



CITY of NOVI CITY COUNCIL

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Agenda Item 8
November 13, 2007

SUBJECT: Consideration of award of a construction contract for the Sanitary Sewer Manhole Rehabilitation project (a CMOM-identified project) to Inland Waters Pollution Control, Inc., the lowest qualified bidder, in the amount of \$204,480.

SUBMITTING DEPARTMENT: Engineering *RJM*

CITY MANAGER APPROVAL: *✓*

EXPENDITURE REQUIRED	\$204,480
AMOUNT BUDGETED	\$216,000 (\$391,000 total for 2007-8 CMOM implementation tasks)
APPROPRIATION REQUIRED	\$18,526 (includes total for 2007-8 CMOM implementation tasks)
LINE ITEM NUMBER	592-592.00-936.500

BACKGROUND INFORMATION:

The City initiated the sanitary sewage *Capacity, Management, Operations and Maintenance (CMOM)* Program in 2004. The first two phases of the program have included an investigation of the existing capacity of the system, an inventory of pump stations, flow metering at key locations throughout the City to identify potential areas of inflow and infiltration problems, an investigation of key areas of the City prone to inflow and infiltration, and the development of a list of projects to add to the City's capital improvements program. The project list includes this project, which is part of the third phase of the CMOM program.

City Council awarded engineering services to Orchard Hiltz & McCliment (OHM) for the third phase CMOM tasks in September 2007. The purpose of the third phase is to complete implementation of the initial recommendations and provide an ongoing program to meet the City's objectives for the sanitary sewer system. The tasks to be completed in the third phase include:

- A. Design, bidding, construction engineering services and a reporting phase for a pilot program within a designated area (upstream of the Country Place pump station in Section 35) for inflow and infiltration removal based on the results of the Sanitary Sewer Evaluation Survey (SSES). (The SSES was completed in CMOM Phase II.)
- B. The cleaning and televising of areas identified as Tier II areas in the SSES.
- C. Additional flow metering of priority areas of the City.

The award of this construction contract is for Task A - the pilot program within a designated area (upstream of the Country Place pump station in Section 35) for inflow and infiltration removal based on the findings from the SSES completed in CMOM Phase II. Inflow and infiltration (I/I) is clean water that enters the sanitary sewage collection system (from sources such as groundwater) through leaking manholes and pipes. I/I essentially diminishes the City's overall sewage collection and treatment capacity and therefore needs to be removed from the system.

In order to study the effectiveness of different I/I removal, this project includes the repair and rehabilitation of 123 sanitary sewer manholes using various rehabilitation methods within the area depicted on the attached map. The goal of the manhole rehabilitation project is to cost-effectively reduce the amount of I/I to the sanitary sewer system, thereby maximizing the available capacity for new development and minimizing the cost to residents for treatment and wet weather control

facilities. The flows in these areas are being metered currently to establish the baseline flows. When the rehabilitation is completed, the flows will be metered again to determine the effectiveness of each of the implemented rehabilitation methods at removing inflow and infiltration. The results of this project will create the template for future work by the City to reduce I/I into the City's sanitary sewer system.

Nine bids were received and opened on November 1, 2007 following a public bid solicitation period. The lowest "as-read" bid was provided by Washtenaw Inc. Maintenance Services in the amount of \$168,305.25. OHM reviewed the qualifications statement provided by Washtenaw and noted that its past experience is primarily related to pedestrian pathways and parking lot improvements, and that minimal general contractor experience is documented for manhole rehabilitation projects. Based on a check of references provided, a review of Washtenaw's past performance on manhole rehab projects was generally unfavorable. (See additional discussion in OHM's attached letter dated November 7, 2007).

Government agencies that are significant buyers of capital construction typically scrutinize the reliability of bids. MDOT's guideline for ascertaining the reasonableness is that if a bid is greater than 10% below the engineer's estimate, it warrants a detailed review of not only the bid's pricing components, but also of the contractor's qualifications. Washtenaw's bid is over 15% lower than OHM's estimate of \$198,647. Because Washtenaw's bid is 15% below the engineer's estimate and its qualifications as a general contractor for this type of work are an issue, we evaluated the second lowest bidder.

The second lowest bid was received from Inland Waters Pollution Control, Inc. Inland Water's bid is recommended as being in the best interest of the City as the bidder has significant relevant experience on many manhole rehabilitation projects for the Detroit Water and Sewerage Department. (OHM's award recommendation letter dated November 5, 2007 and supplemental letter dated November 7, 2007 is attached).

A summary of the bids is as follows:

Bidder	Total Bid
Washtenaw Inc. Maintenance Services	168,305.25
Inland Waters Pollution Control, Inc.	204,480.00
Douglas N. Higgins, Inc.	209,555.00
Kim Construction Company, Inc.	229,020.00
Bidigare Contractors, Inc.	243,827.00
Man Con Michigan, Inc.	253,385.00
D&D Water & Sewer, Inc.	271,857.92
E.T. MacKenzie Corp.	272,350.00
Young's Environmental Cleanup, Inc.	431,188.00

The contract completion date for the manhole rehabilitation work is within 90 days of the Notice to Proceed. We anticipate project completion in February 2008.

RECOMMENDED ACTION: Approval to award a construction contract for the Sanitary Sewer Manhole Rehabilitation project (a CMOM-identified project) to Inland Waters Pollution Control, Inc., the lowest qualified bidder, in the amount of \$204,480.

	1	2	Y	N
Mayor Landry				
Mayor Pro Tem Capello				
Council Member Crawford				
Council Member Gatt				

	1	2	Y	N
Council Member Margolis				
Council Member Mutch				
Council Member Staudt				



November 7, 2007

Mr. Brian Coburn, P.E.
City of Novi
45175 West Ten Mile Road
Novi, Michigan 48375

Regarding: Manhole Rehabilitation Project
Letter of Recommendation Additional Information
OHM Job No. 0163-07-3001

Dear Mr. Coburn:

On November 5, 2007, OHM provided a letter of recommendation for the manhole rehabilitation project to the City of Novi. Our letter recommended that the City award the contract to the second low bidder, Inland Waters Pollution Controls, Inc. The main reason for this selection was that during our review of the low bidder qualifications, Washtenaw Inc. Maintenance Services had minimal work experience as a general contractor for work associated with manhole rehabilitation as written in the attached fax provided by Washtenaw Inc. Maintenance Services and as listed in their Bidders Qualification and Experience Statement provided with their Bid. The second low bidder's Bidder's Qualification and Experience Statement, shows experience with the associated work and the firm is well known for their work in the area.

The purpose of this phase of the CMOM program is to complete implementation of the initial CMOM recommendations and to meet the City's on-going program for the sanitary sewer system. The goal of the manhole rehabilitation project is to cost-effectively reduce the amount of inflow and infiltration to the sanitary sewer system, maximizing the available capacity for new development and minimizing the cost to residents for treatment and wet weather control facilities. In order to meet these objectives, it is critical that the work be completed by a qualified contractor. Failure to do so would limit our ability to meet the program objectives and the success of reduction of inflow and infiltration into the sanitary sewer system.

Our review of work completed by Washtenaw Inc. Maintenance Services for the Village of Maybee, Macomb County Road Commission and Huron Township (for the Huron Clinton Metroparks) indicated that the company was cooperative and worked to complete projects, but work needed to be redone to meet the contract requirements, work claims were submitted for additional time and effort, and the Owner/Engineer had to assist the contractor with work related issues that were the contractor's responsibilities.

Inland Waters has completed numerous projects for Detroit Water and Sewerage Department specifically related to manhole rehabilitation. They have consistently worked with DWSD for 20 years through an on-going contract. Additional work experience provided by Inland Waters, indicates they have completed work for the Cities of Toledo, Cleveland and Cleveland Heights, Ohio, along with work for General Motors.

Lastly, the bidding documents clearly state in the Instructions to Bidders, under Award of Contract, page 9, "The Owner reserves the right to accept any Bid or alternate and award the Contract to other than the Advancing Communities

34000 Plymouth Road | Livonia, Michigan 48150
p. (734) 522-6711 | f. (734) 522-6427
www.ohm-advisors.com

lowest bidder; to waive any irregularities or informalities, or both; to reject any or all Bids; and in general to make the award of the Contract in any manner deemed by the OWNER (Novi), in its sole discretion, to be in the best interests of the OWNER."

An award to Washtenaw would be to a contractor that has acknowledged that they have no experience as a general contractor completing manhole rehabilitation projects (see attached fax and limited experience as shown in their Bidders Qualifications). We would anticipate additional City and Engineer time would be required during the construction phase to ensure compliance with the contract documents. A budget for this additional work cannot be determined at this time and would only be realized upon construction completion.

Award of the contract to Inland Waters Pollution Controls, Inc., would be an additional \$36,174.75 over the contract amount with Washtenaw. However, it is not anticipated that additional City and/or Engineering supervision and inspection would be required during construction, based on the documentation of work experience provided as part of Inland Water's Bidders Qualification. /k

We recommend that the City award this contract to Inland Waters Pollution Controls, Inc. in the amount of \$204,480.00 based on the unit prices bid and the documentation of their work experience. If you have any questions or require additional information, please feel free to contact me at (734) 466-4527.

Sincerely,
OHM



Daniel A. Schmoekel, E.I.T.
Engineer

Enclosures

cc: AI McComb, PE, OHM
File

From: Tom Nolan
Sent: Monday, November 05, 2007 4:48 PM
To: Curtis Maring
Subject: manhole rehab projects
Curt,

List of manhole type projects is included below.

thanks

TN

Previous Manhole Work (*For Inland Waters*)

1. City of Toledo, Ohio, 2005-06. Rehabilitation of 110 manholes. Work included repairs and lining.
2. City of Cleveland, OH, 2005. Repair and lined a 4' diameter by 15' deep brick manhole and the brick inlet and outlet pipes after the manhole had washed out and created a sink hole. Project located in a 8 lane major artery immediately adjacent to Jakob Field.
3. City of Cleveland Hts, OH, 2007. Located and installed 110 Vac-A-Tees to allow lining of residential sewer laterals.
4. General Motors Proving Ground, Milford, MI, 2006. Rerouted a 24" diameter storm sewer approx. 15' deep. Work included installing two new precast catch basins and working with a trench box.
5. General Motors, Pontiac North Campus, 2005-06. Reset manhole frames, lids and adjusting rings to accommodate grade change in preparation for new development after demolition of the existing facility.



November 5, 2007

Mr. Brian Coburn, P.E.
City of Novi
45175 West Ten Mile Road
Novi, Michigan 48375

Engineering Advisors

Regarding: Manhole Rehabilitation Project - Letter of Recommendation
OHM Job No. 0163-07-3001

Dear Mr. Coburn:

A total of nine (9) bids for the above-referenced project were received on November 1, 2007. Listed below are the three lowest bids. Also, a copy of the bid tabulation has been attached for your information.

Contractor	Bid Amount
Washtenaw Inc. Maintenance Services	\$168,305.25
Inland Waters Pollution Controls, Inc.	\$204,480.00
Douglas N. Higgins, Inc.	\$209,555.00

We have reviewed the documentation submitted by Washtenaw Inc. Maintenance Services in regards to their experience. Their current and past work experience lists projects associated with pedestrian pathway and parking lot improvements. No work experience is documented for manhole rehabilitation type projects. In additional information provided by the Contractor, they note that they have not been awarded a project that was specifically related to manhole rehabilitation, but have completed projects that have done manhole rehabilitations. A review of their past performance on these types of projects was marginal or unfavorable from the references provided.

Based on the above information, we reviewed the bid documentation submitted by Inland Waters Pollution Controls, Inc., the second low bidder, and found their work experience to be acceptable. Inland Waters has completed numerous projects for Detroit Water and Sewerage Department specifically related to manhole rehabilitation.

We are recommending award of this contract to Inland Waters Pollution Controls, Inc. in the amount of \$204,480.00 based on the unit prices bid. If you have any questions or require additional information, please feel free to contact me at (734) 466-4527.

Sincerely,
OHM

Daniel A. Schmoekel, E.I.T.
Engineer

cc: AI McComb, PE, OHM

File

Advancing Communities

34000 Plymouth Road | Livonia, Michigan 48150
p. (734) 522-6711 | f. (734) 522-6427
www.ohm-advisors.com



Washtenaw Inc. Maintenance Services

2160 E. Michigan Ave • Ypsilanti, MI 48198

Phone 734-483-3000 • Fax 734-485-6690

E-Mail: info@washtenawinc.com • Webpage: www.washenawinc.com

November 2, 2007

Orchard, Hiltz & McCliment
Attn: Dan Schmoekel
34000 Plymouth Rd.
Livonia, MI 48150

RE: City of Novi
CMOM Manhole Rehabilitation

Dear Mr. Schmoekel,

It was a pleasure speaking to you on the telephone today regarding the above named project. You requested additional qualifications for the Manhole Rehabilitation. We have not been awarded a project that was just manhole rehabilitation but on many of the projects we have completed or are working on now we have done multiple manhole rehabilitations. For example: The City of Montrose – Park St. project we installed a new sanitary system, raised and lowered existing structures. Macomb County – Fuller & Scholar Rd. we had multiple manhole adjustments.

We are planning on using a subcontractor for the cementitious lining and the leak sealing. The subcontractor we would be planning on using at this point would be Advanced Underground Inspection.

We have multiple personnel in our employ that have many years of experience with manhole rehabilitation and feel very confident that we have the manpower and knowledge to get the job done. We look forward to working with you and with the City of Novi.

Please do not hesitate to contact me with any further questions.

Sincerely,

A handwritten signature in black ink that reads "Pam Bufford".

Pam Bufford
Estimator

Your Construction & Landscape Solution
EXCAVATION • CONCRETE SERVICES
LANDSCAPE INSTALLATION • LANDSCAPE MAINTENANCE
DRAINAGE SYSTEMS • IRRIGATION SERVICE
MDOT PREQUALIFIED CONTRACTOR

Tabulation for Bids Received on 11/01/2007

City of Novi - CMOM Phase III - Manhole Rehabilitation
 City of Novi, Oakland County, State of Michigan
 OHM Job No.: 0163-07-3001

Washtenaw Inc. Maintenance Services
 2160 E. Michigan
 Ypsilanti, MI 48198

Inland Waters Pollution Control, Inc.
 2021 S. Schaefer Hwy.
 Detroit, MI 48217

Douglas N. Higgins, Inc.
 3390 Travis Pointe Rd., Ste. A
 Ann Arbor, MI 48108

Kim Construction Company, Inc.
 3142 Holman
 Steger, IL 60475

Item No.	Description	Estimated Quantity	Phone: 734.483.3000		Phone: 734.479.3205		Phone: 734.996.9500		Phone: 708.754.1181	
			Unit Price	Amount	Unit Price	Amount	Unit Price	Amount	Unit Price	Amount
1)	Mobilization, max. \$10,000.00	1 LS	\$10,000.00	\$10,000.00	\$5,150.00	\$5,150.00	\$6,500.00	\$6,500.00	\$10,000.00	\$10,000.00
2)	Audio Video Survey	1 LS	\$6,652.75	\$6,652.75	\$6,500.00	\$6,500.00	\$6,000.00	\$6,000.00	\$1,200.00	\$1,200.00
3)	Method #1 - Remove and Replace Lid	14 Ea	\$250.00	\$3,500.00	\$286.00	\$4,004.00 *	\$200.00	\$2,800.00	\$160.00	\$2,240.00
4)	Method #2 (Vegetation/Gravel) - Remove and Reset Frame	19 Ea	\$75.00	\$1,425.00	\$242.00	\$4,598.00	\$470.00	\$8,930.00	\$750.00	\$14,250.00
5)	Method #3 (Pavement) - Rem. and Reset Frame	6 Ea	\$90.00	\$540.00	\$700.00	\$4,200.00	\$500.00	\$3,000.00	\$1,200.00	\$7,200.00
6)	Method #4 (Vegetation/Gravel) - Remove and Replace Frame	8 Ea	\$175.00	\$1,400.00	\$370.00	\$2,960.00	\$690.00	\$5,520.00	\$1,050.00	\$8,400.00
7)	Method #5 (Pavement) - Remove and Replace Frame	6 Ea	\$225.00	\$1,350.00	\$810.00	\$4,860.00	\$950.00	\$5,700.00	\$1,650.00	\$9,900.00
8)	Method #6 (Vegetation/Gravel) - Replace Adj Rings (<2 ft)	49 Ea	\$350.00	\$17,150.00	\$600.00	\$29,400.00	\$380.00	\$18,620.00	\$405.00	\$19,845.00
9)	Method #7 (Vegetation/Gravel) - Replace Adj Rings (>2 ft)	7 Ea	\$700.00	\$4,900.00	\$900.00	\$6,300.00	\$600.00	\$4,200.00	\$1,000.00	\$7,000.00
10)	Method #8 (Pavement) - Replace Adj Rings (<2 ft)	13 Ea	\$450.00	\$5,850.00	\$1,050.00	\$13,650.00	\$550.00	\$7,150.00	\$405.00	\$5,265.00
11)	Method #9 (Pavement) - Replace Adj Rings (>2 ft)	5 Ea	\$900.00	\$4,500.00	\$1,650.00	\$8,250.00	\$775.00	\$3,875.00	\$1,000.00	\$5,000.00
12)	Method #10 - Apply cementitious coating, Calcium Aluminate	51 Ft	\$250.00	\$12,750.00	\$210.00	\$10,710.00	\$260.00	\$13,260.00	\$175.00	\$8,925.00
13)	Method #11 - Seal Leak(s) with Injectable Polyurethane Grout	72 Ea	\$800.00	\$57,600.00	\$350.00	\$25,200.00	\$825.00	\$59,400.00	\$900.00	\$64,800.00
14)	Method #12 - Heat Shrinkable Manhole Wrap	97 Ea	\$300.00	\$29,100.00	\$594.00	\$57,618.00	\$475.00	\$46,075.00	\$485.00	\$47,045.00
15)	Method #13 - Adjust Elevation (<2 ft)	6 Ea	\$150.00	\$900.00	\$880.00	\$5,280.00	\$250.00	\$1,500.00	\$1,800.00	\$10,800.00
16)	Remove and Replace Concrete Pavement	15 Syd	\$75.00	\$1,125.00	\$170.00	\$2,550.00	\$130.00	\$1,950.00	\$75.00	\$1,125.00
17)	Remove and Replace Asphalt Pavement	175 Syd	\$46.00	\$8,050.00	\$60.00	\$10,500.00	\$72.00	\$12,600.00	\$25.00	\$4,375.00
18)	Remove and Replace Sidewalk Pavement	275 Sft	\$5.50	\$1,512.50	\$10.00	\$2,750.00	\$9.00	\$2,475.00	\$6.00	\$1,650.00
TOTAL BID AMOUNT				\$168,305.25		\$204,480.00 *		\$209,555.00		\$229,020.00

CORRECTIONS

- * OHM corrected contractor multiplication error and adjusted total to reflect multiplication error.

Tabulation for Bids Received on 11/01/2007
City of Novi - CMOM Phase III - Manhole Rehabilitation
 City of Novi, Oakland County, State of Michigan
 OHM Job No.: 0163-07-3001

		Bidigare Contractors, Inc.			Man Con Michigan, Inc.			D& D Water & Sewer, Inc.			E.T. MacKenzie Corp.	
		7820 Chubb Road Northville, MI 48168			5225 22 Mile Road Shelby Twp., MI 48317			7371 Haverhill Lane Canton, MI 48187			6400 Jackson Ann Arbor, MI 48103	
Item No.	Description	Phone: 248.735.1113			Phone: 586.254.9266			Phone: 734.397.3386			Phone: 734.761.5050	
		Estimated Quantity	Unit Price	Amount	Unit Price	Amount	Unit Price	Amount	Unit Price	Amount	Unit Price	Amount
1)	Mobilization, max. \$10,000.00	1 LS	\$10,000.00	\$10,000.00	\$10,000.00	\$10,000.00	\$10,000.00	\$10,000.00	\$10,000.00	\$10,000.00	\$10,000.00	\$10,000.00
2)	Audio Video Survey	1 LS	\$26,500.00	\$26,500.00	\$5,785.00	\$5,785.00	\$6,652.75	\$6,652.75	\$16,000.00	\$16,000.00		
3)	Method #1 - Remove and Replace Lid	14 Ea	\$212.00	\$2,968.00	\$150.00	\$2,100.00	\$167.84	\$2,349.76	\$185.00	\$2,590.00		
4)	Method #2 (Vegetation/Gravel) - Remove and Reset Frame	19 Ea	\$254.00	\$4,826.00	\$350.00	\$6,650.00	\$276.00	\$5,244.00	\$380.00	\$7,220.00		
5)	Method #3 (Pavement) - Rem. and Reset Frame	6 Ea	\$808.00	\$4,848.00	\$1,250.00	\$7,500.00	\$202.76	\$1,216.56	\$355.00	\$2,130.00		
6)	Method #4 (Vegetation/Gravel) - Remove and Replace Frame	8 Ea	\$466.00	\$3,728.00	\$575.00	\$4,600.00	\$471.59	\$3,772.72	\$585.00	\$4,680.00		
7)	Method #5 (Pavement) - Remove and Replace Frame	6 Ea	\$1,109.00	\$6,654.00	\$1,700.00	\$10,200.00	\$398.35	\$2,390.10	\$555.00	\$3,330.00		
8)	Method #6 (Vegetation/Gravel) - Replace Adj Rings (<2 ft)	49 Ea	\$605.00	\$29,645.00	\$575.00	\$28,175.00	\$399.73	\$19,586.77	\$575.00	\$28,175.00		
9)	Method #7 (Vegetation/Gravel) - Replace Adj Rings (>2 ft)	7 Ea	\$1,401.00	\$9,807.00	\$600.00	\$4,200.00	\$641.63	\$4,491.41	\$1,120.00	\$7,840.00		
10)	Method #8 (Pavement) - Replace Adj Rings (<2 ft)	13 Ea	\$1,121.00	\$14,573.00	\$800.00	\$10,400.00	\$326.48	\$4,244.24	\$545.00	\$7,085.00		
11)	Method #9 (Pavement) - Replace Adj Rings (>2 ft)	5 Ea	\$1,263.00	\$6,315.00	\$1,800.00	\$9,000.00	\$568.39	\$2,841.95	\$850.00	\$4,250.00		
12)	Method #10 - Apply cementitious coating, Calcium Aluminate	51 Ft	\$295.00	\$15,045.00	\$250.00	\$12,750.00	\$262.50	\$13,387.50	\$265.00	\$13,515.00		
13)	Method #11 - Seal Leak(s) with Injectable Polyurethane Grout	72 Ea	\$293.00	\$21,096.00	\$900.00	\$64,800.00	\$840.00	\$60,480.00	\$810.00	\$58,320.00		
14)	Method #12 - Heat Shrinkable Manhole Wrap	97 Ea	\$611.00	\$59,267.00	\$700.00	\$67,900.00	\$1,081.20	\$104,875.40	\$730.00	\$70,810.00		
15)	Method #13 - Adjust Elevation (<2 ft)	6 Ea	\$605.00	\$3,630.00	\$200.00	\$1,200.00	\$728.96	\$4,373.76	\$580.00	\$3,480.00		
16)	Remove and Replace Concrete Pavement	15 Syd	\$298.00	\$4,470.00	\$100.00	\$1,500.00	\$125.00	\$1,875.00	\$145.00	\$2,175.00		
17)	Remove and Replace Asphalt Pavement	175 Syd	\$104.00	\$18,200.00	\$30.00	\$5,250.00	\$125.00	\$21,875.00	\$160.00	\$28,000.00		
18)	Remove and Replace Sidewalk Pavement	275 Sft	\$8.20	\$2,255.00	\$5.00	\$1,375.00	\$8.00	\$2,200.00	\$10.00	\$2,750.00		
		TOTAL BID AMOUNT			\$243,827.00			\$253,385.00			\$271,857.92	
\$272,350.00												

CORRECTIONS

- * OHM corrected contractor multiplication error and adjusted total to reflect multiplic

Tabulation for Bids Received on 11/01/2007
City of Novi - CMOM Phase III - Manhole Rehabilitation
 City of Novi, Oakland County, State of Michigan
 OHM Job No.: 0163-07-3001

Young's Environmental
 Cleanup, Inc.
 G-5305 N. Dort Hwy.
 Flint, MI 48505

Phone: 810.789.7155

Item No.	Description	Estimated Quantity	Unit Price	Amount
1)	Mobilization, max. \$10,000.00	1 LS	\$10,000.00	\$10,000.00
2)	Audio Video Survey	1 LS	\$9,653.00	\$9,653.00
3)	Method #1 - Remove and Replace Lid	14 Ea	\$1,000.00	\$14,000.00
4)	Method #2 (Vegetation/Gravel) - Remove and Reset Frame	19 Ea	\$1,290.00	\$24,510.00
5)	Method #3 (Pavement) - Rem. and Reset Frame	6 Ea	\$1,010.00	\$6,060.00
6)	Method #4 (Vegetation/Gravel) - Remove and Replace Frame	8 Ea	\$1,300.00	\$10,400.00
7)	Method #5 (Pavement) - Remove and Replace Frame	6 Ea	\$1,100.00	\$6,600.00
8)	Method #6 (Vegetation/Gravel) - Replace Adj Rings (<2 ft)	49 Ea	\$1,780.00	\$87,220.00
9)	Method #7 (Vegetation/Gravel) - Replace Adj Rings (>2 ft)	7 Ea	\$2,290.00	\$16,030.00
10)	Method #8 (Pavement) - Replace Adj Rings (<2 ft)	13 Ea	\$1,710.00	\$22,230.00
11)	Method #9 (Pavement) - Replace Adj Rings (>2 ft)	5 Ea	\$2,390.00	\$11,950.00
12)	Method #10 - Apply cementitious coating, Calcium Aluminate	51 Ft	\$315.00	\$16,065.00
13)	Method #11 - Seal Leak(s) with Injectable Polyurethane Grout	72 Ea	\$995.00	\$71,640.00
14)	Method #12 - Heat Shrinkable Manhole Wrap	97 Ea	\$1,100.00	\$106,700.00
15)	Method #13 - Adjust Elevation (<2 ft)	6 Ea	\$1,680.00	\$10,080.00
16)	Remove and Replace Concrete Pavement	15 Syd	\$100.00	\$1,500.00
17)	Remove and Replace Asphalt Pavement	175 Syd	\$28.00	\$4,900.00
18)	Remove and Replace Sidewalk Pavement	275 Sft	\$6.00	\$1,650.00

TOTAL BID AMOUNT \$431,188.00

CORRECTIONS

- * OHM corrected contractor multiplication error and adjusted total to reflect multiplications.

CITY OF NOVI

基础物理学实验/王永生·水稳石·徐朝华主编

