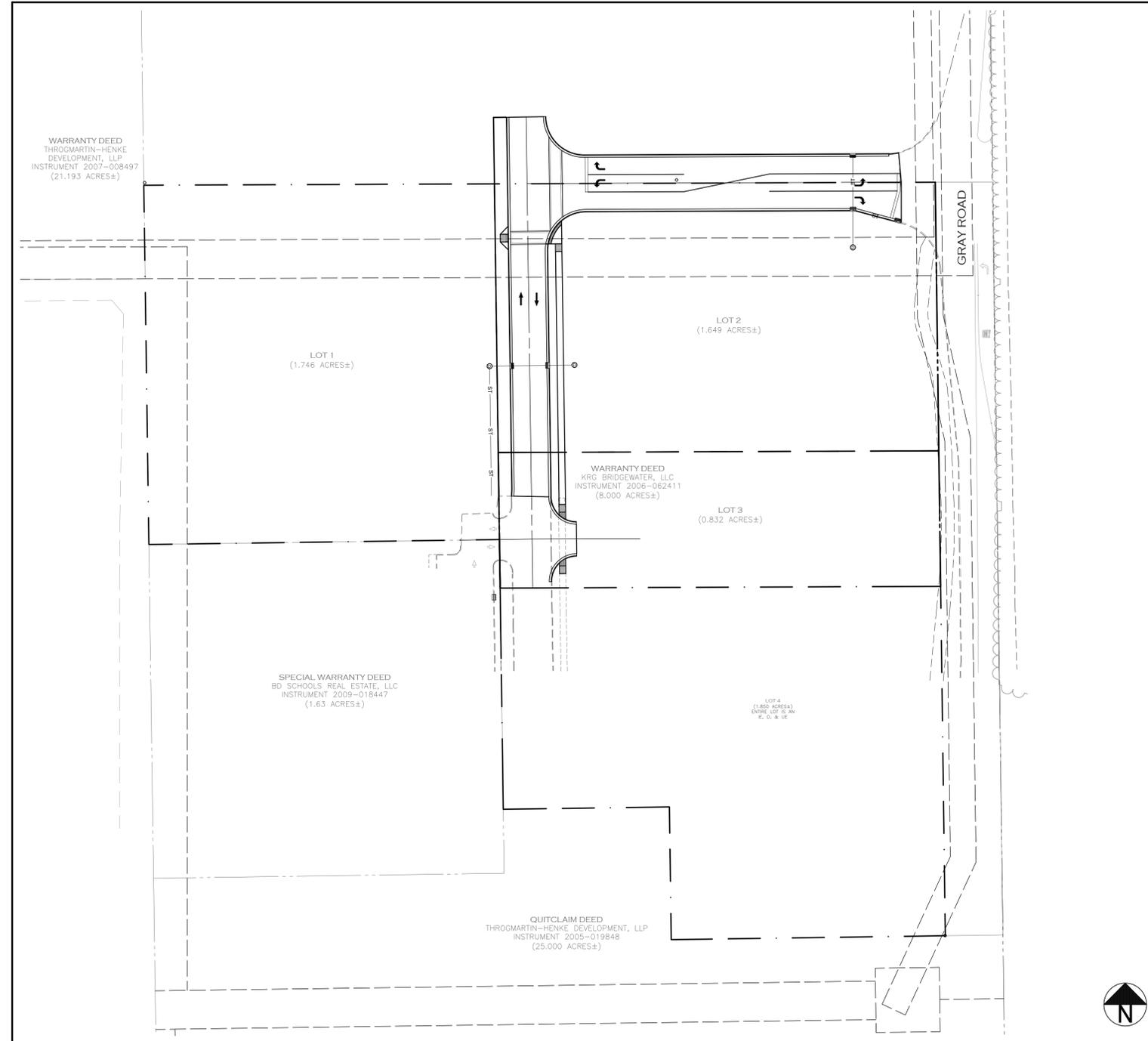
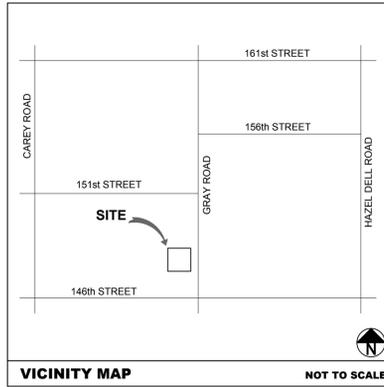


# CIVIL CONSTRUCTION PLANS

FOR

## Bridgewater Marketplace

### Gray Road and 146th Street



#### SHEET INDEX

No.	DESCRIPTION
C0.0	COVER SHEET
C1.0	EXISTING CONDITIONS PLAN
C2.0	SITE PLAN
C2.1	PRIMARY PLAT
C3.0	GRADING PLAN
C3.1	STORM SEWER PLAN & PROFILE
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C4.1	STORMWATER POLLUTION PREVENTION DETAILS
C4.2	STORMWATER POLLUTION PREVENTION NOTES
C4.3	STORMWATER POLLUTION PREVENTION NOTES
C5.0	UTILITY PLAN
C7.0	SITE DETAILS
C7.1	CITY OF WESTFIELD SITE DETAILS
C8.0	CITY OF WESTFIELD STORM SEWER DETAILS
C8.1	CITY OF WESTFIELD SANITARY SEWER DETAILS
C8.2	CITY OF WESTFIELD WATER DETAILS
C8.3-C8.7	CITY OF WESTFIELD STANDARDS

**APPROVAL PENDING**  
NOT FOR CONSTRUCTION

#### PROPERTY LEGAL DESCRIPTION

PART OF THE SOUTHEAST QUARTER OF SECTION 17, TOWNSHIP 18 NORTH, RANGE 4 EAST OF THE SECOND PRINCIPAL MERIDIAN, WASHINGTON TOWNSHIP, HAMILTON COUNTY, INDIANA, DESCRIBED AS FOLLOWS:  
COMMENCING AT THE NORTHEAST CORNER OF THE SOUTHEAST QUARTER; THENCE SOUTH 00 DEGREES 46 MINUTES 18 SECONDS EAST ALONG THE EAST LINE OF THE QUARTER SECTION 1249.14 FEET TO THE NORTHEAST CORNER OF THE 8.000 ACRES TRACT OF LAND DESCRIBED IN WARRANTY DEED TO KRG BRIDGEWATER, LLC RECORDED AS INSTRUMENT 2006-062411 IN THE OFFICE OF THE RECORDER OF HAMILTON COUNTY, INDIANA AND THE POINT OF BEGINNING; THENCE SOUTH 89 DEGREES 46 MINUTES 53 SECONDS WEST ALONG THE NORTH LINE THEREOF 662.99 FEET TO THE NORTHWEST CORNER OF SAID 8.000 ACRE TRACT OF LAND; THENCE SOUTH 00 DEGREES 48 MINUTES 53 SECONDS EAST ALONG THE WEST LINE THEREOF 279.26 FEET TO THE NORTHWEST CORNER OF THE 1.83 ACRES TRACT OF LAND DESCRIBED IN A SPECIAL WARRANTY DEED TO 80 SCHOOLS REAL ESTATE, LLC RECORDED AS INSTRUMENT 2009-018447; THENCE THE NEXT TWO CALLS ALONG THE NORTH AND EAST LINES THEREOF NORTH 89 DEGREES 11 MINUTES 11 SECONDS EAST 273.77 FEET; THENCE SOUTH 00 DEGREES 48 MINUTES 53 SECONDS EAST 209.65 FEET TO A POINT ON THE PERIMETER OF SAID 8.000 ACRES TRACT (THE REMAINING CALLS ALONG SAID PERIMETER); THENCE NORTH 89 DEGREES 11 MINUTES 07 SECONDS EAST 129.74; THENCE SOUTH 00 DEGREES 48 MINUTES 53 SECONDS EAST 103.16 FEET; THENCE NORTH 89 DEGREES 11 MINUTES 04 SECONDS EAST 259.00 FEET TO THE SOUTHEAST CORNER OF SAID 8.000 ACRES TRACT ON THE EAST LINE OF THE QUARTER SECTION; THENCE NORTH 00 DEGREES 46 MINUTES 18 SECONDS WEST ALONG SAID EAST LINE 585.18 FEET TO THE POINT OF BEGINNING, CONTAINING 6.682 ACRES, MORE OR LESS.

#### FLOOD ZONE DESIGNATION

The accuracy of the flood hazard data shown on this report is subject to map scale uncertainty and to any other uncertainty in location or elevation on the referenced Flood Insurance Rate Map. According to the Federal Emergency Management Agency Flood Insurance Rate Map for Hamilton County, Community Panel 18057 C 0140F dated February 19, 2003 the described real estate lies within the Unshaded Zone "X," which area is determined to be outside 500-year floodplain, by graphic plotting only. No field surveying was performed to determine this zone and an elevation certificate may be needed to verify this determination or apply for a variance from the federal management Agency.

#### UTILITY STATEMENT:

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SITE BENCH MARK: 794.30 (NAVD 88)  
A BRONZE DISK STAMPED "HAMILTON COUNTY GEODETIC CONTROL," SET IN THE SOUTH END OF THE MOST SOUTHERN WINGWALL OF THE BRIDGE OVER THE VESTAL-KIRKENDALL DRAIN 61'± EAST OF THE CENTERLINE OF HAZEL DELL ROAD AND 384'± SOUTH OF 156TH STREET.

TBM#100 = 821.29  
CHISELED SQUARE FOUND/SET ON WEST SIDE OF A CONCRETE LIGHT POLE BASE LOCATED ON THE EAST SIDE OF THE EAST PARKING LOT OF THE HUNTINGTON BANK.

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MARK	DATE	DESCRIPTION	REVISIONS
1	09.17.12	REVISED PER CITY REVIEW COMMENTS DATED 09.06.12	
2	10.04.12	REVISED PER CITY REVIEW COMMENTS DATED 09.20.12	
3	10.11.12	REVISED PER CITY REVIEW COMMENTS	

PREPARED FOR:  
**KITE REALTY GROUP**  
30 S. MERIDIAN STREET  
SUITE 1100  
INDIANAPOLIS, IN 46204  
317-577-8600 FAX 317-577-8605

CONSTRUCTION PLANS FOR  
**Bridgewater Marketplace**  
Gray Road & 146th Street  
Westfield, Indiana

PREPARED BY:  
**EMHT**  
Event, Metchart, Hombach & Tilton, Inc.  
200 N. Meridian Street, Suite 1100  
Indianapolis, IN 46204  
Phone: 317.713.6690 Fax: 317.713.6448  
emht.com

Job No. 2012-1167

Michael Thompson

Date: August 31, 2012

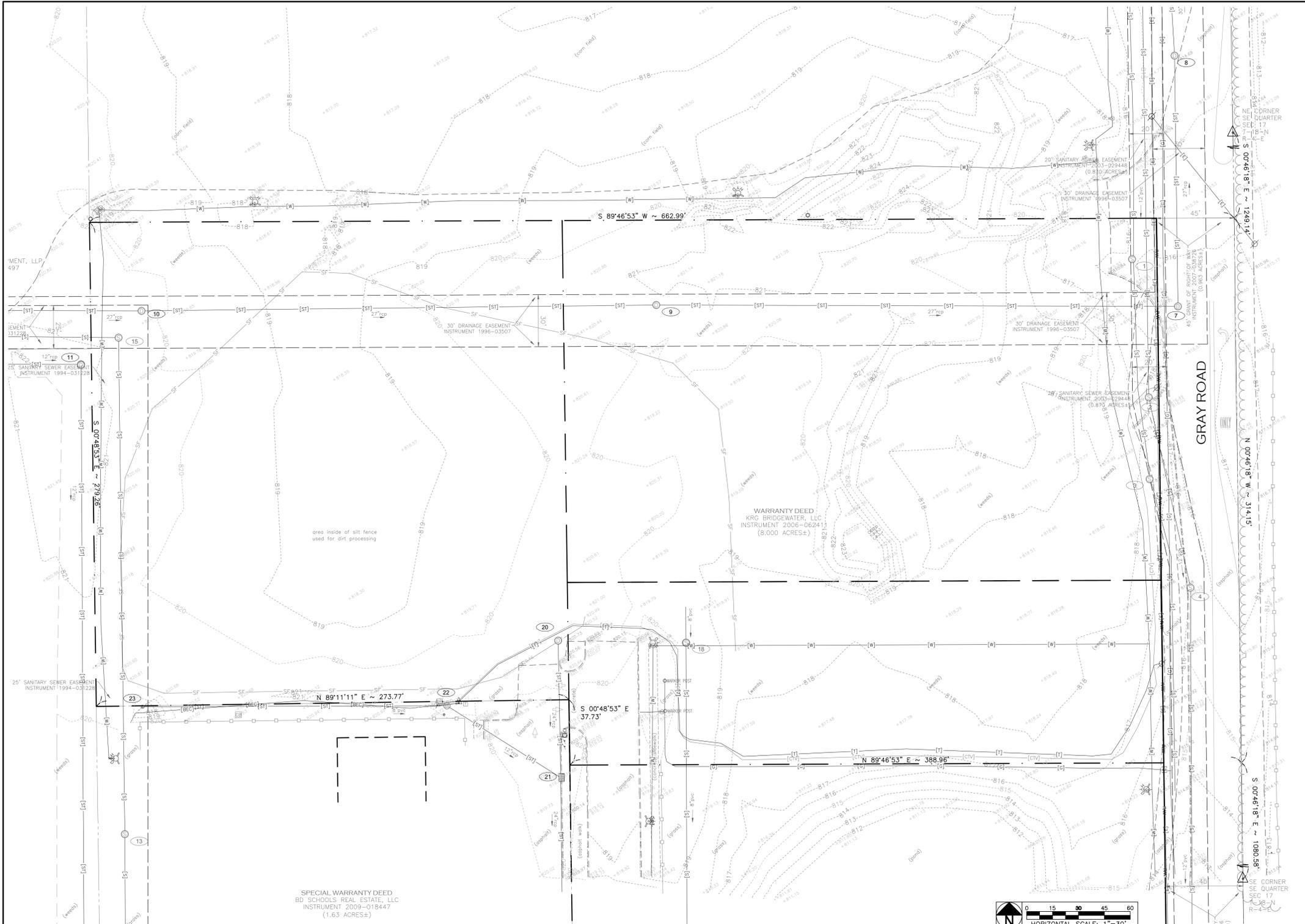
Scale: Not to Scale

Title:

**COVER SHEET**

Sheet:

**C0.0**



LEGEND OF EXISTING FEATURES			
	BUILDING SETBACK LINE		SIGNS
	EASEMENT LINE		MONUMENT FOUND
	RIGHT OF WAY LINE		MONUMENT SET
	BOUNDARY LINE		BENCHMARK
	CENTER LINE		SECTION CORNER
	DRIVE / ROAD		DECIDUOUS TREE, SIZE
	FENCE LINE		CONIFEROUS TREE, SIZE
	GUARD RAIL		SHRUB
	SWALE / FLOWLINE		PARKING COUNT
	POND NORMAL POOL		TRANSFORMER / HVAC
	INTERMEDIATE CONTOUR		PARKING LOT LIGHTING
	INDEX CONTOUR		AREA LIGHTING / DIRECTIONAL LIGHTING
	BURIED ELECTRIC		POWER POLE / GUY WIRE
	OVERHEAD ELECTRIC		ELECTRIC METER / ELECTRIC MANHOLE
	BURIED TELEPHONE		TELEPHONE PEDESTAL / TELEPHONE MANHOLE
	OVERHEAD TELEPHONE		GAS METER / GAS VALVE
	BURIED CABLE TELEVISION		STORM MANHOLE / SANITARY MANHOLE
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	STORM SEWER		FIRE HYDRANTS
	SANITARY SEWER		CLEANOUT / DOWNSPOUT
	FORCE MAIN		STORM SEWER ENDSEWER
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	RIM ELEVATION		TRAFFIC MANHOLE / TRAFFIC LIGHT
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**GENERAL SITE NOTES**

- THE CONTRACTOR SHALL ENSURE THAT ALL NECESSARY PERMITS AND APPROVALS HAVE BEEN OBTAINED FROM AGENCIES HAVING JURISDICTION OVER THE WORK PRIOR TO COMMENCING CONSTRUCTION ACTIVITIES. THE CONTRACTOR SHALL OBTAIN AND PAY THE COST OF ALL PERMITS THAT HAVE NOT BEEN SECURED BY THE OWNER.
- THE CONTRACTOR SHALL COMPLY WITH THE CONSTRUCTION SAFETY STANDARDS AS ISSUED BY THE U.S. DEPARTMENT OF LABOR OCCUPATIONAL HEALTH AND SAFETY ADMINISTRATION AS SET FORTH IN FINAL RULE 29, PART 1926, WHERE SUCH REGULATIONS APPLY TO THE WORK.
- ALL ELEVATIONS SHOWN WITHIN THESE PLANS ARE BASED UPON U.S.G.S. DATUM.
- LOCATIONS OF UTILITIES SHOWN WITHIN THESE PLANS ARE BASED UPON INFORMATION OBTAINED FROM UTILITY COMPANIES OR THEIR REPRESENTATIVES AND FIELD EVIDENCE OF IMPROVEMENTS VISIBLE ON THE GROUND SURFACE. EXACT LOCATIONS OF UNDERGROUND UTILITIES HAVE NOT BEEN VERIFIED. THE CONTRACTOR SHALL NOTIFY UTILITY COMPANIES AND REQUEST FIELD LOCATIONS OF SUCH WITHIN THE WORK AREA PRIOR TO COMMENCING EXCAVATION ACTIVITIES. THE CONTRACTOR SHALL REPORT ANY VARIATIONS FROM THE LOCATIONS SHOWN THAT MAY PRESENT A CONFLICT WITH EXECUTION OF THE WORK TO THE ENGINEER IN ADVANCE OF CONSTRUCTION.
- THE CONTRACTOR SHALL COORDINATE WITH THE RESPECTIVE UTILITY COMPANIES AND SHALL PAY THE COST OF PROTECTION, RELOCATION, REMOVAL, CONNECTION, AND/OR RECONNECTION OF UTILITIES AS NECESSARY FOR EXECUTION OF THE WORK.
- MATERIALS AND WORKMANSHIP SHALL COMPLY WITH ALL APPLICABLE CODES, SPECIFICATIONS, LOCAL ORDINANCES, INDUSTRY STANDARDS AND UTILITY COMPANY REGULATIONS.
- TRAFFIC CONTROL DEVICES SHALL BE FURNISHED, ERECTED, MAINTAINED AND REMOVED BY THE CONTRACTOR IN ACCORDANCE WITH THE MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES. TYPE "C" LIGHTS SHALL BE REQUIRED ON ALL BARRICADES, DRUMS AND SIMILAR DEVICES IN USE AT NIGHT.

SPECIAL WARRANTY DEED  
BD. SCHOOLS REAL ESTATE, LLC  
INSTRUMENT 2009-018447  
(1.63 ACRES±)

STRUCTURE DATA TABLE			
1	SANITARY SEWER POSSIBLE FORCE MAIN RIM EL.: 815.98 IE OUT:	8	STORM MANHOLE RIM EL.: 814.90 IE IN/OUT: 809.60 N/S IE OUT: 812.19 S
2	SANITARY SEWER RIM EL.: 818.16 IE IN: 802.51 N IE OUT: 802.48 S	9	STORM MANHOLE RIM EL.: 820.94 IE IN: 813.07 W IE OUT: 813.06 E
3	SANITARY SEWER POSSIBLE FORCE MAIN RIM EL.: 817.71 IE OUT:	10	STORM MANHOLE RIM EL.: 820.76 IE IN: 815.33 W IE OUT: 815.31 E
4	SANITARY SEWER RIM EL.: 815.72 IE IN: 802.08 N IE OUT: 802.08 S	11	STORM MANHOLE RIM EL.: 821.29 IE IN/OUT: 816.70 W/S
5	SANITARY SEWER RIM EL.: 809.79 IE IN: 801.37 N IE OUT: 801.35 S	12	STORM MANHOLE RIM EL.: 823.76 IE IN/OUT: 817.76 S/E
6	SANITARY SEWER RIM EL.: 813.05 IE IN: 803.38 N IE OUT: 803.28 S	13	SANITARY SEWER RIM EL.: 820.38 IE IN: 810.62 N IE OUT: 810.53 S
7	STORM MANHOLE RIM EL.: 816.28 IE IN: 810.65 W IE OUT: 810.63 N	14	STORM MANHOLE RIM EL.: 819.63 IE IN: 815.70 N IE OUT: 815.67 S
		15	SANITARY SEWER RIM EL.: 820.80 IE IN: 812.40 W IE OUT: 812.19 S
		16	SANITARY SEWER RIM EL.: 824.16 IE IN: 814.35 W IE OUT: 814.28 E
		17	STORM MANHOLE RIM EL.: 823.72 IE IN: 818.12 W IE OUT: 818.09 E
		18	SANITARY SEWER RIM EL.: 819.74 IE IN: 806.83 N (STUB) IE OUT: 806.79 S
		19	SANITARY SEWER RIM EL.: 818.58 IE IN: 805.17 N IE OUT: 805.13 E
		20	STORM MANHOLE RIM EL.: 820.80 IE OUT: 813.75 S
		21	STORM CURB INLET RIM EL.: 819.36 IE IN: 813.06 N IE OUT: 813.01 S
		22	STORM INLET RIM EL.: 819.83 IE IN: 814.46 W IE OUT: 813.98 SE
		23	STORM INLET RIM EL.: 819.54 IE OUT: 816.76 E



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**REVISIONS**

MARK	DATE	DESCRIPTION
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**PREPARED FOR:**

**KITE REALTY GROUP**  
30 S. MERIDIAN STREET  
SUITE 1100  
INDIANAPOLIS, IN 46204  
317-577-8600 FAX 317-577-5605

**CONSTRUCTION PLANS FOR**

**Bridgewater Marketplace**  
Gray Road & 146th Street  
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**PREPARED BY:**

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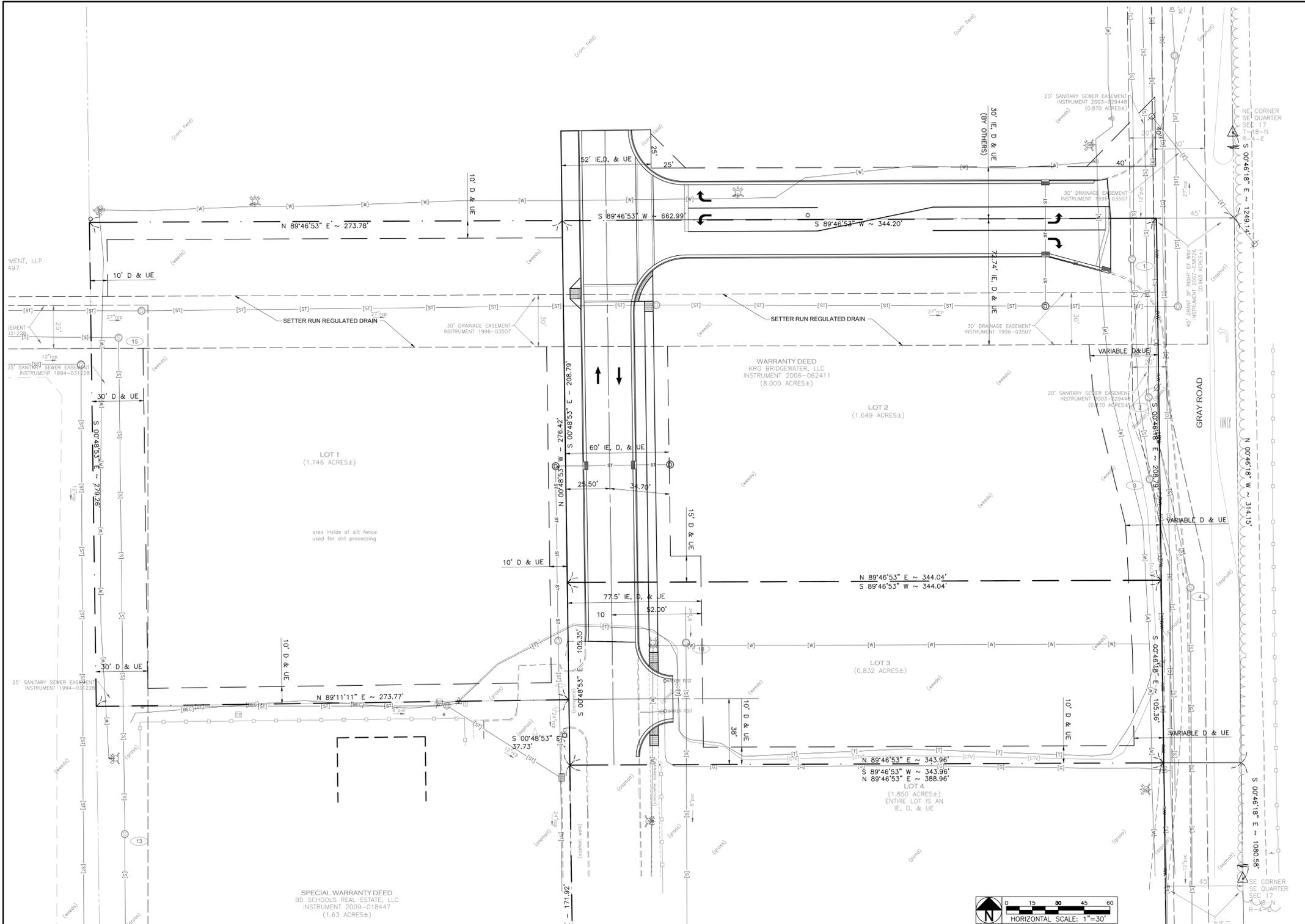
Job No. 2012-1167

**PROFESSIONAL ENGINEER**  
Michael Thompson  
No. PE11011309  
STATE OF INDIANA

Date: August 31, 2012  
Scale: 1" = 30'

Title: **EXISTING CONDITIONS PLAN**

Sheet: **C1.0**



- SITE PLAN NOTES**
- ALL DIMENSIONS ARE TO EDGE OF PAVEMENT OR FACE OF CURB, WHERE APPLICABLE.
  - ALL RADII SHALL BE 5 FEET UNLESS OTHERWISE SHOWN. ALL RADII INDICATED SHALL BE CONSTRUCTED AS CIRCULAR ARCS.
  - ALL DIMENSIONS ARE TO OUTSIDE FACE OF BRICK OR FACING MATERIAL, WHERE APPLICABLE.
  - BEARINGS, DIMENSIONS AND EASEMENTS ARE SHOWN FOR REFERENCE. REFER TO RECORDED PLATS AND SURVEYS FOR ADDITIONAL PROPERTY INFORMATION.
  - REFER TO ARCHITECTURAL PLANS FOR BUILDING DIMENSIONS AND DETAILS.
  - PARKING SPACE STRIPES SHALL BE 4 INCHES WIDE. YELLOW OR WHITE STRIPES SHALL BE PROVIDED AT OWNERS PREFERENCE UNLESS OTHERWISE SHOWN.
  - TRANSVERSE EXPANSION JOINTS ARE TO BE PROVIDED IN CONCRETE SIDEWALKS AND COMBINED WALKS/CURBS WHERE SHOWN AND AT INTERVALS NOT TO EXCEED 12 X THE WIDTH OF THE WALK.
  - EXPANSION JOINTS SHALL BE INSTALLED IN CONCRETE PAVEMENTS AND WALKS AT ALL LOCATIONS WHERE PAVEMENTS AND WALKS ABUT A VERTICAL SURFACE SUCH AS A CURB, WALL, COLUMN, ETC.
  - CONTRACTION JOINTS SHALL BE PROVIDED AT EQUAL INTERVALS BETWEEN EXPANSION JOINTS IN CONCRETE WALKS. INSTALL CONTRACTION JOINTS AS SHOWN BUT IN NO CASE AT INTERVALS GREATER THAN 1.5 X THE WIDTH OF THE WALK.
  - UNLESS OTHERWISE SHOWN, PERMANENT SIGNS SHALL BE MOUNTED ON A SINGLE U-CANAL DRIVE POST DRIVEN 42 INCHES BELOW GRADE. THE BOTTOM EDGE OF THE SIGN SHALL BE 6 FEET ABOVE THE NEAREST PAVEMENT EDGE ELEVATION.
  - THE CONTRACTOR SHALL VERIFY ALL DIMENSIONS AND ELEVATIONS IN THE FIELD PRIOR TO THE START OF CONSTRUCTION. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL FIELD DIMENSIONS AND ELEVATIONS DURING THE ENTIRE CONSTRUCTION SCHEDULE. IF ANY DISCREPANCIES ARE FOUND IN THESE PLANS FROM ACTUAL FIELD DIMENSIONS, THE CONTRACTOR SHALL CONTACT THE ENGINEER IMMEDIATELY.
  - ALL CONSTRUCTION METHODS AND MATERIALS MUST CONFORM TO CURRENT STANDARDS AND SPECIFICATIONS OF THE FEDERAL, STATE, COUNTY, CITY, OR LOCAL REQUIREMENTS, WHICHEVER HAS JURISDICTION.
  - PROVIDE SMOOTH TRANSITION FROM NEWLY PAVED AREAS TO EXISTING AREAS AS NECESSARY. ALL AREAS WHERE PROPOSED PAVEMENT MEETS EXISTING PAVEMENT, THE EXISTING EDGE OF PAVEMENT SHALL BE FREE OF ALL LOOSE DEBRIS. THE EDGE OF EXISTING ASPHALT PAVEMENT SHALL BE PROPERLY SEALED WITH A TACK COAT MATERIAL IN ALL AREAS WHERE NEW ASPHALT PAVEMENT IS INDICATED TO JOIN EXISTING.
  - ALL EXCAVATED AREAS TO BE SEEDED AND/OR SODDED AFTER FINISH GRADING UNLESS OTHERWISE NOTED. ALL NEWLY SODDED/SEEDED AREAS SHALL HAVE A MINIMUM OF 4" OF TOPSOIL. HOLD SOIL DOWN 1" FROM PAVEMENT ELEVATION. CONTRACTOR TO SUPPLY STRAW MULCH WHERE GRASS SEED HAS BEEN PLANTED.
  - RESURFACE OR RECONSTRUCT AT LEAST TO ORIGINAL CONDITIONS ALL AREAS WHERE TRAFFIC BY CONTRACTORS, SUBCONTRACTORS OR SUPPLIERS HAVE DAMAGED EXISTING PAVEMENT, LAWNS OR OTHER IMPROVEMENTS DURING CONSTRUCTION. AFTER CONSTRUCTION WORK IS COMPLETE.
  - ALL UTILITY TRENCHES WITHIN 5 FEET OF PAVEMENT SHALL BE COMPLETELY BACKFILLED WITH GRANULAR BACKFILL.

**LEGEND OF EXISTING FEATURES**

	BUILDING SETBACK LINE		SIGNS
	EASEMENT LINE		MONUMENT FOUND
	RIGHT OF WAY LINE		MONUMENT SET
	BOUNDARY LINE		BENCHMARK
	CENTER LINE		SECTION CORNER
	DRIVE / ROAD		DECIDUOUS TREE, SIZE
	FENCE LINE		CONIFEROUS TREE, SIZE
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	STORM SEWER		FIRE HYDRANTS
	SANITARY SEWER		CLEANOUT / DOWNSPOUT
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	INVERT ELEVATION		MAILBOX
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	FINISHED FLOOR ELEVATION		CABLE PEDESTAL / WATER MANHOLE

**SITE PLAN LEGEND**

	ADA CURB RAMP	P-11, P-11A
	COMBINED CURB AND GUTTER	P-8
	5" CONCRETE SIDEWALK	P-10
	10' ASPHALT TRAIL	P-16
	PAVEMENT STRIPING, 24" STOP BAR	PA-7, PA-7A
	PAVEMENT STRIPING, DOUBLE YELLOW	PA-7, PA-7A
	PAVEMENT STRIPING, PAINTED CROSSWALK	PA-7, PA-7A
	PAVEMENT STRIPING, 4" SOLID	PA-7, PA-7A
	STOP SIGN	P-15.1
	HEAVY DUTY ASPHALT PAVEMENT SECTION	PA-ID
IE, D&UE	INGRESS/EGRESS, DRAINAGE, AND UTILITY EASEMENT	
D&UE	DRAINAGE AND UTILITY EASEMENT	

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**UTILITY STATEMENT:**

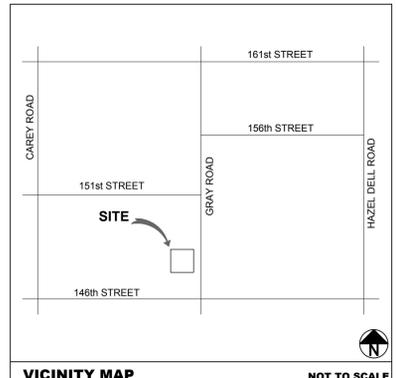
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**BENCHMARK DATA**

SITE BENCH MARK: 794.30 (NAVD 88)  
A BRONZE DISK STAMPED "HAMILTON COUNTY GEODETIC CONTROL" SET IN THE SOUTH END OF THE MOST SOUTHERN WINGWALL OF THE BRIDGE OVER THE VESTAL-KIRKENDALL DRAIN 61'+, EAST OF THE CENTERLINE OF HAZEL DELL ROAD AND 384'+, SOUTH OF 156TH STREET.

TBM#100 = 821.29  
CHISELED SQUARE FOUND/SET ON WEST SIDE OF A CONCRETE LIGHT POLE BASE LOCATED ON THE EAST SIDE OF THE EAST PARKING LOT OF THE HUNTINGTON BANK.

TBM#101 = 819.02  
YELLOW BENCH THE SET IN THE WEST SIDE OF POWER POLE #057-066 ON THE WEST SIDE OF GRAY ROAD AND IS THE 1ST POLE SOUTH OF THE NORTHERN MOST (FUTURE) ENTRANCE TO BRIDGEWATER MARKETPLACE.



**REVISIONS**

MARK	DATE	DESCRIPTION
	09.17.12	REVISED PER CITY REVIEW COMMENTS DATED 09.06.12
	10.04.12	REVISED PER CITY REVIEW COMMENTS DATED 09.20.12



**KITE REALTY GROUP**  
30 S. MERIDIAN STREET  
SUITE 1100  
INDIANAPOLIS, IN 46204  
317-577-8600 FAX 317-577-5605

**Bridgewater Marketplace**  
Gray Road & 146th Street  
Westfield, Indiana

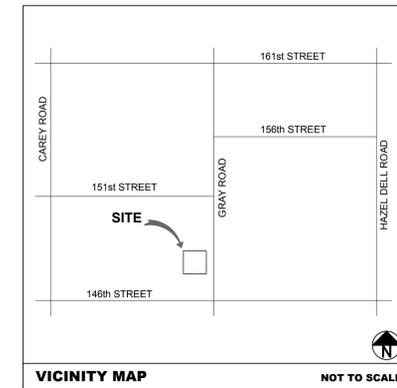
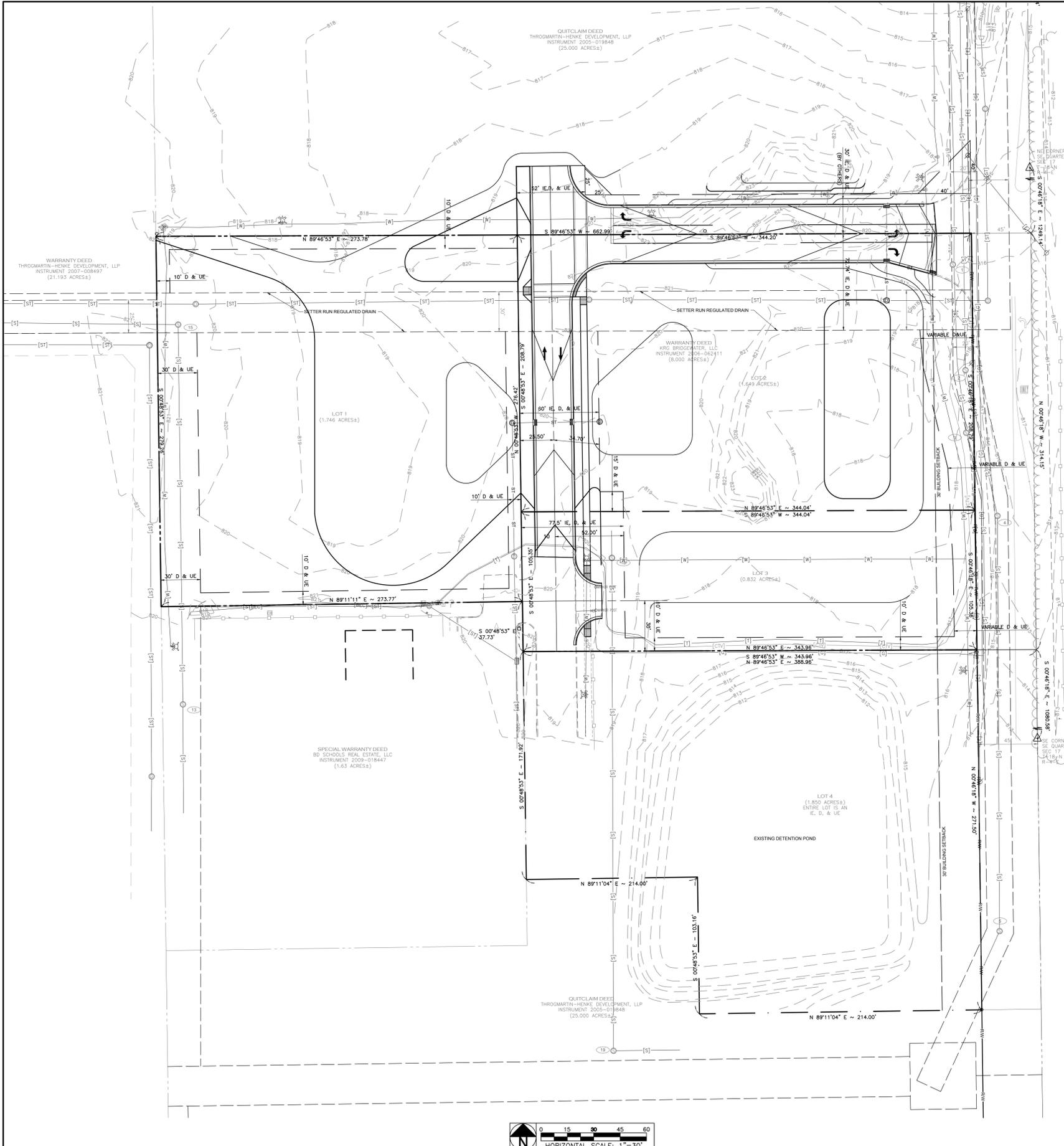


Job No. 2012-1167



Date: August 31, 2012  
Scale: 1"=30'

Title: **SITE PLAN**  
Sheet: **C2.0**



LEGEND OF EXISTING FEATURES			
	BUILDING SETBACK LINE		SIGNS
	EASEMENT LINE		MONUMENT FOUND
	RIGHT OF WAY LINE		MONUMENT SET
	BOUNDARY LINE		BENCHMARK
	CENTER LINE		SECTION CORNER
	DRIVE / ROAD		DECIDUOUS TREE, SIZE
	FENCE LINE		CONIFEROUS TREE, SIZE
	GUARD RAIL		SHRUB
	SWALE / FLOWLINE		PARKING COUNT
	POND NORMAL POOL		TRANSFORMER / HVAC
	INTERMEDIATE CONTOUR		PARKING LOT LIGHTING
	INDEX CONTOUR		AREA LIGHTING / DIRECTIONAL LIGHTING
	BURIED ELECTRIC		POWER POLE / GUY WIRE
	OVERHEAD ELECTRIC		ELECTRIC METER / ELECTRIC MANHOLE
	BURIED TELEPHONE		TELEPHONE PEDAESTAL / TELEPHONE MANHOLE
	OVERHEAD TELEPHONE		GAS METER / GAS VALVE
	BURIED CABLE TELEVISION		STORM MANHOLE / SANITARY MANHOLE
	GAS LINE		STORM SEWER INLETS
	STORM SEWER		FIRE HYDRANTS
	SANITARY SEWER		CLEANOUT / DOWNSPOUT
	FORCE MAIN		STORM SEWER ENDSECTION
	WATER LINE		WATER VALVE / WATER METER
	SPOT GRADE		POST INDICATOR VALVE (PIV)
	STORM STRUCTURE No.		FIRE DEPARTMENT CONNECTION
	RIM ELEVATION		TRAFFIC MANHOLE / TRAFFIC LIGHT
	INVERT ELEVATION		MAILBOX
	SANITARY STRUCTURE No.		ADA PARKING SPACE
	FINISHED FLOOR ELEVATION		CABLE PEDAESTAL / WATER MANHOLE

SITE PLAN LEGEND		
	ADA CURB RAMP	P-11, P-11A
	COMBINED CURB AND GUTTER	P-8
	5" CONCRETE SIDEWALK	P-10
	10" ASPHALT TRAIL	P-16
	PAVEMENT STRIPING, 24" STOP BAR	PA-7, PA-7A
	PAVEMENT STRIPING, DOUBLE YELLOW	PA-7, PA-7A
	PAVEMENT STRIPING, PAINTED CROSSWALK	PA-7, PA-7A
	PAVEMENT STRIPING, 4" SOLID	PA-7, PA-7A
	STOP SIGN	P-15.1
	HEAVY DUTY ASPHALT PAVEMENT SECTION	PA-1D
	INGRESS/EGRESS, DRAINAGE, AND UTILITY EASEMENT	
	DRAINAGE AND UTILITY EASEMENT	

APPROVAL PENDING  
NOT FOR CONSTRUCTION

**PROPERTY LEGAL DESCRIPTION**  
PART OF THE SOUTHEAST QUARTER OF SECTION 17, TOWNSHIP 18 NORTH, RANGE 4 EAST OF THE SECOND PRINCIPAL MERIDIAN, WASHINGTON TOWNSHIP, HAMILTON COUNTY, INDIANA, DESCRIBED AS FOLLOWS:

COMMENCING AT THE NORTHEAST CORNER OF THE SOUTHEAST QUARTER, THENCE SOUTH 00 DEGREES 48 MINUTES 18 SECONDS EAST ALONG THE EAST LINE OF THE QUARTER SECTION 1249.14 FEET TO THE NORTHEAST CORNER OF THE 8.000 ACRES TRACT OF LAND DESCRIBED IN WARRANTY DEED TO KRG BRIDGEWATER, LLC RECORDED AS INSTRUMENT 2006-062411 IN THE OFFICE OF THE RECORDER OF HAMILTON COUNTY, INDIANA AND THE POINT OF BEGINNING; THENCE SOUTH 89 DEGREES 46 MINUTES 53 SECONDS WEST ALONG THE NORTH LINE THEREOF 662.99 FEET TO THE NORTHWEST CORNER OF SAID 8.000 ACRE TRACT OF LAND; THENCE SOUTH 00 DEGREES 48 MINUTES 53 SECONDS EAST ALONG THE WEST LINE THEREOF 279.26 FEET TO THE NORTHWEST CORNER OF THE 1.63 ACRES TRACT OF LAND DESCRIBED IN A SPECIAL WARRANTY DEED TO 80 SCHOOLS REAL ESTATE, LLC RECORDED AS INSTRUMENT 2009-018447; THENCE THE NEXT TWO CALLS ALONG THE NORTH AND EAST LINES THEREOF NORTH 89 DEGREES 11 MINUTES 11 SECONDS EAST 273.77 FEET; THENCE SOUTH 00 DEGREES 48 MINUTES 53 SECONDS EAST 209.65 FEET TO A POINT ON THE PERIMETER OF SAID 8.000 ACRES TRACT (THE REMAINING CALLS ALONG SAID PERIMETER); THENCE NORTH 89 DEGREES 11 MINUTES 07 SECONDS EAST 129.74; THENCE SOUTH 00 DEGREES 48 MINUTES 53 SECONDS EAST 103.16 FEET; THENCE NORTH 89 DEGREES 11 MINUTES 04 SECONDS EAST 259.00 FEET TO THE SOUTHEAST CORNER OF SAID 8.000 ACRE TRACT ON THE EAST LINE OF THE QUARTER SECTION; THENCE NORTH 00 DEGREES 46 MINUTES 18 SECONDS WEST ALONG SAID EAST LINE 585.18 FEET TO THE POINT OF BEGINNING, CONTAINING 6.682 ACRES, MORE OR LESS.

**FLOOD ZONE DESIGNATION**  
The accuracy of the flood hazard data shown on this report is subject to map scale uncertainty and to any other uncertainty in location or elevation on the referenced Flood Insurance Rate Map. According to the Federal Emergency Management Agency Flood Insurance Rate Map for Hamilton County, Community Panel 18057 C 0140F, dated February 19, 2003 the described real estate lies within the Unshaded Zone "X," which area is determined to be outside 500-year floodplain, by graphic plotting only. No field surveying was performed to determine this zone and an elevation certificate may be needed to verify this determination or apply for a variance from the federal management Agency.

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REVISIONS	
DATE	DESCRIPTION
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10.04.12	REVISED PER CITY REVIEW COMMENTS DATED 09.20.12
10.11.12	REVISED PER CITY REVIEW COMMENTS



**KITE REALTY GROUP**  
30 S. MERIDIAN STREET  
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INDIANAPOLIS, IN 46204  
317-577-5600 FAX 317-577-5605

CONSTRUCTION PLANS FOR  
**Bridgewater Marketplace**  
Gray Road & 146th Street  
Westfield, Indiana

PREPARED BY:  
**EMHT**  
Event, Mechanical, Horizontal & Tilt, Inc.  
2400 N. Meridian Street, Suite 100  
Indianapolis, IN 46202  
Phone: 317.713.6690 Fax: 317.713.6690  
emht.com

Job No. 2012-1167



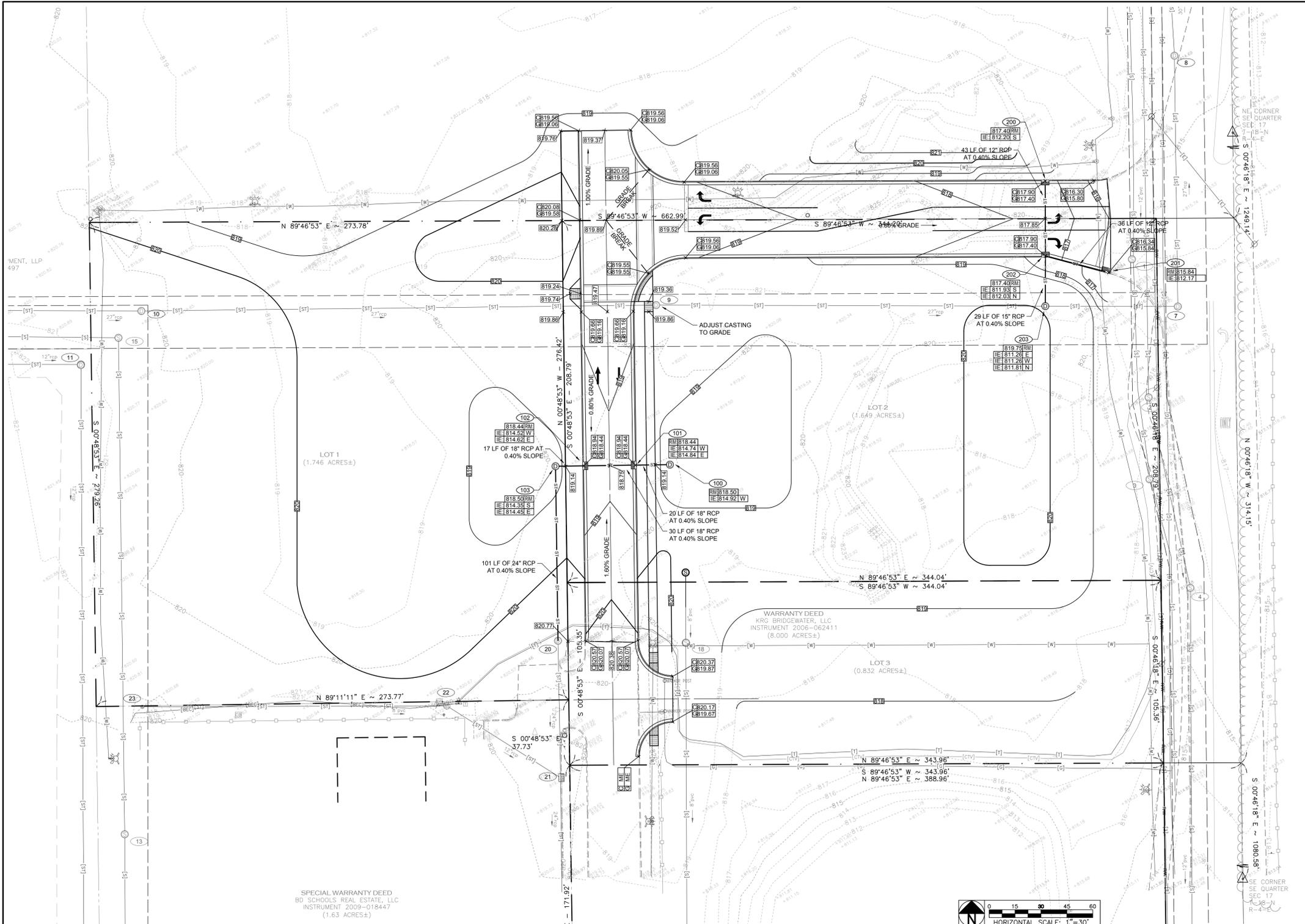
Michael Thompson

Date: August 31, 2012

Scale: 1" = 30'

Title:  
**PRIMARY PLAT**

Sheet:  
**C2.1**



LEGEND OF EXISTING FEATURES			
	BUILDING SETBACK LINE		SIGNS
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	RIGHT OF WAY LINE		MONUMENT SET
	BOUNDARY LINE		BENCHMARK
	CENTER LINE		SECTION CORNER
	DRIVE / ROAD		DECIDUOUS TREE, SIZE
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	INTERMEDIATE CONTOUR		PARKING LOT LIGHTING
	INDEX CONTOUR		AREA LIGHTING / DIRECTIONAL LIGHTING
	BURIED ELECTRIC		POWER POLE / GUY WIRE
	OVERHEAD ELECTRIC		ELECTRIC METER / ELECTRIC MANHOLE
	BURIED TELEPHONE		TELEPHONE PEDESTAL / TELEPHONE MANHOLE
	OVERHEAD TELEPHONE		GAS METER / GAS VALVE
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	GAS LINE		STORM SEWER INLETS
	STORM SEWER		FIRE HYDRANTS
	SANITARY SEWER		CLEANOUT / DOWNSPOUT
	FORCE MAIN		STORM SEWER ENDSECTION
	WATER LINE		WATER VALVE / WATER METER
	SPOT GRADE		POST INDICATOR VALVE (PIV)
	STORM STRUCTURE No.		FIRE DEPARTMENT CONNECTION
	RIM ELEVATION		TRAFFIC MANHOLE / TRAFFIC LIGHT
	INVERT ELEVATION		MAILBOX
	SANITARY STRUCTURE No.		ADA PARKING SPACE
	FINISHED FLOOR ELEVATION		CABLE PEDESTAL / WATER MANHOLE

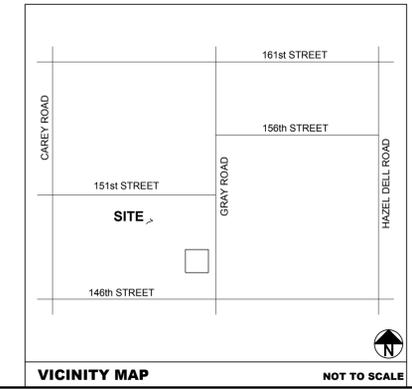
GRADING PLAN LEGEND			
	STORM SEWER		H/V RATIO GRADE
	ROOF DRAIN		FLOW DIRECTION AND GRADE
	SUBSURFACE DRAIN		FINISHED FLOOR ELEVATION
	SUBSURFACE DRAIN		CATCH BASIN INLET
	SWALE FLOW LINE		BEEHIVE / YARD INLET
	CHANNEL FLOW		CURB INLET
	TOP OF BANK		MANHOLE
	NORMAL POOL		CLEANOUT
	POND BOTTOM		END SECTION
	INTERMEDIATE CONTOUR		ROOF DOWNSPOUT
	INDEX CONTOUR		STRUCTURE ID No.
	MATCH EXISTING		RIM ELEVATION
	PAVEMENT SPOT GRADE		PIPE INVERT ELEVATION
	GROUND SPOT GRADE		INVERT WITH DIRECTION
	CURB AND GUTTER GRADE		TOP & BOTTOM OF WALL ELEVATION

**NOTE:**  
DEBRIS GUARD TO BE INSTALLED AT POND OUTFALL PIPE.

**APPROVAL PENDING**  
**NOT FOR CONSTRUCTION**

- GRADING PLAN NOTES**
- TOPSOIL SHALL BE STRIPPED FROM ALL AREAS TO RECEIVE PAVING AND FROM WITHIN THE LIMITS OF PROPOSED BUILDINGS AND STRUCTURES. TOPSOIL SHALL BE STRIPPED TO THE DEPTH SHOWN IN THE GEOTECHNICAL REPORT, OR TO A DEPTH OF 6 INCHES, WHICHEVER IS GREATER.
  - TOPSOIL SHALL BE PLACED TO A DEPTH OF 4 TO 6 INCHES IN ALL AREAS TO BE SEEDED OR SODDED PER THE SPECIFICATIONS.
  - EXCESS TOPSOIL MAY BE PLACED IN MOUNDING AREAS AND NONSTRUCTURAL FILL AREAS AS AVAILABLE.
  - ALL AREAS DISTURBED BY CONSTRUCTION SHALL BE SEEDED OR SODDED UNLESS OTHERWISE SHOWN.
  - FINAL GRADES AT THE PROJECT BOUNDARY SHALL MATCH EXISTING ELEVATIONS UNLESS OTHERWISE SHOWN.
  - THE CONTRACTOR SHALL PERFORM AN EARTHWORK QUANTITY ANALYSIS PRIOR TO COMMENCING CONSTRUCTION TO CONFIRM SUCH QUANTITIES WITH THE ENGINEER. ADJUSTMENTS TO PROPOSED FINISH GRADES BASED UPON THE EARTHWORK QUANTITY ANALYSIS SHALL BE APPROVED BY THE ENGINEER.
  - ALL CONSTRUCTION METHODS AND MATERIALS MUST CONFORM TO CURRENT STANDARDS AND SPECIFICATIONS OF THE FEDERAL, STATE, COUNTY, CITY OR LOCAL REQUIREMENTS, WHICHEVER HAS JURISDICTION.
  - THE CONTRACTOR SHALL VERIFY ALL DIMENSIONS IN THE FIELD PRIOR TO STARTING CONSTRUCTION. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL FIELD DIMENSIONS. IF ANY DISCREPANCIES ARE FOUND IN THESE PLANS FROM THE ACTUAL FIELD CONDITIONS, THE CONTRACTOR SHALL NOTIFY THE ENGINEER IMMEDIATELY.
  - THE EXCAVATING CONTRACTOR MUST TAKE PARTICULAR CARE WHEN EXCAVATING IN AND AROUND EXISTING UTILITY LINES AND EQUIPMENT. VERIFY COVER REQUIREMENTS BY UTILITY CONTRACTORS AND/OR UTILITY COMPANIES SO AS NOT TO CAUSE DAMAGE.
  - THE CONTRACTOR SHALL NOTIFY ALL UTILITY COMPANIES 72 HOURS BEFORE CONSTRUCTION IS TO START. TO VERIFY IF ANY UTILITIES ARE PRESENT ON SITE. ALL VERIFICATIONS (LOCATION, SIZE AND DEPTH) SHALL BE MADE BY THE APPROPRIATE UTILITY COMPANIES. WHEN EXCAVATING IS AROUND OR OVER EXISTING UTILITIES, THE CONTRACTOR MUST NOTIFY THE UTILITY COMPANY SO A REPRESENTATIVE OF THAT UTILITY COMPANY CAN BE PRESENT TO INSTRUCT AND OBSERVE DURING CONSTRUCTION.
  - TRENCHES FOR ALL STORM DRAIN LINES SHALL BE BACKFILLED COMPLETELY WITH ENGINEERED GRANULAR MATERIAL IF WITHIN 5 FEET OF PAVEMENT.
  - AFTER STRIPPING TOPSOIL MATERIAL, PROOFROLL WITH A MEDIUM WEIGHT ROLLER TO DETERMINE LOCATIONS OF ANY POCKETS OF UNSUITABLE MATERIAL. THE NECESSITY FOR SUBDRAINS AND/OR REMOVAL OF ANY UNSUITABLE MATERIAL WITHIN THE PROPOSED PARKING AREAS WILL BE DETERMINED AT THE TIME OF CONSTRUCTION.
  - PROVIDE POSITIVE DRAINAGE WITHOUT PONDING, IN ALL AREAS, AFTER INSTALLATION, CONTRACTOR TO TEST FOR, AND CORRECT, IF ANY, "BIRD BATH" CONDITIONS.
  - ALL PROPOSED SPOT ELEVATIONS ARE THE FINAL PAVEMENT AND FINAL GRADE ELEVATIONS.
  - SEE APPROPRIATE DETAILS TO DETERMINE SUBGRADE ELEVATIONS BELOW FINISH GRADE ELEVATIONS INDICATED.
  - FLOW LINE ELEVATIONS ARE GIVEN AT END OF CONCRETE END SECTIONS.
  - TOR = TOP OF RIM AND REFLECTS PAVEMENT GRADE.
  - STRUCTURES DEEPER THAN FOUR (4) FEET MUST BE ACCESSIBLE WITH STEPS.

STRUCTURE DATA TABLE			
1	SANITARY SEWER POSSIBLE FORCE MAIN RIM EL.: 815.98 IE OUT: 815.98	8	STORM MANHOLE RIM EL.: 814.90 IE IN/OUT: 809.60 N/S
2	SANITARY SEWER RIM EL.: 815.16 IE IN: 802.51 N IE OUT: 802.48 S	9	STORM MANHOLE RIM EL.: 820.94 IE IN: 814.35 W IE OUT: 813.06 E
3	SANITARY SEWER POSSIBLE FORCE MAIN RIM EL.: 817.71 IE OUT:	10	STORM MANHOLE RIM EL.: 820.76 IE IN: 815.33 W IE OUT: 815.31 E
4	SANITARY SEWER RIM EL.: 815.72 IE IN: 802.08 N IE OUT: 802.08 S	11	STORM MANHOLE RIM EL.: 821.29 IE IN/OUT: 816.70 W/S
5	SANITARY SEWER RIM EL.: 809.79 IE IN: 801.37 N IE OUT: 801.35 S	12	STORM MANHOLE RIM EL.: 823.76 IE IN/OUT: 817.76 S/E
6	SANITARY SEWER RIM EL.: 813.05 IE IN: 803.38 N IE OUT: 803.28 S	13	SANITARY SEWER RIM EL.: 820.38 IE IN: 810.62 N IE OUT: 8810.53 S
7	STORM MANHOLE RIM EL.: 816.28 IE IN: 810.65 W IE OUT: 810.63 N	14	STORM MANHOLE RIM EL.: 819.63 IE IN: 815.70 N IE OUT: 815.67 S
15	SANITARY SEWER RIM EL.: 820.80 IE IN: 812.40 W IE OUT: 812.19 S	16	SANITARY SEWER RIM EL.: 824.16 IE IN: 814.35 W IE OUT: 814.28 E
17	STORM MANHOLE RIM EL.: 823.72 IE IN: 818.12 W IE OUT: 818.09 E	18	SANITARY SEWER RIM EL.: 819.74 IE IN: 806.83 N (STUB) IE OUT: 806.79 S
18	SANITARY SEWER RIM EL.: 818.58 IE IN: 805.17 N IE OUT: 805.13 E	19	SANITARY SEWER RIM EL.: 820.80 IE IN: 813.75 S IE OUT: 813.75 S
20	STORM MANHOLE RIM EL.: 820.80 IE OUT: 813.75 S	21	STORM CURB INLET RIM EL.: 819.36 IE IN: 813.06 N IE OUT: 813.01 S
22	STORM INLET RIM EL.: 819.83 IE IN: 814.46 W IE OUT: 813.98 SE	23	STORM INLET RIM EL.: 819.54 IE OUT: 816.76 E



**FLOOD ZONE DESIGNATION**

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MARK	DATE	DESCRIPTION
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**CONSTRUCTION PLANS FOR**

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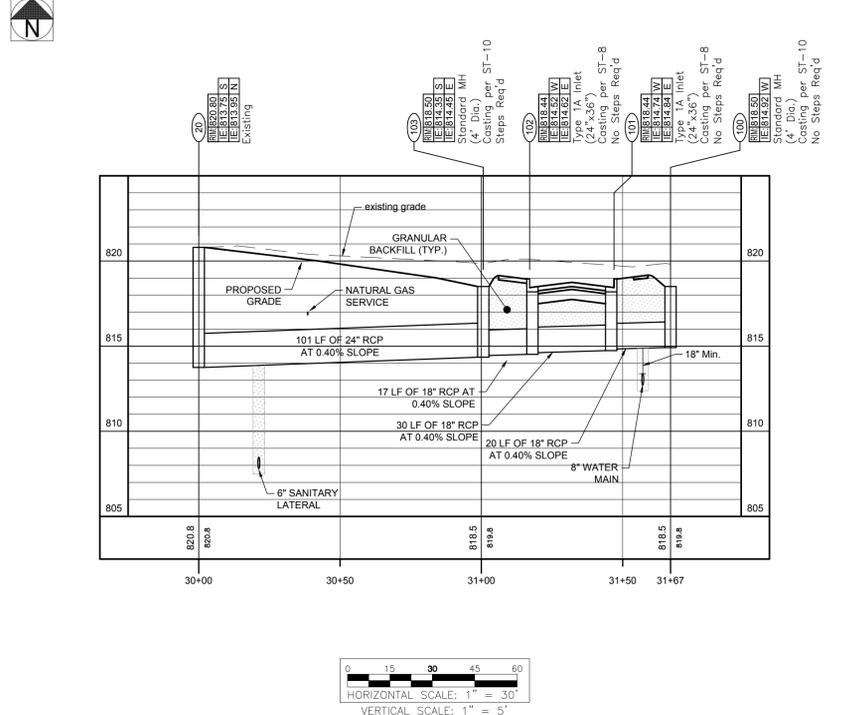
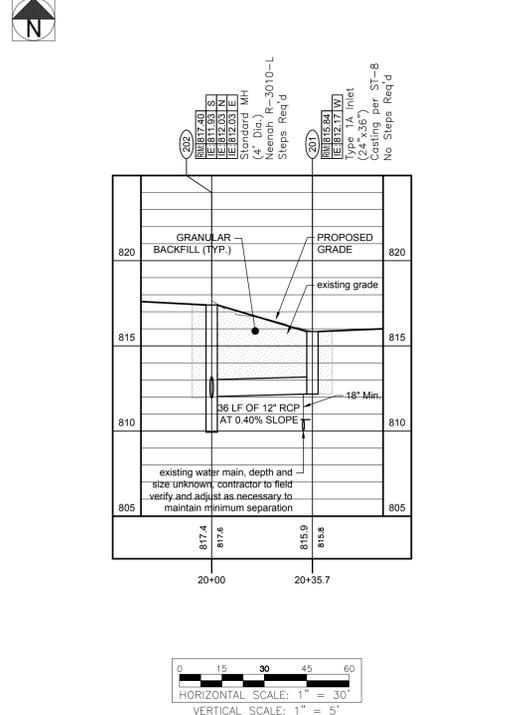
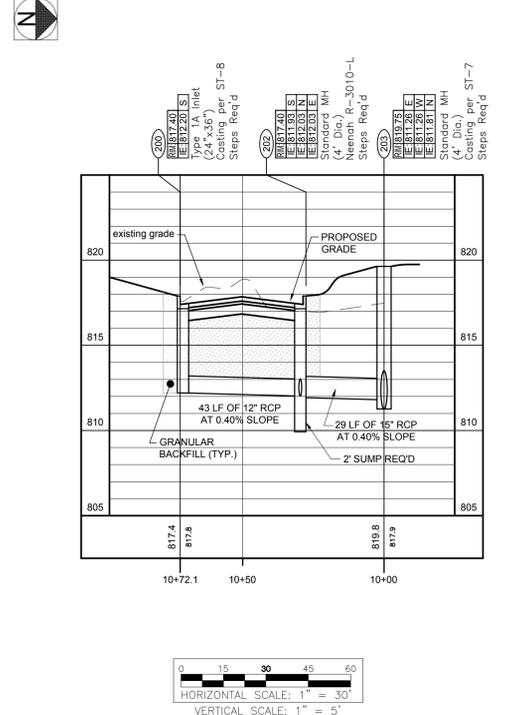
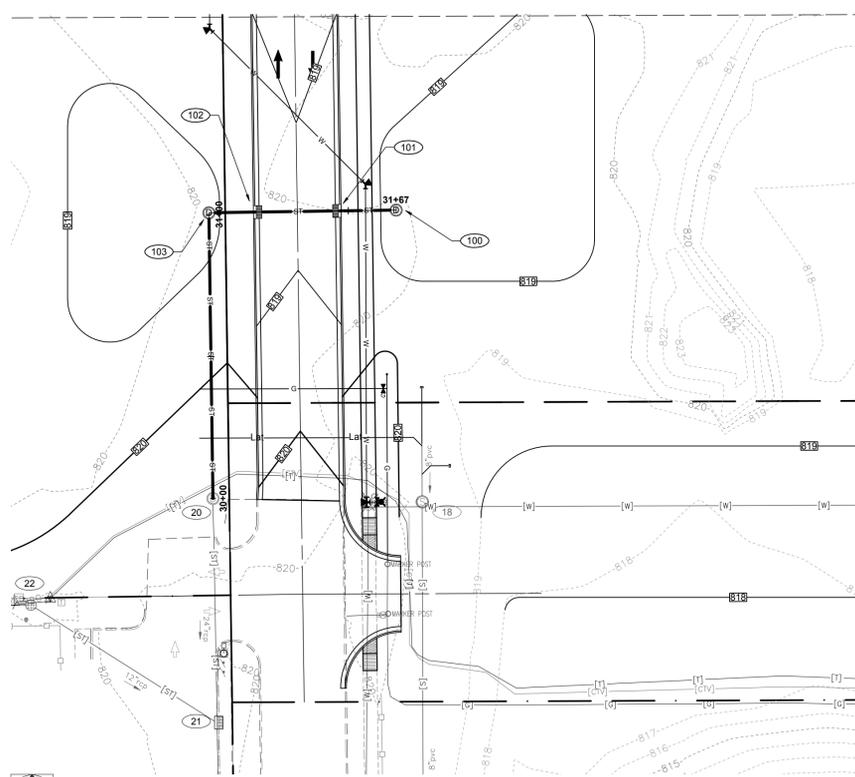
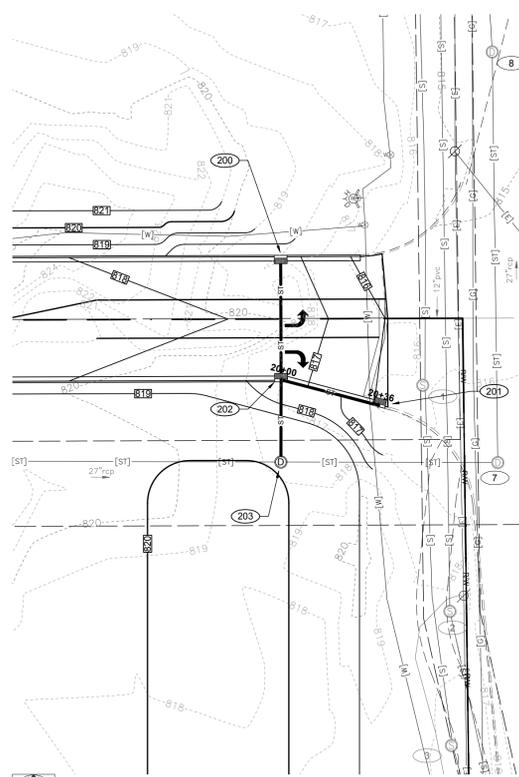
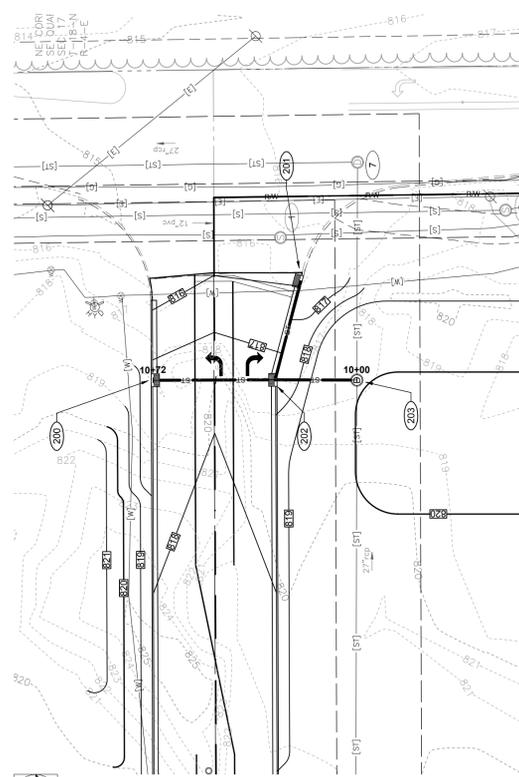
**EMHT**  
Event, McArthur, Hornbigen & Tilton, Inc.  
2400 Woodbury Ave., Ste. 100  
Indianapolis, IN 46204  
Phone: 317.913.6690 Fax: 317.913.6448  
emht.com

Job No. 2012-1167

Date: August 31, 2012  
Scale: 1" = 30'

Title: **GRADING PLAN**

Sheet: **C3.0**



LEGEND OF EXISTING FEATURES			
---	BUILDING SETBACK LINE	+	SIGNS
---	EASEMENT LINE	○	MONUMENT FOUND
---	RIGHT OF WAY LINE	●	MONUMENT SET
---	BOUNDARY LINE	+	BENCHMARK
---	CENTER LINE	+	SECTION CORNER
---	DRIVE / ROAD	+	DECIDUOUS TREE, SIZE
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GRADING PLAN LEGEND			
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---	ROOF DRAIN	+	FLOW DIRECTION AND GRADE
---	SUBSURFACE DRAIN	+	FINISHED FLOOR ELEVATION
---	SUBSURFACE DRAIN	+	CATCH BASIN INLET
---	SWALE FLOW LINE	+	BEEHIVE / YARD INLET
---	CHANNEL FLOW	+	CURB INLET
---	TOP OF BANK	+	MANHOLE
---	NORMAL POOL	+	CLEANOUT
---	POND BOTTOM	+	END SECTION
---	INTERMEDIATE CONTOUR	+	ROOF DOWNSPOUT
---	INDEX CONTOUR	+	STRUCTURE ID No.
---	MATCH EXISTING	+	RIM ELEVATION
---	PAVEMENT SPOT GRADE	+	PIPE INVERT ELEVATION
---	GROUND SPOT GRADE	+	INVERT WITH DIRECTION
---	CURB AND GUTTER GRADE	+	TOP & BOTTOM OF WALL ELEVATION

## APPROVAL PENDING

### NOT FOR CONSTRUCTION

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**BENCHMARK DATA**

SITE BENCHMARK: 794.30 (NAVD 88)  
 A BRONZE DISK STAMPED "HAMILTON COUNTY GEODETIC CONTROL" SET IN THE SOUTH END OF THE MOST SOUTHERN WINGWALL OF THE BRIDGE OVER THE VESTAL-KIRKENDALL DRAIN 61'-W. EAST OF THE CENTERLINE OF HAZEL DELL ROAD AND 384'-W. SOUTH OF 156TH STREET.

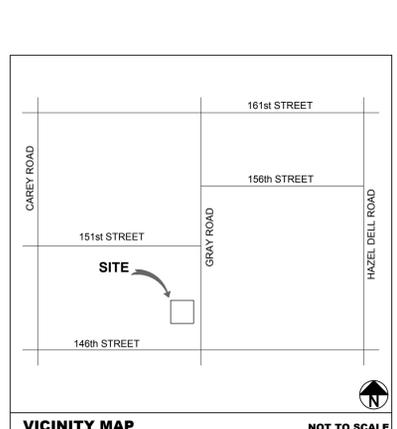
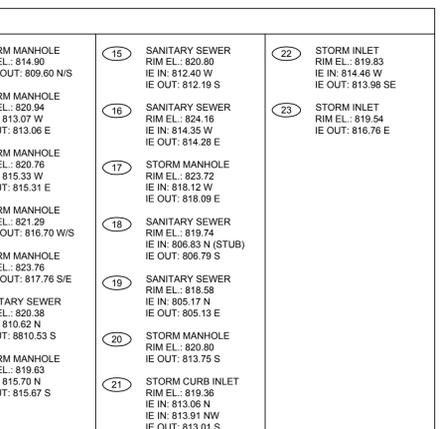
TM5100 = 821.29  
 CHISELED SQUARE FOUND/SET ON WEST SIDE OF A CONCRETE LIGHT POLE BASE LOCATED ON THE EAST SIDE OF THE EAST PARKING LOT OF THE HUNTINGTON BANK.

TM5101 = 819.02  
 YELLOW BENCH THE SET IN THE WEST SIDE OF POWER POLE #057-066 ON THE WEST SIDE OF GRAY ROAD AND IS THE 1ST POLE SOUTH OF THE NORTHERN MOST (FUTURE) ENTRANCE TO BRIDGEWATER MARKETPLACE.

- GRADING PLAN NOTES**
- TOPSOIL SHALL BE STRIPPED FROM ALL AREAS TO RECEIVE PAVING AND FROM WITHIN THE LIMITS OF PROPOSED BUILDINGS AND STRUCTURES. TOPSOIL SHALL BE STRIPPED TO THE DEPTH SHOWN IN THE GEOTECHNICAL REPORT, OR TO A DEPTH OF 6 INCHES, WHICHEVER IS GREATER.
  - TOPSOIL SHALL BE PLACED TO A DEPTH OF 4 TO 6 INCHES IN ALL AREAS TO BE SEEDDED OR SODDED PER THE SPECIFICATIONS.
  - EXCESS TOPSOIL MAY BE PLACED IN MOUNDING AREAS AND NONSTRUCTURAL FILL AREAS AS AVAILABLE.
  - ALL AREAS DISTURBED BY CONSTRUCTION SHALL BE SEEDDED OR SODDED UNLESS OTHERWISE SHOWN.
  - FINAL GRADES AT THE PROJECT BOUNDARY SHALL MATCH EXISTING ELEVATIONS UNLESS OTHERWISE SHOWN.
  - THE CONTRACTOR SHALL PERFORM AN EARTHWORK QUANTITY ANALYSIS PRIOR TO COMMENCING CONSTRUCTION TO CONFIRM SUCH QUANTITIES WITH THE ENGINEER. ADJUSTMENTS TO PROPOSED FINISH GRADES BASED UPON THE EARTHWORK QUANTITY ANALYSIS SHALL BE APPROVED BY THE ENGINEER.
  - ALL CONSTRUCTION METHODS AND MATERIALS MUST CONFORM TO CURRENT STANDARDS AND SPECIFICATIONS OF THE FEDERAL, STATE, COUNTY, CITY OR LOCAL REQUIREMENTS, WHICHEVER HAS JURISDICTION.
  - THE CONTRACTOR SHALL VERIFY ALL DIMENSIONS IN THE FIELD PRIOR TO STARTING CONSTRUCTION. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL FIELD DIMENSIONS. IF ANY DISCREPANCIES ARE FOUND IN THESE PLANS FROM THE ACTUAL FIELD CONDITIONS, THE CONTRACTOR SHALL NOTIFY THE ENGINEER IMMEDIATELY.
  - THE EXCAVATING CONTRACTOR MUST TAKE PARTICULAR CARE WHEN EXCAVATING IN AND AROUND EXISTING UTILITY LINES AND EQUIPMENT. VERIFY COVER REQUIREMENTS BY UTILITY CONTRACTORS AND/OR UTILITY COMPANIES SO AS NOT TO CAUSE DAMAGE.
  - THE CONTRACTOR SHALL NOTIFY ALL UTILITY COMPANIES 72 HOURS BEFORE CONSTRUCTION IS TO START. TO VERIFY IF ANY UTILITIES ARE PRESENT ON SITE. ALL VERIFICATIONS (LOCATION, SIZE AND DEPTH) SHALL BE MADE BY THE APPROPRIATE UTILITY COMPANIES. WHEN EXCAVATING IS AROUND OR OVER EXISTING UTILITIES, THE CONTRACTOR MUST NOTIFY THE UTILITY COMPANY SO A REPRESENTATIVE OF THAT UTILITY COMPANY CAN BE PRESENT TO INSTRUCT AND OBSERVE DURING CONSTRUCTION.
  - TRENCHES FOR ALL STORM DRAIN LINES SHALL BE BACKFILLED COMPLETELY WITH ENGINEERED GRANULAR MATERIAL IF WITHIN 5 FEET OF PAVEMENT.
  - AFTER STRIPPING TOPSOIL MATERIAL, PROOFROLL WITH A MEDIUM WEIGHT ROLLER TO DETERMINE LOCATIONS OF ANY POCKETS OF UNSUITABLE MATERIAL. THE NECESSITY FOR SUBDRAINS AND/OR REMOVAL OF ANY UNSUITABLE MATERIAL WITHIN THE PROPOSED PARKING AREAS WILL BE DETERMINED AT THE TIME OF CONSTRUCTION.
  - PROVIDE POSITIVE DRAINAGE WITHOUT PONDING, IN ALL AREAS, AFTER INSTALLATION, CONTRACTOR TO TEST FOR, AND CORRECT, IF ANY, "BIRD BATH" CONDITIONS.
  - ALL PROPOSED SPOT ELEVATIONS ARE THE FINAL PAVEMENT AND FINAL GRADE ELEVATIONS.
  - SEE APPROPRIATE DETAILS TO DETERMINE SUBGRADE ELEVATIONS BELOW FINISH GRADE ELEVATIONS INDICATED.
  - FLOW LINE ELEVATIONS ARE GIVEN AT END OF CONCRETE END SECTIONS.
  - TOR = TOP OF RIM AND REFLECTS PAVEMENT GRADE.
  - STRUCTURES DEEPER THAN FOUR (4) FEET MUST BE ACCESSIBLE WITH STEPS.

**STRUCTURE DATA TABLE**

1	SANITARY SEWER POSSIBLE FORCE MAIN RIM EL.: 815.98 IE OUT: 815.98	8	STORM MANHOLE RIM EL.: 814.90 IE IN/OUT: 809.60 N/S	15	SANITARY SEWER RIM EL.: 820.80 IE IN: 812.40 W IE OUT: 812.19 S	22	STORM INLET RIM EL.: 819.83 IE IN: 814.46 W IE OUT: 813.98 SE
2	SANITARY SEWER RIM EL.: 818.16 IE IN: 802.51 N IE OUT: 802.48 S	9	STORM MANHOLE RIM EL.: 820.94 IE IN: 813.07 W IE OUT: 813.06 E	16	SANITARY SEWER RIM EL.: 824.16 IE IN: 814.35 W IE OUT: 814.28 E	23	STORM INLET RIM EL.: 819.54 IE OUT: 816.76 E
3	SANITARY SEWER POSSIBLE FORCE MAIN RIM EL.: 817.71 IE OUT:	10	STORM MANHOLE RIM EL.: 820.76 IE IN: 815.33 W IE OUT: 815.31 E	17	STORM MANHOLE RIM EL.: 823.72 IE IN: 818.12 W IE OUT: 818.09 E	18	SANITARY SEWER RIM EL.: 819.74 IE IN: 806.83 N (STUB) IE OUT: 806.79 S
4	SANITARY SEWER RIM EL.: 815.72 IE IN: 802.08 N IE OUT: 802.08 S	11	STORM MANHOLE RIM EL.: 816.70 W/S IE IN/OUT: 817.76 S/E	19	SANITARY SEWER RIM EL.: 818.58 IE IN: 805.17 N IE OUT: 805.13 E	20	STORM MANHOLE RIM EL.: 820.80 IE OUT: 813.75 S
5	SANITARY SEWER RIM EL.: 809.79 IE IN: 801.37 N IE OUT: 801.35 S	12	STORM MANHOLE RIM EL.: 823.76 IE IN/OUT: 817.76 S/E	21	STORM CURB INLET RIM EL.: 819.36 IE IN: 813.06 N IE IN: 813.91 NW IE OUT: 813.01 S		
6	SANITARY SEWER RIM EL.: 813.05 IE IN: 803.38 N IE OUT: 803.28 S	13	SANITARY SEWER RIM EL.: 820.38 IE IN: 810.62 N IE OUT: 801.53 S				
7	STORM MANHOLE RIM EL.: 816.28 IE IN: 810.65 W IE OUT: 810.63 N	14	STORM MANHOLE RIM EL.: 819.83 IE IN: 815.33 W IE OUT: 815.67 S				



REVISIONS

MARK	DATE	DESCRIPTION
	09.17.12	REVISED PER CITY REVIEW COMMENTS DATED 09.06.12
	10.04.12	REVISED PER CITY REVIEW COMMENTS DATED 09.20.12

Know what's below.  
Call before you dig.

PREPARED FOR:

**KITE REALTY GROUP**  
 30 S. MERIDIAN STREET  
 SUITE 1100  
 INDIANAPOLIS, IN 46204  
 317-577-8600 FAX 317-577-8605

CONSTRUCTION PLANS FOR

**Bridgewater Marketplace**  
 Gray Road & 146th Street  
 Westfield, Indiana

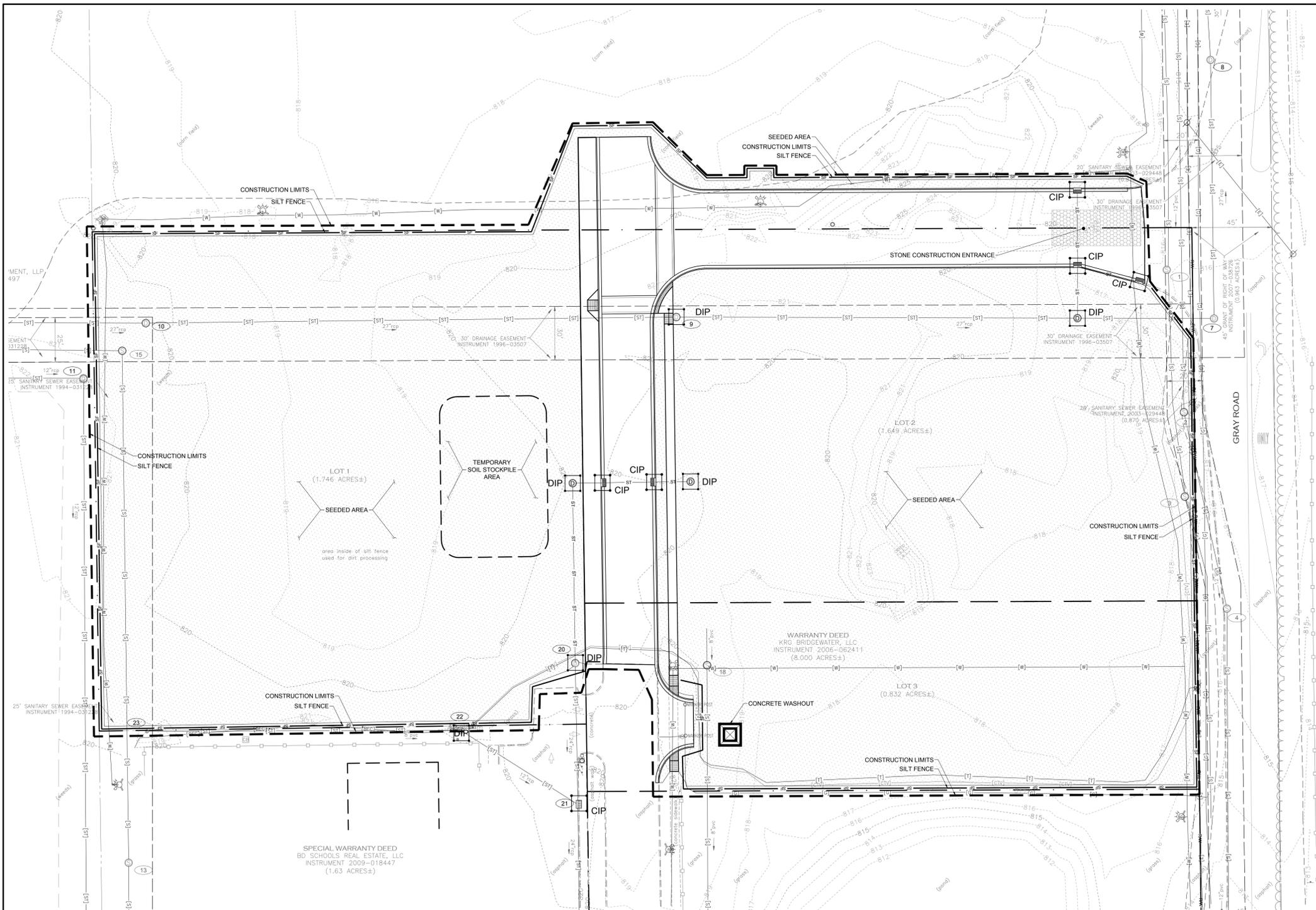
PREPARED BY:

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 Events, Mechanical, Horizontal & Tilted, Inc.  
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 emht.com

Job No. 2012-1167

Michael Thompson  
 State of Indiana  
 Professional Engineer  
 No. PE11011309

Title: **STORM SEWER PLAN & PROFILES**



LEGEND OF EXISTING FEATURES			
	BUILDING SETBACK LINE		SIGNS
	EASEMENT LINE		MONUMENT FOUND
	RIGHT OF WAY LINE		MONUMENT SET
	BOUNDARY LINE		BENCHMARK
	CENTER LINE		SECTION CORNER
	DRIVE / ROAD		DECIDUOUS TREE, SIZE
	FENCE LINE		CONIFEROUS TREE, SIZE
	GUARD RAIL		SHRUB
	SWALE / FLOWLINE		PARKING COUNT
	POND NORMAL POOL		TRANSFORMER / HVAC
	INTERMEDIATE CONTOUR		PARKING LOT LIGHTING
	INDEX CONTOUR		AREA LIGHTING / DIRECTIONAL LIGHTING
	BURIED ELECTRIC		POWER POLE / GUY WIRE
	OVERHEAD ELECTRIC		ELECTRIC METER / ELECTRIC MANHOLE
	BURIED TELEPHONE		TELEPHONE PEDESTAL / TELEPHONE MANHOLE
	OVERHEAD TELEPHONE		GAS METER / GAS VALVE
	BURIED CABLE TELEVISION		STORM MANHOLE / SANITARY MANHOLE
	GAS LINE		STORM SEWER INLETS
	STORM SEWER		FIRE HYDRANTS
	SANITARY SEWER		CLEANOUT / DOWNSPOUT
	FORCE MAIN		STORM SEWER ENDSECTION
	WATER LINE		WATER VALVE / WATER METER
	SPOT GRADE		POST INDICATOR VALVE (PIV)
	STORM STRUCTURE No.		FIRE DEPARTMENT CONNECTION
	RIM ELEVATION		TRAFFIC MANHOLE / TRAFFIC LIGHT
	INVERT ELEVATION		MAILBOX
	SANITARY STRUCTURE No.		ADA PARKING SPACE
	FINISHED FLOOR ELEVATION		CABLE PEDESTAL / WATER MANHOLE

STORMWATER POLLUTION PREVENTION LEGEND	
	TEMPORARY CONSTRUCTION ENTRANCE 6 INCHES OF 2'-3" COARSE AGGREGATE (20'W x 50'L) Minimum, DETAIL EC-22
	PERMANENT SEEDING WITH MULCH, DETAIL EC-SC
	CONCRETE WASHOUT, DETAIL EC-25
	TEMPORARY DROP INLET PROTECTION, EC-1
	TEMPORARY CURB INLET PROTECTION, EC-1
	SILT FENCE (SEDIMENT FENCE), DETAIL EC-4
	LIMITS OF CONSTRUCTION

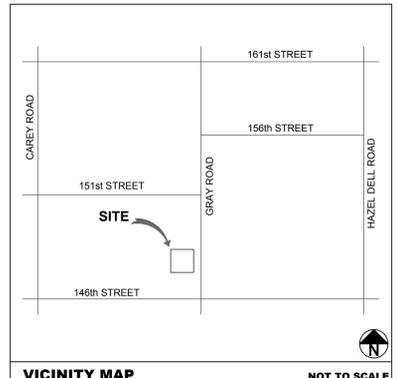
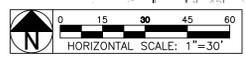
**NOTE:**  
**ADDITIONAL EROSION CONTROL MEASURES MAY BE REQUIRED IN THE FIELD BY THE INSPECTOR.**

**APPROVAL PENDING**  
**NOT FOR CONSTRUCTION**

**FLOOD ZONE DESIGNATION**  
 The accuracy of the flood hazard data shown on this report is subject to map scale uncertainty and to any other uncertainty in location or elevation on the referenced Flood Insurance Rate Map. According to the Federal Emergency Management Agency Flood Insurance Rate Map for Hamilton County, Community Panel 18057, dated February 19, 2003 the described real estate lies within the Unshaded Zone "X", which area is determined to be outside 500-year floodplain, by graphic plotting only. No field surveying was performed to determine this zone and an elevation certificate may be needed to verify this determination or apply for a variance from the federal management Agency.

**UTILITY STATEMENT:**  
 The utilities shown hereon have been located from field survey information and existing drawings. The surveyor makes no guarantee that the utilities shown comprise all such utilities in the area, either in service or abandoned. The surveyor further does not warrant that the utilities shown are in the exact location indicated although he does certify that they are located as accurately as possible from information available.

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**MULCH APPLICATION GUIDELINES**

**MULCH APPLICATION GUIDELINES**  
 MULCH MAY BE APPLIED BY HAND OR BLOWN BY MACHINE. APPLY MULCH AT RATE OF 1.5 TO 2 TONS PER ACRE.  
 MULCH SHALL BE ANCHORED BY HAND PUNCHING, ROLLER PUNCHING, DISC ANCHORING, PLASTIC NETTING OR BY THE USE OF A TACKIFYING AGENT  
**MULCH MATERIALS**  
 STRAW MULCH: PROVIDE AIR DRY, CLEAN, MILDEW AND SEED FREE, SALT HAY OR THRESHED STRAW OF WHEAT, RYE, OATS OR BARLEY.  
 FIBER MULCH: BIODEGRADABLE DYED WOOD CELLULOSE FIBER MULCH, NONTOXIC, FREE OF PLANT GROWTH OR GERMINATION INHIBITORS, WITH MAXIMUM MOISTURE CONTENT OF 15 PERCENT AND A PH RANGE OF 4.5 TO 6.5.  
**TACKIFIER MATERIALS**  
 ASPHALT EMULSION TACKIFIER: ASPHALT EMULSION, ASTM D 977, GRADE SS-1, NONTOXIC AND FREE OF PLANT GROWTH OR GERMINATION INHIBITORS.  
 NONASPHALTIC TACKIFIER: COLLOIDAL TACKIFIER RECOMMENDED BY FIBER-MULCH MANUFACTURER FOR SILURRY APPLICATION, NONTOXIC AND FREE OF PLANT GROWTH OR GERMINATION-INHIBITORS.  
**MAINTENANCE**  
 ADD NEW MULCH IN AREAS WHERE MULCH HAS BEEN DISTURBED BY WIND OR MAINTENANCE OPERATIONS SUFFICIENTLY TO NULLIFY ITS PURPOSE. ANCHOR AS REQUIRED TO PREVENT DISPLACEMENT.

**EROSION CONTROL SEQUENCE AND NOTES**

- BEFORE CONSTRUCTION, MARK PROJECT LIMITS AND ANY AREA WITH SUITABLE VEGETATION FOR FILTER STRIPS IN PERIMETER AREAS.
- INSTALL TEMPORARY CONSTRUCTION ENTRANCE.
- INSTALL INITIAL PERIMETER PRACTICES, INCLUDING PERIMETER SILT FENCE AND INLET PROTECTION PRACTICES FOR EXISTING STORM STRUCTURES.
- STRIP TOPSOIL IN AREAS OF TEMPORARY SEDIMENT BASINS. EXCAVATE SEDIMENT BASINS AND INSTALL EMERGENCY SPILLWAYS AND PRIMARY DISCHARGE STRUCTURES. TEMPORARY SEED BASIN SLOPES AND BOTTOM. CONSTRUCT DIVERSIONS TO DIRECT RUNOFF FROM SITE TO THE BASIN.
- STRIP TOPSOIL, STOCKPILE QUANTITIES NECESSARY FOR COMPLETION OF THE PROJECT AND REMOVE EXCESS FROM THE SITE. SEED STOCKPILES.
- BEGIN MASS EARTHWORK. CONSTRUCT TEMPORARY DIVERSIONS TO DIRECT RUNOFF TO SEDIMENT BASINS. INSTALL STORM SEWER OUTLETS FOR DRY DETENTION BASINS. COMPLETE GRADING OF PONDS, INSTALL EROSION CONTROL BLANKETS AND SEED POND BANKS.
- INSTALL SANITARY SEWER AND STORM SEWER SYSTEMS. INSTALL INLET PROTECTION AS INLETS ARE INSTALLED.
- COMPLETE MASS GRADING. SEED LOTS AND COMMON AREAS AS SHOWN ON PLAN.
- INSTALL STONE BASE FOR ROADS AND DRIVES AS SOON AS GRADE IS ESTABLISHED.
- INSTALL ROADS, CURBS, PAVEMENT AND FINISH BACKFILL. SEED RIGHT-OF-WAYS AND OTHER DISTURBED AREAS NOT PREVIOUSLY SEEDED.
- INSTALL UTILITIES.
- FINISH PERIMETER AND COMMON AREA LANDSCAPING. SEED OR SOD AREAS PER PLAN.
- PROVIDE EROSION AND SEDIMENT CONTROL DURING SITE CONSTRUCTION. SEED AND SOD SITES PER PLAN.
- REMOVE TEMPORARY EROSION CONTROL PRACTICES AFTER VEGETATION IS ESTABLISHED AND PROJECT SITE IS PERMANENTLY STABILIZED.
- MAINTAIN EROSION AND SEDIMENT PRACTICES THROUGHOUT THE DURATION OF THE PROJECT.

**EROSION CONTROL NOTES**

- THE EROSION AND SEDIMENT CONTROL MEASURES SHOWN ON THE DRAWINGS ARE CONSIDERED THE MINIMUM PRACTICES NECESSARY FOR COMPLIANCE WITH THE NPDES GENERAL PERMIT FOR STORM WATER DISCHARGES ASSOCIATED WITH CONSTRUCTION ACTIVITY AS IDENTIFIED UNDER SECTION 327-IAC-15-5 OF THE INDIANA ADMINISTRATIVE CODE. HOWEVER, SITE CONDITIONS, CONSTRUCTION METHODS, SEQUENCING OF WORK AND GENERAL PRACTICE MAY WARRANT VARIATION AND/OR ADDITIONS TO THE QUANTITIES AND LOCATIONS OF MEASURES AS SHOWN.
- UNLESS OTHERWISE SHOWN, TEMPORARY CONTROL MEASURES SHALL BE REMOVED UPON SATISFACTORY ESTABLISHMENT OF PERMANENT VEGETATION.
- SEE SHEET C4.1 FOR DETAILS REFERENCED ON THIS SHEET AND C4.2-C4.3 FOR ADDITIONAL INFORMATION.
- PERIMETER CONTROL MEASURES (I.E. SILT FENCE, DIVERSION DITCHES, TREE PROTECTION FENCING) SHALL BE INSTALLED PRIOR TO COMMENCING EARTHWORK ACTIVITIES.
- IN ADDITION TO THE MAINTENANCE REQUIREMENTS IDENTIFIED FOR INDIVIDUAL MEASURES, ALL EROSION CONTROL MEASURES INSTALLED UNDER THIS PROJECT SHALL BE INSPECTED WEEKLY TO ENSURE THEY ARE FUNCTIONING PROPERLY. MEASURES FOUND TO BE DEFICIENT SHALL BE REPAIRED OR REPLACED IMMEDIATELY THEREAFTER.
- THE CONTRACTOR SHALL MAINTAIN A STABLE CONSTRUCTION ENTRANCE AT ALL TIMES AND SHALL MAKE EFFORTS TO MINIMIZE THE ACCUMULATION OF SOIL, MUD AND DEBRIS ON ADJOINING ROADWAYS.
- TEMPORARY SOIL STOCKPILES SHALL BE CONSTRUCTED IN A MANNER SUCH THAT PROPER DRAINAGE OF THE SITE IS NOT IMPEDED. STOCKPILES SHALL BE CONTAINED WITHIN A PERIMETER CONTROL MEASURE (I.E. SILT FENCE, STRAW BALES OR OTHER BARRIER) TO TRAP SEDIMENT. STOCKPILES THAT WILL REMAIN IN EXCESS OF 6 MONTHS SHALL BE TEMPORARILY SEEDED.
- SYMBOLS FOR INLET PROTECTION MEASURES AND DITCH CHECKS ARE SHOWN LARGER THAN ACTUAL SIZE.
- EROSION CONTROL WITHIN INDIVIDUAL LOTS SHALL BE THE RESPONSIBILITY OF THE BUILDER WHO SHALL BE REQUIRED TO IMPLEMENT MEASURES TO CONTROL THE LOSS OF SEDIMENT FROM THE LOT IN ACCORDANCE WITH THE RECOMMENDATIONS OF THE INDIANA HANDBOOK FOR EROSION CONTROL IN DEVELOPING AREAS.

REVISIONS	
DESCRIPTION	DATE
REVISED PER CITY REVIEW COMMENTS DATED 09.06.12	09.17.12
REVISED PER CITY REVIEW COMMENTS DATED 09.20.12	10.04.12



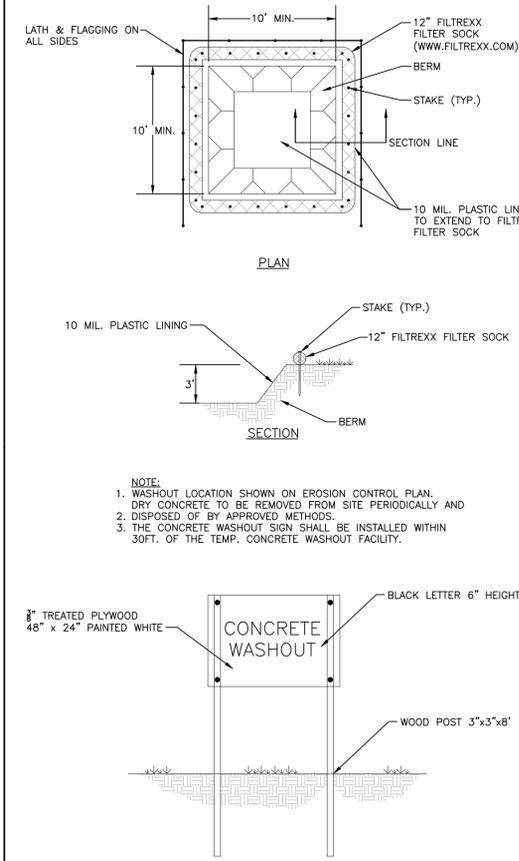
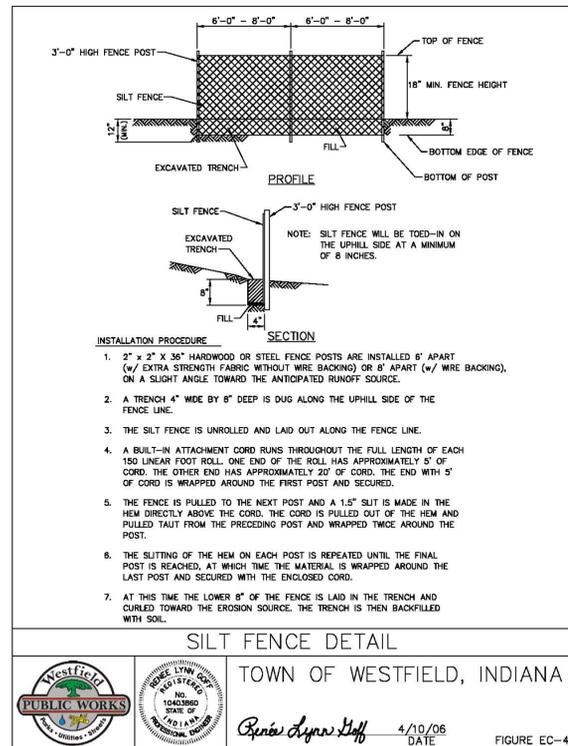
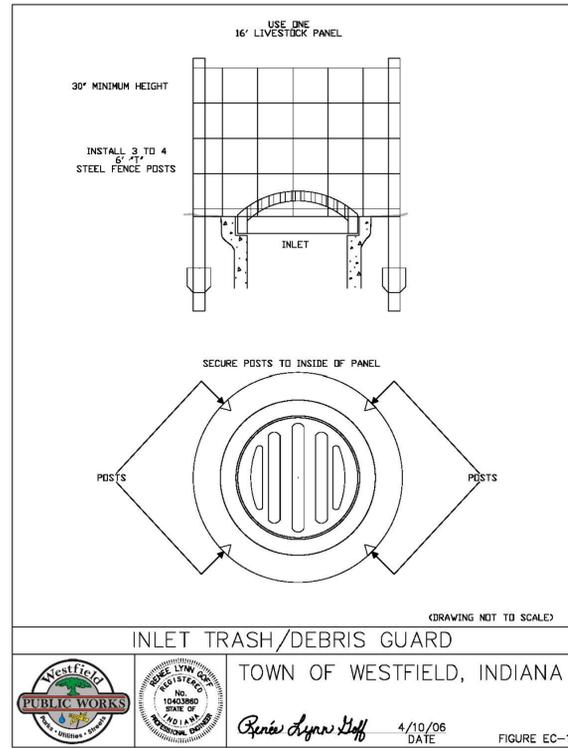
PREPARED FOR:  
**KITE REALTY GROUP**  
 30 S. MERIDIAN STREET  
 SUITE 1100  
 INDIANAPOLIS, IN 46204  
 317-577-5600 FAX 317-577-5605

CONSTRUCTION PLANS FOR  
**Bridgewater Marketplace**  
 Gray Road & 146th Street  
 Westfield, Indiana

PREPARED BY:  
**EMHT**  
 Events, Measurement, Management & Tilt, Inc.  
 2400 N. Meridian Street, Suite 100  
 Indianapolis, IN 46202  
 Phone: 317.213.6690 Fax: 317.213.6690  
 emht.com



Date: August 31, 2012  
 Scale: 1" = 30'  
 Title: **STORMWATER POLLUTION PREVENTION PLAN**  
 Sheet: **C4.0**



**TEMPORARY SEEDING DATES**

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
WHEAT OR RYE												
OATS												
ANNUAL RYEGRASS												

**PERMANENT SEEDING DATES**

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
NON-IRRIGATED*												
IRRIGATED												
DORMANT SEEDING**												

\* IRRIGATION NEEDED DURING THIS PERIOD TO CONTROL EROSION AT TIMES OTHER THAN IN THE SHADED AREAS USE MULCH

\* LATE SUMMER SEEDING DATES MAY BE EXTENDED 5 DAYS IF MULCH IS APPLIED

\*\* INCREASE SEEDING APPLICATION BY 50%

**TEMPORARY SEEDING RATE**

TYPE OF SEED	1,000 SF	ACRE	REMARKS
WHEAT OR RYE	3.5 LBS.	2 BU.	COVER SEED 1"-1 1/2" DEEP
SPRING OATS	2.3 LBS.	3 BU.	COVER SEED 1" DEEP
ANNUAL RYEGRASS	1 LB.	40 LB.	COVER SEED 1/4" DEEP

**PERMANENT SEEDING MIXTURES**

SPECIES	SEEDING RATE LBS/ACRE	SUITABLE PH	DRUGHTY	WELL	WET
LEVEL AND SLOPING, OPEN AREAS					
1. TALL FESCUE	35	.8	5.5-8.3	2	1
2. TALL FESCUE	25	.6	5.5-8.3	1	1
3. KENTUCKY BLUEGRASS	15	.4	5.8-7.5	2	1
4. CREEPING RED FESCUE	15	.4	5.8-7.5	2	1
5. TALL FESCUE	35	.8	5.5-8.3	2	1
6. KENTUCKY BLUEGRASS	15	.4	5.8-7.5	2	1
7. PERENNIAL RYEGRASS	170	4.0	5.0-7.5	1	1
8. TALL FESCUE	170	4.0	5.5-8.3	2	1
9. TALL FESCUE	170	4.0	5.5-8.3	2	1
10. TALL FESCUE	170	4.0	5.5-8.3	2	1

**SEEDING PREPARATION**

APPLY LIME TO RAISE THE PH TO THE LEVEL NEEDED FOR SPECIES BEING SEED. APPLY 23 POUNDS OF 12-12-12 ANALYSIS FERTILIZER (OR EQUIVALENT) PER 1000 SF (APPROXIMATELY 1000 POUNDS PER ACRE) OR FERTILIZE ACCORDING TO TEST APPLICATION OF 150 LBS. OF AMMONIUM NITRATE ON AREAS LOW IN ORGANIC MATTER AND FERTILITY WILL GREATLY ENHANCE VEGETATIVE GROWTH.

WORK THE FERTILIZER AND LIME INTO THE SOIL TO A DEPTH OF 2-3 INCHES WITH A HARROW, DISK OR RAKE OPERATED ACROSS THE SLOPE AS MUCH AS POSSIBLE.

DO NOT USE PHOSPHOROUS CONTAINING FERTILIZERS (12-12-12) UNLESS SOIL TEST SHOW A DEFICIENCY IN PHOSPHOROUS.

**SEEDING**

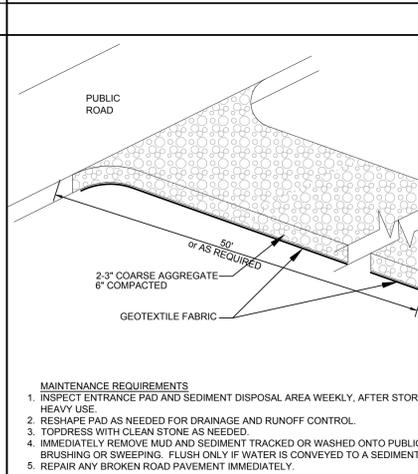
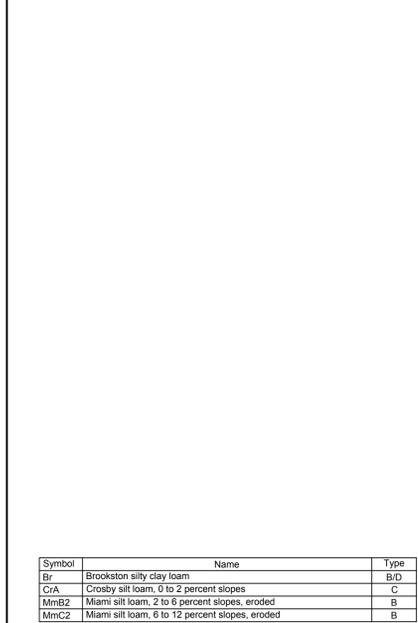
SELECT A SEED MIXTURE BASED ON PROJECTED USE OF THE AREA (SEE PERMANENT SEED MIXTURE CHART). WHILE CONSIDERING BEST SEEDING DATES. IF PERMANENT SEEDING IS NOT PERMITTED USE TEMPORARY SEEDING UNTIL PERMANENT SEEDING CAN BE APPLIED. IF TOLERANCES ARE A PROBLEM, SUCH AS SALT TOLERANCE OF SEEDINGS ADJACENT TO STREETS AND HIGHWAYS, SEE SEED TOLERANCE CHART.

EC-SC SEASONAL SOIL PROTECTION CHART SCALE: NONE

**Brookston Series**  
The Brookston Series consists of deep, nearly level, very poorly drained soils on a broad, gently undulating till plains. These soils formed in loess and the underlying calcareous glacial till. The native vegetation is water-tolerant grasses and hardwoods. The surface layer is silty clay loam with a high organic matter content. Permeability is moderate and the available water capacity is high. If adequately drained, Brookston soils are well suited to farming.

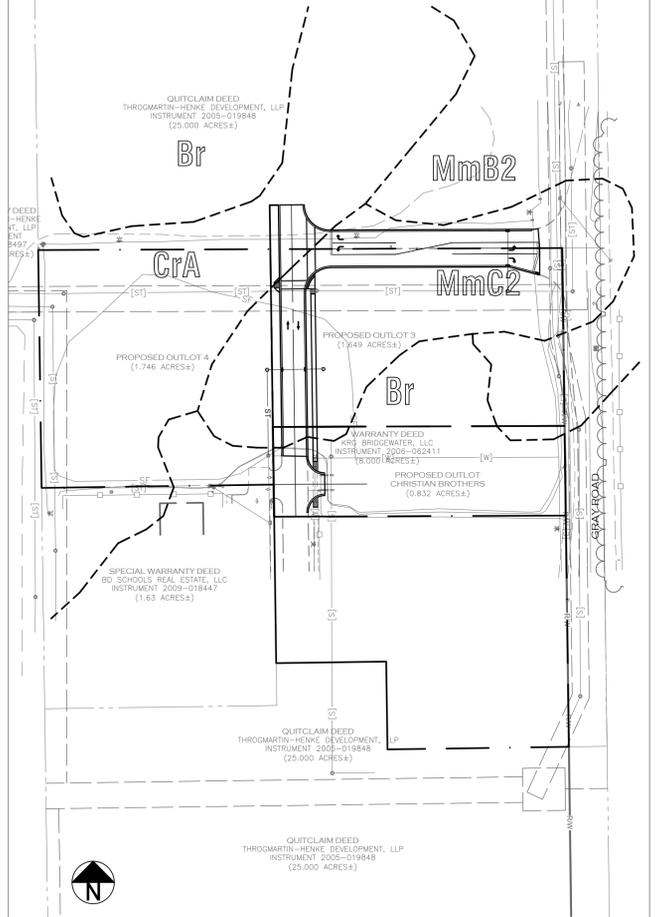
**Crosby Series**  
The Crosby Series consists of deep, nearly level and gently sloping, somewhat poorly drained soils on a broad, gently undulating till plains. Slopes are 0 to 2 percent. These soils formed in loess and the underlying calcareous glacial till. The native vegetation is hardwoods. The surface layer is grayish brown silt loam approximately 6 inches thick and has a low organic matter content. Permeability is slow. Available water capacity is high. If adequately drained, Crosby soils are well suited to farming.

**Miami Series**  
This is a moderately well drained soil with a seasonal water table at 2.0 to 3.5 ft. This soil is located on till plains, slopes are 2 to 6 percent. The native vegetation is hardwood forest. The surface layer is silt loam and has moderately low organic matter content (1.0 to 2.0 percent). Permeability is very slow (<0.06 in/hr) in the most restrictive layer above 60 inches. Available water capacity is moderate (6.1 inches in the upper 60 inches). The pH of the surface layer in non-limed areas is 5.1 to 6.5. Droughtiness and water erosion are management concerns for crop production. This soil is designated potential highly erodible (class 2) in the Highly Erodeable Land (HEL) classification system.



**SWPPP Sequence and Maintenance Schedule**

Practice	BMP Description	Applicability	Maintenance	Installation Sequence
1	Schedule Pre-con with Jurisdictional Entity	All Sites	N/A	Before Construction
2	Temporary Sediment Basin	All Sites	As Needed	Prior To Clearing and Grading
3	Construction Access	Nearly All Sites	Weekly, After Storm Events and As Needed	Prior To Clearing and Grading
4	Tree Preservation and Protection	All Sites	As Needed	Prior To Clearing and Grading
5	Temporary Gravel Construction Entrance Pad	All Sites	Weekly, After Storm Events and As Needed	Prior To Clearing and Grading
6	Wheel Wash	Small Drainage Areas	Weekly, After Storm Events and As Needed	Prior To Clearing and Grading
7	Silt Fence	Up-slope and down-slope sides of construction site, above disturbed slopes within construction site	Weekly, After Storm Events and As Needed	Along with Rough Grading
8	Temporary Diversion	2 acre maximum contributing drainage area	Weekly, After Storm Events and As Needed	Along with Rough Grading
9	Rock Check Dam	Sites with cut or fill slopes	Weekly, After Storm Events and As Needed	Along with Rough Grading
10	Temporary Slope Drain	Small drainage areas	Weekly, After Storm Events and As Needed	Along with Rough Grading
11	Straw Bale Dam	Sites with slopes that are to be stabilized with vegetation	Weekly, After Storm Events and As Needed	After Rough Grading
12	Surface Roughening	Areas of bare soil where additional work is not scheduled to be performed for a minimum of 15 days	Water As Needed	After Rough Grading
13	Temporary Seeding	5 acre maximum contributing drainage area	Weekly, After Storm Events and As Needed	After Rough Grading
14	Temporary Sediment Trap	30 acre maximum contributing drainage area	Weekly, After Storm Events and As Needed	After Rough Grading
15	Fabric Drop Inlet Protection	1 acre maximum contributing drainage area	Weekly, After Storm Events and As Needed	After Each Inlet is placed
16	Basket Curb Inlet Protection	1 acre maximum contributing drainage area	Weekly, After Storm Events and As Needed	After Each Inlet is placed
17	Sandbag Curb Inlet Protection	1 acre maximum contributing drainage area	Weekly, After Storm Events and As Needed	After Each Inlet is placed
18	Outlet Protection	All Sites	Weekly, After Storm Events and As Needed	After Each Outlet is placed
19	Mulching	Temporary surface stabilization	As Needed, After Storm Events	After Finish Grading
20	Erosion Control Blanket (Surface)	Temporary surface stabilization, anchor for mulch	Weekly, After Storm Events and As Needed	After Finish Grading
21	Seed, Sod and Landscape	All Sites	Water As Needed	After Finish Grading
22	Dewatering Structure	Sites requiring dewatering	As Needed	As Needed
23	Dust Control	All Sites	Daily	Duration of Project
24	Solid Waste Management	All Sites	Daily	Duration of Project
25	Hazardous Waste Management	All Sites	Daily	Duration of Project
26	Removal of Inlet Protection	All Sites	N/A	After All areas draining to these areas are stabilized
27	Removal of Silt Fence	All Sites	N/A	After All areas draining to these areas are stabilized



**APPROVAL PENDING NOT FOR CONSTRUCTION**

EC-22 TEMPORARY CONSTRUCTION ENTRANCE SCALE: NONE

**SWPPP Sequence and Maintenance Schedule**

Practice	BMP Description	Applicability	Maintenance	Installation Sequence
1	Schedule Pre-con with Jurisdictional Entity	All Sites	N/A	Before Construction
2	Temporary Sediment Basin	All Sites	As Needed	Prior To Clearing and Grading
3	Construction Access	Nearly All Sites	Weekly, After Storm Events and As Needed	Prior To Clearing and Grading
4	Tree Preservation and Protection	All Sites	As Needed	Prior To Clearing and Grading
5	Temporary Gravel Construction Entrance Pad	All Sites	Weekly, After Storm Events and As Needed	Prior To Clearing and Grading
6	Wheel Wash	Small Drainage Areas	Weekly, After Storm Events and As Needed	Prior To Clearing and Grading
7	Silt Fence	Up-slope and down-slope sides of construction site, above disturbed slopes within construction site	Weekly, After Storm Events and As Needed	Along with Rough Grading
8	Temporary Diversion	2 acre maximum contributing drainage area	Weekly, After Storm Events and As Needed	Along with Rough Grading
9	Rock Check Dam	Sites with cut or fill slopes	Weekly, After Storm Events and As Needed	Along with Rough Grading
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14	Temporary Sediment Trap	30 acre maximum contributing drainage area	Weekly, After Storm Events and As Needed	After Rough Grading
15	Fabric Drop Inlet Protection	1 acre maximum contributing drainage area	Weekly, After Storm Events and As Needed	After Each Inlet is placed
16	Basket Curb Inlet Protection	1 acre maximum contributing drainage area	Weekly, After Storm Events and As Needed	After Each Inlet is placed
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23	Dust Control	All Sites	Daily	Duration of Project
24	Solid Waste Management	All Sites	Daily	Duration of Project
25	Hazardous Waste Management	All Sites	Daily	Duration of Project
26	Removal of Inlet Protection	All Sites	N/A	After All areas draining to these areas are stabilized
27	Removal of Silt Fence	All Sites	N/A	After All areas draining to these areas are stabilized

REVISIONS

MARK	DATE	DESCRIPTION
1	09/17/12	REVISED PER CITY REVIEW COMMENTS DATED 09/06/12
2	10/04/12	REVISED PER CITY REVIEW COMMENTS DATED 09/20/12

811

Know what's below. Call before you dig.

PREPARED FOR:

**KITE REALTY GROUP**  
30 S. MERIDIAN STREET  
INDIANAPOLIS, IN 46204  
317-577-5600 FAX 317-577-5605

CONSTRUCTION PLANS FOR

**Bridgewater Marketplace**  
Gray Road & 146th Street  
Westfield, Indiana

PREPARED BY:

**EMH**  
Event, Mechanical, Hardscape & Tilt, Inc.  
2400 N. Meridian Street, Suite 100, Indianapolis, IN 46202  
Phone: 317.213.6790 Fax: 317.213.6790 emh.com

Job No. 2012-1167

DATE: August 31, 2012

Scale: Not to Scale

Title: **STORMWATER POLLUTION PREVENTION DETAILS**

Sheet: **C4.1**



SECTION D

Additional Measures

D1 Vehicle & Equipment Maintenance

- 1. Description and Purpose: Prevent or reduce the contamination of stormwater resulting from vehicle and equipment maintenance...
2. Suitable Applications: These procedures are suitable on all construction projects where an onsite yard area is necessary for storage and maintenance of heavy equipment and vehicles.
3. Limitations: Onsite vehicle and equipment maintenance should only be used where it is impractical to send vehicles and equipment offsite for maintenance and repair.
4. Implementation: a. If maintenance must occur onsite, use designated areas, located away from drainage course...

D2 Vehicle and Equipment Fueling

- 1. Description and Purpose: Vehicle equipment fueling procedures and practices are designed to prevent fuel spills and leaks, and reduce or eliminate contamination of stormwater.
2. Limitations: Onsite vehicle and equipment fueling should only be used where it is impractical to send vehicles and equipment offsite for fueling.
3. Implementation: a. Use offsite fueling station as much as possible. These businesses are better equipped to handle fuel and spills properly.
4. Inspection and Maintenance: a. Vehicles and equipment should be inspected each day of use for leaks. Leaks should be repaired immediately or problem vehicles or equipment should be removed from the project site.

SECTION D - continued

Additional Measures

D3 Solid Waste Management

- 1. Description and purpose: a. Solid waste management procedures and practices are designed to prevent or reduce the discharge of pollutants to stormwater from solid or construction waste by providing designated waste collection areas and containers...
2. Suitable Applications: a. This BMP is suitable for construction sites where the following wastes are generated or stored.
3. Implementation: The following steps will help keep a clean site and reduce stormwater pollution: a. Select designated waste collection area onsite.
4. Collection, Storage and Disposal: a. Littering on the project site should be prohibited.
5. Inspection and Maintenance: a. Inspect and verify that activity-based BMPs are in place prior to the commencement of associated activities.

Potential Pollutant Sources and Suggested Best Management Practices

- Portable water line flushing: Capture and re-use water on site for dust control. Capture and direct water to area located well away from storm drain system for infiltration and evaporation.
Portable toilets: Locate portable toilets away from gutters, storm drain inlets and waterways. Place portable toilets on stable, flat surface pad not prone to flooding or water ponding.
Installation and Cleaning of Concrete, Masonry, Stucco and Plaster: Use high pressure water, and avoid use of detergents and acids.

Asphalt

- Avoid asphalt paving when storm events are imminent.

Petroleum products

- Avoid storing these materials on site, if possible; otherwise, store these materials away from storm water. Promptly clean up any spills. Properly contain and dispose of motor oil and other lubricants if vehicles are maintained on site.

Painting

- Wash tools and equipment in marked, designated areas of the lot where there is no potential for water to enter storm drains. Wash tools and equipment into sanitary sewer (may require agency approval). Educate painting subcontractors and consider establishing incentives and/or penalties to ensure compliance.

Cleaning

- Use high pressure washing with plain water whenever possible. Use environmentally friendly cleaning products whenever possible. Conduct cleaning and store cleaning chemicals in segregated areas where pollutants cannot enter the storm drain system.

Landscaping

- Avoid using pesticides and herbicides. Avoid on-site storage. If unavoidable, store all chemicals in original packaging material in covered, contained area. Educate landscape subcontractors and consider establishing incentives and/or penalties to ensure compliance.

Treated wood

- Cover treated wood stored on site as recommended for stockpiles. See stockpiles.

Foundation Pesticide Application

- Do not spray foundations during or before predicted rain events. Restrict spraying to inside footprint of building.

Soil amendments & dust control

- For dust control: Consider using clean or recycled site water whenever possible. Protect storm drains and do not allow water to flow from soil areas to storm drains. For soil amendments: Do not over-apply the products. Avoid on-site storage. If unavoidable, store all chemicals in original packaging material in covered, contained area.

Stock Piles

- Year Round: Locate stockpiled materials away from concentrated flows of stormwater and other water. Surround stockpiles left overnight with a temporary berm (e.g., sandbags) that will not allow water to run into the pile. During rainy season or when rain is predicted during dry season: cover all stockpiled materials left overnight (in addition to berms).

Construction Inspection and Maintenance Log. Inspection Type: Routine (every 7 calendar days). Date: 8/31/12. Includes table for Inspection Areas, Location, Maintenance Needed, and Comments.

Construction Inspection and Maintenance Log - continued. Inspection Type: Routine (every 7 calendar days). Date: 8/31/12. Includes table for Inspection Areas, Location, Maintenance Needed, and Comments.



Table with columns: DATE, REVISIONS, DESCRIPTION, MARK. Contains revision history for the document.



KITE REALTY GROUP logo and address: 30 S. MERIDIAN STREET SUITE 1100 INDIANAPOLIS, IN 46204

CONSTRUCTION PLANS FOR Bridgewater Marketplace Gray Road & 146th Street Westfield, Indiana

EMHT logo and contact information: Events, Meetings, Exhibitions & Tilton, Inc.

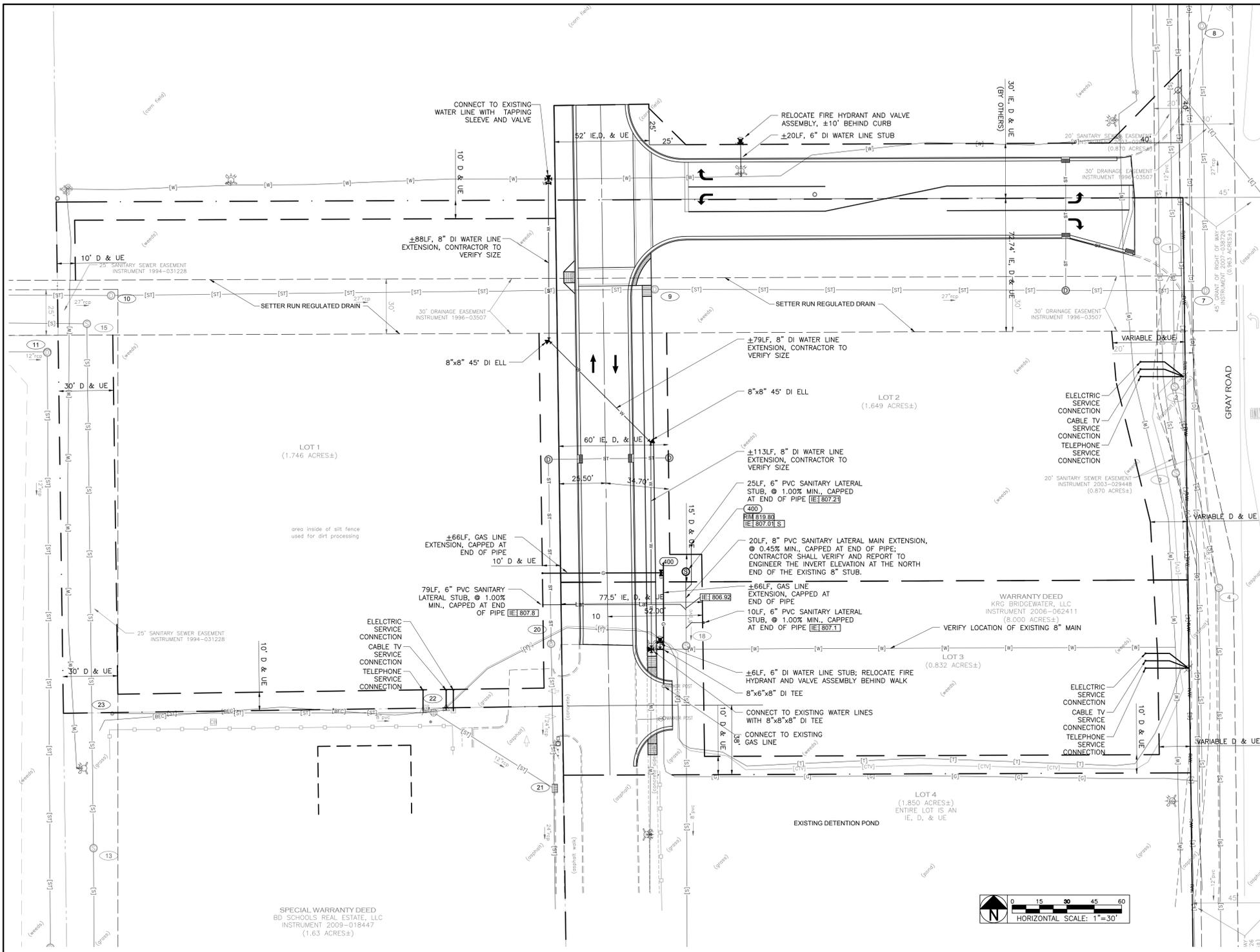
Job No. 2012-1167

Professional Engineer seal for Michael Thompson, State of Indiana, PE 11011309

Date: August 31, 2012 Scale: Not to Scale

Title: STORMWATER POLLUTION PREVENTION NOTES

Sheet: C4.3



NO.	DESCRIPTION	DATE
1	SANITARY SEWER POSSIBLE FORCE MAIN RIM EL.: 815.98 IE OUT: UNABLE TO MEASURE	
2	SANITARY SEWER RIM EL.: 818.16 IE IN: 802.51 N IE OUT: 802.48 S	
3	SANITARY SEWER POSSIBLE FORCE MAIN RIM EL.: 817.71 IE OUT: UNABLE TO MEASURE	
4	SANITARY SEWER RIM EL.: 815.72 IE IN: 801.37 N IE OUT: 802.08 S	
5	SANITARY SEWER RIM EL.: 809.79 IE IN: 801.37 N IE OUT: 801.35 S	
6	SANITARY SEWER RIM EL.: 813.05 IE IN: 803.38 N IE OUT: 803.28 S	
7	STORM MANHOLE RIM EL.: 816.28 IE IN: 816.65 W IE OUT: 810.63 N	
8	STORM MANHOLE RIM EL.: 814.50 IE IN/OUT: 809.60 N/S	
9	STORM MANHOLE RIM EL.: 820.94 IE IN: 813.07 W IE OUT: 813.06 E	
10	STORM MANHOLE RIM EL.: 820.76 IE IN: 815.33 W IE OUT: 816.31 E	
11	STORM MANHOLE RIM EL.: 821.29 IE IN/OUT: 816.70 W/S	
12	STORM MANHOLE RIM EL.: 823.76 IE IN/OUT: 817.76 S/E	
13	SANITARY SEWER RIM EL.: 820.38 IE IN: 810.82 N IE OUT: 810.53 S	
14	STORM MANHOLE RIM EL.: 819.63 IE IN: 815.70 N IE OUT: 815.67 S	
15	SANITARY SEWER RIM EL.: 820.80 IE IN: 812.40 W IE OUT: 812.19 S	
16	SANITARY SEWER RIM EL.: 824.16 IE IN: 814.35 W IE OUT: 814.28 E	
17	STORM MANHOLE RIM EL.: 823.72 IE IN: 818.12 W IE OUT: 818.09 E	
18	SANITARY SEWER RIM EL.: 819.74 IE IN: 806.83 N (STUB) IE OUT: 806.79 S	
19	SANITARY SEWER RIM EL.: 818.58 IE IN: 805.17 N IE OUT: 805.13 E	
20	STORM MANHOLE RIM EL.: 820.80 IE OUT: 817.75 S	
21	STORM CURB INLET RIM EL.: 819.36 IE IN: 813.06 N IE IN: 813.91 NW IE OUT: 813.01 S	
22	STORM INLET RIM EL.: 819.83 IE IN: 814.46 W IE OUT: 813.98 SE	
23	STORM INLET RIM EL.: 819.54 IE OUT: 816.76 E	

LEGEND OF EXISTING FEATURES	
---	BUILDING SETBACK LINE
---	EASEMENT LINE
---	RIGHT OF WAY LINE
---	BOUNDARY LINE
---	CENTER LINE
---	DRIVE / ROAD
---	FENCE LINE
---	GUARD RAIL
---	SWALE / FLOWLINE
---	POND NORMAL POOL
---	INTERMEDIATE CONTOUR
---	INDEX CONTOUR
---	BURIED ELECTRIC
---	OVERHEAD ELECTRIC
---	BURIED TELEPHONE
---	OVERHEAD TELEPHONE
---	BURIED CABLE TELEVISION
---	GAS LINE
---	STORM SEWER
---	SANITARY SEWER
---	FORCE MAIN
---	WATER LINE
---	SPOT GRADE
---	STORM STRUCTURE No.
---	RIM ELEVATION
---	INVERT ELEVATION
---	SANITARY STRUCTURE No.
---	FINISHED FLOOR ELEVATION
---	SIGNS
---	MONUMENT FOUND
---	MONUMENT SET
---	BENCHMARK
---	SECTION CORNER
---	DECIDUOUS TREE, SIZE
---	CONIFEROUS TREE, SIZE
---	SHRUB
---	PARKING COUNT
---	TRANSFORMER / HVAC
---	PARKING LOT LIGHTING
---	AREA LIGHTING / DIRECTIONAL LIGHTING
---	POWER POLE / GUY WIRE
---	ELECTRIC METER / ELECTRIC MANHOLE
---	TELEPHONE PEDESTAL / TELEPHONE MANHOLE
---	GAS METER / GAS METER
---	STORM MANHOLE / SANITARY MANHOLE
---	STORM SEWER INLETS
---	FIRE HYDRANTS
---	CLEANOUT / DOWNSPOUT
---	STORM SEWER ENDSECTIONS
---	WATER VALVE / WATER METER
---	POST INDICATOR VALVE (PIV)
---	FIRE DEPARTMENT CONNECTION
---	TRAFFIC MANHOLE / TRAFFIC LIGHT
---	MAILBOX
---	ADA PARKING SPACE
---	CABLE PEDESTAL / WATER MANHOLE

LEGEND OF PROPOSED UTILITY IMPROVEMENTS	
---	BURIED ELECTRIC CABLE
---	AERIAL ELECTRIC
---	BURIED TELEPHONE CABLE
---	AERIAL TELEPHONE
---	BURIED CABLE TV
---	AERIAL CABLE TV
---	BURIED ELEC/CABLE TV
---	AERIAL ELEC/CABLE TV
---	FIRE LINE
---	FORCE MAIN
---	GAS LINE
---	SANITARY SEWER
---	SANITARY SEWER LATERAL
---	STORM SEWER
---	STORM SEWER LATERAL
---	STORM SEWER INLET
---	STORM SEWER ENDSECTIONS
---	BUILDING DOWNSPOUT
---	UTILITY BENDS
---	UTILITY FITTINGS
---	WATER VALVES
---	FIRE HYDRANT VALVE
---	AIR RELIEF VALVE
---	BLOW-OFF ASSEMBLY
---	POST INDICATOR VALVE
---	FIRE DEPT. CONNECTION
---	WATER METER
---	TRANSFORMER / HVAC
---	PARKING LOT LIGHTING
---	AREA LIGHTING / DIRECTIONAL LIGHTING
---	POWER POLE
---	ELECTRIC METER / ELECTRIC MANHOLE
---	TELEPHONE PEDESTAL
---	GAS METER / GAS VALVE
---	SEWER CLEANOUT
---	STORM MANHOLE / SANITARY MANHOLE
---	STORM SEWER INLETS
---	STORM SEWER ENDSECTIONS
---	BUILDING DOWNSPOUT
---	UTILITY BENDS
---	UTILITY FITTINGS
---	WATER VALVES
---	FIRE HYDRANT VALVE
---	AIR RELIEF VALVE
---	BLOW-OFF ASSEMBLY
---	POST INDICATOR VALVE
---	FIRE DEPT. CONNECTION
---	WATER METER

NOTES:  
SEE EXISTING CONDITIONS PLAN FOR EXISTING UTILITY FEATURES LEGEND. EXISTING UTILITY LINE TYPES ARE NOTED WITHIN BRACKETS.

**NOTE:**  
**SANITARY SEWERS ARE NOT WITHIN 100' OF WATER WELLS.**

**APPROVAL PENDING**  
**NOT FOR CONSTRUCTION**

**UTILITY NOTES**

- REFER TO MECHANICAL, ELECTRICAL AND PLUMBING PLANS FOR CONTINUATION OF UTILITIES WITHIN 5 FEET OF STRUCTURES.
- PRESSURE UTILITY MAINS AND SERVICE LINES MAY NEED TO BE INSTALLED AT A DEPTH GREATER THAN THAT SPECIFIED OR SHOWN ON THE DRAWINGS TO CLEAR EXISTING AND PROPOSED CROSSING UTILITIES. IN SUCH CASES, THE CONTRACTOR SHALL INSTALL VERTICAL BENDS AS REQUIRED TO ACHIEVE APPROPRIATE CLEARANCE BETWEEN THE CROSSING UTILITIES.
- A MINIMUM HORIZONTAL SEPARATION OF 10 FEET BETWEEN WATER LINES AND SEWERS SHALL BE MAINTAINED AT ALL TIMES. A MINIMUM VERTICAL SEPARATION OF 18 INCHES BETWEEN WATER LINES AND SEWERS SHALL BE MAINTAINED AT CROSSINGS. IN THE EVENT THAT MINIMUM SEPARATION REQUIREMENTS CANNOT BE MET, THE CONTRACTOR SHALL UTILIZE PRESSURE-TYPE WATER PIPE FOR THE SEWER PER DETAIL SA-9.
- WATER MAINS SHALL BE INSTALLED WITH A MINIMUM OF 54 INCHES OF COVER AS MEASURED FROM THE TOP OF THE PIPE TO THE FINAL FINISH GRADE ABOVE THE PIPE.
- THRUST BLOCKS OR JOINT RESTRAINTS SHALL BE INSTALLED ON ALL WATER LINES AT ALL BENDS, TEES AND HYDRANTS PER THE DETAILS.
- PIPE LENGTHS SHOWN ARE MEASURED FROM CENTER TO CENTER OF STRUCTURES ROUNDED TO THE NEAREST FOOT.
- PIPE LENGTHS SHOWN FOR STORM SEWERS ARE MEASURED TO THE DOWNSTREAM END OF END SECTIONS.
- WHERE GRADE MODIFICATIONS (CUT OR FILL) ARE SHOWN ADJACENT TO EXISTING VALVE BOX COVERS AND MANHOLE CASTINGS, THE VALVE BOX COVERS AND MANHOLE CASTINGS SHALL BE ADJUSTED FLUSH WITH THE PROPOSED GRADE.
- TRENCHES FOR ALL WATER MAIN LINES SHALL BE BACK FILLED COMPLETELY WITH ENGINEERED GRANULAR MATERIAL WITHIN 6" OF PAVEMENT.
- ADJUSTMENTS OF EXISTING MANHOLE CASTINGS TO GRADE TO A MAXIMUM OF 12 INCHES SHALL BE MADE USING PRECAST CONCRETE ADJUSTING RINGS PROVIDED THE TOTAL HEIGHT OF EXISTING AND NEW ADJUSTING RINGS DOES NOT EXCEED 12 INCHES.
- ADJUSTMENTS OF CASTINGS WHERE THE TOTAL HEIGHT OF ADJUSTING RINGS WOULD EXCEED 12 INCHES SHALL BE MADE BY REPLACING THE CONE AND/OR BARREL SECTION OF THE STRUCTURE.
- PAVEMENTS, WALKS, CURBS AND OTHER SURFACE IMPROVEMENTS REQUIRING REMOVAL FOR INSTALLATION OF UNDERGROUND UTILITIES SHALL BE RESTORED TO THEIR PRESENT CONDITION UNLESS OTHERWISE SHOWN.
- MANHOLE CASTINGS LOCATED WITHIN ASPHALT PAVEMENT AREAS SHALL INCLUDE A CONCRETE PAVED COLLAR EXTENDING A MINIMUM OF 12 INCHES IN ALL DIRECTIONS FROM THE EDGE OF THE CASTING PER THE DETAILS.
- THE CONTRACTOR SHALL MAINTAIN ALL FLOWS AND UTILITY CONNECTIONS TO EXISTING BUILDINGS, ETC. WITHOUT INTERRUPTION UNLESS UNTIL AUTHORIZED TO DISCONNECT BY THE OWNER, UTILITY COMPANIES, AND GOVERNING AUTHORITIES. THE CONTRACTOR SHALL INSTALL AS NECESSARY, TEMPORARY SITE LIGHTING, GAS, SANITARY, WATER, STORM, ELECTRIC, TELEPHONE, AND CABLE SERVICES TO SERVICE BUILDINGS TO REMAIN OPEN.
- CONTRACTOR TO PROVIDE SLEEVES UNDER FOOTINGS OR THROUGH FOUNDATIONS FOR UTILITY CONNECTIONS. CONTRACTOR SHALL PROVIDE ALL BENDS, FITTINGS, ADAPTERS, ETC. AS REQUIRED FOR PIPE CONNECTIONS TO BUILDING CANOPY STUB OUTS, INCLUDING ROOF FOOTING DRAIN CONNECTIONS TO ROOF LEADERS AND TO STORM DRAINAGE SYSTEM.
- CAP STUBS AND PROVIDE FIELD MARKERS.

**WATER MAIN MATERIAL SPECIFICATIONS**

Ductile Iron Pipe and Fittings

A. Ductile Iron (DI) Pipe

Unless indicated otherwise on the construction plans, all 6" through 12" diameter pipe shall be Class 350; 16" through 24" diameter pipe shall be Class 250; complete with all accessories specified in Section 7.03 Ductile Iron Pipe and Fittings and conforming to ANSI/AWWA C151/A21.51 with polyethylene encasement (refer to Section 7.15, "Polyethylene Encasement"). The joint shall be of the push joint (PJ) type conforming to ANSI/AWWA C111/A21.11. Gasket lubricant shall conform to ANSI/AWWA C111/A21.11. The pipe shall be cement mortar lined in accordance with ANSI/AWWA C104/A21.4 and shall be coated outside with a bituminous coating.

B. Ductile Iron Fittings

Ductile iron fittings shall be complete with all accessories (refer to Section 7.03.D) and shall conform to ANSI/AWWA C110/A21.10, 350 pounds per square inch (psi) pressure rating requirements.

All fittings shall be cement mortar lined conforming to ANSI/AWWA C104/A21.4 and shall be coated outside with a bituminous coating or fusion-bonded epoxy.

Fittings shall have distinctly cast into the pipe exterior the pressure rating and letters "DI" or "DUCTILE". All DI fittings acceptable to the Utility shall be rated at a minimum of 70-50-05 (ksi tensile strength-ksi yield strength-percent elongation), in accordance with ANSI/AWWA C110 standards regarding strength of materials.

Fitting joints shall be of the standard mechanical joint (MJ) type conforming to ANSI/AWWA C111/A21.11 or push joint (PJ) type conforming to ANSI/AWWA C111/A21.11.

All T-head bolts shall be in accordance with AWWA C111/A21.11.

C. Compact Ductile Iron Fittings

Lightweight DI, MJ, or PJ type fittings shall conform to ANSI/AWWA C153/A21.53 and may be used at the Contractor's option. Fitting wall thickness shall meet or exceed ductile iron Class 53 and shall have a working pressure rating of 350 psi.

All fittings shall be cement mortar lined conforming to ANSI/AWWA C104/A21.4, and shall be coated outside with a bituminous or fusion bonded epoxy coating.

All T-head bolts shall be in accordance with AWWA C111/A21.11.

D. Mechanical Joint Fitting Accessories

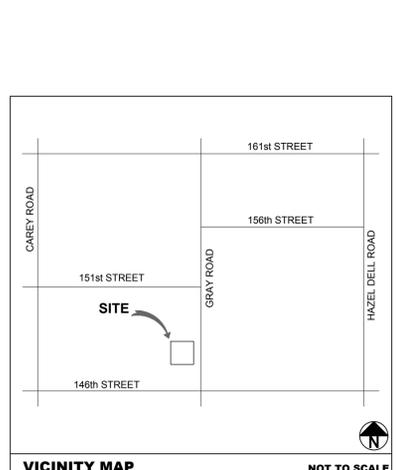
MJ fitting accessories shall consist of gaskets, glands and T-head bolts with nuts. MJ fitting accessories shall conform to ANSI/AWWA C111/A21.11.

E. Special Gasket Material for Ductile Iron Pipe

In construction areas where contaminated soils exist or existing steam utility lines are installed, ductile iron pipe shall be required for installation with special gaskets in the pipe as approved by the Utility. Gasket lubricant shall be as specified by the pipe manufacturer.

F. Acceptable Manufacturers

All manufacturers shall be approved by the Utility, as listed in Appendix M - Approved Manufacturers for Water Main Materials.



**FLOOD ZONE DESIGNATION**

The accuracy of the flood hazard data shown on this report is subject to map scale uncertainty and to any other uncertainty in location or description on the referenced Flood Insurance Rate Map. According to the Federal Emergency Management Agency Flood Insurance Rate Map for Hamilton County, Community Flood dated February 19, 2003 the described real estate lies within the Unshaded Zone "X", which area is determined to be outside 500-year floodplain, by graphic plotting only. No field surveying was performed to determine this zone and an elevation certificate may be needed to verify this determination or apply for a variance from the federal management Agency.

**UTILITY STATEMENT:**

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

**BENCHMARK DATA**

SITE BENCHMARK: 794.30 (NAVD 88)  
A BRONZE DISK STAMPED "HAMILTON COUNTY GEODETIC CONTROL" SET IN THE SOUTH END OF THE MOST SOUTHERN WINGWALL OF THE BRIDGE OVER THE VESTAL-KIRKENDALL DRAIN 61'-4" EAST OF THE CENTERLINE OF HAZEL DELL ROAD AND 384'-4" SOUTH OF 156TH STREET.

TBM#100 = 821.29  
CHISELED SQUARE FOUND/SET ON WEST SIDE OF A CONCRETE LIGHT POLE BASE LOCATED ON THE EAST SIDE OF THE EAST PARKING LOT OF THE HUNTINGTON BANK.

TBM#101 = 819.02  
YELLOW BENCH THE SET IN THE WEST SIDE OF POWER POLE #057-066 ON THE WEST SIDE OF GRAY ROAD AND IS THE 1ST POLE SOUTH OF THE NORTHERN MOST (FUTURE) ENTRANCE TO BRIDGewater MARKETPLACE.

Date: August 31, 2012  
Scale: 1" = 30'

Title: **UTILITY PLAN**

Sheet: **C5.0**

**REVISIONS**

MARK	DATE	DESCRIPTION
	09/17/12	REVISED PER CITY REVIEW COMMENTS DATED 09/06/12
	10/04/12	REVISED PER CITY REVIEW COMMENTS DATED 09/20/12

PREPARED FOR:  
**KITE REALTY GROUP**  
30 S. MERIDIAN STREET  
SUITE 1100  
INDIANAPOLIS, IN 46204  
317-577-9600 FAX 317-577-9605

CONSTRUCTION PLANS FOR  
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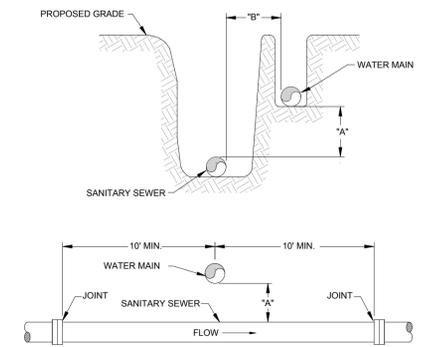
Job No. 2012-1167

Michael Thompson  
Professional Engineer  
No. PE11011309  
STATE OF INDIANA

Date: August 31, 2012  
Scale: 1" = 30'

Title: **UTILITY PLAN**

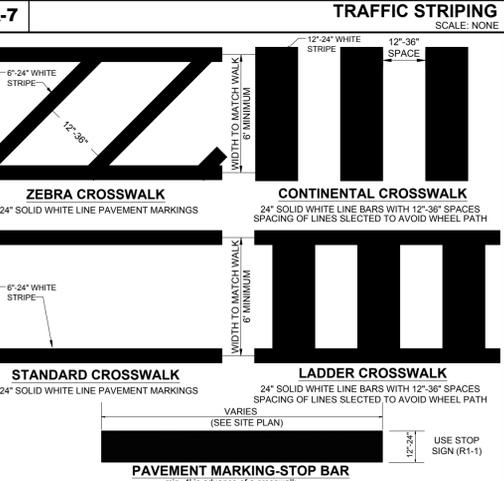
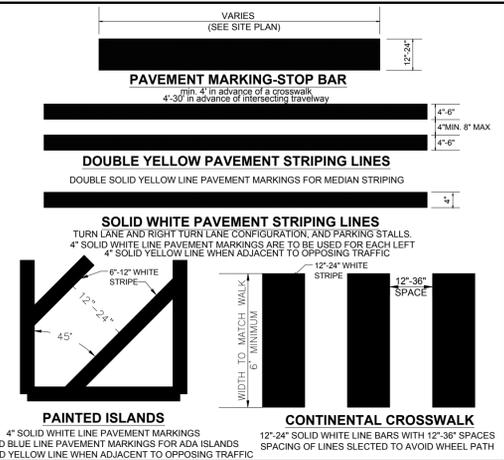
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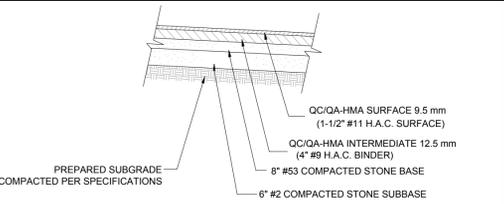
IF "A" IS	IF "B" IS	THEN SANITARY SEWER PIPE SEGMENT SHALL BE
18" OR MORE	10' OR MORE	NO SPECIAL PIPE MATERIAL OR GRADE REQUIREMENTS
LESS THAN 18"	LESS THAN 10'	PVC RATED AT 200 PSI, (EITHER ASTM D-2241 (SDR 21) OR AWWA C-300 (DR 14) OR AWWA C-905 (DR 21) OR DUCTILE IRON (CLASS S1 MIN.))

**NOTES:**  
 Water and sewer crossings and separations shall be in accordance with Ten State Standards and local codes.  
 There shall be no physical connections between a public or private water supply system and a sanitary sewer or appurtenances thereto which would permit the passage of any polluted water into the potable supply.  
 Sanitary sewers shall be laid ten (10) feet horizontally from any existing or proposed water line. The distance shall be measured edge to edge. In cases where it is not practical to maintain a ten (10) foot separation, the appropriate reviewing agency may allow deviation on a case-by-case basis if supported by data from the design engineer. Such deviation 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 to 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.  
 Sanitary sewers crossing water mains shall be laid to provide a minimum vertical separation distance of 18 inches between the outside of water main and the outside of the sewer. This shall be the case where the water main is either above or below 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.  
 Where a water main crosses under a sewer, adequate structural support shall be provided for the sewer to prevent damage to the water main.  
 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 water tightness prior to backfilling.

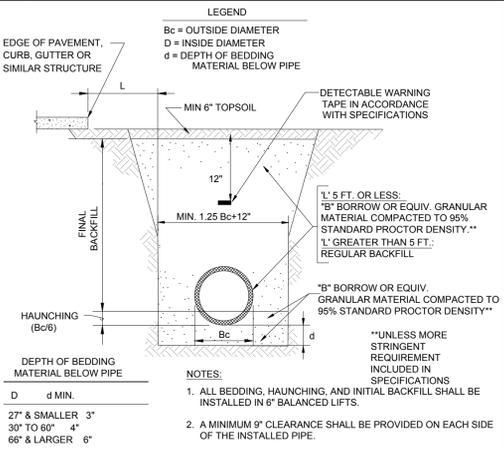
**SA-9 SEWER AND WATER SEPARATION REQUIREMENTS**  
SCALE: NONE



**PA-7A CROSSWALK STRIPING DETAILS**  
SCALE: NONE



**PA-1D ASPHALT PAVEMENT SECTION**  
SCALE: NONE



**ST-3 REINFORCED CONCRETE PIPE (RCP) TRENCH DETAIL**  
SCALE: NONE

MARK	DATE	DESCRIPTION
	09.17.12	REVISED PER CITY REVIEW COMMENTS DATED 09.06.12
	10.04.12	REVISED PER CITY REVIEW COMMENTS DATED 09.20.12



**KITE REALTY GROUP**  
 30 S. MERIDIAN STREET  
 SUITE 1100  
 INDIANAPOLIS, IN 46204  
 317-577-8600 FAX 317-577-8605

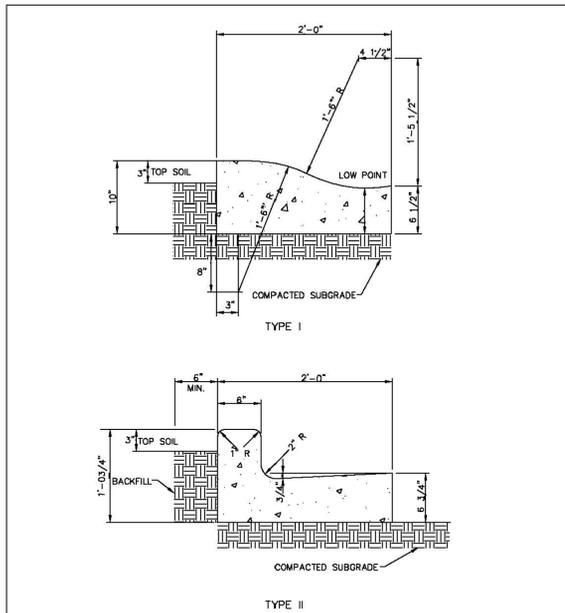
**Bridgewater Marketplace**  
 Gray Road & 146th Street  
 Westfield, Indiana

**EMHT**  
 Event, Mchschwart, Hornbagen & Tilton, Inc.  
 2400 N. Meridian Street, Suite 100  
 Indianapolis, IN 46202  
 Phone: 317.213.6690 Fax: 317.213.6690  
 emht.com

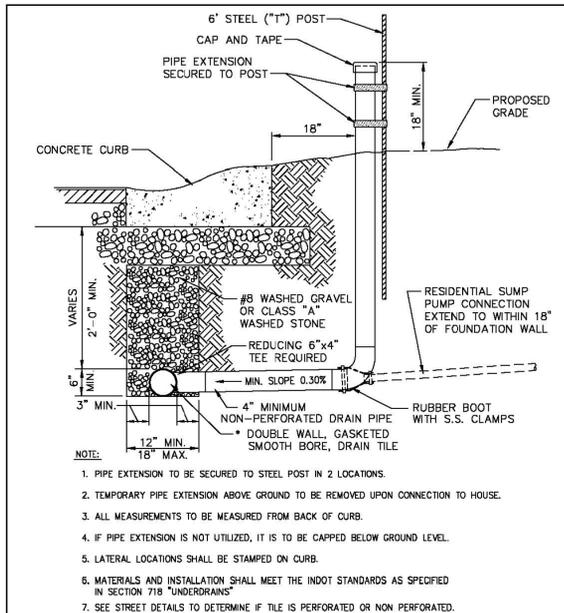
Job No. 2012-1167  
 MICHAEL THOMPSON  
 REGISTERED PROFESSIONAL ENGINEER  
 INDIANA  
 PE 11011309  
 Michael Thompson

Date: August 31, 2012  
 Scale: Not to Scale  
 Title: **SITE & UTILITY DETAILS**  
 Sheet: **C7.0**

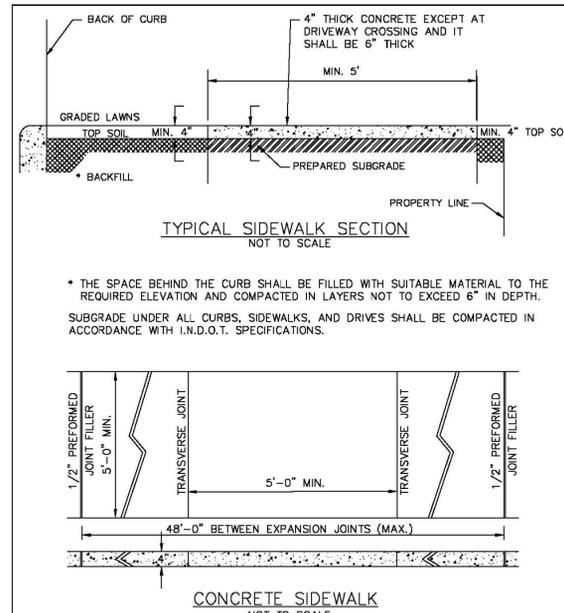
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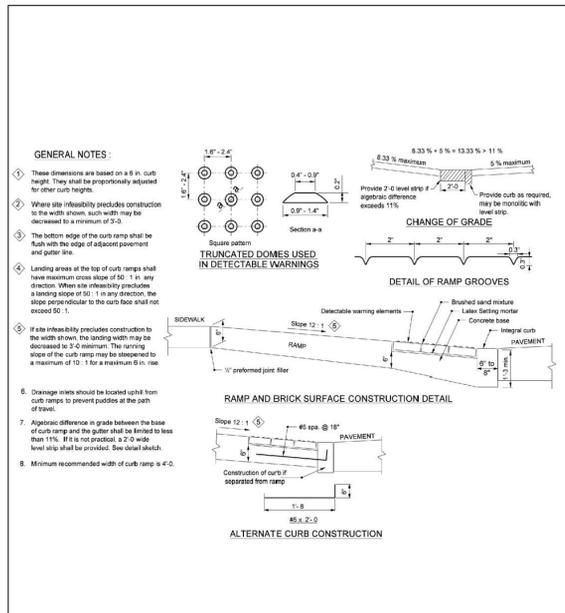
CONCRETE CURB AND GUTTER TYPE I & II  
 TOWN OF WESTFIELD, INDIANA  
 10/9/06 DATE  
 FIGURE P-8



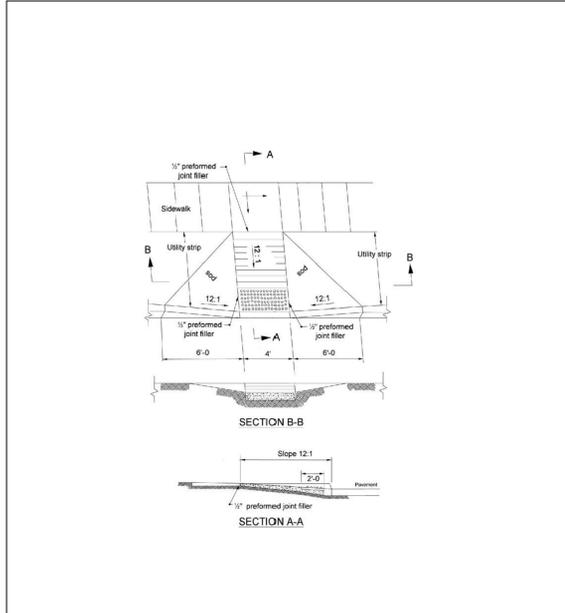
UNDERDRAIN DETAIL  
 TOWN OF WESTFIELD, INDIANA  
 10/9/06 DATE  
 FIGURE P-9



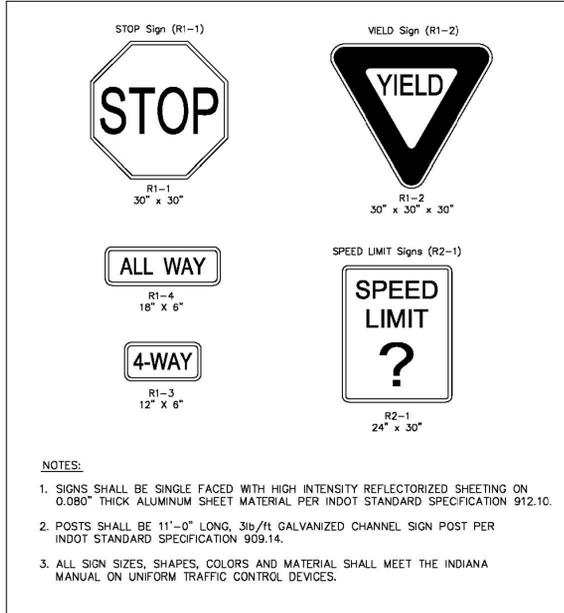
SIDEWALK DETAILS  
 TOWN OF WESTFIELD, INDIANA  
 10/9/06 DATE  
 FIGURE P-10



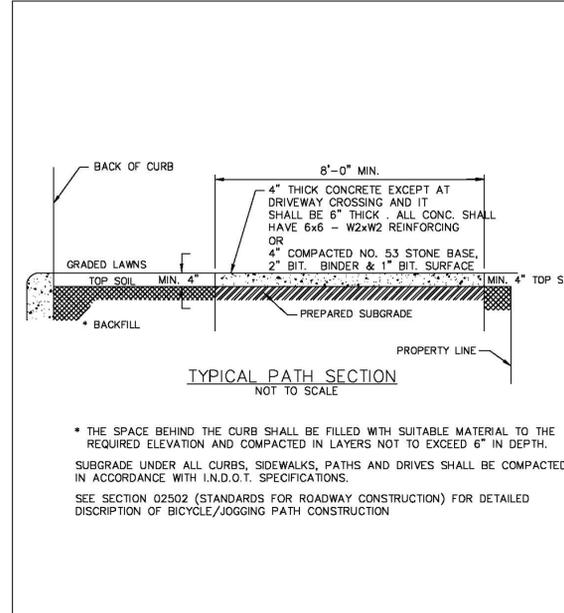
SIDEWALK RAMP FOR HANDICAPPED  
 TOWN OF WESTFIELD, INDIANA  
 10/9/06 DATE  
 FIGURE P-11



SIDEWALK RAMP FOR HANDICAPPED  
 TOWN OF WESTFIELD, INDIANA  
 10/9/06 DATE  
 FIGURE P-11A



TYPICAL SUBDIVISION REGULATORY SIGNS  
 TOWN OF WESTFIELD, INDIANA  
 10/9/06 DATE  
 FIGURE P-15.1



BICYCLE/JOGGING PATH DETAIL  
 TOWN OF WESTFIELD, INDIANA  
 10/9/06 DATE  
 FIGURE P-16

**APPROVAL PENDING**  
 NOT FOR CONSTRUCTION

REVISIONS

MARK	DATE	DESCRIPTION
	09/17/12	REVISED PER CITY REVIEW COMMENTS DATED 09/06/12
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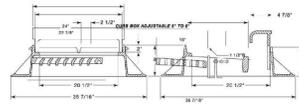
EMHT  
 Registered Professional Engineer  
 Michael Thompson  
 PE 11011309  
 STATE OF INDIANA

Job No. 2012-1167  
 Date: August 31, 2012  
 Scale: Not to Scale  
 Title: CITY OF WESTFIELD SITE DETAILS  
 Sheet: C7.1



R-3010-L- Combination Inlet, With Curb Box

**R-3010-L**  
Combination Inlet Frame, Grate, Curb Box  
Heavy Duty



CATALOG NUMBER	GRATE TYPE	SO. FEET	WEIR REMOVAL LINEAL FEET
R-3010-L	1	1.8	0.6

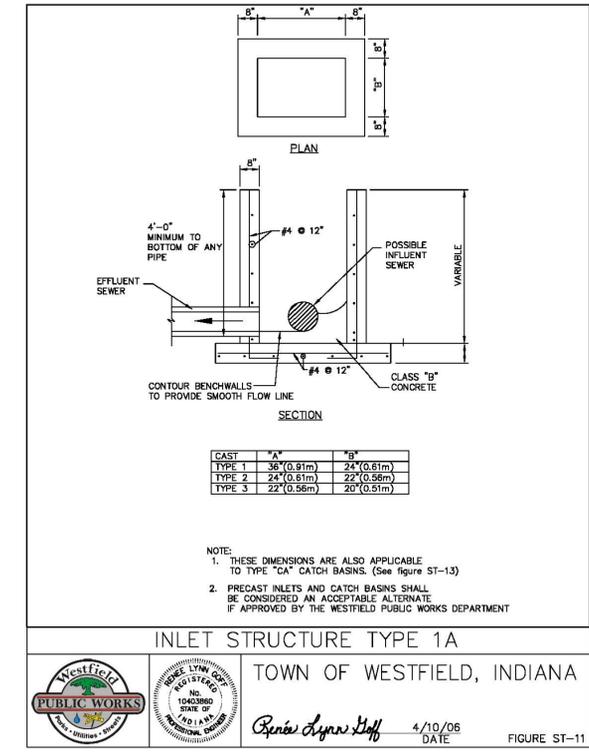
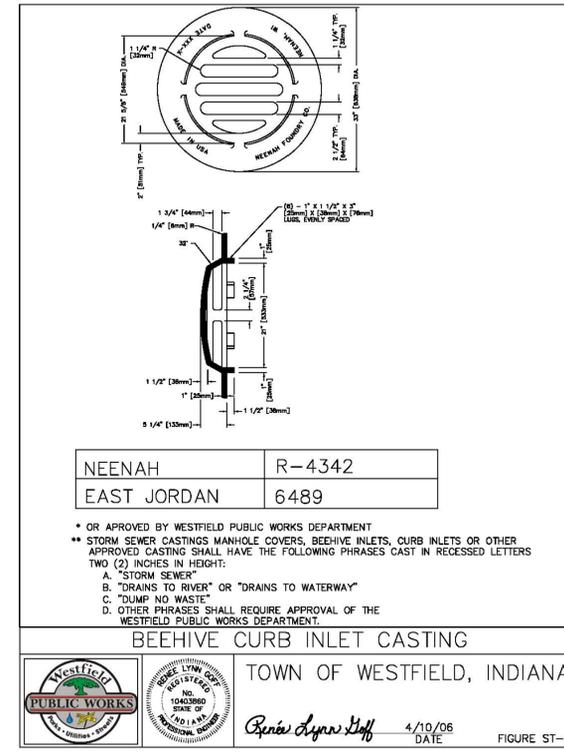
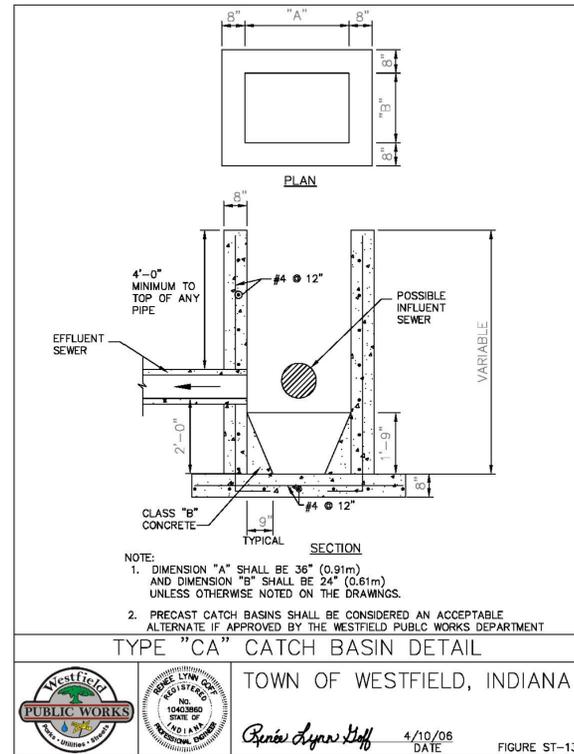
Available Curb Boxes: 1-1/2" Radius Open (standard) Enviro-Curb Boxes available.

Catalog Number	A	B	C	E	F
R-3010-L	16 x 22-7/8	2			

All dimensions are listed in inches unless otherwise noted.

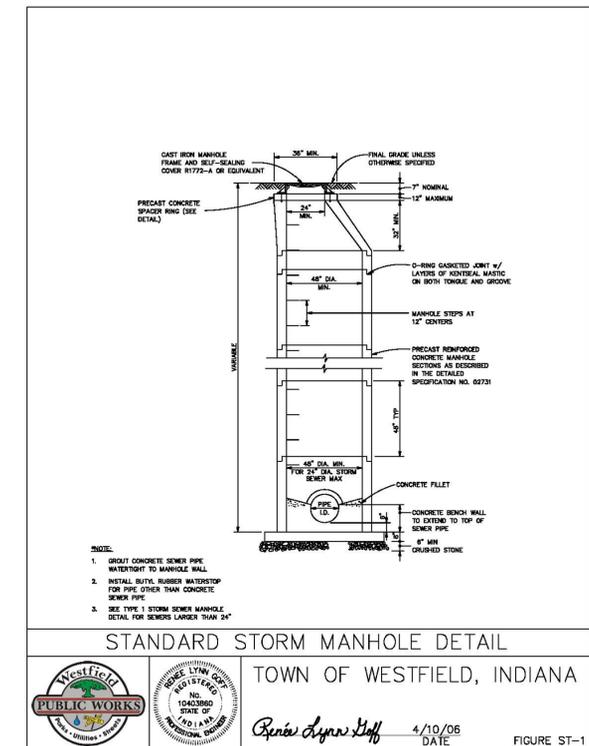
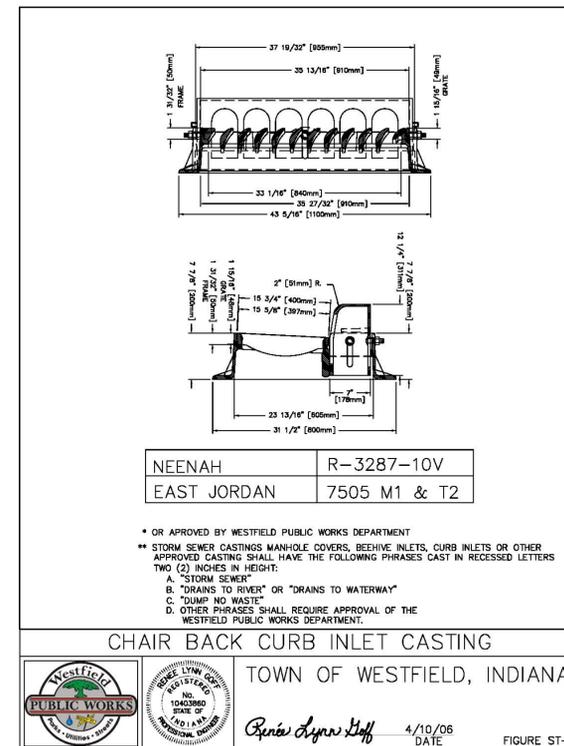
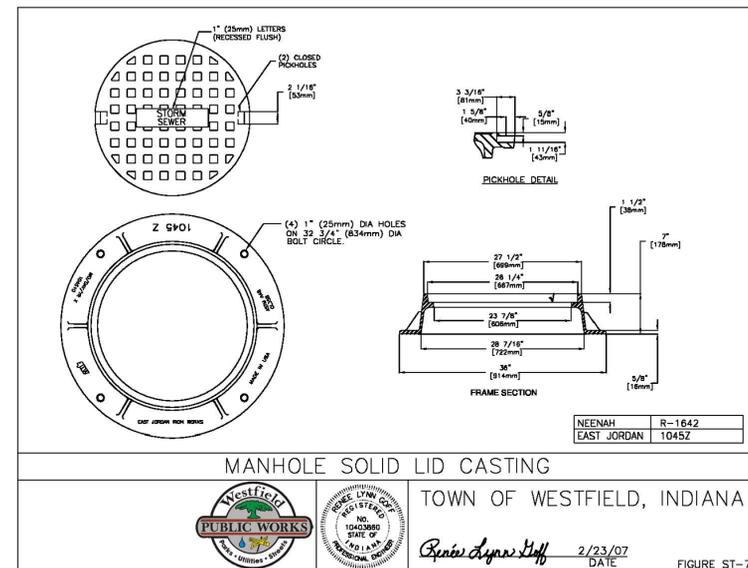
To order Neenah Foundry products, please call **800.558.5075**

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<http://www.nfc.com/municipal/products/print-hl/>

10/3/2012



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CONSTRUCTION PLANS FOR  
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Gray Road & 146th Street  
Westfield, Indiana

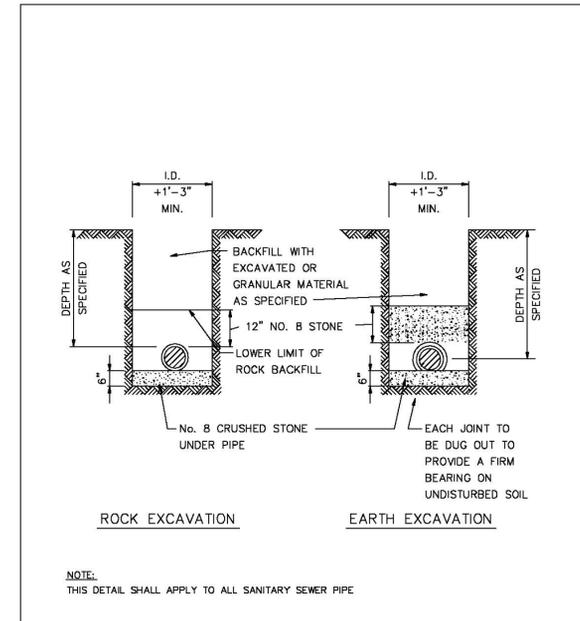
PREPARED BY:  
**EMHT**  
Event, Michael, Thompson & Tilton, Inc.  
200 N. Meridian Street, Suite 1100  
Indianapolis, IN 46204  
Phone: 317.213.6690 Fax: 317.213.6692  
emht.com

Job No. 2012-1167  
MICHAEL THOMPSON  
REGISTERED PROFESSIONAL ENGINEER  
No. PE11011309  
STATE OF INDIANA

Date: August 31, 2012  
Scale: Not to Scale

Title:  
**CITY OF WESTFIELD**  
**STORM SEWER DETAILS**  
Sheet:  
**C8.0**

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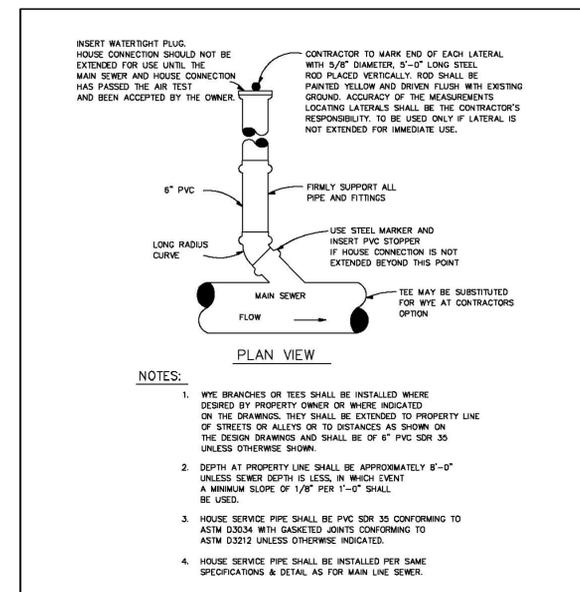


NOTE:  
THIS DETAIL SHALL APPLY TO ALL SANITARY SEWER PIPE

SEWER PIPE BEDDING DETAIL



 TOWN OF WESTFIELD, INDIANA  
 Renee Lynn Hoff 10/9/06 DATE  
 FIGURE S-5



- NOTES:
- WYE BRANCHES OR TEES SHALL BE INSTALLED WHERE DESIRED BY PROPERTY OWNER OR WHERE INDICATED ON THE DRAWINGS. THEY SHALL BE EXTENDED TO PROPERTY LINE OF STREETS OR ALLEYS OR TO DISTANCES AS SHOWN ON THE DESIGN DRAWINGS AND SHALL BE OF 6" PVC SDR 35 UNLESS OTHERWISE SHOWN.
  - DEPTH AT PROPERTY LINE SHALL BE APPROXIMATELY 8'-0" UNLESS SEWER DEPTH IS LESS, IN WHICH EVENT A MINIMUM SLOPE OF 1/8" PER 1'-0" SHALL BE USED.
  - HOUSE SERVICE PIPE SHALL BE PVC SDR 35 CONFORMING TO ASTM D3034 WITH GASKETED JOINTS CONFORMING TO ASTM D3212 UNLESS OTHERWISE INDICATED.
  - HOUSE SERVICE PIPE SHALL BE INSTALLED PER SAME SPECIFICATIONS & DETAIL AS FOR MAIN LINE SEWER.

HOUSE/BUILDING SERVICE CONNECTION DETAIL 1



 TOWN OF WESTFIELD, INDIANA  
 Renee Lynn Hoff 10/9/06 DATE  
 FIGURE S-10

**APPROVAL PENDING**  
**NOT FOR CONSTRUCTION**

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	10/04/12	REVISED PER CITY REVIEW COMMENTS DATED 09/20/12


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 317-577-8600 FAX 317-577-8605

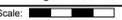
PREPARED BY:  

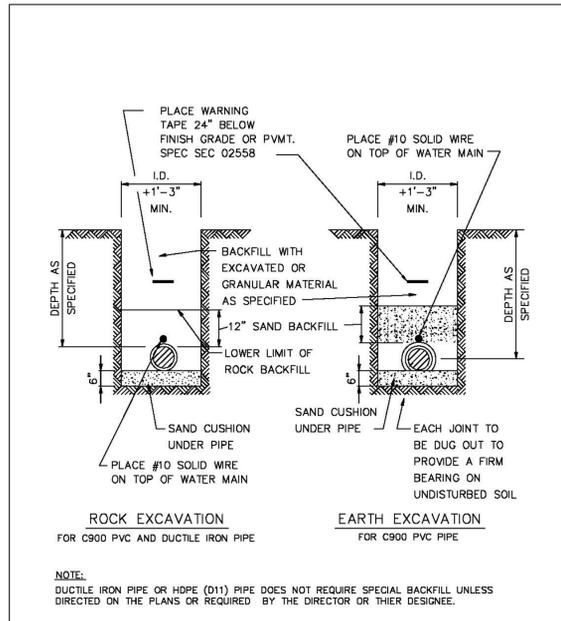
**EMHT**  
 Events, Meetings, Exhibitions & Tilton, Inc.  
 2400 N. Meridian Street, Suite 100  
 Indianapolis, IN 46202  
 Phone: 317.213.6990 Fax: 317.213.6990  
 emht.com

CONSTRUCTION PLANS FOR  
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 Westfield, Indiana

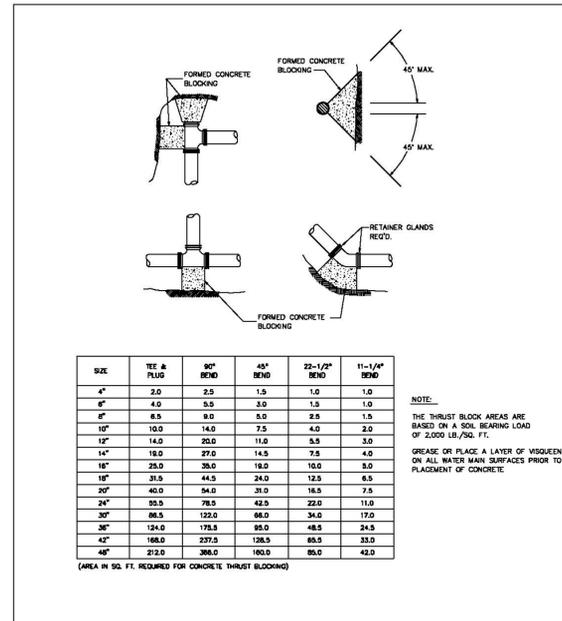
Job No. 2012-1167  

 MICHAEL THOMPSON  
 REGISTERED PROFESSIONAL ENGINEER  
 INDIANA  
 PE11011309  
 STATE OF INDIANA  
 Michael Thompson

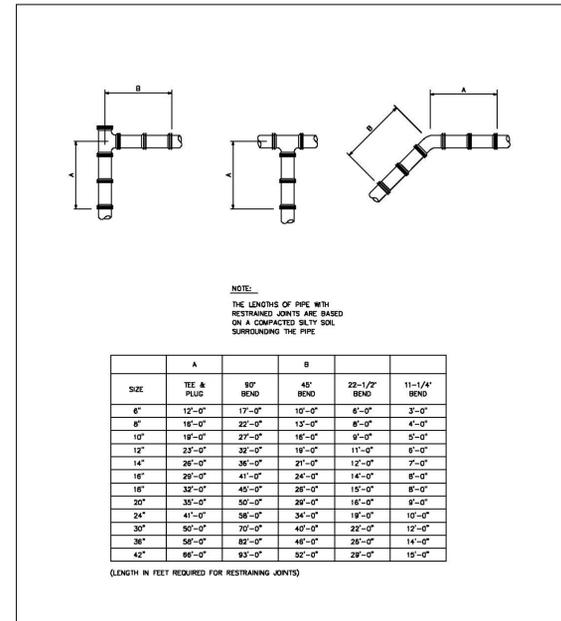
Date: August 31, 2012  
 Scale:  Not to Scale  
 Title:  
**CITY OF WESTFIELD**  
**SANITARY SEWER DETAILS**  
 Sheet:  
**C8.1**



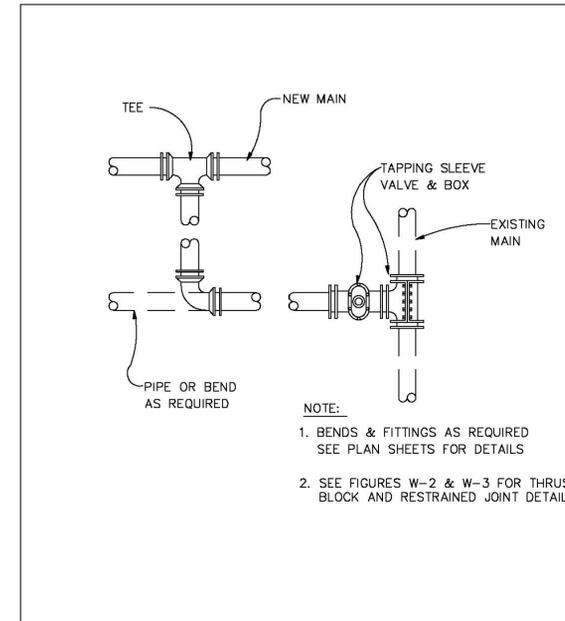
**WATER MAIN INSTALLATION DETAIL**  
TOWN OF WESTFIELD, INDIANA  
Renée Lynn Hoff 10/9/06 DATE  
FIGURE W-1



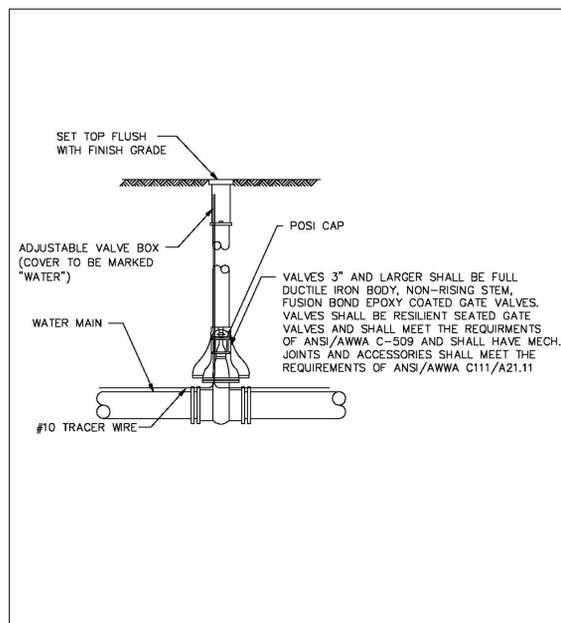
**THRUST BLOCK DETAIL**  
TOWN OF WESTFIELD, INDIANA  
Renée Lynn Hoff 10/9/06 DATE  
FIGURE W-2



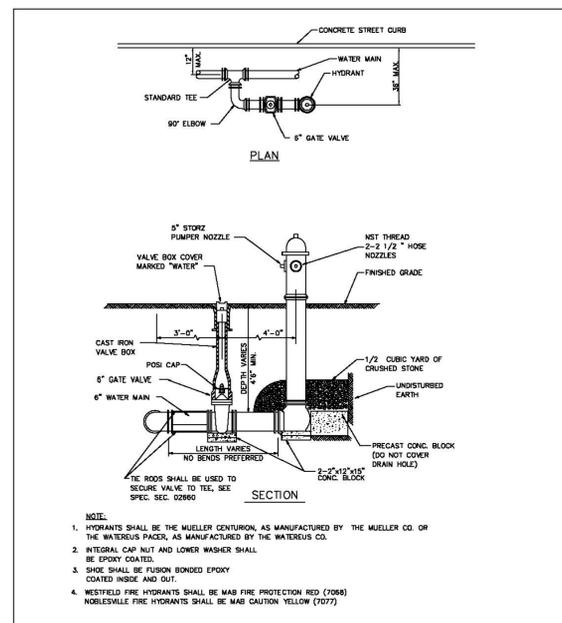
**RESTRAINED JOINT DETAILS**  
TOWN OF WESTFIELD, INDIANA  
Renée Lynn Hoff 10/9/06 DATE  
FIGURE W-3



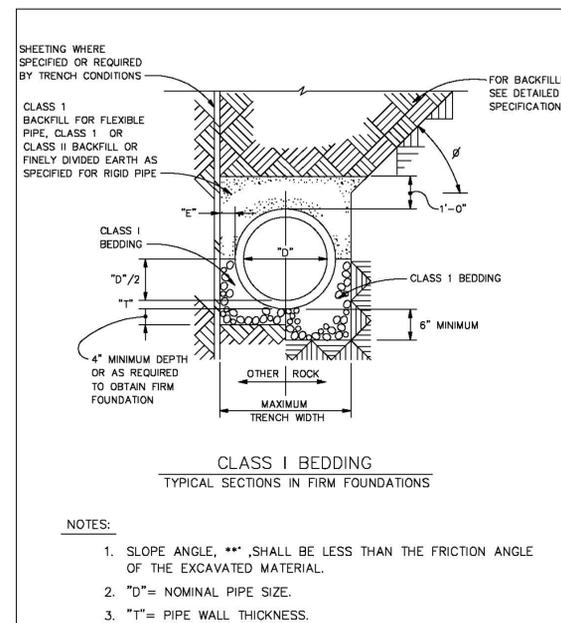
**CONNECTION TO EXISTING MAIN**  
TOWN OF WESTFIELD, INDIANA  
Renée Lynn Hoff 10/9/06 DATE  
FIGURE W-5



**GATE VALVE AND BOX**  
TOWN OF WESTFIELD, INDIANA  
Renée Lynn Hoff 10/9/06 DATE  
FIGURE W-6



**FIRE HYDRANT DETAILS**  
TOWN OF WESTFIELD, INDIANA  
Renée Lynn Hoff 10/9/06 DATE  
FIGURE W-7



**PVC BEDDING DETAIL**  
TOWN OF WESTFIELD, INDIANA  
Renée Lynn Hoff 10/9/06 DATE  
FIGURE W-14

REVISIONS

DATE	DESCRIPTION
09/17/12	REVISED PER CITY REVIEW COMMENTS DATED 09/06/12
10/04/12	REVISED PER CITY REVIEW COMMENTS DATED 09/20/12



PREPARED FOR:  
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INDIANAPOLIS, IN 46204  
317-577-8600 FAX 317-577-8605

CONSTRUCTION PLANS FOR  
**Bridgewater Marketplace**  
Gray Road & 146th Street  
Westfield, Indiana

PREPARED BY:  
**EMHT**  
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emht.com

Job No. 2012-1167  
MICHAEL THOMPSON  
REGISTERED PROFESSIONAL ENGINEER  
INDIANA  
PE11011309  
STATE OF INDIANA

Date: August 31, 2012  
Scale: Not to Scale  
Title: CITY OF WESTFIELD WATER DETAILS  
Sheet: C8.2

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SECTION 01001 - GENERAL REQUIREMENTS

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.
2. Westfield Public Works Department - An agency of the Town which manages public infrastructure within its jurisdiction, (WPWD)
3. Developer - Person or firm having control of the development site, and management of the project.
4. Contractor - The person, firm or corporation with whom the developer has entered into an agreement for construction of the project.
5. Project - The total construction of which the work to be provided may be the whole or part.
6. Work - The entire completed construction or the various separately identified parts thereof required to be furnished.

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

If, during the course of installing Town infrastructure, the existence of hazardous material, including asbestos containing material, is observed in the work area, the Contractor shall immediately notify the Developer in writing. The Contractor shall not perform any work pertinent to the hazardous material prior to receipt of special instructions from the Town of Westfield. Asbestos containing material includes transite pipe.

1.4 DISCOVERY OF HAZARDOUS MATERIAL

If, during the course of installing Town infrastructure, the existence of hazardous material, including asbestos containing material, is observed in the work area, the Contractor shall immediately notify the Developer in writing. The Contractor shall not perform any work pertinent to the hazardous material prior to receipt of special instructions from the Town of Westfield. Asbestos containing material includes transite pipe.

1.5 EASEMENTS

- A. The Developer will obtain utility and/or drainage easements over and through certain private lands for construction. The width or limits of such easements will be defined by the Town, and all permanent and/or temporary easements shall be executed and conveyed to the Town before any construction can commence. If the methods of construction employed by the Contractor are such as to require the use of land beyond the limits obtained, he shall make his own agreements with the property owners affected for the use of such additional land.
B. In all such utility and/or drainage easements, the Contractor shall be required to carefully remove the property owner's fences, or other obstacles to the construction procedure, and replace the same after the work is installed. The backfilling shall be to the grade of the existing ground level or to the grade as established by the property owner in the event the property owner permits the deposit of excess material upon such land.
C. The cost of all such restoration of property shall be borne by the Contractor.

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. If the methods of the construction employed by the Contractor are such as to require the use of land beyond the public thoroughfares, he shall make his own agreements with the property owners affected for the use of such additional.

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
3. U.S. Army Corps of Engineers
4. Indiana Department of Fire Prevention & Building Safety
5. Indiana Department of Transportation
6. Railroads
7. Hamilton County Surveyor's Office
8. Hamilton County Highway Department
B. The Contractor shall obtain permits which relate to construction procedures.
1. All necessary permits or licenses required from the State, County, or Town or other Local Governing Entity in connection with construction procedures under or along existing highways shall be obtained by and at the expense of the Contractor. The construction shall be performed by the Contractor in full accordance with any and all requirements of the State Highway Commission, County Road Commission, WPWD, or other Local Governing Entity including those applying to barricades, watchmen, guarding, lighting, storage of supplies, equipment and excavated materials, method of backfilling, final grading, replacement of pavement or road surface, and all other conditions or requirements which may be stipulated by the State Highway Commission, County Road Commission, or WPWD, whether specifically shown on the drawings or mentioned in the specification.

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. The Contractor will be responsible for notifying the local school corporation, all public safety agencies and the Town. The Contractor shall provide the WPWD a detour route plan for review prior to the road closure.
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 on all streets involved 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 a manner as not to unduly or unnecessarily restrict or impede normal traffic through the streets of the community. Insofar as it is practicable, do not locate excavated material and spoil banks in such manner as to obstruct traffic. Keep the traveled way of all street, roads, and alleys clear and unobstructed insofar as is possible. Do not use streets, roads, or alleys 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 to not 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 WPWD and Homeowner, and for the shortest practicable period of time, consistent with efficient and expeditious construction. The Contractor shall be liable for any damage to persons or property resulting from his work.
E. Streets in which excavation has occurred shall be temporarily restored to receive traffic as soon as possible. Permission to close additional streets shall be denied if, in the opinion of the Town, the restoration on streets where excavation has occurred has not progressed satisfactorily.

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. Use all proper and necessary means to permit the free passage of surface water along the gutters. The Contractor shall immediately remove all matter, exercising such precaution as may be directed by the Town. All material excavated shall be so disposed of as to inconvenience 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.

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 Developer 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 with approval from the WPWD. Work shall be done by the WPWD unless the WPWD approves, in writing, that the work may be done by the Developer or Contractor.
B. Permanent Relocation of Utilities: Water mains, storm sewer, gas lines, wire lines, service connections, water and gas meter boxes, water and gas valve boxes, light and traffic standards, cable ways, signals, and other utility appurtenances located in the public right-of-way which would permanently interfere with the proposed improvements will be moved by the utility involved and paid for by the Developer.

1.12 SUBMITTALS - CERTIFICATE OF COMPLIANCE

The Developer shall upon request of the Town Council or the WPWD, submit to the WPWD a Certificate of Compliance from the manufacturer and/or supplier of each and every specified material or manufactured equipment item. The Certificate shall state that the material or the item of equipment to be furnished has been manufactured with materials in accordance with the applicable sections of all required codes, specifications, and standards as required by the specifications.

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 in the future by the WPWD, service by the manufacturer is required to be furnished as part of the 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.

1.14 DIGITAL AS-BUILTS/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.in.gov/gov/docs/1157135335\_990447.pdf. Additional information can also be received from the WPWD GIS Division.

END OF SECTION 01001

SECTION 02101 - TEMPORARY EROSION AND DUST CONTROL

PART 1 - GENERAL

- 1.1 Please see chapter 600 of the Town of Westfield Stormwater Manual.

END OF SECTION 02101

SECTION 02222 - EARTHWORK FOR 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;
c. Materials which can be excavated with a backhoe, trenching machine, drag line, clam shell, bulldozer, highlight, or similar excavating equipment without the use of explosives, rock rippers, rock hammers, or jack hammers.
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;
c. Materials which cannot be excavated by equipment which is used to remove earth overburden without the use of explosives, rock rippers, rock hammers, or jack hammers;
d. Materials which cannot be excavated with a backhoe, trenching machine, drag line, clam shell, bulldozer, high-lift, or similar excavating equipment without the use of explosives, rock rippers, rock hammers, or jack hammers.
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, FIBER OPTIC 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.

PART 2 - PRODUCTS

2.1 BEDDING

- A. Class I bedding shall be angular 6 to 12 mm (1/4 to 1/2 inch) graded stone, coral, 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 sand), SW (well-graded sand), and SP (pea gravel and/or crushed stone mixed with sand) are included in this class.

2.2 BACKFILL

- A. General: Backfill shall be earth of such gradation and moisture content that the soil will compact to the specified density and remain stable. Unsuitable 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 providing it meets the following soils classified by the Unified Soils Classification System ASTM D-2487 or the Indiana State Highway Standard Specification Section 211 - Special Fill and Backfill ("P" Borrow).
Group Symbols Typical Names
GW Well-graded gravels and gravel-sand mixtures, little or no fines
GP Poorly graded gravels and gravel-sand mixtures, little or no fines
SW Well-graded sands and gravelly sands, little or no fines
SP Poorly graded sands and gravelly sands, 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
GP Poorly graded gravels and gravel-sand mixtures, little or no fines
GM Silty gravels, gravel-sand-silt mixtures
GC Clayey gravels, gravel-sand-clay mixtures
SW Well-graded sands and gravelly sands, 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, silty or clayey fine sands
CL Inorganic clays of low to medium plasticity, gravelly clays, sandy 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
MH Inorganic silts, micaceous or diatomaceous fine sands or silts, elastic silts
CH Inorganic clays of high plasticity, fat clays
OH 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 performed 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 required to be submitted and approved by the WPWD or designated engineer. A trial batch/demonstration may be required. The mix design shall include a list of all ingredients, the source of all aggregates, 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, fiber optic, gas, water or other pipes, wires, conduits and manholes, railroad tracks, buildings, structures and property along the routes of water mains, force mains, and sewers shall be supported and protected from damage by the Contractor.
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. Replace movable items which are damaged during construction.
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 WPWD, 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 areas of operations, the Contractor shall notify the WPWD 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 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 covers, valve boxes, curb stop 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 or 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 tree removal, 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 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 the 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 asphalt mulch/pave 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. The Contractor will minimize over excavation.
B. 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.
1. 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.
1. Do not open more than 100 feet of trench in advance of the installed pipe, unless otherwise directed or permitted by the WPWD or designee. 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.
2. 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 at least at the angle of repose except for areas where solid rock allows for line drilling or presplitting, or where shoring or trench box is to be used. 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.
4. Flatten the trench sides when an excavation has water conditions, silty materials, loose boulders, and areas where erosion, deep frost action, and slide planes appear.
5. 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 1/2-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.
6. Use 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.
7. 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.
8. Do not store excavated or other material nearer than 4 feet from the edge of any excavation. Store and retain materials as 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.
9. The width of trenches in earth for water main pipe, sewers, basin connections, house connections, and other drains up to and including 33 inches in internal diameter shall provide a clearance of not less than 8 inches or more than 10 inches on each side of the pipe. Trenches for pipe larger than 33 inches in internal diameter shall provide a clearance of not less than 10 inches or more than 14 inches on each side of the pipe.
10. The maximum clear width of trenches in earth for manholes shall be the greatest external width of the structure plus the space necessary for the construction and removal of the forms and construction of masonry work.
11. 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 WPWD or designee; should the trench width limits specified in this Article be exceeded.
12. Test 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 whenever adverse atmospheric conditions may exist or develop in an excavation.
13. Provide walkways or bridges with guardrails where employees or equipment are required or permitted to cross over excavations.
14. Provide ladders where employees are required to be in trenches 4 feet deep or more. Ladders shall extend from the floor of the trench to at least 3 feet above the top of the excavation. Locate ladders to provide means of exit without more than 25 feet of lateral travel.
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 and 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 WPWD or designee, until the material is ready to be placed.
B. Remove unsuitable materials from the job site as unsuitable materials are excavated. Remove surplus suitable materials from the job site as trenches are backfilled.

3.8 TEMPORARY PLUGS

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 securing 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 WPWD or designee 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 and after the trench is backfilled, subject to approval of the WPWD or designee.
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.
F. Do not use the following materials for backfill:
1. Unsuitable 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 WPWD or designee 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 Manufacturer's recommendation, or WPWD specifications. The more stringent specification will 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. Unsuitable 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 Pavements: All cuts and trenches in paved streets or other paved areas shall be backfilled with flowable fill material.
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, city/town, school corporation, and public safety agencies.
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 on all streets involved 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 a manner as to not unduly or unnecessarily restrict or impede normal traffic through the streets of the community. Insofar as it is practicable, do not locate excavated material and spoil banks in such manner as to obstruct traffic. Keep the traveled way of all street, roads, and alleys clear and unobstructed insofar as is possible. Do not use streets, roads, or alleys 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 to not 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 WPWD and Homeowner, and for the shortest practicable period of time, consistent with efficient and expeditious construction. The Contractor shall be liable for any damage 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 WPWD or designee. All material excavated must be so disposed of as to inconvenience 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 shall 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.
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 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 surface 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

Table with 4 columns: MARK, DATE, DESCRIPTION, REVISIONS. Includes revision dates and descriptions.

811 logo with text: Know what's below. Call before you dig.

KITE REALTY GROUP logo with address: 30 S. MERIDIAN STREET SUITE 1100 INDIANAPOLIS, IN 46204 317-577-9600 FAX 317-577-9605

Bridgewater Marketplace logo with address: Gray Road & 146th Street Westfield, Indiana

EMHT logo with contact info: Events, Meetings, Exhibitions & Shows, Inc. 2400 N. Meridian Street, Suite 100, Indianapolis, IN 46202 Phone: 317.713.6990 Fax: 317.713.6948 emht.com

Professional Engineer seal for Michael Thompson, No. PE11011309, State of Indiana.

Approval stamp: Date: August 31, 2012. Scale: Not to Scale. Title: CITY OF WESTFIELD STANDARDS. Sheet: C8.3.

APPROVAL PENDING NOT FOR CONSTRUCTION

SECTION 02500 - PAVING AND SURFACING

PART 1 - GENERAL

1.1 DESCRIPTION

A. Scope: This section covers all work involved in the installation of new pavement, walks, and curbs, and the repair and replacement of existing streets, roads, highways, drives, parking areas, curbs, gutters, sidewalks, and other paved areas damaged or destroyed during construction.

B. Related Work Specified in the following Section  
1. Section 02222 Earthwork for Utilities Subgrade Preparation

C. Codes, specifications, and standards referred to by number or title shall form a part of this specification to the extent required by the reference thereto. Except as specifically modified in this specification, paving and surfacing operations, materials and testing will comply with the most current revisions of applicable sections per the latest version of the Indiana Department of Transportation Standard Specifications.

D. Definitions

- 1. Abbreviations
  - a. INDOTSS Indiana Department of Transportation's Standard Specifications.
  - b. AASHTO American Association of State Highway & Transportation Officials.
  - c. ACI American Concrete Institute.
  - d. ASTM American Society for Testing & Materials.
  - e. NRMCA National Ready Mix Concrete Association.
- 2. Rock: A natural aggregate of mineral particles connected by strong and permanent cohesive forces. Rock includes limestone, sandstone, dolomite, granite, marble, and lava.
- 3. Subgrade: The prepared and compacted soil immediately below the pavement or walk system and extending to such depth as will affect the structural design.
- 4. Subbase: The layer of specified or selected material of designed thickness placed on a subgrade to support a base course and surface course.
- 5. Base Course: The layer of specified or selected material of designed thickness placed on a subbase to support a binder or surface course.
- 6. Binder Course: The layer of specified or selected material of designed thickness placed on a base course to support a surface course.
- 7. Surface Course: The layer of specified or selected material of designed thickness placed on a subbase or base course to support the traffic load.

1.2 QUALITY ASSURANCE

A. The Developer/Contractor shall employ, at the request of the Westfield Public Works Department or designee, and pay for the services of an independent testing laboratory (unless otherwise noted) to perform specific services and necessary field density tests. The Developer/Contractor shall demonstrate to the Town of Westfield Public Works Department or designee that proper compaction has been obtained and proper asphalt and concrete mix designs are in compliance with the specifications.

B. Mixing Plant: Prior to placing any hot asphalt concrete pavement or Portland cement concrete pavement, the Contractor shall provide the Westfield Public Works Department or designee the name and location of the bituminous mixing or concrete mixing plant and the type and composition of mixes the Contractor proposes to use in the work.

C. Paving and surfacing shall comply with the tolerances specified in Sections 401.16 (Bituminous), 501.15, 501.16 and 501.23 of INDOTSS.  
1. Subgrade and subbase shall be within 1/2 inch of dimensions indicated on drawings.  
2. Bituminous base shall not vary longitudinally more than 1/4 inch from a 10-foot straightedge. Bituminous and concrete surfaces shall not vary more than 1/8 inch from a 10-foot straightedge.  
3. Finished surface shall be within 1/4 inch of dimensions indicated on drawings.

D. Asphalt and concrete pavement shall be installed by a contractor whose prime business is asphalt or concrete paving.

1.3 JOB CONDITIONS

- A. Do not place paving and surfacing materials on a wet surface, pumping subbase or when weather conditions would prevent the proper construction of paving and surfacing.
- B. Do not place aggregates on frozen subgrade or subbase. Do not place aggregates when ambient air temperature is below 35°F.
- C. Bituminous materials are to be placed in accordance with INDOTSS 402, 405.04, and 406.05.
- D. When air temperatures are at or below 35 degrees F, an admixture is required to be added to the concrete to prevent freezing.
- E. Do not place paving and surfacing materials when natural light is not sufficient to properly observe work or operations.

1.4 GRADE ADJUSTMENT OF EXISTING STRUCTURES

- A. When grade adjustment of existing structures is required, the manhole frames, covers and gratings, and the gas and water valve boxes and covers, shall be removed and reconstructed to grade as required.
- B. On resurfacing work, the castings and boxes shall be adjusted to grade after the last binder course has been laid and before placing the surface course.
- C. All castings, frames and valve boxes adjusted to grade shall be done in advance of the final paving and shall be paid for by the Contractor as part of the project.

1.5 CONTRACTOR'S ORGANIZATION

- A. The Contractor shall be a firm whose prime business is asphalt or concrete paving. The Contractor shall have a competent supervisor on the site during the progress of the work, acting for the Contractor in all matters concerning the work. He shall have the authority to receive directions and act upon them for the Town through the Westfield Public Works Department or designee.
- B. The Contractor shall keep a set of Plans and Specifications available on the site and in good condition.

1.6 TRAFFIC CONTROL

The Developer's Engineer shall plan construction operations so that existing local traffic access can be maintained. During the construction, the Contractor will maintain appropriate use of barricades, lights, flagmen and other protective devices, whether specified for the project or required by the local governing authority. Traffic control devices used for maintenance of traffic shall comply with the latest version of the Indiana Manual on Uniform Traffic Control Devices.

PART 2 - PRODUCTS

2.1 AGGREGATE

- A. Fine aggregates shall consist of natural sand or manufactured sand produced by crushing rock, shells, air-cooled blast furnace slag, or wetbottom boiler slag.  
1. Fine aggregates used in Portland cement concrete and bituminous pavements shall be free from injurious amounts of organic impurities. When subjected to the colorimetric test for organic impurities and a color darker than the standard is produced, it shall be tested for effect of organic impurities on strength of mortar in accordance with AASHTO T 71. If the relative strength at 7 and 28 days, calculated in accordance with section 10 of T 71, is less than 95%, it shall be rejected.
- B. Coarse aggregates shall consist of clean, tough, durable fragments of crushed rock, crushed or uncrushed gravel or shells, or crushed and processed air-cooled blast furnace slag. These materials shall not contain more than 15% flat or elongated pieces and shall not contain particles with an adherent coating. Flat or elongated pieces will be described as pieces having a length in excess of four times its width.
- C. Coarse aggregates shall comply with INDOTSS, Section 904.03. Fine aggregates shall comply with INDOTSS, Section 904.02.

2.2 BITUMINOUS MATERIALS

- A. Petroleum asphalt cement shall be homogeneous, free from water, and shall not foam when heated to 347°F.  
1. Petroleum asphalt cement shall be PG Binder, grade PG 64-22.  
2. Petroleum asphalt emulsion shall be AE-60.
- B. Bituminous materials for prime coat shall consist of:  
1. Cut-back asphalt - MC-70; or  
2. Asphalt emulsion - AE-P.  
3. Materials shall conform to INDOTSS Sections 902.01 and 902.03.
- C. Bituminous materials for tack coat shall consist of:  
1. Asphalt emulsion - AE-T.  
2. Materials shall conform to INDOTSS 902.01.
- D. Bituminous materials for seal coat shall consist of:  
1. Asphalt emulsion - RS-2, AE-90, AE-150, HFRS-2.  
2. Materials shall conform to INDOTSS Sections 902.01.
- E. Cover aggregate shall consist of:  
1. Coarse aggregates, Class A or B, size no. 8, 9, 11 or 12.  
2. Fine aggregate (natural sand only), size no. 23 or 24.  
3. Materials shall conform to INDOTSS Sections 904.01 and 904.03, respectively.

2.3 HOT MIX ASPHALT (HMA)

- A. Hot mix asphalt (HMA) shall consist of an intimate mixture of coarse aggregate, fine aggregate (including mineral filler if required), and asphalt cement or emulsion combined in proportions specified in INDOTSS Section 402.07.
- B. When the use of one type or source of aggregate or binder is started, the use of that same type or source shall be continued for the entire lift being constructed, unless otherwise directed by the Engineer.
- C. The use of recycled materials, RAP or ARS, shall not be permitted unless otherwise directed and approved by Engineer.
- D. Preparation of HMA mixtures shall comply with the requirements of INDOTSS Section 402.07.

2.4 PORTLAND CEMENT CONCRETE

- A. Cement shall be Portland cement and shall meet the requirements of ASTM Specification C 150, ACI 301, and ACI 318. Cement shall be Type I for normal use, Type IA where air entrainment is desired, or Type III or Type IIIA where high early strength is desired and authorized by the Engineer. Blended hydraulic cements which meet the requirements of ASTM Specification C 595 Type IP Portland cement shall be used where a more watertight concrete is required. Fly ash may also be used as a partial cement replacement for Types I or IA. C Pozzolan shall meet requirements specified in INDOTSS Section 901.
- B. Regular fine and coarse aggregates shall meet the requirements of ASTM Specification C 33. Aggregate shall be crushed limestone with a maximum size of 3/4 inch, except in mass concrete the maximum size may be 1 1/2 inches.  
1. Lightweight fine and coarse aggregates shall meet the requirements of ASTM Specification C 330.  
2. Insulating fine and coarse aggregates shall meet the requirements of ASTM Specification C 332.

C. Water shall be potable, clean, and free from injurious amounts of oils, acids, alkalis, organic materials, or other substances that may be deleterious to concrete or steel. A maximum of 500 mg/L of chloride ion may be present in the water.

D. Air entraining admixtures shall meet the requirements of ASTM Specification C 260.  
1. Water reducing and retarding admixtures shall meet the requirements of ASTM C494, Type A or Type D; however, they shall contain no chlorides, be non-toxic after 30 days and compatible with the air entraining admixtures. The amount of admixture added to the concrete shall be in accordance with the manufacturer's requirements. Furnish a compliance statement that the admixture used satisfies all requirements of this specification. Evidence that the admixture is included in the approved list of the INDOTSS Division of Materials and Tests, in accordance with INDOTSS Section 912.03, will satisfy the requirement for a compliance statement.  
2. Fly ash shall meet the chemical and physical requirements of ASTM C 618 for mineral admixture Class F, except loss on ignition shall not exceed 6%. Fly ash shall be sampled and tested in accordance with ASTM C 311 prior to use.

E. Reinforcing steel shall meet the requirements of ASTM Specification A 615, Grade 60.  
1. Welded wire fabric or wire mesh shall meet the requirements of ASTM A 185.  
2. Reinforcing steel and appurtenances shall follow INDOTSS Section 910.01.

F. Prefomed expansion joint filler shall meet the requirements of ASTM Specification D 1752, Type III.  
1. Hot-poured elastic joint filler shall meet the requirements of ASTM D 1190.  
2. Waterproof expansion joint filler shall meet the requirements of ASTM Specification D 1850.  
3. Joint materials specified in INDOTSS Section 906 may be used, approved by the Engineer.

G. Concrete pavement shall be wet cured by using burlap, waterproof blankets, or ponding; or by using a membrane compound. If the membrane method is used, the compound shall be Type 2, complying with AASHTO M148 for white pigmented compound. A pressure sprayer capable of applying a continuous uniform film to the pavement surfaces will be required.

H. Dowel bars shall be smooth, round bars of plain billetsteel conforming to ASTM A615, Grade 40, and free of any deformation or foreign material that would restrict slip in concrete. Dowel bars shall be coated as required by INDOTSS. For expansion joints, each bar shall be provided with a metal cap, or approved plastic cap, on one end that will provide for ample movement of the slabs.  
1. Dowel bars and assemblies shall conform to the requirements of INDOTSS Section 501.14 (f).

I. Concrete base shall meet the requirements of INDOTSS Section 305.

J. Reinforced concrete pavement shall meet the requirements of INDOTSS Section 501.

K. Reinforced concrete for sidewalks and steps shall meet the requirements of INDOTSS Section 604.

L. Reinforced concrete for curbing shall meet the requirements of INDOTSS Section 605.

2.5 UNDERDRAINS

Underdrain material shall be 6-inch polyethylene perforated subsurface drain pipe.

PART 3 - EXECUTION

3.1 GENERAL

- A. The Contractor is responsible to provide equipment, workmanship and materials required to achieve a finished product that meets these specifications.
- B. Use compaction equipment suitable to the material being placed. Compacting equipment shall include at least one piece of equipment capable of providing a smooth even surface on the pavement surface course.
- C. Prior to placing paving and surfacing materials, shape subgrade as required to produce finished pavement grades and cross-sections shown on drawings.
- D. Do not place paving and surfacing material before subgrade is reviewed (proof roll) and accepted by the Westfield Public Works Department or designee. Do not place paving and surfacing materials on a frozen or muddy subgrade.
- E. Compact subgrade to not less than 100% of its maximum density as determined in accordance with AASHTO T99.
- F. Provide adequate drainage at all times to prevent water from standing on subgrade, pavement or walks.

3.2 SUBGRADE

The subgrade material and testing shall comply with INDOTSS Section 207, before placement of subbase.

3.3 SUBBASE PREPARATION

Provide 8 inches of subbase in locations where pavement is to be placed on a material other than Special Backfill. Subbase shall meet the requirements of INDOTSS Section 302.

3.4 AGGREGATE BASE, SURFACE, OR SHOULDERS

- A. Aggregate base, surface, or shoulders shall consist of crushed rock or gravel. The aggregate type shall be suitable for the area in which the project is located. The aggregate thickness shall be as shown on the drawings and as specified herein.
- B. Aggregate shall be Type "A" mix, unless otherwise specified by the Westfield Public Works Department or designee.
- C. Compacted aggregate materials and construction shall conform to INDOTSS Section 303.

D. If the required thickness of the aggregate (Type A) exceeds 4 inches, the material shall be placed and compacted in separate lifts no less than 2 inches nor more than 4 inches of compacted depth. If Type P aggregate is used, it may be placed in individual lifts with a thickness of up to 6 inches.

E. If spreading devices are used which will ensure proper depth and alignment, forms will not be required, otherwise, forms shall be required. Forms shall be of wood or steel, adequate in depth, straight, and uniform in dimensions and equipped with positive means for holding the form ends rigidly together and in line. Segregation of material shall be avoided by any spreading method used. No payment will be made for aggregate placed beyond the dimensions shown on the drawings.

F. Compact material in each lift after material is spread and shaped. Compact material to not less than 100% of maximum dry density as determined by AASHTO T99. Use construction procedures, including sufficient wetting and number of passes, to ensure specified density is attained.

G. The Contractor shall employ an independent testing laboratory to perform field density tests to demonstrate proper compaction of aggregate surface pavement, if requested by the Westfield Public Works Department or designee.

H. In a brick surfaced street, unless specifically excepted and pending the structural adequacy of any remaining brick, the Contractor may remove all brick and enough base material to allow full width repaving using either a bituminous or concrete pavement; or of providing a HMA base and HMA intermediate for the full depth of the brick across the trench and then replace the entire street with 1 inch of HAC surface.

I. Unless otherwise shown on the drawings, the minimum section (excluding subgrade) of reinforced concrete shall be 6 inches of compacted #53, Type "A" aggregate base and 6 inches of 4,000 psi reinforced concrete.

J. Unless otherwise shown on the drawings, for a street with a brick base and an asphalt surface, the replacement section shall be full depth asphalt from the bottom of the brick base to the top of the asphalt surface. The top 1 inch shall be #11 HMA surface.

K. Unless otherwise shown on the drawings, for a street with a concrete base and an asphalt surface, the replacement section shall be a new concrete base, not less than 6 inches thick with #5 HMA base to within 1 inch of the existing grade and then 1 inch of #11 HMA surface.

L. Unless otherwise shown on the drawings, chip and seal pavements shall have 8 inches of compacted aggregate base (#53, Type "A" crushed stone) and 1 inch processed bituminous coated aggregate pavement placed and rolled.

M. Unless otherwise shown on the drawings, gravel pavement shall be replaced with 6 inches of #53, Type "A" compacted stone or gravel aggregate.

3.5 HOT MIX ASPHALT

- A. This work shall consist of constructing one or more courses of HMA base, intermediate, and wedge leveling or surface mixtures on a prepared foundation in accordance with these specifications and in reasonably close conformance with the lines, grades, thicknesses, and typical cross sections shown on the plans or established by the Engineer.  
1. If the required finished depth of any course is to exceed three times the top size of the aggregate used as shown by actual screen analysis, the course shall be constructed in two or more lifts, as directed.  
2. Mix type shall be as indicated on the drawings, without exception, unless otherwise approved in writing by the Engineer.  
a. Job mix formulas shall be prepared and submitted for approval in accordance with INDOTSS 402. The job mix formula shall include standard bituminous mixture information including, but not limited to, aggregate gradation, binder content, maximum specific gravity, and air voids.  
3. Materials and construction requirements shall comply with the requirements of INDOTSS Section 402.
- B. If the previously constructed course is granular, a prime coat will be required.  
1. Apply prime coat uniformly at a rate of 0.25 to 0.80 gallon per square yard depending on condition of surface and amount of loose aggregate.  
2. Apply prime coat with a pressure distributor. Temperature of prime coat shall not exceed 150°F.  
3. Squeegee excess prime coat from the subbase surface. Correct deficient or skipped area.  
4. Prime coat shall be placed in accordance with INDOTSS Section 405.07.

C. Place and spread bituminous base mixture with a bituminous paver. In areas inaccessible to a paving machine, place and spread bituminous base mixture by other acceptable mechanical or hand methods.

D. Tack coat shall be placed on existing bituminous or concrete surfaces before a new lift of bituminous material is added. Apply tack coat uniformly at a rate of 0.06 gallon per square yard (0.000252 ton per square yard).

1. Patch and clean existing surface. The surface shall be free of irregularities and provide a reasonably smooth and uniform surface to receive the tack coat. Remove and replace unstable corrugated areas with suitable patching materials.  
2. Tack coat shall be placed in accordance with INDOTSS Sections 406.03 through 406.05.

E. Placement and compaction of hot mix asphalt (HMA) shall conform to INDOTSS Sections 402.10 through 402.16.

F. Place binder used for wedging or leveling, approaches and feathering by mechanical methods or acceptable hand methods for placing and spreading in accordance with INDOTSS Section 400.

3.6 SEAL COAT AND COVERING AGGREGATE (CHIP AND SEAL)

A. Application shall be as follows:

Seal Type	Cover Aggregate Size Number	Rate of Application Per Square Yard	
		Pounds	Bituminous Material Gallons at 60°F
1-Single Application	23, 24	12-15	0.12-0.16 (only AE-90 or AE-150)
2-Single Application	12	14-17	0.29-0.33
5-First Application	11	16-20	0.36-0.40
Second Application	12	16-19	0.33-0.37

B. Seal coat and covering aggregate shall be placed in accordance with INDOTSS Sections 404.04 through 404.08.

3.7 PORTLAND CEMENT CONCRETE PAVEMENT

- A. Portland cement concrete pavement shall consist of a coarse aggregate base (if required) and a reinforced or unreinforced Portland cement concrete surface, as shown on the drawings.  
1. Use No. 53, Type "A" coarse aggregate for subbase, unless otherwise shown or specified.  
2. Pavement cross-section shall be as shown on drawings.
- B. Where an aggregate base course is shown or specified, it shall be constructed in accordance with Article 3.3 of this specification.

C. Portland cement concrete pavement operations and materials shall comply with INDOTSS Section 501 unless otherwise specified by the Engineer.

- 1. Alternate equipment to that specified in INDOTSS, Section 501 shall be allowed provided that line, grade, surface, smoothness and other requirements of the specifications are met. The equipment used shall be subject to the approval of a Professional Engineer licensed in the State of Indiana.
- 2. Expansion and contraction joints shall be installed as indicated on the drawings or as required by INDOT standards. Expansion joints shall be required whenever new concrete abuts fixed objects or existing concrete surfaces, whether or not shown on the drawings.
- 3. Key-way construction, load transfer devices, the bars and slab and ear reinforcement shall be installed as indicated on the drawings.
- 4. Unless otherwise shown on the drawings, the final finish of concrete pavement shall be by brooming, as set out as Method 1 in INDOTSS Section 504.03, to form a transverse skid-resistant finish.
- 5. The Contractor shall always have materials available to protect the surface of concrete against rain. These materials shall consist of burlap, curing paper or plastic sheeting.
- 6. New concrete pavement shall be protected by the Contractor until opening to traffic is approved by a Professional Engineer licensed in the State of Indiana. It shall not be opened to traffic until the field-cured concrete has attained a flexural strength of 550 psi, or a compressive strength of 3,500 psi. If such tests are not conducted, the pavement shall not be opened to traffic until 14 days after the concrete was placed. Before opening to traffic, the pavement shall be cleaned and permanent lane markings applied to the pavement.

3.8 WALKS

A. Walks shall consist of a coarse aggregate subbase and a reinforced concrete surface. Use No. 24 fine aggregate for subbase, unless otherwise shown. Concrete shall be Class "A", 4,000 psi concrete.

B. Subbase shall be 2 inches thick, and concrete shall be 4 inches thick, unless crossing driveways, of which it will be 6 inches thick, as shown on detail P-10.

C. Compact subbase to not less than 95% of maximum dry density, as determined in accordance with AASHTO T99.

D. Proportion, mix, and place concrete as specified in INDOTSS Sections 604 and 702. Walks shall have a broom surface finish. Edge all outside edges of walk and all joints with a 1/4inch radius edging tool.

E. Unless otherwise shown on the drawings, walks shall be divided into sections not more than five feet in length by dummy joints formed by a jointing tool with a 1/4-inch radius.

F. Form construction joints around all abutting structures and appurtenances such as manhole, utility poles, hatches, and hydrants. Install 1/2inch thick pre-molded expansion joint filler in construction joints. Expansion joint material shall extend for the full depth of the walk.

G. If existing sidewalk is to be removed and replaced with new sidewalk or new sidewalk extended from existing sidewalk, the existing sidewalk shall be removed to the nearest joint of suitable quality or as directed by the Westfield Public Works Department.

3.9 CURBS

- A. The construction of curbs, combination curb and gutter, and integral curb and gutter shall be in accordance with these specifications and as shown on the plans and shall be in reasonably close conformance with the lines and grades shown on the plans or as directed by a Professional Engineer licensed in the State of Indiana.
- B. Excavation for curbs shall be made to the required depth, and the subgrade or base upon which the curb is constructed shall be compacted to a firm, even surface to not less than 95% of maximum dry density as determined in accordance with AASHTO T99.
- C. Concrete for curbs shall be Class A, 4,000 psi, as specified previously for Concrete Pavement.

D. The curbs shall be constructed by the use of wood or metal forms, or, if approved by a Professional Engineer licensed in the State of Indiana, the curb may be constructed using a cast-aluminum curb form. Forms, if used, shall be straight, free from warpage or bent sections, and shall extend for the entire depth of the curb and shall be securely held in place so that no deviation from alignment and grade will occur during placement of concrete. The concrete shall be consolidated by vibration or other acceptable methods. The top of the curb shall be floated smooth and the top outer corner rounded to a 1/4inch radius.

E. The face, top, and gutter of curbs shall not have deviations or irregularities of more than 1/4inch when checked with a 10-foot straightedge.

F. Construction joints shall be placed at 10-foot intervals, unless otherwise shown or directed by a Professional Engineer licensed in the State of Indiana. The joint shall be uniform, of 1/8 to 1/4 inch in width, and to a depth of approximately 2-1/2 inches. The joint may be formed using concrete tools, saw cut or formed by approved removable strips providing a straight joint at right angles to the length of curb. Joints shall be filled with specified bituminous joint filler material. Construction joints shall be formed around all abutting structures such as inlets and shall be as specified previously.

G. As soon as possible after placing and finishing of concrete, the curbing shall be moistened and kept moist for three days, or cured with the use of a specified membrane compound.

H. If existing curb is to be removed and replaced with new curb or new curb extended from existing curb, the existing curb shall be removed to the nearest joint.

I. During the placement of new concrete curb, utility marking shall be embedded into the top of the curb. The marking shall be a 2" high letter stamped into the concrete before the concrete sets up. The letters shall be located perpendicular from the utility feature that is being marked.

- The letters shall be as follows:  
G = Gas  
C = Conduit  
SS = Sewer Service Lateral  
MH = Sanitary Manhole  
W = Water  
V = Water Valve  
D = Subsurface Drain  
S = Storm
- P-1 Typical Pavement Sections
- P-2 Typical Pavement Sections
- P-3 Joint Location Detail
- P-4 Concrete Joint Details
- P-5 Structure Details
- P-7 Joint Location
- P-8 Concrete Curb and Gutter Type I & II
- P-9 Pipe Underdrain
- P-10 Sidewalk Details
- P-11 Sidewalk for Handicapped
- P-12 Subdivision Cul-de-sac
- P-13 Subdivision Temporary Cul-de-sac
- P-14 Standard Barricade
- P-15 Street Signs Detail
- P-15.1 Typical Subdivision Regulatory Signs
- P-16 Bicycle/Jogging Path
- P-17 Typical Driveway Section
- P-18 Repair of Cuts within Pavement Limits
- P-21 Raised Pavement Marker Cast Metal Base, Type 1
- P-22 Raised Pavement Marker Cast Metal Base, Type 2

END OF SECTION 02500

3.10 LANE STRIPING

- A. Lane striping is to be in accordance with all applicable standards of INDOTSS 808 and the construction plans.
- B. Parking lots are to be striped with standard white road paint. Spaces to be striped shall be 10 feet 0 inches wide by 20 feet 0 inches long with 4 inch wide stripes.
- C. Contractor will clean the new pavement surface to remove all dust, dirt, mud and debris prior to striping.

3.11 TESTING FOR HOT MIX ASPHALT (HMA)

- A. At the discretion of the Westfield Public Works Department the Developer/Contractor shall employ and pay for the services of a competent independent testing laboratory to take cores at selected locations and perform described tests. Compaction requirements for HMA mixtures placed in accordance with INDOTSS Section 402 shall be controlled by in place density determined from cores cut from the compacted pavement. A minimum of two cores per section shall be cut for each course of each material or as directed by the Westfield Public Works Department. Sections are defined as that a maximum of 1000 Mg (1041 ton) of HMA base or intermediate or 600 Mg (624 ton) of HMA surface. The transverse core location shall be located so that the edge of the core will be no closer than 75 mm (3 inches) from a confined edge or 150 mm (6 inches) from a non-confined edge of the course being placed.
- B. For compaction of HMA mixtures with quantities less than 100 Mg (104 ton) per day, acceptance may be visual as determined by the Engineer.
- C. The Contractor along with their independent testing lab representative shall obtain cores in the presence of the Westfield Public Works Department with a device that shall produce a uniform 150 mm (6 inches) in diameter pavement sample. Each HMA course shall be cored within one workday of placement. Damaged core(s) shall be discarded and replaced with a core from a nearby location as selected by the Engineer.
- D. The Contractor, in the presence of the Westfield Public Works Department, shall mark the core to define the course to be tested. If the defined area is less than 1.5 times the maximum particle size, the core will be discarded and a core from a new random location will be selected for testing as determined by the Engineer. Within one work day of coring operations the Contractor shall clean, dry, refill and compact the core holes with suitable material approved by the Engineer.
- E. The Contractor's testing lab representative shall take immediate possession of the cores. If the cores are subsequently damaged, additional coring within the specific section(s) will be required at locations to be determined by the Westfield Public Works Department.
- F. Each core shall be tested within one work day of coring operation to determine thickness, bulk specific gravity, aggregate gradation and binder content. Test results shall then be transmitted either verbally or by other means to both the Contractor and the Westfield Public Works Department for verification before each subsequent bituminous lift is placed.  
1. Average thickness of the cores shall not vary from the plan thickness more than 12.5 mm (0.5 inch) for HMA base and intermediate course(s) and 6.25 mm (0.25 inch) for HMA surface course(s) for acceptance in accordance with INDOTSS Section 105.03.

2. The bulk specific gravity shall be determined in accordance with AASHTO T166 or AASHTO T 275. The in place density of a section for a mixture shall be expressed as:

$$\text{Density \%} = (\text{BSG/MSG}) * 100$$

Where:  
BSG = bulk specific gravity as determined from independent testing laboratory  
MSG = maximum specific gravity as reported on job mix formula.

3. The calculated density of the cores shall not be less than 90% nor more than 96% a set out above. Test results which are outside stated limits shall be considered and adjudicated as a failed material in accordance with INDOTSS Section 105.03.

G. The Contractor's independent testing laboratory representative shall determine the aggregate gradation and binder content of the core samples in accordance with ITM 571. Aggregate gradation shall be within tolerances set forth in INDOTSS Section 402.04 and binder content shall be within ±0.5 percent from the job mix formula. Test results which are outside the stated limits shall be considered and adjudicated as a failed material in accordance with INDOTSS Section 105.03.

H. A copy of all core test results shall be submitted to the Engineer for verification of specification compliance within one calendar week of core testing.

I. The Contractor shall make the following tests at their cost and they shall be as specified in this Article and requested by the Engineer. Perform tests in accordance with the following ASTM Specifications:

Test	ASTM Specification
Slump	C143
Air Content	C173
Test Cylinders	C31 or C513
Core Samples	C42
Fly Ash	C311

- 1. Measure slump each time test beams or cylinders are to be made and at any other time requested by the Westfield Public Works Department. The slump shall be as specified in INDOTSS Section 501.03, or as otherwise specified herein, unless specifically excepted by the Westfield Public Works Department.
- 2. Measure air content each time test beams or cylinders are to be made and at any other time requested by the Westfield Public Works Department. The field test may be omitted if the air content is known prior to taking samples. The field test may not be omitted if fly ash is used in the mix.
- 3. Concrete paving mixes shall comply with guidelines of INDOTSS Section 501.04 and shall meet the testing requirements of Section 501.04 (a). However, in lieu of forming test beams as described in Section 501.04 (a) 2, the Contractor may substitute cylinder tests as follows:
  - a. Make test cylinders in sets of four. Field cure one cylinder and break at seven days. Laboratory cure the remaining three cylinders and break at 28 days. The Contractor shall be responsible for handling and transportation of cylinders.
  - b. If fly ash is used in the mix, a total set of seven cylinders shall be taken. The additional three cylinders shall be laboratory cured and broken at 56 days, if the 28-day strength does not meet specifications.
  - c. Make one set of test cylinders for each 100 cubic yards, or fraction of 100 cubic yards, of concrete placed; or at other times requested by the Westfield Public Works Department.
  - d. Unless otherwise specified, concrete shall have a 28-day compressive strength of 4,000 psi, as demonstrated by laboratory tests of cylinders.

3.12 PROTECTION

- A. Maintain compacted aggregate subbase and surface true to line and grade and required density. Maintain subbase until prime coat is placed. Maintain surface until job is complete.
- B. Do not permit vehicular traffic of any kind on any bituminous course until the bituminous mixture has hardened sufficiently not to be distorted beyond specified tolerances. Remove any foreign material which is on the surface of any course before the course is rolled or any subsequent course is placed.
- C. Do not permit traffic on concrete pavement or walks until concrete has developed sufficient strength not to be marked or damaged. Do not permit traffic on concrete for at least 14 days.
- D. Repair or replace damaged pavement and walks to the satisfaction of the Westfield Public Works Department Director or designee.

3.13 CLEANUP

Clean up the job site following pavement and surfacing restoration. Remove all rubbish, excess materials, temporary structures, and equipment. Leave the work in a neat and presentable condition.

SECTION 02503 - STANDARDS OF UTILITY CONSTRUCTION

PART 1 - GENERAL

1.1 MINIMUM STANDARDS FOR SANITARY SEWERS

- A. Wherever possible, sanitary sewer systems along streets shall be located on the opposite side of the street from water mains.
B. As the sanitary sewer system is installed, sewer lines shall be marked with a 2" x 4" or other acceptable stake, with a height allowing a minimum of 6'-0" above grade.
C. During the placement of new concrete curb, utility marking shall be embossed into the top of the curb.
D. All Street castings must be black asphalt dipped.

1.2 MINIMUM STANDARDS FOR WATERMAINS

- A. Water main supply system for subdivisions and industrial/business parks shall be "looped" to allow for both a primary and secondary water supply to the site.
B. Wherever possible, water main systems along streets shall be located on the opposite side of the street from sanitary sewer lines.
C. Lateral connections should be installed in conjunction with installation of water mains.
D. As the water main system is installed, water lines shall be marked with a 2" x 4" or other acceptable stake, with a height allowing a minimum of 6'-0" above grade.

- E. After water mains, hydrants, and valves are installed, there shall be a raised pavement marker installing along the center line of the street perpendicular to each hydrant.
F. During the placement of new concrete curb, utility marking shall be embossed into the top of the curb.
G. All Street castings must be black asphalt dipped.

1.3 MINIMUM STANDARDS FOR STORM SEWERS

- A. As the storm sewer system is installed, storm sewer lines shall be marked with a 2" x 4" or other acceptable stake, with a height allowing a minimum of 6'-0" above grade.
B. During the placement of new concrete curb, utility marking shall be embossed into the top of the curb.
C. All Street castings must be black asphalt dipped.

PART 2 - PRODUCT NOT APPLICABLE

PART 3 - EXECUTION NOT APPLICABLE

END OF SECTION 02503

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 metallic and non-metallic piping.
B. Furnish and install location wire for all buried non-metallic piping.

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 inches and a maximum of six inches and shall have background color specified below, imprinted with black letters.
2. Warning tape shall be as described above except no solid foil is required.

B. Tape background colors and imprints shall be as follows:

Table with 2 columns: Imprint, Background Color. Rows include 'Caution - Water Line Buried Below' (Blue) and '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 manufacturer.

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. For water mains, locator wire shall be installed along the top and taped to the pipe.
B. For sanitary force main, locator wire shall be installed along the top and taped to the pipe.
C. For open-cut (trench) installations, one locator wire should be used. For trenchless installations (jack and bore or directional drilling) two locator wires should be used.

END OF SECTION 02558

SECTION 02660 - WATER MAINS

PART 1 - GENERAL

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
a. ANSI - American National Standards Institute
b. ASTM - American Society for Testing & Materials
c. 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.
3. 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.

- 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.
D. A performance test may not be required by the Public Works Director, at any time, for each crew installing water mains.
E. 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.
b. Pipe joints shall be push-on type.
2. Fittings
a. Fittings shall be ductile iron.
b. Adapter ends connecting to ductile iron water mains shall be as follows:
3. Adapters
a. Adapters from ductile iron water mains to flange joint valves or fittings shall be ductile iron.
b. Adapter ends connecting to ductile iron water mains shall be one of the following:
c. Adapter ends connecting to ductile iron water mains shall be as follows:
4. Line the inside surfaces of all pipe, fittings and adapters with single layer cement mortar lining.
5. Gaskets for mechanical joints and push-on joints shall meet the requirements of ANSI/AWWA C111/A21.11.

2.3 FIRE HYDRANTS

- A. Fire hydrants shall be dry-barrel, compression shutoff, traffic model and comply with AWWA C502.
B. Fire hydrant placement - Fire hydrants shall be no further than 300 feet in all residential subdivisions, subdivision sections, and other residential areas in which dwelling density meets or exceeds three dwellings units per gross acre.

2.4 VALVE BOXES

- A. Valve boxes for butterfly valves and gate valves shall be cast iron.
B. Valve boxes shall be two piece or three piece type.
C. Valve boxes shall be stainless steel split sleeves.
D. Tapping sleeves for 4-inch through 16-inch pipe shall be mechanical joint type.

2.5 TAPPING SADDLES

- A. Tapping sleeves shall be stainless steel split sleeves.
B. Each sleeve shall have a branch connection with a flange end.
C. Tapping sleeves for 4-inch through 16-inch pipe shall be mechanical joint type.

2.6 FLANGE-MECHANICAL JOINT ADAPTERS

- A. Flange-mechanical joint adapters shall be Dresser Style 127, Smith-Blair Type 912 or as approved by the Public Works Director.
B. Air and vacuum valve chambers shall be 4-foot diameter precast concrete manhole barrels with precast concrete flat slab tops.

2.7 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.
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

- A. Inspect water main pipe, fittings, valves, hydrants, and appurtenances prior to installation.
B. Replace damaged or unsuitable products with undamaged and suitable products.
C. Laying of water mains shall meet the requirements of ANSI/AWWA C600, unless otherwise specified in this Section.

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.
C. When the exact location of buried utilities is unknown and piping is to be constructed parallel or close to said utilities, adjust the alignment of the piping to least interfere with these utilities.

3.3 SETTING VALVES, VALVE BOXES AND FIRE HYDRANTS

- A. Clean the interiors of valves and hydrants of foreign matter before installation.
B. Set valves and valve boxes plumb.
C. Set hydrant plungers with the pump nozzle facing the street.
D. All inline water valve caps should be painted blue.

3.4 CONNECTING TO EXISTING MAINS

- A. The Contractor shall locate and verify exact size of all existing mains, both horizontally and vertically.
B. Make each wet connection with a tapping valve and tapping sleeve.
C. Make each dry connection with fittings and hydrants indicated on the drawings.

- WASTEWATER-V-54d for Class A, Type III Valves.
C. Buried valves 2-inch and smaller shall be curb stops.
D. Tapping Valves
1. Tapping valves shall comply with both ANSI/AWWA C500 or C509 and have flange mechanical joint ends.
2. Valves end connecting to tapping sleeve shall have a flange for bolting to the sleeve.
E. Air and Vacuum Valves: Air and vacuum valves shall be as follows:
1. Specification
a. Apco No. 141WD, Val-Matic 100DWS, or equal
b. Apco No. 142WD, Val-Matic 101DWS, or equal
c. Apco No. 143WD, Val-Matic 102DWS, or equal
d. Apco No. 146WD, Val-Matic 103DWS, or equal
e. Apco No. 1600153, Val-Matic 106DWS, or equal

- 2.5 VALVE BOXES
A. Valve boxes for butterfly valves and gate valves shall be cast iron.
B. Valve boxes shall be two piece or three piece type.
C. Valve boxes shall be stainless steel split sleeves.
D. Tapping sleeves for 4-inch through 16-inch pipe shall be mechanical joint type.
2.6 FIRE HYDRANTS
A. Fire hydrants shall be dry-barrel, compression shutoff, traffic model and comply with AWWA C502.
B. Fire hydrant placement - Fire hydrants shall be no further than 300 feet in all residential subdivisions, subdivision sections, and other residential areas in which dwelling density meets or exceeds three dwellings units per gross acre.
2.7 SPRINKLER SYSTEMS
Multi-family dwellings, 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.
2.8 TAPPING SLEEVES
A. Tapping sleeves shall be stainless steel split sleeves.
B. Each sleeve shall have a branch connection with a flange end.
C. Tapping sleeves for 4-inch through 16-inch pipe shall be mechanical joint type.
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.
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.
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.
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.
C. When the exact location of buried utilities is unknown and piping is to be constructed parallel or close to said utilities, adjust the alignment of the piping to least interfere with these utilities.
D. All crossings of water mains and sanitary sewers or storm sewers must be in accordance with 327 IAC 8-3.2-9.
E. No water mains shall be within eight (8) feet of a sanitary sewer manhole, a storm sewer manhole, or a drainage grade 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 grade support structure, per 327 IAC 8-3.2-9.
F. All piping shall be laid to a depth that provides at least 4'-6" of cover.
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.
K. Deflection from a straight line or grade shall not exceed the limits specified in this Section.
L. Provide thrust restraint at horizontal and vertical deflection fittings and at tees, plugs, tapping sleeves and tapping saddles.
M. Where concrete thrust blocking is used, cover the fitting to be blocked with visqueen 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 cranes or other suitable tools or equipment that will not damage products, coatings or linings.
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.
B. Set valves and valve boxes plumb.
C. Set hydrant plungers with the pump nozzle facing the street.
D. All inline water valve caps should be painted blue.
3.4 CONNECTING TO EXISTING MAINS
A. The Contractor shall locate and verify exact size of all existing mains, both horizontally and vertically.
B. Make each wet connection with a tapping valve and tapping sleeve.
C. Make each dry connection with fittings and hydrants indicated on the drawings.
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.
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.
3. Deflect pipe after jointing, if deflection is required.
B. Polyvinyl Chloride Push-on Joints
1. Pipe must be cleaned and installed as specified by the manufacturer's requirements.
2. Deflect the pipe after jointing, if deflection is required.
C. Mechanical Joints
1. Pipe must be cleaned and installed as specified by the manufacturer and AWWA C600 requirements.
2. Do not overtighten joints.
3. Backing off made-up threaded joints to facilitate fit-up or alignment will not be permitted.
D. Shouldered Type Joints
1. Pipe must be cleaned and installed as specified by the manufacturer and AWWA C600 requirements.
2. Do not overtighten joints.
3. Backing off made-up threaded joints to facilitate fit-up or alignment will not be permitted.
E. Flange Joints
1. Pipe must be cleaned and installed as specified by the manufacturer and AWWA C600 requirements.
2. Do not overtighten nuts and bolts.
3.6 RESTRAINING AND SUPPORTS
A. Thrust Blocking
1. Construct thrust blocks of concrete having a 28-day compressive strength of at least 2,000 psi.
2. Lubricate fitting surfaces to prevent bonding between fittings and thrust blocks.
3. Construct thrust blocks between fittings and unobstructed soil.
B. Restraint joint piping shall be as specified in this Section.
C. Mechanical Joint Rod Restraint
1. Mechanical joint rod restraint shall be from fitting to fitting.
2. The number of rods shall conform to the following table:
Pipe Size Rod Size Minimum No. of Rods
4" 3/4" 2
6" 3/4" 2
8" 3/4" 2
10" 3/4" 4
12" 3/4" 4
14" 3/4" 6
16" 3/4" 8
18" 3/4" 10
20" 3/4" 12
24" 3/4" 16
D. Pipe Supports
1. Furnish and install supports required to hold pipe, fittings and valves at the lines and grades indicated on the drawings, without causing strain upon pipe, fittings and valves.
2. Support piping by suitable saddle stands, concrete piers or hangers.
3. Locate supports where necessary, at least 8 feet on center.

- 3.7 AIR AND VACUUM VALVE CHAMBERS
A. Install air and vacuum valve chambers as indicated on the drawings.
B. Mortar for joints and plastering shall consist of one part Portland Cement and two parts fine sand.
C. The water mains may be tested in sections between valves when there is one or more intermediary valves in a water main.
D. Test procedures shall meet the requirements of AWWA Standard C600.
E. Each section of water main shall be complete, and thrust blocks shall have been in place for not less than 10 days prior to being tested.
F. Expel all air from the water main test section during the filling of the main and prior to the application of test pressure.
G. Test water mains at a static pressure of 150 pounds per square inch over a period of two consecutive hours.
3.8 HYDROSTATIC TEST
A. Hydrostatic tests shall be performed on all water mains installed.
B. The Contractor shall make arrangements with the Town Engineer and/or Town Representative for scheduling each test.
C. Set frames and covers so the top of the cover will be flush with finished grade.
D. Vent air and vacuum valve outlets to the surface.
E. Paint air and vacuum valve vents yellow.

- 3.9 FLUSHING
A. Flush water mains and fire hydrants prior to disinfection.
B. Flush water mains with a flushing velocity of at least 2.5 feet per second.
C. The water mains may be tested in sections between valves when there is one or more intermediary valves in a water main.
D. Test procedures shall meet the requirements of AWWA Standard C600.
E. Each section of water main shall be complete, and thrust blocks shall have been in place for not less than 10 days prior to being tested.
F. Expel all air from the water main test section during the filling of the main and prior to the application of test pressure.
G. Test water mains at a static pressure of 150 pounds per square inch over a period of two consecutive hours.
3.10 DISINFECTION
A. Disinfect water mains and fire hydrants prior to disinfection.
B. Flush water mains with a flushing velocity of at least 2.5 feet per second.
C. The water mains may be tested in sections between valves when there is one or more intermediary valves in a water main.
D. Test procedures shall meet the requirements of AWWA Standard C600.
E. Each section of water main shall be complete, and thrust blocks shall have been in place for not less than 10 days prior to being tested.
F. Expel all air from the water main test section during the filling of the main and prior to the application of test pressure.
G. Test water mains at a static pressure of 150 pounds per square inch over a period of two consecutive hours.

- 3.11 DISINFECTION
A. Disinfect water mains and fire hydrants prior to disinfection.
B. Flush water mains with a flushing velocity of at least 2.5 feet per second.
C. The water mains may be tested in sections between valves when there is one or more intermediary valves in a water main.
D. Test procedures shall meet the requirements of AWWA Standard C600.
E. Each section of water main shall be complete, and thrust blocks shall have been in place for not less than 10 days prior to being tested.
F. Expel all air from the water main test section during the filling of the main and prior to the application of test pressure.
G. Test water mains at a static pressure of 150 pounds per square inch over a period of two consecutive hours.

- 3.12 DISINFECTION
A. Disinfect water mains and fire hydrants prior to disinfection.
B. Flush water mains with a flushing velocity of at least 2.5 feet per second.
C. The water mains may be tested in sections between valves when there is one or more intermediary valves in a water main.
D. Test procedures shall meet the requirements of AWWA Standard C600.
E. Each section of water main shall be complete, and thrust blocks shall have been in place for not less than 10 days prior to being tested.
F. Expel all air from the water main test section during the filling of the main and prior to the application of test pressure.
G. Test water mains at a static pressure of 150 pounds per square inch over a period of two consecutive hours.

- 3.13 DISINFECTION
A. Disinfect water mains and fire hydrants prior to disinfection.
B. Flush water mains with a flushing velocity of at least 2.5 feet per second.
C. The water mains may be tested in sections between valves when there is one or more intermediary valves in a water main.
D. Test procedures shall meet the requirements of AWWA Standard C600.
E. Each section of water main shall be complete, and thrust blocks shall have been in place for not less than 10 days prior to being tested.
F. Expel all air from the water main test section during the filling of the main and prior to the application of test pressure.
G. Test water mains at a static pressure of 150 pounds per square inch over a period of two consecutive hours.

- 3.14 DISINFECTION
A. Disinfect water mains and fire hydrants prior to disinfection.
B. Flush water mains with a flushing velocity of at least 2.5 feet per second.
C. The water mains may be tested in sections between valves when there is one or more intermediary valves in a water main.
D. Test procedures shall meet the requirements of AWWA Standard C600.
E. Each section of water main shall be complete, and thrust blocks shall have been in place for not less than 10 days prior to being tested.
F. Expel all air from the water main test section during the filling of the main and prior to the application of test pressure.
G. Test water mains at a static pressure of 150 pounds per square inch over a period of two consecutive hours.

- 3.15 DISINFECTION
A. Disinfect water mains and fire hydrants prior to disinfection.
B. Flush water mains with a flushing velocity of at least 2.5 feet per second.
C. The water mains may be tested in sections between valves when there is one or more intermediary valves in a water main.
D. Test procedures shall meet the requirements of AWWA Standard C600.
E. Each section of water main shall be complete, and thrust blocks shall have been in place for not less than 10 days prior to being tested.
F. Expel all air from the water main test section during the filling of the main and prior to the application of test pressure.
G. Test water mains at a static pressure of 150 pounds per square inch over a period of two consecutive hours.

- 3.16 DISINFECTION
A. Disinfect water mains and fire hydrants prior to disinfection.
B. Flush water mains with a flushing velocity of at least 2.5 feet per second.
C. The water mains may be tested in sections between valves when there is one or more intermediary valves in a water main.
D. Test procedures shall meet the requirements of AWWA Standard C600.
E. Each section of water main shall be complete, and thrust blocks shall have been in place for not less than 10 days prior to being tested.
F. Expel all air from the water main test section during the filling of the main and prior to the application of test pressure.
G. Test water mains at a static pressure of 150 pounds per square inch over a period of two consecutive hours.

- 3.17 DISINFECTION
A. Disinfect water mains and fire hydrants prior to disinfection.
B. Flush water mains with a flushing velocity of at least 2.5 feet per second.
C. The water mains may be tested in sections between valves when there is one or more intermediary valves in a water main.
D. Test procedures shall meet the requirements of AWWA Standard C600.
E. Each section of water main shall be complete, and thrust blocks shall have been in place for not less than 10 days prior to being tested.
F. Expel all air from the water main test section during the filling of the main and prior to the application of test pressure.
G. Test water mains at a static pressure of 150 pounds per square inch over a period of two consecutive hours.

- 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.
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.
3. Deflect pipe after jointing, if deflection is required.
B. Polyvinyl Chloride Push-on Joints
1. Pipe must be cleaned and installed as specified by the manufacturer's requirements.
2. Deflect the pipe after jointing, if deflection is required.
C. Mechanical Joints
1. Pipe must be cleaned and installed as specified by the manufacturer and AWWA C600 requirements.
2. Do not overtighten joints.
3. Backing off made-up threaded joints to facilitate fit-up or alignment will not be permitted.
D. Shouldered Type Joints
1. Pipe must be cleaned and installed as specified by the manufacturer and AWWA C600 requirements.
2. Do not overtighten joints.
3. Backing off made-up threaded joints to facilitate fit-up or alignment will not be permitted.
E. Flange Joints
1. Pipe must be cleaned and installed as specified by the manufacturer and AWWA C600 requirements.
2. Do not overtighten nuts and bolts.
3.6 RESTRAINING AND SUPPORTS
A. Thrust Blocking
1. Construct thrust blocks of concrete having a 28-day compressive strength of at least 2,000 psi.
2. Lubricate fitting surfaces to prevent bonding between fittings and thrust blocks.
3. Construct thrust blocks between fittings and unobstructed soil.
B. Restraint joint piping shall be as specified in this Section.
C. Mechanical Joint Rod Restraint
1. Mechanical joint rod restraint shall be from fitting to fitting.
2. The number of rods shall conform to the following table:
Pipe Size Rod Size Minimum No. of Rods
4" 3/4" 2
6" 3/4" 2
8" 3/4" 2
10" 3/4" 4
12" 3/4" 4
14" 3/4" 6
16" 3/4" 8
18" 3/4" 10
20" 3/4" 12
24" 3/4" 16
D. Pipe Supports
1. Furnish and install supports required to hold pipe, fittings and valves at the lines and grades indicated on the drawings, without causing strain upon pipe, fittings and valves.
2. Support piping by suitable saddle stands, concrete piers or hangers.
3. Locate supports where necessary, at least 8 feet on center.

- 3.7 AIR AND VACUUM VALVE CHAMBERS
A. Install air and vacuum valve chambers as indicated on the drawings.
B. Mortar for joints and plastering shall consist of one part Portland Cement and two parts fine sand.
C. The water mains may be tested in sections between valves when there is one or more intermediary valves in a water main.
D. Test procedures shall meet the requirements of AWWA Standard C600.
E. Each section of water main shall be complete, and thrust blocks shall have been in place for not less than 10 days prior to being tested.
F. Expel all air from the water main test section during the filling of the main and prior to the application of test pressure.
G. Test water mains at a static pressure of 150 pounds per square inch over a period of two consecutive hours.
3.8 HYDROSTATIC TEST
A. Hydrostatic tests shall be performed on all water mains installed.
B. The Contractor shall make arrangements with the Town Engineer and/or Town Representative for scheduling each test.
C. Set frames and covers so the top of the cover will be flush with finished grade.
D. Vent air and vacuum valve outlets to the surface.
E. Paint air and vacuum valve vents yellow.

- 3.9 FLUSHING
A. Flush water mains and fire hydrants prior to disinfection.
B. Flush water mains with a flushing velocity of at least 2.5 feet per second.
C. The water mains may be tested in sections between valves when there is one or more intermediary valves in a water main.
D. Test procedures shall meet the requirements of AWWA Standard C600.
E. Each section of water main shall be complete, and thrust blocks shall have been in place for not less than 10 days prior to being tested.
F. Expel all air from the water main test section during the filling of the main and prior to the application of test pressure.
G. Test water mains at a static pressure of 150 pounds per square inch over a period of two consecutive hours.
3.10 DISINFECTION
A. Disinfect water mains and fire hydrants prior to disinfection.
B. Flush water mains with a flushing velocity of at least 2.5 feet per second.
C. The water mains may be tested in sections between valves when there is one or more intermediary valves in a water main.
D. Test procedures shall meet the requirements of AWWA Standard C600.
E. Each section of water main shall be complete, and thrust blocks shall have been in place for not less than 10 days prior to being tested.
F. Expel all air from the water main test section during the filling of the main and prior to the application of test pressure.
G. Test water mains at a static pressure of 150 pounds per square inch over a period of two consecutive hours.

- 3.11 DISINFECTION
A. Disinfect water mains and fire hydrants prior to disinfection.
B. Flush water mains with a flushing velocity of at least 2.5 feet per second.
C. The water mains may be tested in sections between valves when there is one or more intermediary valves in a water main.
D. Test procedures shall meet the requirements of AWWA Standard C600.
E. Each section of water main shall be complete, and thrust blocks shall have been in place for not less than 10 days prior to being tested.
F. Expel all air from the water main test section during the filling of the main and prior to the application of test pressure.
G. Test water mains at a static pressure of 150 pounds per square inch over a period of two consecutive hours.

- 3.12 DISINFECTION
A. Disinfect water mains and fire hydrants prior to disinfection.
B. Flush water mains with a flushing velocity of at least 2.5 feet per second.
C. The water mains may be tested in sections between valves when there is one or more intermediary valves in a water main.
D. Test procedures shall meet the requirements of AWWA Standard C600.
E. Each section of water main shall be complete, and thrust blocks shall have been in place for not less than 10 days prior to being tested.
F. Expel all air from the water main test section during the filling of the main and prior to the application of test pressure.
G. Test water mains at a static pressure of 150 pounds per square inch over a period of two consecutive hours.

- 3.13 DISINFECTION
A. Disinfect water mains and fire hydrants prior to disinfection.
B. Flush water mains with a flushing velocity of at least 2.5 feet per second.
C. The water mains may be tested in sections between valves when there is one or more intermediary valves in a water main.
D. Test procedures shall meet the requirements of AWWA Standard C600.
E. Each section of water main shall be complete, and thrust blocks shall have been in place for not less than 10 days prior to being tested.
F. Expel all air from the water main test section during the filling of the main and prior to the application of test pressure.
G. Test water mains at a static pressure of 150 pounds per square inch over a period of two consecutive hours.

- 3.14 DISINFECTION
A. Disinfect water mains and fire hydrants prior to disinfection.
B. Flush water mains with a flushing velocity of at least 2.5 feet per second.
C. The water mains may be tested in sections between valves when there is one or more intermediary valves in a water main.
D. Test procedures shall meet the requirements of AWWA Standard C600.
E. Each section of water main shall be complete, and thrust blocks shall have been in place for not less than 10 days prior to being tested.
F. Expel all air from the water main test section during the filling of the main and prior to the application of test pressure.
G. Test water mains at a static pressure of 150 pounds per square inch over a period of two consecutive hours.

- 3.15 DISINFECTION
A. Disinfect water mains and fire hydrants prior to disinfection.
B. Flush water mains with a flushing velocity of at least 2.5 feet per second.
C. The water mains may be tested in sections between valves when there is one or more intermediary valves in a water main.
D. Test procedures shall meet the requirements of AWWA Standard C600.
E. Each section of water main shall be complete, and thrust blocks shall have been in place for not less than 10 days prior to being tested.
F. Expel all air from the water main test section during the filling of the main and prior to the application of test pressure.
G. Test water mains at a static pressure of 150 pounds per square inch over a period of two consecutive hours.

- 3.16 DISINFECTION
A. Disinfect water mains and fire hydrants prior to disinfection.
B. Flush water mains with a flushing velocity of at least 2.5 feet per second.
C. The water mains may be tested in sections between valves when there is one or more intermediary valves in a water main.
D. Test procedures shall meet the requirements of AWWA Standard C600.
E. Each section of water main shall be complete, and thrust blocks shall have been in place for not less than 10 days prior to being tested.
F. Expel all air from the water main test section during the filling of the main and prior to the application of test pressure.
G. Test water mains at a static pressure of 150 pounds per square inch over a period of two consecutive hours.

- 3.17 DISINFECTION
A. Disinfect water mains and fire hydrants prior to disinfection.
B. Flush water mains with a flushing velocity of at least 2.5 feet per second.
C. The water mains may be tested in sections between valves when there is one or more intermediary valves in a water main.
D. Test procedures shall meet the requirements of AWWA Standard C600.
E. Each section of water main shall be complete, and thrust blocks shall have been in place for not less than 10 days prior to being tested.
F. Expel all air from the water main test section during the filling of the main and prior to the application of test pressure.
G. Test water mains at a static pressure of 150 pounds per square inch over a period of two consecutive hours.

- 3.18 DISINFECTION
A. Disinfect water mains and fire hydrants prior to disinfection.
B. Flush water mains with a flushing velocity of at least 2.5 feet per second.
C. The water mains may be tested in sections between valves when there is one or more intermediary valves in a water main.
D. Test procedures shall meet the requirements of AWWA Standard C600.
E. Each section of water main shall be complete, and thrust blocks shall have been in place for not less than 10 days prior to being tested.
F. Expel all air from the water main test section during the filling of the main and prior to the application of test pressure.
G. Test water mains at a static pressure of 150 pounds per square inch over a period of two consecutive hours.

- 3.19 DISINFECTION
A. Disinfect water mains and fire hydrants prior to disinfection.
B. Flush water mains with a flushing velocity of at least 2.5 feet per second.
C. The water mains may be tested in sections between valves when there is one or more intermediary valves in a water main.
D. Test procedures shall meet the requirements of AWWA Standard C600.
E. Each section of water main shall be complete, and thrust blocks shall have been in place for not less than 10 days prior to being tested.
F. Expel all air from the water main test section during the filling of the main and prior to the application of test pressure.
G. Test water mains at a static pressure of 150 pounds per square inch over a period of two consecutive hours.

- 3.20 DISINFECTION
A. Disinfect water mains and fire hydrants prior to disinfection.
B. Flush water mains with a flushing velocity of at least 2.5 feet per second.
C. The water mains may be tested in sections between valves when there is one or more intermediary valves in a water main.
D. Test procedures shall meet the requirements of AWWA Standard C600.
E

SECTION 02660 - WATER MAINS - CONTINUED FROM SHEET C8.4

3.10 DISINFECTION

- A. Disinfect all new and repaired water mains prior to placing them in service. Disinfect pipe, fittings, valves and hydrants with a chlorine solution containing 50 mg/l = 5 mg/l of available chlorine.
B. The chlorinating material shall be calcium hypochlorite. Calcium hypochlorite shall have 70% available chlorine by weight, and sodium hypochlorite shall have 5.25% to 14.7% available chlorine.

Table with columns: Pipe Size, Inside Diameter, Chlorine Gas, Cal. Hvel. (70%), Cal. Hvel. (70%). Rows include pipe sizes from 1/2 inch to 24 inch.

- C. Tap water mains where required to inject chlorine solution into all pipe, fittings, valves and hydrants installed and repaired. Inject chlorine solution into water mains. Leave the chlorine solution in the water mains for 24 hours or longer.
D. Bacteriological Tests - The water main shall be tested for bacteriological quality after disinfection and final flushing.
E. Hose connections on fire hydrants shall not be used for collecting samples. Contact the applicable regulatory agency for sampling criteria and procedures.

3.11 COMPLETION SCHEDULING

Complete water mains as they are installed. Test, flush, sterilize, and place in service each part of the water main which is complete and can be placed in service without preventing work to continue on uncompleted parts of the new water mains.

PART 4 - FIGURES

Table with columns: FIGURE, DESCRIPTION. Lists details for Water Main Installation, Thrust Block Details, Restrainted Joint Details, Steel Casing Detail, Connection to Existing Main, Gate Valve and Box, Fire Hydrant Details, Single Pit, Water Meter and Pit Detail, Water Meter and Pit Detail, Double Water Service Detail, Dual Water Meter and Pit Detail, Irrigation System Connection Detail, Standard Fire Service and Meter Vault, PVC Pipe Bedding Detail.

END OF SECTION 02660

SECTION 02721 - STORM SEWERS

PART 1 - GENERAL

- 1. Please see chapters 100, 400, and 500 of the Town of Westfield Stormwater Manual.

END OF SECTION 02721

SECTION 02731 - GRAVITY SANITARY SEWERS

PART 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, house services, and miscellaneous concrete structures.
B. Sewer pipe shall be the size shown on the drawings and shall meet all requirements of these specifications and 327 IAC 3.
C. If a material type is shown on the drawings, that material shall be used in the installation unless otherwise noted and as approved by Westfield Public Works.

3.2 SUBMITTALS

Before construction and preferably before fabricating, 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.
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.

- 1. Variance from established line and grade shall not be described below 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 elevation between adjoining ends of pipe, due to non-concentricity of jointing 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.
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.

- 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 AND STORM SEWERS
A. All storm sewer crossings must be in accordance with the Town of Westfield's Stormwater Technical Standards Manual, Section 501.01.
B. All water main crossings must be in accordance with 327 IAC 3-6-9 and 327 IAC 3-3-2.9.
C. Sewers must be laid at least 10 feet horizontally from any existing or proposed water main.

- D. 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.
E. 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.

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: PVC composite pipe and fittings shall conform to ASTM D3034 SDR 35, Type PM, latest revision.

- B. Sewers Greater than 15 Inches
1. 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.

- C. 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 ductile iron pipe to which they are used and conform to all other requirements specified for pipe of corresponding class and internal diameter.
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.

- D. 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.

- E. Grease Trap: Grease trap tank shall be constructed of 6000 psi concrete. All tank joints shall be sealed watertight with butyl rubber extrudable preformed gasket material.
F. 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.

- 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.

- 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.
3.4 LAYING PIPE
A. All pipe shall be inspected for soundness and damage due to handling immediately before being lowered into the trench.

Table with columns: Nominal Sewer Size, Minimum Slope In Feet Per 100 Feet (in/100ft). Rows include pipe sizes from 8 inch to 42 inch.

- E. Watertight work in conformance with 327 IAC 3 is required, and the Contractor shall construct the sewers with the type of joint specified therein.
F. All pipe shall be laid to the line and grade as shown on the drawings.
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.

- 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.
J. All PVC pipe entering a manhole shall have a manhole watertop gasket as supplied by the manufacturer firmly clamped around the pipe.
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.

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.
1. When Class I material is used for bedding, little or no compaction is necessary due to the nature of the angular particles.

3.6 MANHOLES AND OTHER STRUCTURES

- A. Manholes shall meet all requirements of 327 IAC 3-6-10.
B. 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.

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.
B. A backwater prevention valve shall be provided for each sanitary sewer lateral.
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.

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. 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.

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 design engineer and a Westfield Public Works representative.

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 that is not installed.
B. The Contractor shall note the special provision under Article 3.4, Paragraph P, 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 WATERIGHTNESS TESTING

- A. Infiltration testing must be performed in accordance with 327 IAC 3-6-19.4. Tests for watertightness shall be conducted on all installed sewers in the presence of and in the manner approved by the Westfield Public Works Department or designee.
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.

- 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.
2. Procedure for Conducting a Low Pressure Air Test
a. Clean pipe to be tested by propping a snug fitting inflated ball through the pipe by water pressure or other adequate method.
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.

Table with columns: Pipe Diameter (Inches), Time (Minutes). Rows include pipe diameters from 4 to 24 inches.

- 3. Safety Precautions During Air Test
a. The air test may be dangerous if, because of ignorance or carelessness, a line is improperly prepared.
b. As a safety precaution, pressurizing equipment should include a regulator set at perhaps 10 psi to avoid over-pressurizing and damaging an otherwise acceptable line.

3.12 HYDROSTATIC TESTING

- A. A hydrostatic test on ductile iron pipe with push-on type joints has two purposes: one is to test the gaskets in place, and the other is to provide a leakage test.
B. Said test shall include all ductile iron sewer pipe with push-on type joints installed by the Contractor.
C. Water for testing may be obtained from the Westfield Public Works Department or designee.
D. Hydrostatic test on ductile iron pipe with push-on type joints installed as gravity sewers and siphons shall be in accordance with the following provisions:
1. The ends of the sewer section being tested shall have test plugs or caps adapted with a top of adequate diameter to fill and pressurize the system with water.

3.13 MANHOLE VACUUM TESTING

- A. A vacuum test shall be conducted by the Contractor on all manholes to ensure watertightness and manhole integrity.
B. The equipment required to conduct a vacuum test on manholes includes inflatable pipe plugs, test head, vacuum pump, flexible air hose, and a vacuum gage.
C. The procedure for conducting an air test on manholes shall be in accordance with these specifications and ASTM C1244-05a:
1. Each manhole shall be tested immediately after assembly and prior to setting the casing or backfilling around the structure.

Table with columns: Depth, ft., Diameter, in. Rows include pipe diameters from 4 to 96 inches.

3.14 CLOSED CIRCUIT TELEVISION INSPECTION

- A. All sections of sewers shall be inspected by closed circuit television.
B. All unacceptable conditions found during television inspection must be corrected by the Contractor and re-televised.
C. Unacceptable conditions are conditions that adversely affect the ability of the system to function as designed or to be properly maintained and may include, but are not limited to, the following:
1. Prorating tabs
2. Cracked or faulty pipe
3. Misalign or deformed pipe
4. Debris in line
5. Infiltration / exfiltration
6. Excessive pipe joints

3.15 DIGITAL AS-BUILTS/RECORD DRAWINGS

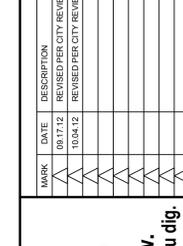
- A. The Developer shall prepare or be responsible for the preparation and submittal of digital as-builts as described in Section 01001, Article 1.14.

PART 4 - FIGURES

Table with columns: Figure, Description, Figure, Description. Lists details for Standard Sanitary Manhole, House/Building Service Detail, Force Main Discharge Detail, Sewer Pipe Bedding Details, Concrete Encasement Detail, Drop Pipe Details, Alternate Drop Pipe Details.

END OF SECTION 02731

Table with columns: REVISIONS, DATE, DESCRIPTION, MARK. Lists revision details for the drawing.



Job No. 2012-1167

Scale: Not to Scale

Title: CITY OF WESTFIELD STANDARDS

Sheet: C8.6



SECTION 02750 - SEWER TELEVISION

PART 1 - GENERAL

1.1 GENERAL

- A. This section covers all work necessary for the cleaning and televising of sanitary and storm sewers to determine the water tightness, connections, alignment, grades and locations of service.
- B. The type equipment required for the work and the methods of accomplishing the work, as well as the type of materials to be incorporated into the work, are covered in this Section.
- C. The Contractor shall introduce enough water into sewer pipe to indicate bellies or sags in line being televised.

PART 2 - PRODUCTS

2.1 EQUIPMENT REQUIRED

- A. The Contractor shall furnish all labor, electronic equipment, and technicians to perform the closed circuit television inspection of the sewers. Operation of the equipment is to be controlled from above ground with a skilled technician at the control panel in the television studio, controlling the movement of the television camera through the sewer in either direction.
- B. The color television camera shall be one specifically designed and constructed for the purpose of televising sewers. The color camera shall have a high resolution lens capable of spanning 360 degrees circumference and 270 degrees on horizontal axis to televise sewer lines 8 inches in diameter and larger. Focal distance shall be adjustable through a range of 1 inch to infinity. The purpose of the rotating head camera is to view all service connections and to locate all defects, as well as any questionable problem areas. The camera shall be mounted to a self-propelled crawler/transporter.
- C. Camera lighting quality shall be suitable to provide a clear, continuously in focus picture of the entire inside periphery of the sewer pipe for all conditions encountered during the work. The camera shall be able to operate efficiently in 100% humidity conditions. The camera, television monitor, and all other necessary components of the video system shall be capable of producing a minimum 350-line resolution color video picture.
- D. The view seen by the television camera shall be transmitted to a VCR and a color monitor of not less than 17 inches. The TV camera shall have the capability of transmitting a color picture with not less than 600 lines of resolution, the monitor and VCR shall have the capability of receiving same. The monitor and VCR shall be located inside a mobile TV studio.
- E. Contractor shall supply digital video to client on 700 mb compact disks in the following format:
  1. Minimum 640 x 480 pixel dimension
  2. Minimum 24 fps (frames per second)
  3. Indexed chapters to allow instant access to points of observation
  4. Cross-platform compatible to allow for viewing on any operating system
- F. The Contractor's mobile studio shall be large enough to accommodate up to three people for the purpose of viewing the monitor while the inspection is in progress. The Westfield Public Works Department or designee shall have access to view the television screen at all times.
- G. The Contractor will provide two clear copies of the video/television inspection to the Westfield Public Works Department with complete log sheets.
- H. The technician will provide audio input at the time of inspection pointing out cracks, root intrusion, broken tile, infiltration and any other items pertinent to the evaluation of the sewer line.
- I. After completion of each section of the sewer inspection, the Contractor shall furnish to the Westfield Public Works Department a computerized report. This report will be generated by an onboard computer and printer and will provide commentary on fault areas. The report will also describe all other pertinent findings regarding service connections, breaks or cracks in pipes, bellies or sags, infiltration, and other items of interest.

PART 3 - EXECUTION Not Used

END OF SECTION 02750

REVISIONS

DESCRIPTION

DATE

MARK

REVISIONS



CONSTRUCTION PLANS FOR  
**Bridgewater Marketplace**  
 Gray Road & 146th Street  
 Westfield, Indiana



Job No. 2012-1167



Michael Thompson

Date: August 31, 2012

Scale: Not to Scale

Title: **CITY OF WESTFIELD STANDARDS**

Sheet: **C8.7**

