OPERATIONS & MAINTENANCE MANUAL

DFI No.: DFI D00538
Facility Type: Water Quality Manhole (Contech CDS5678-8)

November 2011

INDEX

1. Identification

Drainage Facility ID (DFI):	D00538
Facility Type:	Water Quality Manhole
Construction Drawings:	City of Eugene #4543
Location:	Region 2 Highway No: 227 Milepost: See Description Description: This facility is located within ODOT ROW, under Bridge 09572 at MP 0.63, directly across from a residential house (#160 N. Jefferson Street).

2. Facility Contact Information

Contact the City of Eugene, Public Works Maintenance Division, Storm Water Maintenance Supervisor at (541) 682-4800 for:

- Operational Clarification
- Maintenance Clarification
- Repair or Restoration Assistance

3. Construction

Engineer of Record:

City of Eugene, Public Works Engineering
Teri Higgins, (541)682-8462
Contech Senior Design Engineer
Andreea Simescu, 503-258-3138

Facility Construction: 2011

Contractor: Kipco Inc.

4. Storm Drain System and Facility Overview

This water quality manhole is an underground facility designed to treat stormwater runoff. The system is a proprietary product manufactured by Contech Solutions. This system is a CDS Model CDS4578-8-F designed to remove sediments, oils, and debris from the stormwater.

This facility receives stormwater from the northbound and southbound lanes of I-105 (Hwy 227) from the Willamette River to 7th Avenue.

This facility is just over 29 feet in depth, 96-inches in its inside diameter, and This facility is located within ODOT ROW, under Bridge 09572 at MP 0.63. **(Photo 1 and Point A on the Operational Plan in Appendix A**). Vehicular and personnel access to the facility's water quality manhole may be obtained from a driveway and gate to the facility, directly across from a residential house (#160 N. Jefferson Street).

Stormwater enters the diversion chamber **(Photo 2 and Point B on the Operational Plan in Appendix A)** where the diversion weir guides the flow into the unit's separation chamber and pollutants are removed from the runoff (**Photo 3**). This facility contains an Operational and Maintenance manual as prepared by the manufacturer and is provided in **Appendix C**.

The facility, the water quality manhole, is considered an offline facility treating all stormwater flows less than 25 cfs. Flows greater than 25 cfs flow over the diversion weir. After treatment, the water is directed to the north through a 42-inch diameter pipe, draining into the Willamette River.

For further information and details regarding the system refer to **Appendix A** for the **Operational Plan**, **Appendix B** for **Construction Designs**, and **Appendix C** for the **Proprietary Structure Maintenance Requirements**.

Photo 1

Photo 2

Photo 3: Interior of water quality manhole for this facility D00538.

A. Maintenance equipment access:

This facility is located within ODOT ROW, under Bridge 09572 at MP 0.63, directly across from a residential house (#160 N. Jefferson Street). There is a concrete pad area which should allow adequate vehicular access to the system when performing maintenance activities (**Photo 1**).

B. Heavy equipment access into facility:

- ✓ Allowed (no limitations)
- o Allowed (with limitations)
- o Not allowed

C. Special Features:

- o Amended Soils
- o Porous Pavers
- o Liners
- o Underdrains

5. Facility Haz Mat Spill Feature(s)

This manhole facility does not have features to block liquid from draining from the manhole. However, the manhole's sump may provide some storage capacity of hazardous liquids. Another option may be possible by blocking the outfall pipe downstream from the manhole and capturing hazardous liquids there.

6. Auxiliary Outlet

Auxiliary Outlets are provided if the primary outlet control structure cannot safely pass the projected high flows. Broad-crested spillway weirs and over flow risers are the two most common auxiliary outlets used in stormwater treatment facility design. The auxiliary outlet feature is either a part of the facility or an additional storm drain feature/structure.
The auxiliary outlet feature for this facility is:

- ✓ Designed into facility. High flows bypass the treatment features over the weir and exit the manhole into the downstream pipe. **See Appendix C**.

- o Other, as noted below

7. Maintenance Requirements

Routine maintenance table for non-proprietary stormwater treatment and storage/detention facilities have been incorporated into ODOT's Maintenance Guide. These tables summarize the maintenance requirements for ponds, swales, filter strips, bioslopes, and detention tanks and vaults. Special maintenance requirements in addition to the routine requirements are noted below when applicable. The ODOT Maintenance Guide can be viewed at the following website:

http://www.oregon.gov/ODOT/HWY/OOM/MGuide.shtml

Maintenance requirements for proprietary structures, such as underground water quality manholes and/or vaults with filter media are noted in Appendix C when applicable.

The following stormwater facility maintenance table (See ODOT Maintenance Guide) should be used to maintain the facility outlined in this Operation and Maintenance Manual or follow the Maintenance requirements outlined in Appendix C when proprietary structure is selected below:

- ✓ Table 1 (general maintenance)
- o Table 2 (stormwater ponds)
- o Table 3 (water quality biofiltration swales)
- o Table 4 (water quality filter strips)
- o Table 5 (water quality bioslopes)
- o Table 6 (detention tank)
- o Table 7 (detention vault)
- ✓ Appendix C (proprietary structure)
- ✓ Special Maintenance requirements: See Appendix C and the

Proprietary Structure Maintenance Requirements for an O&M Manual specifically written for the water quality structure.

8. Waste Material Handling

Material removed from the facility is defined as waste by DEQ. Refer to the roadwaste section of the ODOT Maintenance Yard Environmental Management System (EMS) Policy and Procedures Manual for disposal options:

http://egov.oregon.gov/ODOT/HWY/OOM/EMS.shtml

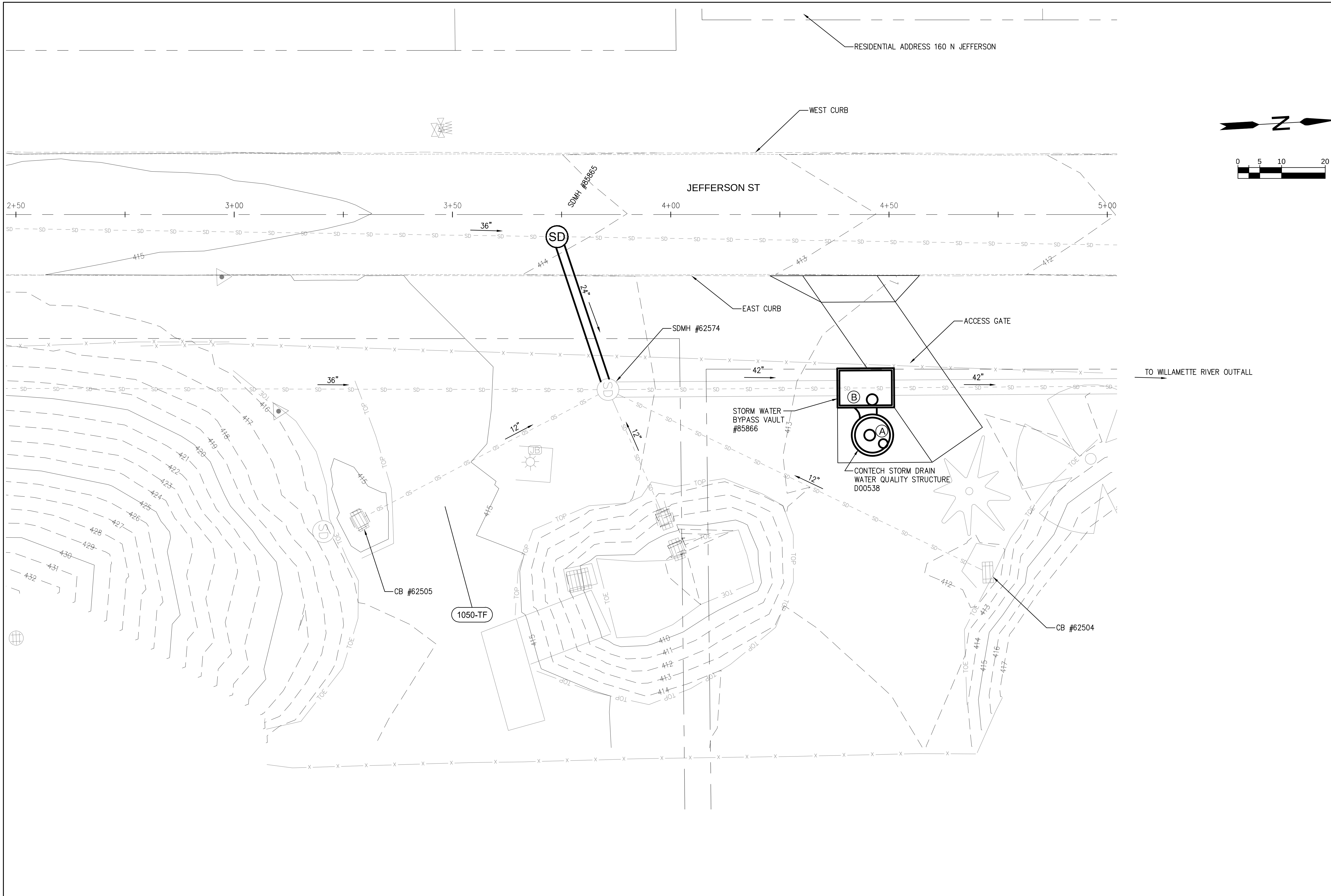
Contact any of the following for more detailed information about management of waste materials found on site:

ODOT Clean Water Unit (503) 986-3008
ODOT Statewide Hazmat Coordinator (503) 229-5129
ODOT Region Hazmat Coordinator (503) 986-2647
ODEQ Northwest Region Office (503) 229-5263

Appendix A

Content:

- ☐ **Operational Plan and Profile Drawing(s)**



I-105 WQ: E 7TH AVE TO WILLAMETTE RIVER OPERATION PLAN

DATE	NOV 2011
SCALE	AS SHOWN
DESIGNED BY	T.HIGGINS
DRAWN BY	R.REMMERS
CHECKED BY	T.HIGGINS
PROJECT NO.	4543

REV.	DATE	DESCRIPTION	BY

CITY OF EUGENE, OREGON
DEPARTMENT OF PUBLIC WORKS
ENGINEERING DIVISION

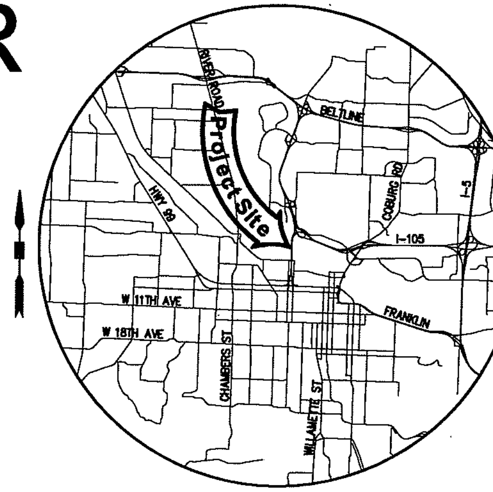
NAD83/NGVD29

Appendix B

Content:

- **City of Eugene Project Plan Sheets**
  - ***Cover/Title Sheet***
  - ***Water Quality/Detention Plan Sheets***
  - ***Other Details***

I-105 WQ: E 7TH AVE TO WILLAMETTE RIVER
PROJECT # 4543



VICINITY MAP
N.T.S.

SHEET INDEX	
NUMBER	TITLE
1	COVER SHEET
D-1	DETAIL - CONTECH CDS UNIT
D-2	GATE DETAIL
C-1	PLAN VIEW
C-2	PROFILE
C-3	PROFILE
TC-1	TEMPORARY TRAFFIC CONTROL PLAN
TC-2	TEMPORARY TRAFFIC CONTROL PLAN
CS-1	CONSTRUCTION SITE MANAGEMENT PLAN
CS-2	CONSTRUCTION SITE MANAGEMENT PLAN

NOTE: This project provides WQ treatment for basin WRWS-080

AS-CONSTRUCTED

CONTRACTOR	Kipco, Inc.
INSPECTOR	J. NEILL
CONTRACT NO.	2012-07
AS BUILTS BY	J. NEILL
DATE	11/07/2011

REGISTERED PROFESSIONAL ENGINEER 17,855
OREGON
JULY 25, 1995
TERI L. HIGGINS
EXPIRES: 06/30/13

ATTENTION: Oregon law requires you to follow rules adopted by the Oregon Utility Notification Center. Those rules are set forth in OAR 952-001-0010 through OAR 952-00-0090. You may obtain copies of these rules from the Center by calling (503) 232-1987. If you have any questions about these rules, you may contact the call Center.

811 Know what's below. Call before you dig.

APPROVED: CITY ENGINEER

DATE	JULY 2011
SCALE	AS SHOWN
DESIGNED BY	T.HIGGINS
DRAWN BY	R.REMMERS
CHECKED BY	T.HIGGINS
PROJECT NO.	4543

REV.	DATE	DESCRIPTION	BY

I-105 WQ: E 7TH AVE TO WILLAMETTE RIVER
COVER SHEET

CITY OF EUGENE, OREGON
DEPARTMENT OF PUBLIC WORKS
ENGINEERING DIVISION

1

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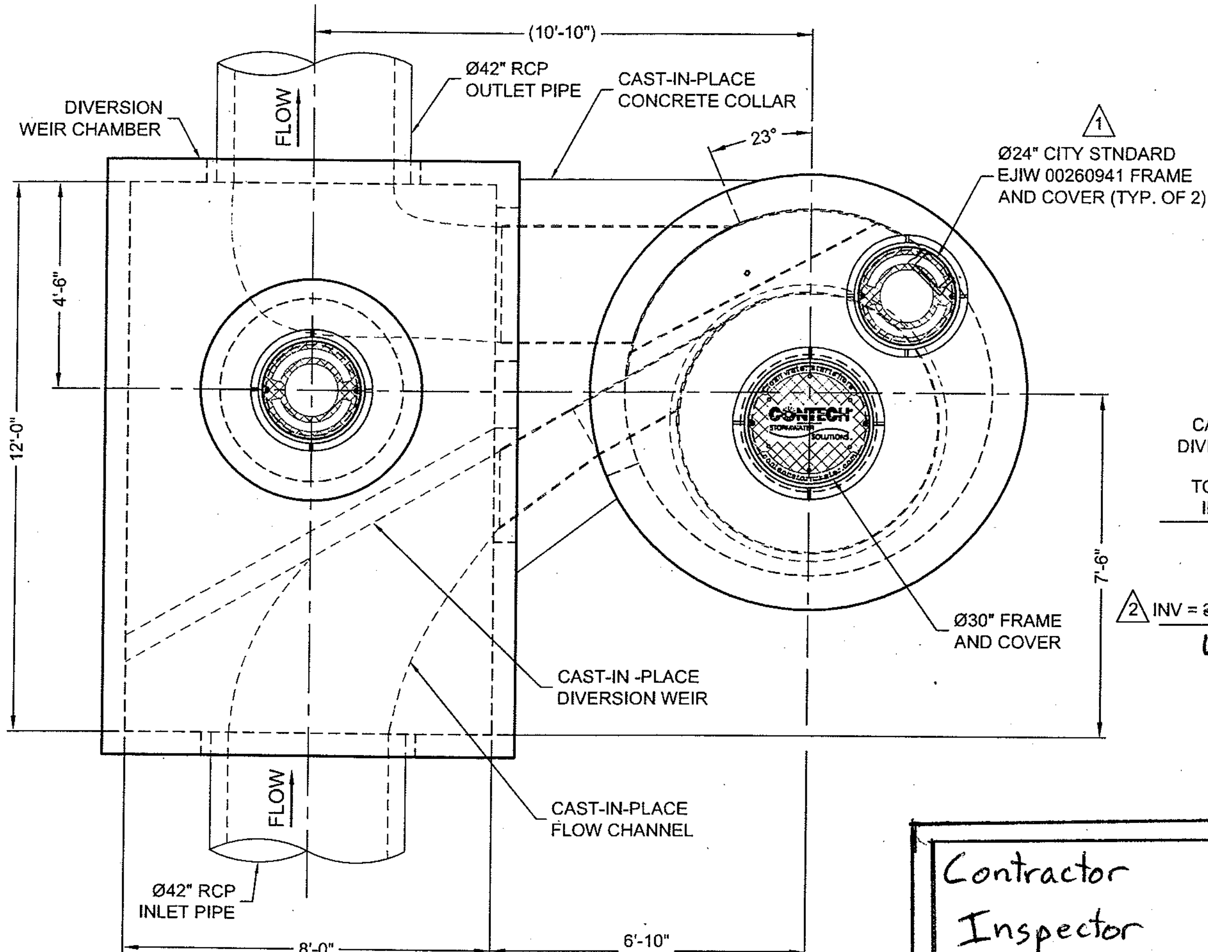
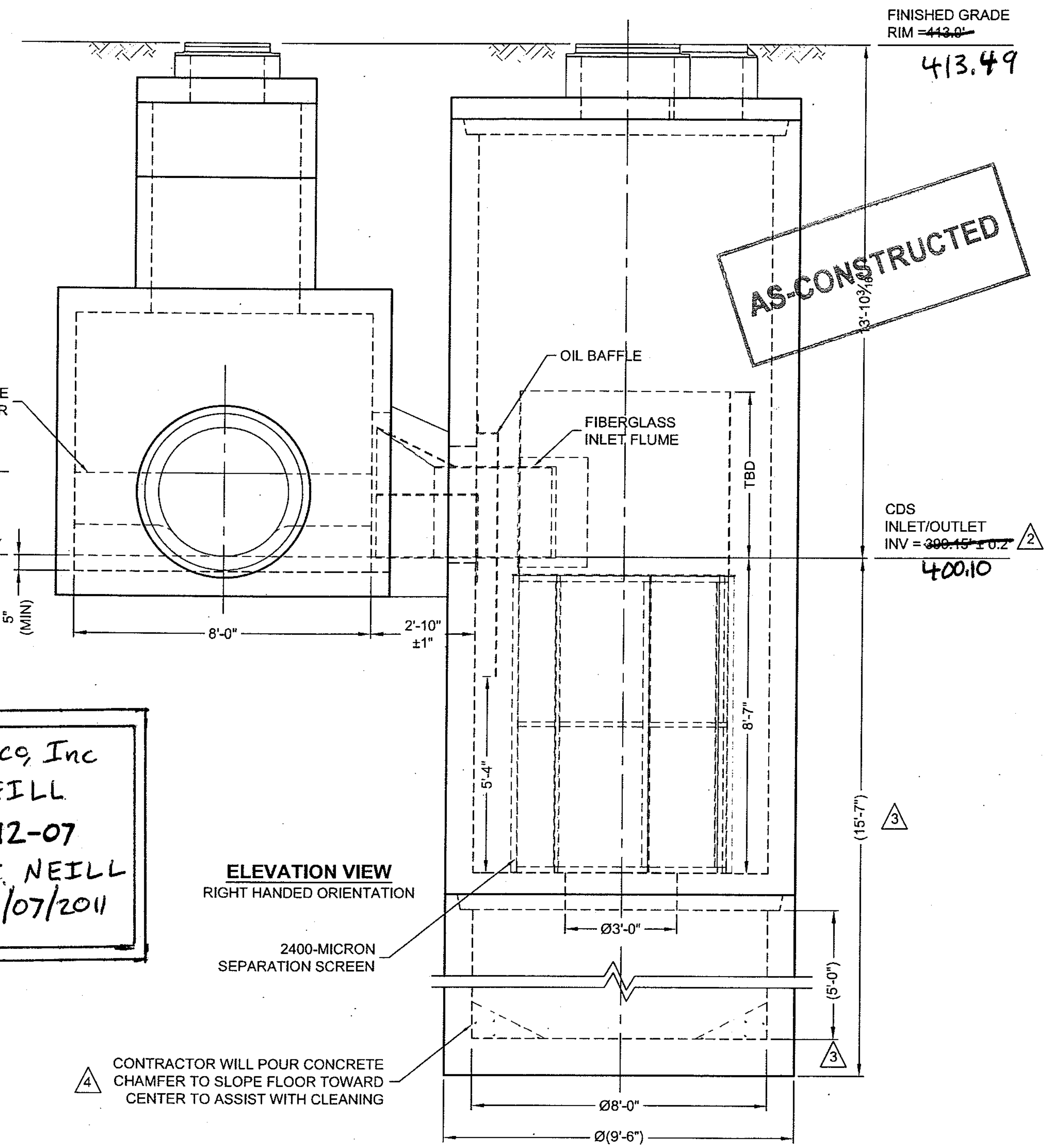


PLAN VIEW
RIGHT HANDED ORIENTATION

Contractor	Kipco, Inc
Inspector	J. NEILL
Contract No.	2012-07
AS BUILTS BY	J. NEILL
DATE	11/07/2011



ELEVATION VIEW
RIGHT HANDED ORIENTATION

GENERAL NOTES

1. CONTECH TO PROVIDE ALL MATERIALS UNLESS NOTED OTHERWISE.
2. DIMENSIONS MARKED WITH ( ) ARE REFERENCE DIMENSIONS. ACTUAL DIMENSIONS MAY VARY.
3. FOR FABRICATION DRAWINGS WITH DETAILED STRUCTURE DIMENSIONS AND WEIGHTS, PLEASE CONTACT YOUR CONTECH CONSTRUCTION PRODUCTS INC. REPRESENTATIVE. www.contech-cpi.com
4. CDS WATER QUALITY STRUCTURE SHALL BE IN ACCORDANCE WITH ALL DESIGN DATA AND INFORMATION CONTAINED IN THIS DRAWING.
5. DESIGN LOADING - AASHTO HS20.

INSTALLATION NOTES

1. ANY SUB-BASE, BACKFILL DEPTH, AND/OR ANTI-FLOTATION PROVISIONS ARE SITE-SPECIFIC DESIGN CONSIDERATIONS AND SHALL BE SPECIFIED BY ENGINEER OF RECORD.
2. CONTRACTOR TO PROVIDE EQUIPMENT WITH SUFFICIENT LIFTING AND REACH CAPACITY TO LIFT AND SET THE CDS MANHOLE STRUCTURE (LIFTING CLUTCHES PROVIDED).
3. CONTRACTOR TO ADD JOINT SEALANT BETWEEN ALL STRUCTURE SECTIONS, AND ASSEMBLE STRUCTURE.
4. CONTRACTOR TO PROVIDE, INSTALL, AND GROUT PIPES. MATCH PIPE INVERTS WITH ELEVATIONS SHOWN.
5. CONTRACTOR TO TAKE APPROPRIATE MEASURES TO ASSURE UNIT IS WATER TIGHT, HOLDING WATER TO FLOWLINE INVERT MINIMUM. IT IS SUGGESTED THAT ALL JOINTS BELOW PIPE INVERTS ARE GROUTED.
6. THE DIVERSION WEIR SHALL BE CAST-IN-PLACE AND REINFORCED WITH #4's @ 12" O.C. THE WEIR SHALL CONNECT TO THE WALLS OF THE WEIR CHAMBER WITH #4 DOWELS @ 12" O.C., SET 4" INTO WALL AND ANCHORED WITH EPOXY.
7. THE CONTRACTOR SHALL PROVIDE A SECONDARY CONCRETE POUR UPSTREAM AND DOWNSTREAM OF THE WEIR TO FACILITATE FLOW WITHIN THE DIVERSION WEIR CHAMBER AND MINIMIZE THE LIKELIHOOD OF SEDIMENTATION. THE CHANNELING SHALL BE A MINIMUM OF 1/2 THE HEIGHT OF THE CDS OUTLET.
8. SCREEN TO BE INSTALLED WITH GREEN FLANGE UP.

MATERIALS LIST - PROVIDED BY CONTECH

COUNT	DESCRIPTION	INSTALLED BY
1	FIBERGLASS INLET FLUME & CYLINDER	CONTRACTOR
1	FIBERGLASS OUTLET FLUME	CONTRACTOR
1	FIBERGLASS OIL BAFFLE	CONTRACTOR
1	2400 MICRON SEP. SCREEN	CONTRACTOR
1	SEALANT FOR JOINTS	CONTRACTOR
3 PLCS	GRADE RINGS/ RISERS	CONTRACTOR
1	Ø30" x 4" FRAME AND COVER (1)	CONTRACTOR
2	Ø24" x 4" EJIW 00260941 F&C'S (1)	CONTRACTOR

SITE DESIGN DATA

WATER QUALITY FLOW RATE	25 CFS
PEAK FLOW RATE	44.7 CFS
RETURN PERIOD OF PEAK FLOW	50 YRS

CONTECH
PROPOSAL
DRAWING

HANS

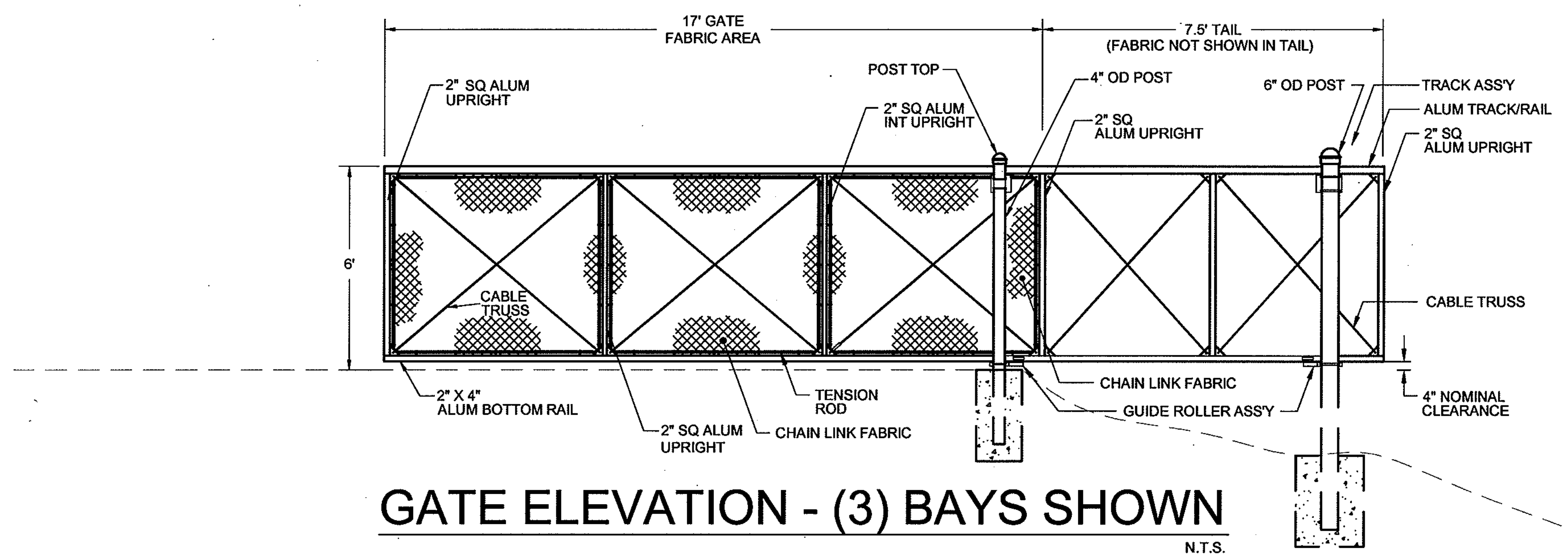
MARK	DATE	REVISION DESCRIPTION	BY
4	7/13/11	ADDED CHAMFER	MBB
3	7/6/11	CHANGED SUMP DEPTH	MBB
2	7/6/11	REVISED INVERT ELEVATIONS	MBB
1	7/6/11	REVISED COVERS	MBB

CDS5678-8-F & BYPASS VAULT - 441684-01
I-105 WQ: 7TH TO WILLAMETTE RIVER
EUGENE, OR

CONTECH CONSTRUCTION PRODUCTS INC.
www.contech-cpi.com
200 Enterprise Drive, Scarborough, ME 04074
CDS

DATE: 6/8/11	
DESIGNED: ALS	DRAWN: MBB
CHECKED: ---	APPROVED: ---
PROJECT No.: 441684	SEQUENCE No.: 01
SHEET: D-1	

GATE DETAIL



GATE ELEVATION - (3) BAYS SHOWN

N.T.S.

NOTES:

1. FOOTING WIDTH TO BE (4)X POST WIDTH. MIN DEPTH TO BE 36".
2. MODIFY AND BRACE EXISTING FENCE AS NECESSARY.

AS-CONSTRUCTED

CONTRACTOR	Kipco, Inc.
INSPECTOR	J. NEILL
CONTRACT NO.	2012-07
AS BUILTS BY	J. NEILL
DATE	11/07/2011

REGISTERED PROFESSIONAL ENGINEER 17,855
OREGON
JULY 25, 1995
TERI L. HIGGINS

EXPIRES: 06/30/13

DATE	JULY 2011
SCALE	AS SHOWN
DESIGNED BY	T.HIGGINS
DRAWN BY	R.REMMERS
CHECKED BY	T.HIGGINS
PROJECT NO.	4543

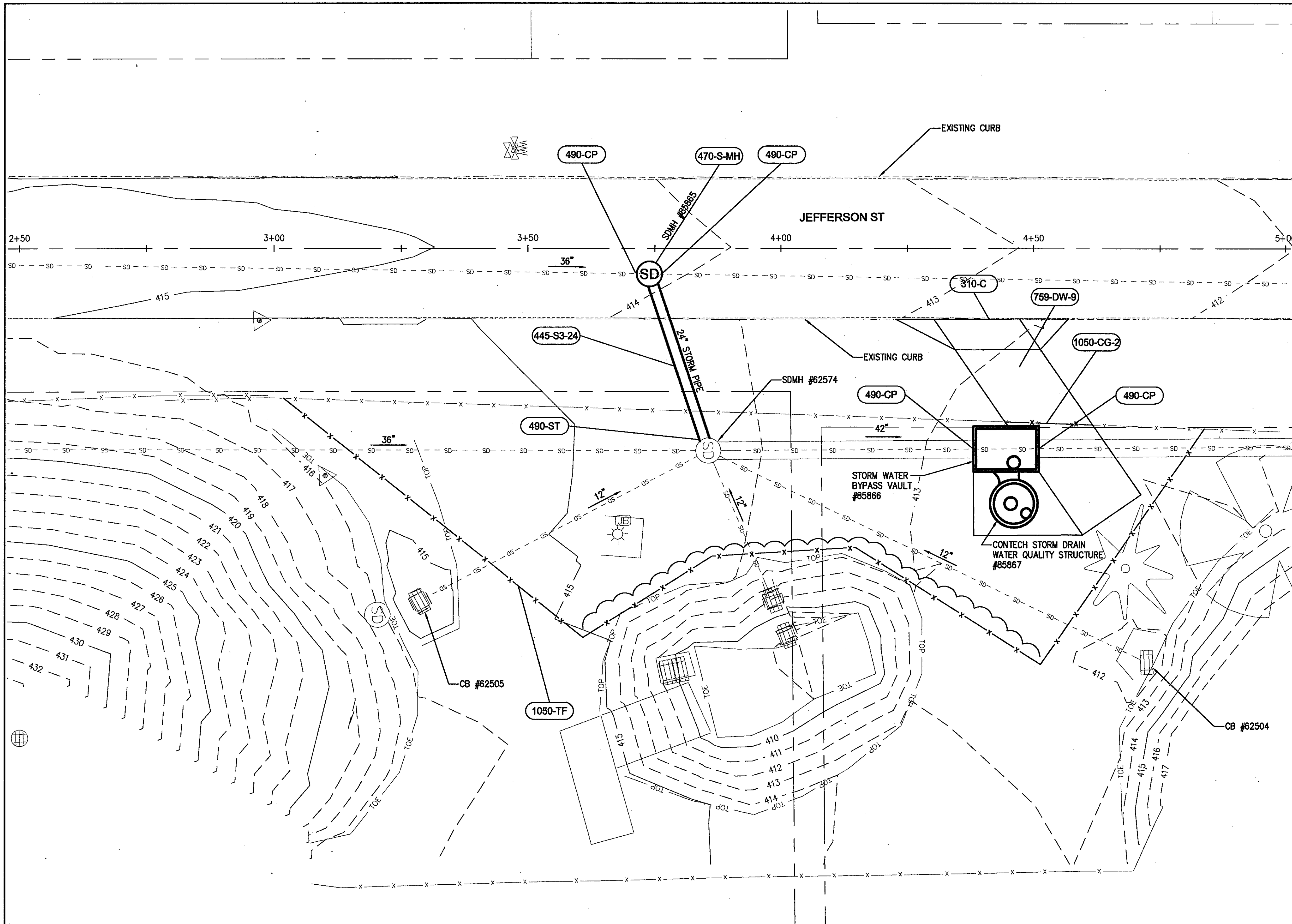
REV.	DATE	DESCRIPTION	BY

I-105 WQ: E 7TH AVE
TO WILLAMETTE RIVER
GATE DETAIL

CITY OF
EUGENE, OREGON
DEPARTMENT OF PUBLIC WORKS
ENGINEERING DIVISION

NAD83/NGVD29

D-2



AS-CONSTRUCTED

N
0 5 10 20

445-S3-24	INSTALL 24" CONCRETE STORM DRAIN PIPE
470-S-MH	INSTALL CONCRETE STORM WATER MANHOLE WITH 72" BASE
490-CP	CONNECT TO EXISTING PIPE
759-DW-9	CONST CONCRETE DRIVEWAY 9" THICK
1050-CG-2	INSTALL CANTILEVERED GATE - 17' OPENING
1050-TF	CONST 6' HIGH TEMPORARY CHAIN LINK FENCE
490-CP	CONNECT TO EXISTING PIPE
490-ST	CONNECT TO EXISTING STRUCTURE
310-C	REMOVE CURB

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I-105 WQ: E 7TH AVE TO WILLAMETTE RIVER
PLAN VIEW

CITY OF EUGENE, OREGON
DEPARTMENT OF PUBLIC WORKS
ENGINEERING DIVISION

City of EUGENE

NAD83/NGVD29

C-1

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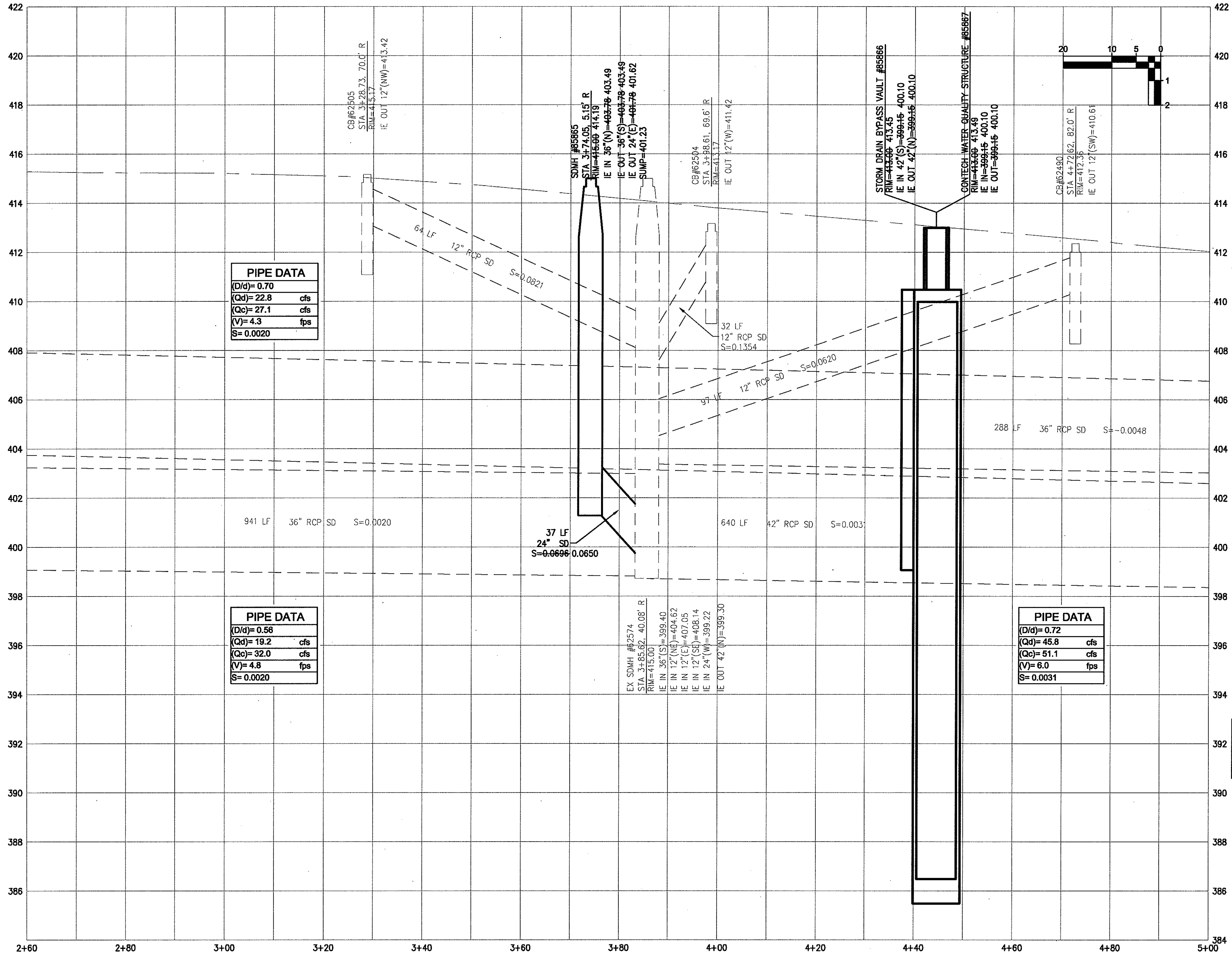

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REV.	DATE	DESCRIPTION	BY

I-105 WQ: E 7TH AVE TO WILLAMETTE RIVER PROFILE

CITY OF EUGENE, OREGON
DEPARTMENT OF PUBLIC WORKS
ENGINEERING DIVISION

NAD83/NGVD29

C-2

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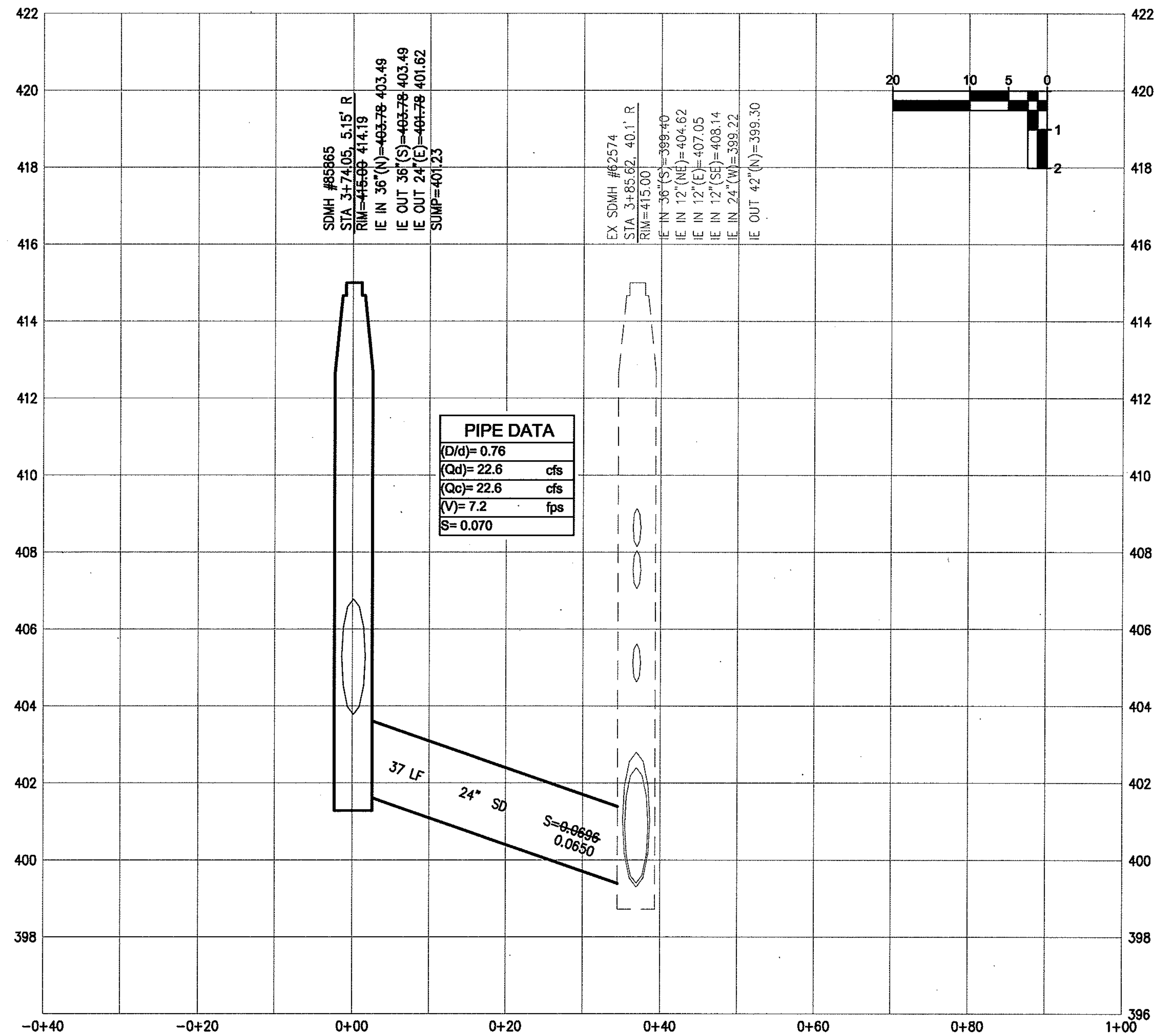

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I-105 WQ: E 7TH AVE TO WILLAMETTE RIVER
PROFILE

CITY OF EUGENE, OREGON
DEPARTMENT OF PUBLIC WORKS
ENGINEERING DIVISION

City of EUGENE

NAD83/NGVD29

C-3

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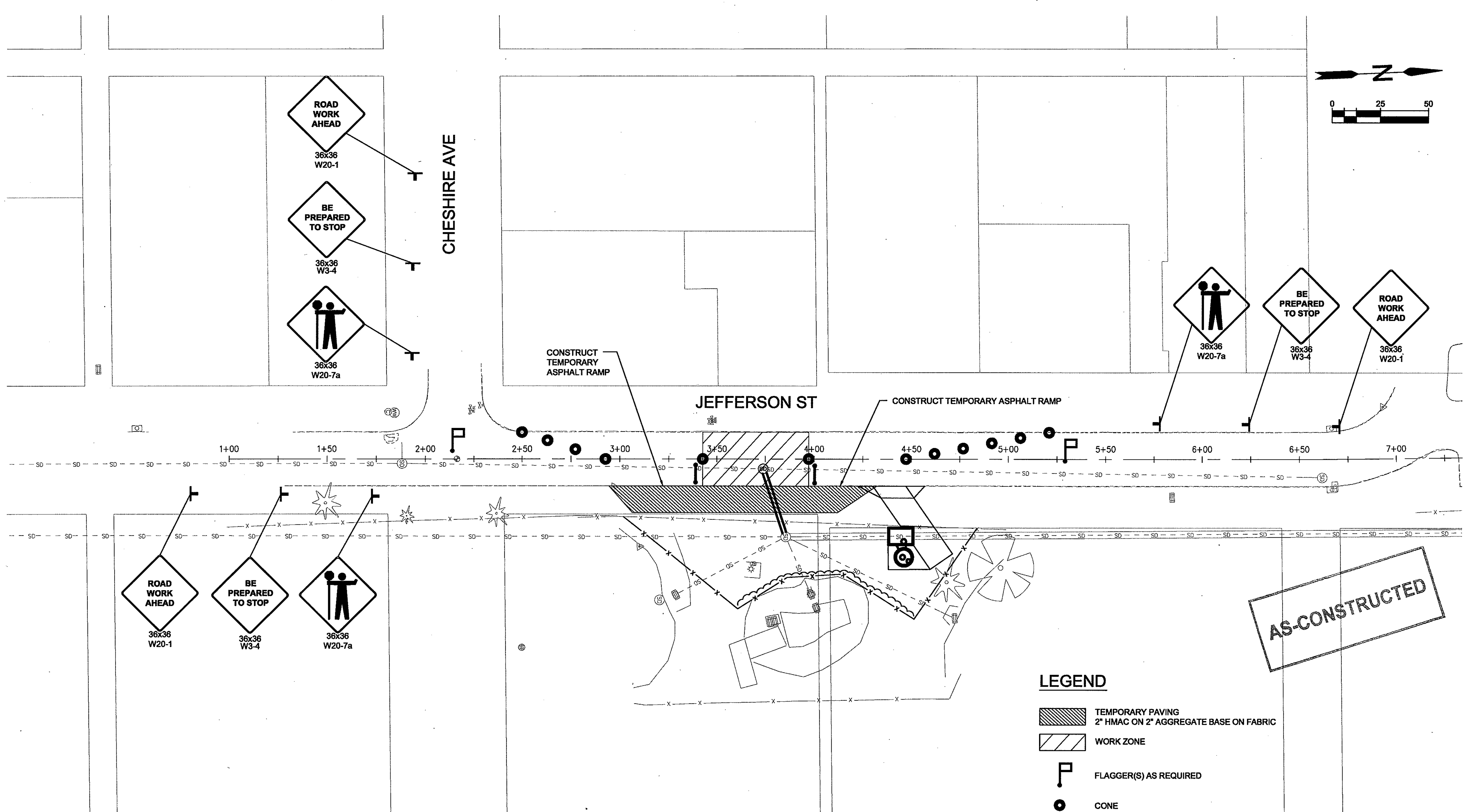

LEGEND

- TEMPORARY PAVING 2" HMAC ON 2" AGGREGATE BASE ON FABRIC
- WORK ZONE
- FLAGGER(S) AS REQUIRED
- CONE
- SIGN
- BARRICADE

NOTES:

1. PROVIDE TEMPORARY PAVING AS SHOWN WHILE CONSTRUCTING MH IN JEFFERSON ST.
2. PROVIDE 2 FLAGGERS, 24 HRS/DAY WHILE BY-PASSING VEHICLES ON TEMPORARY PAVING.

TAPER LENGTHS AND CHANNELIZATION DEVICES

SPEED LIMIT	10 FEET		11 FEET		12 FEET		SHOULDER TAPERS		SIGN SPACING
	SHIFTING		SHIFTING		SHIFTING		SHOULDER		OPTIMAL DISTANCE
MPH	L/2	CONES	L/2	CONES	L/2	CONES	L/3	CONES	
30	75	4	85	4	90	4	50	3	100'

CONTRACTOR	Kipco, Inc.
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DRAWN BY	R.REMMERS
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PROJECT NO.	4543

I-105 WQ: E 7TH AVE TO WILLAMETTE RIVER TEMPORARY TRAFFIC CONTROL PLAN

CITY OF EUGENE, OREGON
DEPARTMENT OF PUBLIC WORKS
ENGINEERING DIVISION

NAD83/NGVD29

TC-1

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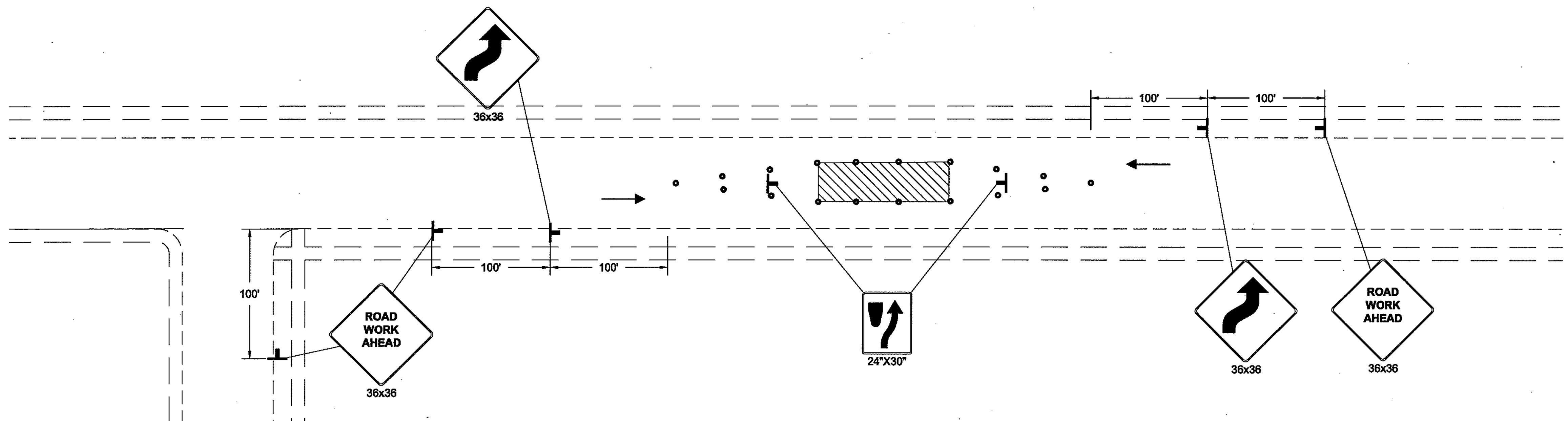
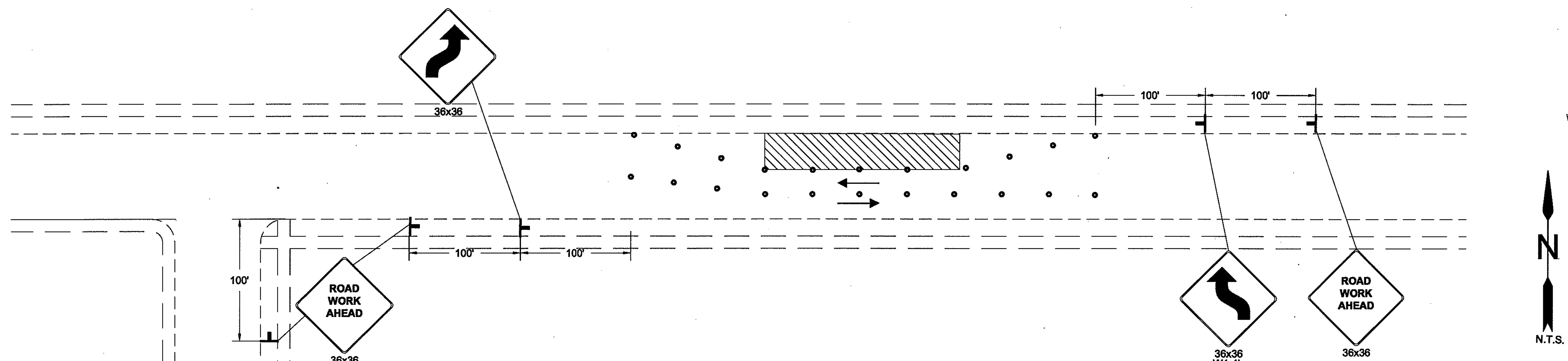
TRAFFIC CONTROL FOR MISCELLANEOUS APPLICATIONS



SHIFTING TAPER APPLICATION



RIGHT LANE SHIFTING TAPER APPLICATION

NOTE:
33RD AVENUE HAS A POSTED SPEED LIMIT OF 25 MPH.

TAPER LENGTHS AND CHANNELIZATION DEVICES

LANE WIDTH	10 FEET		11 FEET		12 FEET		SHOULDER TAPERS		SIGN SPACING
	SHIFTING		SHIFTING		SHIFTING		SHOULDER		OPTIMAL DISTANCE
MPH	L/2	CONES	L/2	CONES	L/2	CONES	L/3	CONES	
25	55	3	60	4	65	4	35	3	100
30	75	4	85	4	90	4	50	3	100

AS-CONSTRUCTED

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PROJECT NO.	4543

I-105 WQ: E 7TH AVE
TO WILLAMETTE RIVER
TEMPORARY TRAFFIC
CONTROL PLAN

CITY OF
EUGENE, OREGON
DEPARTMENT OF PUBLIC WORKS
ENGINEERING DIVISION

City of EUGENE

NAD83/NGVD29

TC-2

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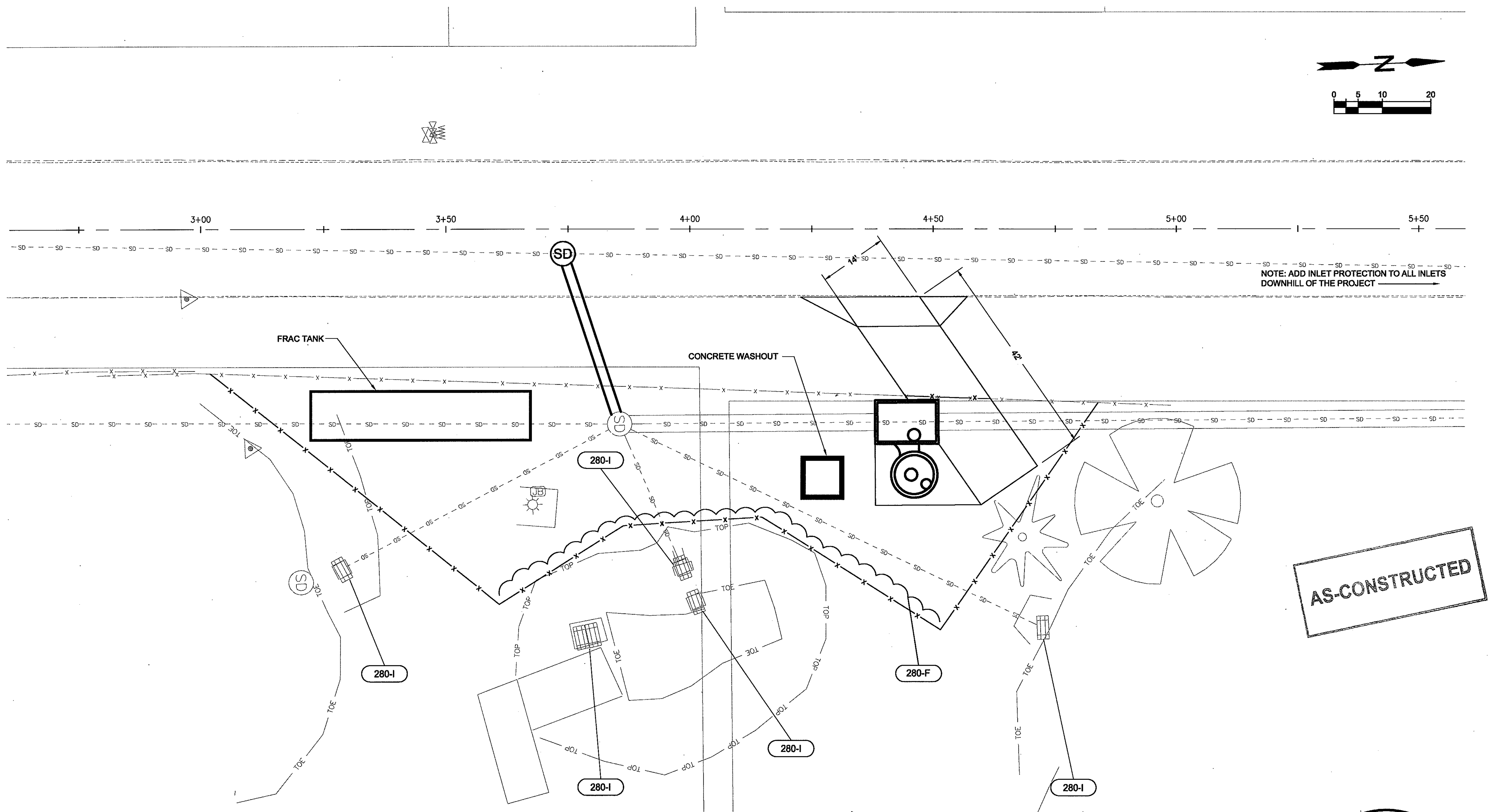

280-I CONST INLET PROTECTION

280-F CONST COMPOST FILTER BERM

NOTES:

1. ALL SAWCUTTING SLURRY MUST BE VACUMED IMMEDIATELY BEHIND SAWCUTTING OPERATIONS.
2. SEED AND APPLY A COMPOST MULCH TO ALL DISTURBED AREAS.

CONTRACTOR	Kipco, Inc.
INSPECTOR	J. NEILL
CONTRACT NO.	2012-07
AS BUILTS BY	J. NEILL
DATE	11/07/2011

REGISTERED PROFESSIONAL ENGINEER 17,855
OREGON
JULY 25, 1995
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DATE	JULY 2011
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DESIGNED BY	T.HIGGINS
DRAWN BY	R.REMMERS
CHECKED BY	T.HIGGINS
PROJECT NO.	4543

REV. | DATE | DESCRIPTION | BY

I-105 WQ: E 7TH AVE TO WILLAMETTE RIVER CONSTRUCTION SITE MANAGEMENT PLAN

CITY OF EUGENE, OREGON
DEPARTMENT OF PUBLIC WORKS
ENGINEERING DIVISION

NAD83/NGVD29

CS-1

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CSMP

EROSION AND SEDIMENTATION CONTROL NOTES

The City will obtain an Erosion Control Permit for this project. Issuance of this permit does not relieve the contractor from all other permitting requirements. Prior to beginning construction activities, all other necessary approvals shall be obtained.

Prior to any ground disturbance on the site one inspection with the Erosion Prevention staff is required. Issuance of the erosion prevention permit does not relieve the permit holder and or the contractor from all other permitting requirements. Prior to beginning construction activities, all other necessary approvals shall be obtained.

Construction shall conform to the 2008 Oregon Standard Specifications for Construction, and the current City of Eugene Amendment(s) to the Oregon Standard Specifications.

The erosion and sediment control measures shown, or described, on this Construction Site Management Plan (CSMP) are the minimum requirements for anticipated site conditions. During the construction period, these measures shall be upgraded as needed for unexpected storm events and to ensure that sediment and sediment-laden water does not leave the site.

The implementation of this Construction Site Management Plan (CSMP) and the construction, maintenance, replacement, and upgrading of the erosion and sediment control measures is the responsibility of the contractor until all construction is completed and accepted and vegetation / landscaping is established.

The boundaries of the clearing limits(or "daylight line") shown on the plans are the construction limits and the contractor shall limit his operation to within this boundary. Any ground disturbance outside of the daylight light shall be immediately repaired and re-seeded with approved seed or to match the common surface covering. This includes tree removal and tree trimming. All wetland areas shall be flagged by the engineer prior to construction and shall not be disturbed unless the proper permits are obtained. The flagging shall be maintained by the contractor for the duration of construction.

The erosion and sediment control measures must be constructed in conjunction with all clearing and grading activities, in such a manner as to ensure that sediment and sediment-laden water does not enter the storm water system, roadways, or violate applicable water quality standards. When designing and implementing measures, the permit holder and or the contractor shall consider the seasonal variation of rainfall, temperature, and other climatic factors relative to the timing of land disturbance activities.

The erosion and sediment control measures on active sites shall be inspected and maintained daily and within the 24 hours after any storm event of greater than 0.5 inches of rain per 24 hour period. Measures shall be inspected by the permit holder and/or the contractor after each rainfall and at least daily during prolonged rainfall. Any required repairs or adjustments shall be made immediately. The erosion and sediment control measures on inactive sites shall be inspected a minimum of once every two (2) weeks or within 48 hours following a storm event.

During the Wet Weather season (October 15 to April 30) all exposed soil and stockpile areas shall be covered or protected by a facility or combination of facilities that result in no storm water runoff leaving a site during a 5-year storm event and saturated soil conditions including, but no limited to, constructed ponds, ditches, swales, infiltration trenches, or pipes. For development sites over 40 acres, the design storm shall be a 10-year storm event consistent with an approved CSMP (perimeter control).

All adjacent properties, water features, and related natural resources are to be kept free of deposits or discharges of soil, sediment or construction-related material from the construction site. In addition, wetland areas shall be surrounded with appropriate fencing as noted on CSMP prior to construction and shall not be disturbed unless the proper permits are obtained.

All erosion and sediment control measures shall be protected from damage at all times. Any measure that is damaged or destroyed shall be repaired or replaced immediately.

Stabilize with appropriate/approved seed mix within seven days of exposure, all areas within 25 feet of waterways, wetlands or other sensitive areas, and completed construction of finished grades.

Street sweeping shall be performed as needed or when directed by the City inspector to ensure public right-of-ways are kept clean and free of debris.

When trucking saturated soils from the site, either water-tight trucks shall be used or loads shall be drained on site until dripping has been reduced to no more than one gallon per hour. Sediment-laden water will not be allowed to enter the stormwater system.

Extracted ground water from excavated trenches shall be disposed of in a suitable manner without damage to adjacent property, City's stormwater system, water features, and related natural resources. Dewatering systems shall be designed and operated so as to prevent removal of the natural soils and so that the groundwater level outside the excavation is not reduced to the extent that would damage or endanger adjacent structures or property. Approval of the system does not guarantee that it will meet the outcomes or be acceptable for use in all situations. Modifications to the system will be required if the outcomes can not be met. At no time will sediment-laden water be allowed to leave the construction site.

A supply of materials necessary to meet the outcomes and implement the construction site management plan or other best management erosion practices under all weather conditions shall be maintained at all times on the construction site.

No hazardous substances, such as paints, thinners, fuels and other chemicals shall be released onto the site, adjacent properties, or into water features, the City's stormwater system, or related natural resources.

No discharge into the City's stormwater system or related natural resources of construction related contaminants resulting from activities such as, but not limited to, concrete sawing, cleaning or washing of equipment, tools, or vehicles, shall occur.

SOIL TYPES

Per Geotechnical Report in the Special Provisions.

AS-CONSTRUCTED

CONTRACTOR	Kipco, Inc.
INSPECTOR	J. NEILL
CONTRACT NO.	2012-07
AS BUILTS BY	J. NEILL
DATE	11/07/2011

REGISTERED PROFESSIONAL ENGINEER
17,855
OREGON
JULY 25, 1995
TERI L. HIGGINS
EXPIRES: 06/30/13

REV.	DATE	DESCRIPTION	BY

DATE	JULY 2011
SCALE	AS SHOWN
DESIGNED BY	T.HIGGINS
DRAWN BY	R.REMMERS
CHECKED BY	T.HIGGINS
PROJECT NO.	4543

I-105 WQ: E 7TH AVE
TO WILLAMETTE RIVER
CONSTRUCTION SITE
MANAGEMENT PLAN

CITY OF
EUGENE, OREGON
DEPARTMENT OF PUBLIC WORKS
ENGINEERING DIVISION

City of EUGENE

NAD83/NGVD29

CS-2

S:\Projects\Proj-3\4543 Wash jeff Storm IMP\Sheets\4543 - CSMP.dwg NEILL Justin M 11/7/2011 12:23 PM

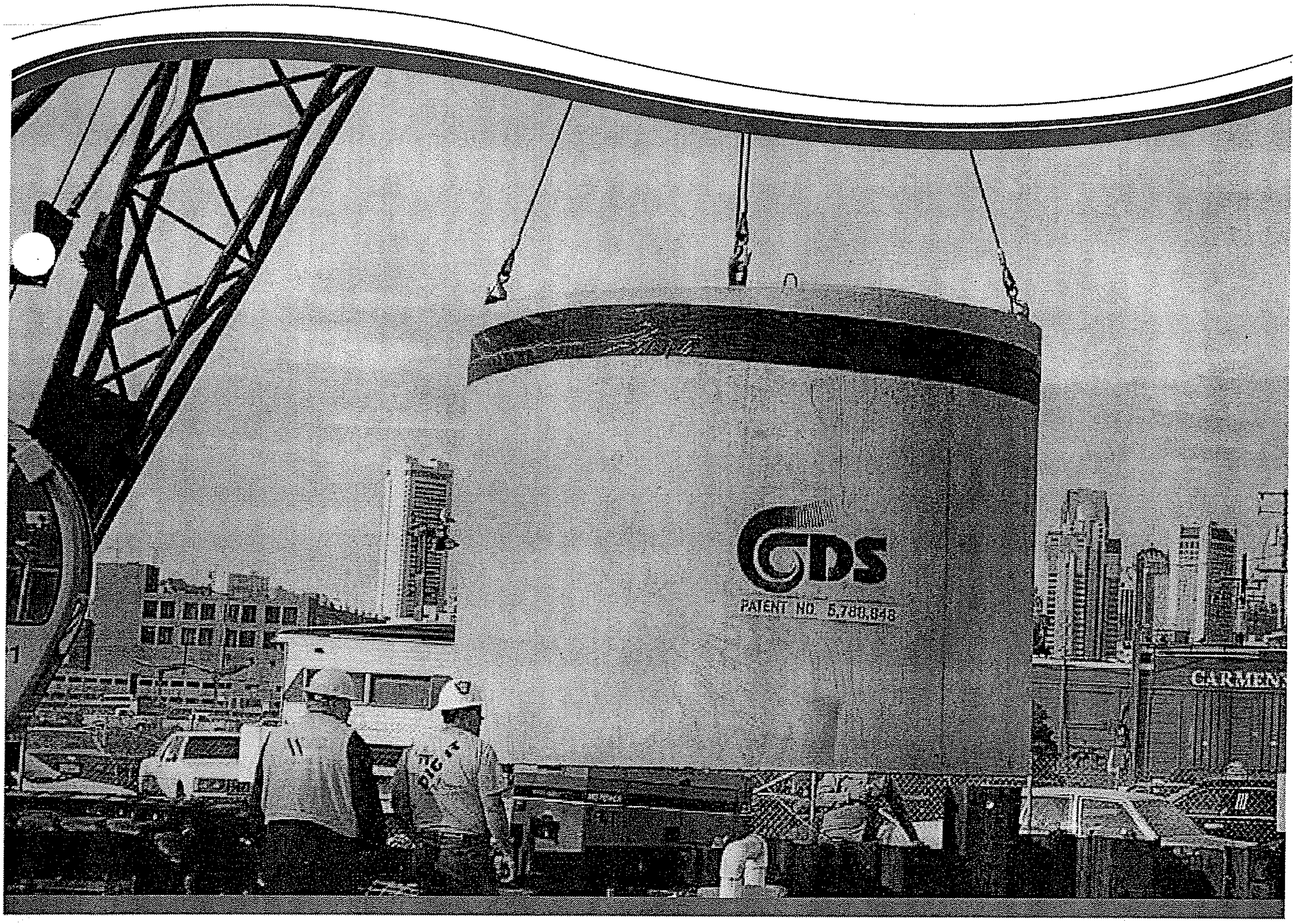
Appendix C

Content:

- **Proprietary Structure Operation & Maintenance Manual**
  Maintenance Requirements

CONTECH®
CONSTRUCTION PRODUCTS INC.

CDS Guide
Operation, Design, Performance and Maintenance



CDS®

Using patented continuous deflective separation technology, the CDS system screens, separates and traps debris, sediment, and oil and grease from stormwater runoff. The indirect screening capability of the system allows for 100% removal of floatables and neutrally buoyant material without blinding. Flow and screening controls physically separate captured solids, and minimize the re-suspension and release of previously trapped pollutants. Inline units can treat up to 6 cfs, and internally bypass flows in excess of 50 cfs. Available precast or cast-in-place, offline units can treat flows from 1 to 300 cfs. The pollutant removal capacity of the CDS system has been proven in lab and field testing.

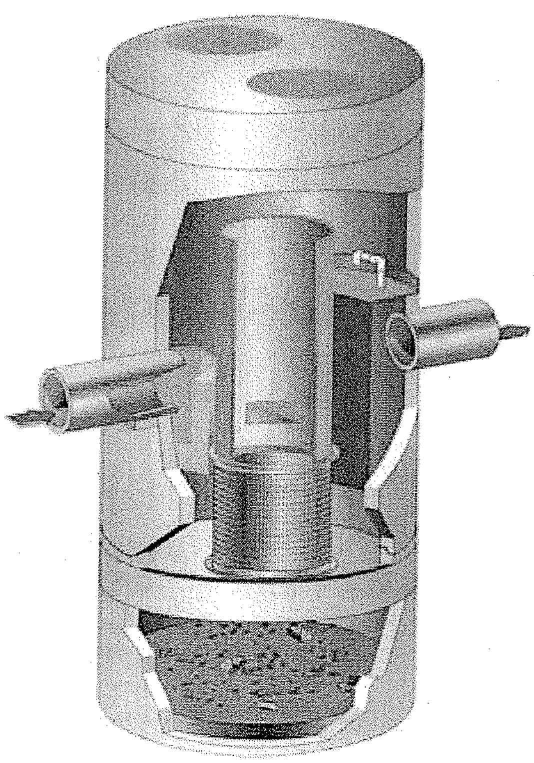
Operation Overview

Stormwater enters the diversion chamber where the diversion weir guides the flow into the unit's separation chamber and pollutants are removed from the flow. All flows up to the system's treatment design capacity enter the separation chamber and are treated.

Swirl concentration and screen deflection force floatables and solids to the center of the separation chamber where 100% of floatables and neutrally buoyant debris larger than the screen apertures are trapped.

Stormwater then moves through the separation screen, under the oil baffle and exits the system. The separation screen remains clog free due to continuous deflection.

During the flow events exceeding the design capacity, the diversion weir bypasses excessive flows around the separation chamber, so captured pollutants are retained in the separation cylinder.



Design Basics

There are three primary methods of sizing a CDS system. The Water Quality Flow Rate Method determines which model size provides the desired removal efficiency at a given flow rate for a defined particle size. The Rational Rainfall MethodTM and Probabalistic Method are used when a specific removal efficiency of the net annual sediment load is required.

Typically in the Unites States, CDS systems are designed to achieve an 80% annual solids load reduction based on lab generated performance curves for a gradation with an average particle size (d50) of 125-microns (μm). For some regulatory environments, CDS systems can also be designed to achieve an 80% annual solids load reduction based on an average particle size (d50) of 75-microns (μm).

Water Quality Flow Rate Method

In many cases, regulations require that a specific flow rate, often referred to as the water quality design flow (WQQ), be treated. This WQQ represents the peak flow rate from either an event with a specific recurrence interval (i.e. the six-month storm) or a water quality depth (i.e. 1/2-inch of rainfall).

The CDS is designed to treat all flows up to the WQQ. At influent rates higher than the WQQ, the diversion weir will direct most flow exceeding the treatment flow rate around the separation chamber. This allows removal efficiency to remain relatively constant in the separation chamber and reduces the risk of washout during bypass flows regardless of influent flow rates.

Treatment flow rates are defined as the rate at which the CDS will remove a specific gradation of sediment at a specific removal efficiency. Therefore they are variable based on the gradation and removal efficiency specified by the design engineer.

Rational Rainfall Method™

Differences in local climate, topography and scale make every site hydraulically unique. It is important to take these factors into consideration when estimating the long-term performance of any stormwater treatment system. The Rational Rainfall Method combines site-specific information with laboratory generated performance data, and local historical precipitation records to estimate removal efficiencies as accurately as possible.

Short duration rain gauge records from across the United States and Canada were analyzed to determine the percent of the total annual rainfall that fell at a range of intensities. US stations' depths were totaled every 15 minutes, or hourly, and recorded in 0.01-inch increments. Depths were recorded hourly with 1-mm resolution at Canadian stations. One trend was consistent at all sites; the vast majority of precipitation fell at low intensities and high intensity storms contributed relatively little to the total annual depth.

These intensities, along with the total drainage area and runoff coefficient for each specific site, are translated into flow rates using the Rational Rainfall Method. Since most sites are relatively small and highly impervious, the Rational Rainfall Method is appropriate. Based on the runoff flow rates calculated for each intensity, operating rates within a proposed CDS system are determined. Performance efficiency curve determined from full scale laboratory tests on defined sediment PSDs is applied to calculate solids removal efficiency. The relative removal efficiency at each operating rate is added to produce a net annual pollutant removal efficiency estimate.

Probabalistic Rational Method

The Probabalistic Rational Method is a sizing program CONTECH developed to estimate a net annual sediment load reduction for a particular CDS model based on site size, site runoff coefficient, regional rainfall intensity distribution, and anticipated pollutant characteristics.

The Probabilistic rational method is an extension of the rational method used to estimate peak discharge rates generated by storm events of varying statistical return frequencies (i.e.: 2-year storm event). Under this method, an adjustment factor is used to adjust the runoff coefficient estimated for the 10-year event, correlating a known hydrologic parameter with the target storm event. The rainfall intensities vary depending on the return frequency of the storm event under consideration. In general, these two frequency dependent parameters increase as the return frequency increases while the drainage area remains constant.

These intensities, along with the total drainage area and runoff coefficient for each specific site, are translated into flow rates using the Rational Method. Since most sites are relatively small and highly impervious, the Rational Method is appropriate. Based on the runoff flow rates calculated for each intensity, operating rates within a proposed CDS are determined. Performance efficiency curve on defined sediment PSDs is applied to calculate solids removal efficiency. The relative removal efficiency at each operating rate is added to produce a net annual pollutant removal efficiency estimate.

Treatment Flow Rate

The inlet throat area is sized to ensure that the WQQ passes through the separation chamber at a water surface elevation equal to the crest of the diversion weir. The diversion weir bypasses excessive flows around the separation chamber, thus helping to prevent re-suspension or re-entrainment of previously captured particles.

Hydraulic Capacity

CDS hydraulic capacity is determined by the length and height of the diversion weir and by the maximum allowable head in the system. Typical configurations allow hydraulic capacities of up to ten times the treatment flow rate. As needed, the crest of the diversion weir may be lowered and the inlet throat may be widened to increase the capacity of the system at a given water surface elevation. The unit is designed to meet project specific hydraulics.

Performance

Full-Scale Laboratory Test Results

A full-scale CDS unit (Model CDS2020-5B) was tested at the facility of University of Florida, Gainesville, FL. This full-scale CDS unit was evaluated under controlled laboratory conditions of pumped influent and the controlled addition of sediment.

Two different gradations of silica sand material (UF Sediment & OK-110) were used in the CDS performance evaluation. The particle size distributions (PSD) of the test materials were analyzed using standard method "Gradation ASTM D-422 with Hydrometer" by a certified laboratory. UF Sediment is a mixture of three different U.S. Silica Sand products referred as: "Sil-Co-Sil 106", "#1 DRY" and "20/40 Oil Frac". Particle size distribution analysis shows that the UF Sediment has a very fine gradation (d50 = 20 to 30 μm) covering a wide size range (uniform coefficient Cu averaged at 10.6). In comparison with the hypothetical TSS gradation specified in the NJDEP (New Jersey Department of Environmental Protection) and NJCAT (New Jersey Corporation for Advanced Technology) protocol for lab testing, the UF Sediment covers a similar range of particle size but with a finer d50 (d50 for NJDEP is approximately 50 μm) (NJDEP, 2003). The OK-110 silica sand is a commercial product of U.S. Silica Sand. The particle size distribution analysis of this material, also included in Figure 1, shows that 99.9% of the OK-110 sand is finer than 250 microns, with a mean particle size (d50) of 106 microns. The PSDs for the test material are shown in Figure 1.

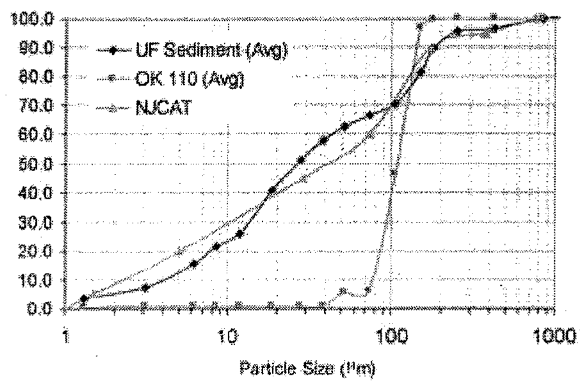


Figure 1. Particle size distributions for the test materials, as compared to the NJCAT/NJDEP theoretical distribution.

Tests were conducted to quantify the CDS unit (1.1 cfs (31.3-L/s) design capacity) performance at various flow rates, ranging from 1% up to 125% of the design capacity of the unit, using the 2400 micron screen. All tests were conducted with controlled influent concentrations approximately 200 mg/L. Effluent samples were taken at equal time intervals across the entire duration of each test run. These samples were then processed with a Dekaport Cone sample splitter to obtain representative sub-samples for Suspended Sediment Concentration (SSC – ASTM Standard Method D3977-97) and particle size distribution analysis.

Results and Modeling

Based on the testing data from the University of Florida, a performance model was developed for the CDS system. A regression analysis was used to develop a fitting curve for the scattered data points at various design flow rates. This model, which demonstrated good agreement with the laboratory data, can then be used to predict CDS system performance with respect to SSC removal for any particle size gradation assuming sandy-silt type of inorganic components of SSC. Figure 2 shows CDS predictive performance for two typical particle size gradations (NJCAT gradation and OK-110 sand).

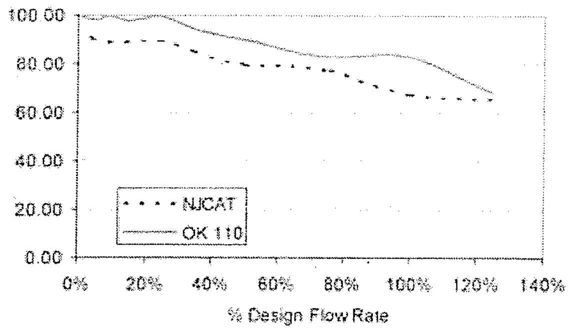


Figure 2. CDS stormwater treatment predictive performance for various particle gradations as a function of operating rate.

Many regulatory jurisdictions set a performance standard for hydrodynamic devices by stating that the devices shall be capable of achieving an 80% removal efficiency for particles having a mean particle size (d50) of 125 microns (WADOE, 2008). The model can be used to calculate the expected performance of such a PSD (shown in Figure 3). Supported by the laboratory data, the model indicates (Figure 4) that the CDS system with 2400 micron screen achieves approximately 80% removal at 100% of design flow rate, for this particle size distribution (d50 = 125 μm).

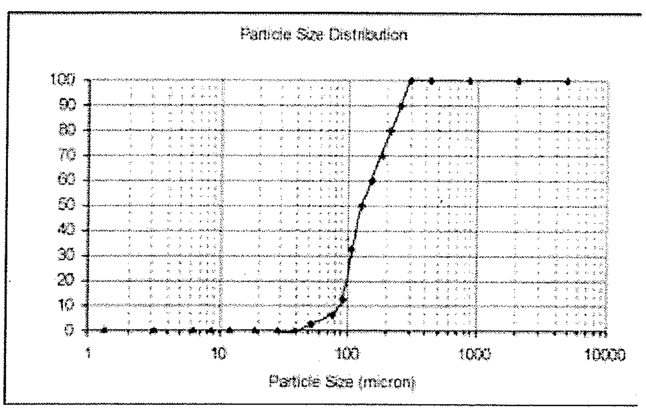


Figure 3. PSD with d50 = 125 microns, used to model performance for Ecology submittal.

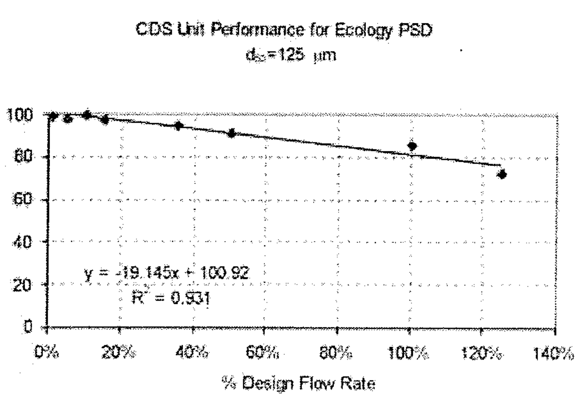


Figure 4. Modeled performance for CDS unit with 2400 microns screen, using Ecology PSD.

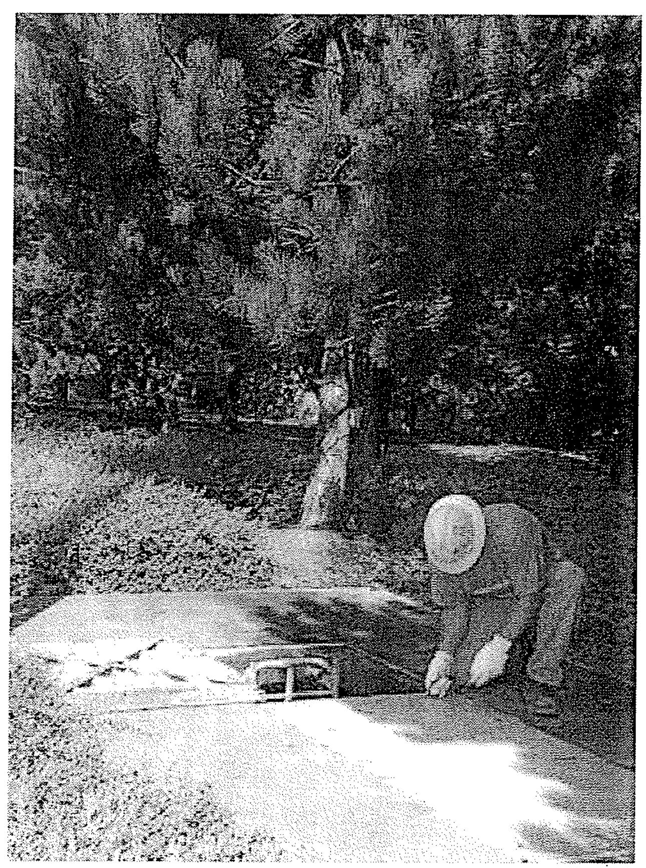
Maintenance

The CDS system should be inspected at regular intervals and maintained when necessary to ensure optimum performance. The rate at which the system collects pollutants will depend more heavily on site activities than the size of the unit, e.g., unstable soils or heavy winter sanding will cause the grit chamber to fill more quickly but regular sweeping of paved surfaces will slow accumulation.

Inspection

Inspection is the key to effective maintenance and is easily performed. Pollutant deposition and transport may vary from year to year and regular inspections will help insure that the system is cleaned out at the appropriate time. At a minimum, inspections should be performed twice per year (i.e. spring and fall) however more frequent inspections may be necessary in climates where winter sanding operations may lead to rapid accumulations, or in equipment washdown areas. Additionally, installations should be inspected more frequently where excessive amounts of trash are expected.

The visual inspection should ascertain that the system components are in working order and that there are no blockages or obstructions to inlet and/or separation screen. The inspection should also identify evidence of vector infestation and accumulations of hydrocarbons, trash, and sediment in the system. Measuring pollutant accumulation can be done with a calibrated dipstick, tape measure or other measuring instrument. If sorbent material is used for enhanced removal of hydrocarbons then the level of discoloration of the sorbent material should also



be identified during inspection. It is useful and often required as part of a permit to keep a record of each inspection. A simple form for doing so is provided.

Access to the CDS unit is typically achieved through two manhole access covers. One opening allows for inspection and cleanout of the separation chamber (screen/cylinder) and isolated sump. The other allows for inspection and cleanout of sediment captured and retained behind the screen. For units possessing a sizable depth below grade (depth to pipe), a single manhole access point would allow both sump cleanout and access behind the screen.

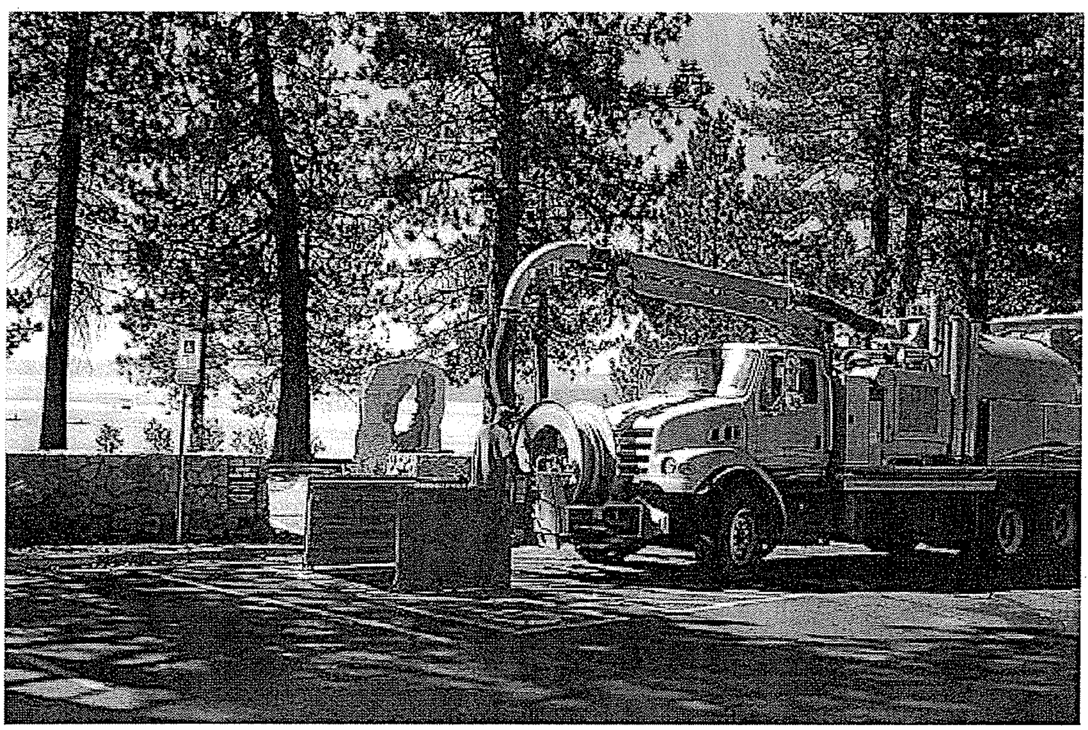
The CDS system should be cleaned when the level of sediment has reached 75% of capacity in the isolated sump and/or when an appreciable level of hydrocarbons and trash has accumulated. If sorbent material is used, it should be replaced when significant discoloration has occurred. Performance will not be impacted until 100% of the sump capacity is exceeded however it is recommended that the system be cleaned prior to that for easier removal of sediment. The level of sediment is easily determined by measuring from finished grade down to the top of the sediment pile. To avoid underestimating the level of sediment in the chamber, the measuring device must be lowered to the top of the sediment pile carefully. Finer, silty particles at the top of the pile typically offer less resistance to the end of the rod than larger particles toward the bottom of the pile. Once this measurement is recorded, it should be compared to the as-built drawing for the unit to determine if the height of the sediment pile off the bottom of the sump floor exceeds 75% of the total height of isolated sump.

Cleaning

Cleaning of the CDS systems should be done during dry weather conditions when no flow is entering the system. Cleanout of the CDS with a vacuum truck is generally the most effective and convenient method of excavating pollutants from the system. Simply remove the manhole covers and insert the vacuum hose into the sump. The system should be completely drained down and the sump fully evacuated of sediment. The area outside the screen should be pumped out also if pollutant build-up exists in this area.

In installations where the risk of petroleum spills is small, liquid contaminants may not accumulate as quickly as sediment. However, an oil or gasoline spill should be cleaned out immediately. Motor oil and other hydrocarbons that accumulate on a more routine basis should be removed when an appreciable layer has been captured. To remove these pollutants, it may be preferable to use adsorbent pads since they are usually less expensive to dispose than the oil/water emulsion that may be created by vacuuming the oily layer. Trash can be netted out if you wish to separate it from the other pollutants. The screen should be power washed to ensure it is free of trash and debris.

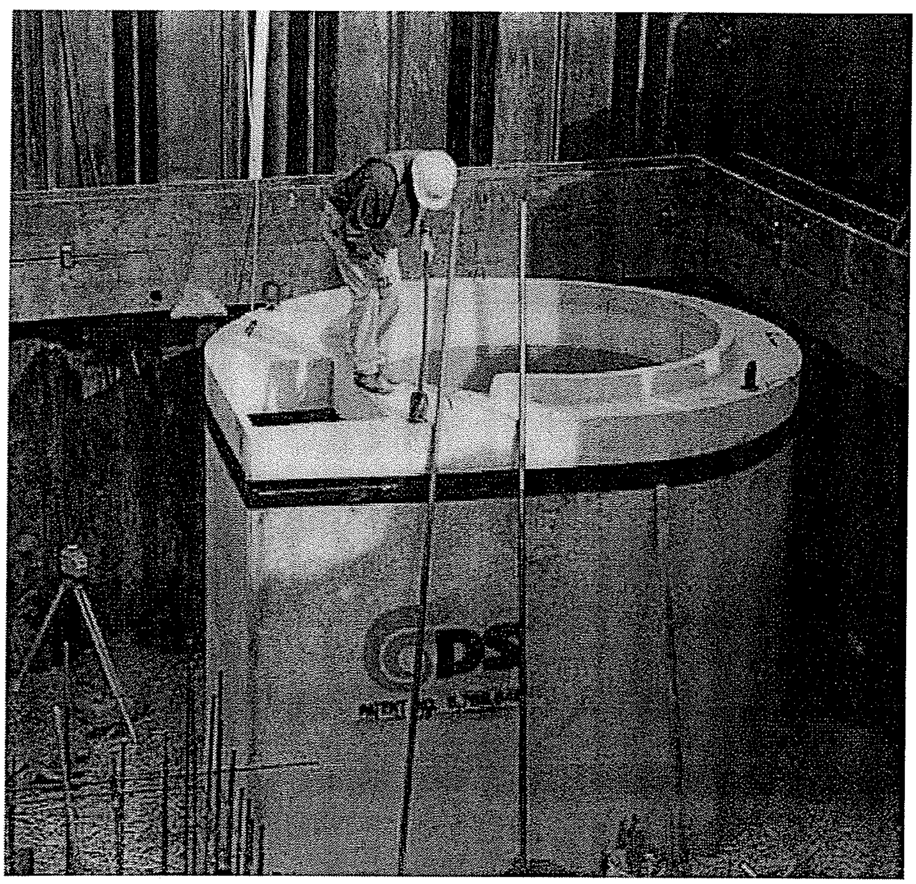
Manhole covers should be securely seated following cleaning activities to prevent leakage of runoff into the system from above and also to ensure proper safety precautions. Confined Space Entry procedures need to be followed. Disposal of all material removed from the CDS system should be done is accordance with local regulations. In many locations, disposal of evacuated sediments may be handled in the same manner as disposal of sediments removed from catch basins or deep sump manholes. Check your local regulations for specific requirements on disposal.



CDS Model	Diameter		Distance from Water Surface to Top of Sediment Pile		Sediment Storage Capacity	
	ft	m	ft	m	yd3	m3
CDS2015-4	4	1.2	3.0	0.9	0.5	0.4
CDS2015	5	1.5	3.0	0.9	1.3	1.0
CDS2020	5	1.5	3.5	1.1	1.3	1.0
CDS2025	5	1.5	4.0	1.2	1.3	1.0
CDS3020	6	1.8	4.0	1.2	2.1	1.6
CDS3030	6	1.8	4.6	1.4	2.1	1.6
CDS3035	6	1.8	5.0	1.5	2.1	1.6
CDS4030	8	2.4	4.6	1.4	5.6	4.3
CDS4040	8	2.4	5.7	1.7	5.6	4.3
CDS4045	8	2.4	6.2	1.9	5.6	4.3

Table 1: CDS Maintenance Indicators and Sediment Storage Capacities

Note: To avoid underestimating the volume of sediment in the chamber, carefully lower the measuring device to the top of the sediment pile. Finer silty particles at the top of the pile may be more difficult to feel with a measuring stick. These finer particles typically offer less resistance to the end of the rod than larger particles toward the bottom of the pile.



CDS Inspection & Maintenance Log

CDS Model: ____________________ Location: ____________________

Date	Water depth to sediment[1]	Floatable Layer Thickness[2]	Describe Maintenance Performed	Maintenance Personnel	Comments

1. The water depth to sediment is determined by taking two measurements with a stadia rod: one measurement from the manhole opening to the top of the sediment pile and the other from the manhole opening to the water surface. If the difference between these measurements is less than eighteen inches the system should be cleaned out. Note: To avoid underestimating the volume of sediment in the chamber, the measuring device must be carefully lowered to the top of the sediment pile.

2. For optimum performance, the system should be cleaned out when the floating hydrocarbon layer accumulates to an appreciable thickness. In the event of an oil spill, the system should be cleaned immediately.

Support

- Drawings and specifications are available at www.contechstormwater.com.
- Site-specific design support is available from our engineers.

CONTECH® CONSTRUCTION PRODUCTS INC.
800.925.5240
contechstormwater.com

CONTECH Construction Products Inc. provides site solutions for the civil engineering industry. CONTECH's portfolio includes bridges, drainage, sanitary sewer, stormwater and earth stabilization products. For information on other CONTECH division offerings, visit contech-cpi.com or call 800.338.1122

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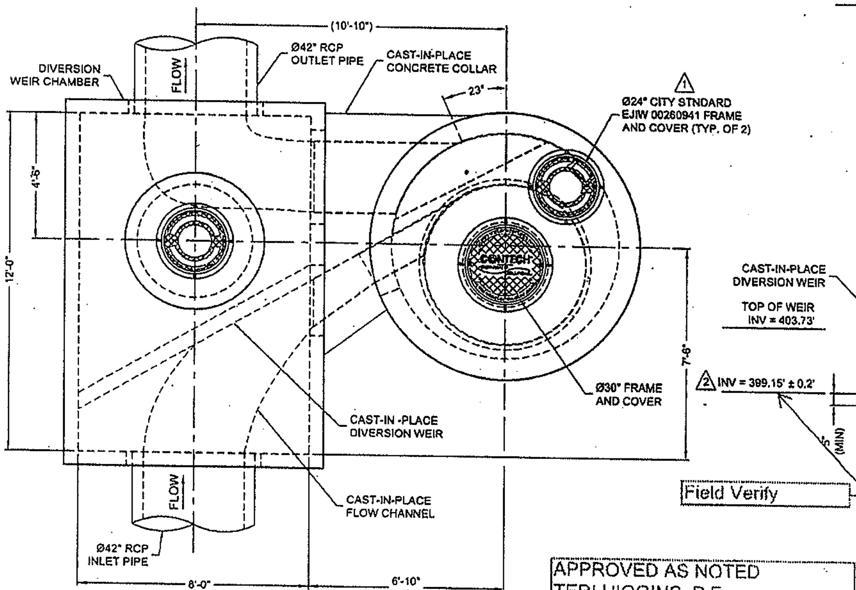
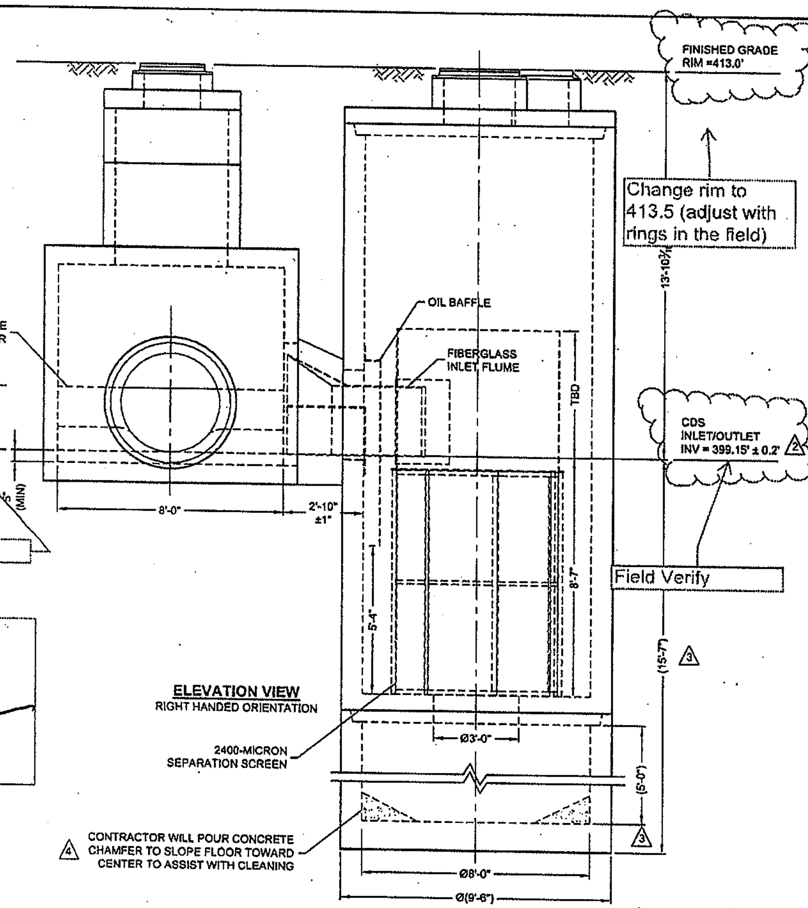
cds_manual 10/08 3M



PLAN VIEW
RIGHT HANDED ORIENTATION



ELEVATION VIEW
RIGHT HANDED ORIENTATION

APPROVED AS NOTED
TERI HIGGINS, P.E.
CITY OF EUGENE
8/29/11

GENERAL NOTES

1. CONTECH TO PROVIDE ALL MATERIALS UNLESS NOTED OTHERWISE.
2. DIMENSIONS MARKED WITH ( ) ARE REFERENCE DIMENSIONS. ACTUAL DIMENSIONS MAY VARY.
3. FOR FABRICATION DRAWINGS WITH DETAILED STRUCTURE DIMENSIONS AND WEIGHTS, PLEASE CONTACT YOUR CONTECH CONSTRUCTION PRODUCTS INC. REPRESENTATIVE. www.contech-cpi.com
4. CDS WATER QUALITY STRUCTURE SHALL BE IN ACCORDANCE WITH ALL DESIGN DATA AND INFORMATION CONTAINED IN THIS DRAWING.
5. DESIGN LOADING - AASHTO HS20.

INSTALLATION NOTES

1. ANY SUB-BASE, BACKFILL DEPTH, AND/OR ANTI-FLOTATION PROVISIONS ARE SITE-SPECIFIC DESIGN CONSIDERATIONS AND SHALL BE SPECIFIED BY ENGINEER OF RECORD.
2. CONTRACTOR TO PROVIDE EQUIPMENT WITH SUFFICIENT LIFTING AND REACH CAPACITY TO LIFT AND SET THE CDS MANHOLE STRUCTURE (LIFTING CLUTCHES PROVIDED).
3. CONTRACTOR TO ADD JOINT SEALANT BETWEEN ALL STRUCTURE SECTIONS, AND ASSEMBLE STRUCTURE.
4. CONTRACTOR TO PROVIDE, INSTALL, AND GROUT PIPES. MATCH PIPE INVERTS WITH ELEVATIONS SHOWN.
5. CONTRACTOR TO TAKE APPROPRIATE MEASURES TO ASSURE UNIT IS WATER TIGHT, HOLDING WATER TO FLOWLINE INVERT MINIMUM. IT IS SUGGESTED THAT ALL JOINTS BELOW PIPE INVERTS ARE GROUTED.
6. THE DIVERSION WEIR SHALL BE CAST-IN-PLACE AND REINFORCED WITH #4's @ 12" O.C. THE WEIR SHALL CONNECT TO THE WALLS OF THE WEIR CHAMBER WITH #4 DOWELS @ 12" O.C., SET 4" INTO WALL AND ANCHORED WITH EPOXY.
7. THE CONTRACTOR SHALL PROVIDE A SECONDARY CONCRETE POUR UPSTREAM AND DOWNSTREAM OF THE WEIR TO FACILITATE FLOW WITHIN THE DIVERSION WEIR CHAMBER AND MINIMIZE THE LIKELIHOOD OF SEDIMENTATION. THE CHANNELING SHALL BE A MINIMUM OF 1/2 THE HEIGHT OF THE CDS OUTLET.
8. SCREEN TO BE INSTALLED WITH GREEN FLANGE UP.

MATERIALS LIST - PROVIDED BY CONTECH

COUNT	DESCRIPTION	INSTALLED BY
1	FIBERGLASS INLET FLUME & CYLINDER	CONTRACTOR
1	FIBERGLASS OUTLET FLUME	CONTRACTOR
1	FIBERGLASS OIL BAFFLE	CONTRACTOR
1	2400 MICRON SEP. SCREEN	CONTRACTOR
1	SEALANT FOR JOINTS	CONTRACTOR
3 PLCS	GRADE RINGS/ RISERS	CONTRACTOR
1	Ø30" x 4" FRAME AND COVER (1)	CONTRACTOR
2	Ø24" x 4" EJIW 00260941 F&C'S (1)	CONTRACTOR.

SITE DESIGN DATA

WATER QUALITY FLOW RATE	25 CFS
PEAK FLOW RATE	44.7 CFS
RETURN PERIOD OF PEAK FLOW	50 YRS

CONTECH
CONTRACT
DRAWING

HANS

MARK	DATE	REVISION DESCRIPTION	BY
4	7/13/11	ADDED CHAMFER	MBB
3	7/8/11	CHANGED SUMP DEPTH	MBB
2	7/8/11	REVISED INVERT ELEVATIONS	MBB
1	7/8/11	REVISED COVERS	MBB

CDS5678-8-F & BYPASS VAULT -
441684-01
I-105 WQ: 7TH TO WILLAMETTE RIVER
EUGENE, OR

CONTECH® CONSTRUCTION PRODUCTS INC.
www.contech-cpi.com

DATE: 6/8/11	
DESIGNED: ALS	DRAWN: MBB
CHECKED: ---	APPROVED: ---
PROJECT No.: 441684	SEQUENCE No.: 01
SHEET: D-1	