

SolarBeam LLC

Network Proposal

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Executive Summary: SolarBeam LLC Network Plan

Project Overview:

SolarBeam LLC, a leading solar panel manufacturer in Tampa Bay, Florida, is gearing up for a strategic network overhaul. In collaboration with ChecoTech Solutions and JS Computing, the company aims to revitalize its digital infrastructure to support a workforce of 200 employees across various roles, encompassing design, engineering, and production.

ISP Selection:

In recognition of the critical role of robust internet connectivity in modern manufacturing, SolarBeam LLC has chosen Frontier Business Communication Fiber Service as its dedicated Internet Service Provider (ISP), ensuring 2-gigabyte network speeds for seamless communication and access to digital resources.

VPN Router with QoS Features:

At the heart of this network enhancement is the ER8411 Omada VPN Router with 10G Ports, bringing advanced Quality of Service (QoS) features to optimize network management. With up to 10 WAN Ports, highly secure VPN protocols, and a suite of security features, this router ensures a resilient and secure network environment.

Security Features:

The Cisco Firepower 1140 Network FPR1140-NGFW-K9 further fortifies the network with abundant security features, including IDS/IPS, DPI, advanced firewall policies, DoS defense, IP/MAC/URL filtering. These features have proven effective in safeguarding networks and have demonstrated success in previous implementations.

Scalability and Redundancy:

Ensuring scalability for the future, SolarBeam LLC incorporates the 52P JetStream 52-Port Gigabit L2+ Managed Switch in each Warehouse Area. Redundancy measures have been strategically implemented through a distributed server architecture.

Distributed Server Architecture:

Material Plant: SCADA Systems - Hosted on servers, utilizing AVEVA™ Plant SCADA software to oversee raw material processing.

Manufacturing Plant: Production Servers - Facilitating file sharing, print services, backup, recovery, and hosting specialized applications for the manufacturing process.

Main Building: Promotion and Sales Servers - Supporting web pages, databases, and communication tools for sales and promotional activities.

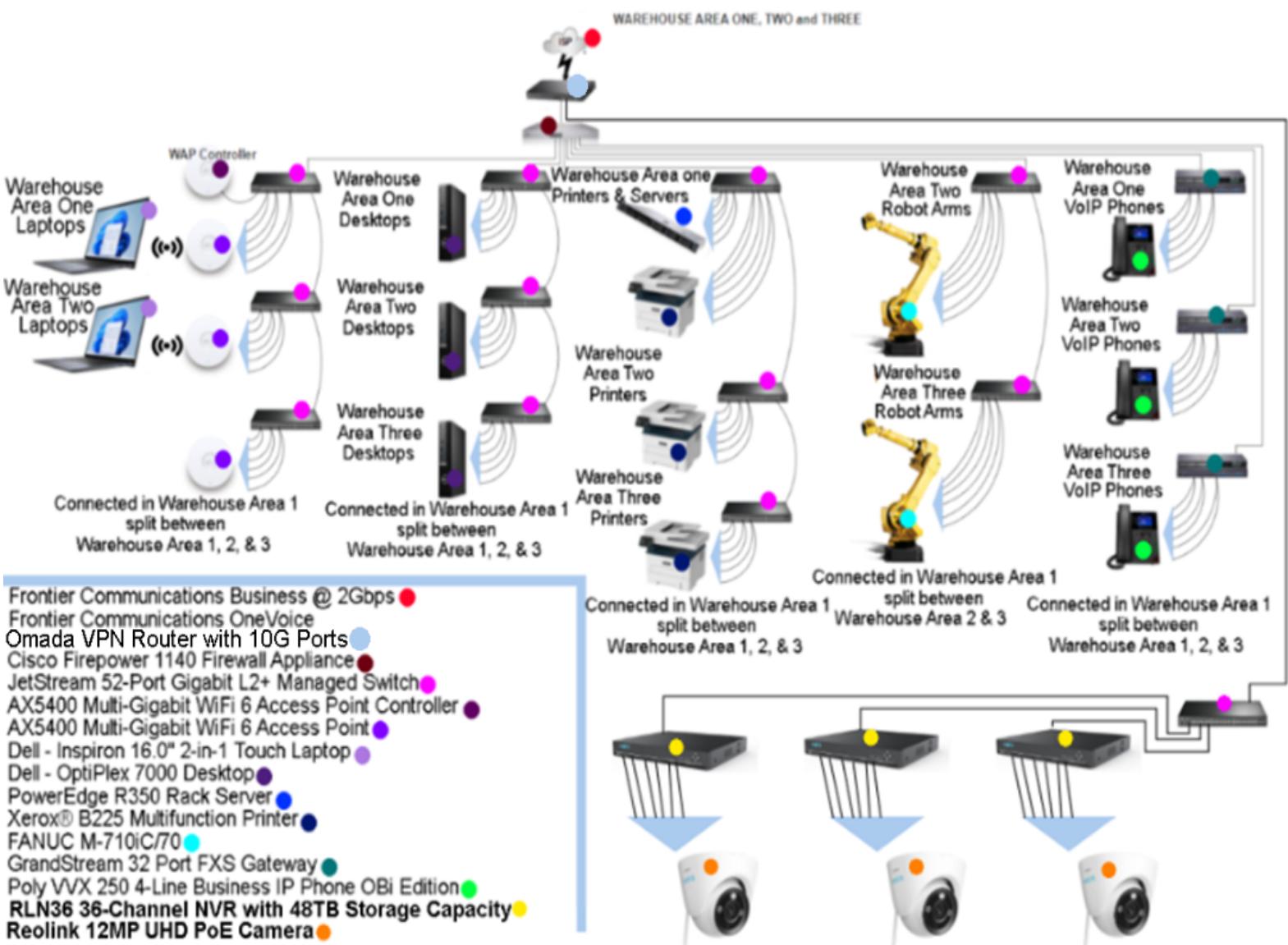
Guest Wi-Fi with Isolation:

SolarBeam LLC extends free guest Wi-Fi service, managed through an AX5400 Multi-Gigabit Ceiling Mount WiFi 6 Access Point. Isolated by a VLAN through the 52P JetStream switch, this setup ensures the protection of the core network in case of any compromise on the guest network. This meticulous approach aligns with stringent security measures to safeguard sensitive manufacturing information.

Dedicated Distribution Sheet of Electronics

Employee Position	Amount of Employee's	Printer	Desktop/Laptop	VoIP Phones
Warehouse Area One				
Customer Service Representatives	5	3 Printer	5 Desktop	5 VoIP Phones
Human Resources Manager	1	1 Printer	1 Desktop	1 VoIP Phone
Training and Development Specialist	1	1 Printer	1 Desktop	1 VoIP Phone
Environmental Compliance Officer	1	1 Printer	1 Desktop	No dedicated phones assumed (use shared phones if necessary)
Accountant	1	1 Printer	1 Desktop	1 VoIP Phone
Warehouse Area Two				
Warehouse Manager	1	1 Printer	1 Desktop	1 VoIP Phone
Logistics Coordinator	1	1 Printer	1 Laptop	1 VoIP Phone
Quality Control Supervisor	1	1 Printer	1 Desktop	1 VoIP Phone
Safety Officer	1	1 Printer	1 Laptop	1 VoIP Phone
Inventory Specialist	3	1 Printer	1 Desktop	1 VoIP Phone
Maintenance Technicians	5	1 Printer	5 Laptops	5 VoIP Phones
IT Support Team	3	1 Printer	3 desktops & 2 Laptops	5 VoIP Phones
Cleaning and Maintenance Crew	5	1 Printer	5 shared desktops in a common area	No dedicated phones assumed (use shared phones if necessary)
Warehouse Area Three				
Assembly Line Supervisors	5	2 Printer	5 Desktops	5 VoIP Phones
Solar Panel Assemblers	150	5 Printer	5 shared desktops in a common area	No dedicated phones assumed (use shared phones if necessary)
Maintenance Technicians	5	1 Printer	5 Laptops	5 VoIP Phones
Cleaning and Maintenance Crew	5	1 Printer	5 shared desktops in a common area	No dedicated phones assumed (use shared phones if necessary)

SolarBeam LLC Facility Physical Network Diagram



SolarBeam LLC Facility Logical Network Diagram



Frontier Communications Business @ 2Gbps: 192.168.1.0 ●

Frontier Communications OneVoice

Cabling: trueCABLE Cat6 Shielded Rise

Router/Firewall Configuration

1 Omada VPN Router with 10G Ports: 192.168.1.1 ●

1 Cisco Firepower 1140 Firewall Appliance: 192.168.1.2 ●

Network ONE

3 JetStream 52-Port Gigabit L2+ Managed Switch: 192.168.1.3 - 1.5 ●

1 AX5400 Multi-Gigabit WiFi 6 Access Point Controller: 192.168.1.6 ●

100 AX5400 Multi-Gigabit WiFi 6 Access Point: 192.168.1.7 - 1.108 ●

Network TWO

3 JetStream 52-Port Gigabit L2+ Managed Switch: 192.168.2.3 - 2.5 ●

31 Dell - OptiPlex 7000 Desktop: 192.168.2.6 - 2.36 ●

Network THREE

3 JetStream 52-Port Gigabit L2+ Managed Switch: 192.168.3.3 - 3.5 ●

15 PowerEdge R350 Rack Server 192.168.3.6 - 3.20 ●

20 Xerox® B225 Multifunction Printer 192.168.3.21 - 3.40 ●

Network FOUR

2 JetStream 52-Port Gigabit L2+ Managed Switch: 192.168.4.3 - 4.4 ●

100 FANUC M-710iC/70 192.168.4.5 - 4.104 ●

Network FIVE

1 GrandStream 32 Port FXS Gateway: 192.168.5.3 ●

8 Poly VVX 250 4-Line Business IP Phone OBi Edition 192.168.5.4 - 5.11 ●

Network SIX

1 GrandStream 32 Port FXS Gateway: 192.168.6.3 ●

10 Poly VVX 250 4-Line Business IP Phone OBi Edition 192.168.6.4 - 6.13 ●

Network SEVEN

1 GrandStream 32 Port FXS Gateway: 192.168.7.3 ●

15 Poly VVX 250 4-Line Business IP Phone OBi Edition 192.168.7.4 - 7.18 ●

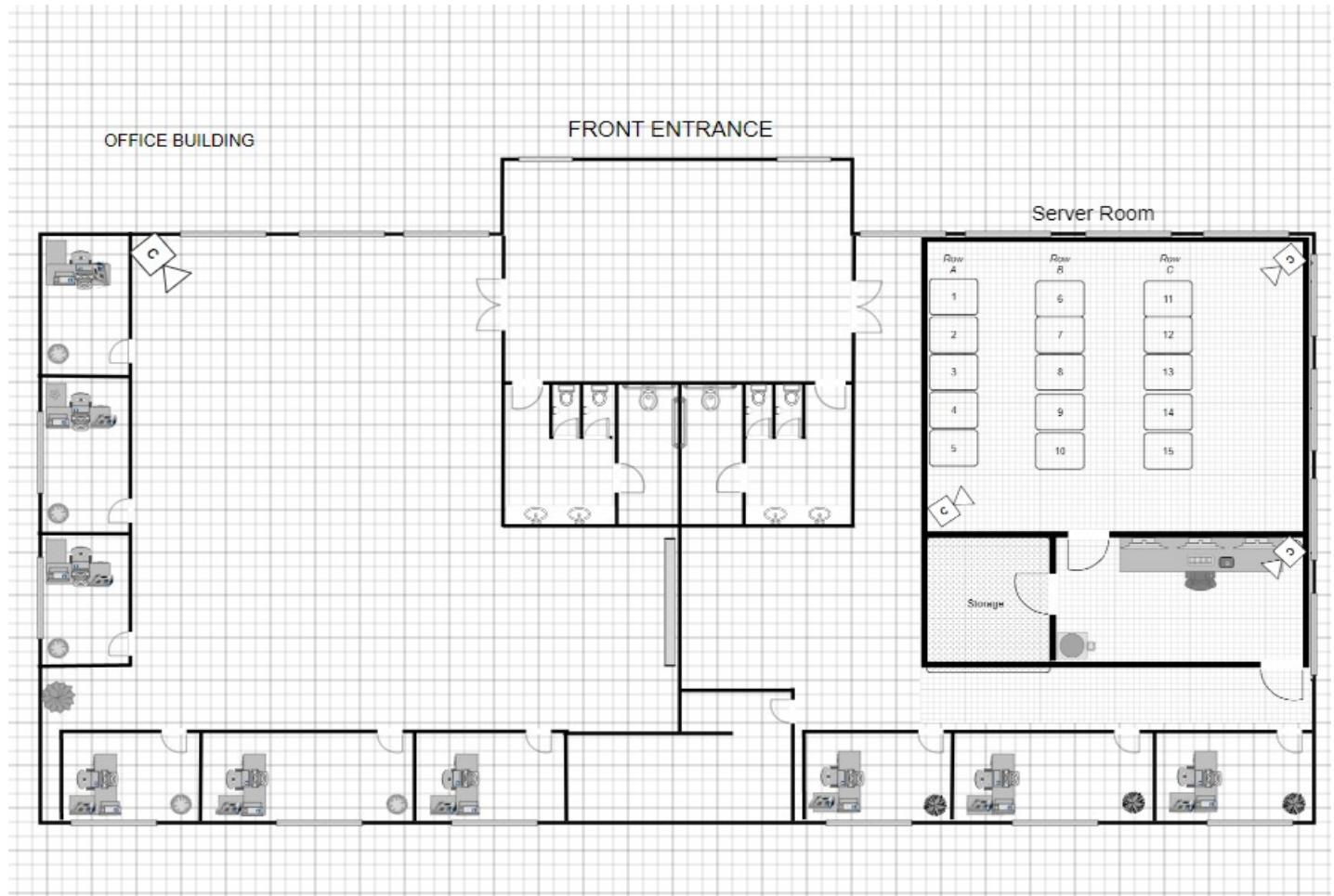
Network EIGHT

1 JetStream 52-Port Gigabit L2+ Managed Switch: 192.168.8.3 ●

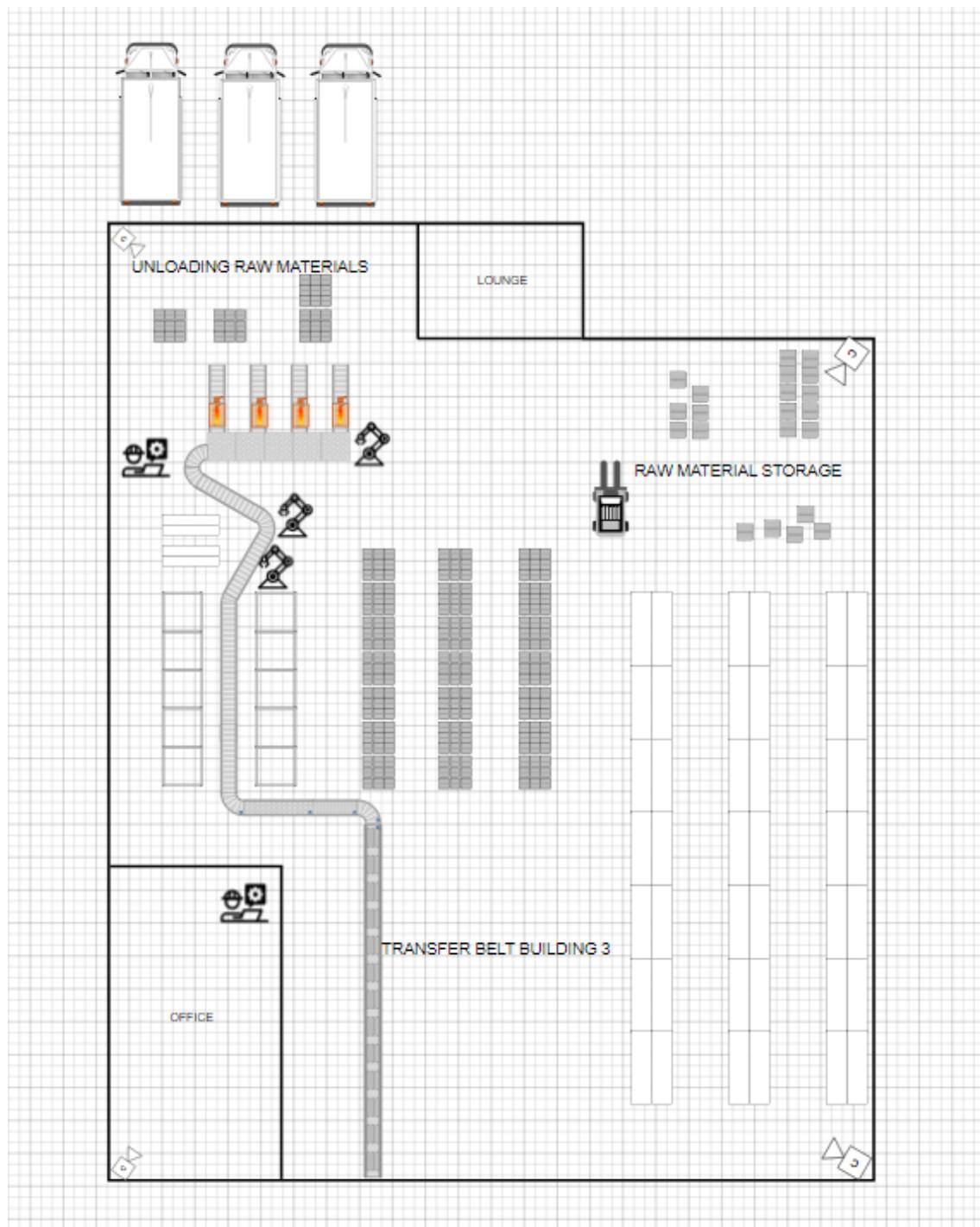
3 Reolink 36-Channel NVR with 48TB Storage Capacity 192.168.8.4 - 8.6 ●

100 Reolink 12MP UHD PoE Camera with Color Night Vision: 192.168.8.7 - 8.106 ●

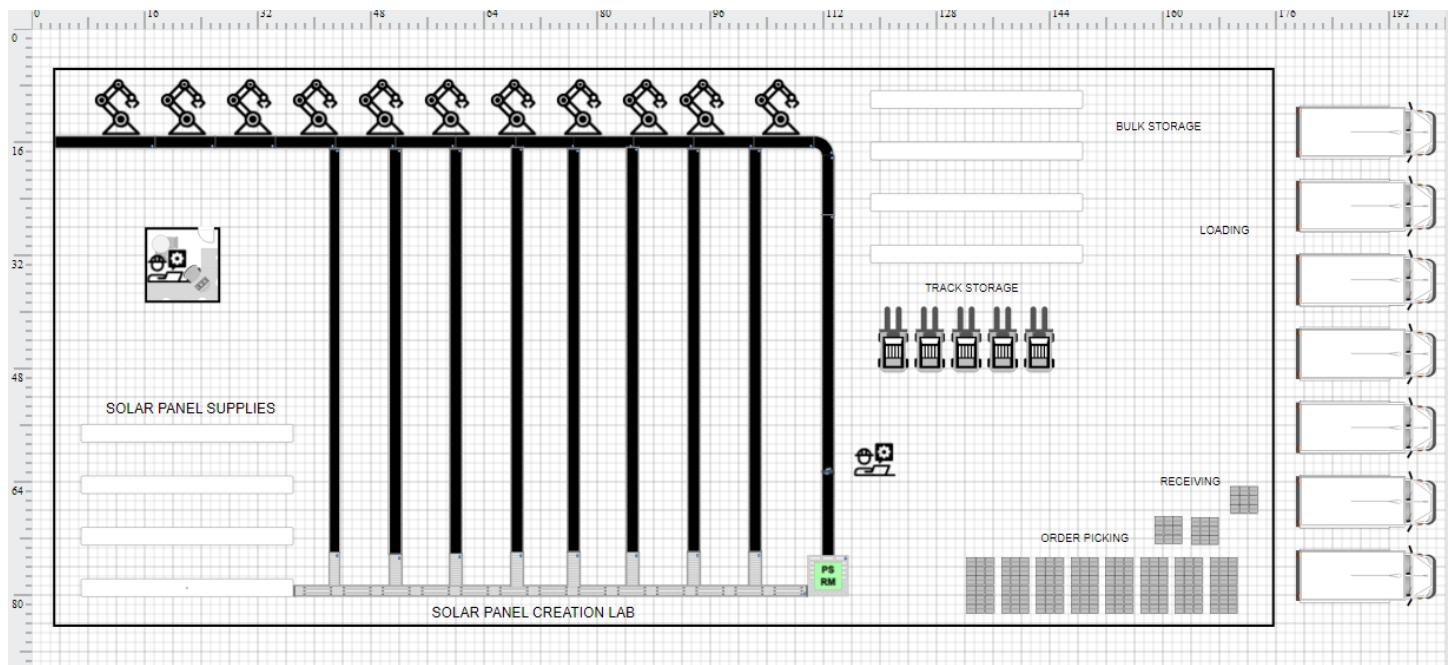
SolarBeam LLC Facility Floor Plan Diagram



SolarBeam LLC Facility Floor Plan Diagram



SolarBeam LLC Facility Floor Plan Diagram



Materials List

Item	Description	Quantity	Unit Price	Total Price
ISP	Business Fiber 2 Gig*	1	\$130	\$130
Router	ER8411 Omada VPN Router with 10G Ports	1	\$400	\$400
VOIP Services	Frontier Communications OneVoice	1	\$30	\$30
Firewall	Cisco Firepower 1140 Network FPR1140-NGFW-K9	1	\$3,350	\$3,350
Switch (Server and Printer)	52P JetStream 52-Port Gigabit L2+ Managed Switch	3	\$549	\$1,647
Server	PowerEdge R350 Rack Server	15	\$3,631.69	\$58,107.04
Switch (Desktop PC)	52P JetStream 52-Port Gigabit L2+ Managed Switch	3	\$549	\$1,647
Switch (WAP)	52P JetStream 52-Port Gigabit L2+ Managed Switch	3	\$549	\$1,647
WAP Controller	AX5400 Multi-Gigabit Ceiling Mount WiFi 6 Access Point	1	\$134.99	\$134.99
WAP	AX5400 Multi-Gigabit Ceiling Mount WiFi 6 Access Point	100	\$134.99	\$13,499
Switch (Cameras)	52P JetStream 52-Port Gigabit L2+ Managed Switch	3	\$549	\$1,647
Camera NVR	RLN36 36-Channel NVR with 48TB Storage Capacity	3	\$200	\$600
Cameras	RLC-1224A 12MP UHD PoE Camera with Color Night Vision	100	\$109	\$10,900

VoIP Gateway	GrandStream 32 Port FXS Gateway	1	\$650	\$650
VOIP Phones	Poly VVX 250 4-Line Business IP Phone OBi Edition	29	\$159	\$4,611
Switch (Robot Arm)	52P JetStream 52-Port Gigabit L2+ Managed Switch	2	\$549	\$1,098
Cat 6 Cabling	DRIPSTONE CAT6 1000ft 23AWG 550Mhz Solid UTP Ethernet Cable RJ45	400	\$87	\$34,800
Robot Arms	FANUC M-710iC/70	100	\$95,000	\$9,500,000
Desktops	Dell - OptiPlex 7000 Desktop	31	\$740	\$22,940
Laptops	Dell - Inspiron 16.0" 2-in-1 Touch Laptop - AMD Ryzen 5 7530U	8	\$849	\$6,792
Printer	Xerox® B225 Multifunction Printer	20	199.99	\$3,999.80
UPS (Printer, PC's, VoIP Phones, Cameras, WAPs, Server)	APC Smart-UPS, Line Interactive, 1500VA	41	\$679	\$27,839
UPS (Robot Arms)	APC Smart-UPS SRT 3000 RM	67	\$2,601.03	\$174,269.01
Scada Software	AVEVA™ Plant SCADA	1	\$550,500	\$550,500
Labor		28 Workers	\$30 per hour	\$336,000

Total Cost before sales tax = **\$10,757,238.84**
Total Cost after 7.50% sales tax = **\$11,564,031.69**

Schedule

Week	Date	Day	Task and Activities
1	2023-12-12 to 2023-12-16	Mon-Fri	Warehouse Area 1 - ISP Business Fiber 2 Gig Installation
1	2023-12-12 to 2023-12-16	Mon-Fri	Warehouse Area 1 - Install and Configure ER8411 Omada VPN Router
1	2023-12-12 to 2023-12-16	Mon-Fri	Warehouse Area 1 - Install and Configure Cisco Firepower 1140 Firewall
2	2023-12-19 to 2023-12-23	Mon-Fri	Warehouse Area 1 - Install and Configure JetStream 52-Port Gigabit L2+ Managed Switch
2	2023-12-19 to 2023-12-23	Mon-Fri	Warehouse Area 1 - Install and Configure PowerEdge R350 Rack Server
3	2023-12-26 to 2023-12-30	Mon-Fri	Warehouse Area 1 - Install and Configure JetStream 52-Port Gigabit L2+ Managed Switch (WAP)
3	2023-12-26 to 2023-12-30	Mon-Fri	Warehouse Area 1 - Install and Configure AX5400 Multi-Gigabit Ceiling Mount WiFi Access Point
4	2024-01-02 to 2024-01-06	Mon-Fri	Warehouse Area 1 - Install and Configure JetStream 52-Port Gigabit L2+ Managed Switch (Cameras)
4	2024-01-02 to 2024-01-06	Mon-Fri	Warehouse Area 1 - Install and Configure RLN36 Camera NVR
5	2024-01-09 to 2024-01-13	Mon-Fri	Warehouse Area 1 - Configure VoIP Gateway - GrandStream 32 Port FXS Gateway
5	2024-01-09 to 2024-01-13	Mon-Fri	Warehouse Area 1 - Install and Configure Poly VVX 250 VoIP Phones

6	2024-01-16 to 2024-01-20	Mon-Fri	Warehouse Area 2 - Install and Configure JetStream 52-Port Gigabit L2+ Managed Switch
6	2024-01-16 to 2024-01-20	Mon-Fri	Warehouse Area 2 - Install and Configure PowerEdge R350 Rack Server
6	2024-01-16 to 2024-01-20	Mon-Fri	Warehouse Area 2 - Install Robot Arms - FANUC M-710iC/70
7	2024-01-23 to 2024-01-27	Mon-Fri	Warehouse Area 2 - Install and Configure JetStream 52-Port Gigabit L2+ Managed Switch (WAP)
7	2024-01-23 to 2024-01-27	Mon-Fri	Warehouse Area 2 - Install and Configure AX5400 Multi-Gigabit Ceiling Mount WiFi Access Point
7	2024-01-23 to 2024-01-27	Mon-Fri	Warehouse Area 2 - Install and Configure Robot Arms - FANUC M-710iC/70
8	2024-01-30 to 2024-02-03	Mon-Fri	Warehouse Area 2 - Install and Configure JetStream 52-Port Gigabit L2+ Managed Switch (Cameras)
8	2024-01-30 to 2024-02-03	Mon-Fri	Warehouse Area 2 - Install and Configure RLN36 Camera NVR
8	2024-01-30 to 2024-02-03	Mon-Fri	Warehouse Area 2 - Install and Configure RLC-1224A Cameras
9	2024-02-06 to 2024-02-10	Mon-Fri	Configure VoIP Gateway - GrandStream 32 Port FXS Gateway
9	2024-02-06 to 2024-02-10	Mon-Fri	Warehouse Area 2 - Install and Configure Poly VVX 250 VoIP Phones
9	2024-02-06 to 2024-02-10	Mon-Fri	Warehouse Area 2 - Install Robot Arms - FANUC M-710iC/70

10	2024-02-13 to 2024-02-17	Mon-Fri	Warehouse Area 3 - Install and Configure JetStream 52-Port Gigabit L2+ Managed Switch
10	2024-02-13 to 2024-02-17	Mon-Fri	Warehouse Area 3 - Install and Configure PowerEdge R350 Rack Server
10	2024-02-13 to 2024-02-17	Mon-Fri	Warehouse Area 3 - Install and Configure JetStream 52-Port Gigabit L2+ Managed Switch (WAP)
10	2024-02-13 to 2024-02-17	Mon-Fri	Warehouse Area 3 - Install and Configure AX5400 Multi-Gigabit Ceiling Mount WiFi Access Point
10	2024-02-13 to 2024-02-17	Mon-Fri	Warehouse Area 3 - Install and Configure JetStream 52-Port Gigabit L2+ Managed Switch (Cameras)
10	2024-02-13 to 2024-02-17	Mon-Fri	Warehouse Area 3 - Install and Configure RLN36 Camera NVR
10	2024-02-13 to 2024-02-17	Mon-Fri	Warehouse Area 3 - Install and Configure RLC-1224A Cameras
10	2024-02-13 to 2024-02-17	Mon-Fri	Warehouse Area 3 - Configure VoIP Gateway - GrandStream 32 Port FXS Gateway
10	2024-02-13 to 2024-02-17	Mon-Fri	Warehouse Area 3 - Install and Configure Poly VVX 250 VoIP Phones
10	2024-02-13 to 2024-02-17	Mon-Fri	Warehouse Area 3 - Install Robot Arms - FANUC M-710iC/70

Conclusion

Having immersed ourselves in the intricate details of the comprehensive network upgrade proposal for SolarBeam LLC, a collaborative venture with ChecoTech Solutions and JS Computing, we distill a concise summary of the innovative solutions tailored to the specific needs of this leading solar panel manufacturer in Tampa Bay. Geared towards revitalizing its digital infrastructure, this project is set to fortify SolarBeam's ability to support a diverse workforce of 200 employees engaged in design, engineering, and production roles.

The selection of Frontier Business Communication Fiber Service as the dedicated Internet Service Provider (ISP) underlines the pivotal role of robust internet connectivity in modern manufacturing. Ensuring 2-gigabyte network speeds, this choice guarantees seamless communication and access to digital resources critical for SolarBeam's operational efficiency.

Central to this network enhancement is the ER8411 Omada VPN Router with 10G Ports, introducing advanced Quality of Service (QoS) features to optimize network management. Boasting up to 10 WAN Ports and a suite of highly secure VPN protocols, this router establishes a resilient and secure network environment. Abundant security features, including IDS/IPS, DPI, advanced firewall policies, DoS defense, and IP/MAC/URL filtering, further fortify the network against potential threats, building upon the success demonstrated in previous implementations.

Scalability for the future is ensured through the incorporation of the 52P JetStream 52-Port Gigabit L2+ Managed Switch in each Warehouse Area, supporting SolarBeam's growth trajectory. Redundancy measures are strategically implemented through a distributed server architecture, catering to specific needs in different areas such as SCADA Systems in the Material Plant, utilizing AVEVA™ Plant SCADA software to oversee raw material processing.

SolarBeam LLC extends its commitment to security with a dedicated Cisco firewall, adding an extra layer of protection to the network infrastructure. This meticulous approach also includes free guest Wi-Fi service, managed through an AX5400 Multi-Gigabit Ceiling Mount WiFi 6 Access Point. This service, isolated by a VLAN through the 52P JetStream switch, ensures the protection of the core network in case of any compromise on the guest network. This stringent security measure aligns with SolarBeam's commitment to safeguarding sensitive manufacturing information.

As SolarBeam embarks on this strategic network overhaul, **it's crucial to note that this proposal's pricing is guaranteed for 60 days**. The total cost before sales tax is **\$10,757,238.84**, and after a 7.50% sales tax, the total cost becomes **\$11,564,031.69**. We eagerly anticipate the opportunity to collaborate closely on the successful implementation of this transformative network plan. Should there be any inquiries or further discussions needed, we remain readily available. Thank you for entrusting Checo Tech and JScomputing with this pivotal initiative.