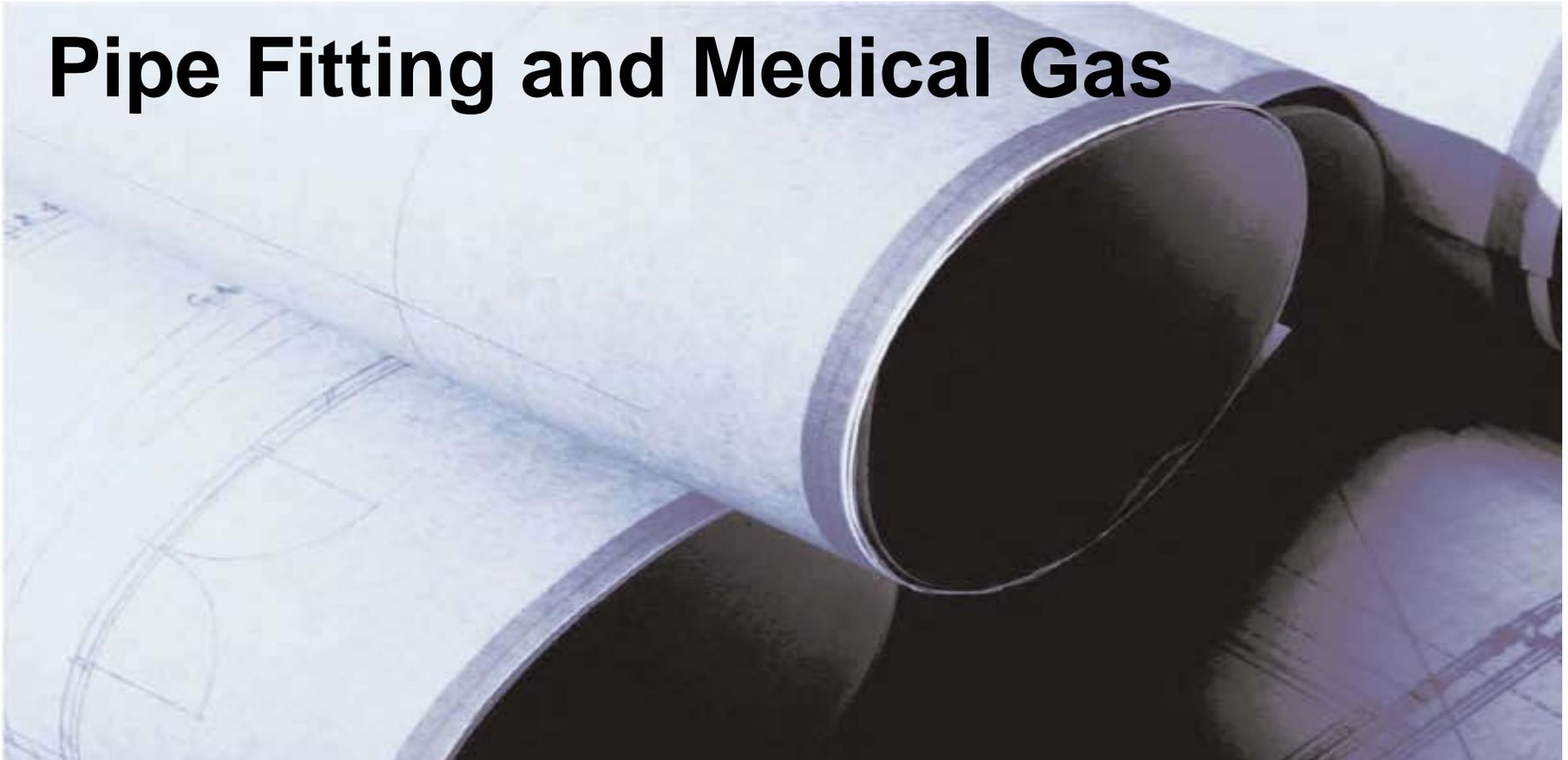


Tips for a Successful Healthcare Project

HEALTH CARE CONSTRUCTION SUMMIT

Tuesday, May 27, 2008

Pipe Fitting and Medical Gas





Topics for Discussion

- Why is health care construction different?
 - *Health care construction in California vs. other states*
- What is unique to your trade on a hospital project?
- Health care construction: The Ideal State vs. Reality
 - *What is suppose to happen*
 - *What does happen*
 - *Common slip-ups to avoid*
- Resources available to help contractors succeed?
- How to get involved in health care construction jobs



Health Care Construction is Different

“It’s a matter of life or death”

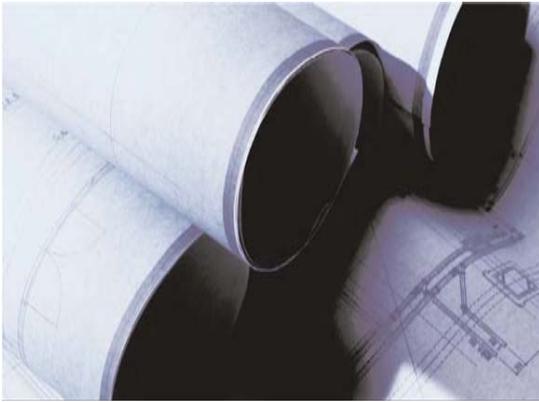
- Patient and staff safety depend on the proper operation of the systems in hospitals
- Life Support
 - *Emergency Power Systems*
 - *Medical Gas Systems*
- Infection Control
 - *Ventilation Systems*
 - *Plumbing Systems*
 - *Architectural Finishes*
- Earthquakes



Health Care Construction is Unique

Higher Standards for Performance

- Commercial buildings may not be repairable or functional following a “Design Event” (fire, earthquake, etc.)
- Hospitals must function following an incident
- Fire philosophy is to “defend in place”
 - *Patients may be too ill to evacuate*
 - *Patients are moved to adjacent “compartments”*
- Earthquake philosophy: Hospitals must be reasonably capable of providing services to the public
 - *Limited damage*
 - *Critical equipment and systems remain operational*



Health Care Construction

What is Suppose to Happen

- The Hospital Design Team (Architects, Engineers, etc.)
 - *Identify existing conditions*
 - *Design a code compliant project*
- OSHPD Reviewers
 - *Identify every code deficiency and see they are corrected*
- Contractors
 - *Build according to the approved drawings*
- IORs and OSHPD Field Staff
 - *Inspect for conformance with the approved drawings*



Health Care Construction

What Does Happen

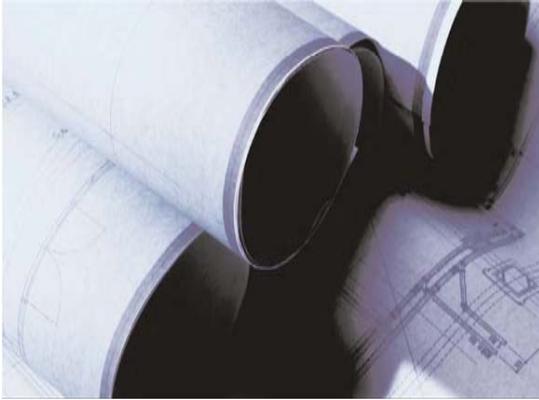
- The Hospital Design Team
 - *Designs a code compliant project based on the information they have and constraints of time and budget*
- OSHPD Reviewers
 - *Identify major code deficiencies, major coordination issues*
- Contractors
 - *Builds according to the approved drawings, accounting for variations in the existing conditions and uncertainty in the code and drawings, corrects “unbuildable” conditions*
- IORs and OSHPD Field Staff
 - *Inspect for conformance with the approved drawings and the code – identifying major and minor code deficiencies*
 - *Attempts to be flexible when code is “unclear” or where the design is “unbuildable”*



Health Care Construction

Keys to a Successful Project

- Familiarity with the building code
- Coordination with other trades
- Craftsmanship!
- Foresight-
 - *Identify potential problems*
 - *Clarify before you build*
- Team effort – not a battle of wills



Health Care Construction

When Problems Arise...

- Types of problems you may encounter
 - *Unforeseen Conditions*
 - *Work that does not match the approved drawings*
 - *Code deficiencies that were not caught in plan review*
 - *Code interpretation issues*
- When problems occur resources are available
- On-site resources
 - *IOR's*
 - *OSHPD Field Staff*



General Tips

- Don't start work without a building permit
- Have a copy of the OSHPD approved plans and specifications (contract documents) onsite
- Conduct a pre-job conference with the foreman, medical gas certifier and OSHPD prior to installation
- Don't substitute for approved materials or methods without project engineer and OSHPD approval



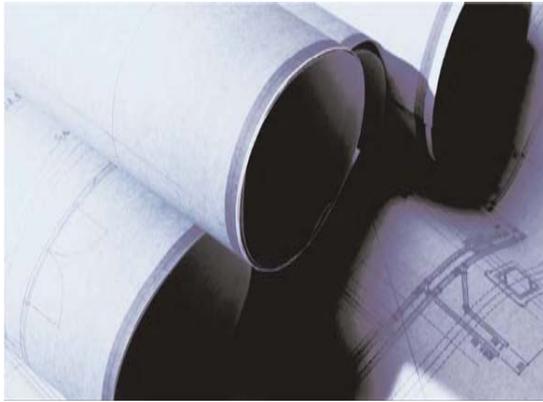
General Tips

- Install per approved construction documents; review changes and any items subject to interpretation prior to installation
- Don't perform work that is not shown on the approved contract documents which alters the intent, scope or function of the project until approved by OSHPD
- Whether the bracing system is an engineered (project specific) or pre-approved system (with verification of suitability for the specific structure) the specific approved details must be used



General Tips

- Timely submittals of changes, redesign, alternate means and material substitutions
- Avoid redesign and material substitutions after construction start



Pipe Fitting

- Long runs of pipe need to provide for thermal expansion/ contraction in selection of hangers and bracing
- National standards for pipe welding require certified welders
- National standards for pressure vessel welding require certified welders
- Bushings shall not be used



Pipe Fitting

- Venting of sterilizers (except small instrument sterilizers) is to be to the outside of the building
- Female PVC screwed fittings shall be used with plastic male fittings and plastic male threads only



Medical Gas Piping

- Install materials in accordance with the contract documents, manufactures installation instructions and/or approved listings
- Establish “clean areas” on the job site for storage of medical gas piping -Take care of pipe and fittings at the job site
- Make sure fittings are cleaned per CGA
- Fit-up and braze within 1 HOUR



Medical Gas Piping

- Make sure finished Medical Gas piping systems are properly labeled
- Establish and distribute the medical gas brazing procedures to your teams
- Respect your “zone” - watch out for dissimilar metals
- Be aware of special plumbing requirements for piping systems over electrical equipment, sensitive areas, and critical patient areas



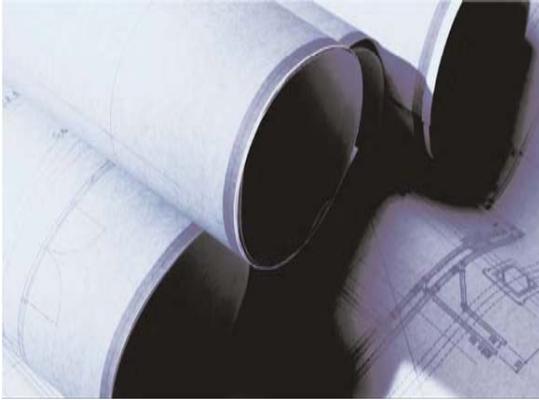
Medical Gas Piping

Installer Qualification

NFPA 99-C, Gas and Vacuum Systems:

5.1.10.10.11.2: Installers of medical gas and vacuum systems shall meet the requirements of ANSI/ASSE standard 6010, professional qualification standard for medical gas and vacuum system installers.

5.1.10.10.12.1: Brazing procedures and brazer performance for the installation of medical gas and vacuum piping shall be qualified in accordance with either section IX, welding and brazing qualifications, of the ASME Boiler and Pressure Vessel Code, or AWS B2.2, standard for brazing procedure and performance qualifications...



Health Care Construction

Additional Resources

- How to get involved in health care construction jobs
 - *Contact your Trade Association*

- Industry resources
 - *Training & Certification Classes*

- OSHPD
 - *www.oshpd.ca.gov/fdd/*



Medical Gas Piping

Installer Training Requirements

- 32 hours of classroom instruction
- 100 item closed book exam
 - 3rd party administered and proctored
 - 75% passing score
- Brazing Qualification
 - Qualification test in horizontal and vertical positions
 - 3rd party administered and proctored
 - Coupons cut and examined at independent lab



Medical Gas Piping

Installer Recertification Requirements

- Submit update exam every three years by mail or online
 - Update required at least once each code cycle

- Brazing continuity maintained in accordance with ASME section IX
 - Must verify continuity either by employer affidavit or re-test every sixth months



Medical Gas Piping

Training Courses Available

- **UA Training Centers**
 - 23 UA locals within the state of California

- **National Inspection Testing and Certification**
 - Located in Los Angeles, CA www.nationalitc.com
 - Installer, verifier, and inspector courses
 - Developed and administers third party qualification exams



Medical Gas Piping

Training Courses Available

- **UA Local 393, San Jose**
 - All plumbing and steamfitter apprentices receive training
 - Roughly 60 – 75 apprentices and journeymen trained each year
 - 500 members currently certified

- **Local 393 encourages OSHPD and municipal inspectors to audit our medical gas and code classes**
 - State of the art training labs
 - Can request inspector qualification exam



Medical Gas Piping

Local 393 Training Lab





Medical Gas Piping

Local 393 Training Lab





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Facilities Development Division (FDD) - Plan Review & Construction Observation

Plan Review and Construction Compliance Goal:

Plan Review and Construction Compliance will (a) provide quality service to our clients by being efficient, flexible, responsive and accountable, and (b) will review plans, specifications, and observe health care facilities construction to ensure compliance with applicable codes and regulations.

PLAN REVIEW & CONSTRUCTION OBSERVATION

- | | |
|--|--|
| → Plan Review Process | → Construction Observation Process |
| → 60/30/30 Program | → Testing Inspection Observation (TIO) |
| → Over the Counter (OTC) | → Hospital Inspector Certification Program |
| → Standard Comments | → Field Reviews - FREER |
| → Alternate Method of Compliance | → SB 1838 Exemption from Plan Review for Projects of \$50,000.00 or less |
| → Comment and Process Review (CPR) | → AB 2632 Project Review |
| → Required Weight & Size | → SB 224 Project Review |
| → Plan Approval with Comments | → Licensed Clinics |