KANE COUNTY

DIVISION of TRANSPORTATION

Carl Schoedel, P.E.
Director of Transportation
County Engineer

41W011 Burlington Road
St. Charles, IL 60175
Phone: (630) 584-1170
Fax: (630) 584-5265

INVITATION TO BID

BID REQUEST: ORCHARD ROAD PUMP STATION INSTALLATION

Section Number: 13-00244-01-DR
Corridor Name: Orchard Road

The County of Kane is seeking to retain the services of qualified and licensed Contractor(s) for the installation of manholes on existing storm sewer piping, a 30" nominal duck-bill style backflow preventer, access drive, pump and associated items including controls and electrical work. The work will be based on the Special Provisions and Plans included with this invitation.

GENERAL REQUIREMENTS: Submit one original bid, one paper copy and one CD copy

- Signed Offer to Contract and Bid Forms
- Certificate of Insurance, due upon official award

Prevailing Wages Apply

SUBMISSION LOCATION: Kane County Division of Transportation
Building A
41W011 Burlington Road
St. Charles, Illinois 60175

SUBMISSION TIME & DATE: 9:00 a.m., Wednesday, October 7, 2015
Bids received after the submittal time will be rejected and returned unopened to the sender.
Faxed or E-Mailed Bid Responses will not be accepted.

CONTACT PERSON: Candi Thomas, PE
Senior Project Manager
Telephone: (630) 584-1170 Fax: (630) 584-5265
thomascandance@co.kane.il.us

ALL QUESTIONS PERTAINING TO THIS SEALED BID MUST BE SUBMITTED IN WRITING TO KDOT NO LATER THAN, **September 30, 2015** TO THE CONTACT PERSON NOTED ABOVE.

INDEX OF SHEETS

IDOT HIGHWAY STANDARDS

280001-07	TEMPORARY EROSION CONTROL SYSTEMS
602406-06	MANHOLE TYPE A 6' DIAMETER
602411-04	MANHOLE TYPE A 7' DIAMETER
602601-03	PRECAST REINFORCED CONCRETE FLAT SLAB TOP
602701-02	CAST IRON STEPS
602421-04	MANHOLE TYPE A 9' DIAMETER
701101-04	OFF-RD OPERATIONS, MULTILANE, 15' TO 24' FROM PAVEMENT EDGE
701106-02	OFF-RD OPERATIONS, MULTILANE, MORE THAN 15' AWAY
701421-07	LANE CLOSURE, MULTILANE, DAY OPERATIONS ONLY, FOR SPEEDS ≥ 45 MPH TO 55 MPH
701426-07	LANE CLOSURE, MULTILANE, INTERMITTANT OR MOVING OPER., FOR SPEEDS >45 MPH
701901-04	TRAFFIC CONTROL DEVICES

DISTRICT ONE STANDARD DETAILS

BD07	STORM SEWER CONNECTION TO EXISTING SEWER

KANE COUNTY, ILLINOIS

DIVISION OF TRANSPORTATION

PLANS FOR PROPOSED

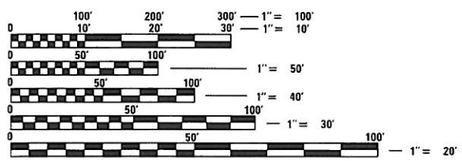
ORCHARD ROAD DRAINAGE SYSTEM MODIFICATION

SECTION 13-00244-01-DR

LOCATION OF SECTION INDICATED THUS: —■—

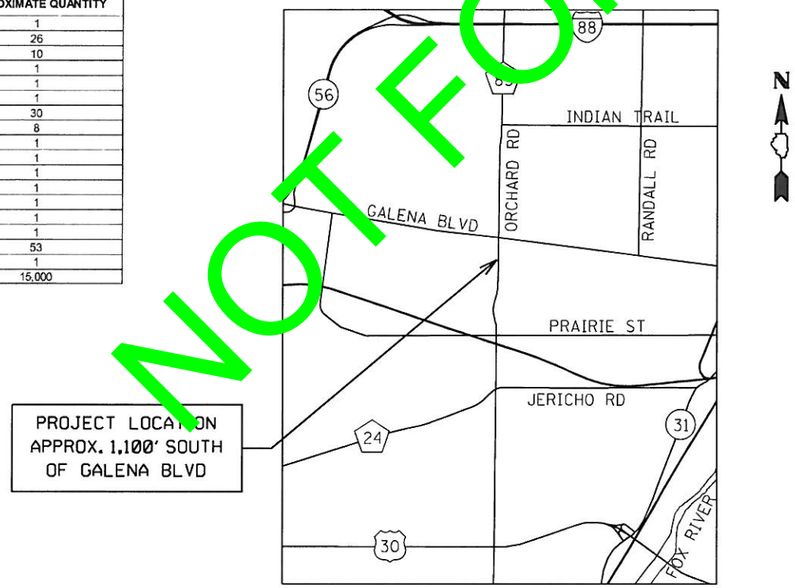
SUMMARY OF QUANTITIES
(Estimate Only for Lump Sum Bid)

ITEM	DESCRIPTION	UNIT	APPROXIMATE QUANTITY
1	MOBILIZATION / TRAFFIC CONTROL	L SUM	1
2	STORM SEWER REMOVAL 30" RCP	FOOT	26
3	STORM SEWER, 30" DIP	FOOT	10
4	MANHOLE, MODIFIED TYPE A W/ 2' SUMP, 6'-DIAMETER, FRAME AND GRATE	EACH	1
5	MANHOLE, BAFFLE PLATE, 7' DIAMETER, 4' x 2.5' HATCH	EACH	1
6	MANHOLE, MODIFIED TYPE A W/ 3' SUMP, 9'-DIAMETER, 4' x 3.5 HATCH	EACH	1
7	DUCTILE IRON PIPE, CLASS 53, 8"	FOOT	30
8	DUCTILE IRON PIPE, CLASS 53, 12"	FOOT	8
9	SLIP-ON CHECK VALVE FOR 30" DIP PIPE	EA	1
10	EROSION CONTROL AND RESTORATION	L SUM	1
11	PUMP, CONTROLS AND PIPING	L SUM	1
12	INLINE CHECK VALVE FOR 8" DUCTILE IRON PIPE PIPE	EA	1
13	8" C.I. VERTICAL CHECK VALVE	EA	1
14	8" C.I. GATE VALVE	EA	1
15	ELECTRICAL	L SUM	1
16	ACCESS DRIVE	SY	53
17	DEPRESSED CURB	L SUM	1
18	ITEMS AS ORDERED BY THE ENGINEER	EA	15,000



FULL SIZE PLANS HAVE BEEN PREPARED USING STANDARD ENGINEERING SCALES. REDUCED SIZED PLANS WILL NOT CONFORM TO STANDARD SCALES. IN MAKING MEASUREMENTS ON REDUCED PLANS, THE ABOVE SCALES MAY BE USED.

J.U.L.I.E.
JOINT UTILITY LOCATION INFORMATION FOR EXCAVATING
1-800-892-0123



LOCATION MAP
N.T.S.

CHRIS P. DAGIANTIS
062-054123
LICENSED PROFESSIONAL ENGINEER
OF
ILLINOIS
EXP. 11-30-2015

KANE COUNTY
DIVISION OF TRANSPORTATION
APPROVED SEP 16 20 15
CARL SCHOEDEL P.E. - COUNTY ENGINEER

CMT
CRAWFORD MURPHY & TILLY, INC.
550 NORTH COMMONS DR., SUITE 116
AURORA, ILLINOIS 60504
(630) 820-1022
SUBMITTED BY
CHRIS P. DAGIANTIS, P.E.
8-28-2015
DATE

GENERAL NOTES:

1. THE CONTRACTOR HAS SOLE AND COMPLETE RESPONSIBILITY FOR THE JOB SITE CONDITIONS DURING THE COURSE OF CONSTRUCTION OF THIS PROJECT, INCLUDING SAFETY OF ALL PERSONS AND PROPERTY; THIS REQUIREMENT SHALL APPLY CONTINUOUSLY AND IS NOT LIMITED TO NORMAL WORKING HOURS. THE CONTRACTOR SHALL DEFEND, INDEMNIFY AND HOLD THE OWNER AND ENGINEER HARMLESS FROM ANY AND ALL LIABILITY, REAL OR ALLEGED, IN CONNECTION WITH THE PERFORMANCE OF WORK ON THIS PROJECT.

2. CONSTRUCTION SHALL BE IN CONFORMANCE WITH KANE COUNTY DIVISION OF TRANSPORTATION AND CITY OF AURORA CONSTRUCTION AND DESIGN STANDARDS. THE STANDARD SPECIFICATIONS FOR WATER AND SEWER MAIN CONSTRUCTION IN ILLINOIS, JULY 2009 EDITION AND THE IDOT STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION. SOIL EROSION AND SEDIMENT CONTROL SHALL BE IN CONFORMANCE WITH THE ILLINOIS URBAN MANUAL.

3. ORCHARD ROAD IS OWNED BY KDOT AND MAINTAINED BY THE CITY OF AURORA. CONTRACTOR SHALL PERFORM HIS DUTIES IN ACCORDANCE WITH THE CITY OF AURORA AND KANE COUNTY DIVISION OF TRANSPORTATION. PRIOR TO THE START OF CONSTRUCTION, THE CONTRACTOR SHALL LAY OUT THE PROPOSED IMPROVEMENTS AND SHALL VERIFY ALL DIMENSIONS, ANGLES AND STATIONS SHOWN. SHOULD THE CONTRACTOR NOTE ANY DISCREPANCIES OR CONFLICTS, HE SHALL NOTIFY THE ENGINEER PRIOR TO PROCEEDING WITH THE PROJECT WORK.

4. BEFORE STARTING WORK THE CONTRACTOR SHALL CONTACT KANE COUNTY (DAVE BOESCH AT 630-584-1170), THE CITY OF AURORA (DAN FELTMAN AT 630-256-3204) AND THE CRAWFORD, MURPHY & TILLY, INC. (CHRIS DAGIANTIS AT 630-820-1022) AT LEAST 48 HOURS IN ADVANCE.

5. PRIOR TO THE START OF CONSTRUCTION, THE CONTRACTOR SHALL ARRANGE TO HAVE ALL UNDERGROUND UTILITIES INCLUDING WATER, GAS, ELECTRIC, STORM SEWER, SANITARY SEWER, TELEPHONE AND OTHER COMMUNICATION UTILITIES AND CABLE TV LOCATED AND SUITABLY MARKED. SHOULD A UTILITY BE IN CONFLICT WITH THE PROPOSED CONSTRUCTION, THE ENGINEER SHALL BE NOTIFIED AT ONCE. IF UTILITIES INTERFERE WITH THE CONSTRUCTION ALIGNMENT, THEY SHALL BE PROTECTED AT NO ADDITIONAL EXPENSE TO THE OWNER AND WITHOUT CLAIM BY THE CONTRACTOR FOR DELAYS DUE TO UTILITY LINES ENCOUNTERED. CONTRACTOR SHALL ALSO COORDINATE WITH UTILITIES TO RELOCATE AS NECESSARY. KDOT SHALL BE NOTIFIED THRU THE ENGINEER 48 HRS IN ADVANCE OF WATERMAIN, SANITARY, AND STORM CROSSINGS.

6. ALL UNPAVED, DISTURBED AREAS IN THE RIGHT-OF-WAY SHALL BE PROPERLY GRADED AND RESTORED WITH A MINIMUM OF FOUR INCHES OF TOP SOIL PER THE REQUIREMENTS OF THE ILLINOIS DEPARTMENT OF TRANSPORTATION "STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION". ALL DISTURBED AREAS SHALL BE CLEANED UP AND RESTORED TO A SIMILAR CONDITION. CLEAN UP SHOULD FOLLOW CLOSELY BEHIND CONSTRUCTION OPERATIONS. PAVEMENT SHALL BE MAINTAINED IN A CLEAN AND NEAT FASHION. THE CONTRACTOR SHALL PROVIDE DAILY STREET SWEEPING ON DAYS WHEN WORK IS PERFORMED.

7. ALL EXCESS MATERIALS SHALL BE HAULED OFFISTE AND DISPOSED OF BY THE CONTRACTOR.

8. THE CONTRACTOR SHALL MAINTAIN A SAFE WORKING DISTANCE FROM OVERHEAD ELECTRICAL FACILITIES. THIS DISTANCE SHALL BE OF A SUFFICIENT DISTANCE TO ALLOW THE INSTALLATION OF THE PROPOSED IMPROVEMENTS WITHOUT DAMAGING OR SACRIFICING THE RELIABILITY OF THE OVERHEAD ELECTRICAL FACILITIES. A MINIMUM WORKING DISTANCE PER N.E.S.C. IS REQUIRED.

9. CONTRACTOR SHALL REGULARLY CLEAN UP THE SITE THROUGHOUT THE COURSE OF THE WORK. CLEANUP SHALL INCLUDE REMOVAL OF ALL EXCESS DIRT, CONCRETE, PIPE PIECES, LUMBER SCRAPS, PAPER CUPS AND OTHER ITEMS LEFT BY THE CONTRACTOR'S FORCES.

10. THE CONTRACTOR SHALL KEEP THE PAVEMENT FREE OF ALL DUST, DIRT AND CONSTRUCTION DEBRIS. THE CONTRACTOR SHALL IMPLEMENT AND MAINTAIN DUST CONTROL MEASURES; THIS COST IS INCIDENTAL TO THE COST OF CONSTRUCTION.

11. ANY DAMAGE TO PROPERTY RESULTING FROM THE CONTRACTOR'S OPERATIONS AND EQUIPMENT SHALL BE REPAIRED TO THE ORIGINAL CONDITION OR BETTER. COST OF SUCH REPAIR IS INCIDENTAL TO THE COST OF CONSTRUCTION.

12. ANY CURB AND GUTTER, STORM SEWER INLETS, MANHOLES, ETC. NOT INDICATED TO BE REPLACED ON THE DRAWINGS THAT ARE DAMAGED BY CONSTRUCTION ACTIVITIES SHALL BE REPAIRED TO THE SATISFACTION OF THE ENGINEER AT THE CONTRACTOR'S EXPENSE.

13. THE CONTRACTOR SHALL COMPACT ALL NATIVE BACKFILL IN TWELVE (12) INCH LIFTS USING APPROPRIATE EQUIPMENT AS APPROVED BY THE ENGINEER.

14. THE CONTRACTOR, HIS/HER SUCCESSORS OR ASSIGNS, AGREES TO HOLD HARMLESS KANE COUNTY, THE CITY OF AURORA AND THE ENGINEER AND DULY APPOINTED AGENTS AND EMPLOYEES AGAINST ANY ACTION FOR PERSONAL INJURY OR PROPERTY DAMAGE SUSTAINED BY REASON OF THE EXERCISE OF THIS CONTRACT.

15. CONTRACTOR'S MEANS AND METHODS FOR CONSTRUCTION SHALL NOT DAMAGE EXISTING EDGE OF PAVEMENT. ALL EXISTING ROADWAY AND EDGE OF PAVEMENT DAMAGED SHALL BE RESTORED AS DIRECTED BY THE CITY AT NO ADDITIONAL COST TO THE CONTRACT.

16. MOBILIZATION SHALL BE INCLUDED IN THE LUMP SUM TOTAL OF THE CONTRACT.

GENERAL NOTES FOR MAINTENACE OF TRAFFIC:

1. TRAFFIC CONTROL SHALL BE CONSIDERED INCIDENTAL TO THE CONTRACT.

2. TRAFFIC CONTROL AND PROTECTION SHALL BE PERFORMED IN ACCORDANCE WITH SECTION 701 OF THE IDOT STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION (LATEST EDITION) AND THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (LATEST EDITION) UNLESS PRIOR APPROVAL IS RECEIVED FROM KANE COUNTY. IN THE EVENT THE MAINTENANCE OF TRAFFIC, INCLUDING FLAGGING OPERATIONS, IS DEEMED DEFICIENT, WORK SHALL STOP IMMEDIATELY. WORK WILL ONLY BE ALLOWED TO RESUME UPON RESOLUTION OF THE DEFICIENCY.

3. ALL TRAFFIC CONTROL DEVICES SHALL MEET NCHRP 350 REQUIREMENTS AND BE IN NEW OR LIKE NEW CONDITION. WHEN DEVICES BECOME WORN, DIRTY, OR FADED THEY SHALL BE REFURBISHED, CLEANED, OR REPLACED. THE COST OF INSTALLING, ERECTING, MAINTAINING, RELOCATING, REPLACING, AND REMOVING TEMPORARY SIGNS SHALL BE CONSIDERED INCLUDED IN THE CONTRACT AS PART OF TRAFFIC CONTROL.

4. ALL NON-APPLICABLE SIGNS SHALL BE COVERED OR REMOVED. FOR EXAMPLE, FLAGGER SIGNS SHALL NOT BE LEFT [illegible] FLAGGERS ARE NOT PRESENT.

5. THE COST OF SUPPLYING, ERECTING, MAINTAINING, AND REMOVING BARRICADES, DRUMS, VERTICAL PANELS, WARNING LIGHTS, SIGNS, TEMPORARY PAVEMENT MARKINGS AND FLAGGERS SHALL BE INCLUDED IN THE CONTRACT AS A PART OF TRAFFIC CONTROL.

6. THE CONTRACTOR SHALL NOTIFY ALL MUNICIPALITIES, EMERGENCY SERVICES, SCHOOL DISTRICTS, AND [illegible] BUSINESSES THAT WILL BE AFFECTED BY CONSTRUCTION OPERATIONS A MINIMUM OF 72 HOURS PRIOR TO IMPLEMENTATION.

7. THE CONTRACTOR SHALL NOT BLOCK TRAFFIC DURING PEAK HOURS AS DEFINED BY THE CITY OF AURORA.

[illegible]0 AM TO [illegible]:00 AM
3[illegible] PM TO 6:00 PM

GENERAL NOTES FOR SOIL EROSION AND SEDIMENT CONTROL:

1. SOIL EROSION AND SEDIMENT CONTROL AND RESTORATION SHALL BE CONSIDERED INCIDENTAL TO THE CONTRACT.

2. ALTHOUGH A NOTICE OF INTENT IS NOT REQUIRED, THE CONTRACTOR IS RESPONSIBLE FOR PROTECTING WATER QUALITY IN ACCORDANCE WITH THE NATIONAL POLLUTION DISCHARGE ELIMINATION SYSTEM (NPDES).

3. SOIL DISTURBANCE SHALL BE CONDUCTED IN SUCH A MANNER AS TO MINIMIZE EROSION. SOIL STABILIZATION MEASURES SHALL CONSIDER THE TIME OF YEAR, SITE CONDITIONS AND THE USE OF TEMPORARY OR PERMANENT MEASURES.

4. SOIL EROSION AND SEDIMENT CONTROL MEASURES, AND PERMANENT AND TEMPORARY STORMWATER PRACTICES SHALL BE IN PLACE PRIOR TO STARTING CONSTRUCTION.

5. CONSTRUCTION MATERIALS AND/OR OTHER STOCKPILES SHALL NOT BE LOCATED ON STREAM BANKS OR IN THE PATH OF THE STREAM FLOW.

6. TEMPORARY EROSION CONTROL DEVICES SHALL BE CONSTRUCTED AS SHOWN ON THE PLANS OR AS DIRECTED BY THE ENGINEER. THE EROSION CONTROL MEASURES INDICATED ON THE PLANS ARE THE MINIMUM REQUIREMENTS. ADDITIONAL MEASURES MAY BE REQUIRED, AS DIRECTED BY THE ENGINEER OR GOVERNING AGENCY.

7. DISTURBED AREAS SHALL BE STABILIZED WITH TEMPORARY OR PERMANENT MEASURES WITHIN 14 CALENDAR DAYS OF THE END OF ACTIVE HYDROLOGIC DISTURBANCE, OR REDISTURBANCE.

8. ANY SEDIMENT OR SOIL REACHING AN IMPROVED PUBLIC RIGHT-OF-WAY, STREET, ALLEY OR PARKING AREA SHALL BE REMOVED BY SCRAPING OR STREET CLEANING AS ACCUMULATIONS WARRANT AND TRANSPORTED TO A CONTROLLED SEDIMENT DISPOSAL AREA.
ALL SEDIMENT AND EROSION CONTROL MEASURES WILL BE INSTALLED PER IDOT STANDARD 280001 OR AS SPECIFIED HEREIN AND PAID FOR IN ACCORDANCE WITH SECTION 280 OF THE STANDARD SPECIFICATIONS. ALL CONSTRUCTION ACTIVITIES WILL BE IN ACCORDANCE WITH THE NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM STORM WATER PERMIT ILR40.

9. ALL STORM SEWERS THAT ARE OR WILL BE FUNCTIONING DURING CONSTRUCTION SHALL BE PROTECTED, BY AN APPROPRIATE SEDIMENT CONTROL MEASURE.

10. CONTRACTOR SHALL PROVIDE LOCATIONS FOR CONCRETE TRUCK WASHOUT 2 DAYS PRIOR TO CONCRETE POUR. LOCATIONS SHALL BE APPROVED BY ENGINEER PRIOR TO ANY CONCRETE POURS. CLEANING OF VEHICLES AND EQUIPMENT, INCLUDING CONCRETE MIXERS, SHALL BE PERFORMED IN A MANNER TO REDUCE THE AMOUNT OF POLLUTANTS LEAVING PROJECT AREA, TRIBUTARY TO STORM SEWERS AND OPEN WATERS TO THE MAXIMUM EXTENT PRATICAL AND TO THE SATISFACTION OF THE ENGINEER. ANY COST INCURRED FOR THIS WORK SHALL BE INCIDENTAL TO THE CONTRACT.

11. THE CONTRACTOR SHALL TAKE ALL PRECAUTIONS TO PROTECT WETLANDS TO REMAIN FROM DAMAGE BY SEDIMENT, CONSTRUCTION EQUIPMENT OR BY HIS WORK CREWS. THE CONTRACTOR SHALL PAY FOR RESTORATION AND ASSOCIATED PENALTIES FOR WETLAND DISTURBANCE BEYOND THAT SHOWN ON THE PLANS.

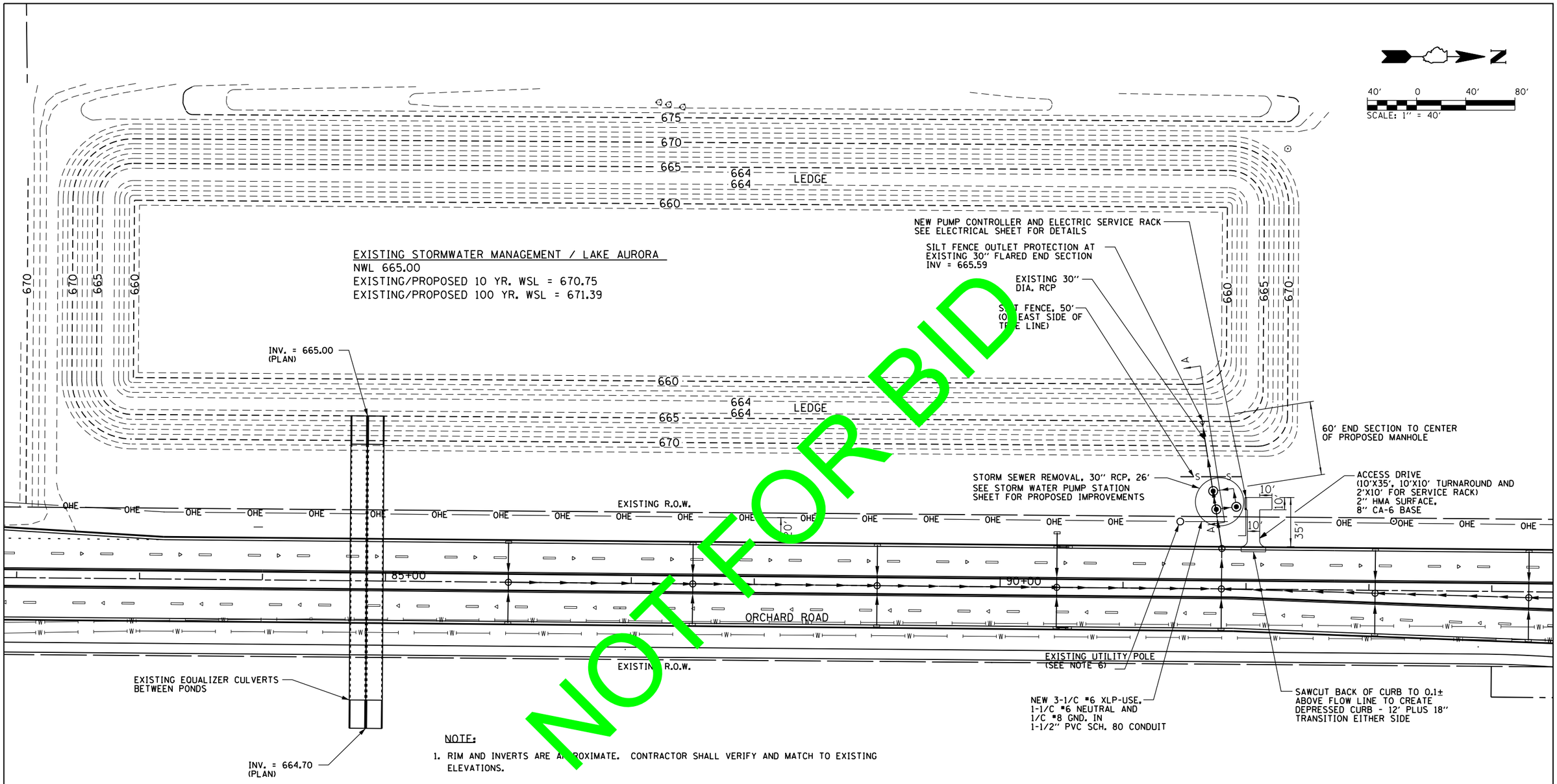
12. SEDIMENT COLLECTED DURING CONSTRUCTION BY THE VARIOUS TEMPORARY EROSION CONTROL SYSTEMS SHALL BE DISPOSED OF ON A REGULAR BASIS. SEDIMENT SHALL BE REMOVED FROM EROSION CONTROL SYSTEMS WHEN THE HEIGHT OF THE SEDIMENT EXCEEDS ONE-HALF OF THE HEIGHT OF THE FILTER DEVICE. THIS WORK WILL NOT BE MEASURED AND PAID FOR SEPARATELY BUT CONSIDERED INCLUDED IN THE UNIT PRICE COST FOR THE MEASURE INSTALLED.

13. IF DEWATERING SYSTEMS ARE USED, ADJOINING PROPERTIES AND DISCHARGE LOCATIONS SHALL BE PROTECTED FROM EROSION. DISCHARGES SHALL BE ROUTED THROUGH AN EFFECTIVE SEDIMENT CONTROL MEASURE (e.g. SEDIMENT TRAP, SEDIMENT FILTER BAG, OR OTHER APPROPRIATE MEASURE. DURING DEWATERING OPERATIONS, WATER WILL BE PUMPED INTO SEDIMENT FILTER BAGS OR SILT TRAPS. DEWATERING DIRECTLY INTO FIELD TILES, STORMWATER STRUCTURES, DITCHES, TURF AREAS OR STREAMS IS PROHIBITED.

14. IT IS THE REPONSIBILITY OF THE PRIME CONTRACTOR TO INFORM ANY SUBCONTRACTOR(S) WHO MAY PERFORM WORK ON THIS PROJECT OF THE REQUIREMENTS IN IMPLEMENTING AND MAINTAINING THESE EROSION CONTROL PLANS AND THE NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM PERMIT REQUIREMENTS SET FORTH BY THE ILLINOIS EPA.
ALL EROSION CONTROL MEASURES SHALL BE KEPT OPERATIONAL AND MAINTAINED CONTINUOUSLY THROUGHOUT THE PERIOD OF LAND DISTURBANCE UNTIL PERMANENT SEDIMENT AND EROSION CONTROL MEASURES ARE OPERATIONAL.

15. TEMPORARY EROSION AND SEDIMENT CONTROL MEASURES SHALL BE INSPECTED BY THE CONTRACTOR ONCE EVERY SEVEN DAYS AND AFTER EACH RAIN EVENT. INSPECTIONS SHALL BE DOCUMENTED AND RECORDS MAINTAINED TO BE MADE AVAILABLE FOR REVIEW UPON REQUEST. RECORDS SHOULD INCLUDE DEFECIENCIES AND CORRECTIONS NEEDED. THE TEMPORARY PROTECTION MEASURES SHALL BE RETURNED TO GOOD WORKING CONDITIONS WITHIN 48 WORKING HOURS AFTER INSPECTION OR AS OTHERWISE DIRECTED. THIS WORK IS INCLUDED IN THE UNIT PRICE OF THE EROSION CONTROL MEASURES INSTALLED.

16. ALL TEMPORARY EROSION AND SEDIMENT CONTROL MEASURES SHALL BE REMOVED WITHIN 30 DAYS AFTER FINAL SITE STABILIZATION IS ACHIEVED OR AFTER THE TEMPORARY MEASURES ARE NO LONGER NEEDED.



NOTE:

1. RIM AND INVERTS ARE APPROXIMATE. CONTRACTOR SHALL VERIFY AND MATCH TO EXISTING ELEVATIONS.
2. ANY DAMAGE TO THE EXISTING CURB AND GUTTER THAT OCCURS AS A RESULT OF THE CONTRACTOR'S CONSTRUCTION ACTIVITIES SHALL BE REPLACED BY THE CONTRACTOR.
3. ALL DISTURBED AREAS SHALL BE FINISHED WITH TOPSOIL, SEED AND EROSION CONTROL BLANKET.
4. CONTRACTOR SHALL NOT DISTURB TREE LINE ALONG WEST SIDE OF IMPROVEMENTS.
5. CONTRACTOR SHALL COORDINATE WITH COMED TO BRACE POWER POLE.
6. CONTRACTOR SHALL PROVIDE 1-1/2" GRS CONDUIT RISER UP TO EXISTING COMED POLE. LEAVE 20'-0" MIN. CABLE SLACK FOR TERMINATION BY COMED. COORDINATE ALL SERVICE CONNECTIONS WITH COMED. NEW SERVICE SHALL BE 60A, 480/277V, 3-PHASE, 4-WIRE.

CMT
CRAWFORD, MURPHY & TILLY, INC.
CONSULTING ENGINEERS

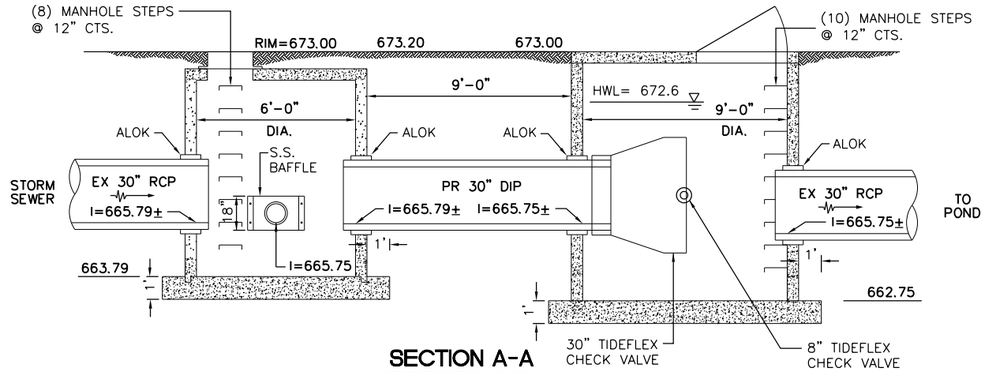
USER NAME = Jim Ohse	DESIGNED - CPD	REVISED -
	DRAWN - JRO	REVISED -
PLOT SCALE = 80.0000 ' / in.	CHECKED - JMS	REVISED -
PLOT DATE = 9/15/2015 - 9:27:43 AM	DATE - 4/15/2015	REVISED -

ORCHARD ROAD
DRAINAGE SYSTEM MODIFICATIONS
KANE COUNTY, ILLINOIS

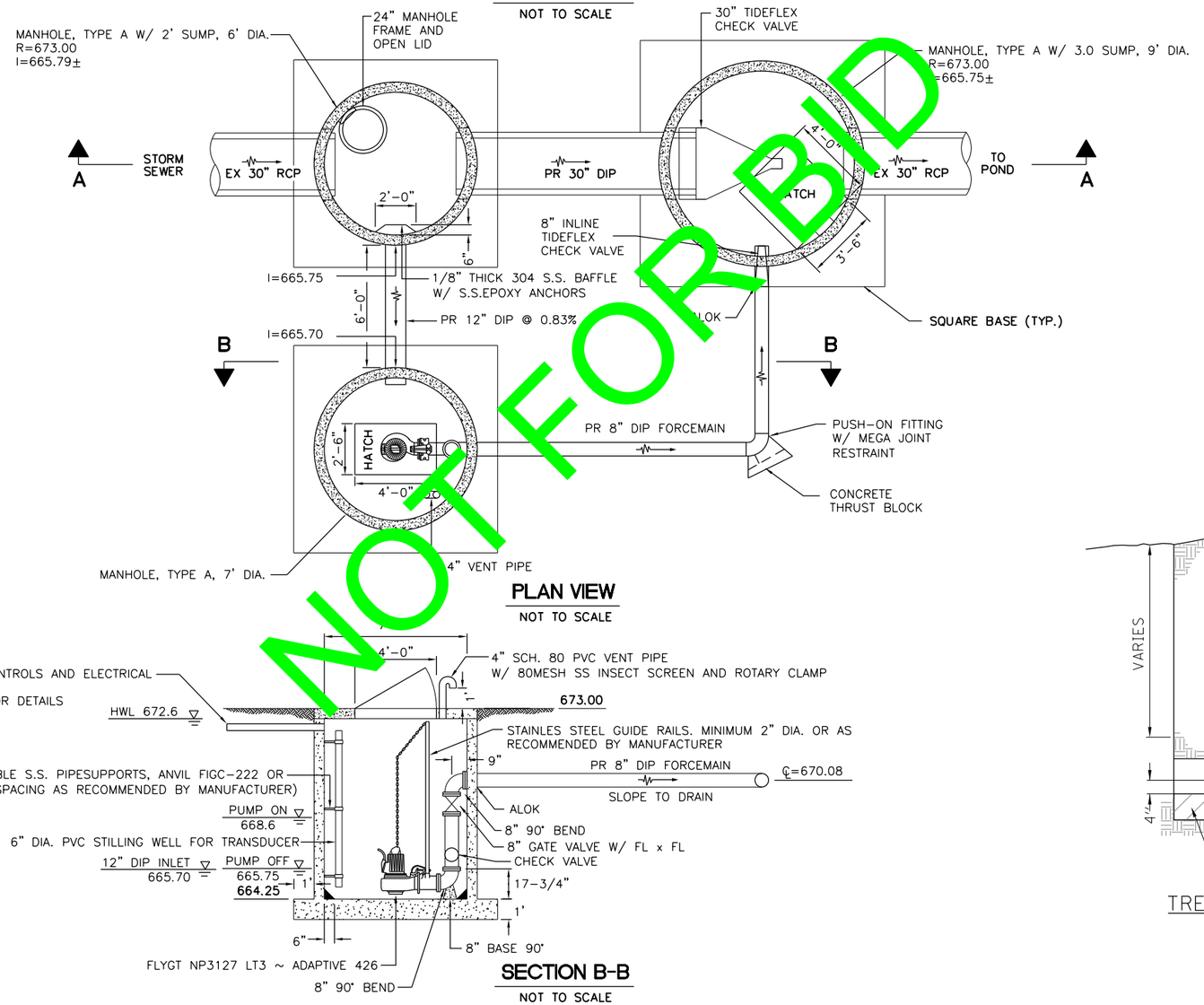
SITE PLAN

SCALE: 1" = 40' | SHEET 1 OF 1 SHEETS

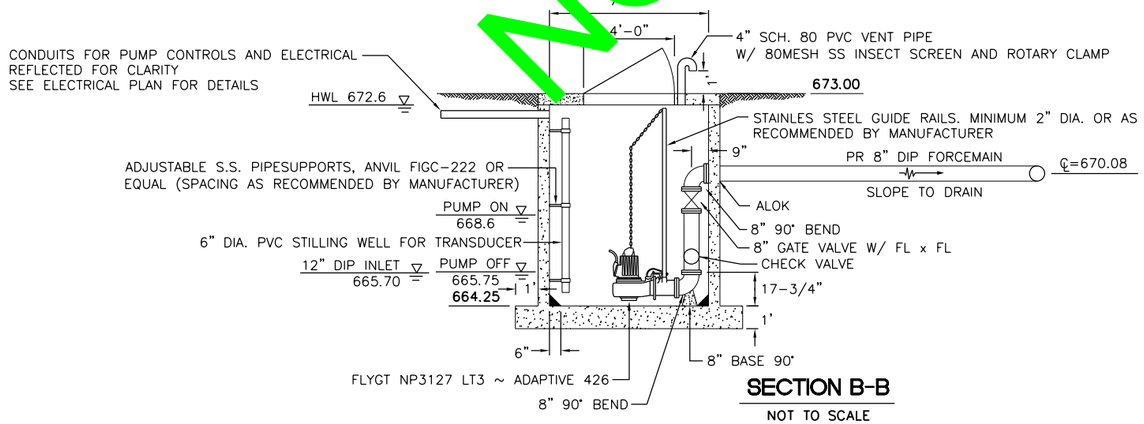
F.A. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
	13-00244-01-DR	KANE	6	3
		CONTRACT NO.		
	ILLINOIS FED. AID PROJECT			



SECTION A-A
NOT TO SCALE



PLAN VIEW
NOT TO SCALE



SECTION B-B
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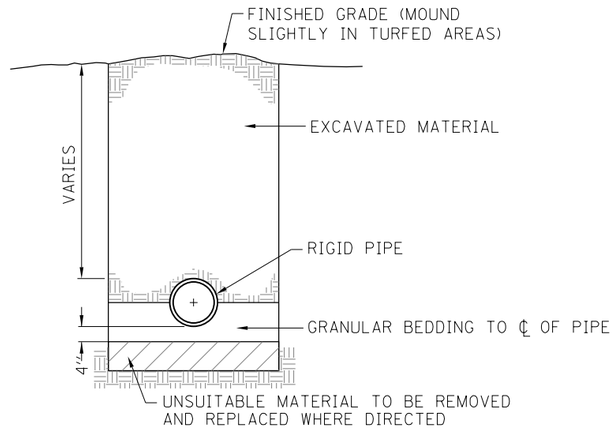


TRENCH DETAIL

CMT
CRAWFORD, MURPHY & TILLY, INC.
CONSULTING ENGINEERS

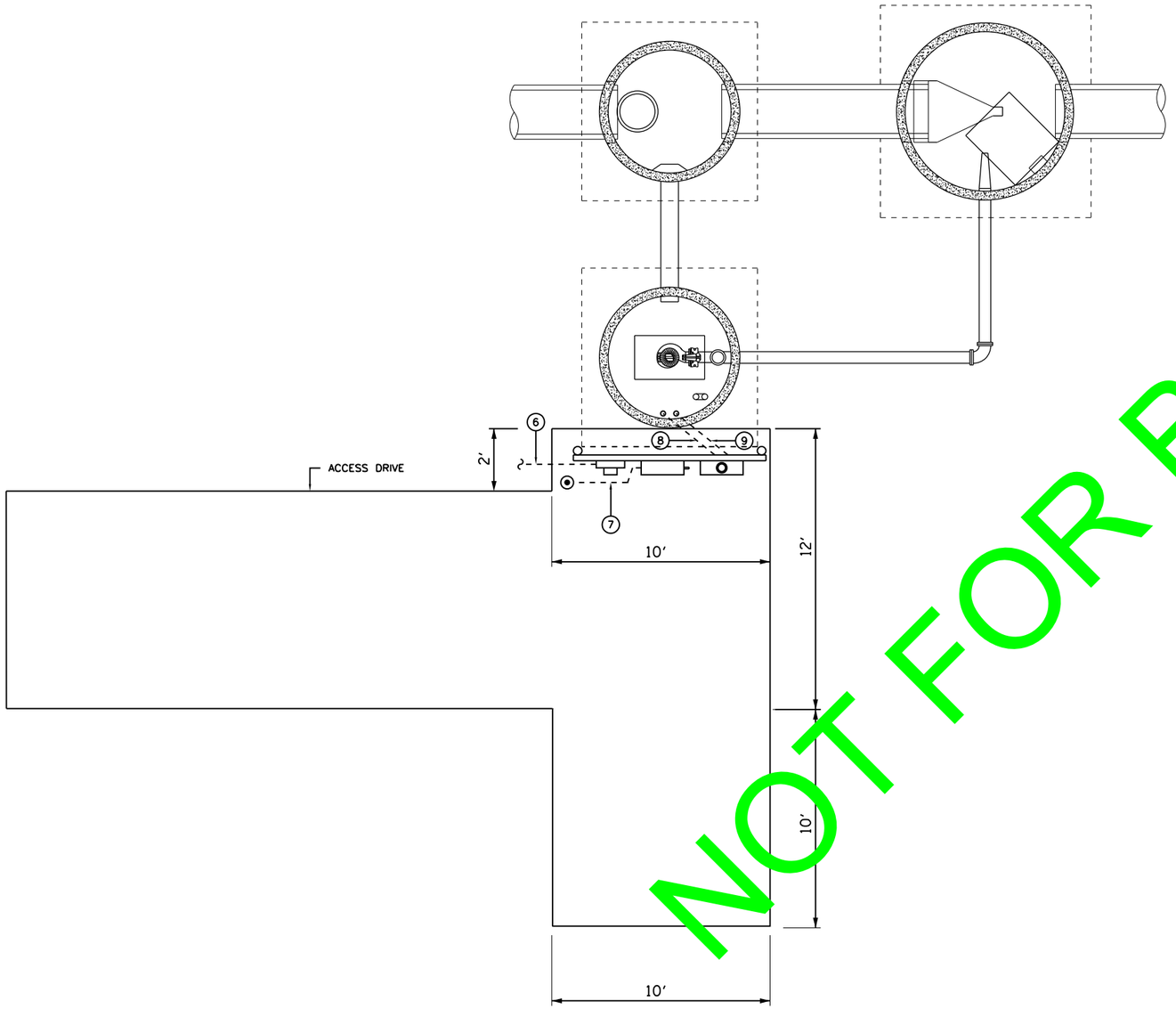
USER NAME = Jim Ohse	DESIGNED - CPD	REVISED -
	DRAWN - JRO	REVISED -
PLOT SCALE = 80.0000 ' / in.	CHECKED - JMS	REVISED -
PLOT DATE = 9/15/2015 - 9:28:19 AM	DATE - CPD	REVISED -

ORCHARD ROAD
DRAINAGE SYSTEM MODIFICATIONS
KANE COUNTY, ILLINOIS

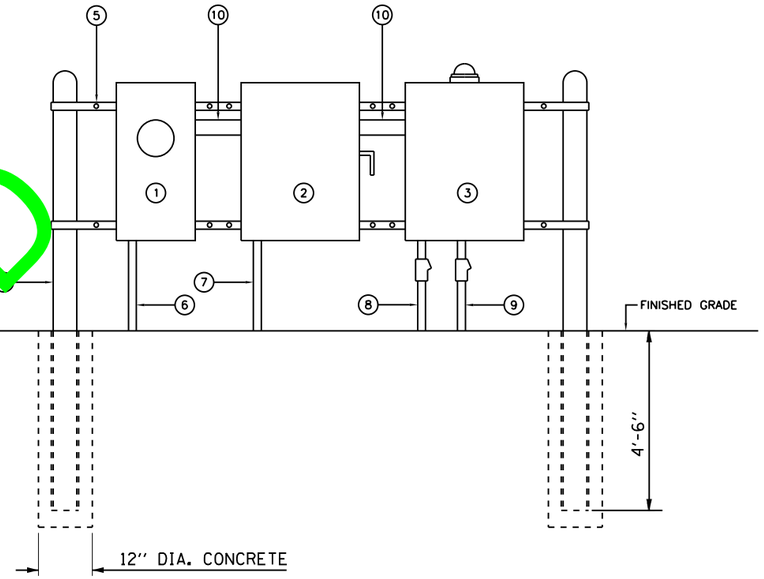
STORM WATER PUMP STATION

SCALE: | SHEET 1 OF 1 SHEETS | STA. | TO STA.

F.A. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
	13-00244-01-DR	KANE	6	4
		CONTRACT NO.		
	ILLINOIS	FED. AID PROJECT		



ELECTRICAL PLAN
NOT TO SCALE



SERVICE ENTRANCE RACK
NOT TO SCALE

KEYED NOTES

1. ELECTRIC METER BASE. COMED TO INSTALL UTILITY METER.
2. 60A, 600 VAC, 3-POLE DISCONNECT IN NEMA 3R ENCLOSURE.
3. PUMP CONTROLLER IN NEMA 4X STAINLESS STEEL ENCLOSURE. SEE CONTROLLER DETAILS.
4. 6" DIAMETER CONCRETE FILLED GALVANIZED STEEL POST.
5. GALVANIZED STRUT TYPE FRAMING.
6. 1-1/2" GRS CONDUIT WITH 3-1/C #6 XLP-USE, 1-1/C #6 NEUTRAL AND 1-1/C #8 GND. TO UTILITY POLE.
7. 1/C #8 BARE COPPER GROUND CONDUCTOR IN 3/4" PVC CONDUIT TO GROUND ROD.
8. 3-1/C #12 XLP-USE, 1/C #12 GND. IN INTRINSICALLY SAFE 1" GRS CONDUIT TO PUMP.
9. FLOAT CONTROL WIRES AND PUMP MONITORING WIRES IN 1-1/2" GRS CONDUIT, AS REQUIRED BY PUMP CONTROLLER MANUFACTURER.
10. 3-1/C #6 XLP-USE, 1-1/C #6 NEUTRAL AND 1-1/C #8 GND. IN 1-1/2" GRS CONDUIT.

CMT
CRAWFORD, MURPHY & TILLY, INC.
CONSULTING ENGINEERS

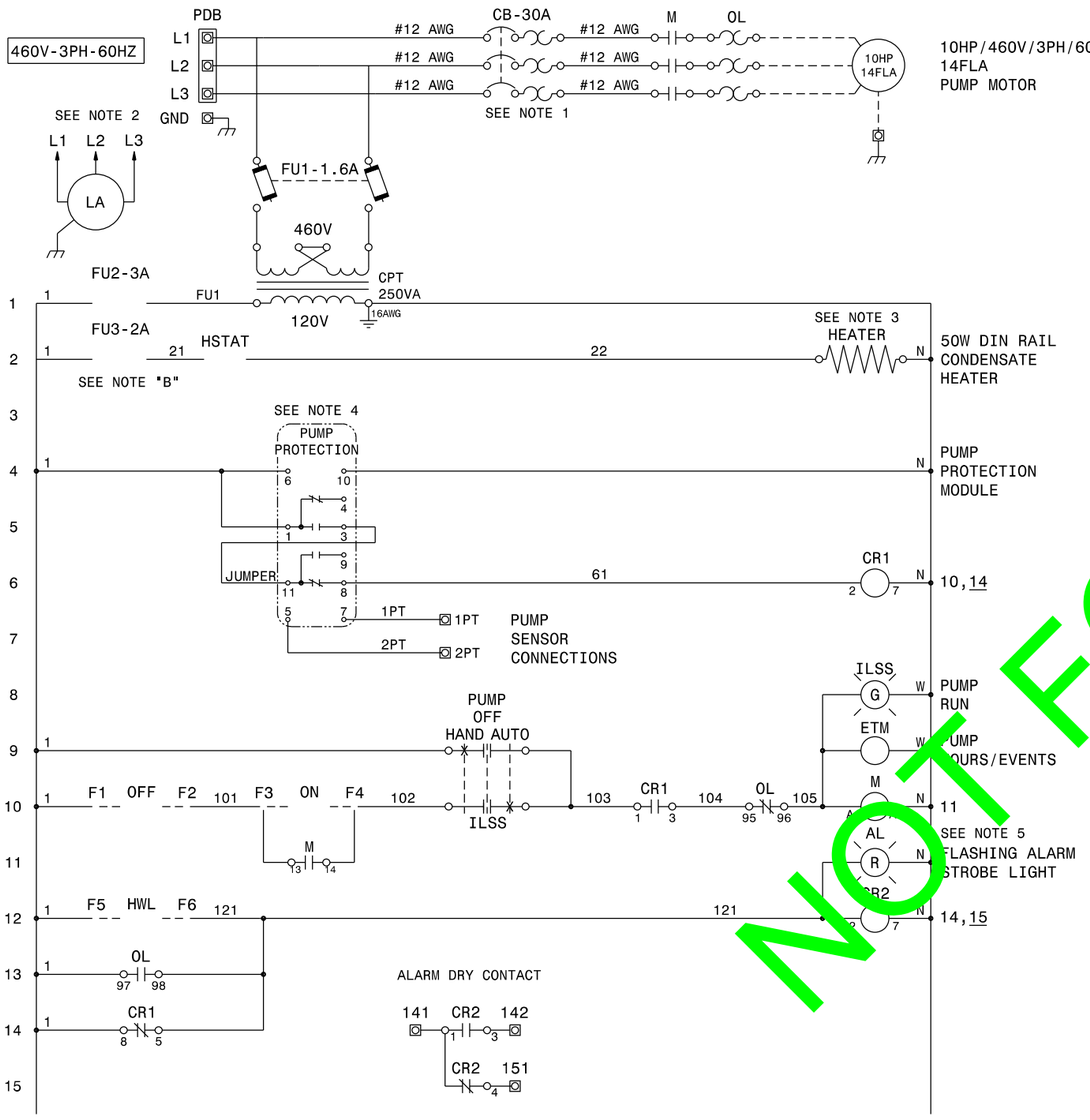
USER NAME = Jim Ohse	DESIGNED - CPD	REVISED -
	DRAWN - JRO	REVISED -
PLOT SCALE = 80.0000 ' / in.	CHECKED - JMS	REVISED -
PLOT DATE = 9/15/2015 - 9:29:06 AM	DATE - CPD	REVISED -

ORCHARD ROAD
DRAINAGE SYSTEM MODIFICATIONS
KANE COUNTY, ILLINOIS

ELECTRICAL PLAN

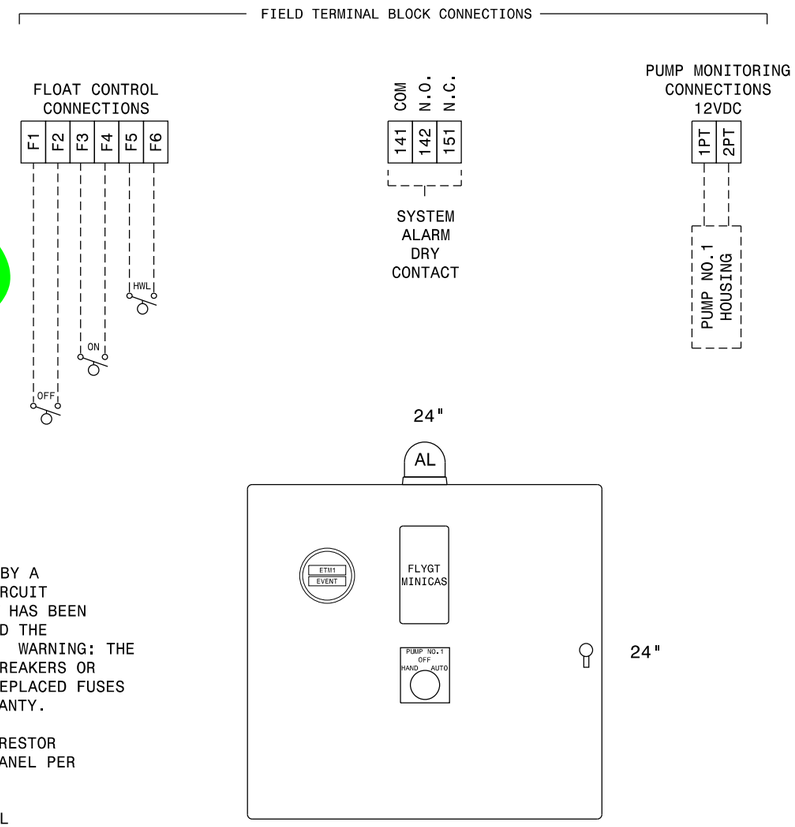
SCALE: | SHEET 1 OF 1 SHEETS | STA. | TO STA.

F.A. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
	13-00244-01-DR	KANE	6	5
		CONTRACT NO.		
	ILLINOIS	FED. AID PROJECT		



NOTES

1. AFTER A CIRCUIT IS DE-ENERGIZED BY A CIRCUIT PROTECTION DEVICE THE CIRCUIT MAY NOT BE RE-ENERGIZED UNTIL IT HAS BEEN DETERMINED THAT THE EQUIPMENT AND THE CIRCUIT CAN BE SAFELY ENERGIZED. WARNING: THE REPEATED RE-CLOSING OF CIRCUIT BREAKERS OR RE-ENERGIZING CIRCUITS THROUGH REPLACED FUSES IS PROHIBITED AND WILL VOID WARRANTY.
2. INSTALL AND CONNECT LIGHTNING ARRESTOR IN SERVICE ENTRANCE DISCONNECT PANEL PER MANUFACTURERS SPECIFICATIONS.
3. SET INTERNAL HEAT STAT TO CONTROL CONDENSATE AS NEEDED.
4. PUMP PROTECTION MODULE WILL SHUTDOWN PUMP IN HIGH TEMPERATURE AND SEAL FAILURE SITUATIONS. PANEL WILL ALSO ISSUE ALARM.
5. EXTERNAL FLASHING ALARM LIGHT IS TO BE TOP MOUNTED ON EXTERIOR OF ALL ENCLOSURES, AND SEALED ACCORDING TO MANUFACTURERS INSTRUCTIONS.
6. INSTALL ALL WIRING TO COMPLY WITH NEC REQUIREMENTS.



NEMA 4X
304SS
24" X 24" X 10"
DEAD-FRONT
ENCLOSURE
WITH
3-POINT PADLOCKABLE LATCH

CMT
CRAWFORD, MURPHY & TILLY, INC.
CONSULTING ENGINEERS

USER NAME = Jim Ohse	DESIGNED - CPD	REVISED -
	DRAWN - JRO	REVISED -
PLOT SCALE = 80.0000 ' / in.	CHECKED - JMS	REVISED -
PLOT DATE = 9/15/2015 - 9:29:34 AM	DATE - CPD	REVISED -

ORCHARD ROAD
DRAINAGE SYSTEM MODIFICATIONS
KANE COUNTY, ILLINOIS

PUMP CONTROLLER DETAILS

SCALE: | SHEET 1 OF 1 SHEETS | STA. | TO STA.

F.A. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
	13-00244-01-DR	KANE	6	6
		CONTRACT NO.		
	ILLINOIS FED. AID PROJECT			

RETURN WITH BID

Illinois Department of Transportation

Local Public Agency
Formal Contract Proposal

PROPOSAL SUBMITTED BY		
Contractor's Name		
Street		P.O. Box
City	State	Zip Code

STATE OF ILLINOIS

COUNTY OF Kane

(Name of City, Village, Town or Road District)

FOR THE IMPROVEMENT OF

STREET NAME OR ROUTE NO. Co. Highway No. 83

SECTION NO. 13-00244-01-DR

TYPE OF FUNDS Non-MFT

☑ SPECIFICATIONS (required) ☑ PLANS (required)

For Municipal Projects
Submitted/Approved/Passed

☐ Mayor ☐ President of Board of Trustees ☐ Municipal Official

Date

Department of Transportation
☐ Released for bid based on limited review

Regional Engineer

Date

For County and Road District Projects
Submitted/Approved

Highway Commissioner

Date

Submitted/Approved

County Engineer/Superintendent of Highways

9-16-15

Date

Note: All proposal documents, including Proposal Guaranty Checks or Proposal Bid Bonds, should be stapled together to prevent loss when bids are processed

RETURN WITH BID

NOTICE TO BIDDERS

County: Kane
Local Public Agency: Division of Transportation
Section Number: 13-00244-01-DR
Route: Co. Highway No. 83

Sealed proposals for the improvement described below will be received at the office of The County Engineer

41W011 Burlington Road, St. Charles, IL 60175 (Address) until 9:00 AM (Time) on October 7, 2015 (Date)

Sealed proposals will be opened and read publicly at the office of The County Engineer

41W011 Burlington Road, St. Charles, IL 60175 (Address) at 9:00 AM (Time) on October 7, 2015 (Date)

DESCRIPTION OF WORK

Name Orchard Road Drainage System Modification Length: 50.00 feet (0.0095 miles)

Location Approximately 1,100 feet south of Galena Blvd.

Proposed Improvement Installation of manholes on existing storm sewer, piping, a 30" nominal duck-bill style backflow preventer, access drive, pump and associated items including controls and electrical.

1. Plans and proposal forms will be available in the office of The County Engineer

   41W011 Burlington Road, St. Charles, IL 60175 (Address) Contacts are Candi Thomas (thomascandance@co.kane.il.us)

2. ☑ Prequalification
   If checked , the 2 low bidders must file within 24 hours after the letting an "Affidavit of Availability" (Form BC 57), in in duplicate, showing all uncompleted contracts awarded to them and all low bids pending award for Federal, State, County, Municipal and private work. One original shall be filed with the Awarding Authority and one original with the IDOT District Office.

3. The Awarding Authority reserves the right to waive technicalities and to reject any or all proposals as provided in BLRS Special Provision for Bidding Requirements and Conditions for Contract Proposals.

4. The following BLR Forms shall be returned by the bidder to the Awarding Authority:
   a. BLR 12200: Local Public Agency Formal Contract Proposal
   b. BLR 12200a Schedule of Prices
   c. BLR 12230: Proposal Bid Bond (if applicable)
   d. BLR 12325: Apprenticeship or Training Program Certification **(do not use for federally funded project)**
   e. BLR 12326: Affidavit of Illinois Business Office

$20 Charge for Proposal
*Non-refundable**
Proposal Available on CD Only

No Proposals issued after 12 NOON Tuesday Oct 6, 2015

5. The quantities appearing in the bid schedule are approximate and are prepared for the comparison of bids. Payment to the Contractor will be made only for the actual quantities of work performed and accepted or materials furnished according to the contract. The scheduled quantities of work to be done and materials to be furnished may be increased, decreased or omitted as hereinafter provided.

6. Submission of a bid shall be conclusive assurance and warranty the bidder has examined the plans and understands all requirements for the performance of work. The bidder will be responsible for all errors in the proposal resulting from failure or neglect to conduct an in depth examination. The Awarding Authority will, in no case be responsible for any costs, expenses, losses or changes in anticipated profits resulting from such failure or neglect of the bidder.

7. The bidder shall take no advantage of any error or omission in the proposal and advertised contract.

8. If a special envelope is supplied by the Awarding Authority, each proposal should be submitted in that envelope furnished by the Awarding Agency and the blank spaces on the envelope shall be filled in correctly to clearly indicate its contents. When an envelope other than the special one furnished by the Awarding Authority is used, it shall be marked to clearly indicate its contents. When sent by mail, the sealed proposal shall be addressed to the Awarding Authority at the address and in care of the official in whose office the bids are to be received. All proposals shall be filled prior to the time and at the place specified in the Notice to Bidders. Proposals received after the time specified will be returned to the bidder unopened.

9. Permission will be given to a bidder to withdraw a proposal if the bidder makes the request in writing or in person before the time for opening proposals.

PROPOSAL

County Kane
Local Public Agency Division of Transportation
Section Number 13-00244-01-DR
Route Co. Highway No. 83

1. Proposal of _____

for the improvement of the above section by the construction of
Installation of manholes on existing storm sewer, piping, a 30" nominal duck-bill style backflow preventer, access drive, pump and associated items including controls and electrical.

a total distance of 50 feet, of which a distance of 50 feet, (0.01 miles) are to be improved.

2. The plans for the proposed work are those prepared by Kane County and approved by the Department of Transportation on _____

3. The specifications referred to herein are those prepared by the Department of Transportation and designated as "Standard Specifications for Road and Bridge Construction" and the "Supplemental Specifications and Recurring Special Provisions" thereto, adopted and in effect on the date of invitation for bids.

4. The undersigned agrees to accept, as part of the contract, the applicable Special Provisions indicated on the "Check Sheet for Recurring Special Provisions" contained in this proposal.

5. The undersigned agrees to complete the work within 45 working days or by _____ unless additional time is granted in accordance with the specifications.

6. A proposal guaranty in the proper amount, as specified in BLRS Special Provision for Bidding Requirements and Conditions for contract Proposals, will be required. Bid Bonds will be allowed as proposal guaranty. Accompanying this proposal is either a bid bond if allowed, on Department form BLR12230 or a proposal guaranty check, complying with the specifications, made payable to:

County Treasurer of Kane

The amount of the check is _____ ( ).

7. In the event that one proposal guaranty check is intended to cover two or more proposals, the amount must be equal to the sum of the proposal guaranties, which would be required for each individual proposal. If the proposal guaranty check is placed in another proposal, it will be found in the proposal for: Section Number **13-00244-01-DR** .

8. The successful bidder at the time of execution of the contract will be required to deposit a contract bond for the full amount of the award. When a contract bond is not required, the proposal guaranty check will be held in lieu therefore. If this proposal is accepted and the undersigned fails to execute a contract and contract bond as required, it is hereby agreed that the Bid Bond or check shall be forfeited to the Awarding Authority.

9. Each pay item should have a unit price and a total price. If no total price is shown or if there is a discrepancy between the product of the unit price multiplied by the quantity, the unit price shall govern. If a unit price is omitted, the total price will be divided by the quantity in order to establish a unit price.

10. A bid will be declared unacceptable if neither a unit price nor a total price is shown.

11. The undersigned submits herewith the schedule of prices on BLR 12200a covering the work to be performed under this contract.

12. The undersigned further agrees that if awarded the contract for the sections contained in the combinations on BLR 12200a, the work shall be in accordance with the requirements of each individual proposal for the multiple bid specified in the Schedule for Multiple Bids below.

INDEX
FOR
SUPPLEMENTAL SPECIFICATIONS
AND RECURRING SPECIAL PROVISIONS

Adopted January 1, 2015

This index contains a listing of SUPPLEMENTAL SPECIFICATIONS, frequently used RECURRING SPECIAL PROVISIONS, and LOCAL ROADS AND STREETS RECURRING SPECIAL PROVISIONS.

ERRATA Standard Specifications for Road and Bridge Construction (Adopted 1-1-12) (Revised 1-1-15)

SUPPLEMENTAL SPECIFICATIONS

CHECK SHEET
FOR
RECURRING SPECIAL PROVISIONS

Adopted January 1, 2015

The following RECURRING SPECIAL PROVISIONS indicated by an "X" are applicable to this contract and are included by reference:

RECURRING SPECIAL PROVISIONS

CHECK SHEET
FOR
LOCAL ROADS AND STREETS RECURRING SPECIAL PROVISIONS

Adopted January 1, 2015

The following LOCAL ROADS AND STREETS RECURRING SPECIAL PROVISIONS indicated by an "X" are applicable to this contract and are included by reference:

LOCAL ROADS AND STREETS RECURRING SPECIAL PROVISIONS

BDE SPECIAL PROVISIONS
For the November 6, 2015 Letting

The following special provisions indicated by an "x" are applicable to this contract and will be included by the Project Development and Implementation Section of the BD&E. An * indicates a new or revised special provision for the letting.

	File Name	#		Special Provision Title	Effective	Revised
	80240	1		Above Grade Inlet Protection	July 1, 2009	Jan. 1, 2012
	80099	2		Accessible Pedestrian Signals (APS)	April 1, 2003	Jan. 1, 2014
	80274	3		Aggregate Subgrade Improvement	April 1, 2012	Jan. 1, 2013
	80192	4		Automated Flagger Assistance Device	Jan. 1, 2008	
	80173	5		Bituminous Materials Cost Adjustments	Nov. 2, 2006	July 1, 2015
	80241	6		Bridge Demolition Debris	July 1, 2009	
	5026I	7		Building Removal-Case I (Non-Friable and Friable Asbestos)	Sept. 1, 1990	April 1, 2010
	5048I	8		Building Removal-Case II (Non-Friable Asbestos)	Sept. 1, 1990	April 1, 2010
	5049I	9		Building Removal-Case III (Friable Asbestos)	Sept. 1, 1990	April 1, 2010
	5053I	10		Building Removal-Case IV (No Asbestos)	Sept. 1, 1990	April 1, 2010
	80360	11	✔	Coarse Aggregate Quality	July 1, 2015	
	80310	12	✔	Coated Galvanized Steel Conduit	Jan. 1, 2013	Jan. 1, 2015
	80341	13		Coilable Nonmetallic Conduit	Aug. 1, 2014	Jan. 1, 2015
	80198	14		Completion Date (via calendar days)	April 1, 2008	
	80199	15		Completion Date (via calendar days) Plus Working Days	April 1, 2008	
	80293	16		Concrete Box Culverts with Skews > 30 Degrees and Design Fills ≤ 5 Feet	April 1, 2012	April 1, 2015
	80294	17		Concrete Box Culverts with Skews ≤ 30 Degrees Regardless of Design Fill and Skews > 30 Degrees with Design Fills > 5 Feet	April 1, 2012	April 1, 2014
	80311	18		Concrete End Sections for Pipe Culverts	Jan. 1, 2013	
	80334	19		Concrete Gutter, Curb, Median, and Paved Ditch	April 1, 2014	Aug. 1, 2014
	80277	20		Concrete Mix Design – Department Provided	Jan. 1, 2012	Jan. 1, 2014
	80261	21		Construction Air Quality – Diesel Retrofit	June 1, 2010	Nov. 1, 2014
	80335	22	✔	Contract Claims	April 1, 2014	
	80029	23		Disadvantaged Business Enterprise Participation	Sept. 1, 2000	Jan. 2, 2015
	80358	24	✔	Equal Employment Opportunity	April 1, 2015	
	80265	25	✔	Friction Aggregate	Jan. 1, 2011	Nov. 1, 2014
	80229	26		Fuel Cost Adjustment	April 1, 2009	July 1, 2015
	80329	27		Glare Screen	Jan. 1, 2014	
	80304	28		Grooving for Recessed Pavement Markings	Nov. 1, 2012	Aug. 1, 2014
	80246	29		Hot-Mix Asphalt Density Testing of Longitudinal Joints	Jan. 1, 2010	April 1, 2012
	80322	30		Hot-Mix Asphalt – Mixture Design Composition and Volumetric Requirements	Nov. 1, 2013	Nov. 1, 2014
	80323	31		Hot-Mix Asphalt – Mixture Design Verification and Production	Nov. 1, 2013	Nov. 1, 2014
	80347	32		Hot-Mix Asphalt – Pay for Performance Using Percent Within Limits – Jobsite Sampling	Nov. 1, 2014	July 1, 2015
	80348	33	✔	Hot-Mix Asphalt – Prime Coat	Nov. 1, 2014	
	80315	34		Insertion Lining of Culverts	Jan. 1, 2013	Nov. 1, 2013
	80351	35		Light Tower	Jan. 1, 2015	
	80336	36		Longitudinal Joint and Crack Patching	April 1, 2014	
	80324	37		LRFD Pipe Culvert Burial Tables	Nov. 1, 2013	April 1, 2015
	80325	38	✔	LRFD Storm Sewer Burial Tables	Nov. 1, 2013	April 1, 2015
	80045	39		Material Transfer Device	June 15, 1999	Aug. 1, 2014
	80342	40		Mechanical Side Tie Bar Inserter	Aug. 1, 2014	Jan. 1, 2015
	80165	41		Moisture Cured Urethane Paint System	Nov. 1, 2006	Jan. 1, 2010
*	80361	42		Overhead Sign Structures Certification of Metal Fabricator	Nov. 1, 2015	
	80337	43		Paved Shoulder Removal	April 1, 2014	

File Name	#		Special Provision Title	Effective	Revised
80349	44		Pavement Marking Blackout Tape	Nov. 1, 2014	
80298	45		Pavement Marking Tape Type IV	April 1, 2012	
80254	46		Pavement Patching	Jan. 1, 2010	
80352	47		Pavement Striping - Symbols	Jan. 1, 2015	
80359	48		Portland Cement Concrete Bridge Deck Curing	April 1, 2015	
80353	49		Portland Cement Concrete Inlay or Overlay	Jan. 1, 2015	April 1, 2015
80338	50		Portland Cement Concrete Partial Depth Hot-Mix Asphalt Patching	April 1, 2014	
80343	51		Precast Concrete Handhole	Aug. 1, 2014	
80300	52		Preformed Plastic Pavement Marking Type D - Inlaid	April 1, 2012	
80328	53		Progress Payments	Nov. 2, 2013	
3426I	54		Railroad Protective Liability Insurance	Dec. 1, 1986	Jan. 1, 2006
80157	55		Railroad Protective Liability Insurance (5 and 10)	Jan. 1, 2006	
80306	56		Reclaimed Asphalt Pavement (RAP) and Reclaimed Asphalt Shingles (RAS)	Nov. 1, 2012	April 1, 2014
80350	57		Retroreflective Sheeting for Highway Signs	Nov. 1, 2014	
80327	58		Reinforcement Bars	Nov. 1, 2013	
80344	59		Rigid Metal Conduit	Aug. 1, 2014	
80354	60		Sidewalk, Corner, or Crosswalk Closure	Jan. 1, 2015	April 1, 2015
80340	61		Speed Display Trailer	April 2, 2014	
80127	62		Steel Cost Adjustment	April 2, 2004	July 1, 2015
80317	63		Surface Testing of Hot-Mix Asphalt Overlays	Jan. 1, 2013	
80355	64		Temporary Concrete Barrier	Jan. 1, 2015	July 1, 2015
80301	65		Tracking the Use of Pesticides	Aug. 1, 2012	
80356	66		Traffic Barrier Terminals Type 6 or 6B	Jan. 1, 2015	
20338	67		Training Special Provisions	Oct. 15, 1975	
80318	68		Traversable Pipe Grate	Jan. 1, 2013	April 1, 2014
80345	69		Underpass Luminaire	Aug. 1, 2014	April 1, 2015
80357	70		Urban Half Road Closure with Mountable Median	Jan. 1, 2015	July 1, 2015
80346	71		Waterway Obstruction Warning Luminaire	Aug. 1, 2014	April 1, 2015
80288	72	✔	Warm Mix Asphalt	Jan. 1, 2012	Nov. 1, 2014
80302	73	✔	Weekly DBE Trucking Reports	June 2, 2012	April 2, 2015
80289	74		Wet Reflective Thermoplastic Pavement Marking	Jan. 1, 2012	
80071	75		Working Days	Jan. 1, 2002	

The following special provisions are in the 2015 Supplemental Specifications and Recurring Special Provisions:

File Name	Special Provision Title	New Location	Effective	Revised
80292	Coarse Aggregate in Bridge Approach Slabs/Footings	Articles 1004.01(b) and 1004.02(f)	April 1, 2012	April 1, 2013
80303	Granular Materials	Articles 1003.04, 1003.04(c), and 1004.05(c)	Nov. 1, 2012	
80330	Pavement Marking for Bike Symbol	Article 780.14	Jan. 1, 2014	
80331	Payrolls and Payroll Records	Recurring CS #1 and #5	Jan. 1, 2014	
80332	Portland Cement Concrete – Curing of Abutments and Piers	Article 1020.13	Jan. 1, 2014	
80326	Portland Cement Concrete Equipment	Article 1103.03(a)(5)	Nov. 1, 2013	
80281	Quality Control/Quality Assurance of Concrete Mixtures	Recurring CS #31	Jan. 1, 2012	Jan. 1, 2014
80283	Removal and Disposal of Regulated Substances	Articles 669.01, 669.08, 669.09, 669.14, and 669.16	Jan. 1, 2012	Nov. 2, 2012
80319	Removal and Disposal of Surplus Materials	Article 202.03	Nov. 2, 2012	
80307	Seeding	Article 250.07	Nov. 1, 2012	
80339	Stabilized Subbase	Article 312.06	April 1, 2014	

File Name	Special Provision Title	New Location	Effective	Revised
80333	Traffic Control Setup and Removal Freeway/Expressway	Articles 701.18(l) and 701.19(a)	Jan. 1, 2014	

The following special provisions require additional information from the designer. The additional information needs to be included in a separate document attached to this check sheet. The Project Development and Implementation section will then include the information in the applicable special provision. The Special Provisions are:

- Bridge Demolition Debris
- Building Removal-Case I
- Building Removal-Case II
- Building Removal-Case III
- Building Removal-Case IV
- Completion Date
- Completion Date Plus Working Days
- DBE Participation
- Material Transfer Device
- Railroad Protective Liability Insurance
- Training Special Provisions
- Working Days

INDEX OF SPECIAL PROVISIONS

PROJECT SPECIFIC SPECIAL PROVISIONS

SPECIAL PROVISION FOR COOPERATION WITH UTILITIES (LR 105)

SPECIAL PROVISION FOR INSURANCE (LR 107-4)

BUREAU OF DESIGN AND ENVIRONMENT (BDE) SPECIAL PROVISIONS

SPECIAL PROVISIONS

The Illinois Department of Transportation's (hereinafter "IDOT") Standard Specifications for Road and Bridge Construction, adopted January 1, 2012 (hereinafter "Standard Specifications") along with the following: (i) the Special Provisions, as provided herein below, (ii) the latest edition of the Illinois Manual on Uniform Traffic Control Devices for Streets and Highways in effect as of the date of this invitation for bids, (hereinafter the "MUTCD"), (iii) the Illinois Department of Transportation's Supplement Specifications and Recurring Special Provisions, adopted January 1, 2015 (as indicated on the check sheet included herein), (iv) the latest edition of IDOT's Highway Standards (hereinafter "Highway Standards") are specifically incorporated herein and made a part hereof for the proposed improvements designated as Section 13-00244-01-DR.

Other applicable standards include the Kane County Division of Transportation (KCDOT) standards, the city of Aurora standards, the Standard Specifications for Water and Sewer Main Construction in Illinois and the Illinois Urban Manual, all latest editions.

LOCATION OF IMPROVEMENT

This project is located approximately 1,100 feet south of the Galena Boulevard and Orchard Road intersection, in the city of Aurora, Kane County, Illinois. The project is on the west side of the road between the curb and tree line, on an existing 30" diameter storm sewer.

DESCRIPTION OF THE IMPROVEMENT

This project consists of the installation of manholes on existing storm sewer, piping, a 30" nominal duck-bill style backflow preventer, access drive, pump and associated items including controls and electrical.

CONTRACT COMPLETION TIME

The completion of this project shall be based on 45 calendar days.

Erosion and sediment control, installation and rough restoration within 14 days of start of construction. Final restoration shall follow immediately, weather permitting.

PREVAILING WAGES

Revised on: 11/10/2014

By submitting a bid, bidder expressly agrees to comply with all applicable State and Federal Prevailing Rate of Wage Laws, and all steps necessary to be in compliance therewith.

Prevailing Wage Rates: It is the policy of the State of Illinois as declared in "AN ACT regulating wages of laborers, mechanics and other workman employed in any public works by the State, County, City or any political subdivision or by any work under construction for public works" approved June 26, 1941, that a wage of no less that the general prevailing hourly rate as paid for work of a similar character in a locality in which work is performed, shall be paid to all laborers, workmen and mechanics employed by and on behalf of any and all public body engaged in public works, exclusive of maintenance work.

The responsive Bidder must include with their bid a separate sheet showing trades to be employed and wage rates to be paid. Prevailing wage rates are subject to revision monthly and the responsive bidder is responsible for any future adjustment thereof. Copies of the current prevailing wage rates are always available from the Illinois Department of Labor on their website.

The undersigned hereby agrees to pay the current Illinois Department of Labor Prevailing Wage Rates for any and all projects worked on for the County of Kane. The undersigned also agrees to provide the Kane County Division of Transportation a sheet showing trades to be employed and wage rates to be paid for each construction or repair project bid on or contracted for.

_____
Company Name

_____
Signature of Officer of Company

_____
Title

_____
Date

PREQUALIFICATION OF BIDDERS

Revised on: 11/10/2014

PREQUALIFICATION OF BIDDERS in accordance with Section 102.01 of the Standard Specifications shall be required of all bidders on this proposal. The primary Contractor will be required to meet all of the following prequalification code(s) for the discipline of work to be completed:

Work Category
5 – HMA Paving
12 – Drainage
14 - Electrical

The Subcontractor will be required to meet the prequalification code for the discipline of work they will be responsible for completing.

BASIS OF PAYMENT

This is a lump sum contract with the addition of one pay item, Items as Ordered by the Engineer, for additional work requested by the engineer in writing during construction. Quantities given are for estimating only. Contractor shall determine and verify work items and their quantities necessary for a complete and functional project without use of Items as Ordered by the Engineer. The Total Lump Sum Bid Amount shall include all materials, equipment, accessories, labor and work required for a complete and functional project.

ITEMS AS ORDERED BY THE ENGINEER

Revised on: 11/10/2014

When additional work not indicated on the Contract drawings is requested in writing by the Engineer during construction, this additional work shall be measured and paid for as described in Articles 104.02 and 109.04.

Basis of Payment: Payment for all additional work shall be made from the ITEMS AS ORDERED BY THE ENGINEER pay item, which shall be in units of one dollar ($1.00).

SPECIAL PROVISIONS FOR INSURANCE (COUNTY)

Revised on: 2/6/2015

The Contractor shall obtain and keep in full force the following insurance coverages:

POLICY: Owner's Protective Liability Insurance

INSURED: The County of Kane, its officers and employees
LIMITS: Not Less than $2,000,000 per occurrence and $5,000,000 aggregate limit.

All other provisions of Article 107.27 of the Standard Specifications shall apply.

The County of Kane Purchasing Department has set forth specific requirements for insurance. The Contractor shall provide a certificate of insurance to the Engineer that meets these requirements as stated in the below URL.

http://www.countyofkane.org/Documents/Purchasing/requiredInsuranceCertificate.pdf

BIDDING PROCESS AND AWARD OF CONTRACT (COUNTY)

Revised on: 2/6//2015

The bidding documents for this project are available at the Kane County Division of Transportation offices for a non-refundable fee of $20 on CD only. All Contractors that purchase bidding documents **must** present the following contact information: Company Name, Phone Number, Fax Number and a responsible email address for addendum notifications.

If addendums are necessary, they will be emailed to the Contractor or subcontractor. The Contractor or subcontractor shall acknowledge receipt of the email addendum by responding back to the contact listed on page one of the Notice to Bidders.

The award of this contract will be made to the lowest responsible bidder. The County reserve the right to reject any or all non-conforming, non-responsive, unbalanced, or conditioned bids, and to reject the bid of any bidder if the County believes that it would be in the best interest of the County not to award to that bidder. The County also has the right to award this contract with the deletion or reduction of any item in its entirety or partially without claim by the Contractor for loss of profit or overhead.

PROSECUTION OF WORK

Revised on: 11/24/14

Add the following paragraph to Article 108.02 of the standard specifications:

"The Contractor shall maintain throughout the course of the project, and provide to the Engineer, at the Engineer's request, a detailed progress schedule of planned construction related tasks and locations that projects a minimum of 2 weeks in to the future. At the Engineer's request, schedules of 4 weeks may be required."

At the Pre-Construction Meeting, the Contractor shall submit a completed progress schedule, ready for review and approval, and a prepared list of subcontractors, which will both be discussed and approved by the Engineer. This project schedule shall show all routes to be worked on and an anticipated estimate of time (in working days) to accomplish each item. All work shall be coordinated with the Engineer so that any crack routing and sealing shall be coordinated with the Engineer so that it occurs prior to proposed striping or other Kane County projects.

The progress schedule may be on IDOT from BC 255 or a detailed Primera schedule.

CONTRACTOR'S DAILY NOTIFICATION

Revised on: 12/29/2014

The Contractor shall notify the Engineer and /or his representative prior to the beginning of each day's work as to the location and type of work that is scheduled to be performed. The Contractor's notification shall be at least 24 hours prior to the day of actual work.

EQUIPMENT PARKING AND STORAGE

Revise the first paragraph of Article 701.11 to read: During working hours, all vehicles and/or non-operating equipment which are parked, 2 hours or less, shall be parked at least 8 feet from the open traffic lane. For other periods of time during working or non-working hours, all vehicles, materials, and equipment shall be parked or stored in a protected area, if the protected area is within a distance of 1,000 feet of the work operation. If there is no protected area within the 1,000 feet, the Contractor may park the equipment 30 feet from the edge of the open lane providing there is no part of the equipment within the 30 feet. The 30 feet is acceptable for 4:1 slopes and flatter. For slopes steeper than 4:1 the clear zone distances as shown on the Typical Section sheets, shall be maintained. If the distance to a protected area or clear zone region requires the equipment to be moved more than the 1,000 feet, then the Contractor shall load and transport the equipment to the protected area or clear zone region. A protected area is defined as behind temporary concrete barrier, temporary bridge rail, or other man-made or natural barriers.

JOINT UTILITY LOCATION INFORMATION FOR EXCAVATORS

The Contractor's shall contact the Joint Utility Locating Information for Excavators (J.U.L.I.E.) System at (800) 892-0123 with a minimum of forty-eight hours advance notice prior to beginning work. The Contractor shall coordinate all work with the utilities.

The Contractor shall take whatever precautions which may be necessary to protect the property of the various public utilities which may be located underground or above ground. Contractor will be required to repair or replace at his own expense, or bear the cost, to repair or replace, any public utility property which has been damaged through his efforts.

Contractor shall coordinate with Engineer to shift manholes as necessary to avoid found existing utilities.

PROTECTION OF EXISTING DRAINAGE FACILITIES DURING CONSTRUCTION

All existing drainage structures are to be kept free of debris resulting from construction operations. During construction, if the Contractor's forces encounter or otherwise become aware of any sewers, underdrains or field drains within the right-of-way other than those shown on the plans, they shall inform the Engineer.

DEFINITION OF PEAK PERIODS

Throughout the contract the phrase PEAK PERIODS is used to describe when certain items of work will either be permitted or restricted. For the purposes of this contract, PEAK PERIODS shall refer to 6:00 a.m. – 9:00 a.m. and 3:00 p.m. – 6:00 p.m. on weekdays. OFF PEAK PERIODS shall refer to any time period that does not fall within the definition of PEAK PERIODS.

TRAFFIC CONTROL

Traffic control shall be in accordance with the applicable sections of the Standard Specifications for Road and Bridge Construction, the guidelines contained in the National Manual of Uniform Traffic Control Devices for Streets and Highways, the Supplemental Specifications, these Special Provisions and any special details and highway standards contained herein and in the plans.

Special attention is called to Articles 107.09 and 107.14 and Section 701 of the Standard Specifications for Road and Bridge Construction and the following traffic control related Highway Standards and Supplemental Specifications and Recurring Special Provisions:

1. Highway Standards: 701101, 701106, 701421, 701426, 701901
2. Supplemental Specifications and Recurring Special Provisions:
   - Work Zone Traffic Control Devices
   - Construction Zone Traffic Control
   - Flaggers In Work Zone

Traffic control standards shall be applied as directed by the Engineer. Suggested applications for each standard are as follows:

701101 This standard should be used when the Contractor's work is confined to the shoulder.

701106 This standard should be used for, minor grading, seeding, and other miscellaneous work which is performed beyond 15' to the edge of the traffic lane.

701421 This Standard is used where at any time, any vehicle, equipment, worker or their activities will encroach on the land adjacent to eh shoulder, or on the shoulder within 24" of the edge of pavement/

701426 This Standard is used where any vehicle, equipment, workers or their activities will require: 1) stationary operations up to 1 hour, or 2) a continuous or intermittent moving operation where the average speed of movement is greater than 1 mph.

701901 This standard includes the traffic control device details.

During the entire construction period, the existing roads shall be kept open to traffic as follows:

(a) In accordance with the applicable portions of the Standard Specifications.
(b) The Contractor shall schedule and conduct his operations so as to insure the least obstruction to traffic, create a minimum of confusion to the public, and to conform to Article 107.09 of the Standard Specifications.
(c) Access to all public roads and private entrances shall be maintained during all stages of the work unless otherwise shown.
(d) Cones, drums or barricades shall be placed on the closed lane, not the open lane.

CONTROL OF WATER

Description: The contractor shall control and remove all water, regardless of source, as necessary to maintain the excavations in a dry condition as long as is necessary to complete the work. The work shall include furnishing all labor, material, and equipment.

The contractor shall be fully responsible for disposal of the water. Pumped water from excavated areas must be filtered prior to discharging back into water bodies.

REMOVAL AND DISPOSAL OF UNSUITABLE MATERIAL

Description: Removal and disposal of unsuitable material shall include all material that cannot be placed onsite due to being surplus material. This material shall be removed and disposed of offsite in accordance with **Section 202** of the Standard Specifications.

CLEAN CONSTRUCTION OR DEMOLITION DEBRIS

Earthwork operations for this project shall be completed in accordance with Section 202 of the Standard Specifications and material properly disposed of in accordance with Article 202.03.

This special provision only applies if the Contractor chooses to dispose of material at a permitted CCDD or registered uncontaminated soil fill facility. *The Contractor is advised to consider the cost of disposing of all surplus materials off-site and properly reflect those costs in their bids for earthwork and removal*

items. The Contractor must be thoroughly familiar with the provisions of the environmental Protection Act as it relates to proper disposal of excavated material and construction debris.

Should the Contractor choose to dispose of materials at a permitted CCDD or registered uncontaminated soil fill facility, the Contractor shall be responsible for the lawful removal of all excavated soil, material and other clean construction or demolition debris in compliance with Public Act 96-1416. Disposal of materials at a permitted CCDD or registered uncontaminated soil fill facility will require that Form LPC-663 be submitted to the operator of that location before any materials can be disposed of at that site. Each certification covers only material from that specified job site. The Contractor shall be responsible for having the required analysis of soil materials completed and the Form 663 adequately completed and signed by a Professional Engineer or Geologist licensed in the State of Illinois

The Contractor is not responsible for the cost of soil remediation. In the event material is rejected it will be returned to the site where the extent of additional effort required to dispose of the material will be determined. The cost of returning rejected material will be the responsibility of the Contractor. The extent of additional effort for disposal or use of rejected material will be coordinated between the Engineer and the Contractor.

It should be noted that "Unsuitable Material" defined in these special provisions for Removal and Disposal of Unsuitable Material should not be confused with "contaminated" or "hazardous" materials.

STORM SEWER REMOVAL

Description: This work shall include the excavation, removal and proper disposal of existing storm sewer. It shall also include the materials and work to connect existing storm sewer to the proposed structures. If a short section of existing pipe is used to connect to existing manhole, a concrete collar shall be installed to support pipe. Excavation of trenches shall be performed according to the applicable requirements of Article 550.04 of the Standard Specifications.

STORM SEWER, 30" DUCTILE IRON PIPE

Description: This work shall consist of excavating, providing and installing 30" diameter ductile iron pipe between the manholes as shown on the plans. Pipe shall be installed as one continuous piece without joints. Pipe shall be centrifugally cast, ductile iron, complying with ANSI/AWWA A21.51/C115 and class 52 thickness.

All work shall be done in accordance with Section 551 of the Standard Specifications. Granular bedding and haunching shall be provided to the center of the pipe, for the trench excavated.

DUCTILE IRON PIPE, 12" AND 8"

Description: Provide and install ductile iron pipe, bends and fittings of the size and at the locations shown on the plans.

A. Ductile iron pips shall conform to AWWA Standard C151, Class 53.The pipe shall be cement mortar lined inside conforming to AWWA Standard C104, and bituminous coated on the outside.

B. Joints inside the manhole shall use flanges. Joints outside the manholes shall be Megalug restrained mechanical joints. Thrust blocks shall also be used at bends.

C. Flanges shall conform ANSI/AWWA A21.15/C115.

D. Mechanical joints shall conform to ANSI/AWWA C111.

E. Polyethylene Encasement (Poly-Wrap) shall be furnished and installed on all Ductile Iron Pipe and fittings when buried. Tube form Poly-Wrap is required, 8 mil minimum thickness.

F. All work shall be done in accordance with Section 551 of the Standard Specifications. Granular bedding and haunching shall be provided to the center of the pipe.

MANHOLES

Description: This work shall be done in accordance with **Section 602** of the Standard Specifications and ASTM C 478-97 insofar as applicable, the following provisions and IDOT standard drawings 602406 (Manhole Type A 6' Diameter), 602411 (Manhole Type A 7' Diameter), 602421 (Manhole Type A 9' Diameter) and 602701 (Manhole Steps).

Manholes that are 6' or 9' diameter shall be IDOT Type A Manholes with flat top slabs modified to have sumps as described in the plans. The 7' manhole shall be an IDOT Type A Manhole with a flat top slab. The 6' manhole is a pipe junction, the 7' manhole will contain the pump and the 9' manhole will contain the slip-on check valve.

Steps: Cast iron steps shall be installed in the junction (6') and check valve (9') manholes.

Slab tops shall be designed to accept the rectangular hatch or frame as shown on the plans.

Granular bedding and backfill shall be installed to the center line the pipes.

Frames and Lids: The 6' diameter manhole will require City of Aurora Standard, Neenah R-1772 with open, type D grate, or approved equal. Adjustment rings shall be added as needed. Adjustment rings

shall be properly sized to allow frame and grate to be firmly seated on top of the adjustment ring. At least one adjustment ring shall be required to allow for 6 inches of topsoil to be placed adjacent to the frame and grate.

Hatches: The 7' and 9' diameter manholes will have welded aluminum sections with a hinged aluminum door of the dimensions shown on the drawings. The hinged door shall be fabricated from 1/4" thick aluminum with non-skid diamond tread on upper surface. All hardware on access assembly shall be stainless steel with a flush upper surface without protrusions. For safety, the door shall have a 300 lbs. / sq. ft. rating and be fitted with a recessed staple for padlock. Door shall be furnished with a flush aluminum drop handle and automatic hold open arm.

SLIP-ON AND IN-LINE CHECK VALVE

Description: The check valve for the 30" DIP shall be of the "duckbill" elastomeric style and the check valve for the 8" DIP shall be of the inline elastomeric style, both Tideflex or equal.

Duckbill Check Valve: The "duckbill" check valve shall be flow operated and be designed to slip over the specified pipe outside diameter and attached by means of vendor furnished stainless steel clamps. The port area shall contour down to a duckbill, which shall allow passage of flow in one direction while preventing reverse flow. The valve shall be one piece rubber construction with nylon reinforcement. The bill portion shall be thinner and more flexible than the valve body, and formed into a curve of 180°. Elastomer material shall be neoprene. The check valve shall be held in place with a stainless steel band and bolts.

Inline Slip-In Check Valve: The inline check valve shall be all rubber and the flow operated check type with a slip-in cuff connection. The valve shall be ply reinforced throughout the body, disc and bill, which is cured and vulcanized into a one-piece uni-body construction. A separate valve body or pipe used as the housing is not acceptable. The valve shall be manufactured with no metal, mechanical hinges or fasteners, which would be used to secure the disc or bill to the valve housing. The port area of the disc shall contour down, which shall allow passage of flow in one direction while preventing reverse flow. The entire valve shall fit within the pipe I.D. Once installed, the check valve shall not protrude beyond the face of the structure or end of the pipe.

The inline check valve shall be furnished with a set of stainless steel expansion clamps. The clamps, which will secure the valve in place, shall be installed inside the cuff portion of the valve, based on installation orientation, and shall expand outwards by means of a turnbuckle. Each clamp shall be predrilled allowing for the valve to be pinned and secured into position in accordance with the manufacturer's installation instructions.

Company name, plant location, valve size and serial number shall be bonded to the check valve.

The 30" check valve shall be of the style to fit within the 9' diameter manhole with approximately 3' clearance to the wall. The 8" check valve will be installed at the pump outlet in the 9' diameter manhole.

Submittal: Submit product literature and shop drawings that includes information on the performance and operation of the valve, materials of construction, dimensions and weights, elastomer characteristics, flow data, head loss data, and pressure ratings.

Quality Assurance: Manufacturer shall have at least 10 years of experience in the production of elastomer "duckbill" style elastomeric valves, and shall provide references and a list of installations upon request. Manufacturer shall have performed hydraulic tests on valves for flow capacity, head loss, and jet velocity at an accredited flow laboratory. Manufacturer shall provide test data upon request.

Manufacturer: Tidflex, General Rubber Corporation, Clay-Val, J&S Valve, or approved equal.

Installation: Check valve shall be installed in accordance with manufacturer's written Installation manual and approved submittals. The manufacturer's authorized representative shall be available for customer service during installation and start-up, and to train personnel in the operation, maintenance and troubleshooting of the check valve.

VERTICAL CHECK VALVE

Description: Vertical check valve body shall be Ductile Iron, ASTM A536 Grade 65-45-12. The Disc shall be a one piece Buna-N (NBR), with integral O-ring sealing with metal and steel reinforcements, ASTM D2000-BG. The valve shall be coated with a fusion-bonded epoxy NSI/NSF 61. The disc accelerator shall be Type 302 Stainless Steel, One piece, Enclosed, Field adjustable and replaceable. Non-slam closing. The backflow actuator shall be a stainless steel screw type backflow actuator. Valve connections shall be flanged class 125 ANSI B16.1 and B16.10 in accordance with ANSI/AWA Standard C508.

Submittal: Submit product literature and shop drawings that includes information on the performance and operation of the valve, materials of construction, dimensions and weights, elastomer characteristics, flow data, head loss data, and pressure ratings.

Quality Assurance: Manufacturer shall have at least 10 years of experience in the production of vertical check valves and shall provide references and a list of installations upon request. Manufacturer shall have performed hydraulic tests on valves for flow capacity, head loss, and jet velocity at an accredited flow laboratory. Manufacturer shall provide test data upon request.

Manufacturer: Val-Matic "Surgebuster" Swing-Flex series 500, or approved equal.

Installation: Check valve shall be installed in accordance with manufacturer's written Installation manual and approved submittals. The manufacturer's authorized representative shall be available for

customer service during installation and start-up, and to train personnel in the operation, maintenance and troubleshooting of the check valve.

GATE VALVES

Description: Resilient seated gate valve for a wet location. The valve shall have a double disc, non-rising stem and open counterclockwise. The valve body and bonnet shall be made from cast iron. The stem shall be manganese bronze. The wedge shall be cast iron encapsulated in rubber. Connections shall be flanged for vertical installation in a vault.

Submittal: Submit product literature and shop drawings that includes information on the performance and operation of the valve, materials of construction, dimensions and weights, elastomer characteristics and pressure ratings.

Quality Assurance: Manufacturer shall have at least 10 years of experience in the production of gate valves and shall be constructed to AWWA C509 Resilient Seated Gate Valves.

Manufacturers: Mueller Company 2360, Clow model 2640, Kennedy Valve KS-FW, No substitutions will be considered.

Installation: Unless necessary due to installation conditions and approved by Engineer, the valves shall be installed per manufacturer recommendations.

PUMP, CONTROLS and PIPING

General: Work under this section includes, but is not limited to, furnishing and installing one (1) submersible pump, one (1) 8-inch base 90 degree fitting, associated ductile iron pipe inside the wet well, stainless-steel guide rails, submersible level transducer, control panel, and associated materials as indicated on the project drawings, herein specified, as necessary for proper and complete performance.

References: Publications listed below form part of this specification to the extent referenced in the text by basic designation only. Consult latest edition of publication unless otherwise noted.

A. American National Std. Institute (ANSI) / American Water Works Assoc. (AWWA)
   1. ANSI B16.1 — Cast iron pipe flanges and flanged fittings.
   2. ANSI/AWWA C115/A21.15 — Cast/ductile iron pipe with threaded flanges.
   3. ANSI 253.1 — Safety Color Code for Marking Physical Hazards.

B. American Society for Testing and Materials (ASTM)
   1. ASTM A48 Gray Iron Castings.
   2. ASTM A126 Valves, Flanges, and Pipe Fittings.
   3. ASTM A307 Carbon Steel Bolts and Studs.
   4. ASTM A36 Structural Steel.

C. Institute of Electrical and Electronics Engineers (IEEE)
   1. ANSI/IEEE Std 100 Standard Dictionary of Electrical Terms.
   2. ANSI/IEEE Std 112 Test Procedure for Polyphase Induction Motors.
   3. IEEE Std 242 Protection of Industrial and Control Power Systems.

D. National Electric Code (NEC) / National Electrical Manufacturers Assoc. (NEMA)
   1. NEC National Electric Code.
   2. NEC 701 National Electric Code article 701.
   3. NEMA Std MG1 Motors and Generators.

E. Miscellaneous References
   1. Ten-State Standards Recommended Standards for Sewage Works.
   2. Hydraulic Institute Std. for Centrifugal, Rotary and Reciprocating Pumps.
   3. NMTBA and JIC Std Standards National Machine Tool Builders Association and Joint Industrial Council

Performance Criteria:

A. The pump station must be designed to handle raw, unscreened storm water. The pump and mechanical slide rail accessories shall be installed in the wet well as shown on the project plans. The pump control panel and liquid level control shall be installed within a factory built stainless steel enclosure.

B. The pump shall be furnished with an 8" discharge connection. The pump shall be selected to deliver 1150 GPM at a total dynamic head of 12.3 feet.

C. Site power furnished to both pump stations shall be 3 phase, 60 hertz, 460 volts, 4 wire, maintained within industry standards. Voltage tolerance shall be plus or minus 10 percent. Control voltage shall not exceed 132 volts.

Manufacturer:

A. Flygt

B. Pump shall be Flygt NP3127 LT3~Adaptive 426 with an 8-inch discharge. Motor is 7.5HP, 480V, 3Ph.

Submittals:

A. Product Data

1. Prior to fabrication, pump manufacturer shall submit 2 paper copies and 1 pdf copy of submittal data for review and approval.

2. Submittal shall include shop drawings, electrical ladder logic drawings, and support data as follows: Catalog cuts sheets reflecting characteristics for major items of equipment, materials of construction, major dimensions, motor data, pump characteristic curves showing the design duty point capacity (GPM), head (FT), and hydraulic brake horsepower (BHP). Electrical components used in the motor branch and liquid level control shall be fully described.

3. Shop drawings shall provide layout of mechanical equipment and anchor bolt locations for slide rail components. Pipe penetrations and station access clearances shall be dimensioned relative to the station centerline. The electrical ladder logic drawings shall illustrate motor branch and liquid level control circuits to extent necessary to validate function and integration of circuits to form a complete working system.

B. Operation & Maintenance Manuals

1. Installation shall be in accordance with written instructions provided by the pump manufacturer. Comprehensive instructions supplied at time of shipment shall enable personnel to properly operate and maintain all equipment supplied. Content and instructions shall assume operating personnel are familiar with pumps, motors, piping and valves, but lack experience on exact equipment supplied.

2. Documentation shall be specific to the pump supplied and collated in functional sections. Each section shall combine to form a complete system manual covering all aspects of equipment supplied by the pump manufacturer. Support data for any equipment supplied by others, even if mounted or included in overall design, shall be provided by those supplying the equipment. Instructions shall include the following as a minimum:

   a. Functional description of each major component, complete with operating instructions.

   b. Instructions for operating pump and pump controls in all modes of operation.

   c. Calibration and adjustment of equipment for initial start-up, replacement of level control components, or as required for routine maintenance.

   d. Electrical schematic diagram of the pump station circuits shall be in accordance with NFPA70. Schematics shall illustrate, to the extent of authorized repair, pump motor

branch, control and alarm system circuits including interconnections. Wire numbers and legend symbols shall be shown. Schematic diagrams for individual components, not normally repairable by the station operator, need not be included. Details for such parts shall not be substituted for an overall system schematic. Partial schematics, block diagrams, and simplified schematics shall not be provided in lieu of an overall system diagram.

e. Mechanical layout drawing of the pump station and components, prepared in accordance with good commercial practice, shall provide installation dimensions and location of all pumps, valves and piping.

3. Operation and maintenance instructions which rely on vendor cut-sheets and literature which include general configurations, or require operating personnel to selectively read portions of the manual shall not be acceptable. Operation and maintenance instructions must be specific to equipment supplied in accordance with these specifications.

Quality Assurance:

A. Upon request from the engineer, the pump manufacturer shall prove financial stability and ability to produce the pump within the specified delivery schedules. Evidence of facilities, equipment and expertise shall demonstrate the manufacturer's commitment to long term customer service and product support.

B. All pump openings and passages shall be of adequate size to pass 3" diameter spheres (minimum) and any trash or stringy material which can pass through an average storm sewer system.

C. The manufacturer's technical representative shall inspect the completed installation, correct or supervise the correction of any defect or malfunction, and instruct operating personnel in the proper operation and maintenance of the equipment as described in Part 3 of this section.

Manufacturer's Warranty:

A. The pump station manufacturer shall warrant all equipment to be of quality construction, free of defects in material and workmanship. A written warranty shall include specific details described below.

1. The pumping units installed in this station are warranted for a period of one (1) year from the time of start-up. The conditions of this warranty are predicated on factory approved installation and start-up of equipment in permanent storm water installation. This warranty covers failures due to defects in material and workmanship. The warranty does not cover normal wear and tear on equipment.

2. All remaining equipment apparatus and parts furnished shall be warranted for a period of one (1) years, excepting those items that are normally consumed in service.

B. Components failing to perform as specified by the engineer, or as represented by the manufacturer, or as proven defective in service during the warranty period, shall be replaced, repaired, or satisfactorily modified by the manufacturer without cost of parts or labor to the owner.

C. It is not intended that the pump manufacturer assume liability for consequential damages or contingent liabilities arising from failure of any vendor supplied product or part which fails to properly operate, however caused. Consequential damages resulting from defects in design, or delays in delivery are also beyond the manufacturer's scope of liability.

D. The warranty shall become effective upon the acceptance by the purchaser or the purchaser's authorized agent, or sixty (60) days after installation, or ninety (90) days after shipment, whichever occurs first.

E. In order to unify responsibility for proper operation of the complete pumping station, it is the intent of these Specifications that all system components be furnished by a single supplier (unitary source). The pumping station must be of standard catalog design, totally warranted by the manufacturer. Under no circumstances will a system consisting of parts compiled and assembled by a manufacturer's representative or distributor be accepted.

Wet well: Pump station wet well shall be the 7' diameter manhole.

Pump Construction:

A. The pump shall be of the integral gear, closed coupled, submersible type design. All components of the pump, including motor and gear reducer (if required) shall be capable of continuous underwater operation. In addition, all components of the pump shall be capable of continuous operation completely submerged to a minimum depth of 25 feet.
B. All metal surfaces coming into contact with the pumped media, other than stainless steel, shall be protected by a factory applied powder coating of an epoxy paint.

Motor:

A. Motors shall be 480V, 3 phase, 60 Hz and rated for Class I, Division I, Group D.

B. The pump motor shall be a NEMA B design, induction type with a squirrel cage rotor, shell type design, housed in an air filled, watertight chamber. The stator windings shall be insulated with moisture resistant Class H insulation rated at 180 degrees Celsius. The stator shall be insulated using Class H monomer-free polyester resin. The motor shall be inverter duty rated in accordance with NEMA MG1, Part 31. The motor shall be designed for continuous duty handling pumped media of 40°C (104°F) and capable of sustaining a minimum of 10 evenly spaced starts per hour.

C. The service factor shall be a minimum of 1.15. The motor shall be designed for operation up to 40°C (104°F) ambient and with a temperature rise not to exceed 80°C. A performance chart shall be provided showing curves for torque, current, power factor, input/output kW and efficiency. This chart shall also include data on starting and no-load characteristics.

D. The power cable shall be sized according to the NEC and ICEA standards and shall be of sufficient length to reach the junction box without the need of any splices. The outer jacket of the cable shall be oil resistant chlorinated polyethylene rubber.

E. The motor horsepower shall be adequate so that the pump is non-overloading throughout the entire pump performance curve from shut-off through run-out.

Motor Cooling System: Motors shall be cooled by a cooling jacket requiring no external hose, pipe, or connections to an outside cooling source.

Elastomers: All mating surfaces where watertight sealing is required shall be machined and fitted with Nitrile Rubber O-rings. Fittings shall be such that sealing is accomplished by metal-to-metal contact between machined surfaces. The sealing shall result in controlled compression of the O-rings without requiring a specific torque limit.

Impeller: The impeller shall be of (ASTM A-48, Class 35B gray iron or ASTM A-532 (Alloy III A) 25% chrome cast iron) dynamically balanced, semi-open, multi-vane, back swept, screw-shaped, non-clog design. The impeller leading edges shall be mechanically self-cleaned automatically upon each rotation as they pass across a spiral groove located on the volute suction. The screw-shaped leading edges of the gray iron impeller shall be hardened to Rc 45 and shall be capable of handling solids, fibrous materials, heavy sludge and other matter normally found in wastewater. The screw shape of the impeller inlet shall provide an inducing effect for the handling of up to 5% sludge and rag-laden wastewater. The impeller to volute clearance shall be readily adjustable by the means of a single trim screw. The impellers shall be locked to the shaft, held by an impeller bolt and shall be coated with alkyd resin primer.

Cable Entry:

A. The cable entry seal design shall preclude specific torque requirements to insure a watertight and submersible seal. The cable entry shall consist of dual cylindrical elastomer grommets, flanked by washers, all having a close tolerance fit against the cable outside diameter and the entry inside diameter. The grommets shall be compressed by the cable entry unit, thus providing a strain relief function.

B. The assembly shall provide ease of changing the cable when necessary using the same entry seal.

C. The cable entry junction chamber and motor shall be sealed from each other, which shall isolate the stator housing from foreign material gaining access through the pump top.

Bearings:

A. The pump shaft shall rotate on two sets of bearings. The lower bearing shall compensate for axial thrust and radial forces. Bearings shall be of sufficient size and properly spaced to transfer all radial and axial loads to the pump housing and minimize shaft deflection.

B. All bearings shall have a minimum L10 rated life of 50,000 hours when continuously operating within the specified range of conditions.

C. Bearings shall be pre-lubricated at the factory.

Mechanical Seal:

A. Each pump shall be provided with a positively driven dual, tandem mechanical shaft seal system consisting of two seal sets, each having an independent spring. The lower primary seal, located between the pump and seal chamber, shall contain one stationary and one positively driven rotating corrosion resistant tungsten-carbide ring. The upper secondary seal, located between the seal chamber and the seal inspection chamber shall be a leakage-free seal. The upper seal shall contain one stationary and one positively driven rotating corrosion resistant tungsten-carbide seal ring. The rotating seal ring shall have small back-swept grooves laser inscribed upon its face to act as a pump as it rotates, returning any fluid that should enter the dry motor chamber back into the lubricant chamber. All seal rings shall be individual solid sintered rings. Each seal interface shall be held in place by its own spring system. The seals shall not depend upon direction of rotation for sealing. Mounting of the lower seal on the impeller hub is not acceptable. Shaft seals without positively driven rotating members or conventional double mechanical seals containing either a common single or double spring acting between the upper and lower seal faces are not acceptable. The seal springs shall be isolated from the pumped media to prevent materials from packing around them, limiting their performance.

B. Each pump shall be provided with a lubricant chamber for the shaft sealing system. The lubricant chamber shall be designed to prevent overfilling and shall provide capacity for lubricant expansion. The seal lubricant chamber shall have one drain and one inspection plug that are accessible from the exterior of the motor unit. The seal system shall not rely upon the pumped media for lubrication.

C. The area about the exterior of the lower mechanical seal in the cast iron housing shall have cast in an integral concentric spiral groove. This groove shall protect the seals by causing abrasive particulate entering the seal cavity to be forced out away from the seal due to centrifugal action.

D. A separate seal leakage chamber shall be provided so that any leakage that may occur past the upper, secondary mechanical seal will be captured prior to entry into the motor stator housing. Such

seal leakage shall not contaminate the motor lower bearing. The leakage chamber shall be equipped with a float type switch that will signal if the chamber should reach 50% capacity.

Pump Shaft:

A. Pump and motor shaft shall be a single unit. Shafts using mechanical couplings shall not be acceptable.

B. The shaft shall be 416 stainless steel. Stainless steel shaft sleeves shall not be acceptable.

Guide Bracket:

A. Guide rails shall be provided on which the pump rides when being raised or lowered in the sump and mounted on the discharge base/elbow. The rails shall align the pump with the discharge elbow as it is lowered into place.

B. Guide rails shall be stainless steel and the diameter shall be as recommended by the pump manufacturer, but not less than 2" in diameter.

C. An upper rail guide shall be furnished to support and align the rails at the top of the sump.

D. The guide rail system shall be non-sparking and approved for use in Class 1, Division 1, Group D hazardous locations.

Discharge Base: A rigid 90-degree discharge base to support the total weight of the pumping unit shall be provided. The base is to be bolted directly to the floor with the 125lb. ANSI flange discharging horizontally.

Volute Suction Cover:

A. The pump volute shall be single piece gray cast iron A-48, Class B with non-concentric design with smooth passages of sufficient size to pass any solids that may enter the impeller and be of suitable thickness to safely withstand the pressure at shut-off head. Inlet and discharge size shall be as specified.

B. The volute shall have a replaceable suction cover insert ring in which are cast spiral-shaped, sharp-edged groove(s). The spiral groove(s) shall provide trash release pathways and sharp edge(s) across which each impeller vane leading edge shall cross during rotation so to remain unobstructed.

C. The insert ring shall be cast of (ASTM A-48, Class 35B gray iron or ASTM A-532 (Alloy III A) 25% chrome cast iron) and provide effective sealing between the multi-vane semi-open impeller and the volute housing. The seal between the pump discharge and discharge piping shall be watertight.

Protection:

A. Thermal Sensors- Thermal sensors shall be used to monitor stator temperatures. The stator shall be equipped with a minimum of two (2) thermal switches embedded in the end coils of the stator winding. These shall be used in conjunction with, and supplemental to, external motor overload protection and wired to the control panel. The pump shall shut down should any of the switches detect high temperature and automatically reset once motor temperature returns to normal. At the manufacturer's recommended temperature, the thermal switches shall open, stop the motor and activate an alarm.

B. Leak sensors - A leakage sensor shall be used to monitor and detect water in the stator chamber. The leakage sensor shall be a float switch which activates when leakage into the chamber reaches 50% chamber capacity, signaling the need to schedule an inspection.

Spare Parts (for each pump unit provided):

A. 2 sets of all gaskets.
B. Mechanical seal set.
C. Complete replacement bearing set.
D. Any special tools required for pump disassembly.

Materials of Construction:

A. Motor Housing: Cast Iron
B. Pump Housing: Cast Iron
C. Pump/Motor Shaft: Stainless Steel
D. Impeller: Cast Iron
E. Mechanical Seals:
F. Inner Seal Ring: Corrosion Resistant Tungsten Carbide
G. Outer Seal Ring: Corrosion Resistant Tungsten Carbide
H. Stator Housing: Cast Iron
I. O-rings and Elastomers: Nitrile
J. Mounting Assembly: Cast Iron
K. Nuts, bolts and fasteners: Stainless Steel
L. Discharge Base: Cast Iron

Piping Inside Wet Well:

A. Flanged pipe shall be centrifugally cast, ductile iron, complying with ANSI/AWWA A21.51/C115 and class 53 thickness.

B. Flanges shall be cast iron class 125 and Comply with ANSI B16.1.

C. Pipe and flanges shall be threaded and suitable thread sealant applied before assembling flange to pipe.

D. Bolt holes shall be in angular alignment within $1/2^0$ between flanges. Flanges shall be faced and a gasket finish applied.

E. Bends and fittings shall be included.

Supports and Thrust Blocks: All pipes connected to the pump station shall be supported according to good commercial practice.

Electrical Control Components:

A. The pump station control panel will be tested as an integral unit by the pump station manufacturer.

B. Panel Enclosure

1. The electrical control equipment shall be mounted within a 36"x30"x14" Nema 4x stainless steel, dead front type control enclosure. The enclosure door shall be hinged and sealed with a neoprene gasket. It shall include a removable plated steel back panel on which control components shall be mounted. Back panel shall be secured to enclosure with collar studs. Operator controls shall be mounted on the enclosure door. The enclosure shall be mounted on stainless steel unistrut as shown on the plans. The control panel shall be equipped with vapor emission type corrosion inhibitors.

2. All components shall be of the highest industrial quality, securely fastened to a removable sub-plate with screws and lockwashers. The sub-plate shall be tapped to accept all mounting screws. Self-tapping screws shall not be used to mount any component. All operating controls and instruments shall be securely mounted and shall be clearly labeled to indicate function.

3. A main terminal block and ground bar shall be furnished for field connection of the electrical supply. The connections shall be designed to accept copper conductors of sufficient size to serve the pump station loads. The main terminal block shall be mounted to allow incoming wire bending space in accordance with Article 373 of the National Electrical Code (NEC).

C. Motor Branch Components

1. A properly sized heavy duty air circuit breaker shall be furnished for each pump motor, and shall have a symmetrical RMS interrupting rating of 65,000 amperes at 480 volts. All circuit breakers shall be sealed by the manufacturer after calibration to prevent tampering. A padlocking operating mechanism shall be installed on each motor circuit breaker. Operator handles for the mechanisms shall be located on the door, with interlocks which permit the door to be opened only when circuit breakers are in the "OFF" position.

2. An open frame, across-the-line, NEMA rated magnetic motor starter shall be furnished for each pump motor. Starters of NEMA size 1 and above shall be designed for addition of at least two auxiliary contacts. Starters rated "O", "OO", or fractional size shall not be acceptable. Power contacts shall be double-break and made of cadmium oxide silver. Coils shall be epoxy molded for protection from moisture and corrosive atmospheres. The starter assembly shall be equipped with a metal mounting plate for durability. All motor starters shall be equipped to provide under-voltage release and overload protection on all three phases. Motor starter contacts and coils shall be easily replaceable without removing the motor starter from its mounted position.

3. Overload relays shall be solid-state block type, having visual trip indication with trip-free operation. Electrically resetting the overload will cause one (1) normally open and one (1) normally closed isolated alarm/control contact to reset, thus re-establishing a control circuit. Trip setting shall be governed by solid-state circuitry and adjustable current setting. Trip classes shall be 10, 15 and 20. Additional features to include phase loss protection, selectable jam/stall protection and selectable ground fault protection. A reset pushbutton, mounted through the control panel door, shall permit resetting the overload relays without opening the door.

D. Other Control Components

1. The pump control panel shall be equipped to terminate pump operation due to high motor winding temperature or moisture in the motor housing and shall utilize the contacts in the pump motor. If either event should occur, the motor starter will drop out, and a mechanical indicator, visible on the door, shall indicate the pump motor has been shutdown. The pump motor shall automatically reset when the condition has been corrected. However, the mechanical indicator shall require manual reset. Dry contacts, wired to terminal blocks, shall be furnished for each pump for thermal/moisture shutdown.

2. The control circuit shall be protected by a normal duty thermal- magnetic air circuit breaker which shall be connected in such a manner as to allow control power to be disconnected from all control circuits.

3. Pump mode selector switches shall be connected to permit manual start and manual stop for each pump individually, and to select automatic operation of each pump under control of the liquid level control system. Manual operation shall override the liquid level control system. Selector switches shall be heavy duty, oil-tight design, with contacts rated NEMA A300 minimum.

4. Pump alternator relay contacts shall operate after pump shutdown. Relay contacts shall be rated 10 amperes minimum at 120 volts non-inductive.

5. Control panel shall be equipped with one oil-tight pilot light for each pump motor. Light shall be wired in parallel with the related pump motor starter to indicate that the motor is on or should be running.

6. Six digit elapsed time indicators (non-reset type) shall be connected to each motor starter to indicate the total running time of each pump in "hours" and "tenth of hours".

7. A duplex ground fault indicating utility receptacle providing 115 VAC, 60 Hertz, single phase current, shall be mounted on the door panel of the control enclosure. Receptacle circuit shall be protected by a 15 ampere thermal-magnetic circuit breaker.

E. Wiring

1. The control panel, as furnished by the manufacturer, shall be completely wired. The contractor shall field connect the power feeder lines to the main terminal block, final connections to the remote alarm devices, and the connections between the pump and the pump motor control. All wiring, workmanship, and schematic wiring diagrams shall be in compliance with applicable standards and specifications set forth by the National Electric Code (NEC).

2. All user serviceable wiring shall be type MTW or THW, 600 volts, and shall be color coded as follows:
   a. Line and load circuits, AC or DC power..... Black
   b. AC control circuit less than line voltage..... Red
   c. DC control circuit..... Blue
   d. Interlock control circuit, from external source..... Yellow
   e. Equipment grounding conductor..... Green
   f. Current carrying ground ..... White
   g. Hot with circuit breaker open..... Orange

3. Control circuit wiring inside the panel, with the exception of internal wiring of individual components, shall be of 16 gauge minimum, type MTW or THW, 600 volts. Power wiring shall be 12 gauge minimum.

4. The ampacity of motor branch conductors and other power conductors shall not exceed the temperature rating of the connecting terminals. Wires shall be clearly numbered at each end in accordance with the electrical diagrams. All wires on the sub-plate shall be bundled and tied.

5. Wires connected to components mounted on the enclosure door shall be bundled and tied in accordance with good commercial practice. Bundles shall be made flexible at the hinged

side of the enclosure. Adequate length and flex shall be provided to allow the door to swing to its full open position without undue stress or abrasion on the wire or insulation. Bundles shall be held in place on each side of the hinge by mechanical fastening devices.

F. Conduit requirements are as follows

1. All conduit and fittings shall be UL listed.

2. Liquid tight flexible metal conduit shall be constructed of smooth, flexible galvanized steel core with smooth abrasion resistant, liquid tight, polyvinyl chloride cover.

3. Conduit shall be supported in accordance with articles 346, 347, and 350 of the National Electric Code.

4. Conduit shall be sized according to the National Electric Code.

G. Grounding

1. The pump control manufacturer shall provide a common ground bar mounted on the enclosure back plate. The mounting surface of the ground bar shall have any paint removed before making final connections.

2. The contractor shall make the field connections to the main ground lug and each pump motor in accordance with the National Electric Code.

H. Identification

1. A permanent corrosion resistant name plate(s) shall be attached to the control and include the following information:

   a. Equipment serial number
   b. Supply voltage, phase and frequency
   c. Current rating of the minimum main conductor
   d. Electrical wiring diagram number
   e. Motor horsepower and full load current
   f. Motor overload heater element
   g. Motor circuit breaker trip current rating
   h. Name and location of equipment manufacturer

2. Control components shall be permanently marked using the same identification shown on the electrical diagram. Identification label shall be mounted adjacent to the device.

3. Switches, indicators, and instruments shall be plainly marked to indicate function, position, etc. Marking shall be mounted adjacent to and above the device.

Liquid Level Control (Submersible Level Transmitters - Pressure Transducers)

A. The level control system shall start and stop pump motor in response to changes in wet well level. Submersible level transmitter shall be provided as follows:

B. The Transducer shall be of the solid-state head-pressure sensing type, suitable for continuous submergence and operation and shall be installed in accordance with manufacturer's instructions.

C. The transducer shall be installed in a suitably sized wall-mounted PVC standpipe stilling well with diaphragm face of the sensor 6 inches above the floor of the wet well. Provide a stainless-steel hanging chain and stainless-steel latching ring at top of wet well in order to permit field-removal and adjustment.

D. The transducer housing shall be fabricated of from stainless steel.

E. A hydraulic fill liquid shall be factory installed behind the diaphragm in order to transmit the sensed pressure to the transducer element.

F. Transducer electronics shall provide a 4-20ma dc output signal directly proportional to the sensed pressure.

G. The internal pressure of the lower transducer assembly shall be relieved to atmospheric pressure through a heavy-duty jacketed hose/cable assembly and a slack bellows mounted in an upper-assembly enclosure. The sealed breather system shall compensate for variations in barometric pressure and expansion and contraction of air due to temperature changes and altitude as well as prevent fouling from moisture and other corrosive elements.

H. The transducer assembly shall be installed where noted on the drawings and placed in successful operation. It shall be provided with input power and output signal transient protection, associated control elements as specified herein and in accordance with manufacturer's instructions.

I. All components in contact with the wet well environment shall be third party listed for use in a Class 1, Division 1, Group D environment. Provide compatible isolating-type (active) intrinsically-safe barrier if required for hazardous location application.

J. Where indicated on the drawings, the Contractor shall include a level display that will convert the 4-20mA signal from the element to feet in a NEMA 4X enclosure. Where mounted exterior include a sun shield. This unit shall re-transmit the 4-20mA signal.

K. The Submersible Level Transmitter shall be "Birdcage" Model BC-001 as manufactured by Blue Ribbon Industrial Components, Winter Park, Florida, or U.S. Filter (Consolidated Electric Company) Bulletin A1000, Model 157GSCI, or equivalent. Level indicator shall be Precisian Digital or equiv.

Location Name	Calibrated Span (USGS)	Transducer Span (psi)	Signal Output
Pump Station	664.25-673.00	0 – 20 psi	4-20 ma DC

L. High Water Alarm with Alarm Silence

1. High water level in the wet well to alert fo maintenance personnel - Should the wet well level rise to the "high water alarm" level, the level transmitter shall energize the alarm signal. The alarm signal shall complete a 115 volt AC circuit for an external alarm device. An indicator on the control panel and visible from roadway shall indicate high level condition exists. The alarm signal shall be maintained until wet well level is lowered and alarm circuit has been manually reset.

2. Alarm silence switch – Provide maintenance personnel a means to de-energize the external alarm device while corrective actions are under way. After silencing the alarm, manual reset of the alarm signal shall provide automatic reset of the liquid level control system. No alarm horn shall be required.

Examination

A. Contractor shall off-load equipment at installation site using equipment of sufficient size and design to prevent injury or damage. Station manufacturer shall provide written instruction for proper handling. Immediately after off-loading, contractor shall inspect pump, equipment and appurtenances for shipping damage or missing parts. Any damage or discrepancy shall be noted in written claim with shipper prior to accepting delivery. Validate all station serial numbers and parts lists with shipping documentation. Notify the manufacturer's representative of any unacceptable conditions noted with shipper.

Installation

A. Install, level, align, and lubricate pump station as indicated on project drawings. Installation must be in accordance with written instructions supplied by the manufacturer at time of delivery.

B. Check motor and control data plates for compatibility to site voltage. Install and test the station ground prior to connecting line voltage to station control panel.

C. Prior to applying electrical power to any motors or control equipment, check all wiring for tight connection. Verify that protective devices (fuses and circuit breakers) conform to project design documents. Manually operate circuit breakers and switches to ensure operation without binding. Open all circuit breakers and disconnects before connecting utility power. Verify line voltage, phase sequence and ground before actual start-up.

Field Quality Control

A. Operational Test

1. Prior to acceptance by owner, an operational test of the pump, and control systems shall be conducted to determine if the installed equipment meets the purpose and intent of the specifications. Tests shall demonstrate that all equipment is electrically, mechanically, structurally, and otherwise acceptable; it is safe and in optimum working condition; and conforms to the specified operating characteristics.

2. After construction debris and foreign material has been removed form the wet well, contractor shall supply clear water volume adequate to operate station through several pumping cycles. Observe and record operation of pumps, suction and discharge gage readings, ampere draw, pump controls, and liquid level controls. Check calibration of all instrumentation equipment, test manual control devices, and automatic control systems. Be alert to any undue noise, vibration or other operational problems.

B. Manufacturers Start-up Services - Coordinate station start-up with manufacturer's technical representative. The representative or factory service technician will inspect the completed installation. Calibrate and adjust instrumentation, correct or supervise correction of defects or malfunctions, and instruct operating personnel in proper operation and maintenance procedures.

Cleaning: Prior to acceptance, inspect interior and exterior of pump station for dirt, splashed material or damaged paint. Clean or repair accordingly. Remove from the job site all tools, surplus materials, scrap and debris.

Protection: The pump station should be placed into service immediately. If operation is delayed, the pump is to be stored and maintained per manufacturer's written instructions.

DEPRESSED CURB

Back of curb shall be cut to create depressed curb. Back of curb shall be cut 0.1' +- above the flow line of the gutter. An 18" long transition to the back of curb to remain shall be cut on either side. Contractor shall dispose of removed materials. Contractor shall coordinate with engineer to locate curb cut with respect to existing joints.

ACCESS DRIVE

Description: Construction of access drive shall include of removal and disposal of existing soil equal to the depth of the pavement, installation of granular base and installation of hot mix asphalt.

Granular base shall be compacted CA-6 crushed limestone grade B.

Hot Mix Asphalt shall be constructed in accordance with Section 406 of the IDOT Standard Specifications and shall be mixture composition IL 9.5, Mix D, N50.

Mix designs and materials inspection reports must be submitted to the KDOT for approval prior to installation.

RESTORATION OF WORK AREA

The disturbed areas shall be restored with topsoil, seed and erosion control blanket.

Topsoil: All work, materials and equipment shall conform to Section 211 and 1081 of the Standard Specifications. Topsoil shall be a minimum of 4". Topsoil shall be imported to bring grade to rim of top of structures.

Seeding: All work, materials and equipment shall conform to Section 250 and 1081 of the Standard Specifications. Seed shall be IDOT Class 2A – Salt Tolerant Roadside Mixtures. The Class 2A seed mixture shall be supplied in pounds of Pure Live Seed.

Erosion control blanket: All work, materials and equipment shall conform to Section 251 and 1081 of the Standard Specification. Erosion control blanket shall be North American Green BioNet S75BN Short-Term Biodegradable Single-Net, or approved equal.

EROSION AND SEDIMENT CONTROL

All work, materials and equipment shall conform to Section 280 and 1081 of the Standard Specifications as noted in the plans.

ELECTRICAL

See Division 16 Electrical Specifications.

Orchard Road Drainage System Modification
Kane County
Section No. 13-00244-01-DR

DIVISION 16 – ELECTRICAL

TABLE OF CONTENTS

PART 1 GENERAL

1.01 WORK INCLUDES

A. Work included in this section is general in nature and applicable to electrical system work. Contractor is also directed to other sections of Division 16 - Electrical for additional related specifications for items described in this section.

B. Work included in this section shall apply to installation and testing of all materials and equipment necessary to completely install electrical system as shown on drawings and as described herein in these specifications, or as may be necessary for a complete and operational electrical system.

C. Unless otherwise noted, all electrical equipment shown on project drawings shall be furnished under Division 16.

D. Drawings pertaining to this installation indicate general location of conduits, wiring, distribution and motor control centers, lighting and outlets, and other details necessary for installation of system.

E. Electrical installation as shown on drawings and as specified herein is based upon best available information, with regard to characteristics of mechanical equipment specified. In the event changes are necessary in order to accommodate mechanical equipment furnished, necessary revisions will be made with approval of Owner's representative.

F. Any minor changes in location of equipment, to include conduits, outlets, etc., from those shown on drawings, shall be made without extra charge if so directed by Owner's representative. These changes shall be any changes in location that, had new locations been the bid-upon location, would not have resulted in an increase in contract construction cost over that actually bid.

G. All electrical equipment shall be installed in conformance with applicable sections of NPFA 70 - National Electrical Code, respective equipment manufacturer's directions, as detailed on drawings and as specified herein. Any installations which void U.L. listing (or other third party listing) and/or manufacturer's warranty of a device or equipment shall NOT be permitted

H. RELATED CONTRACT WORK DESCRIBED ELSEWHERE IN THESE SPECIFICATIONS:

Electrical Contractor shall note that it is **not** the intent of these Division 16 specifications herein to be all-inclusive of electrically related work to be performed as part of this contract.

Contractor shall also comply with electrical requirements in these sections of the specifications, including, but not limited to, wiring of motors, control panels furnished by others, HVAC equipment and all other electrically powered

equipment furnished by others under this project.

1.02 LAWS AND ORDINANCES

A. In installation of this work, Contractor shall comply in every respect with requirements of National Electrical Code (NEC), National Board of Fire Underwriters, and any state and local requirements, laws and ordinances as may be applicable.

B. If, in opinion of the Contractor, there is anything in drawings or specifications that will not strictly comply with above laws, ordinances and rules, the matter shall be referred to the attention of the Owner's representative for a decision before proceeding with that part of the work. No changes on drawings or in specifications shall be made without the full consent of Owner's representative.

C. Contractor shall obtain and pay for all licenses, permits and inspections required by above laws, ordinances and rules for entire electrical wiring job called for in these specifications and accompanying drawings.

1.03 DRAWINGS

A. Drawings for electrical work will be a part of electrical drawings to which will be added, during the period of construction, any other detail drawings as may be necessary in opinion of Owner's representative, to show proper installation of various appliances or equipment with relation to project.

B. Drawings and specifications are intended to be descriptive only, and any error or omissions of detail in either **shall not** relieve Contractor from obligations thereunder to install in correct detail any and all materials necessary for complete and operating electrical systems to extent shown on drawings and described in this specification.

C. Contractor shall, during progress of job, record any and all changes or deviations from original drawings, and, at completion of project, shall deliver to Owner's representative a **single** marked-up set of "as-built" drawings.

1.04 SHOP AND ERECTION DRAWINGS

A. This Contractor shall prepare shop drawings for all parts of his work. Before commencing any work or providing any material, Contractor shall submit for approval of Owner's representative all drawings relating to construction, arrangement or disposition of equipment entering into contract, and show complete equipment with manufacturer's specifications of same.

B. Shop drawings of all distribution and motor control centers, panels, power and lighting systems, fixtures, wire, cables, devices, etc. shall be submitted for approval, as well as complete details of all systems not shown in detail on drawings.

C. SHOP DRAWINGS SHALL BE F ULLY DESCRIPTIVE OF ALL MATERIALS AND EQUIPMENT TO BE INCORPORATED INTO THIS PROJECT. CONTRACTOR SHALL CAREFULLY CHECK ALL SUBMITTED SHOP DRAWINGS, MAKING SURE THEY ARE COMPLETE IN ALL DETAILS AND COVER SPECIFIC ITEMS AS HEREINAFTER SPECIFIED.

D. Shop drawings shall be submitted in sufficient quantity as required by the General Conditions. Three (3) copies will be retained by the Engineer for his use and records.

E. No material or equipment shall be a llowed at the site until shop drawings approved by the Engineer are received by the Resident Engineer at the site.

F. The following information shall be clearly marked on each shop drawing, catalog cut, pamphlet, specifications sheet, etc. submitted:

PROJECT TITLE:
BRANCH OF WORK: ELECTRICAL
NAME OF BUILDING OR LOCATION:
PAGE OF DRAWINGS OR SPECS WITH WHICH EQUIPMENT COMPLIES:
DATE:
SUBMITTED BY:

PART 2 PRODUCTS

2.01 PRODUCTS SHALL BE AS SPECIFIED IN OTHER SECTIONS AND AS DETAILED ON THE DRAWINGS.

PART 3 EXECUTION

3.01 EQUIPMENT STORAGE

A. All electrical equipment considered to be a par t of this contract, to include, but not limited to, motor control centers (MCC), starters, transformers, lighting fixtures, etc., shall be stored before installation in a warm, dry, indoor area so as to protect the equipment from physical damage, freezing, dirt and an y other harmful effects. Equipment stored under tarpaulins or plastic covers **will not** be considered as meeting this requirement.

B. The installation of electrical equipment shall not begin until the structure, if required, within which the equipment is to be permanently housed, is complete enough to provide protection from weather and vandalism (i.e. roof and doors installed).

C. The Contractor will be responsible for ensuring conformance with these procedures.

3.02 EQUIPMENT MOUNTING

A. Electrical Contractor shall be responsible for furnishing and setting all anchor bolts required to install Contractor's equipment.

B. Where concrete mounting pads are required for equipment mounting, Electrical Contractor shall furnish all concrete and form work necessary to complete the installation.

C. Where electrical equipment is located on damp or wet walls or locations as directed, it shall be "stand-off" mounted ½" from wall in a manner so that rear of equipment is freely exposed to surrounding air. Method of mounting shall be approved by Owner's representative before equipment is mounted.

D. Unless otherwise noted, top of safety-switches, control panels, and similar equipment shall be 6'-0" above finish floor or finish grade.

E. Enclosures for panelboards, switches or overcurrent devices shall not be used as junction boxes, auxiliary gutters or raceways for conductors feeding through or tapping-off to other switches or overcurrent devices, unless adequate space for this purpose is provided and the equipment is listed for this use.

F. In order to maintain NEC ratings and classifications of cables, do not combine conduit contents or modify conduit materials of construction unless specifically directed or shown otherwise on project documents.

END OF SECTION 16010

PART 1 GENERAL

1.01 WORK INCLUDES

A. Work included in this section is conduits, raceways and fittings required for operation and maintenance of facility.

1.02 RELATED SECTIONS

A. Section 16010 - General Electrical Requirements
B Section 16123 - Building Wire and Cable
C. Section 16190 - Supporting Devices

1.03 REFERENCE TO STANDARDS

A. Federal Specifications WW-C-581d
B. Federal Specifications WW-C-540c
C. Federal Specifications WC-1094-A
D. ANSI C80.1
E. ANSI C80.3
F. ANSI C80.5
G. UL Standard UL-1
H. UL Standard UL-6
I. UL Standard UL-651
J. UL Standard UL-797
K. UL Standard UL-1479
L. NEMA RN1
M. NEMA RN2
N. NFPA 70 (NEC)
O. NEMA TC-2
P. NEMA TC-3
Q. NEMA TC-7
R. A.A.S.H.T.O.
S. ASTM A615

1.04 DELIVERY, STORAGE AND HANDLING

A. Conduits shall not be shipped loose, but shall be bundled by sizes. Threads of metal conduits shall be protected by plastic caps. Fittings shall be stored in boxes. All equipment shall be stored on pallets to prevent contact with earth and shall be covered with plastic sheeting to protect them from dirt and weather.

1.05 SUBMITTALS (submit only on types applicable for project)

A. Submit under provisions of Division 1.
B. Schedule 40 Galvanized Rigid Steel Conduit
C. Rigid PVC Conduit
D. Liquid Tight Flexible Metal Conduit

E. Fittings and Conduit Bodies
F. Conduit Explosion Proof Seals

1.06 QUALIFICATIONS

A. All material shall be purchased new from suppliers/manufacturers regularly engaged in the business of electrical conduit, ducts and fittings.

1.07 MAINTENANCE SERVICE (WARRANTY)

A. All equipment shall be warranted to be free from defects in material and workmanship for a period of one year from date of substantial completion established by Owner.

PART 2 PRODUCTS

2.01 EQUIPMENT SPECIFICATION
Note that all types specified below may not be used on every project. Refer to project drawings for individual project requirements.

A. Schedule 40 Galvanized Rigid Steel Conduit:

Conduit shall be of heavy wall type fabricated from mild steel tubing and shall have a hot-dipped galvanized inner and outer coating, with a final coating of zinc chromate. Conduit and installation shall comply with all requirements in NEC Article 344.

B. Rigid PVC Conduit:

Conduit shall be Schedule 40 or Schedule 80, as noted on the drawings, PVC, 90°C, UL rated or approved equivalent. Material shall comply to NEMA Specification TC-2 (Conduit), TC-3 (Fittings-UL-514), and UL-651 (Standard for rigid nonmetallic conduit). Conduit and fittings shall carry a UL label (on each 10 foot length of conduit and stamped or molded on every fitting). Conduit and fittings shall be identified for type and manufacturer and shall be traceable to location of plant and date manufactured. Markings shall be legible and permanent. Conduit shall be made from polyvinyl chloride C-300 compound which includes inert modifiers to improve weatherability, heat distortion. Clean rework material, generated by manufacturer's own conduit production, may be used by same manufacturer, provided end products meet requirements of this specification. Conduit and fittings shall be homogeneous plastic material free from visible cracks, holes, or foreign inclusions. Conduit bore shall be smooth and free of blisters, nicks or other imperfections which could mar conductors or cables. Conduit, fittings and cement shall be produced by same manufacturer to assure system integrity and shall be Carlon Plus 40 (Schedule 40) or Plus 80 (Schedule 80) as shown on project drawings, or equal. Conduit and installation shall comply with all requirements in NEC Article 352.

C. Liquid Tight Flexible Metal Conduit (Non-Hazardous Areas):

Liquid tight flexible metal conduit shall consist of polyvinyl jacket over flexible hot

dip galvanized steel tubing. Flexible conduit shall be completely sealed from liquids, dust, dirt and fumes, be resistant to oil, gasoline, grease and abrasion. Jacket shall also be sunlight resistant. Flexible conduit shall be U.L. listed and comply with Article 351 of NEC. Flexible conduit shall be Flexi-Guard Type UAG, as manufactured by O-Z/Gedney, or equal. Conduit and installation shall comply with all requirements in NEC Article 350.

D. Fittings and Conduit Bodies:

Unless otherwise specified, all fittings and conduit bodies shall be manufactured from the same type of material as the conduit system (aluminum, galvanized steel, PVC, etc.). Mounting hardware shall be corrosion resistant, stainless steel, or equivalent.

E. Explosion Proof Conduit Seals

Explosion proof conduit seals shall be suitable for use in Class I, Division 1, Group D classified location. Explosion proof conduit seals shall be Crouse-Hinds EYS or EZS Series, Appleton EYS, ESU, or EY Series, Killark ENY, EYS or EY Series, or O-Z Gedney EYA, EY, EZS Series explosion proof sealing fitting. See also note in Part 3 regarding identification of "poured" conduit seals.

2.02 SEALING

A. Seal annular space between conductors and conduit wall of all conduit terminations where conduit exits from below grade in order to block moisture migration into electrical equipment. Install product only after conductors have been installed, terminated and commissioned for service. Conduit moisture barrier material shall not harden and be compatible with both wire insulation and conduit materials. Installed product shall be easily removed for maintenance or modifications, regardless of the length of time material has been installed. Install moisture seal products per all manufacturers instructions and requirements. Conduit moisture seal material shall be:

a. "Hydroblock" by WaterGuard Technology Products
16023 East Freeway
Channelview, Texas 77530-4365
Phone: (281) 862-0300
Fax: (281) 862-0314

b. American Polywater Corporation
Polywater Duct Sealant FST-180 Series
P.O. Box 53
Stillwater, MN 55082
Phone: (651) 430-2270
Fax: (651) 430-3634

c. O-Z/Gedney
Type DUX Water Sealing Compound

PART 3 EXECUTION

3.01 INSPECTION

A. All conduits shall be inspected for proper fit and finish, for out-of-round and for proper thickness. All burrs and flashing shall be removed. Conduit and fittings shall be clean and free of obstructions.

3.02 INSTALLATION

A. Unless otherwise shown on the project drawings, minimum conduit trade-size shall be 3/4". Larger sizes shall be installed where noted or where required by NEC.

B. Conduit size and fill requirements shall comply with appropriate conduit fill tables in Annex C of NEC. It should be noted these are minimum requirements and larger conduit sizes or smaller fill requirements shall be used whenever specified or detailed on drawings.

C. Flexible conduit shall be provided as a connection between each motor junction box (or any other piece of equipment subject to movement or vibration) and rigid conduit system. Liquid-tight and explosion-proof flexible conduit shall not exceed 3' in length.

D. Ream conduits only after threads are cut. Cut joints square to butt solidly into couplings. Where necessary to join two pieces of conduit and it is impossible to use standard coupling, use three piece conduit coupling. Use of running thread is prohibited. This applies to all rigid conduit installations, underground or otherwise. In order to comply with NEC Article 300.6(A), all rigid steel conduit shall have field-cut threads re-coated using an electrically conductive, corrosion-resistant compound, Thomas & Betts/Shamrock “Kopr-Shield” (a product of Jet Lube, Inc.), or equivalent.

E. Make all joints in underground conduit watertight with approved joint compound. Temporarily plug conduit openings to exclude water, concrete or any foreign materials during construction. Clean conduit runs before pulling in conductors.

F. Hickey hand-bends will not be acceptable for conduits one inch (1") and larger. Use pre-manufactured factory elbows or bends fabricated with hydraulic bending machine. Field bending of all PVC conduit shall be accomplished with use of equipment approved by conduit manufacturer. Open flame bending equipment will not be acceptable.

G. A run of conduit between outlet and outlet, between fitting and fitting or between outlet and fitting shall not contain more than the equivalent of four quarter turn bends (360°), including bends immediately at an outlet or fitting.

H. At all conduit terminations furnish locknuts on both sides of enclosure plus an insulated bushing unless conduit termination is into a factory-threaded conduit opening or watertight (Myers-type) hub.

I. All conduit terminations at NEMA 4 or 4X enclosures shall be made with watertight (Myers-type) hubs listed for the application.

J. Support exposed PVC conduit runs on walls or ceiling every three feet (3') and support exposed rigid metal conduit runs on walls or ceiling every five feet (5') with stainless steel or PVC coated galvanized cast one hole straps, clamp backs and anchors.

K. Perforated metal strapping of any kind is prohibited.

L. All box support hardware shall be constructed of rust-resistant materials such as stainless-steel.

M. Grounding Electrode Conductors shall be installed in non-metallic PVC conduit or bonded to both ends of metallic conduit to comply with NEC 250.64.

N. All conduit and fittings installed in Classified Areas shall be third part listed for the applicable Hazardous Location.

O. Install explosion-proof conduit sealing fittings in conformance with the manufacturer's instructions. Per Article 501 Paragraph 501-5(c)(6) of the NEC, cross-sectional area for conductors installed in a conduit sealing fitting shall not exceed 25%, unless conduit sealing fitting has been specifically approved for a higher percentage of fill.

1. Identification of "poured" conduit seals: Conduit seal fill plugs shall be neatly spray painted red immediately following installation of fill material. Excess spray paint on surrounding surfaces shall be removed at the Contractor's expense. The Engineer will use this means of identification to certify that the Contractor has installed conduit-seal fill materials and plugs in compliance with all U.L., F.M. and manufacturer's requirements. Do not spray paint fill plugs of any spare or future conduit seals.

END OF SECTION 16111

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PART 1 GENERAL

1.01 WORK INCLUDES

A. Work included in this section is supply of wire and cable to provide a complete and operational electrical system.

B. Any bid submitted to the Owner which contains cost adjustments for the current price of metals (copper and/or aluminum) will be rejected. Qualified bids in any form will not be considered.

C. Unless otherwise specified or detailed on drawings, all wire and cable on this project shall be copper construction only.

1.02 RELATED SECTIONS

A. Section 16010 - General Electrical Requirements
B. Section 16111 - Conduit and Raceway
C. Section 16170 - Grounding and Bonding

1.03 REFERENCE TO STANDARDS

A. ANSI/NFPA 70 - National Electrical Code
B. U.L Standard No. 44 - Thermoset Insulated Wires and Cables.
C. IPCEA Publication No. S-61-524.
D. Federal Specification J-C-30[illegible]
E. ASTM Specification B-8.

1.04 DELIVERY, STORAGE AND HANDLING

A. Wire and cable shall be delivered on reels or coiled in boxes. Wire and cables shall be stored and handled to prevent damage to conductor and insulation.

1.05 SUBMITTAL REQUIREMENTS

A. Submit under provisions of Division 1.

B. Contractor shall submit for all cable types and sizes used on this project.

1.06 QUALIFICATIONS

A. Wire and cable shall be manufactured and supplied by a company regularly engaged in business of furnishing wire and cable. If required by Owner's representative, manufacturer shall submit a certification to a minimum experience of five years in manufacture of wire and cable.

1.07 MAINTENANCE SERVICE (WARRANTY)

A. All equipment shall be warranted to be free from defects in material and workmanship for period of one y ear from date of substantial completion established by the Owner.

PART 2 PRODUCTS

2.01 EQUIPMENT SPECIFICATION

A. THHN/THWN

Cable shall be 600 Volt rated, sized as indicated on the drawings. Cable shall comply with Underwriters Laboratories Standard U.L. 83. Cables shall be rated 90°C in dry locations 75°C in wet locations.

C. INSTRUMENTATION SHIELDED CABLE

Shielded instrumentation cable shall be used wher[illegible] required or shown on plans. Cable construction shall be #16 A WG tinned copper, polyethylene insulated, have #18 AWG stranded tinned copper drain wire and aluminum-polyester shield with 100% coverage. Overall jacket shall be polyvinyl Chloride (PVC). Cables shall be 60° C, 600 V rated and U L. recognized. 2-Conductor shielded instrumentation cable for use in conduit shall be Belden #8719, or equivalent.

2.02 COLOR CODING

A. Color code conductor insulation for #10 AWG or smaller conductors. Color code conductors #8 AWG or larger with colored tape or colored insulation. Standard colors:

	120/240V 1 Phase 3W	240 V or 208/120V 3 Phase 3 or 4W	480V 3 Phase 3 or 4W	240/120V 3 Phase 4W,)
Phase A	Black	Black	Brown	Black
Phase B	Red	Red	Orange	Orange (high leg)
Phase C	N/A	Blue	Yellow	Blue
Neutral	White	White	Gray	White
Ground	Green	Green	Green	Green

B. Intrinsically safe wiring shall be light blue color insulation per ANSI/ISA RP12.6 and NEC 504 or per respective equipment manufacturer's recommendations.

C. Control wiring insulation color shall be red.

2.03 WIRE PULLING LUBRICANT

A. Pulling lubricant shall be UL listed, water based, polymer solution. Lubricants containing waxes, soaps or combustible materials are not acceptable. Contractor shall verify the compatibility of the selected cable pulling lubricant and cable

jacket materials proposed. Manufacturers/Lubricants shall be as follows, or equivalent:

1. American Polywater - Polywater J
2. Ideal Industries - ClearGlide
3. American Colloid - Poly-X
4. Buchanan - Quick Slip
5. ARNCO – HydraLube

2.04 SPLICES AND JOINTS

A. Splices and joints shall be as described below, or approved equivalent.

1. #8 and smaller conductors:
   a. Twist-on connectors pre-filled with silicone-based sealant to protect against moisture and corrosion. Units shall be UL 486D listed as weatherproof, waterproof and suitable for direct burial. Units shall be Ideal Industries "Underground" #64 or King Innovation "Dryconn King 6 Blue" Filled Waterproof Connectors, or equivalent.

2. #6 and larger conductors:
   a. New construction: For straight line connections, use compression connector with rubber insulating cover or boot.
   b. New construction: For "Tee" cable taps, use compression connector with rubber insulating cover or boot.
   c. Existing construcion: For taps in cabinets, gutters and other close locations, use O-Z/Gedney type XW & XWC, XTP & XTPC or, PMX & PMXC, or equivalent.

PART 3 EXECUTION

3.01 INSTALLATION (Wire Conductors)

A. Wire and cable shall be installed using accepted industry methods to prevent damage to conductors and insulation. Installation shall comply with all applicable sections of NEC regarding conduit fill.

B. No splices shall be permitted in conduit bodies. All splices shall be made in junction boxes, control panels and cabinets provided for that purpose as detailed or required by need.

C. Neatly train and lace wiring inside boxes, equipment and panelboards.

D. Drawings are diagrammatic in showing circuitry routing between devices and equipment. Provide all phase conductors, neutrals, switched and unswitched legs, grounds, etc., as required for a complete and operational electrical system.

E. All 120V circuits shall have individual neutral conductors. 120V circuits with "shared" neutral conductor shall not be permitted.

F. Minimum wire size shall be #12 unless otherwise noted. Where protected by 15A fuses, control wiring may be #14 AWG.

G. All conductors shall be continuous without splices except at locations approved for the purposes of splicing.

H. All wire sizes shall be stranded except where specifically approved otherwise.

I. Intrinsically safe wiring shall be separated from non-intrinsically safe wiring in compliance with Article 504 of the NEC and ANSI/ISA Standard RP12.6. Intrinsically safe wiring insulation color shall be blue.

J. All circuits shall be labeled in compliance with Section 16195 - Electrical Identification.

K. All damaged or rejected cable shall be removed from the project site and replaced at no additional expense to the project.

3.02 CONNECTIONS AND TERMINATIONS (Wire Conductors)

A. Identify each conductor in panelboards, junction or pull boxes, or troughs with a permanent pressure sensitive label with suitable numbers or letters for easy recognition. Identify control wiring at each end and in junction boxes with numeric wire number corresponding to control wiring diagram.

B. Thoroughly clean wire before installing lugs and connectors.

C. Make splices, taps and terminations to carry full ampacity of conductors without perceptible temperature rise.

D. Terminate spare conductors with electrical tape, identify as “spares” and roll up in box.

3.03 TESTING (Wire Conductors)

A. Inspect wiring for physical damage and proper connection.

B. All wire and cable shall be tested for continuity and short circuits prior to energizing circuits. Verify proper phasing, adjust as required.

C. Comply with all applicable items in Section 16010 and 16950.

END OF SECTION 16123

PART 1 GENERAL

1.01 WORK INCLUDES

A. Enclosures used to house electrical equipment.

1.02 RELATED SECTIONS

A. Section 16010 - General Electrical Requirements
B. Section 16170 - Grounding and Bonding
C. Section 16190 - Supporting Devices
D. Section 16195 - Electrical Identification

1.03 REFERENCE TO STANDARDS

A. NEMA 250 - Enclosures for Electrical Equipment (1000 Volts Maximum).
B. ANSI/NFPA 70 - National Electrical Code.

1.04 DELIVERY, STORAGE, AND HANDLING

A. Cabinets and enclosures shall be delivered to jobsite in original shipping containers and shall be stored in a clean, dry location until ready for installation.

1.05 SUBMITTALS

A. Submit under provisions of Division 1.

B. Product Data: Provide manufacturer's standard data for enclosures and cabinets.

C. Manufacturer's Instructions: Indicate application conditions and limitations of use stipulated by Product testing agency specified under Regulatory Requirements. Include instructions for storage, handling, protection, examination, preparation and installation of Product.

1.06 QUALIFICATIONS

A. Cabinet and Enclosure manufacturer shall be regularly engaged in construction of Product and shall have at least five years experience.

1.07 QUALITY ASSURANCE (RESERVED)

1.08 REGULATORY REQUIREMENTS

A. Conform to requirements of ANSI/NFPA 70.

B. Furnish products listed and classified by Underwriters Laboratories, Inc., as suitable for purpose specified and shown.

1.09 COORDINATION (RESERVED)

1.10 MAINTENANCE SERVICE (WARRANTY)

A. All equipment shall be warranted to be free from defects in material and workmanship for a period of one year from date of substantial completion established by the Owner.

1.11 EXTRA MATERIALS (SPARE PARTS)

A. Provide individual containers of touch up paint for each painted cabinet and enclosure.

B. For each cabinet and enclosure with a locking mechanism, provide two spare keys.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Cabinets and Enclosures shall be as manufactured by Hoffman Engineering, Wiegman, Rittal or equivalent.

2.02 EQUIPMENT SPECIFICATION

A. NEMA 1

Enclosures shall be NEMA 1 rated, hinged, single or double door with slotted flush latch and white interior mounting panel, similar to Hoffman A-*xx*N Series (where *xx* is size subseries), or equivalent. Materials of construction shall be 14 or 16 gauge steel, depending on enclosure size, with polyester powder coating. Large enclosures shall have continuous hinge on door. Where noted, large enclosures shall include door operated light kits. Enclosure shall include grounding device kit or other means of positively grounding door to enclosure body.

B. NEMA 3R

Enclosures shall be NEMA 3R rated, hinged with stainless steel hinge pin, with drip shield, single door, white interior mounting panel and easily released door clamps. Materials of construction shall be 16 or 14 gauge steel, depending on enclosure size, with polyester powder coating. Furnish all exterior-mounted

NEMA 3R enclosures with a NEMA 4X Drain-Vent (specified below) to remove interior moisture and condensation

C. NEMA 4X

Enclosures shall be NEMA 4/ NEMA 4X/ NEMA 12 rated, hinged, gasketed, single or double door, with easily released fast-operating clamp assemblies or quarter turn slotted latch kits replacing conventional screw clamps, white interior mounting panel and stainless steel hinge pin. Materials of construction shall be 16 or 14 gauge (depending on size) Type 304 stainless steel, Type 5052 H-32 aluminum, molded fiberglass polyester or corrosion resistant nonmetallic composite material. Interior mounting panel shall be steel, finish shall be white enamel. Where noted, enclosures shall include door operated light kits. Metallic enclosures shall include grounding device kit or other means of positively grounding door to enclosure body. Furnish all exterior-mounted NEMA 4X enclosures with a NEMA 4X Drain-Vent (specified below) to remove interior moisture and condensation.

D. NEMA 7

Enclosures shall be NEMA 7 rated, suitable for Class 1, Division 1, Group D hazardous locations. Materials of construction shall be copper-free aluminum and shall be either U.L. or F.M. listed and labeled for the application. Covers for small enclosures shall be threaded construction with minimum of 5 threads fully engaged after installation. Larger enclosures shall utilize bolted covers with all bolts torqued per manufacturer's requirements after installation.

D. NEMA 12

Enclosures shall be NEMA 12 rated, continuous hinge, gasketed, single or double door with white interior mounting panel. Materials of construction shall be 16 or 14 gauge steel, depending on enclosure size, with polyester powder coating. Small enclosures shall be similar to Hoffman "CHQR" Series, or equivalent. Medium size enclosures shall include 1-point latch kits or quarter turn slotted latch kits replacing conventional external screw clamps. Large size enclosures shall include 3-point latch kits. Where noted, large enclosures shall include door operated light kits. Enclosure shall include grounding device kit or other means of positively grounding door to enclosure body.

E. Drain-Vents

Where noted or specified, enclosure Drain-Vents shall be furnished and installed in the bottom of enclosures in order to remove unwanted condensation and moisture from within enclosure. Units shall be NEMA 4X rated and shall maintain the NEMA 4X rating of enclosures when installed. Drain-Vents shall be as manufactured by Stahlin Enclosures Model DV4XKIT, or equivalent.

PART 3 EXECUTION

3.01 EXAMINATION

A. Inspect cabinets, enclosures and mounting panels for damage or rust. Inspect gasketing for proper sealing. Inspect hinges and clamps for proper operation.

3.02 PREPARATION

A. Thoroughly clean interior and exterior of cabinets and enclosures. Sand and apply touch up paint where needed. Install mounting panels after equipment is mounted to it.

3.03 INSTALLATION

A. Install cabinets and enclosures at locations shown on drawings and as directed by Owner's representative. Cabinets and enclosures shall be "stand off" mounted 1/2" from wall to provide free air flow behind cabinets and enclosures.

B. To maintain NEMA 4X enclosure ratings, watertight hubs which are UL listed NEMA 4X shall be installed as necessary at conduit entrances to enclosure.

C. At both interior and exterior locations, where enclosure or cabinet knockouts consist of tangental knockouts, the Contractor shall install weatherproof hubs sized for largest knockout, with a reducing bushing sized for the incoming conduit.

END OF SECTION 16160

PART 1 GENERAL

1.01 Work under this item includes the electrical grounding and bonding of the Service Entrance Gear, Electrical Distribution Equipment, metallic raceways, metallic enclosures, utilization equipment and other appurtenances for the work or equipment to be furnished under this project. In general, all work shall meet or exceed that defined in Article 250 of the National Electrical Code NEC/NFPA 70.

1.02 This Specifications section neither replaces any NEC requirements, nor are any NEC requirements not specifically identified considered deleted from the scope of work. Items listed in this Section are furnished to either augment, or exceed those established by NEC.

1.03 WORK INCLUDES

A. Equipment grounding conductors
B. Grounding Electrodes
- C. Grounding Electrode Conductors
- D. Bonding.

1.04 RELATED SECTIONS

A. Section 16010 - General Electrical Requirements
B. Section 16671 - Transient Voltage Surge Suppression (TVSS)

1.05 REFERENCE TO STANDARDS

A. Article 250; ANSI/NFPA 70 - National Electrical Code (NEC)
B. NFPA 780 - Standard for the Installation of Lightning Protection Systems

1.06 DELIVERY, STORAGE, AND HANDLING

A. Ground rods shall be tie-wrapped together and stored away from contact with the earth.

B. Exothermic welds and hardware items shall not be shipped loose but shall be in boxes, labeled with material and equipment enclosed. Boxes shall be stored away from contact with earth and shall be protected from weather.

1.07 SUBMITTALS

A. Submit under provisions of Division 1.

1. Ground rods.
2. Exothermic welding components

1.08 QUALIFICATIONS (RESERVED)

1.09 QUALITY ASSURANCE (RESERVED)

1.10 REGULATORY REQUIREMENTS (RESERVED)

1.11 COORDINATION

A. Installation of all Grounding and Bonding shall be coordinated with other trades and Sub-Contractors. Special attention is required for installation of Concrete-Encased Electrodes within structural footings.

1.12 MAINTENANCE SERVICE (WARRANTY)

A. All equipment shall be warranted to be free from defects in material and workmanship for a period of one year from date of substantial completion established by the Owner.

1.13 EXTRA MATERIALS (SPARE PARTS) (RESERVED)

PART 2 PRODUCTS

2.01 MANUFACTURERS (RESERVED)

2.02 EQUIPMENT SPECIFICATION

A. Ground rods shall be UL listed, single-piece, 3/4" diameter by 10' long copper-clad steel with minimum 10 mil copper cladding.

All buried connections of grounding and bonding components shall be via exothermic weld only. C lamp or compression grounding connections below grade will be rejected and replaced at Contractor's expense.

B. Exothermal Welding Equipment Manufacturers:

1. Erico - Cadweld
2. Continental Industries – Therm-O-Weld
3. Hagar – Ultraweld

C. Grounding conductors shall be 600 volt, same insulation type as used for phase conductors, green in color unless otherwise noted.

D. Grounding electrode conductors in contact to earth shall be bare, stranded, annealed copper. Grounding Electrode Conductors shall be the larger of that detailed on the project drawings, specified herein or as required by NEC.

PART 3 EXECUTION

3.01 EXAMINATION (RESERVED)

3.02 PREPARATION (RESERVED)

3.03 INSTALLATION

A. A continuous grounding system shall be provided throughout the facility. The Contractor shall furnish and install all grounding and bonding as required per NEC and all Local Codes, whether or not specifically shown on the project drawings.

B. Except for separately derived systems, a single-point ground system is intended throughout the facility. So-called "Multi-point", "independent", "clean" or "separate" grounding systems that are not inter-bonded to the single-point facility system do not comply with NEC, are unsafe, and will be rejected.

1. On occasion, supplemental driven ground rods may be required on the project drawings. All such supplemental ground rods are to be bonded to the equipment grounding conductor and are NOT intended to indicate any separation of, or isolation from, the facility grounding system.

C. Equipment ground conductors (green insulated) shall be used solely for grounding and bonding purposes and be kept entirely separate from grounded neutral conductors (white insulation), except where bonded at the 5 KVA transformer.

1. 5 KVA Transformer (separately derived system): The Neutral and Ground conductors shall be bonded together through a Bonding Jumper in the transformer. The Grounding Electrode Conductor shall terminate on the Neutral Bus within the transformer.

2. 200A Service Entrance Disconnect: The Grounding Electrode Conductor shall terminate on the Ground Kit within the Service Entrance Disconnect.

D. Service Entrance Equipment Disconnect Grounding and Bonding

1. Furnish grounding bushings on all metallic service conduits entering Service Entrance Disconnect. Bond each bushing to Ground Kit in the Service Entrance Disconnect as required by NEC Article 250.92 and 250.102C.

E. Grounding Electrode System

1. As a minimum, the Grounding Electrodes shall comply with NEC Articles 250.52 and 250.53. Where present at each new building or structure, all available Grounding Electrodes defined in NEC Article 250.52A1 thru A4 shall be interconnected to form the Grounding Electrode System.

2. Per NEC Article 250.68A, the Grounding Electrode System shall be installed in such a manner that each connection point may be visually inspected, unless encased by concrete or earth.

3. Connection of Grounding Electrode Conductors to individual Grounding Electrodes shall comply with NEC Article 250.70.

   a. Connection at all Grounding Electrodes shall be by use of exothermic welding, Listed clamp or compression connection connections shall NOT be utilized without written approval from the Engineer.

   b. Below-grade ground rod and associated ground wire shall be clean and dry before performing the exothermic weld. Verify that the proper size and type of exothermic weld kit is used before beginning work

   c. Exothermic welds shall be left exposed for inspection and approval before backfilling or otherwise conceealing. Any unacceptable exothermic welds shall be redone, including any necessary replacement material (ground rods, ground wires, etc.) as needed to provide an accepted exothermic weld.

4. Non-Metallic conduits containing grounding electrode conductors shall not be supported with metal clamps that completely encircle the conduit. Use nylon nuts, bolts, straps and/or reinforced fiberglass or premium grade plastic resin strut support with non-metallic hardware as manufactured by Aickinstrut, or equivalent.

F. All metallic raceways, boxes, enclosures, etc. shall include an insulated equipment ground conductor. Due to corrosion, metallic raceway and conduit connectors alone WILL NOT be considered as meeting this requirement. The Equipment Grounding Conductor shall positively bond all electrical components and utilization equipment to the facility ground system.

G. All metallic boxes used for electrical equipment shall include listed grounding screws or lugs. No more than one grounding conductor shall be installed per lug location unless lug is listed for multiple conductors.

H. The largest factory-scored concentric conduit knockouts shall be used to provide conduit bonding to NEMA 1 & 3R enclosures.

   1. If required, provide a conduit reducing hub for the for the specific conduit size terminated.

I. Equipment Grounding Conductors shall be sizes as shown in NEC T250.122, but no less than #12 AWG.

J. General Requirements for Separately Derived Systems
(e.g. Two-Winding Transformers).

Solidly-Grounded Separately-Derived Systems shall be installed per NEC Article 250.30 requirements. In general, the following shall apply for solidly-grounded two-winding transformers unless specifically directed otherwise on the project

drawings.

1. Primary Equipment Ground conductor shall terminate on transformer ground lug “G”.

2. Install the transformer “X0-G” link, or system bonding jumper, within the transformer housing only. Where the System Bonding Jumper consists of a field-installed copper conductor, it shall be sized to NEC Table 250.66 but not less than 12½% of the total cross-sectional area of the secondary phase conductors.

3. Secondary Neutral conductors shall be terminated on transformer “X0” Lug.

4. Secondary Equipment Ground conductors shall be terminated on transformer ground lug “G”.

5. Bond the transformer Neutral “XO” to the nearest grounding electrode in accordance with Article 250.30A7 of the NEC. The grounding electrode conductor shall be sized per Table 250.66, "Grounding Electrode Conductor for Alternating-Current Systems of the latest edition of NEC. Grounding Electrode conductor shall be installed in either non-metallic conduit (Schedule 40 PVC) or bonded at both ends of metallic conduit per NEC Article 250.64E.

6. Neutral and Ground Bus in all downstream equipment shall be kept isolated. Do not re-bond downstream unless required by special conditions, such as those described in NEC Article 250.32.

3.04 INTERFACE WITH OTHER SYSTEMS
(Where used on the project)

A. Interface with Transient Voltage Surge Suppression (TVSS) Systems installed under Section 16671.

B. Lightning Protection Systems shall be bonded per NEC Article 250.106. All Lightning Protection Systems shall be bonded to facility Grounding Electrode system on facility exterior. Isolated grounding for Lightning Protection Systems will not be allowed.

3.05 MANUFACTURER'S FIELD SERVICES (RESERVED)

3.06 TESTING

A. As described in Specifications Section 16950.

B. All grounded metal cases and parts associated with electrical equipment shall be tested for continuity with ground system.

C. If requested, testing shall be performed in the presence of the Owner's representative.

D. Provide a copy of all testing reports to Engineer for record purposes.

END OF SECTION 16170

PART 1 GENERAL

1.01 WORK INCLUDES

A. Strut-type framing for conduit and equipment supports.

B. Anchors and Fasteners.

1.02 RELATED SECTIONS

A. Section 16010 - General Electrical Requirements

1.03 REFERENCE TO STANDARDS

A. ANSI/NFPA 70 - National Electrical Code.
B. NECA - National Electrical Contractors Association.
C. ASTM No. A570 G33
D. ASTM No. A-123
E. ASTM No. A-525

1.04 DELIVERY, STORAGE, AND HANDLING

A. Stored conduit and equipment supports shall not be in contact with earth, but shall be on pallets or other above-grade supports. Conduit and equipment supports shall be covered to minimize exposure to weather.

B. Anchors and fasteners shall be stored in their original containers in a clean, dry place. They shall not be exposed to weather.

1.05 SUBMITTALS

A. Submit under provisions of Division 1.

B. Product Data: Provide manufacturer's catalog data for fastening systems and supports.

C. Manufacturer's instructions: Include application conditions and limitations for use stipulated by Product testing agency specified under Regulatory Requirements. Include instructions for storage, handling, protection, examination and installation of Product.

1.06 QUALIFICATIONS (RESERVED)

1.07 QUALITY ASSURANCE (RESERVED)

1.08 REGULATORY REQUIREMENTS

A. Conform to requirements of ANSI/NFPA 70.

B. Furnish products listed and classified by Underwriters Laboratories, Inc., as suitable for purpose specified and shown.

1.09 COORDINATION (RESERVED)

1.10 MAINTENANCE SERVICE (WARRANTY) (RESERVED)

A. All equipment shall be warranted to be free from defects in material and workmanship for a period of one year from date of substantial completion established by the Owner.

1.11 EXTRA MATERIALS (SPARE PARTS) (RESERVED)

PART 2 PRODUCTS

2.01 MOUNTING STRUT

A. Where utilized, strut-type metal framing shall be provided to mount and support electrical equipment and enclosures as indicated on the drawings.

B. Strut-type supports shall be either aluminum or stainless steel construction. Unless specifically identified for use on the drawings, painted or factory coated steel, galvanized steel or non-metallic strut are not acceptable alternates to this requirement. Use stainless steel on all project locations where strut is in direct physical contact with earth.

C. All mounting hardware shall be stainless steel.

D. Manufacturers:

a. Unistrut
b. B-Line
c. GS-Metals
d. Equivalent meeting specifications

PART 3 EXECUTION

3.01 EXAMINATION

A. Examine all supports and fasteners for straightness, rust and corrosion. Do not use any equipment that is not straight or is rusted or corroded.

3.02 PREPARATION

A. All equipment shall be clean at time of installation. Remove all burs.

3.03 INSTALLATION

A. Install products in conformance with manufacturer's instructions and as detailed on drawings.

B. Provide anchors, fasteners and supports in accordance with NECA Standard of Installation. Do not use spring steel clips or clamps except as noted in Section 16190-3.03H.

C. Use spring-lock washers under all nuts.

3.04 INTERFACE WITH OTHER PRODUCTS (RESERVED)

3.05 MANUFACTURER'S FIELD SERVICES (RESERVED)

END OF SECTION 16190

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PART 1 GENERAL

1.01 WORK INCLUDES

A. This section includes field-installed nameplates, labeling and identification methods for electrical equipment, components and wiring.

1.02 RELATED SECTIONS

A. Section 16010 - General Electrical Requirements

1.03 REFERENCE TO STANDARDS

A. ANSI/NFPA 70 - National Electrical Code

1.04 DELIVERY, STORAGE, AND HANDLING (RESERVED)

1.05 SUBMITTALS

A. Submit under provisions of Division 1.

B. Product Data: Provide catalog data for nameplates, labels and markers.

C. Manufacturer's Instructions: Indicate application conditions and limitations of use stipulated by Product testing agency specified under Regulatory Requirements. Include instructions for storage, handling, protection, examination, preparation and installation of Product.

D. During course of construction, Contractor shall submit Wiring Identification Tables, listing wire marker identification schedules of all proposed wiring and terminations.

1.06 QUALIFICATIONS (RESERVED)

1.07 QUALITY ASSURANCE (RESERVED)

1.08 REGULATORY REQUIREMENTS

A. Conform to requirements of ANSI/NFPA 70.

1.09 COORDINATION (RESERVED)

1.10 MAINTENANCE SERVICE (WARRANTY)(RESERVED)

1.11 EXTRA MATERIALS (SPARE PARTS) (RESERVED)

PART 2 PRODUCTS

2.01 MANUFACTURERS (RESERVED)

2.02 EQUIPMENT SPECIFICATION

A. Nameplates and legend plates shall be engraved three-layer laminated plastic, black letters on white background. Legends (wording) shall be as detailed on drawings or as directed by Owner's representative .

B. All wire markers installed on electrical equipment above grade shall be weatherproof and water resistant. Wire identification labeling, whether factory applied or written in the field, shall utilize an adhesive that does not soften or weaken over time. Sleeve or tubing type labels may be utilized as an alternate. Paper adhesive-backed wire markers will be rejected and replaced at the Contractor's expense. Wire marker labels shall be as manufactured by Brady, or equivalent.

C. All wire markers installed below grade in manholes, handholes or vaults shall be waterproof. Markers shall be non-corroding plastic clip-on sleeve type construction. Markers shall be permanently factory-printed such that label identification will not deteriorate due to time or contact with water. Wire markers used below grade shall be Brady Clip-Sleeve, or equivalent.

D. Provide and install Safety Stripe Tapes on finished floors around electrical gear noting clearances required per NEC Article 110.26. Tape shall be minimum 2" in width with alternating black/yellow striping. Tape shall be Scotch/3M #5702 or equivalent.

PART 3 EXECUTION

3.01 EXAMINATION (RESERVED)

3.02 PREPARATION

A. Degrease and clean surfaces to receive nameplates, legend plates and markers.

3.03 INSTALLATION

A. Secure nameplates and legend plates to equipment using screws or adhesive.

B. Nameplates or legend plates shall be provided for all disconnects enclosed starters, control panels, levelmeters, flowmeters and recorders.

C. Wiring Device identification labels shall be furnished and installed on all wiring device cover plates per Specifications Sections 16141-3.01O and 16141-3.01P.

D. Contractor shall develop the Wiring Identification Tables to be used for **ALL** wiring terminations on this project, and shall submit Tables for review and comment by Owner's Representative prior to installation of any conductors or cables.

Provide wire markers for **ALL** wires and terminations. By “all”, this is intended to include, but not be limited to, all terminations at distribution panelboards, motors, valves, heaters, fan coils, heat pumps, fans, dampers, all MCC terminations, instrumentation & controls, terminal blocks and strips, etc. Wire identification shall be unique to wire that is marked or to terminal that wire lands upon. Identification of a run of wire from termination to termination shall be same throughout run.

E. Provide wire markers in all manholes, handholes and vaults.

F. Include markers labeled “SP” on all spare conductors.

3.04 INTERFACE WITH OTHER PRODUCTS (RESERVED)

3.05 MANUFACTURER'S FIELD SERVICES (RESERVED)

3.06 AS-BUILT WIRING IDENTIFICATION TABLE

A. Upon completion of project, Contractor shall provide five copies of as-built Wiring Identification Table. This table shall list **ALL** circuits installed as part of this work and shall give identification of ALL wires and terminations as installed and marked.

Table shall include routing of **ALL** conductors installed in the project from end-to-end including each conduit, manhole, handhole and vault through which each conductor passes. Include and identify all spare conductors.

END OF SECTION 16195

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PART 1 GENERAL

1.01 SECTION INCLUDES

A. Work included in this section is labor, equipment and materials necessary to provide a complete and operational service entrance as detailed on drawings and specified herein. All work shall be as shown on project drawings and coordinated with serving utility requirements.

1. Contractor shall install base for the utility meter, secondary cable and conduit from the meter base to the existing utility pole. Install conduit riser and leave minimum of 20'-0" cable slack coiled up for ComEd to terminate. Any additional work as required by serving utility but not specifically noted herein shall be considered incidental to this section.

2. Grounding and Bonding for Service Entrance is covered under Section 16170. Contractor shall coordinate this work with the Utility.

1.02 Utility Name: Commonwealth Edison
Contact Individual:
Street Address:

City, State, Zip
Phone No.:
Facsimile No.
Cellular No.

1.03 Any costs incurred under this Section shall be considered incidental to the contract work and will not be paid for separately.

1.04 RELATED SECTIONS

A. Section 16010 - General Electrical Requirements
B. Section 16111 - Conduit and Raceway
C. Section 16170 - Grounding and Bonding
D. Section 16671 - Transient Voltage Surge Suppression (TVSS)
E. Section 16950 - Testing Electrical Systems

1.05 REFERENCE TO STANDARDS

A. ANSI/NFPA 70 - National Electrical Code

1.06 DELIVERY, STORAGE, AND HANDLING (RESERVED)

A. Equipment shall be stored in original cartons, where applicable, and away from contact with earth and protected from weather and abuse.

1.07 SUBMITTALS (RESERVED)

1.08 QUALIFICATIONS (RESERVED)

1.09 QUALITY ASSURANCE (RESERVED)

1.10 REGULATORY REQUIREMENTS

A. Contractor shall comply with all requirements of serving utility.

1.11 COORDINATION

A. Contractor shall coordinate with serving utility.

1.12 MAINTENANCE SERVICE (WARRANTY)

A. Cable and appurtenances shall be warranted to be free from defects in material and workmanship for a period of one year from date of substantial completion.

1.13 EXTRA MATERIALS (SPARE PARTS) (RESERVED)

PART 2 PRODUCTS

2.01 MANUFACTURERS (reserved)

PART 3 EXECUTION

3.01 INSTALLATION

A. Contractor shall comply with all requirements of serving utility.

3.06 TESTING

A. Entire service entrance system shall be tested. Perform testing in accordance with serving utility's recommendations.

B. Comply with all applicable items in Section 16950 - Testing Electrical Systems

END OF SECTION 16421.

PART 1 GENERAL

1.01 WORK INCLUDES

A. This specification describes the requirements for "Transient Voltage Surge Suppression" or "TVSS". TVSS equipment shall be furnished for all locations where noted on project Drawings, referenced in other equipment specifications or as described herein.

B. Furnish and install new surge protection equipment for 240V, 3-Phase, 3-Wire Delta service to new Pump Station Control Panel.

NOTE: TVSS equipment for 208Y/120V, 3-Phase, 4-Wire service and TVSS equipment for 120/240V, 3-Phase, 4-Wire Delta service is not suitable for use on 240V, 3-Phase, 3-Wire Delta service.

1.02 RELATED SECTIONS

A. Section 16010 - General Electrical Requirements.
B. Section 16170 - Grounding and Bonding.
C. Section 16421 - Service Entrance
E. Section 16906 - Pump Control Panels

1.03 REFERENCE TO STANDARDS

A. ANSI/NFPA 70 - National Electrical Code (most current issue).
B. U.L. 1449 "2nd Edition" - Transient Voltage Surge Suppressors
C. U.L. 1283 – Electromagnetic Interference Filters.
D. IEEE C62.41– Recommended Practice on Surge Voltages in Low-Voltage AC Power Circuits
E. IEEE C62.45 – Guide on Surge Testing for Equipment Connected to Low-Voltage Power Circuits
F. NEMA LS-1 – Low Voltage Surge Protection Devices

1.04 DELIVERY, STORAGE AND HANDLING

A. Electrical surge protection equipment shall be stored in a clean dry place, away from construction.

1.05 SUBMITTALS

A. Submit under the provisions of Division 1.

B. Product Data: Provide catalog data for electrical surge protection equipment.

C. Provide information to verify 3rd party testing certification on assembled

equipment ratings. Ratings on individual components will not meet this requirement and will not be considered.

D. Manufacturer's Instructions
Indicate application conditions and limitations of use stipulated by Product testing agency specified under Regulatory Requirements. Include instructions for storage, handling, protection, examination, preparation and installation of Product.

1.06 QUALIFICATIONS

A. Electrical surge protection equipment shall be furnished by manufacturer regularly engaged in the construction of electrical surge protection equipment, having minimum of five years experience in the manufacture of TVSS hardware.

B. Third party tested for compliance.

1.07 QUALITY ASSURANCE (RESERVED)

1.08 REGULATORY REQUIREMENTS

A. Conform to requirements of ANSI/NFPA 70.

B. Furnish products listed and classified by Underwriters Laboratories, Inc., as suitable for purpose specified and shown.

1.09 COORDINATION (RESERVED)

1.10 MAINTENANCE SERVICE (WARRANTY)

A. As a minimum, all equipment shall be warranted to be free from defects in material and workmanship for a period of one year from date of substantial completion established by the Owner.

1.11 EXTRA MATERIALS (SPARE PARTS) (RESERVED)

PART 2 PRODUCTS

2.01 EQUIPMENT SPECIFICATION

A. All Electrical Surge Protection hardware shall be U.L. Listed and labeled as "LISTED TVSS" equipment under the latest edition of UL 1449 "2nd Edition".

B. Visual indication that surge suppressors are functioning properly shall be furnished in the form of display, pilot light or LED for each device. If manufacturer utilizes LED's or pilot lights, one indicator shall be provided for each leg of a multi-phase device.

C. Where TVSS hardware is not an integral part of a factory-assembled piece of equipment, manufacturer or Contractor shall furnish all equipment, brackets and

appurtenances necessary in order to properly install suppressors to manufacturer's requirements.

D. New Pump Station Control Panel surge suppression shall be MCG PT80-24D, or a unit with equivalent ratings and suitable for use on a 240V , 3-Phase, 3-Wire service.

PART 3 EXECUTION

3.01 EXAMINATION (RESERVED)

3.02 PREPARATION (RESERVED)

3.03 INSTALLATION

A. Control panel surge protection shall be installed per manufacturer's instructions by panel builder prior to shipment.

B. Surge protection equipment for all other locations shall be installed per manufacturer's instructions and requirements.

END OF SECTION 16671

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PART 1 GENERAL

1.01 WORK INCLUDES

A. The work on this section includes the supply and installation of level probe and all related mounting hardware and equipment as required to furnish a complete and operational electrical system.

1.02 RELATED SECTIONS

A. Section 16010 - General Electrical Requirements.
B. Section 16111 - Conduits and Raceway.
C. Section 16123 - Building Wire and Cable.
D. Section 16190 - Supporting Devices.
E. Section 16906 - Pump Control Panels
F. Section 16950 - Testing Electrical Systems

1.03 REFERENCE TO STANDARDS

A. U.L. Listed.

1.04 DELIVERY, STORAGE AND HANDLING

A. Level measurement equipment shall be stored indoors from time of delivery to jobsite, protected from weather and construction.

1.05 SUBMITTALS

A. Submit under the provisions of Division 1.

B. Submittal shall include electrical ratings, layout, wiring diagrams, U.L. listing, etc.

1.06 QUALIFICATIONS (RESERVED)

1.07 QUALITY ASSURANCE (RESERVED)

1.08 REGULATORY REQUIREMENTS (RESERVED)

1.09 COORDINATION (RESERVED)

1.10 MAINTENANCE SERVICE (WARRANTY)

A. All equipment shall be warranted to be free from defects in material and workmanship for a period of one year from date of substantial completion established by the Owner.

1.11 EXTRA MATERIALS (SPARE PARTS) (RESERVED)

PART 2 PRODUCTS

2.01 Floats

A. Floats shall be stainless steel as supplied by the control panel manufacturer.

B. Intrinsically safe barriers shall be l isted for use with that manufacturer's equipment.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify length of cable assembly required. Running splices or field splicing in boxes other than those indicated on the drawings will not be allowed.

3.02 INSTALLATION

A. Install equipment as detailed on drawings and per manufacturer's requirements.

B. Suspend floats from supplied mounting kit attached to wet well wall to elevation indicated on the Plans.

3.03 TESTING

A. Provide factory-trained manufacturer's representative services to inspect completed installation, make all adjustment necessary to place system in trouble-free operation and instruct operating personnel in proper care and operation of equipment.

END OF SECTION 16901

PART 1 GENERAL

1.01 WORK INCLUDES

A. The work included in this section is the supply and installation of a new above-grade Pump Station Control Panel at the Walnut St. Pump Station as detailed herein and as required to provide a complete and operational electrical and control system. Major components of Pump Station Control Panel shall be:

1. NEMA 4X single-door or double-door enclosure.
2. 480v, 3P feeder circuit breakers.
3. 120V, 1P & 240V, 2P feeder circuit breakers.
4. Power distribution blocks.
5. Phase Monitor and fusing.
6. TVSS
7. 480V, 3-Phase, Size 3 combination circuit breaker type pump motor starters.
8. Duplex Pump Controller.
9. Terminal strips.
10. Wireway (Panduit, or equivalent).
11. GFCI receptacle.
12. Interior door operated fluorescent light.
13. Interior condensate heater with thermostat.
14. Exterior, top-mounted alarm light, with relays and pushbuttons.
15. Intrinsically safe relays, barriers, etc.

1.02 RELATED SECTIONS

A. Specified Elsewhere:

1. Division 11
2. Section 16010 - General Electrical Requirements.
3. Section 16111 - Conduit and Raceway.
4. Section 16123 - Building Wire and Cable.
5. Section 16170 - Grounding and Bonding.
6. Section 16190 - Supporting Devices.
7. Section 16195 - Electrical Identification.
8. Section 16901 - Level Sensing and Measurement.
9. Section 16950 - Testing Electrical Systems.

1.03 REFERENCE TO STANDARDS

A. ANSI/NFPA 70 - National Electrical Code
B. NECA - National Electrical Contractors Association.
C. NEMA ICS 1 - General Standards for Industrial Control Systems.
D. NEMA ICS 2 - Standards for Industrial Control Devices, Controllers and Assemblies.

E. NEMA ICS 6 - Enclosures for Industrial Controls and Systems.
F. U.L. 508 - Industrial Control Equipment
G. U.L. 913 - Intrinsically Safe Apparatus and Associated Apparatus for Use in Class I, II, III, Division 1 Hazardous (Classified) Locations.
H. Illinois EPA Title 35; Subtitle C; Chapter II; Part 370 - Illinois Recommended Standards for Sewage Works
I. Recommended Standards for Wastewater Facilities; Great Lakes Upper Mississippi River - 10 State Standards
J. ANSI/ISA - RP12.6 Recommended Practice - Installation of Intrinsically Safe Systems for Hazardous (Classified) Locations.
K. NEMA 250 - Enclosures for Electrical Equipment (1000 Volts Maximum).
L. ANSI/NEMA 250 - Enclosures for Electrical Equipment.

1.04 DELIVERY, STORAGE AND HANDLING

A. Items shall be stored in original containers, protected from the weather and construction in a warm, dry, indoor area.

1.05 SUBMITTALS

A. Submit product data under provisions of Division 1.

B. Submittals shall include cut sheets for the enclosure and for all components included in the control panel. Include schematics and wiring diagrams of the control system.

C. Manufacturer's Instructions.

Indicate application conditions and limitations of use stipulated by Product testing agency specified under Regulatory Requirements. Include instructions for storage, handling, protection, examination, preparation and installation of Product.

1.06 QUALIFICATIONS

A. Pumping Control Panel shall be manufactured by a current U.L. 508 and U.L. 913 listed industrial control panel builder. If required by the Owner's representative, manufacturer shall submit a certification to a minimum experience of five (5) years in manufacture of equipment similar to that specified.

B. The Control panel shall not require an individualized U.L. label. However, the Control Panel shall be assembled by a current U.L. 508 and U.L. 913 listed industrial control panel builder in strict compliance with applicable U.L., NEMA, ANSI and NFPA Standards as listed in Section 16906.103, using U.L. listed components or components U.L. recognized for use in their intended application.

1.07 MAINTENANCE SERVICE (WARRANTY)

A. Supplied equipment shall be warranted to be free from defects in material and

workmanship for a period of one year from date of substantial completion established by the Owner.

1.08 EXTRA MATERIALS (SPARE PARTS) (RESERVED)

1.09 OPERATION OF SYSTEM

A. Pumping Station Control (Pump Down Application).

1. The Pump Station Control Panel shall provide automatic On/Off control of one 10HP storm sewer pump based on liquid level. The operator shall input On/Off setpoints, wet well "High Water Level" alarm setpoint and "Low Water Level" alarm setpoint, if desired, and select mode of operation: 1st On/1st Off; Automatic Alternation; Automatic pump control sequence shall be as follows:

- HWL Alarm
- Pump ON
- Pump "All OFF"
- LWL Alarm

2. The Pump Station Control Panel shall output the following alarms to an alarm annunciator provided by others for remote annunciation of alarm conditions at pump station:

- Pump Starter Overload.
- Wet Well High Water Level Alarm.
- Wet Well Low Water Level Alarm.
- Pump Station Power Phase Failure.
- Pump Controller System Failure.

3. A Pump Station Dry Pit Leak Sensor shall be wired to the alarm annunciator provided by others to initiate remote annunciation in the event of a water leak into the Pump Station Dry Pit.

4. The alarm annunciator provided by others shall monitor the Pump Station power status and initiate remote annunciation in the event of a power outage.

5. The alarm annunciator provided by others shall provide a Normally Open (N.O.) "dry contact" that closes on any of the above alarm conditions and remains closed until the "fault" is cleared. This contact shall be used to light a flashing alarm light mounted on top of the Control Panel enclosure.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. The Pump Station Control Panel shall be manufactured by a current U.L. listed U.L. 508 and U.L. 913 industrial control panel manufacturer. Contractor shall furnish all equipment, labor, services, submittals, tools and work required to provide a complete and operational Pump Control Panel as shown on the drawings and specified herein.

2.02 EQUIPMENT SPECIFICATION

A. Pump Station Control Panel Enclosure: The Pump Station Control Panel Enclosure shall be strut support mounted, NEMA 4X stainless steel or aluminum construction rated for outdoor use, and padlockable. Enclosure shall have 3 point latching mechanism and handle for easy release. Enclosure shall not have clasps around the door to maintain a NEMA 4 watertight rating. Provide stainless steel hinge pins, white interior mounting panel, interior door operated light kit and NEMA 4X Drain-Vent to remove interior moisture and condensation. The enclosure shall also provide for "dead-front" construction using hinged inner doors (swing out panel) to mount all operator devices. Enclosure shall be manufactured by Hoffman, APX Enclosures, Hammond or Rittal, and shall be adequately sized to accommodate equipment furnished. Bond all panels and panel doors to ground. Hinges shall not be considered as an adequate grounding path. All hardware shall be corrosion resistant.

The panel manufacturer shall be a current Underwriters laboratories listed UL 508 industrial control panel builder and shall show its follow-up service procedure file number on submittals. All devices within the panel shall be UL listed and/or recognized where applicable and shall be mounted and wired in accordance with the most current edition of UL 508 and UL 913 and the NEC. All conduits for intrinsically safe wiring shall enter the panel enclosure at the intrinsically safe section of the panel.

All conduit entries into the Pump Control Panel shall have watertight threaded hubs, U.L. listed for the respective NEMA 4X enclosure.

Include a label placed on the inside of the panel door with the name, address, phone number and emergency phone number of the service representative for the pumps and control panel.

The Pump Station Control Panel enclosure shall be located as shown on the drawings. Where required, strut mounting equipment shall comply with Section 16190 - Supporting Devices. Include legend plate on inner door labeled "CAUTION: TURN OFF SERVICE ENTRANCE DISCONNECT BEFORE SERVICING". Lettering shall be black or silver on a red background.

B. Equipment: New Pump Station Control Panel Equipment shall include, but not be limited to, the following.

1. Power Distribution Blocks: Power distribution blocks shall be utilized to distribute 480VAC, 3-Phase, 240VAC, Single-Phase and 120VAC power to motor starter circuit breakers and branch circuit breakers in Control

Panel. Suitable UL Listed power distribution equipment designed for the purpose shall also be acceptable. Use of bolted connections of multiple wires at each connection shall not be acceptable. Power distribution block shall be Square D class 9080, Type LB, Gould-Shawmut 68000-69000 Series, or Allen-Bradley Bulletin 1492 Power Blocks sized as required for the respective conductors. All power distribution blocks shall be rated 600 volt with amperage ratings in conformance with NEC Table 310-16 using 75°C wire for the respective lug wire range.

2. Terminal blocks for control wiring shall be Heavy Duty 600 volt, tubular clamp style, with accessories as required, as manufactured by Buchanan, Allen-Bradley, or Cutler-Hammer, or Square D. Control panel interior wiring shall be MTW or THW sized as required per NEC minimum #14 AWG. All connections shall be checked for tightness and secured as required.

3. Power Monitor: Three phase power monitor with adjustable nominal voltage setting: The device shall consist of a solid state voltage and phase angle sensing circuit driving two separate single pole relays, one normally open and the other normally closed. This device shall monitor phase loss, low voltage, phase reversal, and phase unbalance. This device shall drop-out pumps if all phases drop below 90% or if one phase drops below 80-83% of nominal voltage. This device shall have an adjustable 2 to 20 second drop out relay. Power monitor shall be Time Mark Corp. Model 264-2, or Allen-Bradley Bulletin 8135 Line Voltage Monitor Relay. Furnish fuse block with three ½ Amp type KTK fuses. Adjust timing of drop out relay as required. Phase monitor shall be adjusted per the pump motor manufacturer's recommendation.

3. Surge Arresters (TVSS): Surge arresters shall be provided by the pump control panel manufacturer and be as specified under Section 16671. Install per manufacturer's directions, include mounting brackets.

4. Motor Starters: Motor Starters shall comply with Section 16481 - Enclosed Motor Controllers.

5. Circuit Breakers: Circuit breakers shall be 3-Pole 480VAC & 1-Pole 120VAC, 22KA, UL 489 Listed for branch circuit protection as required by the National Electrical Code, Square D Multi-9, or equivalent. Circuit breakers shall be dead -front panel accessible inside Control Panel. Provide Nameplates.

6. Pushbuttons, Indicating Lights, Selector Switches: Indicating lights shall be NEMA 4X, non-metallic, push-to-test 120V LED of color indicated, Square D Type SK, or equivalent. Provide nameplate. Pushbuttons and selector switches shall be NEMA 4X, non-metallic, Square D Type SK, or equivalent, with contact blocks as required. Provide nameplate.

7. Intrinsically Safe Barriers: Intrinsically safe barriers shall be Factory Mutual Listed or U.L. listed for Class I, Division 1, Group D environment.

Barriers shall be so located in control panel as to physically isolate intrinsically safe wiring from other power control cables with grounded metal barrier per Instrument Society of America ISA-RP12.6. All intrinsically safe wiring shall be conductors with "intrinsically safe blue colored" insulation only. Conduit entries into the pump control panel for intrinsically safe systems shall be located at the intrinsically safe section of the panel enclosure.

8. Legend Plates: Legend plates shall be required for all starters, circuit breakers, control panels, and disconnects. Legend plates shall be provided to identify the equipment controlled and the function of each pushbutton, indicating light, pilot light, selector switch and device. Legend plates shall be comply with Section 16195 - Electrical Identification.

10. Convenience Duplex GFCI Receptacle: Provide a duplex receptacle with ground fault circuit interrupter as specified in Section 16141 – Wiring Devices.

11. Fusing: Provide fuse protection as required for control circuitry. Fuses shall be rated 600VAC and shall be Bussman Class J or FNQ-R series fuses, Gould-Shawmut Class J or Class R fuses, or Littlefuse Class J or Class R fuses, sized as required and/or as indicated on the drawings with fuse blocks, with box lug terminals, sized as required. Include hardware for mounting. Provide one box (5 minimum quantity) of each type and size of fuse, upon completion of the job, for use as spares.

12. Alarm Light: Flashing alarm light shall be NEMA 4X, Ingram Products LX40F, or equivalent, 120VAC, with severe duty 40W incandescent bulb. Mount on top of Pump Station Control Panel enclosure. Include all necessary gaskets and mounting hardware to install on NEMA 4X enclosure without sacrificing the enclosure listing. Silicone-rubber or similar sealants shall not be used to meet this requirement.

13. Grounding Bar: Provide a copper grounding bar mounted and bonded inside the panel enclosure, adequately sized to accommodate all ground conductors to or from the pump control panel.

14. Internal Wiring Ducts: All interior wiring inside Pump Control Panel shall be neatly trained and organized and shall be installed in covered, slotted wiring ducts, Panduit, or equivalent. Also, use cable ties and cable management accessories.

PART 3 EXECUTION

3.01 INSTALLATION

A. Pump Control Panel

1. Control panel shall be installed per manufacturer's recommendations as detailed on the drawings and as specified herein.

2. All conduit entries into the panel enclosure shall have watertight threaded hubs, Meyers or equivalent in order to maintain the NEMA 4X rating of the enclosure.

3. Seal all underground conduit openings that terminate within control panel enclosure as specified in Section 16111-2.02.A.

4. Conduits with intrinsically safe wiring shall terminate in the control panel at the intrinsically safe wiring section. Non-intrinsically wiring including, but not limited to, power feeder conductors, branch circuit conductors, and pump motor cables shall not enter the control panel at the intrinsically safe wiring section and shall maintain a minimum separation distance inside the control panel from the intrinsically safe conductors as required by NEC 504 and ANSI/ISA RP12.6.

5. Install explosion proof conduit seals as detailed on the drawings and in conformance with Manufacturer's requirements. Contact the respective conduit seal off manufacturer if assistance is required for direction of installing the packing fibers to form a dam and pouring the sealing compound.

3.02 TESTING

A. Pump Control Panel

Supplier shall provide services of the pump control panel manufacturer's representative for the purpose of inspection, check-out, testing, start-up, instruction of user personnel, and any other required services to provide a complete and operational system. All tests shall be conducted in the presence of the Engineer. Contractor shall provide water as/if required to test pumps under load. Contractor shall furnish 3 copies of test results to Engineer. Supplier shall also furnish 3 copies of Operation and Maintenance Manuals, for operator personnel use, to the Engineer.

Start-up procedure and tests shall include, but not be limited to, the following as well as other tests and requirements specified herein.

a. Conduct megger test on each motor.

b. Check float switches and corresponding circuitry for proper operation.

c. Inspect control panel for correct terminal connections and tightness, correct and tighten as required.

d. Check oil in motors (if applicable).

e. Check for correct rotation of pump motors, correct as required.

f. Check for pump installation and operation.

g. Measure voltage at no load (motor off) and at motor running under load.

h. Measure current in each phase with motor running under load.

i. Verify a label is provided on the pump control panel with the name, address, phone number, and emergency phone number of the service representative.

j. Verify proper operation of all pilot lights and alarm lights.

k. Test receptacles for proper operation.

l. Instruct user personnel about the operation of the control panel and components; indicating items for routine maintenance check, operation modes, failure modes, alarm conditions, etc.

m. Conduct any additional tests as required by the manufacturer.

n. Verify tests and requirements are met as specified in Section 16010 - General Electrical Requirements, and Section 16950 – Testing Electrical Systems.

END OF SECTION 16906

1. GENERAL

A. RELATED DOCUMENTS

1. Drawings and general provisions on Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to work of this Section.

2. Contractor shall note that this section shall be considered a Supplement to testing requirements outlined or described in other sections of these specifications.

B. WORK INCLUDES

1. Extent of Work as required by the Drawings and these Specifications.

C. RELATED WORK

1. Section 16010 - General Electrical Requirements
2. Section 16120 - Wire and Cable
3. Section 16130 - Boxes

D. QUALITY ASSURANCE

1. Regulatory requirements:

a. Governing codes:

NFPA 70 - National Electrical Code (most current issue).

E. SUBMITTALS

1. Submit under provisions of Section 01300.

a. Test Reports:

Test of entire electrical system as noted herein. Submit to the Engineer in triplicate.

b. All specified maximums and minimums of these specifications must be met. Complete test records of all tests shall be made and shall show resistance values obtained and calculations of same, showing method of test and calculation.

2. PRODUCTS

A. MATERIALS

1. Furnish all equipment, tools, manpower, and casual labor to perform specified testing.

3. EXECUTION

A. TESTING

1. After wires and cables are in place and connected to devices and equipment, the system shall be tested for short circuits, improper grounds, and other faults. When fault condition is present, the trouble shall be rectified, then retested.

2. Voltage test shall be made at each lighting and distribution panel. When potential is not within 2 percent of rated voltage, the conditions shall be corrected by tap changes or power company connection of line voltage.

3. Voltage test shall be made between Neutral (White) and Ground (Green) conductors and/or busbar at each lighting and distribution panel. Measured volts shall not exceed 0.2 mV. Locations exceeding this value shall be corrected and re-tested.

4. A voltage test shall be made on the last outlet of each circuit and the potential drop shall not exceed 3 percent of rated voltage.

5. All wiring devices and electrical apparatus furnished under this contract, when grounded or shorted on any integral "live" part, shall be removed and the trouble rectified by replacing all defective parts and materials.

6. All feeder cables, after being pulled in place and before being connected, shall have a Megger test conducted to determine that wire and cable insulation resistance is not less than that recommended by the NEC. All cables failing insulation test shall be removed, replaced with new, and retested.

7. Furnish all meters, instruments, cable connections, equipment or apparatus necessary for making all tests.

8. Testing of MCC's

a. Before energizing any motor control centers, the Contractor shall make a megohmmeter test of all phase busing and check these results with typical manufacturer's data. Readings that fall below manufacturer's values will not be acceptable and the Contractor shall be required to perform any necessary remedial action before energizing.

9. All new motor installations shall be tested under Article 16220. All motors shall be tested for correct direction of rotation. Run tests on all motors and verify that proper overload devices have been installed.

10. Testing of Ground System

a. Each and all grounded cases and metal parts associated with electrical equipment shall be tested for continuity of connection with the ground bus system by the Contractor in the presence of the Construction Manager or his representative.

b. All grounding electrode conductors brought in from the ground field shall be t ested for satisfactory continuity by applying a low DC voltage source of current between the electrical equipment ground bus and the ground field. The grounding path must satisfactorily conduct the current and the resistance as calculated from the current and voltage, and shall not exceed 0.010 ohms.

c. Each ground prior to connection of the Ground Field shall be tested for resistance to earth by a standard method. A Biddle ground ohmmeter or the method of using two auxiliary ground rods may be used. This method requires the use of AC current. Ground resistance shall be calculated and the maximum ground rod resistance to earth shall not exceed 25 ohms. If the resistance is found to be higher than 25 ohms, one additional rod shall be driven with a minimum separation equal to the length of the ground rod used and connected in parallel with the rod under test.

d. Outside ground rod and grid resistances to earth shall not be measured during unusually wet weather. The tests should be performed during normal weather conditions. All tests shall be documented and turned over to the Construction Manager.

B. PHASE RELATIONSHIP

1. Examine connections to equipment for proper phase relationships.

C. CORRECTION OF DEFECTS

1. When tests disclose any unsatisfactory workmanship or equipment furnished under this contract, correct defects and retest. Repeat tests until satisfactory results are obtained.

2. When any wiring or equipment is damaged by tests, repair or replace such wiring or equipment. Test repaired items to ensure satisfactory operation.

END OF SECTION 16950.

State of Illinois
Department of Transportation
Bureau of Local Roads and Streets

SPECIAL PROVISION FOR COOPERATION WITH UTILITIES

Effective: January 1, 1999
Revised: January 1, 2007

All references to Sections or Articles in this specification shall be construed to mean specific Section or Article of the Standard Specifications for Road and Bridge Construction, adopted by the Department of Transportation.

Replace Article 105.07 of the Standard Specifications with the following:

"**105.07 Cooperation with Utilities.** The adjustment of utilities consists of the relocation, removal, replacement, rearrangements, reconstruction, improvement, disconnection, connection, shifting, new installation or altering of an existing utility facility in any manner.

When the plans or special provisions include information pertaining to the location of underground utility facilities, such information represents only the opinion of the Department as to the location of such utilities and is only included for the convenience of the bidder. The Department assumes no responsibility in respect to the sufficiency or the accuracy of the information shown on the plans relative to the location of the underground utility facilities.

Utilities which are to be adjusted shall be adjusted by the utility owner or the owner's representative or by the Contractor as a contract item. Generally, arrangements for adjusting existing utilities will be made by the Department prior to project construction; however, utilities will not necessarily be adjusted in advance of project construction and, in some cases, utilities will not be removed from the proposed construction limits. When utility adjustments must be performed in conjunction with construction, the utility adjustment work will be shown on the plans and/or covered by Special Provisions.

When the Contractor discovers a utility has not been adjusted by the owner or the owner's representative as indicated in the contract documents, or the utility is not shown on the plans or described in the Special Provisions as to be adjusted in conjunction with construction, the Contractor shall not interfere with said utility, and shall take proper precautions to prevent damage or interruption of the utility and shall promptly notify the Engineer of the nature and location of said utility.

All necessary adjustments, as determined by the Engineer, of utilities not shown on the plans or not identified by markers, will be made at no cost to the Contractor except traffic structures, light poles, etc., that are normally located within the proposed construction limits as hereinafter defined will not be adjusted unless required by the proposed improvement.

(a) Limits of Proposed Construction for Utilities Paralleling the Roadway. For the purpose of this Article, limits of proposed construction for utilities extending in the same longitudinal direction as the roadway, shall be defined as follows:

(1) The horizontal limits shall be a vertical plane, outside of, parallel to, and 600 mm (2 ft) distant at right angles from the plan or revised slope limits.

In cases where the limits of excavation for structures are not shown on the plans, the horizontal limits shall be a vertical plane 1.2 m (4 ft) outside the edges of structure footings or the structure where no footings are required.

(2) The upper vertical limits shall be the regulations governing the roadbed clearance for the specific utility involved.

(3) The lower vertical limits shall be the top of the utility at the depth below the proposed grade as prescribed by the governing agency or the limits of excavation, whichever is less.

(b) Limits of Proposed Construction for Utilities Crossing the Roadway. For the purpose of this Article, limits of proposed construction for utilities crossing the roadway in a generally transverse direction shall be defined as follows:

(1) Utilities crossing excavations for structures that are normally made by trenching such as sewers, underdrains, etc. and all minor structures such as manholes, inlets, foundations for signs, foundations for traffic signals, etc., the limits shall be the space to be occupied by the proposed permanent construction unless otherwise required by the regulations governing the specific utility involved.

(2) For utilities crossing the proposed site of major structures such as bridges, sign trusses, etc., the limits shall be as defined above for utilities extending in the same general direction as the roadway.

The Contractor may make arrangements for adjustment of utilities outside of the limits of proposed construction provided the Contractor furnishes the Department with a signed agreement with the utility owner covering the adjustments to be made. The cost of any adjustments made outside the limits of proposed construction shall be the responsibility of the Contractor unless otherwise provided.

The Contractor shall request all utility owners to field locate their facilities according to Article 107.31. The Engineer may make the request for location from the utility after receipt of notice from the Contractor. On request, the Engineer will make an inspection to verify that the utility company has field located its facilities, but will not assume responsibility for the accuracy of such work. The Contractor shall be responsible for maintaining the excavations or markers provided by the utility owners. This field location procedure may be waived if the utility owner has stated in writing to the Department it is satisfied the construction plans are sufficiently accurate. If the utility owner does not submit such statement to the Department, and they do not field locate their facilities in both horizontal and vertical alignment, the Engineer will authorize the Contractor in writing to proceed to locate the facilities in the most economical and reasonable manner, subject to the approval of the Engineer, and be paid according to Article 109.04.

The Contractor shall coordinate with any planned utility adjustment or new installation and the Contractor shall take all precautions to prevent disturbance or damage to utility facilities. Any failure on the part of the utility owner, or their representative, to proceed with any planned utility adjustment or new installation shall be reported promptly by the Contractor to the Engineer orally and in writing.

The Contractor shall take all necessary precautions for the protection of the utility facilities. The Contractor shall be responsible for any damage or destruction of utility facilities resulting from neglect, misconduct, or omission in the Contractor's manner or method of execution or nonexecution of the work, or caused by defective work or the use of unsatisfactory materials. Whenever any damage or destruction of a utility facility occurs as a result of work performed by the Contractor, the utility company will be immediately notified. The utility company will make arrangements to restore such facility to a condition equal to that existing before any such damage or destruction was done.

It is understood and agreed that the Contractor has considered in the bid all of the permanent and temporary utilities in their present and/or adjusted positions.

No additional compensation will be allowed for any delays, inconvenience, or damage sustained by the Contractor due to any interference from the said utility facilities or the operation of relocating the said utility facilities.

State of Illinois
Department of Transportation
Bureau of Local Roads and Streets

SPECIAL PROVISION FOR INSURANCE

Effective: February 1, 2007
Revised: August 1, 2007

All references to Sections or Articles in this specification shall be construed to mean specific Section or Article of the Standard Specifications for Road and Bridge Construction, adopted by the Department of Transportation.

The Contractor shall name the following entities as additional insured under the Contractor's general liability insurance policy in accordance with Article 107.27.

Kane County

City of Aurora

Crawford, Murphy & Tilly, Inc.

The entities listed above and their officers, employees, and agents shall be indemnified and held harmless in accordance with Article 107.26.

COARSE AGGREGATE QUALITY (BDE)

Effective: July 1, 2015

Revise Article 1004.01(b) of the Standard Specifications to read:

"(b) Quality. The coarse aggregate shall be according to the quality standards listed in the following table.

COARSE AGGREGATE QUALITY				
QUALITY TEST	CLASS			
	A	B	C	D
Na_2SO_4 Soundness 5 Cycle, ITP 104 [1/], % Loss max.	15	15	20	25 [2/]
Los Angeles Abrasion, ITP 96 [11/], % Loss max.	40 [3/]	40 [4/]	40 [5/]	45
Minus No. 200 (75 µm) Sieve Material, ITP 11	1.0 [6/]	---	2.5 [7/]	---
Deleterious Materials [10/]				
Shale, % max.	1.0	2.0	4.0 [8/]	---
Clay Lumps, % max.	0.25	0.5	0.5 [8/]	---
Coal & Lignite, % max.	0.25	---	---	---
Soft & Unsound Fragments, % max.	4.0	6.0	8.0 [8/]	---
Other Deleterious, % max.	4.0 [9/]	2.0	2.0 [8/]	---
Total Deleterious, % max.	5.0	6.0	10.0 [8/]	---
Oil-Stained Aggregate [10/], % max	5.0	---	---	

1/ Does not apply to crushed concrete.

2/ For aggregate surface course and aggregate shoulders, the maximum percent loss shall be 30.

3/ For portland cement concrete, the maximum percent loss shall be 45.

4/ Does not apply to crushed slag or crushed steel slag.

5/ For hot-mix asphalt (HMA) binder mixtures, except when used as surface course, the maximum percent loss shall be 45.

6/ For crushed aggregate, if the material finer than the No. 200 (75 µm) sieve consists of the dust from fracture, essentially free from clay or silt, this percentage may be increased to 2.5.

7/ Does not apply to aggregates for HMA binder mixtures.

8/ Does not apply to Class A seal and cover coats.

9/ Includes deleterious chert. In gravel and crushed gravel aggregate, deleterious chert shall be the lightweight fraction separated in a 2.35 heavy media separation. In crushed stone aggregate, deleterious chert shall be the lightweight fraction separated in a 2.55 heavy media separation. Tests shall be run according to ITP 113.

10/ Test shall be run according to ITP 203.

11/ Does not apply to crushed slag.

All varieties of chert contained in gravel coarse aggregate for portland cement concrete, whether crushed or uncrushed, pure or impure, and irrespective of color, will be classed as chert and shall not be present in the total aggregate in excess of 25 percent by weight (mass).

Aggregates used in Class BS concrete (except when poured on subgrade), Class PS concrete, and Class PC concrete (bridge superstructure products only, excluding the approach slab) shall contain no more than two percent by weight (mass) of deleterious materials. Deleterious materials shall include substances whose disintegration is accompanied by an increase in volume which may cause spalling of the concrete."

80360

COATED GALVANIZED STEEL CONDUIT (BDE)

Effective: January 1, 2013
Revised: January 1, 2015

Revise Article 811.03(b) of the Standard Specifications to read:

"(b) Coated Galvanized Steel Conduit. In addition to the methods described in Article 810.05(a) the following methods shall be observed when installing coated conduit.

Coated conduit pipe vise jaw adapters shall be used when the conduit is being clamped to avoid damaging the coating.

Coated conduit shall be cut with a roller cutter or by other means approved by the conduit manufacturer.

After any cutting or threading operations are completed, the bare steel shall be touched up with the conduit manufacturer's touch up compound."

80310

CONTRACT CLAIMS (BDE)

Effective: April 1, 2014

Revise the first paragraph of Article 109.09(a) of the Standard Specifications to read:

"(a) Submission of Claim. All claims filed by the Contractor shall be in writing and in sufficient detail to enable the Department to ascertain the basis and amount of the claim. As a minimum, the following information must accompany each claim submitted."

Revise Article 109.09(e) of the Standard Specifications to read:

"(e) Procedure. The Department provides two administrative levels for claims review.

Level I Engineer of Construction
Level II Chief Engineer/Director of Highways or Designee

(1) Level I. All claims shall first be submitted at Level I. Two copies each of the claim and supporting documentation shall be submitted simultaneously to the District and the Engineer of Construction. The Engineer of Construction, in consultation with the District, will consider all information submitted with the claim and render a decision on the claim within 90 days after receipt by the Engineer of Construction. Claims not conforming to this Article will be returned without consideration. The Engineer of Construction may schedule a claim presentation meeting if in the Engineer of Construction's judgment such a meeting would aid in resolution of the claim, otherwise a decision will be made based on the claim documentation submitted. If a Level I decision is not rendered within 90 days of receipt of the claim, or if the Contractor disputes the decision, an appeal to Level II may be made by the Contractor.

(2) Level II. An appeal to Level II shall be made in writing to the Engineer of Construction within 45 days after the date of the Level I decision. Review of the claim at Level II shall be conducted as a full evaluation of the claim. A claim presentation meeting may be scheduled if the Chief Engineer/Director of Highways determines that such a meeting would aid in resolution of the claim, otherwise a decision will be made based on the claim documentation submitted. A Level II final decision will be rendered within 90 days of receipt of the written request for appeal.

Full compliance by the Contractor with the provisions specified in this Article is a contractual condition precedent to the Contractor's right to seek relief in the Court of Claims. The Director's written decision shall be the final administrative action of the Department. Unless the Contractor files a claim for adjudication by the Court of Claims within 60 days after the date of the written decision, the failure to file shall constitute a release and waiver of the claim."

EQUAL EMPLOYMENT OPPORTUNITY (BDE)

Effective: April 1, 2015

FEDERAL AID CONTRACTS. Revise the following section of Check Sheet #1 of the Recurring Special Provisions to read:

"EQUAL EMPLOYMENT OPPORTUNITY

In the event of the Contractor's noncompliance with the provisions of this Equal Employment Opportunity Clause, the Illinois Human Rights Act, or the Illinois Department of Human Rights Rules and Regulations, the Contractor may be declared ineligible for future contracts or subcontracts with the State of Illinois or any of its political sub-divisions or municipal corporations, and the contract may be cancelled or voided in whole or in part, and such other sanctions or penalties may be imposed or remedies invoked as provided by statute or regulation.

During the performance of this Contract, the Contractor agrees as follows:

(1) That it will not discriminate against any employee or applicant for employment because of race, color, religion, sex, sexual orientation, marital status, order of protection status, national origin or ancestry, citizenship status, age, physical or mental disability unrelated to ability, military status, or an unfavorable discharge from military service; and further that it will examine all job classifications to determine if minority persons or women are underutilized and will take appropriate affirmative action to rectify any such underutilization.

(2) That, if it hires additional employees in order to perform this contract or any portion hereof, it will determine the availability (according to the Illinois Department of Human Rights Rules and Regulations) of minorities and women in the area(s) from which it may reasonably recruit and it will hire for each job classification for which employees are hired in such a way that minorities and women are not underutilized.

(3) That, in all solicitations or advertisements for employees placed by it or on its behalf, it will state that all applicants will be afforded equal opportunity without discrimination because of race, color, religion, sex, sexual orientation, marital status, order of protection status, national origin or ancestry, citizenship status, age, physical or mental disability unrelated to ability, military status or an unfavorable discharge from military service.

(4) That it will send to each labor organization or representative of workers with which it has or is bound by a collective bargaining or other agreement or understanding, a notice advising such labor organization or representative of the Contractor's obligations under the Illinois Human Rights Act and the Illinois Department of Human Rights Rules and Regulations. If any labor organization or representative fails or refuses to cooperate with the Contractor in its efforts to comply with such Act and Rules and Regulations, the

Contractor will promptly so notify the Illinois Department of Human Rights and IDOT and will recruit employees from other sources when necessary to fulfill its obligations thereunder.

(5) That it will submit reports as required by the Illinois Department of Human Rights Rules and Regulations, furnish all relevant information as may from time to time be requested by the Illinois Department of Human Rights or IDOT, and in all respects comply with the Illinois Human Rights Act and the Illinois Department of Human Rights Rules and Regulations.

(6) That it will permit access to all relevant books, records, accounts and work sites by personnel of IDOT and the Illinois Department of Human Rights for purposes of investigation to ascertain compliance with the Illinois Human Rights Act and the Illinois Department of Human Rights Rules and Regulations.

(7) That it will include verbatim or by reference the provisions of this clause in every subcontract it awards under which any portion of the contract obligations are undertaken or assumed, so that the provisions will be binding upon the subcontractor. In the same manner as with other provisions of this contract, the Contractor will be liable for compliance with applicable provisions of this clause by subcontractors; and further it will promptly notify IDOT and the Illinois Department of Human Rights in the event any subcontractor fails or refuses to comply with these provisions. In addition, the Contractor will not utilize any subcontractor declared by the Illinois Human Rights Commission to be ineligible for contracts or subcontracts with the State of Illinois or any of its political subdivisions or municipal corporations."

STATE CONTRACTS. Revise Section II of Check Sheet #5 of the Recurring Special Provisions to read:

"II. EQUAL EMPLOYMENT OPPORTUNITY

In the event of the Contractor's noncompliance with the provisions of this Equal Employment Opportunity Clause, the Illinois Human Rights Act or the Illinois Department of Human Rights Rules and Regulations, the Contractor may be declared ineligible for future contracts or subcontracts with the State of Illinois or any of its political sub-divisions or municipal corporations, and the contract may be cancelled or voided in whole or in part, and such other sanctions or penalties may be imposed or remedies invoked as provided by statute or regulation.

During the performance of this Contract, the Contractor agrees as follows:

1. That it will not discriminate against any employee or applicant for employment because of race, color, religion, sex, sexual orientation, marital status, order of protection status, national origin or ancestry, citizenship status, age, physical or mental disability unrelated to ability, military status, or an unfavorable discharge from military service; and further

that it will examine all job classifications to determine if minority persons or women are underutilized and will take appropriate affirmative action to rectify any such underutilization.

2. That, if it hires additional employees in order to perform this contract or any portion hereof, it will determine the availability (according to the Illinois Department of Human Rights Rules and Regulations) of minorities and women in the area(s) from which it may reasonably recruit and it will hire for each job classification for which employees are hired in such a way that minorities and women are not underutilized.

3. That, in all solicitations or advertisements for employees placed by it or on its behalf, it will state that all applicants will be afforded equal opportunity without discrimination because of race, color, religion, sex, sexual orientation, marital status, order of protection status, national origin or ancestry, citizenship status, age, physical or mental disability unrelated to ability, military status, or an unfavorable discharge from military service.

4. That it will send to each labor organization or representative of workers with which it has or is bound by a collective bargaining or other agreement or understanding, a notice advising such labor organization or representative of the Contractor's obligations under the Illinois Human Rights Act and the Illinois Department of Human Rights Rules and Regulations. If any labor organization or representative fails or refuses to cooperate with the Contractor in its efforts to comply with such Act and Rules and Regulations, the Contractor will promptly so notify the Illinois Department of Human Rights and IDOT and will recruit employees from other sources when necessary to fulfill its obligations thereunder.

5. That it will submit reports as required by the Illinois Department of Human Rights Rules and Regulations, furnish all relevant information as may from time to time be requested by the Illinois Department of Human Rights or IDOT, and in all respects comply with the Illinois Human Rights Act and the Illinois Department of Human Rights Rules and Regulations.

6. That it will permit access to all relevant books, records, accounts and work sites by personnel of IDOT and the Illinois Department of Human Rights for purposes of investigation to ascertain compliance with the Illinois Human Rights Act and the Illinois Department of Human Rights Rules and Regulations.

7. That it will include verbatim or by reference the provisions of this clause in every subcontract it awards under which any portion of the contract obligations are undertaken or assumed, so that the provisions will be binding upon the subcontractor. In the same manner as with other provisions of this contract, the Contractor will be liable for compliance with applicable provisions of this clause by subcontractors; and further it will promptly notify IDOT and the Illinois Department of Human Rights in the event any subcontractor fails or refuses to comply with these provisions. In addition, the Contractor will not utilize any subcontractor declared by the Illinois Human Rights

Commission to be ineligible for contracts or subcontracts with the State of Illinois or any of its political subdivisions or municipal corporations."

80358

FRICTION AGGREGATE (BDE)

Effective: January 1, 2011
Revised: November 1, 2014

Revise Article 1004.01(a)(4) of the Standard Specifications to read:

"(4) Crushed Stone. Crushed stone shall be the angular fragments resulting from crushing undisturbed, consolidated deposits of rock by mechanical means. Crushed stone shall be divided into the following, when specified.

a. Carbonate Crushed Stone. Carbonate crushed stone shall be either dolomite or limestone. Dolomite shall contain 11.0 percent or more magnesium oxide (MgO). Limestone shall contain less than 11.0 percent magnesium oxide (MgO).

b. Crystalline Crushed Stone. Crystalline crushed stone shall be either metamorphic or igneous stone, including but is not limited to, quartzite, granite, rhyolite and diabase."

Revise Article 1004.03(a) of the Standard Specifications to read:

"**1004.03 Coarse Aggregate for Hot-Mix Asphalt (HMA).** The aggregate shall be according to Article 1004.01 and the following.

(a) Description. The coarse aggregate for HMA shall be according to the following table.

Use	Mixture	Aggregates Allowed
Class A	Seal or Cover	Allowed Alone or in Combination [5/]: Gravel Crushed Gravel Carbonate Crushed Stone Crystalline Crushed Stone Crushed Sandstone Crushed Slag (ACBF) Crushed Steel Slag Crushed Concrete

Use	Mixture	Aggregates Allowed
HMA Low ESAL	Stabilized Subbase or Shoulders	<u>Allowed Alone or in Combination</u> [5/]: Gravel Crushed Gravel Carbonate Crushed Stone Crystalline Crushed Stone Crushed Sandstone Crushed Slag (ACBF) Crushed Steel Slag[1/] Crushed Concrete
HMA High ESAL Low ESAL	Binder IL-19.0 or IL-19.0L SMA Binder	<u>Allowed Alone or in Combination</u> [5/]: Crushed Gravel Carbonate Crushed Stone[2/] Crystalline Crushed Stone Crushed Sandstone Crushed Slag (ACBF) Crushed Concrete[3/]
HMA High ESAL Low ESAL	C Surface and Leveling Binder IL-9.5 or IL-9.5L SMA Ndesign 50 Surface	<u>Allowed Alone or in Combination</u> [5/]: Crushed Gravel Carbonate Crushed Stone[2/] Crystalline Crushed Stone Crushed Sandstone Crushed Slag (ACBF) Crushed Steel Slag[4/] Crushed Concrete[3/]
HMA High ESAL	D Surface and Leveling Binder IL-9.5 SMA Ndesign 50 Surface	<u>Allowed Alone or in Combination</u> [5/]: Crushed Gravel Carbonate Crushed Stone (other than Limestone)[2/] Crystalline Crushed Stone Crushed Sandstone Crushed Slag (ACBF) Crushed Steel Slag[4/] Crushed Concrete[3/]
		<u>Other Combinations Allowed:</u> *Up to...* — *With...* 25% Limestone — Dolomite

Use	Mixture	Aggregates Allowed	
		50% Limestone	Any Mixture D aggregate other than Dolomite
		75% Limestone	Crushed Slag (ACBF) or Crushed Sandstone
HMA High ESAL	E Surface IL-9.5 SMA Ndesign 80 Surface	<u>Allowed Alone or in Combination</u> [5/]: Crushed Gravel Crystalline Crushed Stone Crushed Sandstone Crushed Slag (ACBF) Crushed Steel Slag Crushed Concrete[3/] No Limestone	
		<u>Other Combinations Allowed:</u>	
		Up to...	*With...*
		50% Dolomite[2/]	Any Mixture E aggregate
		75% Dolomite[2/]	Crushed Sandstone, Crushed Slag (ACBF), Crushed Steel Slag, or Crystalline Crushed Stone
		75% Crushed Gravel or Crushed Concrete[3/]	Crushed Sandstone, Crystalline Crushed Stone, Crushed Slag (ACBF), or Crushed Steel Slag
HMA High ESAL	F Surface IL-9.5 SMA Ndesign 80 Surface	<u>Allowed Alone or in Combination</u> [5/]: Crystalline Crushed Stone Crushed Sandstone Crushed Slag (ACBF) Crushed Steel Slag No Limestone.	
		<u>Other Combinations Allowed</u>:	

Use	Mixture	Aggregates Allowed	
		Up to...	*With...*
		50% Crushed Gravel, Crushed Concrete[3/], or Dolomite[2/]	Crushed Sandstone, Crushed Slag (ACBF), Crushed Steel Slag, or Crystalline Crushed Stone

1/ Crushed steel slag allowed in shoulder surface only.
2/ Carbonate crushed stone shall not be used in SMA Ndesign 80. In SMA Ndesign 50, carbonate crushed stone shall not be blended with any of the other aggregates allowed alone in Ndesign 50 SMA binder or Ndesign 50 SMA surface.
3/ Crushed concrete will not be permitted in SMA mixes.
4/ Crushed steel slag shall not be used as leveling binder.
5/ When combinations of aggregates are used, the blend percent measurements shall be by volume."

80265

HOT MIX ASPHALT – PRIME COAT (BDE)

Effective: November 1, 2014

Revise Note 1 of Article 406.02 of the Standard Specifications to read:

"Note 1. The bituminous material used for prime coat shall be one of the types listed in the following table.

When emulsified asphalts are used, any dilution with water shall be performed by the emulsion producer. The emulsified asphalt shall be thoroughly agitated within 24 hours of application and show no separation of water and emulsion."

Application	Bituminous Material Types
Prime Coat on Brick, Concrete, or HMA Bases	SS-1, SS-1h, SS-1hP, SS-1vh, RS-1, RS-2, CSS-1, CSS-1h, CSS-1hp, CRS-1, CRS-2, HFE-90, RC-70
Prime Coat on Aggregate Bases	MC-30, CRS-2P"

Add the following to Article 406.03 of the Standard Specifications.

"(i) Vacuum Sweeper 1101.19
(j) Spray Paver ..... 1102.06"

Revise Article 406.05(b) of the Standard Specifications to read:

"(b) Prime Coat. The bituminous material shall be prepared according to Article 403.05 and applied according to Article 403. 10. The use of RC-70 shall be limited to air temperatures less than 60 °F (15 °C).

(1) Brick, Concrete or HMA Bases. The base shall be cleaned of all dust, debris and any substance that will prevent the prime coat from adhering to the base. Cleaning shall be accomplished by sweeping to remove all large particles and air blasting to remove dust. As an alternative to air blasting, a vacuum sweeper may be used to accomplish the dust removal. The base shall be free of standing water at the time of application. The prime coat shall be applied uniformly and at a rate that will provide a residual asphalt rate on the prepared surface as specified in the following table.

Type of Surface to be Primed	Residual Asphalt Rate lb/sq ft (kg/sq m)
Milled HMA, Aged Non-Milled HMA, Milled Concrete, Non-Milled Concrete & Tined Concrete	0.05 (0.244)
Fog Coat between HMA Lifts, IL-4.75 & Brick	0.025 (0.122)

The bituminous material for the prime coat shall be placed one lane at a time. If a spray paver is not used, the primed lane shall remain closed until the prime coat is

fully cured and does not pickup under traffic. When placing prime coat through an intersection where it is not possible to keep the lane closed, the prime coat may be covered immediately following its application with fine aggregate mechanically spread at a uniform rate of 2 to 4 lb/sq yd (1 to 2 kg/sq m).

(2) Aggregate Bases. The prime coat shall be applied uniformly and at a rate that will provide a residual asphalt rate on the prepared surface of 0.25 lb/sq ft ± 0.01 (1.21 kg/sq m ±0.05).

The prime coat shall be permitted to cure until the penetration has been approved by the Engineer, but at no time shall the curing period be less than 24 hours for MC-30 or four hours for PEP. Pools of prime occurring in the depressions shall be broomed or squeegeed over the surrounding surface the same day the prime coat is applied.

The base shall be primed 1/2 width at a time. The prime coat on the second half/width shall not be applied until the prime coat on the first half/width has cured so that it will not pickup under traffic.

The residual asphalt rate will be verified a minimum of once per type of surface to be primed as specified herein for which at least 2000 tons (1800 metric tons) of HMA will be placed. The test will be according to the "Determination of Residual Asphalt in Prime and Tack Coat Materials" test procedure.

Prime coat shall be fully cured prior to placement of HMA to prevent pickup by haul trucks or paving equipment. If pickup occurs, paving shall cease in order to provide additional cure time, and all areas where the pickup occurred shall be repaired.

If after five days, loss of prime coat is evident prior to covering with HMA, additional prime coat shall be placed as determined by the Engineer at no additional cost to the Department."

Revise the last sentence of the first paragraph of Article 406.13(b) of the Standard Specifications to read:

"Water added to emulsified asphalt, as allowed in Article 406.02, will not be included in the quantities measured for payment."

Revise the second paragraph of Article 406.13(b) of the Standard Specifications to read:

"Aggregate for covering prime coat will not be measured for payment."

Revise the first paragraph of Article 406.14 of the Standard Specifications to read:

"**406.14 Basis of Payment.** Prime Coat will be paid for at the contract unit price per pound (kilogram) of residual asphalt applied for BITUMINOUS MATERIALS (PRIME COAT), or POLYMERIZED BITUMINOUS MATERIALS (PRIME COAT)."

Revise Article 407.02 of the Standard Specifications to read:

"**407.02 Materials.** Materials shall be according to Article 406.02, except as follows.

Item	Article/Section
(a) Packaged Rapid Hardening Mortar or Concrete	1018"

Revise Article 407.06(b) of the Standard Specifications to read:

"(b) A bituminous prime coat shall be applied between each lift of HMA according to Article 406.05(b)."

Delete the second paragraph of Article 407.12 of the Standard Specifications.

Revise the first paragraph of Article 408.04 of the Standard Specifications to read:

"**408.04 Method of Measurement.** Bituminous priming material will be measured for payment according to Article 406.13."

Revise the first paragraph of Article 408.05 of the Standard Specifications to read:

"**408.05 Basis of Payment.** This work will be paid for at the contract unit price per pound (kilogram) of residual asphalt applied for BITUMINOUS MATERIALS (PRIME COAT) or POLYMERIZED BITUMINOUS MATERIALS (PRIME COAT) and at the contract unit price per ton (metric ton) for INCIDENTAL HOT-MIX ASPHALT SURFACING."

Revise Article 1032.02 of the Standard Specifications to read:

"**1032.02 Measurement.** Asphalt binders, emulsified asphalts, rapid curing liquid asphalt, medium curing liquid asphalts, slow curing liquid asphalts, asphalt fillers, and road oils will be measured by weight.

A weight ticket for each truck load shall be furnished to the inspector. The truck shall be weighed at a location approved by the Engineer. The ticket shall show the weight of the empty truck (the truck being weighed each time before it is loaded), the weight of the loaded truck, and the net weight of the bituminous material.

When an emulsion or cutback is used for prime coat, the percentage of asphalt residue of the actual certified product shall be shown on the producer's bill of lading or attached certificate of analysis. If the producer adds extra water to an emulsion at the request of the purchaser, the amount of water shall also be shown on the bill of lading.

Payment will not be made for bituminous materials in excess of 105 per cent of the amount specified by the Engineer."

Add the following to the table in Article 1032.04 of the Standard Specifications.

"SS-1vh	160-180	70-80
RS-1, CRS-1	75-130	25-55"

Add the following to Article 1032.06 of the Standard Specifications.

"(g) Non Tracking Emulsified Asphalt SS-1vh shall be according to the following.

Requirements for SS-1vh			
Test		SPEC	AASHTO Test Method
Saybolt Viscosity @ 25C,	SFS	20-200	T 72
Storage Stability, 24hr.,	%	1 max.	T 59
Residue by Evaporation,	%	50 min.	T 59
Sieve Test,	%	0.3 max.	T 59
Tests on Residue from Evaporation			
Penetration @25°C, 100g., 5 sec., dmm		20 max.	T 49
Softening Point,	C	65 min.	T 53
Solubility,	%	97.5 min.	T 44
Orig. DSR @ 82°C,	kPa	1.00 min.	T 315"

Revise the last table in Article 1032.06(f)(2)d. of the Standard Specifications to read:

"Grade	Use
SS-1, SS-1h, RS-1, RS-2, CSS-1, CRS-1, CRS-2, CSS-1h, HFE-90, SS-1hP, CSS-1hP, SS-1vh	Prime or fog seal
PEP	Bituminous surface treatment prime
RS-2, HFE-90, HFE-150, HFE- 300, CRSP, HFP, CRS-2, HFRS-2	Bituminous surface treatment
CSS-1h Latex Modified	Microsurfacing"

Add the following to Article 1101 of the Standard Specifications.

"**1101.19 Vacuum Sweeper.** The vacuum sweeper shall have a minimum sweeping path of 52 in. (1.3 m) and a minimum blower rating of 20,000 cu ft per minute (566 cu m per minute)."

Add the following to Article 1102 of the Standard Specifications:

"**1102.06 Spray Paver.** The spreading and finishing machine shall be capable of spraying a rapid setting emulsion tack coat, paving a layer of HMA, and providing a smooth HMA mat in one pass. The HMA shall be spread over the tack coat in less than five seconds after the

application of the tack coat during normal pavin g speeds. No wheel or other part of the paving machine shall come into contact with the tack coat before the HMA is applied. In addition to meeting the requirements of Article 1102.03, the spray paver shall also meet the re quirements of Article 1102.05 for the tank, heating system, pu mp, thermometer, tachometer or synchronizer, and calibration. The spray bar shall be equipped with properly sized and spaced nozzles to apply a uniform application of tack coat at the specified rate for the full width of the mat being placed."

80348

LRFD STORM SEWER BURIAL TABLES (BDE)

Effective: November 1, 2013
Revised: April 1, 2015

Revise Article 550.02 of the Standard Specifications to read as follows:

"Item	Article Section
(a) Clay Sewer Pipe	1040.02
(b) Extra Strength Clay Pipe	1040.02
(c) Concrete Sewer, Storm Drain, and Culvert Pipe	1042
(d) Reinforced Concrete Culvert, Storm Drain, and Sewer Pipe	1042
(e) Reinforced Concrete Elliptical Culvert, Storm Drain, and Sewer Pipe (Note 1)	1042
(f) Reinforced Concrete Arch Culvert, Storm Drain, and Sewer Pipe (Note 1)	1042
(g) Polyvinyl Chloride (PVC) Pipe	1040.03
(h) Corrugated Polyvinyl Chloride (PVC) Pipe with a Smooth Interior	1040.03
(i) Corrugated Polypropylene (CPP) Pipe with Smooth Interior	1040.08
(j) Rubber Gaskets and Preformed Flexible Joint Sealants for Concrete Pipe	1056
(k) Mastic Joint Sealer for Pipe	1055
(l) External Sealing Band	1057
(m) Fine Aggregate (Note 2)	1003.04
(n) Coarse Aggregate (Note 3)	1004.05
(o) Reinforcement Bars and Welded Wire Fabric	1006.10
(p) Handling Hole Plugs	1042.16
(q) Polyethylene (PE) Pipe with a Smooth Interior	1040.04
(r) Corrugated Polyethylene (PE) Pipe with a Smooth Interior	1040.04

Note 1. The class of elliptical and arch pipe used for various storm sewer sizes and heights of fill shall conform to the requirements for circular pipe.

Note 2. The fine aggregate shall be moist.

Note 3. The coarse aggregate shall be wet."

Revise the table for permitted materials in Article 550.03 of the Standard Specifications as follows:

"Class	**Materials**
A	Rigid Pipes: Clay Sewer Pipe Extra Strength Clay Pipe Concrete Sewer, Storm Drain, and Culvert Pipe Reinforced Concrete Culvert, Storm Drain, and Sewer Pipe Reinforced Concrete Elliptical Culvert, Storm Drain, and Sewer Pipe Reinforced Concrete Arch Culvert, Storm Drain, and Sewer Pipe
B	Rigid Pipes: Clay Sewer Pipe Extra Strength Clay Pipe Concrete Sewer, Storm Drain, and Culvert Pipe Reinforced Concrete Culvert, Storm Drain, and Sewer Pipe Reinforced Concrete Elliptical Culvert, Storm Drain, and Sewer Pipe Reinforced Concrete Arch Culvert, Storm Drain, and Sewer Pipe Flexible Pipes: Polyvinyl Chloride (PVC) Pipe Corrugated Polyvinyl Chloride Pipe (PVC) with a Smooth Interior Polyethylene (PE) Pipe with a Smooth Interior Corrugated Polyethylene (PE) Pipe with a Smooth Interior Corrugated Polypropylene (CPP) Pipe with a Smooth Interior"

Replace the storm sewers tables in Article 550.03 of the Standard Specifications with the following:

STORM SEWERS
KIND OF MATERIAL PERMITTED AND STRENGTH REQUIRED
FOR A GIVEN PIPE DIAMETERS AND FILL HEIGHTS OVER THE TOP OF THE PIPE

Nominal Diameter in.	Type 1 Fill Height: 3' and less With 1' minimum cover								Type 2 Fill Height: Greater than 3' not exceeding 10'							
	RCCP	CSP	ESCP	PVC	CPVC	PE	CPE	CPP	RCCP	CSP	ESCP	PVC	CPVC	PE	CPE	CPP
10	NA	3	X	X	X	X	X	NA	NA	1	*X	X	X	X	X	NA
12	IV	NA	X	X	X	X	X X		II	1	*X	X	X	X	X X	
15	IV	NA	NA	X	X	NA	X	X	II	1	X	X	X	NA	X	X
18	IV	NA	NA	X	X	X	X X		II	2	X	X	X	X	X X	
21	III	NA	NA	X	X	NA	NA	NA	II	2	X	X	X	NA	NA	NA
24	III	NA	NA	X	X	X	X X		II	2	X	X	X	X	X X	
27	III	NA	NA	NA	NA	NA	NA	NA	II	3	X	NA	NA	NA	NA	NA
30	IV	NA	NA	X	X	X	X X		II	3	X	X	X	X	X X	
33	III	NA	NA	NA	NA	NA	NA	NA	II	[illegible]	X	NA	NA	NA	NA	NA
36	III	NA	NA	X	X	X	X X		II	NA	X	X	X	X	X X	
42	II	NA	X	X	NA	X	X	NA	II	NA	X	X	NA	X	NA	NA
48	II	NA	X	X	NA	X	X	X	II	NA	X	X	NA	X	NA	NA
54	II	NA	NA	NA	NA	NA	NA	NA	[illegible]	NA	NA NA	NA		NA	NA	NA
60	II	NA	NA	NA	NA	NA	NA	[illegible]	[illegible]	NA	NA NA	NA		NA	NA	X
66	II	NA	NA	NA	NA	NA	NA	NA	II	NA	NA NA	NA		NA	NA	NA
72	II	NA	NA	NA	NA	NA	NA	NA	II	NA	NA NA	NA		NA	NA	NA
78	II	NA	NA	NA	NA	NA	NA	NA	II	NA	NA NA	NA		NA	NA	NA
84	II	NA	NA	NA	NA	NA	NA	NA	II	NA	NA NA	NA		NA	NA	NA
90	II	NA	NA	NA	NA	NA	NA	NA	II	NA	NA NA	NA		NA	NA	NA
96	II	NA	NA	NA	NA	NA	NA	NA	III	NA	NA NA	NA		NA	NA	NA
102	II	NA	NA	NA	NA	NA	NA	NA	III	NA	NA NA	NA		NA	NA	NA
108	II	NA	NA	NA	NA	NA	NA	NA	III	NA	NA NA	NA		NA	NA	NA

RCCP Reinforced Concrete Culvert, Storm Drain, and Sewer Pipe
CSP Concrete Sewer, Storm drain, and Culvert Pipe
PVC Polyvinyl Chloride Pipe
CPVC Corrugated Polyvinyl Chloride Pipe
ESCP Extra Strength Clay Pipe
PE Polyethylene Pipe with a Smooth Interior
CPE Corrugated Polyethylene Pipe with a Smooth Interior
CPP Corrugated Polypropylene pipe with a Smooth Interior

X This material may be used for the given pipe diameter and fill height.
NA This material is Not Acceptable for the given pipe diameter and fill height.
* May also use Standard Strength Clay Pipe

STORM SEWERS (Metric)
KIND OF MATERIAL PERMITTED AND STRENGTH REQUIRED
FOR A GIVEN PIPE DIAMETERS AND FILL HEIGHTS OVER THE TOP OF THE PIPE

Nominal Diameter in.	Type 1								Type 2							
	Fill Height: 1 m and less With 300 mm minimum cover								Fill Height: Greater than 1 m not exceeding 3 m							
	RCCP	CSP	ESCP	PVC	CPVC	PE	CPE	CPP	RCCP	CSP	ESCP	PVC	CPVC	PE	CPE	CPP
250	NA	3	X	X	X	X	X	NA	NA	1	*X	X	X	X	X	NA
300	IV	NA	X	X	X	X	X	X	II	1	*X	X	X	X	X	X
375	IV	NA	NA	X	X	NA	X	X	II	1	X	X	X	NA	X	X
450	IV	NA	NA	X	X	X	X	X	II	2	X	X X		X	X	X
525	III	NA	NA	X	X	NA	NA	NA	II	2	X	X	X	NA	NA	NA
600	III	NA	NA	X	X	X	X	X	II	2	X	X X		X	X	X
675	III	NA	NA	NA	NA	NA	NA	NA	II	3	X	NA	NA	NA	NA	NA
750	IV	NA	NA	X	X	X	X	X	II	3	X	X X		X	X	X
825	III	NA	NA	NA	NA	NA	NA	NA	II	3	X	NA	NA	NA	NA	NA
900	III	NA	NA	X	X	X	X	X	II	NA	X	X X		X	X	X
1050	II	NA	X	X	NA	X	X	NA	II	NA	X	X	NA	X	NA	NA
1200	II	NA	X	X	NA	X	X	X	II	NA	X	X	NA	X	NA	NA
1350	II	NA	NA	NA	NA	NA	NA	NA	II	NA	NA NA	NA		NA	NA	NA
1500	II	NA	NA	NA	NA	NA	NA	X	II	NA	NA NA	NA		NA	NA	X
1650	II	NA	NA	NA	NA	NA	NA	NA	II	NA	NA NA	NA		NA	NA	NA
1800	II	NA	NA	NA	NA	NA	NA	NA	II	NA	NA NA	NA		NA	NA	NA
1950	II	NA	NA	NA	NA	NA	NA	NA	II	NA	NA NA	NA		NA	NA	NA
2100	II	NA	NA	NA	NA	NA	NA	NA	II	NA	NA NA	NA		NA	NA	NA
2250	II	NA	NA	NA	NA	NA	NA	NA	II	NA	NA NA	NA		NA	NA	NA
2400	II	NA	NA	NA	NA	NA	NA	NA	III	NA	NA NA	NA		NA	NA	NA
2550	II	NA	NA	NA	NA	NA	NA	NA	III	NA	NA NA	NA		NA	NA	NA
2700	II	NA	NA	NA	NA	NA	NA	NA	III	NA	NA NA	NA		NA	NA	NA

RCCP Reinforced Concrete Culvert, Storm Drain, and Sewer Pipe
CSP Concrete Sewer, Storm drain, and Culvert Pipe
PVC Polyvinyl Chloride Pipe
CPVC Corrugated Polyvinyl Chloride Pipe
ESCP Extra Strength Clay Pipe
PE Polyethylene Pipe with a Smooth Interior
CPE Corrugated Polyethylene Pipe with a Smooth Interior
CPP Corrugated Polypropylene pipe with a Smooth Interior
X This material may be used for the given pipe diameter and fill height.
NA This material is Not Acceptable for the given pipe diameter and fill height.
* May also use Standard Strength Clay Pipe

STORM SEWERS
KIND OF MATERIAL PERMITTED AND STRENGTH REQUIRED
FOR A GIVEN PIPE DIAMETERS AND FILL HEIGHTS OVER THE TOP OF THE PIPE

Nominal Diameter in.	Type 3								Type 4						
	Fill Height: Greater than 10' not exceeding 15'								Fill Height: Greater than 15' not exceeding 20'						
	RCCP	CSP	ESCP	PVC	CPVC	PE	CPE	CPP	RCCP	CSP	ESCP	PVC	CPVC	PE	CPP
10	NA	2	X	X	X	X	X	NA	NA	3	X	X	X	X	NA
12	III	2	X	X	X	X	NA	X	IV	NA	NA	X	X	X	NA
15	III	3	X	X	X	NA	NA	X	IV	NA	NA	X	X	NA	X
18	III	NA	X	X	X	X	NA	X	IV	NA	NA	X	X	X	NA
21	III	NA	NA	X	X	NA	NA	NA	IV	NA	NA	X	X	NA	NA
24	III	NA	NA	X	X	X	NA	NA	IV	NA	NA	X	X	X	NA
27	III	NA	NA	NA	NA	NA	NA	NA	IV	NA	NA	NA		NA	NA
30	III	NA	NA	X	X	X	NA	X	IV	NA	NA	X	X	X	NA
33	III	NA	NA	NA	NA	NA	NA	NA	IV	NA	NA	NA		NA	NA
36	III	NA	NA	X	X	X	NA	NA	IV	NA	NA	X	X	X	NA
42	III	NA	NA	X	NA	X	NA	NA	IV	NA	NA	X	NA	X	NA
48	III	NA	NA	X	NA	X	NA	NA	IV	NA	NA	X	NA	X	NA
54	III	NA	NA	NA	NA	NA	NA	NA	IV	NA	NA	NA		NA	NA
60	III	NA	NA	NA	NA	NA	NA	NA	IV	NA	NA	NA		NA	NA
66	III	NA	NA	NA	NA	NA	NA	NA	IV	NA	NA	NA		NA	NA
72	III	NA	NA	NA	NA	NA	NA	NA	IV	NA	NA	NA		NA	NA
78	III	NA	NA	NA	NA	NA	NA	NA	IV	NA	NA	NA		NA	NA
84	III	NA	NA	NA	NA	NA	NA	NA	IV	NA	NA	NA		NA	NA
90	III	NA	NA	NA	NA	NA	NA	NA	1680	NA	NA	NA		NA	NA
96	III	NA	NA	NA	NA	NA	NA	NA	1690	NA	NA	NA		NA	NA
102	III	NA	NA	NA	NA	NA	NA	NA	1700	NA	NA	NA		NA	NA
108	1360	NA	NA	NA	NA	NA	NA	NA	1710	NA	NA	NA		NA	NA

RCCP Reinforced Concrete Culvert, Storm Drain, and Sewer Pipe
CSP Concrete Sewer, Storm drain, and Culvert Pipe
PVC Polyvinyl Chloride Pipe
CPVC Corrugated Polyvinyl Chloride Pipe
ESCP Extra Strength Clay Pipe
PE Polyethylene Pipe with a Smooth Interior
CPE Corrugated Polyethylene Pipe with a Smooth Interior
CPP Corrugated Polypropylene pipe with a Smooth Interior
X This material may be used for the given pipe diameter and fill height.
NA This material is Not Acceptable for the given pipe diameter and fill height.
* May also use Standard Strength Clay Pipe
Note RCCP with a number instead of a Roman numeral shall be furnished according to AASHTO M170 Section 6. This number represents the D-load to produce a 0.01 in crack.

STORM SEWERS (metric)
KIND OF MATERIAL PERMITTED AND STRENGTH REQUIRED
FOR A GIVEN PIPE DIAMETERS AND FILL HEIGHTS OVER THE TOP OF THE PIPE

Nominal Diameter in.	Type 3								Type 4						
	Fill Height: Greater than 3 m not exceeding 4.5 m								Fill Height: Greater than 4.5 m not exceeding 6 m						
	RCCP	CSP	ESCP	PVC	CPVC	PE	CPE	CPP	RCCP	CSP	ESCP	PVC	CPVC	PE	CPP
250	NA	2	X	X	X	X	X	NA	NA	3	X	X	X	X	NA
300	III	2	X	X X		X	NA	X	IV	NA	NA	X	X	X	NA
375	III	3	X	X	X	NA	NA	X	IV	NA	NA	X	X	NA	X
450	III	NA	X	X X		X	NA	X	IV	NA	NA	X	X	X	NA
525	III	NA	NA	X	X	NA	NA	NA	IV	NA	NA	X	X	NA	NA
600	III	NA	NA	X	X	X	NA	NA	IV	NA	NA	X	X	X	NA
675	III	NA	NA NA	NA		NA	NA	NA	IV	NA	NA	NA	NA	NA	NA
750	III	NA	NA	X	X	X	NA X		IV	NA	NA	X	X	X	NA
825	III	NA	NA NA	NA		NA	NA	NA	IV	NA	NA	NA	NA	NA	NA
900	III	NA	NA	X	X	X	NA	NA	IV	NA	NA	X	X	X	NA
1050	III	NA	NA	X	NA	X	NA	NA	IV	NA	NA	X	NA	X	NA
1200	III	NA	NA	X	NA	X	NA	NA	IV	NA	NA	X	NA	X	NA
1350	III	NA	NA NA	NA		NA	NA	NA	IV	NA	NA	NA	NA	NA	NA
1500	III	NA	NA NA	NA		NA	NA	NA	IV	NA	NA	NA	NA	NA	NA
1650	III	NA	NA NA	NA		NA	NA	NA	IV	NA	NA	NA	NA	NA	NA
1800	III	NA	NA NA	NA		NA	NA	NA	IV	NA	NA	NA	NA	NA	NA
1950	III	NA	NA NA	NA		NA	NA	NA	IV	NA	NA	NA	NA	NA	NA
2100	III	NA	NA NA	NA		NA	NA	NA	IV	NA	NA	NA	NA	NA	NA
2250	III	NA	NA NA	NA		NA	NA	NA	80	NA	NA	NA	NA	NA	NA
2400	III	NA	NA NA	NA		NA	NA	NA	80	NA	NA	NA	NA	NA	NA
2550	III	NA	NA NA	NA		NA	NA	NA	80	NA	NA	NA	NA	NA	NA
2700	70	NA	NA NA	NA		NA	NA	NA	80	NA	NA	NA	NA	NA	NA

RCCP Reinforced Concrete Culvert, Storm Drain, and Sewer Pipe
CSP Concrete Sewer, Storm drain, and Culvert Pipe
PVC Polyvinyl Chloride Pipe
CPVC Corrugated Polyvinyl Chloride Pipe
ESCP Extra Strength Clay Pipe
PE Polyethylene Pipe with a Smooth Interior
CPE Corrugated Polyethylene Pipe with a Smooth Interior
CPP Corrugated Polypropylene pipe with a Smooth Interior
X This material may be used for the given pipe diameter and fill height.
NA This material is Not Acceptable for the given pipe diameter and fill height.
* May also use Standard Strength Clay Pipe
Note RCCP with a number instead of a Roman numeral shall be furnished according to AASHTO M170 Section 6. This number represents the metric D-load to produce a 25.4 micro-meter crack.

STORM SEWERS
KIND OF MATERIAL PERMITTED AND STRENGTH REQUIRED
FOR A GIVEN PIPE DIAMETERS AND FILL HEIGHTS OVER THE TOP OF THE PIPE

Nominal Diameter in.	Type 5			Type 6			Type 7	
	Fill Height: Greater than 20' not exceeding 25'			Fill Height: Greater than 25' not exceeding 30'			Fill Height: Greater than 30' not exceeding 35'	
	RCCP	PVC	CPVC	RCCP	PVC	CPVC	RCCP	CPVC
10	NA	X	X	NA	X	X	NA	X
12	IV	X	X	V	X	X	V	X
15	IV	X	X	V	X	X	V	X
18	IV	X	X	V	X	X	V	X
21	IV	X	X	V	X	X	V	X
24	IV	X	X	V	X	X	V	X
27	IV	NA	NA	V	NA	NA	V	NA
30	IV	X	X	V	X	X	V	X
33	IV	NA	NA	V	NA	NA	V	NA
36	IV	X	X	V	X	X	V	X
42	IV	X	NA	V	X	NA	V	NA
48	IV	X	NA	V	X	NA	V	NA
54	IV	NA	NA	V	NA	NA	V	NA
60	IV	NA	NA	V	NA	NA	V	NA
66	IV	NA	NA	V	NA	NA	V	NA
72	V	NA	NA	V	NA	NA	V	NA
78	2020	NA	NA	2370	NA	NA	2730	NA
84	2020	NA	NA	2380	NA	NA	2740	NA
90	2030	NA	NA	2390	NA	NA	2750	NA
96	2040	NA	NA	2400	NA	NA	2750	NA
102	2050	NA	NA	2410	NA	NA	2760	NA
108	2060	NA	NA	2410	NA	NA	2770	NA

RCCP Reinforced Concrete Culvert, Storm Drain, and Sewer Pipe
PVC Polyvinyl Chloride Pipe
CPVC Corrugated Polyvinyl Chloride Pipe
ESCP Extra Strength Clay Pipe
X This material may be used for the given pipe diameter and fill height.
NA This material is Not Acceptable for the given pipe diameter and fill height.
Note RCCP with a number instead of a Roman numeral shall be furnished according to AASHTO M170 Section 6. This number represents the D-load to produce a 0.01 in crack.

STORM SEWERS (metric)
KIND OF MATERIAL PERMITTED AND STRENGTH REQUIRED
FOR A GIVEN PIPE DIAMETERS AND FILL HEIGHTS OVER THE TOP OF THE PIPE

Nominal Diameter in.	Type 5			Type 6			Type 7	
	Fill Height: Greater than 20' not exceeding 25'			Fill Height: Greater than 25' not exceeding 30'			Fill Height: Greater than 30' not exceeding 35'	
	RCCP	PVC	CPVC	RCCP	PVC	CPVC	RCCP	CPVC
250	NA	X	X	NA	X	X	NA	X
300	IV	X	X	V	X	X	V	X
375	IV	X	X	V	X	X	V	X
450	IV	X	X	V	X	X	V	X
525	IV	X	X	V	X	X	V	X
600	IV	X	X	V	X	X	V	X
675	IV	NA	NA	V	NA	NA	V	NA
750	IV	X	X	V	X	X	V	X
825	IV	NA	NA	V	NA	NA	V	NA
900	IV	X	X	V	X	X	V	X
1050	IV	X	NA	V	X	NA	V	NA
1200	IV	X	NA	V	X	NA	V	NA
1350	IV	NA	NA	V	NA	NA	V	NA
1500	IV	NA	NA	V	NA	NA	V	NA
1650	IV	NA	NA	V	NA	NA	V	NA
1800	V	NA	NA	V	NA	NA	V	NA
1950	100	NA	NA	110	NA	NA	130	NA
2100	100	NA	NA	110	NA	NA	130	NA
2250	100	NA	NA	110	NA	NA	130	NA
2400	100	NA	NA	120	NA	NA	130	NA
2550	100	NA	NA	120	NA	NA	130	NA
2700	100	NA	NA	120	NA	NA	130	NA

RCCP Reinforced Concrete Culvert, Storm Drain, and Sewer Pipe
PVC Polyvinyl Chloride Pipe
CPVC Corrugated Polyvinyl Chloride Pipe
ESCP Extra Strength Clay Pipe
X This material may be used for the given pipe diameter and fill height.
NA This material is Not Acceptable for the given pipe diameter and fill height.
Note RCCP with a number instead of a Roman numeral shall be furnished according to AASHTO M170 Section 6. This number represents the metric D-load to produce a 25.4 micro-meter crack.

Revise the sixth paragraph of Article 550.06 of the Standard Specifications to read:

"PVC, PE and CPP pipes shall be joined according to the manufacturer's specifications."

Revise the first and second paragraphs of Article 550.08 of the Standard Specifications to read:

"**550.08 Deflection Testing for Storm Sewers.** All PVC, PE, and CPP storm sewers shall be tested for deflection not less than 30 days after the pipe is installed and the backfill compacted. The testing shall be performed in the presence of the Engineer.

For PVC, PE, and CPP storm sewers with diameters 24 in. (600 mm) or smaller, a mandrel drag shall be used for deflection testing. For PVC, PE, and CPP storm sewers with diameters over 24 in. (600 mm), deflection measurements other than by a mandrel shall be used."

Revise the fifth paragraph of Article 550.08 to read as follows:

"The outside diameter of the mandrel shall be 95 percent of the base inside diameter. For all PVC pipe the base inside diameter shall be defined using ASTM D 3034 methodology. For all PE and CPP pipe, the base inside diameter shall be defined as the average inside diameter based on the minimum and maximum tolerances specified in the corresponding ASTM or AASHTO material specifications."

Revise the first paragraph of Article 1040.03 of the Standard Specifications to read:

"**1040.03 Polyvinyl Chloride (PVC) Pipe.** Acceptance testing of PVC pipe and fittings shall be accomplished during the same construction season in which they are installed. The section properties shall be according to the manufacturer pre-submitted geometric properties on file with the Department. The manufacturer shall submit written certification that the material meets those properties. The pipe shall meet the following additional requirements."

Delete Articles 1040.03(e) and (f) of the Standard Specifications.

Revise Articles 1040.04(c) and (d) of the Standard Specifications to read:

"(c) PE Profile Wall Pipe for Insertion Lining. The pipe shall be according to ASTM F 894. When used for insertion lining of pipe culverts, the pipe liner shall have a minimum pipe stiffness of 46 psi (317 kPa) at five percent deflection for nominal inside diameters of 42 in. (1050 mm) or less. For nominal inside diameters of greater than 42 in. (1050 mm), the pipe liner shall have a minimum pipe stiffness of 32.5 psi (225 kPa) at five percent deflection. All sizes shall have wall construction that presents essentially smooth internal and external surfaces.

(d) PE Pipe with a Smooth Interior. The pipe shall be according to ASTM F 714 (DR 32.5) with a minimum cell classification of PE 335434 as defined in ASTM D 3350. The section properties shall be according to the manufacturer pre-submitted geometric properties on file with the Department. The manufacturer shall submit written

certification that the material meets those properties and the resin used to manufacture the pipe meets or exceeds the minimum cell classification requirements."

Add the following to Section 1040 of the Standard Specifications:

"**1040.08 Polypropylene (PP) Pipe.** Storage and handling shall be according to the manufacturer's recommendations, except in no case shall the pipe be exposed to direct sunlight for more than six months. Acceptance testing of the pipe shall be accomplished during the same construction season in which it is installed. The section properties shall be according to the manufacturer pre-submitted geometric properties on file with the Department. The manufacturer shall submit written certification that the material meets those properties. The pipe shall meet the following additional requirements.

(a) Corrugated PP Pipe with a Smooth Interior. The pipe shall be according to AAHSTO M 330 (nominal size – 12 to 60 in. (300 to 1500 mm)). The pipe shall be Type S or D.

(b) Perforated Corrugated PP Pipe with A Smooth Interior. The pipe shall be according to AASHTO M 330 (nominal size – 12 to 60 in. (300 to 1500 mm)). The pipe shall be Type SP. In addition, the top centerline of the pipe shall be marked so that it is readily visible from the top of the trench before backfilling, and the upper ends of the slot perforations shall be a minimum of ten degrees below the horizontal."

80325

WARM MIX ASPHALT (BDE)

Effective: January 1, 2012
Revised: November 1, 2014

Description. This work shall consist of designing, producing and constructing Warm Mix Asphalt (WMA) in lieu of Hot Mix Asphalt (HMA) at the Contractor's option. Work shall be according to Sections 406, 407, 408, 1030, and 1102 of the Standard Specifications, except as modified herein. In addition, any references to HMA in the Standard Specifications, or the special provisions shall be construed to include WMA.

WMA is an asphalt mixture which can be produced at temperatures lower than allowed for HMA utilizing approved WMA technologies. WMA technologies are defined as the use of additives or processes which allow a reduction in the temperatures at which HMA mixes are produced and placed. WMA is produced by the use of additives, a water foaming process, or combination of both. Additives include minerals, chemicals or organics incorporated into the asphalt binder stream in a dedicated delivery system. The process of foaming injects water into the asphalt binder stream, just prior to incorporation of the asphalt binder with the aggregate.

Approved WMA technologies may also be used in HMA provided all the requirements specified herein, with the exception of temperature, are met. However, asphalt mixtures produced at temperatures in excess of 275 °F (135 °C) will not be considered WMA when determining the grade reduction of the virgin asphalt binder grade.

Equipment.

Revise the first paragraph of Article 1102.01 of the Standard Specifications to read:

"**1102.01 Hot-Mix Asphalt Plant.** The hot-mix asphalt (HMA) plant shall be the batch-type, continuous-type, or dryer drum plant. The plants shall be evaluated for prequalification rating and approval to produce HMA according to the current Bureau of Materials and Physical Research Policy Memorandum, "Approval of Hot-Mix Asphalt Plants and Equipment". Once approved, the Contractor shall notify the Bureau of Materials and Physical Research to obtain approval of all plant modifications. The plants shall not be used to produce mixtures concurrently for more than one project or for private work unless permission is granted in writing by the Engineer. The plant units shall be so designed, coordinated and operated that they will function properly and produce HMA having uniform temperatures and compositions within the tolerances specified. The plant units shall meet the following requirements."

Add the following to Article 1102.01(a) of the Standard Specifications.

"(13) Equipment for Warm Mix Technologies.

a. Foaming. Metering equipment for foamed asphalt shall have an accuracy of ± 2 percent of the actual water metered. The foaming control system shall be electronically interfaced with the asphalt binder meter.

b. Additives. Additives shall be introduced into the plant according to the supplier's recommendations and shall be approved by the Engineer. The system for introducing the WMA additive shall be interlocked with the aggregate feed or weigh system to maintain correct proportions for all rates of production and batch sizes."

Mix Design Verification.

Add the following to Article 1030.04 of the Standard Specifications.

"(e) Warm Mix Technologies.

(1) Foaming. WMA mix design verification will not be required when foaming technology is used alone (without WMA additives). However, the foaming technology shall only be used on HMA designs previously approved by the Department.

(2) Additives. WMA mix designs utilizing additives shall be submitted to the Engineer for mix design verification."

Construction Requirements.

Revise the second paragraph of Article 406.06(b)(1) of the Standard Specifications to read:

"The HMA shall be delivered at a temperature of 250 to 350 °F (120 to 175 °C). WMA shall be delivered at a minimum temperature of 215 °F (102 °C)."

Basis of Payment.

This work will be paid at the contract unit price bid for the HMA pay items involved. Anti-strip will not be paid for separately, but shall be considered as included in the cost of the work.

80288

WEEKLY DBE TRUCKING REPORTS (BDE)

Effective: June 2, 2012
Revised: April 2, 2015

The Contractor shall submit a weekly report of Disadvantaged Business Enterprise (DBE) trucks hired by the Contractor or subcontractors (i.e. not owned by the Contractor or subcontractors) that are used for DBE goal credit.

The report shall be submitted to the Engineer on Department form "SBE 723" within ten business days following the reporting period. The reporting period shall be Monday through Sunday for each week reportable trucking activities occur.

Any costs associated with providing weekly DBE trucking reports shall be considered as included in the contract unit prices bid for the various items of work involved and no additional compensation will be allowed.

80302

RETURN WITH BID

Illinois Department of Transportation

SCHEDULE OF PRICES

County Kane
Local Public Agency Division of Transportation
Section 13-00244-01-DR
Route Co. Highway No. 83

Schedule for Multiple Bids

Combination Letter	Sections Included in Combinations	Total

Schedule for Single Bid

(For complete information covering these items, see plans and specifications)

Bidder's Proposal for making Entire Improvements

Item No.	Items	Unit	Quantity	Unit Price	Total
1	Mobilization	L. Sum	1		
2	Storm Sewer Removal 30" RCP	Foot	26		
3	Storm Sewer, 30" DIP	Foot	10		
4	Manhole, Modified Type A w/ 2' Sump, 6'-Dia., Frame and Grate	Each	1		
5	Manhole, Baffle Plate, 7'-Dia., 4 'x 2.25' Hatch	Each	1		
6	Manhole, Modified Type A w/ 3' Sump, 9'-Dia., 4' x 3.5' Hatch	Each	1		
7	Ductile Iron Pipe, Class 53, 8"	Foot	30		
8	Ductile Iron Pipe, Class 53, 12"	Foot	8		
9	Slip-on Check Valve for 30" DIP Pipe	Each	1		
10	Erosion Control and Restoration	L. Sum	1		
11	Pump, Controls and Piping	L. Sum	1		
12	Inline Check Valve for 8" Ductile Iron Pip	Each	1		
13	8" D.I. Vertical Check Valve	Each	1		
14	8" D.I. Gate Valve	Each	1		
15	Electrical	L. Sum	1		
16	Access Drive	SY	53		
17	Depressed Curb	L. Sum	1		
18	Items As Ordered By The Engineer	Each	15,000		

CONTRACTOR CERTIFICATIONS

County: Kane
Local Public Agency: Division of Transportation
Section Number: 13-00244-01-DR
Route: Co. Highway No. 83

The certifications herinafter made by the bidder are each a material representation of fact upon which reliance is placed should the Department enter into the contract with the bidder.

1. **Debt Deliquency.** The bidder or contractor or subcontractor, respectively, certifies that it is not delinquent in the payment of any tax administered by the Department of Revenue unless the individual or other entity is contesting, in accordance with the procedures established by the appropriate revenue Act, its liability for the tax or the amount of tax. Make a false statement voids the contract and allows the Department to recover all amounts paid to the idividual or entity under the contract in a civil action.

2. **Bid-Rigging or Bid Rotating.** The bidder or contractor or subcontractor, respectively, certifies that it is not barred from contracting with the Department by reason of a violation of either 720 ILCS 5/33E-3 or 720 ILCS 5/33E-4.

   A violation of Section 33E-3 would be represented by a conviction of the crime of bid-rigging which, in addition to Class 3 felony sentencing, provides that any person convicted of this offense or similar offense of any state or the United States which contains the same elements as this offense shall be barred for 5 years from the date of conviction from contracting with any unit of State or local government. No corporation shall be barred from contracting with any unit of State or local government as a result of a conviction under this Section of any employee or agent of such corporation if the employee so convicted is no longer employed by the corporation and: (1) it has been finally adjudicated ot guilty or (2) if it demonstrates to the governmental entity with which it seeks to contract and that entity finds that the commission of the offense was neither authorized, requested, commanded, nor performed by a director, officer or a high managerial agent in behalf of the corporation.

   A violation of Section 33E-4 would be represented by a conviction of the crime of bid-rotating which, in addition to Class 2 felony sentencing, provides that any person convicted of this offense or any similar offense of any state or the United States which contains the same elements as this offense shall be permanently barred from contracting with any unit of State or local government. No corporation shall be barred from contracing with any unit of State or local government as a result of a conviction under this Section of any employee or agent of such corporaton if the employee so convicted is no longer employed by the corporation and: (1) it has been finally adjudicated not guilty or (2) if it demonstrates to the governmental entity with which it seeks to contract and that entity finds that the commission of the offense was neither authorized, requested, commanded, nor performed by a director, officer or a high managerial agent in behalf of the corporation.

3. **Bribery.** The bidder or contractor or subcontractor, respectively, certifies that it has not been convicted of bribery or attempting to bribe an officer or employee of the State of Illinois or any unit of local government, nor has the firm made an admission of guilt of such conduct which is a matter of record, nor has an official, agent, or employee of the firm committed bribery or attempted bribery on behalf of the firm and pursuant to the direction or authorization of a responsible offical of the firm.

4. **Interim Suspension or Suspension.** The bidder or contractor or subcontractor, respectively, certifies that it is not currenty under a suspension as defined in Subpart I of Title 55 Subtitle A Chapter III Part 6 of the Illinois Administrative Code. Furthermore, if suspended prior to completion of this work, the contract or contracts executed for the completion of this work may be cancelled.

SIGNATURES

County: Kane
Local Pulic Agency: Division of Transportation
Section Number: 13-00244-01-DR
Route: Co. Highway No. 83

(If an individual)

Signature of Bidder _____

Business Address _____

(If a partnership)

Firm Name _____

Signed By _____

Business Address _____

Insert Names and Addressed of All Partners { _____

(If a corporation)

Corporate Name _____

Signed By _____
President

Business Address _____

Insert Names of Officers {
President _____
Secretary _____
Treasurer _____

Attest: _____
Secretary