

# DENNIS GROUP

## Career Pathway Process Engineering



# Your Journey Starts Here

Below are general guidelines on skills that are expected for our Process Engineers at Dennis Group. The skills outlined cover Engineer I, Engineer II, Engineer III, Team Lead, and Principal.

If you desire to dedicate 100% of your time within your discipline working in projects, you can aim to become a Team Lead. This position is highly valuable at Dennis Group as we are frequently facing engineering challenges that require a lot of technical knowledge and experience.

If you wish to keep working within your discipline but prefer to assume a leadership position, you can aim to become a Principal. It is very important to the growth of the company that we have leaders that can help in the development of our younger employees and the management of resources within each department. Dennis Group offers a variety of resources, training, and support for those in leadership positions.

Finally, if you wish to start managing projects, you can aim to become a Project Manager. If you choose this pathway, there is a different document that comprises the skill of different levels of project management.

# Process Engineering Competencies

Project Definition	Engineer I	Engineer II	Engineer III	Team Lead	Principal
Survey existing conditions					
Define project requirements					
Material of Construction requirements					
Coordinate with other disciplines					
Review Scope with Client – Create and manage needs list					
Estimate Construction Costs and Schedule					
Create Assumptions/Exclusions List					
Estimate Engineering Time and Costs					
Provide Engineering Proposal to client					

Process Competency	Engineer I	Engineer II	Engineer III	Team Lead	Principal
Estimate Engineering Time and Costs					
Provide Engineering Proposal to client					
Produce Basis of Design documentation					
Present Proposal to Client and manage feedback					
Basic Engineering	Engineer I	Engineer II	Engineer III	Team Lead	Principal
Understanding Dennis Group Project Documentation					
Create Process Design Criteria Basis					
Basic Material Mass Balance (Process)					
Complex Material Mass Balance (Process)					

Basic Energy Balance (Utility Load Calculation)					
Complex Energy Balance (Utility Load Calculation)					
Complex Energy Balance					
Complex Batching Analysis					
Determining Appropriate Food Process Unit Operations					
CIP Design					
Create and Populate Equipment List					
Create and Populate Instrument List					
Hygienic Zoning Requirements					
Utility Load/ Services Calculations and Summary					

Develop Tagging System					
Write preliminary report					

Equipment Sizing and Calculations	Engineer I	Engineer II	Engineer III	Team Lead	Principal
Vessel Sizing and Specification					
Pneumatic and Dry Handling Specification					
Line Sizing and Specification					
Hangers & Pipe Supports Specification (Loading – pounds per linear foot)					
Pump Sizing and Specification					
Sanitary Valve Sizing and Specification					
Utility Valve Sizing and Specification					

Heat Exchanger Sizing and Specification					
General Process Equipment Sizing and Specification					
General Utility Equipment Sizing and Specification					
Instrumentation Type, Sizing and Specification					
Filter and Strainer Specification					
Basic Material Handling Specification					
Process "HAZOP" Analysis					
Fire safety Measures & Design					

Drawings (CAD)	Engineer I	Engineer II	Engineer III	Team Lead	Principal
Create Basic Process Flow Diagrams (PFDs)					

Create Simplified P&IDs					
Create and Edit Detailed System P&IDs					
Review Vendor Shop Drawing					
Review Piping Drawings for Correct Method of Installation					
Create Color Hygienic Zoning Drawings					
Create Material Flow Plans					
Create People Flow Plans					
Create LOTO Documentation					
CAD – Import and Manage Xrefs					
CAD – Standard Tools, Templates and Toolpalets					



CAD – Select Standard Details for the project					
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<b>Food Safety</b>	Engineer I	Engineer II	Engineer III	Team Lead	Principal
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CCP (Critical Control Point) Mapping					
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Food Safety Design Audit					
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Sanitary Equipment Documentation (3A, EHDGE) Reporting					
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Process Food Safety "HAZOP" Analysis					
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Create Allergen Flow Plans					
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Food Safety Certificate					
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<b>Installation Package</b>	Engineer I	Engineer II	Engineer III	Team Lead	Principal
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Knowledge of Bid Package Process				
Bid Package SOW Definition and Development				
Bid Package Specs				
Develop Bid Package Drawings – Layout Drawings with Equipment Locations and Notes				
Interdisciplinary Drawing and Xref Coordination				
Interdisciplinary RFQ, Scope, Schedule Coordination				
Develop Milestone Schedule				
Develop Cost Breakout				
Change Management (Addendums, Drawing Clouding, Revision)				
Develop & Maintain Vendor/Contractor Status Log				

Develop Basic Process & Utility Equipment Bid Package					
Develop Complex Process & Utility Equipment Bid Package					
Develop Process and Utility Piping Installation Bid Package					
Develop Rigging Bid Package					
Develop Platform/Miscellaneous Process Metals Installation Bid Package					
Develop Instrumentation Bid Package					

Automation Support	Engineer I	Engineer II	Engineer III	Team Lead	Principal
Process Narrative					
Develop Functional Analysis Documents					
I/O Lists and Coordination					
Develop Highlighted Drawings					
Develop Pin Charts (Process & CIP)					
PID Control Loops					
Develop Functional Steps					
Develop Interlocks for Process					
Process Validation and Simulation					

Architecture Support	Engineer I	Engineer II	Engineer III	Team Lead	Principal
Review layouts and plans - make sure there is no contamination risk and materials can flow					
Define sanitary requirements for process areas					
Procurement and Contact Administration	Engineer I	Engineer II	Engineer III	Team Lead	Principal
Vet bidders suitable for the project – verify bid list with client					
Create bid packages with RFQ doc info, SOW, milestone schedules, and assemble drawings and specs					
Administer a bid walkthrough which flags key items of scope/specs					
Manage bid process fairly – resolve questions, issue addendums, and ensure bidders will bid					
Create Bid Tab and review with client					
Produce “For Construction” documents capturing addendum items and coordination with other trades					

Drive a kickoff meeting with winner and review mockups					
Review Vendor Submittals					
Attend Vendor Shop Inspection/FAT					
Track shipment/milestone schedule					
Review and track change orders					
Manage and respond to RFIs and other onsite documentation.					
<b>Construction, Commissioning, and Start-up Support</b>	Engineer I	Engineer II	Engineer III	Team Lead	Principal
Create Checkout Documentation					
Site Support of Construction Activities					
Observe rough-in construction for compliance with plans, specs, and details					

Observe final construction					
Lead Process Construction Manager					
Instrumentation Calibration Coordinator					
I/O Check-out Coordinator					
Site Support of Engineering Test Run Activities					
Production Assistance					
Client Training					
Ensure client training performed and close out documents delivered					
Develop and Manage Punchlist					
Validation of System Design per the Functional Specification					

Safety Practices – PPE and LOTO					
GMP Practices and Understanding					
<b>Training, Coordination, and Client Interface</b>	Engineer I	Engineer II	Engineer III	Team Lead	Principal
Primary Client Technical Contact (individual)					
Primary Client Technical Contact (team)					
Gives Peer Review indicating major and minor concerns					
Adjusts after peer review					
Recommends and justifies improvements					
Lead Team of Engineers on a Specific Project – managing/tracking to-dos					
Mentoring of Employees					



Project Lead Experience					
Provide internal training on subject expertise					
Assist other DGL departments answering process questions					
Maintains project document organization					
Good Engineering Judgement					
<b>Soft Skills</b>	Engineer I	Engineer II	Engineer III	Team Lead	Principal
Professionalism					
Client Interaction					
Communication - Written and Verbal (Client, Subcontractors, Vendors)					
Time Management					

Meeting Deadlines					
Multitasking					
Prioritizing					
Productivity/Efficiency					
Accountability and Ownership					
Mutual Respect and Teamwork					
Organization					
Project Management and Planning					
Requested to be part of teams (by PMs or engineers)					
Positive Attitude					

Observed during projects development	Engineer I	Engineer II	Engineer III	Team Lead	Principal
Be responsible and trustworthy					
Be fair					
Represent DG well					
Build lasting relationships					
Deliver value					
Specific Areas of Expertise	Engineer I	Engineer II	Engineer III	Team Lead	Principal
Liquid Handling Process Engineering Expertise (2<Project Experience)					
Dry Powder Handling Process Engineering Expertise (4<Project Experience)					
Packaging Handling Specification					

CIP Process Engineering Expertise (4<Project Experience)					
Expertise in Sanitary Design (4<Projects)					
Utility System Design Capability					
Multiple Area Subject Matter Expert (Dairy, Bakery, Etc.)					
Regulatory Subject Matter Expert (FDA, PMO, 3A, NFPA, etc.)					
Advises Personnel how to Approach Engineering Problems					
Technology Lead – recommend controls software and other methods of improving work-flow					
Develop Methods, Standards, Documents, Quality Control Procedures					
Ability to Coordinate and Lead Design Meetings with the Client					
Business Development					

# Engineer I

Typical Minimum Experience: 0-3 Years

- Works within a team leader group
- Capable of executing all tasks necessary to complete the engineering on a project from design through execution.
- Works autonomously on specific tasks
- Possesses good engineering capability
- May present engineering findings to clients but does not act as the primary engineering contact point.

*Intra-Discipline Mobility*

# Engineer II

Typical Minimum Experience: 3 - 6 Years

- Work independently with little direction
- Possesses a sufficient amount of expertise in some areas
- Strong exposure to all aspects of design/execution
- Capable of being the direct client contact and lead engineer on specific projects.
- Sufficient field experience

*Intra-Discipline Mobility: Engineer III*

## Engineer III

Typical Minimum Experience: 3 - 6 Years

- Work independently
- Possesses a sufficient amount of expertise in many areas
- Strong exposure to all aspects of design/execution on larger projects.
- Capable of being the direct client contact and lead engineer
- Strong understanding of other disciplines

*Intra-Discipline Mobility: Engineer III*

## Principal Engineer III

Typical Minimum Experience: 3 - 6 Years

- Fully versed in all activities associated with design and execution.
- Has successfully executed several large projects.
- Subject matter expert in multiple areas and specific process systems.
- Able to provide guidance and direction to other engineers.
- Interfaces directly with clients.

*Intra-Discipline Mobility: Engineer III*

# SME / Technical Expert

Typical Minimum Experience: 8+ Years

- All of the roles and responsibility of a senior engineer but also involved in building infrastructure of organization, training programs, etc.
- May lead team – see Team Leader

*Intra-Discipline Mobility:*



# Team Lead

Typical Minimum Experience: 8+ Years

- All the roles and responsibilities of a senior engineer but also involved in management
- Responsible for managing Engineers In this capacity they are responsible for:
  - Monitoring work
  - Mentoring
  - Setting goals and evaluating performance
  - Mapping career movement
  - Addressing workplace performance issues
- Assisting engineers on their projects

*Intra-Discipline Mobility:*

# Engineering Manager

Typical Minimum Experience: 8+ Years

- All the roles and responsibilities of a senior engineer
- Subject matter expert in multiple areas and specific process systems.
- Works with the Office Discipline Manager and project managers to obtain work.
- Interfaces with project managers to review deliverables and milestones
- Primary engineer on multiple projects utilizing multiple engineer teams to complete work.
- Can manage complete process only projects
- Supports project teams and backs up team members as necessary.
- Interfaces directly with clients.

*Intra-Discipline Mobility:*