

**MINUTES  
PUBLIC HEARING ON ENGINEER'S RECOMMENDATION  
ON DRAINAGE DISTRICT 22 TILE REPAIR – 2017**

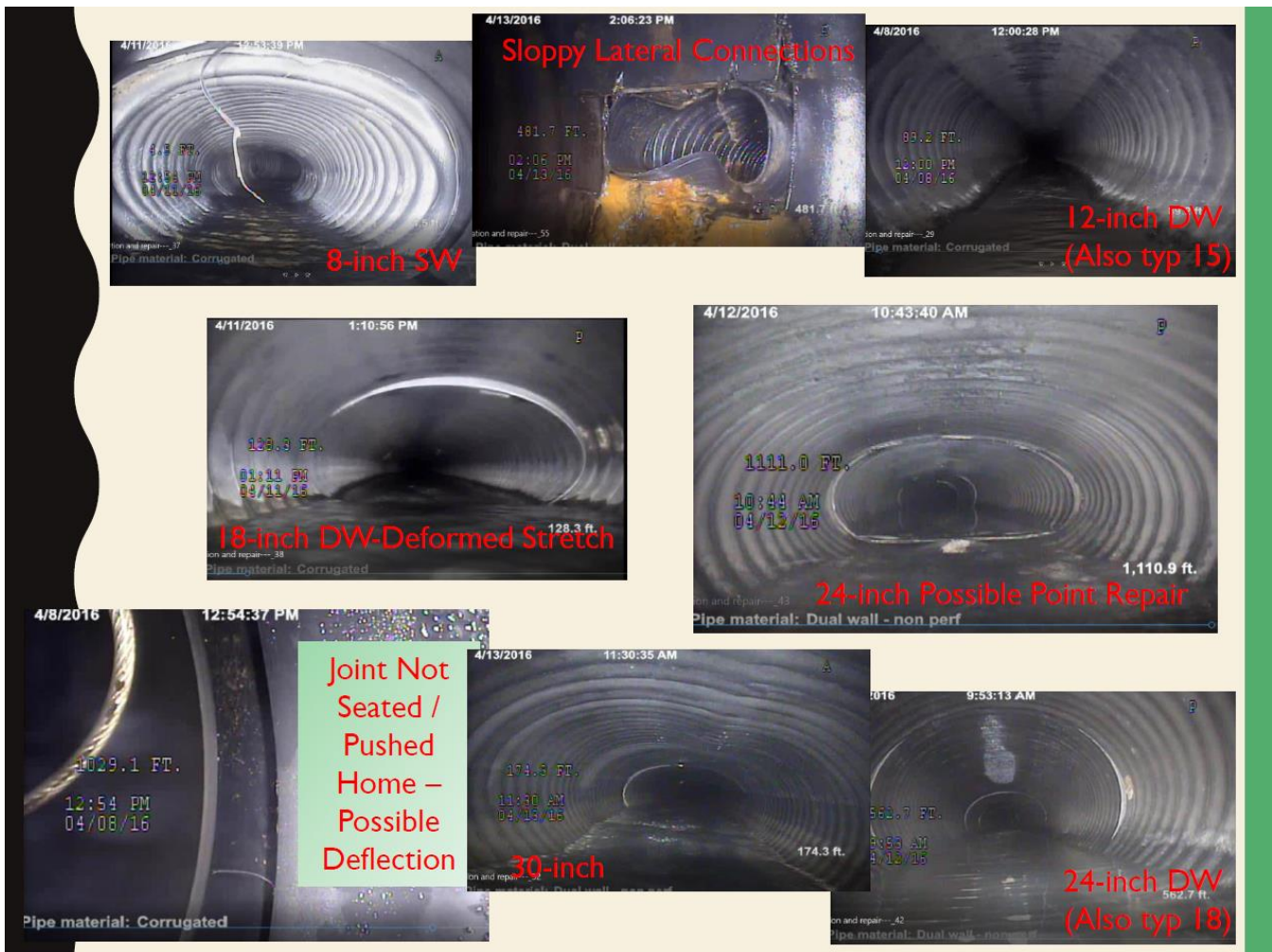
**WEDNESDAY, AUGUST 2, 2017 AT 11:00 A.M.  
HARDING COUNTY COURTHOUSE**

Hardin County Board of Supervisor Chairman, Lance Granzow, opened the meeting. Also present were Supervisors, Renee McClellan and BJ Hoffman; Landowners, Royle Duncan, Jo Duncan, Randy Silvest, Paul Peterson, Brad Fjelland, Bob Peterson, Helen Peterson, Marvin Krause, Brian Krause, Randy Madden, John Liittschwager, Donald Peterson, Dennis Harris and Betty Harris; Engineers, Heather Thomas and Matt Garber, with Clapsaddle Garber Associates; Drainage Clerk, Tina Schlemme.

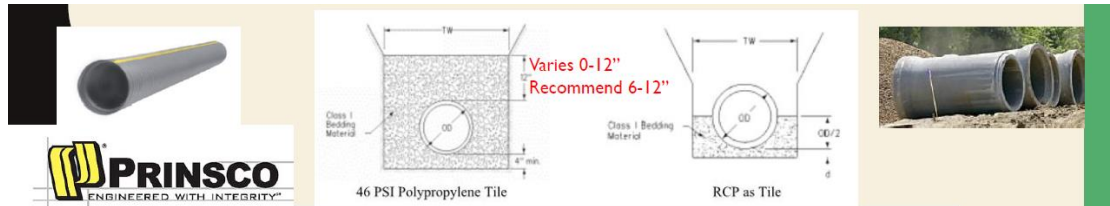
Hoffman moved, McClellan seconded to approve the agenda as presented. All ayes. Motion carried.

Granzow opened the public hearing after introductions were made. Schlemme then verified notice of hearing was published on July 12, 2017 in the Iowa Falls Times Citizen.

The meeting was then turned over to Thomas who explained the project components. She explained that some laterals were improperly connected that should be repaired when needed. She further explained that they would recommend all 30" tile be replaced. They suggest that the road crossings be televised at the time of construction to see if they need replaced as well. Thomas stated a couple spot repairs were needed on the 24" and 18" tile. It was discussed that those locations are not exactly known as they need to speak with Bolton & Menk to obtain GPS locations yet. Thomas also recommends that televising one month after installation with measured deflection be included in the contract. They also advise that televising be completed again in 2019 on the 18" and 24" tiles and compare to earlier televising.



Thomas further explained that they recommend polypropylene pipe for this project but concrete could be bid as an alternative. She described how the tile would be placed in the same trench as the existing tile and that it would be encased in a granular substance with 6-12" above the top of the tile. Landowners voiced concerns with plastic and the depth of the tile. Thomas displayed manufacturer specifications and explained that this thicker product will perform fine for that depth. Madden and Paul Peterson both stated they preferred the concrete method.



## Polypropylene Pipe vs. RCP

Data based on 30-inch diameter ASTM F2881 polypropylene and ASTM C76, B-Wall reinforced concrete pipes

	Polypropylene Pipe (PP)	Reinforced Concrete Pipe (RCP)
<b>Joint Integrity</b>	Extended bell and spigot joint with standard rubber gasket exceeds 25 feet of head pressure per ASTM D3212	Bell and spigot joints when gasket is specified exceeds 25 feet of head pressure per ASTM C1628. Unspecified joints normally are not leak resistant.
<b>Maximum Cover</b>	Compacted Class I Backfill = 39 feet 95% SPD Class II Backfill = 27 feet 90% SPD Class II Backfill = 19 feet 90% SPD Class III Backfill = 15 feet 95% SPD Class IV Backfill = 14 feet (See Technical Note 2.04)	Type 1 Installation with Class IV Pipe = 35 feet Type 1 Installation with Class III Pipe = 23 feet Type 2 Installation with Class III Pipe = 17 feet Type 3 Installation with Class III Pipe = 14 feet (See ACPA Fill Height Tables, Resource #16-201 [Revised 08/13])
<b>Minimum Cover Height</b>	95% SPD Class III Backfill - 1.0 feet (See Technical Note 2.04)	Type 1, 2, 3, 4 Installation - 1.0 feet (Class IV Pipe is required). (See ACPA Fill Height Tables, as above)
<b>Installation Rate</b>	200 feet/day per RS Means	88 feet/day per RS Means
<b>Allowable Backfill</b>	Based on installation requirements, Class I, II, III, or IV backfills may be used. High plasticity soils (MH & CH) are not recommended (See ASTM D2321).	Based on installation requirements, Category I, II, or III backfills may be used. High plasticity soils (MH & CH) are not recommended (See ASTM C1479).
<b>Number of Joints</b>	9 joints per 200 linear feet of pipe (based on 20 feet standard pipe length, 13 foot lengths available upon request)	24 joints per 200 linear feet of pipe (based on 8 feet standard pipe length)
<b>Product Weight</b>	370 pounds per 20 feet stick of pipe	3,320 pounds per 8 feet of pipe
<b>Corrosion Resistant</b>	Unaffected by salts, most chemicals, and "hot" soils (See Technical Note: 4.01)	Salt and chemicals, like hydrogen sulfide, can degrade steel and concrete (See Design Manual "Sulfide and Corrosion Prediction and Control")
<b>Design Service Life</b>	100 years (Based on FDOT analysis)	100 years (Based on FDOT analysis)

**COUNTY MATERIAL CORPORATION**

**Know the Facts: Why you should specify RCP (Reinforced Concrete Pipe) over Polypropylene Pipe**

	Polypropylene Pipe (PP)	Reinforced Concrete Pipe (RCP)
<b>Joint Integrity</b>	<b>PP - Claim:</b> Extended Bell and Spigot joint with standard rubber gasket exceeds 25 feet of head pressure per ASTM-D-3212.	<b>RCP - Fact:</b> ASTM-D-3212 clearly expresses in its section 1.1 "This specification covers joints for plastic pipe systems intended for drain, and gravity sewerage pipe at internal or external pressures less than 25 foot head using flexible watertight elastomeric seals" or 108 psi. In contrast ASTM-C-1428 in section 9.2.1.1 "Hydrostatic pressure to 13 psi" (16 feet of head pressure) for Reinforced Concrete Pipe.
<b>Maximum Cover</b>	<b>PP - Claim:</b> Range of installation depths up to 39 feet of fill.	<b>RCP - Fact:</b> When class V pipes are specified, and/or special design pipes are analyzed by the direct design method, RCP is capable of greatly exceeding 39 feet of fill height. Design depths for RCP over 50 feet are possible and not that uncommon. A 30" RCP CL-V pipe is specified for 53 feet of fill on Resource #16-201 published by the ACPA. RCP has been designed for fill heights up to 150 feet of fill. It should also be noted that PPs claim for 39 feet of fill has some significant exceptions, including, calculations assume no hydrostatic pressure and a density of 120 pcf (1926 kg/m <sup>3</sup> ) for overburden material. Additionally, PP installation is assumed to be in accordance with ASTM D2321. Material must be adequately "knifed" into haunch and in between corrugations. Compaction and backfill material is assumed uniform throughout entire backfill zone.
<b>Minimum Cover Height</b>	<b>PP - Claim:</b> 95% SPD Class III Backfill - 1.0 foot (See technical note 2.04)	<b>RCP - Fact:</b> AASHTO LRFD Bridge Design Specification Section 12 Table 12.6.6.3-1 requires a minimum of 2 feet of cover under a roadway for thermoplastic pipes.
<b>Installation Rate</b>	<b>PP - Claim:</b> 200 feet/day per RS Means	<b>RCP - Fact:</b> Any experienced contractor will tell us that the controlling factors on pipe installation rates are the depth of excavation, foundation preparation, soil types, compaction of the pipe envelope, trench box removal and final backfill. Flowable pipes require wider trench widths and extra care when removing the trench box in order to prevent loss of support along the sides of the pipes. The pipe material itself has a minor influence on the installation rates. Contractors have been consistently indicating that due to the light weight of thermoplastic pipes, the compaction efforts for the pipe envelope is taking significantly longer times for these very light weight pipes, particularly when following the manufacturer's installation recommendations of 4" to 6" soil compaction lifts. Maintaining line and grade with these light weight pipes requires a significant degree of extra care. In addition, installation recommendations from the manufacturers of PP pipe requires that the soil be "knifed" in between every corrugation. An 18" diameter 200 feet long pipeline will require ~3,600 "knifing" actions per manufacturer requirement. Also the following additional requirements for the utilization of a trench box will have a significant effect on the installation rates. While trench boxes increase worker safety in difficult site conditions, their use requires some precautions be taken to ensure a structurally sound finished installation. Construction of a sub-trench is the most effective means of maintaining a sound system; the trench box can simply be pulled along the top edge of the sub-trench. When a regular trench is used, techniques such as lifting the box, keeping the box about three fourths the nominal pipe diameter up from the trench bottom, and providing a wide granular backfill envelope will help provide a quality installation.

	Polypropylene Pipe (PP)	Reinforced Concrete Pipe (RCP)
<b>Allowable Backfill</b>	<b>PP - Claim:</b> Based on installation requirements, Class I, II, III or IV backfills may be used. High plasticity soils (MH & CH) are not recommended (See ASTM D-2321)	<b>RCP - Fact:</b> ASTM-D-2321 relative to CL-V materials; "properly placed and compacted, Class IV materials can provide reasonable levels of pipe support; however, these materials may not be suitable under high fills, surface-applied wheel loads, or under high-energy-level vibratory compactors and tampers. Do not use where water conditions in the trench may prevent proper placement and compaction." In other words, can not be used underneath a roadway.
<b>Number of Joints</b>	<b>PP - Claim:</b> 9 joints per 200 linear feet of pipe (based on 20 feet standard pipe length)	<b>RCP - Fact:</b> Reality is that most utility contractors can not efficiently install 20 feet joint equipment limitations and trench box weights
<b>Product Weight</b>	<b>PP - Claim:</b> 370 pounds per 20 feet stick of pipe.	<b>RCP - Fact:</b> For most jobs the difference in weight is not a factor relative to the equipment. The piece of equipment that digs the trench for a 30 inch diameter pipe is large enough to handle either pipe material, because the equipment size is dictated by the excavation requirements and trench boxes. In addition, a pipe material that weights ~ 19 pounds per foot, becomes very unstable under the effect of high power compaction equipment capable of imparting thousands of pounds force energy. For a 20 foot joint a contractor will need a 24 foot long trench box shield. The trench box shield will need to be lifted every 6' up to an elevation of 12" above the pipe crown. These larger size trench boxes may dictate the use of larger capacity excavator equipment.
<b>Corrosion Resistant</b>	<b>PP - Claim:</b> Unaffected by salts, most chemicals, and "hot" soils.	<b>RCP - Fact:</b> Thermoplastic materials are susceptible to temperature changes that affect the pipe prior to, during and after installation. Oxidation is a growing concern for many thermoplastic pipe materials. Thermoplastic pipes are also susceptible to a phenomenon known as slow crack growth that affect its expected service life.
<b>Design Service Life</b>	<b>PP - Claim:</b> 100 years	<b>RCP - Fact:</b> The DOT requires stringent installation standards and Post-Installation Inspection to ensure the pipe material is installed appropriately with limited deflection. A flexible pipe installed with limited inspection and no control of over-deflection would not be considered to have the same Design Service Life per DOT installation standards. In addition, a special testing protocol is demanded by the DOT in order to qualify any thermoplastic pipe for 100 year service life.

Thomas went on to explain the estimated cost of the project components. Landowners asked if Ryken’s plans and specification could be used for this project to save money on the Engineer’s portion. Thomas stated they have a good working relationship with Ryken and would not have a problem using their plans but changing the details. Landowners raised concerns if the project would be observed the whole time to ensure the tile is properly installed and if that was included in the price. Both Thomas and Garber stated they observation varies with each client. They will observe as much as a client wants but the price shown is for full time oversight.

**Proposed Repair Project**

2017 Base Bid:

1. Replacement of all 30-inch tile outside of the four road crossings. Replacement will be in the same alignment utilizing polypropylene pipe meeting the typical section shown herein with granular Class I material being used for haunch support and backfill to 12-inches above top of pipe. Construction inspection shall include on-site manufacturer’s representative to confirm and field verify installation in accordance with the specified recommendations in addition to internal video investigation approximately 1-month post construction. Any pipe with observable defects shall be immediately replaced.

$6,490 \text{ LF} \times \$50 / \text{LF} = \$324,500$

2. Video investigation of 30” Road Crossings

$4 \text{ Each} \times \$1,000 / \text{Each} = \$4,000$

3. Spot Point Repairs

$\text{Est } 5 \text{ Each} \times \$2,000 / \text{Each} = \$10,000$

2017 Add Option (Field Determined):

1. Replacement of 30” Road Crossings

$4 \text{ Each} \times \$ 6,000 = \$24,000$

2019 Recommended Video Inspection:

1.  $8,180 \text{ LF} \times \$1.25 / \text{LF} = \$10,225$
2. Mobilization & Access = \$1,775

Due to difficulty of installation and ability for lateral connections in the future, we lean towards recommending a polypropylene pipe material. In order to spur competition and competitive bids, we recommend bidding concrete pipe as an alternate. Upon receipt of bids, we can assist the Drainage District with their decision of which alternate to award. The alternate is not included in the opinion of cost at the conclusion of this report.

<b>2017</b>		
	Estimated Construction Total (Base + Add)	\$362,500
	Contingency (10%)	\$36,250
	Engr & Const. Observation (Est. 20%)	\$72,500
	2017 Total	<b>\$471,250</b>
<b>2019</b>		
	Video Inspection	\$12,000
	Estimated Engineer Review	\$4,000
	2019 Total	<b>\$16,000</b>

Madden raised concerns if the lower end of the 30” needed to be replaced as there has not been any blowouts and he believed the televising footage looked okay for that area. Thomas stated she will look at the televising again when the GPS points are received from Bolton & Menk and will supply any updated recommendation at the next landowner’s meeting. Landowners agreed if no televising footage for that area exists, that televising should be ordered.

Landowners asked if the open repair spot would need closed up. Thomas stated they were looking at a spring of 2018 project, but could possibly be a late fall/winter project if pushed. Landowners agreed that the open hole should be repaired and closed up for now.

Landowners also questioned if the one month televising period was too soon. Thomas explained that it’s hard on the contractor to leave the retainage open for much longer. The contractor will have a warranty, but a maintenance performance bond could be written into the bid package. It was discussed that different maintenance performance bond time periods up to 4 years could be included into the bid package as alternate bid items.

Madden stated the last project placed the new tile in a different location across C Avenue than running parallel with the original. He asked if this project needed to follow the same path or if it should be laid parallel with the old. Thomas stated this project will place the tile in the previous projects same trench. Madden then asked how the old tile will be disposed of in which Thomas replied that the contractor will remove and haul away.

Madden further stated he would like to see the old and new tiles connected that was not a part of the original project. Silvest asked that this not be done. He stated Madden got everything he wanted from the original project and Silvest received nothing. He further explained that he paid for a project that did not benefit him and asked that the only benefit he receives from the whole system not be taken away from him.

Granzow asked Thomas if this project would be classified as agriculture or municipal. Thomas explained that typically these projects are considered municipal and regardless of the classification, the proposed project would work for either.

It was discussed that Thomas and Garber should consult with Ryken Engineering if their copyrighted plans and specifications could be used and to proceed with producing plans and specifications for the proposed project. Landowners agreed they would like to meet again to review the plans when ready before a bid letting is set to ensure all concerns will be met. Granzow stated Drainage Attorney, Mike Richards, could be invited to ensure that these concerns are addressed in the contract. It was also discussed that at the next landowners meeting, they would like an answer to the lower end of the 30" tile needing replaced.

Granzow closed the public hearing.

Hoffman moved, McClellan seconded to accept the proposed project as submitted by Clapsaddle Garber Associates with adding concrete as an alternative bid item pending permission from Ryken Engineering to allow copyright of documents to be used. All ayes. Motion carried.

Hoffman moved, McClellan seconded to permit Clapsaddle Garber Associates to televise any necessary portions of the 30" pipe as recommended by the engineer if not already televised. All ayes. Motion carried.

Hoffman moved, McClellan seconded for Clapsaddle Garber Associates to hire a contractor from the in county list to address the repair hole that has been left open and temporarily fix it. All ayes. Motion carried.

Hoffman moved, McClellan seconded to adjourn the meeting. All ayes. Motion carried.