

Providing Vision and
Leadership for the Future
of the HVAC and
Sheet Metal Industry

HUMAN DIMENSIONS ASSESSMENT OF TOP- PERFORMING PERSONNEL WITHIN SHEET METAL AND AIR CONDITIONING CONTRACTORS

2021 Prepared By:

Omar Maali, University of Kansas

Brian Lines, University of Kansas

*Jake Smithwick, University of North Carolina
at Charlotte*

NEW HORIZONS FOUNDATION CONTRIBUTORS

SUMMIT COUNCIL MEMBERS

The Summit Council is comprised of the Premier, Champion, Summit Counselor, Industry Mentors and Summit Circle contributor categories. All members of the Summit Council receive national public acknowledgment at industry annual meetings and other special events and programs. In addition, they have the opportunity to participate in shaping the agenda for the New Horizons educational and research program.

Guy Gast, Chair

Angela Simon, Vice Chair

Ron Rodgers, Chair Emeritus

PREMIER - \$300,000 AND UP

ACCO Engineered Systems

Peter Fortin, California

Bay Area SMACNA Chapter

Sean O'Donoghue, Executive Vice President

**Sheet Metal and Air Conditioning
Contractors' National Association, Inc.**

Represented by Vincent R. Sandusky

CHAMPION - \$200,000 AND UP

McCusker-Gill, Inc.

Kevin R. Gill, Sr., Massachusetts

SMACNA - St. Louis Chapter

Howard Stine, Chapter Representative

Kyle Tibbs, Chapter Executive

SMACNA - Western Washington, Inc.

Brian Fluetsch, Chapter Representative

Julie A. Muller, Esq., Executive Vice-President

SMACNA Greater Chicago

Jim Cesak, Chapter Representative

Tony Adolfs, Executive Vice President

SMACNA Southern California

Richard Rivera, Chapter Representative

Kevin O'Dorisio, Executive Director

Streimer Sheet Metal Works, Inc.

Frederick L. Streimer, Oregon

SUMMIT COUNSELOR - \$100,000 AND UP

AABCO Sheet Metal Co., Inc.

Ronald J. Palmerick, New York

Bright Sheet Metal Co., Inc.

Hank Meyers, Indiana

C & R Mechanical Company

E. Timothy Decker, Missouri

Climate Engineers

Peter Watson, Iowa

Holaday-Parks, Inc.

Grace Pizzey, Washington

Lennox Industries, Inc.

Texas

Marelich Mechanical Co., Inc.

Keith Atteberry, California

NEW HORIZONS FOUNDATION CONTRIBUTORS, CONTINUED

SUMMIT COUNSELOR - \$100,000 AND UP, CONTINUED

NYC SMACNA

John Contrubis, Chapter Representative

William Rothberg, Executive Director

Ron and Cindy Rodgers

Arizona

Sheet Metal Connectors, Inc.

James R. Myers, Minnesota

Sheet Metal Contractors Association of Philadelphia & Vicinity

Ernest J. Menold, Chapter Representative

Peter Jenkins, Executive Director

Sheet Metal Contractors of Iowa, Inc.

John Ilten, Chapter Representative

Kim Best, Executive Vice Presidente

SMACNA Boston, Inc.

James M. Morgan, Chapter Representative

Thomas J. Gunning, Executive Director

SMACNA Oregon & SW Washington

Jerry Henderson, Chaper Executive

Therma, LLC

Joseph Parisi, California

Welsch Heating & Cooling Company

George L. "Butch" Welsch, Missouri

Yearout Mechanical, Inc.

Kevin Yearout, New Mexico

SUMMIT CIRCLE - \$50,000 AND UP

Angie and Michael Simon

California

Charles E. Jarrell Contracting Co.

Howard Stine, Missouri

Felhaber Larson

Daniel Kelly, Minnesota

General Sheet Metal

Carol Duncan, Oregon

Guy and Deana Gast

Iowa, Field of Dreams

Key Air Conditioning Contractors, Inc.

Richard Rivera, California

Melrose Metal Products, Inc.

Mitchell Hoppe, California

Miller Bonded, Inc.

Keith E. Wilson, New Mexico

New England Sheet Metal and Mechanical Co.

John Sloan, California

SMACNA - Cleveland

Tom Martin, Chapter Representative

John Sindyla, Chief Executive Officer

SMACNA - New Mexico

Ronda Gilliland-Lopez, Executive Director

SMACNA Metropolitan Detroit Chapter

Phil McShane, Chapter Representative

Mark Saba, Executive Director

SSM Industries, Inc.

Thomas A. Szymczak, Pennsylvania

Stromberg Metal Works, Inc.

William Gawne, Maryland

Walsh Mechanical Contractors

Paul M. Le Bel, Sr., Massachusetts

NEW HORIZONS FOUNDATION CONTRIBUTORS, CONTINUED

INDUSTRY MENTORS, CONTRACTORS LOOKING TO THE FUTURE - PERSONAL PLEDGES OF \$50,000

Guy Gast
Des Moines, IA

Jack Knox
Smyrna, GA

Ron Rodgers
Peoria, AZ

Angie & Michael Simon
Menlo Park, CA

Mark Watson
Hiawatha, IA

Keith Wilson
Albuquerque, NM

OTHER CONTRIBUTORS

PATRON - \$25,000 AND UP

ACP Sheet Metal Co., Inc.
Nathan Dills, Oklahoma

Cox Engineering Company
Jon Desmond, Massachusetts

D.D.S. Industries, Inc.
Dwight D. Silvia, Massachusetts

Dee Cramer, Inc.
Matt Cramer, Michigan

J.C. Cannistraro, LLC
David Cannistraro, Massachusetts

Lyon Sheet Metal, Inc.
Michael C. Corrigan, Sr., Missouri

Matrix Group International, Inc.
Joanna Pineda, Virginia

Novak Heating & Air Conditioning, Inc.
Randy Novak, Iowa

**Sheet Metal Contractors Association of
Central Pennsylvania**
Lori A. Eshenaur

SMACNA - Sacramento Valley Chapter
Cheryl Sprague

SMACNA Mid-Atlantic
Bernie Brill

SMACNA of Oklahoma, Inc.
Matt Wansley

Viewpoint Construction Software
Karl Rajotte, Pennsylvania

STATESMAN - \$10,000 AND UP

McKamish, Inc.
David McKamish, Pennsylvania

SMACNA - Kansas City Chapter
Stacey Smyly

SMACNA of Long Island, Inc.
Melissa Barbour

U.S. Sheet Metal, Inc.
Bruce J. Stockwell, Michigan
John Unger, Michigan

NEW HORIZONS FOUNDATION CONTRIBUTORS, CONTINUED

AMBASSADOR - \$5,000 AND UP

Emcor Services Scalise Industries

Mark Malencia, Pennsylvania

Enterprise Holdings Foundation

Missouri

Florida SMACNA, Inc.

Lisa Falk

Jack's Mechanical Solutions, Inc.

Gabe Martinez, New Mexico

Murphy Company

Mark Bengard, Missouri

Tri-Metal Fabricators

Joe Toso, British Columbia, Canada

Wm. J. Donovan Co.

Edmund J. Bransfield, Pennsylvania

DIPLOMAT - \$2,500 AND UP

CME, Inc.

David Duclett, California

**Houston Sheet Metal Contractors
Association**

Glenn Rex

Kinetics

Arizona

DELEGATE - \$100 AND UP

Architectural Sheet Metal Systems, Inc.

James Van Becelaere, Missouri

Blue Diamond Sheet Metal, Inc.

Al LaBella, New York

Boston Air Systems, Inc.

Barry Dwyer, Massachusetts

Energy Labs, Inc.

Ray Irani, California

LADCO, Inc.

Doug Hamilton, Iowa

MCA-SMACNA of San Antonio, Inc.

Sandee Morgan

SMACNA Arizona

Carol Goguen

HUMAN DIMENSIONS ASSESSMENT OF TOP-PERFORMING PERSONNEL PROJECT TASK FORCE

Guy Gast, Chair
New Horizons Foundation

Carol Duncan, CEO
General Sheet Metal

Michael McCombie, President
F. E. Moran, Inc.

Ron Rodgers, Chair Emeritus
New Horizons Foundation

Keith Wilson, President/CEO
Miller Bonded, Inc.

Thomas Soles, Executive Director
New Horizons Foundation

NHF EXTENDS A SPECIAL THANK YOU TO THE FOLLOWING INDIVIDUALS WHOSE ORGANIZATIONS CONTRIBUTED A SIGNIFICANT AMOUNT OF DATA TO THIS STUDY

Guy Gast, Chair
New Horizons Foundation

Joseph Lansdell, President
Poynter Sheet Metal, Inc.

Carol Duncan, CEO
General Sheet Metal

Keith Wilson, President/CEO
Miller Bonded, Inc.

Robert Zahner, Senior Vice President
A. Zahner Company

Angie Simon, Vice Chair
New Horizons Foundation

Tom Martin, President
T.H. Martin, Inc.

Jay Hansen, V.P. Operations
C. J. Hansen Company, Inc.

Matt Cramer, President
Dee Cramer, Inc.

Eric Heckman, Circle R Mechanical, Inc.

TABLE OF CONTENTS

1) Executive Summary.	1
2) Data Collection.	2
3) Research Objectives	3
4) Assessments Used in the Study	4
5) Results	6
6) Summary	11
7) Recommendations of How SMACNA Contractors Can Use These Results.	12
8) References.	14
About the Authors.	15
Appendix A – HEXACO Personality Inventory Scale Descriptions	16
Appendix B – Emotional Intelligence Scale Descriptions.	18
Appendix C – QDISC-101 Scale Descriptions	19

1) EXECUTIVE SUMMARY

The objective of this study was to identify the human dimensions (personality, emotional intelligence, and behavioral traits) of individuals who perform different job roles within SMACNA contractors. The study also investigated the distinctive human dimension traits of the top 10% of performers among Project Managers and Field Leaders.

Human Dimension Assessment

The study used a Human Dimensions (HD) Assessment comprised of three measures:

- **HEXACO Personality Inventory:** a measure of the “Big Six” personality traits.
- **Emotional Intelligence Diagnostic:** an assessment of individual capability to recognize and manage their own emotions and those of others.
- **DISC Behavioral Assessment:** a categorical measure of four behavior types and subscales related to communication styles & work-orientation.

These measures are described in greater detail in the report.

Participating Job Roles

A total of 182 participants from 10 companies across the country volunteered to complete the HD Assessment. The participants were from four job roles (*described on [page 2](#)*):

- **Project Managers (PMs)**
- **Field Leaders (FLs)**
- **Estimators (ESTs)**
- **Detailers (VDCs)**

Human Dimension Differences between the Job Roles

Results showed that the four job roles have several differences in human dimension traits, including:

- FLs had higher Modesty than PMs
- FLs had lower Openness to Experience than VDCs
- FLs had higher Greed-Avoidance, lower Fairness, and lower Inquisitiveness than ESTs
- PMs had higher Dependence, higher Sentimentality, and lower Creativity than VDCs
- PMs had lower Prudence than ESTs
- There were no statistically significant differences between VDCs and ESTs, which could be due to the lower number of participants in those roles.

The report discusses the above differences between each job role in detail. This information is helpful for contractors who are evaluating:

- **New-hire candidates:** the candidate can be asked interview questions that explore their “fit” for the distinctive traits of the job role they are interviewing for.
- **Current employees who are transitioning between roles (moving from FL to PM, for example):** the employee can better understand their “match” or “fit” for the new job role and can be coached to develop the strengths that will be most helpful in performing the new role.

Human Dimensions of Top-Performing PMs and FLs

The study also identified the absolute top-performers among the PMs and FLs who participated in the study. This was accomplished by collecting performance

assessments from each participant's supervisor. For example, each participant was rated based on their technical and communication skills, their ability to change and adapt, and other job performance metrics.

The top 10% of performers in PM and FL job roles were compared vs. the other participants in that job role. Several distinctive traits were discovered for the top-performers in each job role:

- **Top-Performing Project Managers:** compared to the other participating PMs, the top 10% of performers in the PM role tended to be less extraverted and more reserved in their communication style. They also tended to have lower fearfulness (greater resiliency and boldness), lower flexibility (prefer to address disagreements head-on when in the best interest of the project), lower creativity (PMs are problem-solvers who will stick to “tried-and-true solutions when available), and higher gentleness (willing to allow people to grow and improve).
- **Top-Performing Field Leaders:** compared to the other participating FLs, the top 10% of performers in the FL role tended to have lower modesty (more keenly aware of their elevated responsibility on the project team), lower forgiveness (able to remember past mistakes that others have made), lower creativity (tendency to stick with tried-and-true solutions), higher fearfulness (more focused on avoiding risks that could result in failed project objectives), and higher self-awareness (ability to understand how their own emotions and the emotions of others can impact performance).

Conclusion and Take-Aways

These results are intended to help contractors hire, develop, and maintain talent in their workforce, which are increasingly challenging issues in the current environment with a workforce in transition.

- **Hiring New Personnel:** increased probability of finding employees who are the right “fit”

for the job role and have the potential to develop into top-performers. Contractors can use interview questions that are designed to investigate the human dimension traits that are most important for the job role. This is helpful because these traits can be hard to evaluate “on paper” such as in a traditional resume. A number of possible interview questions are suggested in [Section 6](#) of the report.

- **Internal Promotion Decisions:** assess employee likelihood of success when transitioning between job roles. Also help employees to be aware of the different skills that are needed in their new role to help them be more successful.
- **Internal Talent Development:** help employees grow and achieve their maximum potential by developing the skills that are most associated with top performance in their job roles. Help employees who may not naturally have those strengths by providing coaching and awareness. Mentorship and performance evaluations can focus on developing the skills that are most needed in the employee's job role. Several suggestions are provided in the report.

2) DATA COLLECTION

Invitations to participate in the study were provided to SMACNA members. A total of 182 participants were included in the study (88 FLs, 42 PMs, 25 ESTs, and 27 VDCs). Each participant completed a detailed Human Dimension Assessment and had their direct supervisor submit a Performance Assessment to assess the participant's skillset and job performance.

Table 1: Number of Participants by Job Role

Job Role	Participants
Project Managers (PMs)	42
Field Leaders (FLs)	88
Estimators (ESTs)	25
Detailers (VDCs)	27
TOTAL	182

Descriptions of the four job roles are:

Project Managers (PMs)

Responsible for the contract administration and performance of awarded projects as well as marketing (in many cases) the company's services.

Field Leaders (FLs)

Drives field outcomes in labor production, quality control, and resource management to consistently deliver strong results in areas where he/she has control. Works closely with the PM to ensure timely delivery of tools, information, and material to support production. Note: the FL role included volunteers that typically had one of the following job titles: foreman, general foreman, superintendent, field executive, or a similar job title.

Estimators (ESTs)

Responsible for the coordination of the mechanical, HVAC, and sheet metal bid process by leading the preparation and assembly of major estimate items.

Detailers (VDCs)

Responsible for the layout of HVAC and mechanical items (ductwork, piping, plumbing, equipment, controls, etc.) and custom sheet metal items by creating a constructible model. Includes information to allow the model to be used so that field installation and shop production may be completed in the most cost-effective manner possible.

It is noted that all data collection took place during Fall 2020, in the midst of the COVID-19 pandemic, which may have impacted the number of responses.

3) RESEARCH OBJECTIVES

The study had two research objectives:

Objective #1: Human Dimension Differences between Job Roles

The first research objective was to identify differences in HD scores between each of the four job roles of SMACNA participants. Understanding the differences between roles is helpful in scenarios when an employee is transitioning between roles or being promoted to another role. It is also helpful when interviewing new candidates who may be qualified "on paper" because the company might be more likely to find the best "fit" candidate based on the needs of the job role.

The first research objective was accomplished by reviewing the results of the human dimensions assessment for all participants in each job role. The results for each job role were analyzed to find statistically significant differences. [Section 4](#) of the report describes the human dimensions assessment in greater detail. [Section 5](#) of the report describes the differences in each combination of job roles (FL vs. PM, FL vs. VDC, FL vs. EST, PM vs. VDC, PM vs. EST, and EST vs. VDC). Several take-aways are recommended based upon the specific differences found between the roles.

Objective #2: Human Dimensions of Top-Performing PMs and FLs

The second research objective was to identify the unique Human Dimensions of Top-Performers in the PM and FL job roles. The top-performers were determined based on performance assessments as follows:

- For the FLs, the top 10% of performers out of the 88 total FLs who participated in the study were identified as top-performing FLs.
- For the PMs, the top 10% of performers out of the total 42 total PMs who participated in the study were identified as top-performing PMs.

The HD results of the top 10% of performers were compared with the remaining PMs and FLs to find any distinguishing characteristics of top-performers. These differences help to identify high-potential employees and reveals the skills common to the most successful PMs & FLs. The results, while only exploratory, suggest that Top-Performing PMs and FLs have distinctive HD characteristics when compared to others within the same job role. These differences are summarized in [Section 5](#).

4) ASSESSMENTS USED IN THE STUDY

Human Dimensions Assessment

Participants completed a human dimensions (HD) assessment with three questionnaires:

HEXACO Personality Inventory

A widely-used assessment that contains 60 questions to measure the “Big 6” personality domains. Each domain contains four sub-domains which give more specific personality-descriptors. The domains, sub-domains, and personality-descriptors are summarized below:

- **Honesty-Humility (H):** contains the sub-domains of Sincerity, Fairness, Greed Avoidance, and Modesty. Typical personality-descriptors include sincere, honest, faithful, loyal, modest/unassuming *versus* sly, deceitful, greedy, pretentious, hypocritical, boastful, pompous.
- **Emotionality (E):** contains the sub-domains of Fearfulness, Anxiety, Dependence, and Sentimentality. Personality-descriptors include emotional, oversensitive, sentimental, fearful, anxious, vulnerable *versus* brave, tough, independent, self-assured, stable.
- **Extraversion (X):** contains the sub-domains of Social Self-Esteem, Social Boldness, Sociability, and Liveliness. Personality-descriptors include

outgoing, lively, extraverted, sociable, talkative, cheerful, active *versus* shy, passive, withdrawn, introverted, quiet, reserved.

- **Agreeableness (A):** contains the sub-domains of Forgiveness, Gentleness, Flexibility, and Patience. Personality-descriptors include patient, tolerant, peaceful, mild, agreeable, lenient, gentle *versus* ill-tempered, quarrelsome, stubborn, choleric.
- **Conscientiousness (C):** contains the sub-domains of Organization, Diligence, Perfectionism, and Prudence. Personality descriptors include organized, disciplined, diligent, careful, thorough, precise *versus* sloppy, negligent, reckless, lazy, irresponsible, absent-minded.
- **Openness (O):** contains the sub-domains of Aesthetic Appreciation, Inquisitiveness, Creativity, and Unconventionality. Personality-descriptors include intellectual, creative, unconventional, innovative, ironic *versus* shallow, unimaginative, conventional.

See [Appendix A](#) for fully detailed definitions of each domain and sub-domain.

Important note for HEXACO scores: higher scores are *not* necessarily better. Each domain is simply a spectrum or range of personality traits and the high vs. low side of each domain is completely arbitrary. Therefore, readers of this report should *not* assume that higher scores are “better” nor that lower scores are “worse.”

Emotional Intelligence Diagnostic:

An assessment of the participant’s capability to recognize and manage their own emotions and the emotions of others. The 28-question diagnostic provides an Emotional Intelligence Quotient (EQ) measured on a scale of 1 to 100, where EQ is a compilation of four skills:

- **Self-Awareness:** the ability to understand your emotions as they happen.

- **Self-Management:** the ability to control your emotional reactions.
- **Social Awareness:** the ability to understand the emotions of other people (even if you do not share the same feelings)
- **Social Management:** the ability to use emotional awareness to create more successful interactions.

See [Appendix B](#) for an explanation of how to interpret the 1-100 scores.

Q-DISC 101 Behavioral Assessment:

Contains 24-question in each of the following four groups:

- **Dominance (D):** associated with control, power, and assertiveness. Actions are focused on accomplishing results. Individuals with high D scores are perceived as demanding, determined, and pioneering.
- **Influence (I):** associated with social interaction skills and communication. Actions are focused on building relationships and persuading others. Individuals with high I scores are perceived as convincing, magnetic, and optimistic.
- **Steadiness (S):** associated with patience, resilience, and thoughtfulness. Actions are focused on compliance and cooperation. Individuals with high S scores are perceived as calm, stable, and unemotional.
- **Compliance/Conscientious (C):** associated with structure and organization. Individuals with high C scores are perceived as cautious, precise, and tactful.

The four behavior types in DISC are determined by two sub-scales of:

- **Work Orientation:** rated on a scale from people- vs. task-oriented

- **Communication Style:** rated on a scale from outgoing to reserved.

See [Appendix C](#) for full definitions and a graphic of the DISC quadrants.

Performance Assessments

Performance assessments were collected for every participant for the purpose of identifying the top-performing personnel among the data sample. The performance assessments were in the form of a questionnaire that was completed by each participant's direct supervisor.

The performance assessments included the following categories:

Technical Skills

This performance category consisted of up to 10 questions related to specific technical skills. The questions were tailored for each job role (PM, FL, EST, VDC). For example, FL technical skills included items such as abilities in job site layout, safety, scheduling, and means & methods, and more; whereas VDC technical skills included items such as the ability to understand spatial interactions, use computer-based tools, and identify design errors and omissions. Each skill was rated on a 1-10 scale.

Leadership and Communication Skills

Consisted of 8 questions designed to measure the participant's ability to work with clients, designers, and other contractors. This category also rated their ability to mentor others, willingness to take accountability, and more. Each skill was rated on a 1-10 scale.

Ability to Change and Adapt

This category consisted of a single question on a 1-10 scale about the participant's overall ability and willingness to adopt change.

Job Performance

A set of questions about the participant's timeliness, quality of work, ability to contribute to profitability, and other general performance questions. Each job performance question was rated on a 1-10 scale.

Additional Performance Assessments

Three additional performance assessments were collected for each participant. First, supervisors were asked to rate the participant's overall performance relative to their peers via a percentile ranking (e.g. most participants were ranked in the top 10% of performers). Supervisors were asked if they would want to assign the participant to a high-profile project (a project their company would be known for). Finally, supervisors were asked whether the participant was among the absolute "cream of the crop" top performers in their experience.

- A scale of 1-10 was used for the skills in the Technical, Leadership & Communication, Ability to Change & Adapt, and Job Performance categories. The scale was defined as:
 - Scores of 9 to 10 referred to top performers based on the supervisor's experience.
 - Scores of 5 referred to performers who were roughly average in their role.
 - Scores of 1 to 2 referred to the lowest performances in the supervisor's experience.
- A percentile assessment scale was used for each participant's overall performance in relation to their peers.
- A scale of 1-10 was used to rate how comfortable the company would be in assigning the participant to a high-profile project. The scale ranged from 10 = Definitely Yes, 8 = Probably Yes; 5 = Maybe; 3 = Probably Not to 1 = Definitely Not.
- The "%" scale referred to the percent of times the participant was rated as being absolutely in the "cream of the crop" top-performers for their role.

5) RESULTS

Performance Assessments for Each Job Role

Performance Assessments were collected for every participant. The assessments were completed by the direct supervisor for each participant. *Table 2* shows the average performance assessments of all participants by job role. The "Assessment Scale" column refers to the following assessments:

Table 2: Average Performance Assessment of Participants by Job Role

Performance Category	Assessment Scale	Average Performance Assessment			
		PMs	FL	VDC	EST
Number of Individuals in the Sample	#	42	88	27	25
Technical Skills	1-10	8.0	8.4	8.3	8.3
Leadership & Communication Skills	1-10	7.7	8.5	7.8	7.9
Ability to Change & Adapt	1-10	8.1	8.5	8.5	8.8
Job Performance	1-10	8.1	8.9	8.8	8.4
Percentile vs. all peers	Percentile	Top 10%	Top 10%	Top 10%	Top 10%
Would put on a high-profile project	1-10	8.6	9.2	9.0	9.6
Is absolutely “cream of the crop”	%	76%	80%	75%	85%

Table 2 shows that the participants had very strong performance assessments in all 4 job roles.

- In the 1-10 scales, the average performance assessments ranged from 7.7 to 8.9 out of 10. These results indicate that the participants had skillsets that were substantially above average.
- The average participant was rated as being in the top 10% of performers for their job role.
- 89% of participants were rated between “Yes” and “Definitely Yes” regarding whether their supervisors would assign them to a high-profile project.
- 75 to 85% of the participants were rated as being absolutely “cream of the crop” for their job role.

Human Dimension Assessment Results

There are several highlights to note among the HD Assessment results.

HEXACO Personality Inventory

Results of the HEXACO Personality Inventory shows that all 4 job roles among SMACNA participants were:

- **Above average** for Honesty-Humility (H) and Conscientiousness (C). In fact, all 4 job roles were nearly in the *top 20%* of scores when compared the general population (e.g. the population at-large including non-construction roles).
- **Below average** for Emotionality (E). In fact, all four job roles were nearly in the *bottom 20%* of scores when compared with the general population. In other words, we can generally expect lower Emotionality across all four job roles that participated in this study.
- **Roughly average** for Extraversion (X), Agreeableness (A), and Openness (O). However, PMs and FLs were slightly lower in Openness compared with the general population. The positive implications of lower Openness scores will be explored in the next section of the report.

Emotional Intelligence Diagnostic

Emotional intelligence in the range of 70-79 should be interpreted as “could become a strength with some improvement” whereas scores of 80-89 are considered to be “a strength to build on.” Since all scores were in the 70-79 range, SMACNA professionals can be considered as having a

balanced emotional intelligence. The closest score to being considered an outright strength was for Self-Management specifically in the EST role (score of 78).

Q-DISC 101 Behavioral Assessment:

PM and FL roles have a balanced preference for task-oriented vs. people-oriented work as well as reserved vs. open styles of communication. EST and VDC roles have a balanced preference for task-oriented vs. people-oriented work and tend to lean toward a more reserved style of communication.

Human Dimension Differences between Job Roles

The first research objective was to identify differences in HD scores between each of the four job roles of SMACNA participants.

Evaluating differences of personality traits with different job roles provides useful information when employees transition from one role to another.

For example: consider a field leader moving into to a detailer position (e.g. perhaps in a situation where the company is moving an individual with valuable tradecraft knowledge and first-hand field experience into their BIM/VDC/Detailer group). If major HD differences exist between the FL and VDC roles, then taking an HD assessment can help identify traits that should be considered when employees transition between these roles. Some FLs may have HD traits that are “good fits” for VDC role; in these cases, there might be a greater probability of a successful transition. In other cases, FLs may not be as good of a “fit” for a VDC position and so guidance on specific areas they can work on would be helpful.

The main HD differences between the roles are summarized below:

- For the *Emotional Intelligence Diagnostic*, there were no differences between the roles at the

overall emotional quotient level nor within any of the sub-skills.

- For the *Q-DISC 101 Behavioral Assessment*, there were no differences between the roles for communication style nor work orientation.
- For the *HEXACO Personality Inventory*, there were several differences between the four job roles at the domain-level (e.g. H, E, X, A, C, O scores) as well at the sub-domains. These differences are described below.

Specific differences between combinations of the four job roles are described in detail below:

Field Leaders (FLs) vs. Project Managers (PMs)

There was only one difference between FLs and PMs in a single area of the Honesty-Humility domain:

- On average, FLs had *Higher Modesty* (+11%) than PMs, which means FLs tend to not consider themselves as superior to others nor as being entitled to privileges that others do not have. Instead, they see themselves as ordinary members of the team to a greater extent than PMs. Conversely, PMs tend to recognize their role in overseeing the project’s well-being.

Take-Away: Although there were minimal HD differences, companies should monitor instances where a FL transitions to the PM role and ensure the individual is willing to take on the different perspective and responsibilities of the position.

Field Leaders (FLs) vs. Detailers (VDCs)

There were three differences between FLs and VDCs, all of which were in the same domain:

- On average, FLs tended to have *Lower Openness to Experience* (−9%) than VDCs, including *Lower Unconventionality* (which corresponds with FLs having a tendency to stick with “tried-

and-true” ideas and avoid unconventional, radical, or unusual ideas to a greater extent than VDCs) and *Lower Aesthetic Appreciation* (which means FLs tend to see beauty in simplicity and typically prefer simple solutions over complex ones).

Take-Away: If a FL is transitioning to a VDC role, they should be encouraged to use their field expertise to think “outside-the-box” in their new role more than they might be accustomed to. For example, FLs who are great problem-solvers are likely candidates to successfully build on this strength when transitioning to a VDC role. It should be noted that at least one company who participated in this study also tests for visual-spatial skills when moving individuals from the field into a BIM/VDC/Detailer role. The purpose of this test is to understand the individual’s ability to “see” in 3-dimensions and work in model space.

Field Leaders (FLs) vs. Estimators (ESTs)

There were three differences between these roles and in different sub-domains:

- On average, FLs had *Higher Greed-Avoidance* (+10%) than ESTs, which means FLs tend to be relatively less motivated by social-status considerations.
- FLs had *Lower Fairness* (–7%) than ESTs, which means that ESTs are scrupulous about not bending the rules.
- FLs had *Lower Inquisitiveness* (–12%) than ESTs, which means FLs are focused on getting work done quickly and have less curiosity about stopping to uncover why things are the way they are.

Take-Away: The opposing differences in Greed-Avoidance and Fairness seem to balance out, especially given that both are part of the Honesty-Humility (H) domain. The lower Inquisitiveness of FLs seems reasonable given their role of leading production in the field.

Project Managers (PMs) vs. Detailers (VDCs)

There were three differences between PMs and VDCs. Two of these differences were in the Emotionality (E) domain and the third was in the Openness to Experience (O) domain:

- On average, PMs had *Higher Dependence* (+29%) than VDCs, which corresponds with a strong ability to identify difficulties or challenges and share that information with others who can provide useful feedback and collaboration.
- PMs had *Higher Sentimentality* (+15%) than VDCs, which means that VDCs tend to rely less on emotional intuition and personal relationships when making business decisions.
- PMs had *Lower Creativity* (–14%) than VDCs, which corresponds with a greater tendency to stick to what works as the “tried-and-true” is their preferred way forward. PMs of course still have problem-solving skills but typically will not rock the boat by trying to solve problems in a new, different, or experimental way.

Take-Away: PMs who have shown creativity, innovativeness, and an ability to “think outside-the-box” may be more successful candidates to transition to a VDC role. Conversely, VDCs who show strong relationship-building skills may have a greater likelihood of success in moving to a PM role.

Project Managers (PMs) vs. Estimators (ESTs)

There was only one difference in a sub area of the Conscientiousness (C) domain:

- On average, PMs had *Lower Prudence* (–7%) than ESTs. This means that ESTs are less likely to act on impulse and tend to be cautious and carefully consider their options. PMs, conversely, are better equipped to act on a “gut-feeling” without needing to pause to analyze the possible consequences.

Take-Away: PMs who transition into a full-time EST role may be more successful if they have a history of being cautious, non-impulsive, and highly measured in their actions when compared with their peers. ESTs who move to a PM role may be encouraged to act decisively and prudently in the best interest of the project given the number of stakeholders who may be awaiting their input. Yet overall, it is not surprising to see minimal differences between PMs and ESTs given that PMs often have substantial estimating responsibility (such as providing input on bids or when handling change orders, for example).

Detailers (VDCs) vs. Estimators (ESTs)

There were no differences among the 37 human dimensions characteristics that were used in this study. This could be due to the relatively smaller sample sizes collected for VDCs (27 participants) and ESTs (25 participants). Gaining additional participation in the future may reveal differences between these roles.

Human Dimensions of Top-Performing PMs and FLs

The second research objective was to identify the unique Human Dimensions of Top-Performers in the PM and FL job roles.

Distinct Human Dimensions of Top-Performing PMs

The following attributes and personality characteristics were distinguished between top-performing PMs (the top 10% of all participants) and other PMs.

Top-Performing PMs have **lower scores** in:

- **Extraversion (–20% vs. other PMs) including the three sub-dimensions of Sociability (–25%), Liveliness (–31%); and Social Boldness (–22%)**
Lower scores in these areas correspond with individuals who are less driven by a need

for social interaction and tend to be more quiet, serious, and introspective. They tend to prioritize tangible things over relationships and are analytical and matter-of-fact in their interactions. When they do interact and communicate, they are thoughtful and sincere. However, this isn't to say that less-extraverted individuals necessarily avoid social interaction. Top-Performing PMs can become comfortable with a small group of close co-workers, particularly when mutual trust is earned over time

- **Fearfulness (–21% vs. other PMs)**
Top-Performing PMs may be bolder and less sensitive to failure (e.g. more resilient)
- **Flexibility (–15% vs. other PMs)**
More willing to stand up against another person's unreasonable suggestions. Less tendency to compromise and accommodate for the purposes of avoiding arguments (prefer to address disagreements head-on when in the best interest of the project).
- **Creativity (–18% vs. other PMs)**
Tendency to stick to what works because the "tried-and-true" is their preferred way forward; avoids the pursuit of new solutions to problems unless absolutely necessary (less experimental).

Top-Performing PMs have **higher scores** in:

- **A more Reserved Communication Style (3-times more reserved than other PMs)**
This means that top-performing PMs are more reserved (as opposed to assertive) in their communication style. Top-Performing PMs prefer to consider things carefully and thoroughly before speaking or making a decision.
- **Gentleness (+19% vs. other PMs)**
Top-performing PMs tend not to dwell on past mistakes of others (do not hold past mistakes against employees). Instead, they focus on moving forward to get the project

done and are more willing to allow people to grow and improve.

Distinct Human Dimensions of Top-Performing FLs

The following attributes and personality characteristics were distinguished between top-performing FLs (the top 10% of participants) and other FLs.

Top-Performing FLs have **lower scores** in:

- **Honesty-Humility (–6% vs. other FLs) and specifically the sub-dimension of Modesty (–6%)**
Top-Performing FLs may have a greater sense of special status among the project team. This may manifest as feelings of having elevated responsibility and decision-making authority on the team that must be exercised for the good of the project.
- **Forgiveness (–9% vs. other FLs)**
Top-Performing FLs tend to remember past mistakes that others have made and will keep those in mind when planning future tasks.
- **Creativity (–11% vs. other FLs)**
Tendency to stick to what works because the “tried-and-true” is their preferred way forward; avoids the pursuit of new solutions to problems unless absolutely necessary (less experimental). This trait is also common to PMs across the board.

Top-Performing FLs have **higher scores** in:

- **Fearfulness (+14% vs. other FLs)**
More sensitive to failure in their tasks (e.g. focused on avoiding risks that could hinder the project from delivering the required outcome).
- **Self-Awareness (+8% vs. other FLs)**
Greater ability to understand their own emotions and how these emotions impact their performance as well as the performance of others.

6) SUMMARY

In today’s hyper-competitive environment, it is critical for contractors to attract, develop, and maintain talent in their workforce. Results from this study suggest several applications for Hiring & Recruitment as well as broader Talent Development efforts.

Differences in Human Dimension Characteristics between Job Roles

There were differences in HD characteristics between all job roles (except EST vs. VDC, which may be due to the smaller sample sizes in these two roles). Understanding the differences between roles is helpful in scenarios when an employee is transitioning between roles or being promoted to another role. It is also helpful when interviewing new candidates who may be qualified “on paper” because the company might be more likely to find the best “fit” candidate based on the needs of the job role.

Differences in Human Dimensions for Top-Performing Project Managers

There were several distinctive characteristics of Top-Performing PMs. Compared with others, the Top-Performing PMs tended to be less extraverted and more reserved in their communication style. Top-Performing PMs also had lower fearfulness (greater resiliency and boldness), lower flexibility (prefer to address disagreements head-on when in the best interest of the project), and lower creativity (PMs are problem-solvers who will stick to “tried-and-true” solutions when available). Finally, Top-Performing PMs are more gentle (willing to allow people to grow and improve).

Differences in Human Dimensions for Top-Performing Field Leaders

There were also several distinctive characteristics of Top-Performing FLs. Compared with others, the Top-Performing FLs tended to have lower modesty (more keenly aware of their elevated responsibility on the

project team), lower forgiveness (able to remember past mistakes that other have made), and lower creativity (tendency to stick with tried-and-true solutions). Top-Performing FLs had higher fearfulness (more focused on avoiding risks that could result in failed project objectives) and higher self-awareness (ability to understand how their own emotions and the emotions of others can impact performance).

7) RECOMMENDATIONS OF HOW SMACNA CONTRACTORS CAN USE THESE RESULTS

There are several applications for how SMACNA contractors can use these results – even if they do not use human dimensions assessments in their operations.

Applications for Hiring and Recruitment

There are several ways that companies can immediately apply these results in their hiring and recruitment activities. For example, the results show the common HD characteristics of above-average performing employees in the four job roles of PMs, FLs, ESTs, and VDCs. The study also identified the distinctive characteristics of the top 10% of performers in the PM and FL roles. Contractors can use this information in their hiring and recruiting processes to evaluate candidates against the “best-in-class” or top-performer characteristics shown in this study. These characteristics are difficult to assess in candidate resumes and other traditional job application materials. However, these characteristics can certainly be evaluated in an interview process to “tease out” the high-performing traits.

For example, here are suggested interview questions to evaluate whether a candidate is prone to the distinct characteristics of Top-Performing PMs. All companies can use these questions as situational interview techniques.

- ✓ **Lower Fearfulness:** describe a time where you had to act boldly, quickly, or decisively. How did you know that you had to act decisively? What were the results?

- ✓ **Lower Flexibility:** tell us about a scenario where you had to address a disagreement head-on because it was in the best interest of the job/customer/project/etc.
- ✓ **Lower Creativity:** have you ever been faced with a choice between using a tried-and-true solution vs. trying a new/innovative approach? How did you approach this?
- ✓ **Higher Gentleness:** give us an example of a time when you allowed a colleague to make a mistake to help them grow and improve.

Here are suggested interview questions to ask candidates related to the distinct characteristics of Top-Performing FLs:

- ✓ **Lower Modesty:** give an example of when you were on a team but were solely responsible for part of the effort/project. How did you ensure you stayed on top of that responsibility and communicate it to your team members?
- ✓ **Lower Forgiveness:** describe a time when you remembered a previous mistake and used this information to avoid negative consequences in a subsequent project.
- ✓ **Higher Fearfulness:** have you ever faced pressure to act quickly/boldly/decisively but knew that you needed to take more time to consider options? How did you approach this situation?
- ✓ **Higher Self-Awareness:** share a time when you felt that the vibe/mood was “off” and negatively impacting the workplace environment. What tipped you off? How did you all work through it?

Applications for Talent Development

The results of this study can also be used for a variety of talent development purposes, such as:

- **Performance Evaluations:** companies can incorporate top-performing characteristics into the performance evaluations that may be reviewed with employees. Supervisors can coach their employees to reflect on the interview questions that were suggested above. In this case, the purpose would be to help build awareness of top-performing characteristics and how these characteristics can be applied to the day-to-day situations that happen on a project (rather than to filter our potential job candidates).
- **Mentoring:** formal and informal mentoring processes can also leverage the questions suggested above. Pairings of mentors & mentees can discuss the characteristics and reflect on situations where the characteristics can be applied in real-world situations.
- **Job Transitions:** employees who must transition between job roles can be supported to help them capitalize on strengths and be mindful of weaknesses within the context of a new role.
- **Advancement on the “Career Ladder”:** Employees who are interested in transitioning to a new role can begin proactively building their skills to become top-performers in the new role.
- **Identifying “High-Potential” Employees:** contractors can identify early career professionals who show the characteristics of a top-performer in their job role. These high-potential employees can be groomed to help them advance professionally and realize their full potential.
- **Improved Communication & Collaboration Skills:** employees in a certain job role can review the HD results of this study to understand their differences from the typical HD results for the other roles. Better understanding of the different HD characteristics can help improve communication and collaboration among the different job roles. For example, the VDC role may recognize that FLs tend to have a lower Openness to Experience; therefore, VDCs should take care to explain any new, innovative, or abnormal approaches that are being recommended for a project and also relate to previous experiences that show the method is “tried-and-true” from other projects the company has delivered.

Final Thoughts

When using these results, contractors should also consider their unique company culture along with different responsibilities they might include in the different job roles. For example, some contractors might engage their PMs more heavily in sales and business development, whereas other contractors might promote a much higher level of PM-engagement in the management of field labor productivity. In each of those cases, the model of successful traits may be different depending on the responsibilities that are prioritized in the job role.

8) REFERENCES

- Ashton, M. C., & Lee, K. (2007). Empirical, Theoretical, and Practical Advantages of the HEXACO Model of Personality Structure. *Personality and Social Psychology Review*, 11(2), 150–166.
- Ashton, M. C., & Lee, K. (2009). The HEXACO-60: A short measure of the major dimensions of personality. *Journal of Personality Assessment*, 91, 340-345.
- Ashton, M. C., & Lee, K. (2017). HEXACO Personality Inventory-Revised (HEXACO-PI-R). In V. Zeigler-Hill & T. K. Shackelford (Eds.), *Encyclopedia of Personality and Individual Differences* (pp. 1-3). Cham: Springer International Publishing.
- Poepsel, M. (2021, February 25). The extraversion personality in the workplace: High vs low. Retrieved March 16, 2021, from <https://www.predictiveindex.com/blog/the-extraversion-driveconstructed/>
- Zeigler-Hill, V., & Shackelford, T. K. (Eds.). (2020). *Encyclopedia of Personality and Individual Differences*. doi:10.1007/978-3-319-28099-8
- TalentSmart, inc. 2011. “Emotional Intelligence Appraisal teaching manual. TalentSmart.
- Rohm, R. A. (2013). What is disc? It is a powerful way to understand people and their personality types! Retrieved March 16, 2021, from <https://www.discoveryreport.com/introduction-to-disc-personality-types.html>

ABOUT THE AUTHORS



Omar Maali, MSc, PMP

Omar Maali is a Ph.D. student and research assistant in the civil engineering department at the University of Kansas. He is currently studying organizational change management, technology adoption, and characteristics of top performers in the AEC industry. Mr. Maali has 5 years of construction field experience as a field engineer and assistant project manager in mechanical and civil projects.



Brian Lines, PHD, PE, FMP

Dr. Brian Lines is an associate professor at the University of Kansas. His research focuses on innovative project delivery techniques within design and construction. Dr. Lines' research program has actively integrated with organizations to deliver more than \$1 Billion in total project value.



Jake Smithwick, PHD, MPA, FMP, SFP

Dr. Jake Smithwick is an assistant professor at the University of North Carolina in Charlotte. His research focuses on organizational performance benchmarking within construction, facility management, and the broader built environment. Dr. Smithwick's industry experience also includes field inspection of nearly 2,000 waterproofing systems (74 million square feet) across the United States, and six years in the US Air Force Reserve, assigned to the civil engineering squadron.



Simplar Foundation

The Simplar Foundation's mission is to share and promote research findings that allow organizations of all types and sizes to improve their ability to operate, better meet the public need, implement best practices, and more effectively train the workforce. Learn more at www.simplarfoundation.org.

APPENDIX A – HEXACO PERSONALITY INVENTORY SCALE DESCRIPTIONS

Major Domains within HEXACO

Domain-Level Scales	Domain-Level Description
Honesty/Humility	<p>Persons with very high scores on the Honesty-Humility scale avoid manipulating others for personal gain, feel little temptation to break rules, are uninterested in lavish wealth and luxuries, and feel no special entitlement to elevated social status.</p> <p>Conversely, persons with very low scores on this scale will flatter others to get what they want, are inclined to break rules for personal profit, are motivated by material gain, and feel a strong sense of self-importance.</p>
Emotionality	<p>Persons with very high scores on the Emotionality scale experience fear of physical dangers, experience anxiety in response to life's stresses, feel a need for emotional support from others, and feel empathy and sentimental attachments with others.</p> <p>Conversely, persons with very low scores on this scale are not deterred by the prospect of physical harm, feel little worry even in stressful situations, have little need to share their concerns with others, and feel emotionally detached from others.</p>
Extraversion	<p>Persons with very high scores on the Extraversion scale feel positively about themselves, feel confident when leading or addressing groups of people, enjoy social gatherings and interactions, and experience positive feelings of enthusiasm and energy.</p> <p>Conversely, persons with very low scores on this scale consider themselves unpopular, feel awkward when they are the center of social attention, are indifferent to social activities, and feel less lively and optimistic than others do.</p>
Agreeableness	<p>Persons with very high scores on the Agreeableness scale forgive the wrongs that they suffered, are lenient in judging others, are willing to compromise and cooperate with others, and can easily control their temper.</p> <p>Conversely, persons with very low scores on this scale hold grudges against those who have harmed them, are rather critical of others' shortcomings, are stubborn in defending their point of view, and feel anger readily in response to mistreatment.</p>
Conscientiousness	<p>Persons with very high scores on the Conscientiousness scale organize their time and their physical surroundings, work in a disciplined way toward their goals, strive for accuracy and perfection in their tasks, and deliberate carefully when making decisions.</p> <p>Conversely, persons with very low scores on this scale tend to be unconcerned with orderly surroundings or schedules, avoid difficult tasks or challenging goals, are satisfied with work that contains some errors, and make decisions on impulse or with little reflection.</p>
Openness to Experience	<p>Persons with very high scores on the Openness to Experience scale become absorbed in the beauty of art and nature, are inquisitive about various domains of knowledge, use their imagination freely in everyday life, and take an interest in unusual ideas or people.</p> <p>Conversely, persons with very low scores on this scale are rather unimpressed by most works of art, feel little intellectual curiosity, avoid creative pursuits, and feel little attraction toward ideas that may seem radical or unconventional.</p>

Sub-Domains Within HEXACO

Domain	Facet	Assessment
Honesty/Humility	<i>Sincerity</i>	Tendency to be genuine in interpersonal relations
	<i>Fairness</i>	Tendency to avoid fraud and corruption
	<i>Greed avoidance</i>	Tendency to be uninterested in possessing lavish wealth, luxury goods, and signs of high social status
	<i>Modesty</i>	Tendency to be modest and unassuming
Emotionality	<i>Fearfulness</i>	Tendency to experience fear
	<i>Anxiety</i>	Tendency to worry in a variety of contexts
	<i>Dependence</i>	One's need for emotional support from others
	<i>Sentimentality</i>	Tendency to feel strong emotional bonds with others
Extraversion	<i>Social Self-Esteem</i>	Tendency to have positive self-regard, particularly in social contexts
	<i>Social Boldness</i>	One's comfort or confidence within a variety of social situations
	<i>Sociability</i>	Tendency to enjoy conversation, social interaction, and parties
	<i>Liveliness</i>	One's typical enthusiasm and energy
Agreeableness	<i>Forgiveness</i>	One's willingness to feel trust and liking toward those who may have caused one harm
	<i>Gentleness</i>	Tendency to be mild and lenient in dealings with other people
	<i>Flexibility</i>	Assesses one's willingness to compromise and cooperate with others
	<i>Patience</i>	Tendency to remain calm rather than to become angry
Conscientiousness	<i>Organization</i>	Tendency to seek order, particularly in one's physical surroundings
	<i>Diligence</i>	Tendency to work hard
	<i>Perfectionism</i>	Tendency to be thorough and concerned with details
	<i>Prudence</i>	Tendency to deliberate carefully and to inhibit impulses
Openness to Experience	<i>Aesthetic Appreciation</i>	One's enjoyment of beauty in art and nature
	<i>Inquisitiveness</i>	Tendency to seek information about, and experience with, the natural and human world
	<i>Creativity</i>	One's preference for innovation and experiment
	<i>Unconventionality</i>	Tendency to accept the unusual

APPENDIX B – EMOTIONAL INTELLIGENCE SCALE DESCRIPTIONS

Definition of Emotional Intelligence Scales

Core EI Skills	Domain-Level Description
Self-Awareness (SEA)	Ability to accurately perceive your emotions in the moment and understand your tendencies across situations.
Self-Management (SM)	Ability to use awareness of your emotions to stay flexible and direct your behavior positively.
Social-Awareness (SOA)	Ability to accurately pick up on emotions in other people and understand what is really going on with them.
Relationship Management (RA)	Ability to use awareness of your own emotions and those of others to manage interactions successfully.

Interpreting Emotional Intelligence Scores

Range	Interpretation
90-100	A strength to capitalize on
80-89	A strength to build on
70-79	With some improvement, this could be a strength
60-69	Something to work towards
59 or below	A goal to address

APPENDIX C – QDISC-101 SCALE DESCRIPTIONS

The instrument provides a score for work orientation (task-oriented vs. people-oriented) and communication style (reserved communication vs. assertive communication) to assign a person into one of the four quadrants – Dominant, Inspiring, Supportive, and Cautious. Each person will display each of the four behaviors to some level, from low to high.

Core EI Skills	Domain-Level Description
Dominant (D)	Associated with control, power, and assertiveness. Actions are focused on accomplishing results. Individuals with high D scores are perceived as demanding, determined, and pioneering.
Inspiring (I)	Associated with social interaction skills and communication. Actions are focused on building relationships and persuading others. Individuals with high I score are perceived as convincing, magnetic, and optimistic.
Supporting (S)	Associated with patience, resilience, and thoughtfulness. Actions are focused on compliance and cooperation. Individuals with high S scores are perceived as calm, stable, and unemotional.
Cautious (C)	Associated with structure and organization. Individuals with high C scores are perceived as cautious, precise, and tactful.

Graphic of the QDISC-101 Behavioral Diagnostic

