

**A Project Review of the Tuba City and Crownpoint  
Judicial/Public Safety Facilities**

Audit Report No. 14-07

**M-E-M-O-R-A-N-D-U-M**

**TO** : Delores Greyeyes, Department Manager III  
**DEPARTMENT OF CORRECTIONS**

**FROM** :   
Elizabeth Begay, CIA, CFE  
Auditor General

**DATE** : December 16, 2013

**SUBJECT** : A Project Review of the Tuba City and Crownpoint Judicial/Public  
Safety Facilities

The Office of the Auditor General, in conjunction with licensed architect, Michael A. Jackson, Praxis Program Management, LLC, herewith transmit Report No. 14-07, a Project Review of the Tuba City and Crownpoint Judicial/Public Safety Facilities.

If you have any questions regarding this report, please call our office at (928) 871-6303.

Enclosure

xc: John Billison, Director  
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# Project Review – December 5, 2013

Tuba City, Arizona – Justice Center

Crownpoint, New Mexico – Justice Center

For

The Navajo Nation

Office of the Auditor General

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## **Executive Summary – Key Points**

### **CMAR Accounting Errors**

The Auditor's Report uncovered a range of accounting errors made by the CMAR. These errors resulted in an incorrect GMP and subsequent incorrect charges against the GMP. These included: CMAR Fee, Navajo Nation Tax, Retention, Variances against Contractually Scheduled Rates, as well as inadequate documentation of sub contract amounts and payments.

The CMAR's accounting process and practices must be amended. Also, the architect, program manager, and Navajo Nation must perform a more detailed review of pay applications on all future projects.

### **Change Orders**

Large scope changes like those initiated by the owner on this project should be avoided whenever possible. Scope changes by the architect due to RFI, ASI and Submittal Review should be kept below a contractual threshold of 2% of the cost of the Work. The architect, consulting program manager and Navajo Nation representative must perform a detailed review of all changes in scope and associated costs *as they occur*, to ensure accuracy and fairness.

### **Warranty**

The general quality of construction is good. The quantity and type of warranty work is not excessive. Proper documentation of warranty issues within the one-year warranty period is essential to ensure their timely correction.

### **Contract**

The Contract was not thoroughly coordinated, although this has not resulted in serious complications. The Navajo Nation may be better served by developing its own contract form specifically designed to protect its interests. In doing so, it must consider delivery method and a balance between risk avoidance and cost.

### **OAC Team Performance**

There was a steep learning curve for the Department of Corrections as users, as well as the design team programmers, that resulted in a limited number of oversights in the final product. The more significant breakdown was the failure of everyone on the OAC team to discover the accounting errors present in every pay application submitted over the course of the projects.

### **Navajo Nation Internal Capability**

The Navajo nation should investigate the cost/benefit tradeoffs of training internal staff to perform as Program Manager, who can support project feasibility, scoping, and budgeting studies as well as programming, design, construction and operations and maintenance for executed projects. Likewise the Nation should consider creation of internal Building Department and Fire Marshall positions.

## **Preface – Project Review**

### **Review Process**

#### **Contracts**

Performance requirements are defined by the Contract. Therefore the Contract becomes the starting point for all review questions. I have reviewed the following Navajo Nation contracts:

- Owner – CMAR (Arviso-Okland)
- Owner – Architect (DMA)
- Owner – Program Manager (Arcadis)

#### **Documents**

- The Auditor’s Draft Performance Audit
- Auditor’s Site Visit Memos
- Final Pay Applications
- Construction Change Orders and CMAR PCO Log
- Project Audit Detail
- Contract Modifications
- Construction Documents
- ASIs and RFIs

#### **On-Site Walk Through and Warranty Issue Review**

- Tuba City – Police and Corrections (Justice was Closed)
- Crownpoint – Police and Corrections (Justice was Closed)

#### **Interviews & Meetings**

- Okland Construction – Glenn Trice, Eva Palomino (Pay Applications)
- Okland Construction – Glenn Trice (Change Orders)
- Arcadis – Tim Brand (Project Process)
- Auditor General’s Office & Auditor – Elizabeth Begay, Daniel Colello, Sanwar Harshwal (Report Reconciliation)

#### **Opinion: The Design and Construction Environment and Process**

In the not too distant past, competitive bid was viewed as the only way for an owner to receive a fair price. An adversarial relationship between the Owner, Architect and Contractor was seen as necessary to prevent collusion through self-interest.

We have discovered that the evidence does not support this. In fact, the reverse tends to be true. Competitive bidding more often than not results in the highest price and the least value.

Creating an environment of trust and respect that allows the owner, architect and contractor to truly collaborate, achieves the most value at the least risk for *all* parties.

A significant proportion of construction cost exists to cover risk. In the past each party tried to avoid risk by contractually shifting it to the others. Risk is expensive and those contractually saddled with the risk almost usually see that they are compensated for it!

However the risk equation need not be a zero sum game. We have learned that through collaboration between an OAC *team* aligned around common goals, risk can be reduced for *everyone*. What is the result? Value increases. Cost decreases.



## **Part I – Audit and Contractual Impacts**

I have read the Auditors Report, but have not reviewed the working papers that support it.

I am neither a CPA nor an auditor and do not have the qualifications to properly review an audit or the appropriate application of required professional accounting standards.

I have had the opportunity to spend four hours with the auditor, Sanwar Harshwal to review the project in general as well as gain an understanding of his approach to the audit. I have no reason to doubt the thoroughness, accuracy or findings resulting from his work.

I have a number of comments, which are limited to contract concerns, and possible improvements that can be considered for future contracts.

### **Contract – General**

- The Contract is an assembly of:
  - AIA A133 – 2009, Standard Form of Agreement Between Owner and Construction Manager as Constructor (with substantial deletions and additions enumerated in an attached Report)
  - Navajo Nation General Conditions for Construction Contracts (Exhibit A)
  - AIA A201 – 2007 General Conditions of the Contract for Construction (Exhibit B)
  - Additional Exhibits: C, D, E, F, G, H, I covering labor and equipment rates as well as certificates of insurance.
- The A133 was edited to reflect the majority of terms and conditions intended for the project. Exhibits A and B do not appear to have been edited to be coordinated with the A133. A thorough cross-referencing of these documents is necessary to eliminate conflicts and potential vagueness on key issues.
- AIA contracts are written to protect the interests of architects, just as AGC contracts are written to project the interests of the general contractor. While these documents are relatively even handed, they are not intended to protect the interests of the owner. Most institutional owners create their own form of agreement written to protect their interests. In the long run this approach may be advantageous to the Navajo Nation.
  - As an owner it is important to be judicious when protecting ones own risk by assigning responsibility for it to others, since the cost of this risk plus a safety factor will be priced into the cost of the Work.
  - Historically Contracts for Construction have described the desired end product in great detail and a rigorous structure for stipulating its cost. They also typically define roles and responsibilities with a focus on risk allocation.
  - What is almost entirely missing is a description of the delivery process itself, the working environment, relationships, required behaviors and process tools and methodologies (such as Lean) whose

intent is to create the greatest value for the owner with the least risk for all team members. The objective should be to create high performance team that is thoroughly integrated and prepared to collaborate in a deep and significant way.

- Procurement RFPs are increasingly asking for integrated design and construction teams as a single source of responsibility for delivery.
- A detailed description of this methodology is too complex to describe here, but I recommend that the Navajo Nation consider it in greater detail if the Nation chooses to create it's own contract(s).

### **Contract – Specific**

- Arviso/Okland may not have provided all of the information requested by the auditor, specifically support for subcontractor contract amounts and payments. While is a requirement of the contract per section 6.11 of the A133 quoted below, it is my opinion that future contracts should be more explicit in terms of accounting standards and the level of documentation required.
  - **§ 6.11 Accounting Records**  
*The Construction Manager shall keep full and detailed records and accounts related to the cost of the Work and exercise such controls as may be necessary for proper financial management under this Contract and to substantiate all costs incurred. The accounting and control systems shall be satisfactory to the Owner. The Owner and the Owner's auditors shall, during regular business hours and upon reasonable notice, be afforded access to, and shall be permitted to audit and copy, the Construction Manager's records and accounts, including complete documentation supporting accounting entries, books, correspondence, instructions, drawings, receipts, subcontracts, Subcontractor's proposals, purchase orders, vouchers, memoranda and other data relating to this Contract. The Construction Manager shall preserve these records for a period of three years after final payment, or for such longer period as may be required by law.*
- The Arviso/Okland Pay Applications do not provide a line item in the schedule of values for each subcontractor. This is required by the contract per 7.1.4 of the A133 – 2009. This omission makes tracking individual subcontractor contracts and payment amounts more difficult.
  - **§ 7.1.4 Each Application for Payment shall be submitted in (3) hard copies as follows:**
    - *Application for Payment Continuation sheet shall itemize the project costs to show sufficient line item detail as required by*

*the Owner or Architect.*

- *Each Subcontractor shall be shown as a separate line item.*
  - *Allowances, Contingency and Contractor's Fee shall be shown as separate line items.*
  - *The Original Contract Amount (GMP) shall not be altered. Change Orders shall be shown as a separate column. Any adjustments to individual line item budgets shall be shown in a separate column.*
  - *Billings for stored material must include proper certification that the material is being stored in a secured location and that the material is clearly identified as going to the Project.*
  - *Payroll certification will be the responsibility of the CM and will be reported no less than monthly to an agency or agencies which will be determined by the Owner and its source of funding.*
- Under a GMP contract, without fixed sub contract line items, determination of pay application amounts involves art as well as science. Payment is based upon *percentage of completion* (7.1.6 & 7.1.7), determined in part by professional judgment. The goal is to provide that subcontractor payments neither exceed the level of completion, jeopardizing the CMAR or the owner, nor fall behind thus jeopardizing the subcontractor's own financial stability.

#### **Contract – FAR**

The original contract did not require conformance with FAR rules. When ARRA money was granted, the contract was not modified. In the future, if federal funding requires adherence to the FAR, this should be clearly specified in the original contract or by modification if it occurs after execution of the original contract.

#### **Pay Application Review Process**

I agree with the auditor that a strict formal process should be in place, and be faithfully executed by all parties.

Due to the possibility of calculation errors in pay applications, it may be appropriate that a “live” copy of the pay application spreadsheet be reviewed by all parties at the outset of each new project, to assure that it complies with everyone's expectations and interpretation of contract requirements.

After pay applications were approved and certified, the Navajo Nation made subsequent deductions from the approved amount based on a further review, and then paid a lesser amount. Every department that will review a pay application should do so before certification. Then, the amount paid should match the amount certified.

#### **Navajo Nation Corrections Department Personnel Skill Set**

It may be desirable for The Navajo Nation to have a Design and Construction Department with the skills required to manage projects undertaken by the Nation. It

is unreasonable to thrust a user group like the Corrections Department into the role of project oversight.

A good alternative is to outsource this expertise to a professional program manager and vest the responsibility with the PM. I believe that this approach is preferable for the time being. It can provide a high level of expertise that can be engaged only when needed. A program manager must be given the authority necessary to manage the project, or results will be unsatisfying.

Arcadis is a widely respected program manager. However their oversight of the pay application process was not rigorous enough to catch any number of errors subsequently discovered by the auditor.

### **CMAR Contract Negotiations**

Negotiating labor and equipment rates serves multiple purposes. Once the negotiation has taken place, there should be no further need for discussion so long as the rates are applied correctly. Negotiated rates should be such that the CMAR covers his risk that actual costs may be higher, while the owner covers his risk that the CMAR may not maintain tight enough control on cost, or might charge rates that are not equitable.

Rates for labor and equipment used in remote locations like the reservation will naturally have higher values, reflecting increased risk and inefficient utilization of labor assets.

## **Part II – Change Orders**

### **Change Order Audit**

While a construction audit looks at all aspects of a project, it normally pays particularly close attention to the change order *process*. The draft auditor's report did not address this area of the project.

Change orders are usually a complex sub contractor driven process. These scope and cost changes are best reviewed at the time they occur. It is my understanding that Arcadis as the owner's representative performed a normal and customary review of these changes, assisted by the architect DMA.

Changes are difficult to scope and price. Looking at any individual change in hindsight is likely to present a picture of fuzzy scope and a price that was over or under actual cost. But when the hundreds of changes that occur on a project are taken as an aggregate a much more balanced representation emerges.

A better picture of the change orders for both projects became apparent after my review of the PCO logs and a subsequent interview with Glenn Trice of Okland and Tim Bland of Arcadis. My observations are described under Direct Expenses below.

### **Change Order Philosophy**

In the old school world of competitive bid, the change order may have been the only way for a contractor to become whole after bidding a project below its cost in order to win the work.

Times have changed. For many reasons, we recognize that competitive bid is not the best delivery strategy to achieve either low price or fair value for the owner.

Similarly, the modern CMAR is a far cry from the contractor of yesterday. He is much more sophisticated and customer focused. Today's project delivery methods and pricing strategies have improved commensurately.

Most of today's sub contractors actually dread the change order process. Studies have shown a correlation between *reduced* change orders and *higher* profit, not the reverse. Small changes are particularly troublesome, because administrative expenses and the risk of unintended consequences can make just breaking even on small changes a challenge. Naturally contractors try to compensate for these unknown factors when possible. This may lead to increased cost to the Owner when compared to what the same work might have cost had it been included in the project from the beginning.

Changes are equally undesirable to Designers who find it difficult to be compensated for their costs let alone the added risk that is created and assumed.

Of course the irony here is that changes are not advantageous to any of the parties. This is why integration and collaboration between Owners, Designers and Constructors has become essential to reduce the level of changes and associated risk experienced during construction.

### **Indirect Expenses**

For both of the subject projects, CMAR fee and tax miscalculations as well as several other accounting errors led to a somewhat skewed project cost. It also must have resulted in inaccuracies through the change order process.

As a result of the auditors report, many of these items have been identified by type and specific instance. All need to be reconciled, resulting in a corrected overall GMP and Final Pay Application(s). I cannot speculate about what the root cause of these errors was, but clearly there was a lack of attention to detail and internal accounting quality control.

Changes in process must be put in place to ensure that all accounting procedures and calculations accurately reflect contractual requirements for future projects.

### **Direct Expenses**

Contract Modifications are a downstream representation of an increase in the scope and cost of the work.

The scope of my review did not encompass a detailed financial review of every line item on the CMAR's PCO Log. This would have required several hundred hours of investigation and likely would not have provided a benefit commensurate with the expense. However I did review each item in enough detail to understand its genesis by type. I also asked spot check questions of Okland to better understand items that were not clear to me. I had a subsequent discussion with Tim Brand of Arcadis who explained that schedule and scope changes were at the root cause of many items.

While the change order process, seemed to be well ordered and comprehensible I did not review the level of information necessary to verify the accuracy of specific PCO items of scope and cost.

Arcadis as the Owner's Representative and DMA as the architect of record reviewed all PCO items to ascertain whether they were legitimate additional scope and that pricing was fair and equitable. This process should have uncovered whether any of the PCO items were defined by the intent of, or were reasonably inferable from the original construction documents, and thus not scope increases.

The CMAR was not able to provide me with an editable spreadsheet with which to sort the various PCO costs. Therefore, the figures cited below are approximations based on my personal categorizations, and are only intended to reflect an order of magnitude rather than a precise accounting of how costs were distributed.

## **Tuba City**

### **Owner**

A large portion of the owner generated change orders contained in the PCO Log reflect scope transferred by the owner to the CMAR for management and implementation.

• Assumption of work normally managed by owner	
○ Site and Off Site Utility and Roadways	\$1,916,514
○ Testing, Inspection & Fees	\$136,307
○ Relocation of Existing Uses	\$826,218
○ Owner FF&E	\$1,164,000
○ IT	\$55,253
○ Phones	\$30,739
○ Dispatch Eq.	\$7,973
○ Frontier Communications	\$130,000
• Addition of Builders Risk insurance	\$72,247
Sub Total	\$4,339,251
The remainder of owner directed scope were smaller items	\$225,000
Contractor Contingency	(\$1,936,126)
<b>Architect managed ASI, RFI and Submittals</b>	<b>\$849,489</b>

Changes instigated through the ASI, RFI and Submittal process equate to roughly 1.7% of the GMP. Traditionally this number has been as much as 3% however some institutional owners are now requiring by contract, that it stay below 2%. I think that this is a reasonable expectation.

Although we would always like to see this number be lower, given the impact of scope increases and the ARRA impact on schedule, 1.7% is a reasonable number.

## **Crownpoint**

### **Owner**

A large portion of the owner directed change orders contained in the PCO Log reflect scope added or transferred by the owner to the CMAR for management and implementation.

• Assumption of Work normally managed by the Owner	
○ State Highway 371 Improvements	\$671,359
○ Testing and Inspection fees	\$96,273
○ Builders Risk Insurance	\$91,426
○ Communications Allowance	\$185,000
○ Owner FF&E Allowance	\$1,148,000
○ Water	\$40,000
○ Power Line Extension	\$75,544
○ Off-Site Communications Procurement	\$166,444
○ Off-Site Power Line Extension Allowance	\$644,549

Contractor Contingency

(\$1,700.914)

**Architect managed ASI, RFI and Submittals**

**\$1,176,185**

ARRA funding prompted scope increases and redesign at Tuba City. The incremental vesting of funding resulted in schedule related impacts. This required that some packages be created on short notice and released prior to full completion of documents. At Tuba City there was an owner driven emphasis on meeting schedule targets necessary to maintain the ARRA funding. The consequential shift of resources by the design team while necessary was detrimental to the timely application of lessons learned on Tuba City to Crownpoint. This is partially responsible for the nature and quantity of ASI, RFI and submittal generated PCOs at Crownpoint. The cost of these changes approaches the 3% threshold and as such is high.



## **Part III – Organizational Performance**

### **The Navajo Nation**

The Navajo Nation hired Arcadis, a highly qualified and reputable international program management company as their representative. The Nation also hired a qualified design team led by DMA architects and a qualified CMAR, Arviso/Okland.

Despite the qualification of the design and construction team, the Navajo Nation retains a responsibility to oversee its professional managers, architects, and consultants. Presently, the Navajo Nation does not have the internal organization, experience or expertise to perform this function adequately.

Anecdotal “evidence” suggested that project communications may not always be carried out internally or externally on a timely enough basis by Navajo Nation departments. This increases the likelihood of misunderstandings, increased team risk and higher cost for design and construction projects.

### **Design and Engineering Services**

DES was originally involved in both the Tuba City and Crownpoint projects, but transitioned out after the hire of Arcadis and acquisition of ARRA funding by the Department of Corrections.

The Nation could benefit from an internal group capable of providing program management services and capable of evaluating projects from feasibility and budgeting through design, construction, operations and maintenance. While this approach will lead to self-sufficiency adequate to eliminate the need to hire an outside program manager, it is a choice that should be made only after a cost benefit analysis. I suspect that for the time being, continued outsourcing is the best strategy.

The Nation could also benefit from having its own building department capable of plan review and inspection services. A Navajo Nation fire marshal would also be helpful to design and construction teams working for the Nation. Most other tribal communities support these functions. However, the workload generated by design and construction on Navajo Nation lands may not justify the investment required at this time.

### **Department of Corrections**

The Department of Corrections is what the design and construction industry refers to as a *user group*, in other words, those who will be the ultimate occupants of the facility.

The Department of Corrections was thrust into a position of leadership in part due to their sense of responsibility for stewardship of the ARRA funding. However, it is unusual to expect a user group to be equipped with the experience and expertise necessary to manage projects. They along with the architect and construction manager failed to identify accounting errors in the pay applications.

## **Department of Justice**

The Department of Justice fulfills a user group role similar to that of the Department of Corrections. Like DOC, they should not be expected to take on the additional responsibility of project management.

## **Professional Consultant Team**

### **Arcadis**

Arcadis served as an owner's representative and program manager for the concurrent projects in Tuba City and Crownpoint.

Arcadis assisted the Navajo Nation in solicitation and selection process for an architect, selecting DMA.

Arcadis seems to have managed the solicitation, programming, design and construction process adequately, with the important exception of financial oversight. Arcadis originally identified the CMAR "fee on fee" error and brought it to the attention of the CMAR. The CMAR claims to have corrected this error, but for unexplained reasons reverted back to the error on pay applications.

After the early attempt to correct the CMAR fee, *no one* discovered the miscalculated fee, tax, retention and labor rate discrepancies on pay applications. The architect certified the pay apps only after the DOC and Arcadis had reviewed them. This strongly suggests that a closer look is essential on all future projects.

### **Dyron Murphy Architects**

Dyron Murphy Architects appear to be a professional organization. The buildings they have designed for the Navajo Nation in Tuba City, Arizona and Crownpoint New Mexico are competently done.

I have an appreciation of what DMA experienced. I would offer only a few suggestions for possible improvement. These observations don't apply to DMA in isolation, but apply to the entire owner, management, design, and construction team.

- Programming was not as sharply focused as it could have been, and for a time allowed an increase in scope and cost that included wants and wishes rather than needs and requirements.
- Navajo Nation user group personnel changed throughout the process. Anecdotally, as much as 75%. This shift may partially explain the difference between programming and design decisions, and dissatisfactions expressed by the current occupants.
- DMA did not possess deep experience and expertise in justice building typologies. Even with programming and justice consultants, there seems to have been a steep learning curve by DMA.
- The arrival of ARRA funding instigated scope increases, redesign and schedule impacts. Incremental funding also affected schedule goals and necessitated some packages being released prior to full completion. This

appears to be partly responsible for the quantity and nature of ASI, RFI and submittal generated PCOs.

- If the Navajo Nation maintains the same team for the Chinle project, the lessons learned on the first two projects should significantly reduce design and construction issues at Chinle.
- The architect's oversight of the pay application process did not uncover any of the errors described in the auditors report. An assumption of accuracy by the CMAR cannot be made. It must be verified.

### **Arviso/Okland – CMAR**

The projects had complex programs, diverse users, and at Tuba City, split funding combined with remote locations and difficult labor requirements. Despite these challenges, the general quality of construction is good.

Arviso/Okland asserts that it is committed to a long-term relationship with the Navajo Nation as a client and is also committed to addressing all legitimate warranty issues on a timely basis.

The noteworthy blemish on their record is the miscalculation of CMAR fee, Navajo Nation tax, retention percentages and variances in labor and other contractually scheduled charges. These errors resulted in an incorrect stating of the GMP and pay application amounts. At a minimum, this clearly calls for internal changes in accounting processes and practice.

### **BIA**

The BIA, who did not participate during programming, and performed a review late in the process after Substantial Completion. At their request a number of changes were made at this time. This is an inefficient way to incorporate BIA requirements, some of which were reportedly not contained in any agency document.

Building occupants reported that the BIA had not adequately provided funding and staff to deliver operations and maintenance to the facilities. I did not verify to what extent these assertions are accurate or not. The Navajo Nation however should pursue clarifying their relationship to the BIA regarding obligations for operation and maintenance support.

## **Part IV – Evaluation of Warranty Claims**

### **Quality of Construction**

The overall quality of construction for both the Tuba City and Crownpoint facilities is good. With a few exceptions, the fit and finish of building systems and components is good.

Nonetheless the users of each building have identified a number of concerns. These issues stem for one of several sources and fall into several *cause/source categories*: Programming, Design, Construction, Operations & Maintenance and Warranty. This method of classification is the result of an analysis of issues found on my own projects over the years, and thus is a personal view, not an industry accepted metric.

Daniel Colello from the Auditor General's office and I walked through the Police and Corrections facilities in Tuba City, and the Police facility in Crownpoint. We interviewed the staff of Corrections at Crownpoint about items listed on the auditor's notes. Our purpose was not to provide an exhaustive list of issues requiring attention, but rather to get an impression of the type, source and seriousness of issues identified by staff.

Warranty issues must be documented by the Nation and submitted to the CMAR. I would suggest a thorough joint walk through to review all known issues. After discussion with the CMAR, I have no reason to believe that all legitimate issues will not be taken care of. In fact that process has already restarted.

*Clearly the lack of resolution to retention and final payment has adversely affected the sub-contractors willingness to address warranty issues expeditiously.*

### **Programming**

- Programming issues are things the users would like to have seen included in the project but were not communicated to the design and construction team during the programming phase of the project. This tends to occur for several reasons most of which are *process* related.
  - The ultimate users may not have participated fully in the programming process. To the extent they did participate, they may not have taken responsibility for defining everything they needed. *(Example: Secure plumbing access panels capable of operation by one man)*
  - The Owner's leadership and owner's representative may lack the experience to identify every feature required by these facilities. In this case there was a programming consultant who was a justice expert, but even so, all the questions necessary to elicit the information may not have been asked. *(Example: Salle-port not sized for ambulances)*

*It is important to understand that even when an owner hires a professional representative, the responsibility for outcomes ultimately*

*still rests with the Owner.*

- Due to budgetary or other constraints the design and construction team may omit specific requirements from the final product. This may occur with or without owner knowledge and explicit acceptance.

*Programming relates to a number of user complaints at both Tuba City and Crownpoint.*

*The users occupying the building feel that various aspects of the facility do not function the way they would like. However these items were not in the program and therefore were not included in the design or the contract for construction. High staff turnover resulted in few of those involved in programming actually occupying the building. This combined with hindsight, is the underlying source of many complaints. This is not to say that they are invalid.*

*Due to the fiduciary responsibility for the project by the OAC team, there is a strict process for request and approval of any change or addition. This process should be made clear to the users by the OAC team. Informal verbal requests cannot be recognized.*

## **Design**

- Design issues are created when the design team incorrectly interprets information specified by the program. This rarely occurs intentionally.
  - The program does not specify how to make every design decision. When questions arise during design, it is important for the designers to have access to the users so that clarifications can be sought. This follow up does not always occur. *(Example: inappropriate hardware sets in an unusually high number of locations)*
  - Often users are restricted from participating at this phase due to a (realistic) fear that they will increase scope by adding a wish list of additional requirements. *(Example: limited number and location of swipe pads)*

*For both of the projects, design decisions were made for good reasons, after much consideration and debate, based on programmed goals and priorities. Building occupants have subsequently disagreed with some of these decisions without understanding the logic behind them. A high level of staff turnover between programming and building occupancy has contributed to the level of misunderstanding. Ultimate user participation throughout design lessens the likelihood of such misunderstandings.*

*The current user leadership now occupying the buildings understand*

*this, and have made numerous contributions to the next project in Chinle based on their experience.*

- Designers and their consultants may believe rightly or wrongly that they know better than the users, what is best for them. I found little evidence of this.
- Design issues also occur due to errors within individual system designs as well as how these systems interface with each other. *(Example: Potential Sequence of Operations conflicts between fire protection and security systems)*

## **Construction**

- Construction Issues are created when the intent of the construction documents is incorrectly interpreted and/or executed.
  - In a sufficiently collaborative environment the CMAR and his sub contractors may question various aspects of the construction documents, even during construction as a final filter to catch errors or find better solutions.
  - Construction is fundamentally the assembly and installation of a multitude of building systems. Most construction (and for that matter design) issues arise at the interface between differing systems.
    - Products and components may be faulty due to a manufacturing problem that is undetectable at the time of installation. *(Example: Security gate hydraulics)*
    - Field labor may not install an item in accordance with the intent of the drawings, specifications and manufacturers recommendations. *(Example: Kitchen emergency gas shut off valve)*
    - Damage may occur to components during installation that is not recognized at the time, but which surfaces later under use. *(Example: Rough edges on handicapped hardware set)*
    - Failure of systems or equipment after closeout, due to previously undiscovered product, material or installation flaws. *(Example: Fire Pump Leak)*

*These factors account for most of the construction warranty issues experienced on the project. This is normal and the team must simply work through the process of evaluating and remedying each issue.*

## **Operations & Maintenance**

- Proper Operations and Maintenance is essential for the use of all building systems.
  - Operational training for the use of building systems is essential. Operations training was provided (twice) and recorded on video for later re-use by the users if necessary. *(Example: operational*

*procedures for HVAC and security systems.)*

*My impression is that some staff members don't thoroughly understand how to operate various systems, and have not taken the initiative to use the videos provided to inform their understanding.*

- A maintenance program is necessary for every facility, along with the funding required to execute it. Some items brought to our attention were due to insufficient maintenance. *(Example: water buildup in the back trough and leaks underneath the housekeeping slab in the Tuba City Corrections laundry, due to lack of daily lint trap cleaning.)*

*Operations and maintenance procedures, funding, and staff are not completely in place at either facility, most notably at Crownpoint.*

- A Capital Replacement Plan is required for every facility. It should annually allocate in the neighborhood of 3.5% of construction cost toward the ultimate replacement of building systems over time. This plan must also contain a schedule that specifies the expected lifespan of each system and a strategy for its preventive maintenance, repair and replacement. *(Example: the need for additional swipe-cards is the responsibility of the Nation. 50, were supplied by the contractor as required by the contract.)*

*Neither the plan nor the funding appears to be in place for either facility. Without the right personnel, training, operations and maintenance procedures as well as a capital replacement plan, the Nation can expect these buildings to deteriorate steadily over time. (Example: Failure to change filters can void warranties and shorten the lifespan of HVAC equipment.)*

## **Warranty**

- As a part of the closeout procedure for every project the OAC project team goes through a punch list and commissioning process to verify that all systems are installed and functioning properly. Despite this effort, every project has a number of issues that crop up afterwards during initial use and shake down of the facility. The one-year warranty period is used to correct these issues. Contractually, all such issues must be brought to the attention of the CMAR in writing.

*This applies to most of the construction warranty issues experienced on the project. The contractor must address warranty issues, as long as written notice has been provided during the warranty period. In my conversations with staff and the CMAR it appeared that some issues had not been communicated in writing, if at all.*

The entire OAC team seems committed to address every legitimate warranty issue experienced by staff. Each warranty issue must be submitted in writing to be contractually binding. The CMAR maintains warranty issue logs for both projects and these should be shared with all team members.

Delay in resolving final payment persuaded many sub contractors that their only recourse was to withhold warranty service until payment was made. With this resolved, I expect that warranty items will be addressed promptly.