MSC Engineering Summary

Monday, April 12, 2021 5:42 PM

MARS SPACE CONSTRUCTION, LLC management has provided front end and detail design engineering services in the Offshore, Oil and Gas, Petro-Chemical, and Food Processing Industries. The management team is moving to the Space Industry to continue providing quality solutions to future space projects.

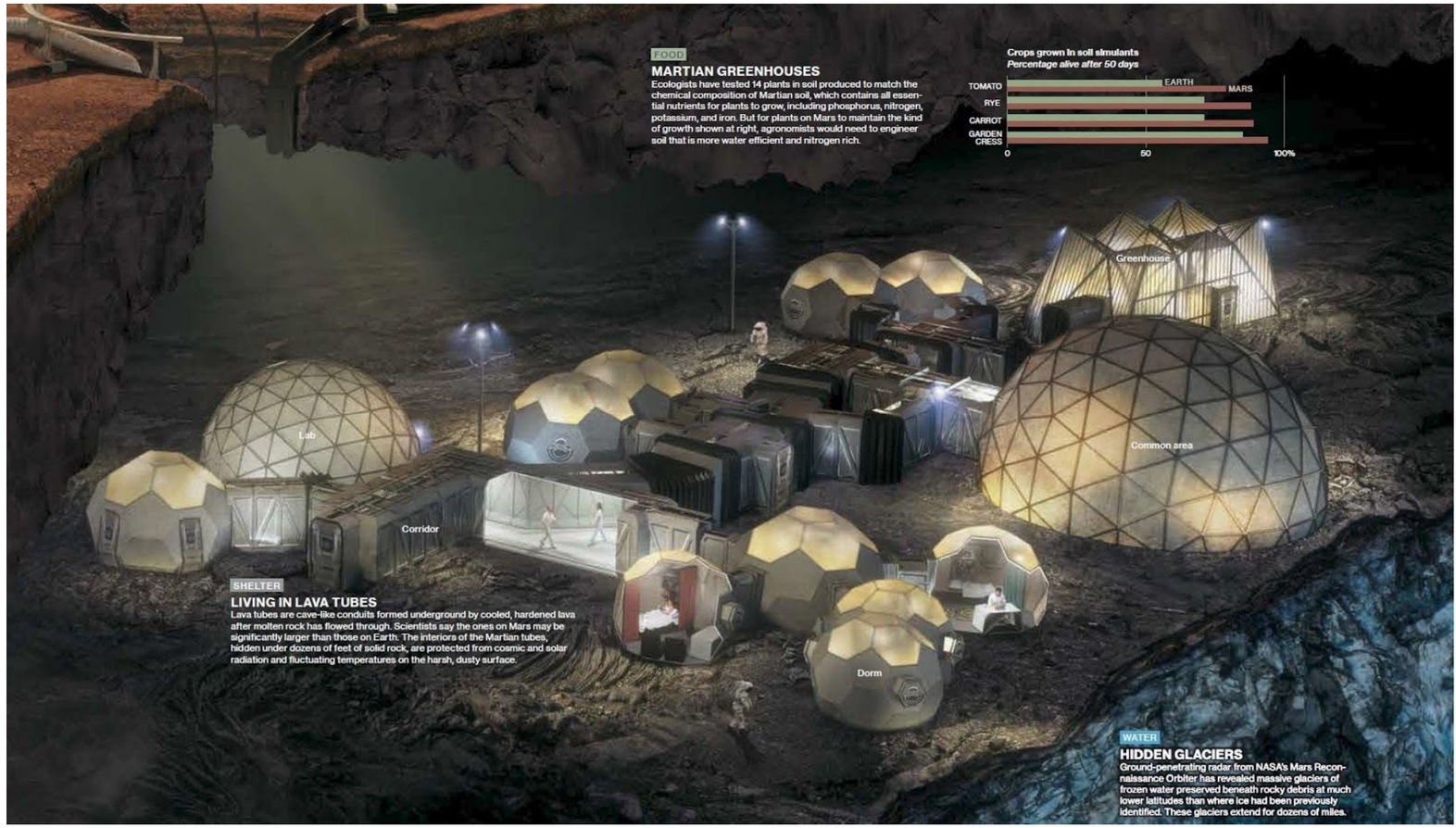
Unique Approach

Our unique integrated team approach to engineering and design enable us to have the input from engineering, procurement, construction, quality, and safety experts at the conceptual stages of design. This results in cost effective and on-time completion of the project.

Our team approach continues throughout the life of the project from the conceptual design to the commissioning and start up.

Quality

We design with quality in mind employing state of the art equipment and software and the latest Total Quality Management (TQM) techniques to meet our client's requirements.



MSC Engineering Standards - Mars

Friday, March 5, 2021 8:00 PM

AUTOCAD CADDWORX LEASE
APPLICATION

Project Folder Example:
Demar-Burrow Global

Mars - Engineering		*.pdf
Action Items List	*.xls	
Cash Expense Report	*.xls	
Change Order Form	*.xls	
Const Progress and Work Hours Temp.	*.xls	
Discipline Activity Status Report	*.xls	
Engineering Task List	*.xls	
Engineering Progress and Work Hours Temp.	*.xls	
Equipment Timesheets	*.xls	
Line List	*.xls	
Master Equipment List	*.xls	
Plant Line Sizing	*.xls	
Project Status Report	*.xls	
Project Trend Log	*.xls	
Project Progress Curves Temp.	*.xls	
RFI	*.xls	
Safety Report Temp.	*.xls	

Mars Engineering		***.pdf**
Periodic Table of Elements		
Size Definition		
Base - (1 - 100)		
Colony - (101-1000), made of multiple bases		
City - (1001 - 1,000,000), made up of multiple colonies		
Engineering Project		
Engineering Directory		
Engineering Specifications - materials, equipment, design variables, systems diagrams, etc.		
Site Definition - plot plan of area with defined design restrictions, codes, etc.		
Site Selection - areas selected meeting site definition criteria		
Site Survey - as-built of area to define underground and above ground restrictions, locate site in survey		
Site 3D Modeling - background for site infrastructure design modeling		
Infrastructure Definition - location of modules within site using area restrictions and limitations		
Module Definition - area required by pre-constructed module or by equipment package usage requirements		
Module Design		
Infrastructure Design		

MSC Engineering Codes for Mars

Friday, March 5, 2021 8:00 PM

Mars Space Construction, LLC Engineering/Design/Construction Codes for Mars		**NASA/ISS (Reference) National Technical Reports Library (NTRL)**	**SpaceX Engineering/Design/Construction Codes**
Systems Code List	*.doc		
Process Storage of Liquids & Gases for Mars	*.doc		
Communications Systems Codes	*.doc		
ISS Communications and Tracking of Visiting Vehicles		N20040086504.pdf	
ISS Testbed to Develop Cognitive Communications Systems		N260007507.pdf N160003476.pdf	
Computers & Data Management (CDM)	*.doc	n/a	
Crew Health Care System (CHeCS)	*.doc		
ISS Medical Hardware Catalog		N201100223979.pdf	
ISS Medical Operations		N20080010877.pdf	
ISS Medical Support for Crewmember Training		N170003840.pdf	
ISS A Unique Approach to Exercise in Long Duration Habitats		N20060022073.pdf	
ISS Microbiological Monitoring of the ISS		N20130009199.pdf	
ISS Risk of Performance Errors Due to Fatigue Resulting from Sleep Loss, Circadian Desynchronization, Extended Wakefulness, and Work Overload		N20110016206.pdf	
ISS to Simulate Interplanetary Transit: Human Health and Performance Applicability of Current Increment Durations and Extended Durations		N20110008393.pdf	
Environmental Control and Life Support System (ECLSS)	*.doc		
ISS help Plan Life Support for Mars?		N160014540.pdf	
ISS Controls & Automation Research in Space Life Support		N190027321.pdf	
ISS Exploration Life Support System Demonstration		N190032192.pdf	
ISS Regenerative Environmental Control & Life Support System		N150008174.pdf	
ISS Would Recycling Life Support Systems save Mass on a Mars Transit?		N170007268.pdf	
ISS Testbed for Advanced Environmental Control & Life Support Systems		N190027253.pdf	
ISS help Plan Life Support for Mars?		N160014540.pdf	
ISS Life Support for Deep Space and Mars		N140011164.pdf	
ISS Advanced EMU Portable Life Support System (PLSS) and Shuttle/ISS EMU Schematics		N20120009158.pdf	

ISS Developing an Advanced Life Support System for the Flexible Path into Deep Space		N20100036823.pdf	
ISS Environmental Control and Life Support System – Verification for the Pressurized Mating Adapters		N20070019851.pdf	
ISS Developing Reliable Life Support for Mars		N170010347.pdf	
Extravehicular Activity (EVA) System	*.doc		
ISS H-II Transfer Vehicle (HTV) and the Operations Concept for Extravehicular Activity (EVA)		N20110010988.pdf	
ISS Experiences with Extra-Vehicular Activities		N160003091.pdf	
ISS Environmental Control and Life Support (ECLS) Hardware Commonality for Exploration Vehicles		N20120015339.pdf	
Guidance, Navigation, and Control System	*.doc		
Habitat & Systems Codes	*.doc		
Deep Space Habitats, Humans to Mars Summit 2015		N150016185.pdf	
NASA Habitation Concepts For Human Missions Beyond Low-Earth-Orbit		N160012094.pdf	
NASA Plant Growth Optimization by Vegetable Production System in HI-SEAS Analog Habitat		N170007809.pdf	
NASA Assessment and mitigation of the effects of noise on habitability in deep space environments:		N190025346.pdf	
NASA Gateway Assessment and mitigation of the effects of noise on habitability in deep space environments		N200002332.pdf	
NASA THE SPACE REVIEW - 2011		N20120008261.pdf	
NASA Lunar Habitat Air lock/Suit lock		N20080018968.pdf	
NASA, "NEEMO Proj.", Utilizes the "Aquarius" Undersea Habitat as an Analog for Long- Duration Space Flight.		N20110011365.pdf	
Instrumentation Systems Codes	*.doc		
ISS Thermal Design and Analysis of an ISS Science Payload		N170007404.pdf	
ISS Independent Assessment of Instrumentation		N140000802.pdf	
ISS Independent Assessment of Instrumentation		N140000803.pdf	
ISS External Active Thermal Control System (EATCS) Ammonia Leak		N190027334.pdf	
Lighting Systems Codes	*.doc		
ISS Use of Photo-Luminescence as an Emergency Egress Guidance System		N140013117.pdf	
ISS Solid State Based Interior Lighting System		N160005080.pdf	
Oxygen Systems Codes	*.doc		
ISS Oxygen Generation Assembly (OGA) Is Not Feasible for Mars Transit		N160014553.pdf	

ISS The Variable Oxygen Regulator (VOR), a stepper actuated two-stage mechanical regulator		N170003941.pdf	
ISS O2 Production, Gas Supply & Partial Pressure Management		N150010425.pdf	
ISS A Cabin Air Separator for EVA Oxygen		N20110010970.pdf	
ISS Fine Water Mist Portable Fire Extinguisher		N20130011664.pdf	
ISS Atomic Oxygen Erosion of EVA-stranded Soft-goods		N170004712.pdf	
ISS Atomic Oxygen Protection of Materials in Low Earth Orbit		N20020038835.pdf	
ISS Advancing the Oxygen Generation Assembly Design to Increase Reliability		N150016494.pdf	
ISS Durability Issues for the Protection of Materials From Atomic Oxygen Attack		N20020082955.pdf	
ISS Atomic Oxygen Erosion of EVA-stranded Soft-goods		N170004713.pdf	
ISS Current Status of the Nitrogen Oxygen Recharge System		N20110012004.pdf	
ISS Plasma Methane Pyrolysis for Spacecraft Oxygen Loop Closure		N180001134.pdf	
ISS Atomic Oxygen Cleaning Shown to Remove Organic Contaminants at Atmospheric Pressure		N20050180649.pdf	
ISS Current Status of the Nitrogen Oxygen Recharge System		N20110012004.pdf	
Power Systems Codes	*.doc		
ISS The SPACE Computer Code for Analyzing the Electrical Power System: Past, Present, and Future		N180005346.pdf	
ISS Advanced Solar Arrays		N190032191.pdf	
ISS CHARGING OF THE INTERNATIONAL SPACE STATION DUE TO ITS HIGH VOLTAGE SOLAR ARRAYS		N2003000606.pdf	
ISS Power System Telemetry Compared With Analytically Derived Data for Shadowed Cases		N20050215029.pdf	
ISS Power System Model Validated		N20050205866.pdf	
ISS Lithium-Ion Battery		N160012048.pdf	
ISS Nickel-Hydrogen Battery Start-Up and Initial Performance		N20010094063.pdf	
Radiation Shielding Systems Codes	*.doc		
ISS Radiation Shielding and Acoustic Simulation		N20040085693.pdf	
Storage Tank Codes	*.doc		
Storage Tank Codes (worksheet)	*.xls		
HISTORICAL TANK CONTENT ESTIMATE FOR AW TANK FARM		DE98059656.pdf	
Thermal Control System (TCS)	*.doc		
ISS Payload Thermal Environments		N150014503.pdf	
ISS External Thermal Control System (ETCS) Loop A		N150001254.pdf	

Pump Module (PM)			
ISS Passive Thermal Control System Top Ten Lessons-Learned		N180006803.pdf	
NASA Thermal Performance of Orion Active Thermal Control System With Seven-Panel Reduced-Curvature Radiator		N20100040420.pdf	
EPA Tank Corrosion Study		PB97127161.pdf	
Waste Systems Codes	*.doc		
NASA Waste Management Plan		DE98051507.pdf	
Water Systems Codes	*.doc		
ISS Status of ISS Water Management and Recovery		N20120015013.pdf N20120016427.pdf N140002687.pdf	
ISS Water Balance Operations		N20110012703.pdf	
ISS Status of the Regenerative ECLS Water Recovery System		N20100033089.pdf	
ISS Water Recovery System Design to Accommodate Dormant Periods for Manned Missions		N150019532.pdf	
ISS Upgrades to the Water Recovery System		N150019533.pdf	
Other Links			
Engineering Drafting Standards			
ISS Turn-Key Use of Onboard 3D Printer for ISS Operations		N170003300.pdf	
ISS Practicing for Mars: The International Space Station (ISS) as a Testbed		N140004801.pdf	
ISS using the International Space Station as a Mars Transit Analog		N190032318.pdf	
ISS Resource Planning & Management for Decrewing/Recrewing Scenarios		N20130013650.pdf	
Instructional Support System, An Overview for Managers		ADA228044.pdf	
ISS Risk Reduction Activities		N20110016203.pdf	
ISS Human Factors Engineering Requirements		N20110002790.pdf	
ISS An Onboard ISS Virtual Reality Trainer		N20130008966.pdf	
ISS Fundamental Physics		PB2016104498.pdf	
ISS Exploring NASA Human Spaceflight and Pioneering Scenarios		N1500018902.pdf	
ISS International Space Station Systems Engineering Case Study		ADA538763.pdf	

ISS Design Review- NASA Reference Manuals

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International Space Station **Design - Reference Manual Name**	**Topic**	**Pages**	**Notes**

Eng. - Equip. Data Sheets (Bechtel/Saulsbury)

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Equipment Design (Bechtel)
Contents - Pipe Specifications & Materials (9.1 - 9.9)
Contents - Pipe Stress Analysis & Pipe Supports (12.1 - 12.75)
Contents - Instrumentation (13.1 - 13.54)
Sect. 2 - Heat Exchangers
Sect. 3 - Vessels
Sect. 4 - Pumps
Sect. 5 - Fire Heaters
Sect. 6 - Compressors
Sect. 7 - Air-Cooled Heat Exchangers
Sect. 8 - Pipe Ways
Sect. 10 - Basic Plant Layout and Piping Design
Sect. 11 - PFD, P&ID, Line Designation Tbl

Equipment Data Sheets - Saulsbury
Air Fin-Fan Coolers
Air Cooled Exch. - Stabilizer Reflux Condenser
Air Cooled Exch. - Y-Grade Condenser
Compressors
Recip. Compressors
Y-Grade Compressors
Exchangers - Shell & Tube
Kettle Heat Exchanger - Fractionator Reboiler
Tubular Heat Exchanger - Fractionator Feed-Product
Tubular Heat Exchanger - Fractionator Side Heater
Tubular Heat Exchanger - Pipeline Liquids Heater
Tubular Heat Exchanger - Stabilizer Feed Heater
Tubular Heat Exchanger - Stabilizer Reboiler
Filters
Horiz. Filter Separator - Residue Gas Filter Coalescer
Vertical Filter - Pipeline Liquids Filter Coalescer
Flares
Plant Flare Datasheet
Heaters
Heater - Hot Oil Heater
Instrument Air
Instrument Air Package Data Sheet
Air Receiver Data Sheet

Equipment Data Sheets - Saulsbury
Pumps
Pumps - Fractionator Feed Pumps
Pumps - Stabilizer Reflux Pumps
Pumps - AODD
Diaphragm Pump
Chemical Injection Pumps
Methanol Injection Datasheet
Centrifugal Pump Horizontal
Cent Pump Horiz - 1 LACT
Cent Pump Horiz - 2 Amine
Cent Pump Horiz - 3 Flare KO
Cent Pump Horiz - 4 Flare NGL Cond
Cent Pump Horiz - 5 Natural Gas Liquids
Cent Pump Horiz - 6 RO Water - Amine
Cent Pump Horiz - 7 Raw Water (Well Water)
Cent Pump Horiz - 8 Water
Cent Pump Horiz - 9 Softened Water
Pumps - Rotary
Compressor LO
Condensate Reject
Glycol Transfer
Heat Media Transfer
Horizontal Rotary Pump

Equipment Data Sheets - Saulsbury
Slug Catcher
Slug Catcher Inquiry *.doc
Slug Catcher - Finger Style *.xls
Slug Catcher - Vessel Style *.xls
Sumps
JATCO Sumps
Tanks
API Storage Tank - Condensate Storage Tank
API Storage Tank - Raw Water Storage
API Storage Tank - Slop Tank
Horizontal Storage Tank - Methanol Storage Tank
Vessels
Horiz. Vessel - Condensate Flash Tank
Horiz. Vessel - Flare KO Drum
Horiz. Vessel - Inlet Separator
Horiz. Vessel - Propane Storage
Horiz. Vessel - Stabilizer Reflux Accumulator
Horiz. Vessel - Y-Grade Surge Drum
Horiz. Vessel - Y-Grade Surge Tanks
Vertical Vessel - CO2 Vent Scrubber
Vertical Vessel - Condensate Stabilizer
Vertical Vessel - Fractionator
Vertical Vessel - Liquid Contactor Trayed

Piping Spec's. - Foster Wheeler

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To Do - Link Specs

Piping Spec's. - Foster Wheeler	
Specification Name	**Service**
A1	PROCESS FLUIDS, LARGE BORE INSTRUMENT AIR, COOLING WATER, PLANT AND UTILITY AIR
A2s	
A2	
A2z	
A4s	

Piping Specifications	Foster Wheeler			
Specification Name	**Flange Class**	**Material**	**Corr. Allow**	**Service**
Piping				
CAA	150	CS	.063	Hydrocarbon & Gen Purpose (750 Degrees F Max)
CAA1	150	CS	.125	Flue Gas Trim Only
CAA3	150	CS	.250	Hydrocarbons, NACE MR-01-75, 500F
CAA4	150	CS (Killed)	.250	Hydrocarbons, P.O. System
CAC3	150	CS (Killed)	.125	0% to 50% Caustic Solution, (PWHT All Welds)
CAJA	150	CS	.063	Plant Air, Cooling Water, Raw & Utility Water
CAH	150	CS	.063	Steam, Boiler Feed Water, Condensate (ANSI B31.3)
CALA	150	CS	.250	Reactor Clarifier Overflow (RCO)
CALB	150	CS	.063	Polymer A&B, and Colbalt Sulfate Injection
CAMA	150	CS	.063	Fire Water (Underground)
CE	150	5CR-1/2MO	.250	Hydrocarbons & General Purpose (PWHT All Welds)
CLA	150	TP 316L SS	.063	WGS Slurry
CAN	150	CS (Galv)	.063	Potable Water and Instrument Air
DAA	300	CS	.125	Hydrocarbons & General Purpose
DAA3	300	CS (Killed)	.250	Hydrocarbons, NACE MR-01-75, 366F Max
DAA4	300	CS (Killed)	.250	Hydrocarbons, NACE MR-01-75, 500F
DE	300	5CR-1/2MO	.250	Hydrocarbons & General Purpose (PWHT All Welds)
STR1	____	CU & CS	None	Steam Tracing

Piping Spec's - Valero-McKee

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To Do - Link Files

Bolt Standard	
Deliverables Lists-Process Project Drafting Outside Eng.	
Deliverables Lists-Process Project Drafting	
Distribution Drawing List	
Engineering Specs	
PIPING	
PROJECT LISTS TEMPLATE	
Refinery Pipe Specs	
SP 50-40-148 Model	
SP 50-40-149 Model	
SP 50-40-151 Model	
SP 50-40-152 Model	
SP 50-40-RV1 Layout1	
SP 50-40-RV2 Layout1	
SP-50-40-37 R1	
Spacing of process equip	
Standard RV Setting	
Standard Shoe Detail	
STMHDR1 Model	
STMHDR2 Model	
Valve Specs	

Unit Specifications - 1

To Do - Link PDF's

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Alkylation Unit (Dresser)	
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Diesel Hydrodesulfurization Unit (Diamond Shamrock)	
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Diesel Hydrodesulfurization Unit (Diamond Shamrock)	
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FCCU (BRAUN)	
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FCCU (BRAUN) - Cont'd.	
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Hydrocracker (Parsons)	
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Unit Specifications - 2

To Do - Link PDF's

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Hydrocracker (Parsons)	
	18
	19
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	25
Reformer-CCR (Flour Daniel)	
#1 Ref Line List	
Sulfur Plant & TGTU (Ford, Bacon & Davis)	
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Vacuum Unit (Foster Wheeler)	
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