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Project: 2024-cs-dent dent-24.007 - Core Scientific - Denton TX
8161 Jim Christal Rd
Denton, Texas 76207

Submittal #01 91 13-5.0 - Cx Plan - Building G 01 91 13 - General Commissioning Requirements

Revision	0	Submittal Manager	Orlando Flores (T5 Data Centers LLC)
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Approvers	Emilo Carcamo (Telios Corporation), James Chang (Telios Corporation), Robbie Murray (Telios Corporation), Caleb Nash (Telios Corporation), Blaine Warden (Telios Corporation), Matt Klentzman (Core Scientific), Baylor Landry (Core Scientific)		
Ball in Court	Emilo Carcamo (Telios Corporation), James Chang (Telios Corporation), Robbie Murray (Telios Corporation), Caleb Nash (Telios Corporation), Blaine Warden (Telios Corporation)		
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Description	Team, Please see attached cx bank plan for building G. I have assigned Telios and Core-Sci as approvers. I have also distributed to IPS for any questions. Thank you		

Submittal Workflow

Name	Sent Date	Due Date	Returned Date	Response	Attachments
General Information Attachments					CoreSci Denton - Cx Plan Building G.pdf
Emilo Carcamo	Mar 11, 2025	Feb 25, 2025		Pending	
James Chang	Mar 11, 2025	Feb 25, 2025		Pending	
Robbie Murray	Mar 11, 2025	Feb 25, 2025		Pending	
Caleb Nash	Mar 11, 2025	Feb 25, 2025		Pending	
Blaine Warden	Mar 11, 2025	Feb 25, 2025		Pending	

Name	Sent Date	Due Date	Returned Date	Response	Attachments
Matt Klentzman		Mar 11, 2025		Pending	
Baylor Landry		Mar 11, 2025		Pending	



PROJECT EXECUTION PLAN

Core-Sci-Denton

8161 Jim Christal Rd

Denton, TX

BUILDING 'G'

Rev. 1.0

1. Executive Summary

a. Project Overview

- I. The commissioning objective of this project is to ensure successful commissioning, quality assurance, quality control (QAQC), and commissioning management of the new data center construction project. The Core-Scientific data center, herein referred to as “the facility” represents a critical infrastructure investment and its proper operation is paramount to the client’s business continuity and success. The project aims to provide comprehensive services to guarantee that the facility operates at optimum performance, meets the industry standards, and functions as designed.
- II. The overall project consists of the design, construction and fitting out of forty-one point two megawatts of critical facility load as well as front of the house equipment.

b. Project Objectives

- I. Commissioning Execution

- To verify and document the proper installation, functionality, and performance of all power, cooling, and controls systems thoroughly to meet the BOD of Core-Scientific Data Centers.
- To identify and rectify any discrepancies, defects, or non-compliance issues during the commissioning process.

II. QAQC

- To establish and enforce rigorous QAQC procedures to ensure that all construction activities adhere to approved design specifications.

III. Commissioning Management

- To provide comprehensive project management services throughout the commissioning process, including planning, scheduling, resource allocation, and reporting.
- To ensure effective coordination among stakeholders including all contractors, subcontractors, engineers, the project management team, the commissioning team, and the owner.

IV. Documentation and reporting

- To maintain detailed records of commissioning activities including QA QC inspections, set in place inspections, pre-energization inspections, Level 3 start up, level 4 functional testing, and level 5 integrated systems testing.
- To provide regular progress reports to the client, highlighting key milestones, issues, and recommendations.

V. Performance Verification

- To conduct thorough performance testing to validate that the facility meets design criteria, and specifications.
- To provide recommendations for any necessary adjustments or improvements to enhance performance.

VI. Risk Mitigation

- To proactively identify potential risks and develop mitigation strategies to minimize project delays, cost overruns, or operational disruptions.

VII. Client Satisfaction

- To prioritize client satisfaction by delivering a fully operational data center, meeting, or exceeding expectations.

VIII. Knowledge transfer

- To provide training verification, and knowledge transferred to the client staff, enabling them to effectively operate and maintain their facility after commissioning.

c. Confidentiality

- Secure and confidential information, especially about the facilities design and operation data, is of prime importance. This document should not be distributed outside of the project team.

2. Project Team

Company	Name/Title	Phone	email
IPS	Otterway Green– Cx PM	(443)-813-3529	Ogreen@ipsdb.com
IPS	Joseph Soroka – VP, Global Data Center Commissioning	(770)-380-4000	jsoroka@ipsdb.com
IPS	Michael Moore – Mechanical SME	(281)799-6550	mmmoore@ipsdb.com
IPS	Tirthankar Mukherjee- Electrical SME	(703)-928-0103	tmukherjee@ipsdb.com
T-5	Orlando Flores- Program manager	(913)-220-7500	oflores@t5datacenters.com
T-5	Kevin Brock- Commissioning Manger	(940)-222-7573	kbrock@t5datacenters.com
T-5	Ronald Odom-Commissioning Manager	(832)-6958478	rodome@t5datacenters.com
T-5	Vincent Karczewski-CX QC Manager	(425)-505-1450	vkarczewski@t5datacenters.com

3. Safety

a. IPS Safety

- Safety is a core value at IPS, and we incorporate it into all aspects of our business culture. We protect our most valuable assets, our employees, as well as employees of the clients and subcontractor slash vendors from injury and illness, property, and the environment from harm or damage through regimented and proactive EHS critical thinking and observation, training, policies, and procedures.

4. Commissioning Team Roles and Responsibilities

a. Commissioning Project Manager (CxPM)

- CxPM is responsible for overseeing all aspects of the quality and commissioning of the project including but not limited to.
- Project planning and strategy
- Stakeholder coordination
- QA QC controls
- Commissioning execution
- Driving team issue tracking and resolution
- Provide the QA/QC plan.
- Provide the Cx plan.
- Provide the QA/QC/Cx schedule.
- Provide the QA/QC/CX issues log.
- Set-up CxAlloy for the commissioning portion of the project.
- Risk management
- Create project schedule.
- Create final QAQC/ Cx report.

b. Electrical Subject Matter Expert (eSME) & Mechanical Subject Matter Expert (mSME)

- Design documents review.
- Short circuit study review
- Create a load bank plan.
- Review set in place inspection checklists.
- Review pre-energization inspection checklists.
- Review L2 verification & inspection checklist.
- Review L3 checklists.
- Review L4 checklists.

- create L4 test scripts.
- Execute all L4 testing.
- create L5 slash integrated system testing script.
- Execute the L5/IST testing.
- Document all Issues for all phases.
- assist in the final Commission report.

c. Acceptance

- Review of all L2 checklists and associated documents submitted by the GC and subcontractors.
- First of kind set in place inspection.
- Final L2 site verification and inspections of equipment
- Witness L3 equipment startups
- Assist with L4 testing.
- Assist with L5 testing.
- Document all Issues for all phases.

5. Equipment List and Test Sampling

Equipment	Set in Place Inspection	L2 Final Inspection	Energization	L3 S/U Witness	L4 FPT	L5 IST
DELTA-1250KVA-UPS	Fok	100%	Fok	Fok	100%	100%
DELTA-250KVA-UPS	Fok	100%	Fok	Fok	100%	100%
BMS/PMS	Fok	100%	Fok	Fok	100%	100%
JCI-500T-CHILLER	Fok	100%	Fok	Fok	100%	100%
FISEN-YVFA0459-CHILLED WATER PUMP	Fok	100%	Fok	Fok	100%	100%
JCI-72K-FAN WALL	Fok	100%	Fok	Fok	100%	100%
WENDLAND-50,000 GAL-THERMAL STORAGE TANK	Fok	100%	Fok	Fok	100%	100%
CONDAIR-RS-20-HUMIDIFER	Fok	100%	Fok	Fok	100%	100%
GIGA ENERGY 2550KVA 18KV KAN-TRANSFORMER	Fok	100%	Fok	Fok	100%	100%
GIGA ENERGY 2550KVA 18KV KAN-TRANSFORMER	Fok	100%	Fok	Fok	100%	100%
CAT-1.25 MW GENERATOR	Fok	100%	Fok	Fok	100%	100%
PEP-1.25MW-GENERATOR	Fok	100%	Fok	Fok	100%	100%
DELTA-800A-STS	Fok	100%	Fok	Fok	100%	100%
AAON-RQA-011-DOAS	Fok	100%	FoK	FoK	100%	100%
DELTA-600A-BUSWAY	FoK	100%	FoK	FoK	100%	100%
DELTA-800A-BUSWAY	FoK	100%	FoK	FoK	100%	100%
MOTIVAIR-MCDU-40-CDU	FoK	100%	FoK	FoK	100%	100%
TBD-4000A-RESERVE BUSDUCT	FoK	100%	FoK	FoK	100%	100%
ENC-PB (IT Container)	FoK	100%	FoK	FoK	100%	100%
ENC-PA (IT Container)	FoK	100%	FoK	FoK	100%	100%
ENC-PA (Reserve IT Container)	FoK	100%	FoK	FoK	100%	100%
ENC-MA (IT Container)	FoK	100%	FoK	FoK	100%	100%
ENC-MB (IT Container)	FoK	100%	FoK	FoK	100%	100%
L5 IST	FoK	100%	FoK	FoK	100%	100%

update log to include:
800A reserve bus taps
CHWP VFDs
MMR CRAHs
Container CRAHs
Container Dehumidifiers

6. Milestone Schedule

MILESTONE	Start Date	End Date
CxPM on-site	1/16/2025	7 /16/2025
Commissioning on-site Kick-off meeting	2/04/2025	2/04/2025
L2- SiP Inspections	5/12/2025	5/16/2025
L2 – Verification and inspections	5/16/2025	5/21/2025
Energizations	5/22/2025	5/28/2025
L3 – Start-ups	5/28/2025	6/2/2025
L4 – Functional Performance Testing – BLDG G1	6/10/2025	6/15/2025
L4 – Functional Performance Testing – BLDG G2	6/15/2025	6/20/2025
L5 – Integrated Systems Testing – BLDG G1	6/21/2025	6 /21/2025
L5 – Integrated Systems Testing – G2	6/21/2025	6/21/2025
Lessons learned meeting	6/22/2025	6/22/2025
Final QAQC/Cx report	6/30/2025	6/30/2025

7. Deliverables by Level

a. Pre-Execution/ Project Management

- I. Create QAQC/Cx plan.
- II. Create QAQC/Cx schedule and assist incorporating into master schedule.
- III. Create and update QAQC/Cx issues log.
- IV. Drive issues to resolution
- V. Assist with Cx folder structure set-up.
- VI. Utilize and maintain CxAlloy for the Cx process.
- VII. Create load bank plan.
- VIII. Design document review
- IX. Review OFE submittals and shop drawings
- X. Participate in Integration and coordination meetings.
- XI. Lead commissioning kickoff meeting on-site
- XII. Lead weekly commissioning meetings through L3.
- XIII. Lead daily commissioning meetings during L4 & L5
- XIV. Create monthly report with for status and activity/progress.
- XV. Provide full-time on-site Cx management for the project.

b. L2

- I. Short Circuit study documentation review
- II. Create Set in Place (SIP) inspection checklists.
- III. Create pre-energization inspection checklists.
- IV. Create L2 inspection checklist.
- V. Execute first of kind (Fok) SiP inspections.
- VI. Witness FoK equipment energizations
- VII. Review all L2 documentation from GC and vendors.
- VIII. Execute a final L2 verification inspection and sign off on L2 tags.

c. L3

- I. Create pre-functionals checklists.
- II. Review vendor start-up plans and test scripts.
- III. Witness Fok testing for all equipment.
- IV. Review all L3 documentation and sign off on L3 tags.

d. L4

- I. Create L4 test scripts.

- II. Execute all L4 testing.
- III. Execute IR scans during loaded L4 testing.
- IV. Sign off on L4 once all.

e. L5

- I. Create L5 Integrated System Testing script and schedule.
- II. Execute an L5 IST pretest meeting.
- III. Execute L5 Integrated System Testing

f. Post Execution

- I. Lead a lesson learned session and provide feedback on the process.
- II. Create a final QAQC/ Cx report.

8. Project Controls

a. Planning and Scheduling

- I. Project planning includes the development of an integrated project schedule that supports the timing requirements of the project and identifies the critical path to project completion. It is based on a logical sequence of the activities required to design, procure, construct and commission the project. The schedule will be the primary tool for controlling and communicating the progress of the project. It provides early identification of potential deviations or delays, allowing corrective action to be taken. The schedule is a living document that evolves throughout the life of the project and is typically updated and issued monthly but tracked daily.
- II. The Critical Path Method type construction schedule will be used to monitor job progress. The CxPM will work with the project team, subcontractors, and vendors to gather all information concerning the sequencing, logic, and durations of all activities, and incorporate it into the Cx schedule.
- III. In addition to major milestones, the schedule will address major internal and external interfaces between the integrated project team members. To ensure success, it is imperative the Project Team buy-in to the initial
- IV. , participate in regular reviews, and develop revised approaches as required throughout the course of the project.
- V. With every Cx schedule update the following will be assessed:
 - Actual completion dates
 - Forecasted completion dates.
 - Changes in planned activities and logic
 - Appropriate corrective action
 - Changes to the critical path

VI. This will ensure that the current Cx schedule is representative of the latest status and any problem areas are identified. Client, GC and vendor reviews and input will be critical to keeping the project schedule on target. Important planned reviews and approvals by clients will also be shown in the schedule.

VII. In addition to the monthly project schedule update, IPS will provide and review a 3-week Look-Ahead at each Cx Meeting, indicating upcoming work activities, and decision milestones.

b. Meetings

I. Weekly (I2 – L3) and daily (L4 – L5) Cx meetings will be used on a regular basis in conjunction with any GC planning sessions to keep the entire team informed and up to date.

c. INFORMATION & DOCUMENT MANAGEMENT

I. General

- Document management protects a project from losing track of its documents or losing the document itself. Document management achieves the following objectives:
 - Provide safe storage of all documents in a project library.
 - Provide clarity regarding which version of a document and/or deliverable is the latest version.
 - Provide a record of approved deliverables over the life of the project.
 - Provide measures to maintain restricted access to confidential documents.
 - Provide an accurate and complete archive of project documents for the organization at the end of the project.
- For purposes of this plan a “document” is any electronic or hardcopy media designed to convey information about or on behalf of the project, including but not limited to books, deliverables, drawings, electronic mail, faxes, letters, memorandum, organizational charts, pictures, presentations, project binders, reports, specifications, and spreadsheets.
- A variety of methods will be leveraged to communicate information between the project stakeholders. These methods will include, but are not limited to the following:
 - Email - Email will be used for general communications as well as to transfer small amounts of data (typically <10mbs) for review or discussion.
 - Document Control System – Both Procore and CxAlloy will be implemented for the project.

- Text message – will be used for short messages that are not required to be saved for tracking purposes.
- Phone calls – can be used for discussions but should always be followed by an email ASAP to preserve the intent and outcome of the phone call.

II. Cx Alloy

- CxAlloy will be the commissioning software used for the project QAQC and Commissioning phases.
- The IPS CxPM will be fully responsible for set-up and management of the commissioning program for the duration of this project.
- All the QAQC and commissioning checklists, and test scripts will be managed through CxAlloy.
- All QAQC and Cx documentation will be submitted and tracked through CxAlloy.
- CxAlloy will be the sole and final source for all quality and commissioning activities tracking.
- Visit the site <https://www.cxalloy.com/>
- Request access to from the IPS Cx PM

d. Cost and Budget Management

I. General Expectations

- The expectation is to implement the necessary cost control systems to provide a reliable forecast of project costs as a basis for coordinating and managing each partner's professional services. The cost systems will promote the achievement of project cost objectives, provide for early identification of potential variances, and allow mitigating actions to be taken to prevent undesirable cost impacts.

II. Budget Management

- Project costs will be tracked by utilizing a standard code of accounts. The estimate generated during the Planning Phase and each subsequent estimate update will utilize the same standard code of accounts allowing for cost

trending throughout the project life cycle. This code of accounts will facilitate reporting actual costs in a way that all personnel can understand the breakdown of costs. A cost report will be issued monthly. It will reflect the current budget, actual costs, and the current forecast for all cost elements associated with the project. The current budget will include all approved project changes to date.

III. Cost Control

- The cost forecast will include all known changes that have been approved, as well as those that are pending approval. Particular attention will be given to pending changes that are significant in size.

IV. Cost Forecasting

- Cost forecasting is the process of continuously predicting the outcome of the cost, time and resources required to complete a scope of work.
- On a monthly basis the project team will analyze the data (invoices, risk register, pending change orders, etc.) received to date and based on this knowledge will forecast the estimate to complete and estimate at completion values with input from the Project manager.

e. Change Management

I. The purpose of this procedure will be to identify potential scope change and allow the client to make a timely decision on whether that scope change is required to achieve the objectives of the project. In this manner, the Project Team will be able to eliminate any unnecessary scope changes.

II. The project will implement a change management process that will provide for timely identification of changes within the project.

III. Change management is a shared responsibility among all team members on the project. It will be the responsibility of all project personnel to notify the Project Management Team of any potential changes as soon as they are recognized so that processing of the change order can occur. This team will work to ensure that the change orders and claims are resolved in a fair and equitable manner.

IV. The Change Management approach consists of four areas:

- Determine that changes are within scope, are beneficial to the project and are priced competitively.
- Determine how the change will be implemented.
- Manage the change as it is implemented.

- Determine how to address changes outside the scope, i.e., go for additional funding or not.

V. The Change Management process has been designed to make sure this approach is followed for all changes. By using this methodology, the project will prevent unnecessary changes from occurring and focus its resources only on beneficial changes to the project.

VI. Types of Change

- **Budget Changes:** changes which will impact the approved project budget. These changes may involve requesting additional funding, releasing funding which would no longer be required or adding to project or management reserves. May require changes to the cost baseline.
- **Owner Scope Changes:** Directive from the owner on changes for the project, which will require additional funding.

9. Project Changes: necessary changes that impact on the project scope which may be the result of unforeseen requirements which were not initially planned for. These changes may also impact on the budget and schedule. These changes may require revision to work breakdown structure, project scope statement, and other project documentation, as necessary.

I. The Project manager is responsible for communicating any approved changes to the Project Stakeholders. Additionally, as changes are approved, the Project Manager must capture these in the project documentation where necessary. These document updates must then be communicated to the Project Team Members and Stakeholders.

b. Typical Types of Changes

<i>Typical types of Changes</i>	<i>Most Common REASONS for each Type</i>
<i>Budget Transfer</i>	<i>Shift in responsibility or budget category</i>
<i>Design Definition</i>	<ul style="list-style-type: none"> • <i>Correction to technical documents</i> • <i>Safety/HAZOP/Environmental definition</i> • <i>Constructability/Operability/Maintenance definition</i> • <i>Change in assumptions for field routings</i>

<i>Typical types of Changes</i>	<i>Most Common REASONS for each Type</i>
	<ul style="list-style-type: none"> ● <i>Design errors & omissions</i> ● <i>Design Development</i> ● <i>Value Engineering</i>
<i>Estimate Adjustment</i>	<ul style="list-style-type: none"> ● <i>Estimate errors & omissions</i> ● <i>Shift in project cost economics (significant change in prices, labor productivity, labor wages)</i>
<i>Field Changes</i>	<ul style="list-style-type: none"> ● <i>Differing site condition or hidden site condition</i> ● <i>Field Operability/Maintenance definition</i> ● <i>Inspection Findings</i>
<i>Owner Preferences</i>	<ul style="list-style-type: none"> ● <i>Substitution of owner-desired items</i> ● <i>Opportunity Work</i> ● <i>Asset Request</i>
<i>PP (Project Plan) Revision</i>	<ul style="list-style-type: none"> ● <i>Schedule changes: acceleration, slowdown, early possession by Owner, change in sequences. Due to factors within the project team's control</i> ● <i>Schedule changes: acceleration, slowdown, early possession by Owner, change in sequences. Due to factors outside the project team's control</i> ● <i>Change in contracting strategy after Funding Approval</i>
<i>Random Events</i>	<ul style="list-style-type: none"> ● <i>Force majeure events: storms, wars, strikes, acts of the public enemy, etc.</i> ● <i>Currency de-valuation or re-valuation</i> ● <i>Uncovering & removing hazardous materials at site, not identified in scope</i> ● <i>Uncovering & removing archaeological features</i>
<i>Scope Changes</i>	<ul style="list-style-type: none"> ● <i>Change in facility capacity (or throughput)</i> ● <i>Shift in business or market strategies</i> ● <i>Technology change</i> ● <i>Legislative change</i> ● <i>Pre-investment / return on investment</i> ● <i>Change in feedstock or product specifications</i> ● <i>Add or delete major features of project</i>
<i>Start-up Changes</i>	<ul style="list-style-type: none"> ● <i>Safety/HAZOP/Environmental definition (at start-up)</i> ● <i>Operability/Maintenance definition (at start-up)</i>

10. Communications Management

a. General Expectations

- It is the expectation that open and direct lines of communication are established at the project kick-off meeting and are maintained throughout the project. Open communication will be imperative to ensure a successful path to meet the Client business objectives.

b. Meetings

- The following project meetings have been established for the project to facilitate and drive resolution, documentation, and information flow to the client for review & approval prior to issue. Additional meetings may be scheduled as needed and will be announced separately. Specific dates, times, and locations will be published within a Meeting Schedule for project team use.

Meeting Type	Frequency	Location
Cx Kick-Off meeting	Once	On-Site - TBD
QAQC Status meetings	Weekly (L2 – L3)	On-Site - TBD
Daily Cx Meetings	Daily (L4 – L5)	On-Site - TBD
Design Review Meetings:	As needed	On-Site – TBD & virtual
Owner Meeting	As needed	On-Site – TBD & virtual

11. Appendix

