Data Center & Colocation
Sample Documentation Package
What We Do:

At Teladata, our focus is bringing together the best teams to achieve difficult goals. We combine expert up-front consulting with real world know-how to upgrade live data center environments without negatively impacting your daily operations. Our 25 years of outstanding performance is the result of hard work, experienced leadership, and a drive to represent the best interest of our clients.

How do we help our clients? By helping people.

- Resolve problems with cost effective solutions
- Offer expert advice and recommendations
- Provide clarity across teams and levels of management

Keeping pace with evolving IT technologies requires a holistic approach to data center and colocation strategies.

We specialize in the design, planning, and project management of data center and colocation projects.

Teladata can lead the way with a roadmap on how to get there.
Assessment Reports

**Goal Oriented:**
- Reliability / Uptime
- Capacity Planning
- Training
- Standards & Guidelines
- Policies and Procedures
- Energy Efficiency
- Risk Analysis
- Mergers and Acquisitions
- Consolidation
- Live Upgrades

**Evaluation:**
- Electrical Power
- Cooling Systems
- Facility Monitoring & Alarms
- Fire Suppression
- Flooring
- Cable Management
- Seismic Bracing
- Regulation Compliance
- Policies & Procedures

**Concise Reporting:**
- Executive Summary
- Analysis of Existing Conditions
- Recommendations & Options
- Budgetary Planning
- Supporting Documentation
Maximize Your Colocation Investment:

Written Recommendations
- Align lease with original financial projections
- Recover overpayments
- Alerts landlord to errors
- Resolve disputes and discrepancies
- Gain control of colocation lease expenditures
- Propose cost reduction opportunities

Lease / Contracts
- Validate actual rental space to utilization rate
- Validate services charges
- Validate data circuit connection fees
- Analyze energy usage
- Identify monitoring options
- Reviews contracts and service level agreements
- Renegotiate contracts to:
  - Take advantage of existing market conditions
  - Negotiate higher level of services
  - Move to a better suited facility

Colocation Auditing

Summary
After implementing TELADATA recommendations, Client will realize a monthly savings of $97,264, which will result in an annual savings of $1,170,696. This represents a 17% reduction in costs.

All recommendations contained in this report will be implemented by TELADATA on behalf of Client. This implementation process can generally be completed within twelve weeks of initiation.

Every month during the term of the contract, TELADATA will audit the invoice from Colocation provider to ensure that the savings are actualized.

Outstanding Issues
There are still some active issues at the end of the negotiation period. These items have the potential to provide additional savings to Client moving forward:
- There is a dispute regarding unused space. TELADATA will continue to resolve this dispute under our contingency contract. This may require another site visit to have the potential be further reduced costs by $25,000 - $35,000 per month.
- TELADATA has identified some phone lines and data circuits that are not currently utilized. However, these are still under review. Some of these circuits may be turned off or renegotiated. TELADATA will continue to analyze this issue under our contingency contract. It has the potential to further reduce costs by $3,000 - $5,000 per month.
- There is a potential to further reduce power costs in both sites. This will require the installation of monitoring tools to allow real-time reporting of power utilization. This is because colocation facilities sell power capacity and it is the customer's responsibility to manage the capacity. Client currently has some "unutilized" capacity that could reduce the fees and save money. TELADATA will work with the sites to optimize power consumption. We estimate the cost to be $5,000 - $6,500 per month. It has the potential to further reduce costs by $20,000 - $25,000 per month.
- Master planning will produce significant savings over the long term. This initiative provides flexibility to make adjustments during the contract term. It also provides a breathing room to allow for review of new technology. We recommend that the planning process begin immediately, so that incremental adjustments can begin. We estimate the cost to to lead this initiative at $12,000 - $16,000 per month.
Site Due Diligence Reporting:

- Formulate Growth Projections
- Site Evaluation
- Cost Estimates
- Extract Document Requirements
- Contract Negotiation
- Build Out Coordination
- Move Coordination
- Testing
- Monitoring
- On-Going Space, Power & Cooling Evaluation

Data Center / Colocation Site Selection
### Before
- Utility Power
- Utility Switch Gear
- UPS (N)
- Mech. Switch Gear
- UPS Output
- Mech. System
- PDU
- Computers

### After
- Utility Power
- Gen (N)
- Gen Switch Gear
- Switch Gear
- UPS (N)
- Mech. Switch Gear
- UPS Output
- Critical MCC
- Fans/Pumps
- Alt. Output
- PDU
- Computers

### Load Projections
**Data Center Load Projection (KW)**
- New Data Center Capacity, 350 KW
- Max Available UPS Power, 256 KW
- Existing Data Center Capacity

**Quarters**

### Project Timeline

<table>
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<tr>
<th>Q1</th>
<th>Q2</th>
<th>Q3</th>
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- Design, Engineering & Construction Doc
- Procurement & General Contractor Selection
- Construction
- Commissioning
- Facilities Training
- Turnover
- IT Transition & Cutover

**High Level Programming**

- 8-12 Hour Planned Downtime Date TBD
- Continued Risk Until Cutover is Complete

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**Prepared for:**
Data Center & Colocation Sample Documentation
Monitoring Points & Strategies
### Data Center Infrastructure

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<th>Year</th>
<th>Remediation</th>
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<th>Expansion</th>
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### Data Center Infrastructure Future Spend

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Cost Estimates & Future Planning
**Assessment**

- Review available maintenance records
- Site inspection
- Update as-built documentation

- Determine needs
- Identify holes
- Interview stakeholders
- Determine monitoring goals

**Programming**

- Create five year plan
- High level cost estimation
- Assemble design team
- Create design package

- Detailed cost estimate
- Present to decision makers

- Project timeline
- Lead time for orders

- Project manage general contractor
- Act on behalf of client to oversee process
- Weekly meetings
- Monitoring infrastructure

- Integrate commissioning as elements of project progress
- Finalize design
- Manage contractors
- Coordinate build schedule

- Present to decision makers

- Detailed cost estimate

- High level cost estimation

- Project timeline

- Project manage general contractor

- Integrate commissioning as elements of project progress

- Detailed cost estimate

- Design engineering

- Construction

- Commission

- Fit-Up

- Coordination / Cutover

- Monitoring

- Policies & Procedures

**Implementation**

- Create five year plan
- High level cost estimation
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- Design engineering

- Construction

- Commission

- Fit-Up

- Coordination / Cutover

- Monitoring

- Policies & Procedures

**Manage**

- Label all equipment
- Coordinate schedule contractors
- Manage cutover

- Install environmental devices
- Integrate dashboards
- Customized dashboards
- Alarm response
- Reports & analytics

- Create Standards
- Implement training program
- Update as-built documentation
- On-Going support

**Schedule:**

- Assessment: 1-2 Months
- Programming: 2-6 Months
- Implementation: 9-18 Months
- Manage: On-Going

**Cost:**

- Assessment: $ 
- Programming: $$ 
- Implementation: $$$ 
- Manage: $$$$
## Equipment Schedule for MEP Coordination

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**Equipment Schedule for MEP Coordination**

Server / Storage / Network Switches / WAN Equipment Subtotal: 18.7

Calculations:

- **Server / Storage / Network Switches / WAN Equipment Subtotal**: 18.7
- **Telecommunications Equipment Subtotal**: 3.0
- **Security Systems Subtotal**: 3.3
- **Total for All Equipment**: 25.0

**Calculations:**

- **BTU**: 6457.0
- **Watts**: 2656.0
- **Amps**: 8840.0
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<tr>
<th>Description</th>
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<th>Room</th>
<th>Owner/Department</th>
<th>Security/Access/CCTV</th>
<th>Floor Type</th>
<th>HVAC</th>
<th>UPS/Generator</th>
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<td>Card Access/Hand Key</td>
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<td>Anti-Static Tile</td>
<td>House Air</td>
<td>Rock Mountable UPS</td>
<td>Standard Sprinkler Head</td>
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</tbody>
</table>

- **Security**: Card Readers And Hard Key Door Locks
- **Floor**: Anti-Static Floor Tile/VCT Floor Tile/Sealed Concrete
- **HVAC**: Air Conditioning, 24 Hour a Day, 7 Days a week.
- **Generator**: Onan/Cummins 200 KW, 277/480 volt, 3 phase Genset
- **UPS**: (APC) 80KVA UPS - 17 Minutes of Run time at Full Load
  - APC UPS's Rack mounted provided by client.
  - EPD (emergency power off) requires RPO (remote power off) module provided by local vendor
- **Fire Suppression**: Pre-Action Dry Pipe, High Temp Sprinkler Heads

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**Technology Room Summary**
Outside Plant Design
Riser Conduit Diagram
Electrical Single Line Diagram
Advantages of 3D design and BIM

- Digital prototype helps identify and resolve design issues early in the design process
- Provides visualization of alternative design solutions and options
- Provides a single background for multiple users to build from
- Provides advanced building performance information
- Improves construction planning and quality control
- Allows better communication across all team members
- Cost efficient

3D Design and Building Information Modeling (BIM)
Data Center Airflow Design
HVAC Layout with Raised Floor
Data Center Airflow
Data Center & Colocation Sample Documentation

Data Center Commissioning

Commissioning Levels:

Level 1
- Submittal Review and Factory Witness Testing

Level 2
- Site Inspection and Verification to Submittal

Level 3
- Installation Inspections and Verifications to Design Drawings

Level 4
- Component Testing to Design Loads

Level 5
- System Integration Tests at Full Design Loads
Develop & Coordinate Move Schedule

<table>
<thead>
<tr>
<th>Item Description</th>
<th>Low</th>
<th>High</th>
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<tbody>
<tr>
<td>1. Cabling Infrastructure</td>
<td>$653,185.00</td>
<td>$741,680.00</td>
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<tr>
<td>2. Technology Rooms: Patch Panel / Equipment Racks</td>
<td>$50,500.00</td>
<td>$58,270.00</td>
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<tr>
<td>3. InfraFire Support</td>
<td>$11,900.00</td>
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<td>4. Power Systems</td>
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<td>5. Fire Suppression</td>
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<td>6. HVAC</td>
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<td>7. Flooring</td>
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<td>8. Communications Equipment</td>
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<tr>
<td>9. Paging</td>
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<tr>
<td>10. Audio Visual/Video Conferencing</td>
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<td>11. Service Providers</td>
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<td>12. Temporary Network Connection</td>
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<tr>
<td>13. Move/Installation Contractors</td>
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<tr>
<td>14. Project Management</td>
<td>$126,125.00</td>
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Preliminary Budget Total: $1,021,391.50 $1,268,165.00

Budget

Fit Up and Move Coordination
Customized Monitoring Dashboard

- Alarms
- Reports
- Status
- Graphics
- Service Tickets
- Event Management System
- Remote Access
- Local & Remote Notification
- Reactive / Proactive Response
- Mitigate Risk

Network Operation Center (NOC)
Monitoring Reports and Trending Analytics

- Capacity Planning
- Environmental Monitoring
- Power Utilization Effectiveness (PUE)

- Alarm Console
- Report
- Trends
- Alarm Message
- Alarm Escalation
Documentation Management

- Capturing construction deviations from construction documents.
- Resource for future maintenance and planning.
- Provide a snapshot of existing design.
- Verify and confirm existing assets, or assets acquired through mergers & acquisitions.

- Job Captain
- Periodic Updates
- Documentation Management
- Plan View Drawings
- Elevation Drawings
- Evacuation Plans
- Fire Protection Plans
- Security Plans
- Equipment Plans
- Reflected Ceiling Plans
- Column Grid
- BOMA (Building Owners and Managers Association) Standards
- Outside Plant – (including Vault Box Butterfly Detail)
- Technology Room
- CAD Conversion
- Identify Carriers
Customized Documentation & Training Materials
- Policies – Establish guidelines and rules
- Procedures – Steps for every day and not so every day operations
- Signage – Information where it is needed the most
- As Built Documents – Everyone has accurate information
- Forms – Keeping operation staff “in the know”
- Training – Reinforcing staff knowledge with training from experts
- DCiM – Asset tracking, capacity planning, modeling, and asset allocation.

Method of Procedures (MOP’s)

Training Materials

Guidelines & Best Practice

Customized Documentation & Training Materials
Technology Convergence Consulting and Project Management

**TELADATA Services**
- IT Infrastructure
- Data Centers
- Monitoring
- Audiovisual
- Telecommunications
- Security
- Technical Documentation

**Assessments**
- Convergence Readiness
- Data Center Capacity
- Network Rooms
- IT Relocation Planning
- Site Selection
- VoIP Readiness
- PoE Deployment
- Cabling Infrastructure

**Standards and Procedures**
- Master Planning
- Create Internal Standards
- Globalized Standards
- Policies & Procedures Handbooks
- Training Videos
- Contractor Safety Videos

**Project Management**
- Design
- Bid Documents
- Resource Planning
- Contract Reconciliation
- Schedule/Timeline Management
- Construction Management

**As-Built Documentation**
- Color drawings
- Photos
- Existing Conditions

**Relocation Coordination**
- Server/Network Equipment
- Desktop Equipment
- Phones
- Move Planning

TELADATA offers a true "end to end" solution including exceptional design services for our conduit infrastructure, data center, and horizontal cabling. The detailed documentation is impeccable and a tremendous asset, helping us save time and money both during the initial project phase and maintaining the site years after they were built. Yahoo has high expectations and TELADATA has consistently exceeded them over almost a decade long relationship. It is refreshing to work with a company that always has our best interests in mind.

— Yahoo!

The IT Department received much kudos for having things up and running with virtually very minimal downtime. This would not have happened if it were not for TELADATA and the team we worked with to get all IT and Engineering labs up and running. Terayon is now able to save 5-6 million on rent each year. This is the second time that I have used TELADATA and I will continue to use this team in the future.

— Motorola, formerly Terayon