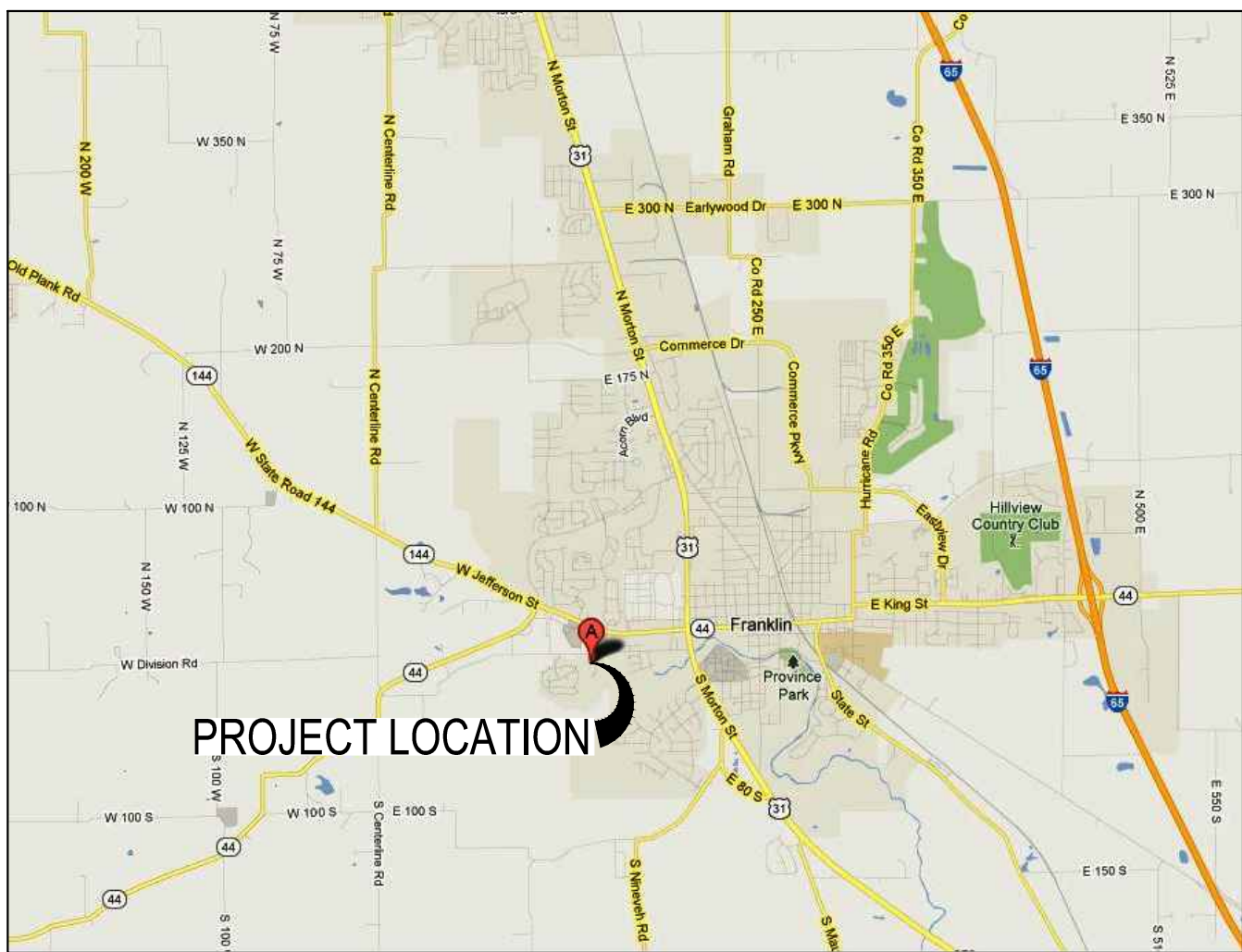


FINAL CONSTRUCTION PLANS

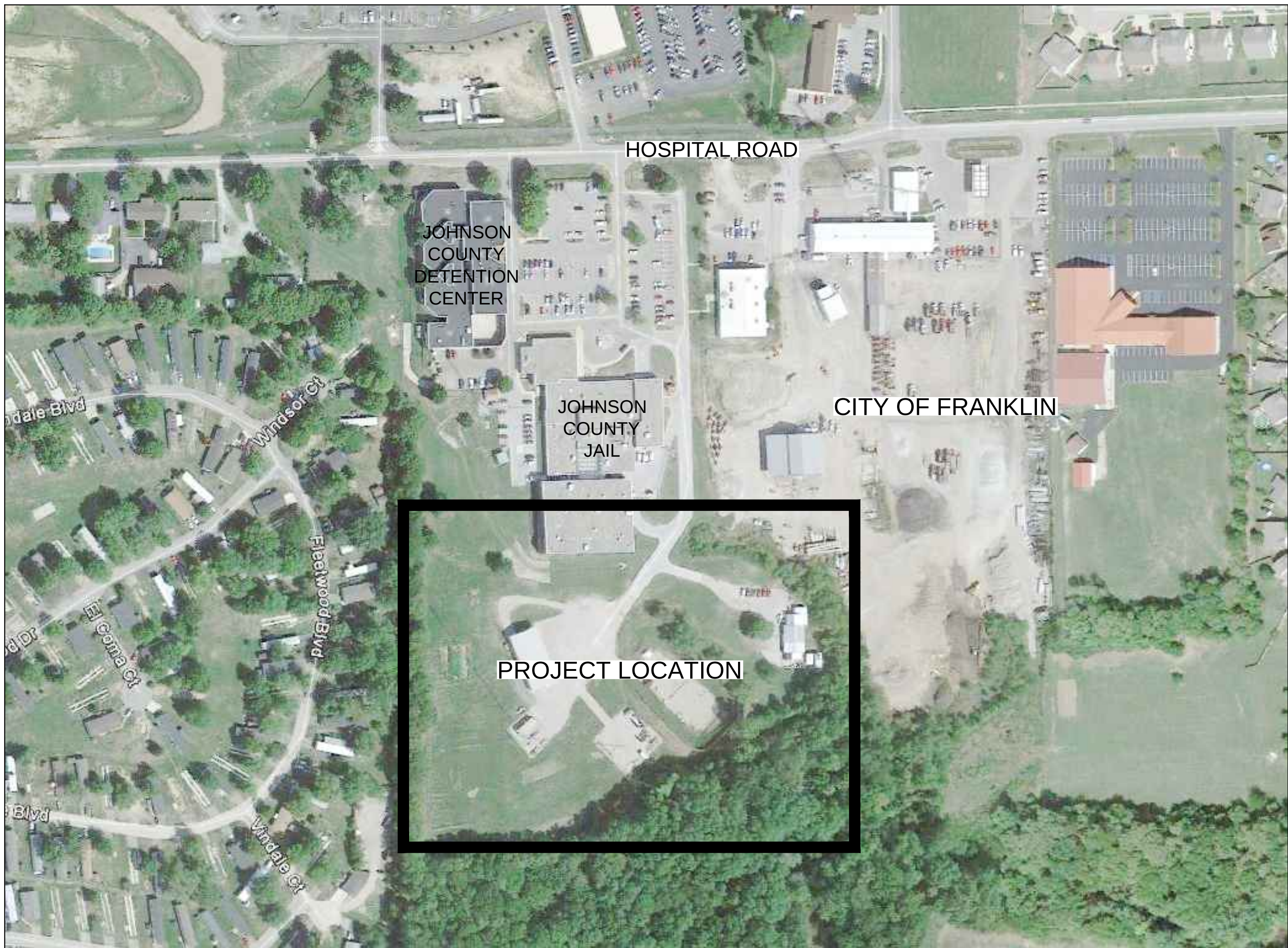
JOHNSON COUNTY SHOOTING RANGE

1091 HOSPITAL ROAD

FRANKLIN, INDIANA



VICINITY MAP
NO SCALE



LOCATION MAP
NO SCALE

PLAN INDEX	
SHEET #	SUBJECT
100	TITLE SHEET
200	TOPOGRAPHICAL SURVEY AND DEMOLITION PLAN
300	SITE DIMENSION AND GRADING PLAN
301	UTILITY PLAN
400	EROSION CONTROL PLAN
401	EROSION CONTROL DETAILS
500	MISCELLANEOUS DETAILS AND SPECIFICATIONS

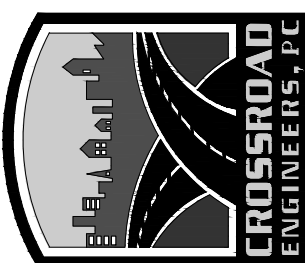


THE REVIEW AND APPROVAL OF THESE SITE PLANS (INCLUDING ANY IMPROVEMENTS MARKED AS "FUTURE" IS VALID FOR 3 YEARS FROM THE FINAL APPROVAL DATE ON FILE WITH THE CITY OF FRANKLIN PLANNING DEPARTMENT.

DIRECTORY PATH : R:\Active\Johnson County Shooting Range\CAD\PLANS
DATE/USER : 5/13/2013 2:54 AM / Greg Ilko

OWNER/DEVELOPER
JOHNSON COUNTY
(BOARD OF COMMISSIONERS)
86 W COURT STREET
FRANKLIN, IN 46131
PHONE: (317) 346-4300
CONTACT: BRIAN BAIRD
bbaird@co.johnson.in.us

ENGINEER
CROSSROAD ENGINEERS, PC
3417 SHERMAN DRIVE
BEECH GROVE, IN 46107
PHONE: (317) 780-1555 x 112
FAX: (317) 780-6525
CONTACT: GREGORY J. ILKO
gilko@crossroadengineers.com



TITLE SHEET

JOHNSON COUNTY SHOOTING RANGE

JOBS No.

DRAWN

LWC

CHECKED

TEN

DATE

April 17, 2013

DESIGNED

CUI

APPR.

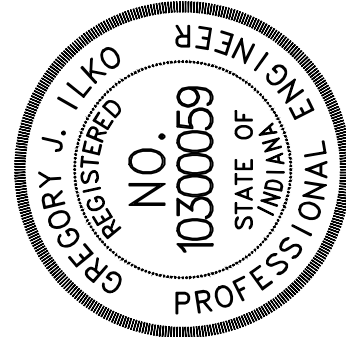
CUI

NO.

100

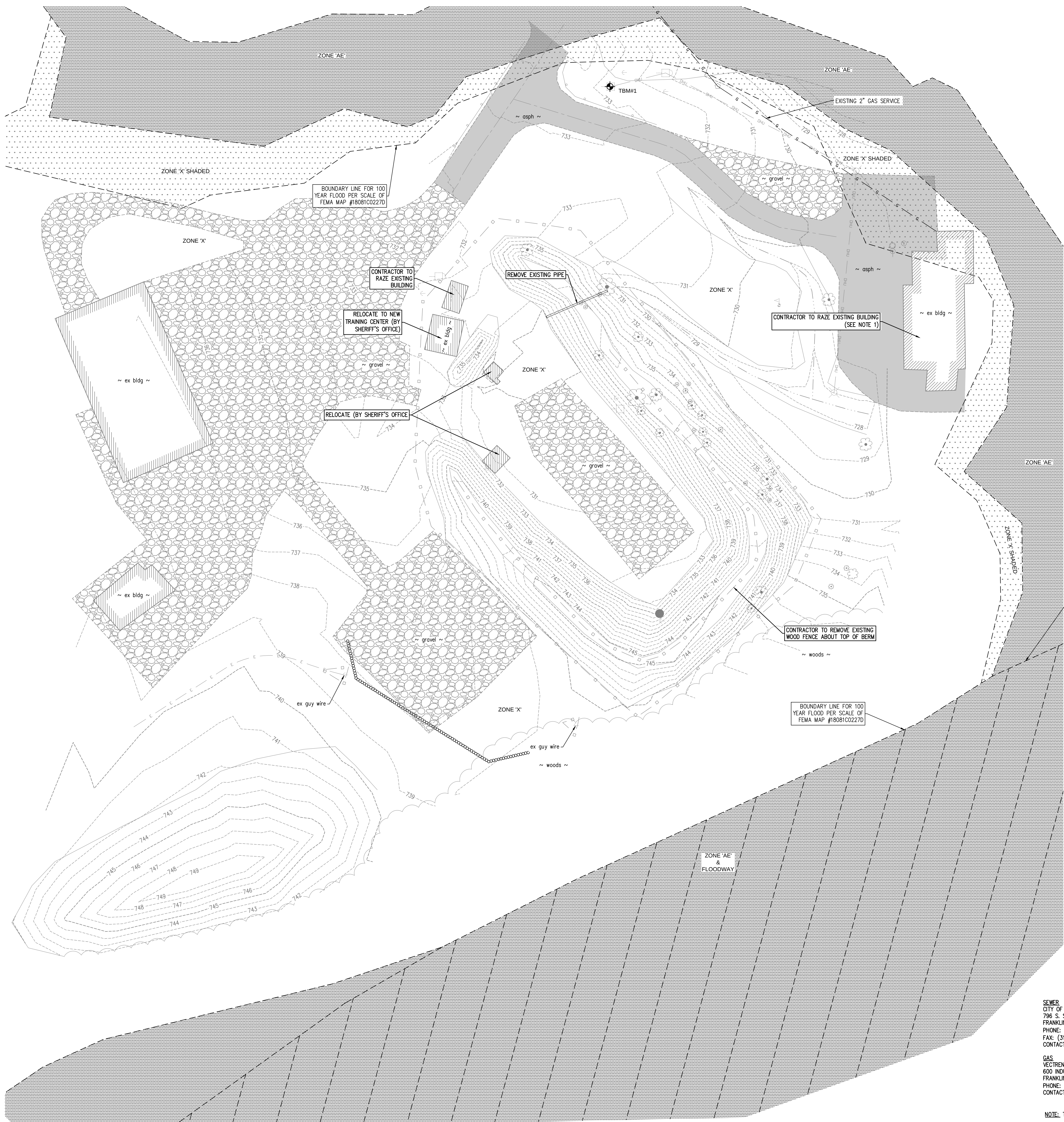
SHEET

100



REVISIONS

NO.	DATE	BY	APP.
1	5-10-13	AEC	CUI
2			
3			
4			
5			
6			
7			
8			
9			



EXISTING LEGEND	
POWERPOLE W/RISER	CONTOURS
LIGHT POLE	PROPERTY LINE
ELECTRIC BOX	PAVEMENT LINE
GUIDE WIRE	FEMA FLOODPLAIN LINE
GAS VALVE	FENCE
FLAG POLE	DITCH
SIGN	OVERHEAD UTILITY LINE
TREE, BUSH & STUMP	TREE LINE
TEMP. BENCHMARK	STORM SEWER
MONUMENT FOUND	GUARDRAIL
ASPHALT	GRAVEL
BUILDING	FLOODPLAIN

TOPOGRAPHICAL NOTES

- DEMOLITION PERMITS, WITH APPLICABLE TESTING RESULTS PROVIDED BY CONTRACTOR, SHALL BE OBTAINED THROUGH THE CITY OF FRANKLIN PRIOR TO ANY DECONSTRUCTION WORK.
- CONTRACTOR SHALL DISPOSE OF ALL MATERIALS IN ACCORDANCE WITH FEDERAL, STATE, AND LOCAL REGULATIONS.
- UTILITIES ARE GRAPHICAL REPRESENTATION PER SURVEY AND MAPPING. CONTRACTOR SHALL FIELD VERIFY ALL UTILITIES PRIOR TO CONSTRUCTION.
- REMOVE EXISTING RESIDENTIAL STRUCTURE, WELLS AND SEPTIC SYSTEMS SHALL BE ABANDON PER ALL FEDERAL, STATE, AND LOCAL REGULATIONS. A REPRESENTATIVE FROM THE DAVESS COUNTY HEALTH DEPARTMENT SHALL BE PRESENT DURING REMOVAL OPERATIONS. CONTRACTOR SHALL BE RESPONSIBLE FOR ALL HAZARDOUS MATERIAL TESTING AND REMOVAL (IF DEEMED NECESSARY) FOR THE EXISTING STRUCTURES.
- CONTRACTOR SHALL COORDINATE WITH APPLICABLE UTILITY COMPANIES FOR SERVICE DIS-CONNECTIONS.

FLOODPLAIN INFORMATION

BY GRAPHIC PLOTTING ONLY, THIS TRACT OF LAND DESCRIBED HEREON LIES WITHIN ZONE 'X' (AREAS DETERMINED TO BE OUTSIDE OF THE 0.2% ANNUAL CHANCE FLOODPLAIN), ZONE 'X' SHADED (AREAS OF 0.2% ANNUAL CHANCE FLOODPLAIN), AND ZONE 'AE' (THE FLOODWAY IS THE CHANNEL OF A STREAM PLUS ANY ADJACENT FLOODPLAIN AREAS) AND IS IN A SPECIAL FLOOD HAZARD AREA AS PLOTTED ON THE FEDERAL EMERGENCY MANAGEMENT AGENCY FLOOD INSURANCE RATE MAP FOR JOHNSON COUNTY, INDIANA, COMMUNITY PANEL NO. 18081C0227D, WHICH BEARS AN EFFECTIVE DATE OF AUGUST 2, 2007.

BENCHMARK INFORMATION

BM #1
NGS BENCHMARK
DESIGNATION -- X 13
PID -- KA0010
VERTICAL ORDER -- FIRST CLASS II
DESCRIPTION:
AT THE INTERSECTION OF NEW STATE ROAD 144 AND OLD STATE ROAD 37, IN THE SOUTHWEST QUARTER OF THE INTERSECTION. A STANDARD DISK, STAMPED 686.370 X 13 1930 AND SET IN THE TOP OF A CONCRETE POST PROJECTING 7 INCHES ABOVE GROUND.
ELEVATION = 685.57 FEET (NAVD 88)
TBM #1
BARN NAIL FOUND ON WEST SIDE OF PWP #364-301 UP ± 1.5'
ELEVATION = 734.64

UTILITIES

Note: Listed below are the Indiana Underground Plant Protection Services Contacts; Others not listed may exist.

SEWER
CITY OF FRANKLIN
796 S. STATE STREET
FRANKLIN, IN 46131
PHONE: (317) 736-3640
FAX: (317) 736-6709
CONTACT: RICK LITTLETON

GAS
VECTREN
600 INDUSTRIAL DRIVE
FRANKLIN, IN 46131
PHONE: (317) 736-2965
CONTACT: DAYNA RAUWERDINK

WATER
INDIANA-AMERICAN WATER CO.
100 S. PARK BLVD.
GREENWOOD, IN 46143
PHONE: (317) 881-0270 EXT. 4
FAX: (317) 887-3054
CONTACT: RON BOLLARD

TELEPHONE/CABLE
COMCAST COMMUNICATIONS
1600 W. VERNAL PIKE
BLOOMINGTON, IN 47404
PHONE: (812) 822-3267
CONTACT: STEVE MCARTOR

ELECTRIC
DUKE ENERGY
2215 N. WORTON STREET
FRANKLIN, IN 46131
PHONE: (317) 736-2017
FAX: (317) 736-2028
CONTACT: COREY HAMBLIN

FIRE DEPARTMENT
CITY OF FRANKLIN FIRE DEPARTMENT
1800 THORNBURG LANE
FRANKLIN, IN 46131
PHONE: (317) 736-3650
FAX: (317) 736-8967
CONTACT: BRYNE PURSIFULL

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

EXISTING UTILITY SIZE AND MATERIAL INFORMATION SHOWN ON THESE PLANS ARE PER THE BEST GRAPHICAL AND VISIBLE INFORMATION AVAILABLE. CONFLICTS MAY EXIST AND IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO FIELD VERIFY ALL SIZING AND MATERIAL INFORMATION PROVIDED. IF ACTUAL CONDITIONS DIFFER FROM THAT INFORMATION SHOWN ON THE PLANS, THE CONTRACTOR SHALL, PRIOR TO THE INSTALLATION OF ANY PROPOSED INFRASTRUCTURE, NOTIFY THE DESIGN ENGINEER IMMEDIATELY.



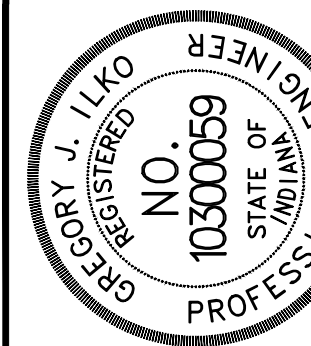
CALL 2 WORKING DAYS BEFORE YOU DIG
1-800-382-5544 or 811

CALL TOLL FREE
PER INDIANA STATE LAW (IS-5-1981) IT IS AGAINST THE LAW TO EXCAVATE WITHOUT NOTIFYING THE UNDERGROUND LOCATION SERVICE TWO (2) WORKING DAYS BEFORE COMMENCING WORK.

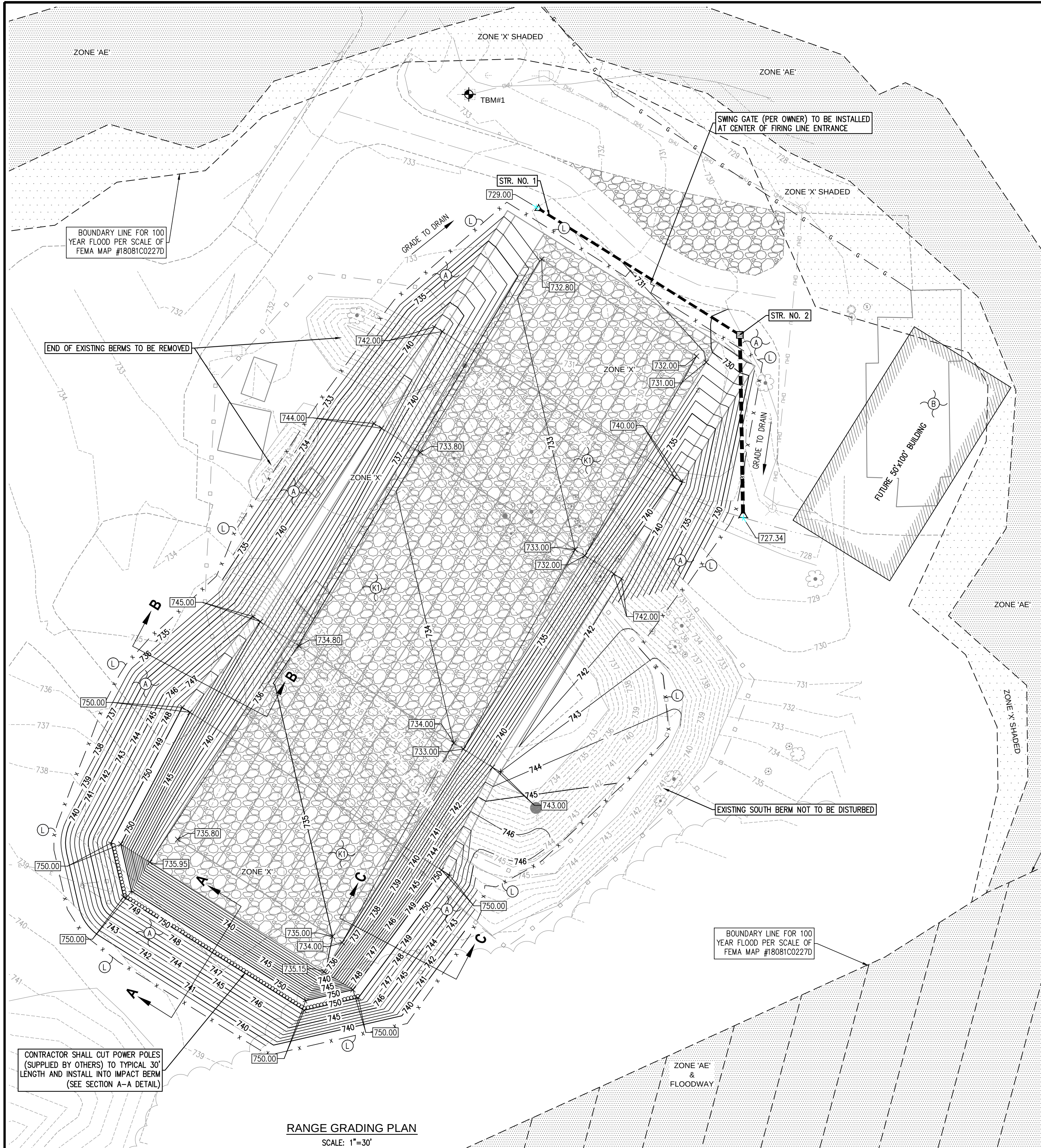


TOPOGRAPHICAL SURVEY AND DEMOLITION PLAN JOHNSON COUNTY SHOOTING RANGE

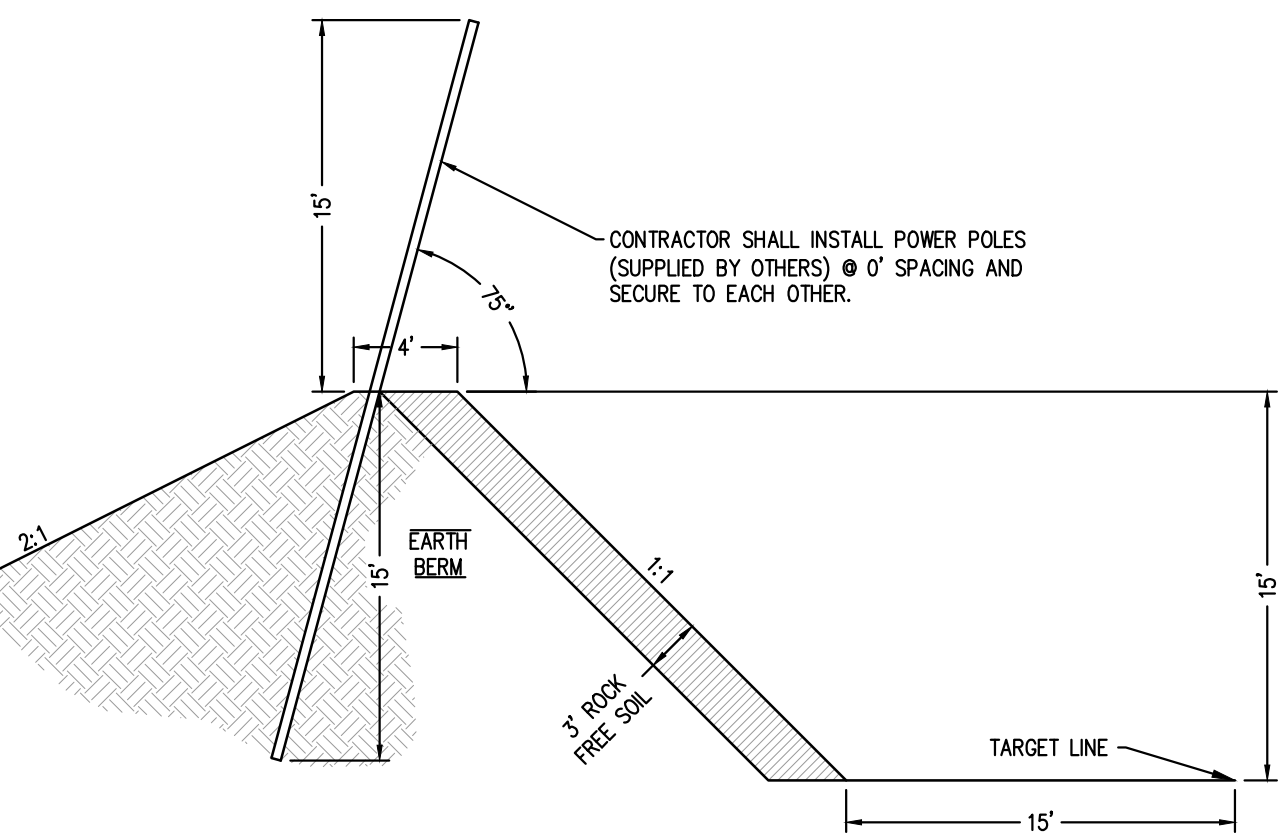
JOB NO.	DRAWN	CHECKED	TEN	CU	APPR.
DATE	April 17, 2013	DESIGNED	CU		



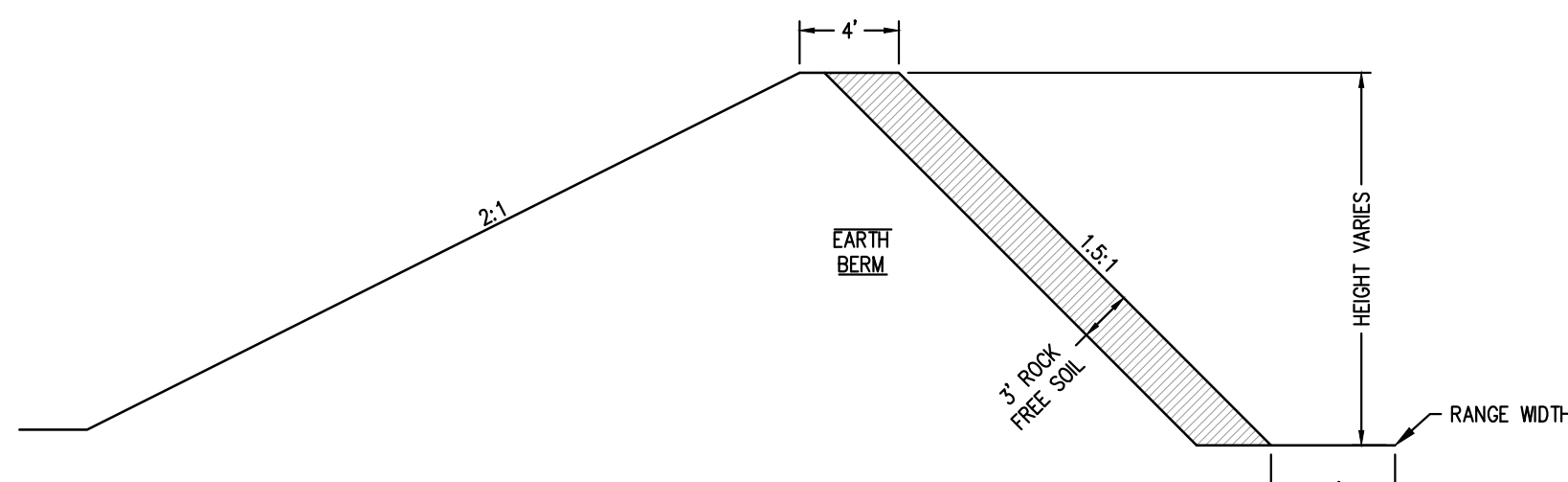
NO.	DATE	BY	REV	REVISIONS
1	5-10-13	AEC		REVISIONS PER TAC COMMENTS RECEIVED 05-02-13
2				
3				
4				
5				
6				
7				
8				
9				



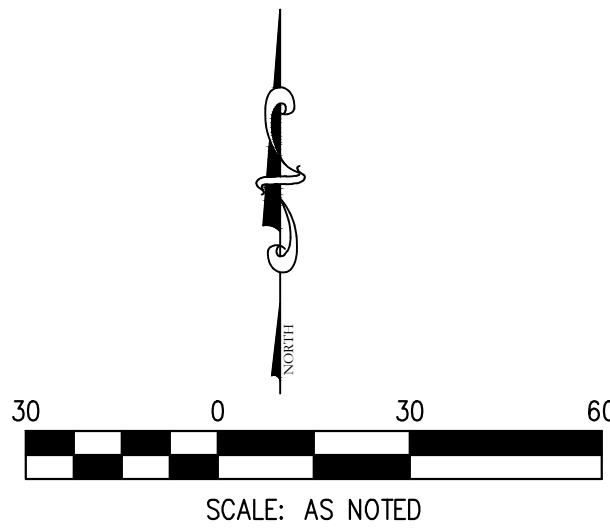
RANGE GRADING PLAN
SCALE: 1"=30'



IMPACT BERM DETAIL
SECTION A-A
NTS



WEST SIDE PROTECTION DETAIL
SECTION B-B
NTS



STORM STRUCTURE DATA TABLE	
STR. NO. 1	STR. NO. 2
INSTALL 105 LFT OF 12" HDPE PIPE @ 0.90% WITH ONE (1) PIPE END SECTION. U.S. EL.=729.00 D.S. EL.=728.06 (CONNECT TO STR. NO. 2)	INSTALL INLET TYPE E-7 WITH 80 LFT OF 15" HDPE PIPE @ 0.90% WITH ONE (1) PIPE END SECTION. RIM EL.=730.00 INV. IN (12"-W)=728.06 INV. IN (15"-S)=728.06 D.S. EL.=727.34

BENCHMARK INFORMATION	
BM #1 NGS BENCHMARK DESIGNATION - X 13 PD - KAD010 VERTICAL ORDER - FIRST CLASS II	
DESCRIPTION: AT THE INTERSECTION OF NEW STATE ROAD 144 AND OLD STATE ROAD 37, IN THE SOUTHWEST QUARTER OF THE INTERSECTION. A STANDARD DISK, STAMPED 686.370 X 13 1930 AND SET IN THE TOP OF A CONCRETE POST PROJECTING 7 INCHES ABOVE GROUND. ELEVATION = 685.57 FEET (NAVD 88)	
TBM #1 BARN NAIL FOUND ON WEST SIDE OF PWP #364-301 UP ± 1.5' ELEVATION = 734.64	

SITE DIMENSION LEGEND	
(A) MULCH SEEDING/LANDSCAPE AREAS	
(B) STRUCTURE FOUNDATION - PER BUILDING PLANS	
(K1) GRAVEL SECTION 6" PEA GRAVEL, ON COMPACTED SUBGRADE (SEE DETAIL-THIS SHEET)	
(L) 6" CHAIN LINK FENCE	

GRADING LEGEND	
X 850.00 TOP OF CURB 850.00 EDGE OF PAVEMENT X 860.00 FINISH GRADE	PROPOSED ELEVATIONS
X 860.00 * X 859.50 * X 860.00 *	PROPOSED ELEVATIONS (TO BE FIELD VERIFIED)
F.F. ELEV. = 810.70	PROPOSED FINISH FLOOR ELEVATION
----- 800 -----	PROPOSED DRAINAGE SWALE
----- 800 -----	EXISTING CONTOURS
----- 800 -----	PROPOSED CONTOURS
--- GRADE BREAK ---	GRADE BREAK
--->--->---	CURB HEIGHT TO TAPER FROM 0.5' TO 0.0' IN 6' LFT.

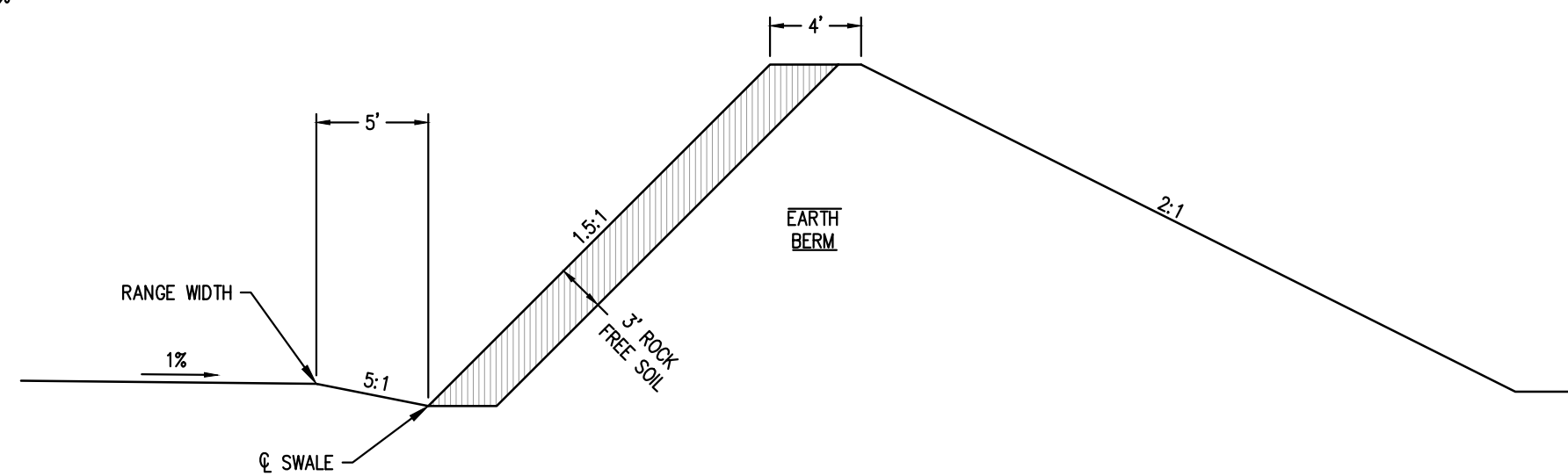
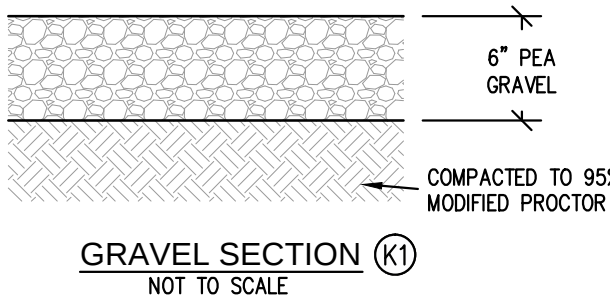
SITE DIMENSION NOTES	
1. CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING TRAFFIC AND PROVIDING ALL NECESSARY FLAGMAN, BARRELS, SIGNAGE, ETC. DURING CONSTRUCTION. ALL APPLICABLE M.U.T.C.D. STANDARDS SHALL GOVERN THIS WORK.	
2. CONTRACTOR SHALL COORDINATE WITH APPLICABLE UTILITY COMPANY'S AND BUILDING PLANS FOR WATER, CABLE, ELECTRIC, GAS, AND TELEPHONE CONNECTION SERVICE POINTS.	
3. LANDSCAPING PLAN TO BE PROVIDED BY OTHERS. CONTRACTOR SHALL COORDINATE WITH OWNER AND CITY OF FRANKLIN FOR SPECIFICATIONS.	
4. EXISTING UTILITY SIZE AND MATERIAL INFORMATION SHOWN ON THESE PLANS ARE PER THE BEST GRAPHICAL AND VISIBLE INFORMATION AVAILABLE. CONFLICTS MAY EXIST AND IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO FIELD VERIFY ALL SIZING AND MATERIAL INFORMATION PROVIDED. IF ACTUAL CONDITIONS DIFFER FROM THAT INFORMATION SHOWN ON THE PLANS, THE CONTRACTOR SHALL, PRIOR TO THE INSTALLATION OF ANY PROPOSED INFRASTRUCTURE, NOTIFY THE DESIGN ENGINEER IMMEDIATELY.	
5. FUTURE BUILDING CONSTRUCTION AND APPLICABLE ARCHITECTURAL PLANS SHALL BE REVIEWED AND PERMITTED SEPARATELY. CONTRACTOR SHALL COORDINATE WITH JOHNSON COUNTY COMMISSIONERS FOR NECESSARY DESIGN INFORMATION.	

GRADING NOTES	
1. CONTRACTOR SHALL BE PROVIDE POSITIVE DRAINAGE AWAY FROM ALL BERMS IN FINAL GRADING OF SITE. IN NO INSTANCE SHALL DRAINAGE TOWARDS THE EXISTING BUILDING FOUNDATIONS BE ALLOWED.	
2. CONTRACTOR SHALL NOT ALLOW DRAINAGE FROM PROJECT SITE TO DISCHARGE ONTO ADJACENT PROPERTIES IN FINAL GRADING OF SITE.	

NOTE:
NO EARTHWORK DISTURBING ACTIVITY MAY COMMENCE UNTIL A STORM WATER MANAGEMENT PERMIT IS OBTAINED.

EXISTING UTILITY SIZE AND MATERIAL INFORMATION SHOWN ON THESE PLANS ARE PER THE BEST GRAPHICAL AND VISIBLE INFORMATION AVAILABLE. CONFLICTS MAY EXIST AND IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO FIELD VERIFY ALL SIZING AND MATERIAL INFORMATION PROVIDED. IF ACTUAL CONDITIONS DIFFER FROM THAT INFORMATION SHOWN ON THE PLANS, THE CONTRACTOR SHALL, PRIOR TO THE INSTALLATION OF ANY PROPOSED INFRASTRUCTURE, NOTIFY THE DESIGN ENGINEER IMMEDIATELY.

RANGE DIMENSIONS
SCALE: 1"=40'



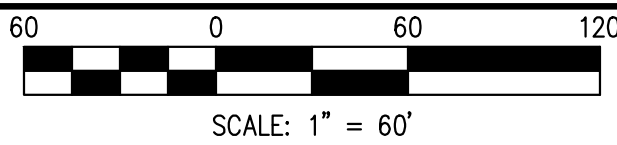
EAST SIDE PROTECTION DETAIL
SECTION C-C
NTS



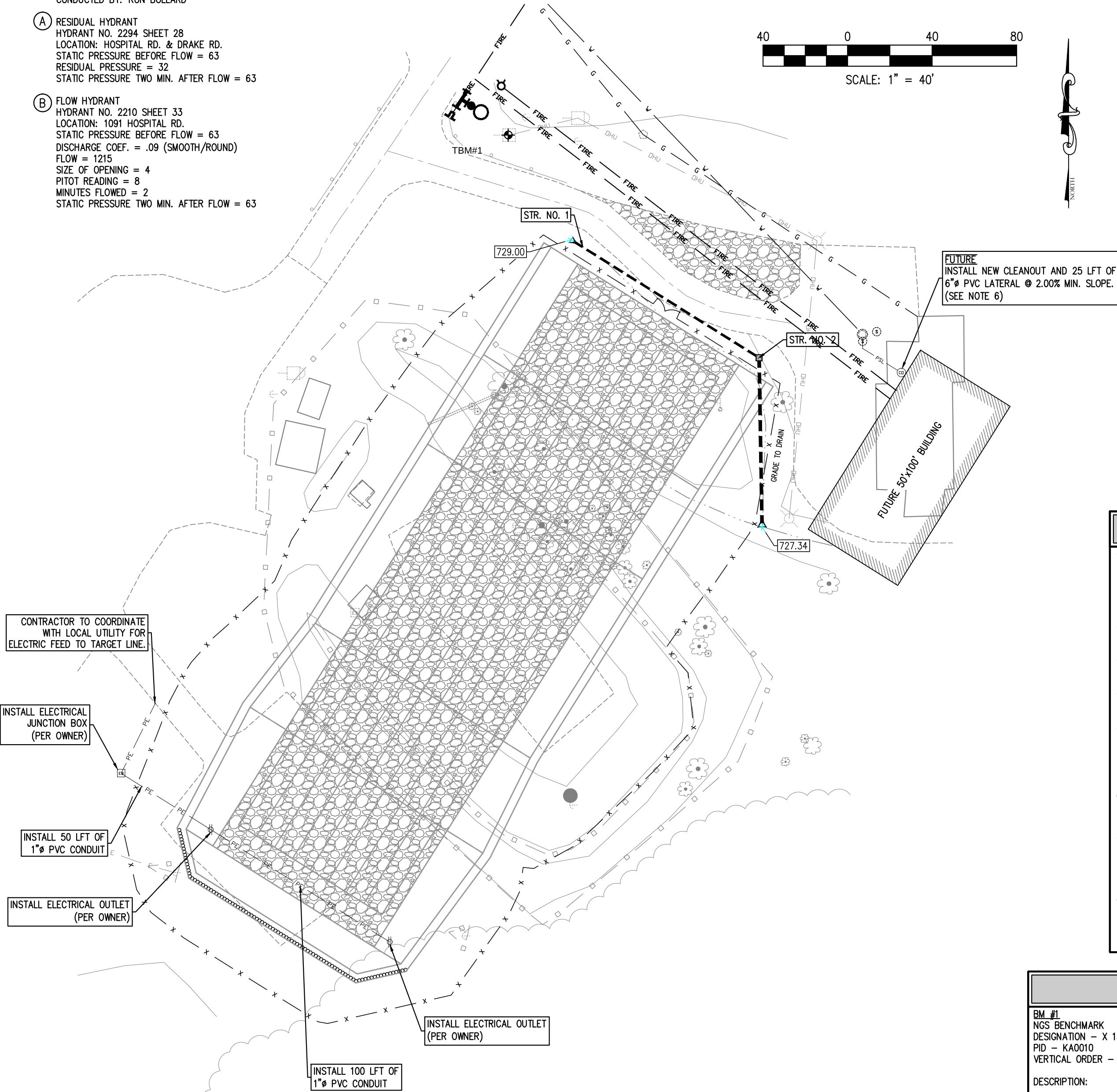
SHEET 300	
SITE DIMENSION AND GRADING PLAN	
JOHNSON COUNTY SHOOTING RANGE	
JOB NO.	DRAWN
DATE	DESIGNED
APRIL 17, 2013	CU
APPR.	CU
NO.	1
DATE	5-10-13
REVISIONS	PER TAC COMMENTS RECEIVED 05-02-13
BY	AEC
APPR.	CU



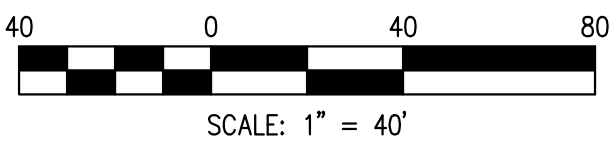
WATER/FIRE SERVICE PLAN
SCALE: 1"=60'



- INDIANA AMERICAN WATER FLOW TEST RESULTS
DATE: 5-7-13 TIME: 9:15 AM
CONDUCTED BY: RON BOLLARD
- (A) RESIDUAL HYDRANT
HYDRANT NO. 2294 SHEET 28
LOCATION: HOSPITAL RD. & DRAKE RD.
STATIC PRESSURE BEFORE FLOW = 63
RESIDUAL PRESSURE = 32
STATIC PRESSURE TWO MIN. AFTER FLOW = 63
- (B) FLOW HYDRANT
HYDRANT NO. 2210 SHEET 33
LOCATION: 1091 HOSPITAL RD.
STATIC PRESSURE BEFORE FLOW = 63
DISCHARGE COEF. = .09 (SMOOTH/ROUND)
FLOW = 1215
SIZE OF OPENING = 4
PITOT READING = 8
MINUTES FLOWED = 2
STATIC PRESSURE TWO MIN. AFTER FLOW = 63



ELECTRICAL/SEWER PLAN
SCALE: 1"=40'



PROPOSED LEGEND	
	PROPERTY LINE
	SECTION LINE
	PHASE LINE
	SETBACK LINE
	FENCE LINE
	DITCH LINE
	SANITARY SEWER WITH MANHOLE
	SANITARY SEWER LATERAL WITH CLEANOUT
	STORM SEWER W/MANHOLE
	ELECTRIC LINE
	WATER LINE
	WATER SERVICE LINE
	GAS LINE
	STORM INLETS
	AQUA SWIRL
	WATER TEE
	45° BEND
	11.25° BEND
	TAPPING SLEEVE
	WATER VALVE
	FIRE HYDRANT
	WATER VAULT
	STORMZ FDC
	ELECTRIC TRANSFORMER
	GENERATOR
	GREASE TRAP
	LIGHT POLE
	YARD LIGHT
	SIGN

UTILITIES NOTES

- WATER MAIN INSTALLATION SHALL BE IN ACCORDANCE WITH THE INDIANA AMERICAN WATER UTILITY STANDARDS AND SPECIFICATIONS. CONTRACTOR SHALL COORDINATE WITH UTILITY FOR CONNECTION AND TESTING PROCEDURES AND REQUIREMENTS. ALL WATER MAIN SHALL BE INSTALLED WITH A MINIMUM 56 INCHES OF COVER FROM FINISH GRADE. MAIN SHALL BE DEFLECTED AS REQUIRED TO MAINTAIN MINIMUM SEPARATION REQUIREMENTS AT ALL UTILITY CROSSINGS.
- CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING TRAFFIC AND PROVIDING ALL NECESSARY FLAGMAN, BARRELS, SLOWING, ETC. DURING CONSTRUCTION. ALL APPLICABLE M.U.T.C.D. STANDARDS SHALL GOVERN THIS WORK.
- CONTRACTOR SHALL COORDINATE WITH APPLICABLE UTILITY COMPANIES AND BUILDING PLANS FOR WATER, CABLE, ELECTRIC, AND TELEPHONE CONNECTION SERVICE POINTS.
- CONTRACTOR TO COORDINATE WITH DUKE ENERGY FOR NECESSARY ELECTRIC SERVICE REQUIREMENTS AND SPECIFICATIONS, AND FUTURE BUILDING PLANS FOR ALL SERVICE POINTS AT BUILDING.
- EXISTING UTILITY SIZE AND MATERIAL INFORMATION SHOWN ON THESE PLANS ARE PER THE BEST GRAPHICAL AND VISIBLE INFORMATION AVAILABLE. CONFLICTS MAY EXIST AND IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO FIELD VERIFY ALL SIZING AND MATERIAL INFORMATION PROVIDED. IF ACTUAL CONDITIONS DIFFER FROM THAT INFORMATION SHOWN ON THE PLANS, THE CONTRACTOR SHALL, PRIOR TO THE INSTALLATION OF ANY PROPOSED INFRASTRUCTURE, NOTIFY THE DESIGN ENGINEER IMMEDIATELY.
- CONTRACTOR TO CLEAN OUT EXISTING MANHOLE AND PIPE. IF EXISTING SANITARY MAIN AT SUCH TIME AS LATERAL CONNECTION IS MADE, A VISUAL INSPECTION SHALL BE PERFORMED AND FINDINGS, AFTER CLEANING OF EXISTING INFRASTRUCTURE, SHALL BE REPORTED TO OWNER/ENGINEER BEFORE NEW LATERAL CONNECTION IS MADE.
- FUTURE PRIVATE HYDRANT SHALL BE PAINTED RED WITH THE TOP CAP PAINTED FOR WATERFLOW:
 - BLUE = 1500 GPM
 - GREEN = 1000-1499 GPM
 - ORANGE = 500-999 GPM
- ALL FUTURE FIRE SERVICE LINES AND FIRE SUPPRESSION SYSTEM LINES SHALL BE SIZED BY FIRE SUPPRESSION SYSTEM DESIGNER. IF CONNECTION TO EXISTING 6" MAIN IS NOT ADEQUATE, FIRE SUPPRESSION DESIGNER MAY REQUIRE CONNECTION TO EXISTING 8" MAIN ON NORTH SIDE OF HOSPITAL ROAD. CONTRACTOR SHALL VERIFY WITH DESIGNER PRIOR TO TAP.

BENCHMARK INFORMATION

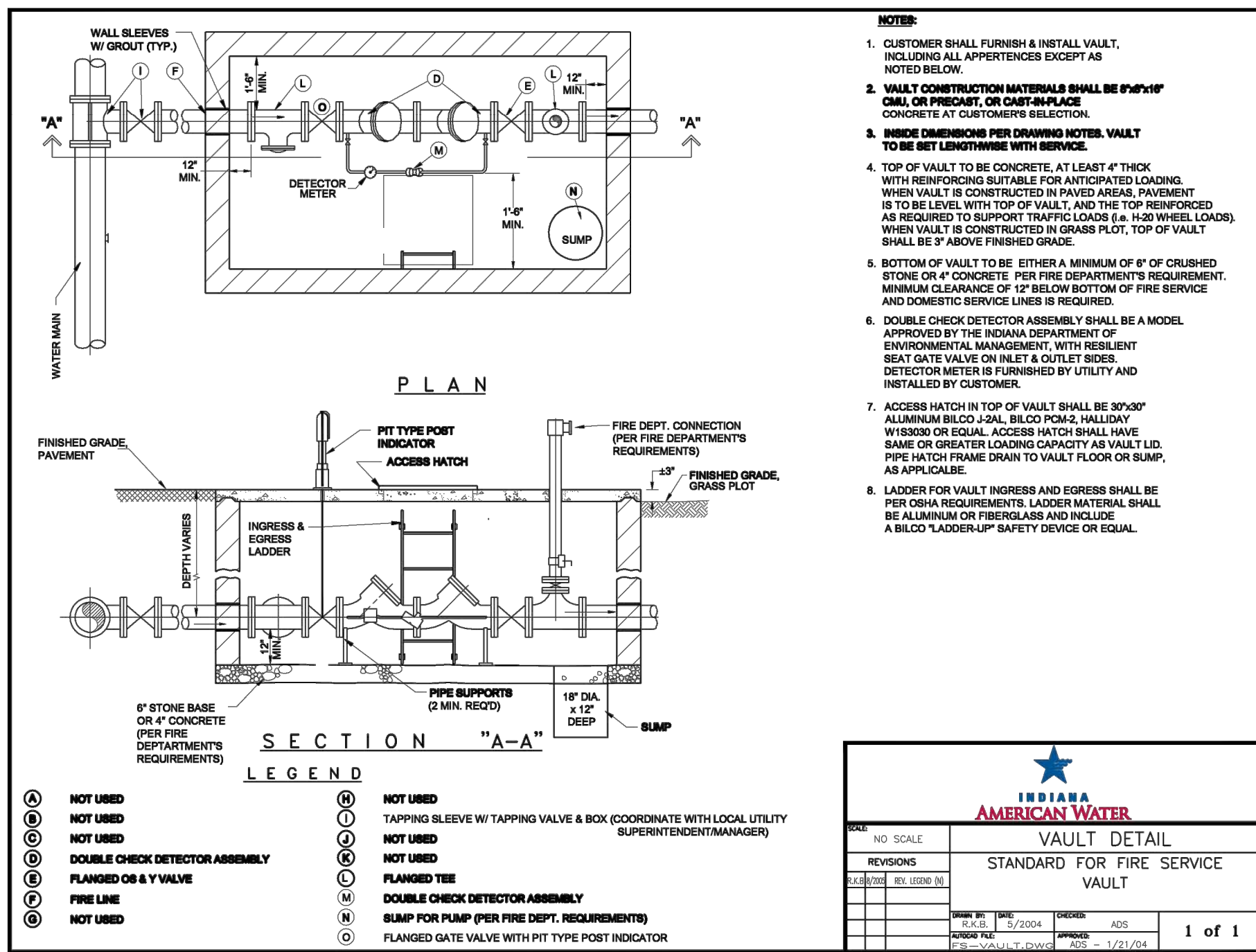
BM #1
NGS BENCHMARK
DESIGNATION - X 13
PID - K40010
VERTICAL ORDER - FIRST CLASS II

DESCRIPTION:
AT THE INTERSECTION OF NEW STATE ROAD 144 AND OLD STATE ROAD 37, IN THE SOUTHWEST QUARTER OF THE INTERSECTION, A STANDARD DISK, STAMPED 686.370 X 13 1930 AND SET IN THE TOP OF A CONCRETE POST PROJECTING 7 INCHES ABOVE GROUND.

ELEVATION = 685.57 FEET (NAVD 88)

TBM #1
BARN NAIL FOUND ON WEST SIDE OF PWP #364-301 UP ± 1.5'

ELEVATION = 734.64



STANDARD FIRE SERVICE VAULT DETAIL
(NOT TO SCALE)

UTILITY PLAN

JOHNSON COUNTY SHOOTING RANGE

JOB NO.	DRAWN	LWC	CHECKED	TEN	CUI
DATE	April 17, 2013	DESIGNED	CUI	APPR.	

NO.	1	2	3	4	5	6	7	8	9
REVISIONS PER TAC COMMENTS RECEIVED 05-02-13									

DATE 5-10-13

BY AEC

APPR. CUI

INDIANA811

Know what's below. Call before you dig.

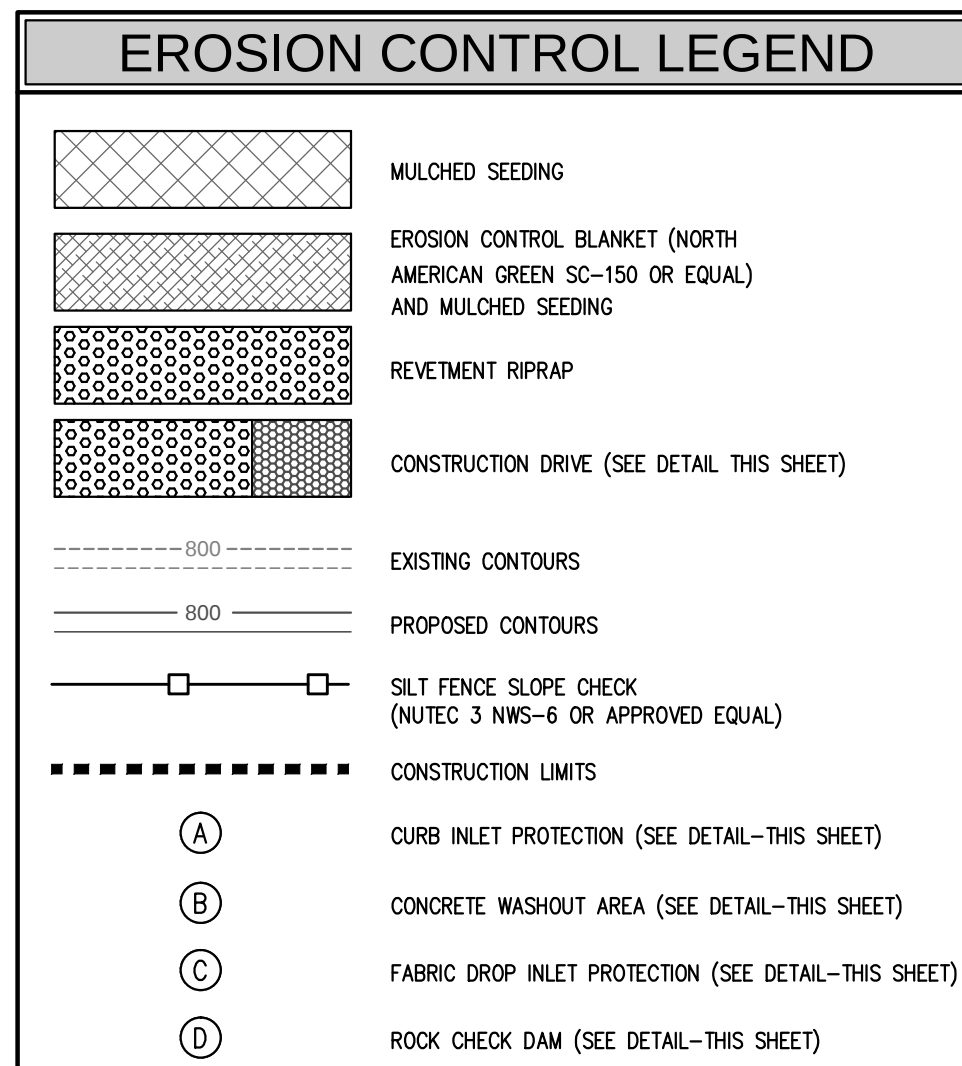
"IT'S THE LAW"

CALL 2 WORKING DAYS BEFORE YOU DIG

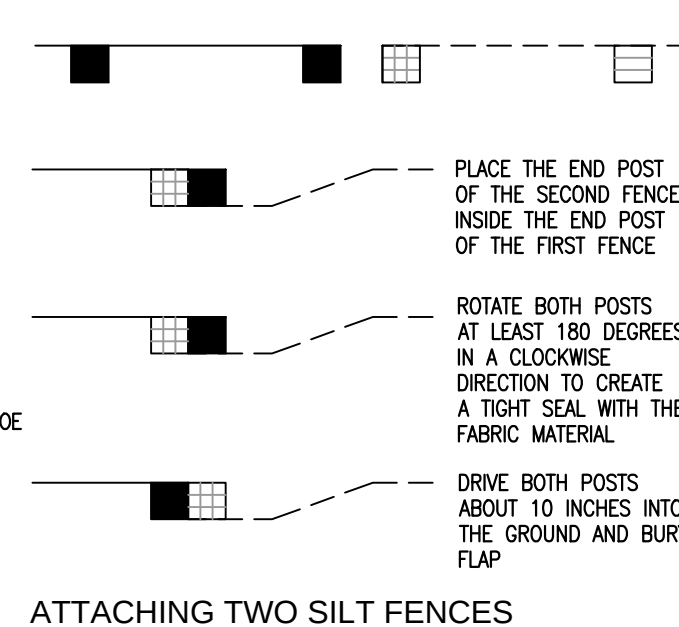
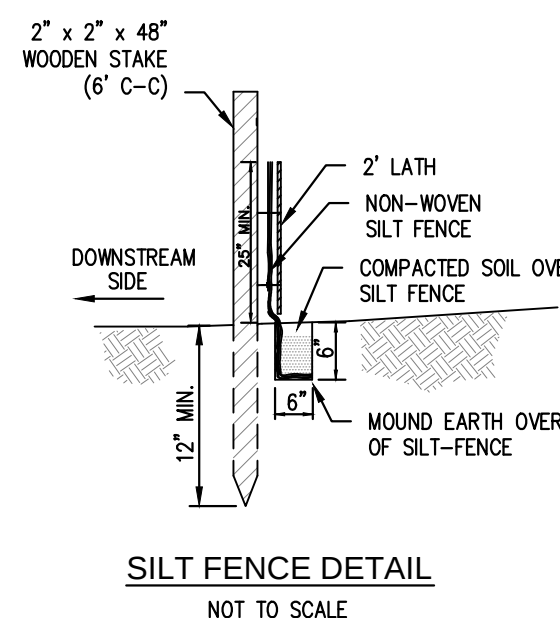
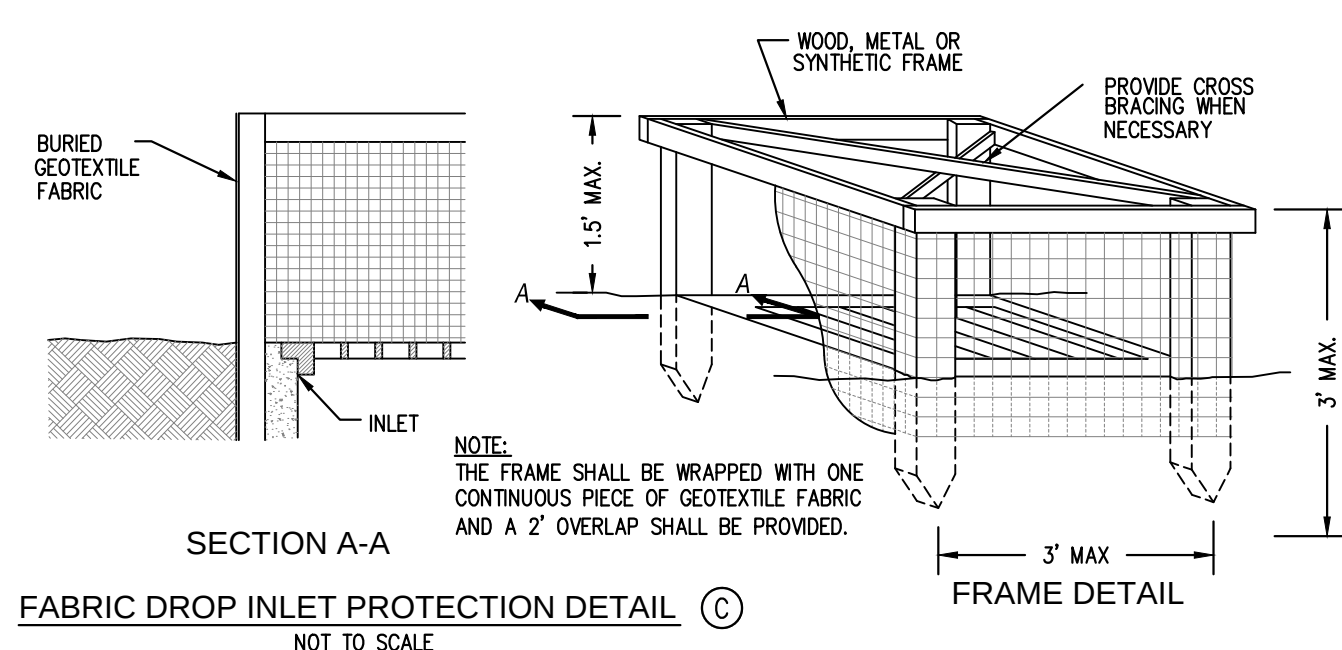
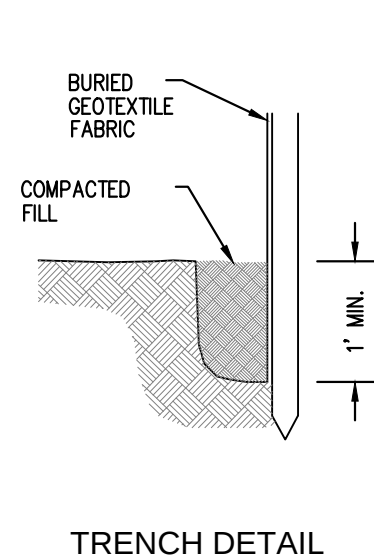
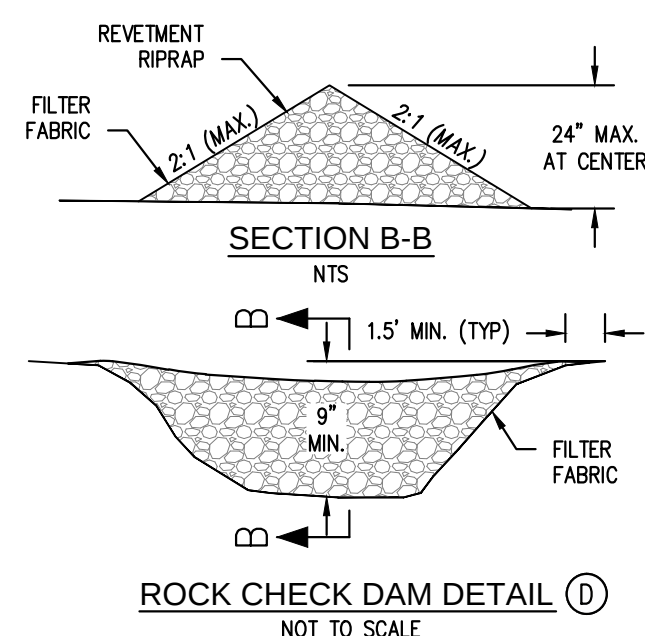
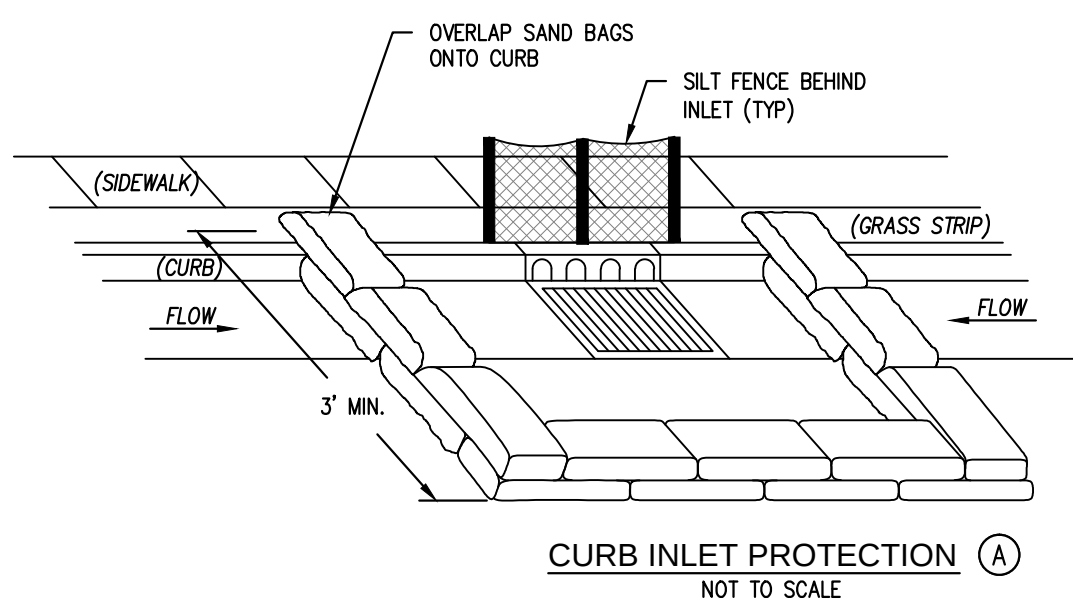
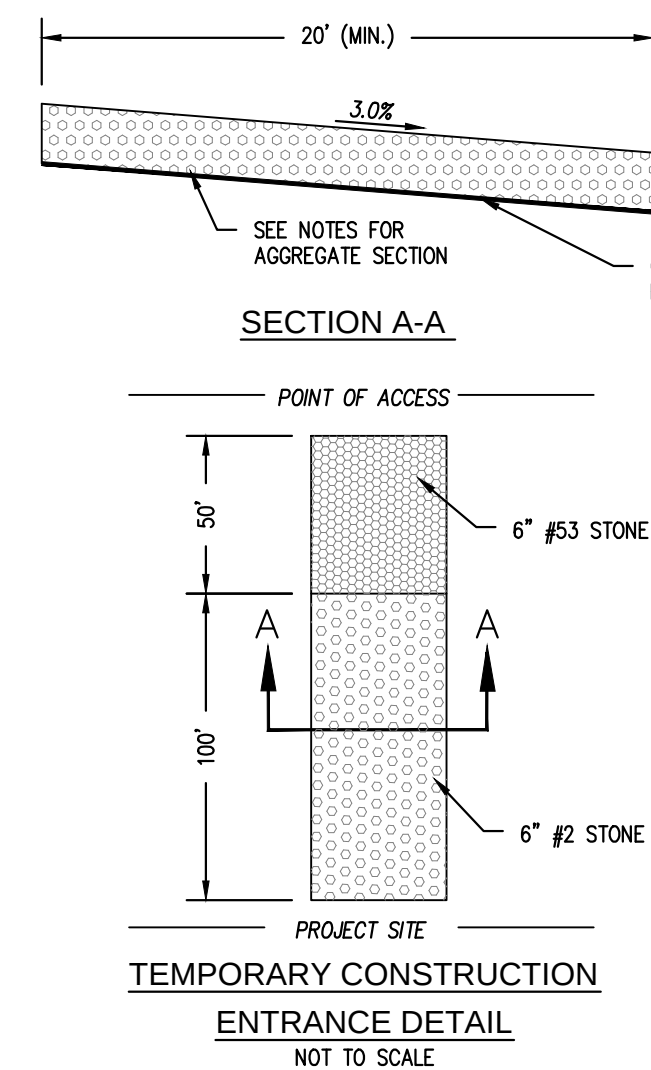
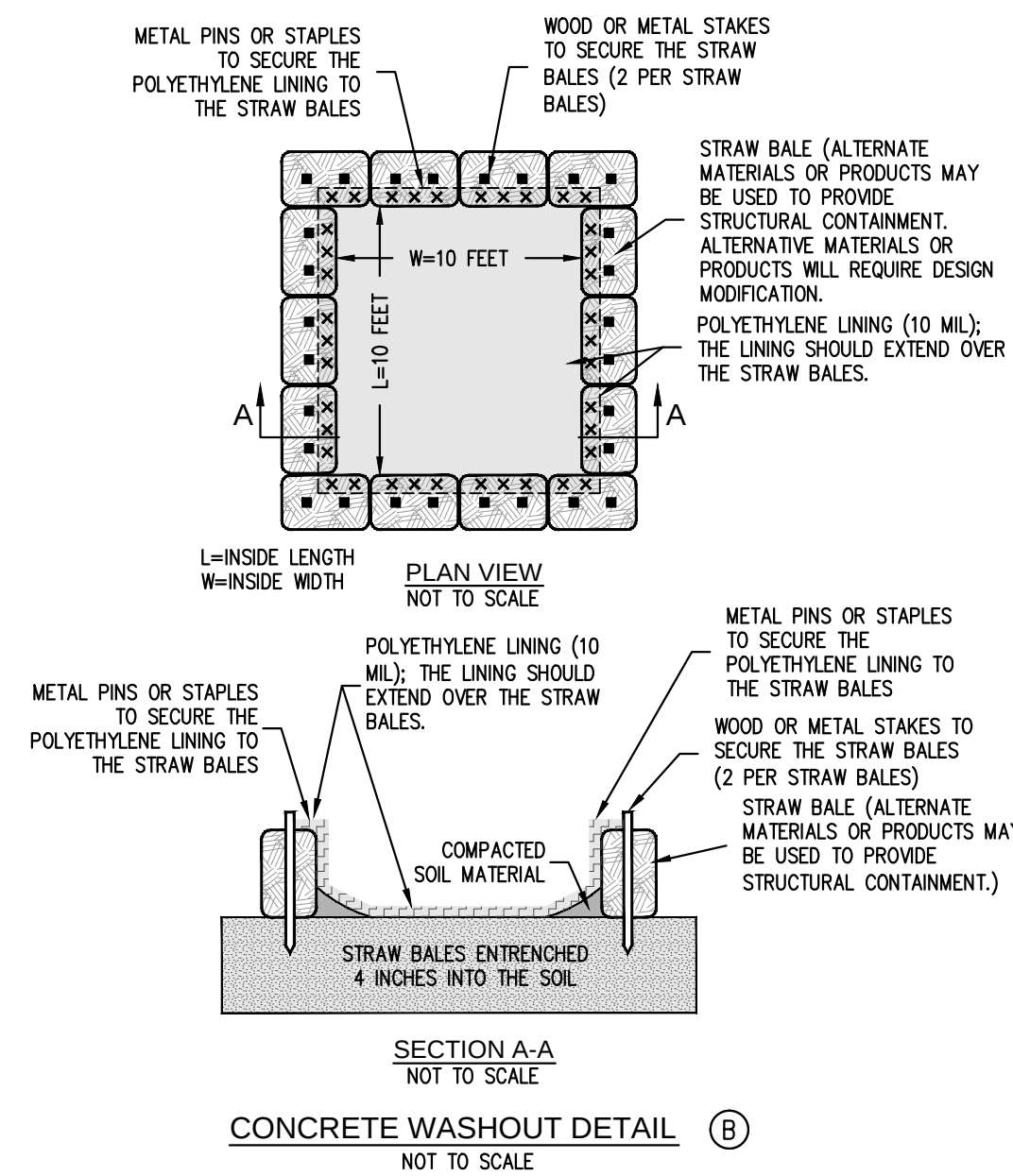
1-800-382-5544 or 811

CALL TOLL FREE

PER INDIANA STATE LAW (5-69-1991) IT IS AGAINST THE LAW TO EXCAVATE WITHOUT NOTIFYING THE UNDERGROUND LOCATION SERVICE TWO (2) WORKING DAYS BEFORE COMMENCING WORK.



1. ADDITIONAL EROSION CONTROL MEASURES MAY BE REQUIRED BY STATE, COUNTY, OR LOCAL OFFICIALS.
2. ADDITIONAL EROSION CONTROL MEASURES MAY BE REQUIRED IN THE FIELD BY THE INSPECTOR.
3. THERE SHALL BE NO DIRT, DEBRIS, OR STORAGE OF MATERIALS WITHIN THE IDENTIFIED PROPOSED PARKING AREAS.
4. CONSTRUCTION STAGING AREA (TO BE DETERMINED BY CONTRACTOR) SHALL INCLUDE THE NOI POSTING, PORT-A-TOILETS, TRASH CONTAINERS, AND FUELING TANKS. CONTRACTOR SHALL NOT LOCATE STAGING AREA WITHIN PROPOSED PARKING AREA.
5. THE INDIVIDUAL MUST PERFORM AN INSPECTION ONCE A WEEK AND AFTER EVERY RAIN OR MORE RAIN EVENT. A LOG OF THE INSPECTION RESULTS MUST BE KEPT AND MADE AVAILABLE TO THE TOWN INSPECTOR UPON REQUEST.



EXISTING UTILITY SIZE AND MATERIAL INFORMATION SHOWN ON THESE PLANS ARE PER THE BEST GRAPHICAL AND VISIBLE INFORMATION AVAILABLE. CONFLICTS MAY EXIST AND IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO FIELD VERIFY ALL SIZING AND MATERIAL INFORMATION PROVIDED, IF ACTUAL CONDITIONS DIFFER FROM THAT INFORMATION SHOWN ON THE PLANS, THE CONTRACTOR SHALL, PRIOR TO THE INSTALLATION OF ANY PROPOSED INFRASTRUCTURE, NOTIFY THE DESIGN ENGINEER IMMEDIATELY.



EARTHWORK

- SCOPE OF WORK**
- A. EXISTING: THE WORK REQUIRED UNDER THIS SECTION CONSISTS OF ALL EXCAVATING, FILLING, ROUGH GRADING AND RELATED ITEMS NECESSARY TO COMPLETE THE WORK INDICATED ON THE DRAWINGS AND DESCRIBED IN THE SPECIFICATIONS. THE CONTRACTOR SHALL NOTIFY IN WRITING THE OWNER AND THE ENGINEER OF ANY CHANGES OR OMISSIONS FOUND ON THE PLANS OR IN THE FIELD, BEFORE THE WORK IS STARTED OR RESUMED.
 1. IN GENERAL, THE ITEMS OF WORK TO BE PERFORMED UNDER THIS SECTION SHALL INCLUDE CLEARING AND GRUBBING, REMOVAL OF TREES AND STUMPS, STRIPPING AND STORAGE OF TOPSOIL, FILL COMPACTATION AND ROUGH GRADING OF ENTIRE SITE. ALL TREES SHALL BE REMOVED UNLESS OTHERWISE NOTED IN PLANS OR DIRECTED BY OWNER.
 2. EXCAVATED MATERIAL THAT IS SUITABLE MAY BE USED FOR FILLS, ALL UNSUITABLE MATERIAL AND EXCESS SURPLUS EXCAVATED SHALL NOT BE REMOVED FROM THE SITE. THE LOCATION OF PUMP AND LENGTH OF HAUL SHALL BE THE CONTRACTOR'S RESPONSIBILITY.
 3. PROVIDE AND PLACE ANY ADDITIONAL FILL MATERIAL FROM OFF THE SITE AS MAY BE NECESSARY TO PRODUCE THE GRADES REQUIRED, FILL OBTAINED FROM OFF SITE SHALL BE OF KIND AND QUALITY AS SPECIFIED FOR FILLS HEREIN AND THE SOURCE APPROVED BY THE OWNER.
 4. THE CONTRACTOR SHALL ACCEPT THE SITE AS HE FINDS IT AND SHALL REMOVE ALL TRASH, RUBBISH AND DEBRIS FROM THE SITE PRIOR TO STARTING EXCAVATION
- 2. BENCHMARK**
- A. MAINTAIN CAREFULLY ALL BENCH MARKS, MONUMENTS AND OTHER REFERENCE POINTS; IF DISTURBED OR DESTROYED, CONTRACTOR SHALL CONTACT ENGINEER.
- 3. REMOVAL OF TREES**
- A. THE INTEGRITY OF THE TOPOGRAPHIC FEATURES (INCLUDING TREES) SHALL BE PRESERVED AS MUCH AS POSSIBLE. THE CONTRACTOR SHALL COORDINATE WITH OWNER AND/OR ENGINEER PRIOR TO CLEARING THE SITE FOR CONSTRUCTION.
 1. ALL BRUSH, STUMPS, WOOD AND OTHER REFUSE FROM THE TREES REMOVED SHALL BE HAULED TO DISPOSAL AREAS OFF THE SITE. DISPOSABLE BY BURNING SHALL NOT BE PERMITTED UNLESS PRIOR PERMITS ARE OBTAINED (WHERE APPLICABLE).
- 4. HANDLING OF TOPSOIL**
- A. REMOVE ALL ORGANIC MATERIAL FROM THE AREAS TO BE OCCUPIED BY BUILDINGS, ROADS, WALKS AND PARKING AREAS. REMOVE AND STORE TOPSOIL IN A LOCATION WHERE IT WILL NOT INTERFERE WITH CONSTRUCTION OPERATIONS. TOPSOIL SHALL BE REASONABLY FREE FROM SUBSOIL, DEBRIS, WEEDS, GRASS, STONES, ETC.
 - B. AFTER COMPLETION OF SITE GRADING AND SUBSURFACE UTILITY INSTALLATION, TOPSOIL SHALL BE REPLACED IN AREAS DESIGNATED ON THE EROSION CONTROL PLAN FOR SEEDING AND/OR SOODING, ANY REMAINING TOPSOIL SHALL BE USED FOR FINISHED GRADING AROUND STRUCTURES AND LANDSCAPING AREAS.
- 5. DISPOSITION OF UTILITIES**
- A. RULES AND REGULATIONS GOVERNING THE RESPECTIVE UTILITIES SHALL BE OBSERVED IN EXECUTING ALL WORK UNDER THIS SECTION.
 - B. IF ACTIVE UTILITIES ARE ENCOUNTERED BUT NOT SHOWN ON THE DRAWINGS, THE ENGINEER SHALL BE ADVISED BEFORE WORK IS CONTINUED.
 - C. INACTIVE AND ABANDONED UTILITIES ENCOUNTERED IN EXCAVATING AND GRADING OPERATIONS SHALL BE REPORTED TO THE ENGINEER. THEY SHALL BE REMOVED, PLUGGED OR CAPPED AS DIRECTED BY THE UTILITY COMPANY OR THE ENGINEER.
 - D. IT SHALL BE THE RESPONSIBILITY OF EACH CONTRACTOR TO VERIFY ALL EXISTING UTILITIES AND CONDITIONS PERTAINING TO HIS PHASE OF THE WORK. IT SHALL ALSO BE THE CONTRACTOR'S RESPONSIBILITY TO CONTACT THE OWNERS OF THE VARIOUS UTILITIES BEFORE WORK IS STARTED.
- 6. SITE GRADING**
- A. GRADES: CONTRACTOR SHALL PERFORM ALL CUTTING, FILLING, COMPACTING OF FILLS AND ROUGH GRADING REQUIRED TO BRING ENTIRE PROJECT AREA TO GRADE AS SHOWN ON THE DRAWINGS.
 - B. ROUGH GRADING: THE TOLERANCE FOR PAVED AREAS SHALL NOT EXCEED 0.10 FEET PLUS OR MINUS AROUND THE ESTABLISHED GRADE. ALL OTHER AREAS SHALL NOT EXCEED 0.10 FEET PLUS OR MINUS AROUND THE ESTABLISHED GRADE. ALL BANKS AND OTHER BREAKS IN GRADE SHALL BE ROUNDED AT THE TOP AND BOTTOM.
- C. COMPACTATION REQUIREMENTS:**
1. ALL BUILDING AREAS SHALL BE COMPACTED TO STANDARDS SPECIFIED BY LOCAL AND/OR STATE BUILDING CODES.
 2. COMPACTATION REQUIREMENTS OF PAVED AREAS SHALL BE 95% OF MAXIMUM DRY DENSITY.

MINOR ADJUSTMENTS TO THE GRADES MAY BE REQUIRED TO EARTHWORK BALANCES WHEN MINOR EXCESS MATERIAL OR SHORTAGES ARE ENCOUNTERED. IT IS RECOGNIZED BY THE PARTIES HERETO THAT THE CALCULATIONS OF THE ENGINEER IN ACCORDANCE WITH THE AMERICAN SOCIETY OF CIVIL ENGINEERS' STANDARD SPECIFICATIONS FOR HIGHWAY CONSTRUCTION, LATEST EDITION, AND THE STANDARD INTERPRETATIONS OF SOIL BORINGS AS THE PHYSICAL LIMITS IN FINISH GRADE AND COMPACTION PERMITTED THE CONTRACTOR, AND THAT ALL OF THESE PARAMETERS MAY CAUSE EITHER AN EXCESS OR SHORTAGE OF ACTUAL EARTHWORK MATERIALS TO COMPLETE THE PROJECT. IF SUCH AN OCCURRENCE SHOULD OCCUR, THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE CORRECTION. THE CONTRACTOR SHALL CONTACT THE ENGINEER TO DETERMINE IF ADJUSTMENTS CAN BE MADE TO CORRECT THE IMBALANCE OF EARTH.

STREETS

- SCOPE OF WORK
- A. THE WORK REQUIRED UNDER THIS SECTION INCLUDES ALL CONCRETE AND BITUMINOUS PAVING AND RELATED ITEMS NECESSARY TO COMPLETE THE WORK INDICATED ON THE DRAWINGS AND DESCRIBED IN THE SPECIFICATIONS, INCLUDING BUT NOT LIMITED TO:
1. ALL STREETS, PARKING AREAS WITHIN THE CONTRACT LIMITS.
 2. CURBS AND CONCRETE RAMPS.
 3. SIDEWALKS AND CONCRETE SLABS.
 4. IN THE CASE OF ANY CONFLICTS WITH THESE SPECIFICATIONS AND LOCAL, STATE, FEDERAL SPECIFICATIONS THE MORE STRINGENT SHALL APPLY.
 - B. IN THE CASE OF ANY CONFLICTS WITH THESE SPECIFICATIONS AND LOCAL, STATE, FEDERAL SPECIFICATIONS THE MORE STRINGENT SHALL APPLY.
2. PAVEMENT CONSTRUCTION
- A. ALL STREET CONSTRUCTION SHALL BE IN ACCORDANCE WITH THE PLANS AND SPECIFICATIONS AND CONFORM TO THE MINIMUM STANDARDS OF THE JOHNSON COUNTY PLANNING AND HIGHWAY DEPARTMENTS, AND IF THERE ARE AREAS UNDEFINED USE THE CURRENT I.N.D.O.T. STANDARDS SPECIFICATIONS, AS REVISED.
- B. FLEXIBLE PAVEMENT
1. MATERIALS
 - A. GENERAL: USE LOCALLY AVAILABLE MATERIALS AND GRADATIONS WHICH CRUSHED OR UNSATISFACTORY REMOVED OF PREVIOUS INSTALLATIONS.
 - B. COMPACTED AGGREGATE BASE: SOUND, ANGULAR OR CRUSHED, STONE, CRUSHED OR UNCRUSHED GRAVEL, OR CRUSHED OR PROCESSED AIR-COOLED BLAST FURNACE SLAG. COURSE AGGREGATE SHALL BE CLASS A, TYPE "0" AND CONFORM TO I.N.D.O.T. STANDARD SPECIFICATIONS SECTION 903.
 - C. BASE COURSE AGGREGATE: SOUND, ANGULAR CRUSHED STONE, CRUSHED OR UNCRUSHED GRAVEL, OR CRUSHED SLAB, SAND, STONE, OR CLAY SCREENINGS. COARSE AGGREGATES SHALL BE CLASS A OR B AND CONFORM TO I.N.D.O.T. STANDARDS SPECIFICATIONS SECTION 903.
 - D. COURSE AGGREGATE FOR SURFACE AND BINDER MIXTURES: CRUSHED STONE, CRUSHED GRAVEL, CRUSHED SLAB, CRUSHED SAND, CRUSHED NATURAL SAND. SURFACE COURSE AGGREGATES SHALL BE CLASS A AND CONFORM TO I.N.D.O.T. STANDARD SPECIFICATIONS SECTION 903.
 - E. ASPHALT CEMENT: PETROLEUM STANDARD ASPHALT CEMENT, AP 5 WITH PENETRATION OF 60-70 OR VISCOSITY GRADED ASPHALT CEMENT AC-20 CONFORMING TO I.N.D.O.T. STANDARD SPECIFICATIONS SECTION 408.
 - F. PRIME COAT: MEDIUM-CURE LIQUID ASPHALT OR ASPHALT EMULSION CONFORMING TO I.N.D.O.T. STANDARD SPECIFICATIONS SECTION 408.
 - G. TACK COAT: RAPID-CURE LIQUID ASPHALT OR ASPHALT EMULSION CONFORMING TO I.N.D.O.T. STANDARD SPECIFICATIONS SECTION 408.
 - H. LANE MARKING PAINT: CHLORINATED RUBBER-ALKYD TYPE, AASHTO M248 (FS TT-1P15), TYPE III.
 - I. SEAL COAT: (NOT APPLICABLE IN JOHNSON COUNTY)
3. ASPHALT-AGGREGATE MIXTURE
- ALL BITUMINOUS MIXTURES ARE TO CONFORM TO CURRENT I.N.D.O.T. SPECIFICATIONS
- A. SPREAD COURSE: HMA SURFACE 9.5mm
 - B. BINDER COURSE: HMA INTERMEDIATE 19.0mm
 - C. BASE COURSE: TYPE: HMA BASE 25.0mm
 - D. IMPROVED: A JOB MIX FORMULA FOR EACH TYPE OF ASPHALT PRIOR TO THE BEGINNING OF THE CONSTRUCTION PROJECT.
4. SURFACE PREPARATION
- A. REMOVE LOOSE MATERIAL FROM COMPACTED SUBBASE SURFACE IMMEDIATELY BEFORE APPLYING PRIME COAT.
- 1) PROOF ROLL SUBGRADE SURFACE WITH LOADED TRI-AXLE TRUCK (48 HOUR NOTICE IS REQUIRED TO BE GIVEN TO THE JOHNSON COUNTY HIGHWAY DEPT.) TO CHECK FOR UNSTABLE AREAS AND AREAS REQUIRING ADDITIONAL COMPACTION.
 - 2) NOTIFY CONTRACTOR OF UNSATISFACTORY CONDITIONS. DO NOT BEGIN PAVING WORK UNTIL DEFICIENT SUBBASE AREAS HAVE BEEN CORRECTED AND ARE READY TO RECEIVE PAVING.
- B. AGGREGATE BASE: AFTER PLACEMENT, PROOF ROLL COMPACTED AGGREGATE BASE SURFACE TO CHECK FOR UNSTABLE AREAS AND AREAS REQUIRING ADDITIONAL COMPACTION.
- 1) NOTIFY CONTRACTOR OF UNSATISFACTORY CONDITIONS. DO NOT BEGIN PAVING WORK UNTIL DEFICIENT AGGREGATE BASE AREAS HAVE BEEN CORRECTED AND ARE READY TO RECEIVE PAVING.
 - 2) REMOVE LOOSE MATERIAL FROM COMPACTED AGGREGATE BASE SURFACE IMMEDIATELY BEFORE APPLYING PRIME COAT.
5. PLACING THE MIX
- A. GENERAL: PLACE BITUMINOUS AGGREGATE MIXTURE ON PREPARED SURFACE, SPREAD AND STRIKE-OFF. SPREAD MIXTURE AT MINIMUM TEMPERATURE OF 225 DEGREES F.(107 DEGREES C), PLACE INACCESSIBLE AND SMALL AREAS BY HAND. PLACE EACH COURSE TO REQUIRED GRADE, CROSS-SECTION, AND COMPACTED THICKNESS.
- B. BASE COURSE, COMPACTED AGGREGATE: SPREAD AND COMPACT IN TWO LIFTS AS FOLLOWS:
- 1) FIRST LIFT: NO. 5'S SHALL BE A MINIMUM OF 4" OR $\frac{1}{2}$ THE TOTAL DEPTH OF AGGREGATE. EXTEND THE FIRST LIFT 4" OR A DISTANCE EQUAL TO THE DEPTH OF THE LIFT BEYOND THE SECOND LIFT.
 - 2) SECOND LIFT: SIZE NO. 53
- C. SURFACE COAT: SURFACE SHALL BE PRIMED IN ACCORDANCE WITH THE APPLICABLE REQUIREMENTS SECTION 408 OF I.N.D.O.T. STANDARD SPECIFICATIONS.
- D. HOT ASPHALT CEMENT BINDER COURSE: SPREAD AND ROLL TO MINIMUM FINISH DEPTHS INDICATED ON DETAILS.
- E. TACK COAT: BINDER COURSE SHALL BE TACKED PRIOR TO THE INSTALLATION OF THE SURFACE COURSE IN ACCORDANCE WITH THE APPLICABLE REQUIREMENTS OF SECTION 409 OF I.N.D.O.T. STANDARD SPECIFICATIONS.

- F. SURFACE COURSE: SPREAD AND ROLL TO MINIMUM FINISH DEPTH INDICATED ON DETAILS. FINISH ELEVATION SHALL BE TRUE TO LINE AND GRADE WITHIN $\frac{1}{8}$ " OF TRUE ELEVATIONS.
 - G. PAVING PLACING: PLACE IN STRIPS NOT LESS THAN 10' WIDE, UNLESS OTHERWISE ACCEPTABLE TO ARCHITECT/ENGINEER. AFTER FIRST STRIP HAS BEEN PLACED AND ROLLED, PLACE SUCCEEDING STRIPS AND EXTERD ROLLING TO OVERLAP PREVIOUS STRIPS. COMPLETE INDIVERSE COURSE FOR A SECTION BEFORE STARTING SURFACE COURSE.
 - H. JOINTS: MAKE JOINTS BETWEEN OLD AND NEW PAVEMENTS, OR BETWEEN PAVES, OR BETWEEN JOINTS IN PAVEMENT, TO ENSURE CONTINUOUS BOND BETWEEN ADJOINING WORK. CONSTRUCT JOINTS TO HAVE SAME TEXTURE, DENSITY AND SMOOTHNESS as OTHER SECTIONS. CLEAN CONTACT SURFACES AND APPLY TACK COAT.
2. GENERAL: BEGIN ROLLING WHEN MIXTURE WILL BEAR ROLLER WEIGHT WITHOUT EXCESSIVE DISPLACEMENT.
- A. COMPACT MIXTURE WITH HOT HAND TAMPERS OR VIBRATING PLATE COMPACTORS IN AREAS INACCESSIBLE TO ROLLERS.
 - B. BREAKDOWN ROLLING: ACCOMPLISH BREAKDOWN OR INITIAL ROLLING IMMEDIATELY FOLLOWING ROLLOF JOINTS, OUTSIDE EDGES, CHECK SURFACE, AFTER BREAKDOWN ROLLING, AND REPAIR DISPLACED AREAS BY LOOSING AND FILLING, IF REQUIRED, WITH HOT MATERIAL.
 - C. SECOND ROLLING: FOLLOW BREAKDOWN ROLLING AS SOON AS POSSIBLE, WHICH MIXTURE IS HOT. CONTINUE SECOND ROLLING UNTIL MIXTURE HAS BEEN THOROUGHLY COMPACTED.
 - D. THIRD ROLLING: PERFORM THIRD ROLLING WHILE MIXTURE IS STILL WARM ENOUGH FOR REMOVAL OF ROLLER MARKS. CONTINUE ROLLING UNTIL ROLLER MARKS ARE ELIMINATED AND COURSE HAS ATTAINED MAXIMUM DENSITY.
 - E. PATCHING: REMOVE AND REPLACE PAVING AREAS MIXED WITH FOREIGN MATERIALS AND DEFECTIVE AREAS. CUT OUT SUCH AREAS AND FILL WITH FRESH HOT MIX. IT IS STILL WARM ENOUGH FOR ROLLOF TO MAXIMUM SURFACE DENSITY AND SMOOTHNESS.
 - F. PROTECTION: AFTER FINAL ROLLING, DO NOT PERMIT VEHICULAR TRAFFIC ON PAVEMENT UNTIL IT HAS COOLED AND HARDENED.
 - G. ERG: ENDEAVOR TO PROTECT PAVING FROM TRAFFIC UNTIL MIXTURE HAS COOLED ENOUGH NOT TO BECOME MARKED.
3. SEAL COAT: (NOT APPLICABLE IN JOHNSON COUNTY)
- TRAFFIC AND LANE MARKINGS:
- A. CLEANING: SWEEP AND CLEAN SURFACE TO ELIMINATE LOOSE MATERIAL AND DUST.
 - B. COLORING: USE CHLORINATED RUBBER BASE TRAFFIC LANE-MARKING PAINT, FACTORY MIXED, QUICK-DRYING, DEEP AND NON-BLEEDING.
 - C. COLOR: YELLOW
- I) DO NOT APPLY TRAFFIC AND LANE MARKING PAINT UNTIL LAYOUT AND PLACEMENT HAS BEEN VERIFIED WITH ARCHITECT/ENGINEER.
 - II) APPLY PAINT WITH MECHANICAL EQUIPMENT TO PRODUCE UNIFORM STRAIGHT EDGES. APPLY IN TWO COATS AT MANUFACTURER'S RECOMMENDED RATES.

- A. TESTING AND INSPECTION SERVICE:
- i. OWNER SHALL EMPLOY A TESTING LABORATORY TO PERFORM PAVEMENT TESTING AND INSPECTION SERVICE FOR QUALITY CONTROL, DURING PAVING OPERATIONS.
 - ii. TESTING SERVICE SHALL HAVE REPRESENTATIVE PRESENT TO OBSERVE AND PERFORM TESTS AT ALL PLACES WHERE PAVING WORK IS BEING PERFORMED.
- B. GENERAL: TESTING SERVICE REPRESENTATIVE SHALL TAKE A MINIMUM OF TWO SAMPLES PER LIFT OF BITUMINOUS AGGREGATE MIX EACH DAY BEFORE PAVING OPERATION. LABORATORY TEST SHALL BE CONDUCTED WITHIN 24 HOURS OF TESTING. TESTING SERVICE SHALL AGREE TO GRADATION AND MOISTURE CONTENT.
- i. TEST IN-PLACE COMPACTED BITUMINOUS AGGREGATE MIX COURSES FOR COMPLIANCE WITH REQUIREMENTS FOR THICKNESS, DENSITY AND AIR Voids AND SURFACE SMOOTHNESS. REPAIR OR REMOVE AND REPLACE UNACCEPTABLE PAVING AS DIRECTED BY ENGINEER.
 - ii. TEST IN-PLACE COMPACTED BITUMINOUS AGGREGATE MIX SHALL BE PLACED AT A LOCATION AS DIRECTED BY THE COUNTY PRIOR TO FULL PRODUCTION FOR EACH TYPE OF MIX. THE TEST SECTION SHALL BE COMPACTED TO DETERMINE A TARGET DENSITY FOR THE REMAINDER OF THE PAVEMENT.
- C. THICKNESS: IN-PLACE COMPACTED THICKNESS WILL NOT BE ACCEPTABLE IF EXCEEDING FOLLOWING ALLOWABLE VARIATION FROM REQUIRED THICKNESS:
- i. BASE COURSE: $\frac{1}{2}\%$, PLUS OR MINUS
 - ii. SUBGRADE COURSE: $\frac{1}{2}\%$, PLUS OR MINUS
 - iii. SURFACE COURSE: $\frac{1}{2}\%$, PLUS OR MINUS
 - iv. A MINIMUM OF TWO TESTS PER COMPACTED LIFT SHALL BE TAKEN. CORES ARE TO BE TAKEN AT LOCATIONS AND AT TIMES OF DAY AS DIRECTED BY THE TESTING SERVICE. THE FOLLOWING TESTS SHALL BE PERFORMED BY THE TESTING SERVICE, ON EACH PAVEMENT COURSE:
 - v. A TEST SECTION AT A MINIMUM SIZE OF 100'X12' SHALL BE PLACED AT A LOCATION AS DIRECTED BY THE TESTING SERVICE FOR FULL PRODUCTION. FOR EACH TYPE OF MIX, THE TEST SECTION SHALL BE COMPACTED TO DETERMINE A TARGET DENSITY OF THE REMAINDER OF THE PAVEMENT.

- D. PAVEMENT THICKNESS
DENSITY
AIR VIDS
- I) TESTING SERVICE SHALL SUBMIT CERTIFIED RESULTS TO THE OWNER AND ARCHITECT/ENGINEER WITHIN 72 HOURS AFTER TESTS ARE MADE, WITH THEIR COMMENTS AND RECOMMENDATIONS FOR ACTION.
- II) PAVEMENT WHICH FAILS TO COMPLY WITH APPROVED JOB MIX FORMULA SHALL BE REPLACED AS DIRECTED BY THE ARCHITECT/ENGINEER.
- E. SURFACE SMOOTHNESS: TEST FINISHED SURFACE FOR SMOOTHNESS, USING 10' STRAIGHTEDGE APPLIED PARALLEL WITH, AND AT RIGHT ANGLES TO CENTERLINE OF PAVED AREA. SURFACE WILL NOT BE ACCEPTABLE IF EXCEEDING THE FOLLOWING TOLERANCES FOR SMOOTHNESS.
- AGGREGATE BASE COURSE SURFACE: 1/4"
- BASE COURSE SURFACE: 1/4"
- BINDER COURSE SURFACE: 1/8"
- WEARING COURSE SURFACE: 1/8"
- I) CHECK SURFACED AREAS AT INTERVALS AS DIRECTED BY TESTING SERVICE.
- F. DENSITY TESTS: DENSITY TESTS SHALL BE MADE AT EACH LIFT. TEST SHALL BE AS FOLLOWS:
- I) TESTS ARE REQUIRED AT VARIOUS TIMES AND LOCATIONS FOR SUBGRADE AND BASE COURSES FOR ASPHALT PAVING AREAS.
- G. TESTING SERVICE SHALL SUBMIT CERTIFIED RESULTS TO THE OWNER AND ENGINEER WITHIN 72 HOURS AFTER TESTS ARE MADE WITH THEIR COMMENTS AND RECOMMENDATIONS FOR ACTION.
- I) SUBGRADE SHALL BE PREPARED IN ACCORDANCE WITH I.N.D.O.T. STANDARD SPECIFICATIONS, SECTION 201 AND SUBSECTION 501.07. NO TRAFFIC SHALL BE PERMITTED ON THE PREPARED SUBGRADE PRIOR TO PAVING.
- II) SEE SITE GRADING, UNDER THE 'EARTHWORK' SECTION FOR ADDITIONAL COMPACTION REQUIREMENTS.

- A. GRADING: DO ANY NECESSARY GRADING IN ADDITION TO THAT PERFORMED IN ACCORDANCE WITH EARTHWORK SECTION TO BRING SUBGRADE, AFTER FINAL COMPACTION, TO THE REQUIRED GRADES AND SLOPES FOR SITE IMPROVEMENTS.
- B. PREPARED SUBGRADE: REMOVE SPONGE AND OTHERWISE UNSUITABLE MATERIAL AND REPLACE WITH STABLE MATERIAL. NO TRAFFIC WILL BE ALLOWED ON PREPARED SUBGRADE PRIOR TO PAVING.
- C. COMPACTION OF SUBGRADE: THE FIRST 6 INCHES BELOW THE SUBGRADE SHALL BE COMPACTED TO AT LEAST 100% OF THE MAXIMUM DRY DENSITY AS DETERMINED BY THE PROVISIONS OF AASHTO T-99.
- D. UTILITY STRUCTURES: CHECK FOR CORRECT ELEVATION OF ALL MANHOLE COVERS, VALVE BOXES AND SIMILAR STRUCTURES LOCATED WITHIN AREAS TO BE PAVED, AND MAKE, OR HAVE MADE, ANY NECESSARY ADJUSTMENTS IN SUCH STRUCTURES.
- E. PLACING CONCRETE:
1. SUBGRADE: PLACE CONCRETE ONLY ON A MOIST, COMPACTED SUBGRADE OR BASE FIRM FROM LOOSE MATERIAL. PLACE NO CONCRETE ON A MUDDY OR FROZEN SUBGRADE.
 2. FORMS: FORMS SHALL BE FREE FROM WATER, TIGHT ENOUGH TO PREVENT LEAKAGE AND SUBSTANTIAL ENOUGH TO MAINTAIN THEIR SHAPE AND POSITION WITHOUT SPRINGING OR SETTLING, WHEN CONCRETE IS PLACED. FORMS SHALL BE CLEAN AND SMOOTH IMMEDIATELY BEFORE CONCRETING.
 3. PLACEMENT: CONCRETE SHALL BE DEPOSITED SO AS TO REQUIRE AS LITTLE REHANDLING AS PRACTICABLE. WHEN CONCRETE IS TO BE PLACED AT AN ATMOSPHERIC TEMPERATURE OF 35 DEGREES F. OR LESS, PARAGRAPH 702.01 OF THE I.N.D.O.T. SPECIFICATIONS LATEST REVISIONS SHALL BE FOLLOWED.
- F. CONCRETE CURB
1. EXPANSION JOINTS: SHALL BE 1/2 INCH GUTT PREMOULDED AT ENDS OF ALL RETURNS AND AT A MAXIMUM SPACING OF 100 FEET.
 2. CONTRACTION JOINTS: WHEN OTHERWISE PROVIDED, CONTRACTION JOINTS SHALL BE SAWED JOINTS SPACED TO 12 FT. ON CENTER.

3. FINISH: TROWEL AND SLOPED CONCRETE AS SOON AS PRACTICABLE, AND FILL WITH A 1/2" MINIMUM PLACED PLAYS.
- G. CONCRAE WALLS AND EXTERIOR STEPS
1. SLOPES: PROVIDE 1/4" INCH PER FOOT CROSS SLOPE. MAKE ADJUSTMENTS ON SLOPES AT WALL CORNERS.
 2. DIMENSIONS: WALLS AND STEPS SHALL BE ONE COURSE CONSTRUCTION AND OF WIDTHS AND DETAILS SHOWN ON THE DRAWINGS.
 3. FINISH: SLORED CONCRETE AND TROWEL WITH A STEEL TROWEL TO A HARD DENSE SURFACE. AFTER 24 HOURS LATER HAVE PREPARED APPLY MEDIAL BROOM FINISH AND SCORP TRANSVERSE JOINTS AT 8' FOOT SPACING. PROVIDE 1/2" INCH EXPANSION JOINTS WHERE SIDEWALKS INTERSECT, AND AT A MAXIMUM SPACING OF 48 FEET BETWEEN EXPANSION JOINTS.
- H. CURING
1. CURING: CONCRETE SHALL BE CURED WITH A CURING COMPOUND AS SPECIFIED, CURE ALL CONCRETE BY ONE OF THE METHODS DESCRIBED IN SECTION 501.17 OF THE I.N.D.O.T. SPECIFICATIONS, LATEST REVISION.
- I. BITUMINOUS PAVEMENT: HOT MIX ASPHALT PAVEMENT SHALL BE AS SPECIFIED IN SECTION 402 OF THE I.N.D.O.T. SPECIFICATIONS LATEST REVISIONS. PAVING SHALL NOT BE PERMITTED DURING UNFAVORABLE WEATHER OR THEN THE TEMPERATURE IS 40 DEGREES F. AND FALLING.
- COMPACTED AGGREGATE SUBBASE: THE THICKNESS SHOWN ON THE DRAWINGS IS THE MINIMUM THICKNESS. THE SUBBASE SHALL BE PLACED AND COMPACTED BY ROLLING WITH A SMOOTH WHEELER ROLLER WEIGHING 8 TO 10 TONS. COMPACT TO 95% COMPACTION USING STANDARD TESTING PROCEDURES. ALONG CURBS, HEADERS AND WALLS AND AT ALL PLACES NOT ACCESSIBLE TO THE ROLLER, THE AGGREGATE MATERIAL SHALL BE TAMPED WITH MECHANICAL TAMPERS OR WITH APPROVED HAND TAMPERS.
- K. CONCRETE RAMPS
1. CONCRETE RAMPS FOR THE DISABLED SHALL BE REQUIRED AS SPECIFIED IN THE PLANS AND SHALL CONFORM WITH CURRENT SPECIFICATIONS ESTABLISHED BY THE AMERICAN DISABILITIES ACT (ADA), SECTION 4.7, "CURB RAMPS."
 2. THE CONCRETE RAMP SHALL BE FLUSH AND FREE OF ABRUPT CHANGES WITH SIDEWALKS, QUAYS OR STREETS, AND PROVIDE A MAXIMUM SLOPE OF 1:12.
 3. THE MINIMUM WIDTH OF A CONCRETE RAMP SHALL BE 48" INCHES EXCLUSIVE OF FLARED SIDES.
 4. SIDES OF CONCRETE RAMPS SHALL HAVE FLARED SIDES AS SHOWN IN THE PLANS.

STORM SEWER SYSTEMS

- SCOPE OF WORK**
- A. THE WORK UNDER THIS SECTION INCLUDES ALL STORM SEWERS, STORM WATER INLETS, AND RELATED ITEMS, INCLUDING EXCAVATING AND BACKFILLING NECESSARY TO COMPLETE THE WORK SHOWN ON THE DRAWINGS.**
- B. IN THE CASE OF ANY CONFLICTS WITH THESE SPECIFICATIONS AND LOCAL, STATE, FEDERAL, SPECIFICATIONS THE MORE STRINGENT SHALL APPLY.**
- 2. STORM SEWER CONSTRUCTION**
- A. STORM SEWERS**
- 1. STORM SEWER STRUCTURES SHALL COMPLY WITH CURRENT SPECIFICATIONS OF THE CITY OF JOHNSON COUNTY, PLANNING AND ALL OTHER RESPONSIBLE AGENCIES IN RESPECT TO DESIGN AND QUALITY OF CONSTRUCTION.**
- 2. ALL STORM SEWER CONSTRUCTION INSIDE PUBLIC RIGHT-OF-WAY, EITHER EXISTING OR TO BE DEDICATED, SHALL BE IN ACCORDANCE WITH THE FOLLOWING:**
- a. WHERE REINFORCED CONCRETE PIPE IS SHOWN ON THE CONSTRUCTION PLANS, IT SHALL BE IN ACCORDANCE WITH A.S.T.M. C-76 CLASS III WALL "C" UNLESS OTHERWISE SPECIFIED ON THE PLANS.**
- b. FOR CORRUGATED ALUMINUM PIPE IS SHOWN ON THE CONSTRUCTION PLANS, IT SHALL BE GAUGE ALUMINIZED UNLESS OTHERWISE SPECIFIED AND SHALL HAVE THE CONNECTING BANDS AND SEALS AS SPECIFIED BY THE MANUFACTURER. C.M.P. SHALL BE ALUMINIZED PIPE IN ACCORDANCE WITH A.S.T.M. A-414.**
- 3. MANHOLES, CATCH BASINS AND INLETS SHALL BE PRECAST CONCRETE. USE OF BRICK OR BLOCK WILL NOT BE PERMITTED UNLESS AUTHORIZED IN WRITING BY THE ENGINEER AND APPROVED IN WRITING BY THE JOHNSON COUNTY PLANNING DEPARTMENT.**
- 4. IF THE CONTRACTOR ELECTS TO USE ALTERNATE PRECAST STRUCTURES, HE SHALL SUBMIT SHOP DRAWINGS TO THE ENGINEER PRIOR TO ANY CONSTRUCTION.**
- 5. PRECAST CONCRETE AND STEEL FOR MANHOLES AND INLETS SHALL BE IN ACCORDANCE WITH A.S.T.M. C-40.**
- 7. CASTINGS SHALL BE AS SHOWN ON THE DETAIL SHEET(S) FOR MANUFACTURER, TYPE AND MODEL NUMBER.**
- 8. NUMBER 53 STONE BACKFILL SHALL BE REQUIRED UNDER ALL PAVEMENT AREAS AND TRENCHES WITHIN THE STREET OF JOHNSON COUNTY.**
- 9. ALL TRENCHES UNDER PAVEMENT SHALL BE COMPACTED TO 95 PERCENT MODIFIED PROCTOR.**

- A. PERMITS AND CODES: THE INTENT OF THIS SECTION OF THE SPECIFICATIONS IS THAT THE CONTRACTOR'S BID ON THE WORK COVERED HEREIN SHALL BE BASED UPON THE DRAWINGS AND SPECIFICATIONS BUT THAT THE WORK SHALL COMPLY WITH ALL APPLICABLE CODES AND REGULATIONS AS AMENDED BY ANY WAIVERS. THE CONTRACTOR SHALL FURNISH ALL BONDS NECESSARY TO GET PERMITS FOR CUTS AND CONNECTIONS TO EXISTING SEWERS.
- B. LOCAL STANDARDS: THE TERM "LOCAL STANDARDS" AS USED HEREIN MEANS THE STANDARDS OF DESIGN AND CONSTRUCTION OF THE RESPECTIVE MUNICIPALITY OR UTILITY COMPANY.
- C. EXISTING UTILITIES: THE CONTRACTOR SHALL LOCATE ALL UTILITIES IN THE AREA OF ALL ACTIVE UTILITY SEWERS AND OTHER DRAINS ENCOUNTERED IN THE SEWER INSTALLATION. THE CONTRACTOR SHALL REPAIR TO THE SATISFACTION OF THE OWNER ANY DAMAGE TO EXISTING ACTIVE IMPROVEMENTS.
- D. WORKING CONDITIONS: THE CONTRACTOR SHALL COMPLY WITH ALL LOCAL AND NATIONAL CODES AND TO BE APPROVED BY ALL LOCAL AND STATE AGENCIES EXERCISING JURISDICTION.
- E. TRENCHING: LAY ALL PIPE IN OPEN TRENCHES, HAVING WHEN THE LOCAL AUTHORITY GIVES WRITTEN PERMISSION FOR TUNNELING, OPEN THE TRENCH SUFFICIENTLY AHEAD OF PIPE-LAYING TO REVEAL ANY OBSTRUCTIONS. THE TRENCH SHALL BE KEPT OPEN TO THE FULL DEPTH OF THE TRENCH TO MAINTAIN BRACE TENSION AS NECESSARY TO PROTECT WORKMEN AND ADJACENT STRUCTURES. ALL TRENCHING TO COMPLY WITH OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION STANDARDS: KEEP TRENCHES FREE FROM OBSTACLES TO CONSTRUCTION. CONDUCT THE DISCHARGE FROM TRENCH DE-WATERING TO DRAINS OR NATURAL DRAINAGE CHANNELS.
- F. SPECIAL SUPPORTS: WHENEVER, IN THE OPINION OF THE ENGINEER, THE SOIL AT OR BELOW THE PIPE GRADE IS UNSTABLE, OR THE SEWERS AND APPURTENANCES SPECIFIED IN THIS SECTION, SUCH SPECIAL SUPPORT, IN ADDITION TO THOSE SHOWN OR SPECIFIED, SHALL BE PROVIDED AS THE ENGINEER MAY DIRECT, AND THE CONTRACT WILL BE ADJUSTED.
- G. BACKFILL: BACKFILL SHALL BE AS SHOWN IN THE PLANS. NOTE THAT PVC & HDPE PIPE SHALL BE COVERED WITH 12" MINIMUM OF #8 STONE. COMPACT THIS BACKFILL THOROUGHLY, TAKING CARE NOT TO DISTURB THE PIPE. BACKFILL UNDER AND WITHIN 5 FEET OF WALLS, PARKING AREAS, DRIVEWAYS AND STREETS SHALL BE "B" BORROW OR EQUIVALENT GRANULAR MATERIAL ONLY AND THOROUGHLY COMPACTED BY THE PROPOSED METHOD.
- H. MANHOLE INVERTS: CONSTRUCT MANHOLE FLOW CHANNELS OF CONCRETE SEWER PIPE OR BRICK, SMOOTHLY FINISHED AND OF SEMICIRCULAR SECTION CONFORMING TO THE INSIDE DIAMETER OF THE CONNECTING SEWERS. MAKE CHANGES IN SIZE OR GRADE GRADUALLY AND CHANSE INDIRECTION BY TRUE CURVES.
- I. SUBDRAINS: ALL SUBDRAINS SHALL BE OF THE SIZE SHOWN ON THE PLANS AND SHALL BE CONSTRUCTED TO THE GRADES SHOWN. ALL DRAINS CONSTRUCTED OFF-SITE AS PART OF THE OUTLET DRAIN WILL BE LOCATED AS SHOWN.
- J. UTILITIES: IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO VERIFY ALL EXISTING UTILITIES AND CONDITIONS PERTAINING TO HIS WORK. IT SHALL ALSO BE THE CONTRACTOR'S RESPONSIBILITY TO CONTACT THE OWNERS OF THE VARIOUS UTILITIES BEFORE WORK IS STARTED. THE CONTRACTOR SHALL NOTIFY IN WRITING THE OWNER OF ANY UTILITIES LOCATED, CUT, DAMAGED, ERRORS OR OMISSIONS FOUND ON THESE PLANS OR IN THE FIELD BEFORE WORK IS STARTED OR RESUMED.

WATER LINE SYSTEM

- SCOPE OF WORK
- A. THE WORK UNDER THIS SECTION INCLUDES ALL WATER MAIN, FIRE HYDRANTS, SEWERS AND RELATED ITEMS, INCLUDING EXCAVATING AND BACKFILLING NECESSARY TO COMPLETE THE WORK SHOWN ON THE DRAWINGS.
2. MATERIALS
- A. ALL MATERIALS SHALL CONFORM TO ALL LOCAL, STATE, AND NATIONAL CODES AND SHALL BE APPROVED BY ALL LOCAL AND STATE AGENCIES HAVING JURISDICTION.
3. APPLICATION
- A. PERMITS AND CODES: THE INTENT OF THIS SECTION OF THE SPECIFICATIONS IS THAT THE CONTRACTOR'S BID OR THE WORK COVERED HEREIN SHALL BE BASED UPON THE DRAWINGS AND SPECIFICATIONS BUT THAT THE WORK SHALL COMPLY WITH ALL APPLICABLE CODES AND REGULATIONS AS AMENDED BY ANY WAIVERS. THE CONTRACTOR SHALL FURNISH ALL BONDS NECESSARY TO GET PERMITS FOR CUTS AND CONNECTIONS TO EXISTING WATER MAINS.
- B. LOCAL STANDARDS: THE TERM "LOCAL STANDARDS" AS USED HEREIN MEANS THE STANDARDS OF DESIGN AND CONSTRUCTION OF THE RESPECTIVE MUNICIPAL DEPARTMENT OR UTILITY COMPANY.
- C. EXISTING IMPROVEMENTS: THE CONTRACTOR SHALL MAINTAIN IN OPERATING CONDITION ALL ACTIVE UTILITIES, SEWERS AND OTHER DRAINS ENCOUNTERED IN THE WATER LINE INSTALLATION. THE CONTRACTOR SHALL MAINTAIN THE NATIONAL SAFETY AND HEALTH ADMINISTRATION STANDARDS, KEEP WORKERS FREE FROM WATER WHILE CONSTRUCTION IS IN PROGRESS, UNDER NO CIRCUMSTANCES SHALL PIPE OR APPURTENANCES BE LAID IN STANDING WATER. CONDUCT THE DISCHARGE FROM TRENCH DE-WATERING TO DRAINS OR STORM DRAINAGE.
- D. TRENCH PROTECTION: THE TRENCH SHALL BE SUFFICIENTLY AHEAD OF PIPE-LAYING TO REVEAL ANY OBSTRUCTIONS. THE MIN. WIDTH OF TRENCH SHALL BE 1.25 TIMES THE OUTSIDE DIA. OF PIPE. SHEET AND BRACE TRENCING AS NECESSARY TO PROTECT WORKMEN AND ADJACENT STRUCTURES. ALL TRENCING SHALL BE PROTECTED BY OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION STANDARDS. KEEP WORKERS FREE FROM WATER WHILE CONSTRUCTION IS IN PROGRESS, UNDER NO CIRCUMSTANCES SHALL PIPE OR APPURTENANCES BE LAID IN STANDING WATER. CONDUCT THE DISCHARGE FROM TRENCH DE-WATERING TO DRAINS OR STORM DRAINAGE.
- E. SPECIAL SPECIFICATIONS: WHENEVER, IN THE OPINION OF THE ENGINEER, THE SOIL AT OR BELOW THE PIPE GRADE IS UNSUITABLE FOR SUPPORTING PIPE AND APPURTENANCES SPECIFIED IN THIS SECTION, SUCH SPECIAL SUPPORT, IN ADDITION TO THOSE SHOWN OR SPECIFIED, SHALL BE PROVIDED AS THE ENGINEER MAY DIRECT, AND SUCH SPECIAL SUPPORT WILL BE ADJUSTED TO THE SOIL CONDITIONS.
- F. BACKFILLING: BACKFILL SHALL BE PLACED AS SHOWN IN THE PLANS. NOTE THAT PWC & HOPE PIPE SHALL BE COVERED WITH 12" MINIMUM OF #8 STONE. COMPACT THIS BACKFILL THOROUGHLY, TAKING CARE NOT TO DISTURB THE PIPE. BACKFILL UNDER AND WITHIN 5 FEET OF WALKS, PARKING AREAS, DRIVEWAYS AND DRIVEWAYS SHALL BE BORROW OR EQUIVALENT GRANULAR MATERIAL ONLY AND THOROUGHLY COMPACTED BY APPROVED METHODS.
- G. UTILITIES: IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO VERIFY ALL EXISTING UTILITIES AND CONDITIONS PERTAINING TO HIS WORK. IT SHALL ALSO BE THE CONTRACTOR'S RESPONSIBILITY TO CONTACT THE OWNERS OF THE VARIOUS UTILITIES BEFORE WORK IS STARTED. THE CONTRACTOR SHALL NOTIFY IN WRITING THE OWNER OF ANY UTILITIES ENCOUNTERED, ANY ERRORS OR OMISSIONS FOUND ON THESE PLANS AND IN THE FIELD BEFORE WORK IS STARTED OR RESUMED.

SANITARY SEWER SYSTEMS

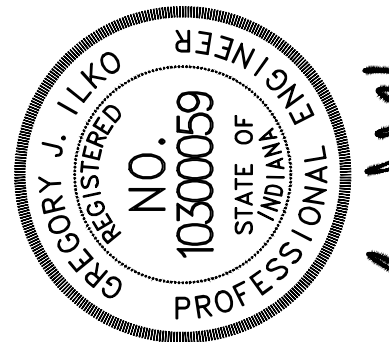
- ## SCOPE OF WORK
- A. THE WORK UNDER THIS SECTION INCLUDES ALL SANITARY SEWERS, MANHOLES, CLEANOUTS AND RELATED ITEMS INCLUDING EXCAVATING AND BACKFILLING, NECESSARY TO COMPLETE THE WORK SHOWN IN THE EXISTING RECORD PLANS. THE END OF THE SEWER SHALL BE TIGHTLY PLUGGED OR CAPPED AT THE TERMINAL POINTS, ADJACENT TO THE BUILDING DRAIN AS SPECIFIED IN THE PLUMBING SPECIFICATIONS AND/OR ARCHITECTURAL DRAWINGS.
- ## B. MATERIALS
- ### 1. SANITARY SEWERS
- ALL GRAVITY PLASTIC SEWER PIPE FITTINGS SHALL CONFORM TO ASTM D3034 WITH A CELL CLASSIFICATION OF 12454-B OR 12454-C. FLEXIBLE GASKETED COMPRESSION JOINTS SHALL BE USED FOR PVC & PVC TRUSS PIPE. NO SOLVENT CEMENT JOINTS SHALL BE ALLOWED.
 - ALL SEWER PIPE AND FITTINGS SHALL CONFORM TO ASTM D2240 STANDARD REVISION.
 - TRACER WIRE SHALL BE INSTALLED WITH ALL NEW SANITARY PIPE.
- ### 2. MANHOLES
- JOINTS BETWEEN REINFORCED CONCRETE MANHOLE SECTIONS AND STEPS SHALL CONFORM TO ASTM C-478 LATEST REVISION. EXTERIOR OF THE MANHOLE SHALL BE WATERPROOFED WITH BISMACTA MATERIAL.
 - CASTINGS SHALL BE OF UNIFORM QUALITY, FREE FROM BLOW Holes, POROSITY, HARD SPOTS, SHRINKAGE DISTORTION OR OTHER DEFECTS. THEY SHALL BE SMOOTH AND WELL-CLEANED BY SHOT-BLASTING OR BY OTHER APPROVED METHOD. THEY SHALL COAT WITH ASPHALT PAINT WHICH SHALL RESULT IN A SMOOTH COATING, TOUGH AND TENACIOUS WHEN COLD, NOT TACKY OR BRITTLE. THEY SHALL BE GRAY IRON MEETING ASTM A-48 LATEST REVISION. MANHOLE COVERS FOR SANITARY SEWER SHALL BE INEAMH TYPE R-1077-A W/172"-68" SP FRAME W/51"-SEALING APPLICATION.
 - ALL MANHOLE SECTIONS SHALL BE JOINED WITH A NOMINALLY 1/2" INCH SIZE BUTY-RUBBER JOINT GASKET MATERIAL, CONFORMING TO ASHITO M-198 AND FEDERAL SPECIFICATION SS-210A. JOINT CONFORMS TO ASTM C-443.
 - MANHOLES SHALL INCLUDE STEPS. SANITARY SEWER STANDARDS REVISIONS SHALL BE THAT STEPS ARE TO BE POLYPROPYLENE CASTED STEEL. STEEL REINFORCING OR AN APPROVED NON-CORROSIVE FIBERGLASS MATERIAL. THE COPOLYMER POLYPROPYLENE SHALL MEET THE REQUIREMENTS OF ASTM-A101 WITH DEFERRED 3/4" INCH DIAMETER OR LARGER REINFORCING STEEL, CONFORMING TO ASTM A-615, GRADE 60. STEPS SHALL BE A MAXIMUM OF 24 INCHES FROM TOP, 24 INCHES FROM BOTTOM AND 16 INCHES SPACING BETWEEN.
- ### C. SANITARY FORCE MAINS
- ALL SANITARY FORCE MAIN PIPE AND FITTINGS SHALL CONFORM TO ASTM D2241, STANDARD SPECIFICATION FOR POLY VINYL CHLORIDE (PVC) PRESSURE-RATED PIPE, (SDR 21, GREATER THAN 4 INCH DIAMETER).
 - TRACER WIRE SHALL BE INSTALLED WITH ALL SANITARY FORCE MAIN PIPE.
- ### D. CASING
- FOR SANITARY SEWERS CONSTRUCTED WITH POLY VINYL CHLORIDE (PVC) AND INSTALLED UNDER RAILROADS SHALL BE Cased IN CONFORMANCE WITH AWWA STANDARD C900-89, STANDARD FOR POLY VINYL CHLORIDE (PVC) PRESSURE PIPE, 4 IN. THROUGH 12 IN. FOR WATER DISTRIBUTION, APPENDIX A.

- A. PERMITS AND CODES:
THE INTENT OF THIS SECTION OF THE SPECIFICATIONS IS THAT THE CONTRACTOR'S BID ON THE WORK COVERED HEREIN SHALL BE BASED UPON THE DRAWINGS AND SPECIFICATIONS BUT THAT THE WORK SHALL COMPLY WITH ALL APPLICABLE CODES AND REGULATIONS AS AMENDED BY CITY ORDINANCES. THE CONTRACTOR SHALL FURNISH ALL BONDS NECESSARY TO GET PERMITS FOR CUTS AND CONNECTIONS TO EXISTING SEWERS.
- B. LOCAL STANDARDS:
THE TERM "LOCAL STANDARDS" AS USED HEREIN MEANS THE STANDARDS OF DESIGN AND CONSTRUCTION OF THE RESPECTIVE MUNICIPAL DEPARTMENT OR UTILITY COMPANY.
- C. EXISTING IMPROVEMENTS:
THE CONTRACTOR SHALL MAINTAIN IN OPERATING CONDITION ALL EXISTING UTILITIES, SEWERS AND OTHER DRAWINGS ENCOUNTERED IN THE SEWER INSTALLATION. THE CONTRACTOR SHALL REPAIR TO THE SATISFACTION OF THE OWNER ANY DAMAGE TO EXISTING EXISTING IMPROVEMENTS.
- D. WORKMANSHIP:
THE CONTRACTOR SHALL CONFORM TO ALL LOCAL, STATE AND NATIONAL CODES AND TO BE APPROVED BY ALL LOCAL AND STATE AGENCIES HAVING JURISDICTION.
- E. TRENCING:
LAY ALL PIPE IN OPEN TRENCHES, EXCEPT WHEN THE LOCAL AUTHORITY GIVES WRITTEN PERMISSION FOR TRENCHING. OPEN THE TRENCH SUFFICIENTLY AHEAD OF PIPE-LAYING TO REVEAL ANY OBSTRUCTIONS, THE MIN. WIDTH OF TRENCH SHALL BE 1.25 TIMES THE OUTSIDE DIA. PLUS 12 INCHES. SHEET AND BRACE TRENCH AS NECESSARY TO PROTECT WORKMEN AND ADJACENT STRUCTURES. ALL TRENCHING TO COMPLY WITH ALL CITY, STATE, SAFETY AND HEALTH ADMINISTRATION STANDARDS. KEEP THE TRENCH FREE FROM WATER WHILE CONSTRUCTION IS IN PROGRESS, UNDER NO CIRCUMSTANCES SHALL PIPE OR APPURTENANCES BE LAID IN STANDING WATER. CONDUCT THE DISCHARGE FROM TRENCH DE-WATERING TO DRAIN OR NATURAL DRAINAGE COURSE.
- F. SPECIAL SUPPORTS:
WHENEVER, IN THE OPINION OF THE ENGINEER, THE SOIL AT OR BELOW THE PIPE GRADE IS UNSUITABLE FOR SUPPORTING SEWERS AND APPURTENANCES SPECIFIED IN THIS SECTION, SUCH SPECIAL SUPPORT, IN ADDITION TO THOSE SHOWN OR SPECIFIED, SHALL BE PROVIDED AS THE ENGINEER MAY DIRECT, AND THE CONTRACT WILL BE ADJUSTED.
- G. BACKFILLING:
BACKFILL SHALL BE PLACED AS SHOWN IN THE PLANS. COMPACT THIS BACKFILL THOROUGHLY, TAKING CARE NOT TO DISTURB THE PIPE. BACKFILL UNDER AND WITHIN 5 FEET OF WALKS, PARKING AREAS, DRIVEWAYS AND STREETS SHALL BE GRANULAR MATERIAL ONLY AND THOROUGHLY COMPACTED BY APPROVED METHODS.
- H. FLOW LINES:
THE FLOW CHANNELS WITHIN MANHOLES SHALL BE AN INTEGRAL PART OF THE PRECAST BASIN. THE CHANNEL SHALL BE SHAPED AND FORMED FOR A CLEAN TRANSITION WITH PROPER HORIZONTALS TO ALLOW THE SMOOTH CONVEYANCE OF FLOW THROUGH THE MANHOLE. THE BENCH WALL SHALL BE FORMED TO THE TOP OF THE INLET PIPE. THE BENCH SHALL BE 1/2" BELOW THE CHANNEL. THE BENCH WALL SHALL SLOPE BACK FROM THE CROWN AT 1/4" INCH PER FOOT TO THE MANHOLE WALL.

- THE CONTRACTOR SHALL FURNISH THE NECESSARY EQUIPMENT TO TEST SEWERS FOR INFILTRATION, ALL SANITARY SEWER GRAVITY LINES, UPON COMPLETION, SHALL BE REQUIRED TO PASS ONE OF THE FOLLOWING TESTS:
- J. HYDROSTATIC TEST:
- A. A HYDROSTATIC TEST SHALL BE PERFORMED WITH A MINIMUM OF TWO (2) FEET OF POSITIVE HEAD. THE RATE OF EXFILTRATION OR INFILTRATION SHALL NOT EXCEED TWO HUNDRED (200) GALLONS PER INCH OF PIPE DIAMETER PER LINEAR MILE PER DAY.
- K. LOW PRESSURE TEST:
- A. A LOW PRESSURE AIR TEST SHALL BE CONDUCTED IN ACCORDANCE WITH ASTM F1417, STANDARD TEST METHOD FOR INSTALLATION ACCEPTANCE OF PLASTIC GRAVITY SEWER LINES USING LOW PRESSURE AIR, FOR ALL SANITARY SEWER MAIN LINES.
- L. ALL SANITARY FORCE MAIN LINES, UPON COMPLETION, SHALL BE REQUIRED TO PASS A LEAKAGE TEST CONDUCTED IN ACCORDANCE WITH AWWA STANDARD C605-94, AWWA STANDARD FOR UNDERGROUND INSTALLATION OF POLYVINYL CHLORIDE (PVC) PRESSURE PIPE AND FITTINGS FOR WATER.
- M. ALL ALL GRAVITY SEWER LINES SHALL ALSO BE AIR TESTED IN ACCORDANCE WITH ASTM C1244-93, STANDARD TEST METHOD FOR CONCRETE SEWER MANHOLES BY NEGATIVE AIR PRESSURE (VACUUM) TEST.
- N. FLUSHING SEWERS:
- A. ALL SANITARY SEWERS EXCEPT BUILDING SEWERS WITH WATER TO OBTAIN FREE FLOW THROUGH EACH SECTION, MUST BE CLEANED AND FREE OF ALL SILT AND TRASH FROM APPURTENANCES JUST PRIOR TO ACCEPTANCE OF WORK.
- O. PLASTIC SEWER PIPE INSTALLATION:
- A. PLASTIC SEWER PIPE SHALL BE INSTALLED IN ACCORDANCE WITH ASTM D2321 PER LATEST REVISION. PIPES SHALL BE TESTED AT THIRTY DAYS. USING A MANDREL THAT IS 5% OF THE INSIDE DIAMETER OF THE PIPE BEING TESTED. SAID MANDREL SHALL BE PULLED BY HAND THROUGH EACH PIPE SECTION TO ENSURE DEFLECTION IS LESS THAN ACCEPTABLE LIMITS.
- P. STORM WATER CONNECTIONS:
- A. ALL ROOF DRAINS, FOOTING DRAINS AND/OR SURFACE WATER DRAINS MAY BE CONNECTED TO THE SANITARY SEWER SYSTEMS, INCLUDING TEMPORARY CONNECTIONS DURING CONSTRUCTION.
- Q. WATERLINE CROSSING:
- A. ALL SANITARY LINES AND SANITARY SEWERS CROSS AND WATER LINES CANNOT BE PLACED ABOVE THE SEWER WITH A MINIMUM OF 18 INCHES VERTICAL CLEARANCE. THE SEWER MUST BE CONSTRUCTED OF WATER WORKS GRADE DUCTILE IRON PIPE WITH MECHANICAL JOINTS WITHIN 10 FEET OF THE WATER LINE.
- R. UTILITIES:
- A. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO VERIFY ALL EXISTING UTILITIES AND CONDITIONS PERTAINING TO HIS WORK. IT SHALL ALSO BE THE CONTRACTOR'S RESPONSIBILITY TO CONTACT THE OWNERS OF THE VARIOUS UTILITIES BEFORE WORK IS STARTED. THE CONTRACTOR SHALL NOTIFY IN WRITING THE ENGINEER AND THE ENGINEER'S OWNER OF ANY CHANGES, ERRORS OR OMISSIONS FOUND ON THESE PLANS OR IN THE FIELD BEFORE WORK IS STARTED OR RESUMED.
- S. SERVICE LATERALS:
- A. INDIVIDUAL BUILDING LINES SHALL BE 6 INCHES IN DIAMETER AND OF MATERIAL EQUAL TO THAT SPECIFIED IN 21. OF THIS SECTION. SERVICE LINES SHALL BE CONNECTED TO THE MAIN SEWER AT LOCATIONS SHOWN IN THESE PLANS.



MISCELLANEOUS DETAILS AND SPECIFICATIONS



NO.	DATE	REVISIONS PER TAC COMMENTS RECEIVED 05-02-13	BY	GJ APPR.
1	5-10-13	REVISIONS	AEC	GJ
2				
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