



The Northern California Pipe User's Group
28th Annual Sharing Technologies Seminar

Concord, CA
February 20, 2020

COMMUNITY OUTREACH PLUS ENGAGED MUNICIPAL STAFF EQUALS SUCCESSFUL PIPE BURSTING AT PEDRO POINT

Louis Sun¹, Brian Martinez¹, Nelson Schlater², Taylor Allen², and Jeffrey Tarantino³

¹ City of Pacifica, Pacifica, CA

² EKI Environment & Water, Inc.

³ Fryer & Lauretta, Inc.

ABSTRACT: In 2011 the City of Pacifica was issued a Cease and Desist Order and entered a Consent Decree to reduce the number of sanitary sewer overflows. The City's Sewer System Management Plan identified the Pedro Point neighborhood as an area of the system that was essential to replace. The design engineer Freyer & Lauretta worked very closely with the City to develop a thorough set of construction documents for bidding. Since the City understood that leaky private laterals are a large contributor to inflow and infiltration in the neighborhood, the bid was structured to allow for the City to obtain pricing for private lateral replacement for residents. This information was the main topic of two public outreach meetings, with the goal of informing residents of the benefits of private lateral replacement. In order to become an eligible bidder, contractors were required to respond to a Statement of Pre-Qualification package where they would be evaluated based on their responses. A mandatory pre-bid site meeting and walk was led by City staff to allow for the contractor to view the existing site conditions, Public Utility Easements, and ask questions about the Project. During construction the project team met for biweekly progress meetings to discuss progress, schedule, and issues. The project progress and schedule were relayed to residents via social media. City engagement and public outreach throughout each phase of the Project resulted in a successful project.

1. INTRODUCTION

The City of Pacifica is located about 15 miles southwest of San Francisco on the Pacific Ocean coastline. The San Francisco Bay Regional Quality Control Board ("RWQCB") has required the City to report any sanitary sewer overflows ("SSO"). Due to the number of SSOs within the City's system, the RWQCB issued a Cease and Desist Order to the City in May 2011. In June 2011 the City entered a Consent Decree with Our Children's Earth Foundation.

The City was required to implement practices to reduce SSO's, a few examples are:

- Developing and implementing a SSO Reduction Plan;
- Developing an initial and long-term capital improvement plan ("CIP") that includes a schedule and budget for projects that are identified in the SSO Reduction Plan and,
- Implementing programs addressing system-wide cleaning, root control, illicit discharge elimination, and private sewer lateral inspection and repair.

In 2011, the City prepared a Sewer System Management Plan which outlined ways to improve the operation and maintenance of the system and assessed the condition and capacity of the system. During the assessment of the condition of the system, it began apparent that the Pedro Point neighborhood contributed to a large amount of inflow and infiltration ("I&I") within the system. Therefore, the replacement of 16,000 LF of sanitary sewer system within the neighborhood would be critical for the City's goal of reducing SSOs.

The neighborhood was built in the 1950s and 1960s between Highway 1 and the Pacific Ocean. The utilities within the neighborhood were developed in phases as homes were built. Due to the varying topography about 50% of the sanitary sewer mains were constructed within public utility easements (PUEs) through backyards rather than within public right of ways in some cases to avoid the need for lift stations. Vitrified clay pipe (VCP) was the primary pipe used in the existing sanitary sewer system. VCP is known to be prone to root intrusion and joint offsets, both of which can lead to blockages and SSOs. Prior to the project the City had to clean the system about every 6 months to avoid the likelihood of SSOs. This practice became very time consuming for City staff.

As a result, the City added the Pedro Point Replacement Project (Project) to the CIP list. The Project consisted of the replacement of 16,000 lineal feet ("LF") of 6-in, 8-in, and 10-in VCP pipe and the replacement or rehabilitation of 52 manholes and 31 lamp holes. Figure 1 below shows the Pedro Point neighborhood on the hill overlooking the Pacific Ocean. The photo was taken from the Pacifica State Beach parking lot.



Figure 1. Google street view image of Pedro Point Neighborhood on the far hill (Source: Google Street view).

The Pedro point neighborhood consists of narrow (<15 feet) and steep (20% grade) residential roads. Access to the neighborhood is limited; San Pedro Ave is the only road connecting the neighborhood to the City. Due to the existing conditions of the roadway, limited neighborhood access, and the large number of sanitary sewer mains in the PUE's, the design engineer Freyer & Laureta, Inc. ("F&L") and the

City chose pipe bursting as the construction method. Conventional open trench replacement would be much more disruptive causing road closures and require a greater amount of road and backyard restoration; which would likely lead to a longer construction schedule.

The Project team consisted of the City of Pacifica (Owner), EKI Environment & Water, Inc. ("EKI", Program Management and Construction Management), and F&L (design engineer). City staff engagement and public outreach were main drivers for the success of the Project. These were both key components of the project through the various phases of the project; the design phase, the bidding phase, and the construction phase. Another key component to the success of this project was the private lateral replacement program. All of which, are described in the sections below.

2. DESIGN PHASE

During the design phase City and F&L with support from EKI, implemented a comprehensive plan for potholing existing utilities to determine their alignment and clearances from the existing sanitary sewer. It was crucial to the design to have an understanding of these parameters early in the project design so that the team could evaluate whether pipe bursting was a feasible construction method. Record maps were obtained from North Coast County Water District ("NCCWD") and Pacific Gas and Electric Company ("PG&E") and minimum clearances were agreed upon with both NCCWD and PG&E. Once the available information was compiled, F&L identified several critical locations for potholing existing utility crossings during the design phase. The potholing program benefited the project in many ways, this was the first interaction between the City and the residents of Pedro Point regarding the Project. This allowed for the City to begin to introduce the Project and begin to discussion of the benefits of the Project to the neighborhood. Existing utility alignments and clearances were able to be confirmed during the design phase, which helped minimize the potential change orders during construction. Potholing also provided enough information on the existing soil conditions for bidders to provide an accurate bid.

City staff was extremely helpful during the preparation of the design documents since they were very familiar with their system as a result of the semiannual maintenance. During the preparation of the construction documents, City staff worked closely with F&L to review the survey and pothole information to identify the portions of the system that would require open trench installation. The active City staff participation during the design phase was particularly helpful because they understood where challenges were likely to be encountered; such as detached structures, retaining walls, or other unique features that would have to be considered and described in the contract documents. The City's engagement during the design phase facilitated F&L production of detailed construction documents which enabled contractors to provide competitive bids.

3. BIDDING PHASE

A prequalification process was implemented into the bidding process because of the large amount of work within PUEs and the existing site conditions; steep and narrow roadways in a residential area. The Statement of Pre-Qualification package consisted of a series of questions for the contractor to answer. These answers were then evaluated based on criterion included in the RFQ to determine their eligibility as a prospective bidder. The questionnaire required the contractor to provide the it's company information, bonding capacity, construction experience for three projects of similar scope, and safety program information, which included Experience Modification Rate ("EMR") and Average Total Recordable Incident Rate. The grading for each component of the questionnaire was clearly defined so the contractor was aware of how the questionnaire would be evaluated.

Of the six contractors that prepared a response to the SOPQ, five of the contractors were determined to be eligible to bid on the project. The contractor who was determined to be ineligible was because their three year average EMR 1.24 exceeding the requirement stated in the package: "Must have an Average Workers' compensation EMR for the last three (3) years of 1 or lower to be considered a responsive bidder."

The bid documents also required that contractors who desired to bid the project to attend a mandatory pre-bid meeting and site walk. After gathering on site and having a brief introduction of the scope of the Project, the contractors were led through the neighborhood by City maintenance staff. During this site walk the contractors were able to take photos and ask questions about the Project (which were documented in a follow-up addendum). The purpose of the pre-bid meeting and site walk was to have the contractors develop a good sense of the site; steep, narrow roads, working in PUEs (especially the existing structures, landscaping, and other improvements that the selected contractor would be responsible for protecting and/or restoring). Since the site was unique and existing conditions posed a challenge, the main goal of this mandatory pre-bid meeting was to reduce the potential for a selected contractor to make a claim that the site conditions were not described accurately within the bid documents.

4. CONSTRUCTION PHASE

The Project team (City staff, F&L, EKI, and contractor) had a standing biweekly meeting to discuss Project progress, upcoming schedule, submittals, Requests for Information (RFI), potential change orders, quality of work, public comments, status of private laterals and comments from the inspector and City staff. The meetings were very beneficial for many reasons; firstly, they the team understand the project progress and upcoming schedule so that this information could be relayed to residents. It also allowed for all parties to meet in one room to discuss any construction issues that have arisen and determine how to resolve the issue. The City was extremely engaged throughout these meetings and provided valuable information to the Project team.

It was also useful to discuss the complaints that the City was receiving from residents. This allowed for the Project Team to be aware of any issues residents were having. In some cases, these complaints were misunderstandings, a resident had called to complain about the asphalt work the contractor had done once the new main was installed. The resident did not understand that this asphalt was temporary asphalt and that the permanent asphalt would be installed at the end of the project. City staff engaged with the resident to explain this. It was made clear in future social media postings that the contractor would be installing temporary asphalt and once the main line work was complete, then the contractor would return to install the permanent asphalt. In other cases, there were residents who had reached out to the contractor to compliment the quality of work. Both good and bad feedback was of interest to the project team, and the biweekly meetings provided a platform for this conversation.

Below are a few photos from the construction inspectors' daily logs to display the conditions during construction.



Figure 2. Pipe bursting in Pedro Point. (Source: Juan Trupp Daily Logs)



Figure 3. Pipe bursting through PUE. (Source: Juan Trupp Daily Logs)



Figure 4. Pipe bursting between homes. (Source: Juan Trupp Daily Logs)

5. PRIVATE LATERAL REPLACEMENT

As previously mentioned, I&I is a large issue for the City. VCP pipe was the primary material used in the existing sanitary sewer system. VCP pipe is known to be prone to root intrusion and joint offsets, both of which can lead to blockages and SSOs. Prior to the project the City had to clean the system in the Pedro Point neighborhood every 6 months to avoid the likelihood of SSOs; which became very time consuming for City staff.

The private laterals were the only portion of the sanitary sewer system that are not within the public right-of-way or PUE's. The City understood that a portion of I&I entering the system is a result of broken private laterals. In January 2012, the City of Pacifica introduced the Lateral Compliance Certificate (LCC) program to enforce the replacement of broken private laterals.

The City's Municipal Code requires residents to obtain a LCC when any of the following occur:

1. Transfer of property ownership when the property is listed for sale after January 1, 2012;
2. When there is remodel or addition that costs \$50,000 or greater;
3. When any plumbing fixtures are added; or
4. When a change in water service is requested (change of meter size or adding second meter).

To obtain a LCC, the property owner must submit a closed circuit tv (CCTV) video of their existing private lateral. This can be obtained by contacting a local plumbing contractor. If the CCTV video shows no apparent defects or leaks, the property owner will receive a LCC, which is valid for 7 years. If there are defects or leaks shown in the CCTV video, the property owner is required to replace their private lateral prior to receiving City approval to make the desired changes in status to the property. Once the private lateral is replaced the property owner will receive a LCC, which is valid for 20 years.

Rather than reconnect the existing private laterals to the new main, the City wanted to incentivize property owners in Pedro Point to replace their laterals. To do this, the City structured the bid to include bid items for private lateral replacement as part of the Basis for Award. Therefore, the Basis of Award included the Base Bid, which was the bid items for the neighborhood replacement (LF of pipe based on the various pipe diameters, manholes, lamp holes, etc.) as well as four items related to private lateral replacement. See Figure 5 for the four private lateral replacement bid items. The private lateral replacement was under a separate contract between the Contractor and the property owner. This approach allowed the City to obtain pricing for private lateral replacement that was much lower than typical estimates from local plumbing contractors. The contractor bidding the Project was also incentivized to give a better price for lateral replacement since the contractor was already mobilized on the site and the deepest excavation (at the connection of the new main to the lateral) had to be done anyways. The City also waived the encroachment permit fee, which is over \$600.

Bid Item No.	Bid Item	Est. Quan.	Unit	Unit Price	Bid Amount
PRIVATE LATERAL REPLACEMENT BID ITEMS (Separate Contract)					
34.	Private Lateral Replacement Minimum Base	20	EA	3,755	75,100
35.	Pipe Burst 4" Private Lateral and Replace with 4" HDPE	1000	LF	75	75,000
36.	Open Trench 4" Private Lateral and Replace with 4" HDPE (SDR17)	100	LF	225	22,500
37.	Cleanout	130	EA	555	72,150

Figure 5. Private Lateral Replacement Bid Items. (Source: Clip of Pacific Trenchless' s bid sheet)

Since the length of private laterals within the neighborhood varied, the bid was structured to give a minimum cost, and unit pricing for private lateral replacement. Looking at the pricing for each bid item above, it was determined that the minimum base cost included the replacement of 42 LF of 4" HDPE and one cleanout. Private laterals above 42 LF would be priced based on the unit pricing. For the replacement of a 42 LF private lateral with one cleanout, plumbers in the area would typically charge about \$6,000. With the Lowest Responsive Responsible Bidders (Pacific Trenchless) pricing, there was an approximate 40% cost savings for the property owner. The City benefits from each lateral replaced, because the I&I is reduced.

6. PUBLIC OUTREACH

In order to educate the Pedro Point property owners two public meetings were held. The first meeting was prior to bidding and focused on introducing the project, explaining the pipe bursting process, informing the residents about what to expect to see regarding asphalt patches for entry and exit pits, and introducing

private lateral replacement program included in the Project. The Second meeting was held once the Lowest Responsive Responsible Bidder was selected, which focused on the private lateral replacement. This presentation explained the LCC process, contractors pricing of private lateral replacement, and the process for entering a contract with the contractor.

Each public meeting had approximately 20 attendees. The meetings were from 6 pm to 7 pm at the Pedro Point Firehouse. The meeting location, which is in the neighborhood, and time were set so as to be convenient for the residents. The meetings began with a presentation and allowed for questions during and after the presentation. This allowed for an engaged audience and assisted with the communication of the project and private lateral replacement. The contractor mentioned to EKI that when they began construction, residents were aware of what the project entailed. This allowed for City staff to focus on their work rather than answering calls with questions and complaints from the residents during construction.

In addition to the two public meetings, the project team also prepared various flyers that were mailed to the residents throughout the project. The City also leveraged social media by posting these flyers and the contractors Three-Week-Look-Ahead schedule, answers to Frequently Asked Questions, and PowerPoint slides from the two public meetings on the neighborhood website, Next Door, and Connect with Pacifica .

The Three-Week-Look-Ahead schedule was likely the most useful piece of information for residents because it was a map that visually displayed what streets have had their sanitary sewer main replaced, which streets are expected to begin construction in the next three weeks, and which streets have not been completed yet. This way key for coordinating the private lateral replacement contract between property owners and residents. It allowed residents plan ahead and usually allowed enough time for the contract to be finalized prior to the contractor mobilizing to the property owners street. This map was updated every two weeks. This allowed residents to have an idea of when there would be temporary disruptions to access, construction noise, other inconveniences associated with construction, and a chance to notify the contractor if the resident wanted to replace their private lateral.

7. CONCLUSION

The Project was deemed substantially complete in October 2018 with less than 3% of the original contract value in change orders. This Project was successful for the following reasons:

1. Nearly 50 property owners had the contractor replace their private lateral;
2. City engagement during the design phase allowed for site specific information to be provided on the bid documents which reduced the amount of change orders;
3. Pre-qualification and mandatory pre-bid walk guided by City staff allowed the City to have confidence that an experienced contractor who has observed the Project site conditions would be selected. This would allow for a smoother project during construction;
4. Bi-weekly progress meetings during construction allowed the Project Team to sync and understand the status of the projects, address issues that have arisen, and ensure the residents were receiving the information they needed for the project;

8. REFERENCES

City of Pacifica (2012). Waste Water Department Administrative Policy Regarding Sewer Lateral Compliance Certificates, Municipal Code Ordinance No. 784 C.S. Chapter 6-13.

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