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RESTRAINED JOINT CALCULATIONS

LENGTH IN FT. TO BE REST. ON EACH SIDE OF FITTING FOR 6" PVC PIPE							
TYPE OF BEND	TEE W/ 4" BRANCH	TEE W/ 6" BRANCH	90° BEND	45° BEND	22 1/2° BEND	11 1/4° BEND	DEADENDS
HORIZ. BEND	28	46	27	11	10	10	12": 51'
VERT. BEND	—	—	—	31-UPPER 10-LOWER	15-UPPER 10-LOWER	10-UPPER 10-LOWER	

LENGTH IN FT. TO BE REST. ON EACH SIDE OF FITTING FOR 12" PVC PIPE								
TYPE OF BEND	TEE W/ 6" BRANCH	TEE W/ 8" BRANCH	TEE W/ 12" BRANCH	90° BEND	45° BEND	22 1/2° BEND	11 1/4° BEND	DEADENDS
HORIZ. BEND	39	58	91	50	21	10	10	12": 97'
VERT. BEND	—	—	—	—	58-UPPER 19-LOWER	28-UPPER 10-LOWER	14-UPPER 10-LOWER	

LENGTH IN FT. TO BE REST. ON EACH SIDE OF FITTING FOR 16" D.I. W/ POLY WRAP									
TYPE OF BEND	TEE W/ 6" BRANCH	TEE W/ 8" BRANCH	TEE W/ 12" BRANCH	TEE W/ 16" BRANCH	90° BEND	45° BEND	22 1/2° BEND	11 1/4° BEND	DEADENDS
HORIZ. BEND	54	87	148	209	68	28	14	10	20": 218'
VERT. BEND	—	—	—	—	—	91-UPPER 25-LOWER	44-UPPER 12-LOWER	22-UPPER 10-LOWER	

LENGTH IN FT. TO BE REST. ON EACH SIDE OF FITTING FOR 20" D.I. W/ POLY WRAP									
TYPE OF BEND	TEE W/ 12" BRANCH	TEE W/ 16" BRANCH	TEE W/ 20" BRANCH	90° BEND	45° BEND	22 1/2° BEND	11 1/4° BEND	DEADENDS	
HORIZ. BEND	136	196	256	82	34	17	10	20": 265'	
VERT. BEND	—	—	—	—	—	110-UPPER 30-LOWER	53-UPPER 15-LOWER	27-UPPER 10-LOWER	

RESTRAINED JOINT NOTES

1. CONTRACTOR SHALL INSTALL RJDI FITTINGS FOR ALL VERTICAL BENDS. FOR HORIZONTAL BENDS, CONTRACTOR MAY INSTALL EITHER CONCRETE THRUST BLOCKING OR THRUST RESTRAINT SYSTEMS. UNLESS NOTED OTHERWISE.

2. RESTRAINED LENGTHS WERE CALCULATED ASSUMING A 2.0 FACTOR OF SAFETY, TYPE 3 TRENCH CONDITIONS, "CL" SOIL CLASSIFICATION, AND 150 PSI HYDROSTATIC TEST PRESSURES.
3. ALL WATER MAIN APPURTENANCES WITHIN RJDI LIMITS MUST BE RESTRAINED AT EACH JOINT.

FOR REDUCERS THE FOLLOWING SHALL BE RESTRAINED ON THE LARGER

4. SIZE:

20"x12" REDUCER = 166'
12"x8" REDUCER = 52'

GENERAL NOTES:

1. WATER MAIN SHALL BE INSTALLED WITH A MINIMUM OF 48" OF COVER, UNLESS OTHERWISE NOTED.
2. ALL PIPING SHALL BE DUCTILE IRON PRESSURE CLASS 250 (UNLESS OTHERWISE NOTED)
3. ENTIRE PUMP STATION SITE (ALL HHRWD PROPERTY) SHALL BE GRADED TO DRAIN SUCH THAT STANDING WATER WILL NOT REMAIN ON SITE.
4. ENTIRE PUMP STATION SITE (ALL HHRWD PROPERTY) NOT UNDER GRAVEL SHALL BE SEEDED.
5. CONTRACTOR SHALL EMPLOY ALL SOIL EROSION PREVENTABLE MEASURES IN ORDER TO KEEP ALL SOIL ON SITE.
6. ALL FITTINGS NOTED AN "RJDI" SHALL BE RESTRAINED JOINT DUCTILE IRON BENDS WITH RESTRAINED PIPE LENGTHS IDENTIFIED ON THIS SHEET. THOSE FITTINGS NOT NOTED AS "RJDI" SHALL EITHER BE RESTRAINED AS IDENTIFIED ON THIS SHEET OR BLOCKED WITH CONCRETE PER DETAILS SHEET.
7. IT IS THE CONTRACTOR'S RESPONSIBILITY TO AVOID EXISTING UTILITIES AND PERFORM ANY REQUIRED REPAIRS. IN ADDITION TO ALL UTILITY LINES, THE CONTRACTOR SHALL BE RESPONSIBLE FOR ANY DAMAGE AND REPAIRS TO BURIED FIBER OPTIC CABLE, FIELD DRAINAGE TILES, AND PRIVATE IRRIGATION SYSTEMS. THE CONTRACTOR SHALL NOTIFY THE OWNER/ENGINEER WHEN UTILITIES OR OTHER SUBSURFACE LINES ARE DAMAGED. INDIANA UNDERGROUND UTILITIES PROTECTION SERVICE SHALL BE NOTIFIED AT LEAST 72 HOURS PRIOR TO BEGINNING ANY WORK. INDIANA UNDERGROUND UTILITIES PROTECTION SERVICE TELEPHONE IS 811. THE CONTRACTOR SHALL REFER TO APPLICABLE SECTIONS OF THE CONTRACT SPECIFICATIONS RELATIVE TO THE ABOVE.
8. CONTRACTOR SHALL NOTIFY RESPECTIVE UTILITY COMPANIES AT LEAST FOUR DAYS PRIOR TO INSTALLATION OF WATER MAIN. CONTRACTOR IS RESPONSIBLE FOR ALL COSTS INCURRED SUPPORTING POLES.
9. THE OWNER HAS OBTAINED THE IDEM, FRANKLIN COUNTY & IDNR PERMITS. THE CONTRACTOR IS RESPONSIBLE FOR ALL OTHER PERMITS NECESSARY TO COMPLETE THE PROJECT, INCLUDING ALL TRAFFIC CONTROL PERMITS.
10. CONTRACTOR SHALL VERIFY ACTUAL PUMP STATION SIZE AND PIPE LOCATIONS AND SUBMIT ANY REQUIRED REVISIONS TO THE ENGINEER PRIOR TO ANY PLACEMENT OF CONCRETE.
11. CONTRACTOR SHALL REMOVE ALL TREES, BRUSH, FENCE, DEBRIS, ETC. ON ENTIRE HHRWD PROPERTY.
12. CONTRACTOR SHALL CONNECT 4" PVC PIPE TO ALL PUMP STATION DRAINS, INSTALL FITTINGS AND PIPE REQUIRED TO A FRENCH DRAIN (4"x4"x4" OF #8 STONE) TO A LOCATION APPROVED BY ENGINEER. LOCATION SHALL BE AT LEAST 30' AWAY FROM PUMP STATION.

SYMBOLS

CULVERT PIPE

DELTA-SURVEY HUB (INDICATES TURN, START, STOP)

DELTA AND MANHOLE LOCATION

SBL SURVEY BASE LINE

APPROXIMATE SOLID ROCK ELEVATION, NO GUARANTEE OF ACCURACY OR ADEQUACY, SEE SPECIFICATIONS

DEPTH OF SOUNDING, NO ROCK ENCOUNTERED

BENCHMARK AND NUMBER

BORING LOCATION AND NUMBER

SPOT ELEVATION

EXISTING FENCE

NEW FENCE

EXISTING CONTOUR & ELEVATION

NEW CONTOUR & ELEVATION

PROPERTY LINE

RIGHT OF WAY

EXISTING STORM SEWER

EXISTING SANITARY SEWER

EXISTING WATER LINE

EXISTING GAS LINE

EXISTING TELEPHONE LINE

RAILROAD

DIRECTION OF FLOW

POWER POLE

DEAD MAN

VEGETATION

TREE

SECTION OR DETAIL NUMBER

SHEET NUMBER WHERE THE DETAIL OR SECTION IS CUT FROM AND/OR DRAWN

BUBBLE & SECTIONING CONVENTIONS

THIS RECORD DOCUMENT HAS BEEN PREPARED BASED ON INFORMATION PROVIDED BY THE CONSTRUCTION CONTRACTOR. GRW ENGINEERS, INC. HAS ATTEMPTED TO VERIFY THE ACCURACY AND/OR COMPLETENESS OF THIS INFORMATION BUT SHALL NOT BE RESPONSIBLE FOR ANY ERRORS OR OMISSIONS WHICH MAY BE INCORPORATED HEREIN AS A RESULT.

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ENGINEER/ARCHITECT: ALEX L. WHITE

CONSTRUCTION COMPANY: ENGINEERED FLUID, INC.

DATE: FEBRUARY 2014

INDEX OF DRAWINGS & GENERAL NOTES

CLIENT CONTRACT NO. G-3

GRW PROJECT NO. 3235

HOOSIER HILLS REGIONAL WATER DISTRICT
DIV. G-3 - P.S. & TELEMETRY IMPROVEMENTS

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1 AS-BUILTS

2/14

CJF

NO.

DESCRIPTION

DATE

BY

REVISIONS

This document, originally issued, sealed, and signed by Alex L. White, Indiana Professional Engineer, No. 11100292, on March 26, 2012, shall not be used in lieu of a certified document.

DESIGNED: ALW

DATE: MARCH 2012

DRAWN: GCR

SCALE: AS SHOWN

REVIEWED: DRC

SHEET NO.

APPROVED: ALW

G-01