Logical Data Model Business Rules

## Part A: Core Assumptions

1. School: Each school can be either one of the following levels: elementary, middle, and high.
2. House Style: Each house style has at least one elevation, which is the base design.
3. Chosen Style: Lots can be built as shown in the primary photo (house\_style\_photo) or reversed.
4. Construction Project:
   1. Seven stages of construction are defined and all are visible to the construction managers.
      1. Stage 1: Foundation
      2. Stage 2: Site preparation
      3. Stage 3: Plumbing and electrical
      4. Stage 4: Framing
      5. Stage 5: Roofing
      6. Stage 6: Exterior
      7. Stage 7: Interior
   2. Customers are accessible to Stage 1, 4 and 7 only and the classification of stages follows:
      1. Stages 1 to 3 are shown as Stage 1
      2. Stages 4 to 6 are shown as Stage 4
      3. Stage 7 is shown as Stage 7
5. Option List:
   1. Option list displays all available decorator options and can be updated.
   2. Same options in different stages are charged with additional cost.
   3. Some options are only available for specific stages.

## Part B: Additional Assumptions

1. School:
   1. School names are unique and can be used as the primary key for a School entity.
   2. Each school must belong to only one school district.
2. House Style:
   1. Each house style may be shared by more than one lot.
   2. Each elevation belongs to one only house style.
   3. Elevation is a weak entity and can be identified by elevation\_id and style\_name.
   4. Room is a weak entity and can be identified by room\_id and style\_name.
   5. The style\_size attribute can be derived from room\_size of room entity.
3. Room: The room\_name attribute can have duplicate values.
4. Employee:
   1. Employees can be specialized as Sales Representative or Construction Manager.
   2. Construction Manager has a work crew number attribute.
5. Escrow:
   1. Within one year after the contract is signed and the house construction has not completed, buyers can reclaim part of the escrow deposit:

Amount to redeem = deposit\_amount \* (1 - project\_pct\_complete)

* 1. After one year after the contract is signed or the house construction has completed, no refund is allowed.

1. Sale:
   1. Each sale requires only one escrow.
   2. The sale record will be keeped with its contract status changed to “void” after contract cancellation or default.
   3. The lot\_premium attribute can be derived from elevation cos
   4. The total price of a sold sale consists of the lot premium and the base price.
   5. The lot\_size attribute is referenced from the style\_size of the house style chosen.
   6. The financing methods are limited to mortgage loan and seller financing.
   7. Each sale may be financed by one bank.
2. Construction Project: The project\_pct\_complete attribute is derived from the task\_pct\_complete in the following way:
   1. Formula: project\_pct\_complete = number of task completed / total number of tasks under a project \* 100
   2. Example:

Assume there are three tasks under one project (i.e. matched with the same project\_id). If one of the task’s task\_pct\_complete has achieved 100% while that of the others are less than 100%, the project\_pct\_complete will equal to 33.3%.

1. Task:
   1. Task is a weak entity and can be identified by task\_id and project\_id.
   2. A new task is appended when a new decorator choice is ordered.
2. Decorator Choice:
   1. The current\_opt\_price attribute is added to fix the option cost once it is chosen such that it will not be affected by price fluctuations in the option list.
   2. An ordered decorator choice can be revised or deleted only if the associated task has not started (i.e. task\_pct\_complete = 0%).
3. Customer:
   1. A customer may have one or more sales records.