



APPLICATION AND AGREEMENT FOR USE OF HIGHWAY RIGHT-OF-WAY FOR UTILITIES ACCOMMODATION

FOR DEPARTMENT USE ONLY

Permit Number 294-2017-016 Highway Number 61 County Des Moines Expiration/Completion Date DEC 31 2017

DOT Project Number NHSX-061-2(62)--3H-29 APPLICANT (INDIVIDUAL OR COMPANY) First Name Middle Initial Last Name Phone Number Ext. Company Name Rathbun Regional Water Association Inc. Phone Number Ext. 641-647-2416 Street Address 16166 Hwy J29 City/Town Centerville State ZIP Code IA 52544 e-Mail Address thvard@rrwa.net Secondary e-Mail Address bbenjamin@rrwa.net

INSTALLATION TO BE ACCOMMODATED Approval is hereby requested to enter within the state highway right-of-way for the accommodation of a utility installation as detailed on the attachments and further described as follows:

The installation shall consist of: Directional bore a 4" SDR-21 Class 200 PVC water line encased in an 8" SDR-212 Class 200 PVC encasement @ Sta. 1437+35' on the west side and Sta. 1437+66' on the east side of new 61. Line will be encased 105' East & 130" west of 61 C/L. See cut sheets for details.

and shall be located as shown on the detailed plan attached hereto. (See current Iowa Department of Transportation Utility Accommodation Policy for submittal of detailed plan requirements. See Section 115.8 (3). http://www.iowadot.gov/traffic/pdfs/UtilityPolicy.pdf

WORK SITE LOCATION

The proposed work as described above is located in Section 35, Twp. 71N, Range 03W on Highway No. 61 generally located 0 (miles) (direction) from Hwy 61 & 160th St. intersection (city, county line, or other landmark). Work proposed is more specifically located as being from 148.58 (Milepost #) and 1437+66' (Highway Station) to (Milepost #) and 1437+66' (Highway Station) on the both/x-verse side of highway.

Disclosure Statement: The information furnished on this form will be used by the Department of Transportation to determine approval or denial of the application. Failure to provide all pertinent information will result in denial of the application. Information furnished is public information and copies may be provided to the public upon request.

The utility company, corporation, applicant, permit holder or licensee, (hereinafter referred to as the Permit applicant) agrees with the Iowa Department of Transportation (hereafter referred to as the Department) that the following stipulations and those special requirements as listed on this document shall govern under this permit after it is approved by the Department.

A. General

- 1. The installation shall meet the requirements of local municipal, county, state, and federal franchise rules and regulations, regulations and directives of the Iowa State Commerce Commission; the Iowa Department of Natural Resources, all rules and regulations of the Department and any other laws or regulations applicable.
2. The Permit Holder shall be fully responsible for any future adjustments of the facilities within the established highway right-of-way caused by highway construction or maintenance operations.
3. As per Section 115.8(8) of the Utility Accommodation Policy, As-Built plans are due within 90 days after completion of construction, the utility owner shall submit to the district representative an as-built plan.
4. The work described in this permit shall be completed as proposed in compliance with the stipulations and special requirements within one year from the date Department approval is received for said request. Failure on the part of the Permit Holder to abide by the stipulations or in constructing the work described as stipulated and within the time frame stated shall render this agreement and request null and void. The Permit Holder also agrees to save the State of Iowa and the Department harmless of any damages or losses that may be sustained by any person, or persons, on account of the conditions and requirements of this agreement.
5. Non-compliance with any of the terms of the Department's policy, permit, or agreement, may be considered cause for shut-down of construction operations, revocation of the permit, or withholding of relocation reimbursement and/or withholding of future application approvals until compliance is confirmed. The cost of any work deemed necessary to be performed by the State in removal of non-complying construction will be assessed against the Permit Holder.

FOR DEPARTMENT USE ONLY

Special Requirements - in addition to the stipulations above, the following special requirements shall apply to this permit:

Applicant Signature and Agreement

The undersigned have read the stipulations of this permit agreement as stated, as well as attachments which may be included, and by signing this application agree to abide by all stipulations and to complete the work as proposed in compliance with the stipulations and attachments within one year from the date Department approval is granted for said request. Failure on the part of the applicant to abide by the stipulations or to construct the work desired as stipulated and within the time frame stated shall render this agreement and request null and void. The undersigned also agrees to save harmless the State of Iowa and the Iowa Department of Transportation from any damage or losses that may be sustained by any person or persons on account of the conditions and requirements of this agreement.

Name of Agent (Print or Type) Tyler Havard	Agent/Owner (Signature) <i>Tyler Havard</i>	Title GIS Tech
Name of Owner (Print or Type) Rathbun Regional Water Association Inc.		Date 9-21-2017
e-Mail Address thavard@rrwa.net		

CITY ACTION (IF PROPOSED WORK IS WITHIN AN INCORPORATED CITY, CITY ACTION IS REQUIRED)

"The undersigned city joins in the grants embodied in the above permit executed by the Iowa Department of Transportation on condition that all of the covenants and undertakings therein running to the Iowa Department of Transportation shall inure to the benefit of the undersigned city and recommends action on said permit application as noted below by the delegated city official".

Recommend Approval Do Not Recommend Approval None Required

Handwritten Signature	Title	Date
Type or Print Name	Authorized Official for the City of	
e-Mail Address		

COUNTY ACTION (IF PROPOSED WORK CROSSES COUNTY RIGHT-OF-WAY, COUNTY ACTION IS REQUIRED)

"The undersigned county joins in the grants embodied in the above permit executed by the Iowa Department of Transportation on condition that all of the covenants and undertakings therein running to the Iowa Department of Transportation shall inure to the benefit of the undersigned county and recommends action on said permit application as noted below by the delegated county official".

Recommend Approval Do Not Recommend Approval None Required

Handwritten Signature	Title	Date
Type or Print Name	Authorized Official for the County of	
e-Mail Address		

FEDERAL HIGHWAY ADMINISTRATION ACTION (WHEN REQUIRED)

Recommend Approval Do Not Recommend Approval None Required

Authorized FHWA Representative Signature	Date
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DEPARTMENT OF TRANSPORTATION FINAL ACTION

Application Approved Application Denied

Authorized Highway District Representative Nora Lind	Signature <i>Nora Lind</i>	Permit Number 29U-2017-016
e-Mail Address nora.lind@iowadot.us		Date 9/25/17

Notice of intention to commence activities on the highway rights-of-way shall be submitted by the applicant a minimum of 48 hours prior to actually commencing the activities as herein granted by this approved application. Notice is to be given to the following Iowa Department of Transportation representative. Except in emergencies a 10 day advance notice is required for lane restrictions of any kind:

Local DOT Contact Person (Type or Print Name) Mt Pleasant RCE		Phone Number
Street Address 205 E. Taft St	City/Town Mt. Pleasant	State IA
e-Mail Address lauren.giarmo@iowadot.us / marv.may@iowadot.us		ZIP Code 52641

B. Construction and Maintenance

1. The location, construction and maintenance of the utility installation covered by this application shall be in accordance with the current Department's Utility Accommodation Policy. <http://www.iowadot.gov/traffic/pdfs/UtilityPolicy.pdf>
2. Before beginning any work in the highway right-of-way, it is the responsibility of the Permit Holder to obtain an easement from the drainage district if necessary. The Department assumes no responsibility for advising the Permit Holder of each location of a drainage district crossing. It is the Permit Holder's responsibility to locate these crossings and obtain any necessary easements or permission from the drainage district. See Code of Iowa, Chapter 468 for additional information.
3. A copy of the approved permit shall be available on the job site at all times for examination by Department personnel.
4. Operations in the construction and maintenance of this utility installation shall be carried on in such a manner as to cause minimum interference to or distraction of traffic on said highway.
5. Traffic protection shall minimally be in accordance with Part VI of the current Manual on Uniform Traffic Control Devices for Streets and Highways. The applicant shall be responsible for correctly using traffic control devices including signs, warning lights, and channelizing devices as needed while work is in progress or the clear zone is impacted. Flagging operations are the responsibility of the applicant. The Department's TC XXX Series Standards are the preferred traffic control specification plans.
http://www.iowadot.gov/design/stdplne_tc.htm
6. The applicant shall seed and mulch all disturbed areas within the highway right-of-way and shall be responsible for the vegetative cover until it becomes well established. Any surfaced areas such as driveways or shoulders and sodded waterways and plantings which are disturbed shall be restored to their original condition. Any damage to any other underground facilities during installation shall be repaired at the permit holder's expense.
7. All personnel in the highway right-of-way shall wear ANSI 107 Class 2 apparel at all times when exposed to traffic or construction equipment.
8. As per Policy Section 115.4(9) parking or storage in the clear zone is prohibited. When not in actual use, vehicles, equipment and materials shall not be parked or stored within the clear zone or median.
9. Unless specifically noted in Special Requirements section, all work performed within the right-of-way shall be restricted to 30 minutes after sunrise to 30 minutes before sunset.
10. Pedestals shall be placed within 12 inches of the right-of-way line.
11. All above and below ground appurtenances (pedestals, hydrants, drains, accesses, etc.) shall be marked with high visibility posts and signs. The minimum height requirement for the signs shall be 5 foot. Urban Roadway Sections may be exempted with department approval.

C. Liability

1. To the extent allowable by law, the Permit Holder agrees to indemnify, defend, and hold the Department harmless from any action or liability arising out of the design, construction, maintenance, placement of traffic control devices, inspection, or use of the Permit Holder's facilities. This agreement to indemnify, defend, and hold harmless applies to all aspects of the Department's application review and approval process, plan and construction reviews, and funding participation.
2. The Permit Holder shall indemnify and save harmless the State of Iowa, its agencies and employees, from any and all causes of action, suits at law or in equity, for losses, damages, claims or demands, and from any and all liability and expense of whatsoever nature, arising out of or in connection with the Permit Holder's use or occupancy of the public highway.
3. The State of Iowa and the Department assume no responsibility for damages to the Permit Holder's property occasioned by any construction or maintenance operations on said highway if the facilities are not located in accordance with this permit.
4. The State of Iowa, its agencies or employees, will be liable for expense incurred by the Permit Holder in its use and occupancy of the highway right-of-way only when negligence of the State, its agencies or employees, is the sole proximate cause of such expense. Whether in contract, tort or otherwise, the liability of the State, its agencies and employees, is limited to the reasonable, direct expense to repair damaged utilities, and in no event will such liability extend to loss of profits or business, indirect, special, consequential or incidental damages.

D. Notification

1. The Permit Holder is responsible for contacting **Iowa One-Call (1-800-292-8989)** and request the location of all underground utilities forty-eight (48) hours before excavation. Before beginning work in the highway right-of-way, the Permit Holder shall also contact any other known utility located in the area of the proposed work.
2. The Permit Holder agrees to give the Department forty-eight (48) hour notice of its intention to start construction or to perform routine maintenance on the highway right-of-way. Said notice shall be made to the local DOT contact person whose name is shown on Page 3.
3. **511 Notification**-In accordance with Iowa Code section 321.348, cities and utilities **may not obstruct or close** primary highways or primary highway extensions (State highways within city limits) **without prior consent of the Iowa DOT**, except in emergency situations. Before setting up a lane closure or a vertical/horizontal restriction of any kind on a primary highway, call your local Iowa DOT Maintenance garage and call the Traffic Management Center per attached documents. Except in emergency situations, a 10 day advance notice is required.
<http://www.iowadot.gov/traffic/utility/pdfs/511UtilityNotification.pdf>

E. Buy America

Buy America applies to relocations of utility facilities that must move due to highway projects under certain specific conditions that include reimbursable locations and relocations due to interstate projects. Please contact the Department's District Engineering Operation Technician (EOT) for more information on Buy America requirements or visit the following link: <http://www.iowadot.gov/traffic/utility/utility.html>

Permit Number: _____

Site Plan & Attachments Checklist for IDOT Utilities Accommodation Permit

- Plans showing IADOT Highway Centerline, Highway Number, DOT Stationing and Milepost are required.
 - Visible orientation (North Arrow) and identifying landmarks are required.
 - Clearly identify Right Of Way (ROW) line with horizontal distance from highway centerline shown, including all breakpoints and changes in the ROW distances.
 - Provide Iowa One Call design request information. (Minimally, the list of utilities)
 - List all of the existing utilities in the installation area. Describe how your installation will address existing utilities that are in conflict, and show all observable existing features, such as power poles, pedestals, markers, handholes, trees, etc.
 - Show all Construction features/Bore Pits with the running line and horizontal distance from roadway edge or centerline. (showing Clear Zone compliance) <http://www.iowadot.gov/traffic/pdfs/UtilityPolicy.pdf>
 - Show the start/stop stationing and depths or elevations for all bores, longitudinal and transverse.
 - Show the start/stop stationing and depths or elevations for all plowing locations.
 - Show casing start/stop locations, lengths, diameter, and material if casings are used.
 - Show all facilities that are to be installed on the site plan.
This includes pedestals, wire, conduit, poles, guy anchors, junction boxes, handholes and manholes.
ALL MUST BE REFERENCED BY DOT Stationing and distance from centerline.
 - Show where installation starts and stops, leaves ROW, stops at existing pedestal, pole, etc.
Use IADOT stationing and distance from centerline of the start and stops.
 - Identify any physical focal points, posts, pedestals, shutoffs, overflow valves, hydrants, etc.
 - Describe any other work to accomplish installation before, during and/or after installation, including: removal of brush/trees, removal of underbuild, construction of access, fence removal, fence replacement, etc.
 - Identify unusual issues to be pointed out on the site plan.
CLARITY IS THE KEY, we can't assume you will do it if it is not shown in the plan.
- Attachments
- Proper Traffic Control Standards (IADOT TCxxx Series Standard plans preferred)
Available at - http://www.iowadot.gov/design/stdplne_tc.htm
 - Required Height / Depth Typical (Supplied by the Department)
 - Title Repair Guide (Rural Locations) (Supplied by the Department)
 - Special Seeding Requirements and Erosion Control (Supplied by the Department)
 - 511 Lane Restriction Requirements (If lane restriction is anticipated) (Supplied by the Department)
 - If paper applications are submitted, at least 2 sets of site plans (11 x 17 preferred) and 1 original of the permit application with all original signatures (Scanned and emailed copies are accepted)

ALL ITEMS MUST BE LEGIBLE FOR REVIEW AND FOR RESCANNING PURPOSES

FRANKLIN TWP.
T-71N R-3W
SEC. 35

For Side Road Details
Refer to Sheet No. E.12

For Intersection Details
Refer to Sheet No. L.20

FRANKLIN TWP.
T-71N R-3W
SEC. 26

Directional bore a 4" SDR-21 Class 200 PVC water line encased in an 8" SDR-212 Class 200 PVC encasement @ Sta. 1437+35' on the west side and Sta. 1437+66' on the east side of new 61 Line will be encased 105' East & 130" west of 61 C/L. See cut sheets for details.

Curve Data
 $\Delta = 21^\circ 43' 32.54''$ (RT)
T = 621.75
L = 1228.56
40.00
12

Sta. 1450+00.00
Stop NB Grading
Stop SB Grading

(Future)
Sta. 1458+40, 44' Lt.
Install 18" X 72' 20000
F.L. = Lt. 698.60
Rt. 700.80

connect to existing 4" water main @ Sta. 11439+35' 28' S of 160th Street C/L

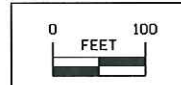
(U.A.C.)
Sta 1445+07, Rt.
48' x 36' x 70' RCB
With Stub Flume Rt.
DA = 42.01 Ac. F-R

Sta. 1443+46
Install 42" X 246' 20000
Skew = 33° Rt. Ahd.
F.L. = Lt. 705.40
Rt. 701.70
Ditch Outlet

Sta. 1450+00, 44' Rt.
Install 24" X 78' 20000
F.L. = Lt. 706.00
Rt. 703.10
Other 704.00

(U.A.C.)
Sta 1455+18
42' x 82' RCP
With Stub Flume Rt
DA = 20 Ac. R

(Future)
Sta. 1455+28, 44' Lt.
Install 42" X 224' 20000/CMP
F.L. = Lt. 697.10
Rt. 689.90
Other 695.70
Other 690.10



For Profile Details
Refer to Sheet No. D.23

US 61

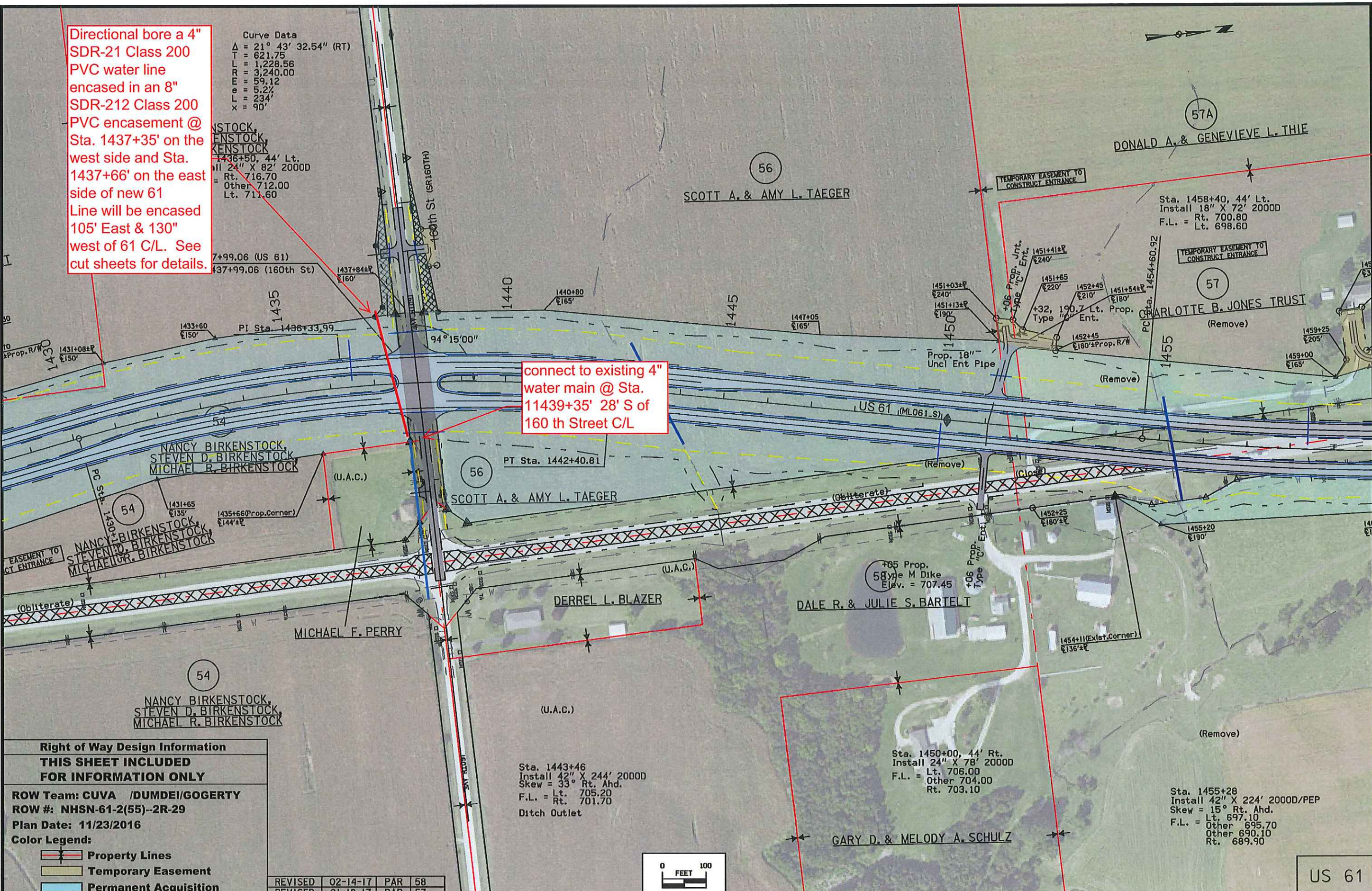
Directional bore a 4" SDR-21 Class 200 PVC water line encased in an 8" SDR-212 Class 200 PVC encasement @ Sta. 1437+35' on the west side and Sta. 1437+66' on the east side of new 61 Line will be encased 105' East & 130' west of 61 C/L. See cut sheets for details.

Curve Data
 $\Delta = 21^\circ 43' 32.54''$ (RT)
 $T = 621.75$
 $L = 1,228.56$
 $R = 3,240.00$
 $E = 59.12$
 $e = 5.2\%$
 $L = 234'$
 $x = 90'$

ENSTOCK, ENSTOCK, ENSTOCK
 1436+50, 44' Lt.
 24" X 82' 2000D
 Rt. 716.70
 Other 712.00
 Lt. 711.60

7+99.06 (US 61)
 437+99.06 (160th St)

connect to existing 4" water main @ Sta. 11439+35' 28' S of 160th Street C/L



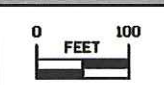
Right of Way Design Information
THIS SHEET INCLUDED FOR INFORMATION ONLY

ROW Team: CUVA /DUMDEI/GOGERTY
 ROW #: NHSN-61-2(55)--2R-29
 Plan Date: 11/23/2016

Color Legend:

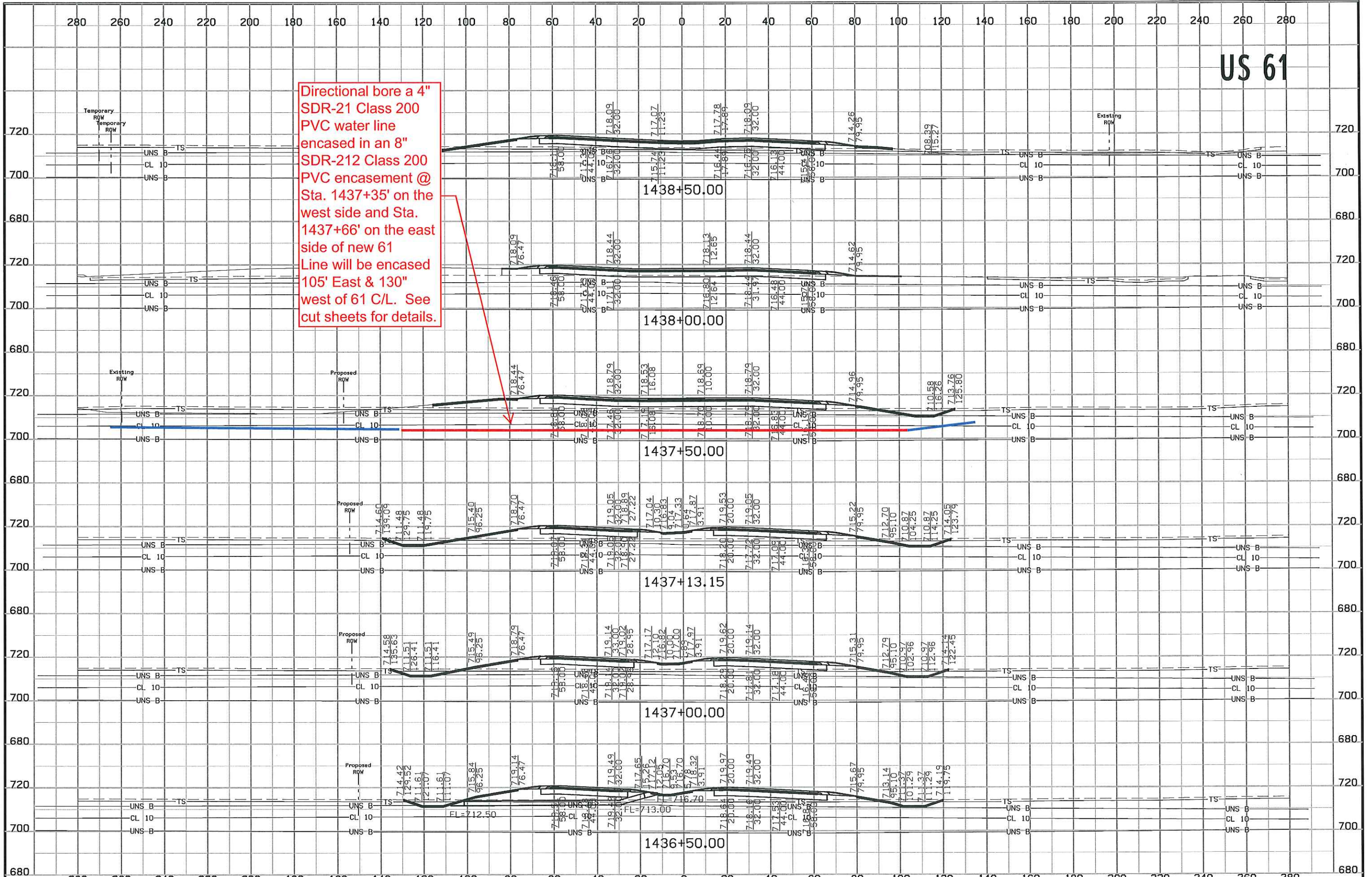
- Property Lines
- Temporary Easement
- Permanent Acquisition

REVISED	02-14-17	PAR	58
REVISED	01-18-17	PAR	57



US 61

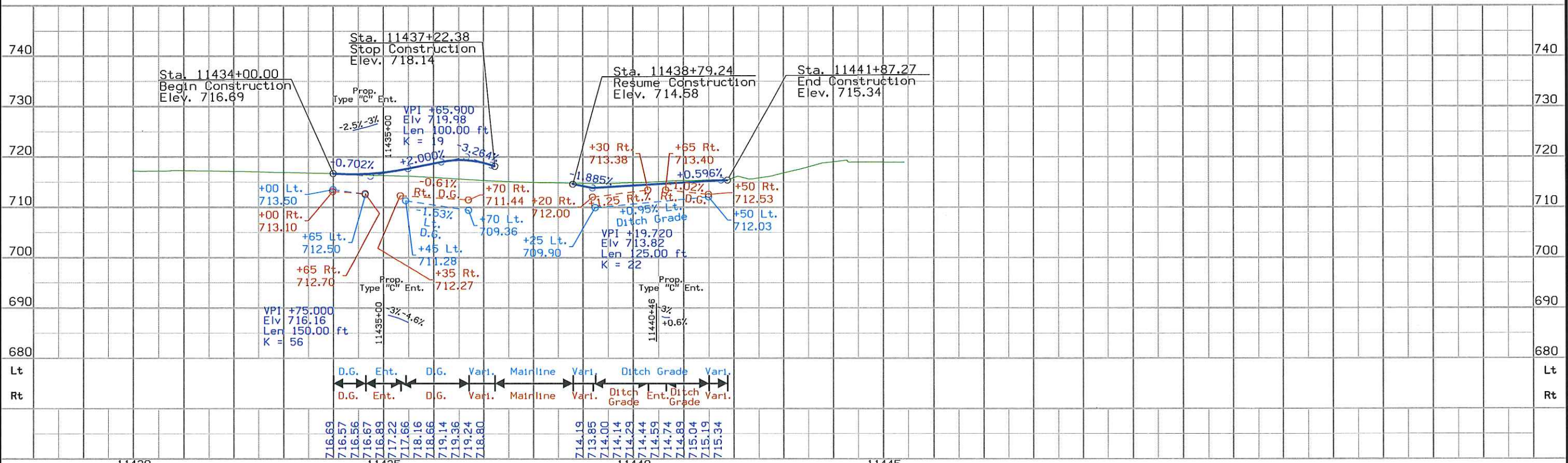
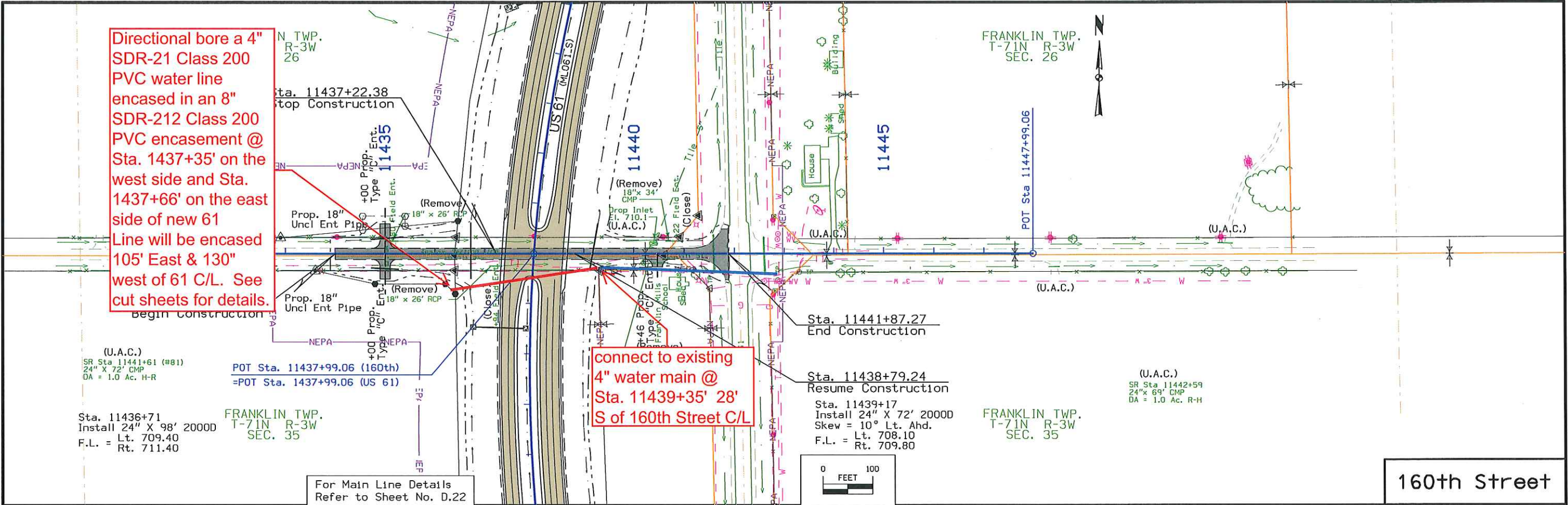
Directional bore a 4" SDR-21 Class 200 PVC water line encased in an 8" SDR-212 Class 200 PVC encasement @ Sta. 1437+35' on the west side and Sta. 1437+66' on the east side of new 61 Line will be encased 105' East & 130' west of 61 C/L. See cut sheets for details.



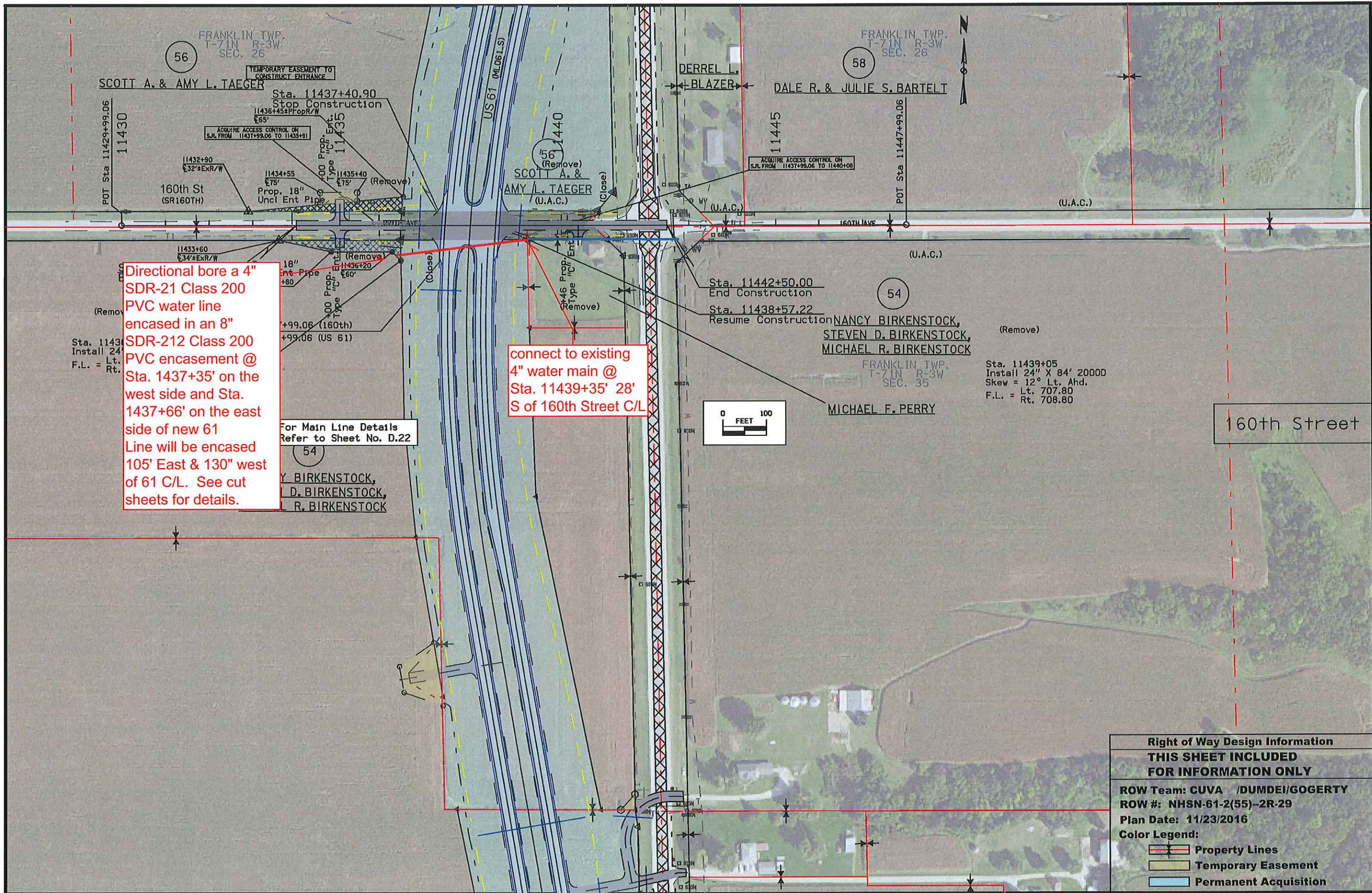
FILE NO.	ENGLISH	DESIGN TEAM	DES MOINES COUNTY	PROJECT NUMBER	SHEET NUMBER
		Van Dyke\Stanley Consultants Inc.		NHSX-061-2(62)--3H-29	W.187

Directional bore a 4" SDR-21 Class 200 PVC water line encased in an 8" SDR-212 Class 200 PVC encasement @ Sta. 1437+35' on the west side and Sta. 1437+66' on the east side of new 61 Line will be encased 105' East & 130' west of 61 C/L. See cut sheets for details.

connect to existing 4" water main @ Sta. 11439+35' 28' S of 160th Street C/L



FILE NO.	ENGLISH	DESIGN TEAM	DESIGNER	COUNTY	PROJECT NUMBER	SHEET NUMBER
		Van Dyke\Stanley Consultants Inc.	DES MOINES	NHSX-061-2(62)--3H-29	E.12	



Directional bore a 4" SDR-21 Class 200 PVC water line encased in an 8" SDR-212 Class 200 PVC encasement @ Sta. 1437+35' on the west side and Sta. 1437+66' on the east side of new 61 Line will be encased 105' East & 130" west of 61 C/L. See cut sheets for details.

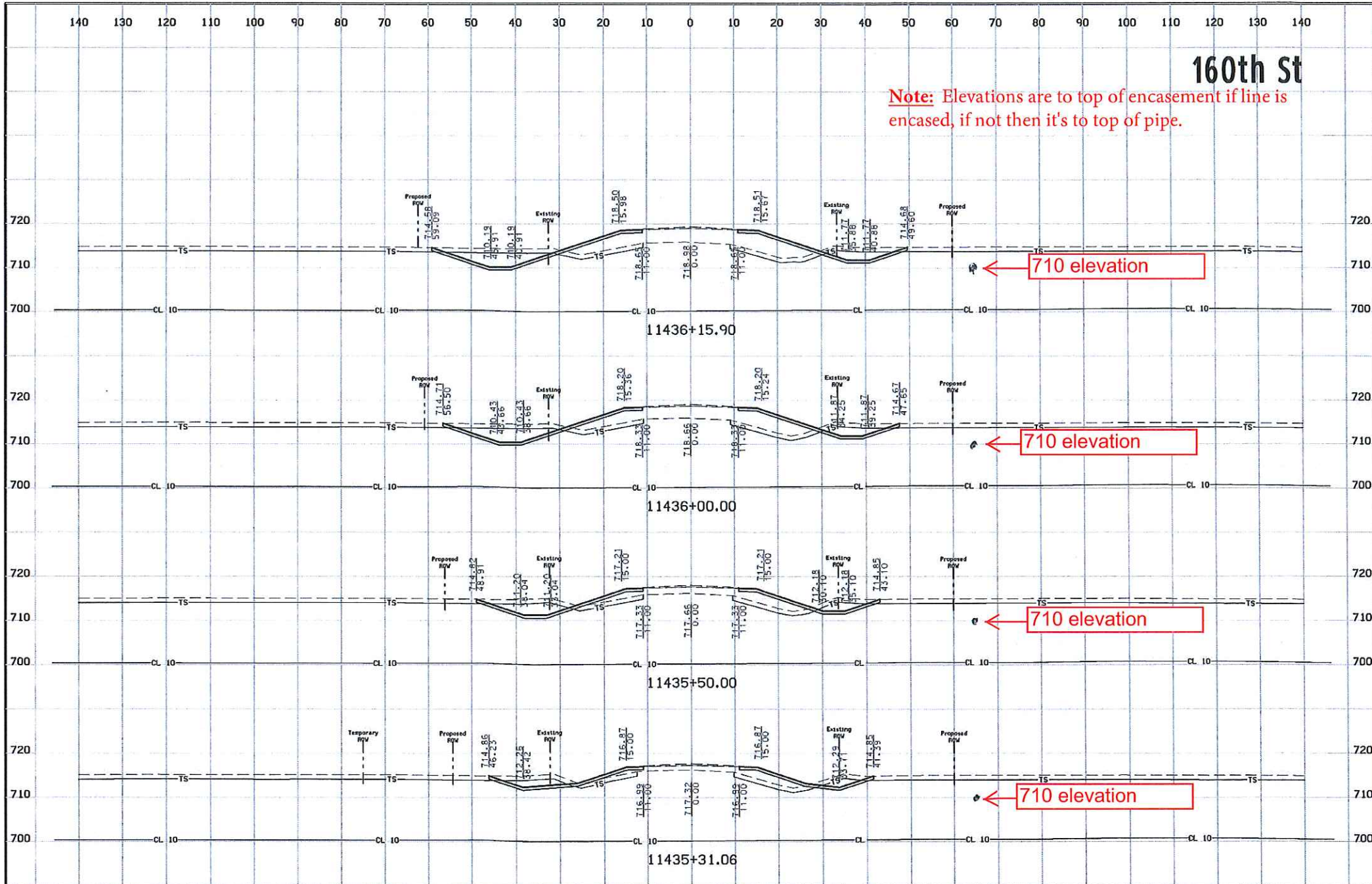
connect to existing 4" water main @ Sta. 11439+35' 28' S of 160th Street C/L

For Main Line Details Refer to Sheet No. D.22

Right of Way Design Information	
THIS SHEET INCLUDED FOR INFORMATION ONLY	
ROW Team: CUVA /DUMDEI/GOGERTY	
ROW #: NHSN-61-2(55)-2R-29	
Plan Date: 11/23/2016	
Color Legend:	
	Property Lines
	Temporary Easement
	Permanent Acquisition

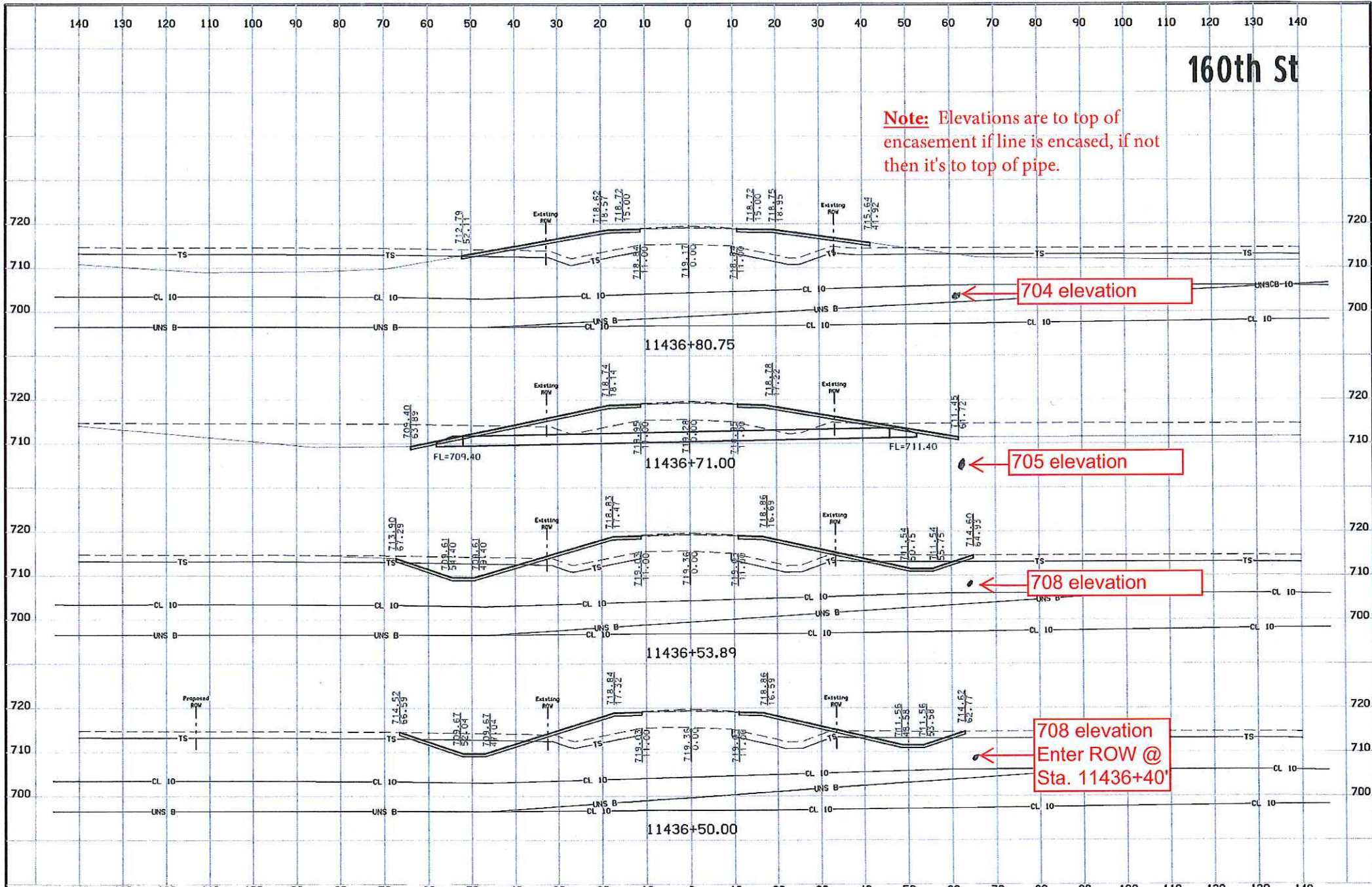
160th St

Note: Elevations are to top of encasement if line is encased, if not then it's to top of pipe.



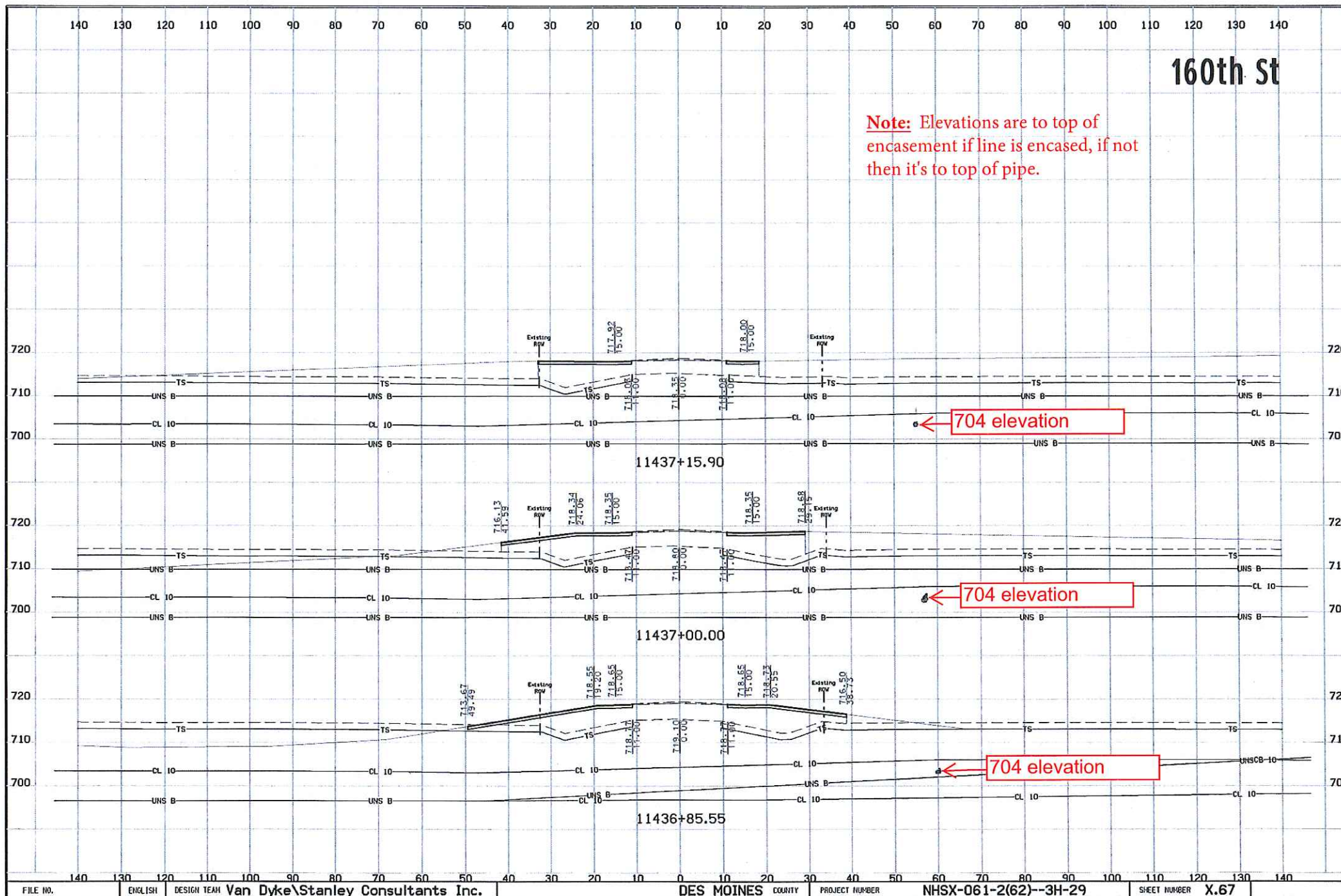
160th St

Note: Elevations are to top of encasement if line is encased, if not then it's to top of pipe.



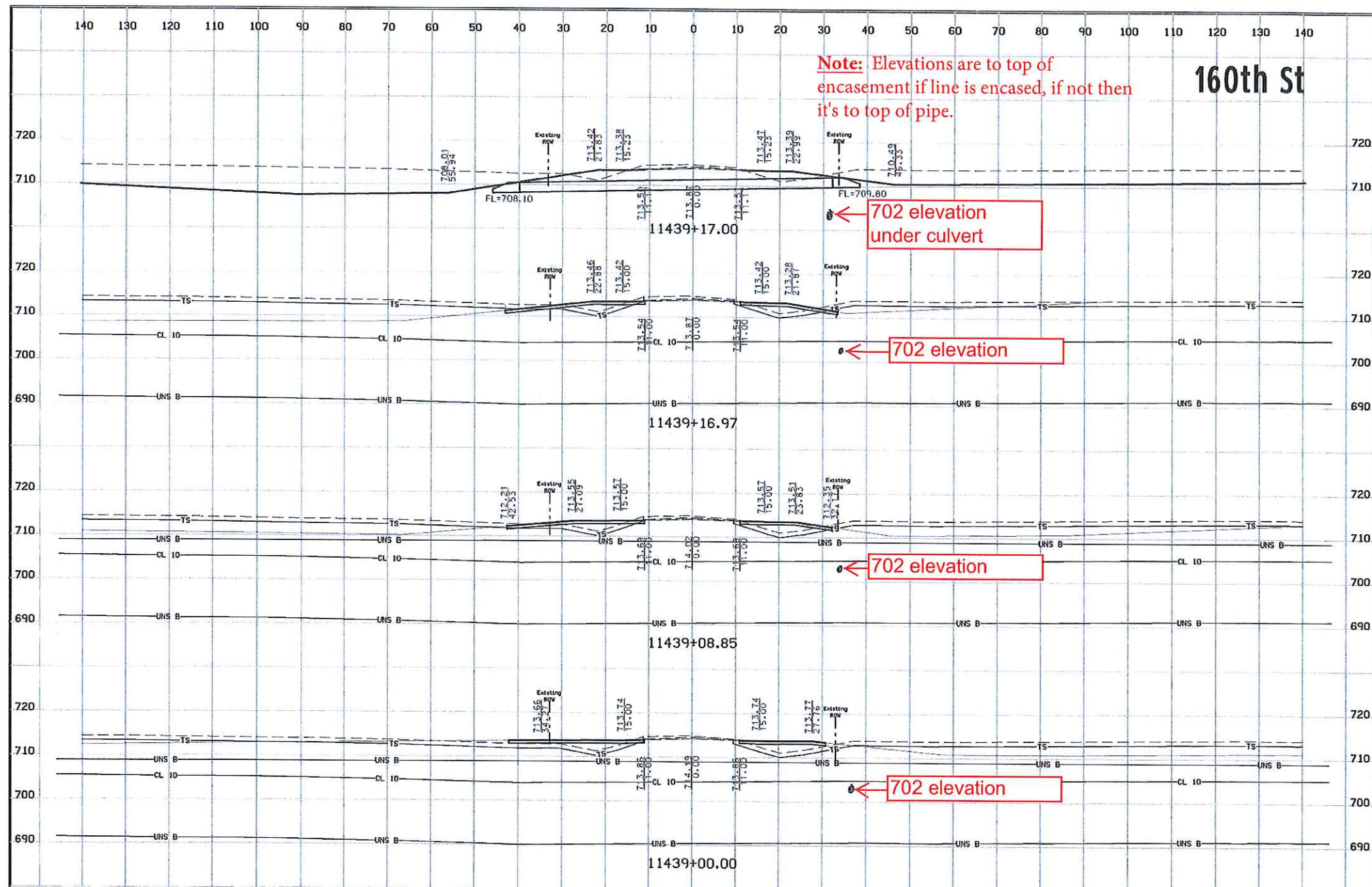
160th St

Note: Elevations are to top of encasement if line is encased, if not then it's to top of pipe.



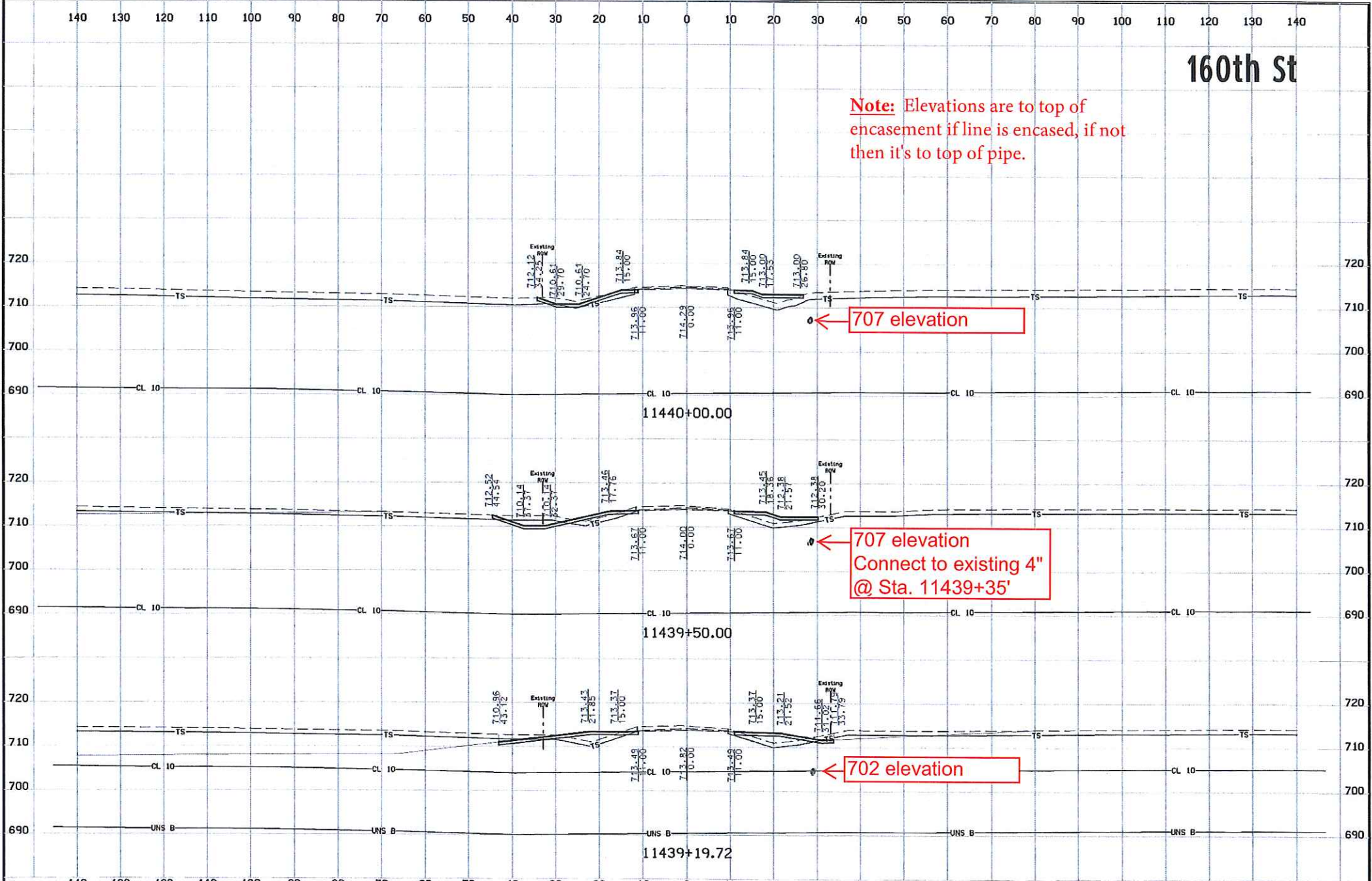
160th St

Note: Elevations are to top of encasement if line is encased, if not then it's to top of pipe.



160th St

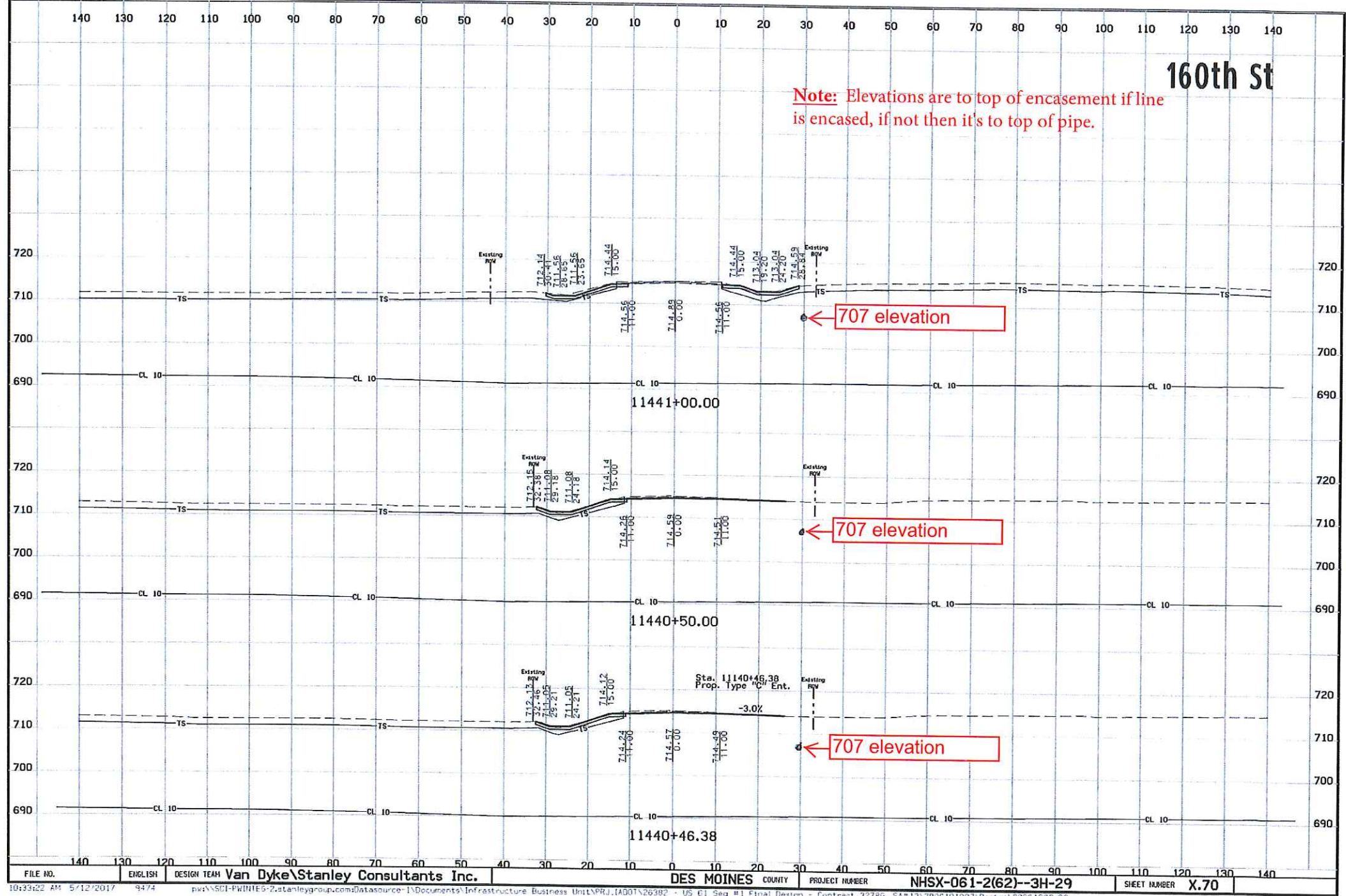
Note: Elevations are to top of encasement if line is encased, if not then it's to top of pipe.



10:33:22 AM 5/12/2017 9474 p:\SCI-PW\INTEG-2.stanleygroup.com\Dat\source\1\Documents\Infrastructure Business Unit\PRJ.LAD01\26382 - US 61 Seg #1 Final Design - Contract 32786, SA#12\2906101097\Design\29361062\08

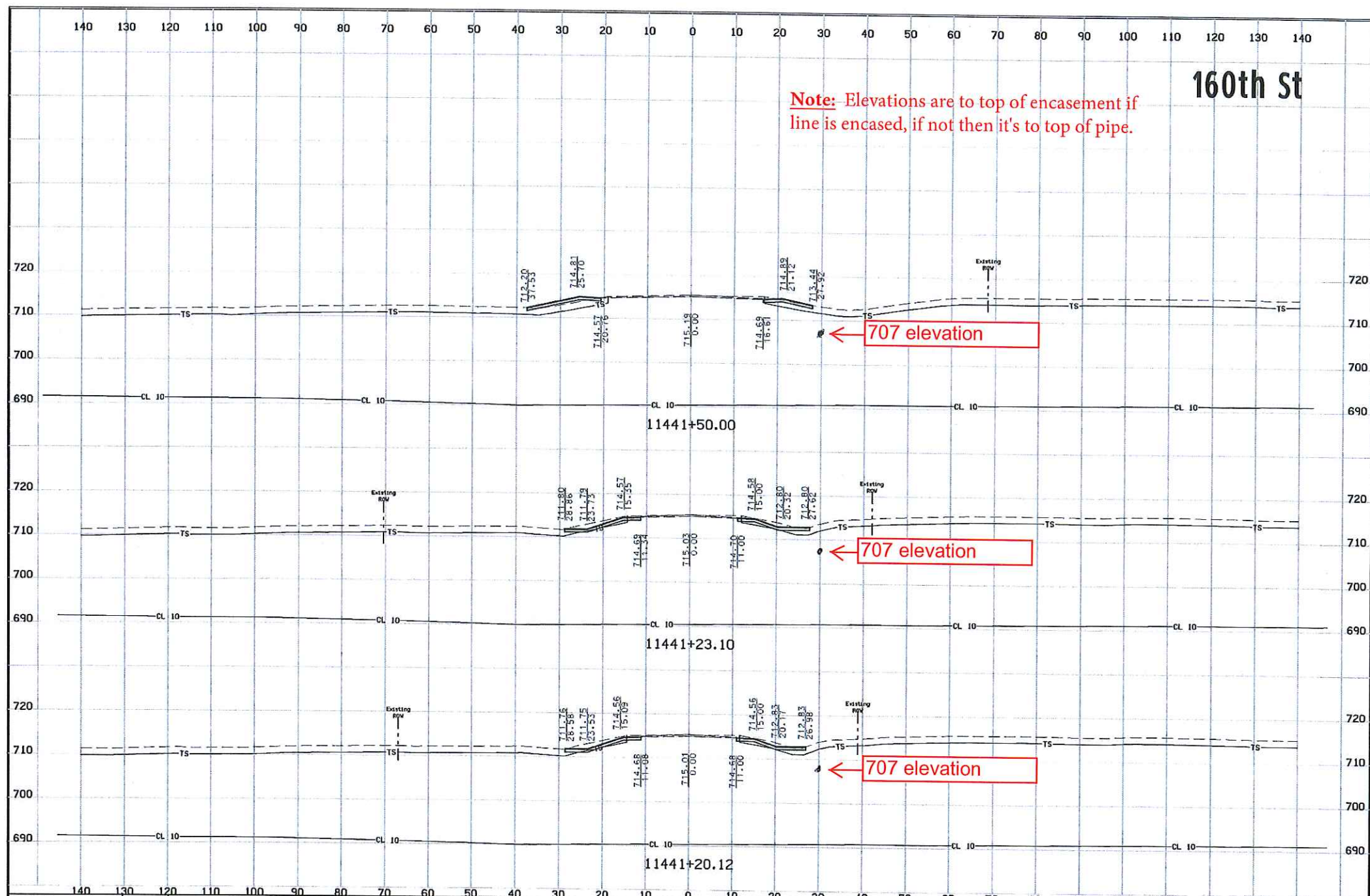
160th St

Note: Elevations are to top of encasement if line is encased, if not then it's to top of pipe.



160th St

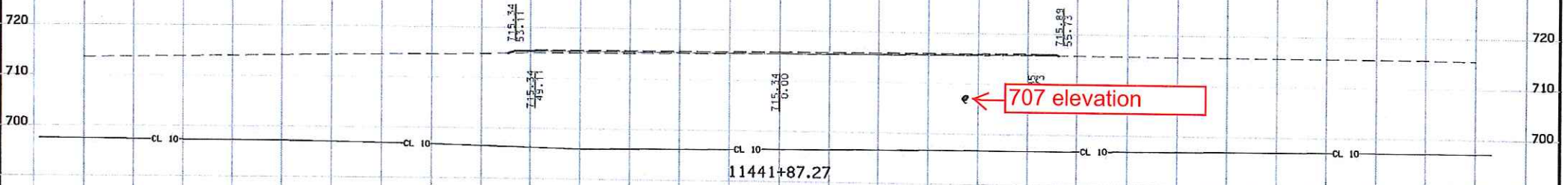
Note: Elevations are to top of encasement if line is encased, if not then it's to top of pipe.



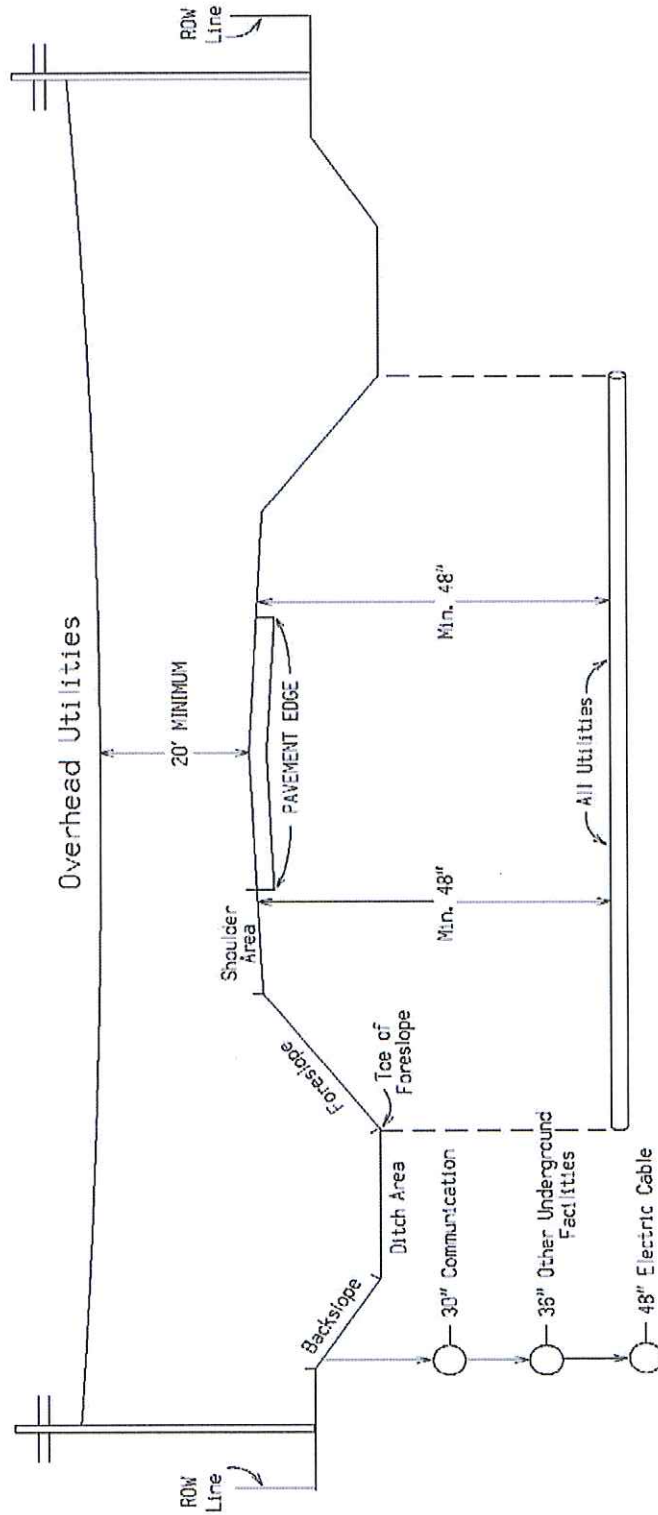
140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 10 20 30 40 50 60 70 80 90 100 110 120 130 140

160th St

Note: Elevations are to top of encasement if line is encased, if not then it's to top of pipe.



Minimum Policy Requirements Rural Section Non-Freeway Highway



Notes:
 Utilities shall be located between the toe of foreslope and the highway row line.
 Utilities should be located as near to the highway row line as practical.
 See Utility Policy, Section 115.13 for further details.

Do not allow work to interfere with the flow of traffic.
 When parked, locate vehicles as far from the open traffic lane as possible. Entrances and driveways should be used whenever appropriate.
 Equip all vehicles with an amber Vehicle Warning Light.

① For work lasting longer than one hour, refer to TC-202 or TC-402.



① VEHICLE STOPPED ON SHOULDER FOR LESS THAN ONE HOUR



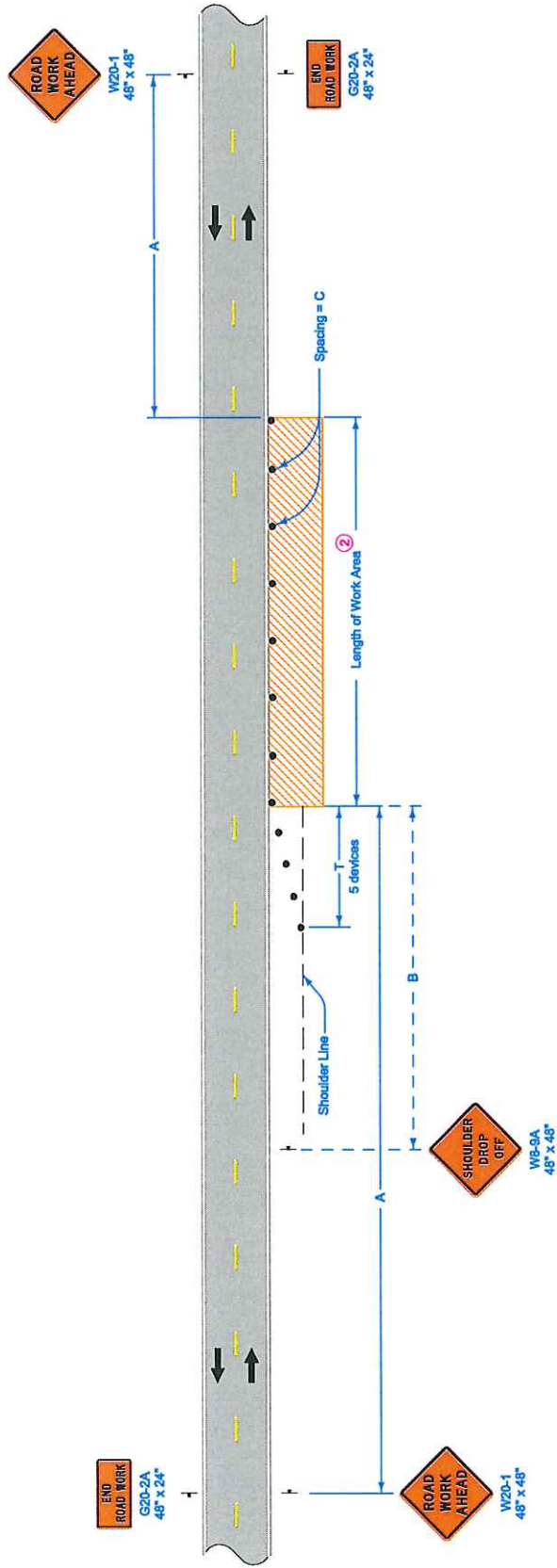
SLOW-MOVING OPERATION



	Traffic Sign
	Direction of Traffic

Possible Contract Item:
Traffic Control

 Iowa Department of Transportation	REVISION 1 10-18-11
	TC-1 SHEET 1 of 1
STANDARD ROAD PLAN <small>REVISIONS: Changed size of W21-6 sign. Updated language of general notes. Made into a color standard.</small>	
<i>Deanna M. Smith</i> <small>APPROVED BY DESIGN METHODS ENGINEERS</small>	
WORK NOT AFFECTING TRAFFIC (TWO-LANE OR MULTI-LANE)	



When a pavement edge drop-off exists, install a SHOULDER DROP-OFF sign.

Pavement edge drop-offs greater than a nominal 10 inches will not be allowed during non-working hours.

Shoulder edge drop-offs shall be mitigated according to Article 1107.08.K2 of the Standard Specifications.

① When the length of a pavement edge drop-off is 1000 feet or less, the temporary fillet requirement of Article 1107.08 of the Standard Specifications does not apply.

Space devices at 40 feet.

② For work areas less than 200 feet long, use channelizers spaced at 20 foot centers or use a vehicle with an amber revolving light or amber strobe light.

Possible Contract Item:
Traffic Control

 Iowa Department of Transportation	REVISION 4 04-17-12
	TC-202
STANDARD ROAD PLAN	
REVISIONS: Removed "x Vertical Panel" from 42" Channelizer in Legend.	
SHEET 1 of 1	
<i>S. J. Jones</i> APPROVED BY DESIGN METEOROLOGICAL ENGINEER	
SHOULDER CLOSURE (ONE LANE)	

SPEED LIMIT (mph)	A	B	C	T
35 or less	500'	250'	40'	100'
40 - 45	700'	350'	80' ①	200'
50 or greater	1000'	500'	100' ①	200'

SPEED LIMIT (mph)	A	B	C	T
35 or less	500'	250'	40'	100'
40 - 45	700'	350'	80' ①	200'
50 or greater	1000'	500'	100' ①	200'

SPEED LIMIT (mph)	A	B	C	T
35 or less	500'	250'	40'	100'
40 - 45	700'	350'	80' ①	200'
50 or greater	1000'	500'	100' ①	200'

SPEED LIMIT (mph)	A	B	C	T
35 or less	500'	250'	40'	100'
40 - 45	700'	350'	80' ①	200'
50 or greater	1000'	500'	100' ①	200'

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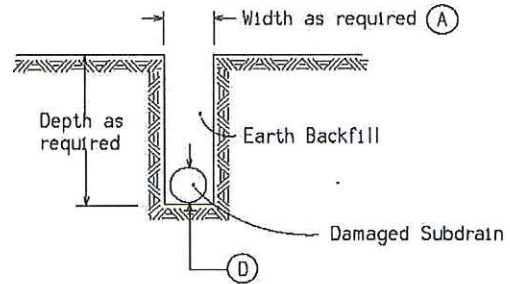
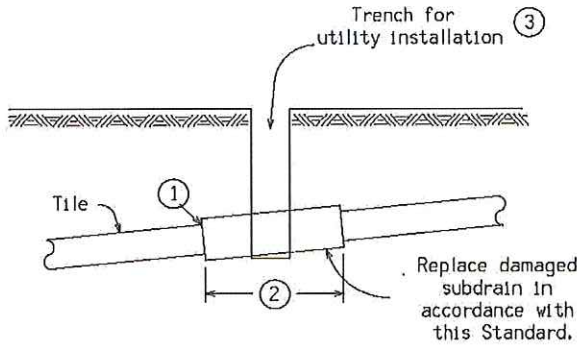
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Tile Line Repair Guideline



Note:
 Replacement of drainage tile shall be accomplished so as to cause the minimum of disturbance to existing field tile. The repaired drainage tile shall be left in a functional condition with special emphasis placed on maintaining existing flow line elevations.

(A) = A minimum of 24" shall be excavated outside the normal utility trench wall or such greater width as may be required to expose a minimum of 12" of undamaged drain tile.

REPLACEMENT SCHEDULE - CASE 'A'										
Existing Tile (D)	4	6	8	10	12	15	18	21	24	>24
Proposed Subdrain Size										
Concrete Pipe	-	-	12	15	15	18	21	24	30	D+6"
Coated C.M.P.	10	12	15	18	21	24	30	36	36	*

* Replacement sizes provide equivalent capacity based on 6" settlement assuming a 0.20% slope with $n = 0.013$ for concrete pipe and $n = 0.025$ for corrugated pipe (Manning Formula)

NOTES:

Tile lines disturbed within the right-of-way (outside the Roadway Embankment Area *) limits shall be repaired as follows:

May be repaired with schedule 40 PVC pipe of compatible size or in accordance with the replacement schedule-case 'A' as listed above. Replacement with schedule 40 PVC pipe shall require using a connecting device of a Femco plain and plain flexible pipe coupling or equal.

Tile lines disturbed within the "Roadway Embankment Area" shall be replaced in accordance with the replacement schedule - case 'A' stated above and as follows:

- ① Concrete collar to be placed around joint where existing tile line and corrugated aluminized metal pipe connect.

- ② Minimum length of corrugated metal pipe shall be 4 feet. Minimum length of 2 feet on each side of the tile line break location.

- ③ Trench shall be backfilled with 8 inches loose material, compacted to 6 inches with a minimum of 95% compaction of natural density.

A. Backfill and compact area around drain tile to be completed by hand until new tile is completely covered. Remainder of the trench shall be backfilled by acceptable methods.

B. Area shall require inspection by the Iowa Department of Transportation inspectors or their designated personnel prior to backfilling of trench.

* "Roadway Embankment Area" is defined as the area lying between the foreslopes of a two-lane roadway and from near foreslope to far foreslope of a four lane roadway.