CONSTRUCTIVELY SPEAKING

US Army Corps of Engineers—Afghanistan Engineer District—

January 23, 2010

Issue No. 2

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If you travel through Kabul, come visit us in Building #203.

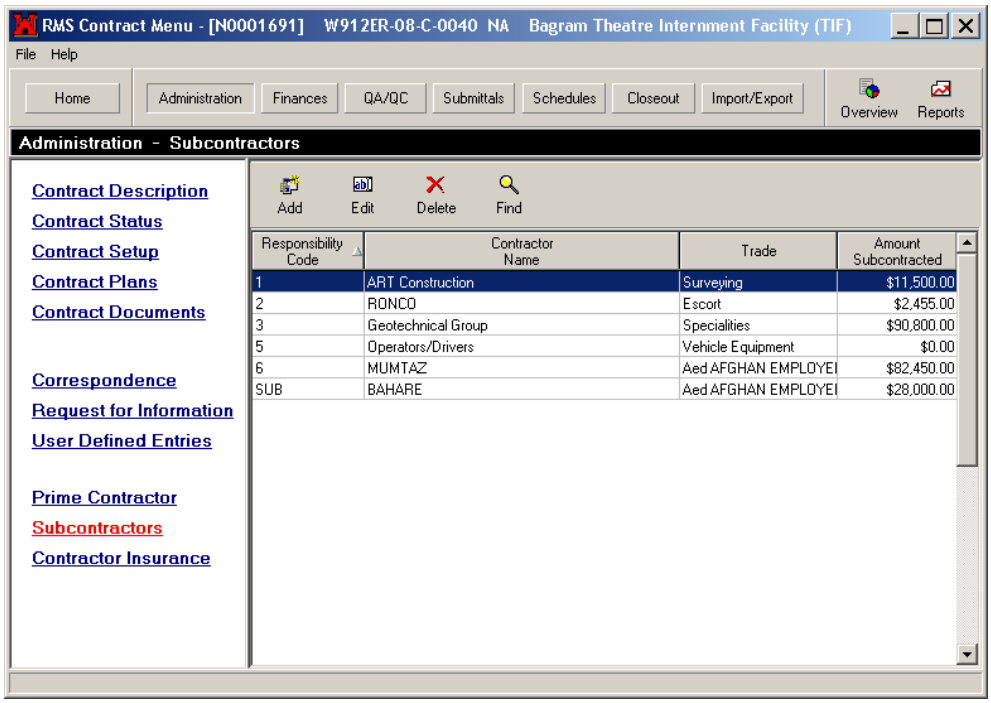
SUBCONTRACTOR PAYMENTS

By Sandy Higgins

In accordance FAR 52.232-5—"Payments Under Fixed-Price Construction Contracts", RMS and QCS have been provided with screens to accommodate the information specified to be furnished by the Prime Contractor relative to any Subcontractor used on the contract.

You will undoubtedly encounter Contractors reluctant (or even refusing) to indicate the Contract Amount of their Subcontractors. Reasons vary for Prime Contractors. Some are fearful that the government will determine WAY TOO MUCH overhead and profit while others want to live off of the subcontractors money. You never have to argue with a Prime Contractor on this, simply point out the FAR requirement and refuse to pay them anything until they comply. Prime Contractors have been barred from Government work due to violations of the Prompt Payment Act. If the Prompt Payment Certification isn't right, then you should return it to the contractor by day 3. Do this by serial letter and give specific reasons why the pay request is rejected.

The first thing to look for is that the Prime Contractor has properly listed their subcontractors under the administration tab as show below. Once they have properly entered them here, they will show up on the Prompt Payment Certification each month. You must make sure they put a contract amount. Stress to them that we don't care how much the contract is as long as we see payment being made. *Cont'd*



SUBCONTRACTOR PAYMENTS (cont'd)

Contractor Requested Earnings

Request Close

Activity Earnings | Subcontractor Earnings | Additional Earnings | Payment POCs

☐ Update Previous Subcontractor Payments

Subcontractor Name	Total Amount Subcontracted	Previous Subcontractor Payments (Excluding Deductions)	Subcontractor Amount Included in this Payment Estimate (Excluding Deductions)	Subcontractor Earnings Deducted by Contractor (Total to Date)
Accurate Concrete	$621,830.00	$0.00	$0.00	$0.00
FP Erectors, LLC	$0.00	$0.00	$0.00	$0.00
HIRE ELECTRIC	$216,400.00	$0.00	$0.00	$0.00
JH KELLY	$117,828.00	$0.00	$0.00	$0.00

This is a screenshot from QCS when a contractor is preparing their pay request. Note the box that can be checked if the contractor wants to report previous payments and get on track. If the contractor wants to hold money from the subcontractor, they need to indicate in the last column and we will essentially hold the money for them.

Payment No. 7 Thru 03/31/2006 Invoice Date 03/31/2006 Requested Earnings Completed ☐ Yes

FOR CONTRACTS IN WHICH YOU HAVE BEEN CONTACTED BY A SUB-CONTRACTOR concerning dispute in payment from the Prime Contractor:

Contact the sub-contractor via email and request the following information for ***disputes concerning payment:***

1. On sub-contactor letterhead, state the AED contract number, the specific work activity done and in dispute, a copy of the sub-contract with the Prime Contractor, and the percent paid for the work activity in dispute, if any.
2. Request a copy of the Sub-Contractor's latest request for payment to the Prime Contractor and last invoice.
3. All documents must be signed by an officer of the sub-contractor's company.

Please make no commitment to the sub-contractor that his issue will be resolved to his satisfaction. However, the above documentation will allow us to confront the contractor with a request/demand that proof of payment for work is done and accepted. Once we have convincing evidence that the prime contractor may not have paid a direct sub-contractor, we will need to do the following:

Confirm by review of the previous payment estimates that the work described by the sub-contractor is work that we have paid the Prime.

Confirm that the Prime Contractor does not have any exceptions to payment listed on his Prompt Payment Certificate.

Validate % complete paid. If we paid 50% for the wall, and the sub built the wall, then he should be paid for 50% of his sub-contract agreed to price. Don't become a street accountant, keep it simple.

If it appears after review of the above that the Contractor may not have paid the Sub-Contractor of accepted and paid contract work, then meet with the Contractor. Explain the sub-contractor's dispute and your conclusion of possible non-payment. Give your Prime Contractor an opportunity to either explain or to review and confirm.

Conclusion is when the Prime shows convincing evidence that he has paid the sub for issue at hand. This would then be sent to the Sub, concluding that AED has done all that they can do to resolve, and that any other action will have to be between the Sub and the Prime through the local legal system.

Prompt Payment Certification And Supporting Data For Contractor Payment Invoice

Page 1 of 8 pages

(1) Contract No.: W912ER-08-C-0040 NA

(2) Location and Description of Work: Bagram, Afghanistan, Bagram Theatre Internment Facility (TIF)

(3) Estimate No.: 10

(4) Invoice Date: 08/23/2009

(5) Contractor Official (name and address) to whom payment is to be sent:
Prime Projects International General Trading LLC
502, Twin Towers, Baniyas Road
Dubai Deira 42252

(6) Discount Terms:
0 Days
0 Percent

(7) If Notice of Assignment has been filed, enter name of Assignee to whom payment is to be sent:
John T. Michael, Project Engineer

(8) Name, Title, phone number, and mailing address of person to be notified in event of a defective invoice:

(9) Subcontractor Name	(10) Total Amount Subcontracted	(11) Previous Subcontractor Payments (Excluding Deductions)	(12) Subcontractor Amount Included in this Payment Estimate (Excluding Deductions)	(13) ** Subcontractor Earnings Deducted by Contractor (Total to Date)
Afghan Operators/Drivers	$0.00	$0.00	$0.00	$0.00
Afghan Rehabilitation Team	$11,500.00	$11,500.00	$0.00	$0.00
BAHARE KAHKASHAN Co	$28,000.00	$28,000.00	$0.00	$0.00
Geotechnical Team	$90,800.00	$90,800.00	$0.00	$0.00
IHSAN QUDRAT CONSTRUCTION COMPA	$73,420.00	$73,420.00	$0.00	$0.00
MUMTAZ CONST GROUP	$82,450.00	$82,450.00	$0.00	$0.00
RONCO Consulting Corporation	$2,455.00	$2,455.00	$0.00	$0.00
TOTAL	$288,625.00	$288,625.00	$0.00	$0.00

** A written notice of any withholding shall be issued to a subcontractor (with a copy to the Contracting Officer) of any such notice issued by the Contractor, specifying (1) the amount to be withheld, (2) the specific causes for the withholding under the terms of the subcontract, and (3) the remedial actions to be taken by the subcontractor in order to receive payment of the amounts withheld. Attach copy of notification to pay estimate. Reference FAR 52.232-27(g).

I herby certify, to the best of my knowledge and belief, that:

(1) The amounts requested are only for performance in accordance with the specifications, terms, and conditions of the contract;

(2) Payments to subcontractors and suppliers have been made from previous payments received under the contract, and timely payments will be made from the proceeds of the payments covered by this certification, in accordance with subcontract agreements and the requirements of Chapter 39 of Title 31, United States, Code; and

(3) This request for progress payments does not include any amounts which the prime contractor intends to withhold or retain from a subcontractor or supplier in accordance with the terms and conditions of the subcontract.

(4) This certification is not to be construed as final acceptance of a subcontractor's performance.

Signature Date

Stephen Shed, Project Manager
Typed Name and Title

COMMON PLUMBING PROBLEMS

By Steve Baughman, Mechanical Engineer

CODE ANALYSIS

Let us take a look at the code and what it has to say about a few particular areas of specific concern that I have noticed here in Afghanistan. Of specific interest is what the code has to say about vents and fixture traps (P-traps) and how they are to be installed.

Vent lines are discussed under chapter 9, Vents, of the International Plumbing Code (IPC). We shall examine section 905, Vent Connections and Grades, and Section 909, Wet Venting, as they are of specific interest in our further discussions.

IPC 905.5 Height above fixtures :

"A connection between a vent pipe and a vent stack... shall be made at least 6 inches (152 mm) above the flood level rim of the highest fixture served by the vent."

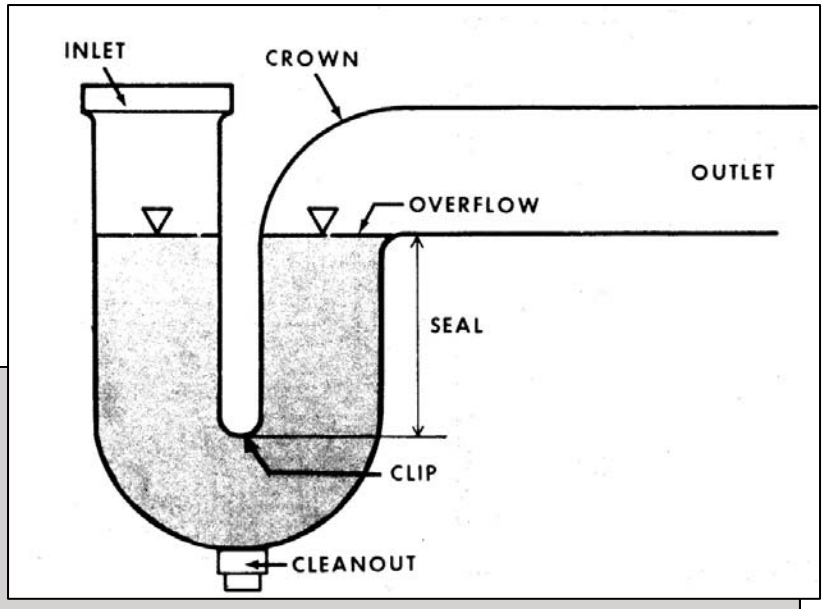
IPC 909.1 Horizontal wet vent permitted:

"Any combination of fixtures within two bathroom groups located on the same floor level is permitted to be vented by a horizontal wet vent. The wet vent shall be considered the vent for the fixtures and shall extend from the connection of the dry vent along the direction of the flow in the drain pipe to the most downstream fixture drain connection to the horizontal branch drain."

Fixture traps are discussed under chapter 10, Traps, Interceptors and Separators, of the IPC with section 1002, Trap Requirements, being of specific interest to us here.

IPC 1002.4 Trap seals:

"Each fixture trap shall have a liquid seal of not less than 2 inches (51 mm) and not more than 4 inches (102 mm)..."



SITE FINDINGS

P-Traps

Look around long enough on most construction sites and you are bound to find a p-trap (shown above). While both traps in these pictures are P-traps, the first is not in compliance with code and the second, although just a sketch, shows the proper shape of a code compliant P-trap. The difference here is in the water seal. It is difficult to see the issue at first but take a look at the dimension called "SEAL" on the trap in above sketch. It is measured from the top of the U-bend (clip) in the trap to the bottom of the outlet and this is the distance that must be between 2 and 4 inches (IPC 1002.4). Often contractors, and even USACE personnel, measure the seal from the bottom of the U-bend (clip) to the bottom of the outlet pipe. Here is the problem with doing that; when the water level drops below the top of the U-bend (clip) it no longer seals the pipe from gas escaping over the top of the water level. The water only acts as a seal when it is above the top of the U-bend (clip) shown in above sketch.

COMMON PLUMBING PROBLEMS

CONT'D

Vents

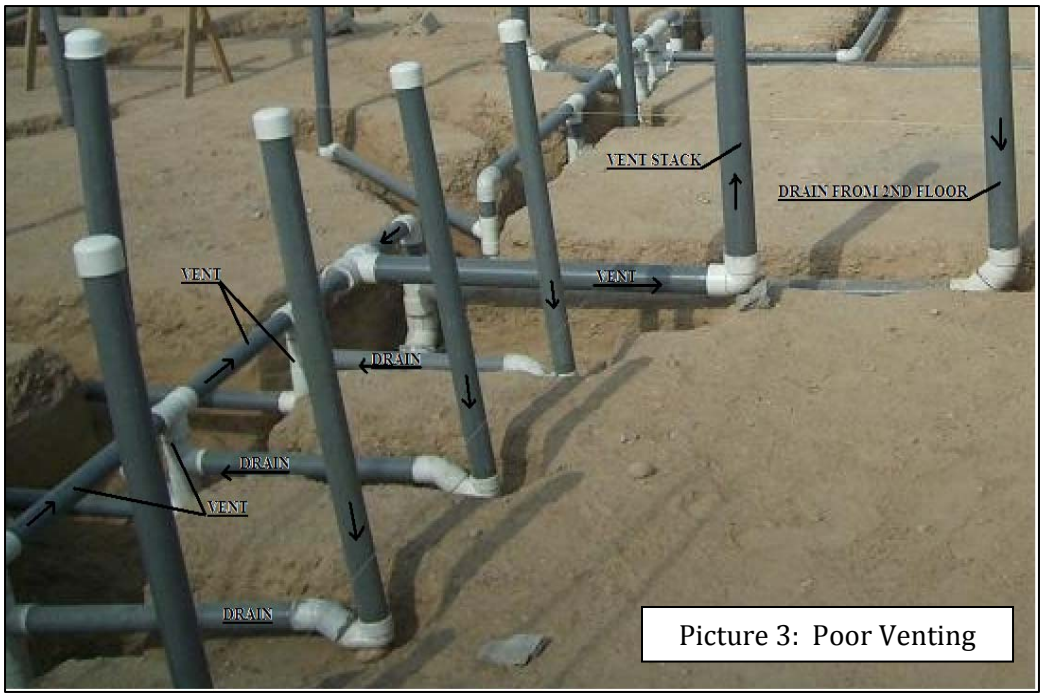
The next big issue is venting pipe. It is hard to explain the reasons why the venting is important without having had first hand experienced in any bathroom here in country. Whether it is difficulty in flushing/draining or bad odors, we have all experience improper venting in one fashion or another. Without a passage way for air to travel, we hamper the draining of the plumbing system and create possible paths for odor and/or sewer gas to escape into the building.

The issue of poor draining is an easy one to see. Take a straw and put into a glass of water. Put your finger over the top of the straw and keep it there while you remove the straw. The water stays in the straw. This is because we have blocked the passage of air and will not let the straw vent.

Odor and sewer gas are both fluids and like all fluids will travel the path of least resistance. When we install vent lines we are trying to give these fluids an easy (low resistance) path to the outdoors. Two key ideas with this are shortest path and high to low pressure. Vent lines must provide the shortest possible route from high pressure areas to low pressure areas so that the odor/sewer gas will flow through them rather than back up the drain line to the P-Trap.

Picture 3 will help to demonstrate poor venting. I use the term poor rather than improper or bad because it will vent or help vent the system but not in the best way. Every little bit we do to improve venting will improve the chances of a functioning plumbing system. So while the picture does not show "complete failure" it does indicate an "inefficient" system.

Picture 3 shows vent lines running horizontally in the floor and then coming together, at the floor level, and running up the stack to the roof.



Picture 3: Poor Venting

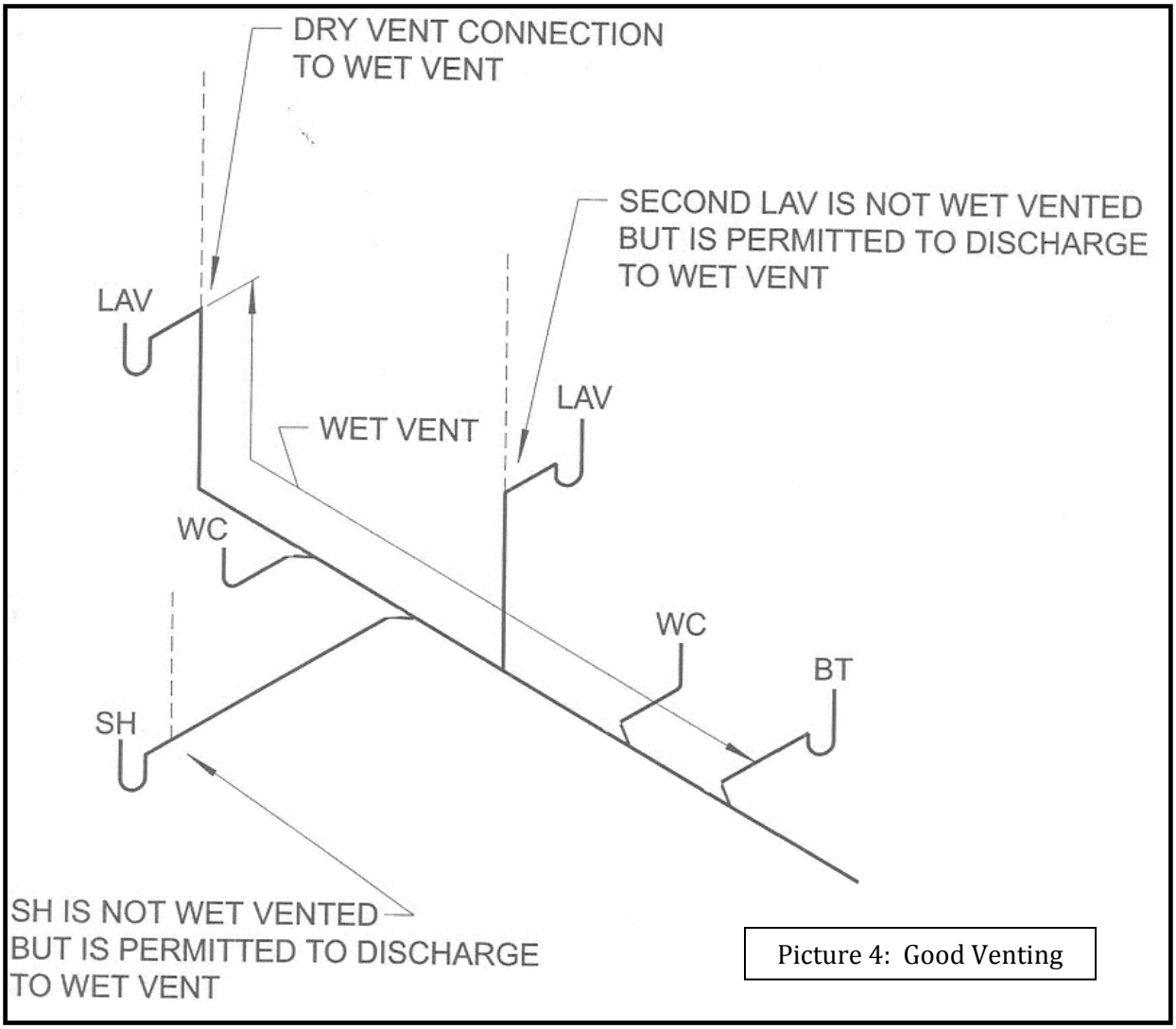
IPC 905.5 tells us that this final connection to the vent stack should be made at least 6 inches above the flood rim level of the highest fixture served. The flood rim level is the highest level the water will reach in a fixture before flooding over the rim. This will always be above the floor and in the case of a lavatory will be several feet above the floor. These vent lines do not represent the shortest path to the stack, nor do they represent a good transition from high pressure to low pressure as they run horizontally bellow the flood rim of the fixture served.

It would have been better to run the drain lines back to a wall and then vent up from them to a point above the flood rim level and then run horizontally over to the stack. This is a problem that is repeated often within country and should be looked for in both designs and in installations in the field.

How should vent and drain lines be tied together? Let us take a look at picture 4, on the following page, good venting. Starting in the upper left hand corner we see a lavatory that is drained back to a wall and then immediately dry vented up the wall (dotted line).

Common Plumbing Problems cont'd

Next we come to a water closet and it is being vented by a combination wet and dry vent. Remember we said not to run horizontal vent lines under the flood rim of the highest fixture served? We can run wet vent lines horizontally under the flood rim. A wet vent is both a drain (in one direction) and a vent (in the opposite direction) at the same time. IPC 909.1 discusses this issue of horizontal wet venting. Vertical wet venting is discussed in 909.2 and is essentially the same so I won't go into much detail here. You start at the connection of the dry vent (no drainage) and follow the flow of the drain line to the drain line of the fixture or fixtures you wish to wet vent. Starting at the lavatory dry vent we can flow downstream along the drain line to the water closet drain connection and see that it meets the criteria for wet venting. We can continue downstream to the shower, the second lavatory, the second water closet and the bathtub and see that each of them has the potential to be wet vented back to the dry vent of the first lavatory. In the case of the second lavatory and the shower, they are being vented by their own dry vent and are therefore not considered to be wet venting. Also note, that in none of these instances is there a dry vent line running horizontally under the fixtures being served.



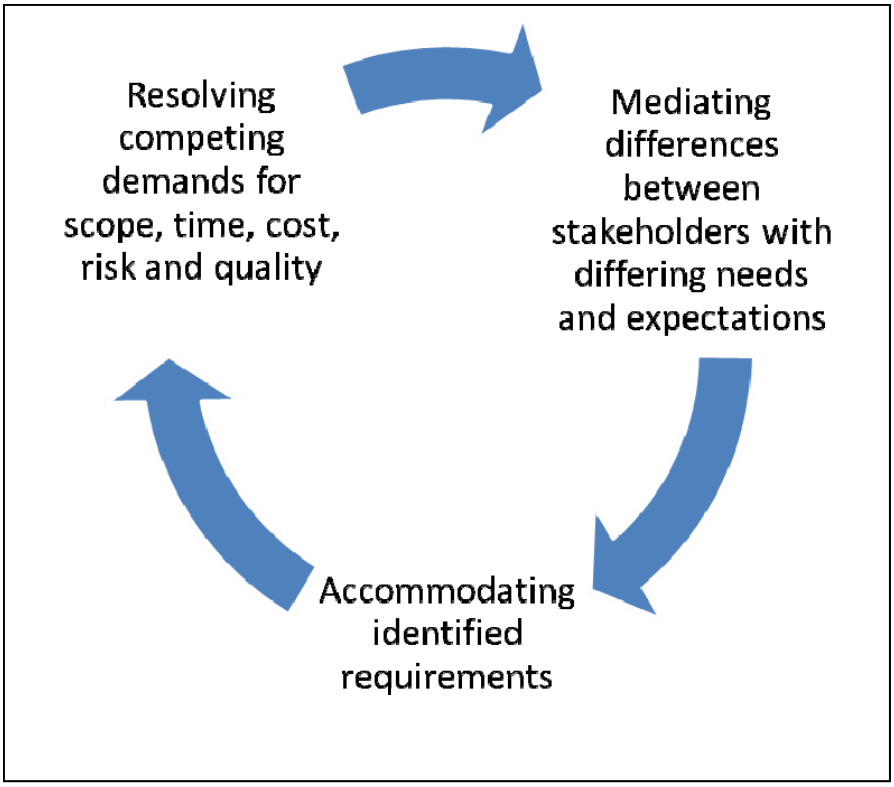
Picture 4: Good Venting

I hope that this has helped to explain some of the common problems seen in the plumbing field here in Afghanistan. Remember that this is not a complete discussion of wet venting, dry venting, or fixture traps and there are other issues that might come into play. But this is a good first look at what the problems are and how they can begin to be solved.

Project/Schedule Management

by Mike Weise, Baker Group

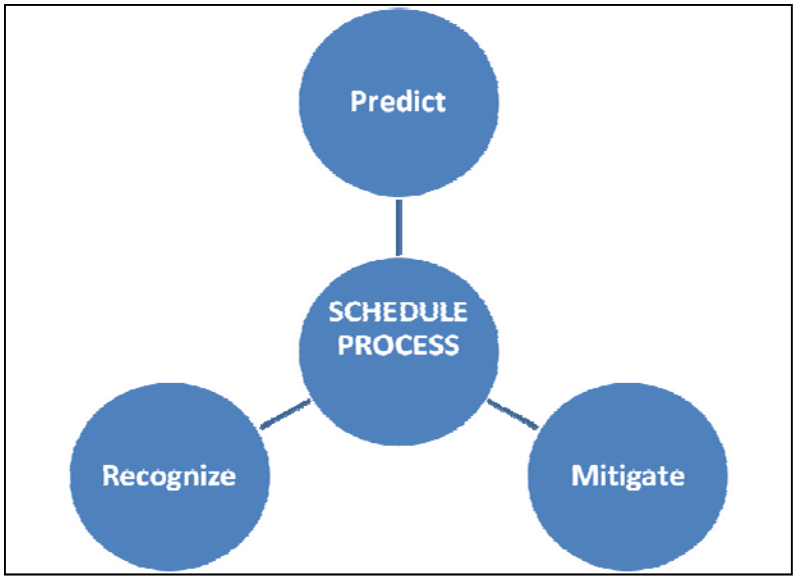
Project management is the application of knowledge, skills, tools, and techniques to project activities to meet project requirements. Project management is accomplished through the use of processes such as initiating, planning, executing, controlling and closing. The project team manages to work the projects, and the work typically involves:



It is important to note that many of the processes within project management are iterative in nature. Although we are doing very similar tasks across multiple projects, we need to recognize and respond to the existence of and the necessity for progressive elaboration in a project throughout its life cycle; i.e., the more you know about your project, the better you are able to manage it. Scheduling is the aspect of project management that maintains a time-based relationship between activities, responsibilities, and execution.

A defined and refined scheduling process becomes necessary to predict, recognize, and mitigate those factors effecting execution performance, and supporting critical milestones on all type of projects. The fundamentals of project planning and scheduling include development, review, approval, reporting, and schedule benchmarking. The regular reporting and monitoring from the process will ensure a proper regard for scheduling and an appropriately placed accountability for the Project Management Plan.

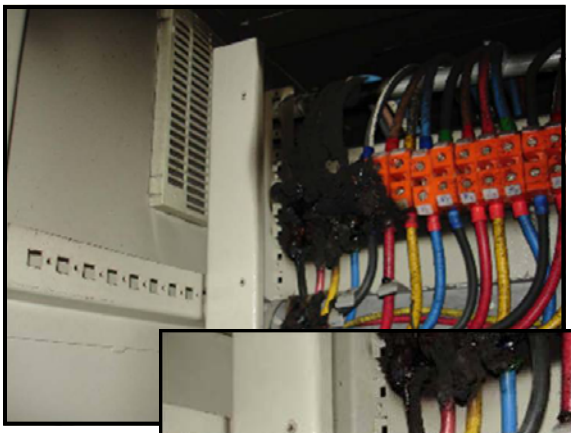
The purpose of Schedule Management is to plan for, monitor, and control the timely progress of the work, from the day the contract is awarded through the engineering, procurement, construction, turnover, start-up, and commissioning of the facility. The key to success is to logically apply knowledge, experience, and instincts to a plan, and then to execute according to the plan. The important objective is early detection, analysis and resolution of execution problems, to prevent and/or minimize schedule impacts to the completion of the project.

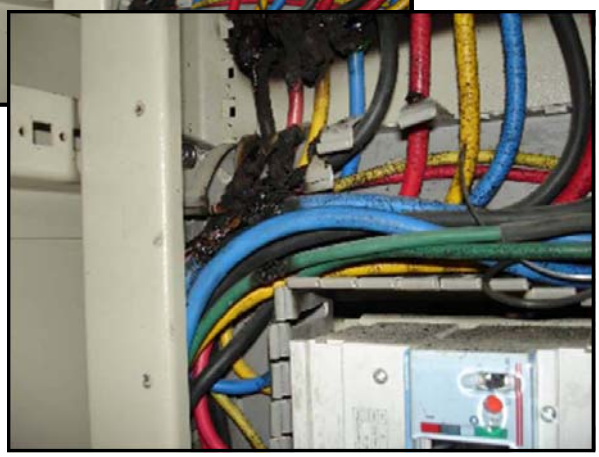


To learn more about this topic, contact the Baker Group via email: TAN Baker Group aed.baker.group@usace.army.mil), or visit our office at Qalaa House, 1st floor Azadi, for information or assistance with your scheduling needs.

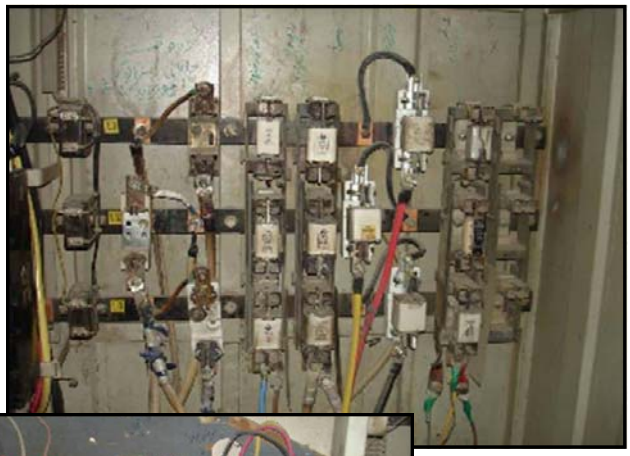
LEGACY AED ELECTRICAL INSTALLATIONS

By Drew Lange/Paul Cravens—AED-N Electrical Engineering





In this article, we want to draw attention to some of the electrical hazards that we have found at various sites. The two photos on the left-hand side show the results of an electrical fire in a panel at a recently completed facility in Kabul. You can see that the conductors overheated, melting the insulation, and causing faults and arcing in adjacent conductors. The melted insulation dropped down onto the conductors below and started additional burns in this panel. An interesting example is the burned spot on the green conductor in the top-left photo. Grounding conductors are usually denoted by their green-colored insulation; grounding conductors are not supposed to carry current, yet this conductor carried enough current to burn through the insulation as shown in the photo.



In the right-hand set of photos, this is an example of improper wiring methods and devices that are still in use at this time. Electrical installations like this are common all over the nation of Afghanistan and can be a significant danger to occupants of the building and to the electricians that are trying to correct them. These devices are connected in a room adjacent to a 630 KVA transformer – that is an enormous amount of dangerous power. On the following page of this article you'll find typical problems with AED electrical installations along with the National Electric Code (NEC) reference which pertains to each problem. Please read and be aware of these problems and our suggestions as you oversee the various installations for the AED.

LEGACY AED ELECTRICAL INSTALLATION Cont'd

Breaker/Conductor Selections
Contractors have typically sized conductors for the load, and sized the breaker too large to protect the conductors. Review NEC 240.4. Check breaker/conductor selections to make sure that breaker protects load-side (downstream) conductor. There have been many cases of overloads that melt and ignite the insulation due to over sizing the breaker (or under sizing the conductor).

Fluorescent Light Ballasts
Magnetic ballasts are only allowed in medical facilities where sensitive equipment is in use. There have been many cases of magnetic ballasts producing enough heat (or arcing), igniting the plastic housing. Make sure lighting schedules and details show electronic ballasts.

Grounding
Grounding plans and details are typically lacking. Review NEC Art. 250 for items such as Service Entrance requirements, buildings served by a feeder, and grounding electrodes. Typically the design build contractors provide a grounding electrode system at every building, but no equipment grounding conductor back to the MDP with the feeder. See NEC 250.32(B).

Disconnect Switches
Sometimes contractors omit disconnects. Review requirements of NEC 422, 424, 430, and 440 to see where a disconnect is required, or where the breaker is allowed to disconnect the equipment.

Receptacles
Make sure designer uses GFI (or RCCD) where required by code. 10mA is the lowest European trip rating available; do not allow 30mA, even if it's written in the RFP. If the designer is putting weatherproof receptacles on the inside of the building, do not comment them out: in this country, floors are cleaned with a garden hose instead of sweeping and mopping.

90 degree Conductors
Contractors will try to use 90 degree conductors to achieve more ampacity with a smaller wire diameter. Use 75 degree table in NEC Table 310.16 because terminations are generally limited to 75 degrees. Review NEC Art. 110.14(C).

Manholes/Handhole ground rod
Ensure contractor installs a ground rod in each power manhole and handhole.

Fire Alarm and Detection System. Fire Alarm systems shall be provided where required by the IBC, NFPA 101, UFC 3-600-01; installation of fire extinguishers shall be in accordance with NFPA 72.

Bushings
Afghan-local electricians generally do not provide bushings where wiring and/or conduit enters junction boxes and panelboards. This could result in damaged insulation, which could cause a fault. See UFGS Specification 26 20 00 Para 3.1.6.16.

Color-coded electrical conductors

The old (pre-2006) and the new (post-2006) IEC requirements for color-coding of conductors:

Conductor	pre-2006 IEC	post-2006 IEC
A	RED	BROWN
B	YELLOW	BLACK
C	BLUE	GREY
N	BLACK	BLUE
GROUND	YELLOW/GREEN	YELLOW/GREEN

Solid green-colored conductors are used in the US for ground conductors; the yellow w/green-stripeconductors are commonly used in Afghanistan for the ground conductors.

Stranded Wire
4mm2 and 6mm2 conductors shall be solid, not stranded. Contractors have been using stranded conductors for all wiring. Stranded wire requires a crimp connector to terminate on a bus. See UFGS Specification 26 20 00 Paragraphs 2.9.1 and 2.10. Also see NEC 110.14.