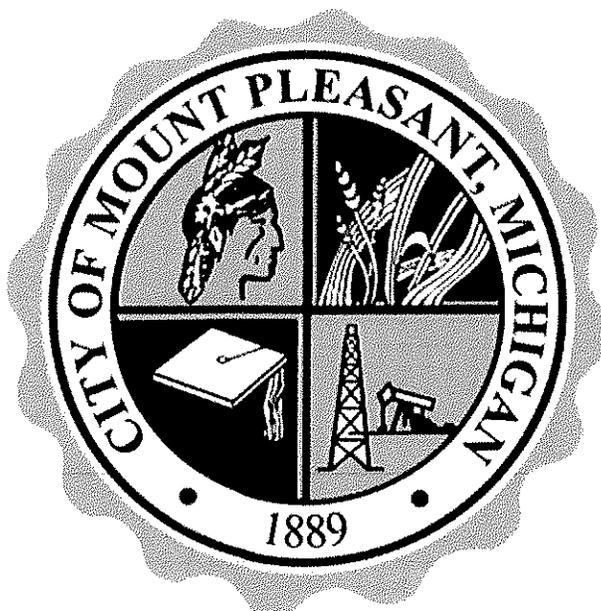


City of Mt. Pleasant, Michigan

# CONTRACT DOCUMENTS

For Construction  
of

Franklin Street Reconstruction  
Water Main Boring Project



**Sharon Tilmann**  
Mayor

**Nancy Ridley**  
Interim City Manager

Prepared By:  
Division of Public Works

**John Zang**  
DPW Director

May 2014

City of Mt. Pleasant, Michigan

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# THE CITY OF MT. PLEASANT, MICHIGAN

**CITY HALL**  
320 W. Broadway • 48858-2447  
(989) 779-5300  
(989) 773-4691 fax

**PUBLIC SAFETY**  
804 E. High • 48858-3595  
(989) 779-5100  
(989) 773-4020 fax

**PUBLIC WORKS**  
1303 N. Franklin • 48858-4682  
(989) 779-5400  
(989) 772-6250 fax

## NOTICE TO BIDDERS

### Franklin Street Reconstruction Water Main Boring Project

The City of Mt. Pleasant, Michigan, is requesting sealed bids at the Office of the City Clerk, City Hall, 320 W. Broadway, Mt. Pleasant, Michigan 48858, until 1:30 p.m. (local time), on June 10, 2014, at which time and place the bids will be publicly opened and read. All bids shall be submitted in a sealed envelope, plainly marked "Franklin Street Reconstruction and Water Main Boring Project – June 10, 2014.

Proposals are solicited on a unit price basis, for the following work:

Street Reconstruction	6.75	STA
Sanitary Sewer Construction	684	LFT
Water Main	1319	LFT
Sidewalk Construction	3120	SFT
Curb and Gutter Construction	1400	LFT
Bituminous Paving	300	TON

All bid proposals must be accompanied by a bid bond, bank cashier's check, bank draft, or certified check for not less than five percent (5%) of the bid price, made payable to the City of Mt. Pleasant.

To view and download complete Plans and Specifications at no charge, visit the City of Mt. Pleasant website at [www.mt-pleasant.org](http://www.mt-pleasant.org) and navigate to the bids and quotes page.

A non-refundable \$50.00 fee is required for plans and specifications picked up at the Public Works Building, 1303 N. Franklin Street, Mt. Pleasant, Michigan 48858, (989) 779-5401, Monday through Friday, 8:00 a.m. to 4:30 p.m. A non-refundable \$60.00 fee is required for plans and specifications that must be mailed.

The City of Mt. Pleasant reserves the right to accept or reject any or all bids, to waive any irregularities in the bids, and to select the bid considered most advantageous to the City.

Bill Brickner  
Engineering Aide  
(989) 779-5407

Jeremy Howard  
City Clerk

City of Mt. Pleasant, Michigan  
**INSTRUCTIONS TO BIDDERS**

1. **Proposals**

Proposals must be made upon the forms provided therefore, with the Bid amount both written and shown in figures, and all other data required submitted.

The Proposal, bound together with all Proposal Documents, must be enclosed in a sealed envelope marked as specified in the Notice to Bidders for such Bid and clearly indicating the name and address of the Bidder and must be received by the City Clerk, City Hall, 320 West Broadway Street, Mt. Pleasant, Michigan 48858, no later than the time and date specified in the Notice to Bidders. At such specified time, Proposals shall be publicly opened and read aloud.

2. **Basis of Proposals**

Proposals are solicited on the basis of unit price(s) and/or lump sum(s), as specified on the Proposal form.

The City of Mt. Pleasant (also referred to as "Owner"), reserves the right to accept any Bid, to reject any or all Bids, to waive any irregularities in the Bids, and to select the Bid considered most advantageous to the city.

3. **Comparison of Bids**

In comparing Bids, consideration shall be given to the time proposed for completion of the Contract, qualifications of Bidder, price differentials, alternate Proposals for the alternate items listed in the Proposal (if applicable), and any other pertinent factors. **The City of Mt. Pleasant grants a preference to businesses located within the Mt. Pleasant City Limits. The preference given is a differential above the low bid if the low bid is not from a City of Mt. Pleasant bidder. The differential allowed is 3% of the total for bids between \$5,000 and \$9,999 and 2% of the total for bids over \$10,000. The maximum credit allowed is \$1500.00.** The Owner reserves the right to make an award to the Bidder whose Proposal is deemed to be in the best interest of the Owner.

4. **Time**

Time is of the essence in the performance of the Contract, and each Bidder, by submitting a Proposal, certifies his/her acceptance of the time allowed by the Contract for the completion of the work specified.

5. **Indemnification**

The Contractor shall save and hold harmless the city and its employees from and against all claims, damages, losses, or expenses, including attorney's fees, arising out of or resulting from the performance of the work; provided that any such claim, damage, loss or expense is caused in whole or in part by any negligent or willful act of omission of the contractor, subcontractor, employee, or anyone under their direction. The Contractor shall at his/her own expense, defend any and all such actions and shall pay all attorney's fees, costs, and expenses pertaining thereto.

6. **Bid Deposits**

Each Proposal shall be accompanied by a certified check, bank cashier's check, bank draft, or a Bid Bond by a recognized Surety Company similar to a U. S. Government Standard Form Bid Bond, in the amount of five percent (5%) of the total amount of the Bid, made payable to the City of Mt. Pleasant, subject to forfeiture to the Owner in the event of failure on the part of the successful Bidder to enter into the attached form of agreement to do the work specified by said Proposal at the price and within the time stated therein. The Bid Deposit of all Bidders, except the three (3) lowest acceptable Bidders, shall be returned within two (2) weeks after opening of bids. The bid deposits of the three (3) lowest acceptable bidders shall be returned within 48 hours after the executed Contract(s) have been finally approved by the Owner.

7. **Liquidated Damages**

A liquidated damage clause, as given in the Contract form, provides that the Contractor shall pay the Owner as liquidated damages, and not as a penalty, the amount as indicated in Section 108.10 of the 2012 MDOT Standard Specifications for Construction for each and every calendar day that the Contractor may be in default of substantial completion of the work required under said Contract.

8. **Insurance and Bonds**

Unless otherwise stated in the supplemental specifications, the successful Bidder will be required to execute (2) Bonds, in the form attached hereto, with Surety acceptable to the Owner and insurance, as follows:

- a. Bond in the amount of 100% of the Estimated Contract Price running to the City of Mt. Pleasant, Michigan, to insure the completion of the entire work, according to the statutes of the State of Michigan in effect at that time.
- b. Bond in the amount of 100% of the Estimated Contract Price running to the People of the State of Michigan for the protection of Subcontractors and Labor and Material Men, according to the statutes of the State of Michigan in effect at that time.
- c. Insurance in the amounts required by City Ordinance as specified in the Section 1 - General Construction Specifications, attached hereto.

The successful bidder shall be required to furnish for each set of executed Contract Documents, and conformed copies thereof, an original conformed Performance Bond, Labor and Materials Bond, and Insurance Certificates.

9. **Permits and Local Codes**

The Owner shall procure the required permits for municipal sanitary sewer construction, municipal water system construction, and soil erosion control.

The Contractor shall obtain, at his/her expense, all other required local construction permits and shall comply with local building code and inspection requirements.

10. **Qualifications of Bidders**

It is the intent of the Owner to award the Contract to a Bidder fully capable, both financially and with regard to experience, to perform and complete all work in a satisfactory and timely manner. Evidence of such competency must be furnished on the forms included in the proposal, listing projects of similar difficulty, scope of work, and size, which the Bidder has satisfactorily undertaken and completed.

It is the intention of the City to award the contract to a Contractor whose ability and financial resources are fully equal to the task of performing the work in a satisfactory manner. With this in view, the Proposal calls for at least five (5) references, using specific names of persons to contact concerning the Contractor's ability to do this particular class of work. References from municipalities are preferred. The mere ability to furnish a Performance Bond shall not be accepted as sufficient evidence of responsibility on the part of the Bidder. The Bidder may also be required to furnish evidence of his current financial status.

11. **Interpretation of Documents**

If any Bidder is in doubt as to the true meaning of any part of the Plans, Specifications or any Contract Document, he/she may submit to the Owner a written request for an interpretation thereof. Any interpretation made in response to such a query shall be made only by Addendum, duly issued, and a copy of such Addendum shall be mailed or duly delivered to each prospective Bidder. The Owner shall not be responsible for any other explanation or interpretation of the Contract Documents. Alternative proposals that are suggested by bidders will be given consideration, if presented before the bid opening. If accepted, an addendum will be issued and sent out to all potential bidders, so that they may bid on the alternatives that have been identified.

12. **Execution of Bid Proposal**

A Bid Proposal, which is not signed by the individual making it, should have attached thereto a Power of Attorney evidencing authority to sign the Bid Proposal in the name of the person for whom it is signed.

A Bid Proposal, which is signed by a partnership, shall be signed by all of the partners or by an Attorney-in-Fact. If signed by an Attorney-in-Fact, there should be attached to the Bid a Power of Attorney evidencing authority to sign the Bid Proposal in the name of the partnership and such Power of Attorney shall be signed by all partners of the partnership.

A Bid Proposal, which is signed for a corporation, should have the correct corporate name thereof and the signature of the President, or other authorized officer(s) of the corporation, manually written below the corporate name and on the line indicating "By: \_\_\_\_\_." If such a Bid Proposal is manually signed by an officer other than the President of the corporation, a certified copy of a Resolution of the Board of Directors evidencing the authority of such officer(s) to sign the Bid Proposal should be attached thereto. Such a Bid Proposal should also bear the attested signature of the Secretary of the corporation and an impression of the corporate seal.

13. **Execution of Contract**

The successful Bidder to whom an award is made shall be required to enter into a written agreement, in the form attached hereto, within ten (10) days after receipt of a Notice of Award and copies of the documents to be executed. In the event the successful Bidder fails to comply with this provision, he/she may be considered by the Owner to have abandoned all his/her rights and interests in the award and his/her certified check or amount of the Bid Bond may be declared to be forfeited to the Owner, and the Contract may be awarded to another.

14. **Bidder Responsibility For Conditions of Work and Site**

The Bidder, or his/her representative, shall make personal investigation of the site of work and of existing structures and shall determine to his/her own satisfaction the conditions to be encountered, the nature of the ground, the difficulties involved in making connections to existing structures and pipes, and any and all other factors affecting the work proposed under the Contract.

The Bidder to whom the Contract is awarded shall not be entitled to any additional compensation by reason of conditions being different from those anticipated or by reason of his/her failure to fully acquaint himself/herself with the conditions at the site affecting the work of the Contract.

15. **Changes in Work**

If any change is required to be made in the work of the Contract, a payment adjustment therefore shall be determined as specified in Section 103 of the 2012 MDOT Standard Specifications for Construction.

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Revised: March 2011

**BID PROPOSAL**

2014 Franklin Street Reconstruction and Water Main Boring Project

TO: City Clerk  
City Hall  
320 W. Broadway Street  
Mt. Pleasant, MI 48858

BID DATE: June 10, 2014  
TIME: 1:30 p.m.

The undersigned, as Bidder, hereby declares that this bid is made in good faith without fraud or collusion with any person or persons bidding of the same Contract; that he has carefully read and examined the Contract Documents, including the Notice to Bidders, Instructions, Bond Forms, Technical and Detailed Specifications, and Contract Drawings, for the designated work and understands all of the same; that he, or his representative, has made such a personal investigation at the site as is necessary to determine the character and difficulties attending the execution of the proposed work; and he proposes and agrees that if this Proposal is accepted, he will contract with the Owner in the form of the Contract hereto annexed, to provide necessary machinery, tools, apparatus and other means of construction, including utility and transportation services, necessary to do all the work and furnish all the materials and equipment specified or referred to in the Contract Documents, including Addenda No. \_\_, \_\_, and \_\_, in the manner and time therein prescribed, and according to the requirements of the Owner as therein set forth to furnish Contractor Bonds and Insurance required of the Contractor by the Contract Documents, and that he will take in full payment therefore the unit prices set forth in the following Proposal.

The Bidder understands that the Owner reserves the right to reject any or all bids and to waive any irregularities in the bidding.

The Bidder agrees that his bid shall be good and may not be withdrawn for a period of sixty (60) calendar days after the scheduled closing time for receiving the bids.

Upon receipt of a written Notice of Award of the Bid, the Bidder shall execute the formal Contract Agreement attached hereto within ten (10) days and shall deliver to the Owner a Surety Bond or Bonds required. In the event the Contract and Bond are not executed within the time above set forth, the Bid Deposit attached in the sum of five percent (5%) of the Bid Proposal shall become the property of the Owner as liquidated damages for the delay and additional expense to the Owner caused thereby.

The Bidder hereby agrees to commence work under this Contract on or before the date to be specified in the written Notice to Proceed executed by the Owner and to fully complete the project as stipulated in the Special Conditions of these Specifications. The Bidder further agrees to pay as liquidated damages the sum indicated in the Special Conditions for each consecutive calendar day thereafter, until substantial completion, that is when all work items in the proposal are complete and notification of substantial completion of work items and final quantities is given to the Director of Public Works by the contractor.

The below unit prices shall include all labor, materials, overhead, profit, insurance, etc., to cover the finished work of the several kinds specified, and the Bidder agrees to perform all of the work described in the Specifications and/or shown on the Plans for the following unit prices:

ITEM NO.	DESCRIPTION	QTY	UNIT	UNIT COST	TOTAL
#1	Preconstruction Audio/Video Recording	1	LSUM		
#2	Mobilization, Max	1	LSUM		
#3	Barricade, Type III, High Intensity, Lighted, Furn.	8	EACH		
#4	Barricade, Type III, High Intensity, Lighted, Oper.	8	EACH		
#5	Plastic Drum, High Intensity, Lighted, Furn.	50	EACH		
#6	Plastic Drum, High Intensity, Lighted, Oper.	50	EACH		
#7	Sign, Temp, Prismatic, Furn.	80	SFT		
#8	Sign, Temp, Prismatic, Oper.	80	SFT		
#9	Minor Traffic Devices	1	LSUM		
#10	Drainage Structure, Remove	7	EACH		
#11	Masonry and Conc. Structure, Rem	20	CYD		
#12	Sidewalk, Rem	3958	SFT		
#13	Driveway, Rem	168	SYD		
#14	Curb, Rem	1480	LFT		
#15	Pavt., Rem	2140	SYD		
#16	Sewer Rem, Less Than 24 Inch	1245	LFT		
#17	Machine Grading, Modified	6.75	STA		
#18	Subgrade Undercutting, Type II	10	CYD		
#19	Erosion Control, Inlet Protection, Fabric Drop	8	EACH		
#20	Drainage Structure, Temp Lowering	5	EACH		
#21	Full Depth Sawcutting	188	LFT		
#22	Sawcutting	126	LFT		
#23	Gas and Water Shutoff Cover Adj, Case 1	5	EACH		
#24	Subbase, CIP	837	CYD		
#25	Aggregate Base, 8 Inch, Modified	2048	SYD		
#26	Dr Structure, CB 24 Inch Dia, Modified	6	EACH		
#27	Dr Structure, SAN 48 Inch Dia, Modified	1	EACH		
#28	Dr Structure, Cover, Adj, Case 1, Modified	3	EACH		
#29	Dr Structure Cover, SAN, Modified	3	EACH		
#30	Dr Structure Cover, STM, Modified	2	EACH		
#31	Dr Structure Cover, CB, Modified	6	EACH		
#30	Sewer, 8 Inch, Modified	684	LFT		
#31	Sewer, 12 Inch, Conc., Modified	61	LFT		
#32	Sewer, Drop Inlet 8 Inch	2	EACH		
#33	Sewer Tap, 8 Inch	2	EACH		
#34	Underdrain, Subgrade, Open-Graded, 4 Inch, Modified	1400	LFT		
#35	HMA, 13A	175	TON		
#36	HMA, 36A	123	TON		
#37	HMA Approach, Modified	59	TON		
#38	Driveway, Nonreinf., Conc., 6 Inch	28	SYD		
#39	Driveway Opening, Conc., Det M	1	EACH		
#40	Curb and Gutter, Conc., Det F4, Modified	1400	LFT		
#41	Sidewalk, Conc., 4 Inch	2126	SFT		
#42	Sidewalk Ramp, ADA	884	SFT		
#43	Detectable Warning Surface, Modified	80	LFT		
#44	Steps, Conc.	2	EACH		
#45	Water Valve, Rem	6	EACH		
#46	Water Main, 4 Inch, Cut & Cap	10	EACH		
#47	Water Main, 6 Inch, Bored	1319	LFT		
#48	Water Service - Long 1 Inch, Bored	13	EACH		

#49	Water Service – Short 1 Inch, Bored	12	EACH	_____	_____
#50	Hydrant Set, Rem	2	EACH	_____	_____
#51	Hydrant Set	2	EACH	_____	_____
#52	Water Valve, 6 Inch	5	EACH	_____	_____
#53	6" x 6" Cross	1	EACH	_____	_____
#54	6" x 8" Cross	1	EACH	_____	_____
#55	Connect to Existing Water Main	1	EACH	_____	_____
#56	Restoration, Modified	7.82	STA	_____	_____
#57	Contractor Staking	1	LSUM	_____	_____

**TOTAL** \_\_\_\_\_

\_\_\_\_\_ and \_\_\_\_\_ /100 Dollars  
(written)

RESPECTFULLY SUBMITTED, \_\_\_\_\_ DATE \_\_\_\_\_

COMPANY NAME \_\_\_\_\_

ADDRESS \_\_\_\_\_

CITY \_\_\_\_\_ STATE \_\_\_\_\_ ZIP CODE \_\_\_\_\_

AREA CODE/TELEPHONE NUMBER \_\_\_\_\_ FAX NUMBER \_\_\_\_\_

AUTHORIZED SIGNATURE \_\_\_\_\_

PRINT OR TYPE NAME AND TITLE \_\_\_\_\_

EXPERIENCE QUESTIONNAIRE  
TO BE FURNISHED BY BIDDER  
CITY OF MOUNT PLEASANT, MICHIGAN

The signatory of this proposal guarantees the truth and accuracy of all statements and of all answers hereinafter made.

1. How many years have you been in business as a contractor under your present name? \_\_\_\_\_

2. How many years have you been a principal officer of a firm under a different name? \_\_\_\_\_  
\_\_\_\_\_

Name of Firm \_\_\_\_\_

3. What projects of a similar nature has your organization contracted for within the past five years? (NOTE: Fill out each blank completely.)

Name of Owner & Location	Name/Address/Phone # of Person in Charge as Reference	Type of Work	Value of Work	Date Completed
1.	_____	_____	_____	_____
2.	_____	_____	_____	_____
3.	_____	_____	_____	_____
4.	_____	_____	_____	_____
5.	_____	_____	_____	_____
6.	_____	_____	_____	_____

**City of Mt. Pleasant, Michigan  
SUPPLEMENTAL SPECIFICATIONS**

**Franklin Street Reconstruction  
Water Main Boring Project**

Construction Specifications

The work under this contract shall be completed following the 2012 MDOT Standard Specifications for Construction along with the City of Mt. Pleasant 2012 Standard Special Provisions, except as modified herein. Unless otherwise stated, this is not a state sponsored project; therefore, the payment of prevailing wages is not a requirement of this contract.

1. Time Constraints

Completion of this project within the time constraints described below is essential. The Contractor shall not begin work on the project before July 7, 2014. All work on this project shall be completed by August 8, 2014.

2. Weekends

No work is to be scheduled by the contractor on Sundays.

Residential/Commercial Access

Access to driveways for local residents, schools, and businesses shall be maintained and available for use. All driveways shall be opened by the Contractor when the Contractor is not working, including all evenings, Sundays, and holidays, except as approved in writing by the Inspector and with written notification to the residents/owners. Contractor is to keep delivery access to businesses during hours of operation.

3. Additional work By Contractor For Property Owner(s)

Any and all additional work between the Contractor and property owner shall be handled and negotiated between the Contractor and property owner. The City shall have no responsibility or liability for any additional construction.

4. Residential Refuse and Recyclable Collection

The City Contractor for trash (refuse) collection is Sunset Waste Services, (888) 707-3867, and recycling collection is MMI (989) 773-6918. Collection starts at 7:30 a.m. The Contractor shall schedule the work to allow and provide access for refuse and recycling Contractors to provide their services to the residential properties. If the refuse and recycling Contractors are unable to collect materials

due to construction operations, then the construction Contractor shall collect and dispose of the refuse and collect and deliver the recyclable material to the Material Recovery Facility (MRF) on River Road at no cost to the City. It is the responsibility of the construction Contractor to contact the refuse and recycling Contractors to coordinate operations.

#### 4. Road Closure

Streets within 300 feet (one block) of construction operations may be closed only to through traffic. All other streets and intersections shall be open to all traffic and maintained in good driving condition by the Contractor at all times. Intersections shall be open to cross street traffic except when construction work is in progress in those intersections. No more than one intersection may be closed at a time.

#### 5. Sidewalk Handicap Ramps

Handicap ramps shall be constructed following the 2012 MDOT Standard Specifications for Construction along with the City of Mt. Pleasant Special Provisions attached herein. Sidewalk handicap ramp construction shall also follow the latest ADA requirements

#### 6. Audio-Video Recording

An aboveground audio-video recording of the construction area along and adjacent to the project meeting the requirements of the Special Provision for Preconstruction Audio-Video Recording is required. Deliver to DPW prior to mobilization.

#### 7. Location Verification

The Contractor shall excavate, as the Contractor deems necessary, or at the direction of the Engineer, all points of the pipe connection or reconnection to verify the material, condition, location, alignment, and elevation prior to setting of manholes, valves, tees, or bends. The cost of this work and the temporary and permanent restoration thereof shall be included in the various unit prices for the project.

#### 8. Concrete Removal

Sidewalk, concrete drives, and curb and gutter removal shall be to existing construction joints. Unbroken joints shall be saw cut prior to removal. If a saw cut can be made where the remaining section is undisturbed, unbroken or unjointed, and is five feet (5') in length at its least direction, then removal may be to that point.

## 9. Excavated Material

All excavated material, concrete, asphalt, broken pipe, and other material shall become the property of the Contractor for disposal, except as noted.

## 10. Tree Protection and Preservation

The Contractor shall protect and preserve trees within the construction area. If the Contractor causes tree damage resulting from non-compliance with the tree crossing detail, or if excessive damage occurs to the trunk or main limbs of a tree, the Contractor shall pay for the damages to the tree. The value of the tree shall be the amount appraised by the City's tree consultant. The Contractor shall also pay for the cost of removal in the event the damaged tree must be removed within a two-year period.

## 11. Truck Route Streets

The Contractor shall not allow any trucks, or equipment associated with this project to be driven on non-truck route City streets. The Contractor shall ensure that all trucks and equipment associated with the project travel only on streets identified as truck route streets on the Truck Route Map in the construction specification details. If any of the Contractors, the Contractors' subs, and/or suppliers, are seen driving on other City streets, the Contractor shall be required to pay for resurfacing the street with a polymer-modified asphalt approved by the City at a rate of application determined by the City.

## 12. Utility Location

The Contractor shall expose all existing utilities and services that will be crossed by proposed pipe. Utility locations and elevations, as shown on the plans, are approximations and shall be verified by the Contractor prior to beginning any work. The Contractor is required to call the MISS DIG system as noted in the Standard Construction Specifications.

## 13. Soil Borings

Should a bidder desire to make soil borings along the route, the Contractor making the borings shall first obtain a permit from Public Works. Insurance meeting the requirements of the City of Mt. Pleasant is required. The soil boring permit fee is \$25.00 per hole, and will be refunded if the results of the soil boring in the form of a soil-boring log are submitted to the City Engineer within one week after the close of bidding.

#### 14. Insurance

The Contractor shall carry insurance that will provide for the full replacement cost of any property that is damaged during the project. The Contractor shall also pay the immediate costs of the homeowner/resident in the event an incident occurs, while waiting for the insurance company to make compensation. Immediate costs include but are not limited to: hotel/motel bills and meals if the building is unusable, costs for basic necessities such as beds or clothes in the event they are damaged.

#### 15. Project Meetings

The Contractor shall attend weekly progress meetings with the Engineer to provide updates on the project, the schedule of work for the following week, and to resolve outstanding issues.

#### 16. Material Testing Reports and Approved Soils Testing Laboratory

The City of Mt. Pleasant will provide the modified proctor for Hubscher 22A aggregate. Each layer of the aggregate base shall be compacted to at least 95 percent of the maximum unit weight, determined by this modified proctor, at a moisture content no greater than optimum. This test will be from Soils & Materials Engineering, Inc. If the Contractor wishes to obtain additional tests on the 22A aggregate, Soils & Materials Engineering, Inc., shall complete them. The approved soils testing laboratory for this project is Soils & Materials Engineering, Inc.

City of Mt. Pleasant

SPECIAL PROVISION  
FOR  
**AGGREGATE BASE, \_\_\_\_ INCH, MODIFIED**

City of MtPleasant

1 of 1

January 29, 2013

**A) Description.** Construct an aggregate base course on a surface approved by the Engineer.

**B) Materials.** Provide materials in accordance with the following:

The materials used for this work shall be made from the reclaimed millings of the existing HMA surface and meet the gradation requirements for 22 A Dense-Graded Aggregates of Section 902.05 of the 2012 Standard Specifications for Construction as close as possible. The method to achieve the gradation needs to be approved by the Engineer before milling starts.

**C) Construction**

Construct Aggregate Base, \_\_\_\_ inch, Modified in accordance with the requirements of Section 302 of the 2012 Standard Specifications for Construction.

**D) Measurement and Payment**

The complete work as measured for Aggregate Base, \_\_\_\_ inch, Modified will be paid for at the contract unit price for the following contract pay items and includes all equipment and labor to place this item.

**Contract Item (Pay Item)**

**Pay Unit**

Aggregate Base, \_\_\_\_ inch, Modified.....Square Yard

City of Mt. Pleasant

SPECIAL PROVISION  
FOR

**CURB AND GUTTER, CONC, DET F4, MODIFIED**

City of MtPleasant

1 of 1

May 14

**A) Description**

Install Curb and Gutter, Conc, Det F4, Modified according to this Special Provision and as shown on the plans.

**B) Materials**

The materials used for this work shall meet the requirements of Section 802.02 of the 2012 Standard Specifications for Construction.

**C) Construction**

Construct Curb and Gutter, Conc, Det F4, Modified in accordance with the requirements of Section 802 of the 2012 Standard Specifications for Construction. The material placed directly under the Curb and Gutter, Conc, Det F4, Modified shall be 22A aggregate, and shall be included in the bid price for Curb and Gutter, Conc, Det F4, Modified, as detailed on the proposed cross-section plan sheet. Thickness of this material shall be approximately 1.5 inches for local streets and 2.25 inches for major streets.

**A) Measurement and Payment**

The complete work as measured for Curb and Gutter, Conc, Det F4, Modified will be paid for at the contract unit price for the following contract pay items and includes all material, equipment, and labor to complete this item

<b>Contract Item (Pay Item)</b>	<b>Pay Unit</b>
Curb and Gutter, Conc, Det F4, Modified.....	Foot

City of Mt. Pleasant  
SPECIAL PROVISION  
FOR  
**DETECTABLE WARNING SURFACE, MODIFIED**

City of MtPleasant

1 of 1

May 14

**A) Description**

This work shall be done in accordance with the requirements of Standard Plan R-28 series and Section 803 of the 2012 Standard Specifications for Construction except that the detectable warning plate shall be an asphalt dipped Cast Iron warning plate.

**B) Materials**

The detectable warning plate shall be an asphalt dipped Cast Iron warning plate meeting the requirements of section 803 of the 2012 Standard Specifications for Construction.

**C) Construction**

This work shall be done in accordance with the requirements of Standard Plan R-28 series and Section 803 of the 2012 Standard Specifications for Construction except that the detectable warning plate shall be an asphalt dipped Cast Iron warning plate.

**D) Measurement and Payment**

The complete work as measured for Detectable Warning Surface, Modified will be paid for at the contract unit price for the following contract pay items and includes all material, equipment, and labor to complete this item.

<b>Contract Item (Pay Item)</b>	<b>Pay Unit</b>
Detectable Warning Surface, Modified.....	Foot

SPECIAL PROVISION  
FOR

**DIRECTIONAL BORE WATER MAIN MATERIALS AND CONSTRUCTION**

City of MtPleasant

1 of 6

May 14

**A) Description**

This Special Provision addresses the installation of water mains by guided boring, including connecting to existing water services or other water mains. All gate valve, gate well, and other appurtenances shall be installed using the Special Provision for Water System Materials and Construction. The Contractor will provide all labor, components, materials, tools and appurtenances necessary or proper for the performance and completion of the contract. Inspection and payment will be by the method stipulated in the contract.

Guided boring is a method of trenchless construction using a surface launched steerable drilling tool controlled from a mobile drilling frame, and includes a field power unit, mud mixing system and mobile spoils extraction system. The drilling frame differs from micro-tunneling, auger boring or pipe jacking equipment. The drilling frame is set back from an access pit that has been dug at the location of a proposed gate well (or other appurtenances), and a high-pressure fluid jet toolhead, that uses a mixture of bentonite clay and water, is launched and guided to the correct invert elevation and line required at the gate well. Using a real-time guidance system attached behind or within the toolhead, which measures inclination, roll, and azimuth, the toolhead is guided through the soil to create a pilot tunnel. Tunneling may also be performed between proposed gate wells or other appurtenances. Upon reaching the pit dug at the target location, the toolhead is removed and a reamer, with the product pipe attached, is joined to the arm swing and pulled back through the tunnel. A vacuum spoils extraction system removes any excess spoils generated during the installation. The gate wells are then completed at both locations and the surface restored to the original condition.

1) Qualifications

- i) Guided Boring Contractors shall have actively engaged in the installation of pipe using guided boring for a minimum of three years. The Contractor shall also have completed at least 5,000 feet of guided boring installations ranging from 6 inches to 24 inches in diameter, in the last year.
- ii) Field supervisory personnel employed by the Guided Boring Contractor will have at least three years' experience in the performance of this type of work.

2) Site Conditions

- i) Guided boring operations must not interfere with, interrupt or endanger the surface or activity upon the surface, and shall be located as called for on the project drawings.
- ii) Contractor must comply with all applicable jurisdictional codes and OSHA requirements.
- iii) When rock stratum, boulders, underground obstructions, or other soil conditions that impede the progress of drilling operations are encountered, the Contractor and Project Engineer will review the situation and jointly determine the feasibility of continuing drilling operations, by making adjustments or switching to an alternate construction method.

**B) Materials**

1) Pipe and Fittings

Restrained Joint PVC Pipe , fittings, and additional appurtenances used shall be in accordance with the Special Provision for Water System Materials and Construction.

2) Drilling Fluid

- i) Drilling fluid shall be a mixture of water and bentonite clay. The fluid shall be inert. The fluid should remain in the tunnel to ensure the stability of the tunnel, reduce drag on the pulled pipe, and provide backfill within the annulus of the pipe and tunnel.
- ii) Disposal of excess drilling fluid and spoils shall be the responsibility of the Contractor, who must comply with all relevant regulations, right-of-way, work space and permit agreements. Excess drilling fluid and spoils shall be disposed at an approved location. The Contractor is responsible for transporting all excess drilling fluid and spoils to the disposal site and paying any disposal costs. Excess drilling fluid and spoils shall be transported in a manner that prevents accidental spillage onto roadways. Excess drilling fluid and spoils will not be discharged into sanitary sewers, storm drain systems or waterways.
- iii) Drilling fluid returns (caused by fracturing or formations) at locations other than the entry and exit points shall be minimized. The Contractor shall immediately clean up any drilling fluid that surfaces through fracturing.
- iv) Mobile spoils removal equipment capable of quickly removing spoils from entry or exit pits and areas with returns caused by fracturing shall be present during guided boring operations to fulfill the requirements of paragraphs above.

- v) The Contractor shall be responsible for making provisions for a clean water supply for the mixing of drilling fluid. A permit to use water can be obtained from the Division of Public Works. No water may be taken from City fire hydrants. The Contractor shall be responsible for complying with all the requirements of that permit.

**C) Construction**

1) General

The Engineer must be notified immediately if any obstruction is encountered that stops forward progress of drilling operations. The Contractor and Engineer must review the situation and jointly determine the feasibility of continuing guided boring operations or switching to an alternative construction method. When it is determined that it is impossible to continue drilling operations, the Contractor will be directed how to proceed by the Project Engineer. Dewatering of pits and excavations must meet the general provisions and specifications for water main construction in effect at the City of Mt Pleasant. The type of dewatering method will be at the option of the Contractor. When water is encountered, the Contractor must provide a dewatering system of sufficient capacity to remove water, keeping any excavations free of water until the backfill operation is in progress. Dewatering shall be performed in a manner so that removal of soil particles is held to a minimum.

2) Preparation

Excavate required pits in accordance with the project drawings.

The drilling procedures and equipment shall provide protection to workers, particularly against electrical shock. As a minimum, grounding mats, grounded equipment, hot boots, hot gloves, safety glasses, and hard hats will be used by crewmembers. The drilling equipment shall have an alarm system capable of detecting electrical current. The Contractor is responsible for existing utilities, as stated under the Miss Dig System. All utilities that the boring operation may encounter shall be exposed to determine the actual depth and location. The costs of exposing utilities, whether shown on the plans or not, shall be the responsibility of the Contractor and included in the bid price for installing the new water main.

3) Guided Boring Operations

i) Equipment

- (1) The drilling equipment must be capable of placing the pipe within the planned line and grade.

- (2) The drilling equipment must have a minimum pullback rating of 35,000 lbs., a torque rating of 2,000 foot lbs., and mud flow of 24 gallons per minute.
- (3) The guidance system must have the capability of measuring inclination, roll and azimuth. The guidance system must have an independent means to ensure the accuracy of the installation. The Contractor shall demonstrate a viable method to eliminate accumulated error due to the inclinometer (pitch or accelerometer). The guidance system shall be capable of generating a plot of the borehole survey for the purpose of an as-built drawing. The guidance system must meet the following specifications.

Inclination:	Accuracy	0.06'
	Range	90°
	Repeatability	0.09
Roll:	Accuracy	0.1
	Range	0' to 360°
Azimuth:	Repeatability	0.1
	Range	0' TO 360°

4) Pilot Hole Boring

- i) The entry angle of the pilot hole and the boring process shall maintain a curvature that does not exceed the allowable bending radius of the product pipe.
- ii) Alignment Adjustments and Restarts
  - (1) The Contractor shall follow the pipeline alignment as shown on the drawings, within the specifications stated. If adjustments are required, the Contractor shall notify the Project Engineer for approval prior to making the adjustments.

(2) In the event of difficulties at any time during boring operations requiring the complete withdrawal from the tunnel, the Contractor will be allowed to withdraw and abandon the tunnel by completely filling the void and begin a second attempt at a location approved by the Project Engineer; or at the option of the Contractor and with the approval of the Engineer, the Contractor may excavate at the point of the difficulty and install the product pipe by trench method per the contract documents and technical specifications for construction. The number of access pits shall be kept to a minimum and the equipment must be capable of boring the following lengths in a single bore. The guided boring system shall have the capability of boring and installing 12-inch diameter and smaller water main in a continuous run without intermediate pits, for a minimum distance of 700 feet.

iii) Installing Product Pipe

(1) After the pilot hole is completed, the Contractor shall install a swivel to the reamer and commence pullback operations. Pre-reaming of the tunnel may be necessary and is at the option of the Contractor.

(2) Reaming diameter shall not exceed 1.4 times the diameter of the product pipe being installed.

(3) The product pipe being pulled into the tunnel shall be protected and supported so that it moves freely and is not damaged by stones and debris on the ground during installation.

(4) Pullback forces shall not exceed the allowable pulling forces for the product pipe.

(5) The Contractor shall allow sufficient length of product pipe to extend past the termination point to allow connections to adjacent pipe sections or gate valves. Pulled pipes shall be allowed 24 hours of stabilization prior to making tie-ins. The length of extra product pipe shall be at the Contractor's discretion and cost.

(6) The Contractor shall install a braided 12 gauge, blue in color, tracer wire at the same time as the product pipe. The tracer wire shall be connected to each hydrant at a bolt on the bottom of the hydrant barrel by use of a soldered connection, a crimped U-shaped connection, or a ring lug.

iv) Water Service Connections

Water service connections shall be made in accordance with the special provision for Water System Materials and Construction.

**D) Testing**

Testing shall be done in accordance with the special provision for Water System Materials and Construction.

**E)**

**Measurement and Payment**

Payment for the completed work for the various items shall be as described in the Special Provision for Water System Materials and Construction.

<b>Contract Item (Pay Item)</b>	<b>Pay Unit</b>
Water Main, __ inch Bored.....	Linear Foot
Water Service - Short, __ inch, Bored.....	Each
Water Service - Long, __ inch, Bored.....	Each

City of Mt. Pleasant

SPECIAL PROVISION  
FOR

**DR STRUCTURE COVER, \_\_\_\_\_, MODIFIED**

City of MtPleasant

1 of 2

May 14

**A) Description**

Dr Structure Cover, \_\_\_\_\_, Modified, hereinafter referred to as Cover, shall consist of materials and work as described in Section 403 of the Michigan Department of Transportation 2012 Standard Specifications for Construction except as modified herein.

**B) Materials**

Covers shall include geotextile fabric, frame, grate or cover and shall be of the type indicated on the plans.

1) Dr Structure Cover, CB , Modified

Catch basin cover types shall depend on their location on the plans.

- i) Catch basins covers located in Det M openings shall be model 5100Z with type M1 grate as manufactured by East Jordan Iron Works, or approved equal.
- ii) All other catch basins covers located in the curb shall be model 7000 with type M2 grate as manufactured by East Jordan Iron Works, or approved equal.
- iii) Unless otherwise indicated on the plans, catch basins covers outside of the curb shall be model 1040 with type M1 grates as manufactured by East Jordan Iron Works, or approved equal.

2) Dr Structure Cover, STM, Modified

- i) Storm drainage structure covers shall be model 1040 with type B cover as manufactured by East Jordan Iron Works, or approved equal.

3) Dr Structure Cover, SAN, Modified

- i) Sanitary drainage structure covers shall be model 1040 with type A cover as manufactured by East Jordan Iron Works, or approved equal. The preferred cover shall be stamped with the City of Mt. Pleasant logo.

**C) Construction**

Construct drainage structure covers according to the details on the plans and section 403 of the Standard Specifications. Drainage structure shall be wrapped with geotextile fabric as shown on the plans.

**A) Measurement and Payment**

This work will be measured and paid as specified in section 403 & 802 of the Standard Specifications using the following contract items (pay items).

<b>Contract Item (Pay Item)</b>	<b>Pay Unit</b>
Dr Structure Cover, CB, Modified.....	Each
Dr Structure Cover, STM, Modified.....	Each
Dr Structure Cover, SAN, Modified.....	Each

City of Mt. Pleasant

SPECIAL PROVISION  
FOR

**GAS/WATER SHUTOFF COVER ADJ, CASE 1**

City of MtPleasant

1 of 1

May 14

**A) Description**

Adjust gas and water shutoff covers according to this Special Provision and as shown on the plans.

**B) Materials**

The materials used for this work shall meet the requirements of the utility owning the shutoff.

**C) Construction**

Adjust gas and water shutoff covers in accordance with the requirements of Section 403.03 C of the 2012 Standard Specifications for Construction for drainage structures.

**A) Measurement and Payment**

The complete work as measured for Gas/Water Shutoff Cover, Adj, Case 1 will be paid for at the contract unit price for the following contract pay items and includes all material, equipment, and labor to complete this item

<b>Contract Item (Pay Item)</b>	<b>Pay Unit</b>
Gas/Water Shutoff Cover, Adj, Case 1.....	Each

City of Mt. Pleasant

SPECIAL PROVISION  
FOR

**HMA APPLICATION ESTIMATE - LOCAL STREET**

City of MtPleasant

1 of 1

May 14

**A) Description**

This work shall be done in accordance with the requirements of section 501 of the 2012 Standard Specifications for Construction and applicable supplemental specifications and special provisions, and as specified herein. The HMA Approach bid item shall include paving of HMA Driveways and cross streets. Cross streets shall be constructed in two passes at the same cross-section as the mainline pavement, follow the procedures outlined in MDOT 501.03F4

**B) Materials**

The HMA leveling course and HMA Approach shall be HMA, 13A. The HMA top course shall be HMA, 36A.

The leveling course shall have a yield of 175 pounds per square yard and the binder shall be PG 56-28

The top course shall have a yield of 125 pounds per square yard, an AWI of 260, minimum, and the binder shall be PG 58-28.

HMA Approach shall be 13A. Cross streets shall be constructed in two passes, have a yield of 300 pounds per square yard, and the binder shall be PG 58-28. Driveways shall be constructed in one pass, have a yield of 220 pounds per square yard, and the binder shall be PG 58-28.

The HMA Bond Coat material shall be per Section 501.03. The uniform rate of application shall be 0.05 - 0.15 gallons per square yard.

City of Mt. Pleasant  
SPECIAL PROVISION  
FOR  
**LINES, LEVELS, AND SURVEYS**

City of Mt. Pleasant

1 of 1

May 14

Staking is by the Contractor. The contractor shall carefully preserve all benchmarks, reference points, grade stakes, and other necessary control points and be held responsible for all errors that may result from their loss or disturbances.

SPECIAL PROVISION  
FOR

**MACHINE GRADING, MODIFIED**

City of MtPleasant

1 of 1

May 14

**A) Description**

This work shall consist of all excavation, including earth, necessary to shape the subgrade to the cross-sections shown on the plans for pavements, sidewalks, curbs, drive approaches, etc., within the right-of-way of the project. The work shall include proper disposal of excavated materials. This work shall also include all embankments necessary to shape areas behind curb and gutter, around all drives and sidewalks to grade to allow for placement of topsoil.

**B) Materials**

This work shall conform to the requirements of Section 205 of the Michigan Department of Transportation 2012 Standard Specifications for Construction of machine grading, earth excavation, embankment and density except as modified herein.

**C) Measurement and Payment**

Machine Grading, Modified will be measured by length in Stations along the street centerline and will be paid for at the contract unit price per Station, which price shall be payment in full for all labor, equipment and materials, including embankment, excavation and disposal of excavated material needed to accomplish this work, on both sides of the street and any adjacent side streets to the limits shown on the plans

Suitable excavated material as determined by the Engineer may be used as fill material behind proposed curb. Use of excavated material for fill material will be considered as included in the work of Machine Grading, Modified.

The completed work as measured for Machine Grading, Modified will be paid for at the contract unit price for the following contract item (pay item).

<b>Contract Item (Pay Item)</b>	<b>Pay Unit</b>
Machine Grading, Modified.....	Station

City of Mt. Pleasant  
SPECIAL PROVISION  
FOR  
MAINTAINING TRAFFIC

City of MtPleasant

1 of 3

May 14

**A) Description**

Traffic shall be maintained throughout the project according to sections 104.11 and 812 of the Michigan Department of Transportation 2012 Standard Specifications and as specified herein. The Contractor shall for the safety and protection of through and local traffic, furnish, erect, and maintain traffic control devices as shown on the plans and as directed by the Engineer. The Contractor shall remove the traffic control devices in a prompt, safe, and orderly manner upon completion of the work or when directed by the Engineer.

The Contractor shall maintain access to business and residential driveways at all times as described herein.

The Contractor shall notify the Engineer a minimum of 72 business hours prior to the implementation of any detours, street closures, or lane closures.

Traffic control elements, traffic control devices, barricade lighting, barricade spacing, taper lengths, etc., shall conform to the requirements of the 2005 edition of the Michigan Manual of Uniform Traffic Control Devices as amended, unless otherwise specified herein. This includes advance warning signs, barricades and channeling devices at intersecting streets, on which traffic is to be maintained.

The Contractor is required to contact all local and state police, fire, emergency services that have jurisdiction within the construction influence area a minimum of five (5) calendar days prior to the implementation of any lane closure or detours.

Changes and/or adjustments to the maintaining traffic plans and standards may be applied as determined by the Engineer.

1) Construction Influence Area (CIA)

The CIA shall include the right-of-way of the street where work is to take place from the beginning to the end of the construction signing and inclusive of all the construction signing on the intersecting streets & detours..

**B) Materials**

All traffic control devices and their usage shall conform to the 2005 edition of the Michigan Manual of Uniform Traffic Control Devices as amended, and as specified as herein.

Construction signing shall be required as shown in the Maintaining Traffic plan sheets.

Signs, barricades, and plastic drums shall be cleaned over the entire surface as required by the Engineer.

1) Temporary Signs

All signs must be approved by the Engineer prior to use.

All diamond-shaped warning signs shall be 48" x 48" mounted at a 7' minimum bottom height. Distances shown between construction warning, regulatory, and guide signs shown on the plans and typical are approximate and may require field adjustment, as directed by the Engineer. All temporary signs shall be constructed with legends and symbols flush to the sign's face and not extending beyond the sign borders or edges. Temporary warning, regulatory, and guide signs not required for a particular work Operation shall be removed, completely covered, or laid down with the legs off, as directed by the Engineer.

**C) Construction**

The contractor shall limit street excavation activities to 300 feet at a time. The contractor's backfill and aggregate base placement shall follow closely behind, such that no more than 300 feet of road shall be without existing pavement or a minimum of four (4) inches of compacted gravel on the sub-base.

**D) Residential Access**

Access to driveways for local residents and businesses shall be maintained and available for use. All driveways shall be open when the contractor is not working, including all evenings, nights, Sundays, and holidays except as approved in writing by the inspector and with written notifications to the residents/owners by the contractor.

**Street Closures**

Streets within 300 feet (one block) of construction operations may be closed only to through traffic. All other streets and intersections shall be open to all traffic and maintained in good driving condition by the contractor at all times. Intersections shall be open to cross street traffic except when construction work is in progress in those intersections. No more than one intersection may be closed at a time.

Residential Refuse and Recycling Collection

The city contractor for trash (refuse) is Republic Services/Allied Waste, 877-698-7274, and MMI Industries, 989-773-6918, for recycling. Collection begins at 7:30 a.m. The contractor shall schedule the work to allow and provide access for refuse and recycling contractors to provide their services to the residential properties. If the refuse and recycling contractors are unable to collect materials due to construction operations, then the construction contractor shall collect and deliver the refuse and recyclable material to a cross street for collection at no cost to the City. It is the responsibility of the construction contractor to contact the refuse and recycling contractors to coordinate operations.

**E) Measurement and Payment**

This work will be measured and paid as specified in section 403 & 802 of the Standard Specifications using the following contract items (pay items).

<b>Contract Item (Pay Item)</b>	<b>Pay Unit</b>
Barricade, Type III, High Intensity, Lighted, Furn.....	Each
Barricade, Type III, High Intensity, Lighted, Oper.....	Each
Minor Traf Devices.....	Lump Sum
Plastic Drum, High Intensity, Furn.....	Each
Plastic Drum, High Intensity, Oper.....	Each
Sign, Type B, Temp, Prismatic, Furn.....	Square Foot
Sign, Type B, Temp, Prismatic, Oper.....	Square Foot
Traffic Regulator Control.....	Lump Sum

SPECIAL PROVISION  
FOR

**PRECONSTRUCTION AUDIO VIDEO RECORDING**

City of MtPleasant

1 of 4

May 14

**A) Description**

The work covered under this special provision consists of furnishing all labor, materials and equipment to provide High Definition color video recording along the entire length of the project to serve as a record of "original" conditions.

**B) Equipment**

All audio-video taping equipment shall be supplied and operated by a professional firm actively engaged in pre-construction audio-video recording.

**C) Inspection**

**1) Requirements**

Prior to commencing any other work, a continuous color audio-video recording shall be made of the project.

**i) Coverage Area**

Shall include all above ground features located within the zone of construction influence. Of particular concern are any existing faults, fractures, defects or other imperfections exhibited by any above ground features.

**2) Qualifications**

The audio-video and photography shall be performed by a professional, qualified, established audio-video recording firm knowledgeable in construction practices which have a minimum of one year of experience in the implementation of established inspection procedures.

**3) Acceptance of Recording**

The City reserves the right to reject the audio-video recording because of poor quality, unintelligible audio, or uncontrolled pan or zoom. Any recording rejected by the City shall be re-recorded at no cost to the City. Under no circumstances shall construction begin until the City has received and accepted the audio-video recording.

**4) Equipment**

When conventional wheeled vehicles are used for recording, the distance from the camera lens to the ground shall not be less than twelve (12) feet to insure proper perspective. In some instances, audio-video coverage will be required in areas not accessible on conventional wheeled vehicles. Such coverage shall be obtained by walking or special conveyance approved by the Engineer.

**i) Audio-Video Recording Media**

The audio-video recording provided shall be a color cassette utilizing the VHS format and shall be compatible with the City's tape player or in a DVD format.

**ii) Camera(s)**

A color video camera shall be used that shall have High Definition recording capability. The camera shall be a professional quality camera acceptable to the Engineer.

**5) Execution**

**i) Audio**

Each tape shall begin with the current date, project name, project number and municipality, and be followed by the general location; i.e. name of the street or location of "cross country" line, viewing side and direction of progress.

**ii) Video**

To preclude the possibility of tampering or editing in any manner, all video recordings shall, by electronic means, display continuously and simultaneously generated transparent digital information to include the date and time of recording, as well as the corresponding engineering stationing numbers. The date information will contain the month, day and year. For example, 3/16/01, and shall be placed directly below the time information. The time information shall consist of hours, minutes, and seconds, separated by colons. For example, 11:25:14. This transparent information shall appear on the extreme upper left-hand third of the screen.

**(1)Engineering Station Numbers**

Station numbers shall be continuous, accurate, correspond to the project stationing and include the standard engineering symbols (for example, 16+50). This information shall appear in the lower half of the viewing screen.

**(2)Additional Information**

Below the engineering stationing, periodic transparent alphanumeric information, consisting of the name of the project, name of the area covered, direction of travel, viewing side, etc., shall appear.

**iii) Audio-Video Tracks**

The audio-video recording shall consist of one (1) video and two (2) audio tracks, all of which shall be recorded simultaneously. All tracks shall consist of original, live recordings and, thus, shall not be copies of other audio or video recordings. Audio track 1 shall contain the narrative commentary of the camera operator, recorded simultaneously with his fixed elevation video record of the zone of influence of construction. Audio Track 2 shall contain the narrative commentary and evaluations of the ground level remote technician whose function shall be to provide a complete circumsppection of any features not adequately visible to the camera operator and to describe in detail the extent of any damage encountered. In order to maintain viewer orientation, transition from fixed camera overview to remote camera picture shall be by means of an electronic dissolve.

**iv) Lighting Requirements**

All taping shall be done during times of good visibility. Auxiliary lighting may be required to fill in shadow areas and/or when recording inside a building. The lighting shall be sufficient to illuminate all details in the area. Lighting shall be required upon the request of the Engineer.

**v) Recording Coverage**

Recording coverage shall include all surface features located within the zone of influence of construction specified on the plans and supported by appropriate audio description. Audio description shall be made simultaneously with video coverage.

**(1)Coverage**

Video coverage shall include, but not be limited to, all existing driveways, sidewalks, curbs, ditches, streets (including condition of paving for full width), landscaping, trees, culverts, catch basins, manholes, headwalls, retaining walls, fences, visible utilities, and all buildings located within the zone of influence. Of particular concern are any existing faults, fractures, defects, or other imperfections exhibited by the above-mentioned surface features.

**(2)Houses and Buildings**

Structures shall be identified visually by house or building number, when possible, in such a manner that the progress of the tape and the proposed construction may be located by reference to the houses and buildings.

**(3)General**

Taping shall not be done during periods of visible precipitation or when more than 10% of the ground area is covered with snow, leaves, floodwaters or debris, unless otherwise authorized by the Engineer.

**(4)Rate of Speed**

The rate of speed in the general direction of travel of conveyance used during taping shall not exceed 48 feet per minute. Panning rates and zoom-in, zoom-out rates shall be controlled sufficiently such that the rates will produce clarity of the object viewed during playback of the tapes.

**(5)Coverage Area**

The Engineer shall have the authority to designate areas that may be omitted or added for audio-video coverage.

**(6)Identification**

**(a) Tape Cassettes and Tape Cases**

Cassettes and cases shall be properly identified by tape number, location and project name and municipality in a manner acceptable to the Engineer.

**(b) Records**

A record of the contents of each tape shall be supplied by a sheet identifying each segment of the tape by location; i.e. roll number, street or road viewing, tape counter number, viewing side, point starting from, traveling direction and ending destination point.

**A) Measurement and Payment**

The complete work as measured for Preconstruction Audio Video Taping will be paid for at the contract unit price for the following contract pay item and includes all material, equipment, and labor to complete the item.

<b>Contract Item (Pay Item)</b>	<b>Pay Unit</b>
Preconstruction Audio Video Recording.....	Lump Sum

City of Mt. Pleasant  
SPECIAL PROVISION  
FOR  
RESTORATION, MODIFIED

City of MtPleasant

May 14

**A) Description**

This work shall include all labor, materials and equipment to clean up and restore public and private ground to a condition equal to or better than that which existed prior to construction. This includes removal and legal disposal of all construction debris, litter, and materials.

**B) Materials**

1) Topsoil

Black dirt or natural surface soil, high in organic material, free from stones, brush, debris, objectionable weeds, or other litter, and approved by the City Engineer prior to spreading. The engineer may perform a soil test prior to approval. Peat material is not acceptable.

2) Fertilizer

Fertilizer shall be commercial seed starting 20-10-10 grade supplied in the manufacturer's packaging with composition clearly marked. Bulk fertilizer may be used when certified delivery slips are furnished by the Contractor, meeting section 816 of the 2012 MDOT specifications.

3) Seed

Seed material and application shall meet section 816 of the 2012 MDOT specifications, using TUF seed mixture.

4) Mulch and Adhesive

Mulch and adhesives shall meet section 816 of the 2012 MDOT specifications, for wood fiber mulch. Paper mulch or straw are not acceptable.

**C) Construction**

1) Preparation of Seed Bed

i) Grading

Grades on areas to be seeded shall be maintained in a true and even condition. Where the grades are not defined, they shall be established by the Contractor to blend with existing adjacent grades without irregularities and shall provide for proper drainage.

**ii) Placing Topsoil**

Topsoil shall be evenly spread by blade graders, or other approved methods, to a minimum depth of four inches (4"). Any irregularities in the surface resulting from topsoiling or other operations shall be corrected in order to prevent the formation of depressions where water will stand. Topsoil shall not be placed until the subgrade has been smoothly graded and compacted, and the engineer or inspector approves the subgrade in writing.

**iii) Application of Fertilizer**

Fertilizer shall meet the requirements of section 812 of the 2012 MDOT specifications for Class A fertilizer.

**iv) Cleanup**

After completion of the above operations, the surface shall be cleared of stones, roots, brush, wire, grade stakes, and other objects that might be a hindrance to maintenance operations.

**2) Seeding**

TUF seed mixture meeting requirements of section 816 of the 2012 MDOT specifications shall be used on all lawn areas and adjacent backslopes. No seeding shall be done until the Engineer has inspected the seed container and has given written approval of the topsoil. Seeding for erosion control measures shall be cereal rye seed.

**3) Mulching**

**i) Straw and Hay Mulch**

As part of the seeding and fertilizing operations, wood fiber mulch shall be spread over the surface as required in section 816 of the 2012 MDOT specifications. Paper mulch is not acceptable.

**ii) Mulch Adhesive**

Mulch shall be held in place by a spray coating of mulch adhesive. The Contractor shall protect all traffic, signs, structures, and other objects from being marked or disfigured by the adhesive material. Fire hydrants shall be covered prior to the placement of all sprayed materials. Adhesive material shall be applied uniformly at a rate of 400 gallons per acre, sprayed simultaneously with the mulch, or a surface application of adhesive sprayed immediately following mulching.

**4) Establishment of Seeded Areas**

The Contractor shall be responsible for the proper care of the seeded area during the period when the grass is becoming established, and shall be responsible for a total grass cover. The acceptance of the work will not be given until grass cover is established.

i) Watering

Seeded areas shall be watered whenever excessive drying is evident during the period set for establishment of the seeded area. The Contractor shall be responsible for the proper care of the seeded areas and for the establishment of a uniform stand of grass until final acceptance of the entire work covered by the Contract.

The City has established a program to encourage residents to water the newly seeded areas, to help establish the lawn. Residents will be given a credit on their water bill for watering the newly seeded areas.

ii) Weeds

After the grass has become established, if it appears to have more than ten percent (10%) weeds, the Contractor shall spray with an approved herbicide (weed killer).

**D) Measurement and Payment**

Restoration, Modified shall be paid for by the square station as measured along the project centerline and will include all work necessary to restore both sides of the street. The price paid shall be payment in full for all Restoration, Modified work.

**Contract Item (Pay Item)**

**Pay Unit**

Restoration, Modified.....

Station

CITY OF MT. PLEASANT  
SPECIAL PROVISION  
FOR  
**SANITARY SEWER MATERIALS AND CONSTRUCTION**  
1 of 11

**DESCRIPTION**

The Contractor shall furnish all labor, equipment, and materials to completely construct, test, and place in operation, the sanitary sewer system as shown on the Plans and specified herein.

**MATERIALS**

A. Service Pipe

Six-inch (6") service pipe used for riser pipe and house leads shall be constructed of the following material:

PVC conforming to D-3034 with 0.180-inch wall thickness (SDR-35). Joints and couplings shall conform to ASTM D-3212. Pipe shall have a home mark, and shall not be blue in color.

B. Sewer Main Pipe

Unless otherwise specified on the Plans or Proposal form, the Contractor shall utilize the following materials, subject to Specifications and size limitations. Sewer pipe materials may be changed only at manholes.

1. Eight-inch (8") diameter through fifteen-inch (15") diameter pipe - Shall be SDR 35 PVC sewer pipe meeting the requirements of ASTM D-3034.
2. Sixteen-inch (16") diameter pipe and larger - Shall be SDR 35 PVC pipe meeting the requirements of ASTM F-679.
3. Joints shall meet ASTM D-3212 push on type with seating mark. Service lead connections shall be made using standard wye fittings.

C. Manholes

1. Pre-Cast Sections

Manholes shall be constructed of circular pre-cast concrete units with circular reinforcement and shall conform to the requirements of the current Specifications for Pre-Cast Reinforced Concrete Manhole Risers and Tops ASTM C-478.

Marking of the sections shall be done within six (6) days after manufacture. Certification from the manufacturer that the manholes supplied meet the required Specifications shall be provided to the Engineer by the Contractor.

Cone sections shall be the eccentric type with a minimum depth of 12".

Joints between sections shall be rubber O-ring gasket. Mastic sealing compound will not be accepted.

Manhole connections shall be made with an integrally cast seal system, such as "Kor-N-Seal", "Lock-Joint Flexible Manhole Sleeve", or an approved equal. Connections to existing manholes (without flexible coupling) with PVC pipe shall be made using a water stop cemented to the plastic pipe.

## 2. Manhole Steps

Manhole steps shall be plastic-coated steel. They shall be placed sixteen-inches (16") apart unless otherwise shown and shall be cast in the manhole walls. It will not be acceptable to grout the steps in place after the manhole section is poured.

Plastic-coated steel steps shall consist of a 3/8-inch diameter deformed steel reinforcing rod covered with a copolymer polypropylene plastic. The steel rod shall be grade 60 and conform to the ASTM A-615. The plastic shall conform to ASTM 2146-68, Type II, Grade 49108.

Steps shall also conform to the following standards:

- a. Michigan Department of Labor Occupational Safety Standards, Part 3, Rule 341.
- b. ASTM C-478.
- c. OSHA 1910.27 G

3. Castings

Manhole frames and covers shall be EJIW 1040 or equal. The preferred casting shall be stamped with the City of Mt. Pleasant logo, available at East Jordan Iron Works. Castings shall have a minimum clear internal opening of 24 inches.

Top of casting shall be set as follows:

- a. Flush with paved or grass surfaces.
- b. Four-inches (4") below gravel road surface with eight-inches (8") of adjustment.

4. Cement Mortar

Mortar for block and brick work in manholes and other appurtenances shall be mixed in the proportion of one (1) part Portland cement to three (3) parts sand. Hydrated lime may be added in proportions not to exceed ten percent (10%) of the volume of the cement.

5. Adjusting Rings

Casting adjustments shall be accomplished with pre-cast concrete grade rings conforming to ASTM C478. Rings shall have an ID not less than twenty-four-inches (24") nor greater than twenty-five inches (25"), a minimum thickness of two-inches (2"), and a minimum OD of forty-inches (40").

6. Brick and Block

Fill-in around pipes shall be accomplished with bricks and/or blocks. Brick shall be concrete confirming to ASTM C-55, Grade N. Block shall be concrete conforming to ASTM C-139.

7. Concrete

Concrete used in manhole construction shall be transit mixed with a twenty-eight (28) day compressive strength of 3,000 psi. The approximate proportions of the mix shall be one (1) part cement, two (2) parts fine aggregate, and three (3) parts coarse aggregate. The mix shall contain six (6) sacks of cement per cubic yard with a maximum allowable slump of three and one half-inches (3 1/2").

## CONSTRUCTION

### A. Sewer Main

Polyvinyl chloride (PVC) pipe shall be installed according to the UniBell Plastic Pipe Association Recommended Standards and Practices, and shall conform to ASTM D2321.

The installation, handling, and storage of all pipe shall be in accordance with manufacturer's recommendations. Pipe shall be protected at all times against impact, shocks, and free fall. Stockpiling of pipe at the job site shall be in such a location as to minimize handling.

Trenches for pipe shall be excavated so that there will be a minimum clearance of six-inches (6") on each side of the barrel of the pipe and a maximum width of trench at the level of the top of the pipe of not more than 16 inches greater than the OD of the pipe 30 inch ID or smaller and not more than 24 inches greater than the OD of pipe 33 inch ID or larger. There shall be, at all times, sufficient width to permit the pipe to be laid and to permit first-class construction methods to be used. Sufficient space shall be provided in the trench to permit the joint to be properly made.

The trench bottom shall be undercut a minimum of four-inches (4") below the final location of the pipe and the trench then filled with Class II sand or crushed stone compacted with hand tampers to provide a cushion for bedding the pipe. The bedding material shall be free of stone over 1 ½ inches in size.

The trench shall be dry during the pipe laying operation. Bell holes shall be excavated so that after placement, the barrel of the pipe will have full bearing on the trench bottom. The laying of pipe shall commence at the outlet and proceed upgrade with spigot ends pointing in the direction of flow.

All pipe shall be laid to the line and grade called for on the Plans utilizing an in-line laser beam system for vertical and horizontal control. Each pipe, as laid, shall be checked by the Contractor with a suitable target to insure that this result is obtained. Vertical elevation of the invert shall, at any point, be within plus or minus 0.04 foot (1/2-inch) of plan elevation. Horizontal alignment must meet the same tolerance.

Joints shall be made in accordance with the manufacturer's requirements. The socket of the pipe last laid shall be wiped clean and the spigot end of the pipe to be laid shall then be centered and pushed home to the stop mark. The pipe shall be centered so that they will form a sewer with a uniform invert.

After the pipe is laid, Class II sand, fine gravel or crushed stone shall be placed the entire width of the trench up to the spring line of the pipe. Backfill shall be carefully tamped under the haunches of the pipe. Care shall be taken during backfilling and tamping so that the line and grade of the pipe are not disturbed. After compacting, Class II sand, fine gravel or crushed shall be placed until the entire width of the trench is filled to not less than one foot (1') above the top of the pipe. The maximum stone size for backfill material within one foot (1') of the top of pipe shall be 1 ½ inches. If sand is used for backfill around and over the pipe, it shall be thoroughly compacted with a vibratory compactor; hand compaction will not be acceptable.

The remainder of the backfilling may be done with Class II sand backfill. All backfill is to be compacted in maximum one-foot (1') lifts to a density of ninety-five percent (95%) of the maximum unit weight as determined by the modified proctor and shall contain no debris, frozen material, organic material, etc., within two feet (2') of the top of the pipe. Unless crushed stone is used as backfill around the pipe, the use of a hoe pack will not be allowed for compaction.

Main sewer line stubs for future connections shall be furnished and placed by the Contractor according to details shown on the drawings and as directed by the Engineer. The end of the stub where future connections will be made shall be properly supported on crushed stone or concrete and braced when not resting on original ground so that any settlement will not disturb the connection. The end of the main sewer line stub shall be witnessed and marked in the manner described for sanitary sewer leads.

Excavation for structures shall be extended sufficiently beyond the limits of the structure to provide ample room for form construction, backfill compaction, and other construction methods to be followed, wherever necessary.

In case soft material is encountered in the bottom of a sewer trench or underneath a drainage structure which, in the opinion of the Engineer, is not suitable for supporting the pipe, the Engineer may order the removal of this soft material and its replacement with crushed stone, concrete or other material in order to make a suitable foundation for the construction of the sewer structure.

Where the construction is on or along the line of an existing sewer, the Contractor shall maintain sanitary sewer services by means of bypass pumping or other methods approved by the Owner.

The pumps, when used, shall be large enough to handle the peak daily flow of the pipe which is being bypassed. If flow exceeds the pump capacity, the plugs shall be pulled allowing the flow to pass through the downstream sewer. When plugs are used to control flow or for pumping, they shall be of the pneumatic type to allow for quick release without entering the manhole.

If sand bags are used to block a downstream pipe in a manhole, each bag shall be tied off with a rope to allow removal of the sand bag without entering the manhole.

Flow control shall be monitored so that surcharging of sewers, flooding of private or public property (including basements) does not occur. Any damage caused by the control of flow shall be the Contractor's responsibility to repair, correct or indemnify.

Smaller sewers with low flow, which must be temporarily blocked, shall use the bypass pumping procedure or temporary fluming to maintain flow.

The Contractor shall be responsible for any damage that may result from failure to maintain sewer flow.

B. Service Leads

1. Riser Pipe

Where shown on the Plans or where directed by the Engineer, the Contractor shall put in six-inch (6") pipe risers extending from the branch connection in the sewer up to within eleven-feet (11') of the ground surface or to a depth adequate to serve the house lead elevation shown at the property line. These pipes shall be laid up with a joint as specified, and the top pipe shall be closed with a stopper. All risers shall be laid up and held securely in place and the backfill shall be carefully placed around them so as not to disturb them. One-inch (1") crushed stone, six-inches (6") thick shall be placed under and around the "Y" branch and over it to a height of six-inches (6") above the sewer to furnish an adequate support to the riser pipe.

The top of each riser pipe shall be measured and recorded by the Contractor in the same manner as specified for measuring and marking stub connections.

## 2. Sewer Leads

Sewer leads shall be installed at the locations and elevations shown on the Plans or as directed by the Engineer. Before sewer leads are installed, the Contractor shall confirm the exact location with the property owner, if property is occupied. On vacant lots, the sewer leads will generally be located at approximately the mid-point of the front lot line, unless the owner requests another location. The sewer leads shall connect to the six-inch (6") wye or six-inch (6") riser and generally extend to the street right-of-way line. All sewer leads that do not have other pipe connected to them immediately shall be fitted with suitable stoppers and braced for pressure tests.

In order to properly mark the location of every wye, riser, clean out, and sewer lead, the Contractor shall make accurate measurements of each installation before the sewer lead is backfilled. The measurements shall indicate the distance from each wye to the center of the downstream manhole. The measurement of risers, clean outs, and sewer leads shall indicate the distance from the main line sewer and to two (2) fixed reference points, i.e. fire hydrants, manholes, building corners.

The Contractor shall furnish the Engineer with a copy of these measurements immediately upon the completion of each street.

In addition to measurements, the Contractor shall furnish and place a treated two inch by four inch (2" x 4") marking stick at each lead of such length that it will reach from the lead to within six-inches (6") of the ground surface. Each marker shall be set in a vertical position and held vertical while backfilling the trench. Two (2) 16-penny common nails shall be driven into the top of each two inch by four inch (2" x 4") marking stick so the sewer lead location may be found with a magnetic locator.

## 3. Tapping Existing Mains

Where existing main sewer lines are to be tapped, the Contractor shall use a pre-formed saddle approved by the Engineer. A hole shall be cored to the proper size in the main line and all rough edges smoothed to prevent obstructions. Tap shall be horizontal to forty-five (45) degrees above horizontal. No vertical taps are allowed. The exterior of the main line pipe shall be thoroughly cleaned in order to provide a prepared surface for gluing the saddle onto the main line. The Contractor shall clean the main line of all debris, which may enter during his tapping operation. The Contractor shall insure that the sewer lead does not protrude into the main.

The Contractor shall notify the Engineer prior to making any connection to the main line and shall not backfill the connection prior to approval of the Engineer. If the pipe becomes covered with water or backfill material, the Contractor shall remove the water or material to facilitate the inspection.

### C. Manholes

Sanitary sewer manholes are to be constructed as shown on the detailed drawings. Pre-cast concrete manholes sections shall be installed in a plumb position.

All masonry items shall be clean and shall be thoroughly wetted by immersion, when practical to do so, just before laying. If immersion is impractical, masonry items shall be thoroughly sprinkled before laying.

All items shall be laid in a full bed of mortar, without subsequent grouting, flushing or filling and shall be thoroughly bonded. Interior joints shall not be more than 1/4-inch in width. Whole brick and block only shall be used, except to effect closures.

Mortars mixed by hand shall be prepared in a suitable clean watertight box. The ingredients, except water, shall first be thoroughly mixed dry until of uniform color; then water shall be added and the mixing continued until proper consistency and uniform texture is produced.

No re-tempered mortar or mortar that has been mixed for more than thirty (30) minutes shall be used in the work. No cement mortar shall be mixed when temperature is below thirty (30) degrees Fahrenheit without properly heating the sand and water.

All manholes shall be finished so that all visible leakage is repaired. The interior and exterior joints between manhole sections and adjusting rings shall be plastered with at least one-half-inch (1/2") thick mortar. All plastered areas shall have a brushed finish. All lift holes shall be mortared and finished. The bottom of the manhole, the flow line of the sewer, and the steps shall be clean of all mortar, concrete, dirt and other debris.

The flow channels shall be constructed with a minimum depth of 80 percent of the pipe diameter. The flow channel and manhole bottom shall be sloped to prevent accumulation of sewage and shall have a brushed finish.

No sanitary sewer leads shall be connected to a sanitary manhole. Sanitary sewer leads shall connect to the main sewer line. Backfill materials around manholes shall meet the same requirements as trench backfill for pipe that is installed under and within the zone of influence of pavement.

Where shown on the Plans, new sewers shall be connected into existing manholes. In such cases, new channels shall be constructed using 3,000 psi concrete. Where required, existing manholes shall be demolished. This work shall be included in other items of the project.

## **CLEANING AND TESTING SANITARY SEWERS**

### **A. Cleaning**

Before the sewer may be tested, the Contractor shall clean the sewers using a hydraulic system consisting of a high-pressure pump feeding water to a nozzle, which directs the water against the walls, and flow line of the pipe, dislodging the debris and flushing it toward a manhole. All debris shall be removed at the nearest downstream manhole.

### **B. Testing**

The Contractor shall furnish all equipment and personnel to conduct an acceptance test using low-pressure air. The test shall be conducted under the supervision of the Engineer.

All stubs, sewer leads and risers shall be installed completely and securely plugged with suitable stoppers that will withstand the internal test pressures. The section of line being tested shall also be securely plugged at each manhole. All stoppers shall be adequately braced.

Low-pressure air test of installed PVC pipe shall be in accordance with the most recent Recommended Practice (Uni-B-6-79) of the UniBell Plastic Pipe Association, as well as ASTM F1417.

The completed installation of PVC sewers shall at no point have out-of-round pipe deflections greater than five percent (5%). The contractor shall provide "go-no-go" test mandrels to test the deflection of the PVC pipe. The test shall be conducted not less than at least thirty (30) days after pipe installation. Testing shall be performed by the Contractor under the supervision of the Engineer.

### **C. Infiltration**

The maximum allowable infiltration shall not exceed 100 gallons per day per inch diameter per mile.

D. Connections

If the sewer installation fails to meet these requirements, the Contractor shall determine the source or sources of the leakage and all defective materials or workmanship shall be repaired or replaced. The completed sewer installation shall meet the requirement of the test.

**METHOD OF MEASUREMENT AND PAYMENT**

A. Sewer (San), \_\_", Modified

1. Description

The work of Sewer (San), \_\_", Modified, shall consist of excavation, removal and disposal of existing sewer pipe, furnishing and placing SDR 35 plastic sewer pipe and cap, and trench backfill, in accordance with section 402 of the 2012 MDOT Standard Specifications for Construction, MDOT Standard Plan R-83-B, and special details within the construction plans, except as modified.

2. Method of Measurement and Basis of Payment

Sewer (San), \_\_", Modified, will be measured in place by length in feet and will be paid for at the contract unit price which price shall be payment in full for any fittings, couplers, cap, sheeting or shoring trench walls, backfill as required and all labor, material and equipment needed to accomplish this work. Removal of existing sewer less than 12 inches in diameter will not be paid for separately, but will be included in the pay item for construction Sewer (San), \_\_", Modified

B. Dr Structure (San), \_\_ inch dia,

1. Description

Dr Structure (San), \_\_ inch dia, shall consist of excavation, the furnishing and placing of pre-cast sections, concrete work, drop pipes, connection of existing and new pipes, and backfilling, in accordance with section 403 of the 2012 MDOT Standard Specifications for Construction and special details within the construction plans.

2. Method of Measurement and Basis of Payment

Dr Structure (San), \_\_ inch dia, will be measured and paid for by the unit each shall be payment in full for all labor, material and equipment needed to accomplish this work. This work shall include but is not limited to: excavation, backfill, concrete, reinforcing steel, waterstops, temporary sewer supports, removing portion of sewer, connecting existing and proposed sewers, construction of a manhole riser, boots, drop inlets (if required), grade rings, concrete bench and flow channel.

C. Dr Structure, Tap, \_\_ inch

1. Description

Dr Structure, Tap, \_\_ inch, shall consist of coring the Dr Structure at the correct elevation, location, and size utilizing a coring machine. This work shall include using a water stop, stopping all leaks and removing and reconstructing the existing flow channel, as directed by the Engineer.

2. Method of Measurement and Basis of Payment

Dr Structure, Tap, \_\_ inch, will be measured and paid for by the unit each shall be payment in full for all labor, material and equipment needed to accomplish this work.

<u>PAY ITEM</u>	<u>PAY UNIT</u>
Sewer (San), __ inch, Modified	Foot
Dr Structure (San), __ inch, Modified	Each
Dr Structure Tap (San), __ inch, Modified	Each

City of Mt. Pleasant

SPECIAL PROVISION  
FOR

**TECHNICAL SPECIFICATIONS**

City of MtPleasant

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May 14

**GENERAL REQUIREMENT**

The 2012 MDOT STANDARD SPECIFICATIONS FOR CONSTRUCTION shall govern all technical specifications of this contract. The following parts of the contract will prevail over all other parts in the following order:

- A. Special Provisions
- B. Supplemental Specifications
- C. Project Plans and Drawings
- D. City of Mt. Pleasant Standard Special Provisions
- E. MDOT Standard Plans
- F. MDOT Standard Specifications
- G. City of Mt. Pleasant Standard Construction Specifications

The Contractor shall not take advantage of any apparent error or omission in the contract documents. If any uncertainty, inconsistency, omission, or conflict is discovered in the contract documents, the Engineer will decide as to the true intent.

City of Mt. Pleasant  
SPECIAL PROVISION  
FOR  
**UNDERDRAIN, SUBGRADE, OPEN-GRADED, 4 INCH, MODIFIED**

City of MtPleasant

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May 14

**A) Description**

This work consists of constructing and installing underdrains.

**B) Materials**

MDOT 34G aggregate or approved 1/2" crushed aggregate  
4-inch geotextile-wrapped perforated plastic pipe

**C) Construction**

This work shall be done in accordance with the requirements of Section 404.03 of the MDOT 2012 Standard Specifications for Construction with the follow exceptions:

- 1) Backfill from trench bottom to 2 inches above shall be MDOT 34G or approved 1/2" crushed aggregate.
- 2) The remaining trench shall be backfilled with class II sand compacted, by means of a vibratory compactor, to at least 95% of its maximum density.
- 3) Underdrain pipe will be geotextile-wrapped; backfill material will not be wrapped.
- 4) Unless otherwise specified on the plans, underdrain pipe shall be placed at an elevation such that the bottom of the pipe is at an elevation 4 feet below the top of curb elevation.

**D) Measurement and Payment**

This work will be measured and paid as specified in section 404.04 of the MDOT 2012 Standard Specifications with the following exception. The unit price for Underdrain, Subgrade, Open-Graded, 4 inch, Modified shall include the following:

- 1) The cost of providing the pipe and fittings with a geotextile wrap
- 2) Not the cost of providing and lining the trench with geotextile.
- 3) The cost of connecting the downstream end of the underdrain pipe to either a drainage structure or an existing underdrain pipe.

**Contract Item (Pay Item)**

**Pay Unit**

Underdrain, Subgrade, Open-Graded, 4 inch, Modified..... Foot

City of Mt. Pleasant

SPECIAL PROVISION  
FOR

**UTILITY COORDINATION**

City of MtPleasant

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May 14

The contractor shall cooperate and coordinate construction activities with the owners of utilities as stated in Section 104.08 of the 2012 MDOT Standard Specifications for Construction. In addition, for the protection of underground utilities, the contractor shall follow the requirements in Section 107.12 of the 2012 MDOT Standard Specifications for Construction. Contractor delay claims, resulting from a utility, will be determined based upon Section 109.05E of the 2012 MDOT Standard Specifications for Construction.

**A) General**

For protection of underground utilities, the Contractor shall call the Miss Dig system at (800) 482-7171 a minimum of three (3) working days prior to excavating. Members will thus be routinely notified. This does not relieve the Contractor of the responsibility of notifying utility owners who may not be a part of the Miss Dig alert system.

**B) Coordination with Utilities**

During the course of the construction, the Contractor will encounter both overhead and underground utilities. The contact information of the utility company representatives are as follows:

Consumers Energy - Electric  
Richard Klender  
1325 Wright Avenue  
Alma, MI 48801  
(517) 466-4279

Charter Communication – Cable TV  
Jeff Price  
915 E. Broomfield Rd.  
Mt. Pleasant, MI 48858  
(989) 773-7090

DTE Energy/MichCon – Gas  
Dave Newcomb  
609 Bjornson  
Big Rapids, MI 49307  
(231) 592-3244

City of Mt. Pleasant – Water, Sanitary &  
Storm Sewer  
Jason Moore  
1303 N. Franklin Ave.  
Mt. Pleasant, MI 48858  
(989) 779-5405 or (989) 779-5401

Frontier – Telephone  
Jeff James  
345 Pine Street  
Alma, MI 48801  
(989) 463-0392

The Contractor's attention is directed to existing underground gas mains, which are located adjacent to or near the work. The Contractor shall use extreme care when working in these areas, and shall notify DTE Energy/MichCon Gas Company at least three (3) working days in advance before beginning any excavation in these areas.

**C) Relocation**

If Utility relocation work is anticipated for this project, contact the appropriate utility company immediately to coordinate relocations. This will minimize delays to the Contractor's operations due to utility work.

Owners of public or private utilities will not be required to relocate utilities in order to facilitate the operations of construction equipment, unless it is determined by the Engineer that such poles or structures constitute a hazard to the public or are extremely dangerous to the Contractor's operations.

SPECIAL PROVISION  
FOR

**WATER SYSTEM MATERIALS AND CONSTRUCTION**

City of MtPleasant

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May 14

**A) Description**

The Contractor shall furnish all labor, equipment, and materials to completely construct, test, and place in operation, the water system as shown on the drawings and specified herein.

**B) Materials**

1) Water Main Pipe

i) Ductile Iron Pipe

Ductile iron pipe shall meet the requirements of ANSI/AWWA C151/A21.51. Where these specifications differ with ANSI/AWWA C151/A21.51 these specifications will prevail.

Cement Mortar Lining - Cement mortar lining of pipe shall conform to ANSI/AWWA C104/A21.4. Care shall be taken to insure that no mortar remains in the joint surface of the bell. If mortar is found in the joint surface or lining, of greater thickness than allowed, the pipe will be returned.

Length of Pipe - The minimum nominal laying length of the pipe shall be eighteen feet (18'). A maximum of twenty percent (20%) of the total number of each size of an order may be furnished as much as twenty-four inches (24") shorter than the nominal laying length; an additional ten percent (10%) may be furnished as much as six inches (6") shorter than nominal laying length.

Pipe Thickness - Ductile iron pipe shall have a wall metal thickness as follows:

6-inch pipe	0.31 inch (Class 52)
8-inch pipe	0.33 inch (Class 52)
12-inch pipe	0.37 inch (Class 52)
16-inch pipe	0.37 inch (Class 51)
20-inch pipe	0.39 inch (Class 51)

Tolerances will be as allowed in ANSI/AWWA C151/A21.51. Pipe sizes not listed above will not be approved for use as main lines in the City water system.

Coating - The inside and outside of the pipe shall be coated with a bituminous coating of either coal-tar or asphalt base one mil. thick.

Independent Tests - The supplier shall furnish reports of all tests and inspections as required in the ANSI/AWWA C151/A21.51.

ii) Polyvinyl Chloride Pipe (PVC)

Polyvinyl chloride pipe (PVC) shall be of a class and designation as shown on the proposal, Plans and/or special conditions, with a SDR of 18 to 13.5 and compound designation Class No. 12454A, ASTM D-1784. PVC pipe shall be in accordance with current AWWA Standard C-900, meet the ANSI/NSF standard 14, and be blue in color.

PVC pipe sizes six to twelve inches (6" - 12") in diameter shall be Class 150, and pipe sizes greater than twelve inches (12") shall be Class 200.

A single strand of 12 gauge insulated copper wire, blue in color, shall be buried in the trench twelve inches (12") above the PVC pipe. Solder all wire splices and wrap with "Scotch 2200 Vinyl Mastic Pads". The tracer wire shall be connected to each hydrant at a bolt on the bottom of the hydrant barrel by use of a soldered connection, a crimped U-shaped connection, or a ring lug.

iii) Restrained Joint PVC Pipe (RJPVC)

Restrained Joint PVC Pipe (RJPVC) shall use a Certa-Lok™ or approved equal joint restraint system. RJPVC shall meet the above requirements for Polyvinyl Chloride Pipe except that it shall be Class 235.

iv) Water Services

Allowable sizes are one inch, two inch, four inch (1", 2", 4"), or as specified for mains. Service saddles are required at each service connection on water main.

Material for four inch (4") shall be ductile iron or polyvinyl chloride, as specified for mains. Material for one inch (1") and two (2") shall be one of the following:

(1) Type K annealed seamless copper tubing conforming to ASTM B-88.

(2) One inch (1") shall be copper tube size, polyethylene (PE) water service pipe meeting AWWA C901 specifications. Markings on the pipe shall be AWWA C901, PE 3406, ASTM D-2737, dimension ratio SDR-9 brand name, date of manufacture, nominal size, sizing type (i.e., copper tube Size (CTS)), pressure rating 160 PSI at 73 1/2°F temperature, seal or (mark) of accuracy.

(3) Two inch (2") shall be copper tube size, polyethylene (PE) water service pipe meeting AWWA C901 specifications. Markings on the pipe shall be AWWA C901, PE 3406, ASTM D-2737, dimension ratio 7, brand name, date of manufacture, nominal size, sizing type (i.e., copper tube size (CTS)), pressure rating 200 PSI at 73 1/2°F temperature, seal or (mark) of accuracy.

v) Joints

(1) Cast and Ductile Iron Pipe

(a) Mechanical - ANSI A21.11 or AWWA C111 with rubber gaskets.

(b) Push-on - ANSI A21.11 or AWWA C111 with thermite welded sockets and cable.

vi) Fittings

(1) Cast Iron or Ductile Iron ANSI A21.10 or AWWA C110 or C153, 250 psi working pressure through twelve inches (12") and 150 psi above. Cutting-in sleeves, Clow Corporation #F 1220 or Traverse City Iron Works #A 847 M.

(2) All fittings are to be mechanical joint, including bends, tees, valves, hydrants. All fittings on new water main shall be Mega Lug fittings.

vii) Valves

(1) Gate - AWWA C509, full resilient wedge, non-rising stem, mechanical joint, fully bronze mounted with roller and gear operator. Waterous Series 500 or Clow RW Valve or equal. Turn counter-clockwise to open.

(2) Butterfly - AWWA C504, Class 150-B, cast iron short body, cast iron disc, mechanical joint, worm gear traveling nut operator for direct burial allowed only for valves larger than sixteen inches (16"). Turn counterclockwise to open.

(3) Boxes - Three section cast iron with lid marked "WATER":

(a) Upper Section - Screw on adjoining center section and full diameter throughout.

(b) Center Section - Minimum five inch (5") inside diameter.

(c) Base Section - Fit over valve bonnet and shaped round for valves through ten inches (10") and oval for twelve inches (12") and over.

(4) Hydrants

- (a) Style - Break-away traffic model by East Jordan Iron Works, Model 5 – BR. AWWA C502, open clockwise.
- (b) Size - Hydrant with eight inch (8") I.D. barrel.
- (c) Inlet – six inch (6") diameter mechanical joint.
- (d) Drain - Tapped and plugged with brass plug.
- (e) Nozzles - National Standard Thread
  - (i) Two (2) 2-1/2 inch hose nozzles.
  - (ii) One (1) 4-1/2 inch pumper nozzle.
- (f) Operating nut and nozzle cap nuts to be 1-3/4 inch square.
- (g) Burial - six feet (6') minimum or as directed on the Plans or by the Engineer. The Contractor is to verify needed fire hydrant length to provide for 22 inch port height above the ground.
- (h) Conforming to City standards.

(5) Service Fittings

- (a) Unions will not be allowed between corporation stop and the curb stop. New services and the repair of existing services shall be made so that there will be a continuous, unbroken pipe between the corporation stop and the curb stop.
- (b) Service Saddles - Double-strap bronze or brass parts, AWWA CC threads. For PVC C900 pipe, use Ford S90 or approved equivalent.
- (c) Brass Corporation Stops [With CC (AWWA) threads]
  - (i) Ford - one inch (1") F600; Mueller – one inch (1") H15000 or approved equivalent.
  - (ii) Polyethylene Pipe - Use above specified corporations with adapter. Ford C 06-44.
  - (iii) For two inch (2") Services - Ford FB 1000, Mueller P-25008

(d) Brass Curb Stops – two inch (2") Minneapolis pattern required.

(i) Ford Z22-333M, Z22-444M, Z44-777M, Mueller P25155 or approved equivalent. Polyethylene pipe will require a Ford C 06-44 adapter or equal.

(e) Curb Stop Boxes - six feet (6') burial – two inch (2") Minneapolis tapped base with 1-1/4 inch upper section riser with pentagon brass nut in cap. Mueller H10300, Ford type PL or approved equivalent.

(6) Miscellaneous

(a) Stainless Steel Tie Rods and Clamps - Clow Corp. or Traverse City Iron Works.

(b) Plastic Seamless Encasement Tubing

(i) Material - ASTM D-1248 Polyethylene, Type III, Class C, eight (8) mils thick.

(ii) Closing Tape – two inches (2") wide Poly-Ken #900 or Scotchwrap #50.

(c) Tapping Sleeves

(i) The tapping sleeve shall be a Ford Tapping sleeve, style FAST, with a stainless steel flange and rubber coat.

(ii) Stainless steel tapping sleeve shall not be allowed on water mains larger than 16 inches.

(iii) Full circle mechanical joint cast iron shall be required on water mains larger than 16 inches.

(iv) All tapping sleeves must be pressure tested to 150 psi before main is tapped.

(7) Shop Drawings and Material Inspection

(a) The Contractor shall have the City Water Department Superintendent review shop drawings and all materials to be used on the City water system prior to installation.

## C) Construction

### 1) Water Main

The installation, handling, and storage of all pipe and appurtenances shall be according to manufacturer's recommendations. Pipe shall, at all times, be protected against impact shocks and free fall. Stockpiling of pipe and appurtenances at the site shall be in such a location as to minimize handling and prevent collecting or submergence with water.

The depth of trench shall be such that the top of the pipe to be placed therein shall not be less than six feet (6') or more than seven feet (7') below the proposed finish grade. The depth shall be increased or decreased, if so shown on the Plans or so ordered by the Engineer. Depths shall be noted on the "As Built" Plans and Daily Inspection Reports. The trench shall be of such width as will readily permit the laying, handling and assembling of the pipes in the trench and to allow thorough filling and compacting of the earth backfill, adjacent to the lower half of the pipe. All hub holes shall be excavated to an extra width and depth to allow for proper examining of the pipe and shall provide a solid bearing for the pipe, practically its full length without refilling before the pipe is laid. Blocking of the pipe will not be allowed.

The trench bottom shall be undercut three to four-inches (3"-4") below the final location of the pipe and the trench then filled with Class II sand or crushed stone compacted with hand tampers to provide a cushion for bedding the pipe. The Contractor shall provide the sand or crushed stone from off the site, except when the trench passes through well-defined strata of sand or gravel.

Trenches for pipe shall be excavated so that there will be a minimum clearance of six inches (6") on each side of the barrel of the pipe and a maximum width of trench at the level of the top of the pipe, of not more than 16 inches greater than the OD of the pipe.

There shall be, at all times, a sufficient width to permit the pipe to be laid and to permit first-class construction methods to be used. Sufficient space shall be provided in the trench to permit the joint to be properly made.

Excavation for structures shall be extended sufficiently beyond the limits of the structure to provide ample room for placement and for other construction methods to be followed, wherever necessary.

In case soft material is encountered in the bottom of a trench or underneath a special structure, which, in the opinion of the Engineer, is not suitable for supporting the pipe or structure, the Engineer may order the removal of this soft material and its replacement with crushed stone, concrete or other material in order to make a suitable foundation for the construction of the pipe or structure.

After the pipe is laid, Class II sand, fine gravel or crushed stone shall be placed the entire width of the trench up to the spring line of the pipe. Backfill shall be carefully tamped under the haunches of the pipe. Additional sand, gravel or stone shall then be placed until the entire width of the trench is filled to not less than one foot (1') above the top of the pipe. Sand used for backfill around and over the pipe shall be thoroughly compacted with a vibratory compactor; hand compaction will not be acceptable.

The remainder of the backfilling may be done with acceptable material. All backfill, including pipe bedding, is to be compacted in maximum one-foot (1') lifts to a density of 95 percent of the maximum unit weight as determined by the modified proctor.

After the trench has been excavated as required, the pipe, fittings, valves and hydrants shall, after first being thoroughly inspected and the joints cleaned, be placed in the trench. All pipe fittings, and valves that will not be chlorinated with the new water main, shall be swabbed inside with five percent (5%) bleach (Sodium Hypochlorite) full strength before assembly and placement into the system. All pipe, fittings, valves and hydrants shall be carefully placed into the trench in such a manner as to prevent damage to them. Under no circumstances shall water main materials be dropped or dumped into the trench.

All lumps, blisters, and excess tar coating shall be removed from the bell and spigot ends of all ductile iron pipe and fittings. The outside of the spigot and the inside of the bell shall be wire-brushed and wiped clean before the pipe is laid.

Any damage to the exterior coating of the pipe shall be repaired with an approved coating before the pipe is laid. After placing a length of pipe in the trench, the spigot end shall be lubricated and then entered into the bell and the pipe pushed to the stop mark and brought to correct line and grade. Lubricants recommended by the pipe manufacturer and approved for use on a potable water system shall be applied as recommended. Due care should be used to seat the gasket evenly in the bell at all points.

The plain end of the slip type joint is furnished with a slight taper to ease its sliding fit with the gasket when the joint is made up. When necessary to cut pipe in the field, the outside of the cut end should be tapered by filing or grinding back about 1/8-inch at an angle of about 30 degrees with the centerline of the pipe.

Cutting pipe for inserting valves, fittings, etc., shall be performed in a neat workmanlike manner, without damage to the pipe or lining, and so as to leave a smooth end at right angles to the axis of the pipe.

Ductile Iron - Cutting shall be performed with a roller or shear type cutter for pipe sizes up to 20 inches in diameter. When machine cutting is not available for cutting pipe twenty 20 inches in diameter, or larger, electric arc cutting method will be permitted, using a carbon or steel rod. Only qualified, experienced workmen shall be used for this.

Asbestos-Cement or PVC Pipe - Cutting the pipe shall be performed by hand saw, abrasive discs or with a special asbestos-cement or PVC pipe cutting tool. All piping cutting tools must be of the true cutting variety. Under no circumstances is the pipe to be cut with a roller or shear type cutting tool.

If the trench contains any water, the open ends of the pipe shall be plugged with a water tight plug. A plug shall be used during any breaks in construction to prevent any possible contamination.

Whenever it is desirable to deflect the pipe in order to form a long-radius curve or to avoid obstructions, the pipe may be deflected within the tolerances recommended by the manufacturer and approved by the Engineer. No deflections in excess of those recommended by the manufacturer shall be allowed except by utilization of standard fittings as specified herein.

i) Valve and Hydrant Operation

No valves or fire hydrants on the existing system or new system, after it is in operation within the City system, shall be operated for any purpose by the Contractor without prior permission of the City Water Superintendent. Any unauthorized operation of said valves or fire hydrants shall result in a three hundred dollar (\$300.00) fine per incident.

ii) Notification Procedure for Scheduled Water main Shutdown

A 48 hour notification is required to the Water Department and to critical users, as identified below, all others require a 24 hour notification. Notification must be in writing stating the time of shutdown and length of time water is to be off. It shall be the responsibility of the Contractor to notify, in writing, all persons affected by any shutoff in accordance with the notification procedures.

Critical users are Central Michigan University, restaurants, beauty shops, hospitals, medical care facilities, nursing homes, schools, and commercial laundries.

iii) Shutdown of Water Mains

Water mains shall not be shutdown on Mondays, Saturdays, Sundays, or holidays, and/or one (1) day on either side of the holiday unless approved in advance by the Director of Public Works or Water Superintendent. From Tuesday through Friday, water mains shall be shutdown after 9:00 a.m. and are to be placed back into service before 4:30 p.m., after notification specified in the preceding paragraph. Notification must also be given to the City Water Superintendent and the Fire Department. The City has a water main shutdown procedure and checklist which are part of this specification by reference.

2) Valve Manholes

Valves twenty 20 inches or larger shall be installed in a valve manhole. All air release valves shall be in manholes. Details and materials of construction shall be as shown on the Plans and as specified for sanitary sewer manholes. The cover shall have "WATER" cast in the top.

3) Setting Valves and Boxes

All valves shall be set at a depth to the top of pipe, from a minimum of six feet (6') to a maximum of seven feet (7') below finished grade, with the stem in a vertical position and shall be plumb. The valve box shall be set so that it will not transmit shock or stress to the valve. It shall be centered over the stem nut of the valve and shall be true and plumb. The box shall be adjusted so that the cover is flush with the finished ground surface or as directed by the Engineer. Unless otherwise specified, a valve box shall be provided for every valve.

4) Setting Fire Hydrants

Fire hydrants shall be located as shown on the Plans, or as directed by the Engineer. All hydrants shall be set plumb and to a grade which will place center of the pumper nozzle above finished grade, (E.J.I.W. 22" above finished grade), unless otherwise directed by the Engineer. At no time shall the breakaway flange be below finished grade. Sufficient barrel extensions shall be furnished and installed by the Contractor to meet this requirement. Barrel extensions shall be installed such that the breakaway flange is located at finished grade level. Barrel extensions, if needed, shall be incidental to construction.

Each hydrant shall be connected to the main by a six inch (6") branch. A six inch (6") resilient wedge gate valve with box shall be installed with a valve depth of six feet (6') minimum to seven (7') feet maximum from finished grade to top of pipe, in each hydrant connection. The hydrant and valve shall be connected to the main line tee, as shown in the City standard detail, and the steamer port on the hydrant shall face the roadside.

5) Blocking

All bends, stub ends, plugs and any other portion of the system, which may be subject to separation of joints because of water pressure, shall be securely braced or blocked. Blocking shall be concrete blocks or concrete poured in place and shall be so placed as to prevent any movement of pipe or fitting joints due to water pressure. Shape of blocks shall be in accordance with the details shown on the Plans and within the following sizes:

Bearing Area in Square Feet Against Trench Wall in Sand

Pipe Size	Tees Plugs	Hydrants 90 deg. Els	45 deg. Els	22-1/2 deg. Els	11-1/4 deg. Els
4"	2		2	1	1
6"	3		3	2	1
8"	4		6	3	1
10"	7		9	5	2
12"	9		11	6	2
14"	11		15	8	3
16"	13		20	10	3
18"	16		25	12	4
20"	20		28	14	4
24"	28		40	20	6

OTHER SOIL CONDITIONS:

Cemented Sand or Hardpan	Multiply above by 0.5
Gravel	Multiply above by 0.7
Hard Dry Clay	Multiply above by 0.7
Soft Clay	Multiply above by 2.0

Muck - secure all fittings with tie rod clamps with concrete reaction backing, the same as listed for sand conditions.

6) Water Service Connection

- i) Water service connections shall not be made prior to the water main passing the bacteriological tests.
- ii) Water service materials must meet City specifications and be one inch (1") in size, unless specified otherwise.
- iii) Each service will consist of a saddle, corporation, piping, curb stop, and curb box.
- iv) Depth shall be a minimum of six feet (6') and a maximum of seven feet (7') of cover to the finished grade of the project or development.
- v) Curb boxes shall be adjusted to finished grade.
- vi) Curb boxes shall be fully screwed onto the curb stop valve.
- vii) Pipe must be beveled and lubricated with an approved lubricant for use on potable water systems.
- viii) Curb stops are to be installed so that the key top is parallel to curb, or proposed curb, when in the off position. (i.e. Flow is to be perpendicular to curb.) Curb boxes installed in concrete or bituminous areas shall be separated from the concrete or bituminous by the use of a length of four inches (4") PVC pipe.
- ix) The Contractor will check to see if existing curb stop is in the on or off position and leave new curb stop in same position. No curb stop valve will be turned on unless there is someone in the building to ensure there are no leaks
- x) Water services, if extended past the curb stop, shall be extended straight for a minimum of six feet (6') or past the right-of-way line perpendicular to the curb or proposed curblines.
- xi) Services are to be flushed prior to backfilling.
- xii) Taps are to be on the service side of the main.
- xiii) Taps shall be horizontal to five degrees above horizontal.
- xiv) Cookies must be given to the inspector at the time of tap.

7) Water Service Reconnections

- i) The City Water Department shall be notified of any iron pipe or lead pipe water services in use (pressurized).
- ii) Except for iron or lead pipes, all reconnections shall be of the same materials as the existing service and use brass fittings.
- iii) Where iron pipe or lead pipe water services are encountered, a new one inch (1") water service connection shall be constructed, in accordance with Sec. 8.03F, Water Service Connection above.
- iv) Reconnection shall include service saddle, corporation, and piping meeting City specifications.
- v) Taps shall be on the service side of the main.
- vi) Taps shall be horizontal to 5 degrees above horizontal.
- vii) After reconnection is made and before the service line is pressurized, the water meter shall be removed, the line flushed, and the meter reinstalled. Any stopped water meters caused by reconnection will be charged to the Contractor on a time and material basis for repair and re-installation.

8) Live Taps

All service taps shall be made live taps, including chlorination and testing taps.

**D) Testing and Sterilization**

1) Pressure Testing

The Contractor shall furnish equipment for the test, and the test shall be run by him under the direction of the Engineer. The test shall be made at 150 pounds per square inch hydrostatic pressure, and shall be maintained for at least two (2) hours and the leakage shall not exceed 10.45 gallons per day, per inch diameter, per mile of pipe. The City will provide a certified gauge for the test. The Contractor shall furnish all labor and all additional equipment to make the test.

All valves shall be opened such that all air in the line can be removed upon filling with water. The Contractor shall install any corporation stops necessary to allow the air to be expelled. The main shall be filled at a velocity no greater than 1 foot per second. Flushing at a minimum velocity of 3 feet per second shall be preformed prior to starting any pressure testing.

The Contractor shall run a preliminary test to determine that all air has been expelled and to check for any leakage. If any leakage should exist, the Contractor shall make the necessary repairs and perform the preliminary testing until satisfactory results are obtained. The final test shall be made in the presence of the Engineer or Water Superintendent. If the test to be witnessed by the Engineer or Water Superintendent fails, the Contractor will be billed \$75.00 per hour with a \$150.00 minimum for the additional testing. The City will provide a certified gauge for the pressure test. The Contractor shall provide any additional equipment necessary to add and measure the water necessary to maintain the hydrostatic pressure within five pounds per square inch (5 psi) of the required test pressure for the duration of the test. If the City's gauge becomes damaged while in the Contractor's possession, the Contractor will be charged for the repair/replacement of the gauge.

When the testing period is complete, the Contractor shall add and measure the water to bring the final pressure reading to the initial pressure reading. The total gallons added during the duration of the test shall not exceed the allowable leakage.

## 2) Sterilization

Before the mains are chlorinated, they shall be thoroughly flushed. All mains shall be chlorinated for a period of twenty-four (24) hours. The Contractor shall furnish all necessary equipment and materials and the work shall be done under the direction of the City Engineer in accordance with all local and state health department regulations. Chlorine shall be added in sufficient quantity to give a 50 PPM residual of free chlorine after a twenty-four (24) hour period. Chlorine tablets shall not be used.

After completion of the chlorine procedure, the main shall be flushed and sampled, as per Michigan Department of Public Health requirements. Samples shall be taken from each end of the main with additional samples taken in order to maintain a minimum of 1 sample for each 1,200 feet of main. Sample shall also be taken at the end of each branch installed. The chlorinated water flushed from the main shall not be discharged to a storm sewer or open drainage way, that would result in discharge to surface water. The chlorinated water must be discharged to a sanitary sewer, held on site, or treated, until the chlorine is removed. All requirements of the Federal Clean Water Act (CWA) must be followed.

Two consecutive samples of water, 24 hours apart, shall be taken from the main by the Water Department for bacteriological tests, at a rate established by the DPW, per test. If the results of these tests indicate safe water, the main may be placed in service. If the tests should result in unsafe conditions, the chlorination shall be repeated by the Contractor. The Contractor shall be responsible for all costs associated with necessary retesting.

**E) Measurement and Payment**

1) Water Main, \_\_\_ inch

i) Description

The work of Water Main, \_\_\_ inch, Modified shall consist of excavation, the furnishing and placing of the complete water main (including all fittings, testing, concrete work, disinfecting, backfilling and removal of surplus excavated material), protection and replacement or repair of existing utilities and restoration of the surface to within four inches (4") of original grade. All work shall be done in accordance with the Plans and/or Specifications.

ii) Method of Measurement and Basis of Payment

Water Main, \_\_\_ inch, Modified will be measured in place by length in feet and will be paid for at the contract unit price which price shall be payment in full for any fittings, couplers, sheeting or shoring trench walls, backfill as required and all labor, material and equipment needed to accomplish this work.

2) Water Valve \_\_\_inch

i) Description

The work of Water Valve \_\_\_ inch, shall consist of excavation, the furnishing and placing of valves, valve manholes (inc. castings), and/or boxes, as applicable. All work shall be done in accordance with the Plans and/or Specifications.

ii) Method of Measurement and Basis of Payment

Water Valve \_\_\_ inch, will be paid for by the unit each, and shall include the valve box and/or valve manhole, and casting, as well as all labor, materials, and related work as described above.

3) Hydrant Set

i) Description

The work of Hydrant Set shall consist of furnishing and installing fire hydrant, an auxiliary valve, valve box, connecting piping, fittings, thrust block, barrel extension, drainage pit, and miscellaneous appurtenances. All work shall be done in accordance with the Plans and/or Specifications.

ii) Method of Measurement and Basis of Payment

Hydrant Set shall be paid for by the unit each, and shall include the auxiliary valve, valve box, connecting piping, fittings, thrust block, barrel extension, and miscellaneous appurtenances. All work shall be done in accordance with the Plans and/or Specifications.

4) Tapping Sleeve & Valve \_\_\_ inch by \_\_\_ inch

i) Description

The work of Tapping Sleeve & Valve \_\_\_ inch by \_\_\_ inch, shall consist of furnishing and installing tapping sleeves and valves on existing mains without loss of pressure in the existing main. It shall also include the installation of a valve box or manhole, as applicable. All work shall be done in accordance with the Plans and/or Specifications.

ii) Method of Measurement and Basis of Payment

Tapping Sleeve & Valve \_\_\_ inch by \_\_\_ inch shall be paid for by the unit each, and shall include the installation of a valve box or manhole, as applicable. There will be a time and materials charge by the City if main has to be de-pressurized to pull out cookie.

5) Water Service - (Short or Long), \_\_\_inch

i) Description

The work of Water Service - (Short or Long), \_\_\_inch, shall consist of excavation, furnishing and placement of sand backfill, removal of surplus excavated material, tapping the main, furnishing and installation of service clamp or saddle, corporation stops, curb stops, curb boxes, service pipe, and fittings to connect to existing service pipe, in accordance with the Specifications. Long-side service leads shall include crossing roads. Short-side service leads are those which do not cross roads.

ii) Method of Measurement and Basis of Payment

Water Service - (Short or Long), \_\_\_ inch, shall be paid for by the unit each, and shall include tapping the main, furnishing and installation of service clamp or saddle, corporation stops, curb stops, curb boxes, service pipe, and fittings to connect to existing service pipe, in accordance with the Specifications.

6) Water Service Reconnection \_\_\_ inch

i) Description

The work of Water Service Reconnection \_\_\_ inch, shall consist of excavation, furnishing and placement of sand backfill, removal of surplus excavated material, tapping the main, furnishing and installation of service clamp or saddle, corporation stops, service pipe from the main to the reconnection point between the main and the existing curb stop box, and fittings to connect to existing service pipe, in accordance with the Specifications.

ii) Method of Measurement and Basis of Payment

Water Service Reconnection \_\_\_ inch, shall be paid for by the unit each, and shall include tapping the main, furnishing and installation of service clamp or saddle, corporation stops, service pipe, and fittings to connect to existing service pipe, in accordance with the Specifications

<b>Contract Item (Pay Item)</b>	<b>Pay Unit</b>
Water Main, ___ inch.....	Linear Foot
Water Valve ___ inch.....	Each
Hydrant Set.....	Each
Tapping Sleeve & Valve ___ inch by ___ inch.....	Each
Water Service - (Short or Long), ___ inch.....	Each
Water Service Reconnection ___ inch.....	Each

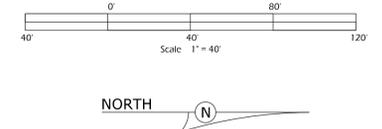
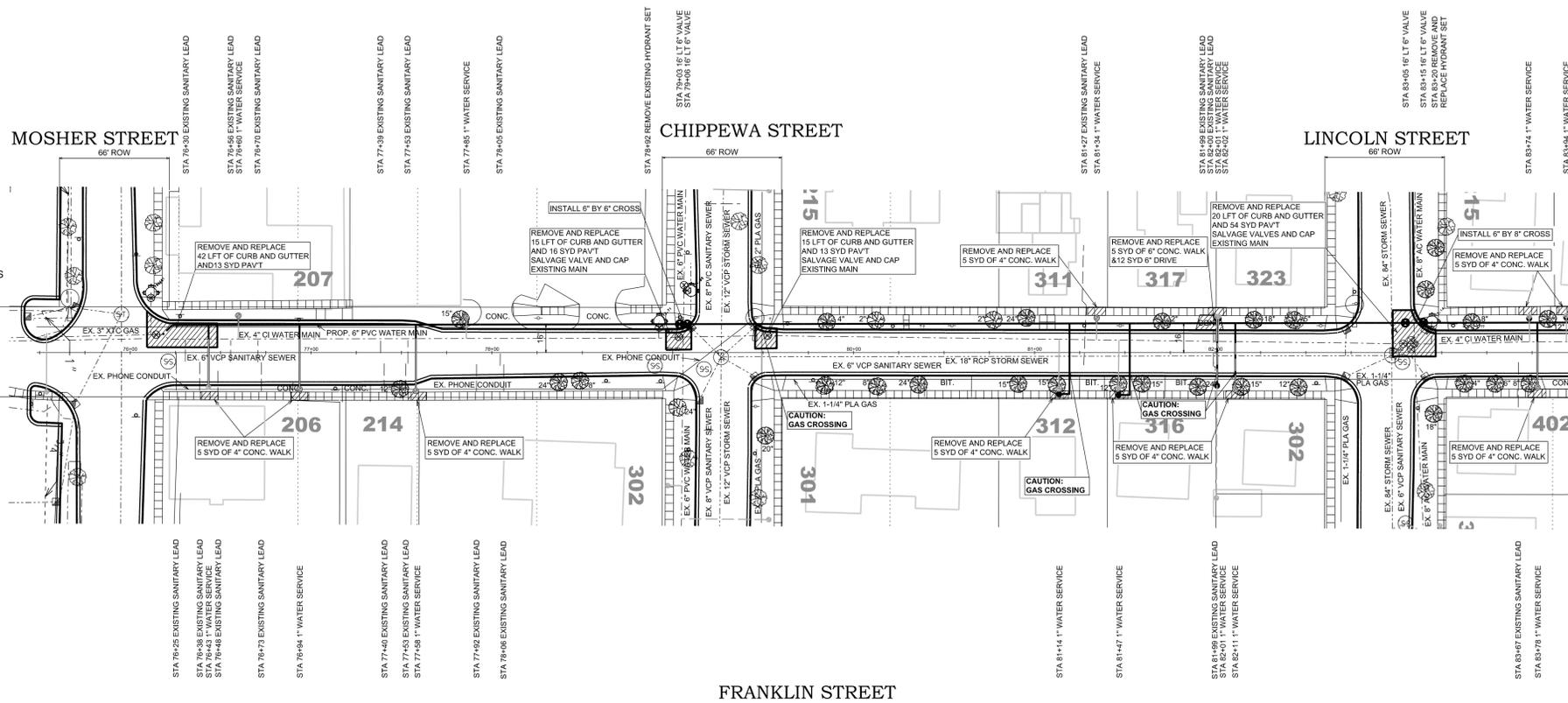


**QUANTITIES THIS SHEET**

ITEMS	QUANTITY
CURB AND GUTTER, REM	92 LFT
PAVT REM	96 SYD
SIDEWALK REM	55 SYD
DRIVEWAY REM	12 SYD
WATER VALVE REM	4 EA
WATER MAIN, 4 INCH, CUT AND CAP	9 EA
WATER MAIN, 6 INCH, BORED	785 LFT
WATER SERVICE - LONG 1 INCH, BORED	8 EA
WATER SERVICE - SHORT 1 INCH, BORED	7 EA
HYDRANT SET, REM	2 EA
INSTALL HYDRANT SET	1 EA
WATER VALVE, 6 INCH	4 EA
6" BY 6" CROSS	1 EA
6" BY 8" CROSS	1 EA
SIDEWALK, CONC., 4 INCH	55 SYD
SIDEWALK, CONC., 6 INCH	5 SYD
CONC PAVT, NONREINF, 6 INCH	12 SYD
CURB AND GUTTER, CONC., DET F4	92 LFT
HMA, 13A	8 TON
HMA, 36A	8 TON
RESTORATION, MODIFIED	7.82 STATIONS

**LEGEND**

- WATER SERVICE
- TREE
- LIGHT POLE
- TRAFFIC CONTROL SIGN
- SANITARY SEWER MAN HOLE
- STORM SEWER MAN HOLE
- STORM SEWER CATCH BASIN



MATCHLINE STA 84+00  
SEE SHEET 3 OF 4

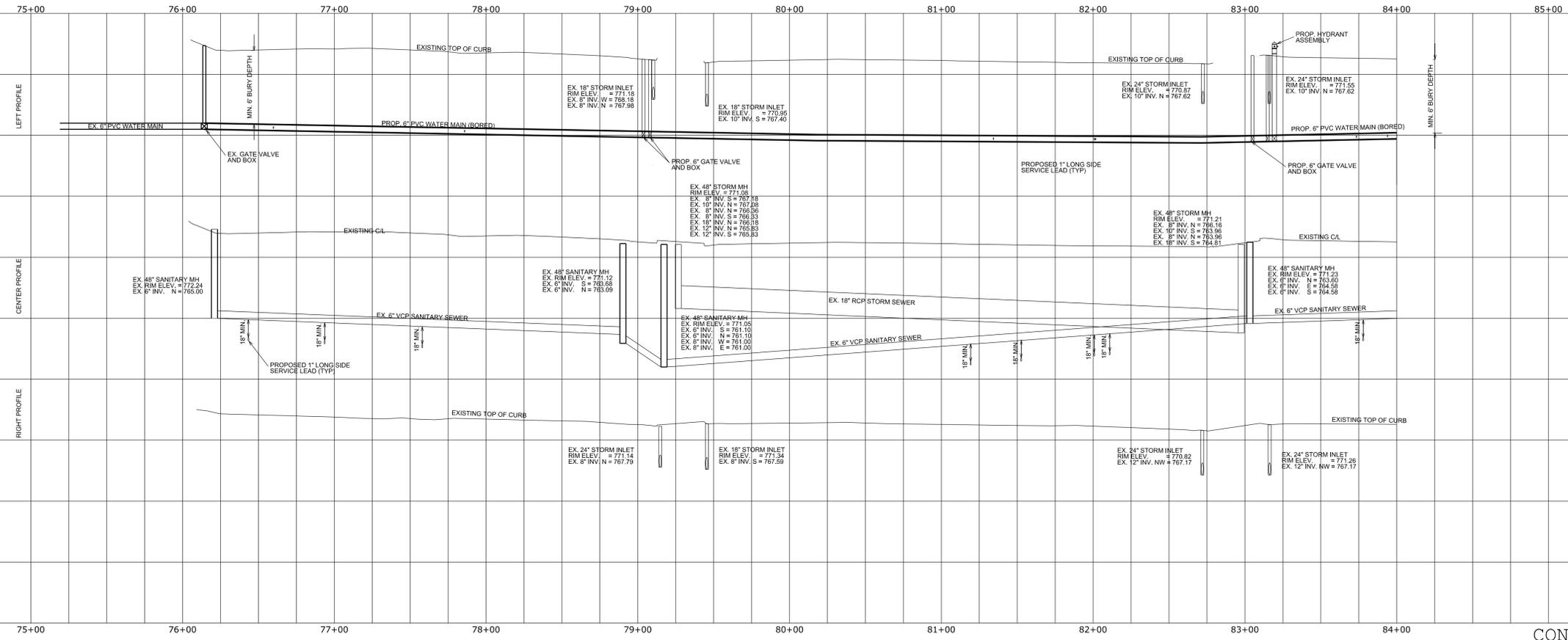
**GENERAL CONSTRUCTION NOTES**

- CONTRACTOR SHALL VERIFY ALL LOCATIONS AND DEPTHS OF EXISTING UTILITIES PRIOR TO DRILLING WATER MAIN.
- THE DEPTH OF WATER SERVICES AND WATER MAIN SHALL BE A MINIMUM OF 6 FEET, IN THE EVENT OF A CONFLICT WITH ANOTHER UTILITY, THE WATER SERVICE AND WATER MAIN SHALL BE A MINIMUM OF 18" BELOW THE CONFLICTING UTILITY.
- ALL WATER SERVICES TO BE REPLACED WITH MATERIAL MEETING THE CITY OF MT. PLEASANT SPECIFICATIONS.
- WATER SERVICE RE-ROUTES SHALL BE INCLUDED IN WATER SERVICE UNIT PRICE.
- WATER CURB STOPS AND BOXES INCLUDED IN WATER SERVICE UNIT PRICE.
- ALL STORM WATER INLETS SHALL BE PROTECTED FROM SEDIMENT DURING THE CONSTRUCTION PROCESS, UNTIL ADEQUATE STABILIZATION OF DISTURBED AREAS.
- CONTRACTOR MUST WORK WITHIN ROAD RIGHT OF WAY. SHOULD THE NEED ARISE TO DO WORK OUTSIDE OF THE RIGHT OF WAY, THE CONTRACTOR IS RESPONSIBLE FOR GETTING PERMISSION FROM THE PROPERTY OWNER, IN WRITING, AND REPAIR ALL DAMAGE AS A RESULT OF CONSTRUCTION.
- CONTRACTOR TO PROTECT EXISTING TREES.
- ALL PAVEMENT REMOVALS SHALL BE SAW CUT.
- CONTRACTOR RESPONSIBLE FOR PLUGGED WATER METERS.
- ALL WATER SHUTDOWNS, INCLUDING SERVICE CHANGE OVERS, REQUIRE 24 HOUR NOTICE TO RESIDENTS BEING EFFECTED.

CALL MISS DIG

BEFORE DIGGING UNDERGROUND OR WORKING NEAR OVERHEAD WIRES, CALL MISS DIG AT LEAST 3 BUSINESS DAYS IN ADVANCE OF STARTING YOUR PROJECT. 18001 482-7171

IT'S THE LAW



JOB NUMBER: 591-9824-HFRAN  
 DRAWN BY: BR  
 DESIGNED BY: BR  
 CHECKED BY: ST  
 DATE: 3/24  
 SCALE: 1" = 40'  
  
**CITY OF MT. PLEASANT**  
 DIVISION OF PUBLIC WORKS  
 1303 FRANKLIN ST.  
 MT. PLEASANT, MT 59103  
 WWW.MT-PLEASANT.ORG

REVISED:  
 AS-CONSTRUCTED  
 SHEET NUMBER  

2 / 4

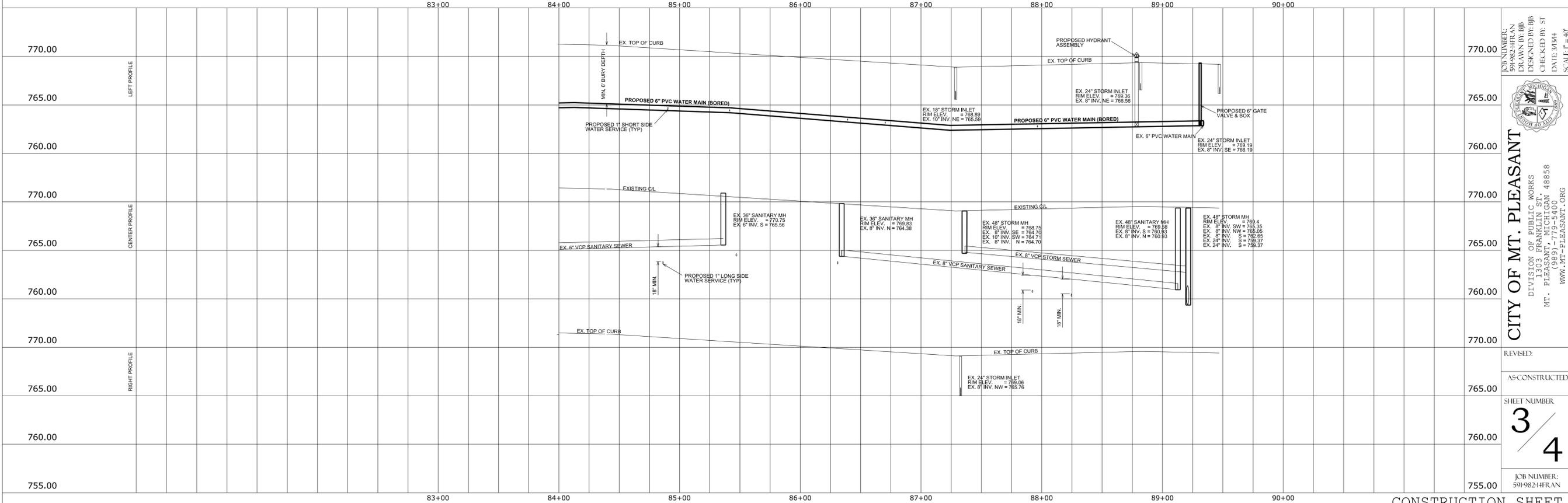
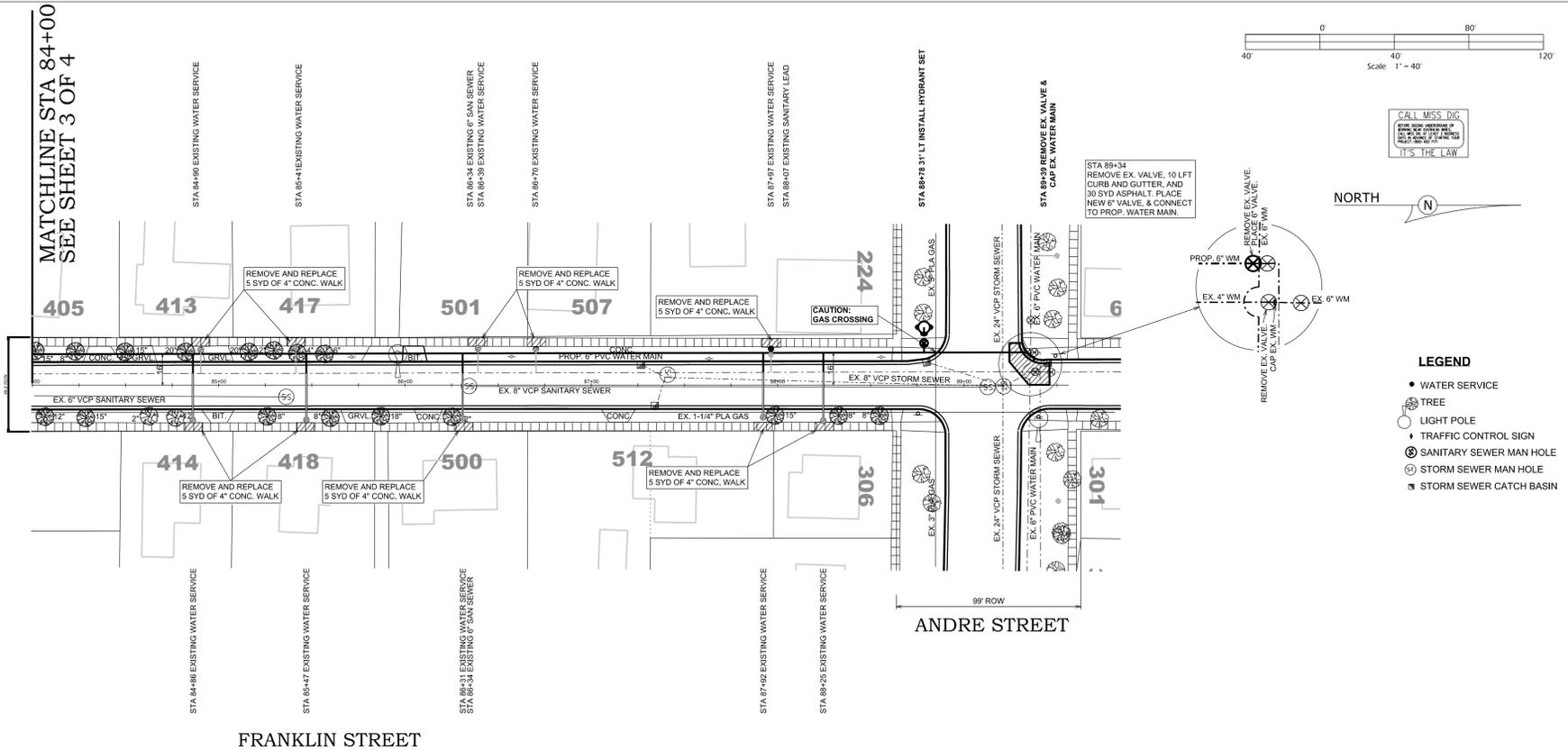
 JOB NUMBER:  
 591-9824-HFRAN

**QUANTITIES THIS SHEET**

ITEMS	QUANTITY
CURB AND GUTTER, REM	10 LFT
PAV'T REM	30 SYD
SIDEWALK REM	50 SYD
WATER VALVE REM	2 EA
WATER MAIN, 4 INCH, CUT AND CAP	1 EA
WATER MAIN, 6 INCH, BORED	534 LFT
WATER SERVICE - LONG 1 INCH, BORED	5 EA
WATER SERVICE - SHORT 1 INCH, BORED	5 EA
HYDRANT SET	1 EA
WATER VALVE, 6 INCH	1 EA
SIDEWALK, CONC., 4 INCH	50 SYD
CURB AND GUTTER, CONC., DET F4	10 LFT
HMA, 13A	3 TON
HMA, 36A	3 TON
RESTORATION, MODIFIED	5.34 STATIONS
CONNECT TO EXISTING WATER MAIN	1 EA

**GENERAL CONSTRUCTION NOTES**

- CONTRACTOR SHALL VERIFY ALL LOCATIONS AND DEPTHS OF EXISTING UTILITIES PRIOR TO DRILLING WATER MAIN.
- THE DEPTH OF WATER SERVICES AND WATER MAIN SHALL BE A MINIMUM OF 6 FEET, IN THE EVENT OF A CONFLICT WITH ANOTHER UTILITY, THE WATER SERVICE AND WATER MAIN SHALL BE A MINIMUM OF 18" BELOW THE CONFLICTING UTILITY.
- ALL WATER SERVICES TO BE REPLACED WITH MATERIAL MEETING THE CITY OF MT. PLEASANT SPECIFICATIONS.
- WATER SERVICE RE-ROUTES SHALL BE INCLUDED IN WATER SERVICE UNIT PRICE.
- WATER CURB STOPS AND BOXES INCLUDED IN WATER SERVICE UNIT PRICE.
- ALL STORM WATER INLETS SHALL BE PROTECTED FROM SEDIMENT DURING THE CONSTRUCTION PROCESS, UNTIL ADEQUATE STABILIZATION OF DISTURBED AREAS.
- CONTRACTOR MUST WORK WITHIN ROAD RIGHT OF WAY. SHOULD THE NEED ARISE TO DO WORK OUTSIDE OF THE RIGHT OF WAY, THE CONTRACTOR IS RESPONSIBLE FOR GETTING PERMISSION FROM THE PROPERTY OWNER, IN WRITING, AND REPAIR ALL DAMAGE AS A RESULT OF CONSTRUCTION.
- CONTRACTOR TO PROTECT EXISTING TREES.
- ALL PAVEMENT REMOVALS SHALL BE SAW CUT.
- CONTRACTOR RESPONSIBLE FOR PLUGGED WATER METERS.
- ALL WATER SHUTDOWNS, INCLUDING SERVICE CHANGE OVERTS, REQUIRE 24 HOUR NOTICE TO RESIDENTS BEING EFFECTED.



JOB NUMBER: 591-982-HFRAN  
 DRAWN BY: JRB  
 DESIGNED BY: JRB  
 CHECKED BY: ST  
 DATE: 3/14  
 SCALE: 1" = 40'

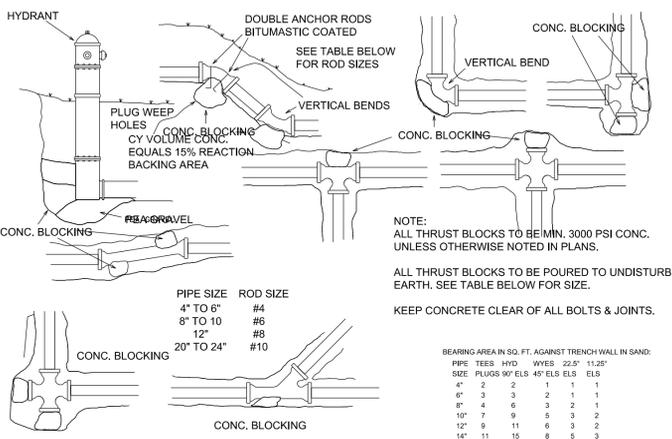
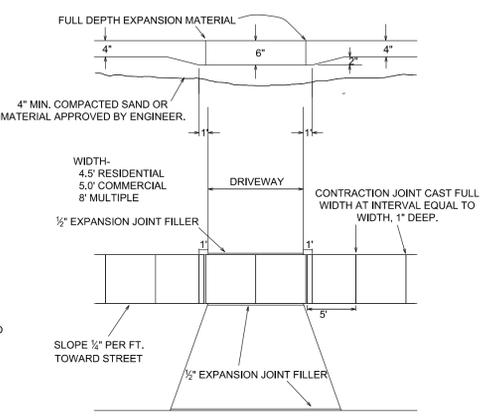


**CITY OF MT. PLEASANT**  
 DIVISION OF PUBLIC WORKS  
 MT. PLEASANT, MICHIGAN 48858  
 (989) 779-5400  
 WWW.MT-PLEASANT.ORG

REVISED:  
 AS-COSTRUCTED  
 SHEET NUMBER  
**3 / 4**

JOB NUMBER: 591-982-HFRAN

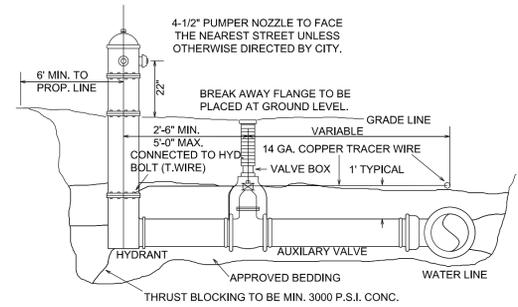
- NOTE:
- FOR SIDEWALK WIDTH SEE CITY ENGINEER IF EXISTING SIDEWALK DIFFERS.
  - 1/2" EXPANSION JOINT (FILLER) MATERIAL TO BE PLACED AT ALL POINTS WHERE NEW CONCRETE ABUTS EXISTING CONCRETE.
  - CONCRETE - CLASS A 3500 P.S.I. 5%±1% AIR ENTRAINED - 6 SACKS/CU. YD. 4" SLUMP. MAXIMUM LIMESTONE AGG.
  - 1" EXPANSION JOINT FILLER TO BE PLACED AT 50' MAXIMUM INTERVALS (FULL DEPTH)
  - SIDEWALKS TO BE A MINIMUM OF 4" IN DEPTH EXCEPT AT DRIVEWAYS WHERE DEPTH SHALL BE INCREASED TO 6" AS SHOWN IN DETAIL, AT RIGHT.
  - ALL VALVES SHALL BE SEPARATELY BOXED OUT WITH EXPANSION JOINT FILLER.
  - CURING COMPOUND SHALL BE APPLIED AT A RATE OF 1 GALLON PER 200 S.F. OF SURFACE IMMEDIATELY AFTER FREE WATER HAS LEFT THE SURFACE.
  - CONCRETE SURFACE SHALL BE LIGHTLY BROOMED IN A TRANSVERSE DIRECTION PRIOR TO CURING.
  - ALL FRESH CONCRETE SHALL BE PROTECTED FROM THE ELEMENTS, BY THE CONTRACTOR FOR NOT LESS THAN 3 DAYS.
  - NEW SIDEWALKS TO BE 12" OFF PROPERTY LINE UNLESS MATCHING TO EXISTING WALK.
  - FOR ADDITIONAL SPECIFICATIONS AND INFORMATION SEE SECTION 12 OF THE CITY STANDARD CONSTRUCTION SPECIFICATIONS.



BEARING AREA IN SQ. FT. AGAINST TRENCH WALL IN SAND:

PIPE SIZE	HYD	WYES	22.5°	11.25°
SIZE	PLUGS	90°	45°	ELS
4"	2	2	1	1
6"	3	3	2	1
8"	4	6	3	2
10"	7	9	5	3
12"	9	11	6	3
14"	11	15	8	3
16"	13	20	10	3
18"	16	25	12	4
20"	20	28	14	4
24"	28	40	20	11

OTHER SOIL CONDITIONS:  
 CEMENTED SAND OR HAROPAN - MULTIPLY ABOVE BY 0.5  
 GRAVEL - MULTIPLY ABOVE BY 0.7  
 HARD DRY CLAY - MULTIPLY ABOVE BY 0.7  
 SOFT CLAY - MULTIPLY ABOVE BY 2.0



BEARING AREA IN SQ. FT. AGAINST TRENCH WALL IN SAND:

PIPE SIZE	TEES	HYDRANTS	WYES	22.5°	11.25°
SIZE	PLUGS	90°	45°	ELS	ELS
4"	2	2	1	1	1
6"	3	3	2	2	1
8"	4	6	3	2	1
10"	7	9	5	3	2
12"	9	11	6	3	2
14"	11	15	8	3	3
16"	13	20	10	6	3
18"	16	25	12	7	4
20"	20	28	14	8	4
24"	28	40	20	11	6

OTHER SOIL CONDITIONS:  
 CEMENTED SAND OR HAROPAN - MULTIPLY ABOVE BY 0.5  
 GRAVEL - MULTIPLY ABOVE BY 0.7  
 HARD DRY CLAY - MULTIPLY ABOVE BY 0.7  
 SOFT CLAY - MULTIPLY ABOVE BY 2.0

HYDRANTS TO BE BREAK-AWAY. TRAFFIC MODEL BY EAST JORDAN IRON WORKS OR TRAVERSE CITY IRON WORKS; AWWA C502. MECHANICAL JOINT, OPENING CLOCKWISE, WITH PLUGGED DRAIN OUTLET AND 1 1/2 INCH OPENING NUT & WITH 2 1/2 INCH HOSE NOZZLES AND 1 1/2 INCH PUMPER NOZZLE.

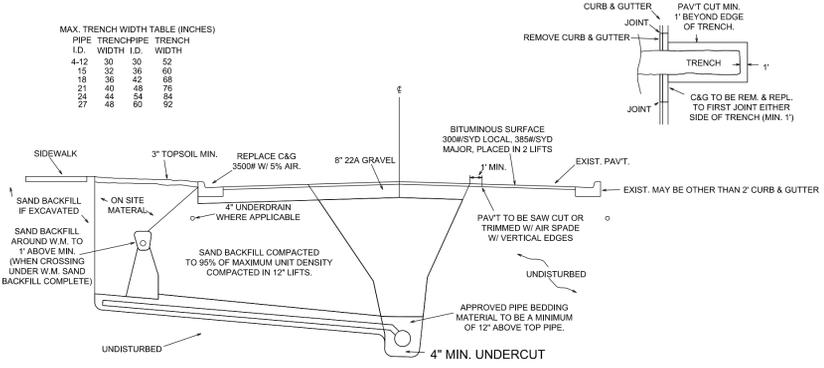
GATE VALVES TO BE AWWA C-509 MECHANICAL JOINTS, RESILIENT WEDGE, NONRISING STEM, WATEROUS SERIES 500 OR APPROVED EQUAL. TURN COUNTER CLOCKWISE TO OPEN.

FOR ADDITIONAL SPECIFICATIONS SEE SECTION 8 OF CITY STANDARD CONSTRUCTION SPECIFICATIONS.

TYPICAL FIRE HYDRANT & VALVE LOCATION

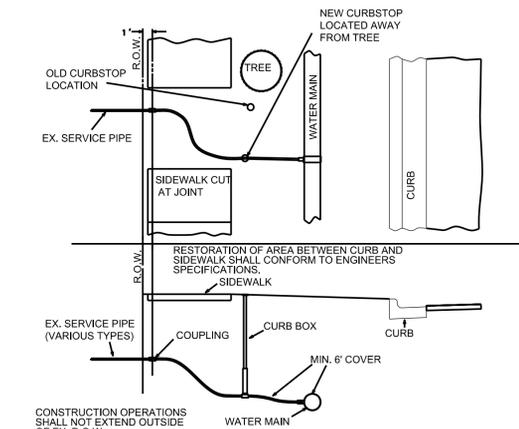
MAX. TRENCH WIDTH TABLE (INCHES)

PIPE I.D.	TRENCH WIDTH	PIPE I.D.	TRENCH WIDTH
4-12	30	30	52
15	32	36	60
18	36	42	68
21	40	48	76
24	44	54	84
27	48	60	92



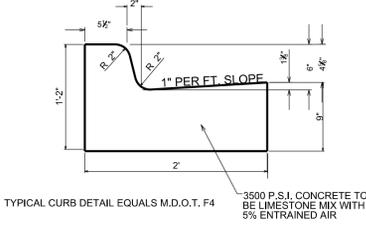
TYPICAL LOCATION OF THRUST BLOCKS

NOTE:  
 NO PERSON SHALL COVER ANY TRENCH UNTIL APPROVED BY THE CITY INSPECTOR OR ENGINEER.  
 72 HOURS PRIOR TO EXCAVATION CALL MISS DIG 1-800-482-7171



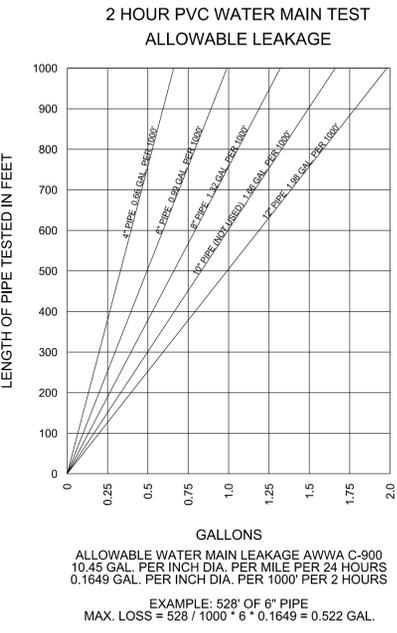
TYPICAL WATER SERVICE RE-CONNECTION

- NOTE:
- CURB AND GUTTER SHALL BE REMOVED FROM JOINT TO JOINT AS A MINIMUM AND SHALL BE REPLACED BY CONTRACTOR.
  - EACH SERVICE TO SERVE ONLY ONE HOUSE.
  - WATER SERVICE PIPE SHALL BE OF TYPE AND SIZE SPECIFIED IN THE CITY OF MT. PLEASANT STANDARD SPECIFICATION BOOK.
  - THE METHOD OF EXCAVATION, PLACING OF PIPE, JOINTING, TESTING, AND BACKFILL SHALL CONFORM TO THE REQUIREMENTS OF THE DIVISION OF PUBLIC WORKS.
  - NO WORK SHALL BEGIN WITHOUT FIRST RECEIVING A WRITTEN PERMIT FROM THE D.P.W..
  - NO WATER SERVICE SHALL BE COVERED UNTIL AFTER IT HAS BEEN INSPECTED AND APPROVED BY AUTHORIZED PERSONNEL OF THE D.P.W. (24 HOUR NOTICE REQUIRED).
  - PROPERTY DISTURBED DURING REPLACEMENT SHALL BE RESTORED TO PREVIOUS OR BETTER CONDITION.



TYPICAL CURB AND GUTTER

- NOTE:
- A. EXPANSION JOINTS SHALL:
1. BE PLACED AT ALL SPRING LINES AND POINTS OF CURVATURE AND POINTS OF TANGENCY.
  2. BE PLACED A MINIMUM OF EVERY 100 LINEAL FEET INTERVAL.
  3. BE PLACED AT EXPANSION JOINTS IN ABUTTING PAVEMENT.
  4. BE PLACED AT LOCATIONS SHOWN IN OTHER DETAILS AND TYPICAL DRAWINGS FOR HANDICAP RAMP, SIDEWALKS, CONCRETE DRIVEWAY APPROACHES AS SHOWN ON THE PLANS AND/OR AS DIRECTED IN THE FIELD BY THE INSPECTOR OR ENGINEER.
  5. BE PLACED AT ENDS OF PREVIOUSLY POURED CURB, IF PREVIOUS POUR WAS MADE 30 MINUTES OR MORE PRIOR TO THE CURRENT POUR (THIS INCLUDES AT BOTH ENDS OF CURB AND GUTTER REPLACEMENT ABUTTING EXISTING CONCRETE).
- EXPANSION MATERIAL SHALL EXTEND THE FULL DEPTH AND WIDTH OF STRUCTURE WITH NO CONCRETE BRIDGING BETWEEN THE SEPARATED CONCRETE.
- B. CONTRACTION JOINTS (USED ONLY IF SECTION IS STEEL REINFORCED)
1. CONTRACTION JOINTS SHALL BE PLACED OPPOSITE AND IN LINE WITH CONTRACTION JOINTS IN ABUTTING CONCRETE PAVEMENT.
- C. PLANE OF WEAKNESS JOINTS SHALL:
1. BE PLACED UNIFORMLY (10 FT. MAX.) BETWEEN CONTRACTION AND/OR EXPANSION JOINTS.
  2. BE PLACED AT STRUCTURES SUCH AS VALVES, POLES AND MANHOLES WHEN THESE STRUCTURES ARE WITHIN OR WITHIN A PORTION OF THE CURB AND GUTTER.
- D. ALL CURB AND GUTTER IS TO HAVE A 4 INCH MIN. 22A AGGREGATE BASE (ON CITY CONTRACTS BASE IS INCIDENTAL TO CURB AND GUTTER PRICE).
- E. ALL DRIVEWAY CUTS ARE TO HAVE THE BACK EDGE OF CURB A MIN. OF 1" ABOVE THE FLOW LINE OF THE GUTTER. AT LOCATIONS WHERE THE DRIVEWAY SLOPES AWAY FROM THE CURB THEN A HIGHER BACK OF CURB AT THE DRIVEWAY OPENINGS MAY BE REQUIRED TO KEEP AS MUCH WATER AS POSSIBLE FROM DRAINING ON TO THE DRIVEWAY. THE RECOMMENDED MAX. HEIGHT IS 2 INCHES.
- F. WHITE PIGMENTED LIQUID CURING COMPOUND ASTM C309, TYPE 1-0, CLASS B VEHICLE. RATE OF 1 GALLON PER 200 SQ. FEET IS TO BE APPLIED TO ALL EXPOSED CONCRETE AS SOON AS FREE WATER LEAVES THE SURFACE.



JOB NUMBER:  
 DRAWN BY: RB  
 DESIGNED BY: RB  
 CHECKED BY: S.T.  
 DATE: FEB. 2014  
 SCALE: NONE

CITY OF MT. PLEASANT  
 DIVISION OF PUBLIC WORKS  
 1303 FRANKLIN ST.  
 MT. PLEASANT, MT. 59901  
 WWW.MT-PLEASANT.ORG

REVISED:  
 AS-COSTRUCTED

SHEET NUMBER  
 4 / 4

JOB NUMBER:  
 59198214FRAN

# CITY OF MT. PLEASANT DIVISION OF PUBLIC WORKS

## 2014 FRANKLIN STREET RECONSTRUCTION

THE IMPROVEMENTS COVERED BY THESE PLANS SHALL BE DONE IN ACCORDANCE WITH THE MICHIGAN DEPARTMENT OF TRANSPORTATION 2012 STANDARD SPECIFICATIONS AND SUPPLEMENTAL SPECIFICATIONS.

THE PROPOSED IMPROVEMENTS COVERED BY THESE PLANS ARE IN ACCORDANCE WITH THE AASHTO: A POLICY ON GEOMETRIC DESIGN OF HIGHWAYS AND STREETS, 2004, & 2005 MMUTCD.

MISS DIG: CALL TOLL FREE 1-800-482-7171 MINIMUM OF THREE WORKING DAYS BEFORE STARTING THIS PROJECT, OR ANY DIGGING.

UTILITIES:  
THE FOLLOWING UTILITIES ARE LOCATED IN OR NEAR THE RIGHT-OF-WAY OF THIS PROJECT.

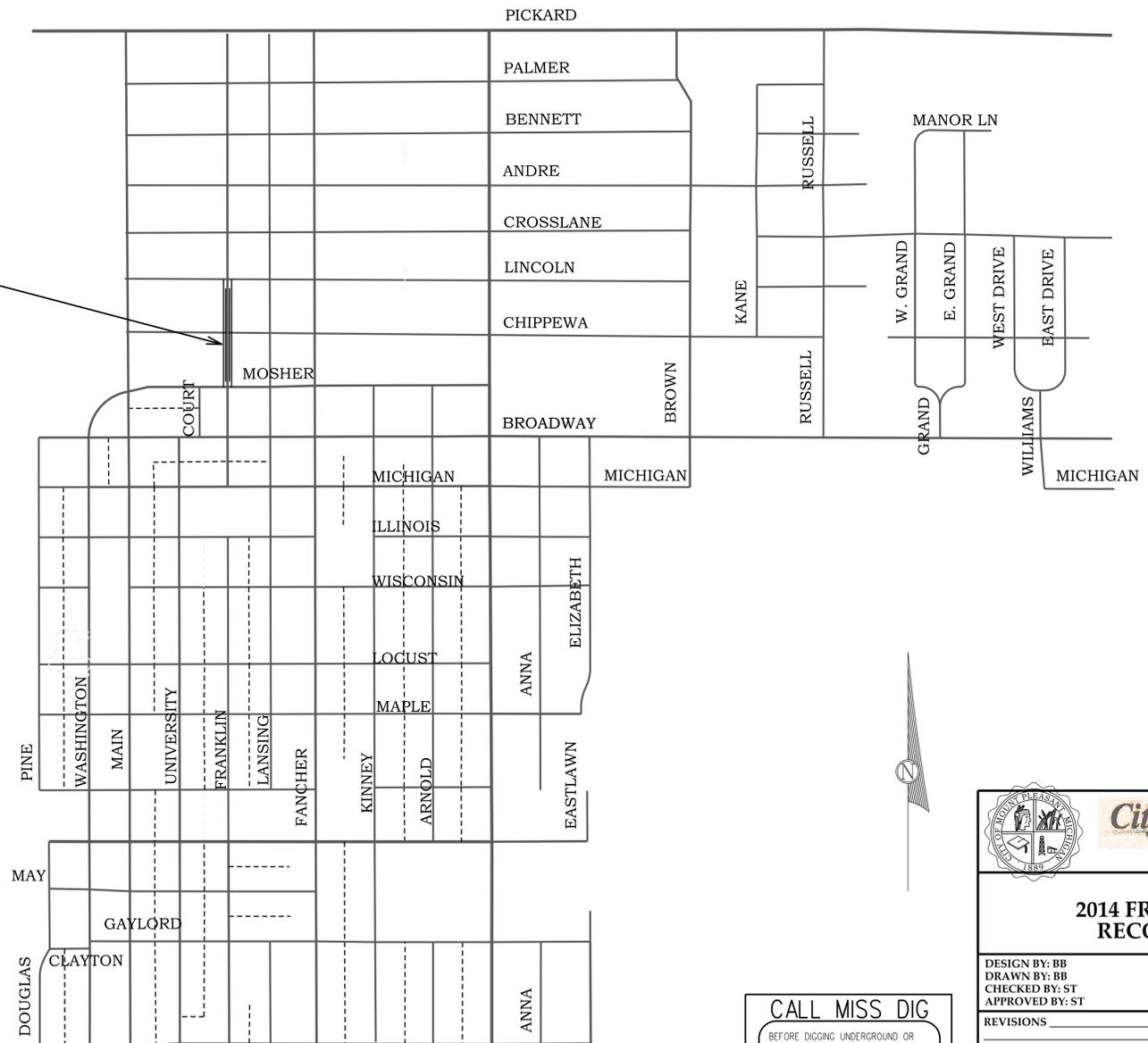
UTILITY	OWNER	CONTACT
GAS	DTE/MICHCON 609 BJORNSON BIG RAPIDS, MI 49307	LARRY BOURKE (231) 349-2364 (CELL) (231) 592-3244 (DESK)
ELECTRIC	CONSUMERS ENERGY 1325 WRIGHT AVENUE ALMA, MI 48801	RICHARD KLENDER (989) 466-4279
TELEPHONE	FRONTIER COMMUNICATION 345 PINE STREET ALMA, MI 48801	MARK MARSHALL (989) 463-0392
CABLE	CHARTER COMMUNICATION 915 E. BROOMFIELD RD. MT. PLEASANT, MI 48858	JEFF PRICE (989) 773-7090
SEWER & WATER	CITY OF MT. PLEASANT 1303 N. FRANKLIN ST. MT. PLEASANT, MI 48858	JASON MOORE (989) 779-5405

### INDEX

1. COVER SHEET
2. DETAIL SHEET
3. REMOVAL SHEET
4. CONSTRUCTION SHEET
5. SOIL EROSION KEY SHEET

THIS PROJECT IS TO BE CONSTRUCTED TO 2012 MDOT STANDARD SPECIFICATIONS FOR CONSTRUCTION

PROJECT LOCATION



MAYOR  
SHARON TILMANN

VICE MAYOR  
JIM HOLTON

COMMISSIONERS  
TONY KULICK  
RICK RAUTANEN  
JON JOSLIN

MATTHEW SOUS  
KATHLEEN L. LING

INTERIM CITY MANAGER  
NANCY RIDLEY  
DIRECTOR OF PUBLIC WORKS  
JOHN ZANG

**CALL MISS DIG**  
BEFORE DIGGING UNDERGROUND OR WORKING NEAR OVERHEAD WIRES, CALL MISS DIG AT LEAST 3 BUSINESS DAYS IN ADVANCE OF STARTING YOUR PROJECT. (800) 482-7171  
**IT'S THE LAW**



**COVER SHEET**  
**2014 FRANKLIN STREET RECONSTRUCTION**

DESIGN BY: BB	CONSTRUCTED	DATE OF PLAN	MARCH 19, 2014
DRAWN BY: BB	CHECKED BY: ST	APPROVED BY: ST	SCALE NONE
REVISIONS		DATE/INITIALS	
CONTROL SECT.		JOB NO.	FED. PROJECT
LOCAL	LOCAL	LOCAL	LOCAL
PLOT DATE:			

DRAWING PATH: J:\CONSTRUCTION\14CONS\FRANKLIN\STREET  
FED. ITEM NO. LOCAL  
JOB NO.: 203-451-703-14FRAN  
CONTROL SECTION: LOCAL  
FRANKLIN STREET FROM MOSHER TO LINCOLN



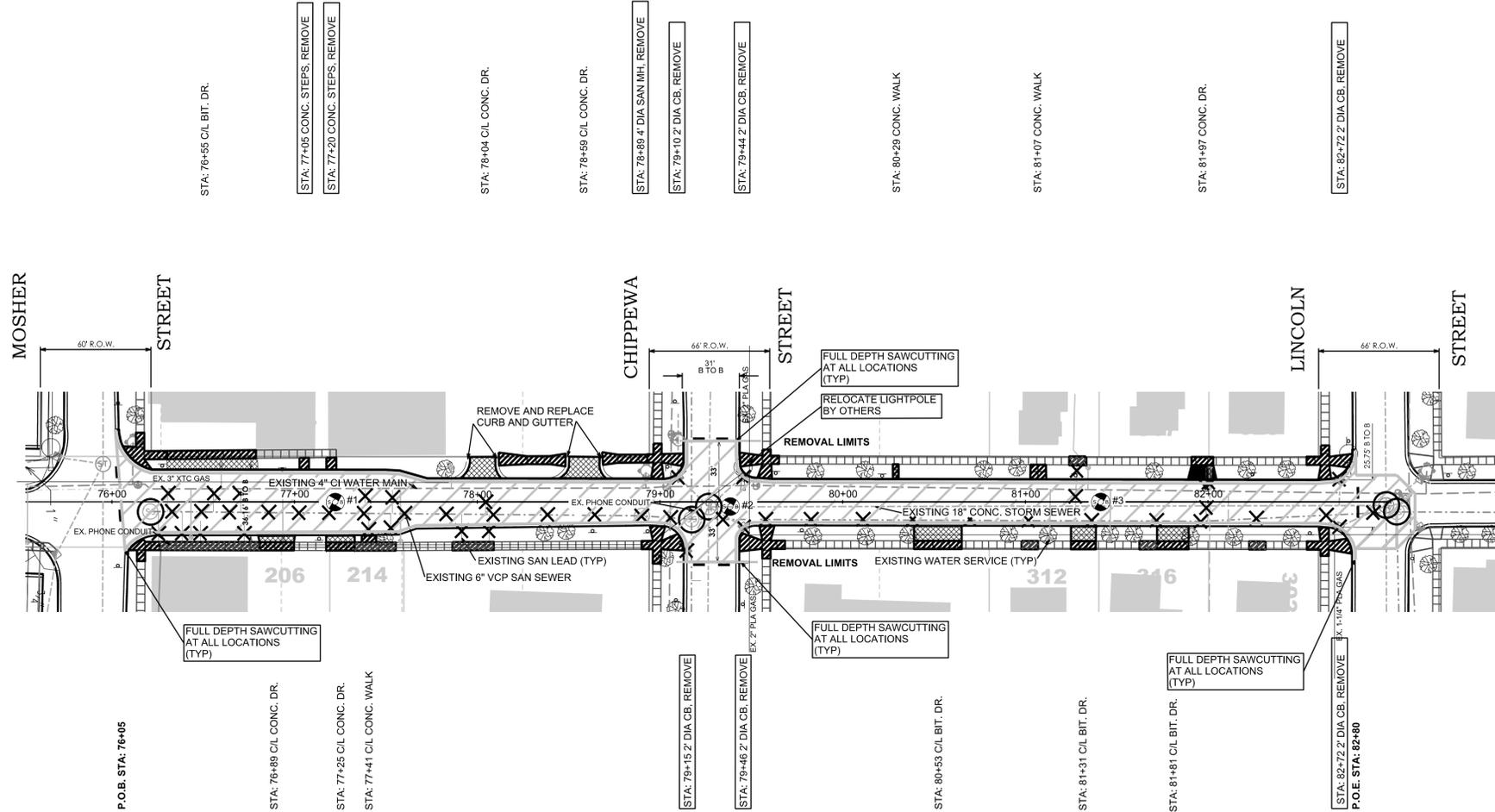
**LEGEND**

- SOIL BORING LOCATION
- SANITARY MANHOLE
- STORM MANHOLE
- TREE
- WATER SHUT OFF VALVE
- FIRE HYDRANT
- CURB STOP
- CATCH BASIN
- TRAFFIC CONTROL SIGN
- LIGHT POLE
- TYPE III BARRICADE

**QUANTITIES THIS SHEET**

**ROADWAY ITEMS**

Preconstruction Audio/Video Recording	1 Ls
Mobilization, Max	1 Ls
Barricade, Type III, High Intensity, Lighted, Furn.	8 Ea
Barricade, Type III, High Intensity, Lighted, Oper.	8 Ea
Plastic Drum, High Intensity, Lighted, Furn.	50 Ea
Plastic Drum, High Intensity, Lighted, Oper.	50 Ea
Sign, Temp, Prismatic, Furn.	80 Sft
Sign, Temp, Prismatic, Oper.	80 Sft
Minor traffic Devices	1 Ls
Drainage Structure, Remove	7 Ea
Masonry and Conc. Structure, Rem	20 Cyd
Sidewalk, Rem	3013 Sft
Driveway, Rem	168 Syd
Curb, Rem	1480 Lft
Pavt, Rem, Modified	2140 Syd
Sewer Rem, Less Than 24 Inch	1245 Lft
Machine Grading, Modified	6.75 Sta
Subgrade Undercutting, Type II	10 Cyd
Erosion Control, Inlet Protection, Fabric Drop	8 Ea
Drainage Structure, Temp Lowering	5 Ea
Full Depth Sawcutting	188 Lft
Sawcutting	126 Lft
Gas And Water Shutoff Cover Adj, Case 1	5 Ea
Contractor Staking	Lsum



FRANKLIN STREET

**REMOVAL LEGEND**

- Driveway, Rem
- Sidewalk, Rem
- Pavt, Rem, Modified
- Drainage Structure Temporary Lowering
- Gas and Water Shutoff, Adj, Modified
- Structure, Rem
- Curb and Gutter, Rem
- Sewer Line, Remove

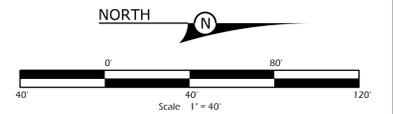
**SOIL BORING INFORMATION**

- #1 0" TO 2" BITUMINOUS  
2" TO 10" CONCRETE  
10" TO 36" SAND AND GRAVEL MIX
- #2 0" TO 4" BITUMINOUS  
4" TO 48" SAND AND GRAVEL MIX
- #3 0" TO 3" BITUMINOUS  
3" TO 48" SAND AND GRAVEL MIX

**GENERAL NOTES**

- CONTRACTOR TO VERIFY EXISTING CONDITIONS PRIOR TO CONSTRUCTION.
- CONTRACTOR TO INSTALL BARRICADES PRIOR TO REMOVALS.
- CONTRACTOR TO MAINTAIN ACCESS TO DRIVES AT NIGHT AND ON WEEKENDS.
- CONTRACTOR TO INSTALL SOIL EROSION CONTROL MEASURES PRIOR TO REMOVALS. SEE SHEET 2 FOR SESC PLAN.

CALL MISS DIG  
BEFORE DIGGING UNDERGROUND OR  
WORKING NEAR OVERHEAD WIRES.  
CALL MISS DIG AT LEAST 3 BUSINESS  
DAYS IN ADVANCE OF STARTING YOUR  
PROJECT. (800) 482-7171  
IT'S THE LAW



**City of Mt. Pleasant**  
DIVISION OF PUBLIC WORKS  
-ENGINEERING DEPARTMENT-

**REMOVAL SHEET  
FRANKLIN STREET  
FROM MOSHER STREET TO LINCOLN STREET**

DESIGN BY <b>BB</b>	CONSTRUCTED
DRAWN BY <b>BB</b>	DATE OF PLAN <b>MARCH 19, 2014</b>
CHECKED BY <b>ST</b>	SCALE <b>1" = 40'</b>
APPROVED BY <b>ST</b>	SHEET <b>3</b> OF <b>5</b> SHEETS

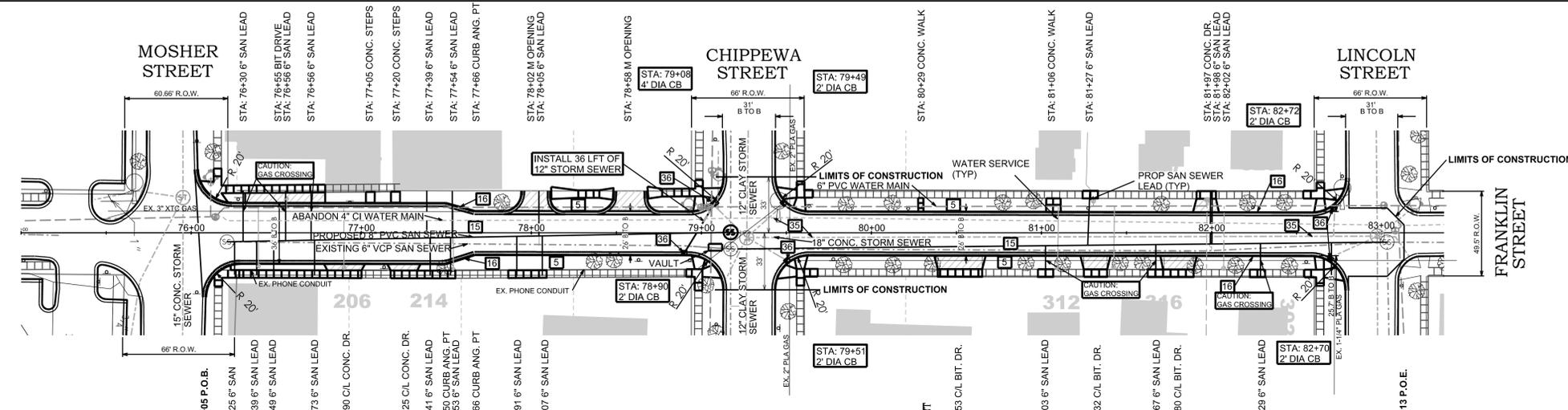
REVISIONS	DATE/INITIALS

CONTROL SECT.	JOB NO.	FED. PROJECT	FED. ITEM NO.
LOCAL	203-451-703-14FRAN	LOCAL	LOCAL

**PLOT DATE:**

DRAWING PATH: J:\CONSTRUCTION\14CONSTR\FRANKLIN\STREET  
FED. ITEM NO. LOCAL  
FED. PROJECT: LOCAL  
JOB NO.: 203-451-703-14FRAN  
CONTROL SECTION: LOCAL  
FRANKLIN STREET - FROM MOSHER TO LINCOLN

- LEGEND**
- SOIL BORING LOCATION
  - SANITARY MANHOLE
  - STORM MANHOLE
  - TREE
  - WATER SHUT OFF VALVE
  - FIRE HYDRANT
  - CURB STOP
  - CATCH BASIN
  - TRAFFIC CONTROL SIGN
  - LIGHT POLE
  - SOIL EROSION KEY NUMBER



**QUANTITIES THIS SHEET**

ROADWAY ITEMS	QUANTITY
Subbase, CIP	837 Cyd
Aggregate Base, 8 Inch, Modified	2048 Syd
Dr Structure, CB, 24 Inch Dia, Modified	6 Ea
Dr Structure, SAN, 48 Inch Dia, Modified	1 Ea
Dr Structure Cover, Adj, Case 1,	3 Ea
Dr Structure Cover, SAN, Modified	3 Ea
Dr Structure Cover, STM, Modified	2 Ea
Dr Structure Cover, CB, Modified	6 Ea
Sewer, 8 Inch, Modified	684 Lft
Sewer, 12 Inch, Modified	61 Lft
Sewer, Drop Inlet 8 Inch	2 Ea
Sewer Tap, 8 Inch	2 Ea
Underdrain, Subgrade, Open Graded, 4 Inch	1400 Lft
HMA, 13A	175 Ton
HMA, 36A	123 Ton
HMA Approach	59 Ton
Driveway, Nonreinf. Conc., 6 Inch	28 Syd
Driveway Opening, Conc., Det M	1 Ea
Curb and Gutter, Conc., Det F4, Modified	1400 Lft
Sidewalk, Conc., 4 Inch	1181 Sft
Sidewalk, Conc., 6 Inch	948 Sft
Sidewalk Ramp, ADA	884 Sft
Detectable Warning Surface, Modified	80 Lft
Steps, Conc.	2 Ea
Slope Restoration, Modified	677 Lft

**PROPOSED DRAINAGE STRUCTURES**

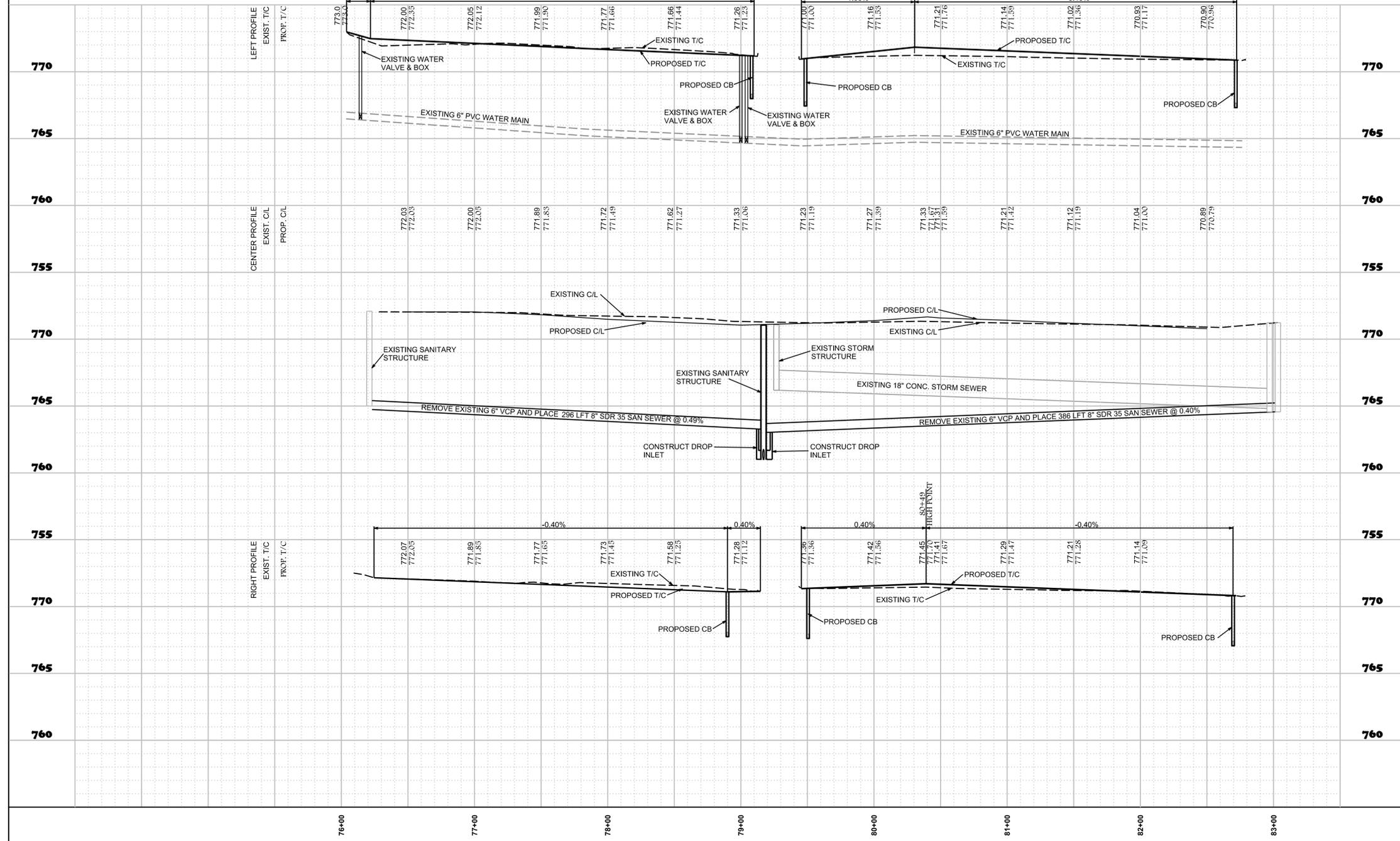
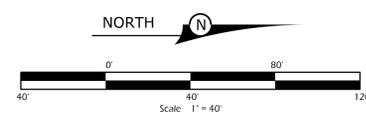
STATION	OFFSET	SIZE	T/C / RIM ELEV.	REMARKS	INVERT ELEV.
78+90	12' RT	24" CB	771.18 (T/C)	8" INVERT WEST 8" INVERT NORTH	768.18 767.98
79+14	26' RT	24" CB	771.17 (T/C)	8" INVERT NORTH	767.79
79+17	1' LT	48" SAN	771.09 (RIM)	8" INVERT WEST 8" INVERT EAST 8" INVERT SOUTH (DROP INLET)	760.96 760.96 763.28
79+45	14' LT	24" CB	770.95 (T/C)	10" INVERT SOUTH	767.40
79+45	14' RT	24" CB	771.34 (T/C)	8" INVERT SOUTH	767.59
82+70	15' RT	24" CB	770.82 (T/C)	8" INVERT NW'LY	767.22
82+71	15' LT	24" CB	770.87 (T/C)	8" INVERT NE'LY	767.57

**EXISTING SANITARY STRUCTURES**

STATION	OFFSET	SIZE	T/C / RIM ELEV.	REMARKS	INVERT ELEV.
76+21	5' RT	48"	772.09 (RIM)	8" INVERT NORTH	765.00
79+17	9' RT	48"	771.05 (RIM)	EXISTING 8" EAST EXISTING 8" WEST 8" INV. NORTH (DROP) 8" INV. SOUTH (DROP)	761.00 761.00 763.01 761.00 763.56 761.00
83+03	5' RT	48"	771.22 (RIM)	8" INV. SOUTH EXISTING 6" NORTH	764.56 764.66

- GENERAL CONSTRUCTION NOTES**
- CONTRACTOR TO VERIFY EXISTING SITE CONDITIONS PRIOR TO CONSTRUCTION.
  - CONTRACTOR TO MAINTAIN DRIVEWAY ACCESS EVERY NIGHT, AND THROUGH THE WEEKEND.
  - CONTRACTOR TO PROTECT EXISTING TREES.
  - CONTRACTOR TO MAINTAIN SOIL EROSION CONTROL MEASURES UNTIL SEEDING IS ESTABLISHED.
  - CONTRACTOR TO VERIFY EXISTING SANITARY INVERTS PRIOR TO CONSTRUCTION.
  - CONTRACTOR TO VERIFY SANITARY LEADS ARE LIVE PRIOR TO RE-INSTITUTION.
  - CONTRACTOR TO WORK AROUND EXISTING POWER POLES. CURBS MAY NEED TO BE ADJUSTED.

**CALL MISS DIG**  
BEFORE DIGGING UNDERGROUND OR WORKING NEAR OVERHEAD WIRES, CALL MISS DIG AT LEAST 3 BUSINESS DAYS IN ADVANCE OF STARTING YOUR PROJECT. (800) 482-7171  
**IT'S THE LAW**



**City of Mt. Pleasant**  
DIVISION OF PUBLIC WORKS  
-ENGINEERING DEPARTMENT-

**PLAN AND PROFILE SHEET  
FRANKLIN STREET  
FROM MOSHER TO LINCOLN**

DESIGN BY <b>BB</b>	CONSTRUCTED
DRAWN BY <b>BB</b>	DATE OF PLAN <b>MARCH 19, 2014</b>
CHECKED BY <b>ST</b>	SCALE <b>1" = 40'</b>
APPROVED BY <b>ST</b>	SHEET <b>4</b> OF <b>5</b> SHEETS

REVISIONS: **SANITARY SEWER ALIGNMENT BB 5/9/14** DATE/INITIALS

CONTROL SECT.	JOB NO.	FED. PROJECT	FED. ITEM NO.
LOCAL	203-451-703-14FRAN	LOCAL	LOCAL

**PLOT DATE:**

DRAWING PATH: J:\CONSTRUCTION\14CONSTR\FRANKLIN STREET  
FED. ITEM NO. LOCAL  
FED. PROJECT LOCAL  
JOB NO.: 203-451-703-14FRAN  
CONTROL SECTION: LOCAL  
FRANKLIN STREET - FROM MOSHER TO LINCOLN

# MICHIGAN SOIL EROSION & SEDIMENTATION CONTROL GUIDEBOOK

FEBRUARY 1975 FIGURE 2



	APR	MAY	JUN	JUL	AUG	SEPT	OCT
IRRIGATED AND/OR MULCHED WITHOUT IRRIGATION OR MULCH							
IRRIGATED AND/OR MULCHED WITHOUT IRRIGATION OR MULCH							
IRRIGATED AND/OR MULCHED WITHOUT IRRIGATION OR MULCH							

### RATE OF APPLICATION (ALL ZONES)

PER 1000 SF	PER ACRE
2 LBS	3 BU
1 1/2 LB	20-25 LBS
1 LB	30-40 LBS
3 LBS	2-3 BU
1/2 LB	20-25 LBS
3 LBS	2-3 BU

### SEEDING ZONES

TYPE OF SEED	APR	MAY	JUN	JUL	AUG	SEPT	OCT
<b>ZONE 1</b>							
SPRING OATS/BARLEY OR DOMESTIC RYEGRASS							
SUDANGRASS							
RYE OR PERENNIAL RYE							
WHEAT							
<b>ZONE 2</b>							
SPRING OATS/BARLEY OR DOMESTIC RYEGRASS							
SUDANGRASS							
RYE OR PERENNIAL RYE							
WHEAT							
<b>ZONE 3</b>							
SPRING OATS/BARLEY OR DOMESTIC RYEGRASS							
SUDANGRASS							
RYE OR PERENNIAL RYE							
WHEAT							

# SOIL EROSION & SEDIMENTATION CONTROL PLAN

## MICHIGAN UNIFIED KEYING SYSTEM

### SESC GENERAL NOTES:

- CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING TEMPORARY AND PERMANENT CONTROL MEASURES UNTIL VEGETATION HAS BEEN ESTABLISHED ON ALL DISTURBED AREAS. MAINTENANCE SHALL INCLUDE PERIODIC INSPECTIONS, REMOVING ACCUMULATED SEDIMENT AND REPAIRING OR REPLACING DAMAGED CONTROL MEASURES. INSPECTIONS SHALL BE PERFORMED DAILY DURING THE CONSTRUCTION PROCESS. FOLLOWING CONSTRUCTION INSPECTIONS SHALL BE PERFORMED AT LEAST ON A WEEKLY BASIS AND AFTER EVERY SIGNIFICANT RAIN EVENT UNTIL VEGETATION HAS BEEN ESTABLISHED.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR REMOVAL OF TEMPORARY CONTROL MEASURES AFTER ALL DISTURBED AREAS HAVE BEEN RESTORED AND VEGETATION HAS BEEN ESTABLISHED. INSTALL FILTER FABRIC UNDER ALL CATCH BASIN GRATES UNTIL PERMANENT SOIL EROSION MEASURES HAVE TAKEN EFFECT. INSTALL MUD TRACKING CONTROL DEVICE AND SILT FENCES PRIOR TO ANY SITE WORK.
- THE OWNER SHALL BE RESPONSIBLE FOR MAINTENANCE OF PERMANENT CONTROL MEASURES AFTER THE ESTABLISHMENT OF VEGETATION ON DISTURBED AREAS. THE OWNER SHALL MAKE PERIODIC INSPECTIONS, AND REPLACE OR REPAIR DAMAGED PERMANENT CONTROL MEASURES AS REQUIRED.
- TIMING SEQUENCE AND CONSTRUCTION SCHEDULE:**  
**PHASE ONE** - EARTH GRADE CHANGE, DITCHES, UTILITIES, PARKING LOT SUBGRADE, PLACE AND MAINTAIN TEMPORARY CONTROL MEASURES DURING THIS CONSTRUCTION PHASE.  
 - MUD TRACKING CONTROL DEVICE  
 - GEOTEXTILE SILT FENCE AND/OR STRAW BALES.  
 - VEGETATIVE BUFFER  
 - RIPRAP  
**PHASE TWO** - FINAL RESTORATION AND BITUMINOUS PAVING  
 MAINTAIN TEMPORARY AND PERMANENT CONTROL MEASURES  
 PLACE PERMANENT CONTROL MEASURE  
 - TOPSOIL, SEED, MULCH AND FERTILIZER IN ACCORDANCE WITH CURRENT MOOT STANDARDS AND SPECIFICATIONS.  
 PERMANENT SEEDING REQUIRED BETWEEN MAY 1 THROUGH OCTOBER. DORMANT SEEDING REQUIRED AFTER NOVEMBER 15, BUT NOT ON FROZEN GROUND.
- ANTICIPATED START CONSTRUCTION DATES:  
**PHASE 1: NOVEMBER 2006**
- PERMANENT CONTROL MEASURES SHALL BE COMPLETED WITHIN 15 CALENDAR DAYS AFTER FINAL EARTH CHANGE IS COMPLETED.
- TEMPORARY SEEDING, OR DORMANT SEEDING SHALL BE UTILIZED FOR "WINTER STABILIZATION".

KEY	DETAIL	CHARACTERISTICS	INDICATES APPLICABILITY OF A SPECIFIC CONTROL MEASURE TO ONE OR MORE OF THE SEVEN PROBLEM AREAS						
			A	B	C	D	E	F	G
1	STRIPPING & STOCKPILING TOPSOIL	TOPSOIL MAY BE STOCKPILED ABOVE BROW AREAS TO ACT AS A BARRIERS. STOCKPILE SHOULD BE TEMPORARILY SEED.	*				*	*	
2	SELECTIVE GRADING & SHAPING	WATER CAN BE DIVERTED TO MINIMIZE EROSION. FLATTER SLOPES EASE EROSION PROBLEMS.	*				*	*	*
3	GRUBBING OMITTED	SAVES COST OF GRUBBING, PROVIDES NEW SPROUTS, RETAINS EXISTING ROOT MAT SYSTEM, REDUCES WIND PULL AT NEW FOREST EDGE, DISCOURAGES EQUIPMENT ENTRANCE.	*				*	*	*
4	VEGETATIVE STABILIZATION	MAY UTILIZE A VARIETY OF PLANT MATERIAL. STABILIZES SOIL, HAS WINNING EROSION, REDUCES RUNOFF TO MINIMIZE SOIL, REDUCING RUNOFF VOLUME SHOULD INCLUDE PREPARED TOPSOIL, SED.	*	*	*	*	*	*	*
5	SEEDING	INEXPENSIVE AND VERY EFFECTIVE. STABILIZES SOIL, HAS WINNING EROSION, REDUCES RUNOFF TO MINIMIZE SOIL, REDUCING RUNOFF VOLUME SHOULD INCLUDE PREPARED TOPSOIL, SED.	*	*	*	*	*	*	*
6	SEEDING WITH MULCH AND/OR MATTING	FACILITATES ESTABLISHMENT OF VEGETATIVE COVER. EFFECTIVE FOR GRADING WAYS WITH LOW VELOCITY. EASILY PLACED IN SMALL QUANTITIES BY INDEPENDENT PERSONNEL. SHOULD INCLUDE PREPARED TOPSOIL, SED.	*	*	*	*	*	*	*
7	HYDRO-SEEDING	EFFECTIVE ON LARGE AREAS. MULCH TACKLING AGENT USED TO PROVIDE IMMEDIATE PROTECTION UNTIL GRASS IS ROOTED. SHOULD INCLUDE PREPARED TOPSOIL, SED.	*	*	*	*	*	*	*
8	SOODING	PROVIDES IMMEDIATE PROTECTION. CAN BE USED ON STEEP SLOPES WHERE SEED MAY BE DIFFICULT TO ESTABLISH. TO BE PLACED, MAY BE REPAIRED IF DAMAGED. SHOULD INCLUDE PREPARED TOPSOIL, SED.	*	*	*	*	*	*	*
9	VEGETATIVE BUFFER STRIP	SLOWS RUNOFF VELOCITY. FILTERS SEDIMENT FROM RUNOFF. REDUCES VOLUME OF RUNOFF ON SLOPES.	*	*	*	*	*	*	*
10	MULCHING	USED ALONG TO PROTECT EXPOSED AREAS FOR SHORT PERIODS. PROTECTS SOIL FROM IMPACT OF FALLING PINE. PRESERVES SOIL MOISTURE AND PROTECTS GERMINATING SEED FROM TEMPERATURE EXTREMES.	*				*	*	
11	ROUGHENED SURFACE	REDUCES VELOCITY AND INCREASES INFILTRATION RATES. COLLECTS SEDIMENT. HOLDS WATER, SEED, AND MULCH BETTER THAN SMOOTH SURFACES.	*				*	*	
12	COMPACTION	HELPS HOLD SOIL IN PLACE, MAKING EXPOSED AREAS LESS VULNERABLE TO EROSION.	*				*	*	
13	RIPRAP, RUBBLE, GABIONS	USED WHERE VEGETATION IS NOT EASILY ESTABLISHED. EFFECTIVE FOR HIGH VELOCITIES OR HIGH CONCENTRATIONS. PERMITS RUNOFF TO RELIEVE SOIL. DISSIPATES ENERGY FLOW AT SYSTEM OUTLETS.	*	*	*	*	*	*	
14	AGGREGATE COVER	STABILIZES SOIL SURFACE, HAS WINNING EROSION. PERMITS CONSTRUCTION TRAFFIC IN ADVERSE WEATHER. MAY BE USED AS PART OF PERMANENT BASE CONSTRUCTION OF PAVED AREAS.	*				*	*	
15	PAVING	PROTECTS AREAS WHICH CANNOT OTHERWISE BE PROTECTED, BUT INCREASES RUNOFF VOLUME AND VELOCITY. IRREGULAR SURFACE WILL HELP SLOW VELOCITY.	*				*	*	
16	CURB & GUTTER	KEEPS HIGH VELOCITY RUNOFF ON PAVED AREAS FROM LEAVING PAVED AREAS. COLLECTS AND CONVEYS RUNOFF TO ENCLOSED DRAINAGE SYSTEM OR PREPARED DRAINAGEWAY.	*				*	*	
17	BENCHES	REDUCES RUNOFF VELOCITY BY REDUCING EFFECTIVE SLOPE LENGTH. CONVEYS SEDIMENT TO DOWNSTREAM. PROVIDES ACCESS TO SLOPES FOR SEEDING, MULCHING AND MAINTENANCE.	*				*	*	
18	DIVERSION BERM	DIVERTS WATER FROM VULNERABLE AREAS. COLLECTS AND DIVERTS WATER TO PREPARED DRAINAGE WAYS. MAY BE PLACED AS PART OF NORMAL CONSTRUCTION OPERATION.	*				*	*	

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			A	B	C	D	E	F	G
19	DIVERSION DITCH	COLLECTS AND DIVERTS WATER TO REDUCE EROSION POTENTIAL. MAY BE INCORPORATED IN PERMANENT PROJECT DRAINAGE SYSTEMS.	*				*	*	*
20	BERM & DITCH	DIVERTS WATER TO A PREPARED DRAINAGEWAY. MAY BE USED AT INTERVALS ACROSS SLOPE FACE TO REDUCE EFFECTIVE SLOPE LENGTH.	*				*	*	*
21	FILTER BERM	CONSTRUCTED OF GRASS OR STONE. INTERCEPTS AND DIVERTS RUNOFF TO STABILIZED AREAS OR PREPARED DRAINAGE SYSTEMS. SLOWS RUNOFF AND COLLECTS SEDIMENT.	*	*			*	*	*
22	BRUSH FILTER	USES SLASH AND LOGS FROM CLEARING OPERATIONS. CAN BE COVERED AND SEEDED RATHER THAN REMOVED. ELIMINATES NEED FOR BURNING OR REMOVAL OF MATERIAL FROM SITE.					*	*	*
23	BARE CHANNEL	LEAST EXPENSIVE FORM OF DRAINAGEWAY. MAY BE USED ONLY WHERE GRADIENT IS VERY LOW AND WITH SOILS OF MINIMAL EROSION POTENTIAL.					*	*	*
24	GRASSSED WATERWAY	MUCH MORE STABLE FORM OF DRAINAGEWAY THAN BARE CHANNEL. GRASS CAN BE USED TO SLOW RUNOFF AND FILTER OUT SEDIMENT. USED WHERE BARE CHANNEL WOULD BE ERODED.					*	*	*
25	SLOPE DRAIN (SURFACE PIPE)	PREVENTS EROSION ON SLOPES WHEN RUNOFF CANNOT BE DIVERTED TO EDGE OF SLOPE AREA.	*				*	*	*
26	SLOPE DRAIN (PIPE CHUTE)	PREVENTS EROSION ON SLOPES WHEN RUNOFF CANNOT BE DIVERTED TO EDGE OF SLOPE AREA. USUALLY PERMANENT. CAN BE CONSTRUCTED OR EXTENDED AS GRADING PROGRESSES.	*				*	*	*
27	SLOPE DRAIN (CONDUIT/PIPE)	PREVENTS EROSION ON SLOPES WHEN RUNOFF CANNOT BE DIVERTED TO EDGE OF SLOPE AREA. USUALLY PERMANENT. CAN BE CONSTRUCTED OR EXTENDED AS GRADING PROGRESSES.	*				*	*	*
28	DROP SPILLWAY	SLOWS VELOCITY OF FLOW, REDUCES EROSION CAPACITY.					*	*	*
29	PIPE DROP	REDUCES RUNOFF VELOCITY. REMOVES SEDIMENT AND TURBIDITY. CAN BE DESIGNED TO HANDLE LARGE VOLUMES OF FLOW.					*	*	*
30	PIPE SPILLWAY	REMOVES SEDIMENT AND TURBIDITY FROM RUNOFF. MAY BE PART OF PERMANENT EROSION CONTROL PLAN.					*	*	*
31	ENERGY DISSIPATER	SLOWS RUNOFF VELOCITY TO NON-EROSIVE LEVEL. PERMITS SEDIMENT COLLECTION FROM RUNOFF.	*				*	*	*
32	LEVEL SPREADER	CONVERTS COLLECTED CHANNEL OR PIPE FLOW BACK TO SHEET FLOW. AVOIDS CHANNEL, EXAGGERATES AND CONCENTRATES OFF PROJECT SITE. SIMPLE TO CONSTRUCT.					*	*	*
33	SEDIMENTATION TRAP	MAY BE CONSTRUCTED OF A VARIETY OF MATERIALS. TRAPS SEDIMENT. RELEASES RUNOFF AT NON-EROSIVE RATES. CONTROLS RUNOFF AT SYSTEM OUTLETS. CAN BE CLEANED AND EXPANDED AS NEEDED.					*	*	*
34	SEDIMENT BASIN	TRAPS SEDIMENT. RELEASES RUNOFF AT NON-EROSIVE RATES. CONTROLS RUNOFF AT SYSTEM OUTLETS. CAN BE CLEANED AND EXPANDED AS NEEDED.					*	*	*
35	STORM SEWER	SYSTEM REMOVES COLLECTED RUNOFF FROM SITE, PARTICULARLY FROM PAVED AREAS. CAN ACCEPT LARGE CONCENTRATIONS OF RUNOFF. CONDUCTS RUNOFF TO MUNICIPAL SEWER SYSTEM OR STABILIZED OUTFALL LOCATION. USE CATCH BASINS TO COLLECT SEDIMENT.					*	*	*
36	CATCH BASIN, DRAIN INLET	COLLECTS HIGH VELOCITY CONCENTRATED RUNOFF. MAY USE FILTER, SCREEN OVER INLET.					*	*	*

KEY	DETAIL	CHARACTERISTICS	INDICATES APPLICABILITY OF A SPECIFIC CONTROL MEASURE TO ONE OR MORE OF THE SEVEN PROBLEM AREAS						
			A	B	C	D	E	F	G
37	SOIL FILTER	INEXPENSIVE AND EASY TO CONSTRUCT. PROVIDES IMMEDIATE PROTECTION. PROTECTS AREAS AROUND INLETS FROM EROSION.					*	*	*
38	STRAW BALE FILTER	INEXPENSIVE AND EASY TO CONSTRUCT. CAN BE LOCATED AS NECESSARY TO COLLECT SEDIMENT. MAY BE USED IN CONJUNCTION WITH SNOW FENCE FOR WIND STABILITY.					*	*	*
39	ROCK FILTER	CAN UTILIZE MATERIAL FOUND ON SITE. EASY TO CONSTRUCT. FILTERS SEDIMENT FROM RUNOFF.					*	*	*
40	INLET SEDIMENT TRAP	EASY TO SHAPE. COLLECTS SEDIMENT. MAY BE CLEANED AND EXPANDED AS NEEDED.					*	*	*
41	STONE AND ROCK CROSSING	MAY BE ROCK OR CLEAN RUBBLE. MINIMIZES STREAM TURBIDITY. IMPROVES STREAM CHANNEL. MAY ALSO SERVE AS DITCH CHECK OR SEDIMENT TRAP.					*	*	*
42	TEMPORARY CULVERT	ELIMINATES STREAM TURBULENCE AND TURBIDITY. PROVIDES UNOBSTRUCTED PASSAGE FOR FISH AND OTHER WATER LIFE. CAPACITY FOR NORMAL FLOW CAN BE PROVIDED WITH STORM WATER FLOWING OVER ROADWAY.					*	*	*
43	CULVERT SEDIMENT TRAP	EASY TO INSTALL AT INLET. KEEP CLEAN AND FREE FLOWING. MAY BE CONSTRUCTED OF LUMBER OR LOGS.					*	*	*
44	CULVERT SEDIMENT TRAP	DEFLECTS CURRENTS AWAY FROM STREAMBANK AREAS.					*	*	*
45	TEMP. STREAM CHANNEL CHANGE	NEW CHANNEL KEEPS NORMAL FLOWS AWAY FROM CONSTRUCTION. REQUIRES STATE PERMIT.					*	*	*
46	SHEET PILING	PROTECTS ERODIBLE BANK AREAS FROM STREAM CURRENTS DURING CONSTRUCTION. MANUAL DESTRUCTION WHEN REMOVED.					*	*	*
47	COFFERDAM	WORK CAN BE CONTINUED DURING MOST UNFURNISHED STREAM CONDITIONS. CLEAR WATER CAN BE PUMPED DIRECTLY BACK INTO STREAM.					*	*	*
48	CONSTRUCTION DAM	PERMITS WORK TO CONTINUE DURING NORMAL STREAM STAGES. CONTROLLED FLOODING CAN BE ACCOMPLISHED DURING PERIODS OF INACTIVITY.					*	*	*
49	CHECK DAMS	REDUCES FLOW VELOCITY. CATCHES SEDIMENT. CAN BE CONSTRUCTED OF LOGS, STRAW, RYE, LUMBER, MASONRY, OR SAND BAGS.					*	*	*
50	WEIR	CONTROLS SEDIMENTATION IN LARGE STREAMS. CAUSES MANUAL TURBIDITY.					*	*	*
51	RETAINING WALL	REDUCES GRADIENT WHERE SLOPES ARE EXTREMELY STEEP. PERMITS RESTORATION OF EXISTING VEGETATION, KEEPING SOIL STABLE IN CRITICAL AREAS. REQUIRES MAINTENANCE.					*	*	*
52	SEEPAGE CONTROL	PREVENTS PIPING AND SOIL SURFACE ON CUT SLOPES.					*	*	*
53	WINDBREAK	MINIMIZES WIND EROSION. MAY BE SNOW FENCE.					*	*	*
54	SILT FENCE	USES GEOTEXTILE FABRIC AND POSTS OR POLES. EASY TO CONSTRUCT AND LOCATE AS NECESSARY.					*	*	*



## City of Mt. Pleasant

DIVISION OF PUBLIC WORKS  
-ENGINEERING DEPARTMENT-

### SOIL EROSION KEY SHEET

### FRANKLIN STREET

### FROM MOSHER TO LINCOLN

DESIGN BY <b>BB</b>	CONSTRUCTED
DRAWN BY <b>BB</b>	DATE OF PLAN <b>MARCH 19, 2014</b>
CHECKED BY <b>ST</b>	SCALE <b>NONE</b>
APPROVED BY <b>ST</b>	SHEET <b>5</b> OF <b>5</b> SHEETS

REVISIONS		DATE/INITIALS	

CONTROL SECT.	JOB NO.	FED. PROJECT	FED. ITEM NO.
LOCAL	203-451-703-14FRAN	LOCAL	LOCAL

**PLOT DATE:**

DRAWING PATH: J:\CONSTRUCTION\14CONSTR\FRANKLIN\STREET CONTROL SECTION LOCAL