

# COLLABORATIVE TAKT TIME PLANNING OF NON-REPETITIVE WORK

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## 1 BACKGROUND

“**Takt**” or “Taktzeit” in German means “beat,” the regularity with which something gets done.

Takt is used to structure construction work and thus “shape” schedules of work anticipated and control of work being executed.

Use of takt imposes a rationale and methodology to achieve continuous flow in the schedule.

**Takt time planning (TTP)** uses capacity buffers and clearly delineated handoffs between trades to mark schedule control points; these can help increase predictability in system performance.

## 2 IDENTIFICATION OF PROBLEM

The aim of this paper and a companion paper (by other authors) is to articulate TTP methods used so as to allow for comparison, refinement, and improvement.

- This paper describes an approach for takt time planning (TTP) that was developed and tested on a pilot project in California.
- A companion paper describes their approach for TTP that they applied in Germany, that is, in a different project type-, commercial-, and geographical context.

## 3 RESEARCH METHODOLOGY FOLLOWED ON PILOT PROJECT

The here-described approach was piloted on the gut-and-remodel of a small healthcare project.

The researchers and project team engaged in action research to study, not so much if-, but how takt time might be used to plan and execute work. At first, units of repetitive work were not obvious.

They developed a TTP approach on the basis of “**work density**,” a trade-specific characteristic, expressed in unit of time/unit of area, defined as: *Given a certain work area, work density describes how much time a given trade will require to do their work in that area, based on the product design and the scope of work done by that trade for a given task in the schedule (thus depending on work already in place and work that will follow), the means and methods the trade will use to do their work while accounting for their crew’s capabilities and crew size.* Work density thus captures what will be done, by whom, when, where, and how.

## 4 TAKT TIME APPROACH DEVELOPED ON PILOT PROJECT IN CALIFORNIA

**TTP is a work structuring method.** Work structuring means breaking an entire project into smaller pieces (so-called “chunks”) while addressing the following questions:

1. In what units (chunks) will work be assigned to production units?
2. How will work chunks be sequenced?

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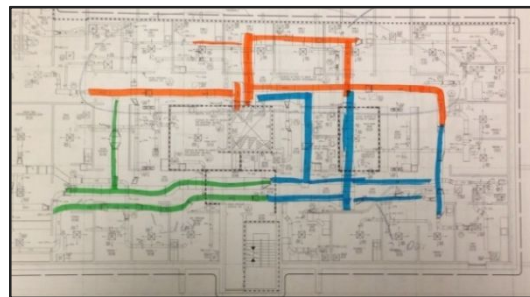
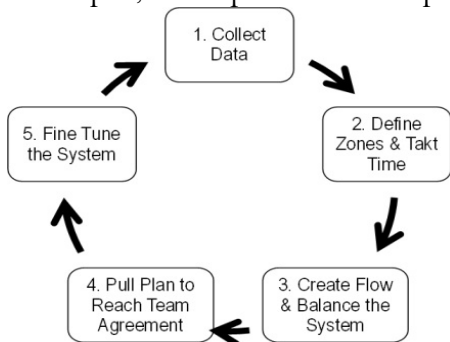


3. How will work be released from one production unit to the next?
4. Will consecutive production units execute work in a continuous flow process or will their work be decoupled?
5. Where will decoupling buffers be needed and how should they be sized?
6. When will the different chunks of work be done?

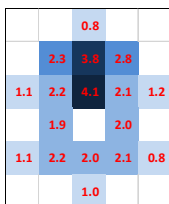
Structuring of work using TPP to ascertain manageability of the pieces, has as **objectives**:

1. Have trades work in a way they prefer.
2. Aim for constant crew sizes and continuous work flow (i.e., no work interruptions).
3. Avoid trade stacking (i.e., only 1 trade works in any 1 zone at any time).
4. Use timely on-takt handoffs.
5. Balance the whole while pushing for speed.

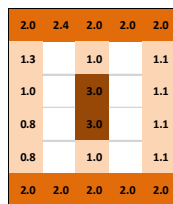
The collaborative TTP approach, as developed, comprises 5 steps:



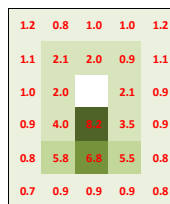
**Step 1 - Collect Data:** Input from Mechanical Trade using Chunks of 2-Day Takt



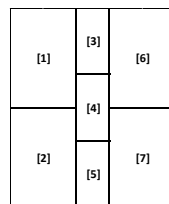
Mechanical Trade



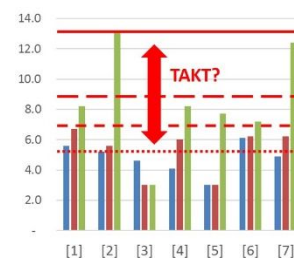
Framing Trade



Electrical Trade



Tentative Zoning



Time needed per Zone per Trade

**Step 2 - Define Zones and Takt Time:** Work Density for Different Trades and Zoning



**Step 3 - Create Flow and Balance the System:** Meshed Patterns of Work Flow by 2-day Takt

**Step 4 - Pull Plan to Reach Team Agreement**

**Step 5 - Fine Tune the System**

## 5 RESEARCH CONTRIBUTION

This paper presented a characterization and formalization of a method for collaborative TTP of non-repetitive work. This may inform the use of TTP on other projects, as well as serve as a basis for comparing and contrasting takt time- and other planning methods.

