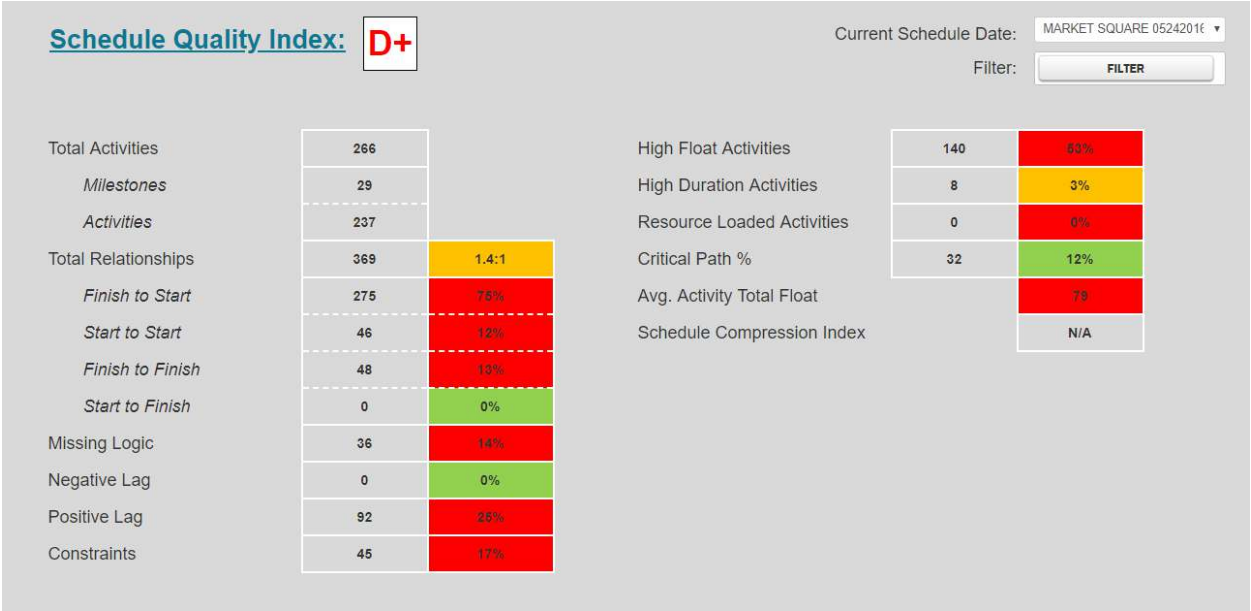
SmartPM™

Understanding the Schedule Quality Index



Schedule Quality Index: D+

Current Schedule Date: MARKET SQUARE 05242016

Filter: FILTER

Total Activities	266	
Milestones	29	
Activities	237	
Total Relationships	369	1.4:1
Finish to Start	275	75%
Start to Start	46	12%
Finish to Finish	48	13%
Start to Finish	0	0%
Missing Logic	36	14%
Negative Lag	0	0%
Positive Lag	92	25%
Constraints	45	17%

High Float Activities	140	53%
High Duration Activities	8	3%
Resource Loaded Activities	0	0%
Critical Path %	32	12%
Avg. Activity Total Float		79
Schedule Compression Index		N/A

SmartPM's Schedule Quality Index grade assessment is guided by the United States Defense Contract Management Agency's (DCMA) 14-point schedule assessment guideline. The DCMA guideline was developed by the Department of Defense to evaluate the enormous volume of contracts and schedules they were tasked with managing. Essentially, it is evaluating whether a schedule is well-built and whether it adheres to a set of best practices considered important to the success and manageability of a project. These best practices are broken down into a list of the following 14 checks:

Total Relationships (to Activities Ratio): The Total Relationships to Activities Ratio is an indicator of how structurally sound the schedule is. If it is 1:1, it means that for every one activity there is one successor tie. Given that, the ratio should be closer to 2:1 (2 successors to every 1 activity) to score a good grade

> **Why it Matters:** In complex projects, there are usually trades moving from area to area, as well as new trades coming into a given area after one leaves. For instance, a 2:1 ratio provides two successor ties that show (1.) a drywall crew that completed in one area can move to a new area and (2.) that the follow-on painters can move into the vacated area.

Finish to start ties: These ties are essentially indicating to the schedule that a successor activity can't start until a predecessor activity is 100% complete. It is considered best practices to have mostly Finish to Start activities in a schedule. The DCMA 14-point schedule assessment methodology recommends that more than 90% of all logic ties in a schedule be Finish to Start.

> **Why it Matters:** From a scheduling perspective, Finish to Start ties eliminate the risk of trades working to closely together in an area.

Start to Start Ties: These ties indicate that a given activity can start on or after the start date of its predecessor. In some instances, the need for Start to Start links is reasonable. However, the risk of having too many in each schedule increases the risk that multiple areas have trade flows set to follow each other in a somewhat of a compressed state. The DCMA methodology gives a 5% threshold of activities that can be Start to Start – or it fails.

> **Why it Matters:** Start to Start ties are a risk because if one preceding trade is impacted all suffer – which could ultimately result in inefficiencies to the trades and potential claims for overages.

Finish to Finish Ties: Like Start to Start ties, Finish to Finish ties are a sign of overlapping trades and is a risk for the same reasons as Start to Start. This logic tie essentially states that the successor can't finish until the predecessor is complete. The DCMA methodology gives a 5% threshold of activities that can be Finish to Finish – or it fails.

Start to Finish Ties – This is a tie that essentially states that a successor can't finish until the predecessor starts. It is odd, and most scheduling professionals denounce this.

Missing Logic – Scheduling best practices indicate that every activity, except the first activity and the last activity, have a predecessor or a successor. When an activity does not have a predecessor then it is likely constraint driven; and when an activity doesn't have a successor it will have a very high total float, and/or indicate that the logic is missing. This is a crucial metric.

> **Why it Matters:** Missing logic is a risk because it creates unrealistic float, can alter the true critical path and absorbs delay without being seen.

Positive and Negative Lag: Positive and negative lag are risks for the same reason Start to Start and Finish to Finish logic ties are risks.

Constraints: Constraints are designed to set an activity to be started or finished on a date that is predetermined. In some instances, the need is reasonable. However, excessive use indicates a problem in the schedule. Constraints cause the schedule to no longer be "logic driven" and puts the schedule at risk of and erroneous critical path.

> **Why it Matters:** The use of too many constraints can result in delays not being seen or understood – thus resulting in difficulty in managing a project and/or disputes.

High Float Activities: Float is an indicator of how much room an activity can be delayed before it delays the job. When a schedule has many activities with a lot of float (in SmartPM's case greater than 2 months), it indicates flawed logic. This metric goes hand in hand with the Activity to Relationship metric because it indicates that there is not ample enough logic to effectively manage the crews – and it has a heightened risk of inefficiencies amongst the trades and delays not being seen until it is too late. This also can result in an erroneous critical path.

> **Why it Matters:** A scheduler should do the best they can to minimize High Float Activities because schedules need to be "reactive" to delays so the Responsible Manager can understand the extent at which delays will affect the end date.

High Duration Activities: High Duration Activities indicate a schedule doesn't have enough detail, or at least, certain activities that don't. This is a risk because it can confuse the critical path and confuse the order in which certain work should be performed. The SmartPM flags schedules experiencing more than 5% of total activities with durations of 2 months long.

> **Why it Matters:** The risks associated with this are (1) not knowing the true critical path (2) not seeing true delays. Both result in heightened level of inefficiencies and increase the chance of a dispute.

Resource Loaded Activities: A resource loaded schedule provides so much more value in understanding true progress, supporting the payment application review process, managing resources and quantifying impacts. Without this, project management is simply more difficult.

Critical Path Percentage: If a schedule's critical path has too little activities or too many activities, chances are the schedule logic is off; and an erroneous critical path is likely present. Too little promotes this risk more than too many, but too many also makes it difficult to trust this as the "true" critical path – making it difficult to manage the schedule effectively from a delay oversight perspective.

Average Activity Total Float: This metric is necessary to monitor for similar reasons as the number of high float activities. Similar risk as missing logic is present if the average total float is high and there are not that many activities that are over two months of float. This is just another way to pick it up.