NOVATO SANITARY DISTRICT, (NSD)

STANDARD SPECIFICATIONS AND DRAWINGS

ADDENDUM NO. 1
(ISSUED MARCH, 2008)

A. This Addendum No. 1, pages 1 through 15, shall become a part of NSD's Standard Specifications and Drawings ("Standard Specs") and all provisions of the Standard Specs shall apply thereto. Also, included with this Addendum are:

1. RECEIPT OF ADDENDUM NO. 1 (to be signed by Permittee/Authorized Signatory and returned to District as proof of acknowledgement).

PLEASE NOTE THAT UNLESS NOTED OTHERWISE, CHANGES ARE IN STRIKEOUT FORM FOR DELETIONS AND BOLD ITALICS FOR ADDITIONS.

Addendum Item 1: Part A – GENERAL INFORMATION. On Page 5, section 2-01 Definitions and Terms modify the term Job Engineer and add the term Permittee as follows:

Job Engineer – The engineer ***of the work***, ~~including the District Engineer,~~ ***including but not limited to, the engineer hired or retained by the project proponent or project developer,*** licensed by the State of California as a Civil Engineer, under whose direction ***design and construction documents including but not limited to*** plans, profiles, ***specifications*** and details for the work are prepared and submitted to the District for review and approval. ***The job engineer shall be responsible for the project design and all construction staking. This definition may also include the District Engineer where the District is the project proponent or project developer.***

Permittee – The Permit holder. Under certain conditions, and if the Permittee chooses to self perform the work, the term may also be interchangeable with the term Contractor, provided the Permittee is adequately licensed and bonded and meets all the criteria to be so termed.

Addendum Item 2: Part B – ENGINEERING AND DESIGN REQUIREMENTS. On Pages 15-16, modify section 4-02, paragraph J as follows:

J. Sewer Connections to Existing System – Connection of new main or trunk sewers to the existing sewer system shall be made at existing ***feasible*** manholes or by constructing a new manhole at the point of connection. ***Residential*** ~~S~~***s***ide sewer connections ***of four (4) inch diameter*** to existing main sewers shall be accomplished by connecting to wye branches or laterals where they exist, by installing a standard saddle connection ***tap, or wye branch***, or by connecting to an existing manhole. ***ALL*** ~~S~~***s***ide sewers ~~8~~ ***six (6)*** inches and larger shall be connected to ***the public sewer main*** ~~at~~ ***within standard*** manholes ***only, either at an existing feasible manhole, or by constructing a new manhole. Feasibility of connection at an existing manhole shall be solely at the discretion of the Manager-Engineer, whose determination of feasibility shall be final.***

Addendum Item 3: Part D – GENERAL CONSTRUCTION REQUIREMENTS. On Page 46, add the following language to section 14-04 Conformity with Plans and Allowable Deviations.

Non conforming work will be repaired or reworked to conform to these standards. A "Stop Work Order" (SWO) may be issued in such cases. The SWO will serve as a means to notify the Permittee and the Contractor of serious violations of these standards (non conforming work), or of work being done in a dangerous or unsafe manner. When issued <u>all</u> sanitary sewer work shall stop immediately except for work deemed necessary by the District to correct the non conformance. Dangerous or unsafe work will stop immediately and be subject to CAL-OSHA notification. Other work can resume when the non conforming/unsafe condition is corrected to the satisfaction of the District and/or CalOSHA . Standard Detail SD21 is an example of a SWO.

<u>Addendum Item 4</u>: Part E – TECHNICAL CONSTRUCTION REQUIREMENTS. On page 72, add the following language after section 19-02, paragraph F.

<u>SPECIAL SECTION 19-02, F-BM. BAY MUD STANDARDS</u>

1. <u>Definitions</u> – For the purpose of this section the following additional definitions shall be used:

a. Project Geotechnical Engineer – The project Geotechnical Engineer shall be a Registered Geotechnical Engineer in the State of California. The Project Geotechnical Engineer shall be hired or retained by the project proponent or project developer, and shall have a verifiable minimum of ten (10) years experience with construction in bay mud conditions in the San Francisco Bay Area.

2. <u>Definition of Bay Mud</u> - Project site shall be considered to be underlain by bay mud if any one of the following criteria apply:

a. The District Engineer so reports, unless a qualified soils engineer (with qualification as defined for Project Geotechnical Engineer in 1. above), reports in writing, together with substantiating evidence in the form of test boring logs, to the contrary; or
b. It is located less than 10 feet above mean sea level, unless an approved soils engineer reports in writing, together with substantiating evidence in the form of test boring logs, to the contrary; or
c. It is located outside the Rancho Line, designated "Grant Bldg." on the United States Department of Interior Geologic Survey 7.5 minute series topographic map.

3. <u>Submittal Requirements</u> – If a development is underlain by bay mud as defined above the following items shall be submitted to the District for review shall consist of the following items:

a. Map of the proposed development layout drawn to an appropriate scale showing existing and proposed elevation contours, the overall relationships to adjacent properties and historic physical features.
b. All Geotechnical reports together with soil boring logs, settlement tests of the bay mud and a map showing the contours of the bottom of the bay mud and calculated subsidence over a 50 year period under existing conditions and for alternative heights of new fill.
c. Calculations of the expected sewage flows from the proposed development.

d. Updated geotechnical reports which incorporate any changes in the project design since the pre-design submittal including calculations of new settlements if there has been any surcharging or wicking.

e. Plan and profiles of all sewer mains which show the as installed profiles of the new sewers together with the predicted profiles of the sewers after 50 years of settlement. The Project Geotechnical Engineer shall sign the plans as attesting to the accuracy of the predicted profiles.

f. Details of all connections to structures and manholes.

<u>Note</u>: The District reserves the right to hire another engineer and/ or Geotechnical Engineer to review the developer's reports, sewer design, plan, specifications and details. The cost of a District hired engineer(s) shall be reimbursed by the developer.

4. <u>Sewer System Design</u> – The Design Engineer shall follow the following principals in the design of a sewer system on land underlain by bay mud:

a. The gravity sewers shall be designed to slope toward areas of maximum settlement.

b. The installed grade of all sewers shall be a minimum of 150% of the allowable slope per the District Standard Specifications.

c. The predicted grade of all sewer mains after 50 years shall be 150% of the allowable slope per District Standard Specifications.

d. All sewers in bay mud shall be installed on bedding consisting of a minimum of 12" in depth of ¾ " or 1-1/2" crushed rock placed over geofabric laid at the bottom of the trench and extending up each side of the trench to be wrap over the top of the pipe zone material 12" above the pipe.

e. Sewers shall not be deeper than 10 feet or less than 4 feet of cover.

f. Public sewers shall have a minimum diameter of 8"

g. Pump stations shall not be pile supported and shall be located in areas of maximum settlement.

h. All pressure lines connecting to a pump station structure shall exit the structure through a suitable flexible joint or ball joint.

i. Gravity sewers shall connect to pump stations or manholes through a PVC high deflection coupling located within one foot of the structure.

j. All sewer lines connecting to a pile supported structure shall connect through a flexible telescoping or rotational type of joint, which is designed to remain watertight through the predicted range of movement over 50 years of settlement between the structure and soil.

k. All sewer laterals under pile supported structures shall not be buried but shall be positively fixed to the pile supported grade beams so they will remain fixed with the structure.

5. <u>Materials</u> – The following are minimum standards for materials to be used for sewers to be installed in areas underlain by bay mud:

a. All sewer pipe material shall be PVC AWWA C-900 or C-905 DR=18.

b. Lateral sewers may be PVC Schedule 40 solvent weld.

c. Geofabric shall be Mirafi 700 or approved equal.

d. All metal to be buried underground shall be Type 316 stainless steel.

6. <u>Construction Methods</u> – The following special construction methods shall be employed for sewers systems being installed in bay mud.

a. Sewers shall only be installed after all new fill has been placed and contoured to final subgrade.

b. Sewers shall not be installed during the months of December, January, February or March.

c. Trenches shall be dug in the bay mud and shored in a manner to minimize any destabilization of the trench bottom. If in the opinion of the District Engineer or the Project Soils Engineer the trench bottom has been disturbed or is not remaining stable all trenching and/or pipe laying shall immediately cease and the Project Soils Engineer shall propose to the District for favorable review a method of trench stabilization. Under no circumstances shall rock larger in size than "Engineer's Rock" (12-inch maximum dimension) be used to stabilize the trench bottom.

d. During trench excavation all excavated materials shall either be hauled off site or stored a minimum of 50 feet away from the edge of the trench.

7. Standards for Construction Inspection – shall be in conformance with section 14-12 of the District's Standard Specifications.

8. Performance Standards –The as-built sewer system shall comply with the District's Standard Specifications as shown in Section 14-10 of the District's Standard Specifications.

Addendum Item 5: Part E - TECHNICAL CONSTRUCTION REQUIREMENTS. On Pages 84-85, delete the language of section 20-02, paragraph A.2 Asbestos-Cement Pipe and Fittings in its entirety (including the heading "Asbestos-Cement Pipe and Fittings"), and replace with the words "***Not used***".

Addendum Item 6: Part E - TECHNICAL CONSTRUCTION REQUIREMENTS. On Page 85, delete the language of section 20-02, paragraph A.5 Reinforced Plastic Mortar Pipe and Fittings in its entirety (including the heading "Reinforced Plastic Mortar Pipe and Fittings"), and replace with the words "***Not used***".

Addendum Item 7: Part E - TECHNICAL CONSTRUCTION REQUIREMENTS. On Page 87, delete the language of section 20-02, paragraph B.2 Asbestos-Cement Pipe and Fitting Joints in its entirety (including the heading "Asbestos-Cement Pipe and Fitting Joints"), and replace with the words "***Not used***".

Addendum Item 8: Part E - TECHNICAL CONSTRUCTION REQUIREMENTS. On Page 87a, delete the language of section 20-02, paragraph B.5 Reinforced Plastic Mortar Pipe and Fitting Joints in its entirety (including the heading "Reinforced Plastic Mortar Pipe and Fitting Joints"), and replace with the words "***Not used***".

Addendum Item 9: Part E - TECHNICAL CONSTRUCTION REQUIREMENTS. On Page 87, add the following language as section 20-02, paragraph A.8:

8. High Density Polyethylene Pipe (HDPE) - Polyethylene Plastic Pipe shall be high-density polyethylene pipe (HDPE) and meet the applicable requirements of ASTM F714 Polyethylene (PE) Plastic Pipe (SDR-PR)Based on Outside Diameter, ASTM D1248, ASTM D3550, AWWA C906 Polyethylene (PE) pressure Pipe & Fittings, 4 inch through 63 inch for water or sewer pipe.

All pipe shall be made of virgin material. The pipe shall be homogenous throughout and shall be free of visible cracks, holes, foreign material, blisters, or other deleterious faults.

HDPE pipe shall be shall have an SDR 17 rating.

Addendum Item 10: Part E - TECHNICAL CONSTRUCTION REQUIREMENTS. On Page 87a, add the following language as section 20-02, paragraph B.8:

8. High Density Polyethylene (HDPE) Pipe Joints - Pipe sections shall be heat fused together. Only those tools specifically designed for joining polyethylene pipe and only those personnel approved by the pipe supplier and District shall join polyethylene pipe.

a. Butt Fusion – This technique consists of heating the squared ends of two pipes, a pipe and fitting, or two fittings by holding them against a heated plate, removing the plate when the proper melt is obtained, promptly bringing the ends together and allowing the joint to cool while maintaining the appropriate applied force.

b. Saddle Fusion – This technique involves melting the concave surface of the base of a saddle fitting, while simultaneously melting a matching pattern on the surface of the pipe, bringing the two melted surfaces together and allowing the joint to cool while maintaining the appropriate applied force.

Inspect pipe lengths and fittings for unacceptable cuts, gouges, deep scratches or other defects. Damaged products should not be used. Refer to PolyPipe® InfoBrief No. 17 for allowable surface damage according to the Plastics Pipe Institute (PPI).

c. Workmanship - Any surface damage at pipe ends that could compromise the joining surfaces or interfere with fusion tools and equipment shall be removed.

- ***(i) Verify that all required tools and equipment are on site and in proper working order.***
- ***(ii) Pipe and fitting surfaces where tools and equipment are fitted must be clean and dry. Use clean, dry, non-synthetic (cotton) cloths or paper towels to remove dirt, snow, water and other contaminants.***
- ***(iii) Shield heated fusion equipment and surfaces from inclement weather and winds. A temporary shelter over fusion equipment and the operation may be required at the District's discretion.***
- ***(iv) Relieve tension in the line before making connections. When joining coiled pipe, making an S-curve between pipe coils can relieve tension. In some cases, it may be necessary to allow pipe to equalize to the temperature of its surroundings. Allow pulled-in pipes to relax for several hours to recover from tensile stresses.***
- ***(v) Pipes must be correctly aligned before making connections.***

d. Trial fusions. A trial fusion, daily, may be done (at the District's discretion) to verify the fusion procedure and equipment settings for the actual jobsite conditions.

Note: Polyethylene cannot be joined by solvent bonding or threading. Extrusion welding or hot air welding is not recommended. None of these methods shall be acceptable to the District.

Addendum Item 11: Part E - TECHNICAL CONSTRUCTION REQUIREMENTS. On Page 93, add the following language as section 20-03, paragraph G:

G. Trenchless Sewer Installation

When required by jobsite conditions and approved by the District, sewer pipe may be installed by trenchless methods as specified herein below:

1. <u>Pipe Bursting</u> – Trenchless sewer installation by "pipe bursting" involves the shattering of an existing sewer and pushing the broken pieces into the surrounding soil and then inserting a polyethylene pipe liner.

a. <u>Methods</u> - Pipe bursting methods may include a hydraulic expanding head or a conical head pulled through the sewer to be burst with sufficient force to break the existing sewer and insert the new liner pipe. Use of a pneumatic percussive head is not allowed unless specifically permitted by the District.

The Contractor shall be certified by the Pipe Bursting System Manufacturer that such firm is a licensed installer of their system. Polyethylene pipe jointing shall be performed by personnel trained in the use of joint fusion and stab joint equipment and recommended methods for pipe liner connections.

b. <u>Preparation</u> - Prior to commencing the pipe bursting procedure, the Contractor shall televise the lateral to determine if there are any obstructions or special problems in the sewer to be pipe burst. Blemishes such as roots, sags or offset joints shall be repaired or removed prior to commencing pipe bursting work. The lateral shall be re-televised to show repairs are completed to the satisfaction of the district.

c. <u>Access Excavations</u> - The Contractor shall construct access excavations as necessary for the pipe bursting and liner insertion. Excavations for pulling or pushing equipment shall have adequate support provided to prevent damage to adjacent areas.

d. <u>Pipe Installation</u> – Pipe fused joints shall conform to NSD standard Part E Section 20-02 B-8. Thread the necessary lines through sewer section to be rehabilitated and then pull the bursting head followed by the liner pipe.

e. <u>Testing</u> – Water or air test per NSD standards and televise completed pipe in the presence of the District representative.

f. <u>Backfill "Pulling Pit(s)"</u> – Backfill shall conform to NSD Standard Trench Detail SD-2. An "Encroachment" permit may be required by the City of Novato or County of Marin for work in ROWs or roadways.

<u>Addendum Item 12</u>: Part E - TECHNICAL CONSTRUCTION REQUIREMENTS. On Pages 95-96, add the following language as section 20-04, paragraph A.4:

4. Vacuum testing of manholes shall conform to the following procedure.

a. Tests shall not be conducted until sealing of the manhole is complete and cured.

b. Tests shall not be conducted until the manhole is set to finish grade and paving is completed (if applicable).

c. All pipes entering the manhole shall be plugged (brace plugs if needed).

d. The test apparatus shall be placed inside the top of the manhole (as high as possible) and inflated according to the manufacturers recommendations.

e. A vacuum of 10 inches of mercury shall be drawn, the vacuum valve closed and the vacuum pump or air compressor turned off. With the valves closed, the time shall be measured for the vacuum to drop to 9 inches of mercury.

f. The manhole shall pass if the time for the vacuum reading to drop from 10 inches of mercury to 9 inches of mercury meets or exceeds the times listed in Standard Detail #SD22.

g. If the test fails, the test shall be repeated after repairs are made and curing completed. Retesting shall continue until a satisfactory test is obtained.

Addendum Item 13: Part E - TECHNICAL CONSTRUCTION REQUIREMENTS. On Pages 95-96, add the following language as section 20-04, paragraph A.5:

5. Television Inspection: ***After the sewers have been backfilled, completed, tested and cleaned, but before final paving and acceptance of the job, the Contractor shall televise the line with closed circuit television. Televising shall be done in the presence of the District Inspector, and the Contractor shall furnish to the District a DVD disk and written log of the complete television inspection. The television camera shall be equipped with a measuring device so that the depth of any sags can be accurately determined. All closed circuit televising shall be recorded in color with audio explanations and a written log.***

The grade of all gravity sewers shall be within 0.05 feet of the elevations and grades shown on the plans with the provision that, in no event, shall a gravity sewer, drain, or air vent line be allowed to have a sag or standing water greater than 0.10 feet deep.

Defects, including but not limited to sags, leaks, breaks, excessive pipe deflection, etc., which are in excess of the limits specified above, as revealed by the television inspection shall be promptly corrected by the Contractor at no expense to the District.

After correction of the defect or defects found by the television inspection, the pipeline where the corrections were made shall be re-televised at the Contractor's expense. The re-televising shall conform to the above specifications.

Addendum Item 14: Part E - TECHNICAL CONSTRUCTION REQUIREMENTS. On Pages 95-96, add the following language as section 20-04, paragraph A.6:

6. CCTV Inspection of Sewer Lines

a. Description Of Work: The following section will describe the Procedures, Methodology and District Criteria for providing the District with Closed Circuit Television (CCTV) Inspection and pipeline evaluation.

b. Quality Requirements: The work product expected of the project shall be suitable to merge seamlessly and error-free to the DISTRICT's Information Management System (IMS). The DISTRICT will not accept incomplete, incompatible or erroneous condition assessment data. The Closed Circuit Television (CCTV) Inspection procedure and documentation will provide the District with damage event codes and data messaging of pipeline conditions found or procedure actions taken by the CCTV Operator. Use of Event Codes and Data Messages in the sequence specified, provides definition of data gaps or otherwise incomplete inspection runs to the database manager. CCTV work submitted by the Permittee, that does not conform to procedures, data handling, and integration needs of the District will be rejected and returned to the Permittee and the requirement for video inspection for the project will be deemed incomplete.

c. Definitions:

CONTRACTOR: Consistent with section 2-01 of these Standard Specifications, for the purposes of this section 20-04, paragraph A.6, this is the person or business actually performing the described work, even though the CCTV work (or portion thereof), may be performed by a sub-contractor of such Contractor.

EVENTS: Are the findings of the CCTV work. Events are defined by the Location, Type and Condition of Lateral sewers, all Structural damage, and the Extent, Location and Type of Condition damage, i.e.: excessive debris, roots, grease, corrosion, sags

EVENT CODES: A system of character codes used to define the type and extent of damage to the televised line segment. When an event code is entered by the CCTV Operator, its rating value shall be automatically entered into the Events Log

DAMAGE RATING SYSTEM; A system of event codes and damage ratings, provided by the District and incorporated and used by the camera operator to provide the pipeline rating when the event code is entered.

DATA MESSAGES: A word or code describing actions taken by the CCTV Operator that conveys clarifying information to the Database Manager. Data messages define data gaps, stops and their causes, start and end points, and intended reverse setup actions and location. The data messaging words or codes are included with the event codes for easy referral and entry by the CCTV operator.

PICAX: The District's video database system (Information Management System - IMS) provided by ICOM, Inc.

d. Submittals:

i. The Contractor shall provide a copy of digital logs, digital video imaging recorded using "Picax" in a MPEG 4 format to a Digital Video Disk (DVD), so the District can evaluate image quality, production impacts, and the ability of the inspection to transfer its output file(s) seamlessly and without the use of additional programming and associated costs to maintain compatibility with the District's IMS.

ii. The Contractor may also be required to submit the following to the District upon request: Bypass Pumping Plan for approval by District Engineer. Provide calculations and pump specifications together with a plan drawing designed by a Registered Civil Engineer in the State of California. Bypass pump systems may be required to have redundancy to insure adequate overflow protection.

e. Cleaning Operations: The success of CCTV inspection is dependent on the ability to view the internal condition of the sewer line. Water depth in lines being cleaned shall be controlled to levels that will not block the camera lens from observing the bottom and sides of the subject sewer pipe unless a sag is recorded. Heavy line cleaning to remove all roots and grease accumulations is may be required. Sufficient line cleaning is necessary to allow the passage of the track-mounted camera later specified. Sewer line cleaning prior to TV inspection shall include the removal of foreign materials from the pipe walls, inverts and structures to obtain a clear picture of the internal condition of the line. Materials removed during the cleaning process shall be captured at the downstream manhole. No dislodged material shall be allowed to continue downstream of the cleaning operation. This shall be accomplished by using suitable tools for that purpose and be properly disposed of.

f. Pre-Inspection Procedures: Pre-inspection line cleaning shall be accomplished using a high pressure hydro-flusher or hydro-Vactor combination vehicle to insure full visibility if the entire

pipe line interior. Existing incoming sewer flows shall be plugged off at the upstream manhole of each section of cleaning and video inspection. A Bypass Plan may be required by the Permittee if the District feels that plugging flow may result in an overflow. The Permittee shall then immediately perform the video inspection/condition assessment of the sewer.

If after the completion of sewer line cleaning, a full line inspection cannot be completed due to a "STOP" condition (roots, grease, debris, mainline damage or protruding lateral) such that no further video progress can be made, the District will review and evaluate the collected data and will require the Contractor to return to the line segment and implement additional cleaning methods. Additional methods would employ a rodding machine equipped with tools to remove roots or heavy debris that is restricting camera travel within the line. The full length of the line is to be opened and cleared using this additional procedure to allow passage of the camera and completion of the digital video inspection and condition assessment. STOP conditions such as mainline damage or protruding laterals will be repaired by the Contractor prior to further inspection.

Water used during the line cleaning process shall be provided by the Contractor. The Permittee shall provide and use a hydrant meter to record the volume of water taken from any hydrant used during the course of the work. The Contractor shall pay for water used during the line cleaning process.

g. <u>Cleaning Precautions</u>: During sewer cleaning operations, satisfactory precautions shall be taken in the use of cleaning equipment. When using hydraulically propelled cleaning tools which depend on water pressure to provide their cleaning force, the Permittee shall take all necessary precautions to insure that the water pressure created does not damage or cause flooding of public or private property being served by the sewer. Any damage caused by the Contractor's operations is the responsibility of the Contractor.

h. <u>Manhole Cleaning</u>: All manhole structures within the alignment of the sewer main to be televised will be cleaned using high-velocity jet equipment. The cleaning process shall remove accumulated debris from all interior surfaces without damaging the structural integrity of the manhole.

i. <u>Material Removal And Disposal</u>: All sludge, dirt, sand, rocks, grease, and other solid or semisolid material resulting from the cleaning operations shall be removed at the downstream manhole of the section being cleaned. Passing material from line segment to line segment is not permitted. Permittee shall collect all sewer cleaning debris with a sand trap, fork or vacuum equipment. Permittee shall remove all debris cleaned from the sewer cleaning operation and dispose of debris at the Permittee expense. The Permittee shall be responsible for any damage that is a result of debris entering the downstream system.

j. <u>Plugging Or Blocking</u>: Plugging or blocking of the upstream sewer flows for the cleaning and CCTV work is required to produce video images satisfactory to the District. If the sewer flows are too large to be contained within the sewer system during cleaning and video operations, bypass pumping or inspections during late night, low flow hours may be required. Late night or nonstandard work hours must be scheduled and authorized by the District five working days prior to beginning work.

k. <u>Bypass Pumping</u>: When bypass pumping is required, the Contractor shall supply the pumps, piping, and other equipment to divert the flow of sewage around the line segment in which work is to be performed. The bypass system shall be of sufficient capacity to handle existing flow plus any additional flow that may occur during a rainstorm. The Contractor shall be responsible for

furnishing the necessary labor and supervision to set up and operate the bypass pumping system. Engines shall be equipped in a manner to keep noise to a minimum.

l. Flow Control Precautions: When flow in a sewer line is plugged, blocked, or bypassed, sufficient precautions must be taken to protect the sewer lines and connected homes from damage that might result from sewer surcharging. The discharge of any sewage from the sewer system to other than the downstream sanitary sewer system is prohibited and is a violation of the Federal Clean Water Act and the Novato Sanitary District's NPDES discharge permit, and subjects the District to enforcement actions and the levying of fines and penalties. The Contractor shall assume damage liability for all of his operations and extend liability protection to the District for any and all of his operations.

m. Video Inspection / Condition Assessment (Vi/Ca) System: A primary goal of CCTV inspection is to accurately determine the quantity and location of the building laterals or side sewers; to provide a description and rating for conditions that appear unusual or uncommon to a good sound sewer; provide the required digital imaging and reports, and to seamlessly enter error-free data and images to the IMS. Vi/Ca reports shall document the following conditions or events:

- ***i. Cracks - radial and longitudinal, hairline or open;***
- ***ii. Laterals (identify active or inactive, if possible) - quadrant location, protruding, cracks, roots;***
- ***iii. Corrosion - iron stains, roughened aggregate, exposed aggregate, exposed rebar, or exposed soil;***
- ***iv. Offsets/sags - 1-inch, 2-inch, 4-inch, etc;***
- ***v. Roots - light, moderate, heavy, or matted roots;***
- ***vi. Grease - light, moderate, or heavy;***
- ***vii. Infiltration - water stains, dripping water, or stream of water;***
- ***viii. Other - holes in pipe, missing tile***
- ***ix. Pulled joints- short stabs, rubber gaskets showing***
- ***x. Actions or observations defined by Data Messages found in the Event Codes***

The CCTV Operator shall provide a verbal description and have control of the movement of the television camera at all times. The CCTV camera shall be self propelled. The travel speed of the camera shall be uniform and shall not exceed 30 feet per minute. Any means of propelling the camera through the sewer that would exceed this rate of speed or produce non-uniform or jerky movements is not acceptable. In no case will the hose of a high-velocity water-cleaning machine be allowed as a tow cable unless specifically authorized by the District Engineer.

The CCTV Operator shall at all times be able to move the camera through the line in either direction without loss of quality in the video presentation on the monitor. The picture at all times shall be free of electrical interference and provide a clear, stable image at the resolutions specified.

n. Video Camera: The Contractor shall use a standard forward viewing color camera with an 180-degree rotating head color camera. Rotating head cameras shall pan and zoom on all defects and events. The color camera shall be operative under 100 percent humidity conditions in the sewer. The camera shall be intrinsically safe and approved for sanitary sewer TV inspection use by a Nationally Recognized Testing Laboratory. The center of the camera lens shall be at or above the springline of the sewer being televised. The camera and its support equipment shall not block the sewage flow at any time.

Lighting and camera quality shall be suitable to allow a clear in-focus picture for a minimum of six lineal feet of the entire inside periphery of the sewer pipe. The camera shall have minimum capability

of 350 lines of resolution and should be of the "articulating head" type to allow laterals and defects to be viewed directly. To ensure peak picture quality throughout all conditions encountered during the survey, a variable intensity control of the camera lights and remote control adjustments for focus and iris shall be located at the monitoring station. Focal distance shall be adjustable through a range of from six inches to infinity. Continuously displayed on the monitors as part of the video presentation and digital database image capture system shall be the date of the survey, number designation of the upstream and downstream manholes (provided by the District)of the section being surveyed, and a continuous forward and reverse read-out of the camera distance from the manhole of reference.

At the beginning of each inspection run, the footage counter shall be reset to the distance represented by the distance measured from the center of the manhole structure to the camera lens. Video recording of the line segment run shall start at the pipe opening at the manhole wall or at a distance of 2.0' or 2.5' from the center of the 4.0' or 5.0' standard manhole structure. Digital video recording shall be continuous between manhole structures.

If the camera becomes stuck at any time and cannot be removed from the sewer, the Contractor shall immediately report the emergency condition to the District and make necessary arrangements to remove the camera from the line. Bypass pumping shall be employed by the contractor to avoid sewage backup damage and route sewage around the blocked line segment. Any Damage costs and all costs related to the recovery of the stuck camera and for the return of the sewer line segment to service are the responsibility of the Permittee.

Addendum Item 15: Part E - TECHNICAL CONSTRUCTION REQUIREMENTS. On Page 107, delete the language of section 24-16, Other Standard Structures in its entirety (including the heading "Other Standard Structures").

~~23-16 Other Standard Structures. All other standard structures to be made of concrete shall be constructed in accordance with this section and as detailed in the Standard drawings.~~

Addendum Item 16: Part E - TECHNICAL CONSTRUCTION REQUIREMENTS. On Page 107, add the following language as a new section 23-16.

23-16 Temporary Setting of Manhole Covers.

The District may accept sewer main extensions prior to the final lift of paving under the following conditions:

A. The manholes are installed to the grade of the first pavement lift with an eight inch sand collar and a four inch hot AC plug as shown in the Standard Details
B. The owner agrees to raise the manholes to grade and construct the standard concrete collar in accordance with the District's Standard Specifications at the time the second lift of pavement is applied.
C. The owner provides an "improvement security" in accordance with Section 611 of the District's Sanitary Code in the amount of $500 per manhole, which will be refunded at the time the manhole is raised to final grade.
D. The owner agrees to apply for an inspection permit and pay the current "commercial inspection fee" per manhole at the time the manhole is raised to grade.

Addendum Item 17: Part E - TECHNICAL CONSTRUCTION REQUIREMENTS. On Page 110, delete the language of section 24-06, Manhole Steps in its entirety (including the heading "Manhole Steps"), and replace with the words "***Not used***".

NOVATO SANITARY DISTRICT

Beverly B. James **Date**
Manager-Engineer

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RECEIPT OF ADDENDUM NO. 1

On behalf of _____ (Owner/Permittee), Permit No. _____
(Print Owner/Permittee Name)
I acknowledge receipt of the above NSD Standard Specifications and Drawings, Addendum No.1, pages 1 through 15, issue date March 2008.

_____
Authorized Company Name

_____
Authorized Signature/Date

_____
Printed Name and Title of Authorized Signatory

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NOVATO SANITARY DISTRICT

500 DAVIDSON STREET • NOVATO • CALIFORNIA 94945 • PHONE (415) 892-1694 • FAX (415) 898-2279
www.novatosan.com

Stop Work Order (Red Tag)

Permit # _____ Date ___/___/___
Project Name_____
Address_____
Inspector/District Representative _____
Contractor _____
Project's Representative _____
Position _____ Company _____

STOP SANITARY SEWER WORK IMMEADIATLY

The items listed below have not been completed or installed in accordance with Novato Sanitary District Standards. Repair or re-installation of these items is required for resumption of work or use of the facilities.
Written verification of completed items by a District representative is required prior to continuing work or use of the facilities.
☐ No NSD Permit Issued ☐ Submittals Required (Listed Below)
☐ Dangerous or unsafe working conditions. ☐ Notified CAL-OSHA

_____
_____
_____
_____
_____
_____

Items released on Date ___/___/___ Inspected by _____
Conditions of release _____
_____
Initialed by Proj. Rep. _____, NSD Rep. ____

Note; The Sanitary District reserves the right to add items to this list.
Completion of this list does not guarantee acceptance by the District.

Page _____of _____

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Printed On Recycled Paper

Sample Form

Novato Sanitary District
500 Davidson Street
Novato, CA 94945 (415)892-1694

Stop Work Order (SWO)

Drawn by K. Craig 2/14/08 M:\personal\Kevin\Word Documents\Standard Specs	Standard Details	SD 21

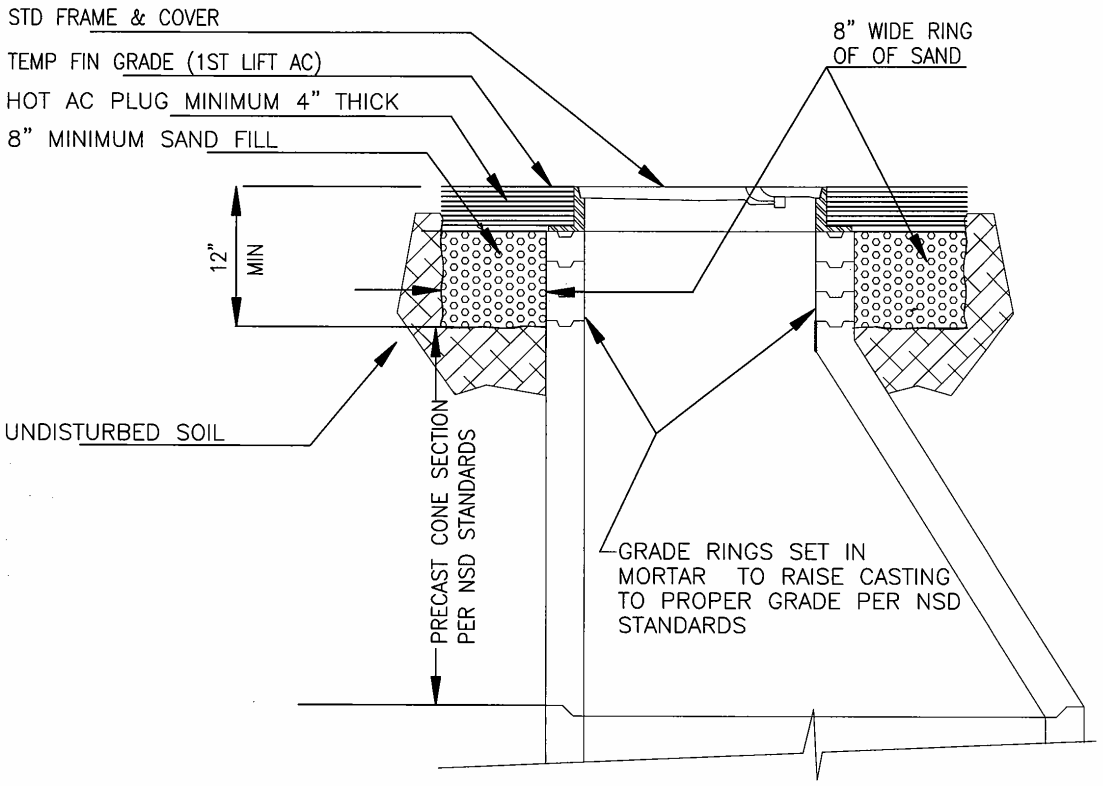
Vacuum Testing Time Chart

Depth of Man Hole (Feet)	Allowable Time (seconds) 48 Inch Diameter Diameter	60 Inch Diameter	72 Inch
8	20	26	33
10	25	33	41
12	30	39	49
14	35	46	57
16	40	52	67
18	45	59	73
20	50	65	81
22	55	72	89
24	60	78	97
26	65	85	105
28	70	91	113
30	75	98	121

Novato Sanitary District
500 Davidson Street
Novato, CA 94945 (415)892-1694

Vacuum Testing Time Chart

Drawn by K. Craig 2/20/08 M:\personal\Kevin\Word Documents\SD 22 Vac Test	Standard Details	SD 22



Temporary Set Manhole Detail

Notes:

1) Temporary set manhole covers shall conform to NSD Standard Specification Part E Section 23–16.

2) AC shall be maintained by the owner per City of Novato or County of Marin Standards.

3) Other portions of the manhole shall be completed and tested to the current Novato Sanitary District Standards.

Novato Sanitary District 500 Davidson Street Novato, CA 94945 (415)892–1694		
Temp. Set MH Detail		
Drawn by K. Craig 2/20/08 M:\person\Kevin\Word Documents\SD 23 Temp Set MH Det	Standard Details	SD 23