Return to Agenda

Marina Coast Water District
Staff Report

Agenda Item: 10-A

Meeting Date: February 14, 2012

Submitted By: Carl Niizawa
Reviewed By: Jim Heitzman

Presented By: Carl Niizawa

Agenda Title: Backwater Protection Policy and Sewer Back-Up

Detailed Description:

On September 15, 2011, a sewer back-up incident associated with the District sewer maintenance operations occurred at the Marina Community Partners Building 100, 12th Street, Marina. $40,000 in clean-up and restoration costs was incurred. Staff filed for an insurance claim, and while the District's insurance provider questioned the claim on the basis that the District's code requires a backwater valve (which would have prevented such an incident), the claim was paid. This issue was brought before District's Executive Committee in November and December. At each of these meetings, more details on backwater issues was requested, including the District's practice with new development, the experience of other agencies, and more details on the backwater incident at the Community Partners Building. At its January 27, 2012 meeting, the Executive Committee asked that this item be brought before the Board.

Community Partners Building Incident and District History of Backwater Complaints
(See attachment A)

District Backwater Policy
In review of comparative practice for backwater protection with other agencies, it was found that the District is more aggressive than other agencies. The District's policy (see attachment B) is for all laterals to have backwater protection, either an overflow device or a backwater valve, and the backwater valve to be installed:

1. When backwater protection is required.
2. When the lowest floor elevation is below the street or less than 1 foot above the top of the concrete box containing the overflow device.
3. Sewage cannot be allowed to overflow on the surrounding area

It is notable that #1 and #3 can be subjective to the reviewer.

Significantly, it appears from review of the California Uniform Plumbing Code and discussion with other agencies, that the District policy is not consistent with the State Plumbing Code:

2010 California UPC
710.0 Drainage of Fixtures Located Below the Next Upstream Manhole or Below the Main Sewer Level.
710.1 Where a fixture is installed on a floor level that is lower than the next upstream manhole cover of the public or private sewer, serving such drainage piping, shall be protected from backflow of sewage by installing an approved type of backwater valve. Fixtures on floor levels above such elevation shall not discharge through the backwater valve. Cleanouts for drains that

pass through a backwater valve shall be clearly identified with a permanent label stating "backwater valve downstream".

The underlined sentence of the 710.1 prohibits drainage from floors above the rim elevation of the upstream manhole from going through the backwater valve. Building officials from Watsonville and the City of Los Angeles confirmed this interpretation as meaning that sanitary flows should not go through a backwater valve, if and only if, the floor level is beneath the rim elevation of the upstream manhole. Second story plumbing which is above such elevation shall not.

It is apparent that the District's standards have not been consistent the California Plumbing Code for years. The backwater policy restricting flows through the backwater valve has been in the Plumbing Code since the 1970s. Deviations from the code are not unusual for jurisdictions; however, there is typically a finding for such deviation which is usually minor.

The backwater standard is significantly different than the plumbing code. For example, the standard has backwater overflow devices on residential cleanouts. No other jurisdiction has such requirement and another jurisdiction felt that such was a violation of the state plumbing code which states that "707.3 Cleanouts shall be designed to be gas and water tight."

Experience of other Agencies with backflow issues:
Salinas - The largest sewer system in the area, the City of Salinas, indicates that they have about 5-7 complaints of backwater a year. They have not received any claims for compensation. Their policy is consistent with the California Plumbing Code. Existing buildings are exempt from any new code requirement.

Seaside – They receive 4-7 complaints a year on backwater. Their policy is consistent with the state code. Existing buildings are exempt from any new code requirement.

Monterey - The City has a history of backwater problems. Several lawsuits for sewage backups occurred in Monterey, resulting in hundreds of thousands of dollars of payments. The City adopted a requirement for backwater valves for floor elevations less than 2' above the upstream rim elevation (the same as the District). The City implemented a new policy and informed existing properties at risk (several thousand) that the installation of the backwater valve is their responsibility and that the City would be responsible for backwater problems.

Watsonville – Application consistent with the code. Existing buildings are exempt from any new code requirement.

Los Angeles – Several backwater problems, application consistent with the code. Existing buildings are exempt from any new code requirement.

District's Practice with Recent Developments

A survey of recent past MCWD staff development plan reviews was done related to the installation of sanitary sewer backwater valves. From the research into the actual results of the plan reviews of a wide-variety of development projects, it is apparent that the decision to install or not install backwater valves in development projects is currently a subjective one. The end-result is that there was a non-uniform application of MCWD's standard.

Table 1 (below) contains specific data regarding the results of the plan review process relative to backwater valve installation for some recent and well-known projects.

A project that is not shown in Table 1 is the residential redevelopment project named Stilwell Kidney conducted by Monterey Bay Military Housing (associated with Clark-Pinnacle / RCI). More than thirty backwater valves were installed within the Stilwell Kidney project on lots that had final floor elevations lower than the elevation of the rim for the upstream manhole. Staff's current review discovered many additional lots that meet the criteria for requiring the installation of a backwater valve yet no backwater valve was called for or installed. After engaging with the design engineer for the project, the lack of clear policy that could be understood by the designer and the subjective review by staff yielded discrepancies in backwater valve installations within this project.

TABLE 1- Survey of Recent Developments regarding backwater valves

Development	Structure	Clean-out (Only) Installed?	Backwater Valve Installed?	Final Floor Elevation	U/S Manhole Rim Elevation	Action Meets CUPC Standard	Action Meets MCWD Standard	NOTES
City of Marina	Marina Library	Yes	No	42.04	39.50	Yes	Yes	
740 Neeson, Marina	Bldg 1	No	Yes	101.90	101.10	No	Yes	
Imjin Office Park	Carpenters Union	No	Yes	99.25	100 (est.)	Yes	Yes	
Imjin Office Park	FORA / MCWD	No	Yes	98.50	99.29	Yes	Yes	
Monterey Peninsula College	Public Safety Training, Bldg 4465	Yes	No	262.65	262.5	Yes	No	Re-develop-ment
Monterey Peninsula College	Public Safety Training, Bldg 4464	Yes	No	276.57	279.1	No	No	Re-develop-ment
Monterey College of Law	Bldg 4474	Yes	No	252.0	249.15	Yes	Yes	Re-develop-ment

Development	Structure	Clean-out (Only) Installed?	Backwater Valve Installed?	Final Floor Elevation	U/S Manhole Rim Elevation	Action Meets CUPC Standard	Action Meets MCWD Standard	NOTES
Monterey Peninsula College	Marina Ed Center	Yes	No	113.8	113.18	Yes	No	State project
WalMart (Marina)		Yes	No	30.36	30.32	Yes	No	Re-develop-ment
Community Hospital of Monterey Peninsula		Yes	No	93.50	92.1	Yes	Yes	
State Parks & Recreation	Marina State Beach	No	Yes	53.00	59 (est.)	Yes	Yes	Install soon
Shell Gas Station (Marina)		No	Yes	43.5	53.0	Yes	Yes	Install soon
Dunes	Best Buy	Yes	No	79.70	75.87	Yes	Yes	Checked in field
Dunes	Old Navy	Yes	No	79.20	74.37	Yes	Yes	Checked in field
Dunes	Kohls	Yes	No	76.20	74.37	Yes	Yes	Checked in field
Dunes	Bed, Bath & Beyond	Yes	No	77.20	72.95	Yes	Yes	Checked in field
Dunes	Michaels'	Yes	No	76.70	72.99	Yes	Yes	Checked in field
Dunes	Target	Yes	No	76.80	73.34	Yes	Yes	Checked in field
Dunes	REI	Yes	No	77.80	75.15	Yes	Yes	Checked in field

Policy Recommendation:
Staff revise District Standard for better consistency with the state code. As the District serves a multi-jurisdictional community, recommend seeking concurrence with the jurisdictions on this policy. Following adoption of the revised Standard, provide outreach for better community understanding of the new Standard.

Sewer backup on 9/15/11, Marina Community Partners, Building #2862

Summary: The Executive Committee requested District staff summarize the series of events preceding and following the backup of sewage into the office building of Marina Community Partners LLC on 9/15/11. Marina Community Partners currently occupies Building # 2862, located at 100, 12th Street, Marina. This report is intended to answer any questions the Board of Directors may have concerning the special circumstances regarding this event and how past District practices in this vicinity of our service area relate to past and present general practices in the rest of our service area.

The sewer lines in the vicinity of the Marina Community Partners LLC, Building #2862, located at 100 12th Street, have been maintained by MCWD since 1996 on a corrective maintenance schedule. See attached map for reference location. In previous years, District staff installed four cleanouts at the top of the hill to facilitate corrective maintenance of the sewer lines serving the occupied buildings in the 100 12th Street vicinity. Staff has confirmed the subject sewer lines were in fact deeded to the District when the Former Fort Ord water and wastewater infrastructure was conveyed to the District in 2001. Please refer to attached Bestor Engineering map of the wastewater collection infrastructure in this area, which has been deeded to the District.

These sewer lines are not properly constructed sewer mains, as they were installed by the Army at the time these barracks were built some 70 years ago. These common wastewater lines that convey flow from multiple buildings in this vicinity do not properly tie into receiving manholes. Most of these lines are directly tied into a sewer main or tied into a manhole in a manner with no access for preventative or corrective maintenance. Staff is unaware of any other active sewer lines in the District with this particular problem. If sewer mains are to be properly maintained, the utility tasked with maintenance needs proper access to insert a hydro-jetting hose below the blockage. As seen on the attached map, most of these lines do not terminate into a properly constructed manhole or even have a cleanout or manhole at the bottom of the hill prior to the connection to the sewer main.

On 9/15/11, Marina Coast Water District Operations and Maintenance staff responded to a call from the occupants of the building reporting their sewer lateral was not accepting flow at Building #2902. Upon arrival by MCWD staff, the cleanout of the subject building was observed to not be accepting flow. In an attempt to clear the blockage, MCWD staff hydro-jetted the sewer line from the cleanout above the blockage. As a result of our efforts, sewage backed up into building #2862. This building is currently the office for Marina Community Partners LLC. For clarification, please refer to the attached hand sketch drawing of placement of vehicles, staff, and equipment in relation to the buildings and facilities. This was not a required reportable spill since it occurred on a private lateral. The cause of this blockage appears to be root intrusion.

District staff has responded to numerous corrective maintenance events of this kind over the last 15 years in this vicinity. After surveying the historical records concerning this type of activity and interviewing staff it is estimated that similar backup events into buildings in this vicinity have taken place on three separate occasions. These backup events, including the subject event, have occurred two times at Building #2862, occupied by Marina Community Partners and once into building #2861, previously occupied by FORA.

In an effort to reduce the likelihood of a repeat backup event at building #2862, District staff installed a backwater device on the lateral that serves the Marina Community Partners building at our cost. The meter box and device costs $190, and the installation took District Operations and Maintenance staff two hours to install. Total cost to the district is $310. District staff installed this device on the lateral for building #2862 as an initial stop gap measure until a more complete assessment of the infrastructure shortcomings could be completed and follow-up corrective actions could be put in place.

This part of the former Fort Ord has been slated for demolition for many years. Due to slowdown in development and the prolonged "temporary" status of these buildings the infrastructure has never been adequately modified to facilitate preventative or corrective maintenance of the sewers lines in this area. There are currently five buildings occupied in this vicinity. The Operations and Maintenance staff has installed six cleanouts at the bottom of each of the sewers lines before they connect into the sewer main below the subject properties to facilitate corrective maintenance in this area. The cost to install the six cleanouts was $1,550 in equipment, labor and materials.

District Operations and Maintenance staff has been directed to only jet the properly constructed sewer mains in this area as we typically do for the rest of the Marina and Ord communities. This direction to District staff is an effort to minimize the likelihood of a repeat event similar to what happened at the Marina Community Partners building on 9/15/11. District staff has been instructed that if these sewer lines are blocked or not receiving adequate flow in the future, they are to only jet below the blockage from the recently installed cleanouts with low pressure and notify the Operations and Maintenance Superintendent or the Operations and Maintenance Superintendent.

Staff recently hired Greenline to camera the sewer lines in this vicinity. The results of the camera work confirmed that root intrusion has taken place on these sewer lines. District staff has begun carefully hydro jetting theses lines from the newly installed District cleanouts and placing them on a preventative maintenance schedule. Once the lines are cleared, staff plans to have Greenline return to camera these lines again to confirm the root intrusion problem has been adequately resolved in the subject area. Staff is confident this resolution to the problem sewer lines in this area will minimize the potential for a repeat event similar to the 9/15/11 Marina Community Partners backup.

Typically when District customers call us to report a slow or blocked lateral, District staff makes a site visit to investigate if it is the District owned and operated sewer main or if it is the customer's lateral. If District staff finds the sewer main is clear of obstructions and flowing freely we kindly inform the customer that they need to call a plumber to clear their lateral. If it is found that the sewer main is blocked or backing up we respond accordingly to clear the blockage. Staff has estimated that MCWD typically gets about 6-12 calls per year from customers experiencing slow or blocked drains. Roughly 90% of the time it is determined that the problem resides in the customer's lateral rather than the Districts sewer mains. Standard MCWD practice in hydro-jetting sewer blockages is to jet from below the blockage against the flow of the pipe. This is done at all times to minimize the possibility of sewage backing up into a building.

Customer service records regarding backwater issues. Note that there may have more sewer backup incidents, not recorded in customer services files.

SEWAGE OVERFLOWS FROM CUSTOMERS CLEANOUTS

MARINA		ORD		
DATE	ADDRESS	DATE		ADDRESS
10/19/2001	3167 Eucalyptus St.	10/23/2001		103 New Guinea
		6/25/2002		247 Ardennes
		12/3/2002		6874 Malmedy
2/5/2003	3097 Ellis Ct.	1/3/2003		164 Corregidor
4/26/2003	252 Carmel Ave	3/16/2003		338 Ardennes
7/30/2003	248 Carmel Ave	9/17/2003		187 Monterey St
		9/28/2003		123 Noumea
		8/10/2004		150 Gigling Rd.
3/19/2005	234 Peninsula Dr			
3/20/2005	222 Peninsula Dr	5/12/2006	*	Marina Comm. Partners
2/26/2006	3002 Ellen Ct	8/2/2006		210 Ardennes
		11/10/2006		Naples/Anzio
		12/23/2006		314 Aachen
		3/4/2007		301 Elbe
		12/12/2008		270 Tunisia
		2/13/2008	*	FORA Building
10/19/2009	248 Carmel Ave	2/24/2009		212 Metz
		10/20/2010		183 Monterey Rd
		2/11/2011		212 Normandy
		4/6/2011		Gigling Police Sta.
		6/29/2011	*	1130 Remagen
		9/15/2011	*	Marina Comm. Partners

*** Sewage came up in building**

Attachments: Drawing 9_15_11
12th Street Old FOR A
Ord WW Easement Map

Attachment to Backwater Policy Report

Marina Coast Water District

Policies Related to Backwater Valves

MARINA COAST

WATER DISTRICT CODE

CALIFORNIA

2001

A Codification of the General Ordinances of of the Marina Coast Water District, California

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Beginning with Supp. No. 9,
Supplemented by Municipal Code Corporation

Municipal Code Corporation
PO Box 2235 Tallahassee, FL 32316
800-262-2633 • Fax: 850-575-8852
Municode.com • info@municode.com

PREFACE

The Marina Coast Water District, California Code, originally published by Book Publishing Company, has been kept current by regular supplementation by Municipal Code Corporation, its successor in interest.

During original codification, the ordinances were compiled, edited and indexed by the editorial staff of Book Publishing Company under the direction of Lloyd Lowrey, Jr., attorney.

The code is organized by subject matter under an expandable three-factor decimal numbering system which is designed to facilitate supplementation without disturbing the numbering of existing provisions. Each section number designates, in sequence, the numbers of the Title, chapter, and section. Thus, Section 2.12.040 is Section .040, located in Chapter 2.12 of Title 2. In most instances, sections are numbered by tens (.010, .020, .030, etc.), leaving nine vacant positions between original sections to accommodate future provisions. Similarly, chapters and titles are numbered to provide for internal expansion.

In parentheses following each section is a legislative history identifying the specific sources for the provisions of that section. This legislative history is complemented by an ordinance disposition table, following the text of the code, listing by number all ordinances, their subjects, and where they appear in the codification; and beginning with Supplement No. 9, legislation can be tracked using the "Code Comparative Table and Disposition List."

A subject-matter index, with complete cross-referencing, locates specific code provisions by individual section numbers.

This supplement brings the Code up to date through Ordinance 54, passed June 14, 2011.

Municipal Code Corporation
1700 Capital Circle SW
Tallahassee, FL 32310
800-262-2633

Chapter 7.04

UNIFORM PLUMBING CODE ADOPTED

Sections:

7.04.010 Uniform plumbing code adopted.

All that certain plumbing code, entitled California Plumbing Code, consisting of the latest edition of the Uniform Plumbing Code of the International Association of Plumbing and Mechanical Officials, as modified and approved by the California Building Standards Commission for inclusion in Title 24 of the California Code of Regulations, is adopted as the Uniform Plumbing Code of Marina Coast Water District. (Amended during 3-02 supplement: Ord. 2 § 501, 1967)

7.04.020 Administrative authority.

Wherever the term "administrative authority" is used in the Uniform Plumbing Code, it shall be construed to mean only those persons duly authorized by the district board to administer the code as follows:

A. Administration of the code and enforcement of regulations thereof shall be under the direction of the general manager.

B. The interpretation of technical provisions of the ordinance codified in this section, review of plans and specifications required hereby, determination of the suitability of alternate materials and types of construction and the development of rules and regulations covering unusual conditions not inconsistent with the requirements of said ordinance shall be made by the district engineer. (Amended during 3-02 supplement: Ord. 2 § 502, 1967)

5.16.110 Installation and jointing of building sewers.

Jointing methods shall be: approved Caulder type or bell-and-spigot connections for vitrified clay pipe; rubber ring connections for asbestos cement pipe; band seal connection with stainless steel clamps for cast iron pipe. (Amended during 3-02 supplement: Ord. 2 § 611, 1967)

5.16.120 Cleanouts.

Cleanouts shall be installed in every building sewer at the plumbing system connection, usually two feet from the foundation, at bends of forty-five degrees or larger, and at the connection to the lateral sewer, usually at the property line. In no case shall the distance between cleanouts measured along the pipeline be greater than one hundred feet. The cleanouts shall be constructed of the same material and size as the building sewer as shown in Standard Detail S-106. (Amended during 3-02 supplement: Ord. 2 § 612, 1967)

5.16.130 Building sewer testing.

A wet test will be required of the building sewer from the connection at the street lateral to the connection with the building plumbing system. The building sewer shall be plugged at its connection with the street lateral and completely filled with water from its lowest point to finished grade at its highest point. The building sewer shall be water-tight at all points and no leakage will be allowed. The district shall be notified at least twenty-four hours before the work is to be tested and inspected. No building sewer shall be covered or put into use until it has been tested and approved as prescribed herein. The contractor shall supply all equipment and materials to complete the test. (Amended during 3-02 supplement: Ord. 2 § 613, 1967)

5.16.140 Abandoned sewage disposal facilities.

A. Every abandoned building (house) sewer or part thereof, shall be plugged or capped in an approved manner within five feet of the property line.

B. Every cesspool, septic tank or seepage pit which has been abandoned or has been discontinued otherwise from future use shall have the sewage removed therefrom, a hole made in the bottom slab, and be completely filled with sand or other approved material.

C. The top cover or arch over the cesspool or septic tank or seepage pit shall be removed and filled in accordance with Section 1119(c) of the Uniform Plumbing Code. (Amended during 3-02 supplement: Ord. 2 § 614, 1967)

5.16.150 Backwater protection.

Devices to prevent reverse sewage flows from entering any building shall be installed in accordance with Standard Detail S-111. (Amended during 3-02 supplement: Ord. 2 § 615, 1967)

5.16.160 Permit required.

In accordance with Chapter 5.24 of this code, no person shall construct, extend or connect to any public sewer without first obtaining a written permit from the district and paying all fees and connection charges and furnishing bonds as required therein. The provisions of this section requiring permits shall not be construed to apply to contractors constructing sewers and appurtenances under contracts awarded and entered into by the

PROCEDURES GUIDELINES AND DESIGN REQUIREMENTS

Revised: November 2007

Marina Coast Water District
11 Reservation Road
Marina, CA 92933
(831) 384-6131

House connections shall be constructed to the property line. There shall be one house sewer lateral constructed for each individually owned dwelling unit and it shall have a minimum diameter of 4 inches.

Four-inch sewer house connections shall be laid to the grade as established by the applicant so that the 4-inch house connection will have a minimum cover of 3 feet from the top of the curb to the top of the pipe per Standard Plan S-7. The sewer laterals from the main to the building, and inside the buildings are governed by the Uniform Plumbing Code and enforced by the local building authority.

500.8 TOWNHOUSES AND CONDOMINIUM LATERALS

For buildings containing two to four units, either one 4-inch diameter lateral to each unit or one 6-inch or larger diameter lateral to the building shall be used. For buildings containing more than four units, either one 4-inch diameter lateral to each unit or one 8-inch or larger diameter lateral to the building shall be used. A lateral shall serve only one building regardless of number of units per building.

500.9 BACKWATER PREVENTION

Backwater prevention devices are required on sewer laterals connecting to all buildings. Variances may be considered by the District Engineer on a case by case basis. Exceptions cannot be granted for laterals to buildings where the building ground floor elevation is below the rim elevation of the uphill sewer manhole on the main line.

500.10 INDUSTRIAL PRETREATMENT

Requirements for industrial pretreatment of sewage will be determined by the Monterey Regional Water Pollution Control Agency (MRWPCA). Design requirements will be dependent upon those industrial pretreatment requirements.

500.11 GREASE INTERCEPTORS

All restaurants and other facilities which discharge grease into the District's sewers shall be required to use grease traps or grease interceptors to minimize grease problems in collection systems and treatment plants. The minimum interceptor size shall be 750 gallons. All interceptors shall be equipped with automatic draw-off devices for easier removal of accumulated grease. Small kitchens may install grease traps instead of interceptors, with the approval of the District Engineer. Comply with Appendix 15 and the Uniform Plumbing Code for sizing.

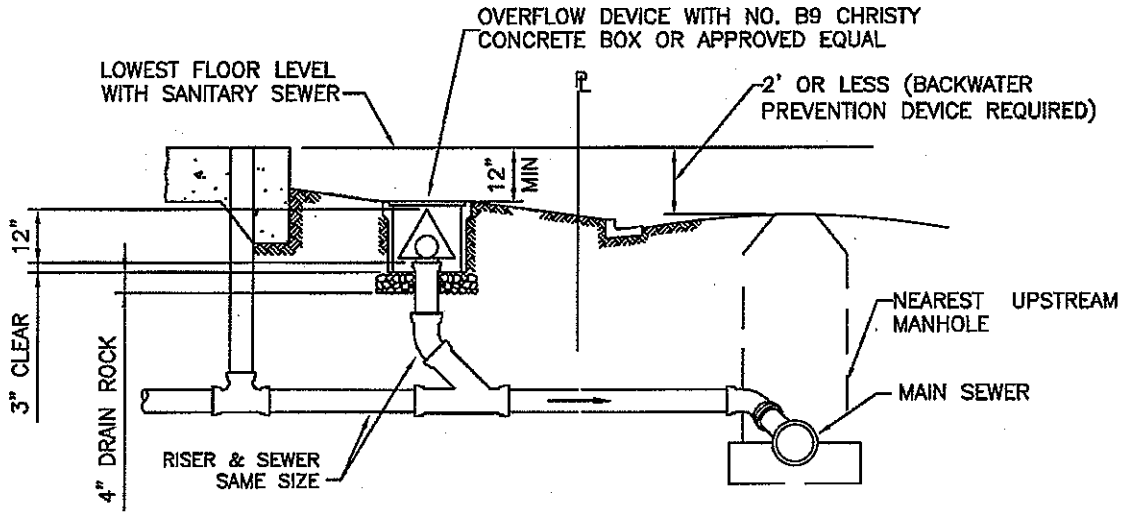
It will be the responsibility of the owner of each facility to maintain proper operating order of the interceptor unit and to remove accumulated grease at suitable intervals to avoid excessive buildup in the unit. The Marina Coast Water District approves the location and design of the interceptor unit.

500.12 STANDARD SEWER NOTES

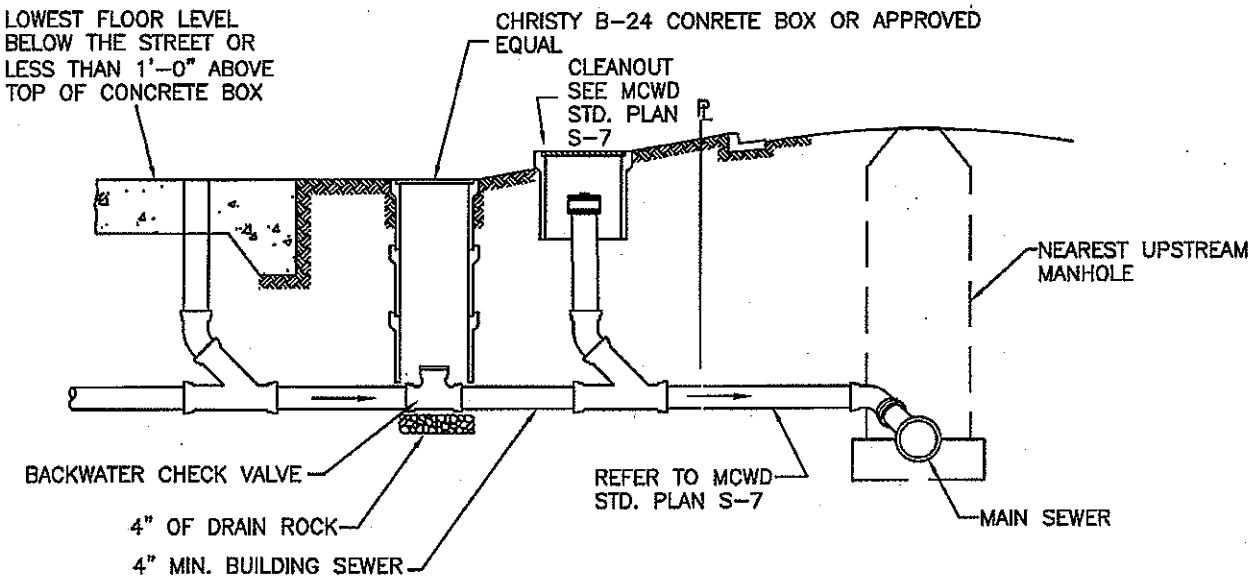
Standard sewer notes to be included on all sewer system construction plans shall be as follows:

1. The sewer system as shown on these plans shall be constructed in accordance with the standard plans and specifications of the Marina Coast Water District. Contractor shall keep a copy of the standard specifications and drawings on the jobsite at all times.

2. The Marina Coast Water District shall be notified at least 48 hours prior to commencing work on the



TYPICAL CLEANOUT AND OVERFLOW DEVICE



BACKWATER VALVE

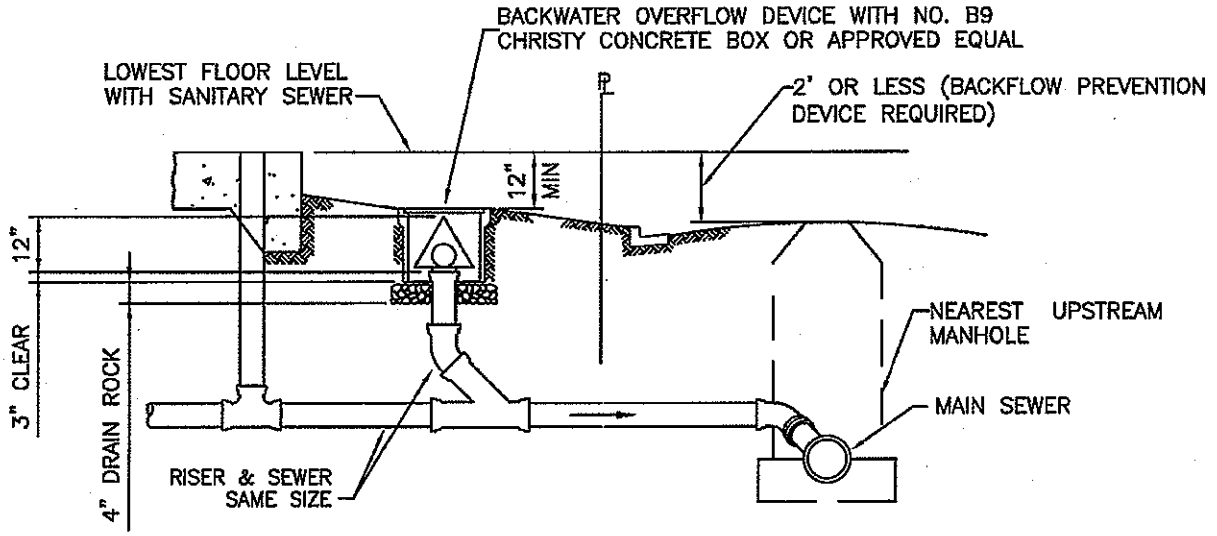
NOTES:

1- EVERY BUILDING SEWER SHALL HAVE AN OVERFLOW DEVICE AND/OR BACKWATER VALVE INSTALLED IN THE SEWER LATERAL SERVING THE BUILDING. COMBINATION BACKWATER VALVE/CLEAN-OUT IS ALLOWED.

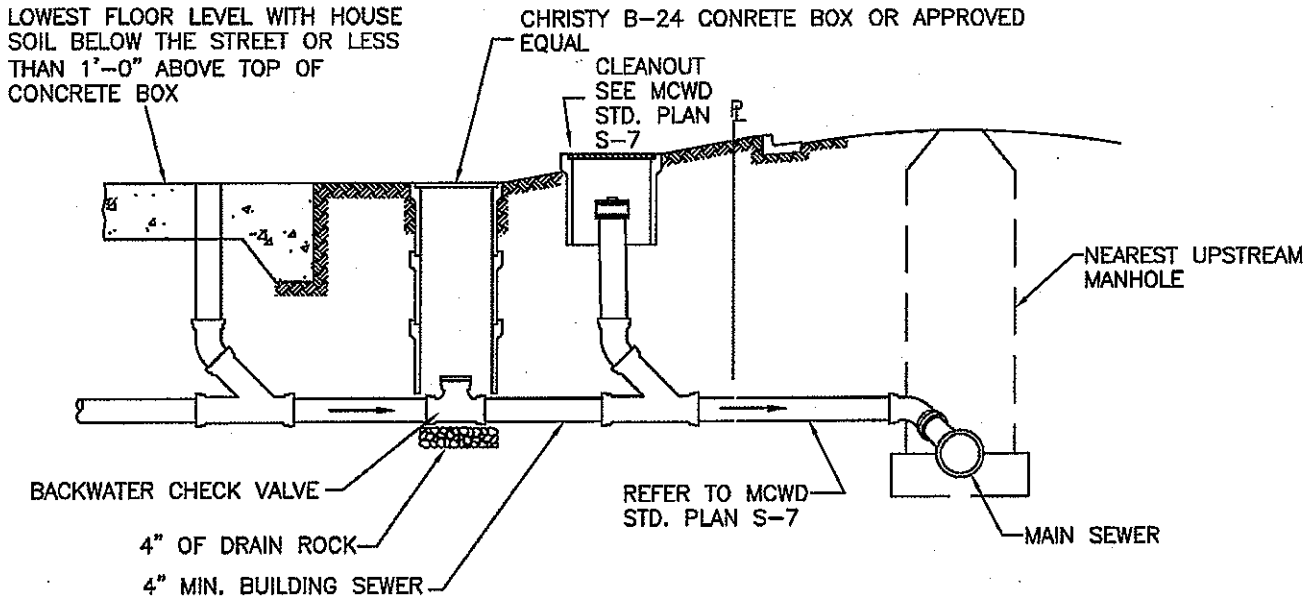
2- OVERFLOW DEVICES SHALL BE INSTALLED ON ALL LATERALS; HOWEVER BACKWATER VALVES SHALL BE INSTALLED (A) WHEN BACKWATER PROTECTION IS REQUIRED, (B) WHEN THE LOWEST FLOOR LEVEL IS BELOW THE STREET OR LESS THAN 1 FOOT ABOVE THE TOP OF THE CONCRETE BOX CONTAINING THE OVERFLOW DEVICE, OR (C) SEWAGE CANNOT BE ALLOWED TO OVERFLOW ON THE SURROUNDING AREA.

3- AN OVERFLOW DEVICE OR A BACKWATER VALVE MAY BE WAIVED WHEN WHEN THE LOWEST FLOOR LEVEL TO BE SEWERED IS MORE THAN 2 FEET ABOVE THE RIM OF THE NEAREST UPSTREAM MANHOLE AND IN THE OPINION OF THE DISTRICT SUCH INSTALLATION IS UNNECESSARY FOR PROTECTION OR FOR HEALTH AND SAFETY REQUIREMENTS.

APPROVED BY DISTRICT ENGINEER	MARINA COAST WATER DISTRICT STANDARD PLAN	STANDARD
DATE 11/2007	BACKWATER PROTECTION	S-13
		SHEET 1 OF 1



TYPICAL CLEANOUT AND OVERFLOW DEVICE



BACK WATER VALVE

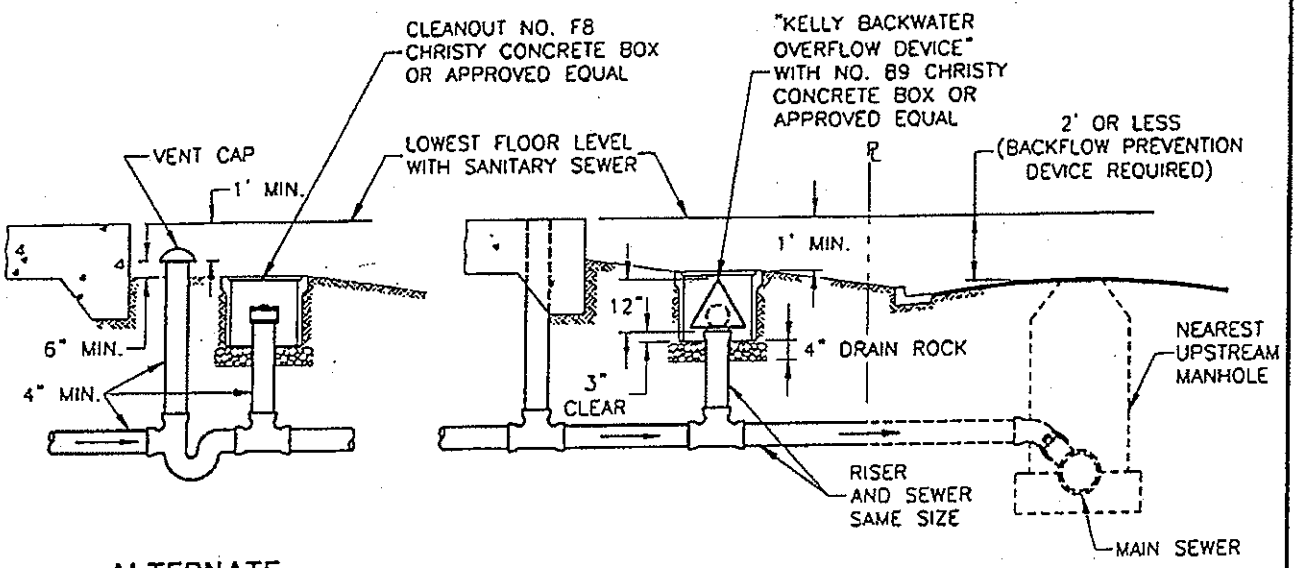
NOTES:

1- EVERY BUILDING SEWER SHALL HAVE AN OVERFLOW DEVICE AND/OR BACKWATER VALVE INSTALLED IN THE SEWER LATERAL SERVING THAT INDIVIDUAL BUILDING EXCEPT WHEN THE LOWEST FLOOR LEVEL TO BE SEWERED IS MORE THAN 2 FEET ABOVE THE RIM OF THE NEAREST UPSTREAM MANHOLE.

2- OVERFLOW DEVICES SHALL BE INSTALLED ON ALL LATERALS; HOWEVER BACKWATER VALVES SHALL BE INSTALLED WHERE BACKFLOW PROTECTION IS REQUIRED, AND EITHER (A) TOPOGRAPHY PREVENTS THE USE OF THE OVERFLOW DEVICE, THAT IS THE 1 FOOT MINIMUM DIFFERENTIAL BETWEEN THE LOWEST FLOOR LEVEL TO BE SEWERED AND THE TOP OF THE CONCRETE BOX CONTAINING THE OVERFLOW DEVICE IS NOT AVAILABLE OR, (B) SEWAGE CANNOT BE ALLOWED TO OVERFLOW ON THE SURROUNDING AREA.

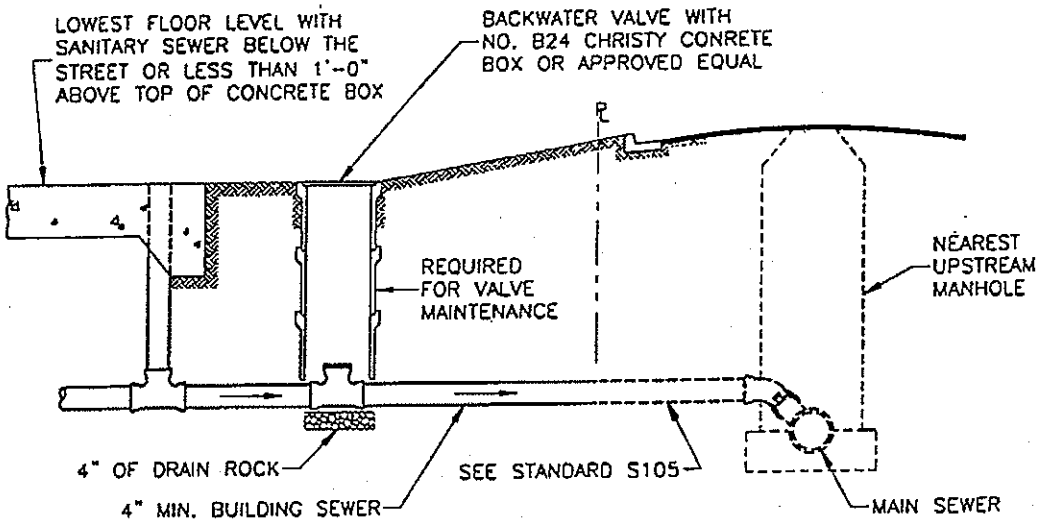
3- AN OVERFLOW DEVICE OR A BACKWATER VALVE MAY BE WAIVED WHEN, IN THE OPINION OF THE DISTRICT, SUCH INSTALLATION IS UNNECESSARY FOR PROTECTION OR FOR HEALTH AND SAFETY REQUIREMENTS.

APPROVED BY DISTRICT ENGINEER	MARINA COAST WATER DISTRICT STANDARD PLAN	STANDARD
DATE 04/2005	BACKWATER PROTECTION	S-13
		SHEET 1 OF 1



ALTERNATE
OVERFLOW DEVICE

TYPICAL CLEANOUT AND OVERFLOW DEVICE



BACK WATER VALVE

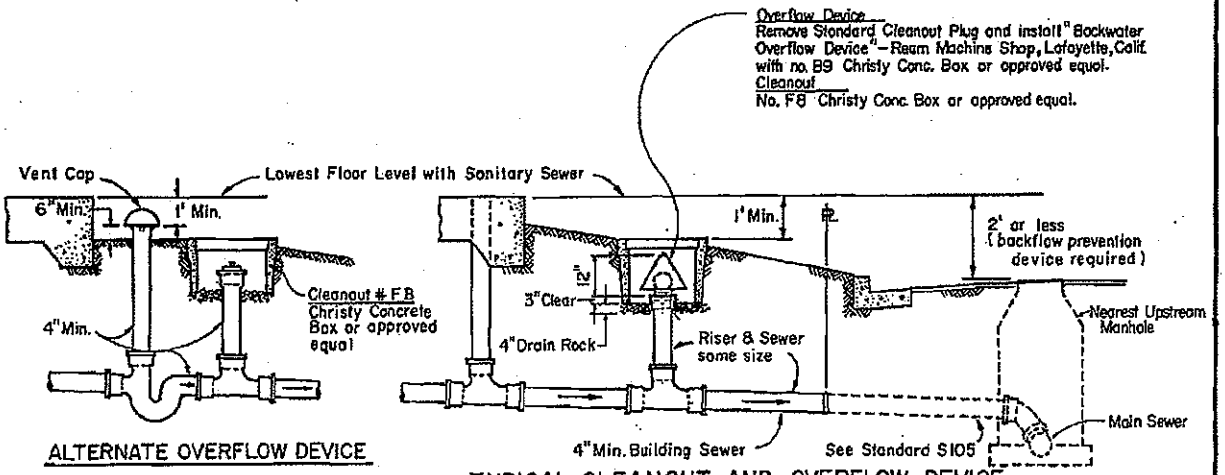
NOTES:

1- EVERY BUILDING SEWER SHALL HAVE AN OVERFLOW DEVICE OR BACKWATER VALVE INSTALLED IN THE SEWER LATERAL SERVING THAT INDIVIDUAL BUILDING EXCEPT WHEN THE LOWEST FLOOR LEVEL TO BE SEWERED IS MORE THAN 2 FEET ABOVE THE RIM OF THE NEAREST UPSTREAM MANHOLE.

2- OVERFLOW DEVICES WILL NORMALLY BE INSTALLED; HOWEVER BACKWATER VALVES SHALL BE INSTALLED WHERE BACKFLOW PROTECTION IS REQUIRED, AND EITHER (A) TOPOGRAPHY PREVENTS THE USE OF THE OVERFLOW DEVICE, THAT IS THE 1 FOOT MINIMUM DIFFERENTIAL BETWEEN THE LOWEST FLOOR LEVEL TO BE SEWERED AND THE TOP OF THE CONCRETE BOX CONTAINING THE OVERFLOW DEVICE IS NOT AVAILABLE OR, (B) SEWAGE CANNOT BE ALLOWED TO OVERFLOW ON THE SURROUNDING AREA.

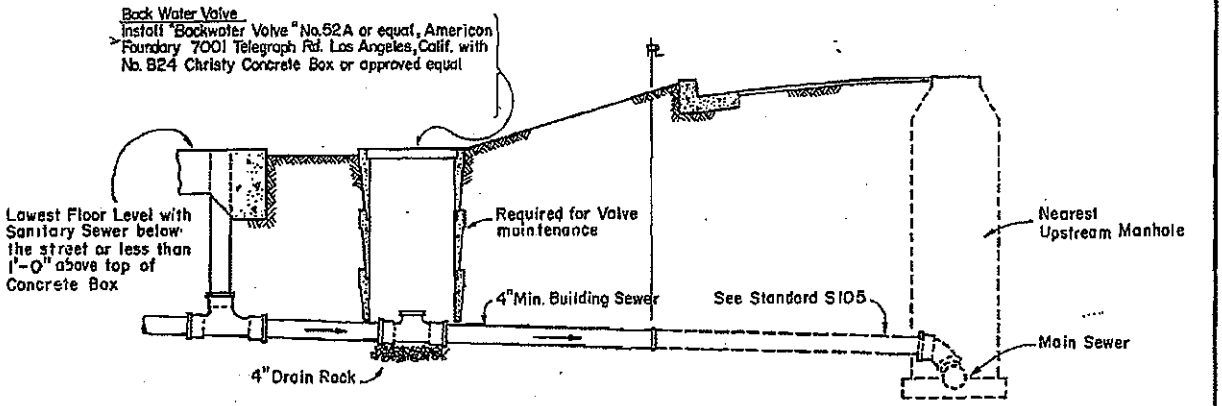
3- AN OVERFLOW DEVICE OR A BACKWATER VALVE MAY BE WAIVED WHEN, IN THE OPINION OF THE DISTRICT, SUCH INSTALLATION IS UNNECESSARY FOR PROTECTION OR FOR HEALTH AND SAFETY REQUIREMENTS.

APPROVED BY PROPOSED DATE 9/96	BACKWATER PROTECTION	MARINA COAST WATER DISTRICT	STANDARD S-107 REVISED



ALTERNATE OVERFLOW DEVICE

TYPICAL CLEANOUT AND OVERFLOW DEVICE



BACK WATER VALVE

GENERAL NOTES

1. Every building sewer shall have an overflow device or backwater valve installed in the sewer lateral serving that individual building except when the lowest floor level to be sewered is more than two feet (2') above the rim of the nearest upstream manhole.

2. Overflow devices will normally be installed. However backwater valves shall be installed where backflow protection is required, and either (a) Topography prevents the use of the overflow device, that is the one foot (1') minimum differential between the lowest floor level to be sewered and the top of the concrete box containing the overflow device is not available or, (b) Sewage cannot be allowed to overflow on the surrounding area.

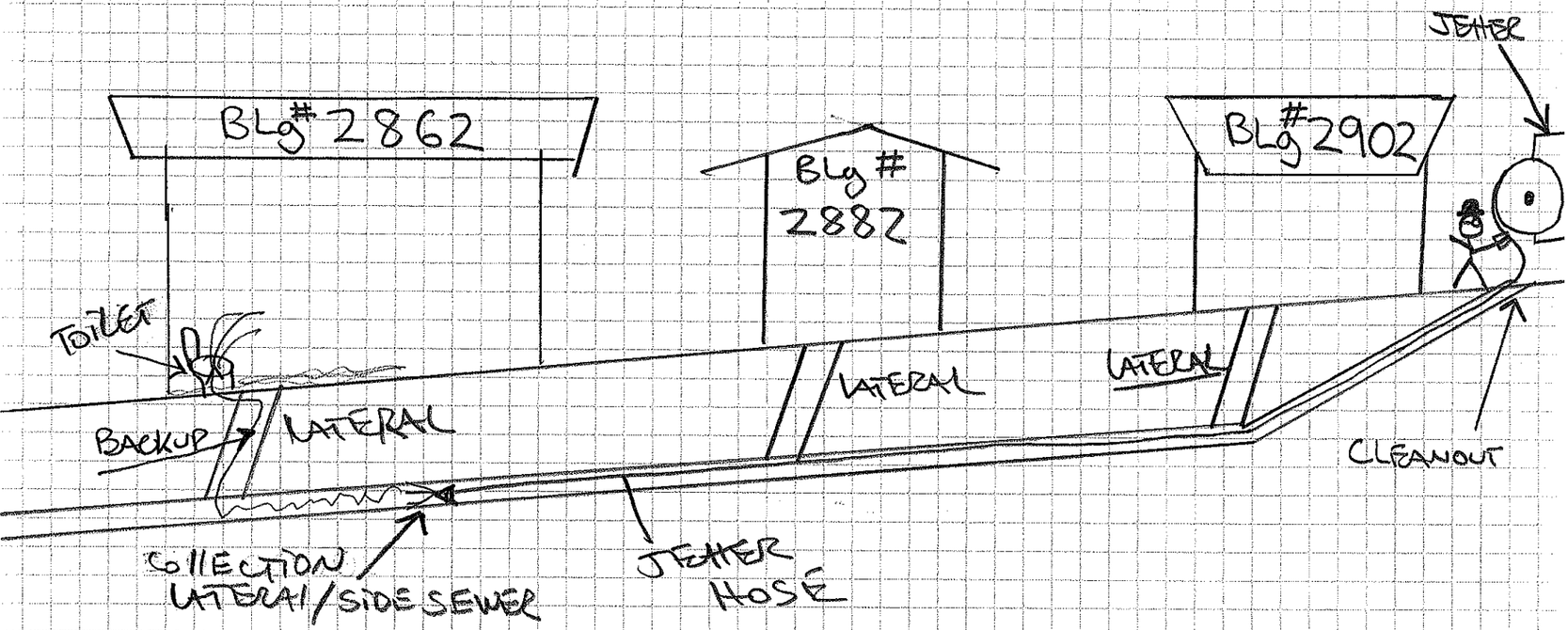
3. An overflow device or a backwater valve may be waived when, in the opinion of the district, such installation is unnecessary for protection of for health and safety requirements.

Approved _____ Approved _____ Date _____
District Engineer, R.C.E. No. 12641 District

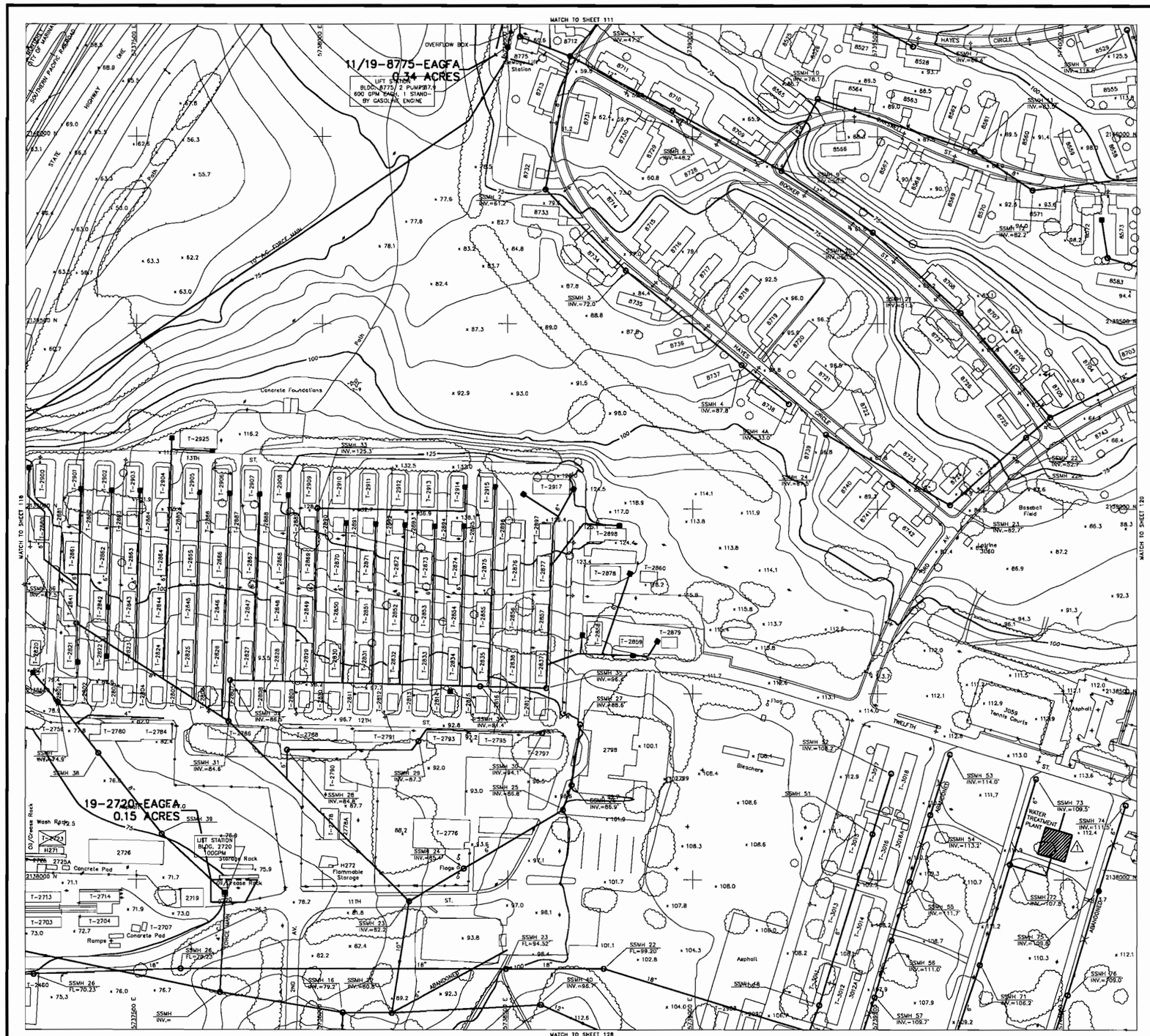
MARINA COUNTY WATER DISTRICT
MARINA, CALIFORNIA.

BACKWATER PROTECTION

STANDARD
S111


JETTER
Bldg # 2862
Bldg # 2882
Bldg # 2902
TOILET
BACKUP
LATERAL
LATERAL
LATERAL
CLEANOUT
COLLECTION LATERAL/SIDE SEWER
JETTER HOSE

* NOT TO SCALE


MATCH TO SHEET 111
11/19-8775-EAGFA
0.34 ACRES
LIFT STATION
BLDG. 8775/ 2 PUMPS/ 87.9
600 GPM EACH, 1 STAND-
BY GASOLINE ENGINE
OVERFLOW BOX
Lift Station
10" A.C. FORCE MAIN
Concrete Foundations
19-2720-EAGFA
0.15 ACRES
LIFT STATION
BLDG. 2720
100GPM
Wash Rack
Oil/Grease Rack
H271
Flammable Storage
H272
Flammable Storage
Concrete Pad
Ramps
Flags
Bleachers
Baseball Field
Tennis Courts
Asphalt
Pipeline
3060
WATER TREATMENT PLANT
ABANDONED
MATCH TO SHEET 118
MATCH TO SHEET 120
MATCH TO SHEET 128
HAYES
CIRCLE
BOOKER
12TH
13TH
11TH
2ND
AVE.
ST.
SSMH 1 INV.=47.2
SSMH 2 INV.=76.7
SSMH 3 INV.=72.0
SSMH 4 INV.=87.8
SSMH 5 INV.=83.5
SSMH 6 INV.=48.2
SSMH 7 INV.=81.2
SSMH 8 INV.=82.2
SSMH 9 INV.=82.2
SSMH 10 INV.=94.0
SSMH 11 INV.=85.1
SSMH 21 INV.=82.7
SSMH 22 INV.=52.7
SSMH 23 FL=94.32
SSMH 24 INV.=85.47
SSMH 25 INV.=86.8
SSMH 26 INV.=84.6
SSMH 27 INV.=88.6
SSMH 28 INV.=87.7
SSMH 29 INV.=87.3
SSMH 30 INV.=94.1
SSMH 31 INV.=84.8
SSMH 32 INV.=86.9
SSMH 33 INV.=125.3
SSMH 34 INV.=84.4
SSMH 35 INV.=96.5
SSMH 36 INV.=108.2
SSMH 37 INV.=108.4
SSMH 38
SSMH 39
SSMH 40 INV.=98.4
SSMH 41 INV.=80.8
SSMH 42 INV.=79.2
SSMH 43 INV.=110.0
SSMH 51
SSMH 52
SSMH 53 INV.=114.0
SSMH 54 INV.=113.2
SSMH 55 INV.=111.7
SSMH 56 INV.=111.0
SSMH 57 INV.=105.7
SSMH 58
SSMH 71 INV.=106.2
SSMH 72 INV.=107.8
SSMH 73 INV.=109.5
SSMH 74 INV.=111.5
SSMH 75 INV.=109.0
SSMH 76 INV.=109.0
SSMH 26 FL=79.23
SSMH 26 FL=70.23
SSMH INV.=
T-2925
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HWY 1
HWY 1
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S
HAYESCIR
Former FORA Bldg. #2901
Former FORA Bldg. #2880
Bldg. #2902
CORPSST
Bldg. #2962
Site of 9/15/11 back up
Bldg. # 2902
12THST
2NDAV
12THST
MAIN
2NDAV
11THST
11THST
Feet
0
90
180
360
540
720