CTA-N Operations Building

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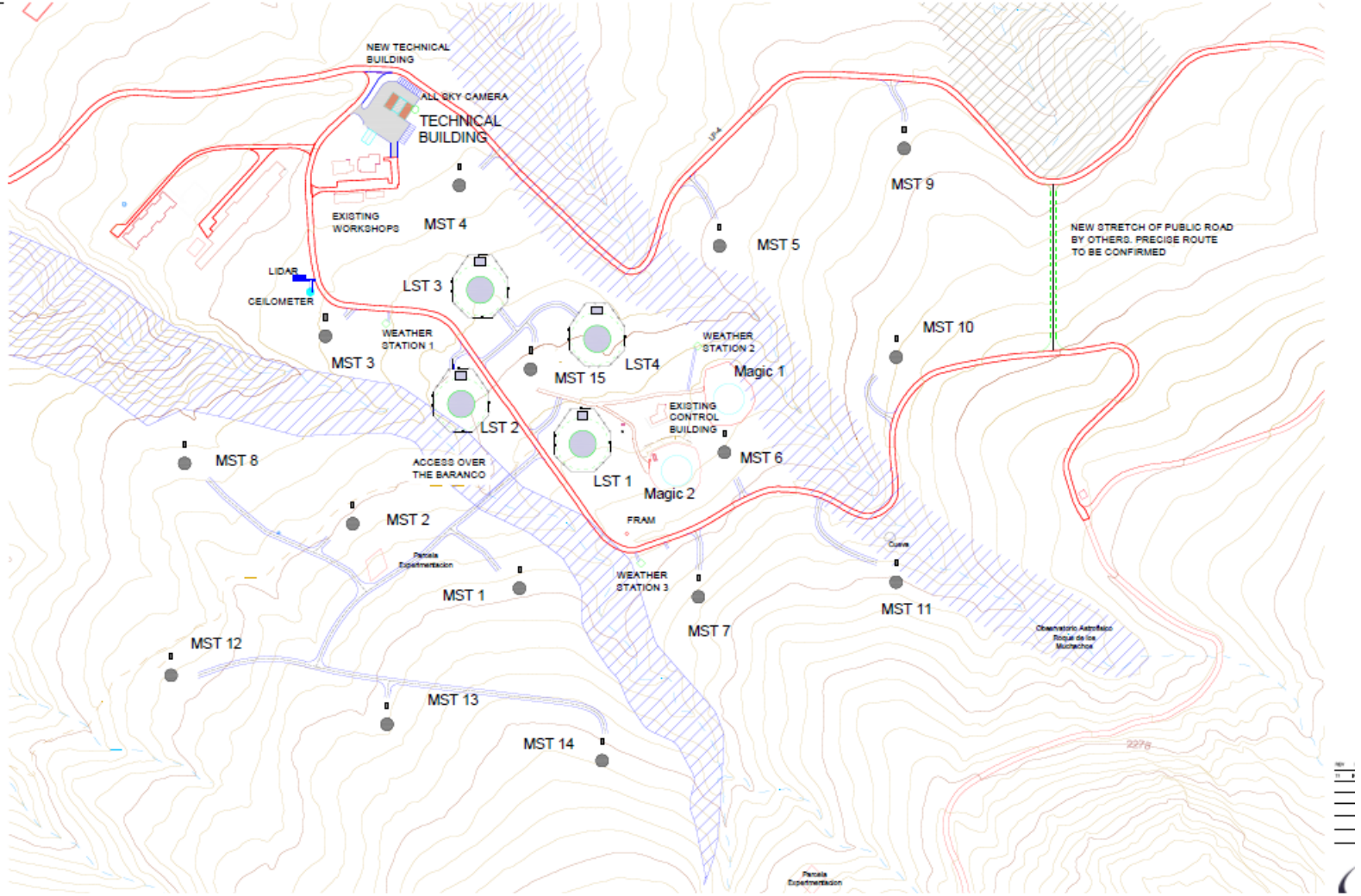
Master Plan


NEW TECHNICAL BUILDING
ALL SKY CAMERA
TECHNICAL BUILDING
EXISTING WORKSHOPS
MST 4
LIDAR
CEILOMETER
LST 3
WEATHER STATION 1
MST 3
MST 15
LST4
WEATHER STATION 2
Magic 1
MST 9
MST 5
NEW STRETCH OF PUBLIC ROAD BY OTHERS. PRECISE ROUTE TO BE CONFIRMED
MST 10
LST 2
EXISTING CONTROL BUILDING
MST 8
ACCESS OVER THE BARANCO
LST 1
Magic 2
MST 6
MST 2
FRAM
WEATHER STATION 3
MST 1
MST 7
MST 11
MST 12
MST 13
MST 14

Project Budget

Concept	EUR
Initial study	6,000.00
Geotechnical study	6 000.00
Environmental impact study	6 000.00
Basic project	12,000.00
Building and civil works project (inc. Safety and Health Study)	42,000.00
Low voltage electrical project (Inc, Safety and Health Study)	4,000.00
Medium voltage electrical project (inc. Safety and Health Study)	4,000.00
Telecommunications project (inc. Study Security and Health)	2,400.00
Subtotal phase of project writing	82,400.00
Building construction management	51,000.00
Health and Safety Coordination of building work	6,000.00
Address of low voltage electrical installation	4,000.00
Health and Safety Coordination of low voltage works	2,000.00
Processing and xpedientes and certifications low voltage	1,000.00
Address of medium voltage electrical installation	4,000.00
Safety and Health Coordination of medium voltage work	2,000.00
Processing of files and certifications of medium voltage	1,000.00
Telecommunications installation address	1,500.00
Health and Safety Coordination of telecommunications works	1,000.00
Processing and telecommunications xpedientes and certifications	500.00
Subtotal phase of construction management	74,000.00
Subtotal	156,400.00
IGIC (7%)	10,948.00
Total	**167,348.00**

ORM Requirements

Any operations at the Observatorio del Roque de los Muchachos (ORM) must comply with the general guidelines and requirements of the observatory, to guarantee the sustainability of the installation at all time.

As a general policy, the construction of buildings and facilities in the observatory should be minimized to only those strictly essential to perform or support the scientific activities. Therefore, the buildings to be constructed should always be optimised, and any activity that is not justified or that can be carried out outside the limits of the observatory should be discarded.

The ORM is located within the outskirt area of the Parque Nacional de La Caldera de Taburiente. This area is classified as undeveloped land under special protection, prohibiting any construction except those of preferential public interest. This classification includes facilities for astrophysical observation. For that reason, the IAC direction and the ORM administration request that the CTA Operations and operations Building should be adapted to just the essential activities required for the operations of the CTA North observatory, minimizing impact, volumes and areas.

The operations of CTA North shall be supported whenever it is necessary with working spaces at sea level: such as in the CALP, or in the future CATELP building in Los Cancajos (Breña Baja), including administrative offices, warehouse, specialised workshops and laboratories.

Feasibility Stage Design

The building will have the most efficient orientation (i.e east-west doors and windows), having its main access from inside the observatory road for reasons of safety and functionality. Access to the building shall not be
from the LP-4 road.

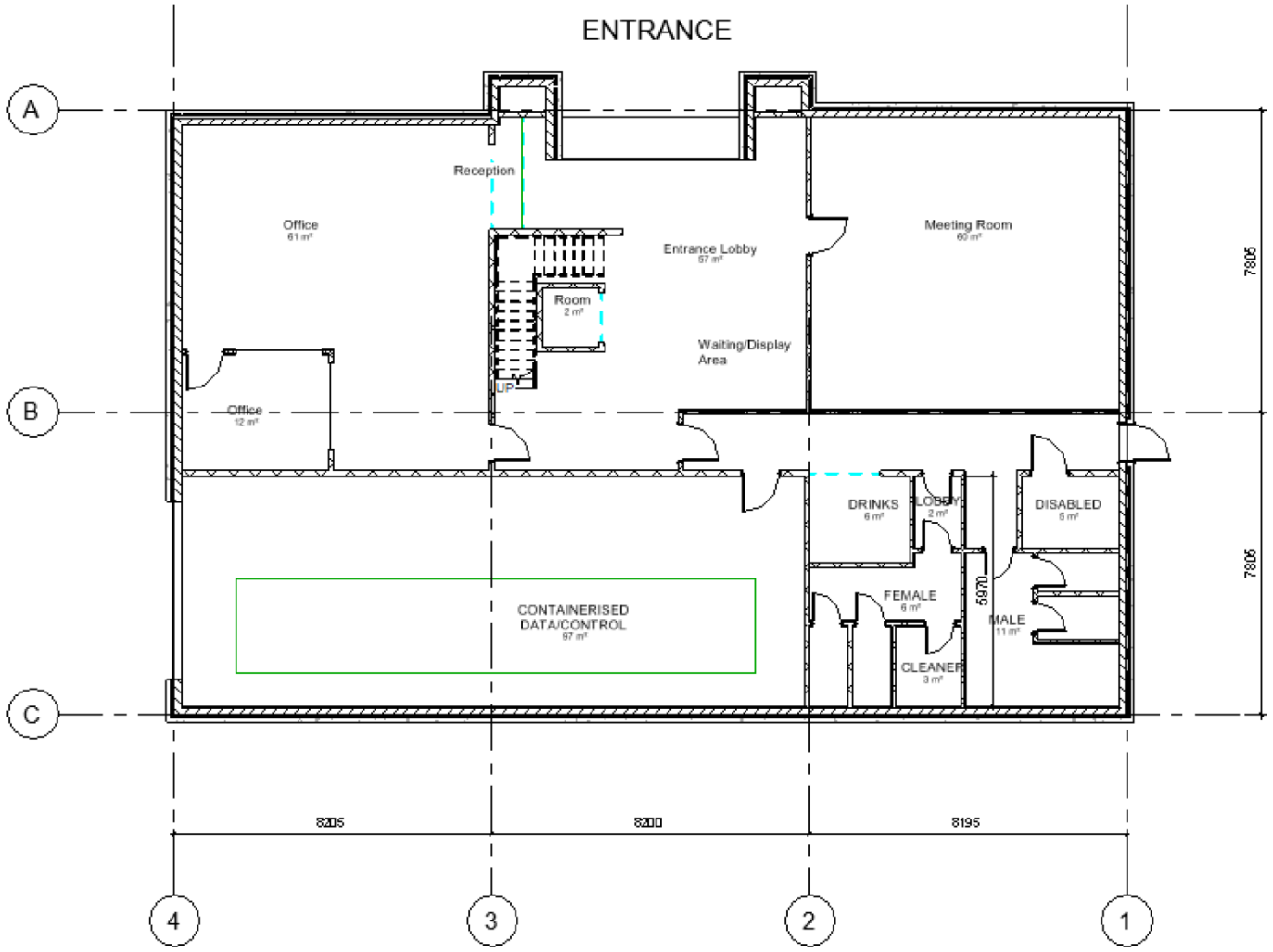
Some initial work has been completed in gathering information on the spatial requirements and the functional requirements for the building which are listed below.

Additionally, at a recent CTA operator Graphical User Interface (GUI) design workshop the design requirements of the layout of the Control Room was discussed. The result of this information gathering exercise is summarised in Section 5

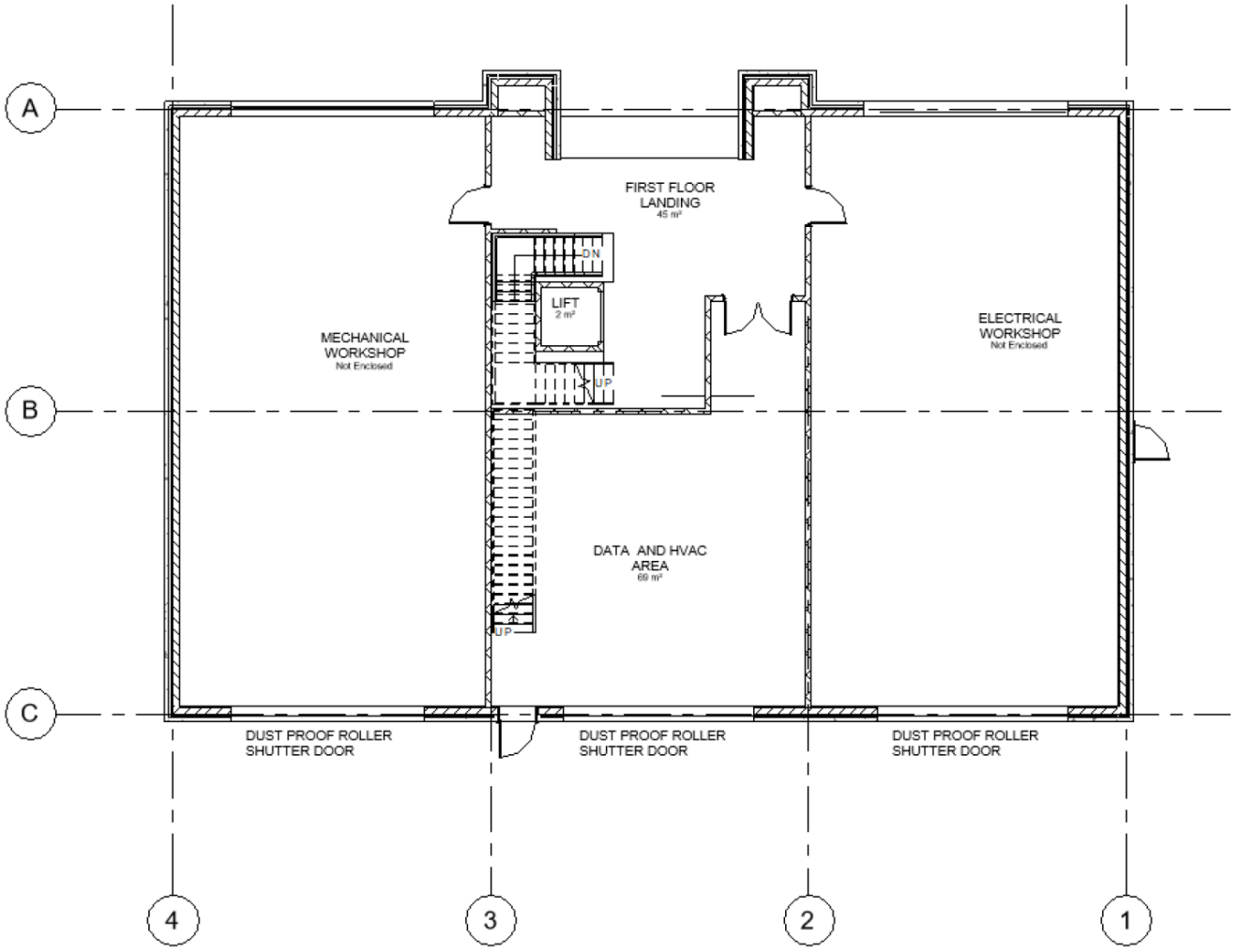
Operations Building

1. Room for *containerized* Data centre. Container dimensions 2.4m x 12.0m x 2.5m high. Dedicated cooling system – may be externally located.
2. Control room for the operation of the array.
3. Small Reception. – NOT REQUIRED
4. Open plan office - 8 persons maximum
5. Meeting room.-.8 persons maximum
6. Kitchen.
7. Male, Female and disabled toilets.
8. Storage room – (122 sqm)
9. Electronics workshop (122 sq.m)
10. Mechanical workshop (122 sqm)
11. Dedicated heating system and air conditioning (HVAC) for the building and IT equipment–heating
needed during evenings and night-time.
12. Room for the electrical switch room, HVAC, room
13. Parking places for staff and visitors

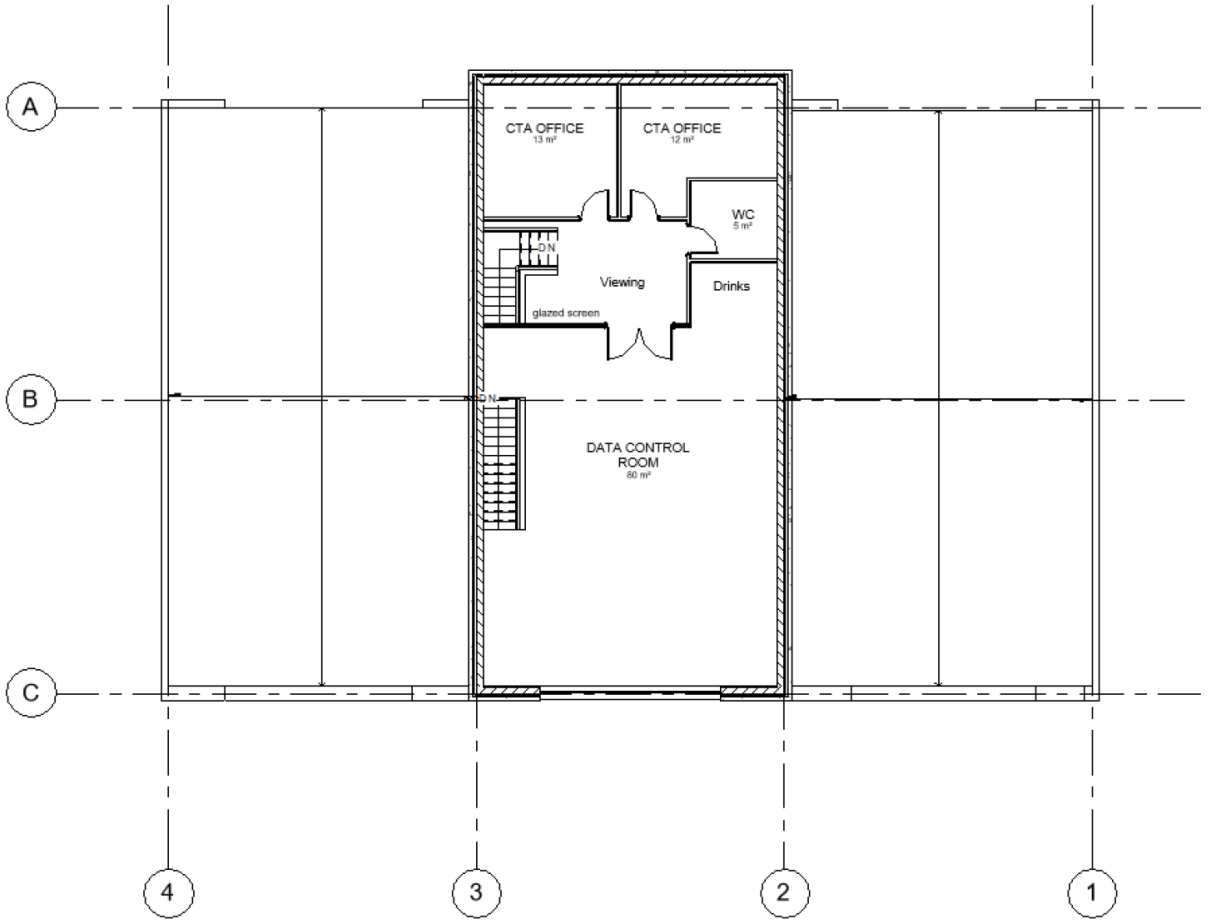
Ground Floor level



First Floor level

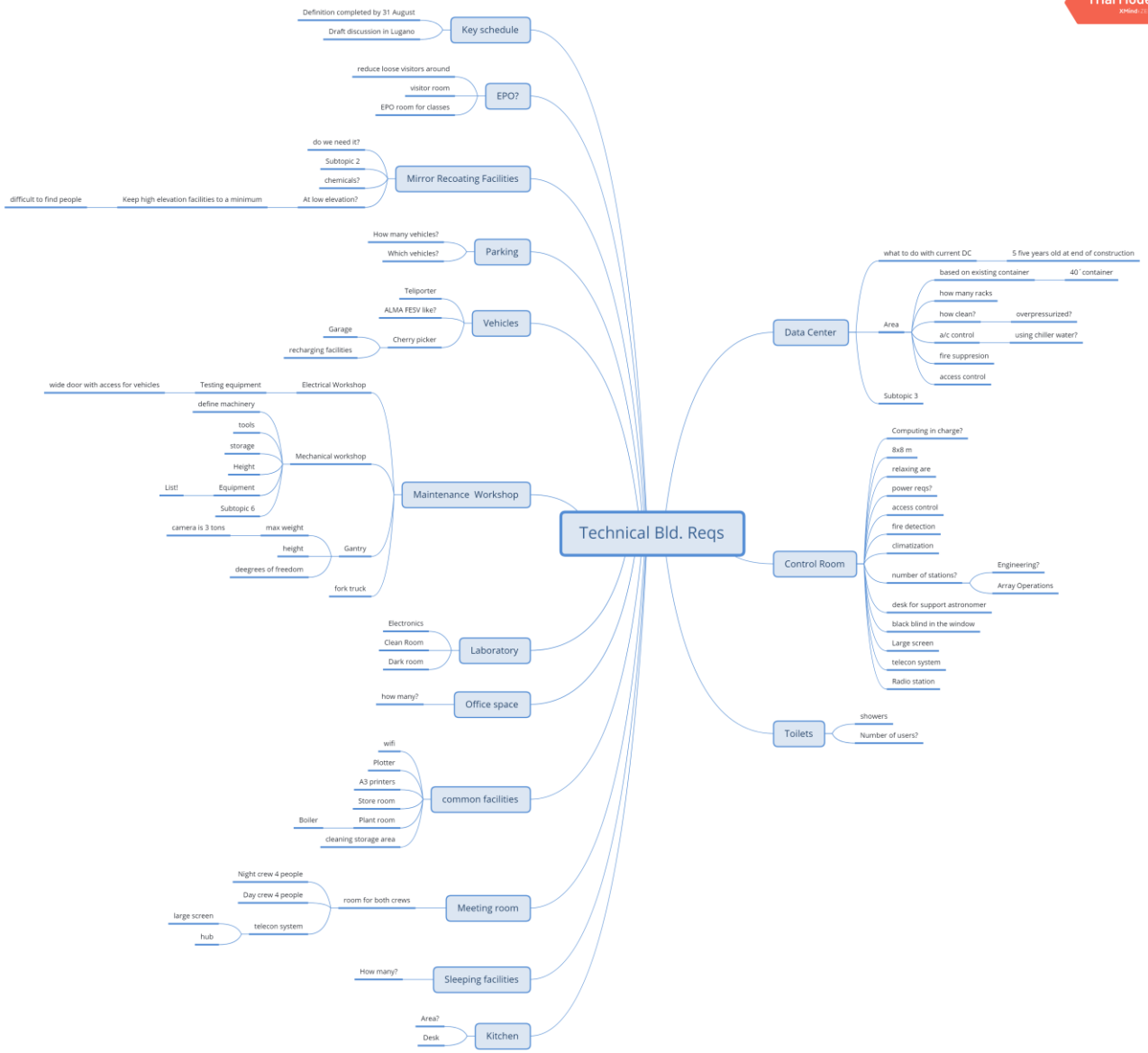


Second Floor Level



Concept Studies

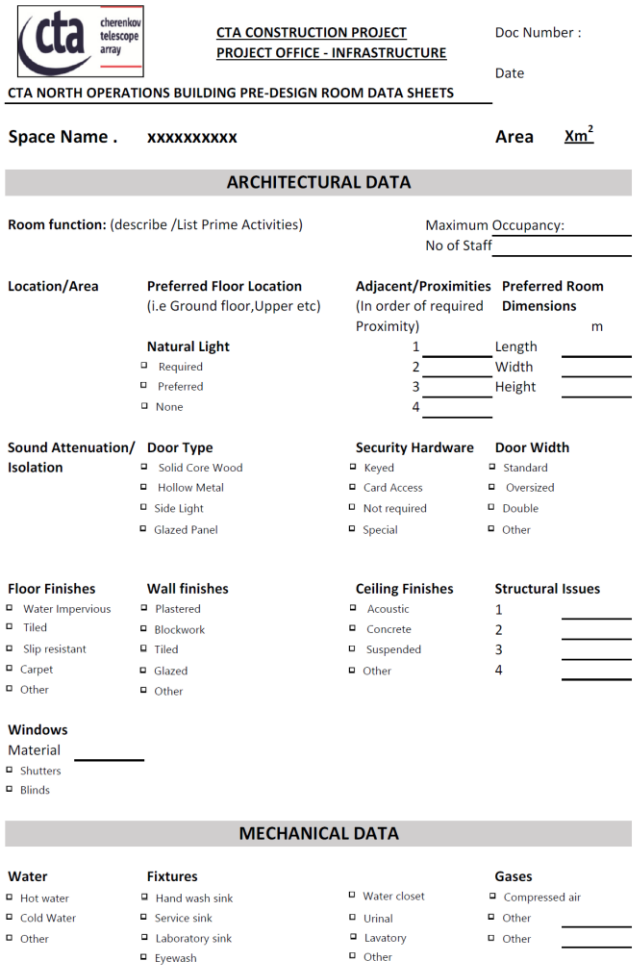
Mind Map


Technical Bld. Reqs
Key schedule
Definition completed by 31 August
Draft discussion in Lugano
EPO?
reduce loose visitors around
visitor room
EPO room for classes
Mirror Recoating Facilities
do we need it?
Subtopic 2
chemicals?
At low elevation?
difficult to find people
Keep high elevation facilities to a minimum
Parking
How many vehicles?
Which vehicles?
Vehicles
Teliporter
ALMA FESV like?
Cherry picker
Garage
recharging facilities
Maintenance Workshop
Electrical Workshop
Testing equipment
wide door with access for vehicles
Mechanical workshop
define machinery
tools
storage
Height
Equipment
List!
Subtopic 6
Gantry
max weight
camera is 3 tons
height
deegrees of freedom
fork truck
Laboratory
Electronics
Clean Room
Dark room
Office space
how many?
common facilities
wifi
Plotter
A3 printers
Store room
Plant room
Boiler
cleaning storage area
Meeting room
room for both crews
Night crew 4 people
Day crew 4 people
telecon system
large screen
hub
Sleeping facilities
How many?
Kitchen
Area?
Desk
Data Center
what to do with current DC
5 five years old at end of construction
Area
based on existing container
40´container
how many racks
how clean?
overpressurized?
a/c control
using chiller water?
fire suppresion
access control
Subtopic 3
Control Room
Computing in charge?
8x8 m
relaxing are
power reqs?
access control
fire detection
climatization
number of stations?
Engineering?
Array Operations
desk for support astronomer
black blind in the window
Large screen
telecon system
Radio station
Toilets
showers
Number of users?

GUI Design workshop

- *Visitors are expected often at La Palma (ORM).*
- *Consider a glass separation as an option to enable visitors to view Control Room.*
- *Consider putting the computer terminal towers in another room to avoid noise - this does not mean to use the computing cluster, but just the towers for terminals of the operators.*
- *Static electricity due to low humidity must be controlled, otherwise it is very uncomfortable.*
- *Ideas of type of light (blue) for the control room.*
- *Blackout shutters to avoid light leaking out.*
- *Cafeteria or a kitchen close should be close to the Control Room.*
- *It was commented about the usual issue about the typical "U" shape in the control room.where people are back to back. Alternative solution would be to consider the LSST project example for an alternative.*
- *Preference for putting displays in the wall instead of pedestals.*
- *Preference of using large displays instead of projectors.*
- *A brief discussion was held whether to have webcams at each telescope or for areas of telescopes.*
- *It is believed that some webcams would be needed, an could have some that are movable and permit to see several telescopes. It is unclear if these auxiliary displays belong inside the control room.*

RDS – Room Data Sheets



cherenkov telescope array

CTA CONSTRUCTION PROJECT
PROJECT OFFICE - INFRASTRUCTURE

Doc Number :

Date

CTA NORTH OPERATIONS BUILDING PRE-DESIGN ROOM DATA SHEETS

Space Name . xxxxxxxxxx **Area** Xm²

ARCHITECTURAL DATA

Room function: (describe /List Prime Activities)

Maximum Occupancy:
No of Staff

Location/Area

Preferred Floor Location (i.e Ground floor,Upper etc)

Natural Light
- Required
- Preferred
- None

Adjacent/Proximities (In order of required Proximity)
1
2
3
4

Preferred Room Dimensions m
Length
Width
Height

Sound Attenuation/ Isolation

Door Type
- Solid Core Wood
- Hollow Metal
- Side Light
- Glazed Panel

Security Hardware
- Keyed
- Card Access
- Not required
- Special

Door Width
- Standard
- Oversized
- Double
- Other

Floor Finishes
- Water Impervious
- Tiled
- Slip resistant
- Carpet
- Other

Wall finishes
- Plastered
- Blockwork
- Tiled
- Glazed
- Other

Ceiling Finishes
- Acoustic
- Concrete
- Suspended
- Other

Structural Issues
1
2
3
4

Windows
Material
- Shutters
- Blinds

MECHANICAL DATA

Water
- Hot water
- Cold Water
- Other

Fixtures
- Hand wash sink
- Service sink
- Laboratory sink
- Eyewash
- Water closet
- Urinal
- Lavatory
- Other

Gases
- Compressed air
- Other
- Other

PRE-DESIGN ROOM DATA SHEETS

VENTILATION DATA

Temperature
- Normal
- Air Conditioned
- Other

Relative Humidity
- Normal
- Other

Remarks

Air Change Rate
Pressure +
or -
Other

ELECTRICAL DATA

Lighting
- Flourescent
- Task Lighting
- Lux Levels
- Other

Power
- General 230v 13A
- Special Outlet 115v
- 3 Phase
- Other
- Other

Quantity

Location (wall,floor ceiling bench)

FIRE AND ALARM SYSTEMS

Fire and Detection
- Audible/Sounder
- Call point
- Emergency Lighting
- Heat
- Smoke

Intruder
- PIR
- Heat

Extinguisher
- Foam
- Co2
- Powder
- Other

COMMUNICATION DATA

- Telephone
- Data/LAN
- Wi-Fi
- Satellite Feed
- Digital Project
- Clock
- Public Address System
- Sound System
- Other

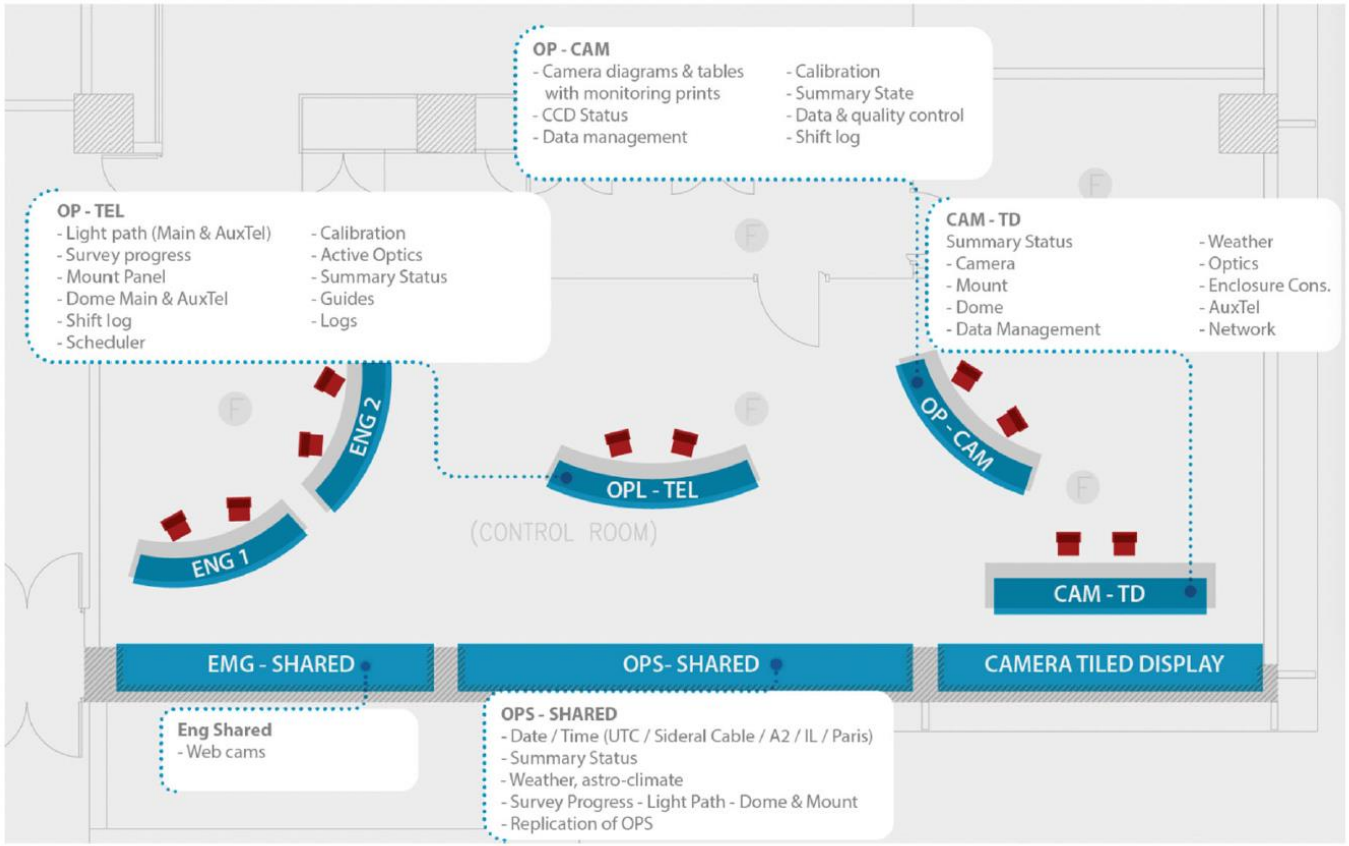
Remarks/Considerations

FURNITURE, EQUIPMENT AND MACHINERY

Provide detailed description of furniture & equipment and machinery to include dimension weight and where possible manufactures specification

Type(Name or Equip.Spec Sheet) Quantity Dimensions Remarks

Example – Control Room



LSST Control room Layout presented at the meeting – as example/starting point for discussions

Minutes from Steve – La Palma Briefing 1

- Stephen Brown Conducted Presentation of the CTAN Operations Building (OB) on 7th August 2019 with Stefan, Igor, Paolo and then again on the 8th August with Patricia, Daniel, Markus, Paolo Javier
-
- In both meetings an overview of the progress on the Operations Building (OB) was presented
-
- Document presented was a Briefing document written by Infrastructures giving a concept design for the building based on floor areas given to CTA PO by LST team some years ago.
- From this CTA PO developed concept floor plans and elevations.
- A Operations Building Briefing Document (OBDD)was produced to enable IAC to enagage the services of an Architect to advise on the construction costs based on a fixed floor area and typical construction as specified within the OBBD
- Outcome of the Architects cost exercise 1.6m Euro - .3m short – additional FEDER monies obtained.

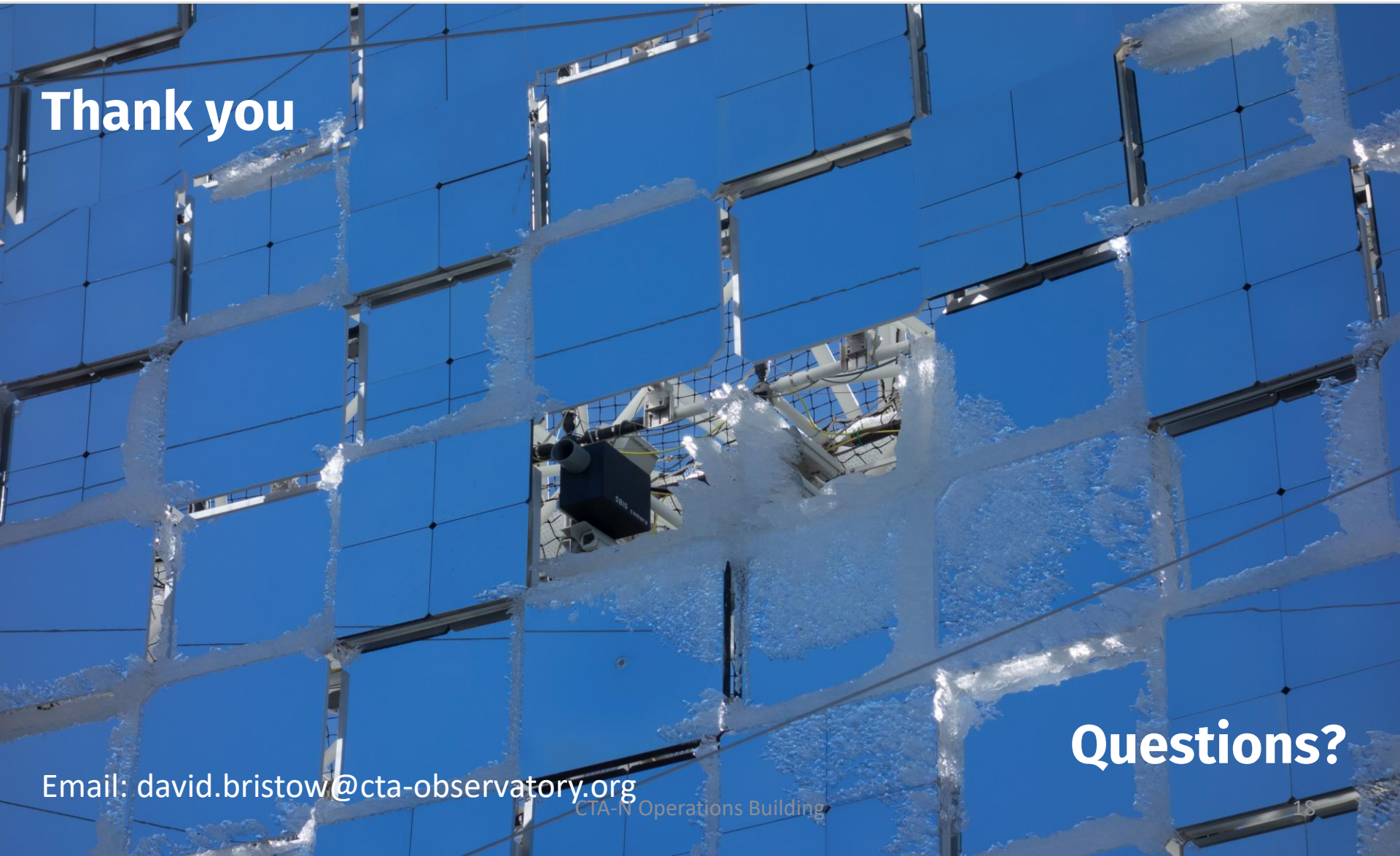
CTA Minutes from Steve – La Palma Briefing 2

- Further iteration of floor areas within floor area budget.
- Tender for the detailed design of the Operations has been launched by IAC- therefore finalised requirement documents needed by end of Sept ??
- CTA Infra to produce Room Data Sheets for each area of the building – to be sent out to all teams for completion.
- CTA Infra to produce more detailed specification for building for Sept ??
-
- Specific points from meeting with LST/MST/IAC on the 8th August -
-
- Detailed discussion to resolve issues around Data Container and Commisioning Container move to Operations Building :
- 1 How will Data Centre be integrated with the OB ?
- 2 All temporary structures to be removed from LST1 area at the end of 2022 in compliance with construction permit that expires on this date. How will commissioning of LST2-4 be performed after this date?
- 3 Commissioning will not be carried out at sea level. Commissioning operation will need to be done from OB.

CTA Minutes from Steve – La Palma Briefing 3

- It was agreed for CTA, LST and MST (PC, DM, MG) to have separate meetings to discuss these issues and arrive at solutions to feed into detailed specification for the building.

- Storage areas – CTA LST MST (PC, DM, MG) to assess storage need, minimised for essential maintenance items. Understood that main storage will be at sea level.
-
- Essential to have shelter for Cherry Picker. No money for this OB budget. CTA action to resolve this issue. General opinion that this shelter would be at OB. IAC would prefer this to be elsewhere.
-
- Discussion around need for shower within OB. IAC management view is that this was unnecessary and would be excluded from the design. Agreed to look into the legal requirements for this.NB. Royal Decree 486/1997 covers welfare facilities – cannot be overruled by IAC management requirements. QU. Is this something that CTA requires?



Thank you

Questions?

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Thank you……Questions…?