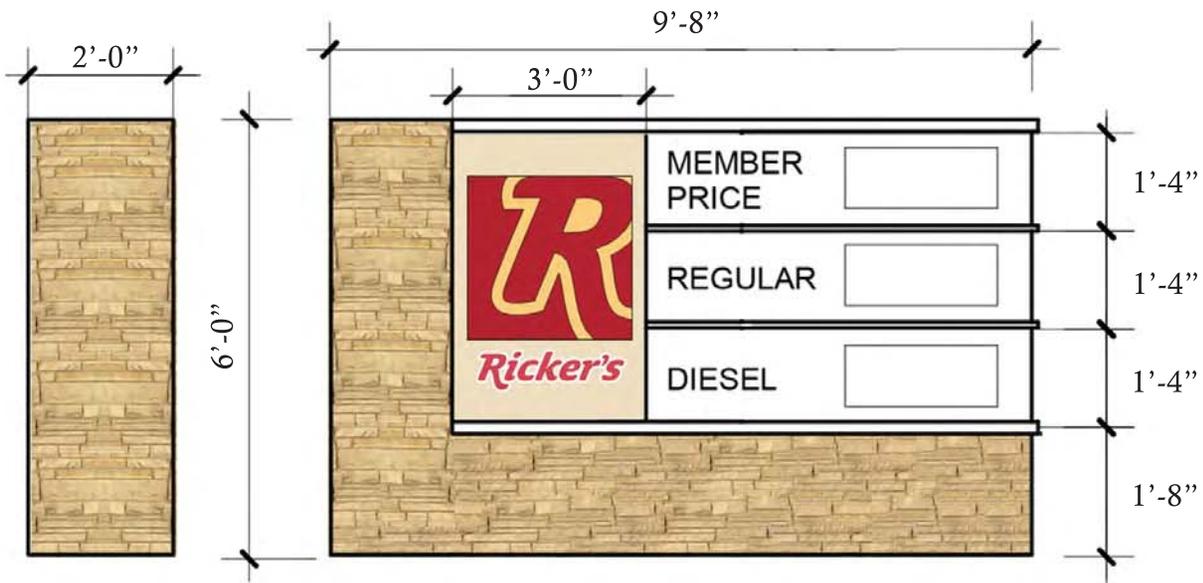
East Elevation



West Elevation



South Elevation



Side Street Ground Sign Elevation

Street Facing Ground Sign Elevation

