The purpose of this thesis is to determine the transformability of Skeleton-Infill Apartment Buildings, built from 1982 in Japan with the intention of allowing more possibilities of transformations in order to fit better to inhabitants’ needs. After more than 30 years of actual experience, a considerable number of post-occupancy evaluation investigations appeared in the academia in Japan. The present research collected these materials, evaluated each building’s transformations from the time they were built through 2015, and proposed a way to facilitate more effective transformability for this type of buildings. The thesis consists of nine chapters, as follows:

Chapter 1 – Introduction. Along with the above stated purpose, the main problems, goals, research method, terminology, and basic construction of the discussion of the research were explained.

Chapter 2 – Review of Previous Research on Transformability. This chapter is divided in three parts, covering three types of contribution to this field: 1) the contribution of designers through their trials and studies, 2) the efforts of investigative researchers to record and evaluate the experienced results, and 3) theories and models of evaluation developed by previous researchers.

Chapter 3 – Transformability Assessment Method. In this chapter, a new method for assessment of transformability is proposed. The method is based on two essential questions about any transformation: 1) WHAT transforms, and 2) HOW EASILY does it transform? As an answer to 1) – Building Parts (BP) is proposed, and as an answer to 2) – a Degree of Freedom of Transformation (DFT) Index is proposed. BP is based on Steward Brands’ “Shearing Layers of Change” and represents the collection of a building’s main sub-systems. The DFT Index is a user-centered index of transformation readiness that corresponds to the involvement of certain parties in the transformation process (besides user, professionals, experts, and institutions of society). The more parties there are in the process, the more costly, delayed and infrequent are the transformations. On the other hand, when the user can apply the transformation himself there are the least barriers. The DFT Index is precisely determined through the DFT Index Determination Protocol which consists of a series of four questions (Q1–Q4).

Chapter 4 – Example Set of SI Apartment Houses. In this chapter, basic information on 16 selected examples of SI apartment houses is presented. The examples were selected according to the availability of data about design intentions, experienced transformation records, as well as its planning, access, and structural principles, which constitute a range of variation of the type.

Chapter 5 – Intended TP Analysis. Based on the method proposed in Ch.3, intentions regarding transformability for 14 out of 16 examples were evaluated, according to verbal statements and design materials made by their Architects. The Intended TP (INT TP) for each of the examples was derived as a result.

Chapter 6 – Experienced TP Analysis. Based on the method proposed in Ch.3, the transformations actually experienced for 12 out of 16 examples were evaluated, according to POE investigations made by other researchers. Analogically to Ch. 5, Experienced TP (EXP TP) for each of the examples was derived.

Chapter 7 – Using the results, INT TP and EXP TP, a design intentions were compared to their actualizations, and the approaching behavior was analyzed for the trend of EXP TP toward INT TP over time. In order to overcome differences in investigative research materials (different numbers of units surveyed and/or different numbers of years after completion at the moment of survey, different periods covered by surveys, etc.), “unit-years” as the measurement of accumulated transformation experience was introduced.

Chapter 8 – Substantial Transformability. In this chapter, a procedure for logically determining the substantial transformability of any SI building based on its design characteristics was explained, a SUB TP Estimation Chart was formulated, a number of SUB TPs were analyzed for several important design characteristics, hypotheses about general characteristics of transformability were proposed and tested.

Chapter 9 – Concluding Remarks. Based on the assessment method proposed in Ch. 3, and the analysis presented through Ch. 4~8, the following was pointed out: 1) approaching behavior of EXP TP toward INT TP could be observed, 2) approx. 100 unit-years might be enough for confirming whether the design intentions were achieved through experience, 3) approx. 40 unit-years might be enough for determining the timespan of transformations in case of buildings with movable partitions and storage, and 4) the SUB TP Estimation Chart was developed for concluding the substantial transformability of buildings based on their characteristics. Additionally, two hypotheses were proven: a) buildings do have layers with different pace of change as proposed by Steward Brand with “Shearing Layers of Change”, and b) higher DFT Index implies less necessary accumulated experience period for confirming the INT TP.