



Infrastructure Challenges Establishing the Canadian Air Wing at Kandahar Airfield, Afghanistan

Jun 2008 – Sep 2009

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KAF Infra Program Manager



Outline



- Background/Aim
- Requirements – Concept of Ops
- A4 CE Infra Reach Back Support
- The Players
- SOR/OA
- Concepts/Budget/Schedule
- Construction Photos
- Challenges
- Conclusion



Background



- Government of Canada (GoC) motions to extend Canada's Afghanistan mission to 2011.
- GoC approved the recommendation of the 2008 Manley Report for helicopter support to Joint Task Force Afghanistan (JTF-Afg).
- Canadian Helicopter Force (Afghanistan) (CHF(A)) and Canadian Heron Unmanned Aerial Vehicle Detachment (Afghanistan) (CHUD(A)) were formed to provide Commander JTF-Afg with aviation effects for mobility and force protection operations.



Aim



→ A4 Construction Engineering tasked to manage and implement the construction of infrastructure to support new Cdn aircraft being introduced to Afghanistan.



Requirements / Constraints



- No surplus ramps and facilities available within Kandahar Airfield to accommodate the new Canadian Forces aircraft
- Continual growth of operations and competition among participating nations makes it extremely difficult to secure any existing infrastructure, even for very short periods of time
- Loss of the new aircraft capability will reduce transport, intelligence, surveillance and reconnaissance capabilities
- Degradation of these capabilities will reduce the operational effectiveness of all multinational forces in Afghanistan, and those of the Canadian Forces in particular



Requirements / Constraints



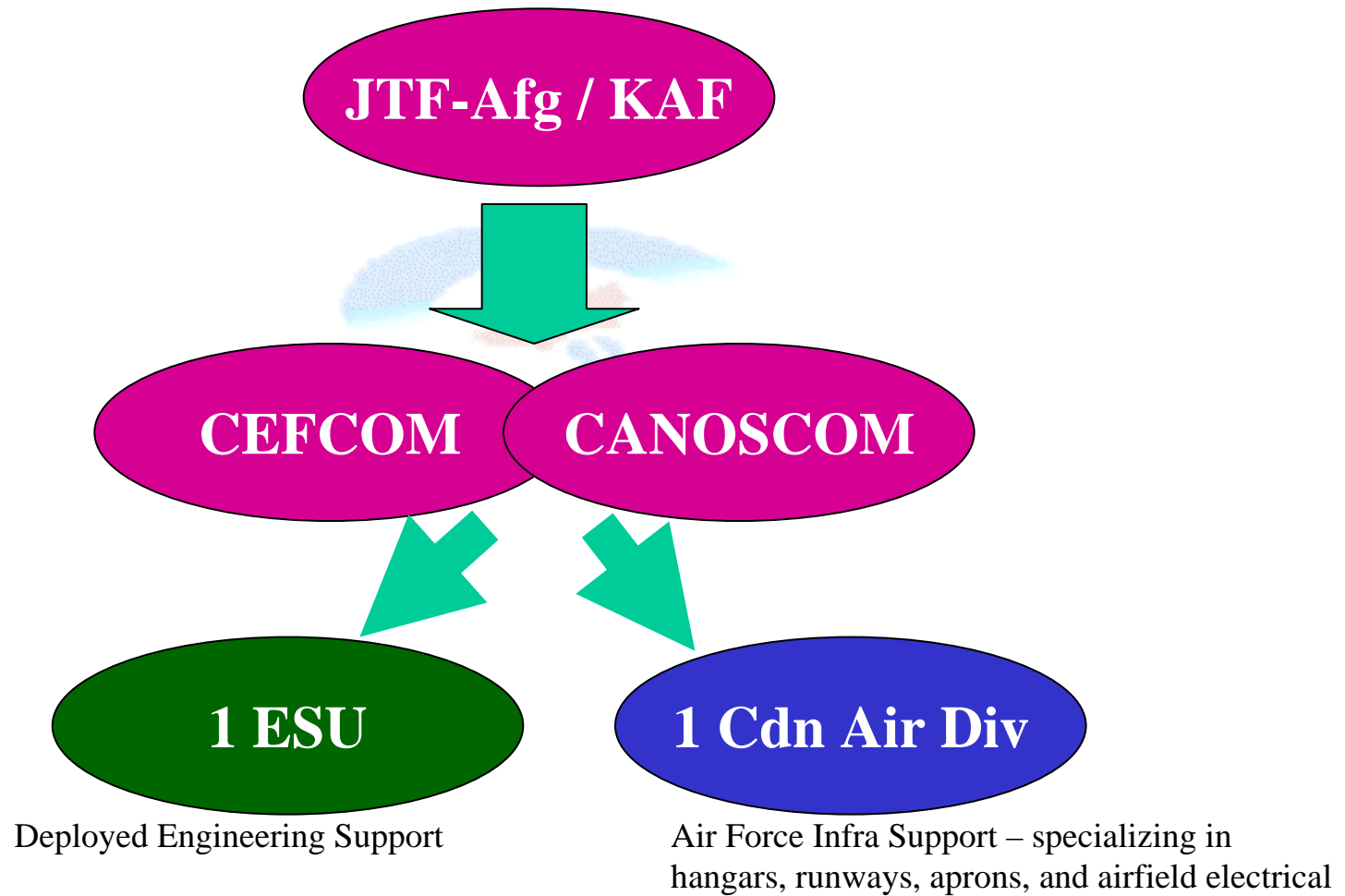
- Allocated real estate could be / was reassigned if nation did not act quick enough
 - If you don't build soon, we'll give it to some one else
 - Lengthy Canadian approval process for infrastructure – 12+ months

- No infrastructure was approved with aircraft announcement
 - Had to progress independent projects to obtain approvals

- New infrastructure must capitalize on “deployable” to meet the intent to depart AOR in 2011



Reach Back Support



Base \cong Expeditionary





Infra Program



- Development plan approval (*NATO*)
- Charter (*mutually draft, Div sample*)
- SOR (*Overall Infra “program”*)
- Options (*MRADP Update*)
- Projects (*NATO design template, ICAO standards*)
 - management approach
 - schedule reviews



Base \cong Expeditionary

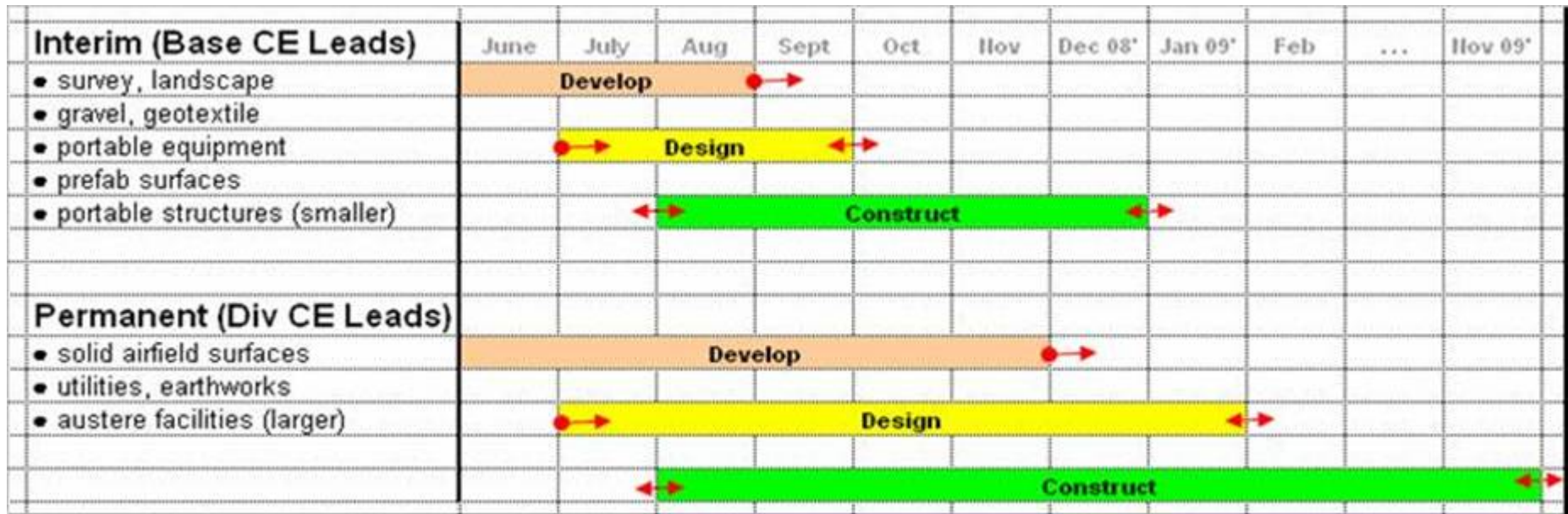


8 Wg Trenton "The new AF Infra Mgt Standard"



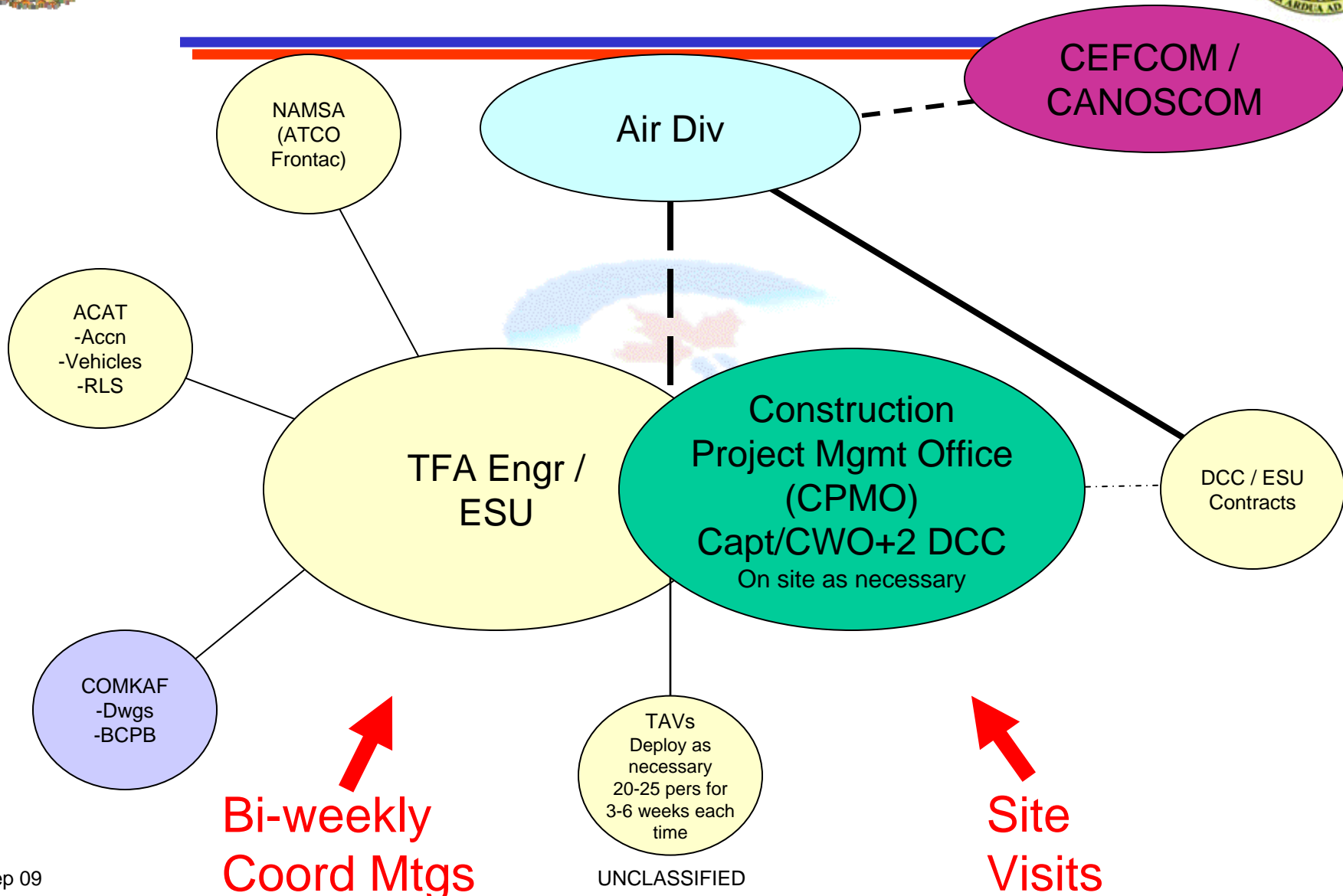


Schedule (Program)





Management Team





The Players



- Six CH147D Chinook
- Four unmanned aerial vehicles from Project NOCTUA
- Eight CH 146 Griffon
- Others TBD?





The Players



- Six CH147D Chinook
- Less defined project
- Canada had given up Chinooks 10+ yrs ago
- Not sure of full infra requirements
- Minimal proposed layout, had to start from scratch
- Organization being created in theatre as developed
- Continually growing requirements





The Players



- Four unmanned aerial vehicles from Project NOCTUA
- Well defined project
- \$2M for infrastructure identified with project
- PMO well engaged with contractor to develop level of service required
- Came to table with proposals, that could be adjusted to meet available real estate





The Players



- Eight CH 146 Griffon
- Late to the table, initially not approved, but then later added to the SOR
- Requirements understood, but how were they to integrate with CH 147D?
- GoC had not approved, so could not be included in the MND SS(EPA) approval for infra
 - Had to handle separately
 - Additional delays to ordering hangers, etc





Statement of Requirement



- ➔ 52 000 m² of ramp, taxiway, and hangar flooring (concrete surface) capable of supporting aircraft storage and operations.
- ➔ Erection of 5 relocatable Hangars for aircraft maintenance.
- ➔ 100 ISO Containers to be used as office, workshop, and headquarters areas.
- ➔ Large shipping containers to be used as relocatable office and storage facilities.
- ➔ Concrete bunkers and fencing to protect personnel and equipment.
- ➔ Deployment of temporary personnel to manage the construction.
- ➔ Required utilities and communication facilities as the current location is not serviced.



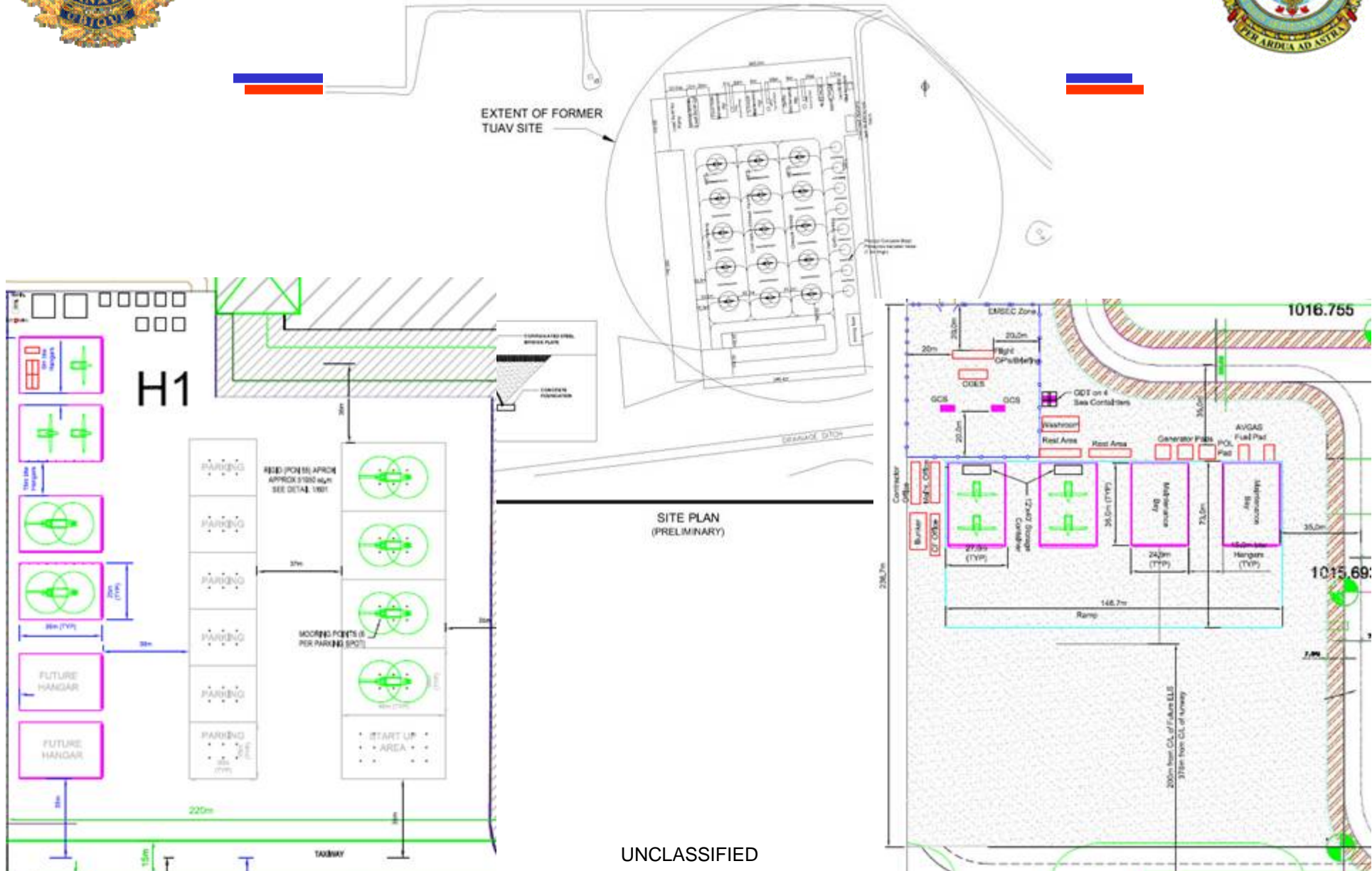
Considerations



- Relatively short timelines for implementation.
 - Projects identified in Apr 08, and need to accept delivery of UAVs and helicopters by Dec 08
- Forced to develop temporary and longer term solutions
- Canada's combat mission ends in Feb 2011, so facilities must be redeployable to Canada at the end
- Limited availability of materials, contractors, and labour
 - Canada did not have the forces available to build all the facilities without the support of contractors
 - Readily available in KAF, but also under high demands from all ISAF nations
 - Security access policies continually changing, making delivery of supplies unreliable



Initial Concepts



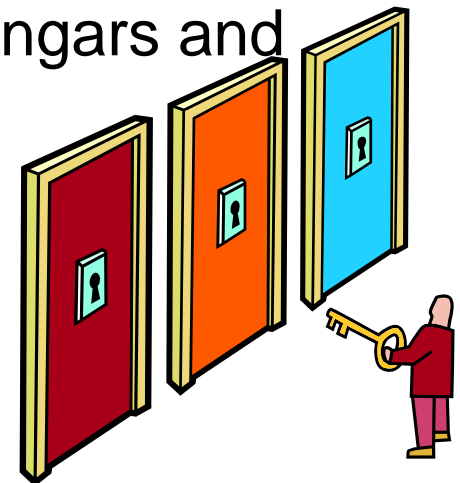
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Options Analysis



- Option 1 – Status Quo – make use of limited existing areas
- Option 2 – Create austere ramp area with deployable airfield matting and associated interim infrastructure
- Option 3 – Construct a concrete ramp, hangars and associated infrastructure





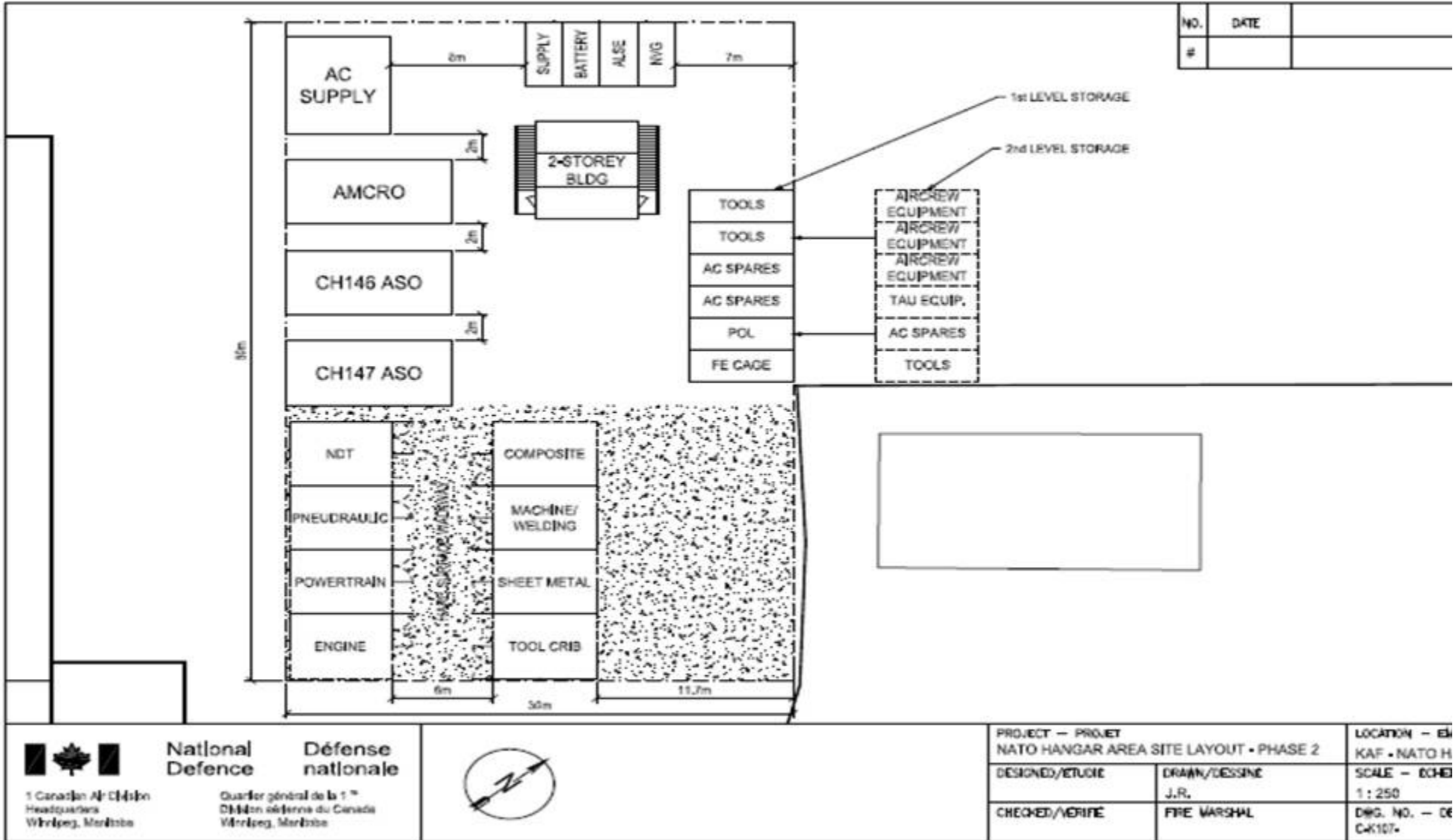
IMLC Requirements



- Temporary (Nov 08 – Jun 09)
 - NATO Area Setup
 - NATO Hgr for Maint (as reqd/avail)
 - Shop Sets
 - Maint Offices
 - QM/Storage Areas (MEX 26, Seacans)
 - SEVs (need to confirm qty/duplication of Shop Sets)
 - TAU Area
 - Sqn HQ
 - Flt Ops
 - Co-located with TAU
- Concerns
 - Power limited, require generators at site



NATO Area (IMLC-Temp)



National Defence / Défense nationale

1 Canadian Air Division
Headquarters
Windsor, Manitoba

Quartier général de la 1^{re}
Division aérienne du Canada
Windsor, Manitoba





NOCTUA Requirements



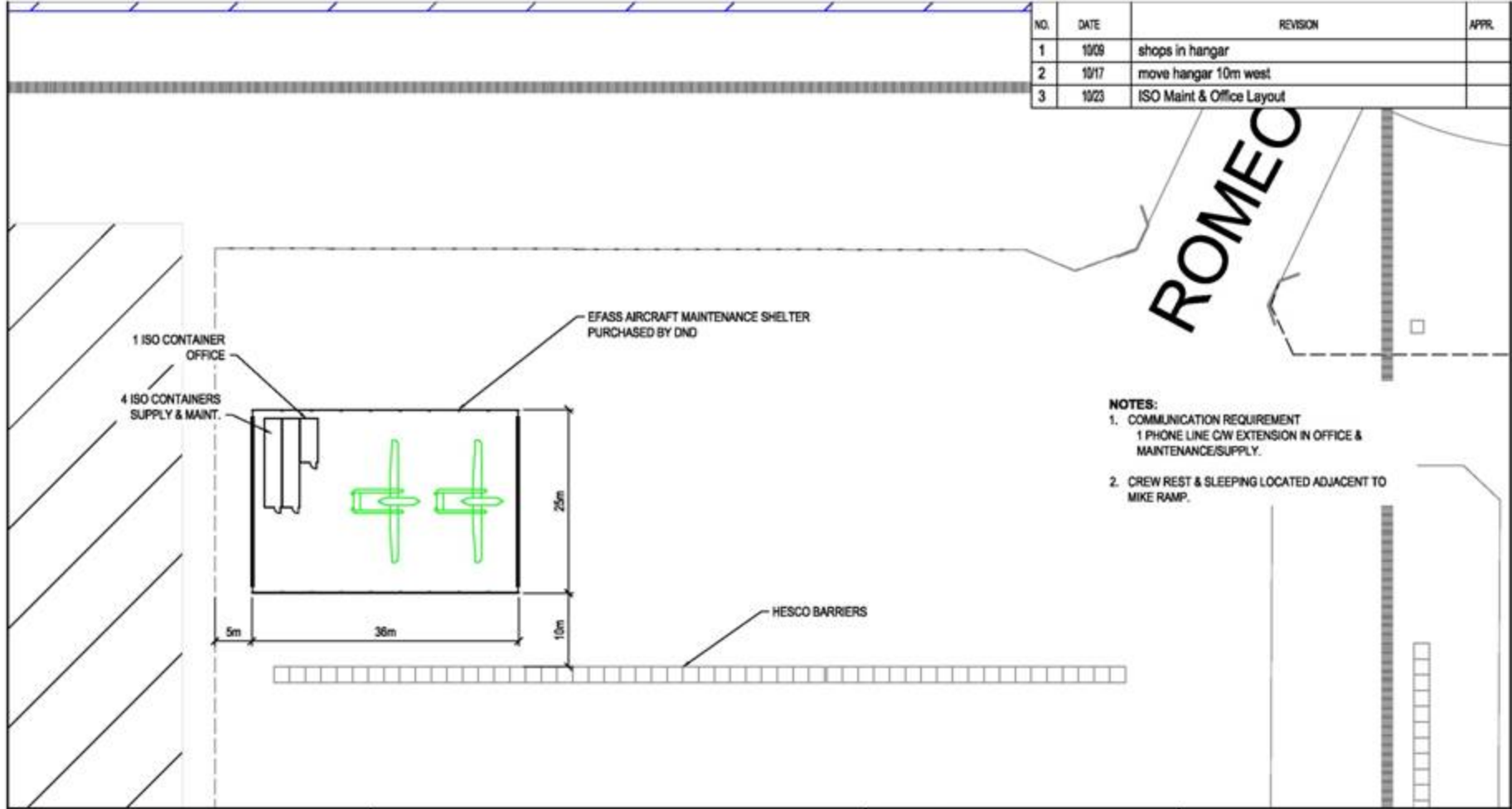
- Temporary (Nov 08 – Jun 09)
 - M Ramp Setup
 - EFASS Hangar for Maint/Storage
 - Maint/Parts Storage ISOs (4)
 - Contractor Office (1)
 - Crew Rest Area (crew qtrs to be used)
 - BFI Area
 - Sqn HQ
 - Flt Ops
 - QM Storage
 - GCS/GDT Setup
 - Co-located with IMLC (Permanent)
- Concerns
 - Power limited, require generators at site
 - Parking space limited due to site constraints



Mike Ramp (NOCTUA-Temp)



NO.	DATE	REVISION	APPR.
1	10/09	shops in hangar	
2	10/17	move hangar 10m west	
3	10/23	ISO Maint & Office Layout	



- NOTES:**
1. COMMUNICATION REQUIREMENT
1 PHONE LINE CW EXTENSION IN OFFICE & MAINTENANCE/SUPPLY.
 2. CREW REST & SLEEPING LOCATED ADJACENT TO MIKE RAMP.

<p>National Défense 1 Canadian Air Division Headquarters Winnipeg, Manitoba</p> <p>Défense nationale Quartier général de la 1^{re} Division aérienne du Canada Winnipeg, Manitoba</p>		PROJECT - PROJET NOCTUA SITE LAYOUT - MIKE RAMP		LOCATION - EMPLACEMENT KAF - MIKE RAMP	
		DESIGNED/ÉTUDE J.R.	DRAWN/DESSINÉ J.R.	SCALE - ÉCHELLE 1 : 500	DATE 2008-10-07
		CHECKED/VÉRIFIÉ	FRE MARSHAL	DWG. NO. - DESSIN NO. C-K107-3001	



IMLC Requirements



- Permanent (Jun 09 – onward)
 - H1 Ramp
 - 2 Hgrs for IMLC
 - Shared space with other Cdn assets
 - Minimal Shop Sets and material storage space available
 - BFI Area
 - Maint Offices
 - Sqn HQ (TBC or remain at TAU)
 - Flt Ops (TBC or remain at TAU)
 - TAU Area
 - TBC?
- Concerns
 - Decision on location of Sqn HQ and Flt Ops required



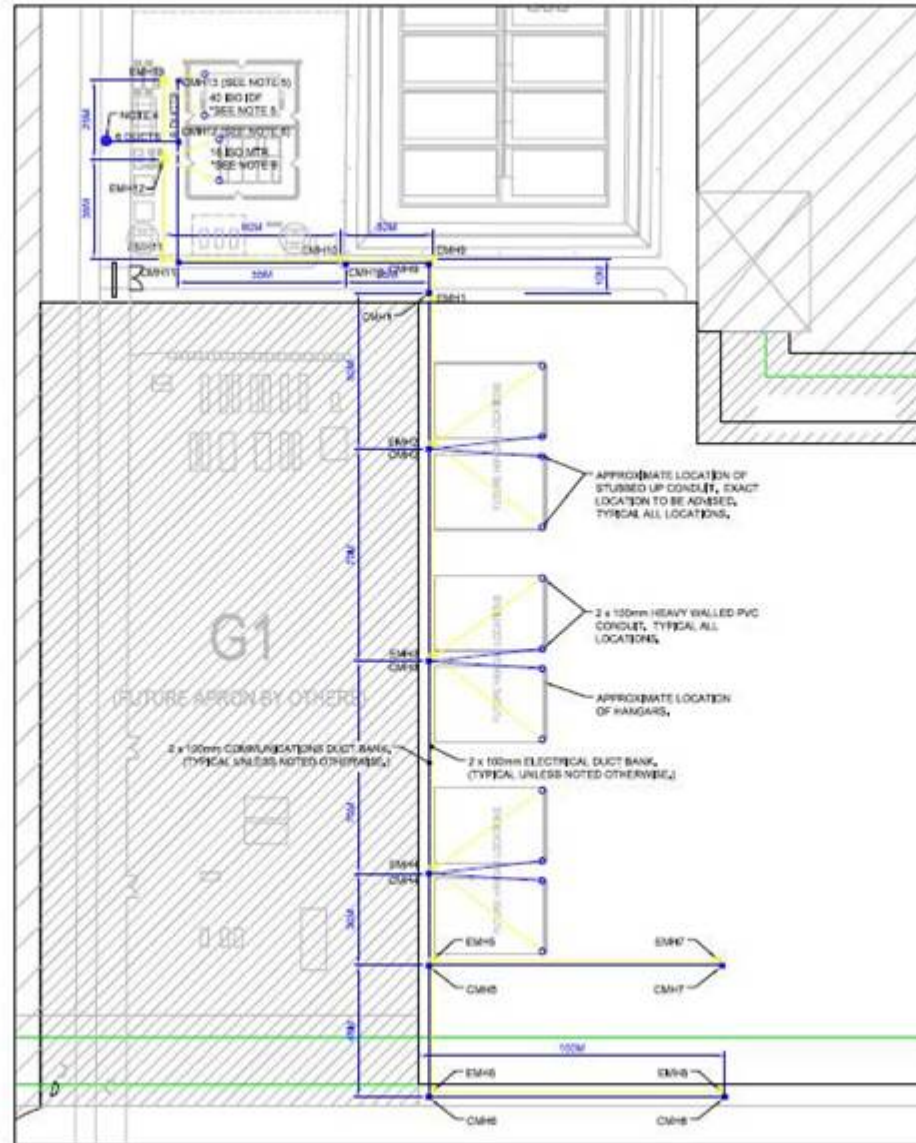
NOCTUA Requirements



- Permanent (Jun 09 – onward)
 - H1 Ramp
 - 1-2/3 - 2 Hgrs for NOCTUA
 - Shared space with other Cdn assets
 - Maint/Parts Storage inside hangar
 - BFI Area
 - No change to Temp Requirements
 - Shared space with other Cdn assets
- Concerns
 - Minimal space available for extra requirements, may have to co-locate 2nd/3rd line storage within Cdn Supply Area



H1 Ramp Conduit Plan



1.001 000000 000000
 1.001 000000 000000

- NOTES
1. APPROXIMATE LOCATIONS OF STUBBED UP CONDUITS, EXACT LOCATIONS TO BE ADVISED, TYPICAL ALL LOCATIONS.
 2. APPROXIMATE LOCATIONS OF MANHOLES FOR ALL SERVICES, EXACT LOCATIONS TO BE ADVISED, SEE DETAILS ON MANHOLES AND DUCT BANKS ON DRAWING 502.
 3. PROVIDE AND INSTALL 6 x 100mm CONDUITS FROM EMHS12 TO TEMPLATED NATO MANHOLE SYSTEM.
 4. APPROXIMATE LOCATION OF NATO CMHS1. PROVIDE 6 x 100mm HEAVY WALLED PVC CONDUITS FROM NATO TEMPLATE MANHOLE TO CMHS1.
 5. PROVIDE 6 x 100mm HEAVY WALLED PVC CONDUITS TO 40 BJO EXF. LOCATIONS TO BE DETERMINED ON SETL.
 6. PROVIDE 2 x 100mm HEAVY WALLED PVC CONDUITS TO 16 BJO MTR. LOCATIONS TO BE DETERMINED ON SETL.



DATE: 14 SEP 2011
 TIME: 10:00 AM
 PROJECT: KANDAHAR AIRFIELD AFHQ

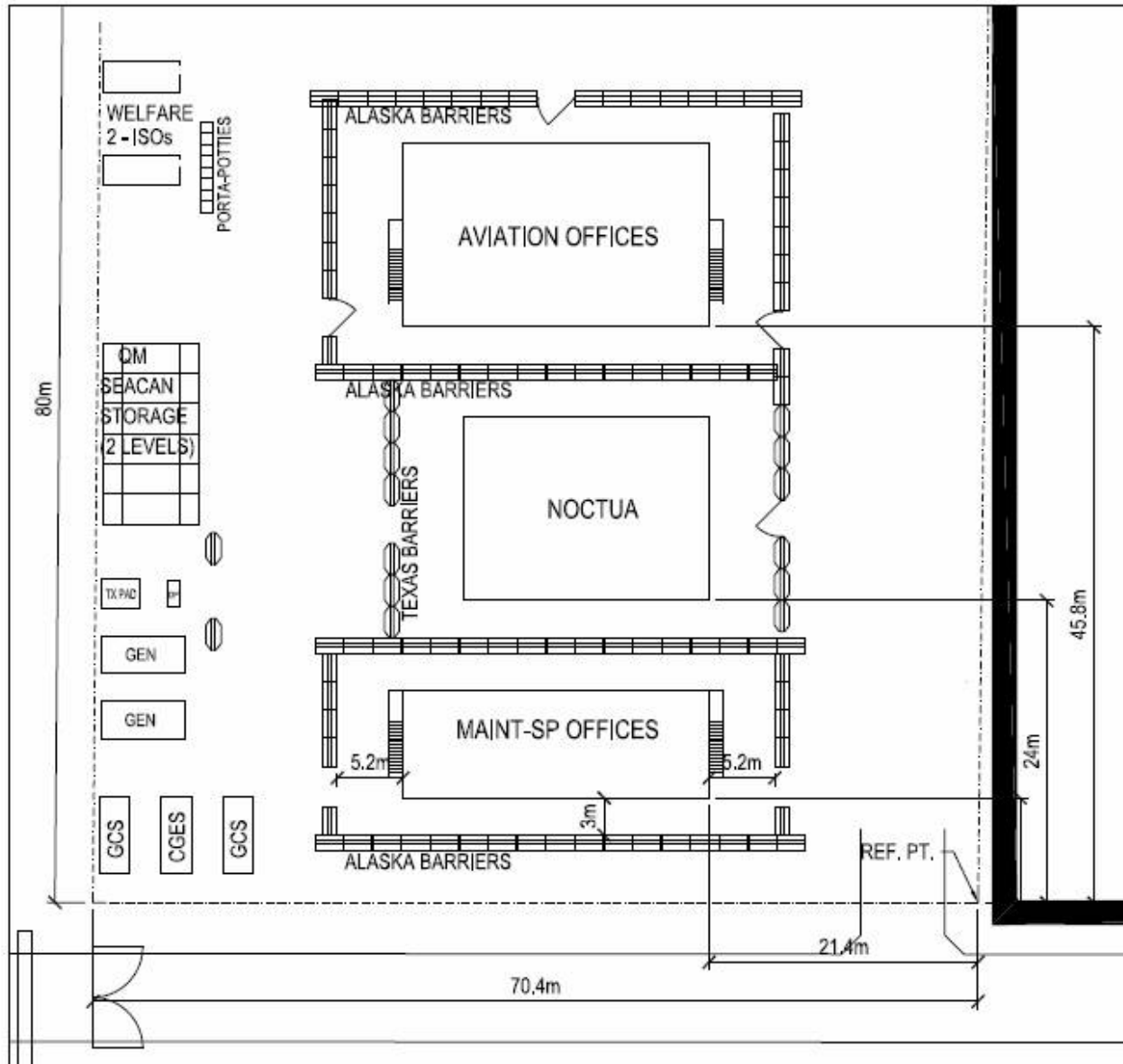
PROJECT: HOTEL 1 APRON CONSTRUCTION

PROJECT: HOTEL 1 APRON CONSTRUCTION

Canada



Bulk Fuel Installation (BFI) Site





Project Budget Breakdown



Project	Total Projected Costs (\$)
Construct Cdn ISR/Avn Ramp	12,123,214
Construct Hangar for UAV	860,000
Construct 4 Cdn ISR/Avn Hangars	7,885,456
Construct Offices for UAV	522,413
Construct Offices for Avn	1,172,317
Site Force Protection Projects	226,588
Site Utilities	1,535,963
Site Communications Facilities	890,914
Construct Accn to house personnel	5,098,232
Total	30,315,098

\$24.7M



Proposed Schedule



Project	Comments	Start Date	Completion Date
Construct Cdn ISR/Avn Ramp	Construct approximately 52, 000 square meters of ramp, taxiway, and hangar flooring (concrete surface capable of supporting aircraft storage and operations)	Feb-09	Jun-09 (Aug 09)
Construct Hangar for UAV	Purchase / construct re-locatable austere hangar to be used for storage and maintenance of the new UAV aircraft	Nov-08	Dec-08
Construct 4 Cdn ISR/Avn Hangars	Purchase / construct re-locatable austere hangars to be used for storage and maintenance of the new aircraft	Apr-09	Jun-09 (Aug 09)
Construct Offices for UAV	21 large shipping containers to be used as re-locatable office and storage facilities	Nov-08	Dec-08
Construct Offices for Avn	70 large shipping containers to be used as re-locatable office and storage facilities	Mar-09	Jun-09 (Sep 09)
Site Force Protection Projects	Concrete bunkers and fencings to protect personnel and equipment	May-09	Jul-09 (ongoing)
Site Utilities	Required utilities and communication facilities, as the current location is not serviced	Mar-09	Jul-09
Site Communications Facilities	Required utilities and communication facilities, as the current location is not serviced	Mar-09	Jul-09 (Sep 09)
Construct Accn to house personnel	Construct accommodations to house additional personnel at KAF associated with the new aircraft and facilities	Mar-09	Aug-09 (ongoing)



NOCTUA/IMLC Timelines



17 Nov 08	MND Approval of SS(EPA) \$24M, DND 8s issued to DCC
24 Nov 08	Tender packages ready for H1 Ramp, Hangars
7 Dec 08	Tender package for 40 ISO Complex, Primary Electrical Dist
3 Nov – 15 Dec	Const TAV (M Ramp, BFI offices, NATO Area Offices/Layout)
Mid Dec 08	M Ramp, NATO Area, BFI office complete
Mid Dec 08	Tender Close for ramp, hangars
5 Jan 09	Tender Award for ramp, hangars
9 Jan – 9 Feb 09	H1 Ramp Design
Early Jan 08	Tender Award for 40 ISO, Primary Electrical Dist
Early Feb 09	H1 Ramp Construction begins
Mid Jun 09	H1 Ramp Ph 1 Complete
Mid Apr 09	Hangars arrive
Jun/Jul 09	Const TAV (H1 Hgrs, MEX 26, Shop Sets)
End Aug 09	40 ISO Complete
Mid Aug 09	Hangars Complete, Shop Set setup (TBC)
Early Sep 09	H1 Ramp Complete
Sep 09	Move to BFI and H1 Area

* All timings contingent on contractor availability

Site Conditions



Equipment



Interim



Test Lane



Apron Construction



Manholes / Grounding



Quality Control



Quality Control



Quality Control



Offices



Offices



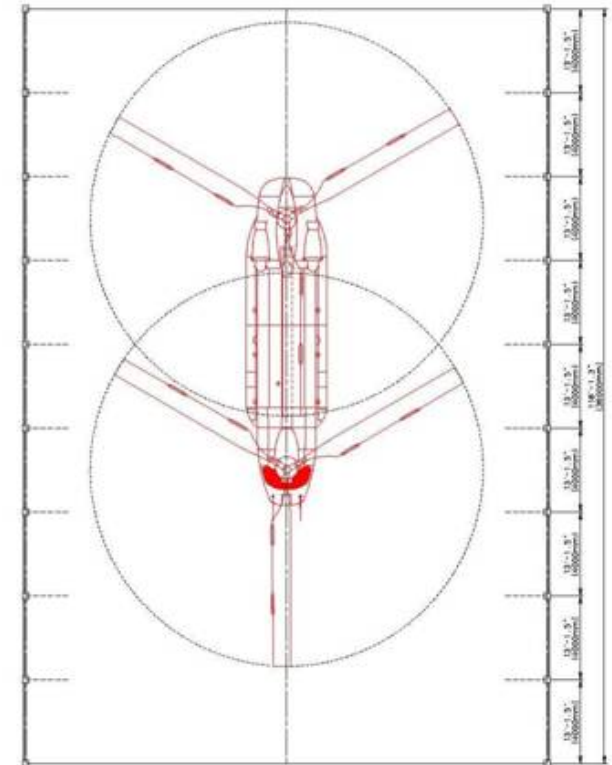
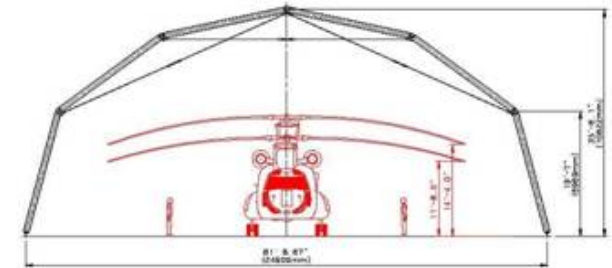
EFASS Hgr





EFASS 25m

81' wide (24.9m) x 119' long (36m)

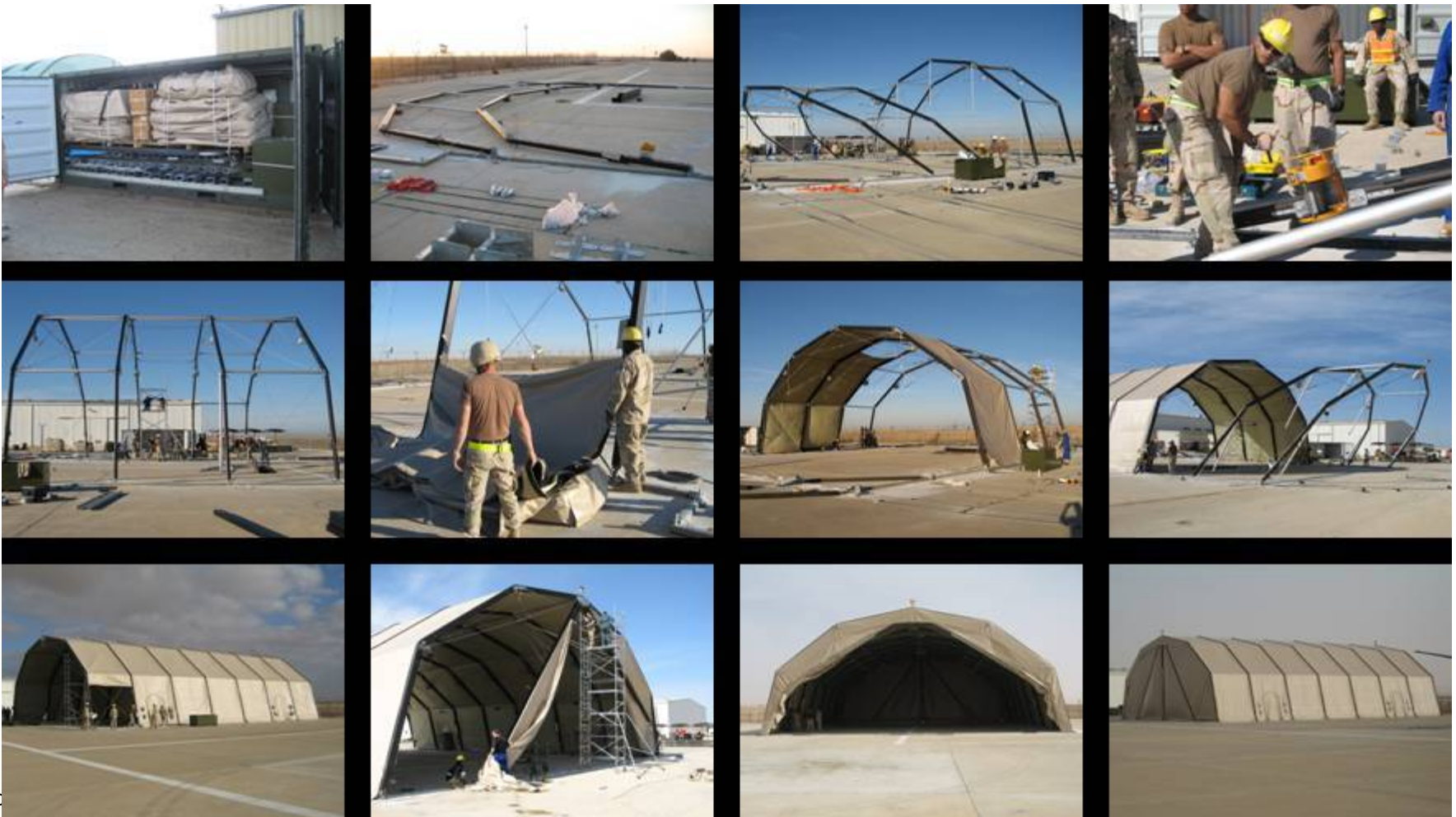




EFASS Construction Sequence



Shipped in one 20' container, erected without cranes



Final Product



Final Product



Final Product



Final Product



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Final Product



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Final Product



2009/08/16 12:05

Final Product



2009/08/16 12:05

Final Product

Hand painted lines

2009/08/15 14:06



Challenges



- Construction delays
 - Security changes – access to KAF
 - Material shortfalls
- Lack of bidders
 - 1 bidder on most projects = higher cost/ less control
- Quality issues
 - Construction standards/techniques
 - Design/build – only option?
 - Phasing – working with Contractor
 - Reduced joint sealing
 - Design Life – Canada in place to 2011? Other users?



Challenges



-
- Relocating operational Air Wing to new location
 - Maintaining operations
 - Minimizing disruption
 - Close coordination with units



Conclusions



- Initial 52,000 m² of concrete ramp and taxiway completed per the design-build performance specification provided.
- Paved surfaces will suffice to meet the full range of intended operational requirements for the foreseeable future.
 - local construction practice and limitations on quality control
 - Advance periodic maintenance
 - periodically monitored for FOD and other pavement distresses
- There have not been any significant issues with the contractor
 - other than expected delays in construction typically caused within a high-tempo operational environment.
- Overall, based on the resulting \$92/m² bid for the complete ramp project, which was 100% lower unit cost than expected, the value for the money was achieved.
- More importantly, the ramp and taxiway are being used extensively.
- Pace of approval, design, and construction unprecedented
 - 14 months (Jun 08 – Aug 09)

Go CE!

Questions?

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