**(A)Entities**

| Entity Name | Multiplicity | Relationship | Multiplicity | Entity Name |
| --- | --- | --- | --- | --- |
| School | 0..\* | Belongs | 1..1 | School District |
| School District | 1..1  0..\* | Contains  Belongs | 0..\*  1..1 | School |
| Subdivision | 1..1  1..1 | Consists  Contains | 0..\*  0..\* | School District  Lot |
| House\_Style | 1..1  1..1  1..\*  1..1 | Follows  Describe  Describe  Offers | 1..\*  1..\*  0..\*  0..\* | Elevation  Room  Lot  Chosen\_Style |
| Chosen\_Style | 0..\*  1.,1 | Selected from  Decide | 1..1  1..1 | House\_Style |
| Lot | 0..\*  0..\*  1..1 | Has  Belongs  Sold | 1..1  1..1  0..1 | House\_Style  Subdivision |
| Room | 1..\*  0..1 | Belongs  Has | 1..1  0..\* | House\_Style  Decorator\_Choice |
| Elevation | 1..\* | Belongs | 1..1 | House\_Style |
| Escrow | 1..1 | Pays | 1..1 | Sale |
| Sale Representative | 1..1 | Sells | 0..\* | Sale |
| Employee |  |  |  |  |
| Consturction\_Manager | 1..1 | Supervise | 0..\* | Construction\_porject |
| Construction\_porject | 1..1 | Has | 0..\* | Task |
| Task | 0..\* | Belongs | 1..1 | Construction\_porject |
| Sale | 1..1  0..1  1..1  0..\*  0..\*  0..\*  1..1 | Requires  Sells  Decides  Belongs  Paid  Financed  Initiates | 1..1  1..1  1..1  1..1  1..1  0..1  1.1 | Escrow  Lot  Chosen\_Style  Sale\_Representative  Customer  Bank  Consturction\_Project |
| Bank | 1..1 | Finances | 0..\* | Sale |
| Escrow | 1..1 | Pays | 1..1 | Sale |
| Customer | 1..1 | Participate | 0..\* | Sale |
| Decorator\_Choices | 0..\*  0..\*  0..\* | Belongs  Chosen from  Affects | 1..1  1..1  0..1 | Construction\_Proejct  Option\_List  Room |
| Option\_List | 1..1 | Determines | 0..\* | Decorator\_Choice |

**(B)Attributes**

| Entity Name | Attributes | Description | Data Type & Length | Domain | default | Primary/  Alternate key | Multivalued  /Nulls | Derived |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| School | school\_name  school\_level | Name of school  Education Level this school provided | VARCHAR(20)  VARCHAR(10) | Name  Level |  | YES/YES  NO/NO | NO/NO  NO/NO | NO  NO |
| School\_District | district\_id  district\_name | Id of education district  Name of education district | NUMBER(10)  VARCHAR(50) | ID  Name |  | YES/YES  NO/YES | NO/NO  NO/YES | NO |
| Subdivision | sub\_id  sub\_ name  Sub\_map | Id of the land for built  Name of the land  Link of the map | NUMBER(10)  VARCHAR(20)  HTTPURI | ID  Name  Link |  | YES/YES  NO/YES  NO/YES | NO/NO  NO/YES  YES/YES | NO  NO  NO |
| House\_Style | style\_name  house\_style\_photo  base\_price  style\_desc  style\_size  floor\_plan\_link | Name of the Style  Link of photos  Basic Price  Description of the house style  Total size of the house  Link to floor plan | VARCHAR(20)  HTTPURI  NUMBER(10,2)  VARCHAR(200)  NUMBER(7,2)  HTTPURI | Name  Link  Price  Description  Size  Link |  | YES/YES  NO/YES  NO/NO  NO/NO  NO/NO  NO/NO | NO/NO  NO/YES  NO/NO  YES/YES  NO/YES  YES/YES | NO  NO  NO  NO  YES  NO |
| Lot | lot\_id  street  city  state\_zip  latitude  longitude | Id of the lot  Street address  City address  Zip code  Latitude  Longitude | NUMBER(10)  VARCHAR(30)  VARCHAR(20)  NUMBER(5)  NUMBER(7)  NUMBER(7) | ID  Street  City  Zip |  | YES/YES  NO/NO  NO/NO  NO/NO  NO/NO  NO/NO | NO/NO  NO/NO  NO/NO  NO/NO  NO/NO  NO/NO | NO  NO  NO  NO  NO  NO |
| Room | room\_id  room\_name  room\_size  floor  room\_desc window\_no  ceiling | ID of the room  Name of the room  Size of the room  Type of Floor  Description of the room  Number of the window  Type of the ceiling | NUMBER(10)  VARCHAR(50)  NUMBER(7,2)  NUMBER(2)  VARCHAR(200)  NUMBER(2)  VARCHAR(50) | ID  Name  Size  Description |  | NO/NO  NO/NO  NO/NO  NO/NO  NO/NO  NO/NO  NO/NO | YES/NO  NO/NO  NO/NO  NO/NO  NO/YES  NO/YES  NO/YES | NO  NO  NO  NO  NO  NO  NO |
| Elevation | elevation\_id  elevation\_desc  elevation\_cost | Id of the exterior  Description of the exterior  Cost of exterior | NUMBER(10)  VARCHAR(200)  NUMBER(10,2) | ID  Description  Price | Base design | NO/NO  NO/NO  NO/NO | NO/NO  YES/YES  NO/NO | NO  NO  NO |
| Chosen\_Style | style\_id  reversed\_style  Elevation\_chosen | Id of house style  Whether the actual house is built reversely to the style  Choice of the exterior | NUMBER(10)  CHAR(1)  NUMBER(10) | ID  ID |  | YES/YES  NO/NO  NO/NO | NO/NO  YES/NO  NO/NO | NO  NO  NO |
| Escrow | escrow\_id  escrow\_agent\_id  deposit\_amount  street  city  state\_zip | Id for the escrow  Id for the agent  Amount of deposit money  Bill address of the escrow | NUMBER(10)  NUMBER(10)  NUMBER(10,2)  VARCHAR(30)  VARCHAR(20)  NUMBER(5) | ID  ID  Price  Street  City  Zip |  | YES/YES  NO/NO  NO/NO  NO/NO  NO/NO  NO/NO | NO/NO  YES/NO  NO/NO  NO/YES  NO/YES  NO/YES | NO  NO  NO  NO  NO  NO |
| Sale | invoive\_id  lot\_premium  date\_sold  financing\_method  contract\_status | Id of the invoice  Money added on the base price  Date when the sale happened  Method for paying bill  Whether this contract is normal or not | NUMBER(10)  NUMBER(10,2)  DATE  VARCHAR(100)  VARCHAR(10) | ID  Price  Contract | current date  Valid | YES/YES  NO/NO  NO/NO  NO/NO  NO/NO | NO/NO  NO/NO  NO/NO  NO/NO  NO/NO | NO  YES  NO  NO  NO |
| Employee | employee\_id  employee\_fname  employee\_lname  title | Id of employee  Name of employee  Name of employee  Title of this employee | NUMBER(10)  VARCHAR(20)  VARCHAR(20)  VARCHAR(30) | ID  Name  Name  Title |  | YES/YES  NO/NO  NO/NO  NO/NO | NO/NO  NO/NO  NO/NO  YES/NO | NO  NO  NO  NO |
| Sales\_Representitive | liscense\_no | License of the representative | NUMBER(10) | ID |  | YES/YES | NO/NO | NO |
| Construction\_Manager | crew\_no | License Number of the manager | NUMBER(10) | ID |  | YES/YES | NO/NO | NO |
| Task | task\_id  task\_desc  task\_pct\_complete | Id of task  Description of the task  Complete percentage of the task | NUMBER(10)  VARCHAR(200)  NUMBER(5,2) | ID  Description  Percentage | 0 | NO/NO  NO/NO  NO/NO | NO/NO  YES/YES  NO/NO | NO  NO  NO |
| Construction\_Project | project\_id  start\_date  est\_completion\_date  current\_stage  percent\_pct\_complete  constuction\_photo | Id of the project  Start date  Estimated date of completion  The stage of the project now  Percent of completion  Link for the construction | NUMBER(10)  Date  Date  NUMBER(1)  NUMBER(5,2)  HTTPURI | ID  Stage  Percentage  Link | 1  0 | YES/YES  NO/NO  NO/NO  NO/NO  NO/NO  NO/YES | NO/NO  NO/NO  NO/YES  NO/NO  NO/NO  NO/YES | NO  NO  NO  NO  YES  NO |
| Customer | customer\_id  customer\_fname  customer\_lname  street  city  state\_zip | Id of the customer  Name of the customer  Name of the customer  address | NUMBER(10)  VARCHAR(20)  VARCHAR(20)  VARCHAR(30)  VARCHAR(20)  NUMBER(5) | ID  NAME  NAME  Street  City  Zip |  | YES/YES  NO/NO  NO/NO  NO/NO  NO/NO  NO/NO | NO/NO  NO/NO  NO/NO  NO/YES  NO/YES  NO/YES | NO  NO  NO  NO  NO  NO |
| Decorator\_Choice | dchoice\_id  choice\_selected\_date  Item\_quantity  current\_opt\_price | Id of the decoration choice  Date when selection is made  Quantity number of the item  Current price of the option | NUMBER(10)  DATE  NUMBER(3)  NUMBER(10,2) | ID  Price | current date | YES/YES  NO/NO  NO/NO  NO/NO | NO/NO  NO/NO  NO/NO  NO/NO | NO  NO  NO  NO |
| Option\_List | option\_id  stage\_no  style\_name  option\_desc  option\_cost  option\_category | Id for option chosen  Number of stage  Name of the style  Description of the option  Cost of the option  Category of the option | NUMBER(10)  NUMBER(1)  VARCHAR(20)  VARCHAR(200)  NUMBER(10,2)  VARCHAR(20) | ID  Stage  Name  Description  Price  Category | 1 | NO/NO  NO/NO  NO/NO  NO/NO  NO/NO  NO/NO | NO/NO  NO/NO  NO/NO  NO/YES  NO/NO  NO/NO | NO  NO  NO  NO  NO  NO |
| Bank | bank\_id  phone\_no  fax\_no  street  city  state\_zip | Id of the bank  Number of phone  Number of fax  Address of the bank  address | NUMBER(10)  NUMBER(10)  NUMBER(10)  VARCHAR(30)  VARCHAR(20)  NUMBER(5) | ID  Street  City  Zip |  | YES/YES  NO/NO  NO/NO  NO/NO  NO/NO  NO/NO | NO/NO  NO/NO  NO/NO  NO/YES  NO/NO  NO/YES | NO  NO  NO  NO  NO  NO |