



MEETING MINUTES

August 10, 2021

Virtual Meeting

Attendees:

Name of Attendees	Company / Agency	Email Address
Adam Brown	West Yost Associates	abrown@westyost.com
Alexandra Watson	HydroScience Engineers	awatson@hydroscience.com
Asa Utterback	Coastland and Civil	autterback@coastlandcivil.com
Bao Nguyen	Solano Irrigation Water District	bnguyen@sidwater.org
Ben Wright	Black & Veatch Engineers	wrightb@bv.com
Bill Brick	CDM Smith	brickwd@cdmsmith.com
Christina Ramirez	West Yost Associates	cramirez@westyost.com
Christopher Brown	Oro Loma Sanitary District	cbrown@oroloma.org
Chung Linh	San Francisco Public Works	chung.linh@sfdpw.org
Dan Zarraonandia	Precon Products	danz@pre-conproducts.com
Daniel Landy	Pe Pipe	dlandy@pepipe.org
Davina Carboni	Brown and Caldwell	dcarboni@brwncald.com
Dillon Miele	Sacramento Sewer District	mieled@sacsewer.com
Dru Nielson	McMillen Jacobs Associates	nielson@mcmjac.com
Dustin La Vallee	EBMUD	dustin.lavallee@ebmud.com
Edgar Benitez	Forterra	edgar.benitez@forterrabp.com
Eric Yu	San Francisco Public Works	eric.yu@sfdpw.org
Gean Na	Concrete Pipe Organization	gna@concretepipe.org
Gerardo Santana	Solano Irrigation Water District	gsantana@sidwater.org
Jacob Monroe	ADS - Pipe Associates	jacob.monroe@ads-pipe.com
James Kohne	Woodard & Curran	jrkohne@gmail.com
James Yorita	City of Sacramento	jyorita@cityofsacramento.org
Jeremy Hynum	McGuire and Hester	jhynum@mcguireandhester.com
Jimmy Dang	Oro Loma Sanitary District	jdang@oroloma.org
Jocelyn Kung	San Francisco Public Works	jocelyn.kung@sfdpw.org
Joe Barnes		jobarnes209@gmail.com
John Moala	San Francisco Public Works	john.moala@sfdpw.org
Joseph Osolongo	City of San Jose	joseph.osolongo@sanjoseca.gov
Ken Deibert	West County Wastewater	kdeibert@wcwd.org
Kevin Kai		h2o4u@hotmail.com
Kevin Morales	Contra Costa Sanitary District	kmorales@centralsan.org
Kevin Randeni	Dublin San Ramon Service District	randeni@dsrsd.com
Kevin Yoshiki	Contra Costa Sanitary District	kyoshiki@centralsan.org

Minutes by Alexandra Watson, HydroScience Engineers
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Page 1 of 7

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Kris Decker	Oro Loma Sanitary District	kdecker@oroloma.org
kurt chirbs	Clock Spring NRI	kchirbas@cs-nri.com
M. Boyce	EBMUD	marisa.boyce@ebmud.com
Madison Veggian	Woodard & Curran	mveggian@woodardcurran.com
Maryna Asuncion (West Yost)	West Yost Associates	masuncion@westyost.com
Matthew Lim	San Francisco Public Works	Matthew.Lim@sfdpw.org
Mike Garcia-Forterra	Forterra	Mike.Garcia@forterrabp.com
Mike Scholz	JCM Industries	mscholz@jcmind.com
Ming Yee	San Francisco Public Works	mmyee@sflower.org
Morgan DeAngelis	House and Associates	mdeangelis@housenassociates.com
My Huynh	Sacramento Sewer District	huynhm@sacsewer.com
Mykaiah Clermont	West Yost Associates	mclermont@westyost.com
Nancy McWilliams	Solano Irrigation Water District	nmcwilliams@sidwater.org
Nealsen Cayanan	Contra Costa Sanitary District	ncayanan@centralsan.org
Nohemi Sanchez	Contra Costa Sanitary District	nsanchez@centralsan.org
Oranis Pimentel	Mott MacDonald	oranis.pimentel@mottmac.com
Peter Dyke	Pe Pipe	pdyke@pepipe.org
Peter Wright	City of Sacramento	pwright@cityofsacramento.org
Richard Davis	Harris & Associates	Richard.Davis@weareHarris.com
Robert Allen	Trident Environmental & Engineering	ballen@Tridenteng.com
Robert Le	HydroScience Engineers	rle@hydroscience.com
S Khan	San Francisco Public Works	saied.khan@sfdpw.org
Tony Leonardo	Dublin San Ramon Service District	tleonardo@dsrsd.com
Uriel Romero	Solano Irrigation Water District	uromero@sidwater.org
Weizhi Cheng	City of Burlingame	wcheng@burlingame.org
Zaheer Shaikh	Harris & Associates	zaheer.shaikh@weareharris.com

Announcements:

- **PUG**
 - **PUG Membership Renewal**
The PUG new year has started in June. We are looking forward to this new year.
 - **Future Presentations for Monthly Meetings**
For future meetings, PUG is open to presentations for future topics. We are booked through December.
- **NASTT**
 - **August 18, 2021 - Virtual**
Municipal Sewer Grouting Good Practices Course
 - **September 13-14, 2021 - LIVE**
South Central Trenchless Technology Conference – Sugar Land, TX.
 - **September 17, 2021, Virtual**
Laterals Good Practices Course

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Page 2 of 7

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- **October 13-14, 2021 - Virtual**
New Installation Methods Good Practices Course
- **November 8-10, 2021 - LIVE**
No-Dig - North Vancouver, BC
- **WESTT**
 - **Trenchless Technology Webinar**
Part 4: Thursday, August 12, 2021, 11:00-12:30 PDT.
- **WEFTEC 2021**
 - October 16-20 Conference - LIVE - McCormick Place, Chicago and On-line
 - October 18-20 Exhibition
 - November 16-18 WEFTEC Online.

General:

July 2021 Meeting Minutes: An overview of the July meeting minutes was presented.

Financial Update: The organization account as of June 30 was \$66,420.11. The current total in the organization account as of July 31 is \$76,922.11 (Dustin La Vallee)

Project Discussions:

West Yost (Adam Brown):

1. Highlands's Gravity Sewer with SASD 10,500 Clay pipe feet pipes range 10 to 30 inches. 3600 20-inch HDPE force main 55 MHs on the project some polymer concrete. Engineers estimate around 14-M. Bids range 11.1 to 13.9 million. Contractor Raines Construction.
2. Navy Drive in I-5 went to 42-inch to 52" CIPP under I-5 in Stockton to bid 3 million Bid range 2.5 and 3.8 million. Contractor SAK Construction.
3. Sacramento combined storm and sewer and installation of weir Vault to handle an overflow and 800-feet, pipe size of 30-inch to 42-inch. Engineers estimate 1.5 million bid range 1.1 to 1.8 M. Cobabe Brothers low bidder contractor.
4. Port of Oakland:
 - Airport project going to construction 1300-feet of CIPP, 1800-feet of pipe bursting 15-inch sewer up to 20-inch of HDPE DR 11. DR 11 is difficult to procure so contractor requested to use DR17.
 - 700-feet open cut on bay mud, trench depth is 15-feet deep. Engineers estimate \$5.2 M low bid \$3.4-M and average 4.4 million. Contractor Ranger Pipeline.

West Water District (Ken Deibert): 3 FM projects:

1. Alexa Hills LS to Hill top mall 10" HDPE 3,920 ft. \$1 million job starting September
2. La Honda FM, low bid 388k, 6" HDPE, 380 ft (running parallel). Construction starts October 21.
3. Hill Top Vineyards: \$1M, 12", HDPE FM 870 ft -divergent (running parallel). Construction starts November.

SID (Nancy) asked how many people are using HDPE and sizes for utility owners and how many engineers are designing HDPE?

Minutes by Alexandra Watson, HydroScience Engineers
Secretary, Nor Cal PUG

Page 3 of 7

- OLSD (Kris Decker): 30 miles, mostly 8" diameter over the next 3 years.
- Christopher Brown blend of open cut and trenchless and fusing the 6 ft. of lateral (lateral connection is a usable wye).
- Research HDPE vs PVC prior to design. Where PVC and HDPE work best?
- Peter Dyke available to answer any questions regarding the large diameter HDPE.

Presentation: "Mechanical Fittings and Repairs on High Density Polyethylene Pipe (HDPE)", Mike Scholz, JMC Industries.

Highlights from the presentation include:

- This presentation will provide an overview of the working characteristics of HDPE pipe, the design considerations and installation techniques of products recommended for the repair, connection, and branching, and discuss examples of completed projects.

Overview:

- **Working characteristics of HDPE:**

Need special attention to the repair of connection and tapping procedures performed in this type of pipe and need to determine what type of mechanical fitting best suits the project.

HDPE Characteristics has thermal expansion and contraction, sensitive to pressure and temperature, low coefficient of friction, low modulus of elasticity, less resistance to stress & unique dimensional tolerance.

Common Problems:

- Not using insert stiffeners in bolt in joint connections main source of failure: Need to add stiffeners to the MJ connections to HDPE.
- Lack of restraint main source of failure: property engineer restraint limited the availability of mechanical fitting and rotation of the pipe.
- Fusion Joints Improper fusion joints: always check the manufacture recommendations.
- Third party damage: digging and boring without locating existing pipelines can cause damage to existing pipe, leads to unforeseen repairs.
- Incorrect fitting or application: consult experience manufacture with mechanical fittings.
- **Testing:**
 - How do we know if the mechanical joints do work HDPE? JCM for repair, connecting and tapping joints have been testing various their products to satisfaction to guaranty the suitability and design capability.
 - Testing criteria range from short term testing (special applications) to long term (1,000 hours) evaluations
 - The test considers temperature and pressure cycles to fully address HDPE characteristics
 - JCM has special monitor equipment to produce accurate test data and historical reference.

- Various pictures of test examples of MJ to HDPE Joint connections.
- Buttress thread design (55 degrees angle thread) allows to hold the fitting onto the O.D of the pipe without point loading and deforming the pipe.

- **General Application Information:**

JCM recommends fusion joints as a primary method of connections. When correctly implemented fused joints are self-restraining and leak proof.

Some field conditions are not feasible to fuse joints per manufactures” recommendation. Mechanical fittings to joint or repair HDPE are a secondary and limiting choice.

Recommended Design parameter for mechanical fittings on HDPE:

Gaskets are critical element on the joint, gaskets need to have a wide cross section and a mechanical sealing lip internally confined and have enough volume to store compressed energy and the right hardness and flex to maintain a seal when pipe expands and contract.

Body shall conform to the pipe be supported wide enough to prevent point loading or uneven deformation to the pipe.

Bolting shall be replaceable, self-aligning, & heavy enough to properly load the gasket and add a safety factor.

- **Mechanical Products for HDPE:**

Why to use stiffeners? HDPE moves with pressure, recommendation to measure the pipe on the field and supply to the manufactures to make sure the proper stiffeners size

Prevents Creep:

- Stiffeners will block the creep
- Provide a stable base for bolt torque energy

Toe-in:

- Stiffeners will allow for 360-degree contact on the pipe
- Provide durable support for the bolted fitting.

Do spring washers work?

Spring washers also known as “W washers. these washers work better above ground conditions

JMC recommends using Polyethylene Encasement for fittings under corrosive soils & check Standards ANSI AWWA C105.A21.5 for Polyethylene Encasement for ductile-Iron pipe systems.

Mechanical products for HDPE thar are designed with the following features:

Minutes by Alexandra Watson, HydroScience Engineers
Secretary, Nor Cal PUG

Page 5 of 7

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- Mechanical lip gasket, broad footprint fitting, pipe to gasket contact, gasket durometer deflects pipe fluctuations, wide cross section gasket, size and formed to fit the pipe, and the angular groove.

Mechanical Products for HDPE

Water pressure applications standards HDPE pipe use SDR 17 to SDR 11

For higher pressure applications thinner wall pipe contact the manufactures to consult

Fittings:

- Universal clamp coupling use for repair clamp and a coupling. Needs restraint.
- Repair sleeve
 - Repair sleeve w/gasket system to seal pipe size up to 120-inch and higher-pressure applications furnished with or without outlet.
 - Repair sleeve Install on damage or abandoned outlet by reinforcing weak points- original use on direct tap C900 type.
 - Couplings and Flange coupling adapters “FCAs” specify pipe stiffeners and restraint when install on HDPE pipe.
 - Service saddles well suited for HDPE with a broad pressure activation gasket and stainless-steel strap where not conducting to fusing.
 - Tapping Sleeves use first on HDPE since the 1980. The tapping sleeve shall be design for the outside diameter of the pipe and a manufacture w/ a wide gasket and a groove within the outlet and a wide body to reinforce the pipe. Recommended the maximum tapping machine cutter size to be no more than 90% of the ID of the HDPE.
 - Line stops temporarily shut down and install a segment of a pipe and very useful during emergencies and modifications without interruption of services.
 - New wall anchor: mechanical wall anchor restraint: bidirectional 2-way serrated restraint system to counteract lateral movement from either direction and control radius sleeping of the pipe.
 - Serrations are design to be on the exterior pipe wall without damaging the pipe.
- **Case Studies:**

Various case studies presented.

- 36” HDPE failure in Gainesville, Florida. Used repair clamp with restraints/ fittings manufactured 316 SS.
- December 25, 2017 - Leaking 24” bolting coupling reported to Colorado Springs Utility Department. Isolation was not possible due to a broken valve. As-builts were inaccurate. Encapsulating fitting method and repair on top of the coupling. Planning is critical to minimize disruptions of the area.

Minutes by Alexandra Watson, HydroScience Engineers
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Page 6 of 7

- Toronto- Canada Repair of a 22” leaking electrofusion coupling trench dept 20-ft deep trench, difficult environment, manufacture a fitting to encapsulated electrofusion coupling.

- **Summary:**

Mechanical fittings offer many advantages for HDPE piping system where applications required additional strength and when fusion is not possible.

- **Recommendations**

- Correct applications and design and verify manufactures sizes and critical elements
- Spread sheet of crucial facts
- determine the project details and specifications are correct
- Verify application with the fitting manufacture.
- Make sure manufacture has experience and suspensible track record to complete the project correctly.

- **Q & A:**

- What is the difference between the universal clamp coupling & wall anker restraint?
 - Universal clamp coupling fitting is the basic patch clamp used on piping with a 360-degree gasket. No restraint, only seal on the repair. Universal clamp coupling use at irrigation piping and on temporary repairs.
 - Wall anker is a restraint joint to prevent the pipe moving lateral and vertical.
- What connections is recommended for a 20-psi, 36-inch pipe system with 4 air valves on the service line: saddle, tapping sleeve or coupling?
 - Over 12” is recommended a tapping sleeve saddle style with treaded of on the main line to provide more support.
 - Coupling mostly for joining where fusion of the HDPE is not feasible.
- Do fittings need stiffeners?
 - Yes, provide a stiffener with fittings. Lack of stiffeners and restrained are the common areas for failure

Thank you to Mike Scholz for a great presentation and contribution to PUG monthly meeting.

Mike’s contact information: (916) 803-2888, email: mscholz@jcmind.com

Next Meeting:

The next meeting is scheduled for Tuesday, September 14, 2021. **“Smart cover System”**, Brogan Quist, Smart Cover System.